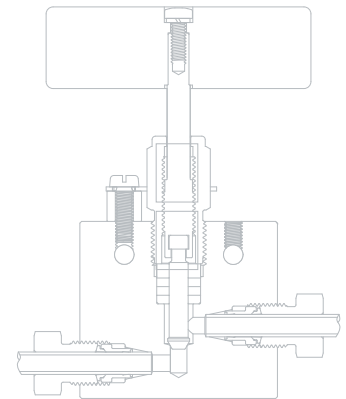
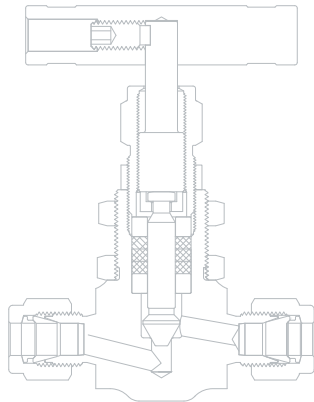
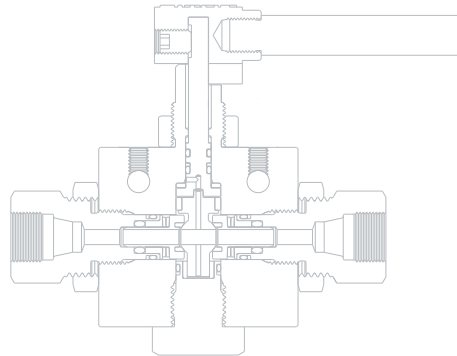
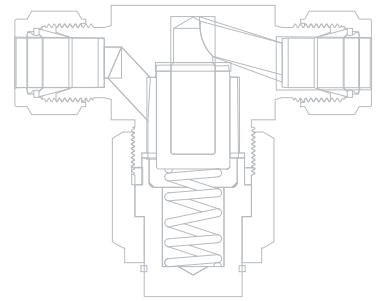
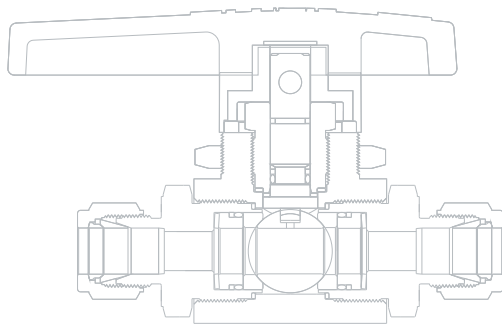
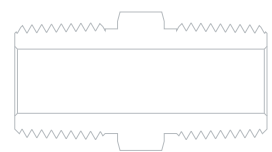
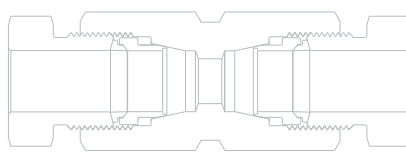
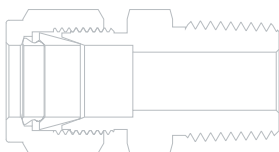




# FITOK

Full Technical Catalog  
For Hydrogen Application Products



**FITOK Full Technical Catalog**  
**For Hydrogen Application Products**

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# General Introduction

## Product Categories

Part Number with the **-HG** Suffix: Applicable for harsh hydrogen working conditions, offer excellent safety and reliability. Products are designed, manufactured, tested, and packaged to EC79 and HGV3.1 standards. A declaration of conformity or a third-party certification for EC79 or other relevant international standards can be provided. These products do not include the specific markings required by EC79 and HGV3.1.

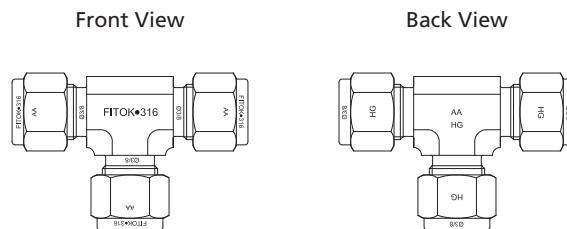
Part Number with the **-EC79** Suffix: Applicable for harsh hydrogen working conditions. Products are designed, manufactured, tested, marked, and packaged to the EC79 standard. A declaration of conformity or a third-party certification can be provided. The following products include the specific EC79 markings: 6D series tube fittings, 6P series pipe fittings, and 20D series tube fittings.

Part Number with the **-HGV** Suffix: Applicable for harsh hydrogen working conditions. Products are designed, manufactured, tested, marked, and packaged to the ANSI HGV 3.1-2015 standard. A declaration of conformity can be provided. These products include the specific markings required by HGV3.1.

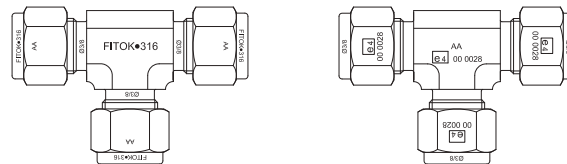
(For general hydrogen applications, select products with the standard FITOK part number, which are not covered in this catalog.)

## Product Markings

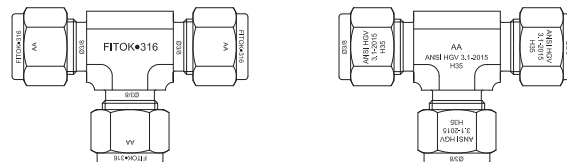
Part Number with the **-HG** Suffix



Part Number with the **-EC79** Suffix



Part Number with the **-HGV** Suffix



Note: "AA" refers to the 6-digit trace number of the product.

## Product Highlights

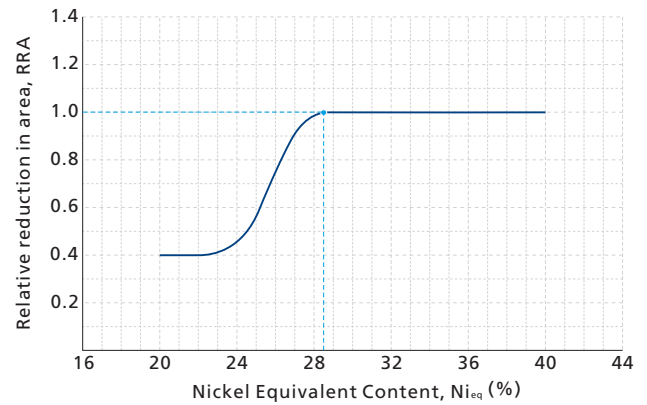
### Material

- Tailor-Made 316/316L Stainless Steel

Tailor-Made 316/316L stainless steel with nickel equivalent not less than 28.5% have excellent resistance to hydrogen embrittlement.

| Material                      | Composition, % |       |       | Ni <sub>eq</sub> % |
|-------------------------------|----------------|-------|-------|--------------------|
|                               | Ni             | Cr    | Mo    |                    |
| ASTM A479 316 SS              | 10-14          | 16-18 | 2-3   | >22.4              |
| FITOK Tailor-Made 316/316L SS | 12-14          | 17-18 | 2.6-3 | ≥28.5              |

Hirayama's equation:  $Ni_{eq} = 12.6C + 0.35Si + 1.05Mn + Ni + 0.65Cr + 0.98Mo$



RRA is a quantitative description of hydrogen embrittlement risk

- XM-19 Stainless Steel

XM-19 is a high strength austenitic stainless steel with excellent mechanical properties and resistance to hydrogen embrittlement. FITOK utilizes XM-19 for components requiring high mechanical strength, such as stems of medium pressure ball valves and lower stems of medium pressure needle valves.

- Low-Temperature FKM and EPDM

FKM and EPDM O-rings conform to EC79 standard, offering excellent performance in terms of hydrogen compatibility and low temperature (-40 °C).

### Working Pressure

Materials with higher mechanical properties offer higher working pressures across the same sizes. Most products are rated for working pressures up to 6,500 psig (450 bar).

### Testing and Leak Rate Standard

FITOK leak rate standard is significantly more stringent than those required by HGV 3.1 and EC79. Proportional sampling helium leak tests are conducted on valves, filters, quick-connects, and metal hoses. Each valve, filter, quick-connect, and metal hose is bubble tested using a helium-nitrogen gas mixture prior to shipment.

| Products                  | Leak Rate Standard                             |                                  |                                  |
|---------------------------|------------------------------------------------|----------------------------------|----------------------------------|
|                           | FITOK                                          | EC-79                            | HGV 3.1                          |
| Valves and Other Products | $\leq 1 \times 10^{-6} \text{ Ncm}^3/\text{s}$ | $\leq 10 \text{ Ncm}^3/\text{h}$ | $\leq 10 \text{ Ncm}^3/\text{h}$ |
|                           | 11.6 days/ $\text{Ncm}^3$                      | 6 minutes/ $\text{Ncm}^3$        | 6 minutes/ $\text{Ncm}^3$        |
| Tube Fittings             | $\leq 1 \times 10^{-9} \text{ Ncm}^3/\text{s}$ | $\leq 10 \text{ Ncm}^3/\text{h}$ | $\leq 10 \text{ Ncm}^3/\text{h}$ |
|                           | 32 years/ $\text{Ncm}^3$                       | 6 minutes/ $\text{Ncm}^3$        | 6 minutes/ $\text{Ncm}^3$        |

### Assembly

FITOK double ferrule fittings can be assembled by torque or by turns.

Assembly-by-torque can significantly enhance efficiency and quality, making it perfect for mass production.

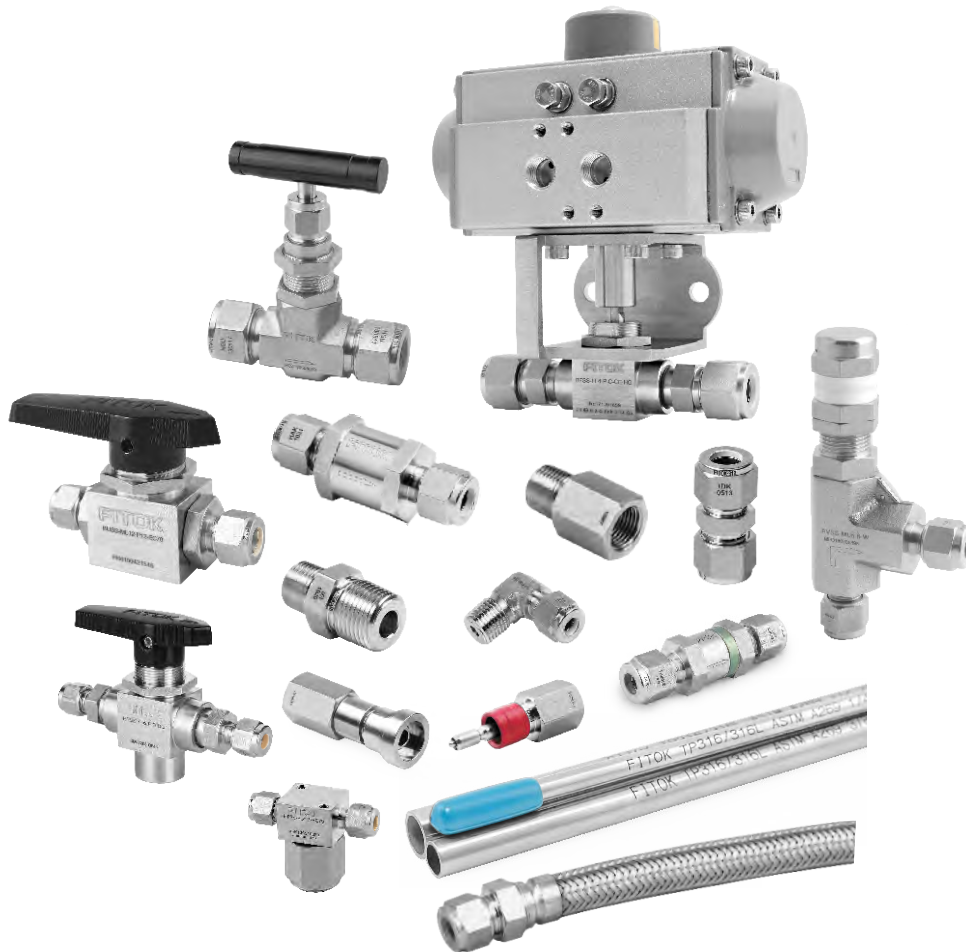


Assembly by Torque



Tool Kit

# Products with Working Pressures Up to 6,500 psig (450 bar)

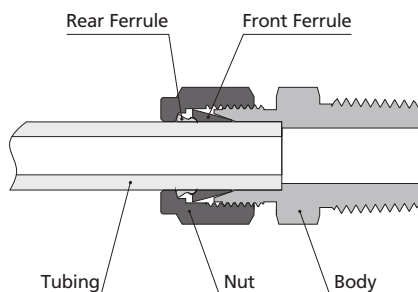


## 6D Series Tube Fittings



### Features

- ⦿ Allowable working pressure  $\geq 6,500$  psig (450 bar)
- ⦿ The slight axial movement of the front and rear ferrules along the outer wall of the tubing during installation reduces the requirement for dimensional accuracy in the tubing's length direction. This minimizes interference between adjacent fittings and enhances reliability
- ⦿ A minimum of 25 assembly and disassembly cycles while maintaining reliable sealing performance
- ⦿ 4 times safety factor
- ⦿ EC79 compliant FKM O-ring for reliable performance
- ⦿ Tube ends can be assembled by torque or turns
- ⦿ Tube ends with a helium leak rate  $\leq 1 \times 10^{-9}$  Ncm<sup>3</sup>/s



### Technical Data

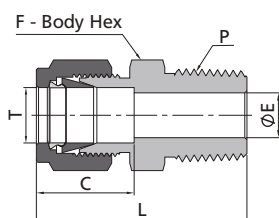
| Body Material       | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$                                                         |                                                  |                                                  |
|---------------------|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| Working Pressure    | Tube Ends                                                                                                             |                                                  |                                                  |
|                     | The maximum working pressure of the tube end is determined by the maximum working pressure of the tubing that is used |                                                  |                                                  |
|                     | NPT Threads                                                                                                           |                                                  |                                                  |
|                     | Thread Size                                                                                                           | Female, psig (bar)                               | Male, psig (bar)                                 |
|                     | 1/4                                                                                                                   | 6,600 (454)                                      | 8,000 (551)                                      |
|                     | 3/8                                                                                                                   | 6,500 (450)                                      | 7,800 (537)                                      |
|                     | 1/2                                                                                                                   | 6,500 (450)                                      | 7,700 (530)                                      |
|                     | 3/4                                                                                                                   | 6,500 (450)                                      | 7,300 (502)                                      |
|                     | SAE/MS Straight Threads                                                                                               |                                                  |                                                  |
|                     | Thread Size                                                                                                           | Light-duty (Female/Male Thread Ends), psig (bar) | Heavy-duty (Female/Male Thread Ends), psig (bar) |
|                     | 7/16-20                                                                                                               | 5,075 (350)                                      | 9,135 (630)                                      |
|                     | 1/2-20                                                                                                                | 5,075 (350)                                      | 9,135 (630)                                      |
|                     | 9/16-18                                                                                                               | 5,075 (350)                                      | 9,135 (630)                                      |
|                     | 3/4-16                                                                                                                | 4,567 (315)                                      | 9,135 (630)                                      |
| Working Temperature | -40~248 °F (-40~120 °C)                                                                                               |                                                  |                                                  |

### Matching Tubing and Installation Method

| Tubing Type                                       | Installation Method      | Recommended Index |
|---------------------------------------------------|--------------------------|-------------------|
| FITOK TMP and TCT Series Tubing                   | Assembly by Torque/Turns | Recommended       |
| ASTM A269/A213-Compliant Tubing from Other Brands |                          | Acceptable        |

## Ordering Information and Dimensions

### Male Connectors



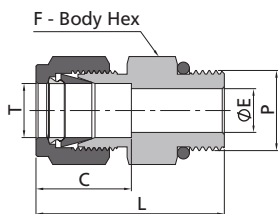
**Fractional Tube to NPT Thread**

| Basic Ordering Number | T-Tube O.D. (in.) | P-NPT Size | Dimensions, in. (mm) |             |             |             | Working Pressure psig (bar) |
|-----------------------|-------------------|------------|----------------------|-------------|-------------|-------------|-----------------------------|
|                       |                   |            | L                    | C           | E (min.)    | F           |                             |
| SS-CM-FL4-NS4-        | 1/4               | 1/4        | 1.49 (37.8)          | 0.60 (15.2) | 0.19 (4.8)  | 0.56 (14.3) | 8,000 (551)                 |
| SS-CM-FL4-NS6-        | 1/4               | 3/8        | 1.51 (38.4)          | 0.60 (15.2) | 0.19 (4.8)  | 0.69 (17.5) | 7,800 (537)                 |
| SS-CM-FL4-NS8-        | 1/4               | 1/2        | 1.76 (44.7)          | 0.60 (15.2) | 0.19 (4.8)  | 0.87 (22.2) | 7,700 (530)                 |
| SS-CM-FL6-NS4-        | 3/8               | 1/4        | 1.57 (39.9)          | 0.66 (16.8) | 0.28 (7.1)  | 0.63 (15.9) | 7,500 (517)                 |
| SS-CM-FL6-NS6-        | 3/8               | 3/8        | 1.57 (39.9)          | 0.66 (16.8) | 0.28 (7.1)  | 0.69 (17.5) | 7,500 (517)                 |
| SS-CM-FL6-NS8-        | 3/8               | 1/2        | 1.82 (46.2)          | 0.66 (16.8) | 0.28 (7.1)  | 0.87 (22.2) | 7,500 (517)                 |
| SS-CM-FL8-NS4-        | 1/2               | 1/4        | 1.71 (43.4)          | 0.90 (22.9) | 0.28 (7.1)  | 0.81 (20.6) | 6,700 (462)                 |
| SS-CM-FL8-NS6-        | 1/2               | 3/8        | 1.71 (43.4)          | 0.90 (22.9) | 0.38 (9.7)  | 0.81 (20.6) | 6,700 (462)                 |
| SS-CM-FL8-NS8-        | 1/2               | 1/2        | 1.93 (49.0)          | 0.90 (22.9) | 0.41 (10.4) | 0.87 (22.2) | 6,700 (462)                 |

**Metric Tube to NPT Thread**

| Basic Ordering Number | T-Tube O.D. (mm) | P-NPT Size | Dimensions, mm (in.) |             |            |             | Working Pressure psig (bar) |
|-----------------------|------------------|------------|----------------------|-------------|------------|-------------|-----------------------------|
|                       |                  |            | L                    | C           | E (min.)   | F           |                             |
| SS-CM-ML6-NS4-        | 6                | 1/4        | 37.9 (1.49)          | 15.3 (0.60) | 4.8 (0.19) | 14.0 (0.55) | 8,000 (551)                 |
| SS-CM-ML6-NS6-        | 6                | 3/8        | 38.4 (1.51)          | 15.3 (0.60) | 4.8 (0.19) | 18.0 (0.71) | 7,800 (537)                 |
| SS-CM-ML6-NS8-        | 6                | 1/2        | 44.7 (1.76)          | 15.3 (0.60) | 4.8 (0.19) | 22.0 (0.87) | 7,700 (530)                 |
| SS-CM-ML8-NS4-        | 8                | 1/4        | 38.7 (1.52)          | 16.2 (0.64) | 6.4 (0.25) | 15.0 (0.59) | 7,540 (520)                 |
| SS-CM-ML8-NS6-        | 8                | 3/8        | 39.3 (1.55)          | 16.2 (0.64) | 6.4 (0.25) | 18.0 (0.71) | 7,540 (520)                 |
| SS-CM-ML8-NS8-        | 8                | 1/2        | 45.6 (1.80)          | 16.2 (0.64) | 6.4 (0.25) | 22.0 (0.87) | 7,540 (520)                 |
| SS-CM-ML10-NS4-       | 10               | 1/4        | 40.9 (1.61)          | 17.2 (0.68) | 7.1 (0.28) | 18.0 (0.71) | 8,000 (551)                 |
| SS-CM-ML10-NS6-       | 10               | 3/8        | 40.9 (1.61)          | 17.2 (0.68) | 7.9 (0.31) | 18.0 (0.71) | 7,800 (537)                 |
| SS-CM-ML10-NS8-       | 10               | 1/2        | 46.5 (1.83)          | 17.2 (0.68) | 7.9 (0.31) | 22.0 (0.87) | 7,700 (530)                 |
| SS-CM-ML12-NS4-       | 12               | 1/4        | 43.4 (1.71)          | 22.8 (0.90) | 7.1 (0.28) | 22.0 (0.87) | 6,800 (470)                 |
| SS-CM-ML12-NS6-       | 12               | 3/8        | 43.4 (1.71)          | 22.8 (0.90) | 9.5 (0.37) | 22.0 (0.87) | 6,800 (470)                 |
| SS-CM-ML12-NS8-       | 12               | 1/2        | 49.0 (1.93)          | 22.8 (0.90) | 9.5 (0.37) | 22.0 (0.87) | 6,800 (470)                 |

### Male Connectors



Adapt to straight thread boss of SAE J1926-1, ISO 11926-1 and MS 16142.

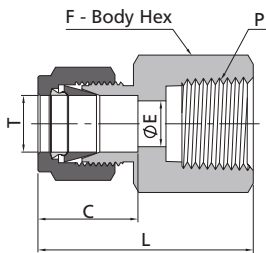
**Fractional Tube to SAE/MS Straight Thread**

| Basic Ordering Number | T-Tube O.D. (in.) | P-SAE/MS Thread Specification | Dimensions, in. (mm) |             |             |             | Working Pressure psig (bar) |
|-----------------------|-------------------|-------------------------------|----------------------|-------------|-------------|-------------|-----------------------------|
|                       |                   |                               | L                    | C           | E (min.)    | F           |                             |
| SS-CM-FL4-SH7-        | 1/4               | 7/16-20                       | 1.37 (34.8)          | 0.60 (15.2) | 0.18 (4.5)  | 0.56 (14.3) | 9,135 (630)                 |
| SS-CM-FL4-SH9-        | 1/4               | 9/16-18                       | 1.44 (36.6)          | 0.60 (15.2) | 0.30 (7.5)  | 0.69 (17.5) | 9,135 (630)                 |
| SS-CM-FL4-SH12-       | 1/4               | 3/4-16                        | 1.48 (37.6)          | 0.60 (15.2) | 0.19 (4.8)  | 0.87 (22.2) | 9,135 (630)                 |
| SS-CM-FL6-SH7-        | 3/8               | 7/16-20                       | 1.43 (36.3)          | 0.66 (16.8) | 0.18 (4.5)  | 0.56 (14.3) | 7,500 (517)                 |
| SS-CM-FL6-SH9-        | 3/8               | 9/16-18                       | 1.51 (38.3)          | 0.66 (16.8) | 0.28 (7.1)  | 0.69 (17.5) | 7,500 (517)                 |
| SS-CM-FL6-SH12-       | 3/8               | 3/4-16                        | 1.54 (39.1)          | 0.66 (16.8) | 0.28 (7.1)  | 0.87 (22.2) | 7,500 (517)                 |
| SS-CM-FL8-SH9-        | 1/2               | 9/16-18                       | 1.61 (40.9)          | 0.90 (22.9) | 0.30 (7.5)  | 0.81 (20.6) | 6,700 (462)                 |
| SS-CM-FL8-SH12-       | 1/2               | 3/4-16                        | 1.65 (41.9)          | 0.90 (22.9) | 0.41 (10.4) | 0.87 (22.2) | 6,700 (462)                 |

## Metric Tube to SAE/MS Straight Thread

| Basic Ordering Number | T-Tube O.D. (mm) | P-SAE/MS Thread Size | Dimensions, mm (in.) |             |            |             | Working Pressure psig (bar) |
|-----------------------|------------------|----------------------|----------------------|-------------|------------|-------------|-----------------------------|
|                       |                  |                      | L                    | C           | E (min.)   | F           |                             |
| SS-CM-ML6-SH7-        | 6                | 7/16-20              | 33.1 (1.30)          | 15.3 (0.60) | 4.8 (0.19) | 14.0 (0.55) | 9,135 (630)                 |
| SS-CM-ML6-SH9-        | 6                | 9/16-18              | 35.6 (1.40)          | 15.3 (0.60) | 4.8 (0.19) | 18.0 (0.71) | 9,135 (630)                 |
| SS-CM-ML8-SH7-        | 8                | 7/16-20              | 35.4 (1.39)          | 16.3 (0.64) | 5.1 (0.20) | 18.0 (0.71) | 7,500 (520)                 |
| SS-CM-ML8-SH9-        | 8                | 9/16-18              | 36.1 (1.42)          | 16.3 (0.64) | 6.4 (0.25) | 18.0 (0.71) | 7,500 (520)                 |
| SS-CM-ML10-SH7-       | 10               | 7/16-20              | 36.2 (1.43)          | 17.2 (0.68) | 5.1 (0.20) | 18.0 (0.71) | 8,400 (580)                 |
| SS-CM-ML10-SH9-       | 10               | 9/16-18              | 37.3 (1.47)          | 17.2 (0.68) | 7.1 (0.28) | 18.0 (0.71) | 8,400 (580)                 |
| SS-CM-ML10-SH12-      | 10               | 3/4-16               | 39.4 (1.55)          | 17.2 (0.68) | 7.9 (0.31) | 22.0 (0.87) | 8,400 (580)                 |
| SS-CM-ML12-SH7-       | 12               | 7/16-20              | 40.6 (1.60)          | 22.8 (0.90) | 5.2 (0.20) | 22.0 (0.87) | 6,800 (470)                 |
| SS-CM-ML12-SH9-       | 12               | 9/16-18              | 39.9 (1.57)          | 22.8 (0.90) | 7.1 (0.28) | 22.0 (0.87) | 6,800 (470)                 |
| SS-CM-ML12-SH12-      | 12               | 3/4-16               | 41.7 (1.64)          | 22.8 (0.90) | 9.5 (0.37) | 22.0 (0.87) | 6,800 (470)                 |

## Female Connectors



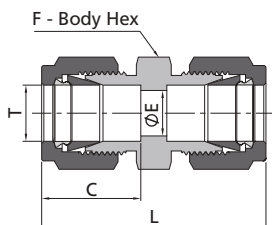
## Fractional Tube to NPT Thread

| Basic Ordering Number | T-Tube O.D. (in.) | P-NPT Size | Dimensions, in. (mm) |             |             |             | Working Pressure psig (bar) |
|-----------------------|-------------------|------------|----------------------|-------------|-------------|-------------|-----------------------------|
|                       |                   |            | L                    | C           | E           | F           |                             |
| SS-CF-FL4-NS4-        | 1/4               | 1/4        | 1.41 (35.8)          | 0.60 (15.2) | 0.19 (4.8)  | 0.75 (19.1) | 6,600 (454)                 |
| SS-CF-FL4-NS6-        | 1/4               | 3/8        | 1.48 (37.6)          | 0.60 (15.2) | 0.19 (4.8)  | 0.87 (22.2) | 6,500 (450)                 |
| SS-CF-FL4-NS8-        | 1/4               | 1/2        | 1.67 (42.4)          | 0.60 (15.2) | 0.19 (4.8)  | 1.06 (27.0) | 6,500 (450)                 |
| SS-CF-FL6-NS4-        | 3/8               | 1/4        | 1.48 (37.6)          | 0.66 (16.8) | 0.28 (7.1)  | 0.75 (19.1) | 6,600 (454)                 |
| SS-CF-FL6-NS6-        | 3/8               | 3/8        | 1.54 (39.1)          | 0.66 (16.8) | 1.34 (7.1)  | 0.88 (22.2) | 6,500 (450)                 |
| SS-CF-FL6-NS8-        | 3/8               | 1/2        | 1.73 (43.9)          | 0.66 (16.8) | 0.28 (7.1)  | 1.06 (27.0) | 6,500 (450)                 |
| SS-CF-FL8-NS4-        | 1/2               | 1/4        | 1.59 (40.4)          | 0.90 (22.9) | 0.41 (10.4) | 0.81 (20.6) | 6,600 (454)                 |
| SS-CF-FL8-NS6-        | 1/2               | 3/8        | 1.65 (41.9)          | 0.90 (22.9) | 0.41 (10.4) | 0.87 (22.2) | 6,500 (450)                 |
| SS-CF-FL8-NS8-        | 1/2               | 1/2        | 1.84 (46.7)          | 0.90 (22.9) | 0.41 (10.4) | 1.06 (27.0) | 6,500 (450)                 |

## Metric Tube to NPT Thread

| Basic Ordering Number | T-Tube O.D. (mm) | P-NPT Size | Dimensions, mm (in.) |             |            |             | Working Pressure psig (bar) |
|-----------------------|------------------|------------|----------------------|-------------|------------|-------------|-----------------------------|
|                       |                  |            | L                    | C           | E          | F           |                             |
| SS-CF-ML6-NS4-        | 6                | 1/4        | 35.8 (1.41)          | 15.3 (0.60) | 4.8 (0.19) | 19.0 (0.75) | 6,600 (454)                 |
| SS-CF-ML6-NS6-        | 6                | 3/8        | 37.7 (1.48)          | 15.3 (0.60) | 4.8 (0.19) | 22.0 (0.87) | 6,500 (450)                 |
| SS-CF-ML6-NS8-        | 6                | 1/2        | 42.5 (1.67)          | 15.3 (0.60) | 4.8 (0.19) | 27.0 (1.06) | 6,500 (450)                 |
| SS-CF-ML8-NS4-        | 8                | 1/4        | 37.0 (1.46)          | 16.2 (0.64) | 6.4 (0.25) | 19.0 (0.75) | 6,600 (454)                 |
| SS-CF-ML8-NS6-        | 8                | 3/8        | 38.5 (1.52)          | 16.2 (0.64) | 6.4 (0.25) | 22.0 (0.87) | 6,500 (450)                 |
| SS-CF-ML8-NS8-        | 8                | 1/2        | 43.3 (1.70)          | 16.2 (0.64) | 6.4 (0.25) | 27.0 (1.06) | 6,500 (450)                 |
| SS-CF-ML10-NS4-       | 10               | 1/4        | 37.8 (1.49)          | 17.2 (0.68) | 7.9 (0.31) | 19.0 (0.75) | 6,600 (454)                 |
| SS-CF-ML10-NS6-       | 10               | 3/8        | 39.4 (1.55)          | 17.2 (0.68) | 7.9 (0.31) | 22.0 (0.87) | 6,500 (450)                 |
| SS-CF-ML10-NS8-       | 10               | 1/2        | 44.2 (1.74)          | 17.2 (0.68) | 7.9 (0.31) | 27.0 (1.06) | 6,500 (450)                 |
| SS-CF-ML12-NS4-       | 12               | 1/4        | 40.3 (1.59)          | 22.8 (0.90) | 9.5 (0.37) | 22.0 (0.87) | 6,600 (454)                 |
| SS-CF-ML12-NS6-       | 12               | 3/8        | 41.9 (1.65)          | 22.8 (0.90) | 9.5 (0.37) | 22.0 (0.87) | 6,500 (450)                 |
| SS-CF-ML12-NS8-       | 12               | 1/2        | 46.7 (1.84)          | 22.8 (0.90) | 9.5 (0.37) | 27.0 (1.06) | 6,500 (450)                 |

## Unions



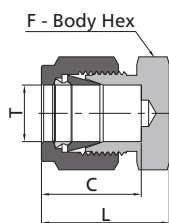
### Fractional Tube

| Basic Ordering Number | T-Tube O.D. (in.) | Dimensions, in. (mm) |             |             |             | Working Pressure psig (bar) |
|-----------------------|-------------------|----------------------|-------------|-------------|-------------|-----------------------------|
|                       |                   | L                    | C           | E           | F           |                             |
| SS-U-FL4-             | 1/4               | 1.61 (40.9)          | 0.60 (15.2) | 0.19 (4.8)  | 0.50 (12.7) | 10,200 (703)                |
| SS-U-FL6-             | 3/8               | 2.02 (51.3)          | 0.90 (22.9) | 0.41 (10.4) | 0.81 (20.6) | 7,500 (517)                 |
| SS-U-FL8-             | 1/2               | 2.11 (53.6)          | 0.96 (24.4) | 0.62 (15.7) | 1.06 (27.0) | 6,700 (462)                 |

### Metric Tube

| Basic Ordering Number | T-Tube O.D. (mm) | Dimensions, mm (in.) |             |            |             | Working Pressure psig (bar) |
|-----------------------|------------------|----------------------|-------------|------------|-------------|-----------------------------|
|                       |                  | L                    | C           | E          | F           |                             |
| SS-U-ML6-             | 6                | 41.0 (1.61)          | 15.3 (0.60) | 4.8 (0.19) | 14.0 (0.55) | 10,300 (710)                |
| SS-U-ML8-             | 8                | 43.2 (1.70)          | 16.2 (0.64) | 6.4 (0.25) | 15.0 (0.59) | 7,500 (520)                 |
| SS-U-ML10-            | 10               | 46.2 (1.82)          | 17.2 (0.68) | 7.9 (0.31) | 18.0 (0.71) | 8,400 (580)                 |
| SS-U-ML12-            | 12               | 51.2 (2.02)          | 22.8 (0.90) | 9.5 (0.37) | 22.0 (0.87) | 6,800 (470)                 |

## Caps



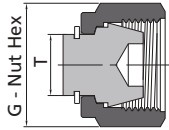
### Fractional Tube

| Basic Ordering Number | T-Tube O.D. (in.) | Dimensions, in. (mm) |             |             | Working Pressure psig (bar) |
|-----------------------|-------------------|----------------------|-------------|-------------|-----------------------------|
|                       |                   | L                    | C           | F           |                             |
| SS-TC-FL4-            | 1/4               | 0.92 (23.4)          | 0.60 (15.2) | 0.50 (12.7) | 10,200 (703)                |
| SS-TC-FL6-            | 3/8               | 1.01 (25.7)          | 0.66 (16.8) | 0.63 (15.9) | 7,500 (517)                 |
| SS-TC-FL8-            | 1/2               | 1.15 (29.2)          | 0.90 (22.9) | 0.81 (20.6) | 6,700 (462)                 |

### Metric Tube

| Basic Ordering Number | T-Tube O.D. (mm) | Dimensions, mm (in.) |             |             | Working Pressure psig (bar) |
|-----------------------|------------------|----------------------|-------------|-------------|-----------------------------|
|                       |                  | L                    | C           | F           |                             |
| SS-TC-ML6-            | 6                | 23.1 (0.91)          | 15.3 (0.60) | 14.0 (0.55) | 10,300 (710)                |
| SS-TC-ML8-            | 8                | 24.5 (0.96)          | 16.2 (0.64) | 15.0 (0.59) | 7,500 (520)                 |
| SS-TC-ML10-           | 10               | 26.6 (1.05)          | 17.2 (0.68) | 18.0 (0.71) | 8,400 (580)                 |
| SS-TC-ML12-           | 12               | 29.1 (1.15)          | 22.8 (0.90) | 22.0 (0.87) | 6,800 (470)                 |

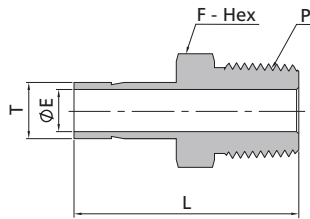
## Plugs



| Fractional Tube       |                   |                      |                             |
|-----------------------|-------------------|----------------------|-----------------------------|
| Basic Ordering Number | T-Tube O.D. (in.) | Dimensions, in. (mm) | Working Pressure psig (bar) |
|                       |                   | G                    |                             |
| SS-TP-FL4-            | 1/4               | 0.56 (14.3)          | 10,200 (703)                |
| SS-TP-FL6-            | 3/8               | 0.69 (17.5)          | 7,500 (517)                 |
| SS-TP-FL8-            | 1/2               | 0.87 (22.2)          | 6,700 (462)                 |

| Metric Tube           |                  |                      |                             |
|-----------------------|------------------|----------------------|-----------------------------|
| Basic Ordering Number | T-Tube O.D. (mm) | Dimensions, mm (in.) | Working Pressure psig (bar) |
|                       |                  | G                    |                             |
| SS-TP-ML6-            | 6                | 14.0 (0.55)          | 10,300 (710)                |
| SS-TP-ML8-            | 8                | 16.0 (0.63)          | 7,540 (520)                 |
| SS-TP-ML10-           | 10               | 19.0 (0.75)          | 8,400 (580)                 |
| SS-TP-ML12-           | 12               | 22.0 (0.87)          | 6,800 (470)                 |

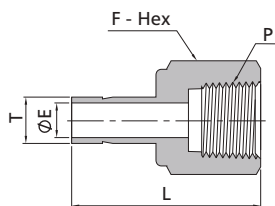
## Male Adapters



| Fractional Tube to NPT Thread |                         |               |                      |            |             |                                   |  |
|-------------------------------|-------------------------|---------------|----------------------|------------|-------------|-----------------------------------|--|
| Basic<br>Ordering<br>Number   | T-Tube<br>O.D.<br>(in.) | P-NPT<br>Size | Dimensions, in. (mm) |            |             | Working<br>Pressure<br>psig (bar) |  |
|                               |                         |               | L                    | E          | F           |                                   |  |
| SS-AM-FT4-NS4-                | 1/4                     | 1/4           | 1.46 (37.1)          | 0.17 (4.3) | 0.56 (14.3) | 8,000 (551)                       |  |
| SS-AM-FT4-NS6-                | 1/4                     | 3/8           | 1.49 (37.8)          | 0.17 (4.3) | 0.69 (17.5) | 7,800 (537)                       |  |
| SS-AM-FT4-NS8-                | 1/4                     | 1/2           | 1.71 (43.4)          | 0.17 (4.3) | 0.87 (22.2) | 7,700 (530)                       |  |
| SS-AM-FT6-NS4-                | 3/8                     | 1/4           | 1.53 (38.9)          | 0.27 (6.9) | 0.56 (14.3) | 7,500 (517)                       |  |
| SS-AM-FT6-NS6-                | 3/8                     | 3/8           | 1.56 (39.6)          | 0.27 (6.9) | 0.69 (17.5) | 7,500 (517)                       |  |
| SS-AM-FT6-NS8-                | 3/8                     | 1/2           | 1.78 (45.2)          | 0.27 (6.9) | 0.87 (22.2) | 7,500 (517)                       |  |
| SS-AM-FT8-NS4-                | 1/2                     | 1/4           | 1.75 (44.5)          | 0.28 (7.1) | 0.56 (14.3) | 6,700 (462)                       |  |
| SS-AM-FT8-NS6-                | 1/2                     | 3/8           | 1.78 (45.2)          | 0.37 (9.4) | 0.69 (17.5) | 6,700 (462)                       |  |
| SS-AM-FT8-NS8-                | 1/2                     | 1/2           | 2.00 (50.8)          | 0.37 (9.4) | 0.87 (22.2) | 6,700 (462)                       |  |

| Metric Tube to NPT Thread |                  |            |                      |            |             |                             |
|---------------------------|------------------|------------|----------------------|------------|-------------|-----------------------------|
| Basic Ordering Number     | T-Tube O.D. (mm) | P-NPT Size | Dimensions, mm (in.) |            |             | Working Pressure psig (bar) |
|                           |                  |            | L                    | E          | F           |                             |
| SS-AM-MT6-NS4-            | 6                | 1/4        | 38.1 (1.50)          | 4.1 (0.16) | 14.0 (0.55) | 8,000 (551)                 |
| SS-AM-MT6-NS6-            | 6                | 3/8        | 39.2 (1.54)          | 4.1 (0.16) | 18.0 (0.71) | 7,800 (537)                 |
| SS-AM-MT6-NS8-            | 6                | 1/2        | 42.1 (1.66)          | 4.1 (0.16) | 22.0 (0.87) | 7,700 (530)                 |
| SS-AM-MT8-NS4-            | 8                | 1/4        | 39.1 (1.54)          | 5.6 (0.22) | 14.0 (0.55) | 7,540 (520)                 |
| SS-AM-MT8-NS6-            | 8                | 3/8        | 39.9 (1.57)          | 5.6 (0.22) | 19.0 (0.75) | 7,540 (520)                 |
| SS-AM-MT10-NS4-           | 10               | 1/4        | 39.9 (1.57)          | 7.1 (0.28) | 14.0 (0.55) | 8,000 (551)                 |
| SS-AM-MT10-NS6-           | 10               | 3/8        | 40.6 (1.60)          | 7.1 (0.28) | 18.0 (0.71) | 7,800 (537)                 |
| SS-AM-MT10-NS8-           | 10               | 1/2        | 46.2 (1.82)          | 7.1 (0.28) | 22.0 (0.87) | 7,700 (530)                 |
| SS-AM-MT12-NS4-           | 12               | 1/4        | 46.5 (1.83)          | 7.1 (0.28) | 14.0 (0.55) | 6,800 (470)                 |
| SS-AM-MT12-NS6-           | 12               | 3/8        | 46.2 (1.82)          | 8.8 (0.35) | 18.0 (0.71) | 6,800 (470)                 |
| SS-AM-MT12-NS8-           | 12               | 1/2        | 52.1 (2.05)          | 8.8 (0.35) | 22.0 (0.87) | 6,800 (470)                 |

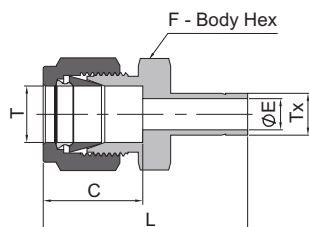
## Female Adapters



| Fractional Tube to NPT Thread |                   |            |                      |            |             |                             |
|-------------------------------|-------------------|------------|----------------------|------------|-------------|-----------------------------|
| Basic Ordering Number         | T-Tube O.D. (in.) | P-NPT Size | Dimensions, in. (mm) |            |             | Working Pressure psig (bar) |
|                               |                   |            | L                    | E          | F           |                             |
| SS-AF-FT4-NS4-                | 1/4               | 1/4        | 1.46 (37.1)          | 0.17 (4.3) | 0.75 (19.1) | 6,600 (454)                 |
| SS-AF-FT4-NS6-                | 1/4               | 3/8        | 1.55 (39.4)          | 0.17 (4.3) | 0.87 (22.2) | 6,500 (450)                 |
| SS-AF-FT4-NS8-                | 1/4               | 1/2        | 1.79 (45.5)          | 0.17 (4.3) | 1.06 (27.0) | 6,500 (450)                 |
| SS-AF-FT6-NS4-                | 3/8               | 1/4        | 1.50 (38.1)          | 0.27 (6.9) | 0.75 (19.1) | 6,600 (454)                 |
| SS-AF-FT6-NS6-                | 3/8               | 3/8        | 1.59 (40.4)          | 0.27 (6.9) | 0.87 (22.2) | 6,500 (450)                 |
| SS-AF-FT6-NS8-                | 3/8               | 1/2        | 1.84 (46.7)          | 0.27 (6.9) | 1.06 (27.0) | 6,500 (450)                 |
| SS-AF-FT8-NS4-                | 1/2               | 1/4        | 1.71 (43.4)          | 0.37 (9.4) | 0.75 (19.1) | 6,600 (454)                 |
| SS-AF-FT8-NS6-                | 1/2               | 3/8        | 1.79 (45.5)          | 0.37 (9.4) | 0.87 (22.2) | 6,500 (450)                 |
| SS-AF-FT8-NS8-                | 1/2               | 1/2        | 2.04 (51.8)          | 0.37 (9.4) | 1.06 (27.0) | 6,500 (450)                 |

| Metric Tube to NPT Thread |                  |            |                      |            |             |                             |
|---------------------------|------------------|------------|----------------------|------------|-------------|-----------------------------|
| Basic Ordering Number     | T-Tube O.D. (mm) | P-NPT Size | Dimensions, mm (in.) |            |             | Working Pressure psig (bar) |
|                           |                  |            | L                    | E          | F           |                             |
| SS-AF-MT6-NS4-            | 6                | 1/4        | 37.1 (1.46)          | 4.1 (0.16) | 19.0 (0.75) | 6,600 (454)                 |
| SS-AF-MT8-NS4-            | 8                | 1/4        | 37.6 (1.48)          | 5.6 (0.22) | 19.0 (0.75) | 6,600 (454)                 |
| SS-AF-MT8-NS6-            | 8                | 3/8        | 36.5 (1.44)          | 5.6 (0.22) | 22.0 (0.87) | 6,500 (450)                 |
| SS-AF-MT10-NS4-           | 10               | 1/4        | 38.1 (1.50)          | 7.1 (0.28) | 19.0 (0.75) | 6,600 (454)                 |
| SS-AF-MT10-NS6-           | 10               | 3/8        | 40.1 (1.58)          | 7.1 (0.28) | 22.0 (0.87) | 6,500 (450)                 |
| SS-AF-MT10-NS8-           | 10               | 1/2        | 46.5 (1.83)          | 7.1 (0.28) | 27.0 (1.06) | 6,500 (450)                 |
| SS-AF-MT12-NS4-           | 12               | 1/4        | 43.7 (1.72)          | 8.8 (0.35) | 19.0 (0.75) | 6,600 (454)                 |
| SS-AF-MT12-NS6-           | 12               | 3/8        | 42.9 (1.69)          | 8.8 (0.35) | 22.0 (0.87) | 6,500 (450)                 |
| SS-AF-MT12-NS8-           | 12               | 1/2        | 52.3 (2.06)          | 8.8 (0.35) | 27.0 (1.06) | 6,500 (450)                 |

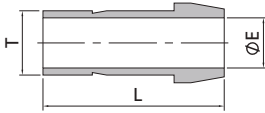
## Reducers



| Fractional Tube       |                   |                    |                      |             |            |             |                             |
|-----------------------|-------------------|--------------------|----------------------|-------------|------------|-------------|-----------------------------|
| Basic Ordering Number | T-Tube O.D. (in.) | Tx-Tube O.D. (in.) | Dimensions, in. (mm) |             |            |             | Working Pressure psig (bar) |
|                       |                   |                    | L                    | C           | E          | F           |                             |
| SS-R-FL4-FT4-         | 1/4               | 1/4                | 1.54 (39.1)          | 0.60 (15.2) | 0.17 (4.3) | 0.50 (12.7) | 10,200 (703)                |
| SS-R-FL4-FT6-         | 1/4               | 3/8                | 1.60 (40.6)          | 0.60 (15.2) | 0.19 (4.8) | 0.50 (12.7) | 7,500 (517)                 |
| SS-R-FL4-FT8-         | 1/4               | 1/2                | 1.82 (46.2)          | 0.60 (15.2) | 0.19 (4.8) | 0.56 (14.3) | 6,700 (462)                 |
| SS-R-FL6-FT4-         | 3/8               | 1/4                | 1.63 (41.4)          | 0.66 (16.8) | 0.17 (4.3) | 0.63 (15.9) | 7,500 (517)                 |
| SS-R-FL6-FT6-         | 3/8               | 3/8                | 1.70 (43.2)          | 0.66 (16.8) | 0.27 (6.9) | 0.63 (15.9) | 7,500 (517)                 |
| SS-R-FL6-FT8-         | 3/8               | 1/2                | 1.91 (48.5)          | 0.66 (16.8) | 0.28 (7.1) | 0.63 (15.9) | 6,700 (462)                 |
| SS-R-FL8-FT4-         | 1/2               | 1/4                | 1.77 (45.0)          | 0.90 (22.9) | 0.17 (4.3) | 0.81 (20.6) | 6,700 (462)                 |
| SS-R-FL8-FT6-         | 1/2               | 3/8                | 1.84 (46.7)          | 0.90 (22.9) | 0.27 (6.9) | 0.81 (20.6) | 6,700 (462)                 |
| SS-R-FL8-FT8-         | 1/2               | 1/2                | 2.06 (52.3)          | 0.90 (22.9) | 0.37 (9.4) | 0.81 (20.6) | 6,700 (462)                 |

| Metric Tube           |                  |                   |                      |             |            |             |                             |
|-----------------------|------------------|-------------------|----------------------|-------------|------------|-------------|-----------------------------|
| Basic Ordering Number | T-Tube O.D. (mm) | Tx-Tube O.D. (mm) | Dimensions, mm (in.) |             |            |             | Working Pressure psig (bar) |
|                       |                  |                   | L                    | C           | E          | F           |                             |
| SS-R-ML6-MT8-         | 6                | 8                 | 39.9 (1.57)          | 15.3 (0.60) | 4.8 (0.19) | 14.0 (0.55) | 7,540 (520)                 |
| SS-R-ML6-MT10-        | 6                | 10                | 40.7 (1.60)          | 15.3 (0.60) | 4.8 (0.19) | 14.0 (0.55) | 8,400 (580)                 |
| SS-R-ML6-MT12-        | 6                | 12                | 46.3 (1.82)          | 15.3 (0.60) | 4.8 (0.19) | 14.0 (0.55) | 6,800 (470)                 |
| SS-R-ML8-MT6-         | 8                | 6                 | 40.3 (1.59)          | 16.2 (0.64) | 4.1 (0.16) | 15.0 (0.59) | 7,540 (520)                 |
| SS-R-ML8-MT10-        | 8                | 10                | 42.0 (1.65)          | 16.2 (0.64) | 6.4 (0.25) | 15.0 (0.59) | 7,540 (520)                 |
| SS-R-ML8-MT12-        | 8                | 12                | 47.6 (1.87)          | 16.2 (0.64) | 6.4 (0.25) | 15.0 (0.59) | 6,800 (470)                 |
| SS-R-ML10-MT6-        | 10               | 6                 | 42.4 (1.67)          | 17.2 (0.68) | 4.1 (0.16) | 18.0 (0.71) | 8,400 (580)                 |
| SS-R-ML10-MT8-        | 10               | 8                 | 43.4 (1.71)          | 17.2 (0.68) | 5.6 (0.22) | 18.0 (0.71) | 7,540 (520)                 |
| SS-R-ML10-MT12-       | 10               | 12                | 49.8 (1.96)          | 17.2 (0.68) | 7.9 (0.31) | 18.0 (0.71) | 6,800 (470)                 |
| SS-R-ML12-MT6-        | 12               | 6                 | 44.9 (1.77)          | 22.8 (0.90) | 4.1 (0.16) | 22.0 (0.87) | 6,800 (470)                 |
| SS-R-ML12-MT8-        | 12               | 8                 | 45.9 (1.81)          | 22.8 (0.90) | 5.6 (0.22) | 22.0 (0.87) | 6,800 (470)                 |
| SS-R-ML12-MT10-       | 12               | 10                | 46.7 (1.84)          | 22.8 (0.90) | 7.1 (0.28) | 22.0 (0.87) | 6,800 (470)                 |

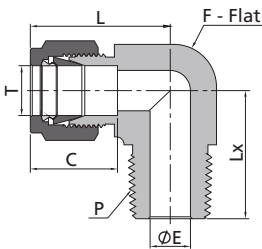
## Port Connectors



| Fractional Tube       |                   |                      |            |                             |
|-----------------------|-------------------|----------------------|------------|-----------------------------|
| Basic Ordering Number | T-Tube O.D. (in.) | Dimensions, in. (mm) |            | Working Pressure psig (bar) |
|                       |                   | L                    | E          |                             |
| SS-P-FL4-             | 1/4               | 0.97 (24.6)          | 0.17 (4.3) | 10,200 (703)                |
| SS-P-FL6-             | 3/8               | 1.03 (26.2)          | 0.27 (6.9) | 7,500 (517)                 |
| SS-P-FL8-             | 1/2               | 1.41 (35.8)          | 0.37 (9.4) | 6,700 (462)                 |

| Metric Tube           |                  |                      |            |                             |
|-----------------------|------------------|----------------------|------------|-----------------------------|
| Basic Ordering Number | T-Tube O.D. (mm) | Dimensions, mm (in.) |            | Working Pressure psig (bar) |
|                       |                  | L                    | E          |                             |
| SS-P-ML6-             | 6                | 24.6 (0.97)          | 4.1 (0.16) | 10,230 (710)                |
| SS-P-ML8-             | 8                | 25.9 (1.02)          | 5.6 (0.22) | 7,540 (520)                 |
| SS-P-ML10-            | 10               | 26.1 (1.03)          | 7.1 (0.28) | 8,400 (580)                 |
| SS-P-ML12-            | 12               | 35.8 (1.41)          | 8.8 (0.35) | 6,800 (470)                 |

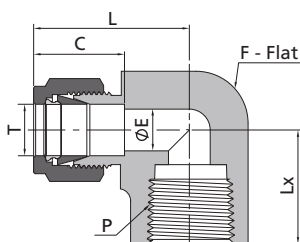
## Male Elbows



| Fractional Tube to NPT Thread |                   |            |                      |             |             |             |             |                             |
|-------------------------------|-------------------|------------|----------------------|-------------|-------------|-------------|-------------|-----------------------------|
| Basic Ordering Number         | T-Tube O.D. (in.) | P-NPT Size | Dimensions, in. (mm) |             |             |             |             | Working Pressure psig (bar) |
|                               |                   |            | L                    | C           | E           | F           | Lx          |                             |
| SS-LM-FL4-NS4-                | 1/4               | 1/4        | 1.06 (26.9)          | 0.60 (15.2) | 0.19 (4.8)  | 0.50 (12.7) | 0.92 (23.4) | 8,000 (551)                 |
| SS-LM-FL4-NS6-                | 1/4               | 3/8        | 1.17 (29.7)          | 0.60 (15.2) | 0.19 (4.8)  | 0.69 (17.5) | 1.03 (26.2) | 7,800 (537)                 |
| SS-LM-FL4-NS8-                | 1/4               | 1/2        | 1.25 (31.8)          | 0.60 (15.2) | 0.19 (4.8)  | 0.81 (20.6) | 1.30 (33.0) | 7,700 (530)                 |
| SS-LM-FL6-NS4-                | 3/8               | 1/4        | 1.20 (30.5)          | 0.66 (16.8) | 0.28 (7.1)  | 0.63 (15.9) | 1.00 (25.4) | 7,500 (517)                 |
| SS-LM-FL6-NS6-                | 3/8               | 3/8        | 1.23 (31.2)          | 0.66 (16.8) | 0.28 (7.1)  | 0.69 (17.5) | 1.03 (26.2) | 7,500 (517)                 |
| SS-LM-FL6-NS8-                | 3/8               | 1/2        | 1.31 (33.3)          | 0.66 (16.8) | 0.28 (7.1)  | 0.81 (20.6) | 1.30 (33.0) | 7,500 (517)                 |
| SS-LM-FL8-NS4-                | 1/2               | 1/4        | 1.42 (36.1)          | 0.90 (22.9) | 0.28 (7.1)  | 0.81 (20.6) | 1.11 (28.2) | 6,700 (462)                 |
| SS-LM-FL8-NS6-                | 1/2               | 3/8        | 1.42 (36.1)          | 0.90 (22.9) | 0.38 (9.7)  | 0.81 (20.6) | 1.11 (28.2) | 6,700 (462)                 |
| SS-LM-FL8-NS8-                | 1/2               | 1/2        | 1.42 (36.1)          | 0.90 (22.9) | 0.41 (10.4) | 0.81 (20.6) | 1.30 (33.0) | 6,700 (462)                 |

| Metric Tube to NPT Thread |                  |            |                      |             |            |             |             |                             |
|---------------------------|------------------|------------|----------------------|-------------|------------|-------------|-------------|-----------------------------|
| Basic Ordering Number     | T-Tube O.D. (mm) | P-NPT Size | Dimensions, mm (in.) |             |            |             |             | Working Pressure psig (bar) |
|                           |                  |            | L                    | C           | E          | F           | Lx          |                             |
| SS-LM-ML6-NS4-            | 6                | 1/4        | 27.0 (1.06)          | 15.3 (0.60) | 4.8 (0.19) | 12.7 (0.50) | 23.4 (0.92) | 8,000 (551)                 |
| SS-LM-ML6-NS6-            | 6                | 3/8        | 29.8 (1.17)          | 15.3 (0.60) | 4.8 (0.19) | 17.5 (0.69) | 26.2 (1.03) | 7,800 (537)                 |
| SS-LM-ML6-NS8-            | 6                | 1/2        | 31.8 (1.25)          | 15.3 (0.60) | 4.8 (0.19) | 20.6 (0.81) | 33.0 (1.30) | 7,700 (530)                 |
| SS-LM-ML8-NS4-            | 8                | 1/4        | 28.8 (1.13)          | 16.2 (0.64) | 6.4 (0.25) | 14.3 (0.56) | 24.4 (0.96) | 7,540 (520)                 |
| SS-LM-ML8-NS6-            | 8                | 3/8        | 30.6 (1.20)          | 16.2 (0.64) | 6.4 (0.25) | 17.5 (0.69) | 26.2 (1.03) | 7,540 (520)                 |
| SS-LM-ML8-NS8-            | 8                | 1/2        | 32.6 (1.28)          | 16.2 (0.64) | 6.4 (0.25) | 20.6 (0.81) | 33.0 (1.30) | 7,540 (520)                 |
| SS-LM-ML10-NS4-           | 10               | 1/4        | 31.5 (1.24)          | 17.2 (0.68) | 7.1 (0.28) | 17.5 (0.69) | 26.2 (1.03) | 8,000 (551)                 |
| SS-LM-ML10-NS6-           | 10               | 3/8        | 31.5 (1.24)          | 17.2 (0.68) | 7.9 (0.31) | 17.5 (0.69) | 26.2 (1.03) | 7,800 (537)                 |
| SS-LM-ML10-NS8-           | 10               | 1/2        | 33.5 (1.32)          | 17.2 (0.68) | 7.9 (0.31) | 20.6 (0.81) | 33.0 (1.30) | 7,700 (530)                 |
| SS-LM-ML12-NS4-           | 12               | 1/4        | 36.0 (1.42)          | 22.8 (0.90) | 7.1 (0.28) | 20.6 (0.81) | 28.2 (1.11) | 6,800 (470)                 |
| SS-LM-ML12-NS6-           | 12               | 3/8        | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 28.2 (1.11) | 6,800 (470)                 |
| SS-LM-ML12-NS8-           | 12               | 1/2        | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 33.0 (1.30) | 6,800 (470)                 |
| SS-LM-ML12-NS12-          | 12               | 3/4        | 39.8 (1.57)          | 22.8 (0.90) | 9.5 (0.37) | 27.0 (1.06) | 36.8 (1.45) | 6,800 (470)                 |

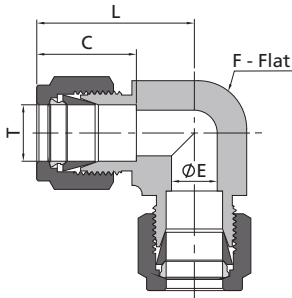
## Female Elbows



| Fractional Tube to NPT Thread |                   |            |                      |             |             |             |             |                             |
|-------------------------------|-------------------|------------|----------------------|-------------|-------------|-------------|-------------|-----------------------------|
| Basic Ordering Number         | T-Tube O.D. (in.) | P-NPT Size | Dimensions, in. (mm) |             |             |             |             | Working Pressure psig (bar) |
|                               |                   |            | L                    | C           | E           | F           | Lx          |                             |
| SS-LF-FL4-NS4-                | 1/4               | 1/4        | 1.24 (31.6)          | 0.60 (15.2) | 0.19 (4.8)  | 0.81 (20.6) | 0.88 (22.4) | 6,600 (454)                 |
| SS-LF-FL4-NS6-                | 1/4               | 3/8        | 1.33 (33.7)          | 0.60 (15.2) | 0.19 (4.8)  | 0.94 (23.8) | 1.36 (34.6) | 6,500 (450)                 |
| SS-LF-FL4-NS8-                | 1/4               | 1/2        | 1.39 (35.3)          | 0.60 (15.2) | 0.19 (4.8)  | 1.06 (27.0) | 1.70 (43.2) | 6,500 (450)                 |
| SS-LF-FL6-NS4-                | 3/8               | 1/4        | 1.31 (33.3)          | 0.66 (16.8) | 0.28 (7.1)  | 0.81 (20.6) | 0.88 (22.4) | 6,600 (454)                 |
| SS-LF-FL6-NS6-                | 3/8               | 3/8        | 1.40 (35.6)          | 0.66 (16.8) | 0.28 (7.1)  | 0.94 (23.8) | 1.36 (34.6) | 6,500 (450)                 |
| SS-LF-FL6-NS8-                | 3/8               | 1/2        | 1.46 (37.1)          | 0.66 (16.8) | 0.28 (7.1)  | 1.06 (27.0) | 1.70 (43.2) | 6,500 (450)                 |
| SS-LF-FL8-NS4-                | 1/2               | 1/4        | 1.42 (36.1)          | 0.90 (22.9) | 0.41 (10.4) | 0.81 (20.6) | 0.88 (22.4) | 6,600 (454)                 |
| SS-LF-FL8-NS6-                | 1/2               | 3/8        | 1.49 (37.9)          | 0.90 (22.9) | 0.41 (10.4) | 0.94 (23.8) | 1.36 (34.6) | 6,500 (450)                 |
| SS-LF-FL8-NS8-                | 1/2               | 1/2        | 1.57 (39.9)          | 0.90 (22.9) | 0.41 (10.4) | 1.06 (27.0) | 1.70 (43.2) | 6,500 (450)                 |

| Metric Tube to NPT Thread |                  |            |                      |             |            |             |             |                             |
|---------------------------|------------------|------------|----------------------|-------------|------------|-------------|-------------|-----------------------------|
| Basic Ordering Number     | T-Tube O.D. (mm) | P-NPT Size | Dimensions, mm (in.) |             |            |             |             | Working Pressure psig (bar) |
|                           |                  |            | L                    | C           | E          | F           | Lx          |                             |
| SS-LF-ML6-NS4-            | 6                | 1/4        | 32.1 (1.26)          | 15.3 (0.60) | 4.8 (0.19) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-LF-ML8-NS4-            | 8                | 1/4        | 32.7 (1.29)          | 16.2 (0.64) | 6.4 (0.25) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-LF-ML10-NS4-           | 10               | 1/4        | 33.5 (1.32)          | 17.2 (0.68) | 7.9 (0.31) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-LF-ML10-NS6-           | 10               | 3/8        | 35.6 (1.40)          | 17.2 (0.68) | 7.9 (0.31) | 23.8 (0.94) | 34.6 (1.36) | 6,500 (450)                 |
| SS-LF-ML10-NS8-           | 10               | 1/2        | 37.4 (1.47)          | 17.2 (0.68) | 7.9 (0.31) | 27.0 (1.06) | 43.2 (1.70) | 6,500 (450)                 |
| SS-LF-ML12-NS4-           | 12               | 1/4        | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-LF-ML12-NS6-           | 12               | 3/8        | 38.1 (1.50)          | 22.8 (0.90) | 9.5 (0.37) | 23.8 (0.94) | 34.6 (1.36) | 6,500 (450)                 |
| SS-LF-ML12-NS8-           | 12               | 1/2        | 39.9 (1.57)          | 22.8 (0.90) | 9.5 (0.37) | 27.0 (1.06) | 43.2 (1.70) | 6,500 (450)                 |

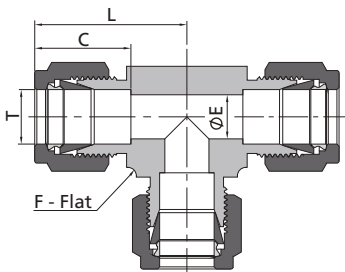
## Union Elbows



| Fractional Tube       |                   |                      |             |             |             |                             |
|-----------------------|-------------------|----------------------|-------------|-------------|-------------|-----------------------------|
| Basic Ordering Number | T-Tube O.D. (in.) | Dimensions, in. (mm) |             |             |             | Working Pressure psig (bar) |
|                       |                   | L                    | C           | E           | F           |                             |
| SS-LU-FL4-            | 1/4               | 1.06 (26.9)          | 0.60 (15.2) | 0.19 (4.8)  | 0.50 (12.7) | 10,200 (703)                |
| SS-LU-FL6-            | 3/8               | 1.20 (30.5)          | 0.66 (16.8) | 0.28 (7.1)  | 0.63 (15.9) | 7,500 (517)                 |
| SS-LU-FL8-            | 1/2               | 1.42 (36.1)          | 0.90 (22.9) | 0.41 (10.4) | 0.81 (20.6) | 6,700 (462)                 |

| Metric Tube           |                  |                      |             |            |             |                             |
|-----------------------|------------------|----------------------|-------------|------------|-------------|-----------------------------|
| Basic Ordering Number | T-Tube O.D. (mm) | Dimensions, mm (in.) |             |            |             | Working Pressure psig (bar) |
|                       |                  | L                    | C           | E          | F           |                             |
| SS-LU-ML6-            | 6                | 27.0 (1.06)          | 15.3 (0.60) | 4.8 (0.19) | 12.7 (0.50) | 10,300 (710)                |
| SS-LU-ML8-            | 8                | 28.8 (1.13)          | 16.2 (0.64) | 6.4 (0.25) | 14.3 (0.56) | 7,540 (520)                 |
| SS-LU-ML10-           | 10               | 31.5 (1.24)          | 17.2 (0.68) | 7.9 (0.31) | 17.5 (0.69) | 8,400 (580)                 |
| SS-LU-ML12-           | 12               | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 6,800 (470)                 |

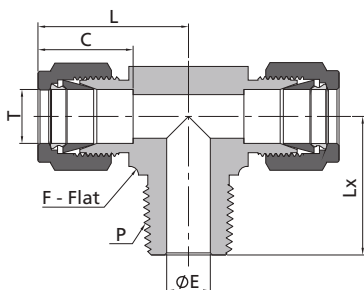
## Union Tees



| Fractional Tube       |                   |                      |             |             |             |                             |
|-----------------------|-------------------|----------------------|-------------|-------------|-------------|-----------------------------|
| Basic Ordering Number | T-Tube O.D. (in.) | Dimensions, in. (mm) |             |             |             | Working Pressure psig (bar) |
|                       |                   | L                    | C           | E           | F           |                             |
| SS-TTT-FL4-           | 1/4               | 1.06 (26.9)          | 0.60 (15.2) | 0.19 (4.8)  | 0.50 (12.7) | 10,200 (703)                |
| SS-TTT-FL6-           | 3/8               | 1.20 (30.5)          | 0.66 (16.8) | 0.28 (7.1)  | 0.63 (15.9) | 7,500 (517)                 |
| SS-TTT-FL8-           | 1/2               | 1.42 (36.1)          | 0.90 (22.9) | 0.41 (10.4) | 0.81 (20.6) | 6,700 (462)                 |

| Metric Tube           |                  |                      |             |            |             |                             |
|-----------------------|------------------|----------------------|-------------|------------|-------------|-----------------------------|
| Basic Ordering Number | T-Tube O.D. (mm) | Dimensions, mm (in.) |             |            |             | Working Pressure psig (bar) |
|                       |                  | L                    | C           | E          | F           |                             |
| SS-TTT-ML6-           | 6                | 27.0 (1.06)          | 15.3 (0.60) | 4.8 (0.19) | 12.7 (0.50) | 10,300 (710)                |
| SS-TTT-ML8-           | 8                | 29.9 (1.18)          | 16.2 (0.64) | 6.4 (0.25) | 15.9 (0.63) | 7,540 (520)                 |
| SS-TTT-ML10-          | 10               | 31.5 (1.24)          | 17.2 (0.68) | 7.9 (0.31) | 17.5 (0.69) | 8,400 (580)                 |
| SS-TTT-ML12-          | 12               | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 6,800 (470)                 |

## Male Branch Tees

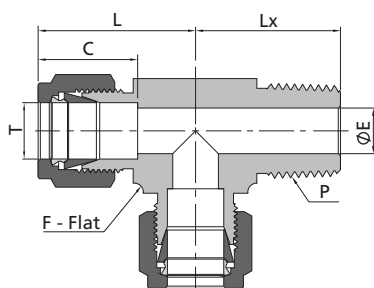


| Fractional Tube to NPT Thread |                   |            |                      |             |            |             |             |                             |
|-------------------------------|-------------------|------------|----------------------|-------------|------------|-------------|-------------|-----------------------------|
| Basic Ordering Number         | T-Tube O.D. (in.) | P-NPT Size | Dimensions, in. (mm) |             |            |             |             | Working Pressure psig (bar) |
|                               |                   |            | L                    | C           | E (min.)   | F           | Lx          |                             |
| SS-TTM-FL4-NS4-               | 1/4               | 1/4        | 1.06 (26.9)          | 0.60 (15.2) | 0.19 (4.8) | 0.50 (12.7) | 0.92 (23.4) | 8,000 (551)                 |
| SS-TTM-FL6-NS4-               | 3/8               | 1/4        | 1.20 (30.5)          | 0.66 (16.8) | 0.28 (7.1) | 0.63 (15.9) | 1.00 (25.4) | 7,500 (517)                 |
| SS-TTM-FL6-NS6-               | 3/8               | 3/8        | 1.31 (33.3)          | 0.66 (16.8) | 0.28 (7.1) | 0.81 (20.6) | 1.11 (28.2) | 7,500 (517)                 |

Metric Tube to NPT Thread

| Basic Ordering Number | T-Tube O.D. (mm) | P-NPT Size | Dimensions, mm (in.) |             |            |             |             | Working Pressure psig (bar) |
|-----------------------|------------------|------------|----------------------|-------------|------------|-------------|-------------|-----------------------------|
|                       |                  |            | L                    | C           | E (min.)   | F           | Lx          |                             |
| SS-TTM-ML6-NS4-       | 6                | 1/4        | 27.0 (1.06)          | 15.3 (0.60) | 4.8 (0.19) | 12.7 (0.50) | 23.4 (0.92) | 8,000 (551)                 |
| SS-TTM-ML8-NS4-       | 8                | 1/4        | 29.9 (1.18)          | 16.2 (0.64) | 6.4 (0.25) | 15.9 (0.63) | 25.4 (1.00) | 7,540 (520)                 |
| SS-TTM-ML10-NS4-      | 10               | 1/4        | 33.5 (1.32)          | 17.2 (0.68) | 7.1 (0.28) | 20.6 (0.81) | 28.2 (1.11) | 8,000 (551)                 |
| SS-TTM-ML10-NS6-      | 10               | 3/8        | 33.5 (1.32)          | 17.2 (0.68) | 7.9 (0.31) | 20.6 (0.81) | 28.2 (1.11) | 7,800 (537)                 |
| SS-TTM-ML12-NS4-      | 12               | 1/4        | 36.0 (1.42)          | 22.8 (0.90) | 7.1 (0.28) | 20.6 (0.81) | 28.2 (1.11) | 6,800 (470)                 |
| SS-TTM-ML12-NS6-      | 12               | 3/8        | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 28.2 (1.11) | 6,800 (470)                 |
| SS-TTM-ML12-NS8-      | 12               | 1/2        | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 33.0 (1.30) | 6,800 (470)                 |

## Male Run Tees



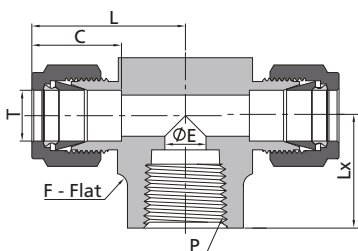
Fractional Tube to NPT Thread

| Basic Ordering Number | T-Tube O.D. (in.) | P-NPT Size | Dimensions, in. (mm) |             |            |             |             | Working Pressure psig (bar) |
|-----------------------|-------------------|------------|----------------------|-------------|------------|-------------|-------------|-----------------------------|
|                       |                   |            | L                    | C           | E (min.)   | F           | Lx          |                             |
| SS-TMT-FL4-NS4-       | 1/4               | 1/4        | 1.06 (26.9)          | 0.60 (15.2) | 0.19 (4.8) | 0.50 (12.7) | 0.92 (23.4) | 8,000 (551)                 |
| SS-TMT-FL6-NS4-       | 3/8               | 1/4        | 1.20 (30.5)          | 0.66 (16.8) | 0.28 (7.1) | 0.63 (15.9) | 1.00 (25.4) | 7,500 (517)                 |
| SS-TMT-FL6-NS6-       | 3/8               | 3/8        | 1.31 (33.3)          | 0.66 (16.8) | 0.28 (7.1) | 0.81 (20.6) | 1.11 (28.2) | 7,500 (517)                 |

Metric Tube to NPT Thread

| Basic Ordering Number | T-Tube O.D. (mm) | P-NPT Size | Dimensions, mm (in.) |             |            |             |             | Working Pressure psig (bar) |
|-----------------------|------------------|------------|----------------------|-------------|------------|-------------|-------------|-----------------------------|
|                       |                  |            | L                    | C           | E (min.)   | F           | Lx          |                             |
| SS-TMT-ML6-NS4-       | 6                | 1/4        | 27.0 (1.06)          | 15.3 (0.60) | 4.8 (0.19) | 12.7 (0.50) | 23.4 (0.92) | 8,000 (551)                 |
| SS-TMT-ML8-NS4-       | 8                | 1/4        | 29.9 (1.18)          | 16.2 (0.64) | 6.4 (0.25) | 15.9 (0.63) | 25.4 (1.00) | 7,540 (520)                 |
| SS-TMT-ML10-NS4-      | 10               | 1/4        | 33.5 (1.32)          | 17.2 (0.68) | 7.1 (0.28) | 20.6 (0.81) | 28.2 (1.11) | 8,000 (551)                 |
| SS-TMT-ML10-NS6-      | 10               | 3/8        | 33.5 (1.32)          | 17.2 (0.68) | 7.1 (0.28) | 20.6 (0.81) | 28.2 (1.11) | 7,800 (537)                 |
| SS-TMT-ML12-NS4-      | 12               | 1/4        | 36.0 (1.42)          | 22.8 (0.90) | 7.1 (0.28) | 20.6 (0.81) | 28.2 (1.11) | 6,800 (470)                 |
| SS-TMT-ML12-NS6-      | 12               | 3/8        | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 28.2 (1.11) | 6,800 (470)                 |
| SS-TMT-ML12-NS8-      | 12               | 1/2        | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 33.0 (1.30) | 6,800 (470)                 |

## Female Branch Tees



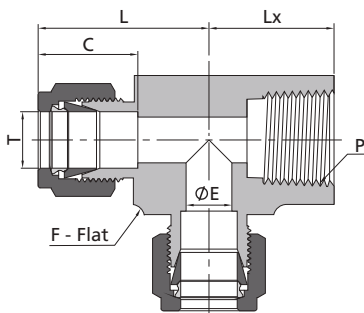
Fractional Tube to NPT Thread

| Basic Ordering Number | T-Tube O.D. (in.) | P-NPT Size | Dimensions, in. (mm) |             |            |             |             | Working Pressure psig (bar) |
|-----------------------|-------------------|------------|----------------------|-------------|------------|-------------|-------------|-----------------------------|
|                       |                   |            | L                    | C           | E          | F           | Lx          |                             |
| SS-TTF-FL4-NS4-       | 1/4               | 1/4        | 1.24 (31.6)          | 0.60 (15.2) | 0.19 (4.8) | 0.81 (20.6) | 0.88 (22.4) | 6,600 (454)                 |
| SS-TTF-FL6-NS4-       | 3/8               | 1/4        | 1.31 (33.3)          | 0.66 (16.8) | 0.28 (7.1) | 0.81 (20.6) | 0.88 (22.4) | 6,600 (454)                 |
| SS-TTF-FL6-NS6-       | 3/8               | 3/8        | 1.40 (35.6)          | 0.66 (16.8) | 0.28 (7.1) | 0.94 (23.8) | 1.36 (34.6) | 6,500 (450)                 |

## Metric Tube to NPT Thread

| Basic Ordering Number | T-Tube O.D. (mm) | P-NPT Size | Dimensions, mm (in.) |             |            |             |             | Working Pressure psig (bar) |
|-----------------------|------------------|------------|----------------------|-------------|------------|-------------|-------------|-----------------------------|
|                       |                  |            | L                    | C           | E          | F           | Lx          |                             |
| SS-TTF-ML6-NS4-       | 6                | 1/4        | 32.1 (1.26)          | 15.3 (0.60) | 4.8 (0.19) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-TTF-ML8-NS4-       | 8                | 1/4        | 32.7 (1.29)          | 16.2 (0.64) | 6.4 (0.25) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-TTF-ML10-NS4-      | 10               | 1/4        | 33.5 (1.32)          | 17.2 (0.68) | 7.9 (0.31) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-TTF-ML12-NS4-      | 12               | 1/4        | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-TTF-ML12-NS6-      | 12               | 3/8        | 38.1 (1.50)          | 22.8 (0.90) | 9.5 (0.37) | 23.8 (0.94) | 34.6 (1.36) | 6,500 (450)                 |
| SS-TTF-ML12-NS8-      | 12               | 1/2        | 39.9 (1.57)          | 22.8 (0.90) | 9.5 (0.37) | 27.0 (1.06) | 43.2 (1.70) | 6,500 (450)                 |

## Female Run Tees



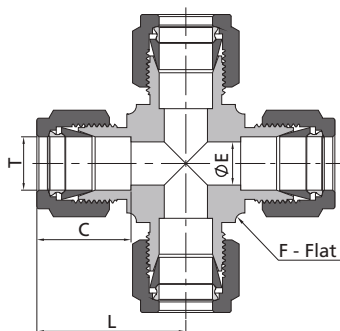
## Fractional Tube to NPT Thread

| Basic Ordering Number | T-Tube O.D. (in.) | P-NPT Size | Dimensions, in. (mm) |             |            |             |             | Working Pressure psig (bar) |
|-----------------------|-------------------|------------|----------------------|-------------|------------|-------------|-------------|-----------------------------|
|                       |                   |            | L                    | C           | E          | F           | Lx          |                             |
| SS-TFT-FL4-NS4-       | 1/4               | 1/4        | 1.24 (31.6)          | 0.60 (15.2) | 0.19 (4.8) | 0.81 (20.6) | 0.88 (22.4) | 6,600 (454)                 |
| SS-TFT-FL6-NS4-       | 3/8               | 1/4        | 1.31 (33.3)          | 0.66 (16.8) | 0.28 (7.1) | 0.81 (20.6) | 0.88 (22.4) | 6,600 (454)                 |

## Metric Tube to NPT Thread

| Basic Ordering Number | T-Tube O.D. (mm) | P-NPT Size | Dimensions, mm (in.) |             |            |             |             | Working Pressure psig (bar) |
|-----------------------|------------------|------------|----------------------|-------------|------------|-------------|-------------|-----------------------------|
|                       |                  |            | L                    | C           | E          | F           | Lx          |                             |
| SS-TFT-ML6-NS4-       | 6                | 1/4        | 32.1 (1.26)          | 15.3 (0.60) | 4.8 (0.19) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-TFT-ML8-NS4-       | 8                | 1/4        | 32.7 (1.29)          | 16.2 (0.64) | 6.4 (0.25) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-TFT-ML10-NS4-      | 10               | 1/4        | 33.5 (1.32)          | 17.2 (0.68) | 7.9 (0.31) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-TFT-ML12-NS4-      | 12               | 1/4        | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 22.4 (0.88) | 6,600 (454)                 |
| SS-TFT-ML12-NS6-      | 12               | 3/8        | 38.1 (1.50)          | 22.8 (0.90) | 9.5 (0.37) | 23.8 (0.94) | 34.6 (1.36) | 6,500 (450)                 |
| SS-TFT-ML12-NS8-      | 12               | 1/2        | 39.9 (1.57)          | 22.8 (0.90) | 9.5 (0.37) | 27.0 (1.06) | 43.2 (1.70) | 6,500 (450)                 |

## Union Crosses



## Fractional Tube

| Basic Ordering Number | T-Tube O.D. (in.) | Dimensions, in. (mm) |             |             |             | Working Pressure psig (bar) |
|-----------------------|-------------------|----------------------|-------------|-------------|-------------|-----------------------------|
|                       |                   | L                    | C           | E           | F           |                             |
| SS-C-FL4-             | 1/4               | 1.06 (26.9)          | 0.60 (15.2) | 0.19 (4.8)  | 0.50 (12.7) | 10,200 (703)                |
| SS-C-FL6-             | 3/8               | 1.20 (30.5)          | 0.66 (16.8) | 0.28 (7.1)  | 0.63 (15.9) | 7,500 (517)                 |
| SS-C-FL8-             | 1/2               | 1.42 (36.1)          | 0.90 (22.9) | 0.41 (10.4) | 0.81 (20.6) | 6,700 (462)                 |

## Metric Tube

| Basic Ordering Number | T-Tube O.D. (mm) | Dimensions, mm (in.) |             |            |             | Working Pressure psig (bar) |
|-----------------------|------------------|----------------------|-------------|------------|-------------|-----------------------------|
|                       |                  | L                    | C           | E          | F           |                             |
| SS-C-ML6-             | 6                | 27.0 (1.06)          | 15.3 (0.60) | 4.8 (0.19) | 12.7 (0.50) | 10,300 (710)                |
| SS-C-ML8-             | 8                | 29.9 (1.18)          | 16.2 (0.64) | 6.4 (0.25) | 15.9 (0.63) | 7,540 (520)                 |
| SS-C-ML10-            | 10               | 33.5 (1.32)          | 17.2 (0.68) | 7.9 (0.31) | 20.6 (0.81) | 8,400 (580)                 |
| SS-C-ML12-            | 12               | 36.0 (1.42)          | 22.8 (0.90) | 9.5 (0.37) | 20.6 (0.81) | 6,800 (470)                 |

# 6P Series Pipe Fittings



## Features

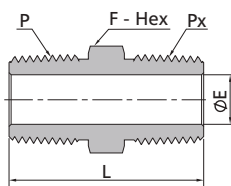
- ◎ Allowable working pressure  $\geq 6,500$  psig (450 bar)
- ◎ Rolled male thread provides higher strength and hardness
- ◎ EC-79 compliant FKM O-ring for reliable performance
- ◎ When both equipped with FITOK fittings, the connection achieves a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s

## Technical Data

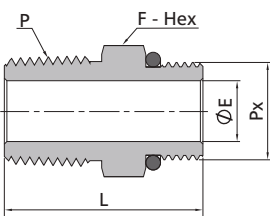
|                             |                                                               |
|-----------------------------|---------------------------------------------------------------|
| <b>Body Material</b>        | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$ |
| <b>Working Temperature</b>  | -40~248 °F (-40~120 °C)                                       |
| <b>Thread Specification</b> | NPT: ASME B1.20.1, SAE AS71051<br>SAE/MS: ASME B1.1, SAE J475 |

## Ordering Information and Dimensions

### Hex Nipples

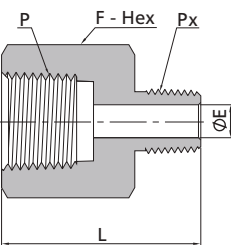


| Male NPT Thread       |            |             |                      |            |             |                             |
|-----------------------|------------|-------------|----------------------|------------|-------------|-----------------------------|
| Basic Ordering Number | P-NPT Size | Px-NPT Size | Dimensions, in. (mm) |            |             | Working Pressure psig (bar) |
|                       |            |             | L                    | E          | F           |                             |
| SS-PHN-NS4-           | 1/4        | 1/4         | 1.40 (35.6)          | 0.28 (7.1) | 0.56 (14.3) | 8,000 (551)                 |
| SS-PHN-NS6-           | 3/8        | 3/8         | 1.43 (36.3)          | 0.38 (9.7) | 0.69 (17.5) | 7,800 (537)                 |



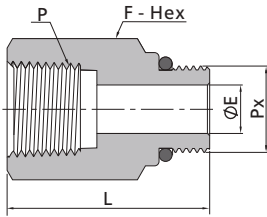
| Male NPT Thread to Male SAE/MS Straight Thread |            |                                |                      |             |             |                             |
|------------------------------------------------|------------|--------------------------------|----------------------|-------------|-------------|-----------------------------|
| Basic Ordering Number                          | P-NPT Size | Px-SAE/MS Thread Specification | Dimensions, in. (mm) |             |             | Working Pressure psig (bar) |
|                                                |            |                                | L                    | E           | F           |                             |
| SS-PHN-NS4-SH7-                                | 1/4        | 7/16-20                        | 1.23 (31.2)          | 0.18 (4.5)  | 0.56 (14.3) | 8,000 (551)                 |
| SS-PHN-NS6-SH9-                                | 3/8        | 9/16-18                        | 1.31 (33.2)          | 0.30 (7.5)  | 0.69 (17.5) | 7,800 (537)                 |
| SS-PHN-NS8-SH12-                               | 1/2        | 3/4-16                         | 1.62 (41.1)          | 0.39 (10.0) | 0.87 (22.2) | 7,700 (530)                 |

### Adapters



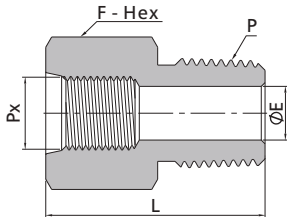
| Female NPT Thread to Male NPT Thread |            |             |                      |            |             |                             |
|--------------------------------------|------------|-------------|----------------------|------------|-------------|-----------------------------|
| Basic Ordering Number                | P-NPT Size | Px-NPT Size | Dimensions, in. (mm) |            |             | Working Pressure psig (bar) |
|                                      |            |             | L                    | E          | F           |                             |
| SS-PA-NS4-                           | 1/4        | 1/4         | 1.40 (35.6)          | 0.28 (7.1) | 0.75 (19.1) | 6,600 (454)                 |
| SS-PA-NS6-NS4-                       | 3/8        | 1/4         | 1.50 (38.1)          | 0.28 (7.1) | 0.87 (22.2) | 6,500 (450)                 |

## Adapters



**Female NPT Thread to Male SAE/MS Straight Thread**

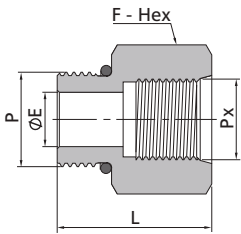
| Basic Ordering Number | P-NPT Size | Px-SAE/MS Thread Specification | Dimensions, in. (mm) |            |             | Working Pressure psig (bar) |
|-----------------------|------------|--------------------------------|----------------------|------------|-------------|-----------------------------|
|                       |            |                                | L                    | E          | F           |                             |
| SS-PA-NS4-SH7-        | 1/4        | 7/16-20                        | 1.22 (31.0)          | 0.18 (4.5) | 0.75 (19.1) | 6,600 (454)                 |
| SS-PA-NS6-SH9-        | 3/8        | 9/16-18                        | 1.39 (35.3)          | 0.30 (7.5) | 0.94 (23.8) | 6,500 (450)                 |



**Female SAE/MS Straight Thread to Female NPT Thread**

| Basic Ordering Number | P-NPT Size | Px-SAE/MS Thread Specification | Dimensions, in. (mm) |            |             | Working Pressure psig (bar) |
|-----------------------|------------|--------------------------------|----------------------|------------|-------------|-----------------------------|
|                       |            |                                | L                    | E          | F           |                             |
| SS-PA-US12-NS6-       | 3/8        | 3/4-16                         | 1.50 (38.0)          | 0.38 (9.6) | 1.19 (30.2) | 7,800 (537)                 |

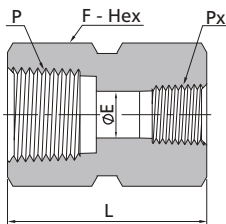
## Reducing Bushings



**Male SAE/MS Straight Thread to Female SAE/MS Straight Thread**

| Basic Ordering Number | P-SAE Nominal Size | P-SAE/MS Thread Specification | Px-SAE/MS Thread Specification | Dimensions, in. (mm) |             |             | Working Pressure psig (bar) |
|-----------------------|--------------------|-------------------------------|--------------------------------|----------------------|-------------|-------------|-----------------------------|
|                       |                    |                               |                                | L                    | E           | F           |                             |
| SS-PRB-SH9-US7-       | 8                  | 9/16-18                       | 7/16-20                        | 1.18 (30.0)          | 0.30 (7.5)  | 0.81 (20.6) | 9,135 (630)                 |
| SS-PRB-SH12-US7-      | 8                  | 3/4-16                        | 7/16-20                        | 0.98 (24.9)          | 0.39 (9.9)  | 0.87 (22.2) | 9,135 (630)                 |
| SS-PRB-SH12-US9-      | 8                  | 3/4-16                        | 9/16-18                        | 1.19 (30.2)          | 0.42 (10.7) | 1.00 (25.4) | 9,135 (630)                 |

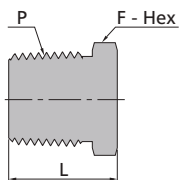
## Hex Couplings



**Female NPT Thread**

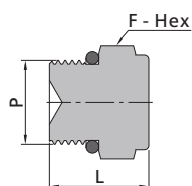
| Basic Ordering Number | P-NPT Size | Px-NPT Size | Dimensions, in. (mm) |             |             | Working Pressure psig (bar) |
|-----------------------|------------|-------------|----------------------|-------------|-------------|-----------------------------|
|                       |            |             | L                    | E           | F           |                             |
| SS-PCG-NS4-           | 1/4        | 1/4         | 1.19 (30.2)          | 0.45 (11.4) | 0.75 (19.1) | 6,600 (454)                 |
| SS-PCG-NS6-NS4-       | 3/8        | 1/4         | 1.38 (35.1)          | 0.45 (11.4) | 0.87 (22.2) | 6,500 (450)                 |
| SS-PCG-NS6-           | 3/8        | 3/8         | 1.31 (33.3)          | 0.59 (15.0) | 0.87 (22.2) | 6,500 (450)                 |

## Pipe Plugs



**Male NPT Thread**

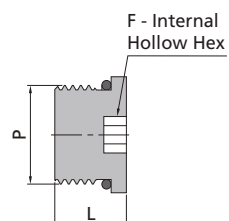
| Basic Ordering Number | P-NPT Size | Dimensions, in. (mm) |             |
|-----------------------|------------|----------------------|-------------|
|                       |            | L                    | F           |
| SS-PP-NS4-            | 1/4        | 0.75 (19.1)          | 0.56 (14.3) |
| SS-PP-NS6-            | 3/8        | 0.78 (19.8)          | 0.69 (17.5) |



Male SAE/MS Straight Thread

| Basic Ordering Number | P-SAE/MS Thread Specification | Dimensions, in. (mm) |             |
|-----------------------|-------------------------------|----------------------|-------------|
|                       |                               | L                    | F           |
| SS-PP-SH7-            | 7/16-20                       | 0.76 (19.3)          | 0.56 (14.3) |
| SS-PP-SH9-            | 9/16-18                       | 0.82 (20.8)          | 0.69 (17.5) |
| SS-PP-SH12-           | 3/4-16                        | 0.89 (22.6)          | 0.87 (22.2) |

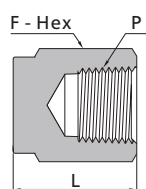
## Hollow Hex Plugs



Male SAE/MS Straight Thread

| Basic Ordering Number | P-SAE/MS Thread Specification | Dimensions, in. (mm) |            |
|-----------------------|-------------------------------|----------------------|------------|
|                       |                               | L                    | F          |
| SS-PI-SH7-            | 7/16-20                       | 0.45 (11.4)          | 0.19 (4.8) |
| SS-PI-SH9-            | 9/16-18                       | 0.48 (12.2)          | 0.25 (6.4) |
| SS-PI-SH12-           | 3/4-16                        | 0.56 (14.2)          | 0.31 (7.9) |

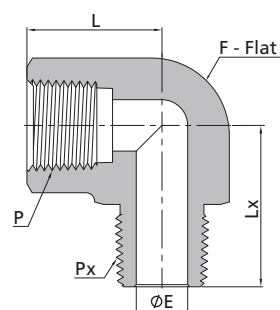
## Pipe Caps



Female NPT Thread

| Basic Ordering Number | P-NPT Size | Dimensions, in. (mm) |             | Working Pressure<br>psig (bar) |
|-----------------------|------------|----------------------|-------------|--------------------------------|
|                       |            | L                    | F           |                                |
| SS-PC-NS4-            | 1/4        | 0.91 (23.1)          | 0.75 (19.1) | 6,600 (454)                    |
| SS-PC-NS6-            | 3/8        | 1.03 (26.2)          | 0.87 (22.2) | 6,500 (450)                    |
| SS-PC-NS8-            | 1/2        | 1.34 (34.0)          | 1.06 (27.0) | 6,500 (450)                    |

## Street Elbows



Female NPT Thread to Male NPT Thread

| Basic Ordering Number | P-NPT Size | Px-NPT Size | Dimensions, in. (mm) |            |             |             | Working Pressure<br>psig (bar) |
|-----------------------|------------|-------------|----------------------|------------|-------------|-------------|--------------------------------|
|                       |            |             | L                    | E          | F           | Lx          |                                |
| SS-PSE-NS4-NS6-       | 1/4        | 3/8         | 1.17 (29.7)          | 0.34 (8.6) | 0.69 (17.5) | 1.17 (29.7) | 7,200 (496)                    |

## BU Series Ball Valves



### Features

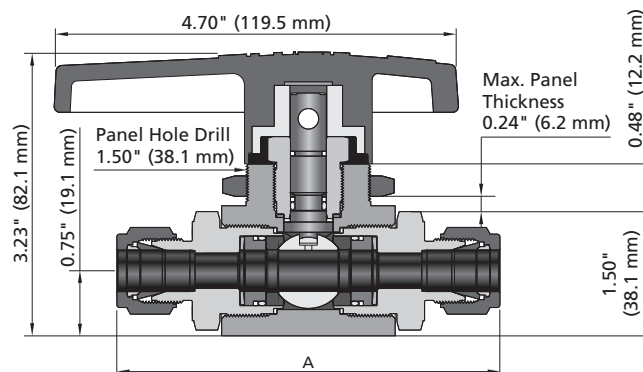
- Spring-loaded seat offers a consistent and reliable sealing force
- EC-79 compliant FKM O-ring for reliable performance
- PEEK seat offers exceptional wear resistance and excellent hydrogen compatibility
- Panel mounting optional
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6} \text{ Ncm}^3/\text{s}$
- Each valve is tested for internal and external leakage using a helium-nitrogen gas mixture at 6,500 psig (450 bar) before shipment



### Technical Data

|                       |                                                          |
|-----------------------|----------------------------------------------------------|
| Orifice               | 0.47 in. (12.0 mm)                                       |
| Max. Working Pressure | 6,500 psig (450 bar)                                     |
| Working Temperature   | -40~248 °F (-40~120 °C)                                  |
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % ≥ 28.5 |

### Ordering Information and Dimensions

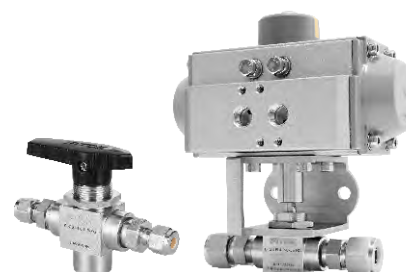


| Ordering Number | Connection Type and Size |        | Orifice in. (mm) | Cv  | Dimensions, in. (mm) |
|-----------------|--------------------------|--------|------------------|-----|----------------------|
|                 |                          |        |                  |     | A                    |
| BUSS-FL6-P12-   | 6D Series Tube Fittings  | 3/8"   | 0.28 (7.1)       | 4.0 | 4.20 (106.6)         |
| BUSS-FL8-P12-   |                          | 1/2"   | 0.41 (10.3)      | 7.2 | 4.40 (111.8)         |
| BUSS-ML10-P12-  |                          | 10 mm  | 0.31 (7.9)       | 4.2 | 4.21 (107.0)         |
| BUSS-US12-P12-  | Female SAE/MS            | 3/4-16 | 0.47 (12.0)      | 7.8 | 4.02 (102.0)         |

# BF Series Ball Valves

## Features

- Spring-loaded seat offers a consistent and reliable sealing force
- Pneumatic or manual actuators available
- 2-way or 3-way valve configurations available
- EC-79 compliant FKM O-ring for reliable performance
- PEEK seat offers exceptional wear resistance and excellent hydrogen compatibility
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s
- Each valve is tested for internal and external leakage using a helium-nitrogen gas mixture at 6,500 psig (450 bar) before shipment

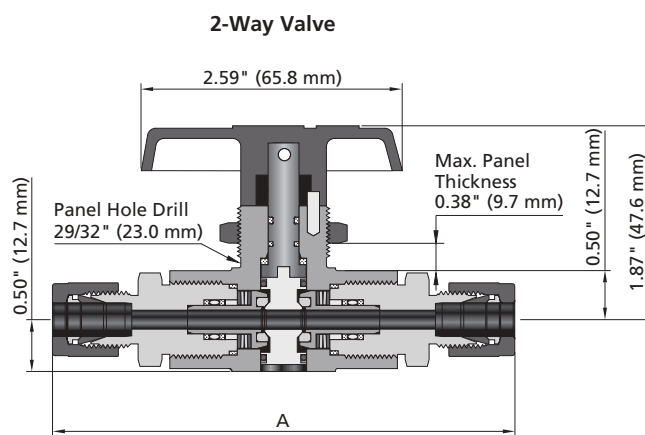


## Technical Data

|                       |                                                          |
|-----------------------|----------------------------------------------------------|
| Orifice               | 0.19 in. (4.8 mm)                                        |
| Max. Working Pressure | 6,500 psig (450 bar)                                     |
| Working Temperature   | -40~248 °F (-40~120 °C)                                  |
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % ≥ 28.5 |

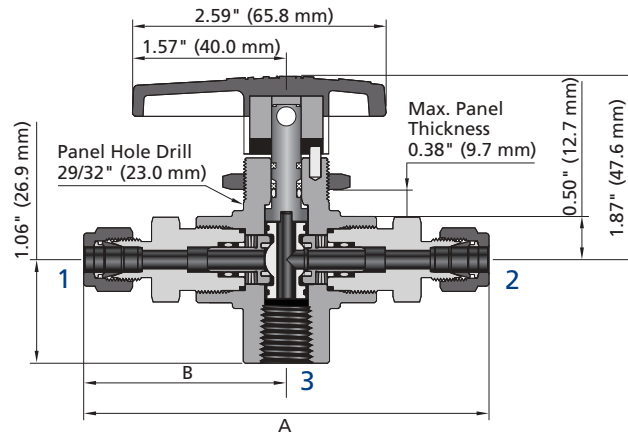
## Ordering Information and Dimensions

### Manual



| Ordering Number | Connection Type and Size |       | Orifice in. (mm) | Cv  | Dimensions, in. (mm) |
|-----------------|--------------------------|-------|------------------|-----|----------------------|
|                 |                          |       |                  |     | A                    |
| BFSS-FL4-P-     | 6D Series Tube Fittings  | 1/4"  | 0.19 (4.8)       | 1.6 | 4.14 (105.2)         |
| BFSS-FL6-P-     |                          | 3/8"  |                  | 1.4 | 4.39 (111.5)         |
| BFSS-ML10-P-    |                          | 10 mm |                  | 1.3 | 4.41 (112.0)         |

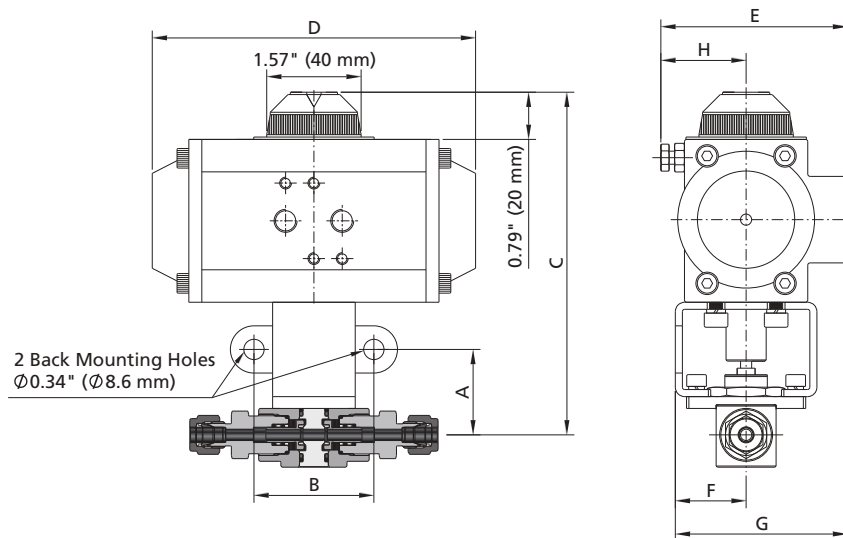
### 3-Way Valve



| Ordering Number | Connection Type and Size   |       |              |     | Orifice in. (mm) | Cv   | Dimensions, in. (mm) |             |
|-----------------|----------------------------|-------|--------------|-----|------------------|------|----------------------|-------------|
|                 | Connection 1 & 2           |       | Connection 3 |     |                  |      | A                    | B           |
| BFSS-FL4-P-3-   | 6D Series<br>Tube Fittings | 1/4"  | Female NPT   | 1/4 | 0.19 (4.8)       | 0.75 | 4.14 (105.2)         | 2.07 (52.6) |
| BFSS-FL6-P-3-   |                            | 3/8"  |              |     |                  |      | 4.39 (111.5)         | 2.19 (55.6) |
| BFSS-ML10-P-3-  |                            | 10 mm |              |     |                  |      | 4.41 (112.0)         | 2.20 (55.9) |

### Pneumatic Actuated

### 2-Way Valve

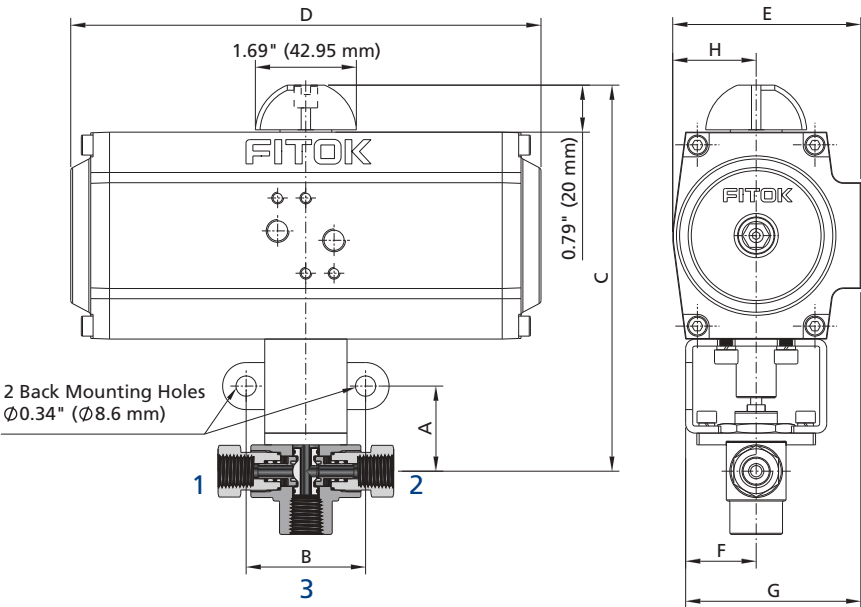


| Ordering Number | Connection Type and Size   |       | Orifice in. (mm) | Cv  | Dimensions, in. (mm) |             |              |              |             |             |             |             |
|-----------------|----------------------------|-------|------------------|-----|----------------------|-------------|--------------|--------------|-------------|-------------|-------------|-------------|
|                 |                            |       |                  |     | A                    | B           | C            | D            | E           | F           | G           | H           |
| BFSS-FL4-P-O-   | 6D Series<br>Tube Fittings | 1/4"  | 0.19 (4.8)       | 1.6 | 1.43 (36.2)          | 2.00 (50.8) | 6.01 (151.2) | 6.06 (154.0) | 2.78 (70.5) | 1.38 (35.0) | 3.01 (76.5) | 1.14 (29.0) |
| BFSS-FL6-P-D-   |                            | 3/8"  |                  | 1.4 |                      |             |              |              |             |             |             |             |
| BFSS-ML10-P-C-  |                            | 10 mm |                  | 1.3 |                      |             |              |              |             |             |             |             |

Note: "-O-", "-D-", "-C-" are designators for pneumatic actuator.

- O: 90° normally open pneumatic actuator;
- D: 90° double acting pneumatic actuator;
- C: 90° normally closed pneumatic actuator.

3-Way Valve



| Ordering Number  | Connection Type and Size |       |              |     | Orifice in. (mm) | Cv   | Dimensions, in. (mm) |             |              |              |             |             |             |             |
|------------------|--------------------------|-------|--------------|-----|------------------|------|----------------------|-------------|--------------|--------------|-------------|-------------|-------------|-------------|
|                  | Connection 1 & 2         |       | Connection 3 |     |                  |      | A                    | B           | C            | D            | E           | F           | G           | H           |
| BFSS-FNS4-P-LX3- | Female NPT               | 1/4   | Female NPT   | 1/4 | 0.19 (4.8)       | 0.75 | 1.43 (36.2)          | 2.00 (50.8) | 1.97 (164.2) | 7.87 (200.0) | 3.15 (80.0) | 1.18 (30.0) | 2.93 (74.5) | 1.40 (35.5) |
| BFSS-FL4-P-LX3-  | 6D Series Tube Fittings  | 1/4"  |              |     |                  |      |                      |             |              |              |             |             |             |             |
| BFSS-ML6-P-LX3-  |                          | 3/8"  |              |     |                  |      |                      |             |              |              |             |             |             |             |
| BFSS-ML10-P-RX3- |                          | 10 mm |              |     |                  |      |                      |             |              |              |             |             |             |             |

Note: "-LX", "-RX" are designators for pneumatic actuator.  
-LX: 180° left end normally open pneumatic actuator;  
-RX: 180° right end normally open pneumatic actuator.

## NF Series Needle Valves

### Features

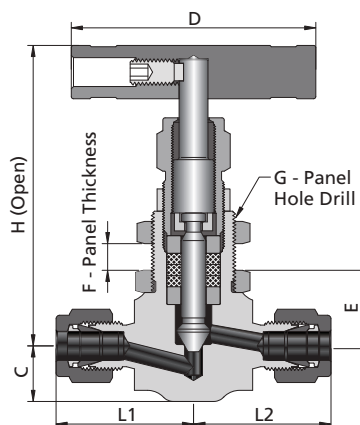
- One-piece forged body
- Two-piece stem design prevents abrasion between the stem tip and seat and reduces wear between the packing and stem
- Stem tip features a specially treated surface that ensures excellent sealing performance
- Panel mounting optional
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6} \text{ Ncm}^3/\text{s}$
- Each valve is tested for internal and external leakage using a helium-nitrogen gas mixture at 6,500 psig (450 bar) before shipment



### Technical Data

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| Max. Working Pressure | 6,500 psig (450 bar)                                               |
| Working Temperature   | -40~248 °F (-40~120 °C)                                            |
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$      |
| Stem Tip Material     | FITOK Tailor-Made Hard 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$ |
| Stem Tip Type         | Taper                                                              |

### Ordering Information and Dimensions



| Ordering Number | Connection Type and Size |      | Orifice in. (mm) | Cv   | Dimensions, in. (mm) |             |             |             |             |             |            |             |
|-----------------|--------------------------|------|------------------|------|----------------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|
|                 |                          |      |                  |      | L1                   | L2          | H           | D           | C           | E           | F          | G           |
| NFSS-FL4-7-Y-   | 6D Series Tube Fittings  | 1/4" | 0.16 (4.0)       | 0.35 | 1.22 (30.9)          | 1.22 (30.9) | 2.85 (72.5) | 2.17 (55.0) | 0.49 (12.5) | 0.71 (18.0) | 0.25 (6.4) | 0.77 (19.6) |
| NFSS-FL6-8-Y-   |                          | 3/8" | 0.25 (6.4)       | 0.85 | 1.44 (36.5)          | 1.44 (36.5) | 3.38 (85.8) | 2.50 (63.5) | 0.62 (15.8) | 0.87 (22.0) | 0.38 (9.7) | 0.96 (24.4) |

# CH Series Check Valves



## Features

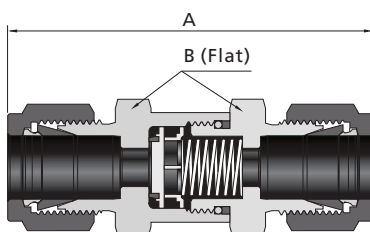
- Optional cracking pressure ranges
- EC-79 compliant EPDM O-ring for reliable performance
- Mountable in any direction
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s
- Each valve is tested for internal and external leakage using a helium-nitrogen gas mixture at 6,500 psig (450 bar) before shipment



## Technical Data

|                              |                                                          |
|------------------------------|----------------------------------------------------------|
| <b>Max. Working Pressure</b> | 6,500 psig (450 bar)                                     |
| <b>Working Temperature</b>   | -40~248 °F (-40~120 °C)                                  |
| <b>Body Material</b>         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % ≥ 28.5 |

## Ordering Information and Dimensions



| Ordering Number | Connection Type and Size |      | Cv   | Cracking Pressure Range, psig (bar) | Dimensions, in. (mm) |              |
|-----------------|--------------------------|------|------|-------------------------------------|----------------------|--------------|
|                 |                          |      |      |                                     | A                    | B            |
| CHSS-FL4-       | 6D Series Tube Fittings  | 1/4" | 0.67 | 1~5 (0.06~0.34)                     | 2.43 (61.7)          | 11/16 (17.5) |
| CHSS-FL4-1-     |                          | 1/4" | 0.67 | 0~3 (0~0.21)                        | 2.43 (61.7)          | 11/16 (17.5) |
| CHSS-FL6-2-     |                          | 3/8" | 1.80 | 0~4 (0~0.28)                        | 2.75 (69.9)          | 1.0 (25.4)   |
| CHSS-FL6-3-     |                          | 3/8" | 1.80 | 7~15 (0.49~1.1)                     | 2.75 (69.9)          | 1.0 (25.4)   |
| CHSS-FL8-4-     |                          | 1/2" | 1.80 | 20~30 (1.4~2.1)                     | 2.96 (75.2)          | 1.0 (25.4)   |

# RV Series Proportional Relief Valves

## Features

- Optional set pressure ranges, with factory pre-setting available to meet specific requirements
- Balanced stem design eliminates back-pressure effect
- EC-79 compliant EPDM O-ring for reliable performance
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s
- Each valve is performance tested for set pressure and resealing pressure before shipment



## Technical Data

|                             |                                                                       |
|-----------------------------|-----------------------------------------------------------------------|
| <b>Max. Inlet Pressure</b>  | 6,500 psig (450 bar), up to 8000 psig (556 bar) during relief process |
| <b>Max. Outlet Pressure</b> | 1,500 psig (103 bar)                                                  |
| <b>Working Temperature</b>  | -40~248 °F (-40~120 °C)                                               |
| <b>Body Material</b>        | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$         |

Note: Outlet pressure shall not exceed inlet pressure.

## Set Pressure and Resealing Pressure

Set pressure: the upstream pressure at which the valve opens and the indication of flow occurs.

Set pressure of each valve after initial relief fluctuates within:

$\pm 3.0$  psig (0.20 bar) or  $\pm 5\%$  (whichever is greater) of the initial set pressure at 60 to 80°F (15 to 26°C),  
 $\pm 6.0$  psig (0.40 bar) or  $\pm 20\%$  (whichever is greater) of the initial set pressure below 60°F (15°C) or above 80°F (26°C).

For valves not opened for a period of time, the set pressure may be higher.

Resealing pressure: the upstream pressure at which the valve is fully closed as a result of a drop of upstream pressure after the valve opens. Resealing pressure is always lower than set pressure.

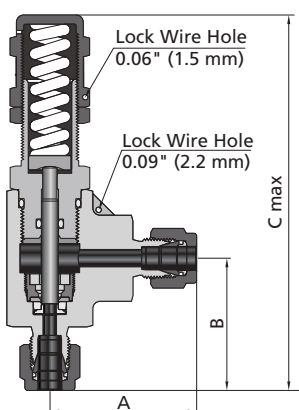
Set pressure and resealing pressure may be affected by factors such as the type of media, operating temperatures, and the frequency of operation.

## Testing

Each valve is tested for set and resealing pressures before shipment.

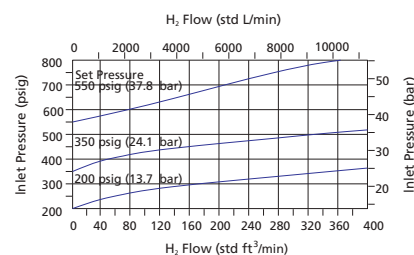
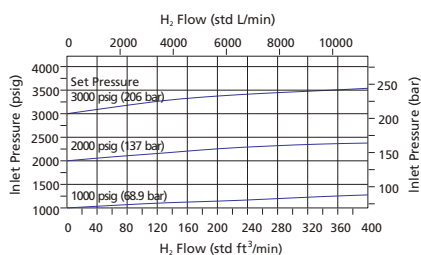
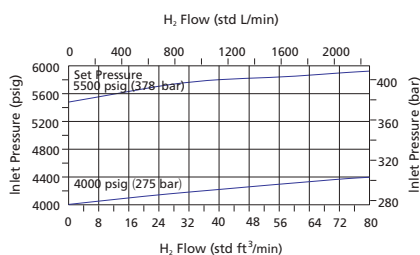
| Test Set Pressure<br>psig (bar) | Resealing Pressure as a<br>Percentage of Set Pressure |
|---------------------------------|-------------------------------------------------------|
| 50 to 200 (3.4 to 13.7)         | $\geq 50\%$                                           |
| 201 to 6,500 (13.8 to 450)      | $\geq 85\%$                                           |

## Ordering Information and Dimensions



| Ordering Number | Connection Type and Size |       | Orifice in. (mm) | Cv   | Set Pressure Range, psig (bar) | Dimensions, in. (mm) |             |              |
|-----------------|--------------------------|-------|------------------|------|--------------------------------|----------------------|-------------|--------------|
|                 |                          |       |                  |      |                                | A                    | B           | C            |
| RVSS-FL4-6-K-   | 6D Series Tube Fittings  | 1/4"  | 0.14 (3.6)       | 0.41 | 5,000~6,500 (345~450)          | 1.60 (40.6)          | 1.44 (36.6) | 4.16 (105.6) |
| RVSS-FL4-6-C-   |                          | 1/4"  |                  |      | 4,500~6,000 (310~414)          | 1.60 (40.6)          | 1.44 (36.6) | 4.14 (105.2) |
| RVSS-FL6-6-J-   |                          | 3/8"  |                  |      | 3,500~4,500 (241~310)          | 1.60 (40.6)          | 1.44 (36.6) | 4.14 (105.2) |
| RVSS-FL8-6-W-   |                          | 1/2"  |                  |      | 2,500~3,500 (172~241)          | 1.72 (43.7)          | 1.72 (43.7) | 5.81 (147.6) |
| RVSS-ML6-6-P-   |                          | 6 mm  |                  |      | 1,500~2,500 (103~172)          | 1.60 (40.6)          | 1.44 (36.6) | 4.14 (105.2) |
| RVSS-ML8-6-Y-   |                          | 8 mm  |                  |      | 700~1,500 (48.3~103)           | 1.60 (40.6)          | 1.44 (36.6) | 4.14 (105.2) |
| RVSS-ML12-6-O-  |                          | 12 mm |                  |      | 300~700 (20.7~48.3)            | 1.83 (46.5)          | 1.83 (46.5) | 5.92 (150.4) |
| RVSS-ML12-6-F-  |                          | 12 mm |                  |      | 50~300 (3.4~20.7)              | 1.83 (46.5)          | 1.83 (46.5) | 5.92 (150.4) |

## Flow Data at 70°F (20°C)



## EV Series Excess Flow Valves

In the event of a downstream line rupture and the excess flow occurs, the poppet quickly moves to the tripped position to stop the uncontrolled release of system media. At this point, the flow reaching the downstream through the bleed vent is lower than one percent of the flow rate in the trip range. When system pressure reaches balance through the bleed vent, the spring resets the poppet to the open position automatically.

### Features

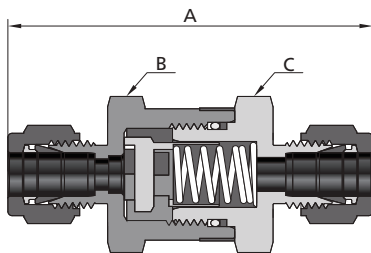
- Green ring mounted on the body for easy identification
- EC-79 compliant EPDM O-ring for reliable performance
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s
- Each valve is tested for external leakage using a helium-nitrogen gas mixture at 6,500 psig (450 bar) before shipment



### Technical Data

|                       |                                                          |
|-----------------------|----------------------------------------------------------|
| Max. Working Pressure | 6,500 psig (450 bar)                                     |
| Working Temperature   | -40~248 °F (-40~120 °C)                                  |
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % ≥ 28.5 |

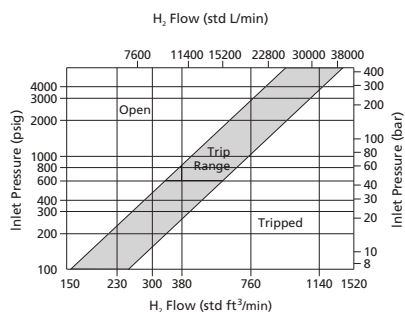
### Ordering Information and Dimensions



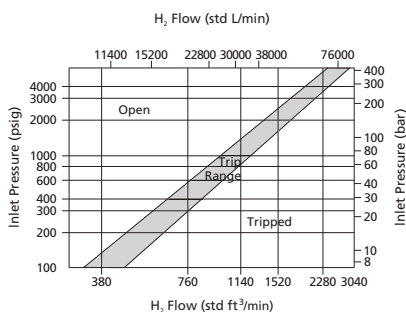
| Ordering Number | Connection Type and Size | Orifice in. (mm) | Cv  | Dimensions, in. (mm) |             |             |
|-----------------|--------------------------|------------------|-----|----------------------|-------------|-------------|
|                 |                          |                  |     | A                    | B           | C           |
| EVSS-FL4-4-     | 6D Series Tube Fittings  | 1/4"             | 0.5 | 2.43 (61.7)          | 0.69 (17.5) | 0.69 (17.5) |
| EVSS-FL6-6-     |                          | 3/8"             | 1.1 | 2.75 (69.9)          | 1.0 (25.4)  | 1.0 (25.4)  |
| EVSS-ML12-8-    |                          | 12 mm            | 1.1 | 2.96 (75.2)          | 1.0 (25.4)  | 1.0 (25.4)  |

### Flow Data at 70°F (20°C)

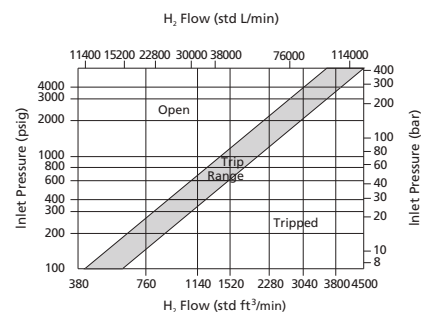
EVSS-FL4-4-



EVSS-FL6-6-



EVSS-ML12-8-



# FT Series Filters



## Features

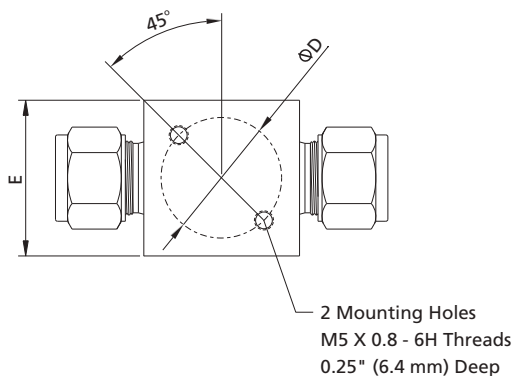
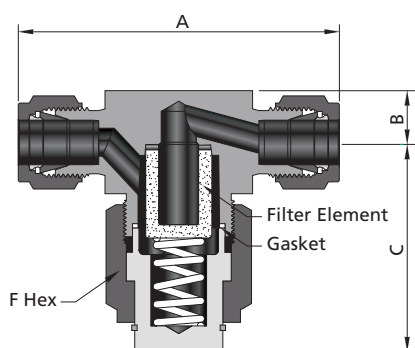
- Easy to replace filter element without removing body from system
- 7 and 15  $\mu\text{m}$  element nominal pore sizes as standard
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6} \text{ Ncm}^3/\text{s}$
- Each filter is tested for external leakage using a helium-nitrogen gas mixture at 6,500 psig (450 bar) before shipment



## Technical Data

|                            |                                                               |
|----------------------------|---------------------------------------------------------------|
| Max. Working Pressure      | 6,500 psig (450 bar)                                          |
| Max. Differential Pressure | 1,000 psig (69 bar)                                           |
| Working Temperature        | -40~248 °F (-40~120 °C)                                       |
| Body Material              | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$ |
| Filter Element             | Sintered 316 SS                                               |
| Gasket                     | 316 SS, Silver-Plated                                         |

## Ordering Information and Dimensions



| Ordering Number | Connection Type and Size |      | Orifice in. (mm) | Nominal Pore Size $\mu\text{m}$ | Effective Filter Element Area in. <sup>2</sup> (mm <sup>2</sup> ) | Dimensions, in. (mm) |             |             |             |             |             |
|-----------------|--------------------------|------|------------------|---------------------------------|-------------------------------------------------------------------|----------------------|-------------|-------------|-------------|-------------|-------------|
|                 |                          |      |                  |                                 |                                                                   | A                    | B           | C           | ØD          | E           | F           |
| FTSS-FL4-7-     | 6D Series Tube Fittings  | 1/4" | 0.17 (4.4)       | 7                               | 1.30 (830)                                                        | 2.47 (62.7)          | 0.38 (9.7)  | 1.49 (37.8) | 1.00 (25.4) | 1.00 (25.4) | 1 (25.4)    |
| FTSS-FL4-15-    |                          |      |                  | 15                              |                                                                   |                      |             |             |             |             |             |
| FTSS-FL6-7-     |                          | 3/8" | 0.25 (6.4)       | 7                               | 2.00 (1280)                                                       | 2.84 (72.1)          | 0.46 (11.7) | 1.74 (44.2) | 1.13 (28.6) | 1.13 (28.6) | 1.13 (28.6) |
| FTSS-FL6-15-    |                          |      |                  | 15                              |                                                                   |                      |             |             |             |             |             |
| FTSS-FL8-7-     |                          | 1/2" | 0.25 (6.4)       | 7                               | 2.00 (1280)                                                       | 3.04 (77.2)          | 0.46 (11.7) | 1.74 (44.2) | 1.13 (28.6) | 1.13 (28.6) | 1.13 (28.6) |
| FTSS-FL8-15-    |                          |      |                  | 15                              |                                                                   |                      |             |             |             |             |             |

# QC Series Quick-Connects

## Features

- Both the body and stem are fitted with a valve, achieving double-end shutoff when uncoupled
- Push-to-connect coupling to enable quick and easy operation
- Locking mechanism with large contact area to ensure reliable stem retainment
- Stem protector, body protector and keyed options available
- EC-79 compliant EPDM O-ring for reliable performance
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s
- External leak tested respectively when the body and stem are coupled and uncoupled, using a helium-nitrogen gas mixture at the maximum working pressure

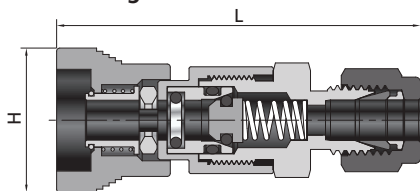
## Technical Data

|                       | Coupled                                                  | Uncoupled and When Coupling and Uncoupling           |
|-----------------------|----------------------------------------------------------|------------------------------------------------------|
| Max. Working Pressure | QC4: 3,000 psig (207 bar)<br>QC6: 1,500 psig (103 bar)   | QC4: 250 psig (17.2 bar)<br>QC6: 250 psig (17.2 bar) |
| Working Temperature   | -40~248 °F (-40~120 °C)                                  |                                                      |
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % ≥ 28.5 |                                                      |

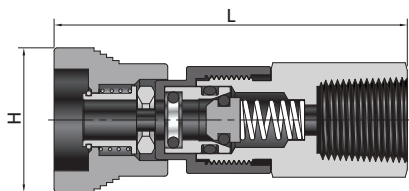
## Ordering Information and Dimensions

### Bodies

#### Tube Fitting



#### Female NPT

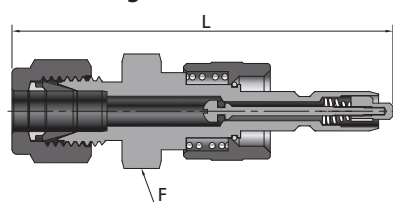


| Fitting Size in. | Ordering Number | Dimensions  |             |
|------------------|-----------------|-------------|-------------|
|                  |                 | H           | L           |
|                  |                 | in. (mm)    | in. (mm)    |
| 1/4              | SS-QC4-FL4-B-   | 0.91 (23.1) | 2.30 (58.4) |
| mm               | —               | mm (in.)    | mm (in.)    |
| 6                | SS-QC4-ML6-B-   | 23.1 (0.91) | 58.4 (2.30) |

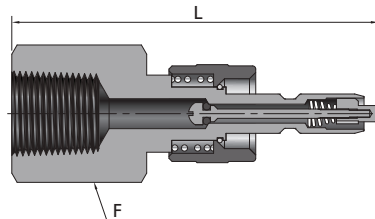
| NPT Size in. | Ordering Number | Dimensions  |             |
|--------------|-----------------|-------------|-------------|
|              |                 | H           | L           |
|              |                 | in. (mm)    | in. (mm)    |
| 1/4          | SS-QC4-FNS4-B-  | 0.91 (23.1) | 2.42 (61.5) |
| 1/4          | SS-QC6-FNS4-B-  | 1.03 (26.2) | 2.54 (64.5) |

### Stems

#### Tube Fitting



#### Female NPT



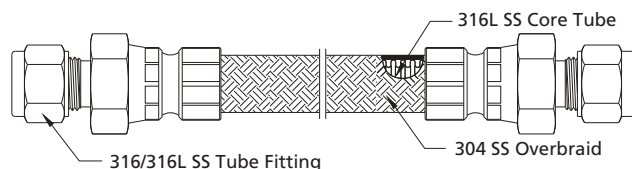
| Fitting Size in. | Ordering Number | Flow Coefficient (Cv) | Dimensions |             |
|------------------|-----------------|-----------------------|------------|-------------|
|                  |                 |                       | F          | L           |
|                  |                 |                       | in.        | in. (mm)    |
| 1/4              | SS-QC4-FL4-D-   | 0.2                   | 5/8        | 2.42 (61.5) |
| mm               | —               | —                     | mm         | mm (in.)    |
| 6                | SS-QC4-ML6-D-   | 0.2                   | 16         | 61.5 (2.42) |

| BSPT Size in. | Ordering Number | Flow Coefficient (Cv) | Dimensions   |             |
|---------------|-----------------|-----------------------|--------------|-------------|
|               |                 |                       | F            | L           |
|               |                 |                       | in. (mm)     | in. (mm)    |
| 1/4           | SS-QC4-FNS4-D-  | 0.2                   | 0.75 (19.05) | 2.32 (58.9) |
| 1/4           | SS-QC6-FNS4-D-  | 0.5                   | 0.75 (19.05) | 2.47 (62.7) |

## MH & MM Series Metal Hoses

### Features

- Core tube made of 316L SS, fitting made of FITOK tailor-made 316/316L SS with Ni<sub>eq</sub>% ≥ 28.5
- Overbraid material: 304 SS
- Welded fitting-to-hose construction provides a secure and reliable connection
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-7}$  Ncm<sup>3</sup>/s
- Each metal hose is tested for external leakage using a helium-nitrogen gas mixture at the maximum working pressure

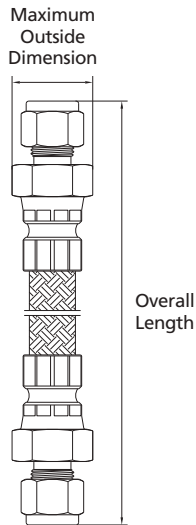


### Technical Data

| MH Series            |                    |                  |               |                      |                                         |                                       |
|----------------------|--------------------|------------------|---------------|----------------------|-----------------------------------------|---------------------------------------|
| Nominal<br>Hose Size | Inside<br>Diameter | Min. Bend Radius |               | Temperature<br>Range | Working<br>Pressure at<br>70 °F (20 °C) | Burst<br>Pressure at<br>70 °F (20 °C) |
|                      |                    | Static           | Dynamic       |                      |                                         |                                       |
|                      |                    | in. (mm)         | in. (mm)      |                      | psig (bar)                              | psig (bar)                            |
| 1/4                  | 0.28 (7.1)         | 2.25 (57.2)      | 10.00 (254.0) | -40~248<br>(-40~120) | 3,100 (213)                             | 12,400 (854)                          |
| 3/8                  | 0.42 (10.6)        | 3.00 (76.2)      | 12.00 (305.0) |                      | 2,000 (137)                             | 8,000 (551)                           |
| 1/2                  | 0.53 (13.5)        | 4.50 (114)       | 16.00 (406.0) |                      | 1,800 (124)                             | 7,200 (496)                           |

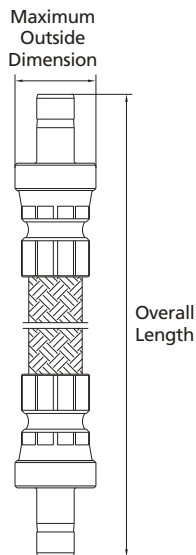
| MM Series            |                    |                         |              |                      |                                         |                                       |
|----------------------|--------------------|-------------------------|--------------|----------------------|-----------------------------------------|---------------------------------------|
| Nominal<br>Hose Size | Inside<br>Diameter | Min. Bend Radius        |              | Temperature<br>Range | Working<br>Pressure at<br>70 °F (20 °C) | Burst<br>Pressure at<br>70 °F (20 °C) |
|                      |                    | Annular Convuluted Core |              |                      |                                         |                                       |
|                      |                    | Static                  | Dynamic      |                      |                                         |                                       |
|                      | in. (mm)           | in. (mm)                | in. (mm)     | °F (°C)              | psig (bar)                              | psig (bar)                            |
| 1/4                  | 0.25 (6.4)         | 0.79 (20.0)             | 4.33 (110.0) | -40~248<br>(-40~120) | 1,600 (110)                             | 6,400 (440)                           |
| 3/8                  | 0.38 (9.5)         | 0.98 (25.0)             | 5.91 (150.0) |                      | 1,470 (101)                             | 6,000 (414)                           |
| 1/2                  | 0.50 (12.7)        | 1.18 (30.0)             | 4.88 (124.0) |                      | 1,110 (76.4)                            | 4,500 (310)                           |

## Ordering Information and Dimensions



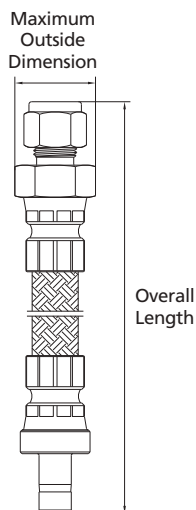
**Tube Fitting End**

| Ordering Number     | Nominal Hose Size | Tube Fitting Size | Overall Length | Minimum Inside Diameter | Maximum Outside Dimension |
|---------------------|-------------------|-------------------|----------------|-------------------------|---------------------------|
|                     |                   | in.               | in. (mm)       | in. (mm)                | in. (mm)                  |
| SS-MH4-FL4-F24-     | 1/4               | 1/4               | 24 (610)       | 0.19 (4.8)              | 0.94 (23.8)               |
| SS-MM4-FL4-F36-R-   |                   |                   | 36 (914)       | 0.19 (4.8)              | 0.87 (22.0)               |
| SS-MH4-FL4-M1000-   |                   |                   | 39.4 (1,000)   | 0.19 (4.8)              | 0.94 (23.8)               |
| SS-MH6-FL6-F24-     | 3/8               | 3/8               | 24 (610)       | 0.28 (7.1)              | 1.09 (27.7)               |
| SS-MM6-FL6-F36-R-   |                   |                   | 36 (914)       | 0.28 (7.1)              | 1.01 (25.7)               |
| SS-MM6-FL6-M1000-R- |                   |                   | 39.4 (1,000)   | 0.28 (7.1)              | 1.01 (25.7)               |
| SS-MH8-FL8-F24-     | 1/2               | 1/2               | 24 (610)       | 0.41 (10.4)             | 1.30 (33.1)               |
| SS-MM8-FL8-F36-R-   |                   |                   | 36 (914)       | 0.41 (10.4)             | 1.15 (29.3)               |
| SS-MH8-FL8-M1000-   |                   |                   | 39.4 (1,000)   | 0.41 (10.4)             | 1.30 (33.1)               |



**Tube Adapter End**

| Ordering Number     | Nominal Hose Size | Tube Adapter Size | Overall Length | Minimum Inside Diameter | Maximum Outside Dimension |
|---------------------|-------------------|-------------------|----------------|-------------------------|---------------------------|
|                     |                   | in.               | in. (mm)       | in. (mm)                | in. (mm)                  |
| SS-MH4-FT4-F24-     | 1/4               | 1/4               | 24 (610)       | 0.17 (4.3)              | 0.81 (20.6)               |
| SS-MM4-FT4-F36-R-   |                   |                   | 36 (914)       | 0.17 (4.3)              | 0.76 (19.2)               |
| SS-MH4-FT4-M1000-   |                   |                   | 39.4 (1,000)   | 0.17 (4.3)              | 0.81 (20.6)               |
| SS-MH6-FT6-F24-     | 3/8               | 3/8               | 24 (610)       | 0.27 (6.8)              | 1.01 (25.6)               |
| SS-MM6-FT6-F36-R-   |                   |                   | 36 (914)       | 0.27 (6.8)              | 0.91 (23.1)               |
| SS-MM6-FT6-M1000-R- |                   |                   | 39.4 (1,000)   | 0.27 (6.8)              | 0.91 (23.1)               |
| SS-MH8-FT8-F24-     | 1/2               | 1/2               | 24 (610)       | 0.37 (9.4)              | 1.14 (29.0)               |
| SS-MM8-FT8-F36-R-   |                   |                   | 36 (914)       | 0.37 (9.4)              | 1.02 (26.0)               |
| SS-MH8-FT8-M1000-   |                   |                   | 39.4 (1,000)   | 0.37 (9.4)              | 1.14 (29.0)               |



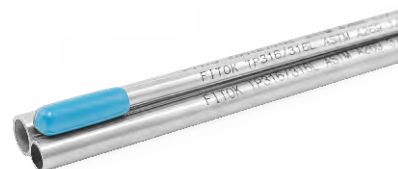
**Tube Fitting to Tube Adapter End**

| Ordering Number         | Nominal Hose Size | Tube Fitting Size | Overall Length | Minimum Inside Diameter | Maximum Outside Dimension |
|-------------------------|-------------------|-------------------|----------------|-------------------------|---------------------------|
|                         |                   | in.               | in. (mm)       | in. (mm)                | in. (mm)                  |
| SS-MH4-FL4-FT4-F24-     | 1/4               | 1/4               | 24 (610)       | 0.17 (4.3)              | 0.94 (23.8)               |
| SS-MM4-FL4-FT4-F36-R-   |                   |                   | 36 (914)       | 0.37 (9.4)              | 1.30 (33.1)               |
| SS-MH8-FL8-FT8-M1000-   | 1/2               | 1/2               | 39.4 (1,000)   | 0.17 (4.3)              | 0.87 (22.0)               |
| SS-MM8-FL8-FT8-M1000-R- |                   |                   | 39.4 (1,000)   | 0.37 (9.4)              | 1.15 (29.3)               |

# TMP Series Tubing

## Features

- FITOK Enhanced-316/316L stainless steel tubing features Ni, Cr, and Mo content near the upper limits of ASTM A269 and a  $Ni_{eq}$  of no less than 28.5%, providing better resistance to hydrogen embrittlement
- Complies with ASTM A269 and ASTM A213 standards, featuring tighter tolerances than required by the standards and a maximum hardness that is less than 90% of the upper limit specified
- Working temperature: -40 to 248 °F (-40 to 120 °C)
- Standard lengths: 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m
- Tube cutting, tube end processing, ferrule presetting, and pipeline system installation and testing services are available based on customer needs



## Materials

| UNS                    | Grade             | FITOK Designator | Composition % |       |       |         |
|------------------------|-------------------|------------------|---------------|-------|-------|---------|
|                        |                   |                  | C             | Cr    | Ni    | Mo      |
| Enhanced-S31600/S31603 | Enhanced-316/316L | SH               | ≤0.030        | 17-18 | 12-14 | 2.6-3.0 |

## Mechanical Properties

| UNS                    | Grade             | Yield Strength ksi (Mpa) | Tensile Strength ksi (Mpa) | Elongation % | Hardness |
|------------------------|-------------------|--------------------------|----------------------------|--------------|----------|
| Enhanced-S31600/S31603 | Enhanced-316/316L | ≥30 (205)                | ≥75 (515)                  | ≥35          | ≤80 HRB  |

## Dimensional Tolerance

| Tube O.D. (D)<br>in. (mm)     | O.D. Tolerance, in. (mm) | Wall Thickness Tolerance % |
|-------------------------------|--------------------------|----------------------------|
| 3/32 (2.38) ≤ D < 3/16 (4.76) | +0.003 (0.08)/-0         | +/-10                      |
| 3/16 (4.76) ≤ D ≤ 1 (25.4)    | +/-0.004 (0.10)          |                            |

## Working Pressure at Ambient Temperature

### Fractional

| Tube O.D.<br>in. | Wall Thickness in.    |       |       |       |       |
|------------------|-----------------------|-------|-------|-------|-------|
|                  | 0.028                 | 0.035 | 0.049 | 0.065 | 0.083 |
|                  | Working Pressure psig |       |       |       |       |
| 1/4              | 4000                  | 5100  | 7500  | 10200 |       |
| 3/8              |                       | 3300  | 4800  | 6500  | 7500  |
| 1/2              |                       | 2600  | 3700  | 5100  | 6700  |

Note: For gas service, select a tube thickness outside of the shaded area when the tube is used with 6D series tube fittings.

### Metric

| Tube O.D.<br>mm | Wall Thickness mm    |     |     |     |     |
|-----------------|----------------------|-----|-----|-----|-----|
|                 | 1.0                  | 1.2 | 1.5 | 1.8 | 2.0 |
|                 | Working Pressure bar |     |     |     |     |
| 6               | 420                  | 540 | 710 |     |     |
| 8               | 310                  | 390 | 520 |     |     |
| 10              | 240                  | 300 | 400 | 510 | 580 |
| 12              | 200                  | 250 | 330 | 410 | 470 |

## Ordering Information

| Ordering Number  |                    | Tube O.D. | Wall Thickness | Working Pressure<br>psig (bar) | Length/Each |
|------------------|--------------------|-----------|----------------|--------------------------------|-------------|
| SH-TMP-4-035-20F | SH-TMP-4-035-6M    | 1/4"      | 0.035"         | 5,100 (350)                    | 6 m         |
| SH-TMP-4-049-20F | SH-TMP-4-049-6M    | 1/4"      | 0.049"         | 7,500 (517)                    | 6 m         |
| SH-TMP-6-065-20F | SH-TMP-6-065-6M    | 3/8"      | 0.065"         | 6,500 (448)                    | 6 m         |
| SH-TMP-8-065-20F | SH-TMP-8-065-6M    | 1/2"      | 0.065"         | 5,100 (352)                    | 6 m         |
| SH-TMP-8-083-20F | SH-TMP-8-083-6M    | 1/2"      | 0.083"         | 6,700 (462)                    | 6 m         |
| —                | SH-TMP-6MM-1.0-6M  | 6 mm      | 1.0 mm         | 6,090 (420)                    | 6 m         |
| —                | SH-TMP-8MM-1.2-6M  | 8 mm      | 1.2 mm         | 5,655 (390)                    | 6 m         |
| —                | SH-TMP-8MM-1.5-6M  | 8 mm      | 1.5 mm         | 7,540 (520)                    | 6 m         |
| —                | SH-TMP-10MM-1.5-6M | 10 mm     | 1.5 mm         | 5,800 (400)                    | 6 m         |
| —                | SH-TMP-12MM-2.0-6M | 12 mm     | 2.0 mm         | 6,815 (470)                    | 6 m         |

Note: Tubing with other outside diameters, wall thicknesses, and lengths is available. For more details, please contact FITOK.

# TCT Series Tubing

## Features

- ◎ The entire coiled tubing is free from any welds
- ◎ FITOK Enhanced-316/316L stainless steel tubing features Ni, Cr, and Mo content near the upper limits of ASTM A269 and a Ni<sub>eq</sub> of no less than 28.5%, providing better resistance to hydrogen embrittlement
- ◎ Complies with ASTM A269 and ASTM A213 standards, featuring tighter tolerances than required by the standards and a maximum hardness that is less than 90% of the upper limit specified
- ◎ Working temperature: -40 to 248 °F (-40 to 120 °C)
- ◎ Tube cutting, tube end processing, ferrule presetting, and pipeline system installation and testing services are available based on customer needs



## Materials

| UNS                    | Grade             | FITOK Designator | Composition % |       |       |         |
|------------------------|-------------------|------------------|---------------|-------|-------|---------|
|                        |                   |                  | C             | Cr    | Ni    | Mo      |
| Enhanced-S31600/S31603 | Enhanced-316/316L | SH               | ≤0.030        | 17-18 | 12-14 | 2.6-3.0 |

## Mechanical Properties

| UNS                    | Grade             | Yield Strength<br>ksi (Mpa) | Tensile Strength<br>ksi (Mpa) | Elongation<br>% | Hardness |
|------------------------|-------------------|-----------------------------|-------------------------------|-----------------|----------|
| Enhanced-S31600/S31603 | Enhanced-316/316L | ≥30 (205)                   | ≥75 (515)                     | ≥35             | ≤80 HRB  |

## Dimensional Tolerance

| Tube O.D. (D)<br>in. (mm)     | O.D. Tolerance, in. (mm) | Wall Thickness Tolerance<br>% |
|-------------------------------|--------------------------|-------------------------------|
| 3/32 (2.38) ≤ D < 3/16 (4.76) | +0.003 (0.08)/-0         | ±10                           |
| 3/16 (4.76) ≤ D ≤ 1 (25.4)    | +/-0.004 (0.10)          |                               |

## Ordering Information

| Ordering Number      | Tube O.D. | Wall Thickness | Working Pressure<br>psig (bar) | Length/Coil |
|----------------------|-----------|----------------|--------------------------------|-------------|
| SH-TCT-4-035-600F    | 1/4"      | 0.035"         | 5,100 (350)                    | 600 ft      |
| SH-TCT-4-049-600F    | 1/4"      | 0.049"         | 7,500 (517)                    | 600 ft      |
| SH-TCT-6-065-600F    | 3/8"      | 0.065"         | 6,500 (448)                    | 600 ft      |
| SH-TCT-8-065-300F    | 1/2"      | 0.065"         | 5,100 (352)                    | 300 ft      |
| SH-TCT-8-083-300F    | 1/2"      | 0.083"         | 6,700 (462)                    | 300 ft      |
| SH-TCT-6MM-1.0-200M  | 6 mm      | 1.0 mm         | 6,090 (420)                    | 200 m       |
| SH-TCT-8MM-1.2-200M  | 8 mm      | 1.2 mm         | 5,655 (390)                    | 200 m       |
| SH-TCT-8MM-1.5-200M  | 8 mm      | 1.5 mm         | 7,540 (520)                    | 200 m       |
| SH-TCT-10MM-1.5-100M | 10 mm     | 1.5 mm         | 5,800 (400)                    | 100 m       |
| SH-TCT-12MM-2.0-100M | 12 mm     | 2.0 mm         | 6,815 (470)                    | 100 m       |

Notes: 1. Tubing with other outside diameters, wall thicknesses, and lengths is available. For more details, please contact FITOK.

2. The TCT series tubing has the same working pressure as the TMP series tubing at ambient temperature.

**FITOK**

## Products with Working Pressures Up to 20,000 psig (1,379 bar)

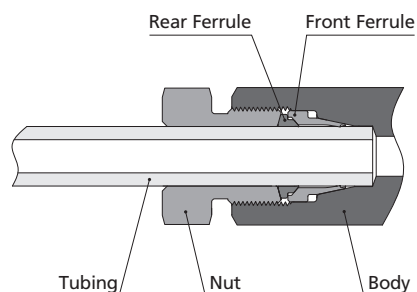


## 20D Series Tube Fittings



### Features

- ◎ The slight axial movement of the front and rear ferrules along the outer wall of the tubing during installation reduces the requirement for dimensional accuracy in the tubing's length direction. This minimizes interference between adjacent fittings and enhances reliability
- ◎ A minimum of 25 assembly and disassembly cycles while maintaining reliable sealing performance
- ◎ 3 times safety factor
- ◎ EC79 compliant FKM O-ring for reliable performance
- ◎ Tube ends can be assembled by torque or turns
- ◎ Tube ends with helium leak rate  $\leq 1 \times 10^{-9}$  Ncm<sup>3</sup>/s



### Technical Data

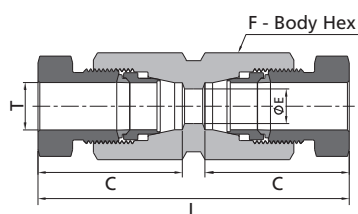
|                              |                                                                                                                       |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Body Material</b>         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % ≥ 28.5                                                              |
| <b>Max. Working Pressure</b> | Tube: 20,000 psig (1,379 bar)<br>NPT Thread: 15,000 psig (1,034 bar)<br>SAE/MS Straight Thread: 10,150 psig (700 bar) |
| <b>Working Temperature</b>   | -40~248 °F (-40~120 °C)                                                                                               |

### Matching Tubing and Installation Method

| Tubing Type                                                                               | Installation Method      | Recommended Index |
|-------------------------------------------------------------------------------------------|--------------------------|-------------------|
| FITOK T20D series tubing                                                                  | Assembly by Torque/Turns | Recommended       |
| Tubing from Other Brands with O.D. and Wall Thickness Tolerances Compliant with ASTM A269 | Assembly by Turns        | Acceptable        |
| FITOK T20M series tubing                                                                  |                          |                   |
| Tubing from Other Brands with O.D. Compliant with ASME B1.1 2A thread class               |                          |                   |

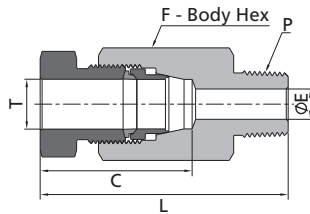
### Ordering Information and Dimensions

#### Unions

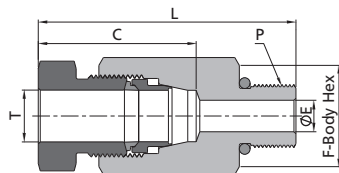


| Tube                  |                 | Dimensions, in. (mm) |             |             |             |
|-----------------------|-----------------|----------------------|-------------|-------------|-------------|
| Basic Ordering Number | T-Tube O.D. in. | L                    | C           | E           | F           |
| SS-DU-DFF4-           | 1/4             | 3.00 (76.2)          | 1.38 (35.2) | 0.19 (4.8)  | 0.63 (15.9) |
| SS-DU-DFF6-           | 3/8             | 3.07 (77.9)          | 1.42 (36.1) | 0.25 (6.4)  | 0.75 (19.1) |
| SS-DU-DFF8-           | 1/2             | 3.36 (85.4)          | 1.56 (39.6) | 0.37 (9.5)  | 1.00 (25.4) |
| SS-DU-DFF12-          | 3/4             | 5.38 (136.7)         | 2.49 (63.3) | 0.56 (14.2) | 1.50 (38.1) |
| SS-DU-DFF16-          | 1               | 7.06 (179.3)         | 3.24 (82.3) | 0.69 (17.5) | 1.75 (44.5) |

## Male Connectors

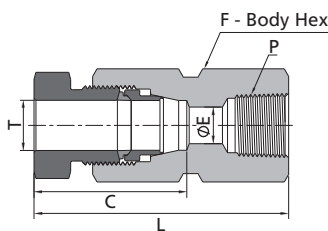


| Tube to NPT Thread    |                 |            |                      |             |            |             |
|-----------------------|-----------------|------------|----------------------|-------------|------------|-------------|
| Basic Ordering Number | T-Tube O.D. in. | P-NPT Size | Dimensions, in. (mm) |             |            |             |
|                       |                 |            | L                    | C           | E          | F           |
| SS-DCM-DFF4-NS4-      | 1/4             | 1/4        | 2.08 (52.8)          | 1.39 (35.2) | 0.19 (4.8) | 0.63 (15.9) |
| SS-DCM-DFF4-NS6-      | 1/4             | 3/8        | 2.08 (52.8)          | 1.39 (35.2) | 0.19 (4.8) | 0.69 (17.5) |
| SS-DCM-DFF4-NS8-      | 1/4             | 1/2        | 2.32 (59.0)          | 1.39 (35.2) | 0.19 (4.8) | 0.87 (22.2) |
| SS-DCM-DFF6-NS4-      | 3/8             | 1/4        | 2.17 (55.1)          | 1.42 (36.1) | 0.25 (6.4) | 0.75 (19.1) |
| SS-DCM-DFF6-NS6-      | 3/8             | 3/8        | 2.17 (55.1)          | 1.42 (36.1) | 0.25 (6.4) | 0.75 (19.1) |
| SS-DCM-DFF6-NS8-      | 3/8             | 1/2        | 2.30 (58.3)          | 1.42 (36.1) | 0.25 (6.4) | 0.87 (22.2) |
| SS-DCM-DFF8-NS4-      | 1/2             | 1/4        | 2.53 (64.3)          | 1.56 (39.6) | 0.25 (6.4) | 1.00 (25.4) |
| SS-DCM-DFF8-NS6-      | 1/2             | 3/8        | 2.53 (64.3)          | 1.56 (39.6) | 0.31 (7.9) | 1.00 (25.4) |
| SS-DCM-DFF8-NS8-      | 1/2             | 1/2        | 2.65 (67.4)          | 1.56 (39.6) | 0.37 (9.5) | 1.00 (25.4) |
| SS-DCM-DFF12-NS8-     | 3/4             | 1/2        | 3.74 (95.1)          | 2.49 (63.3) | 0.38 (9.6) | 1.50 (38.1) |
| SS-DCM-DFF16-NS8-     | 1               | 1/2        | 4.46 (113.2)         | 3.24 (82.3) | 0.38 (9.6) | 1.75 (44.5) |

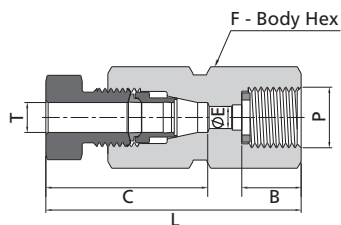


| Tube to Male SAE O-Ring |                 |                      |                      |             |            |             |
|-------------------------|-----------------|----------------------|----------------------|-------------|------------|-------------|
| Ordering Number         | T-Tube O.D. in. | P-SAE/MS Thread Size | Dimensions, in. (mm) |             |            |             |
|                         |                 |                      | L                    | C           | E          | F           |
| SS-DCM-DFF4-SH7-        | 1/4             | 7/16-20              | 2.04 (51.7)          | 1.39 (35.2) | 0.18 (4.5) | 0.63 (15.9) |
| SS-DCM-DFF4-SH9-        | 1/4             | 9/16-18              | 2.07 (52.7)          | 1.39 (35.2) | 0.19 (4.8) | 0.69 (17.5) |
| SS-DCM-DFF6-SH7-        | 3/8             | 7/16-20              | 2.09 (53.0)          | 1.42 (36.1) | 0.18 (4.5) | 0.75 (19.1) |
| SS-DCM-DFF6-SH9-        | 3/8             | 9/16-18              | 2.13 (54.0)          | 1.42 (36.1) | 0.25 (6.4) | 0.75 (19.1) |
| SS-DCM-DFF8-SH7-        | 1/2             | 7/16-20              | 2.49 (63.3)          | 1.56 (39.6) | 0.18 (4.5) | 1.00 (25.4) |
| SS-DCM-DFF8-SH9-        | 1/2             | 9/16-18              | 2.49 (63.3)          | 1.56 (39.6) | 0.30 (7.5) | 1.00 (25.4) |

## Female Connectors



| Tube to NPT Thread    |                 |            |                      |             |             |             |
|-----------------------|-----------------|------------|----------------------|-------------|-------------|-------------|
| Basic Ordering Number | T-Tube O.D. in. | P-NPT Size | Dimensions, in. (mm) |             |             |             |
|                       |                 |            | L                    | C           | E           | F           |
| SS-DCF-DFF4-FNS4-     | 1/4             | 1/4        | 2.33 (59.1)          | 1.38 (35.2) | 0.19 (4.8)  | 0.94 (23.8) |
| SS-DCF-DFF6-FNS4-     | 3/8             | 1/4        | 2.29 (58.1)          | 1.42 (36.1) | 0.25 (6.4)  | 0.94 (23.8) |
| SS-DCF-DFF8-FNS4-     | 1/2             | 1/4        | 2.78 (70.6)          | 1.56 (39.6) | 0.37 (9.5)  | 1.00 (25.4) |
| SS-DCF-DFF8-FNS8-     | 1/2             | 1/2        | 3.03 (77.0)          | 1.56 (39.6) | 0.37 (9.5)  | 1.38 (34.9) |
| SS-DCF-DFF12-FNS8-    | 3/4             | 1/2        | 3.85 (97.8)          | 2.49 (63.3) | 0.56 (14.2) | 1.50 (38.1) |
| SS-DCF-DFF16-FNS8-    | 1               | 1/2        | 4.75 (120.7)         | 3.24 (82.3) | 0.67 (17.1) | 1.75 (44.5) |

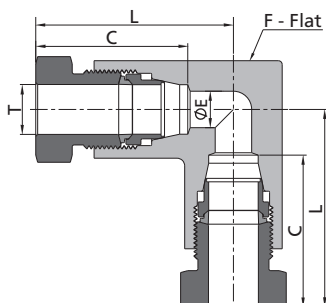


Adapt to EN 837-1/3 straight thread bore.

| Tube to HRG Thread <sup>①</sup> |                 |            |                      |             |             |            |             |  |
|---------------------------------|-----------------|------------|----------------------|-------------|-------------|------------|-------------|--|
| Ordering Number                 | T-Tube O.D. in. | P-HRG Size | Dimensions, in. (mm) |             |             |            |             |  |
|                                 |                 |            | L                    | B           | C           | E          | F           |  |
| SS-DCF-DFF4-HRG4-               | 1/4             | 1/4        | 2.19 (55.5)          | 0.51 (12.9) | 1.39 (35.2) | 0.19 (4.8) | 0.75 (19.1) |  |
| SS-DCF-DFF6-HRG4-               | 3/8             | 1/4        | 2.27 (57.6)          | 0.51 (12.9) | 1.42 (36.1) | 0.20 (5.0) | 0.75 (19.1) |  |
| SS-DCF-DFF8-HRG8-               | 1/2             | 1/2        | 2.65 (67.2)          | 0.74 (18.8) | 1.56 (39.6) | 0.28 (7.0) | 1.06 (27.0) |  |

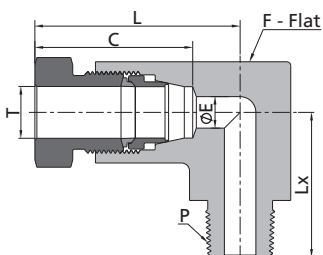
① The HRG gasket includes a RG gasket at the seal female end.

## Union Elbows



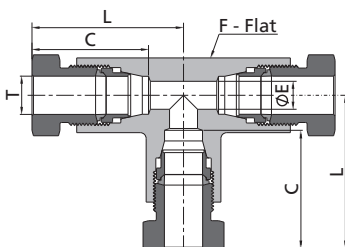
| Tube                  |                 | Dimensions, in. (mm) |             |             |             |
|-----------------------|-----------------|----------------------|-------------|-------------|-------------|
| Basic Ordering Number | T-Tube O.D. in. | L                    | C           | E           | F           |
| SS-DLU-DFF4-          | 1/4             | 1.70 (43.1)          | 1.38 (35.2) | 0.19 (4.8)  | 0.63 (15.9) |
| SS-DLU-DFF6-          | 3/8             | 1.67 (42.4)          | 1.42 (36.1) | 0.25 (6.4)  | 0.75 (19.1) |
| SS-DLU-DFF8-          | 1/2             | 2.03 (51.6)          | 1.56 (39.6) | 0.37 (9.5)  | 1.00 (25.4) |
| SS-DLU-DFF12-         | 3/4             | 3.11 (79.1)          | 2.49 (63.3) | 0.56 (14.2) | 1.50 (38.1) |
| SS-DLU-DFF16-         | 1               | 4.14 (105.2)         | 3.24 (82.3) | 0.69 (17.5) | 1.75 (44.5) |

## Male Elbows



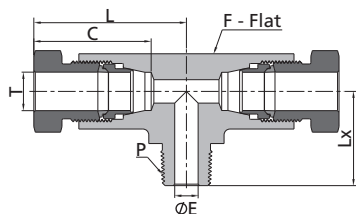
| Tube to NPT Thread          |                       |               |                      |             |             |            |             |  |
|-----------------------------|-----------------------|---------------|----------------------|-------------|-------------|------------|-------------|--|
| Basic<br>Ordering<br>Number | T-Tube<br>O.D.<br>in. | P-NPT<br>Size | Dimensions, in. (mm) |             |             |            |             |  |
|                             |                       |               | L                    | Lx          | C           | E          | F           |  |
| SS-DLM-DFF4-NS4-            | 1/4                   | 1/4           | 1.70 (43.1)          | 0.94 (23.8) | 1.38 (35.2) | 0.19 (4.8) | 0.63 (15.9) |  |
| SS-DLM-DFF4-NS6-            | 1/4                   | 3/8           | 1.70 (43.1)          | 1.00 (25.4) | 1.38 (35.2) | 0.19 (4.8) | 0.75 (19.1) |  |
| SS-DLM-DFF4-NS8-            | 1/4                   | 1/2           | 1.70 (43.1)          | 1.38 (34.9) | 1.38 (35.2) | 0.19 (4.8) | 1.00 (25.4) |  |
| SS-DLM-DFF6-NS4-            | 3/8                   | 1/4           | 1.67 (42.4)          | 1.00 (25.4) | 1.42 (36.1) | 0.25 (6.4) | 0.75 (19.1) |  |
| SS-DLM-DFF6-NS6-            | 3/8                   | 3/8           | 1.67 (42.4)          | 1.06 (27.0) | 1.42 (36.1) | 0.25 (6.4) | 0.75 (19.1) |  |
| SS-DLM-DFF6-NS8-            | 3/8                   | 1/2           | 1.67 (42.4)          | 1.38 (34.9) | 1.42 (36.1) | 0.25 (6.4) | 1.00 (25.4) |  |
| SS-DLM-DFF8-NS4-            | 1/2                   | 1/4           | 2.03 (51.6)          | 1.19 (30.2) | 1.56 (39.6) | 0.25 (6.4) | 1.00 (25.4) |  |
| SS-DLM-DFF8-NS6-            | 1/2                   | 3/8           | 2.03 (51.6)          | 1.19 (30.2) | 1.56 (39.6) | 0.31 (7.9) | 1.00 (25.4) |  |
| SS-DLM-DFF8-NS8-            | 1/2                   | 1/2           | 2.03 (51.6)          | 1.38 (34.9) | 1.56 (39.6) | 0.37 (9.5) | 1.00 (25.4) |  |
| SS-DLM-DFF12-NS8-           | 3/4                   | 1/2           | 3.11 (79.1)          | 1.73 (44.0) | 2.49 (63.3) | 0.38 (9.6) | 1.50 (38.1) |  |
| SS-DLM-DFF16-NS8-           | 1                     | 1/2           | 4.14 (105.2)         | 2.06 (52.4) | 3.24 (82.3) | 0.38 (9.6) | 1.75 (44.5) |  |

## Union Tees



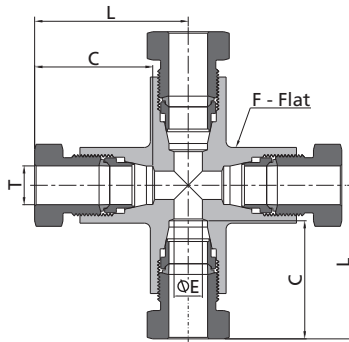
| Tube                  |                 | Dimensions, in. (mm) |             |             |             |
|-----------------------|-----------------|----------------------|-------------|-------------|-------------|
| Basic Ordering Number | T-Tube O.D. in. | L                    | C           | E           | F           |
| SS-DT-DFF4-           | 1/4             | 1.70 (43.1)          | 1.38 (35.2) | 0.19 (4.8)  | 0.63 (15.9) |
| SS-DT-DFF6-           | 3/8             | 1.67 (42.4)          | 1.42 (36.1) | 0.25 (6.4)  | 0.75 (19.1) |
| SS-DT-DFF8-           | 1/2             | 2.03 (51.6)          | 1.56 (39.6) | 0.37 (9.5)  | 1.00 (25.4) |
| SS-DT-DFF12-          | 3/4             | 3.11 (79.1)          | 2.49 (63.3) | 0.56 (14.2) | 1.50 (38.1) |
| SS-DT-DFF16-          | 1               | 4.14 (105.2)         | 3.24 (82.3) | 0.69 (17.5) | 1.75 (44.5) |

## Male Branch Tees



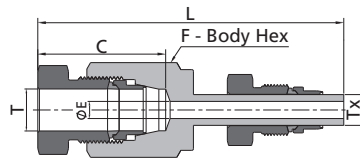
| Tube to NPT Thread          |                       |               |                      |             |             |            |             |  |
|-----------------------------|-----------------------|---------------|----------------------|-------------|-------------|------------|-------------|--|
| Basic<br>Ordering<br>Number | T-Tube<br>O.D.<br>in. | P-NPT<br>Size | Dimensions, in. (mm) |             |             |            |             |  |
|                             |                       |               | L                    | Lx          | C           | E          | F           |  |
| SS-DT-DFF4-DFF4-NS4-        | 1/4                   | 1/4           | 1.70 (43.1)          | 1.00 (25.4) | 1.38 (35.2) | 0.19 (4.8) | 0.63 (15.9) |  |
| SS-DT-DFF6-DFF6-NS4-        | 3/8                   | 1/4           | 1.67 (42.4)          | 1.06 (27.0) | 1.42 (36.1) | 0.25 (6.4) | 0.75 (19.1) |  |
| SS-DT-DFF8-DFF8-NS4-        | 1/2                   | 1/4           | 2.03 (51.6)          | 1.19 (30.2) | 1.56 (39.6) | 0.25 (6.4) | 1.00 (25.4) |  |
| SS-DT-DFF8-DFF8-NS6-        | 1/2                   | 3/8           | 2.03 (51.6)          | 1.19 (30.2) | 1.56 (39.6) | 0.31 (7.9) | 1.00 (25.4) |  |
| SS-DT-DFF12-DFF12-NS8-      | 3/4                   | 1/2           | 3.11 (79.1)          | 1.73 (44.0) | 2.49 (63.3) | 0.38 (9.6) | 1.50 (38.1) |  |
| SS-DT-DFF16-DFF16-NS8-      | 1                     | 1/2           | 4.14 (105.2)         | 2.06 (52.4) | 3.24 (82.3) | 0.38 (9.6) | 1.75 (44.5) |  |

## Union Crosses



| Tube                  |                 | Dimensions, in. (mm) |             |             |             |
|-----------------------|-----------------|----------------------|-------------|-------------|-------------|
| Basic Ordering Number | T-Tube O.D. in. |                      |             |             |             |
|                       |                 | L                    | C           | E           | F           |
| SS-DX-DFF4-           | 1/4             | 1.70 (43.1)          | 1.38 (35.2) | 0.19 (4.8)  | 0.63 (15.9) |
| SS-DX-DFF6-           | 3/8             | 1.67 (42.4)          | 1.42 (36.1) | 0.25 (6.4)  | 0.75 (19.1) |
| SS-DX-DFF8-           | 1/2             | 2.03 (51.6)          | 1.56 (39.6) | 0.37 (9.5)  | 1.00 (25.4) |
| SS-DX-DFF12-          | 3/4             | 3.01 (76.4)          | 2.49 (63.3) | 0.56 (14.2) | 1.50 (38.1) |

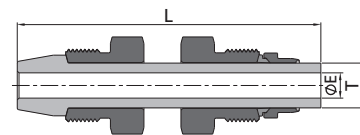
## Reducers



| Tube                        |                       |                        |                      |             |             |             |  |
|-----------------------------|-----------------------|------------------------|----------------------|-------------|-------------|-------------|--|
| Basic<br>Ordering<br>Number | T-Tube<br>O.D.<br>in. | Tx-Tube<br>O.D.<br>in. | Dimensions, in. (mm) |             |             |             |  |
|                             |                       |                        | L                    | C           | E           | F           |  |
| SS-DR-DFF4-DFT6-            | 1/4                   | 3/8                    | 3.20 (82.1)          | 1.38 (35.2) | 0.19 (4.8)  | 0.63 (15.9) |  |
| SS-DR-DFF6-DFT8-            | 3/8                   | 1/2                    | 3.43 (87.1)          | 1.42 (36.1) | 0.25 (6.4)  | 0.75 (19.1) |  |
| SS-DR-DFF8-DFT6-            | 1/2                   | 3/8                    | 3.53 (89.7)          | 1.56 (39.6) | 0.21 (5.3)  | 1.00 (25.4) |  |
| SS-DR-DFF12-DFT8-           | 3/4                   | 1/2                    | 4.61 (117.1)         | 2.49 (63.3) | 0.28 (7.1)  | 1.50 (38.1) |  |
| SS-DR-DFF16-DFT12-          | 1                     | 3/4                    | 6.92 (175.7)         | 3.24 (82.3) | 0.42 (10.7) | 1.75 (44.5) |  |

The tube stub end is preassembled with the nut and ferrules before ex-work.

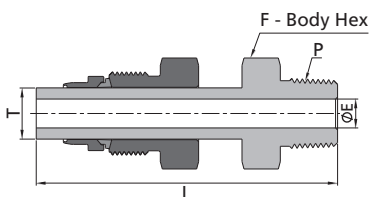
## Port Connectors



| Tube                  |                 | Dimensions, in. (mm) |             |
|-----------------------|-----------------|----------------------|-------------|
| Basic Ordering Number | T-Tube O.D. in. |                      |             |
|                       |                 | L                    | E           |
| SS-DP-DFF4-           | 1/4             | 2.66 (67.5)          | 0.12 (3.0)  |
| SS-DP-DFF6-           | 3/8             | 2.72 (69.0)          | 0.21 (5.3)  |
| SS-DP-DFF8-           | 1/2             | 3.04 (77.3)          | 0.28 (7.1)  |
| SS-DP-DFF12-          | 3/4             | 4.83 (122.8)         | 0.42 (10.7) |
| SS-DP-DFF16-          | 1               | 5.98 (152.0)         | 0.66 (16.7) |

The tube stub end is preassembled with the nut and ferrules before ex-work.

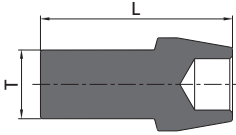
## Adapters



| Tube to NPT Thread    |                 | Dimensions, in. (mm) |              |            |             |
|-----------------------|-----------------|----------------------|--------------|------------|-------------|
| Basic Ordering Number | T-Tube O.D. in. | P-NPT Size           |              |            |             |
|                       |                 |                      | L            | E          | F           |
| SS-DAM-DFT4-NS4-      | 1/4             | 1/4                  | 2.30 (58.5)  | 0.12 (3.0) | 0.56 (14.3) |
| SS-DAM-DFT6-NS4-      | 3/8             | 1/4                  | 2.38 (60.4)  | 0.21 (5.3) | 0.56 (14.3) |
| SS-DAM-DFT6-NS8-      | 3/8             | 1/2                  | 2.67 (67.9)  | 0.21 (5.3) | 0.87 (22.2) |
| SS-DAM-DFT8-NS4-      | 1/2             | 1/4                  | 2.55 (64.8)  | 0.25 (6.4) | 0.56 (14.3) |
| SS-DAM-DFT8-NS8-      | 1/2             | 1/2                  | 2.84 (72.2)  | 0.28 (7.1) | 0.87 (22.2) |
| SS-DAM-DFT12-NS8-     | 3/4             | 1/2                  | 4.31 (109.6) | 0.38 (9.6) | 0.87 (22.2) |
| SS-DAM-DFT16-NS8-     | 1               | 1/2                  | 5.05 (128.2) | 0.38 (9.6) | 1.06 (27.0) |

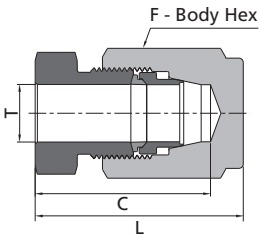
The tube stub end is preassembled with the nut and ferrules before ex-work.

## Plugs



| Tube                  |                 |                      |
|-----------------------|-----------------|----------------------|
| Basic Ordering Number | T-Tube O.D. in. | Dimensions, in. (mm) |
|                       |                 | L                    |
| SS-DTP-DFF4-          | 1/4             | 1.20 (30.4)          |
| SS-DTP-DFF6-          | 3/8             | 1.19 (30.2)          |
| SS-DTP-DFF8-          | 1/2             | 1.36 (34.6)          |
| SS-DTP-DFF12-         | 3/4             | 2.30 (58.3)          |
| SS-DTP-DFF16-         | 1               | 2.64 (67.0)          |

## Caps

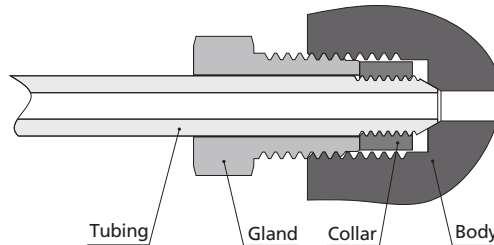


| Tube                  |                 |                      |             |             |
|-----------------------|-----------------|----------------------|-------------|-------------|
| Basic Ordering Number | T-Tube O.D. in. | Dimensions, in. (mm) |             |             |
|                       |                 | L                    | C           | F           |
| SS-DTC-DFF4-          | 1/4             | 1.70 (43.1)          | 1.38 (35.2) | 0.63 (15.9) |
| SS-DTC-DFF6-          | 3/8             | 1.76 (44.8)          | 1.42 (36.1) | 0.75 (19.1) |
| SS-DTC-DFF8-          | 1/2             | 1.85 (47.0)          | 1.56 (39.6) | 1.00 (25.4) |
| SS-DTC-DFF12-         | 3/4             | 3.22 (81.9)          | 2.49 (63.3) | 1.50 (38.1) |
| SS-DTC-DFF16-         | 1               | 4.06 (103.2)         | 3.24 (82.3) | 1.75 (44.5) |

## 20M Series Medium Pressure Fittings

### Features

- Standard tapered threads
- Leak rate of  $\leq 1 \times 10^{-8}$  Ncm<sup>3</sup>/s
- Compatible with FITOK T20M series tubing or tubing with an outer diameter that meets ASME B1.1 2A thread class specifications

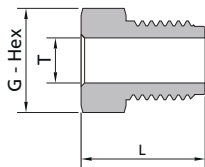


### Technical Data

|                       |                                                               |
|-----------------------|---------------------------------------------------------------|
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$ |
| Max. Working Pressure | 20,000 psig (1,379 bar)                                       |
| Working Temperature   | -40~248 °F (-40~120 °C)                                       |

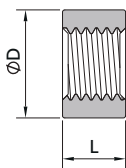
### Ordering Information and Dimensions

#### Glands



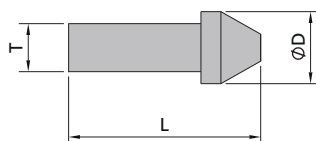
| Tube                    |                    |                      |             |
|-------------------------|--------------------|----------------------|-------------|
| T - Tube<br>O.D.<br>in. | Ordering<br>Number | Dimensions, in. (mm) |             |
|                         |                    | G                    | L           |
| 1/4                     | SS-MG-MF4-         | 0.50 (12.7)          | 0.58 (14.7) |
| 3/8                     | SS-MG-MF6-         | 0.63 (15.9)          | 0.73 (18.5) |
| 9/16                    | SS-MG-MF9-         | 0.94 (23.8)          | 0.88 (22.4) |

#### Collars



| Tube                    |                    |                      |            |
|-------------------------|--------------------|----------------------|------------|
| T - Tube<br>O.D.<br>in. | Ordering<br>Number | Dimensions, in. (mm) |            |
|                         |                    | D                    | L          |
| 1/4                     | SS-MCO-MF4-        | 0.38 (9.7)           | 0.22 (5.6) |
| 3/8                     | SS-MCO-MF6-        | 0.47 (11.9)          | 0.25 (6.4) |
| 9/16                    | SS-MCO-MF9-        | 0.72 (18.3)          | 0.31 (7.9) |

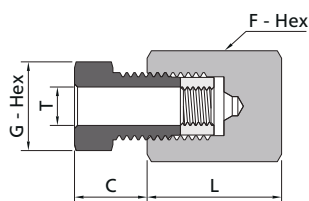
#### Plugs<sup>①</sup>



| Tube                    |                    |                      |             |
|-------------------------|--------------------|----------------------|-------------|
| T - Tube<br>O.D.<br>in. | Ordering<br>Number | Dimensions, in. (mm) |             |
|                         |                    | D                    | L           |
| 1/4                     | SS-MTP-MF4-        | 0.38 (9.7)           | 0.94 (23.8) |
| 3/8                     | SS-MTP-MF6-        | 0.47 (11.9)          | 1.18 (30.0) |
| 9/16                    | SS-MTP-MF9-        | 0.72 (18.3)          | 1.40 (35.6) |

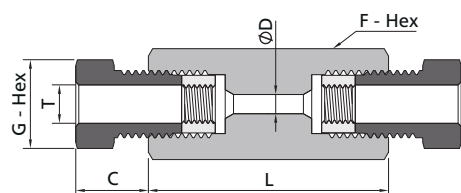
① When using plug, collar is not required.

## Caps



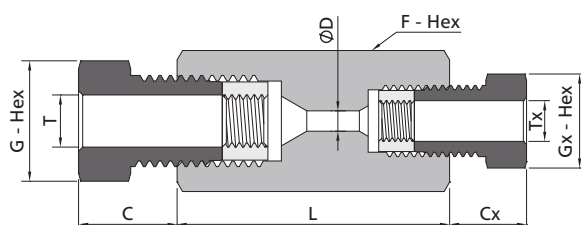
| Tube                    |                    |                      |             |             |             |
|-------------------------|--------------------|----------------------|-------------|-------------|-------------|
| T - Tube<br>O.D.<br>in. | Ordering<br>Number | Dimensions, in. (mm) |             |             |             |
|                         |                    | L                    | C           | G           | F           |
| 1/4                     | SS-MTC-MF4-        | 0.81 (20.6)          | 0.38 (9.7)  | 0.50 (12.7) | 0.63 (15.9) |
| 3/8                     | SS-MTC-MF6-        | 1.13 (28.6)          | 0.44 (11.2) | 0.63 (15.9) | 0.75 (19.1) |
| 9/16                    | SS-MTC-MF9-        | 1.38 (34.9)          | 0.55 (14.0) | 0.94 (23.8) | 1.00 (25.4) |

## Unions



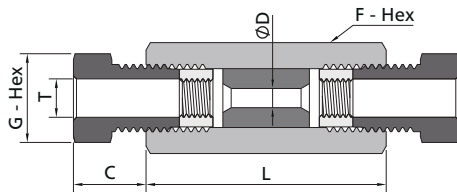
| Tube                    |                    |                      |             |            |             |             |
|-------------------------|--------------------|----------------------|-------------|------------|-------------|-------------|
| T - Tube<br>O.D.<br>in. | Ordering<br>Number | Dimensions, in. (mm) |             |            |             |             |
|                         |                    | L                    | C           | D          | G           | F           |
| 1/4                     | SS-MU-MF4-         | 1.62 (41.1)          | 0.38 (9.7)  | 0.11 (2.8) | 0.50 (12.7) | 0.63 (15.9) |
| 3/8                     | SS-MU-MF6-         | 1.75 (44.5)          | 0.44 (11.2) | 0.20 (5.2) | 0.63 (15.9) | 0.75 (19.1) |
| 9/16                    | SS-MU-MF9-         | 2.14 (54.3)          | 0.55 (14.0) | 0.31 (7.9) | 0.94 (23.8) | 1.00 (25.4) |

## Reducing Unions



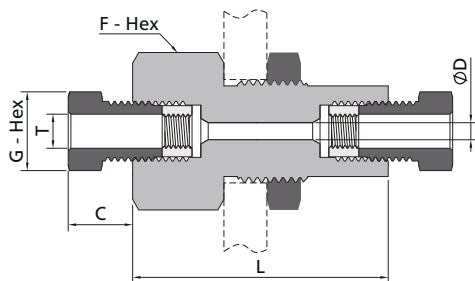
| Tube                    |                          |                    |                      |             |             |            |             |             |             |
|-------------------------|--------------------------|--------------------|----------------------|-------------|-------------|------------|-------------|-------------|-------------|
| T - Tube<br>O.D.<br>in. | Tx - Tube<br>O.D.<br>in. | Ordering<br>Number | Dimensions, in. (mm) |             |             |            |             |             |             |
|                         |                          |                    | L                    | C           | Cx          | D          | G           | Gx          | F           |
| 3/8                     | 1/4                      | SS-MU-MF6-MF4-     | 1.75 (44.5)          | 0.44 (11.2) | 0.38 (9.7)  | 0.11 (2.8) | 0.63 (15.9) | 0.50 (12.7) | 0.75 (19.1) |
| 9/16                    | 1/4                      | SS-MU-MF9-MF4-     | 2.00 (50.8)          | 0.55 (14.0) | 0.38 (9.7)  | 0.11 (2.8) | 0.94 (23.8) | 0.50 (12.7) | 1.00 (25.4) |
| 9/16                    | 3/8                      | SS-MU-MF9-MF6-     | 2.00 (50.8)          | 0.55 (14.0) | 0.44 (11.2) | 0.20 (5.2) | 0.94 (23.8) | 0.63 (15.9) | 1.00 (25.4) |

## Unions (Slip Type)



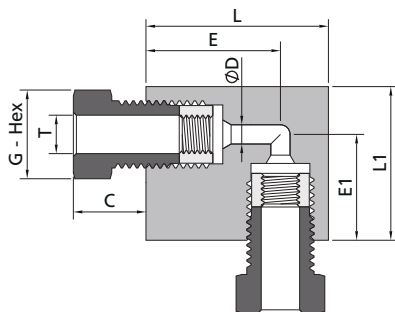
| Tube              |                 | Dimensions, in. (mm) |             |            |             |             |
|-------------------|-----------------|----------------------|-------------|------------|-------------|-------------|
| T - Tube O.D. in. | Ordering Number | L                    | C           | D          | G           | F           |
| 1/4               | SS-MSU-MF4-     | 1.62 (41.1)          | 0.38 (9.7)  | 0.11 (2.8) | 0.50 (12.7) | 0.63 (15.9) |
| 3/8               | SS-MSU-MF6-     | 1.75 (44.5)          | 0.44 (11.2) | 0.20 (5.2) | 0.63 (15.9) | 0.75 (19.1) |
| 9/16              | SS-MSU-MF9-     | 2.14 (54.3)          | 0.55 (14.0) | 0.31 (7.9) | 0.94 (23.8) | 1.00 (25.4) |

## Bulkhead Unions



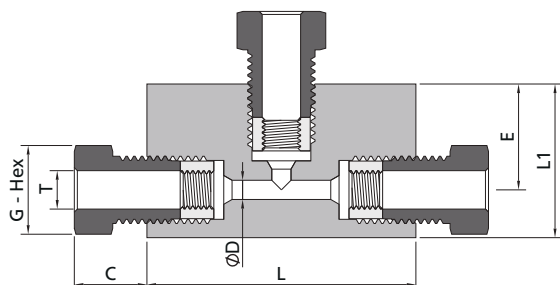
| Tube              |                 | Dimensions, in. (mm) |             |            |             |             |                 |                      |
|-------------------|-----------------|----------------------|-------------|------------|-------------|-------------|-----------------|----------------------|
| T - Tube O.D. in. | Ordering Number | L                    | C           | D          | G           | F           | Panel Hole Size | Max. Panel Thickness |
| 1/4               | SS-MBU-MF4-     | 1.88 (47.8)          | 0.38 (9.7)  | 0.11 (2.8) | 0.50 (12.7) | 1.00 (25.4) | 0.81 (20.6)     | 0.38 (9.7)           |
| 3/8               | SS-MBU-MF6-     | 2.00 (50.8)          | 0.44 (11.2) | 0.20 (5.2) | 0.63 (15.9) | 1.06 (27.0) | 0.94 (23.9)     | 0.38 (9.7)           |
| 9/16              | SS-MBU-MF9-     | 2.38 (60.5)          | 0.55 (14.0) | 0.31 (7.9) | 0.94 (23.8) | 1.38 (34.9) | 1.13 (28.6)     | 0.38 (9.7)           |

## Union Elbows



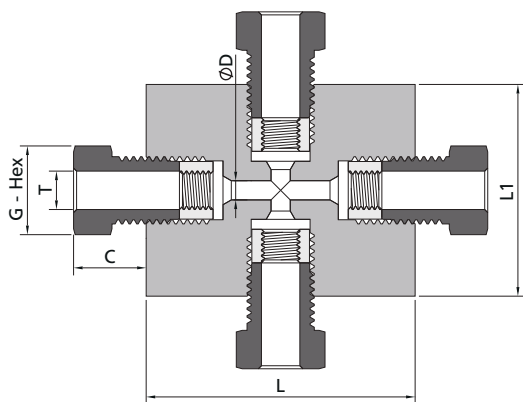
| Tube              |                 | Dimensions, in. (mm) |            |             |             |             |             |             |             |
|-------------------|-----------------|----------------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| T - Tube O.D. in. | Ordering Number | C                    | D          | G           | L           | E           | L1          | E1          | Thickness   |
| 1/4               | SS-MLU-MF4-     | 0.38 (9.7)           | 0.11 (2.8) | 0.50 (12.7) | 1.12 (28.4) | 0.75 (19.1) | 1.12 (28.4) | 0.75 (19.1) | 0.63 (15.9) |
| 3/8               | SS-MLU-MF6-     | 0.44 (11.2)          | 0.20 (5.2) | 0.63 (15.9) | 1.38 (34.9) | 1.00 (25.4) | 1.38 (34.9) | 1.00 (25.4) | 0.75 (19.1) |
| 9/16              | SS-MLU-MF9-     | 0.55 (14.0)          | 0.31 (7.9) | 0.94 (23.8) | 1.75 (44.5) | 1.25 (31.8) | 1.75 (44.5) | 1.25 (31.8) | 1.00 (25.4) |

## Union Tees



| Tube              |                 | Dimensions, in. (mm) |            |             |             |             |             |             |
|-------------------|-----------------|----------------------|------------|-------------|-------------|-------------|-------------|-------------|
| T - Tube O.D. in. | Ordering Number | C                    | D          | G           | L           | L1          | E           | Thickness   |
| 1/4               | SS-MT-MF4-      | 0.38 (9.7)           | 0.11 (2.8) | 0.50 (12.7) | 1.50 (38.1) | 1.12 (28.4) | 0.75 (19.1) | 0.63 (15.9) |
| 3/8               | SS-MT-MF6-      | 0.44 (11.2)          | 0.20 (5.2) | 0.63 (15.9) | 2.00 (50.8) | 1.38 (34.9) | 1.00 (25.4) | 0.75 (19.1) |
| 9/16              | SS-MT-MF9-      | 0.55 (14.0)          | 0.31 (7.9) | 0.94 (23.8) | 2.50 (63.5) | 1.75 (44.5) | 1.25 (31.8) | 1.00 (25.4) |

## Union Crosses

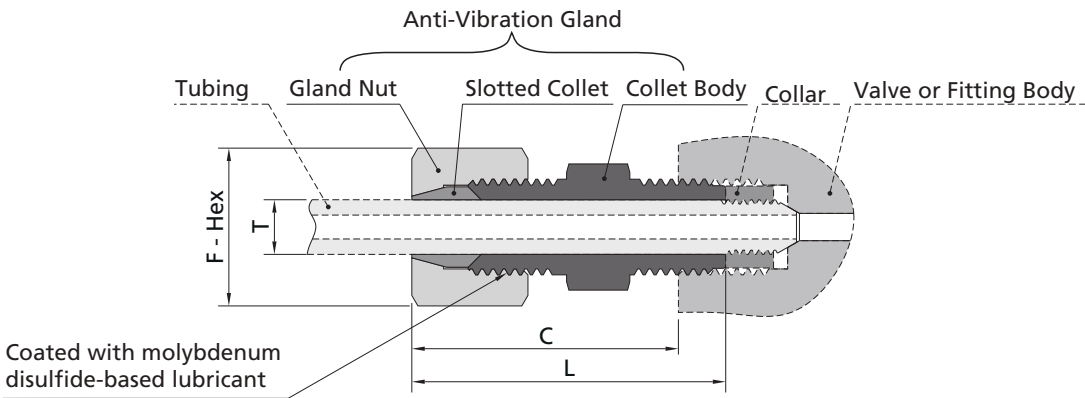


| Tube              |                 | Dimensions, in. (mm) |            |             |             |             |             |  |
|-------------------|-----------------|----------------------|------------|-------------|-------------|-------------|-------------|--|
| T - Tube O.D. in. | Ordering Number | C                    | D          | G           | L           | L1          | Thickness   |  |
| 1/4               | SS-MX-MF4-      | 0.38 (9.7)           | 0.11 (2.8) | 0.50 (12.7) | 1.50 (38.1) | 1.50 (38.1) | 0.63 (15.9) |  |
| 3/8               | SS-MX-MF6-      | 0.44 (11.2)          | 0.20 (5.2) | 0.63 (15.9) | 2.00 (50.8) | 2.00 (50.8) | 0.75 (19.1) |  |
| 9/16              | SS-MX-MF9-      | 0.55 (14.0)          | 0.31 (7.9) | 0.94 (23.8) | 2.50 (63.5) | 2.50 (63.5) | 1.00 (25.4) |  |

Anti-Vibration Glands

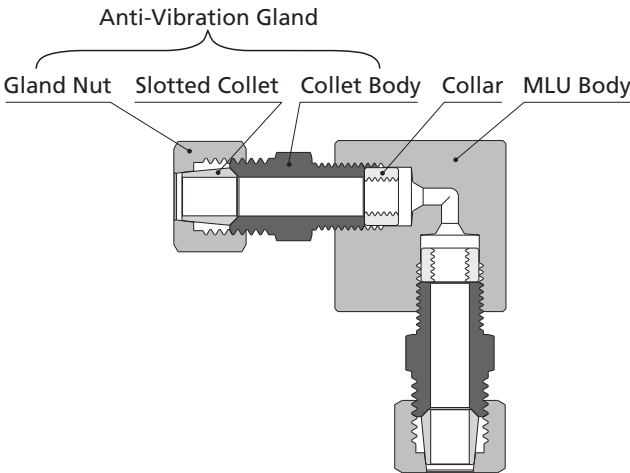
For tubing systems exposed to extreme vibration or shock, these anti-vibration gland assemblies can be selected as replacements for standard glands to significantly extend vibrational fatigue life.

To order complete anti-vibration gland assemblies, which include gland nuts, slotted collets, and collet bodies, example: SS-MAV-MF4-, as shown below.



| Tube                    |                    |                      |             |             |
|-------------------------|--------------------|----------------------|-------------|-------------|
| T - Tube<br>O.D.<br>in. | Ordering<br>Number | Dimensions, in. (mm) |             |             |
|                         |                    | L                    | C           | F           |
| 1/4                     | SS-MAV-MF4-        | 1.24 (31.6)          | 1.05 (26.7) | 0.63 (15.9) |
| 3/8                     | SS-MAV-MF6-        | 1.50 (38.1)          | 1.22 (30.9) | 0.81 (20.6) |
| 9/16                    | SS-MAV-MF9-        | 1.78 (45.2)          | 1.42 (36.0) | 0.94 (23.8) |

To order fittings with anti-vibration glands, add -AV to the fitting ordering number. Example: SS-MLU-MF4-AV-, as shown below.



# PMH Series Pipe Fittings



## Features

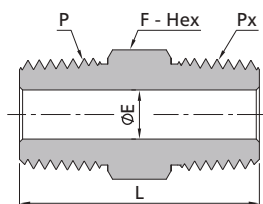
- Enhanced 316L stainless steel allows for reduced outside dimensions while maintaining the working pressure and flow capacity
- Rolled male thread provides higher strength and hardness
- When both equipped with FITOK fittings, the connection achieves a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s

## Technical Data

|                       |                                                               |
|-----------------------|---------------------------------------------------------------|
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$ |
| Max. Working Pressure | 15,000 psig (1,034 bar)                                       |
| Working Temperature   | -40~248 °F (-40~120 °C)                                       |

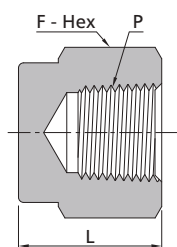
## Ordering Information and Dimensions

### Hex Nipples



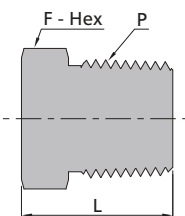
| Male NPT Thread       |            |             |                      |             |            |
|-----------------------|------------|-------------|----------------------|-------------|------------|
| Basic Ordering Number | P-NPT Size | Px-NPT Size | Dimensions, in. (mm) |             |            |
|                       |            |             | L                    | F           | E          |
| SS-HPN-NS4-           | 1/4        | 1/4         | 1.47 (37.4)          | 0.56 (14.3) | 0.25 (6.4) |
| SS-HPN-NS6-           | 3/8        | 3/8         | 1.52 (38.6)          | 0.69 (17.5) | 0.31 (7.9) |
| SS-HPN-NS8-           | 1/2        | 1/2         | 1.95 (49.6)          | 0.87 (22.2) | 0.38 (9.6) |

### Pipe Caps



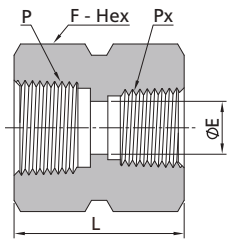
| Female NPT Thread     |            |                      |             |
|-----------------------|------------|----------------------|-------------|
| Basic Ordering Number | P-NPT Size | Dimensions, in. (mm) |             |
|                       |            | L                    | F           |
| SS-HPC-FNS4-          | 1/4        | 0.91 (23.1)          | 0.94 (23.8) |
| SS-HPC-FNS6-          | 3/8        | 1.03 (26.2)          | 1.13 (28.6) |
| SS-HPC-FNS8-          | 1/2        | 1.34 (34.0)          | 1.37 (34.9) |

### Pipe Plugs



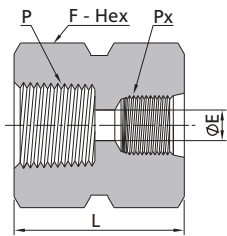
| Male NPT Thread       |            |                      |             |
|-----------------------|------------|----------------------|-------------|
| Basic Ordering Number | P-NPT Size | Dimensions, in. (mm) |             |
|                       |            | L                    | F           |
| SS-HPP-NS4-           | 1/4        | 0.87 (22.2)          | 0.56 (14.3) |
| SS-HPP-NS6-           | 3/8        | 0.93 (23.6)          | 0.69 (17.5) |
| SS-HPP-NS8-           | 1/2        | 1.16 (29.5)          | 0.87 (22.2) |

## Hex Couplings



Female NPT Thread

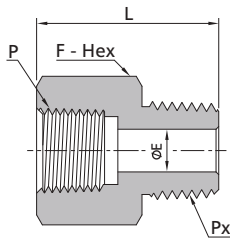
| Basic Ordering Number | P-NPT Size | Px-NPT Size | Dimensions, in. (mm) |             |             |
|-----------------------|------------|-------------|----------------------|-------------|-------------|
|                       |            |             | L                    | E           | F           |
| SS-HPG-FNS4-          | 1/4        | 1/4         | 1.32 (33.5)          | 0.41 (10.4) | 0.94 (23.8) |
| SS-HPG-FNS6-          | 3/8        | 3/8         | 1.32 (33.5)          | 0.54 (13.8) | 1.13 (28.6) |
| SS-HPG-FNS8-          | 1/2        | 1/2         | 1.72 (43.8)          | 0.67 (17.0) | 1.37 (34.9) |



Female NPT Thread to Female SAE/MS Straight Thread

| Basic Ordering Number | P-NPT Size | Px-SAE/MS Thread Size | Dimensions, in. (mm) |            |             |
|-----------------------|------------|-----------------------|----------------------|------------|-------------|
|                       |            |                       | L                    | E          | F           |
| SS-HPG-FNS4-US7-      | 1/4        | 7/16-20               | 1.36 (34.5)          | 0.18 (4.5) | 0.94 (23.8) |
| SS-HPG-FNS8-US9-      | 1/2        | 9/16-18               | 1.32 (33.5)          | 0.30 (7.5) | 1.38 (34.9) |

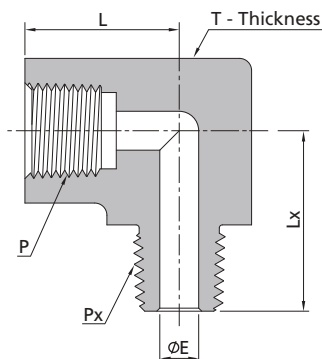
## Adapters



Female NPT Thread to Male NPT Thread

| Basic Ordering Number | P-NPT Size | Px-NPT Size | Dimensions, in. (mm) |            |             |
|-----------------------|------------|-------------|----------------------|------------|-------------|
|                       |            |             | L                    | E          | F           |
| SS-HPA-FNS4-NS4-      | 1/4        | 1/4         | 1.37 (34.9)          | 0.25 (6.4) | 0.94 (23.8) |
| SS-HPA-FNS4-NS6-      | 1/4        | 3/8         | 1.37 (34.9)          | 0.31 (7.9) | 0.94 (23.8) |
| SS-HPA-FNS6-NS4-      | 3/8        | 1/4         | 1.42 (36.0)          | 0.25 (6.4) | 1.13 (28.6) |
| SS-HPA-FNS6-NS6-      | 3/8        | 3/8         | 1.42 (36.0)          | 0.31 (7.9) | 1.13 (28.6) |
| SS-HPA-FNS6-NS8-      | 3/8        | 1/2         | 1.61 (41.0)          | 0.38 (9.6) | 1.13 (28.6) |
| SS-HPA-FNS8-NS6-      | 1/2        | 3/8         | 1.72 (43.1)          | 0.31 (7.9) | 1.37 (34.9) |
| SS-HPA-FNS8-NS8-      | 1/2        | 1/2         | 1.89 (48.0)          | 0.38 (9.6) | 1.37 (34.9) |

## Street Elbows



Female NPT Thread to Male NPT Thread

| Basic Ordering Number | P-NPT Size | Px-NPT Size | Dimensions, in. (mm) |            |             |             |
|-----------------------|------------|-------------|----------------------|------------|-------------|-------------|
|                       |            |             | L                    | E          | Lx          | T           |
| SS-HPE-FNS4-NS4-      | 1/4        | 1/4         | 1.00 (25.4)          | 0.25 (6.4) | 1.06 (27.0) | 0.75 (19.1) |
| SS-HPE-FNS4-NS6-      | 1/4        | 3/8         | 1.00 (25.4)          | 0.31 (7.9) | 1.06 (27.0) | 0.75 (19.1) |
| SS-HPE-FNS6-NS6-      | 3/8        | 3/8         | 1.20 (30.6)          | 0.31 (7.9) | 1.20 (30.6) | 1.00 (25.4) |
| SS-HPE-FNS6-NS8-      | 3/8        | 1/2         | 1.20 (30.6)          | 0.38 (9.6) | 1.38 (35.0) | 1.00 (25.4) |
| SS-HPE-FNS8-NS8-      | 1/2        | 1/2         | 1.50 (38.1)          | 0.38 (9.6) | 1.61 (40.8) | 1.37 (34.9) |

# AMH Series Adapter Fittings

## Features

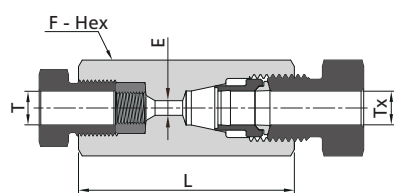
- Enhanced 316L stainless steel allows for reduced outside dimensions while maintaining the working pressure and flow capacity
- Rolled male thread provides higher strength and hardness
- When both equipped with FITOK fittings, the connection achieves a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s

## Technical Data

|                              |                                                                              |
|------------------------------|------------------------------------------------------------------------------|
| <b>Body Material</b>         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$                |
| <b>Max. Working Pressure</b> | Tube end: 20,000 psig (1,379 bar)<br>NPT thread end: 15,000 psig (1,034 bar) |
| <b>Working Temperature</b>   | -40~248 °F (-40~120 °C)                                                      |

## Ordering Information and Dimensions

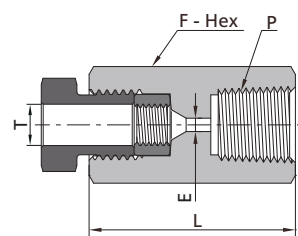
### 20M Series Medium Pressure Fittings to 20D Series Tube Fittings



20M Series Medium Pressure Fittings to 20D Series Tube Fittings

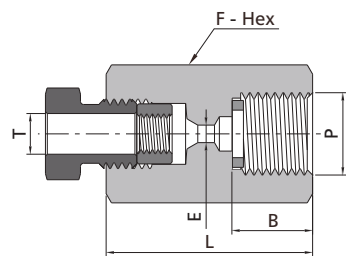
| Ordering Number  | T-Tube O.D. in. | Tx-Tube O.D. in. | Dimensions, in. (mm) |            |             |
|------------------|-----------------|------------------|----------------------|------------|-------------|
|                  |                 |                  | L                    | E          | F           |
| SS-FFC-MF4-DFF4- | 1/4             | 1/4              | 1.67 (42.3)          | 0.11 (2.8) | 0.63 (15.9) |
| SS-FFC-MF4-DFF6- | 1/4             | 3/8              | 1.76 (44.7)          | 0.11 (2.8) | 0.75 (19.1) |
| SS-FFC-MF6-DFF4- | 3/8             | 1/4              | 1.85 (47.1)          | 0.19 (4.8) | 0.75 (19.1) |
| SS-FFC-MF6-DFF6- | 3/8             | 3/8              | 1.89 (47.9)          | 0.20 (5.2) | 0.75 (19.1) |
| SS-FFC-MF6-DFF8- | 3/8             | 1/2              | 2.06 (52.2)          | 0.20 (5.2) | 1.00 (25.4) |
| SS-FFC-MF9-DFF6- | 9/16            | 3/8              | 2.07 (52.6)          | 0.25 (6.4) | 1.00 (25.4) |
| SS-FFC-MF9-DFF8- | 9/16            | 1/2              | 2.24 (57.0)          | 0.31 (7.9) | 1.00 (25.4) |

### 20M Series Medium Pressure Fittings to Female NPT



20M Series Medium Pressure Fittings to Female NPT

| Ordering Number  | T-Tube O.D. in. | P-NPT Size | Dimensions, in. (mm) |            |             |
|------------------|-----------------|------------|----------------------|------------|-------------|
|                  |                 |            | L                    | E          | F           |
| SS-FFC-MF4-FNS4- | 1/4             | 1/4        | 1.63 (41.3)          | 0.11 (2.8) | 0.94 (23.8) |
| SS-FFC-MF4-FNS6- | 1/4             | 3/8        | 1.63 (41.3)          | 0.11 (2.8) | 1.13 (28.6) |
| SS-FFC-MF6-FNS4- | 3/8             | 1/4        | 1.75 (44.5)          | 0.20 (5.1) | 0.94 (23.8) |
| SS-FFC-MF6-FNS6- | 3/8             | 3/8        | 1.81 (46.0)          | 0.20 (5.1) | 1.13 (28.6) |
| SS-FFC-MF6-FNS8- | 3/8             | 1/2        | 2.13 (54.0)          | 0.20 (5.1) | 1.37 (34.9) |
| SS-FFC-MF9-FNS6- | 9/16            | 3/8        | 2.00 (50.8)          | 0.31 (7.9) | 1.13 (28.6) |
| SS-FFC-MF9-FNS8- | 9/16            | 1/2        | 2.25 (57.2)          | 0.31 (7.9) | 1.37 (34.9) |



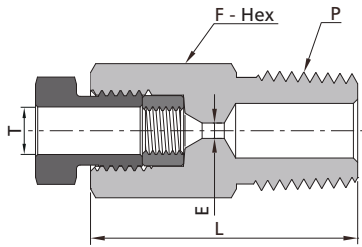
Adapt to EN 837-1/3 straight thread bore.

20M Series Medium Pressure Fittings to Female HRG<sup>①</sup>

| Ordering Number  | T-Tube O.D. in. | P-HRG Size | Dimensions, in. (mm) |             |            |             |
|------------------|-----------------|------------|----------------------|-------------|------------|-------------|
|                  |                 |            | L                    | B           | E          | F           |
| SS-FFC-MF4-HRG4- | 1/4             | 1/4        | 1.30 (33.0)          | 0.51 (12.9) | 0.11 (2.8) | 0.75 (19.1) |
| SS-FFC-MF6-HRG4- | 3/8             | 1/4        | 1.50 (38.0)          | 0.51 (12.9) | 0.22 (5.5) | 0.75 (19.1) |
| SS-FFC-MF9-HRG8- | 9/16            | 1/2        | 1.97 (50.0)          | 0.74 (18.8) | 0.28 (7.0) | 1.06 (27.0) |

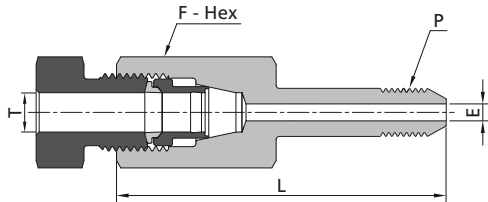
① The HRG gasket includes a RG gasket at the seal female end.

## 20M Series Medium Pressure Fittings to Male NPT



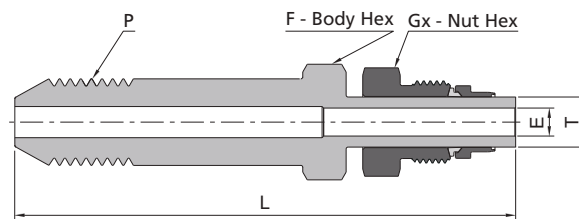
| 20M Series Medium Pressure Fittings to Male NPT |                 |            |                      |            |             |  |
|-------------------------------------------------|-----------------|------------|----------------------|------------|-------------|--|
| Ordering Number                                 | T-Tube O.D. in. | P-NPT Size | Dimensions, in. (mm) |            |             |  |
|                                                 |                 |            | L                    | E          | F           |  |
| SS-FMA-MF4-NS4-                                 | 1/4             | 1/4        | 1.37 (34.9)          | 0.11 (2.8) | 0.63 (15.9) |  |
| SS-FMA-MF4-NS6-                                 | 1/4             | 3/8        | 1.37 (34.9)          | 0.11 (2.8) | 0.69 (17.5) |  |
| SS-FMA-MF6-NS4-                                 | 3/8             | 1/4        | 1.50 (38.1)          | 0.20 (5.2) | 0.75 (19.1) |  |
| SS-FMA-MF6-NS6-                                 | 3/8             | 3/8        | 1.50 (38.1)          | 0.20 (5.2) | 0.75 (19.1) |  |
| SS-FMA-MF6-NS8-                                 | 3/8             | 1/2        | 1.63 (41.3)          | 0.20 (5.2) | 0.87 (22.2) |  |
| SS-FMA-MF9-NS6-                                 | 9/16            | 3/8        | 1.75 (44.5)          | 0.31 (7.9) | 1.00 (25.4) |  |
| SS-FMA-MF9-NS8-                                 | 9/16            | 1/2        | 1.94 (49.2)          | 0.31 (7.9) | 1.00 (25.4) |  |

## 20D Series Tube Fittings to Medium Pressure Cone & Thread Tubing



| 20D Series Tube Fittings to Medium Pressure Cone & Thread Tubing |                 |        |                      |            |             |  |
|------------------------------------------------------------------|-----------------|--------|----------------------|------------|-------------|--|
| Ordering Number                                                  | T-Tube O.D. in. | P-Size | Dimensions, in. (mm) |            |             |  |
|                                                                  |                 |        | L                    | E          | F           |  |
| SS-FMA-DFF4-MCT4-                                                | 1/4             | 1/4    | 1.98 (50.2)          | 0.11 (2.8) | 0.63 (15.9) |  |
| SS-FMA-DFF4-MCT6-                                                | 1/4             | 3/8    | 2.28 (58.0)          | 0.19 (4.8) | 0.63 (15.9) |  |
| SS-FMA-DFF6-MCT4-                                                | 3/8             | 1/4    | 2.10 (53.3)          | 0.11 (2.8) | 0.75 (19.1) |  |
| SS-FMA-DFF6-MCT6-                                                | 3/8             | 3/8    | 2.35 (59.6)          | 0.20 (5.2) | 0.75 (19.1) |  |
| SS-FMA-DFF6-MCT9-                                                | 3/8             | 9/16   | 2.51 (63.7)          | 0.25 (6.4) | 0.75 (19.1) |  |
| SS-FMA-DFF8-MCT6-                                                | 1/2             | 3/8    | 2.50 (63.5)          | 0.20 (5.2) | 1.00 (25.4) |  |
| SS-FMA-DFF8-MCT9-                                                | 1/2             | 9/16   | 2.74 (69.7)          | 0.31 (7.9) | 1.00 (25.4) |  |

## Medium Pressure Cone & Thread Tubing to Split Male 20D Series Tube Fittings



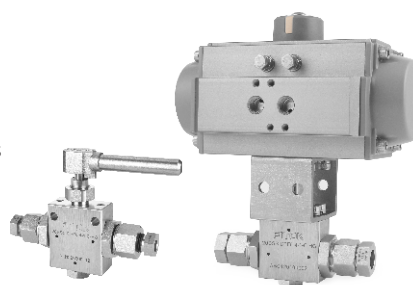
| Medium Pressure Cone & Thread Tubing to Split Male 20D Series Tube Fittings <sup>①</sup> |                 |        |                      |             |             |             |
|------------------------------------------------------------------------------------------|-----------------|--------|----------------------|-------------|-------------|-------------|
| Ordering Number                                                                          | T-Tube O.D. in. | P-Size | Dimensions, in. (mm) |             |             |             |
|                                                                                          |                 |        | L                    | E           | F           | Gx          |
| SS-MMA-MCT4-DFT4-                                                                        | 1/4             | 1/4    | 2.70 (68.7)          | 0.11 (2.8)  | 0.63 (15.9) | 0.63 (15.9) |
| SS-MMA-MCT6-DFT6-                                                                        | 3/8             | 3/8    | 3.15 (80.1)          | 0.20 (5.2)  | 0.75 (19.1) | 0.75 (19.1) |
| SS-MMA-MCT9-DFT8-                                                                        | 1/2             | 9/16   | 3.65 (92.6)          | 0.28 (7.1)  | 1.00 (25.4) | 0.94 (23.8) |
| SS-MMA-MCT12-DFT12-                                                                      | 3/4             | 3/4    | 5.98 (152.0)         | 0.44 (11.1) | 1.50 (38.1) | 1.38 (34.9) |

① The tube stub end is preassembled with the nut and ferrules before ex-work.

## 20B Series Ball Valves

### Features

- Spring-loaded mechanism offers a consistent and reliable sealing force
- XM-19 stem for higher strength and enhanced resistance to hydrogen embrittlement
- Seat designed with Vespel improves flush resistance and withstands high temperatures
- EC-79 compliant EPDM O-ring for excellent low-temperature performance and implosion resistance
- Pneumatic actuator optional
- Proportional sampling helium leak tested to a leak rate of  $\leq 2 \times 10^{-6}$  Ncm<sup>3</sup>/s
- Each valve is tested for internal and external leakage using a helium-nitrogen gas mixture at 10,150 psig (700 bar) before shipment

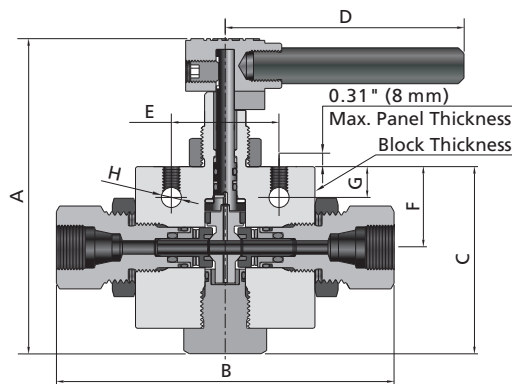


### Technical Data

|                       |                                                          |
|-----------------------|----------------------------------------------------------|
| Max. Working Pressure | 20,000 psig (1,379 bar)                                  |
| Working Temperature   | -40~185 °F (-40~85 °C)                                   |
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % ≥ 28.5 |

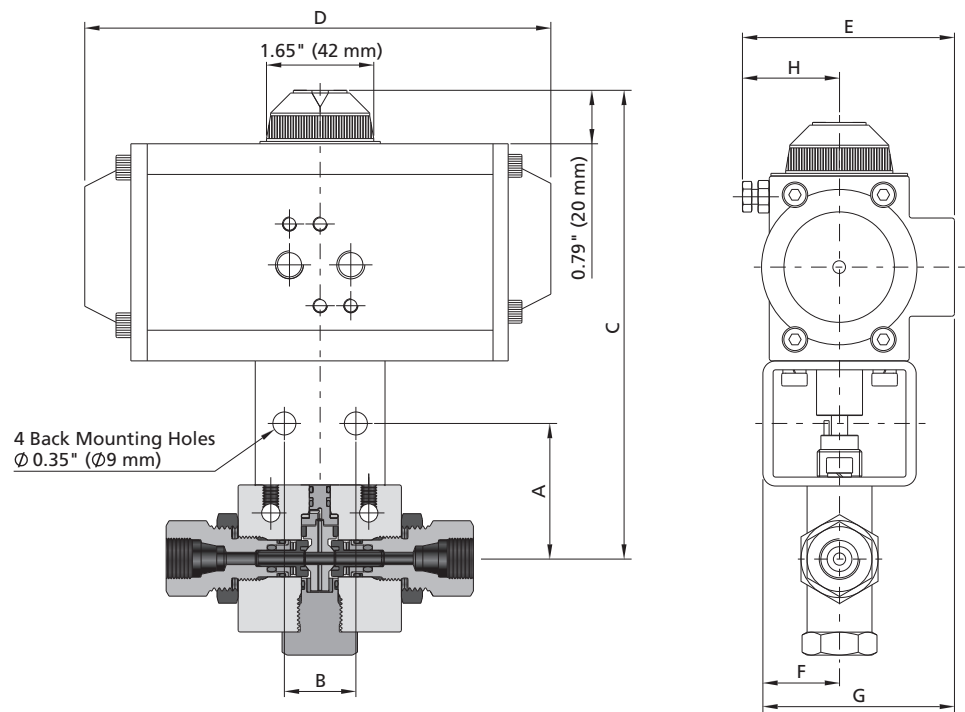
### Ordering Information and Dimensions

#### Manual



| Ordering Number | Connection Type and Size |      | Orifice in. (mm) | Cv   | Dimensions, in. (mm) |              |             |             |             |             |             |            |                 |
|-----------------|--------------------------|------|------------------|------|----------------------|--------------|-------------|-------------|-------------|-------------|-------------|------------|-----------------|
|                 |                          |      |                  |      | A                    | B            | C           | D           | E           | F           | G           | H          | Block Thickness |
| 20BSS-DFF4-4-1- | 20D Series Tube Fittings | 1/4" | 0.19 (4.8)       | 0.82 | 4.39 (111.5)         | 4.70 (119.5) | 2.60 (66.2) | 3.33 (84.5) | 1.50 (38.1) | 1.13 (28.6) | 0.43 (10.9) | 0.28 (7.1) | 1.00 (25.4)     |
| 20BSS-DFF6-4-1- |                          | 3/8" |                  |      |                      |              |             |             |             |             |             |            |                 |
| 20BSS-DFF8-4-1- |                          | 1/2" |                  |      |                      |              |             |             |             |             |             |            |                 |

Pneumatic Actuated



| Ordering Number   | Connection Type and Size |      | Orifice in. (mm) | Cv   | Dimensions, in. (mm) |           |              |              |             |           |             |           |
|-------------------|--------------------------|------|------------------|------|----------------------|-----------|--------------|--------------|-------------|-----------|-------------|-----------|
|                   |                          |      |                  |      | A                    | B         | C            | D            | E           | F         | G           | H         |
| 20BSS-DFF4-4-1-O- | 20D Series Tube Fittings | 1/4" | 0.19 (4.8)       | 0.82 | 2.09 (53.1)          | 1.10 (28) | 7.19 (182.6) | 6.04 (153.5) | 3.33 (84.5) | 1.18 (30) | 3.09 (78.5) | 1.42 (36) |
| 20BSS-DFF6-4-1-C- |                          | 3/8" |                  |      |                      |           |              |              |             |           |             |           |
| 20BSS-DFF8-4-1-D- |                          | 1/2" |                  |      |                      |           |              |              |             |           |             |           |

Note: "-O", "-C", "-D" are designators for pneumatic actuator  
-O: 90° normally open pneumatic actuator;  
-C: 90° normally closed pneumatic actuator;  
-D: 90° double acting pneumatic actuator. .

## 20N Series Needle Valves

### Features

- Two-piece stem design prevents abrasion between the stem tip and seat and reduces wear between the packing and stem
- XM-19 stem for higher strength and enhanced resistance to hydrogen embrittlement
- Stem tip features a specially treated surface that ensures excellent sealing performance
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s
- Each valve is tested for internal and external leakage using a helium-nitrogen gas mixture at 10,150 psig (700 bar) before shipment

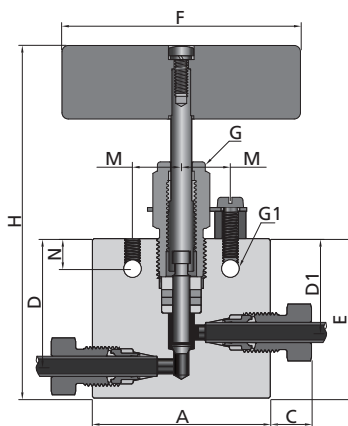


### Technical Data

| Needle Valve          |                                                          |
|-----------------------|----------------------------------------------------------|
| Max. Working Pressure | 20,000 psig (1,379 bar)                                  |
| Working Temperature   | -40~248 °F (-40~120 °C)                                  |
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % ≥ 28.5 |
| Packing Material      | PTFE                                                     |

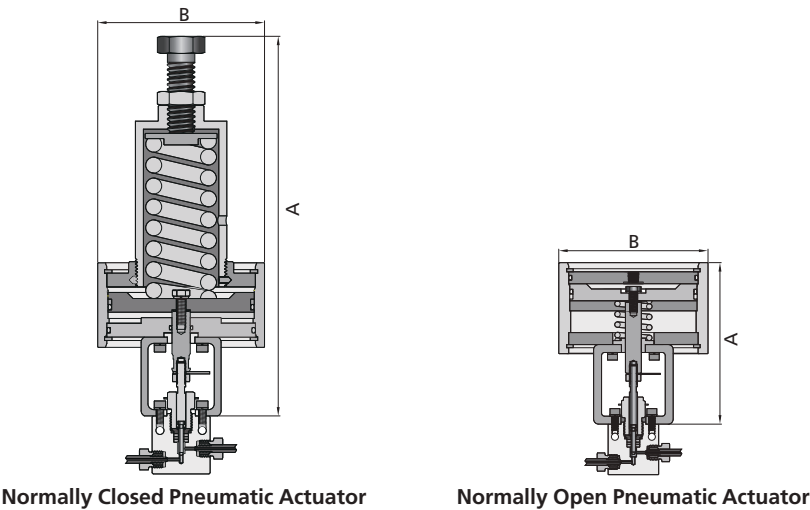
### Ordering Information and Dimensions

#### Manual



| Ordering Number | Connection Type and Size |      | Orifice in. (mm) | Cv   | Dimensions, in. (mm) |             |             |             |             |              |             |            |              |             |             |                 |
|-----------------|--------------------------|------|------------------|------|----------------------|-------------|-------------|-------------|-------------|--------------|-------------|------------|--------------|-------------|-------------|-----------------|
|                 |                          |      |                  |      | A                    | C           | D           | D1          | E           | F            | G           | G1         | H            | M           | N           | Block Thickness |
| 20NSS-DFF4-1-   | 20D Series Tube Fittings | 1/4" | 0.19 (4.8)       | 0.65 | 2.33 (59.2)          | 0.52 (13.3) | 1.62 (41.2) | 1.19 (30.2) | 2.00 (50.8) | 3.00 (76.2)  | 0.75 (19.1) | 0.22 (5.6) | 4.90 (124.5) | 0.62 (15.8) | 0.38 (9.7)  | 0.75 (19.1)     |
| 20NSS-DFF6-1-   |                          | 3/8" | 0.25 (6.4)       | 0.95 | 2.27 (57.6)          | 0.54 (13.6) | 1.62 (41.2) | 1.19 (30.2) | 2.00 (50.8) | 3.00 (76.2)  | 0.75 (19.1) | 0.22 (5.6) | 4.97 (126.3) | 0.62 (15.8) | 0.38 (9.7)  | 0.75 (19.1)     |
| 20NSS-DFF8-1-   |                          | 1/2" | 0.37 (9.5)       | 1.90 | 2.86 (72.7)          | 0.60 (15.3) | 2.37 (60.3) | 1.75 (44.5) | 2.88 (73.2) | 4.00 (101.6) | 1.00 (25.4) | 0.34 (8.6) | 6.21 (157.7) | 0.69 (17.5) | 0.50 (12.7) | 1.00 (25.4)     |

Pneumatic Actuated



| Ordering Number | Connection Type and Size |       | Orifice in. (mm) | Cv   | Dimensions, in. (mm) |              |
|-----------------|--------------------------|-------|------------------|------|----------------------|--------------|
|                 |                          |       |                  |      | A                    | B            |
| 20NSS-DFF4-1-C- | 20D Series Tube Fittings | 1/4 " | 0.19 (4.8)       | 0.65 | 13.08 (332.3)        | 5.75 (146.0) |
| 20NSS-DFF6-1-O- |                          | 3/8 " | 0.25 (6.4)       | 0.95 | 5.94 (151.0)         | 5.75 (146.0) |
| 20NSS-DFF8-1-C- |                          | 1/2 " | 0.37 (9.5)       | 1.90 | 16.24 (412.5)        | 6.54 (166.0) |

Note: "-C", "-O" are designators for pneumatic actuator  
-C: normally closed pneumatic actuator;  
-O: normally open pneumatic actuator.

## 20C Series Check Valves

### Features

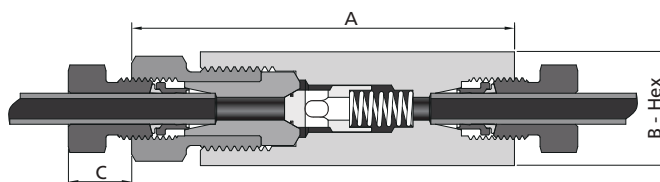
- ◎ EC-79 compliant EPDM O-ring for excellent low-temperature performance and implosion resistance
- ◎ Mountable in any direction
- ◎ Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s
- ◎ Each valve is tested for internal and external leakage using a helium-nitrogen gas mixture at 10,150 psig (700 bar) before shipment



### Technical Data

|                       |                                                               |
|-----------------------|---------------------------------------------------------------|
| Max. Working Pressure | 20,000 psig (1,379 bar)                                       |
| Cracking Pressure     | 14~26 psig (0.97~1.79 bar)                                    |
| Working Temperature   | -40~185 °F (-40~85 °C)                                        |
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$ |

### Ordering Information and Dimensions



| Ordering Number | Connection Type and Size |      | Orifice in. (mm) | Cv   | Dimensions, in. (mm) |             |             |
|-----------------|--------------------------|------|------------------|------|----------------------|-------------|-------------|
|                 |                          |      |                  |      | A                    | B           | C           |
| 20CSS-DFF4-     | 20D Series Tube Fittings | 1/4" | 0.19 (4.9)       | 0.63 | 3.35 (85.0)          | 0.81 (20.6) | 0.52 (13.3) |
| 20CSS-DFF6-     |                          | 3/8" | 0.25 (6.4)       | 1.70 | 3.72 (94.6)          | 1.00 (25.4) | 0.53 (13.5) |
| 20CSS-DFF8-     |                          | 1/2" | 0.36 (9.12)      | 3.40 | 4.41 (112.0)         | 1.38 (35.1) | 0.60 (15.3) |

## 20CG Series Check Valves

### Features

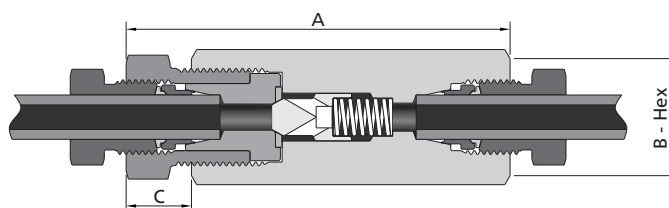
- ◎ PEEK seat offers exceptional wear resistance and excellent hydrogen compatibility
- ◎ Metal cone to PEEK seating design ensures reliable performance under high-pressure and high-flow conditions, making it particularly suitable for hydrogen fueling applications
- ◎ Mountable in any direction
- ◎ Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s
- ◎ Each valve is tested for internal and external leakage using a helium-nitrogen gas mixture at 10,150 psig (700 bar) before shipment



### Technical Data

|                              |                                                          |
|------------------------------|----------------------------------------------------------|
| <b>Max. Working Pressure</b> | 20,000 psig (1,379 bar)                                  |
| <b>Working Temperature</b>   | -40~248 °F (-40~120 °C)                                  |
| <b>Body Material</b>         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % ≥ 28.5 |

### Ordering Information and Dimensions



| Ordering Number | Connection Type and Size            |       | Orifice in. (mm) | Cv   | Dimensions, in. (mm) |             |             |
|-----------------|-------------------------------------|-------|------------------|------|----------------------|-------------|-------------|
|                 |                                     |       |                  |      | A                    | B           | C           |
| 20CGSS-DFF4-    | 20D Series Tube Fittings            | 1/4"  | 0.19 (4.8)       | 0.63 | 3.35 (85.0)          | 0.81 (20.6) | 0.52 (13.3) |
| 20CGSS-DFF6-    |                                     | 3/8"  | 0.25 (6.4)       | 1.70 | 3.72 (94.6)          | 1.00 (25.4) | 0.53 (13.5) |
| 20CGSS-DFF8-    |                                     | 1/2"  | 0.33 (8.5)       | 2.23 | 4.41 (112.0)         | 1.38 (35.1) | 0.60 (15.3) |
| 20CGSS-MF4-     | 20M Series Medium Pressure Fittings | 1/4"  | 0.13 (3.2)       | 0.28 | 2.94 (74.7)          | 0.81 (20.6) | 0.38 (9.7)  |
| 20CGSS-MF6-     |                                     | 3/8"  | 0.22 (5.5)       | 0.84 | 3.12 (79.3)          | 1.00 (25.4) | 0.44 (11.2) |
| 20CGSS-MF9-     |                                     | 9/16" | 0.36 (9.1)       | 2.30 | 4.18 (106.2)         | 1.38 (35.1) | 0.55 (14.0) |

# HSR Series Relief Valves

## Features

- Optional set pressure ranges, with factory pre-setting available to meet specific requirements
- Mountable in any direction
- Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6}$  Ncm<sup>3</sup>/s
- Each valve is performance tested for set pressure and resealing pressure before shipment



## Technical Data

|                                     |                                                               |
|-------------------------------------|---------------------------------------------------------------|
| <b>Max. Working Pressure</b>        | 20,000 psig (1,379 bar)                                       |
| <b>Max. Allowable Back Pressure</b> | 500 psig (34.5 bar)                                           |
| <b>Working Temperature</b>          | -40~248 °F (-40~120 °C)                                       |
| <b>Body Material</b>                | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$ |

Note: The system's maximum working pressure should not exceed 90% of the relief valve's set pressure.

## Set Pressure and Resealing Pressure

Set pressure: the upstream pressure at which the valve opens and the indication of flow occurs.

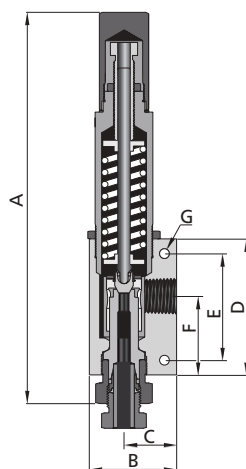
Set pressure of each valve after initial relief fluctuates within  $\pm 5\%$  of the initial set pressure.

For valves not opened for a period of time, the set pressure may be higher.

Resealing pressure: the upstream pressure at which the valve is fully closed as a result of a drop of upstream pressure after the valve opens. Resealing pressure is always lower than set pressure.

Set pressure and resealing pressure may be affected by factors such as the type of media, operating temperatures, and the frequency of operation.

## Ordering Information and Dimensions



| Ordering Number     | Connection Type and Size |      |            |     | Orifice in. (mm) | Cv  | Set Pressure psig (bar)   | Dimensions, in.(mm) |             |             |             |             |             |            |
|---------------------|--------------------------|------|------------|-----|------------------|-----|---------------------------|---------------------|-------------|-------------|-------------|-------------|-------------|------------|
|                     | Inlet                    |      | Outlet     |     |                  |     |                           | A                   | B           | C           | D           | E           | F           | G          |
| HSRSS-DFF8-FNS12-1- | 20D Series Tube Fittings | 1/2" | Female NPT | 3/4 | 0.31 (7.9)       | 1.2 | 1,500~5,000 (103~345)     | 9.46 (240.4)        | 2.00 (50.8) | 1.19 (30.2) | 3.25 (82.6) | 2.25 (57.1) | 1.94 (49.3) | 0.28 (7.2) |
| HSRSS-DFF8-FNS12-2- |                          |      |            |     | 0.25 (6.4)       | 0.8 | 5,000~10,000 (345~690)    |                     |             |             |             |             |             |            |
| HSRSS-DFF8-FNS12-3- |                          |      |            |     | 0.16 (4.0)       | 0.3 | 10,000~20,000 (690~1,370) |                     |             |             |             |             |             |            |

Note: G is the diameter of mounting holes.

## 20FC Series Filters

### Features

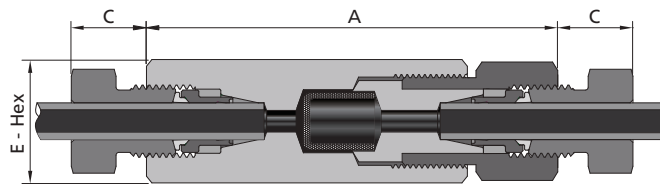
- ⦿ Cup design offers approximately six times the effective filter area of disc-type units
- ⦿ Easy to replace filter element
- ⦿ Pressure differential less than 1,000 psig (69 bar) in a flowing condition
- ⦿ 5  $\mu\text{m}$  element nominal pore size as standard
- ⦿ Proportional sampling helium leak tested to a leak rate of  $\leq 1 \times 10^{-6} \text{ Ncm}^3/\text{s}$
- ⦿ Each valve is tested for external leakage using a helium-nitrogen gas mixture at 10,150 psig (700 bar) before shipment



### Technical Data

|                       |                                                               |
|-----------------------|---------------------------------------------------------------|
| Max. Working Pressure | 20,000 psig (1,379 bar)                                       |
| Working Temperature   | -40~248 °F (-40~120 °C)                                       |
| Body Material         | FITOK Tailor-Made 316/316L SS, Ni <sub>eq</sub> % $\geq 28.5$ |

### Ordering Information and Dimensions

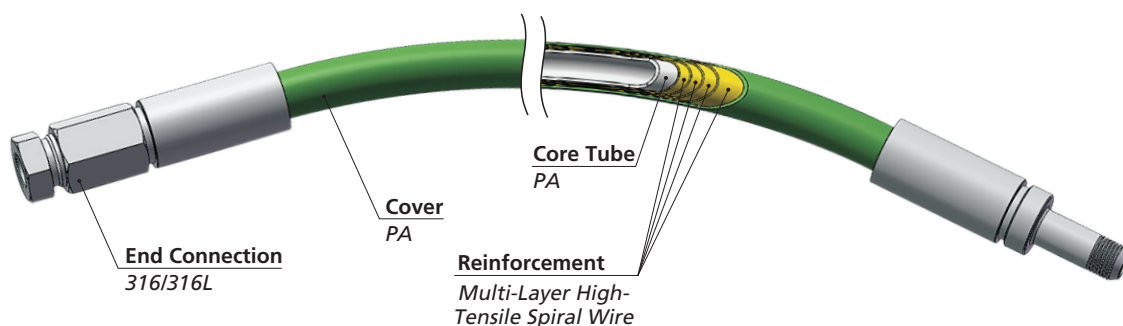


| Ordering Number | Connection Type and Size |      | Orifice in. (mm) | Nominal Pore Size $\mu\text{m}$ | Effective Filter Element Area in. <sup>2</sup> (mm <sup>2</sup> ) | Dimensions, in. (mm) |             |             |
|-----------------|--------------------------|------|------------------|---------------------------------|-------------------------------------------------------------------|----------------------|-------------|-------------|
|                 |                          |      |                  |                                 |                                                                   | A                    | C           | E           |
| 20FCSS-DFF4-5-  | 20D Series Tube Fittings | 1/4" | 0.19 (4.8)       | 5                               | 0.81 (522.6)                                                      | 3.34 (84.8)          | 0.52 (13.3) | 0.81 (20.6) |
| 20FCSS-DFF6-5-  |                          | 3/8" | 0.31 (7.9)       |                                 | 0.81 (522.6)                                                      | 3.51 (89.2)          | 0.54 (13.6) | 1.00 (25.4) |
| 20FCSS-DFF8-5-  |                          | 1/2" | 0.44 (11.1)      |                                 | 1.53 (987.1)                                                      | 4.30 (109.2)         | 0.60 (15.3) | 1.38 (35.0) |

# HHP Series High Pressure Hoses

## Features

- Core tube material: Polyamide (PA)
- Reinforcement: Multi-layer high-tensile spiral wire
- Cover material: Polyamide (PA)
- Green cover by default, with other colors available upon request
- End connection material: Tailor-made 316/316L stainless steel with Ni<sub>eq</sub> % ≥ 28.5
- Working temperature: -40 °F ~ 176 °F (-40 °C ~ 65 °C)
- Each hose is tested for external leakage using a helium/air gas mixture at the maximum working pressure prior to shipment



## Technical Data

| Nominal Hose Size (DN) | Inside Diameter in. (mm) | Outside Diameter in. (mm) | Core Tube Material | Reinforcement (layers of spiral wire) | Cover Material | Max. Working Pressure psig (bar) | Burst Pressure psig (bar) | Min. Inside Bend Radius in. (mm) | Weight lbs/ft (kg/m) | Color |
|------------------------|--------------------------|---------------------------|--------------------|---------------------------------------|----------------|----------------------------------|---------------------------|----------------------------------|----------------------|-------|
| 6                      | 0.24 (6.0)               | 0.55 (13.9)               | PA                 | 4                                     | PA             | 13950 (962.5)                    | 55800 (3850)              | 6.10 (155)                       | 0.323 (0.48)         | Green |
| 10                     | 0.39 (9.85)              | 0.72 (18.4)               |                    |                                       |                | 13950 (962.5)                    | 55800 (3850)              | 7.87 (200)                       | 0.470 (0.70)         |       |
| 16                     | 0.63 (16.0)              | 1.09 (27.6)               |                    |                                       |                | 8000 (550)                       | 39900 (2750)              | 11.81 (300)                      | 0.811 (1.207)        |       |

## Ordering Information and Dimensions

| Basic Ordering Number | Hose Information |                                       | End Connection Type and Size                  |       | Insert I.D. in. (mm) | Overall Length in. (mm) |
|-----------------------|------------------|---------------------------------------|-----------------------------------------------|-------|----------------------|-------------------------|
|                       | Specifica-tion   | Reinforcement (layers of spiral wire) |                                               |       |                      |                         |
| -HHP-6-4-MCT6-M2000-  | DN6              | 4                                     | 20M Series Coned and Threaded Nipple Fittings | 3/8"  | 0.130 (3.3)          | 78.740 (2000)           |
| -HHP-10-4-DFF8-F144-  | DN10             |                                       | 20D Series Tube Fittings                      | 1/2"  | 0.217 (5.5)          | 144 (3657.6)            |
| -HHP-16-4-DFF9-M5000- | DN16             |                                       | 20D Series Tube Fittings                      | 9/16" | 0.402 (10.2)         | 196.850 (5000)          |

## T20D Series Tubing

### Features

- FITOK Enhanced-316/316L stainless steel tubing features Ni, Cr, and Mo content near the upper limits of ASTM A269 and a Ni<sub>eq</sub> of no less than 28.5%, providing better resistance to hydrogen embrittlement
- Stricter dimensional tolerances than required by ASTM A269
- Working temperature: -40 to 248 °F (-40 to 120 °C)
- The best match for T20D series tubing is 20D series tube fittings
- Standard lengths: 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m
- Tube cutting, tube end processing, ferrule presetting, and pipeline system installation and testing services are available based on customer needs



### Materials

| UNS                    | Grade             | FITOK Designator | Composition % |       |       |         |
|------------------------|-------------------|------------------|---------------|-------|-------|---------|
|                        |                   |                  | C             | Cr    | Ni    | Mo      |
| Enhanced-S31600/S31603 | Enhanced-316/316L | SH               | ≤0.030        | 17-18 | 12-14 | 2.6-3.0 |

### Mechanical Properties

| UNS                    | Grade             | Yield Strength ksi (MPa) | Tensile Strength ksi (MPa) | Elongation % | Hardness |
|------------------------|-------------------|--------------------------|----------------------------|--------------|----------|
| Enhanced-S31600/S31603 | Enhanced-316/316L | 75-110 (517-758)         | 105-140 (724-965)          | ≥25          | ≤26 HRC  |

### Dimensional Tolerance

| Tube O.D. in. | O.D. Tolerance in. (mm) | Wall Thickness Tolerance % |
|---------------|-------------------------|----------------------------|
| 1/4           | ±0.005 (0.13)           | ±10                        |
| 3/8           |                         |                            |
| 1/2           |                         |                            |
| 3/4           |                         |                            |
| 1             |                         |                            |

### Ordering Information

| Ordering Number <sup>①</sup> |                   | Tube O.D. in. | Wall Thickness in. | Working Pressure psig (bar) |
|------------------------------|-------------------|---------------|--------------------|-----------------------------|
| SH-T20D-4-065-20F            | SH-T20D-4-065-6M  | 1/4           | 0.065              | 20,000 (1,379)              |
| SH-T20D-6-083-20F            | SH-T20D-6-083-6M  | 3/8           | 0.083              |                             |
| SH-T20D-8-109-20F            | SH-T20D-8-109-6M  | 1/2           | 0.109              |                             |
| SH-T20D-12-165-20F           | SH-T20D-12-165-6M | 3/4           | 0.165              |                             |
| SH-T20D-16-172-20F           | SH-T20D-16-172-6M | 1             | 0.172              | 17,800 (1,220)              |

① In the ordering number, "6M" designator refers to 6 m tubing length, "20F" designator refers to 20 ft tubing length.

# T20M Series Tubing

## Features

- FITOK Enhanced-316/316L stainless steel tubing features Ni, Cr, and Mo content near the upper limits of ASTM A269 and a  $Ni_{eq}$  of no less than 28.5%, providing better resistance to hydrogen embrittlement
- ASME B1.1 compliant dimensional tolerances
- Working temperature: -40 to 248 °F (-40 to 120 °C)
- The best match for T20M series tubing is 20M series medium pressure fittings
- Standard lengths: 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m
- Tube cutting, cone and thread processing, tube bending, and pipeline system installation and testing services are available based on customer needs



## Materials

| UNS                    | Grade             | FITOK Designator | Composition % |       |       |         |
|------------------------|-------------------|------------------|---------------|-------|-------|---------|
|                        |                   |                  | C             | Cr    | Ni    | Mo      |
| Enhanced-S31600/S31603 | Enhanced-316/316L | SH               | ≤0.030        | 17-18 | 12-14 | 2.6-3.0 |

## Mechanical Properties

| UNS                    | Grade             | Yield Strength ksi (MPa) | Tensile Strength ksi (MPa) | Elongation % | Hardness |
|------------------------|-------------------|--------------------------|----------------------------|--------------|----------|
| Enhanced-S31600/S31603 | Enhanced-316/316L | 87-110 (599-758)         | 105-140 (729-965)          | ≥25          | ≥98 HRB  |

## Dimensional Tolerance

| Tube O.D. in. | O.D. Tolerance in. (mm)    | Tube I.D. in. | I.D. Tolerance in. (mm) |
|---------------|----------------------------|---------------|-------------------------|
| 1/4           | -0.005/-0.01 (-0.13/-0.26) | 0.109         | 0/-0.005 (0/-0.13)      |
| 3/8           |                            | 0.203         |                         |
| 9/16          |                            | 0.312         |                         |
| 3/4           |                            | 0.438         | +/-0.005 (+/-0.13)      |
| 1             |                            | 0.562         |                         |

## Ordering Information

| Ordering Number <sup>①</sup> |               | Tube O.D.<br>in. | Tube I.D.<br>in. | Working Pressure<br>psig (bar) |
|------------------------------|---------------|------------------|------------------|--------------------------------|
| SH-T20M-4-20F                | SH-T20M-4-6M  | 1/4              | 0.109            | 20,000 (1,379)                 |
| SH-T20M-6-20F                | SH-T20M-6-6M  | 3/8              | 0.203            |                                |
| SH-T20M-9-20F                | SH-T20M-9-6M  | 9/16             | 0.312            |                                |
| SH-T20M-12-20F               | SH-T20M-12-6M | 3/4              | 0.438            |                                |
| SH-T20M-16-20F               | SH-T20M-16-6M | 1                | 0.562            |                                |

① In the ordering number, "6M" designator refers to 6 m tubing length, "20F" designator refers to 20 ft tubing length.

## Coned and Threaded Nipples



| Ordering Number <sup>①</sup> | Tube O.D.<br>in. | Tube I.D.<br>in. | Length L <sup>②</sup><br>in. (mm) |
|------------------------------|------------------|------------------|-----------------------------------|
| SH-T20M-4CT-3N               | 1/4              | 0.109            | 3.00 (76.2)                       |
| SH-T20M-4CT-6N               |                  |                  | 6.00 (152.4)                      |
| SH-T20M-4CT-12N              |                  |                  | 12.00 (304.8)                     |
| SH-T20M-6CT-3N               | 3/8              | 0.203            | 3.00 (76.2)                       |
| SH-T20M-6CT-6N               |                  |                  | 6.00 (152.4)                      |
| SH-T20M-6CT-12N              |                  |                  | 12.00 (304.8)                     |
| SH-T20M-9CT-4N               | 9/16             | 0.312            | 4.00 (101.6)                      |
| SH-T20M-9CT-8N               |                  |                  | 8.00 (203.2)                      |
| SH-T20M-9CT-12N              |                  |                  | 12.00 (304.8)                     |
| SH-T20M-12CT-4N              | 3/4              | 0.438            | 4.00 (101.6)                      |
| SH-T20M-12CT-8N              |                  |                  | 8.00 (203.2)                      |
| SH-T20M-12CT-12N             |                  |                  | 12.00 (304.8)                     |
| SH-T20M-16CT-6N              | 1                | 0.562            | 6.00 (152.4)                      |
| SH-T20M-16CT-8N              |                  |                  | 8.00 (203.2)                      |
| SH-T20M-16CT-12N             |                  |                  | 12.00 (304.8)                     |

① In ordering number, "N" designator refers to the unit of length in inches.

② Nipples in customized length available upon request.

# Technical Information

## Differences between T20D and T20M Series Medium Pressure Tubing

For 20D series tube fittings, FITOK provides customers with T20D and T20M series tubing for connection. Among them, 20D series tube fittings best match with T20D series tubing, which is recommended. Key differences between FITOK T20D and T20M series tubing are outlined in the table below.

| Performances                      |                     |                 |
|-----------------------------------|---------------------|-----------------|
| Type                              | T20D Series         | T20M Series     |
| Manufacturing Process             | Cold-Drawn 1/8-Hard | Cold-Drawn Hard |
| Max. Working Pressure, psig (MPa) | 20,000 (138)        |                 |
| Yield Strength, ksi               | 75-110              | 87-110          |
| Tensile Strength, ksi             | 105-140             |                 |
| Hardness                          | ≤26 HRC             | ≥98 HRB         |
| Elongation, %                     | ≥25                 |                 |

| Dimensions                       |                         |                    |                                  |               |
|----------------------------------|-------------------------|--------------------|----------------------------------|---------------|
|                                  | T20D Series             |                    | T20M Series                      |               |
| Dimension and Tolerance Standard | ASTM A269               |                    | ASME B1.1                        |               |
| Tube O.D. in.                    | O.D. Tolerance in. (mm) | Wall Thickness in. | O.D. Tolerance in. (mm)          | Tube I.D. in. |
| 1/4                              | +/-0.005<br>(+/-0.13)   | 0.065              | -0.002, -0.007<br>(-0.05, -0.17) | 0.109         |
| 3/8                              |                         | 0.083              | -0.005, -0.01<br>(-0.13, -0.25)  | 0.203         |
| 1/2                              |                         | 0.109              | -                                | -             |
| 9/16                             |                         | -                  | -0.005, -0.01<br>(-0.13, -0.25)  | 0.312         |
| 3/4                              |                         | 0.165              |                                  | 0.438         |
| 1                                |                         | 0.172              |                                  | 0.562         |

# Assembly-by-Torque Instructions for 6D and 20D Series Tube Fittings

## Assembly-by-Torque Instructions for 6D Series Tube Fittings

### Scope

These installation instructions apply only to 6D series tube fittings with "-HG", "-EC79", or "-HGV" suffix in the part number.

### Matching Tubing

| Tubing Type                             | Recommended Index |
|-----------------------------------------|-------------------|
| FITOK TMP/TCT Series Tubing             | Recommended       |
| ASTM A269/A213 Tubing from Other Brands | Acceptable        |

### Initial Installation

1. Loosen the nut at finger-tight position by 1/4 turns.
2. Insert the tube into the tube fitting and make sure the tube rests against the port shoulder as shown in Fig. 1.
3. Finger-tighten the nut.
4. Secure the fitting body firmly and tighten the nut with a torque wrench until the torque reaches the values specified in Table 1 as shown in Fig. 2.

| Table 1       |                         |                                      |                                |
|---------------|-------------------------|--------------------------------------|--------------------------------|
| Tube O.D., in | Tube Wall Thickness, in | Initial Assembly Torque, ft·lb (N·m) | Reassembly Torque, ft·lb (N·m) |
| 1/4           | 0.035                   | 11.8±0.4 (16±0.5)                    | 10.3±0.4 (14±0.5)              |
|               | 0.049                   | 13.3±0.4 (18±0.5)                    | 11.4±0.4 (15.5±0.5)            |
| 3/8           | 0.049                   | 25.8±0.7 (35±1)                      | 19.9±0.7 (27±1)                |
|               | 0.065                   | 28±0.7 (38±1)                        | 20.7±0.7 (28±1)                |
| 1/2           | 0.049                   | 29.5±0.7 (40±1)                      | 22.9±0.7 (31±1)                |
|               | 0.065                   | 33.2±0.7 (45±1)                      | 25.8±0.7 (35±1)                |
|               | 0.083                   | 36.9±0.7 (50±1)                      | 28±0.7 (38±1)                  |
| Tube O.D., mm | Tube Wall Thickness, mm | Initial Assembly Torque, ft·lb (N·m) | Reassembly Torque, ft·lb (N·m) |
| 6             | 1.0                     | 9.2±0.4 (12.5±0.5)                   | 7.7±0.7 (10.5±1)               |
| 8             | 1.0                     | 17.7±0.7 (24±1)                      | 15.5±0.7 (21±1)                |
|               | 1.2                     | 19.2±0.7 (26±1)                      | 15.5±0.7 (21±1)                |
| 10            | 1.0                     | 24.3±0.7 (33±1)                      | 19.2±0.7 (26±1)                |
|               | 1.5                     | 30.2±0.7 (41±1)                      | 22.9±0.7 (31±1)                |
| 12            | 1.5                     | 31±0.7 (42±1)                        | 25.1±0.7 (34±1)                |
|               | 2.0                     | 33.9±0.7 (46±1)                      | 27.3±0.7 (37±1)                |

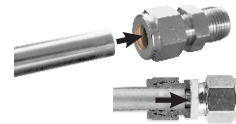


Fig. 1

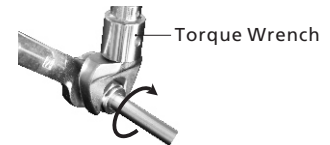


Fig. 2



Fig. 3

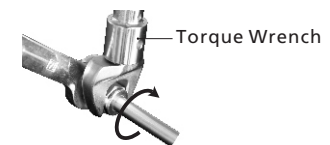


Fig. 4

### Reassembly Installation

1. Insert the tube assembled with ferrules into the body until the front ferrule rests against the body of the fitting as shown in Fig. 3.
2. Secure the body of the fitting firmly and tighten the nut with a torque wrench until the torque reaches the values specified in Table 1 as shown in Fig. 4.

### Notes

1. Please be noted that the torque wrench shall be perpendicular to the axis of tube when using it.
2. Make sure the tube is in relaxed condition during installation. Do not insert a tilted tube into the body.
3. Ensure the tube end is smooth, straight, free of burrs, and the tube surface is free of defects, such as dents, scratches or protrusion.
4. For bent tubing, ensure sufficient straight length is reserved at both ends for proper tube fitting installation.
5. Do not rotate the fitting body, instead, secure the fitting body and turn the nut.
6. Do not install or tighten the fitting when there is pressure in the system.
7. Do not discharge the system by loosening fitting nut or tube cap.

## Assembly-by-Torque Instructions for 20D Series Tube Fittings

### Scope

These installation instructions apply only to 20D series tube fittings with "-HG", "-EC79", or "-HGV" suffix in the part number.

### Matching Tubing

FITOK T20D series tubing.

T20M series tubing can only be assembled by turns. Refer to Matching Tubing and Installation Method on page 36 for details.

### Summary of Installation Method and Torque

| Table 1      |                                      |                                |                                                           |                                                       |                                |
|--------------|--------------------------------------|--------------------------------|-----------------------------------------------------------|-------------------------------------------------------|--------------------------------|
| Fitting Size | Manual Assembly-by-Torque            |                                | Assembly-by-Torque Using Presetting Tool                  |                                                       |                                |
|              | Initial Assembly Torque, ft-lb (N·m) | Reassembly Torque, ft-lb (N·m) | Initial Installation                                      |                                                       | Reassembly Torque, ft-lb (N·m) |
|              |                                      |                                | Pressure for Presetting Using Presetting Tool, psig (MPa) | Initial Assembly Torque after Presetting, ft-lb (N·m) |                                |
| 1/4 "        | 14.8±0.7 (20±1)                      | 9.6±0.7 (13±1)                 | <i>1020±150 (7±1)</i>                                     | <i>11.1±0.7 (15±1)</i>                                | <i>11.1±0.7 (15±1)</i>         |
| 3/8 "        | 51.6±1.8 (70±2.5)                    | 25.8±1.5 (35±2)                | <i>1740±150 (12±1)</i>                                    | <i>19.9±1.1 (27±1.5)</i>                              | <i>19.9±1.1 (27±1.5)</i>       |
| 1/2 "        | <i>81.1±3 (110±4)</i>                | <i>51.6±2.2 (70±3)</i>         | 2030±150 (14±1)                                           | 19.9±1.1 (27±1.5)                                     | 19.9±1.1 (27±1.5)              |
| 3/4 "        | N/A                                  | N/A                            | 4930±150 (34±1)                                           | 73.8±2.2 (100±3)                                      | 73.8±2.2 (100±3)               |
| 1 "          | N/A                                  | N/A                            | 6680±150 (46±1)                                           | 162.3±3.7 (220±5)                                     | 162.3±3.7 (220±5)              |

Installation programs and torque values displayed in italics and gray font are acceptable, but not recommended.

### Manual Installation

#### Initial Installation

Install the ferrule nut and ferrules onto the tube in a fixed sequence and orientation as shown in Fig. 1. Insert the tube into the fitting body or valve body, ensuring the tube rests against the port shoulder, and finger-tighten the ferrule nut. Secure the fitting body or valve body, and tighten the ferrule nut with a torque wrench to the specified torque in Table 1.

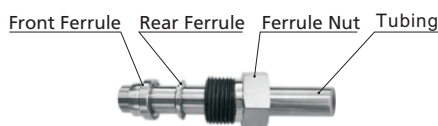


Fig. 1 Orientation of Nut and Ferrule

#### Reassembly Installation

Connect the tube end to the fitting body or valve body and finger-tighten the ferrule nut. Secure the fitting body or valve body, and tighten the ferrule nut with a torque wrench to the specified torque in Table 1.

### Presetting and Installation Using Hydraulic Presetting Tool

#### Presetting Using Hydraulic Presetting Tool

##### 1. Tools

1.1 Installation tool is shown in Fig. 2. Please select appropriate die head and torque wrench according to tube O.D.

1.2 As shown in Fig. 3, turn the locking handle counterclockwise to ensure it is fully open.

1.3 Finger-tighten the die head after screwing it clockwise into the presetting body, and then use the die head wrench to tighten the die head until it is flush with the presetting body. Finger-tighten the locking handle clockwise and make sure the die head is firmly secured as shown in Fig. 4.

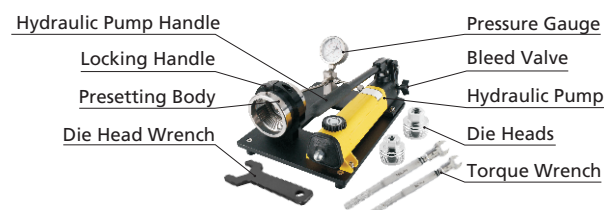


Fig. 2 Installation Tool



Fig. 3 Unscrew Locking Handle

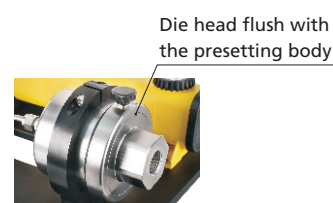


Fig. 4 Die Head Installation

## 2. Presetting

- 2.1 As shown in Fig. 1, install the ferrule nut, rear ferrule, and front ferrule onto the tube in the correct orientation and sequence.
  - 2.2 Insert the tube end into the die head until the tube rests firmly against the step in the die head. Finger-tighten the ferrule nut as shown in Fig. 5.
  - 2.3 Close the bleed valve as shown in Fig. 6.
  - 2.4 Turn the hydraulic pump handle until the pressure gauge indicates the corresponding pressure value shown in Table 1, and hold for 30 seconds, during which the pressure may drop slightly, but do not pressurize again as shown in Fig. 7.
  - 2.5 Open the bleed valve. Unscrew the ferrule nut counterclockwise and take the preset tube end off as shown in Fig. 8. As the tube may deform as a result of being pressed during the tube presetting, you may remove the tube by slightly rocking it. Exercise care not to rotate the tube.
- \* If the hydraulic pump fails to build pressure: a. Check whether the bleed valve is closed. b. Check the oil level in the pump, as the pump doesn't work with a low oil level.
- \* Operate hydraulic pump only during presetting. Otherwise, die head may be damaged.



Fig. 5 Finger-Tight Tube End Presetting



Fig. 6 Close Bleed Valve



Fig. 7 Pressurize to the Pressure Specified in Table 1



Fig. 8 Remove Preset Tube End

## 3. Examination of Preset Products

- 3.1 The threads and cones of the ferrule nut are lubricated to lower the torque during installation. The lubricant is likely to be scratched off in the process of thread screwing in. This is normal and can be purged clean.
- 3.2 After presetting, it is normal to find some types of rear ferrules rotatable along the axis of the tube. However, if you find the rear ferrule movable along the axis of the tube, or the front ferrule movable or rotatable along the axis of the tube, the presetting is unsatisfactory.

## Initial Installation

Screw the preset tube end into the fitting body or valve body, and finger-tighten the ferrule nut. Secure the fitting body or valve body, use a torque wrench to tighten the ferrule nut to the specified torque in Table 1.

## Reassembly Installation

Screw the tube end into the fitting body or valve body, and finger-tighten the ferrule nut. Then secure the fitting body or valve body, and use a torque wrench to tighten the ferrule nut to the specified torque in Table 1.

## Notes

1. Please be noted that the torque wrench shall be perpendicular to the axis of tube when using it.
2. Make sure the tube is in relaxed condition during installation. Do not insert a tilted tube into the body.
3. Ensure the tube end is smooth, straight, free of burrs, and the tube surface is free of defects, such as dents, scratches or protrusion.
4. For bent tubing, ensure sufficient straight length is reserved at both ends for proper tube fitting installation.
5. Do not rotate the fitting body, instead, secure the fitting body and turn the nut.
6. Do not install or tighten the fitting when there is pressure in the system.
7. Do not discharge the system by loosening fitting nut or tube cap.

# Assembly-by-Turns Instructions for 6D and 20D Series Tube Fittings

Refer to FITOK Full Technical Catalog for General Instrumentation for Assembly-by-Turns Instructions for 6D Tube Fittings.

Refer to FITOK Full Technical Catalog for Medium and High Pressure for Assembly-by-Turns Instructions for 20D Tube Fittings.

