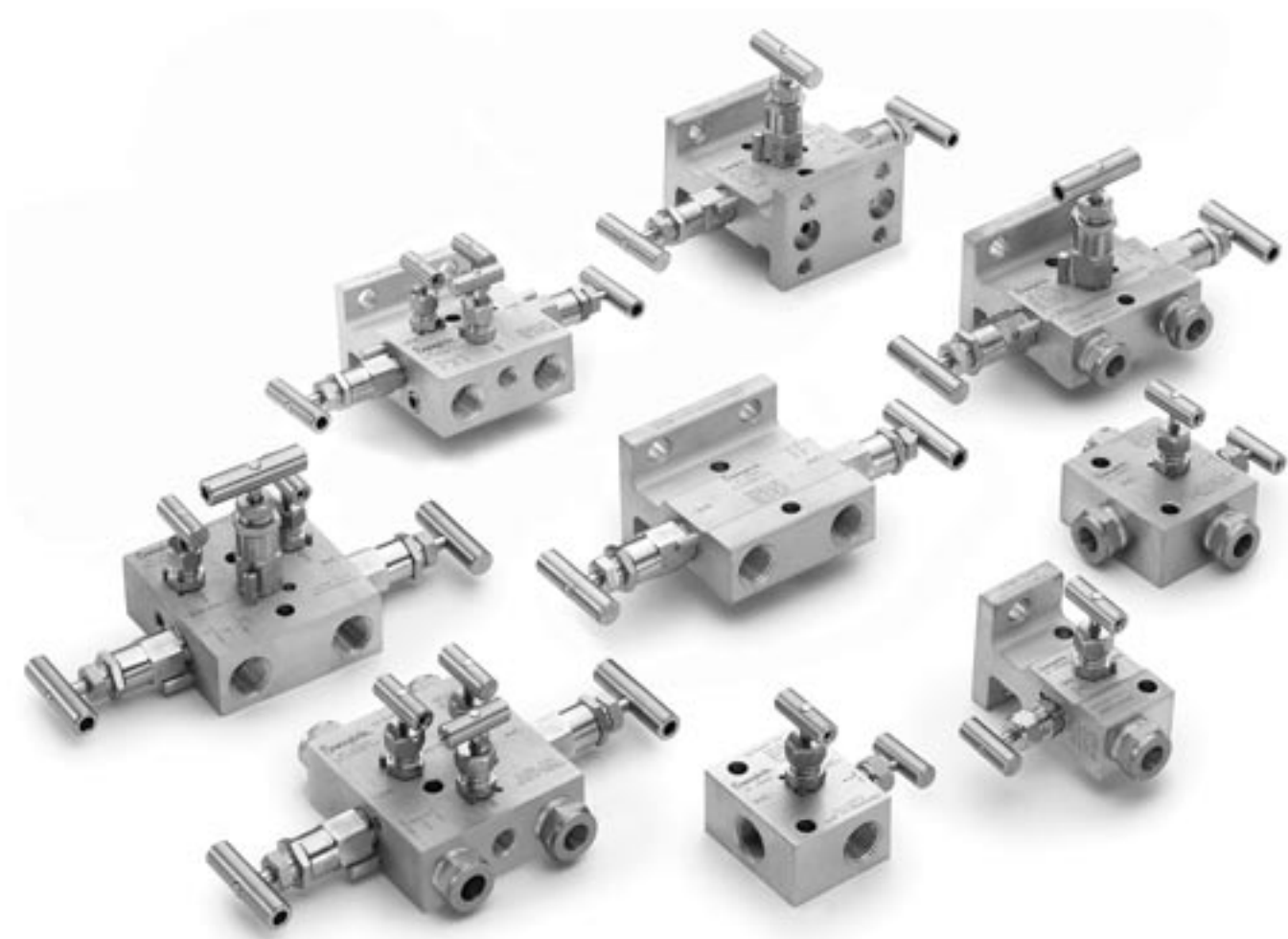


# Instrument Manifolds



## V, VB, and VL Series

- 2-, 3-, and 5-valve instrument manifolds
- All 316 stainless steel construction with PTFE packing
- Working pressures up to 6000 psig (413 bar)
- Temperatures up to 1200°F (648°C) with Grafoil® valve packing

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## Manifold Features

Swagelok® offers a variety of 2-, 3-, and 5-valve instrument manifolds. The 2-valve manifolds are designed for static pressure and liquid level applications; the 3- and 5-valve manifolds are designed for differential pressure applications.

The V, VB, and VL series manifolds feature a horizontal body design. Manifold connections include 1/2 in. and 12 mm female Swagelok tube fitting, 1/2 in. female pipe (NPT and ISO 228/1), and flange (MSS SP-99).

### Flange Connections

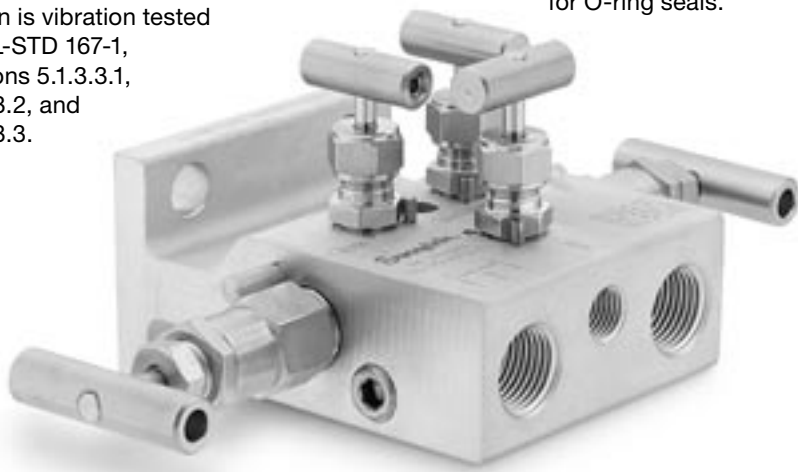
- Flange design meets the requirements of MSS SP-99.
- Standard flange seal is a fluorocarbon FKM O-ring.
- Flange seals and flange bolts are included with manifold.

### Safety Stop Pin

- 316 stainless steel pin prevents detachment of the bonnet from the body due to vibration.
- Design is vibration tested to MIL-STD 167-1, Sections 5.1.3.3.1, 5.1.3.3.2, and 5.1.3.3.3.

### Bonnet-to-Body Seal

- Metal-to-metal seal eliminates the need for O-ring seals.



### Body Design

- One-piece construction provides strength.

### Materials of Construction

- All 316 stainless steel construction.
- Designed with 4:1 design factor.

### Mounting Options

- 2 1/8 in. (54 mm) port center lines for direct instrument mounting with flange connections.
- Remote mounting with female Swagelok tube fitting and NPT connections.

### Internal Finish

- Burr-free threads and internal surfaces reduce leaks, promoting accurate transmitter readings.

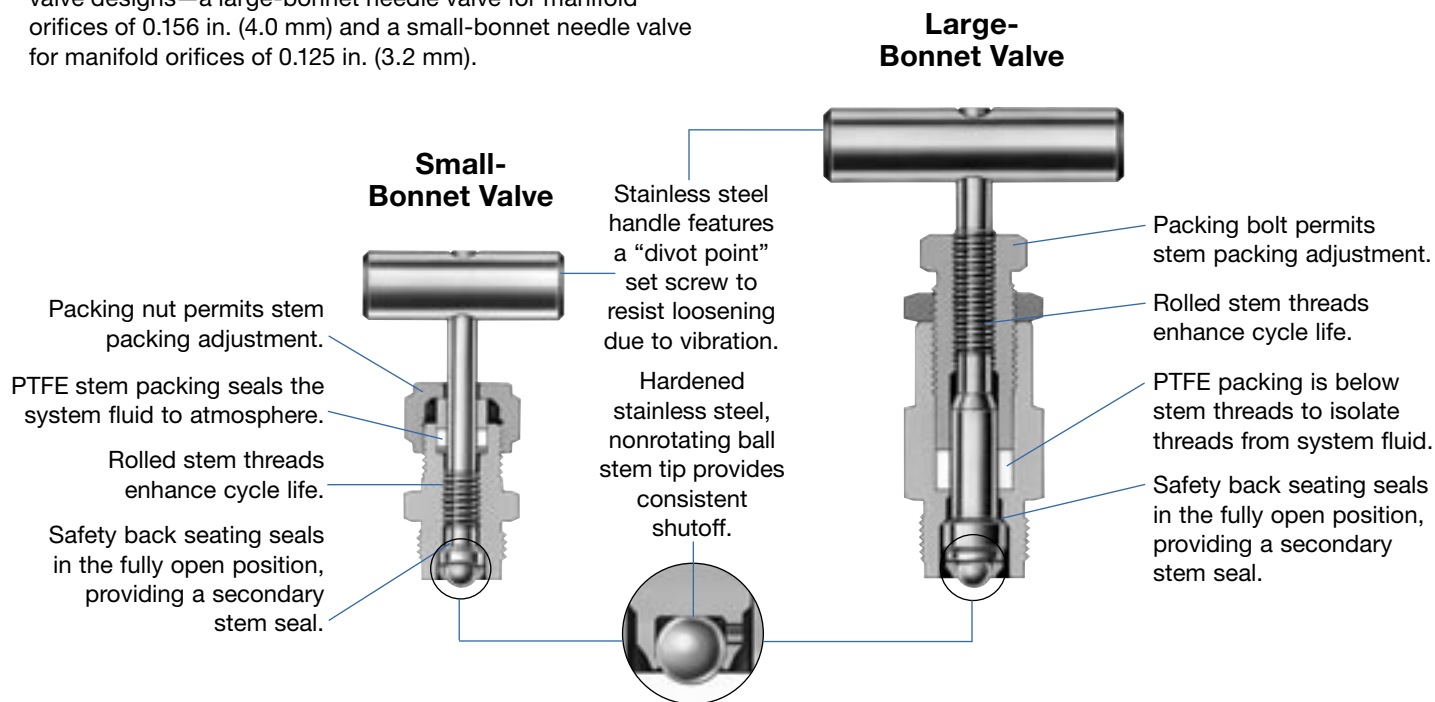
- ⚠ Packing adjustments may be required during the service life of the valve.
- ⚠ Valves that have not been cycled for a period of time may have a higher initial actuation torque.

## Valve Features

The flow through a Swagelok manifold is controlled by a series of stainless steel needle valves. Each valve has a specific function—to block pressure, to bleed off pressure, or to equalize pressure—depending on its location on the manifold.

The control of all these functions is shared by two needle valve designs—a large-bonnet needle valve for manifold orifices of 0.156 in. (4.0 mm) and a small-bonnet needle valve for manifold orifices of 0.125 in. (3.2 mm).

On both designs, the stem packing is externally adjustable in the open position. PTFE is the standard packing material; optional Grafoil packing is available for high-temperature applications.



## Technical Data

|                                      |                                             |
|--------------------------------------|---------------------------------------------|
| <b>Orifice Size</b><br>(block valve) | 0.125 in. (3.2 mm) for all 2-valve V series |
|                                      | 0.156 in. (4.0 mm) for all others           |
| <b>Weight</b>                        | 2-valve: 2.0 to 3.5 lb (0.9 to 1.6 kg)      |
|                                      | 3-valve: 3.2 to 6.4 lb (1.5 to 2.9 kg)      |
|                                      | 5-valve: 6.0 to 8.0 lb (2.7 to 3.6 kg)      |

## Testing

Every Swagelok instrument manifold is factory tested with nitrogen at 1000 psig (69 bar). Seats have a maximum allowable leak rate of 0.1 std cm<sup>3</sup>/min.

Shell testing is performed with a liquid leak detector to a requirement of no detectable leakage.

## Cleaning and Packaging

Every Swagelok instrument manifold is cleaned and packaged in accordance with Swagelok standard cleaning and packaging specification (SC-10), MS-06-62.

## Pressure-Temperature Ratings<sup>①</sup>

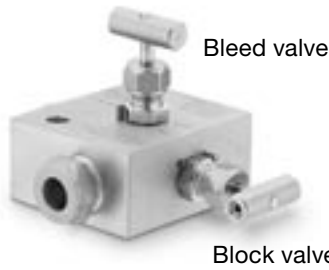
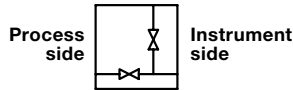
|                               |                                       |
|-------------------------------|---------------------------------------|
| <b>ASME Class</b>             | <b>2500</b>                           |
| <b>Material Group</b>         | <b>2.2</b>                            |
| <b>Material Name</b>          | <b>316 SS</b>                         |
| <b>Temperature</b><br>°F (°C) | <b>Working Pressure</b><br>psig (bar) |
| –65 (–53) to 100 (37)         | 6000 (413)                            |
| 200 (93)                      | 5160 (355)                            |
| 250 (121)                     | 4910 (338)                            |
| 300 (148)                     | 4660 (321)                            |
| 350 (176)                     | 4470 (307)                            |
| 400 (204)                     | 4280 (294)                            |
| 450 (232)                     | 4130 (284)                            |
| 500 (260)                     | 3980 (274)                            |
| 550 (260)                     | 3870 (266)                            |
| 600 (315)                     | 3760 (259)                            |
| 650 (343)                     | 3700 (254)                            |
| 700 (371)                     | 3600 (248)                            |
| 750 (398)                     | 3520 (242)                            |
| 800 (426)                     | 3460 (238)                            |
| 850 (454)                     | 3380 (232)                            |
| 900 (482)                     | 3280 (225)                            |
| 950 (510)                     | 3220 (221)                            |
| 1000 (537)                    | 3030 (208)                            |
| 1050 (565)                    | 3000 (206)                            |
| 1100 (593)                    | 2685 (184)                            |
| 1150 (621)                    | 2285 (157)                            |
| 1200 (648)                    | 1715 (118)                            |

① Ratings based on optional Grafoil packing. Ratings limited to:

- –20 to 450°F (–28 to 232°C) with standard fluorocarbon FKM flange seals.
- 450°F (232°C) with standard PTFE packing.
- 1000°F (537°C) with Grafoil packing and MSS flange end connection.

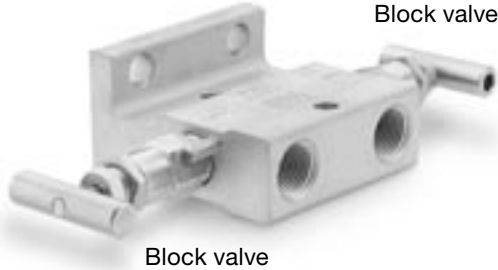
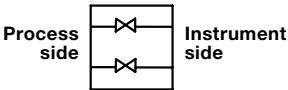
2-Valve Manifolds

V Series



- Allows for block and bleed (or calibration) of static pressure transmitter or gauge
- Consists of one block valve and one bleed valve
- End connections—1/2 in. and 12 mm female Swagelok tube fitting; 1/2 in. female pipe (NPT); flange (MSS)
- Horizontal body style
- Direct instrument mount and remote mount

VL Series



- Designed for liquid level applications
- Consists of two block valves operating in parallel to shut off either one of the two process lines through the manifold
- No equalizer passage through the manifold
- End connections—1/2 in. female pipe (NPT) to flange
- Horizontal body style
- Direct instrument mount

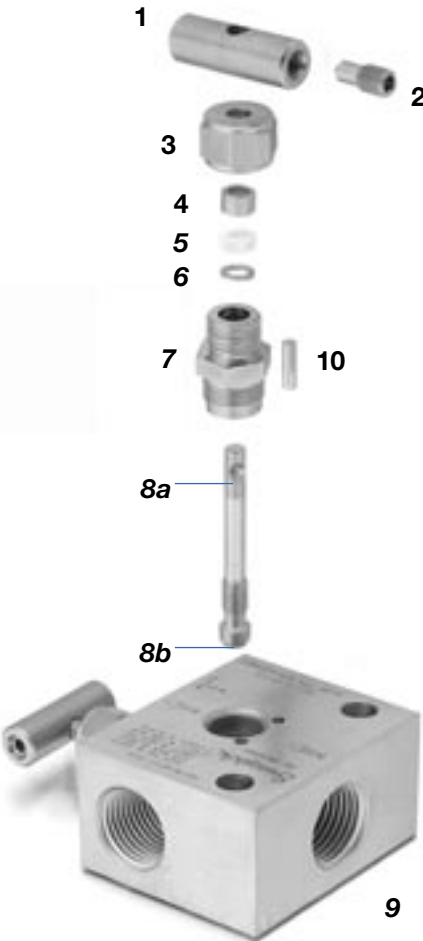
V Series

Materials of Construction

Materials for pressure-containing wetted parts are in compliance with ASME B31.1.

| Component                | Material Grade/<br>ASTM Specification                                  |
|--------------------------|------------------------------------------------------------------------|
| 1 Handle                 | 316 SS/A479                                                            |
| 2 Set screw              |                                                                        |
| 3 Packing nut            |                                                                        |
| 4 Upper gland            |                                                                        |
| 5 Packing                | PTFE/D1710                                                             |
| 6 Lower gland            | 316 SS/A240 or A167                                                    |
| 7 Bonnet                 | 316 SS/A479                                                            |
| 8a Stem                  | 316 SS/A276                                                            |
| 8b Ball tip              | 316 SS/A479                                                            |
| 9 Body                   |                                                                        |
| 10 Stop pin              | 316 SS/A479                                                            |
| Flange seals (not shown) | Fluorocarbon FKM                                                       |
| Flange bolts (not shown) | B8M CL.2B/A193                                                         |
| Lubricants               | Fluorinated base with PTFE and tungsten disulfide<br>Hydrocarbon-based |

Wetted components listed in *italics*.



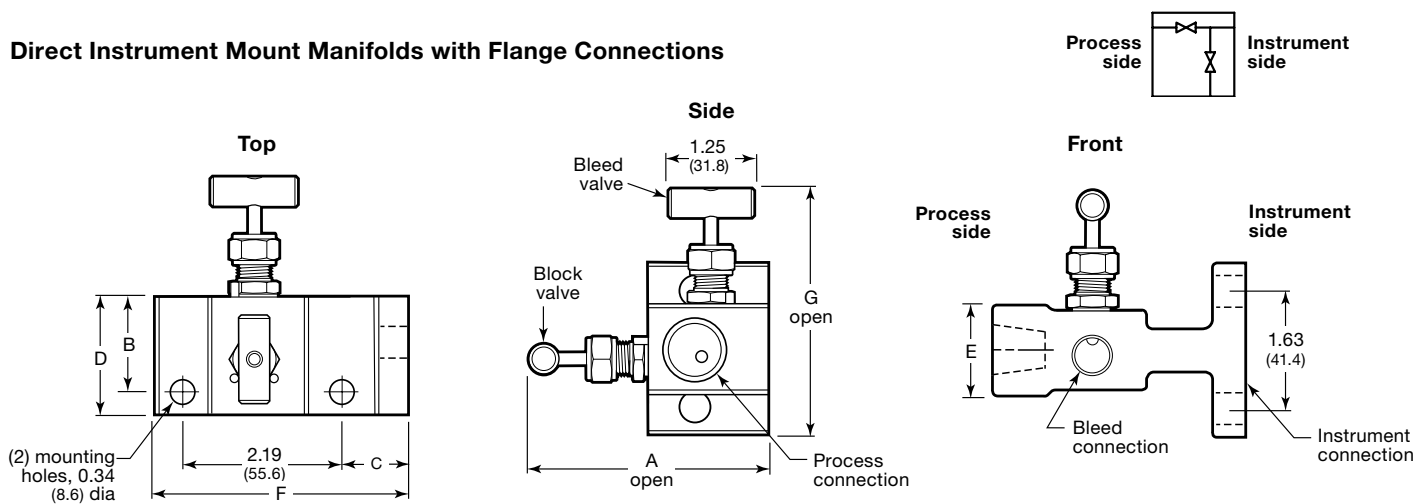
## 2-Valve Manifolds

### V Series

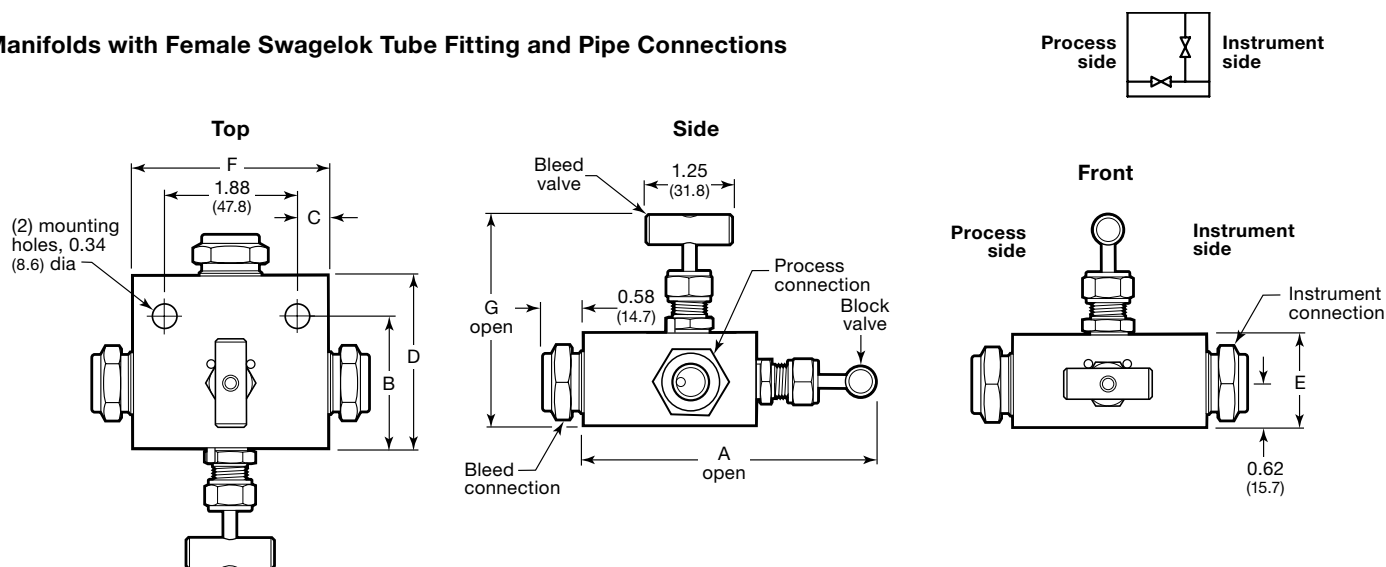
#### Ordering Information and Dimensions

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

#### Direct Instrument Mount Manifolds with Flange Connections



#### Manifolds with Female Swagelok Tube Fitting and Pipe Connections



| End Connections                      |              |                    | Ordering Number | Dimensions, in. (mm) |                |                |                |                |                |                |
|--------------------------------------|--------------|--------------------|-----------------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Process                              | Instrument   | Bleed              |                 | A                    | B              | C              | D              | E              | F              | G              |
| 1/2 in. female Swagelok tube fitting |              |                    | SS-V2BFS8       | 4.19<br>(106)        | 1.89<br>(48.0) | 0.44<br>(11.2) | 2.48<br>(63.0) | 1.31<br>(33.3) | 2.75<br>(69.9) | 3.02<br>(76.7) |
| 1/2 in. female Swagelok tube fitting | Flange (MSS) | 1/4 in. female NPT | SS-V2BFS8-FL    | 3.33<br>(84.6)       | 1.31<br>(33.3) | 0.90<br>(22.9) | 1.63<br>(41.4) | 1.25<br>(31.8) | 3.46<br>(87.9) | 3.46<br>(87.9) |
| 12 mm female Swagelok tube fitting   |              |                    | SS-V2BFS12MM    | 4.19<br>(106)        | 1.89<br>(48.0) | 0.44<br>(11.2) | 2.48<br>(63.0) | 1.31<br>(33.3) | 2.75<br>(69.9) | 3.02<br>(76.7) |
| 12 mm female Swagelok tube fitting   | Flange (MSS) | 1/4 in. female NPT | SS-V2BFS12MM-FL | 3.33<br>(84.6)       | 1.31<br>(33.3) | 0.90<br>(22.9) | 1.63<br>(41.4) | 1.25<br>(31.8) | 3.46<br>(87.9) | 3.46<br>(87.9) |
| 1/2 in. female NPT                   |              |                    | SS-V2BF8        | 3.82<br>(97.0)       | 1.62<br>(41.1) | 0.31<br>(7.9)  | 2.12<br>(53.8) | 1.31<br>(33.3) | 2.50<br>(63.5) | 3.02<br>(76.7) |
| 1/2 in. female NPT                   | Flange (MSS) | 1/4 in. female NPT | SS-V2BF8-FL     | 3.33<br>(84.6)       | 1.31<br>(33.3) | 0.90<br>(22.9) | 1.63<br>(41.4) | 1.25<br>(31.8) | 3.48<br>(88.4) | 3.46<br>(87.9) |

2-Valve Manifolds

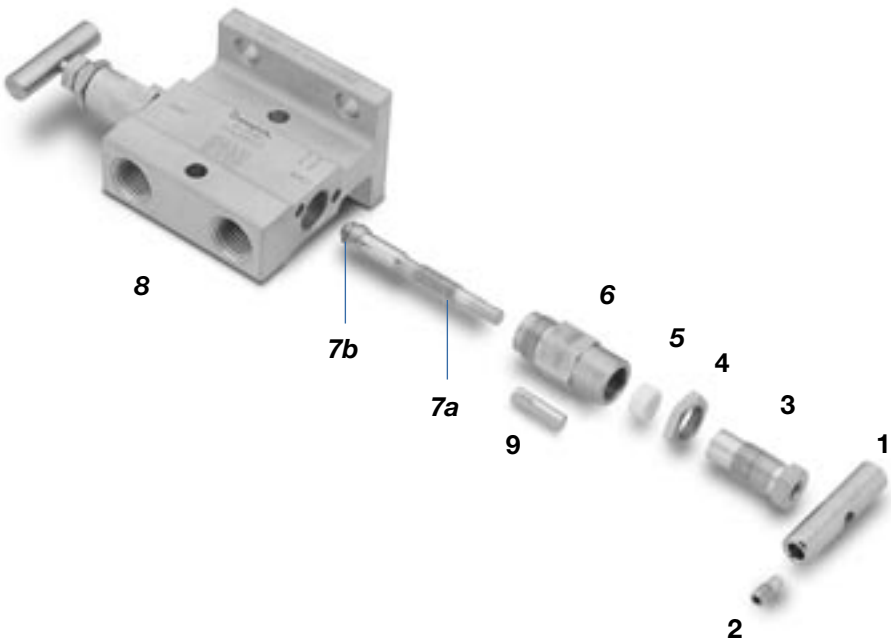
VL Series

Materials of Construction

Materials for pressure-containing wetted parts are in compliance with ASME B31.1.

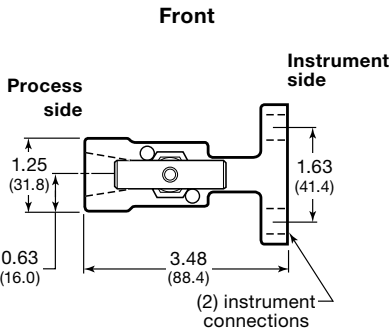
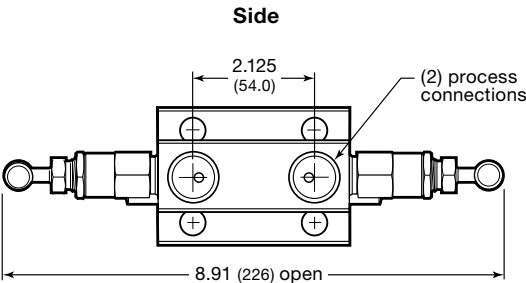
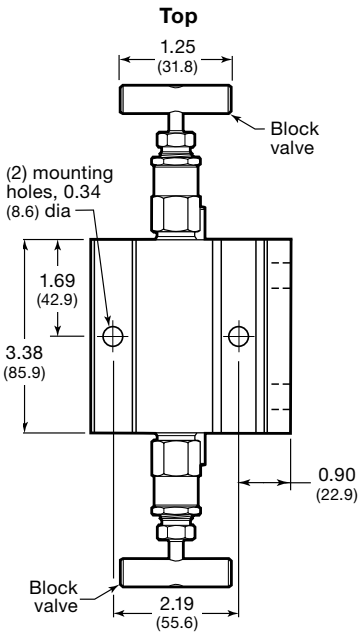
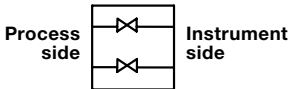
| Component                   | Material Grade/<br>ASTM Specification                   |
|-----------------------------|---------------------------------------------------------|
| 1 Handle                    | 316 SS/A479                                             |
| 2 Set screw                 |                                                         |
| 3 Packing bolt              |                                                         |
| 4 Jam nut                   | 316 SS/A276                                             |
| 5 Packing                   | PTFE/D1710                                              |
| 6 Bonnet                    | 316 SS/A479                                             |
| 7a Stem                     | 316 SS/A276                                             |
| 7b Ball tip                 | 316 SS/A479                                             |
| 8 Body                      |                                                         |
| 10 Stop pin                 | 316 SS/A479                                             |
| Flange seals<br>(not shown) | Fluorocarbon FKM                                        |
| Flange bolts<br>(not shown) | B8M CL.2B/A193                                          |
| Lubricants                  | Fluorinated base<br>with PTFE and<br>tungsten disulfide |
|                             | Hydrocarbon-based                                       |

Wetted components listed in *italics*.



Ordering Information and Dimensions

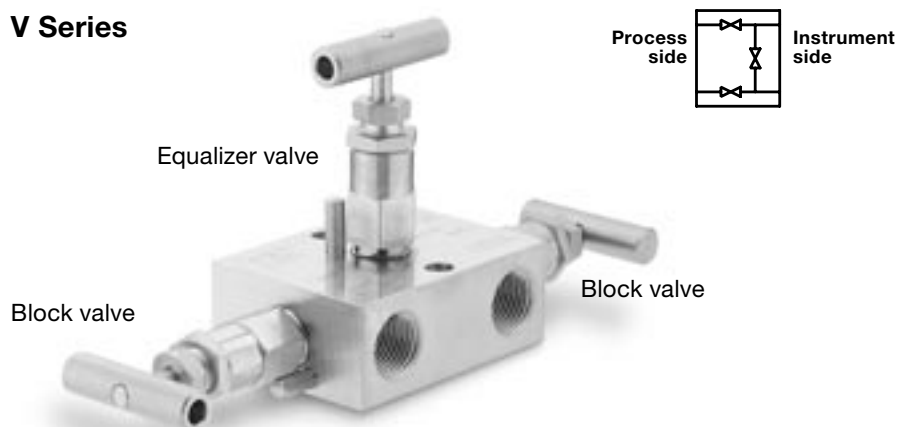
Dimensions, in inches (millimeters), are for reference only and are subject to change.



| End Connections    |              | Ordering Number |
|--------------------|--------------|-----------------|
| Process            | Instrument   |                 |
| 1/2 in. female NPT | Flange (MSS) | SS-VL2NBF8-FL   |

## 3-Valve Manifolds

### V Series



- Designed for mounting on differential pressure transmitters with 2 1/8 in. (54 mm) center-to-center connections
- Consists of two block valves and one equalizer valve
- End connections—1/2 in. and 12 mm female Swagelok tube fitting, 1/2 in. female pipe (NPT), and flange (MSS)
- Horizontal body style
- Direct instrument mount and remote mount

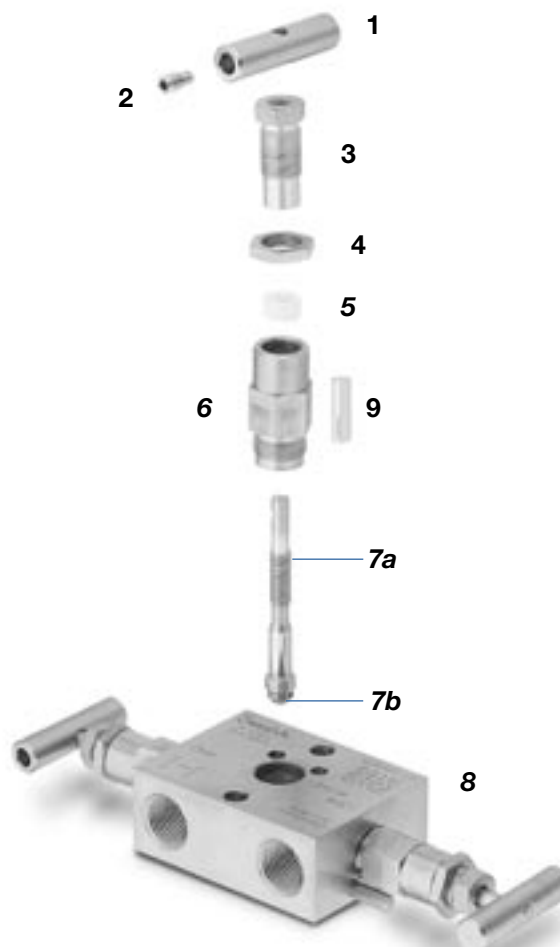
### V Series

#### Materials of Construction

Materials for pressure-containing wetted parts are in compliance with ASME B31.1.

| Component                | Material Grade/<br>ASTM Specification             |
|--------------------------|---------------------------------------------------|
| 1 Handle                 | 316 SS/A479                                       |
| 2 Set screw              |                                                   |
| 3 Packing bolt           |                                                   |
| 4 Jam nut                | 316 SS/A276                                       |
| 5 Packing                | PTFE/D1710                                        |
| 6 Bonnet                 | 316 SS/A479                                       |
| 7a Stem                  | 316 SS/A276                                       |
| 7b Ball tip              | 316 SS/A479                                       |
| 8 Body                   |                                                   |
| 9 Stop pin               | 316 SS/A479                                       |
| Flange seals (not shown) | Fluorocarbon FKM                                  |
| Flange bolts (not shown) | B8M CL.2B/A193                                    |
| Lubricants               | Fluorinated base with PTFE and tungsten disulfide |
|                          | Hydrocarbon-based                                 |

Wetted components listed in *italics*.

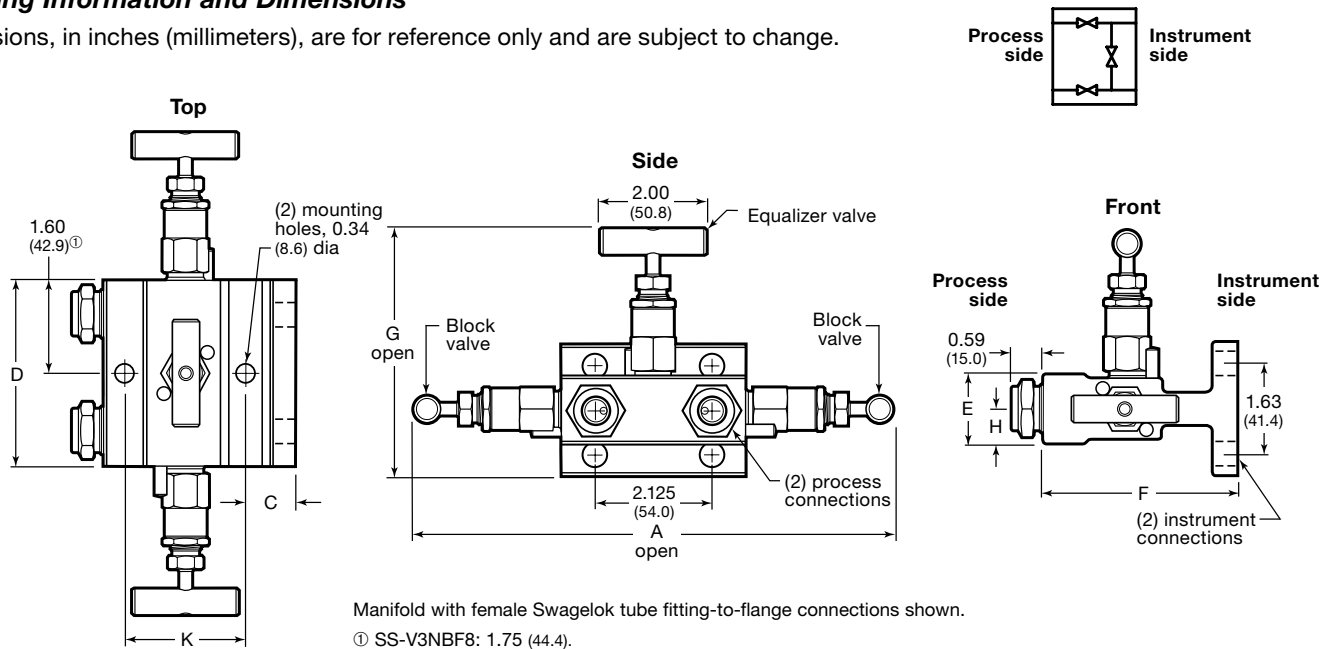


3-Valve Manifolds

V Series

Ordering Information and Dimensions

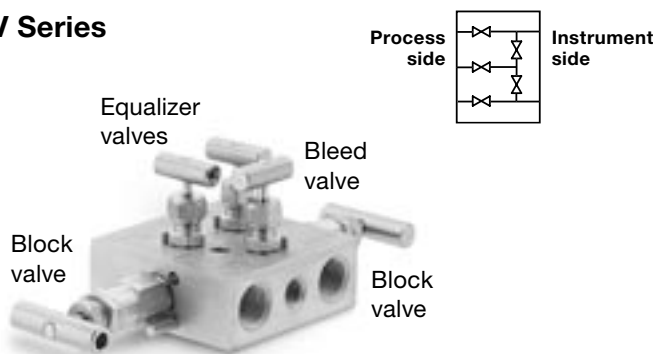
Dimensions, in inches (millimeters), are for reference only and are subject to change.



| End Connections                      |              | Ordering Number  | Dimensions, in. (mm) |             |             |             |             |            |             |             |
|--------------------------------------|--------------|------------------|----------------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|
| Process                              | Instrument   |                  | A                    | C           | D           | E           | F           | G          | H           | K           |
| 1/2 in. female NPT                   |              | SS-V3NBF8        | 9.03 (229)           | 0.31 (7.9)  | 3.50 (88.9) | 1.31 (33.3) | 2.50 (63.5) | 4.08 (104) | 0.66 (16.8) | 1.88 (47.8) |
| 1/2 in. female NPT                   | Flange (MSS) | SS-V3NBF8-FL     | 8.91 (226)           | 0.90 (22.9) | 3.38 (85.9) | 1.25 (31.8) | 3.48 (88.4) | 4.51 (115) | 0.63 (16.0) | 2.19 (55.6) |
| 1/2 in. female Swagelok tube fitting |              | SS-V3NBFS8       |                      | 0.46 (11.7) |             | 1.31 (33.3) | 3.04 (77.2) | 4.08 (104) | 0.66 (16.8) | 1.88 (47.8) |
| 1/2 in. female Swagelok tube fitting | Flange (MSS) | SS-V3NBFS8-FL    |                      | 0.90 (22.9) |             | 1.25 (31.8) | 3.48 (88.4) | 4.51 (115) | 0.63 (16.0) | 2.19 (55.6) |
| 12 mm female Swagelok tube fitting   |              | SS-V3NBFS12MM    |                      | 0.46 (11.7) |             | 1.31 (33.3) | 3.04 (77.2) | 4.08 (104) | 0.66 (16.8) | 1.88 (47.8) |
| 12 mm female Swagelok tube fitting   | Flange (MSS) | SS-V3NBFS12MM-FL |                      | 0.90 (22.9) |             | 1.25 (31.8) | 3.48 (88.4) | 4.51 (115) | 0.63 (16.0) | 2.19 (55.6) |
| Flange (MSS)                         |              | SS-V3NBFL        |                      |             |             | 2.40 (61.0) | 4.07 (103)  | 4.55 (116) | 1.20 (30.5) |             |

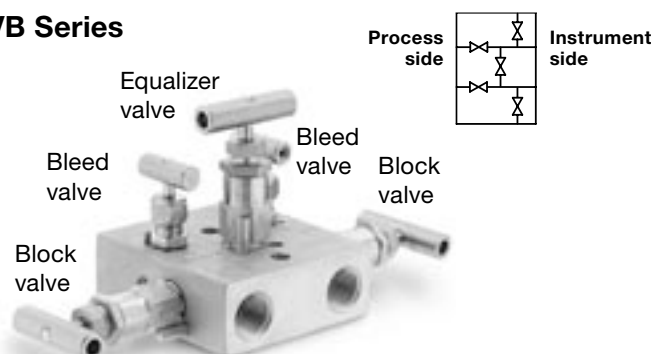
## 5-Valve Manifolds

### V Series



- Designed for mounting on differential pressure transmitters where a double-equalize function is required
- Consists of two block valves, two equalizer valves, and one bleed valve
- End connections—1/2 in. and 12 mm female Swagelok tube fittings, 1/2 in. female pipe (NPT), and flange (MSS)
- Horizontal body style
- Direct instrument mount and remote mount

### VB Series



- Designed for mounting on differential pressure transmitters where a double-bleed function is required.
- Consists of two block valves, two bleed valves, and one equalizer valve
- End connections—1/2 in. and 12 mm female Swagelok tube fittings, 1/2 in. female pipe (NPT), and flange (MSS)
- Horizontal body style
- Direct instrument mount and remote mount

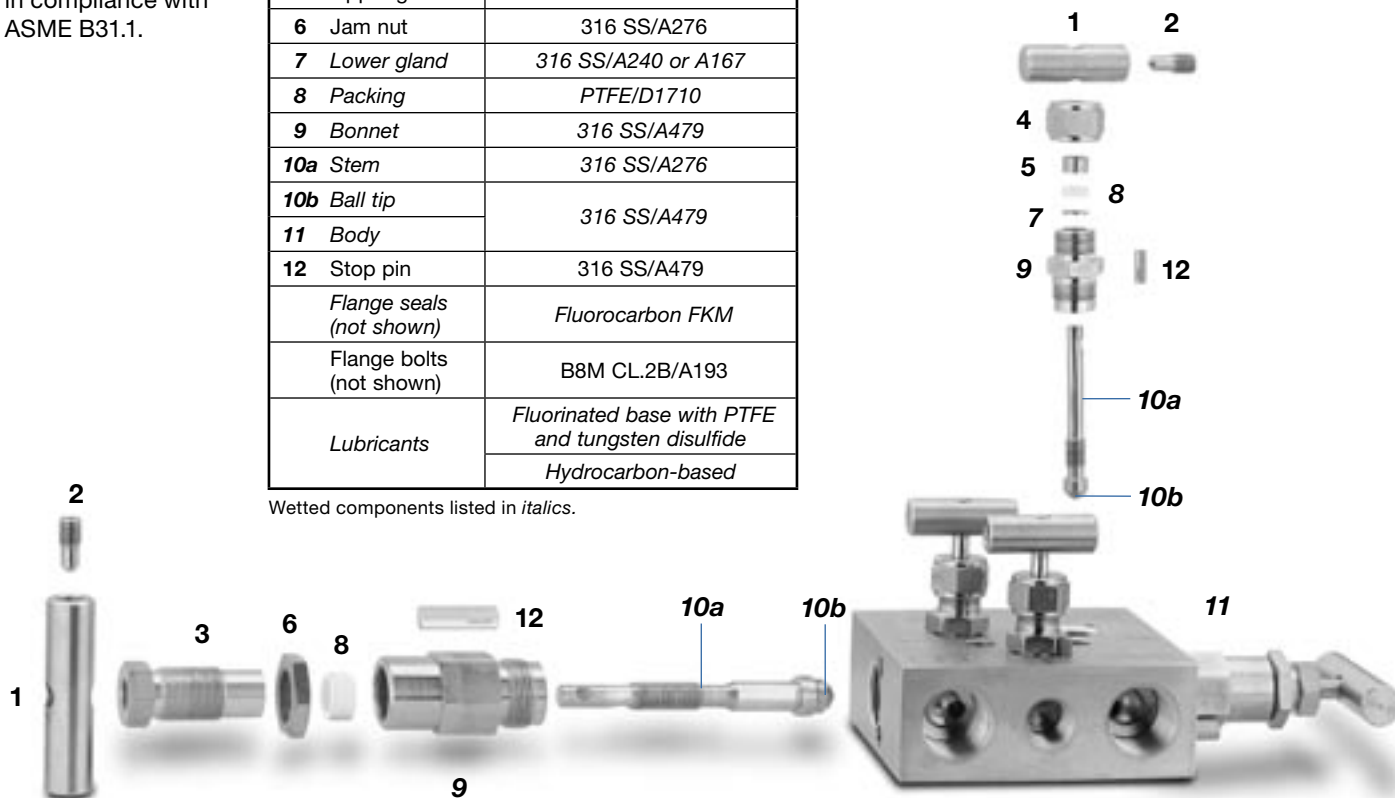
### V Series

#### Materials of Construction

Materials for pressure-containing wetted parts are in compliance with ASME B31.1.

| Component                | Material Grade/ ASTM Specification                |
|--------------------------|---------------------------------------------------|
| 1 Handle                 | 316 SS/A479                                       |
| 2 Set screw              |                                                   |
| 3 Packing bolt           |                                                   |
| 4 Packing nut            |                                                   |
| 5 Upper gland            |                                                   |
| 6 Jam nut                | 316 SS/A276                                       |
| 7 Lower gland            | 316 SS/A240 or A167                               |
| 8 Packing                | PTFE/D1710                                        |
| 9 Bonnet                 | 316 SS/A479                                       |
| 10a Stem                 | 316 SS/A276                                       |
| 10b Ball tip             | 316 SS/A479                                       |
| 11 Body                  |                                                   |
| 12 Stop pin              | 316 SS/A479                                       |
| Flange seals (not shown) | Fluorocarbon FKM                                  |
| Flange bolts (not shown) | B8M CL.2B/A193                                    |
| Lubricants               | Fluorinated base with PTFE and tungsten disulfide |
|                          | Hydrocarbon-based                                 |

Wetted components listed in *italics*.



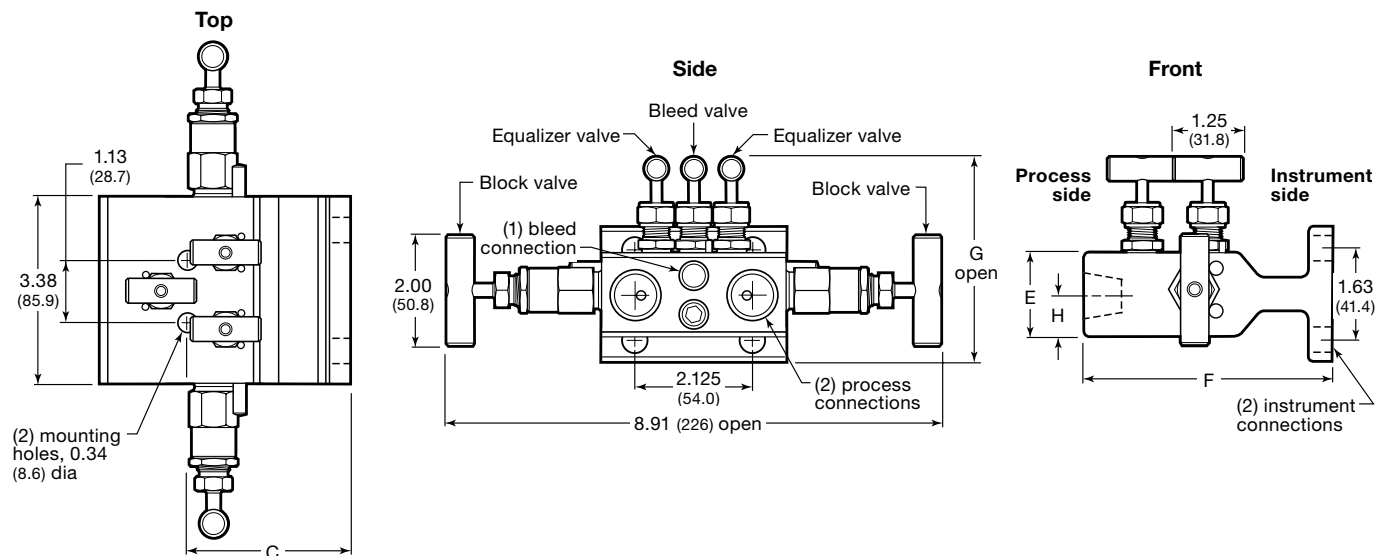
## 5-Valve Manifolds

### V Series

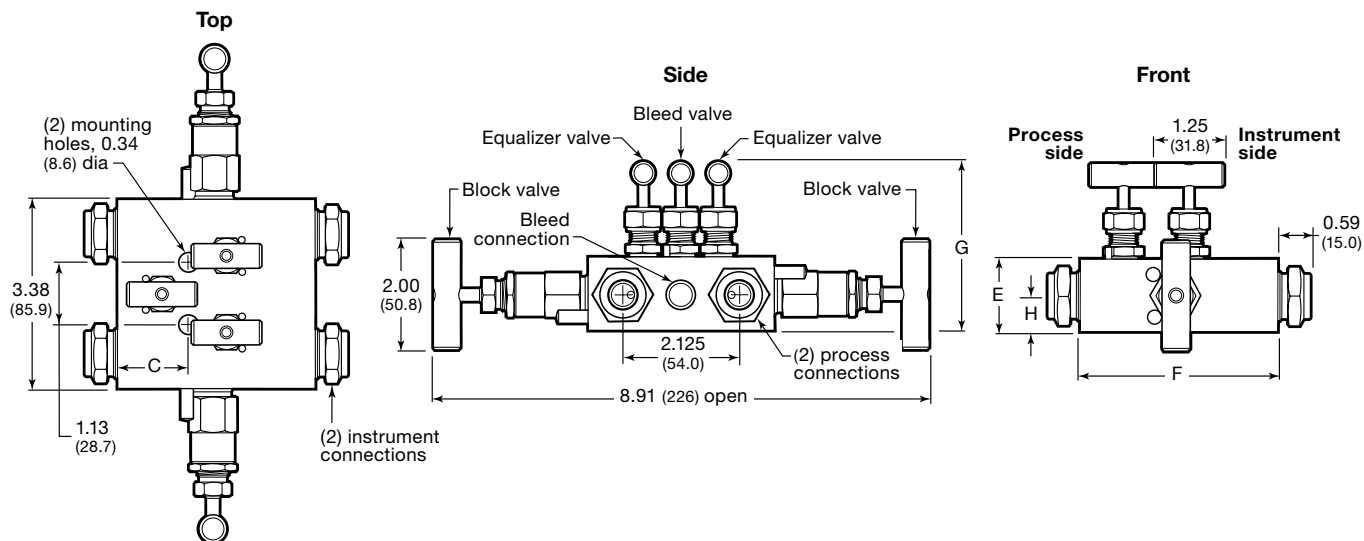
#### Ordering Information and Dimensions

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

#### Direct Instrument Mount Manifolds with Flange Connections



#### Manifolds with Female Swagelok Tube Fitting and Pipe Connections



| End Connections                      |              |                    | Ordering Number  | Dimensions, in. (mm) |                |                |                |                |
|--------------------------------------|--------------|--------------------|------------------|----------------------|----------------|----------------|----------------|----------------|
| Process                              | Instrument   | Bleed              |                  | C                    | E              | F              | G              | H              |
| 1/2 in. female Swagelok tube fitting |              | 1/4 in. female NPT | SS-V5NBFS8       | 1.28<br>(32.5)       | 1.31<br>(33.3) | 3.55<br>(90.2) | 3.65<br>(92.7) | 0.63<br>(16.0) |
| 1/2 in. female Swagelok tube fitting | Flange (MSS) |                    | SS-V5NBFS8-FL    | 2.88<br>(73.2)       | 1.49<br>(37.8) | 4.43<br>(114)  | 3.64<br>(92.5) | 0.75<br>(19.1) |
| 12 mm female Swagelok tube fitting   |              |                    | SS-V5NBFS12MM    | 1.28<br>(32.5)       | 1.31<br>(33.3) | 3.55<br>(90.2) | 3.65<br>(92.7) | 0.63<br>(16.0) |
| 12 mm female Swagelok tube fitting   | Flange (MSS) |                    | SS-V5NBFS12MM-FL | 2.88<br>(73.2)       | 1.49<br>(37.8) | 4.43<br>(114)  | 3.64<br>(92.5) | 0.75<br>(19.1) |
| 1/2 in. female NPT                   |              |                    | SS-V5NBF8        | 1.42<br>(36.0)       | 1.31<br>(33.3) | 3.62<br>(91.9) | 3.07<br>(78.0) | 0.63<br>(16.0) |
| 1/2 in. female NPT                   | Flange (MSS) |                    | SS-V5NBF8-FL     | 2.88<br>(73.2)       | 1.49<br>(37.8) | 4.47<br>(114)  | 3.66<br>(93.0) | 0.75<br>(19.1) |
| Flange (MSS)                         |              | 1/8 in. female NPT | SS-V5NBFL        | 2.98<br>(75.7)       | 1.50<br>(38.1) | 5.00<br>(127)  |                | —              |

## 5-Valve Manifolds

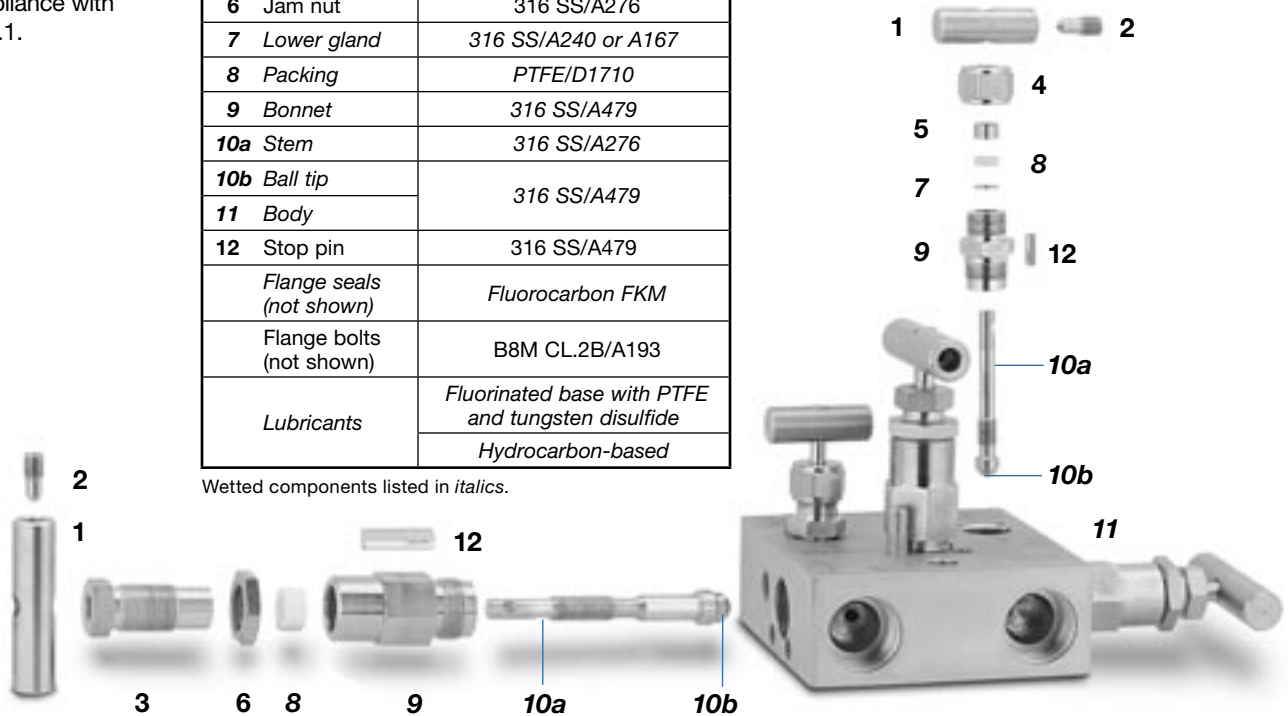
### VB Series

#### Materials of Construction

Materials for pressure-containing wetted parts are in compliance with ASME-B31.1.

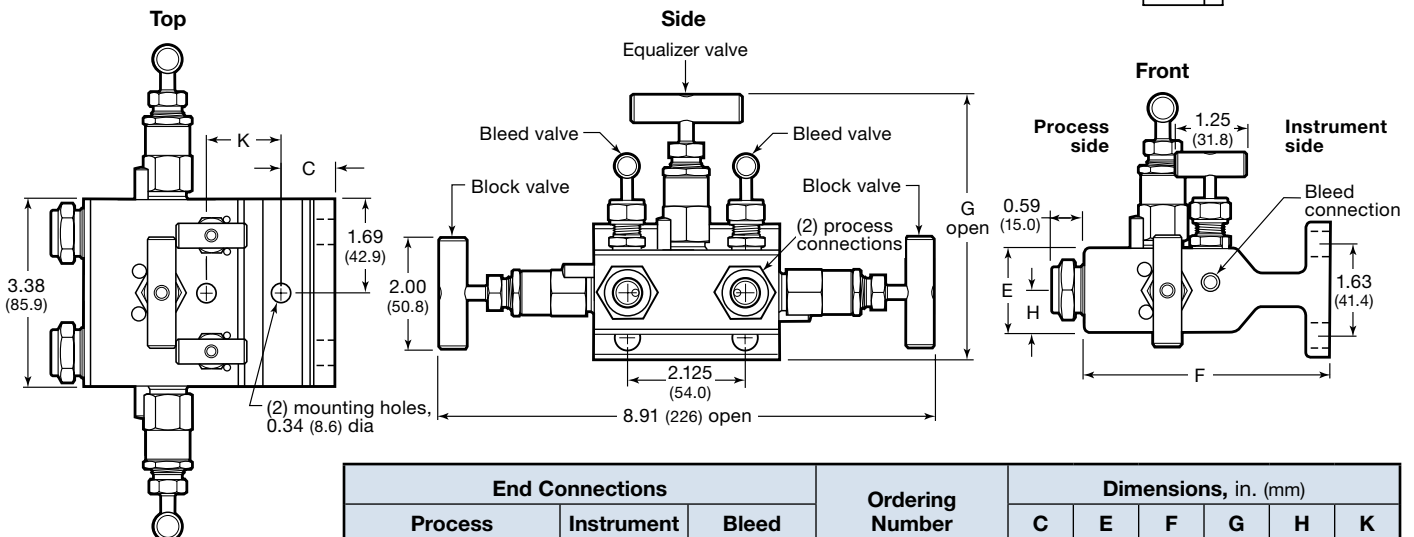
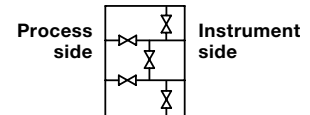
| Component                | Material Grade/ ASTM Specification                                     |
|--------------------------|------------------------------------------------------------------------|
| 1 Handle                 | 316 SS/A479                                                            |
| 2 Set screw              |                                                                        |
| 3 Packing bolt           |                                                                        |
| 4 Packing nut            |                                                                        |
| 5 Upper gland            |                                                                        |
| 6 Jam nut                | 316 SS/A276                                                            |
| 7 Lower gland            | 316 SS/A240 or A167                                                    |
| 8 Packing                | PTFE/D1710                                                             |
| 9 Bonnet                 | 316 SS/A479                                                            |
| 10a Stem                 | 316 SS/A276                                                            |
| 10b Ball tip             | 316 SS/A479                                                            |
| 11 Body                  |                                                                        |
| 12 Stop pin              | 316 SS/A479                                                            |
| Flange seals (not shown) | Fluorocarbon FKM                                                       |
| Flange bolts (not shown) | B8M CL.2B/A193                                                         |
| Lubricants               | Fluorinated base with PTFE and tungsten disulfide<br>Hydrocarbon-based |

Wetted components listed in *italics*.



#### Ordering Information and Dimensions

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



Manifold with female Swagelok tube fitting-to-flange connections shown.

| End Connections                      |              |                    | Ordering Number | Dimensions, in. (mm) |             |             |            |             |             |
|--------------------------------------|--------------|--------------------|-----------------|----------------------|-------------|-------------|------------|-------------|-------------|
| Process                              | Instrument   | Bleed              |                 | C                    | E           | F           | G          | H           | K           |
| 1/2 in. female NPT                   |              | 1/8 in. female NPT | SS-VB5NBF8      | 3.09 (78.5)          | 1.31 (33.3) | 3.62 (91.9) | 4.08 (104) | 0.61 (15.5) | 1.88 (47.8) |
| 1/2 in. female NPT                   | Flange (MSS) |                    | SS-VB5NBF8-FL   | 0.94 (23.9)          | 1.49 (37.8) | 4.47 (114)  | 4.76 (121) | 0.71 (18.0) | 1.35 (34.3) |
| 1/2 in. female Swagelok tube fitting |              |                    | SS-VB5NBFS8     | 3.05 (77.5)          | 1.31 (33.3) | 3.55 (90.2) | 4.08 (104) | 0.61 (15.5) | 1.88 (47.8) |
| 1/2 in. female Swagelok tube fitting | Flange (MSS) |                    | SS-VB5NBFS8-FL  | 0.94 (23.9)          | 1.49 (37.8) | 4.43 (113)  | 4.71 (120) | 0.75 (19.1) | 1.35 (34.3) |

## Options

### High-Temperature Packing

- Grafoil valve packing material for high-temperature service. See **Pressure-Temperature Ratings**, page 3.
- Includes Grafoil flange seals on MSS flanges.

To order a manifold with optional Grafoil packing, add **-G** to the manifold ordering number.

Example: SS-V3NBF8-FL-G

### Flange Seal Materials

- MSS flange seals are available in Grafoil, virgin PTFE, and reinforced PTFE for system compatibility.
- Temperature ratings are included in the table below.

To order a manifold with an optional MSS flange seal material, add a material designator to the manifold ordering number.

Example: SS-V3NBF8-FL-T

| MSS Flange Seal Material | Material Designator | Lubricant/Sealant | Temperature Rating °F (°C) | Packing Material |
|--------------------------|---------------------|-------------------|----------------------------|------------------|
| Fluorocarbon FKM         | —                   | Silicone base     | –20 to 450 (–28 to 232)    | PTFE             |
| Grafoil                  | -G                  | Fluorinated base  | –65 to 1000 (–53 to 537)   | Grafoil          |
| Virgin PTFE              | -T                  | Silicone base     | –65 to 250 (–53 to 121)    | PTFE             |
| Reinforced PTFE          | -TRL                |                   |                            | PTFE             |

## Mounting Kits

### Mounting Bracket Kit

Kit contains stainless steel bracket, U-bolts, cap screws, nuts, lock washers, spacer, and instructions. Kit does not fit 3-valve manifolds with flange-to-flange end connections.

Ordering number: **SS-MB-VBK**



### Steam-Trace Block Kits

Kit contains plated steel trace block with two 1/4 in. female NPT ports, cap screws, nuts, lock washers, block retainer plate, heat transfer gasket, and instructions.



| Manifold Styles       | Kit Ordering Number |
|-----------------------|---------------------|
| 3-valve, flange       | S-MB-M3SK           |
| 3-valve, pipe-to-pipe | S-MB-M5SK           |
| 3-valve, tube-to-tube |                     |
| 5-valve, all styles   |                     |

### MSS Flange Fasteners

- Optional long studs or short bolts are available for special flange mounting applications. See table below for flange fastener length comparison.
- All fasteners are stainless steel with 7/16-20 threads.
- Optional fasteners are available for all V, VB, and VL series manifolds with MSS flanges.

To order a manifold with optional flange fasteners, add a fastener designator to the manifold ordering number.

| MSS Flange Fasteners   | Length in. (mm) | Hex Size in. | Fastener Designator |
|------------------------|-----------------|--------------|---------------------|
| Standard hex head bolt | 1.0 (25.4)      | 5/8          | —                   |
| Long stud with hex nut | 2.6 (66.0)      | 11/16        | -LGB                |
| Short hex head bolt    | 0.875 (22.2)    | 5/8          | -SHB                |

Example: SS-V3NBF8-FL-LGB

### Mounting Hole Center Line

- Elongated mounting holes on the instrument flange allow for center line installations between 2 1/8 and 2 1/4 in. (54.0 and 57.2 mm).
- Available on 3- and 5-valve V and VB series manifolds with MSS flanges.
- Pressure rating is 3600 psig at 100°F (248 bar at 37°C) and 2480 psig at 450°F (170 bar at 232°C).

To order, add **-EH** to the manifold ordering number.

Example: SS-V5NBF8-FL-EH

### Hydrostatic Testing

Hydrostatic testing is available as an option.

To order, add **-W20** to the manifold ordering number.

Example: SS-V2BF8-W20

## Maintenance Kits

### Flange Seal and Bolt Kits

- Kit contains flange seals, flange bolts, lubricant, and instructions.
- Select a kit ordering number from the tables below based on the manifold series, flange style, and seal material.



### V, VB, and VL Series with MSS Flanges

| Flange Seal Material | Kit Ordering Number |                |
|----------------------|---------------------|----------------|
|                      | 2-Valve             | 3- and 5-Valve |
| Fluorocarbon FKM     | SS-MK-V2V           | SS-MK-V3V      |
| Grafoil              | SS-MK-V2G           | SS-MK-V3G      |
| Virgin PTFE          | SS-MK-V2T           | SS-MK-V3T      |
| Reinforced PTFE      | SS-MK-V2R           | SS-MK-V3R      |

## Accessories

### Eccentric Flanges

- Used with flange-to-flange manifolds to allow the connection of process flange taps or process root valves.
- Offered with Swagelok tube fitting, female NPT, or pipe butt weld connections.
- Provide an offset connection of 1/16 in. (1.6 mm) from the bolt hole center line.



Eccentric View



Swagelok Tube Fitting



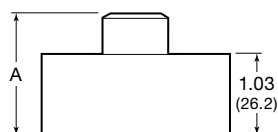
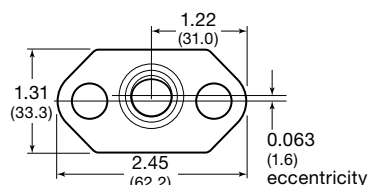
Female NPT



Pipe Butt Weld

### Dimensions

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



| End Connection        | A, in. (mm) |
|-----------------------|-------------|
| Swagelok tube fitting | 2.25 (57.2) |
| Female NPT            | 1.03 (26.2) |
| Pipe butt weld        | 1.55 (39.4) |

### Ordering Information

- Kit includes two (2) flanges, two (2) flange seals, four (4) 7/16-20 hex bolts, lubricant, and instructions.
- Flange seal material is fluorocarbon FKM with a temperature rating of -20 to 450°F (-28 to 232°C).



### Eccentric Flange Seal Kits

| Material Grade/ASTM Specification | End Connection |                       | Kit Ordering Number | Bolt Material |
|-----------------------------------|----------------|-----------------------|---------------------|---------------|
|                                   | Size           | Type                  |                     |               |
| CF8M SS/<br>ASTM A351             | 1/4 in.        | Female NPT            | SS-MKV-V3F4         | 316 SS        |
|                                   | 1/2 in.        | Swagelok tube fitting | SS-MKV-V3S8         |               |
|                                   |                | Female NPT            | SS-MKV-V3F8         |               |
|                                   |                | Pipe butt weld        | SS-MKV-V3W8P        |               |

### Optional Eccentric Flange Seal Materials

To order an eccentric flange seal kit with an optional seal material, replace **MKV** in the kit ordering number with a seal designator.

| Flange Seal Material | Seal Designator | Temperature Rating<br>°F (°C) |
|----------------------|-----------------|-------------------------------|
| Virgin PTFE          | -MKT            | -65 to 250 (-53 to 121)       |
| Reinforced PTFE      | -MKR            |                               |
| Grafoil              | -MKG            | -65 to 1000 (-53 to 537)      |

Example: SS-**MKT**-V3F4

## Accessories

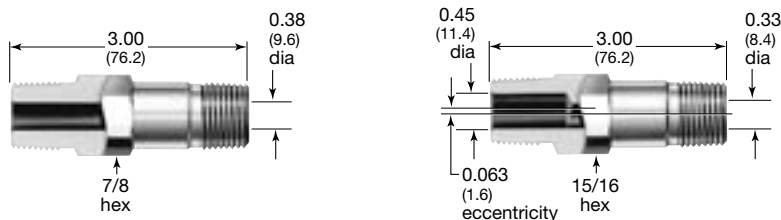
### Concentric and Eccentric Pipe Nipples

- Used with eccentric flanges to adapt to different flange tap spacings.
- Provide an offset of 1/16 in. (1.6 mm) from center line.
- Offered with 1/2 in. male NPT end connections.
- Available in 316 stainless steel and carbon steel.



### Ordering Information

- Order pipe nipples as individual components.
- See ordering number in the **Pipe Nipple Selection** table below.



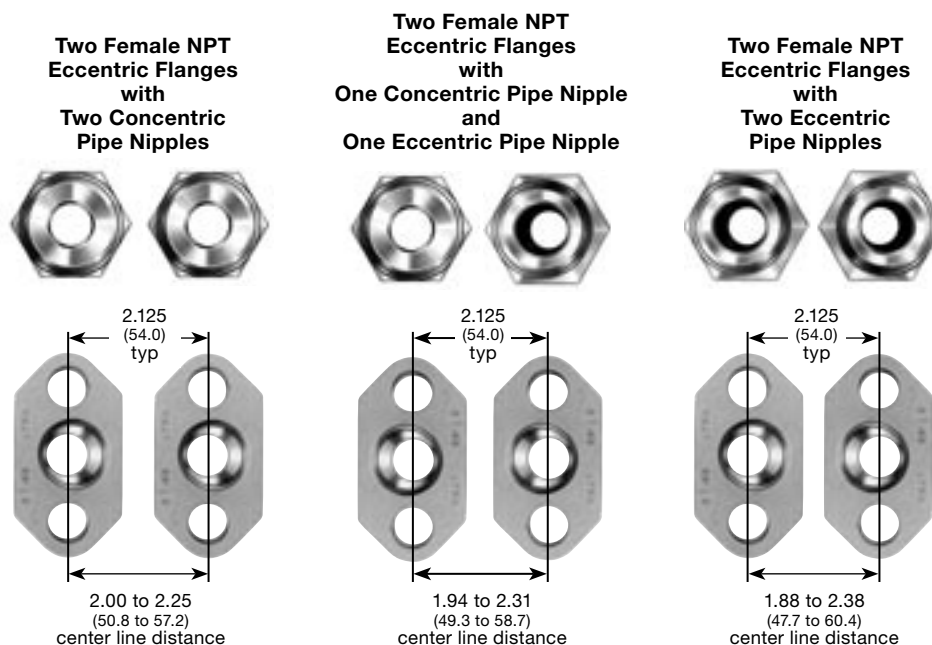
Dimensions, in inches (millimeters), are for reference only and are subject to change.

### Pipe Nipple Selection

| Type       | Material Grade/ASTM Specification | Ordering Number | Pressure Rating at 70°F (20°C)<br>psig (bar) | Temperature Rating<br>°F (°C) | Pressure Rating at Maximum Temperature    |
|------------|-----------------------------------|-----------------|----------------------------------------------|-------------------------------|-------------------------------------------|
| Concentric | 316 SS/A276                       | SS-CLNM8        | 10 000 (689)                                 | -65 to 1200<br>(-53 to 648)   | 2850 psig at 1200°F<br>(196 bar at 648°C) |
|            | Carbon steel/A108                 | S-CLNM8         | 8 000 (551)                                  | -20 to 350<br>(-28 to 176)    | 6970 psig at 350°F<br>(480 bar at 176°C)  |
| Eccentric  | 316 SS/A276                       | SS-ELNM8        | 7 500 (516)                                  | -65 to 1200<br>(-53 to 648)   | 2140 psig at 1200°F<br>(147 bar at 648°C) |
|            | Carbon steel/A108                 | S-ELNM8         | 6 000 (413)                                  | -20 to 350<br>(-28 to 176)    | 5230 psig at 350°F<br>(360 bar at 176°C)  |

### Optional Center Line Distances

- A variety of center line distances can be obtained by using various combinations of eccentric flanges and pipe nipples.
- The illustrations at the right show these combinations using female NPT eccentric flanges.



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

## Accessories

### DP Transmitter Calibration Fittings

- Speed transmitter calibration by reducing the number of steps in the traditional calibration.
- Allow rapid access to the cell for calibration—only the bleed port tap requires removal to access transmitter ports.
- Prevent possible galling of transmitter NPT body threads—straight threads on the calibration tube fitting screw directly into plug/bleed port fittings.
- Choice of fitting with 5/16-24 in. thread and 1/4 in. tubing or 1/4-28 in. thread and 1/4 in. tubing, depending on the bleed port size of the transmitter plug.
- Are available in 316 stainless steel material.

Ordering number for fitting  
with 5/16-24 thread:  
**SS-400-1-0253**

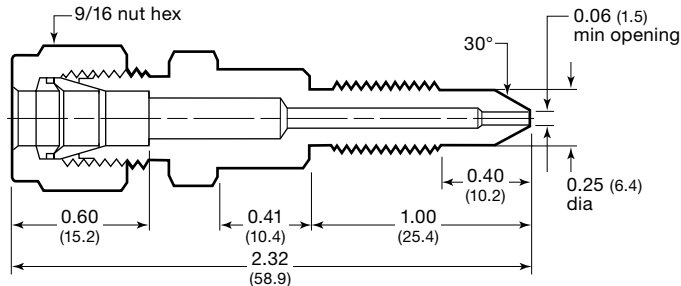


Ordering number for fitting  
with 1/4-28 thread:  
**SS-400-1-0257**

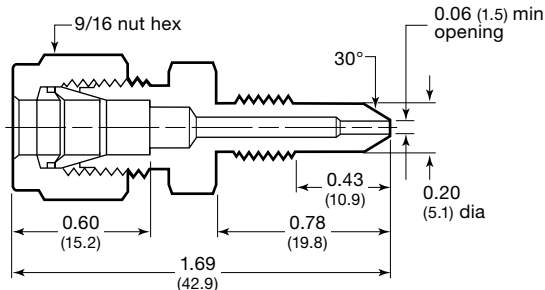
### Dimensions

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

**Calibration Fitting with 5/16-24 in. Thread**



**Calibration Fitting with 1/4-28 in. Thread**



### Gauge Adapters

- Adapt female BSP/ISO parallel thread to male NPT threads.
- Are offered in 1/4, 3/8, and 1/2 in. male NPT sizes.
- Are available in 316 stainless steel material.



For more information, see the Swagelok *Pipe Fittings* catalog, MS-01-147.

### Positionable Gauge Adapters

- Allow 360° orientation of pressure gauges.
- Are offered with 1/2 in. male NPT inlet connection.
- Are available with 1/2 in. NPT and ISO parallel gauge connections.
- Are all 316 stainless steel material.



For more information, see the Swagelok *Pressure Gauges, Industrial and Process—PGI Series* catalog, MS-02-170.

### Additional Manifold Products

For direct-mount manifolds, see the Swagelok *Direct-Mount Manifolds—VE Series* catalog, MS-02-308.

For remote-mount manifolds, see the Swagelok *Remote-Mount Manifold—Two Valve* catalog, MS-02-330.



**Safe Product Selection**

**When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.**

**Caution: Do not mix or interchange parts with those of other manufacturers.**

**Warranty Information**

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit [swagelok.com](http://swagelok.com) or contact your authorized Swagelok representative.

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