

Introduction

Parker U Series Union Bonnet Valves have been engineered for use at pressures up to 6,000 (414 bar) and temperatures as high as 1,200°F (649°C). A non-rotating lower stem helps to extend packing life by removing rotation from the packing area. Stem packing below the threads isolates the thread lubricant from the flow, ensuring adequate lubrication regardless of the media.

Features

- ▶ Union bonnet design ensures high integrity seal under severe service applications
- ▶ Packing below the power threads protects thread lubricants from media and isolates the lubricants from the media
- ▶ Dust seal in the packing nut protects stem threads from external contamination
- ▶ Stem swivel above the packing eliminates entrapment area and increases packing life
- ▶ Choice of Grafoil® or PTFE packing
- ▶ Choice of Regulating or Blunt stem types. Blunt stem type helps combat wire draw which may occur when two phase flow is present (i.e. steam service)
- ▶ 316 stainless steel construction
- ▶ Wide variety of US Customary and SI ports
- ▶ Panel mountable
- ▶ 100% factory tested

Materials of Construction

| Item # | Description | Material |
|--------|----------------|----------------------------|
| *1 | Body | ASTM A 182, Type F316 |
| 2 | Bonnet Nut | ASTM A 479, Type 316 |
| *3 | Bonnet | ASTM A 479, Type 316 |
| *4 | Lower Stem* | ASTM A 564, Type 630 |
| 5 | Upper Stem | ASTM A 564, Type 630 |
| 6 | Stem Guide | ASTM A 581, Type 416 |
| 7 | Ball | 440-C Stainless Steel |
| *8 | Bonnet Seal** | Nickel-Chromium-Iron Alloy |
| 9 | Packing Nut | ASTM A 479, Type 316 |
| *10 | Packing*** | Grafoil® |
| *11 | Packing Washer | 316 Stainless Steel |
| 12 | Handle**** | Aluminum |
| 13 | Handle Screw | 316 Stainless Steel |
| 14 | Dust Seal***** | Nylon 6/6 |
| 15 | Locking Nut | Stainless Steel |

* Wetted parts

* Lower Stem material is ASTM A 276 Type 316 with HT option

** Not required on U6 and U12 Series which have metal-to-metal seals

*** Optional PTFE Packing is available

**** Handle material is stainless steel with HT option

***** Dust Seal not available with HT option

Lubrication: Molybdenum disulfide with soft metallic fillers

Specifications

Pressure Rating:

6000 psig (414 bar) CWP

Temperature Rating:

PTFE packing:

-65°F to 450°F (-54°C to 232°C)

Grafoil® packing:

-65°F to 700°F (-54°C to 371°C)

Grafoil® packing with HT option:

-65°F to 1200°F (-54°C to 649°C)

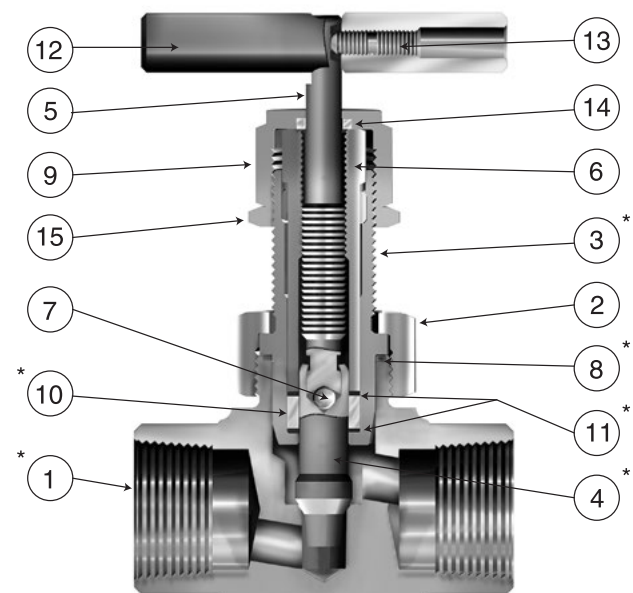
Orifice: .177" to .437" (4.5mm to 11.1mm)

Cv: .53 to 3.55

Pressure Rating and Tubing Selection:

For working pressures of A-LOK® and CPI™ tube connections, please see the Instrument Tubing Selection Guide (Bulletin 4200-TS), found in the Technical Section of the Parker Instrumentation Products Master Binder, or the Parker Instrument Tube Fitting Installation Manual (Bulletin 4200-B4).

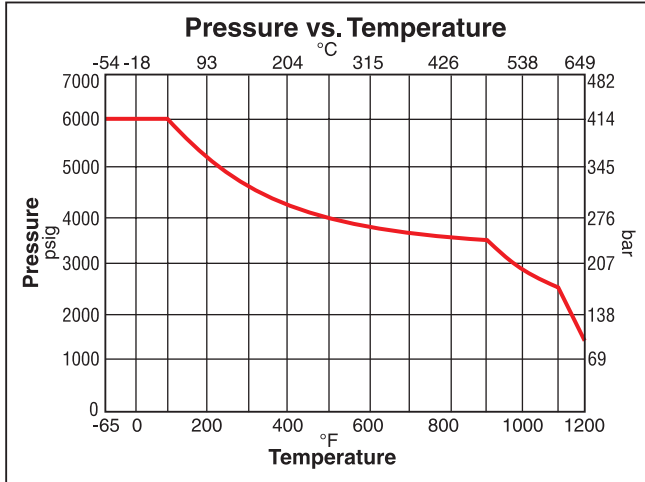
For working pressures of valves with external or internal pipe threads, please see Catalog 4260, Instrumentation Pipe Fittings.



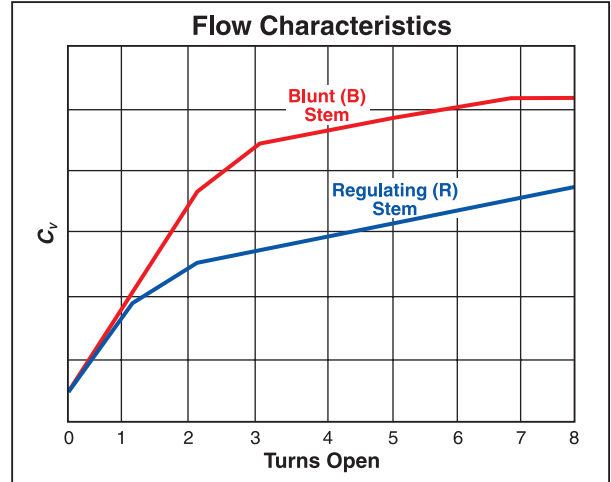
Model Shown: 16F-U16LR-G-SS

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Pressure vs. Temperature

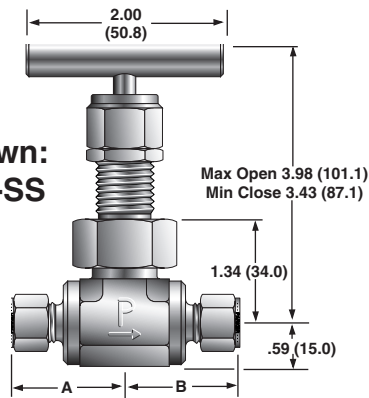


Flow Characteristics



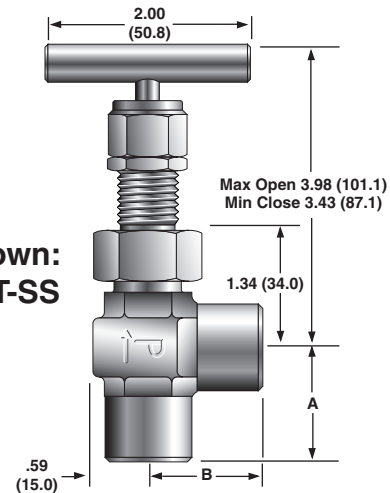
U6 Series Dimensions / Flow Data

Model Shown:
4Z-U6LB-T-SS



Panel Hole Diameter:
0.65 (16.5)
Max Panel Thickness:
0.42 (10.7)

Model Shown:
4F-U6AR-T-SS



() Denotes dimensions
in millimeters

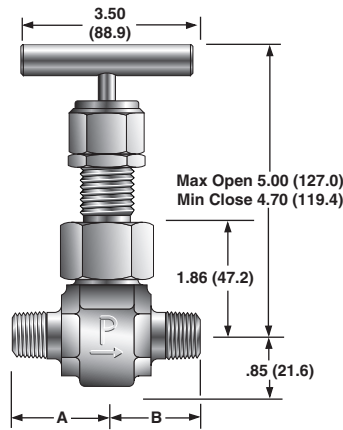
| Basic Part Number | | End Connections | | Stem Type | Flow Data | | | | Dimensions | | | | | |
|-------------------|----------|-------------------------|-----------------|------------|-----------|-----|--------|------------------|------------|------------------|------|------|------|------|
| Inline | Angle | Inlet (Port 1) | Outlet (Port 2) | | Orifice | | Inline | | Angle | | A† | | B† | |
| | | | | | Inch | mm | Cv | X _T * | Cv | X _T * | Inch | mm | Inch | mm |
| 2F-U6LR | 2F-U6AR | 1/8" Female NPT | | Regulating | 0.188 | 4.8 | 0.58 | 0.83 | 0.77 | 0.70 | 1.00 | 25.4 | 1.00 | 25.4 |
| 2F-U6LB | 2F-U6AB | | | Blunt | | | 0.69 | 0.50 | 0.91 | 0.42 | | | | |
| 4A-U6LR | 4A-U6AR | 1/4" Compression A-LOK® | | Regulating | 0.177 | 4.5 | 0.53 | 0.80 | 0.70 | 0.67 | 1.38 | 35.1 | 1.38 | 35.1 |
| 4A-U6LB | 4A-U6AB | | | Blunt | | | 0.65 | 0.48 | 0.86 | 0.40 | | | | |
| 4F-U6LR | 4F-U6AR | 1/4" Female NPT | | Regulating | 0.228 | 5.8 | 0.78 | 0.95 | 1.04 | 0.80 | 1.03 | 26.2 | 1.03 | 26.2 |
| 4F-U6LB | 4F-U6AB | | | Blunt | | | 0.82 | 0.59 | 1.09 | 0.50 | | | | |
| 4M-U6LR | 4M-U6AR | 1/4" Male NPT | | Regulating | 0.177 | 4.5 | 0.53 | 0.80 | 0.70 | 0.67 | 1.09 | 27.7 | 1.09 | 27.7 |
| 4M-U6LB | 4M-U6AB | | | Blunt | | | 0.65 | 0.48 | 0.86 | 0.40 | | | | |
| 4W-U6LR | 4W-U6AR | 1/4" Socket Weld | | Regulating | 0.177 | 4.5 | 0.53 | 0.80 | 0.70 | 0.67 | .91 | 23.1 | .91 | 23.1 |
| 4W-U6LB | 4W-U6AB | | | Blunt | | | 0.65 | 0.48 | 0.86 | 0.40 | | | | |
| 4Z-U6LR | 4Z-U6AR | 1/4" Compression CPI™ | | Regulating | 0.177 | 4.5 | 0.53 | 0.80 | 0.70 | 0.67 | 1.38 | 35.1 | 1.38 | 35.1 |
| 4Z-U6LB | 4Z-U6AB | | | Blunt | | | 0.65 | 0.48 | 0.86 | 0.40 | | | | |
| M6A-U6LR | M6A-U6AR | 6mm Compression A-LOK® | | Regulating | 0.177 | 4.5 | 0.53 | 0.80 | 0.70 | 0.67 | 1.38 | 35.1 | 1.38 | 35.1 |
| M6A-U6LB | M6A-U6AB | | | Blunt | | | 0.65 | 0.48 | 0.86 | 0.40 | | | | |
| M6Z-U6LR | M6Z-U6AR | 6mm Compression CPI™ | | Regulating | 0.177 | 4.5 | 0.53 | 0.80 | 0.70 | 0.67 | 1.38 | 35.1 | 1.38 | 35.1 |
| M6Z-U6LB | M6Z-U6AB | | | Blunt | | | 0.65 | 0.48 | 0.86 | 0.40 | | | | |
| M8A-U6LR | M8A-U6AR | 8mm Compression A-LOK® | | Regulating | 0.177 | 4.5 | 0.53 | 0.80 | 0.70 | 0.67 | 1.38 | 35.1 | 1.38 | 35.1 |
| M8A-U6LB | M8A-U6AB | | | Blunt | | | 0.65 | 0.48 | 0.86 | 0.40 | | | | |
| M8Z-U6LR | M8Z-U6AR | 8mm Compression CPI™ | | Regulating | 0.177 | 4.5 | 0.53 | 0.80 | 0.70 | 0.67 | 1.38 | 35.1 | 1.38 | 35.1 |
| M8Z-U6LB | M8Z-U6AB | | | Blunt | | | 0.65 | 0.48 | 0.86 | 0.40 | | | | |

* Tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = X_T$.
 † For CPI™ and A-LOK®, dimensions are measured with nuts in the finger tight position.

Dimensions in inches/millimeters are for reference only, subject to change.

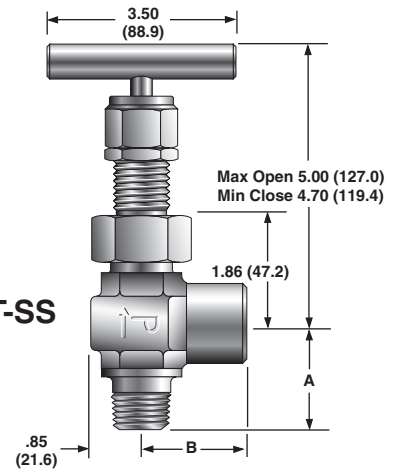
U16 Series Dimensions / Flow Data

Model Shown:
16M-U16LR-G-SS



Panel Hole Diameter:
1.02 (25.9)
Max Panel Thickness:
0.62 (15.7)

Model Shown:
16M16F-U16AB-T-SS



() Denotes dimensions in millimeters

| Basic Part Number | | End Connections | | Stem Type | Flow Data | | | | Dimensions | | | | | |
|-------------------|-------------|-------------------------|-----------------|------------|-----------|--------|-------|---------|------------|---------|------|------|------|------|
| Inline | Angle | Inlet (Port 1) | Outlet (Port 2) | | Orifice | Inline | | Angle | | A† | | B† | | |
| | | | | | Inch | mm | C_V | X_T^* | C_V | X_T^* | Inch | mm | Inch | mm |
| 8A-U16LR | 8A-U16AR | 1/2" Compression A-LOK® | | Regulating | 0.394 | 10.0 | 1.59 | 0.73 | 2.11 | 0.62 | 1.97 | 50.0 | 1.97 | 50.0 |
| 8A-U16LB | 8A-U16AB | | | Blunt | | | 1.90 | 0.95 | 2.53 | 0.81 | | | 1.97 | 50.0 |
| 8F-U16LR | 8F-U16AR | 1/2" Female NPT | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.56 | 39.6 | 1.56 | 39.6 |
| 8F-U16LB | 8F-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.56 | 39.6 |
| 8M-U16LR | 8M-U16AR | 1/2" Male NPT | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.92 | 48.8 | 1.92 | 48.8 |
| 8M-U16LB | 8M-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.92 | 48.8 |
| 8PSW-U16LR | 8PSW-U16AR | 1/2" Pipe Socket Weld | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.56 | 39.6 | 1.56 | 39.6 |
| 8PSW-U16LB | 8PSW-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.56 | 39.6 |
| 8W-U16LR | 8W-U16AR | 1/2" Tube Socket Weld | | Regulating | 0.394 | 10.0 | 1.59 | 0.73 | 2.11 | 0.62 | 1.69 | 42.9 | 1.69 | 42.9 |
| 8W-U16LB | 8W-U16AB | | | Blunt | | | 1.90 | 0.95 | 2.53 | 0.81 | | | 1.69 | 42.9 |
| 8Z-U16LR | 8Z-U16AR | 1/2" Compression CPI™ | | Regulating | 0.394 | 10.0 | 1.59 | 0.73 | 2.11 | 0.62 | 1.97 | 50.0 | 1.97 | 50.0 |
| 8Z-U16LB | 8Z-U16AB | | | Blunt | | | 1.90 | 0.95 | 2.53 | 0.81 | | | 1.97 | 50.0 |
| 12A-U16LR | 12A-U16AR | 3/4" Compression A-LOK® | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.97 | 50.0 | 1.97 | 50.0 |
| 12A-U16LB | 12A-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.97 | 50.0 |
| 12F-U16LR | 12F-U16AR | 3/4" Female NPT | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.63 | 41.4 | 1.63 | 41.4 |
| 12F-U16LB | 12F-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.63 | 41.4 |
| 12M-U16LR | 12M-U16AR | 3/4" Male NPT | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.63 | 41.4 | 1.63 | 41.4 |
| 12M-U16LB | 12M-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.63 | 41.4 |
| 12PSW-U16LR | 12PSW-U16AR | 3/4" Pipe Socket Weld | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.56 | 39.6 | 1.56 | 39.6 |
| 12PSW-U16LB | 12PSW-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.56 | 39.6 |
| 12W-U16LR | 12W-U16AR | 3/4" Tube Socket Weld | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.56 | 39.6 | 1.56 | 39.6 |
| 12W-U16LB | 12W-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.56 | 39.6 |
| 12Z-U16LR | 12Z-U16AR | 3/4" Compression CPI™ | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.97 | 50.0 | 1.97 | 50.0 |
| 12Z-U16LB | 12Z-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.97 | 50.0 |
| 16A-U16LR | 16A-U16AR | 1" Compression A-LOK® | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.97 | 50.0 | 1.97 | 50.0 |
| 16A-U16LB | 16A-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.97 | 50.0 |
| 16F-U16LR | 16F-U16AR | 1" Female NPT | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.81 | 46.0 | 1.81 | 46.0 |
| 16F-U16LB | 16F-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.81 | 46.0 |
| 16M-U16LR | 16M-U16AR | 1" Male NPT | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.81 | 46.0 | 1.81 | 46.0 |
| 16M-U16LB | 16M-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.81 | 46.0 |
| 16Z-U16LR | 16Z-U16AR | 1" Compression CPI™ | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.97 | 50.0 | 1.97 | 50.0 |
| 16Z-U16LB | 16Z-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.97 | 50.0 |
| M12A-U16LR | M12A-U16AR | 12mm Compression A-LOK® | | Regulating | 0.394 | 10.0 | 1.59 | 0.73 | 2.11 | 0.62 | 1.97 | 50.0 | 1.97 | 50.0 |
| M12A-U16LB | M12A-U16AB | | | Blunt | | | 1.90 | 0.95 | 2.53 | 0.81 | | | 1.97 | 50.0 |
| M12Z-U16LR | M12Z-U16AR | 12mm Compression CPI™ | | Regulating | 0.394 | 10.0 | 1.59 | 0.73 | 2.11 | 0.62 | 1.97 | 50.0 | 1.97 | 50.0 |
| M12Z-U16LB | M12Z-U16AB | | | Blunt | | | 1.90 | 0.95 | 2.53 | 0.81 | | | 1.97 | 50.0 |
| M20A-U16LR | M20A-U16AR | 20mm Compression A-LOK® | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.97 | 50.0 | 1.97 | 50.0 |
| M20A-U16LB | M20A-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.97 | 50.0 |
| M20Z-U16LR | M20Z-U16AR | 20mm Compression CPI™ | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.97 | 50.0 | 1.97 | 50.0 |
| M20Z-U16LB | M20Z-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.97 | 50.0 |
| M25A-U16LR | M25A-U16AR | 25mm Compression A-LOK® | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.97 | 50.0 | 1.97 | 50.0 |
| M25A-U16LB | M25A-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.97 | 50.0 |
| M25Z-U16LR | M25Z-U16AR | 25mm Compression CPI™ | | Regulating | 0.437 | 11.1 | 1.82 | 0.72 | 2.42 | 0.61 | 1.97 | 50.0 | 1.97 | 50.0 |
| M25Z-U16LB | M25Z-U16AB | | | Blunt | | | 2.67 | 0.80 | 3.55 | 0.68 | | | 1.97 | 50.0 |

* Tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = X_T$.

† For CPI™ and A-LOK®, dimensions are measured with nuts in the finger tight position.

Dimensions in inches/millimeters are for reference only, subject to change.



How to Order

Dimensions in inches/millimeters are for reference only, subject to change.

The correct part number is easily derived from the following example and ordering chart. The six product characteristics required are coded as shown in the chart.

The example below describes an angle pattern U6 Series needle valve equipped with 1/4" CPI™ compression inlet and outlet ports, a regulating stem type, Grafoil® packing, stainless steel construction.

Example 1: 4Z-U6AR-G-SS

| 4Z | | - | | U6A | | R | | - | | G | | - | | SS | |
|-------------|-----|--------------|------|--------------|------|-----------|------------|---------|----------|---------------|-----------------|---|--|----|--|
| Inlet Port* | | Outlet Port* | | Valve Series | | Stem Type | | Packing | | Body Material | | | | | |
| Inlet Port* | | Outlet Port* | | Valve Series | | Stem Type | | Packing | | Body Material | | | | | |
| 2F | 4F | 4W | M6A | M8 | U6A | B | Blunt | T | PTFE | SS | Stainless Steel | | | | |
| 4A | 4M | 4Z | M6Z | M8Z | U6L | R | Regulating | G | Grafoil® | | | | | | |
| 4A | 6W | 8W | 12A | M12A | U12A | | | | | | | | | | |
| 4F | 6Z | 8Z | 12Z | M12Z | U12L | | | | | | | | | | |
| 4Z | 8A | 10A | M10A | M14A | | | | | | | | | | | |
| 6A | 8F | 10Z | M10Z | M14Z | | | | | | | | | | | |
| 6F | | | | | | | | | | | | | | | |
| 8A | 8W | 12PSW | 16M | M20Z | U16A | | | | | | | | | | |
| 8F | 8Z | 12W | 16Z | M25A | U16L | | | | | | | | | | |
| 8M | 12F | 12Z | M12Z | M25Z | | | | | | | | | | | |
| 8PSW | 12M | 16F | M20A | | | | | | | | | | | | |

*If the inlet and outlet ports are the same, eliminate the outlet port designator.

How to Order Options

High Temperature – Add the suffix **-HT** to the end of the part number to receive valves with a 316 stainless steel lower stem and stainless steel handle. **Example:** 4M-U6LB-G-SS-**HT**

Oxygen Cleaning – Add the suffix **-C3** to the end of the part number to receive valves cleaned and assembled for oxygen service in accordance with Parker Specification ES8003. **Example:** 8A-U12LR-T-SS-**C3**

Stainless Steel Bar Handle – To obtain valves with stainless steel bar handle, add the suffix **-ST** to the end of the part number. **Example:** 12Z-U16AB-T-SS-**ST**

ASME B31.1 Compliant Valves – Add the suffix **-QC311**. **Example:** 8F-U12LR-G-SS-**QC311**

How to Order Maintenance Kits

Stainless Steel T-Bar Handles with Handle Screw – **Examples:** U6: V4-BAR-HANDLE-SS; U12: U12-BAR-HANDLE-SS; U16: U16-BAR-HANDLE-SS

Aluminum T-Bar Handles with Handle Screw – **Examples:** U6: V4-BAR-HANDLE-AL; U12: U12-BAR-HANDLE-AL; U16: U16-BAR-HANDLE-AL

Panel Mounting Nuts – **Examples:** U6: U6-LOCKNUT; U12: U12-LOCKNUT; U16: U16-LOCKNUT

PTFE Packing Kits – Consists of One PTFE Packing; One Dust Seal; Maintenance Instructions. Kit-Valve Series-T. **Example:** KIT-U12-T

Grafoil® Packing Kits – Consists of One Grafoil® Packing; One Dust Seal; Maintenance Instructions. Kit-Valve Series-G. **Example:** KIT-U16-G

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