

## Weld Fittings



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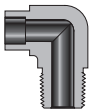
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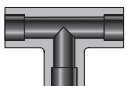
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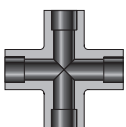
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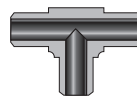
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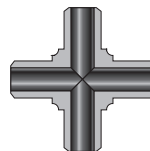
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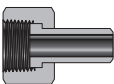
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## Features

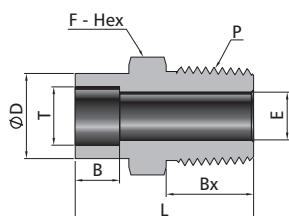
- ❖ Available in sizes from 1/8 to 2 in. and 6 mm to 38 mm
- ❖ CIR-LOK weld fittings materials include 316 316L stainless steel
- ❖ Quality machining of all ports ensures consistent welding
- ❖ For critical applications and high temperatures

## Materials Standards

| Materials                | Bar Stock                          | Forgings                           |
|--------------------------|------------------------------------|------------------------------------|
| 316 316L stainless steel | ASTM A276<br>ASME SA479, EN 1.4401 | ASTM A182<br>ASME SA182, EN 1.4401 |
| Alloy 20                 | ASTM B473                          | ASTM B462                          |
| Alloy 400/<br>R-405      | ASTM B164,<br>ASME SB164           | ASTM B564,<br>ASME SB564           |
| Alloy 600                | ASTM B166, ASME SB166              | ASTM B564, ASME SB564              |
| Alloy 625                | ASTM B446                          | ASTM B564, ASME SB564              |
| Alloy 825                | ASTM B425                          | ASTM B564, ASME SB564              |
| Alloy C-276              | ASTM B574                          | ASTM B564                          |
| Carbon steel             | ASTM A108                          | —                                  |
| Duplex 2507              | ASTM A479                          | ASTM A182                          |

## Tube Socket Weld Fittings

### Male Connectors



#### Fractional Tube

| T-Tube Size (in.) | P-NPT Size | Basic Ordering Number | Dimension, mm |      |      |      |      |      | Working Pressure psig (bar) |
|-------------------|------------|-----------------------|---------------|------|------|------|------|------|-----------------------------|
|                   |            |                       | L             | D    | B    | Bx   | F    | E    |                             |
| 1/4               | 1/4        | FSW4-WMC-NPT4-        | 29.2          | 12.2 | 7.1  | 14.2 | 14.3 | 4.8  | 8000 (551)                  |
| 3/8               | 1/4        | FSW6-WMC-NPT4-        | 31.8          | 15.2 | 7.9  | 14.2 | 15.9 | 7.1  | 8000 (551)                  |
| 3/8               | 3/8        | FSW6-WMC-NPT6-        | 31.8          | 15.2 | 7.9  | 14.2 | 17.5 | 7.1  | 7800 (537)                  |
| 3/8               | 1/2        | FSW6-WMC-NPT8-        | 37.3          | 15.2 | 7.9  | 19.1 | 22.2 | 7.1  | 7700 (530)                  |
| 1/2               | 1/4        | FSW8-WMC-NPT4-        | 33.3          | 18.5 | 9.7  | 14.2 | 19.1 | 7.1  | 6600 (454)                  |
| 1/2               | 3/8        | FSW8-WMC-NPT6-        | 33.3          | 18.5 | 9.7  | 14.2 | 19.1 | 9.6  | 6600 (454)                  |
| 1/2               | 1/2        | FSW8-WMC-NPT8-        | 38.9          | 18.5 | 9.7  | 19.1 | 22.2 | 10.4 | 6600 (454)                  |
| 3/4               | 3/4        | FSW12-WMC-NPT12-      | 45.1          | 26.4 | 11.2 | 19.1 | 27.0 | 15.7 | 5900 (406)                  |
| 1                 | 1          | FSW16-WMC-NPT16-      | 53.6          | 34.5 | 15.7 | 23.9 | 34.9 | 22.4 | 5300 (365)                  |

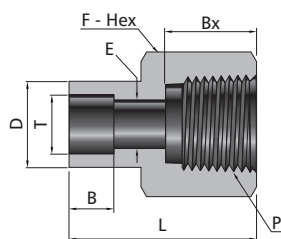
#### NPT Thread

#### Metric Tube

| T-Tube Size (mm) | P-NPT Size | Basic Ordering Number | Dimension, mm |      |      |      |    |      | Working Pressure psig (bar) |
|------------------|------------|-----------------------|---------------|------|------|------|----|------|-----------------------------|
|                  |            |                       | L             | D    | B    | Bx   | F  | E    |                             |
| 6                | 1/4        | MSW6-WMC-NPT4-        | 29.2          | 12.0 | 7.1  | 14.2 | 14 | 4.8  | 8000 (551)                  |
| 12               | 1/2        | MSW12-WMC-NPT8-       | 38.9          | 17.6 | 9.7  | 19.1 | 22 | 9.5  | 6820 (470)                  |
| 14               | 1/4        | MSW14-WMC-NPT4-       | 33.3          | 21.3 | 10.4 | 14.2 | 15 | 7.1  | 6930 (478)                  |
| 14               | 3/8        | MSW14-WMC-NPT6-       | 35.0          | 21.6 | 10.4 | 14.2 | 18 | 9.6  | 6930 (478)                  |
| 14               | 1/2        | MSW14-WMC-NPT8-       | 40.0          | 21.3 | 10.4 | 19.1 | 22 | 10.4 | 6930 (478)                  |
| 16               | 1/4        | MSW16-WMC-NPT4-       | 35.0          | 23.3 | 10.4 | 14.2 | 18 | 7.1  | 6190 (426)                  |
| 16               | 1/2        | MSW16-WMC-NPT8-       | 40.0          | 23.3 | 10.4 | 19.1 | 22 | 11.9 | 6190 (426)                  |
| 18               | 1/4        | MSW18-WMC-NPT4-       | 40.4          | 26.0 | 11.2 | 14.2 | 19 | 7.1  | 6050 (417)                  |
| 28               | 3/4        | MSW28-WMC-NPT12-      | 55.5          | 40.5 | 18.4 | 19.1 | 30 | 15.7 | 5040 (348)                  |
| 38               | 1 1/4      | MSW38-WMC-NPT20-      | 68.3          | 52.5 | 26.9 | 23.9 | 46 | 28.6 | 5000 (344)                  |

#### NPT Thread

### Female Connectors



#### Fractional Tube

| T-Tube Size (in.) | P-NPT Size | Basic Ordering Number | Dimension, mm |      |      |      |      |      | Working Pressure psig (bar) |
|-------------------|------------|-----------------------|---------------|------|------|------|------|------|-----------------------------|
|                   |            |                       | L             | D    | B    | Bx   | F    | E    |                             |
| 1/8               | 1/8        | FSW2-WFC-FNPT2-       | 21.1          | 7.4  | 2.5  | 10.4 | 14.3 | 2.3  | 6500 (447)                  |
| 1/4               | 1/8        | FSW4-WFC-FNPT2-       | 26.7          | 12.2 | 7.1  | 10.4 | 14.3 | 4.8  | 6500 (447)                  |
| 1/4               | 1/4        | FSW4-WFC-FNPT4-       | 30.0          | 12.2 | 7.1  | 15.0 | 19.1 | 4.8  | 6600 (454)                  |
| 3/8               | 1/4        | FSW6-WFC-FNPT4-       | 31.5          | 15.2 | 7.9  | 15.0 | 19.1 | 7.1  | 6600 (454)                  |
| 1/2               | 3/8        | FSW8-WFC-FNPT6-       | 34.5          | 18.5 | 9.7  | 15.0 | 22.2 | 10.4 | 5300 (365)                  |
| 1/2               | 1/2        | FSW8-WFC-FNPT8-       | 40.4          | 18.5 | 9.7  | 19.8 | 27.0 | 10.4 | 4900 (337)                  |
| 3/4               | 3/4        | FSW12-WFC-FNPT12-     | 43.9          | 26.4 | 11.2 | 20.6 | 33.3 | 16.0 | 4600 (316)                  |
| 1                 | 1          | FSW16-WFC-FNPT16-     | 54.1          | 34.5 | 15.7 | 25.4 | 41.3 | 22.4 | 4400 (303)                  |

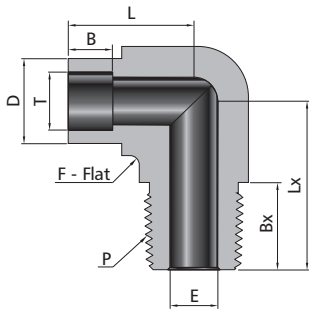
#### NPT Thread

#### Metric Tube

| T-Tube Size (mm) | P-NPT Size | Basic Ordering Number | Dimension, mm |      |      |      |    |      | Working Pressure psig (bar) |
|------------------|------------|-----------------------|---------------|------|------|------|----|------|-----------------------------|
|                  |            |                       | L             | D    | B    | Bx   | F  | E    |                             |
| 8                | 1/4        | MSW8-WFC-FNPT4-       | 27.0          | 13.7 | 7.5  | 15.0 | 19 | 4.8  | 6600 (454)                  |
| 10               | 1/4        | MSW10-WFC-FNPT4-      | 29.0          | 19.5 | 9.5  | 15.0 | 19 | 7.1  | 6600 (454)                  |
| 14               | 1/4        | MSW14-WFC-FNPT4-      | 32.0          | 22.1 | 10.4 | 15.0 | 22 | 9.5  | 6930 (478)                  |
| 28               | 3/4        | MSW28-WFC-FNPT12-     | 54.1          | 40.5 | 18.4 | 20.6 | 35 | 19.8 | 4600 (316)                  |

#### NPT Thread

## Male Elbows

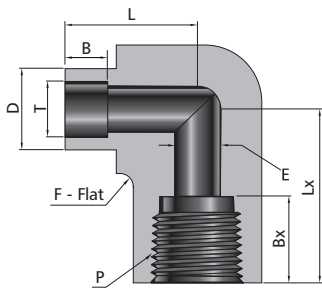


### Fractional Tube

| T-Tube<br>Size<br>(in.) | P-NPT<br>Size | Basic<br>Ordering<br>Number | Dimension, mm |      |      |      |      |      |      |            | Working<br>Pressure<br>psig (bar) |
|-------------------------|---------------|-----------------------------|---------------|------|------|------|------|------|------|------------|-----------------------------------|
|                         |               |                             | L             | Lx   | D    | B    | Bx   | F    | E    |            |                                   |
| 1/4                     | 1/4           | FSW4-WME-NPT4-              | 20.1          | 26.7 | 14.7 | 7.1  | 14.2 | 12.7 | 4.8  | 8000 (551) |                                   |
| 3/8                     | 1/4           | FSW6-WME-NPT4-              | 26.4          | 26.7 | 14.7 | 7.9  | 14.2 | 12.7 | 7.1  | 8000 (551) |                                   |
| 3/8                     | 3/8           | FSW6-WME-NPT6-              | 24.6          | 29.7 | 20.2 | 7.9  | 14.2 | 17.5 | 7.1  | 7800 (537) |                                   |
| 3/8                     | 1/2           | FSW6-WME-NPT8-              | 25.9          | 36.8 | 23.8 | 7.9  | 19.1 | 20.6 | 7.1  | 7700 (530) |                                   |
| 1/2                     | 1/2           | FSW8-WME-NPT8-              | 27.4          | 36.8 | 23.8 | 9.7  | 19.1 | 20.6 | 10.4 | 6600 (454) |                                   |
| 3/4                     | 3/4           | FSW12-WME-NPT12-            | 38.9          | 39.6 | 26.4 | 11.2 | 19.1 | 27.0 | 15.7 | 5900 (406) |                                   |

### NPT Thread

## Female Elbows

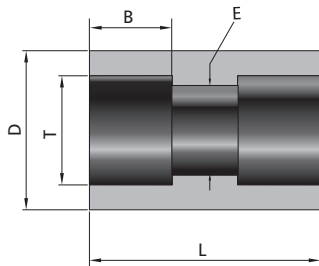


### Fractional Tube

| T-Tube<br>Size<br>(in.) | P-NPT<br>Size | Basic<br>Ordering<br>Number | Dimension, mm |      |      |     |      |      |      |            | Working<br>Pressure<br>psig (bar) |
|-------------------------|---------------|-----------------------------|---------------|------|------|-----|------|------|------|------------|-----------------------------------|
|                         |               |                             | L             | Lx   | D    | B   | Bx   | F    | E    |            |                                   |
| 1/4                     | 1/4           | FSW4-WFE-FNPT4-             | 22.9          | 29.7 | 20.2 | 7.1 | 15.0 | 17.5 | 4.8  | 7400 (509) |                                   |
| 3/8                     | 1/4           | FSW6-WFE-FNPT4-             | 25.1          | 29.7 | 20.2 | 7.9 | 15.0 | 17.5 | 7.1  | 7400 (509) |                                   |
| 3/8                     | 1/2           | FSW6-WFE-FNPT8-             | 28.7          | 39.6 | 29.3 | 7.9 | 19.8 | 25.4 | 7.1  | 5700 (392) |                                   |
| 1/2                     | 1/2           | FSW8-WFE-FNPT8-             | 30.2          | 39.6 | 29.3 | 9.7 | 19.8 | 25.4 | 10.4 | 5700 (392) |                                   |

### NPT Thread

## Unions



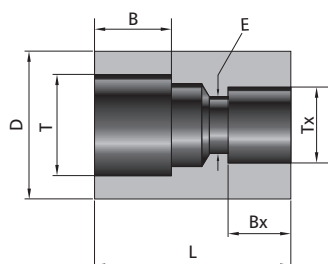
### Fractional Tube

| T-Tube Size (in.) | Basic Ordering Number | Dimension, mm |      |      |      | Working Pressure psig (bar) |
|-------------------|-----------------------|---------------|------|------|------|-----------------------------|
|                   |                       | L             | D    | B    | E    |                             |
| 1/4               | FSW4-WU-FSW4-         | 19.1          | 12.2 | 7.1  | 4.8  | 10700 (737)                 |
| 3/8               | FSW6-WU-FSW6-         | 22.4          | 15.2 | 7.9  | 7.1  | 8100 (558)                  |
| 1/2               | FSW8-WU-FSW8-         | 26.9          | 18.5 | 9.7  | 10.4 | 6600 (454)                  |
| 5/8               | FSW10-WU-FSW10-       | 30.2          | 23.4 | 10.4 | 12.7 | 6200 (427)                  |
| 3/4               | FSW12-WU-FSW12-       | 33.3          | 26.4 | 11.2 | 16.0 | 5900 (406)                  |
| 7/8               | FSW14-WU-FSW14-       | 35.5          | 31.5 | 12.7 | 18.8 | 5730 (395)                  |
| 1                 | FSW16-WU-FSW16-       | 36.6          | 34.5 | 15.7 | 22.4 | 5600 (385)                  |

### Metric Tube

| T-Tube Size (mm) | Basic Ordering Number | Dimension, mm |      |      |      | Working Pressure psig (bar) |
|------------------|-----------------------|---------------|------|------|------|-----------------------------|
|                  |                       | L             | D    | B    | E    |                             |
| 8                | MSW8-WU-MSW8-         | 22.4          | 14.3 | 7.9  | 6.4  | 9790 (675)                  |
| 10               | MSW10-WU-MSW10-       | 23.6          | 16.5 | 7.9  | 7.4  | 8100 (558)                  |
| 12               | MSW12-WU-MSW12-       | 26.9          | 20.2 | 9.7  | 9.5  | 6820 (470)                  |
| 14               | MSW14-WU-MSW14-       | 28.0          | 23.8 | 10.0 | 10.4 | 6930 (478)                  |
| 16               | MSW16-WU-MSW16-       | 30.2          | 23.8 | 10.4 | 12.7 | 6190 (426)                  |
| 20               | MSW20-WU-MSW20-       | 28.0          | 27.0 | 11.2 | 17.0 | 5510 (380)                  |

## Reducing Unions



Fractional Tube

| T-Tube Size (in.) | Tx-Tube Size (in.) | Basic Ordering Number | Dimension, mm |      |      |      |      | Working Pressure psig (bar) |
|-------------------|--------------------|-----------------------|---------------|------|------|------|------|-----------------------------|
|                   |                    |                       | L             | D    | B    | E    | Bx   |                             |
| 3/8               | 1/4                | FSW6-WU-FSW4-         | 22.4          | 15.2 | 7.9  | 4.8  | 7.1  | 8100 (558)                  |
| 1/2               | 1/4                | FSW8-WU-FSW4-         | 24.3          | 18.5 | 9.7  | 4.8  | 7.1  | 6600 (454)                  |
| 1/2               | 3/8                | FSW8-WU-FSW6-         | 26.1          | 18.5 | 9.7  | 7.1  | 7.9  | 6600 (454)                  |
| 3/4               | 3/8                | FSW12-WU-FSW6-        | 29.8          | 26.4 | 11.2 | 7.1  | 7.9  | 5900 (406)                  |
| 3/4               | 1/2                | FSW12-WU-FSW8-        | 31.6          | 26.4 | 11.2 | 10.4 | 9.7  | 5900 (406)                  |
| 1                 | 3/4                | FSW16-WU-FSW12-       | 32.1          | 34.5 | 15.7 | 16.0 | 11.2 | 5600 (385)                  |

Fractional Tube

Metric Tube

| T-Tube Size (mm) | Tx-Tube Size (mm) | Basic Ordering Number | Dimension, mm |      |      |      |      | Working Pressure psig (bar) |
|------------------|-------------------|-----------------------|---------------|------|------|------|------|-----------------------------|
|                  |                   |                       | L             | D    | B    | E    | Bx   |                             |
| 14               | 10                | MSW14-WU-MSW10-       | 26.0          | 20.0 | 10.4 | 7.4  | 7.9  | 6930 (478)                  |
| 25               | 14                | MSW25-WU-MSW14-       | 30.0          | 35.0 | 15.7 | 10.4 | 10.0 | 5450 (376)                  |
| 25               | 22                | MSW25-WU-MSW22-       | 35.8          | 34.5 | 15.7 | 19.0 | 13.5 | 5450 (376)                  |

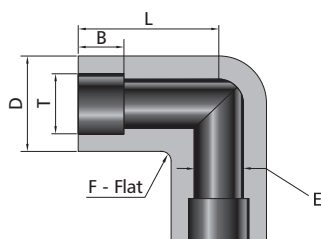
Metric Tube

Metric Tube

| T-Tube Size (mm) | Tx-Tube Size (in.) | Basic Ordering Number | Dimension, mm |      |      |      |      | Working Pressure psig (bar) |
|------------------|--------------------|-----------------------|---------------|------|------|------|------|-----------------------------|
|                  |                    |                       | L             | D    | B    | E    | Bx   |                             |
| 20               | 3/4                | MSW20-WU-FSW12-       | 28.0          | 27.0 | 11.2 | 15.7 | 11.2 | 5510 (380)                  |
| 28               | 3/4                | MSW28-WU-FSW12-       | 36.8          | 40.0 | 20.0 | 15.7 | 11.2 | 5040 (348)                  |

Fractional Tube

## Union Elbows



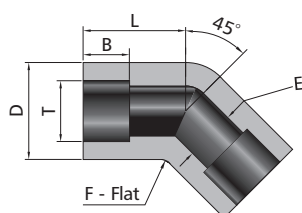
Fractional Tube

| T-Tube Size (in.) | Basic Ordering Number | Dimension, mm |      |      |      |      | Working Pressure psig (bar) |
|-------------------|-----------------------|---------------|------|------|------|------|-----------------------------|
|                   |                       | L             | D    | B    | F    | E    |                             |
| 1/8               | FSW2-WUE-FSW2-        | 15.0          | 11.0 | 2.5  | 9.5  | 2.3  | 12600 (863)                 |
| 1/4               | FSW4-WUE-FSW4-        | 21.8          | 12.8 | 7.1  | 11.1 | 4.8  | 10700 (737)                 |
| 3/8               | FSW6-WUE-FSW6-        | 26.4          | 14.7 | 7.9  | 12.7 | 7.1  | 8100 (558)                  |
| 1/2               | FSW8-WUE-FSW8-        | 29.7          | 20.2 | 9.7  | 17.5 | 10.4 | 6600 (454)                  |
| 5/8               | FSW10-WUE-FSW10-      | 36.1          | 23.8 | 10.4 | 20.6 | 12.7 | 6200 (427)                  |
| 3/4               | FSW12-WUE-FSW12-      | 39.6          | 29.3 | 11.2 | 25.4 | 16.0 | 5900 (406)                  |
| 1                 | FSW16-WUE-FSW16-      | 48.8          | 36.7 | 15.7 | 31.8 | 22.4 | 5600 (385)                  |

Metric Tube

| T-Tube Size (mm) | Basic Ordering Number | Dimension, mm |      |      |      |      | Working Pressure psig (bar) |
|------------------|-----------------------|---------------|------|------|------|------|-----------------------------|
|                  |                       | L             | D    | B    | F    | E    |                             |
| 10               | MSW10-WUE-MSW10-      | 24.6          | 16.5 | 7.9  | 14.3 | 7.4  | 8100 (558)                  |
| 12               | MSW12-WUE-MSW12-      | 29.7          | 20.2 | 9.7  | 17.5 | 9.5  | 6820 (470)                  |
| 14               | MSW14-WUE-MSW14-      | 36.0          | 23.8 | 10.0 | 20.6 | 10.4 | 6930 (478)                  |
| 16               | MSW16-WUE-MSW16-      | 36.0          | 23.8 | 10.4 | 20.6 | 12.7 | 6190 (426)                  |

## Union 45° Elbows



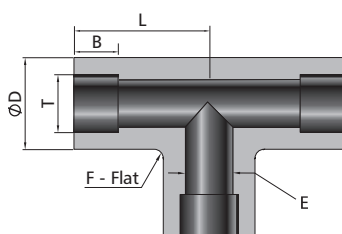
### Fractional Tube

| T-Tube Size (in.) | Basic Ordering Number | Dimension, mm |      |      |      |      | Working Pressure psig (bar) |
|-------------------|-----------------------|---------------|------|------|------|------|-----------------------------|
|                   |                       | L             | D    | B    | F    | E    |                             |
| 1/4               | FSW4-W45UE-FSW4-      | 15.0          | 14.7 | 7.1  | 12.7 | 4.8  | 10700 (737)                 |
| 3/8               | FSW6-W45UE-FSW6-      | 19.1          | 16.5 | 7.9  | 14.3 | 7.1  | 8100 (558)                  |
| 1/2               | FSW8-W45UE-FSW8-      | 21.3          | 20.2 | 9.7  | 17.5 | 10.4 | 6600 (454)                  |
| 3/4               | FSW12-W45UE-FSW12-    | 28.7          | 29.3 | 11.2 | 25.4 | 16.0 | 5900 (406)                  |
| 1                 | FSW16-W45UE-FSW16-    | 31.8          | 36.7 | 15.7 | 31.8 | 22.4 | 5600 (385)                  |

### Metric Tube

| T-Tube Size (mm) | Basic Ordering Number | Dimensions, mm |      |      |      |      | Working Pressure psig (bar) |
|------------------|-----------------------|----------------|------|------|------|------|-----------------------------|
|                  |                       | L              | D    | B    | F    | E    |                             |
| 8                | MSW8-W45UE-MSW8-      | 17.3           | 14.7 | 7.9  | 12.7 | 6.4  | 9790 (675)                  |
| 10               | MSW10-W45UE-MSW10-    | 19.1           | 16.5 | 7.9  | 14.3 | 7.4  | 8100 (558)                  |
| 12               | MSW12-W45UE-MSW12-    | 21.3           | 20.2 | 9.7  | 17.5 | 9.5  | 6820 (470)                  |
| 14               | MSW14-W45UE-MSW14-    | 26.4           | 23.8 | 10.0 | 20.6 | 10.4 | 6930 (478)                  |
| 16               | MSW16-W45UE-MSW16-    | 26.4           | 23.8 | 10.4 | 20.6 | 12.7 | 6190 (426)                  |
| 20               | MSW20-W45UE-MSW20-    | 28.7           | 29.3 | 11.2 | 27.0 | 16.0 | 5510 (380)                  |
| 22               | MSW22-W45UE-MSW22-    | 29.7           | 31.2 | 13.5 | 31.8 | 19.0 | 6850 (472)                  |
| 25               | MSW25-W45UE-MSW25-    | 31.8           | 36.7 | 15.7 | 31.8 | 22.0 | 5450 (376)                  |

## Union Tees



### Fractional Tube

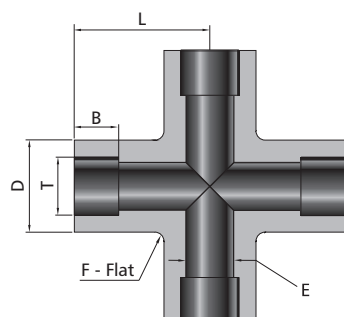
| T-Tube Size (in.) | Basic Ordering Number  | Dimension, mm |      |      |      |      | Working Pressure psig (bar) |
|-------------------|------------------------|---------------|------|------|------|------|-----------------------------|
|                   |                        | L             | D    | B    | F    | E    |                             |
| 1/8               | FSW2-WUT-FSW2-FSW2-    | 15.0          | 12.8 | 2.5  | 9.5  | 2.3  | 12600 (868)                 |
| 1/4               | FSW4-WUT-FSW4-FSW4-    | 21.8          | 12.8 | 7.1  | 11.1 | 4.8  | 10700 (737)                 |
| 3/8               | FSW6-WUT-FSW6-FSW6-    | 26.4          | 14.7 | 7.9  | 12.7 | 7.1  | 8100 (558)                  |
| 1/2               | FSW8-WUT-FSW8-FSW8-    | 29.7          | 20.2 | 9.7  | 17.5 | 10.4 | 6600 (454)                  |
| 5/8               | FSW10-WUT-FSW10-FSW10- | 36.1          | 23.8 | 10.4 | 20.6 | 12.7 | 6200 (428)                  |
| 3/4               | FSW12-WUT-FSW12-FSW12- | 39.6          | 29.3 | 11.2 | 25.4 | 16.0 | 5900 (406)                  |
| 1                 | FSW16-WUT-FSW16-FSW16- | 48.8          | 36.7 | 15.7 | 31.8 | 22.4 | 5600 (385)                  |

### Metric Tube

| T-Tube Size (mm) | Basic Ordering Number  | Dimension, mm |      |      |      |      | Working Pressure psig (bar) |
|------------------|------------------------|---------------|------|------|------|------|-----------------------------|
|                  |                        | L             | D    | B    | F    | E    |                             |
| 8                | MSW8-WUT-MSW8-MSW8-    | 18.5          | 14.7 | 7.9  | 12.7 | 6.4  | 9790 (675)                  |
| 10               | MSW10-WUT-MSW10-MSW10- | 24.6          | 16.5 | 7.9  | 14.3 | 7.4  | 8100 (558)                  |
| 12               | MSW12-WUT-MSW12-MSW12- | 29.7          | 20.2 | 9.7  | 17.5 | 9.5  | 6820 (470)                  |
| 14               | MSW14-WUT-MSW14-MSW14- | 36.0          | 23.8 | 10.0 | 20.6 | 10.4 | 6930 (478)                  |
| 16               | MSW16-WUT-MSW16-MSW16- | 36.0          | 23.8 | 10.4 | 20.6 | 12.7 | 6190 (426)                  |
| 20               | MSW20-WUT-MSW20-MSW20- | 39.6          | 29.3 | 11.2 | 25.4 | 17.0 | 5510 (380)                  |
| 22               | MSW22-WUT-MSW22-MSW22- | 41.3          | 31.2 | 13.5 | 27.0 | 19.0 | 6850 (472)                  |
| 25               | MSW25-WUT-MSW25-MSW25- | 48.8          | 36.7 | 15.7 | 31.8 | 22.0 | 5450 (376)                  |



## Union Crosses



### Fractional Tube

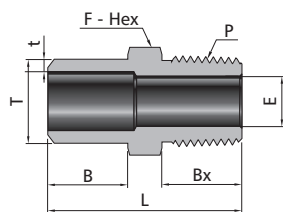
| T-Tube Size (in.) | Basic Ordering Number        | Dimension, mm |      |      |      |      | Working Pressure psig (bar) |
|-------------------|------------------------------|---------------|------|------|------|------|-----------------------------|
|                   |                              | L             | D    | B    | F    | E    |                             |
| 1/8               | FSW2-WUC-FSW2-FSW2-FSW2-     | 15.0          | 11.0 | 2.5  | 9.5  | 2.3  | 12600 (863)                 |
| 1/4               | FSW4-WUC-FSW4-FSW4-FSW4-     | 21.8          | 12.8 | 7.1  | 11.1 | 4.8  | 10700 (737)                 |
| 3/8               | FSW6-WUC-FSW6-FSW6-FSW6-     | 26.4          | 14.7 | 7.9  | 12.7 | 7.1  | 8100 (558)                  |
| 1/2               | FSW8-WUC-FSW8-FSW8-FSW8-     | 29.7          | 20.2 | 9.7  | 17.5 | 10.4 | 6600 (454)                  |
| 5/8               | FSW10-WUC-FSW10-FSW10-FSW10- | 36.1          | 23.8 | 10.4 | 20.6 | 12.7 | 6200 (428)                  |
| 3/4               | FSW12-WUC-FSW12-FSW12-FSW12- | 39.6          | 29.3 | 11.2 | 25.4 | 16.0 | 5900 (406)                  |
| 1                 | FSW16-WUC-FSW16-FSW16-FSW16- | 48.8          | 36.7 | 15.7 | 31.8 | 22.4 | 5600 (385)                  |

### Metric Tube

| T-Tube Size (mm) | Basic Ordering Number       | Dimension, mm |      |      |      |      | Working Pressure psig (bar) |
|------------------|-----------------------------|---------------|------|------|------|------|-----------------------------|
|                  |                             | L             | D    | B    | F    | E    |                             |
| 8                | MSW8-WC-MSW8-MSW8-MSW8-     | 18.5          | 14.7 | 7.9  | 12.7 | 5.9  | 9790 (675)                  |
| 10               | MSW10-WC-MSW10-MSW10-MSW10- | 24.6          | 16.5 | 7.9  | 14.3 | 7.1  | 8100 (558)                  |
| 12               | MSW12-WC-MSW12-MSW12-MSW12- | 29.7          | 20.2 | 9.7  | 17.5 | 9.5  | 6820 (470)                  |
| 14               | MSW14-WC-MSW14-MSW14-MSW14- | 36.0          | 23.8 | 9.7  | 20.6 | 10.4 | 6930 (478)                  |
| 16               | MSW16-WC-MSW16-MSW16-MSW16- | 36.0          | 23.8 | 10.0 | 20.6 | 12.7 | 6190 (426)                  |
| 20               | MSW20-WC-MSW20-MSW20-MSW20- | 39.6          | 29.3 | 11.2 | 25.4 | 17.0 | 5510 (380)                  |
| 22               | MSW22-WC-MSW22-MSW22-MSW22- | 41.3          | 31.2 | 13.5 | 27.0 | 19.0 | 6850 (472)                  |
| 25               | MSW25-WC-MSW25-MSW25-MSW25- | 48.8          | 36.7 | 15.7 | 31.8 | 22.0 | 5450 (376)                  |

## Tube Butt Weld Fittings

### Male Connectors



#### Fractional Tube

| T-Tube<br>O.D.<br>(in.) | t-Wall<br>Thick-<br>ness (in.) | P-NPT<br>Size | Basic<br>Ordering<br>Number | Dimension, mm |      |      |      |      | Working<br>Pressure<br>psig (bar) |
|-------------------------|--------------------------------|---------------|-----------------------------|---------------|------|------|------|------|-----------------------------------|
|                         |                                |               |                             | L             | B    | Bx   | F    | E    |                                   |
| 1/4                     | 0.065                          | 1/4           | FBW4-WMC-NPT4-              | 29.7          | 9.7  | 14.2 | 14.3 | 7.1  | 8000 (551)                        |
| 1/4                     | 0.065                          | 1/2           | FBW4-WMC-NPT8-              | 36.8          | 9.7  | 19.1 | 22.2 | 11.9 | 7700 (530)                        |
| 3/8                     | 0.095                          | 1/4           | FBW6-WMC-NPT4-              | 29.7          | 9.7  | 14.2 | 14.3 | 7.1  | 8000 (551)                        |
| 3/8                     | 0.095                          | 1/2           | FBW6-WMC-NPT8-              | 36.8          | 9.7  | 19.1 | 22.2 | 11.9 | 7700 (530)                        |
| 1/2                     | 0.095                          | 1/4           | FBW8-WMC-NPT4-              | 34.3          | 14.2 | 14.2 | 14.3 | 7.1  | 6780 (468)                        |
| 1/2                     | 0.095                          | 1/2           | FBW8-WMC-NPT8-              | 41.4          | 14.2 | 19.1 | 22.2 | 11.9 | 6780 (468)                        |
| 5/8                     | 0.109                          | 1/4           | FBW10-WMC-NPT4-             | 34.8          | 14.2 | 14.2 | 17.5 | 7.1  | 5760 (397)                        |
| 5/8                     | 0.109                          | 1/2           | FBW10-WMC-NPT8-             | 41.4          | 14.2 | 19.1 | 22.2 | 11.9 | 5760 (397)                        |
| 3/4                     | 0.120                          | 1/4           | FBW12-WMC-NPT4-             | 40.1          | 19.1 | 14.2 | 20.6 | 7.1  | 5530 (381)                        |
| 3/4                     | 0.120                          | 1/2           | FBW12-WMC-NPT8-             | 46.2          | 19.1 | 19.1 | 22.2 | 11.9 | 5530 (381)                        |
| 1                       | 0.134                          | 1/4           | FBW16-WMC-NPT4-             | 42.9          | 19.1 | 14.2 | 27.0 | 7.1  | 4480 (309)                        |
| 1                       | 0.134                          | 1/2           | FBW16-WMC-NPT8-             | 47.8          | 19.1 | 19.1 | 27.0 | 11.9 | 4480 (309)                        |

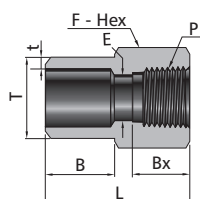
#### NPT Thread

#### Metric Tube

| T-Tube<br>O.D.<br>(mm) | t-Wall<br>Thickness<br>(mm) | P-NPT<br>Size | Basic<br>Ordering<br>Number | Dimension, mm |      |      |    |      | Working<br>Pressure<br>psig (bar) |
|------------------------|-----------------------------|---------------|-----------------------------|---------------|------|------|----|------|-----------------------------------|
|                        |                             |               |                             | L             | B    | Bx   | F  | E    |                                   |
| 12                     | 2.2                         | 1/4           | MBW12-WMC-NPT4-             | 34.3          | 14.2 | 14.2 | 14 | 7.1  | 6470 (446)                        |
| 12                     | 2.2                         | 1/2           | MBW12-WMC-NPT8-             | 41.1          | 14.2 | 19.1 | 22 | 11.9 | 6470 (446)                        |
| 14                     | 2.5                         | 1/4           | MBW14-WMC-NPT4-             | 34.3          | 14.2 | 14.2 | 15 | 7.1  | 6280 (433)                        |
| 14                     | 2.5                         | 1/2           | MBW14-WMC-NPT8-             | 41.4          | 14.2 | 19.1 | 22 | 11.9 | 6280 (433)                        |
| 15                     | 2.5                         | 1/4           | MBW15-WMC-NPT4-             | 34.8          | 14.2 | 14.2 | 16 | 7.1  | 5770 (398)                        |
| 16                     | 2.8                         | 1/4           | MBW16-WMC-NPT4-             | 35.6          | 14.2 | 14.2 | 18 | 7.1  | 6140 (423)                        |
| 16                     | 2.8                         | 1/2           | MBW16-WMC-NPT8-             | 41.1          | 14.2 | 19.1 | 22 | 11.9 | 6140 (423)                        |
| 20                     | 3.0                         | 1/2           | MBW20-WMC-NPT8-             | 46.2          | 19.1 | 19.1 | 22 | 11.9 | 5110 (352)                        |
| 22                     | 3.0                         | 1/4           | MBW22-WMC-NPT4-             | 41.2          | 19.1 | 14.2 | 24 | 7.1  | 4620 (319)                        |
| 22                     | 3.0                         | 1/2           | MBW22-WMC-NPT8-             | 46.1          | 19.1 | 19.1 | 24 | 11.9 | 4620 (319)                        |
| 25                     | 3.5                         | 3/4           | MBW25-WMC-NPT12-            | 47.8          | 19.1 | 19.1 | 27 | 15.7 | 4730 (326)                        |
| 25                     | 3.5                         | 1             | MBW25-WMC-NPT16-            | 54.9          | 19.1 | 23.9 | 35 | 22.4 | 4730 (326)                        |
| 28                     | 4.0                         | 1/2           | MBW28-WMC-NPT8-             | 54.2          | 21.4 | 19.1 | 30 | 11.9 | 4850 (335)                        |

#### NPT Thread

## Female Connectors



### Fractional Tube

### NPT Thread

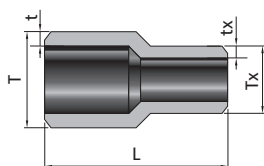
| T-Tube<br>O.D.<br>(in.) | t-Wall<br>Thick-<br>ness (in.) | P-NPT<br>Size | Basic<br>Ordering<br>Number | Dimension, mm |      |      |      |     | Working<br>Pressure<br>psig (bar) |
|-------------------------|--------------------------------|---------------|-----------------------------|---------------|------|------|------|-----|-----------------------------------|
|                         |                                |               |                             | L             | B    | Bx   | F    | E   |                                   |
| 1/4                     | 0.065                          | 1/4           | FBW4-WFC-FNPT4-             | 27.9          | 9.7  | 15.0 | 19.1 | 3.0 | 6600 (454)                        |
| 1/4                     | 0.065                          | 3/8           | FBW4-WFC-FNPT6-             | 29.5          | 9.7  | 15.0 | 22.2 | 3.0 | 5300 (365)                        |
| 3/8                     | 0.095                          | 1/4           | FBW6-WFC-FNPT4-             | 27.9          | 9.7  | 15.0 | 19.1 | 4.7 | 6600 (454)                        |
| 3/8                     | 0.095                          | 3/8           | FBW6-WFC-FNPT6-             | 29.5          | 9.7  | 15.0 | 22.2 | 4.7 | 5300 (365)                        |
| 1/2                     | 0.095                          | 1/4           | FBW8-WFC-FNPT4-             | 26.7          | 14.2 | 15.0 | 19.1 | 7.9 | 6600 (454)                        |
| 1/2                     | 0.095                          | 3/8           | FBW8-WFC-FNPT6-             | 34.0          | 14.2 | 15.0 | 22.2 | 7.9 | 5300 (365)                        |
| 1/2                     | 0.095                          | 1/2           | FBW8-WFC-FNPT8-             | 38.9          | 14.2 | 19.8 | 27.0 | 7.9 | 4900 (337)                        |

### Metric Tube

### NPT Thread

| T-Tube<br>O.D.<br>(mm) | t-Wall<br>Thickness<br>(mm) | P-NPT<br>Size | Basic<br>Ordering<br>Number | Dimension, mm |      |      |    |      | Working<br>Pressure<br>psig (bar) |
|------------------------|-----------------------------|---------------|-----------------------------|---------------|------|------|----|------|-----------------------------------|
|                        |                             |               |                             | L             | B    | Bx   | F  | E    |                                   |
| 14                     | 2.5                         | 1/4           | MBW14-WFC-FNPT4-            | 33.0          | 14.2 | 15.0 | 19 | 9.0  | 6280 (433)                        |
| 14                     | 2.5                         | 1/2           | MBW14-WFC-FNPT8-            | 38.9          | 14.2 | 19.8 | 27 | 9.0  | 4900 (337)                        |
| 20                     | 3.0                         | 1/2           | MBW20-WFC-FNPT8-            | 43.7          | 19.1 | 19.8 | 27 | 14.0 | 4900 (337)                        |
| 28                     | 4.0                         | 1/2           | MBW28-WFC-FNPT8-            | 49.8          | 23.9 | 19.8 | 30 | 15.7 | 4850 (335)                        |

## Reducing Unions



### Fractional Tube

### Fractional Tube

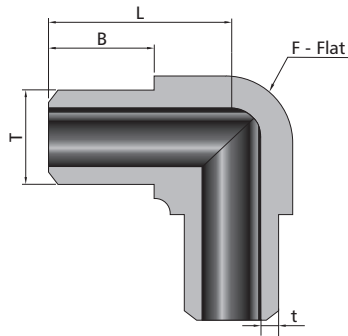
| T-Tube<br>O.D.<br>(in.) | t-Wall<br>Thickness<br>(in.) | Tx-Tube<br>O.D.<br>(in.) | tx-Wall<br>Thick-ness<br>(in.) | Basic<br>Ordering<br>Number | L<br>(mm) | Working<br>Pressure<br>psig (bar) |
|-------------------------|------------------------------|--------------------------|--------------------------------|-----------------------------|-----------|-----------------------------------|
| 3/8                     | 0.095                        | 1/4                      | 0.065                          | FBW6-WU-FBW4-               | 38.1      | 9930 (685)                        |
| 1/2                     | 0.095                        | 1/4                      | 0.065                          | FBW8-WU-FBW4-               | 38.1      | 6780 (468)                        |
| 1/2                     | 0.095                        | 3/8                      | 0.095                          | FBW8-WU-FBW6-               | 38.1      | 6780 (468)                        |
| 3/4                     | 0.120                        | 1/2                      | 0.095                          | FBW12-WU-FBW8-              | 38.1      | 5530 (381)                        |
| 1                       | 0.134                        | 3/4                      | 0.120                          | FBW16-WU-FBW12-             | 38.1      | 4480 (309)                        |

### Metric Tube

### Metric Tube

| T-Tube<br>O.D.<br>(mm) | t-Wall<br>Thickness<br>(mm) | Tx-Tube<br>O.D.<br>(mm) | tx-Wall<br>Thickness<br>(mm) | Basic<br>Ordering<br>Number | L<br>(mm) | Working<br>Pressure<br>psig (bar) |
|------------------------|-----------------------------|-------------------------|------------------------------|-----------------------------|-----------|-----------------------------------|
| 20                     | 3.0                         | 14                      | 2.5                          | MBW20-WU-MBW14-             | 38.1      | 6470 (445)                        |
| 22                     | 3.0                         | 14                      | 2.5                          | MBW22-WU-MBW14-             | 38.1      | 5780 (395)                        |
| 22                     | 3.0                         | 18                      | 2.8                          | MBW22-WU-MBW18-             | 38.1      | 5780 (395)                        |
| 25                     | 3.5                         | 22                      | 3.0                          | MBW25-WU-MBW22-             | 38.1      | 5780 (395)                        |
| 38                     | 5.0                         | 25                      | 3.5                          | MBW38-WU-MBW25-             | 38.1      | 5540 (380)                        |

## Union Elbows



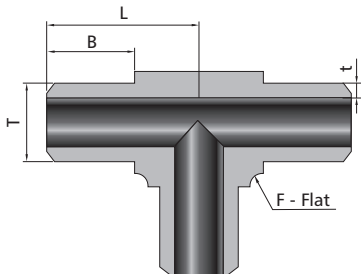
### Fractional Tube

| T-Tube<br>O.D.<br>(in.) | t-Wall<br>Thick-<br>ness (in.) | Basic<br>Ordering<br>Number | Dimension, mm |      |      | Working<br>Pressure<br>psig (bar) |
|-------------------------|--------------------------------|-----------------------------|---------------|------|------|-----------------------------------|
|                         |                                |                             | L             | B    | F    |                                   |
| 1/4                     | 0.065                          | FBW4-WUE-FBW4-              | 16.3          | 9.7  | 9.5  | 10320 (712)                       |
| 3/8                     | 0.095                          | FBW6-WUE-FBW6-              | 18.0          | 9.7  | 11.1 | 9930 (685)                        |
| 1/2                     | 0.095                          | FBW8-WUE-FBW8-              | 24.4          | 14.2 | 14.3 | 6780 (468)                        |
| 3/4                     | 0.120                          | FBW12-WUE-FBW12-            | 33.3          | 19.1 | 20.6 | 5530 (381)                        |
| 1                       | 0.134                          | FBW16-WUE-FBW16-            | 37.1          | 19.1 | 27.0 | 4480 (309)                        |

### Metric Tube

| T-Tube<br>O.D.<br>(mm) | t-Wall<br>Thickness<br>(mm) | Basic<br>Ordering<br>Number | Dimension, mm |      |      | Working<br>Pressure<br>psig (bar) |
|------------------------|-----------------------------|-----------------------------|---------------|------|------|-----------------------------------|
|                        |                             |                             | L             | B    | F    |                                   |
| 10                     | 2.2                         | MBW10-WUE-MBW10-            | 18.0          | 9.7  | 11.1 | 8160 (563)                        |
| 14                     | 2.5                         | MBW14-WUE-MBW14-            | 25.4          | 14.2 | 15.9 | 6280 (433)                        |
| 16                     | 2.8                         | MBW16-WUE-MBW16-            | 26.2          | 14.2 | 17.5 | 6140 (423)                        |
| 20                     | 3.0                         | MBW20-WUE-MBW20-            | 33.3          | 19.1 | 20.6 | 5110 (352)                        |
| 22                     | 3.0                         | MBW22-WUE-MBW22-            | 35.3          | 19.1 | 23.8 | 4620 (319)                        |
| 25                     | 3.5                         | MBW25-WUE-MBW25-            | 37.1          | 19.1 | 27.0 | 4730 (326)                        |

## Union Tees



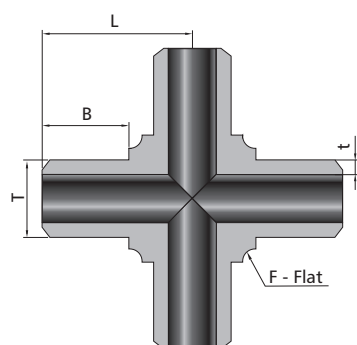
### Fractional Tube

| T-Tube<br>O.D.<br>(in.) | t-Wall<br>Thick-<br>ness (in.) | Basic<br>Ordering<br>Number | Dimension, mm |      |      | Working<br>Pressure<br>psig (bar) |
|-------------------------|--------------------------------|-----------------------------|---------------|------|------|-----------------------------------|
|                         |                                |                             | L             | B    | F    |                                   |
| 1/4                     | 0.065                          | FBW4-WUT-FBW4-FBW4-         | 16.3          | 9.7  | 9.5  | 10320 (712)                       |
| 3/8                     | 0.095                          | FBW6-WUT-FBW6-FBW6-         | 18.0          | 9.7  | 11.1 | 9930 (685)                        |
| 1/2                     | 0.095                          | FBW8-WUT-FBW8-FBW8-         | 24.4          | 14.2 | 14.3 | 6780 (468)                        |
| 3/4                     | 0.120                          | FBW12-WUT-FBW12-FBW12-      | 33.3          | 19.1 | 20.6 | 5530 (381)                        |
| 1                       | 0.134                          | FBW16-WUT-FBW16-FBW16-      | 37.1          | 19.1 | 27.0 | 4480 (309)                        |

### Metric Tube

| T-Tube<br>O.D.<br>(mm) | t-Wall<br>Thickness<br>(mm) | Basic<br>Ordering<br>Number | Dimension, mm |      |      | Working<br>Pressure<br>psig (bar) |
|------------------------|-----------------------------|-----------------------------|---------------|------|------|-----------------------------------|
|                        |                             |                             | L             | B    | F    |                                   |
| 6                      | 1.8                         | MBW6-WUT-MBW6-MBW6-         | 16.3          | 9.7  | 9.5  | 12660 (873)                       |
| 8                      | 1.8                         | MBW8-WUT-MBW8-MBW8-         | 16.3          | 9.7  | 9.5  | 8320 (574)                        |
| 10                     | 2.2                         | MBW10-WUT-MBW10-MBW10-      | 18.0          | 9.7  | 11.1 | 8160 (563)                        |
| 12                     | 2.2                         | MBW12-WUT-MBW12-MBW12-      | 24.4          | 14.2 | 14.3 | 6470 (446)                        |
| 14                     | 2.5                         | MBW14-WUT-MBW14-MBW14-      | 25.4          | 14.2 | 15.9 | 6280 (433)                        |
| 16                     | 2.8                         | MBW16-WUT-MBW16-MBW16-      | 26.2          | 14.2 | 17.5 | 6140 (423)                        |
| 20                     | 3.0                         | MBW20-WUT-MBW20-MBW20-      | 33.3          | 19.1 | 20.6 | 5110 (352)                        |
| 22                     | 3.0                         | MBW22-WUT-MBW22-MBW22-      | 35.3          | 19.1 | 23.8 | 4620 (319)                        |
| 25                     | 3.5                         | MBW25-WUT-MBW25-MBW25-      | 37.1          | 19.1 | 27.0 | 4730 (326)                        |
| 32                     | 4.5                         | MBW32-WUT-MBW32-MBW32-      | 49.3          | 23.9 | 34.9 | 4730 (326)                        |

## Union Crosses



### Fractional Tube

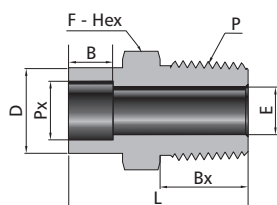
| T-Tube<br>O.D.<br>(in.) | t-Wall<br>Thick-<br>ness (in.) | Basic<br>Ordering<br>Number  | Dimension, mm |      |      | Working<br>Pressure<br>psig (bar) |
|-------------------------|--------------------------------|------------------------------|---------------|------|------|-----------------------------------|
|                         |                                |                              | L             | B    | F    |                                   |
| 1/4                     | 0.065                          | FBW4-WUC-FBW4-FBW4-FBW4-     | 16.3          | 9.7  | 9.5  | 10320 (712)                       |
| 3/8                     | 0.095                          | FBW6-WUC-FBW6-FBW6-FBW6-     | 18.0          | 9.7  | 11.1 | 9930 (685)                        |
| 1/2                     | 0.095                          | FBW8-WUC-FBW8-FBW8-FBW8-     | 24.4          | 14.2 | 14.3 | 6780 (468)                        |
| 3/4                     | 0.120                          | FBW12-WUC-FBW12-FBW12-FBW12- | 33.3          | 19.1 | 20.6 | 5530 (381)                        |
| 1                       | 0.134                          | FBW16-WUC-FBW16-FBW16-FBW16- | 37.1          | 19.1 | 27.0 | 4480 (309)                        |

### Metric Tube

| T-Tube<br>O.D.<br>(mm) | t-Wall<br>Thickness<br>(mm) | Basic<br>Ordering<br>Number  | Dimension, mm |     |      | Working<br>Pressure<br>psig (bar) |
|------------------------|-----------------------------|------------------------------|---------------|-----|------|-----------------------------------|
|                        |                             |                              | L             | B   | F    |                                   |
| 6                      | 1.8                         | MBW6-WUC-MBW6-MBW6-MBW6-     | 16.3          | 9.7 | 9.5  | 12660 (873)                       |
| 8                      | 1.8                         | MBW8-WUC-MBW8-MBW8-MBW8-     | 16.3          | 9.7 | 9.5  | 8320 (574)                        |
| 10                     | 2.2                         | MBW10-WUC-MBW10-MBW10-MBW10- | 18.0          | 9.7 | 11.1 | 8160 (563)                        |

## Pipe Socket Weld Fittings

### Male Connectors

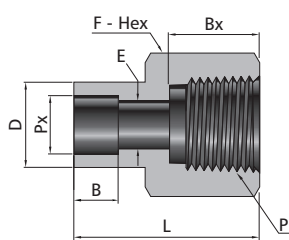


#### Pipe

#### NPT Thread

| Px-Pipe Size | P-NPT Size | Basic Ordering Number | Dimension, mm |      |      |      |      |      | Working Pressure psig (bar) |
|--------------|------------|-----------------------|---------------|------|------|------|------|------|-----------------------------|
|              |            |                       | L             | D    | B    | Bx   | F    | E    |                             |
| 1/4          | 1/4        | PSW4-WMC-NPT4-        | 35.2          | 22.4 | 9.9  | 14.2 | 23.8 | 7.1  | 8000 (551)                  |
| 1/4          | 1/2        | PSW4-WMC-NPT8-        | 40.0          | 22.4 | 9.9  | 19.1 | 23.8 | 9.1  | 7700 (530)                  |
| 3/8          | 3/8        | PSW6-WMC-NPT6-        | 38.0          | 26.2 | 9.9  | 14.2 | 27.0 | 9.7  | 7100 (489)                  |
| 3/8          | 1/2        | PSW6-WMC-NPT8-        | 42.9          | 26.2 | 9.9  | 19.1 | 27.0 | 11.9 | 7100 (489)                  |
| 1/2          | 3/8        | PSW8-WMC-NPT6-        | 40.3          | 31.8 | 9.9  | 14.2 | 33.3 | 9.7  | 6800 (468)                  |
| 1/2          | 1/2        | PSW8-WMC-NPT8-        | 45.2          | 31.8 | 9.9  | 19.1 | 33.3 | 11.9 | 6800 (468)                  |
| 3/4          | 1/2        | PSW12-WMC-NPT8-       | 54.3          | 37.3 | 13.0 | 19.1 | 38.1 | 11.9 | 5800 (399)                  |
| 3/4          | 3/4        | PSW12-WMC-NPT12-      | 54.3          | 37.3 | 13.0 | 19.1 | 38.1 | 15.7 | 5800 (399)                  |
| 1            | 3/4        | PSW16-WMC-NPT12-      | 55.8          | 47.2 | 13.0 | 19.1 | 47.6 | 15.7 | 6100 (420)                  |
| 1            | 1          | PSW16-WMC-NPT16-      | 60.6          | 47.2 | 13.0 | 23.9 | 47.6 | 22.4 | 5300 (365)                  |

### Female Connectors

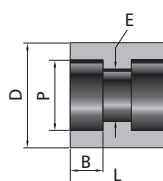


#### Pipe

#### NPT Thread

| Px-Pipe Size | P-NPT Size | Basic Ordering Number | Dimension, mm |      |      |      |      |      | Working Pressure psig (bar) |
|--------------|------------|-----------------------|---------------|------|------|------|------|------|-----------------------------|
|              |            |                       | L             | D    | B    | Bx   | F    | E    |                             |
| 1/4          | 1/4        | PSW4-WFC-FNPT4-       | 33.5          | 22.4 | 9.9  | 15.0 | 23.8 | 9.1  | 8000 (551)                  |
| 1/4          | 3/8        | PSW4-WFC-FNPT6-       | 33.5          | 22.4 | 9.9  | 15.0 | 23.8 | 9.1  | 6790 (463)                  |
| 3/8          | 3/8        | PSW6-WFC-FNPT6-       | 34.1          | 26.2 | 9.9  | 15.0 | 27.0 | 12.4 | 7100 (489)                  |
| 3/8          | 1/2        | PSW6-WFC-FNPT8-       | 39.1          | 26.2 | 9.9  | 19.8 | 27.0 | 12.4 | 4900 (337)                  |
| 1/2          | 1/2        | PSW8-WFC-FNPT8-       | 40.0          | 31.8 | 9.9  | 19.8 | 33.3 | 15.7 | 6800 (468)                  |
| 1/2          | 3/4        | PSW8-WFC-FNPT12-      | 40.6          | 31.8 | 9.9  | 20.6 | 33.3 | 15.7 | 4600 (316)                  |
| 3/4          | 3/4        | PSW12-WFC-FNPT12-     | 53.2          | 37.3 | 13.0 | 20.6 | 38.1 | 20.8 | 5800 (399)                  |
| 3/4          | 1          | PSW12-WFC-FNPT16-     | 58.1          | 37.3 | 13.0 | 25.4 | 41.3 | 20.8 | 4400 (303)                  |

### Unions

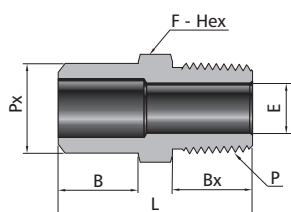


#### Pipe

| P-Pipe Size | Basic Ordering Number | Dimension, mm |      |      |      | Working Pressure psig (bar) |
|-------------|-----------------------|---------------|------|------|------|-----------------------------|
|             |                       | L             | D    | B    | E    |                             |
| 1/8         | PSW2-WU-PSW2-         | 25.7          | 17.1 | 9.9  | 7.0  | 8230(568)                   |
| 1/4         | PSW2-WU-PSW4-         | 26.9          | 22.4 | 9.9  | 9.1  | 8000(551)                   |
| 3/8         | PSW2-WU-PSW6-         | 28.4          | 26.2 | 9.9  | 12.4 | 7100(489)                   |
| 1/2         | PSW2-WU-PSW8-         | 28.4          | 31.8 | 9.9  | 15.7 | 6800(468)                   |
| 3/4         | PSW2-WU-PSW12-        | 44.5          | 37.3 | 13.0 | 20.8 | 5800(399)                   |
| 1           | PSW2-WU-PSW16-        | 44.5          | 47.2 | 13.0 | 26.7 | 6100(420)                   |

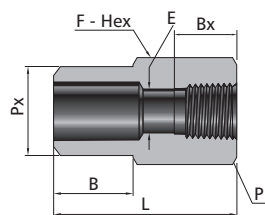
## Pipe Butt Weld Fittings

### Male Connectors



| Pipe                  |               |                             | NPT Thread    |      |      |      |      |                                   |
|-----------------------|---------------|-----------------------------|---------------|------|------|------|------|-----------------------------------|
| Px-Sch80<br>Pipe Size | P-NPT<br>Size | Basic<br>Ordering<br>Number | Dimension, mm |      |      |      |      | Working<br>Pressure<br>psig (bar) |
|                       |               |                             | L             | B    | Bx   | F    | E    |                                   |
| 1/4                   | 1/4           | PBW4-WMC-NPT4-              | 34.3          | 14.2 | 14.2 | 14.3 | 7.1  | 8000 (551)                        |
| 1/4                   | 1/2           | PBW4-WMC-NPT8-              | 41.3          | 14.2 | 19.1 | 22.2 | 7.7  | 7700 (537)                        |
| 3/8                   | 1/4           | PBW6-WMC-NPT4-              | 34.8          | 14.2 | 14.2 | 17.5 | 7.1  | 6650 (459)                        |
| 3/8                   | 1/2           | PBW6-WMC-NPT8-              | 41.3          | 14.2 | 19.1 | 22.2 | 10.7 | 6650 (459)                        |
| 1/2                   | 1/4           | PBW8-WMC-NPT4-              | 41.3          | 19.1 | 14.2 | 22.2 | 7.1  | 6190 (427)                        |
| 1/2                   | 1/2           | PBW8-WMC-NPT8-              | 46.2          | 19.1 | 19.1 | 22.2 | 11.9 | 6190 (427)                        |
| 3/4                   | 1/4           | PBW12-WMC-NPT4-             | 42.9          | 19.1 | 14.2 | 27.0 | 7.1  | 5040 (348)                        |
| 3/4                   | 1/2           | PBW12-WMC-NPT8-             | 47.8          | 19.1 | 19.1 | 27.0 | 11.9 | 5040 (348)                        |
| 1                     | 1/4           | PBW16-WMC-NPT4-             | 50.0          | 23.9 | 14.2 | 34.9 | 7.1  | 4640 (320)                        |
| 1                     | 1/2           | PBW16-WMC-NPT8-             | 54.9          | 23.9 | 19.1 | 34.9 | 11.9 | 4640 (320)                        |

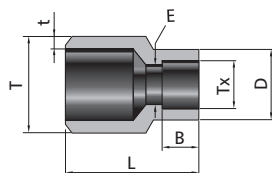
### Female Connectors



| Pipe                  |               |                             | NPT Thread    |      |      |      |      |                                   |
|-----------------------|---------------|-----------------------------|---------------|------|------|------|------|-----------------------------------|
| Px-Sch80<br>Pipe Size | P-NPT<br>Size | Basic<br>Ordering<br>Number | Dimension, mm |      |      |      |      | Working<br>Pressure<br>psig (bar) |
|                       |               |                             | L             | B    | Bx   | F    | E    |                                   |
| 1/4                   | 1/2           | PBW4-WFC-FNPT8-             | 38.9          | 14.2 | 19.8 | 27.0 | 7.6  | 4900 (337)                        |
| 3/8                   | 1/2           | PBW6-WFC-FNPT8-             | 38.9          | 14.2 | 19.8 | 27.0 | 10.7 | 4900 (337)                        |
| 1/2                   | 1/4           | PBW8-WFC-FNPT4-             | 37.3          | 19.1 | 15.0 | 22.2 | 10.4 | 7500 (516)                        |
| 1/2                   | 1/2           | PBW8-WFC-FNPT8-             | 43.7          | 19.1 | 19.8 | 27.0 | 13.9 | 4900 (337)                        |

## Weld Adapters

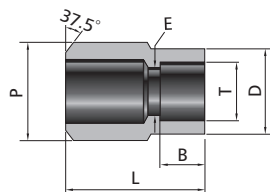
### Tube Butt Weld to Tube Socket Weld



#### Fractional Tube

| T-Tube<br>O.D.<br>(in.) | t-Wall<br>Thick-<br>ness (in.) | Tx-Tube<br>Size<br>(in.) | Basic<br>Ordering<br>Number | Dimension, mm |      |      |      | Working<br>Pressure<br>psig (bar) |
|-------------------------|--------------------------------|--------------------------|-----------------------------|---------------|------|------|------|-----------------------------------|
|                         |                                |                          |                             | L             | B    | D    | E    |                                   |
| 1/4                     | 0.083                          | 1/8                      | FBW4-WA-FSW2-               | 14.2          | 2.5  | 8.0  | 2.3  | 12600 (868)                       |
| 3/8                     | 0.095                          | 1/4                      | FBW6-WA-FSW4-               | 19.1          | 7.1  | 12.2 | 4.8  | 8200 (564)                        |
| 1/2                     | 0.095                          | 1/4                      | FBW8-WA-FSW4-               | 22.4          | 7.1  | 12.7 | 4.8  | 7500 (516)                        |
| 1/2                     | 0.095                          | 3/8                      | FBW8-WA-FSW6-               | 22.4          | 7.9  | 15.2 | 8.3  | 7500 (516)                        |
| 3/4                     | 0.120                          | 1/2                      | FBW12-WA-FSW8-              | 28.4          | 9.7  | 18.5 | 10.4 | 6300 (434)                        |
| 1                       | 0.134                          | 1/2                      | FBW16-WA-FSW8-              | 35.1          | 9.7  | 18.5 | 10.4 | 5300 (365)                        |
| 1                       | 0.134                          | 3/4                      | FBW16-WA-FSW12-             | 38.1          | 11.2 | 26.4 | 16.0 | 5300 (365)                        |

### Pipe Butt Weld to Tube Socket Weld



#### Pipe

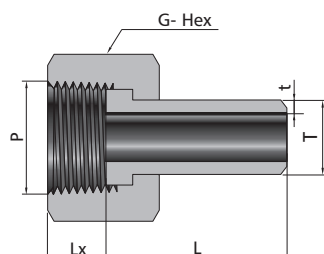
#### Fractional Tube

| P-Sch80<br>Pipe Size | T-Tube<br>Size<br>(in.) | Basic<br>Ordering<br>Number | Dimension, mm |      |      |      | Working<br>Pressure<br>psig (bar) |
|----------------------|-------------------------|-----------------------------|---------------|------|------|------|-----------------------------------|
|                      |                         |                             | L             | B    | D    | E    |                                   |
| 1/4                  | 1/4                     | PBW4-WA-FSW4-               | 22.4          | 7.1  | 12.2 | 4.8  | 10810 (744)                       |
| 3/8                  | 1/4                     | PBW6-WA-FSW4-               | 26.2          | 7.9  | 12.2 | 4.8  | 8500 (586)                        |
| 3/8                  | 3/8                     | PBW6-WA-FSW6-               | 26.2          | 7.9  | 15.2 | 7.1  | 8500 (586)                        |
| 3/8                  | 1/2                     | PBW6-WA-FSW8-               | 25.4          | 9.7  | 18.5 | 10.4 | 6930 (476)                        |
| 1/2                  | 1/4                     | PBW8-WA-FSW4-               | 28.4          | 7.1  | 12.2 | 4.8  | 8190 (563)                        |
| 1/2                  | 3/8                     | PBW8-WA-FSW6-               | 28.4          | 7.9  | 15.2 | 7.1  | 8190 (563)                        |
| 1/2                  | 1/2                     | PBW8-WA-FSW8-               | 30.2          | 9.7  | 18.5 | 10.4 | 6930 (476)                        |
| 3/4                  | 1/4                     | PBW12-WA-FSW4-              | 38.1          | 7.1  | 12.2 | 4.8  | 6930 (476)                        |
| 3/4                  | 3/8                     | PBW12-WA-FSW6-              | 38.1          | 7.9  | 15.2 | 7.1  | 6930 (476)                        |
| 3/4                  | 1/2                     | PBW12-WA-FSW8-              | 38.1          | 9.7  | 18.5 | 10.4 | 6930 (476)                        |
| 3/4                  | 3/4                     | PBW12-WA-FSW12-             | 38.1          | 11.2 | 26.4 | 16.0 | 6190 (483)                        |
| 1                    | 3/8                     | PBW16-WA-FSW6-              | 35.1          | 7.9  | 15.2 | 7.1  | 6300 (434)                        |
| 1                    | 1/2                     | PBW16-WA-FSW8-              | 39.6          | 11.2 | 18.5 | 10.4 | 6300 (434)                        |



## Pipe to Weld Fittings

### Pipe to Tube Butt Weld



#### ISO Parallel Thread

#### Metric Tube

| P-ISO Thread Size | T-Tube O.D. (mm) | t-Wall Thickness (mm) | Basic Ordering Number | Dimension, mm |      |     | Working Pressure psig (bar) |
|-------------------|------------------|-----------------------|-----------------------|---------------|------|-----|-----------------------------|
|                   |                  |                       |                       | L             | G    | Lx  |                             |
| 1/2               | 12               | 2.2                   | FBP8-PTW-MBW12-       | 30            | 27.0 | 9.2 | 6470 (446)                  |
| 1/2               | 14               | 2.5                   | FBP8-PTW-MBW14-       | 30            | 27.0 | 9.2 | 6280 (433)                  |
| 1/2               | 16               | 2.8                   | FBP8-PTW-MBW16-       | 34            | 27.0 | 9.2 | 6140 (423)                  |

#### Metric Thread

#### Metric Tube

| P-Metric Thread Size | T-Tube O.D. (mm) | t-Wall Thickness (mm) | Basic Ordering Number | Dimension, mm |    |    | Working Pressure psig (bar) |
|----------------------|------------------|-----------------------|-----------------------|---------------|----|----|-----------------------------|
|                      |                  |                       |                       | L             | G  | Lx |                             |
| M12 x 1.5            | 6                | 1.8                   | FMS12-PTW-MBW6-       | 25            | 16 | 8  | 12660 (873)                 |
| M12 x 1.5            | 8                | 1.8                   | FMS12-PTW-MBW8-       | 30            | 16 | 9  | 8320 (574)                  |
| M14 x 1.5            | 8                | 1.8                   | FMS14-PTW-MBW8-       | 30            | 18 | 9  | 8320 (574)                  |
| M14 x 1.5            | 10               | 2.2                   | FMS14-PTW-MBW10-      | 30            | 18 | 9  | 8160 (563)                  |
| M16 x 1.5            | 8                | 1.8                   | FMS16-PTW-MBW8-       | 30            | 22 | 9  | 8320 (574)                  |
| M16 x 1.5            | 10               | 2.2                   | FMS16-PTW-MBW10-      | 30            | 22 | 9  | 8160 (563)                  |
| M16 x 1.5            | 12               | 2.2                   | FMS16-PUW-MBW12-      | 34            | 22 | 14 | 6470 (446)                  |
| M18 x 1.5            | 10               | 2.2                   | FMS18-PTW-MBW10-      | 34            | 22 | 10 | 8160 (563)                  |
| M18 x 1.5            | 12               | 2.2                   | FMS18-PTW-MBW12-      | 34            | 22 | 10 | 6470 (446)                  |
| M18 x 1.5            | 14               | 2.5                   | FMS18-PTW-MBW14-      | 34            | 22 | 10 | 6280 (433)                  |
| M20 x 1.5            | 10               | 2.2                   | FMS20-PTW-MBW10-      | 34            | 25 | 11 | 8160 (563)                  |
| M20 x 1.5            | 12               | 2.2                   | FMS20-PTW-MBW12-      | 34            | 25 | 11 | 6470 (446)                  |
| M20 x 1.5            | 14               | 2.5                   | FMS20-PTW-MBW14-      | 34            | 25 | 11 | 6280 (433)                  |
| M20 x 1.5            | 15               | 2.5                   | FMS20-PTW-MBW15-      | 34            | 25 | 11 | 6160 (425)                  |
| M20 x 1.5            | 16               | 2.8                   | FMS20-PTW-MBW16-      | 34            | 25 | 11 | 6140 (423)                  |
| M22 x 1.5            | 14               | 2.5                   | FMS22-PTW-MBW14-      | 34            | 27 | 11 | 6280 (433)                  |
| M22 x 1.5            | 16               | 2.8                   | FMS22-PTW-MBW16-      | 34            | 27 | 11 | 6140 (423)                  |
| M24 x 1.5            | 16               | 2.8                   | FMS24-PTW-MBW16-      | 34            | 30 | 11 | 6140 (423)                  |
| M24 x 1.5            | 18               | 2.8                   | FMS24-PTW-MBW18-      | 34            | 30 | 11 | 5670 (392)                  |
| M24 x 1.5            | 20               | 3.0                   | FMS24-PTW-MBW20-      | 34            | 30 | 11 | 5110 (352)                  |
| M27 x 2              | 14               | 2.5                   | FMS27-PTW-MBW14-      | 34            | 32 | 14 | 6280 (433)                  |
| M27 x 2              | 16               | 2.8                   | FMS27-PTW-MBW16-      | 34            | 32 | 14 | 6140 (423)                  |
| M27 x 2              | 18               | 2.8                   | FMS27-PTW-MBW18-      | 34            | 32 | 14 | 5670 (392)                  |
| M27 x 2              | 20               | 3.0                   | FMS27-PTW-MBW20-      | 40            | 32 | 14 | 5110 (352)                  |
| M27 x 2              | 22               | 3.0                   | FMS27-PTW-MBW22-      | 40            | 32 | 14 | 4620 (319)                  |
| M30 x 2              | 22               | 3.0                   | FMS30-PTW-MBW22-      | 40            | 35 | 18 | 4620 (319)                  |
| M30 x 2              | 25               | 3.5                   | FMS30-PTW-MBW25-      | 45            | 35 | 18 | 4730 (326)                  |
| M33 x 2              | 28               | 4.0                   | FMS33-PTW-MBW28-      | 45            | 41 | 18 | 5160 (356)                  |
| M36 x 2              | 30               | 4.0                   | FMS36-PTW-MBW30-      | 45            | 41 | 18 | 4760 (328)                  |

## How to Order

**MBW6**
**WMC**
**NPT4**
**316**

| Port 1 Type                            | Port 1 Size                               | Fitting Configuration        | Port 2, Port 3 and Port 4 | Material              |
|----------------------------------------|-------------------------------------------|------------------------------|---------------------------|-----------------------|
| <b>FSW</b> Fractional Tube Socket Weld | <b>2</b> 1/8 in.                          | <b>WMC</b> Male Connector    | Same as port 1            | <b>316</b> 316 S.S.   |
| <b>FBW</b> Fractional Tube Butt Weld   | <b>4</b> 1/4 in.                          | <b>WFC</b> Female Connector  |                           | <b>316L</b> 316L S.S. |
| <b>MSW</b> Metric Tube Socket Weld     | <b>6</b> 3/8 in. or 6 mm                  | <b>WU</b> Union              |                           | <b>304</b> 304 S.S.   |
| <b>MBW</b> Metric Tube Butt Weld       | <b>8</b> 1/2 in. or 8 mm                  | <b>WUE</b> Union Elbow       |                           | <b>304L</b> 304L S.S. |
| <b>PBW</b> Pipe Butt Weld              | <b>10</b> 5/8 in. or 10 mm                | <b>WUT</b> Union Tee         |                           |                       |
| <b>PSW</b> Pipe Socket Weld            | <b>12</b> 3/4 in. or 12 mm or M12 x 1.5   | <b>WUC</b> Union Cross       |                           |                       |
| <b>FNPT</b> Female NPT                 | <b>14</b> 7/8 in. or 14 mm or M14 x 1.5   | <b>WME</b> Male Elbow        |                           |                       |
| <b>NPT</b> Male NPT                    | <b>16</b> 1 in. or 16 mm or M16 x 1.5     | <b>WFE</b> Female Elbow      |                           |                       |
| <b>NPTO</b> O-ring with Male NPT       | <b>18</b> 18 mm or M18 x 1.5              | <b>W45UE</b> 45° Union Elbow |                           |                       |
| <b>FBT</b> Female BSPT                 | <b>20</b> 1 1/4 in. or 20 mm or M20 x 1.5 |                              |                           |                       |
| <b>MBT</b> Male BSPT                   | <b>22</b> 22 mm or M22 x 1.5              |                              |                           |                       |
| <b>MBTO</b> O-ring with Male BSPT      | <b>24</b> 1 1/2 in. or M24 x 1.5          |                              |                           |                       |
| <b>FBP</b> Female BSPP                 | <b>25</b> 25 mm                           |                              |                           |                       |
| <b>PMBP</b> Male BSPP (for BP)         | <b>27</b> M27 X 2                         |                              |                           |                       |
| <b>MBS</b> Male BSPP (for BS)          | <b>28</b> 28 mm                           |                              |                           |                       |
| <b>MBP</b> Male BSPP (for BG)          | <b>30</b> 30 mm or M30 x 2                |                              |                           |                       |
| <b>FMS</b> Female ISO                  | <b>32</b> 2 in. or 32 mm                  |                              |                           |                       |
| <b>MS</b> Male ISO (for BG)            | <b>38</b> 38 mm                           |                              |                           |                       |
| <b>BPMS</b> Male ISO (for BP)          |                                           |                              |                           |                       |
| <b>BSMS</b> Male ISO (for BS)          |                                           |                              |                           |                       |

