

# Swagelok® Nuclear Products

Code-Compliant, Safety-Related, and Commercial Grade



ASME Section III, NQA-1, 10CFR50 Appendix B Compliant Products

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## How to Order Code-Compliant and Safety-Related Fittings

**Step 1:** Use the tables on pages 4 through 7 to determine if the fitting can be certified to the desired nuclear requirements.

**Step 2:** Provide a complete specification, in English, that includes all material requirements and quality assurance requirements to your authorized Swagelok sales and service representative.

**Step 4:** Your purchase order must document acceptance of any exceptions identified.

Please contact your authorized Swagelok representative with any questions.

## NuSource Statement

Swagelok has entered into an agreement with NuSource LLC, an accredited ASME N Certificate Holder, to allow NuSource to offer code-compliant and safety-related valves that are manufactured by Swagelok. NuSource is a supplier of custom engineered hardware solutions for the commercial nuclear industry.

## Swagelok Nuclear Products Available through NuSource

### Code-Compliant Products

Code-compliant products are designed, fabricated, and tested in accordance with the requirements of Section III of the ASME Boiler and Pressure Vessel Code. Swagelok design specifications are available for many code valves.

ASME B16.34 is a widely accepted industry standard for code-compliant valves, and it addresses design, testing, and performance. Swagelok valves that comply with ASME B16.34 have these characteristics:

- Wall thicknesses of body and other pressure-containing components meet specified values for each pressure class and material of construction.
- Materials comply with ASME and ASTM standards for chemistry and mechanical properties.
- Bolting is ASTM grade bolting with maximum applied stress, as applicable.
- Internally loaded and blowout-proof stems enhance operator safety.
- Pressure testing is conducted for shell leakage at 1.5 times rated pressure and seat leakage at 1.1 times rated pressure.
- Valves are permanently marked with body material, operating pressure and temperature, and manufacturer name. Valves also are tagged.

Swagelok ASME B16.34 valves are listed in the table on page 4 and detailed starting on page 8. In addition to valves, a variety of stainless steel fittings, flanges, and tubing is available for code applications, as identified in the table on page 5.

### Safety-Related Products

Safety-related products are designed, fabricated, and tested in accordance with the requirements of 10CFR50 Appendix B, 10CFR21, and NQA-1. These products are identified in the tables on pages 5 through 7.

### Commercial-Grade Products

Most Swagelok products can be used in commercial-grade applications within nuclear power plants. For these non-safety and non-code-compliant products, see our standard product catalogs for specifications and ordering information. Please note any special requirements when placing a request for quotation.

## Code-Compliant Valves Available

Ordering Number	Description	Pressure Class	End Connection
SS-12HNRW16P-CCT	Needle valve for Code applications, B16.34 compliant, not for shutoff service	1679	1 inch schedule 80 pipe butt weld
SS-12NBS12-A-CCT	Angle pattern needle valve for Code applications, B16.34 compliant except end connections	2200	3/4 inch Swagelok tube fitting
SS-12NBS12-CCT	Needle valve for Code applications, B16.34 compliant except end connections	2200	
SS-12NBS6-CCT	Needle valve for Code applications, B16.34 compliant except end connections	2200	3/8 inch Swagelok tube fitting
SS-12NBS8-CCT	Needle valve for Code applications, B16.34 compliant except end connections	2200	1/2 inch Swagelok tube fitting
SS-12NRS8-CCT	Needle valve for Code applications, B16.34 compliant except end connections, not for shutoff service	2200	
SS-3HNBS4-CCT	Needle valve for Code applications, Code Case N-757-1 compliant	1998	1/4 inch Swagelok tube fitting
SS-3NBS4-CCT	Needle valve for Code applications, B16.34 compliant except end connections	2200	
SS-3NRF2-CCT	Needle valve for Code applications, B16.34 compliant, not for shutoff service	1998	1/8 inch pipe thread
SS-6HNBS6-CCT	Needle valve for Code applications, Code Case N-757-1 compliant	1998	3/8 inch Swagelok tube fitting
SS-6HNBS8-CCT	Needle valve for Code applications, Code Case N-757-1 compliant	1998	1/2 inch Swagelok tube fitting
SS-6HNBW6T-CCT	Needle valve for Code applications, B16.34 compliant	1734	3/8 inch tube butt weld
SS-6HNRW8P-CCT	Needle valve for Code applications, Code Case N-757-1 compliant, not for shutoff service	1998	1/2 inch schedule 80 pipe socket weld
SS-6NBF4-CCT	Needle valve for seismic applications without Code design analysis, B16.34 compliant	2200	1/4 pipe thread
SS-6NBSW8T-CCT	Needle valve for Code applications, B16.34 compliant	2200	1/2 inch tube socket weld
SS-8CP4-1/3-CCT	Inline check valve for Code application, B16.34 compliant	900	1/2 inch pipe thread
SS-CHFS12-EP-1/3-CCT	Inline check valve for Code applications, B16.34 compliant except end connections	150	3/4 inch Swagelok tube fitting
SS-CHFS12-EP-1-CCT	Inline check valve for Code applications, B16.34 compliant except end connections	150	
SS-CHFS12-EP-25-CCT	Inline check valve for Code applications, B16.34 compliant except end connections	150	
SS-CHFS8-EP-1/3-CCT	Inline check valve for Code applications, B16.34 compliant except end connections	150	1/2 inch Swagelok tube fitting
SS-CHFS8-EP-1-CCT	Inline check valve for Code applications, B16.34 compliant except end connections	150	
SS-H83PS6-CCT	Two-way ball valve for Code applications	900	3/8 inch Swagelok tube fitting
SS-H83XPS6-CCT	Three-way ball valve for Code applications	900	
SS-V2BFS6-CCT	2-valve manifold for Code applications, B16.34 compliant except end connections	1800	
SS-VB5NBFS6-CCT	5-valve manifold for Code applications, B16.34 compliant except end connections	1800	
SS-3HNRSW6T65-4-CTS	Needle valve for Code applications, 4 inch tube stubs, B16.34 compliant	1515	3/8 inch 0.065 inch wall tube, socket welded
SS-6UW-BW6-T1-CUW	Bellows sealed valve for Code applications, bonnet sniffer tube, Code Case N-757-1 compliant	1707	3/8 inch tube butt weld
SS-6UW-CUW	Bellows sealed valve for Code applications, B16.34 compliant except end connections	1500	3/8 inch Swagelok tube fitting
SS-6UW-T1-CUW	Bellows sealed valve for Code applications, bonnet sniffer tube, Code Case N-757-1 compliant	1679	
SS-6UW-TJ6-4C-CTS-CUW	Air actuated, bellows sealed valve for Code applications, 6 inch tube stubs, B16.34 compliant	1500	3/8 inch 0.049 inch wall tube, butt welded
SS-6UW-TJ6-4D-CTS-CUW	Air actuated, bellows sealed valve for Code applications, 6 inch tube stubs, B16.34 compliant	1500	
SS-6UW-TW4-T1-CUW	Bellows sealed valve for Code applications, bonnet sniffer tube, Code Case N-757-1 compliant	1707	1/4 inch tube butt weld
SS-12UAW-CUW	Bellows sealed angle valve for Code applications, Code Case N-757-1 compliant	871	3/4 inch Swagelok tube fitting

Additional configurations are available on request. Contact your authorized Swagelok representative for more information.

## Code-Compliant 316 Stainless Steel, ASME B16.34 Valves and Tubing

See **How to Order**, page 2.

Valve Series ASME Pressure Class	N Series Union-Bonnet Needle Valves CL2200	UW Series Bellows- Sealed Valves CL1500	CP Series Inline Check Valves CL900	V Series Instrument Manifolds CL1800	Tubing, Seamless Instrument (Nuclear tubing must be designated as Nuclear Grade)
See Page	8	10	12	15	<b>Stainless Steel Tubing, MS-01-181, MS-01-107</b>
<b>Applicable Codes and Standards</b>					
NQA-1	✓	✓	✓	✓	✓
10CFR50 / 21 (Safety-Related)	✓	✓	✓	✓	✓
HAF604 (China)	✓	✓	✓	✓	✓
ISO 9001	✓	✓	✓	✓	✓
ASME III Class 1	✓	✓	✓	✓	✓
ASME III Class 2	✓	✓	✓	✓	✓
ASME III Class 3	✓	✓	✓	✓	✓
N285 Class 1	✓	✓	✓	✓	✓
N285 Class 2	✓	✓	✓	✓	✓
N285 Class 3	✓	✓	✓	✓	✓
N285 Class 6	✓	✓	✓	✓	✓
ASME B16.34	✓	✓	✓	✓	
ASME B31.1	①	✓	②	✓	
ASME B31.3	①	✓	✓	✓	
PED—Sound Engineering Practice	✓	✓	✓	✓	✓
<b>Standard Materials</b>					
316/316L SS	✓	✓	✓	✓	✓
<b>Standard End Connection Types and Sizes<sup>③</sup></b>					
Swagelok Tube Fitting	✓	✓		✓	
Tube Socket Weld	✓	✓			
Pipe Socket Weld	✓	✓			
Female NPT	✓	✓	✓	✓	
Fractional Sizes, in.	1/4 to 3/4	3/8 and 3/4	1/2	3/8	1/8 to 2 <sup>①</sup>
Metric Sizes, mm	Contact your authorized Swagelok representative for metric sizes.			—	3 to 50 <sup>①</sup>

① Exception to ASME B31.1 and B31.3: 650°F (343°C) maximum temperature rating.

② Exception to ASME B31.3: Threaded joints not prevented from loosening. CP and CPA series 1/2 in. male NPT end wall required is 0.109 in. (2.77 mm) minimum.

③ Valves with Swagelok tube fitting end connections can be certified to ASME Section III. Valves with socket weld, butt weld, and female NPT end connections can be certified to meet the requirements of ASME B16.34 and ASME Section III.

## Code-Compliant and Safety-Related Stainless Steel Fittings

See **How to Order**, page 2.

Product	Swagelok Gaugeable Tube Fittings	Weld Fittings (TSW, PSW, Butt, Automatic)	Weld Rings	VCO® and VCR® Face Seal Fittings	Pipe Fittings	Union Ball Joint
Swagelok Product Catalog	Gaugeable Tube Fittings and Adapter Fittings, MS-01-140	Weld Fittings, MS-01-149		VCO O-Ring Face Seal Fittings, MS-01-28; VCR Metal-Gasket Face Seal Fittings, MS-01-24	Pipe Fittings, MS-01-147	
<b>Applicable Codes and Standards</b>						
NQA-1	✓	✓	✓	✓	✓	✓
10CFR50 / 21 (Safety-Related)	✓	✓	✓	✓	✓	✓
HAF604 (China)	✓	✓	✓	✓	✓	✓
ISO 9001	✓	✓	✓	✓	✓	✓
Canadian Registration (CRN)	✓	✓		✓	✓	✓
ASME III Class 1	✓	✓	✓	✓	✓	
ASME III Class 2	✓	✓	✓	✓	✓	
ASME III Class 3	✓	✓	✓	✓	✓	
RCC-M Class 1	①	①	①	①	①	
RCC-M Class 2	①	①	①	①	①	
RCC-M Class 3	①	①	①	①	①	
N285 Class 1	✓	✓	✓	✓	✓	
N285 Class 2	✓	✓	✓	✓	✓	
N285 Class 3	✓	✓	✓	✓	✓	
N285 Class 6	✓	✓	✓	✓	✓	✓
ASME B31.1	✓	✓		✓		
ASME B31.3	✓	✓		✓		
PED—Sound Engineering Practice	✓	✓	✓	✓	✓	✓
Intergraph Available	✓	✓			✓	
<b>Standard Materials</b>						
316 / 316L SS	✓	✓		✓	✓	✓
<b>Standard End Connection Types and Sizes</b>						
Swagelok Tube Fitting	✓	✓		✓	✓	✓
Tube Socket Weld	✓	✓		✓	✓	✓
Pipe Socket Weld	✓	✓		✓	✓	✓
Female NPT	✓	✓		✓	✓	✓
Fractional Sizes, in.	1/16 to 2 <sup>③</sup>	1/8 to 2 <sup>③</sup>	1/4 to 1/2	1/8 to 1	1/16 to 1	1/8 to 2 <sup>③</sup>
Metric Sizes, mm	2 to 50 <sup>③</sup>	6 to 18	—	—	—	—

① There are known material differences between ASME and RCC-M for Swagelok 300 series stainless steel. Customers must accept noted exceptions.

② Other steel alloys and materials may be available. Contact your authorized Swagelok representative.

③ Order silver-plated ferrules for over 1 in. / 25 mm Swagelok tube fitting end connections.

## Safety-Related Stainless Steel Valves, Flanges, and Quick-connects

See **How to Order**, page 2.

Product	N and HN Series Severe-Service Union-Bonnet Needle Valves	U Series Bellows-Sealed Valves	60 Series General-Purpose Ball Valves	Integral Bonnet Needle Valves	50 Series Lift Check Valves	C, CA, CP, CPA Series Check Valves	V Series Instrument Manifolds	Gauge Valves	Flanges	Quick Connects	FM Series Hose <sup>®</sup>
Swagelok Product Catalog	MS-01-168	MS-01-38	MS-01-146	MS-01-164	MS-01-98	MS-01-176	MS-01-178	MS-01-52	MS-02-200	MS-01-138	Hose and Flexible Tubing, MS-01-180
<b>Applicable Codes and Standards</b>											
NQA-1	✓	✓	✓	✓	✓		✓	✓	✓		✓
10CFR50 / 21 (Safety-Related)	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
HAF604 (China)	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
ISO 9001	✓	✓	✓	✓	✓	✓	✓	✓	✓	®	✓
Canadian Registration (CRN)	✓	✓	✓	✓	✓	✓	✓	✓			✓
N285 Class 6	✓	✓	✓	✓	✓	✓	✓	✓			
ASME QME-1 <sup>①</sup>	②	②									
ASME B31.1	③	✓	✓	④	③		✓	④		✓	✓
ASME B31.3	③	✓	✓	⑤	③		✓	⑤		✓	✓
PED—CE Marked			⑥								
PED—Sound Engineering Practice	✓	✓	⑥	✓	✓	✓	✓	✓			
Intergraph Available	✓	✓	✓	✓	✓	✓	✓				
<b>Standard Materials</b>											
316 / 316L SS	✓	✓	✓	✓	✓	✓	✓	✓			
<b>Standard End Connection Types and Sizes</b>											
Swagelok Tube Fitting	✓	✓	✓	✓	✓	✓			✓	✓	✓
Tube Socket Weld	✓	✓	✓		✓				✓	✓	
Pipe Socket Weld	✓	✓	✓		✓				✓	✓	
Female NPT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fractional Sizes, in.	1/8 to 1	1/4 to 3/4	1/8 to 2 <sup>⑦</sup>	1/8 to 3/4	1/4 to 3/4	1/8 to 1	1/2	1/2 to 3/4	1/16 to 2 <sup>③</sup>	1/8 to 1	1/4 to 2
Metric Sizes, mm	6 to 12	6 to 12	6 to 25	3 to 18	6	6 to 25	—	—	2 to 50 <sup>③</sup>	6 to 12	6 to 50

① Applies only to active (actuated) valves; does not apply to manually operated valves.

② Contact your authorized Swagelok representative for information about models and actuators compliant with ASME QME-1.

③ Exception to ASME B31.1 and B31.3: 1000°F (537°C) maximum temperature rating.

④ Exception to ASME B31.1 107.1(d): Stem can be removed along with packing nut.

⑤ Exception to ASME B31.3 307 2.2: Stem can be removed along with packing nut.

⑥ 67 and 68 series valves are CE marked for PED. 62, 63, and 65 valves follow PED Sound Engineering Practice.

⑦ Order silver-plated ferrules for over 1 in. / 25 mm Swagelok tube fitting end connections.

⑧ QC Series Quick-connects only.

⑨ Other Hose products are available. Contact your authorized Swagelok representative.

## Safety-Related Stainless Steel Valves

See **How to Order**, page 2.

Product	OG, 1G, 92 Toggle Valves	Bleed Valves and Purge Valves	JB Series Screwed- Bonnet Needle Valves	40 and 40G Series Instrument Ball Valves	AFS, FKB, SK, and 83 Series Ball Valves	XS Series Excess Flow Valves	R Series Proportional Relief Valves	D60 Series Distribution Block Valves	6DB Series Blowdown Valves
Swagelok Product Catalog	MS-01-54	MS-01-62	MS-01-84	MS-02-331	MS-02-303, MS-02-354, MS-02-345, MS-01-166	MS-01-110	MS-01-141	MS-02-02	MS-02-118
<b>Applicable Codes and Standards</b>									
NQA-1	✓	✓	✓	✓	✓	✓	✓	✓	✓
10CFR50 / 21 (Safety-Related)	✓	✓	✓	✓	✓	✓	✓	✓	✓
HAF604 (China)	✓	✓	✓	✓	✓	✓	✓	✓	✓
ISO 9001	✓	✓	✓	✓	✓	✓	✓	✓	✓
Canadian Registration (CRN)	✓	✓	✓	✓	✓	✓	✓		✓
N285 Class 6		✓	✓	✓	✓	✓	✓		✓
ASME B31.1	①	✓	①	①				✓	✓
ASME B31.3	②	✓	②	②				✓	
PED—Sound Engineering Practice	✓	✓	✓	✓	✓	✓	✓	③	✓
Intergraph Available									
<b>Standard Materials</b>									
316 / 316L SS	✓	✓	✓	✓	✓	✓	✓		✓
<b>Standard End Connection Types and Sizes</b>									
Swagelok Tube Fitting	✓	✓	✓	✓	✓	✓	✓		✓
Tube Socket Weld								✓	✓
Pipe Socket Weld								✓	✓
Female NPT	✓	✓	✓	✓	✓	✓	✓		✓
Fractional Sizes, in.	1/8 to 1/2	1/8 to 1/2	1/8 to 3/8	1/16 to 3/4	1/8 to 1	1/8 to 1/2	1/4 to 1/2	④	1/4 to 1/2
Metric Sizes, mm	3 to 12	—	6 to 8	3 to 12	6 to 16	6 to 12	6 to 12	④	10 to 12

① Exception to ASME B31.1 107.1(d): Stem can be removed along with packing nut.

② Exception to ASME B31.3 307 2.2: Stem can be removed along with packing nut.

③ 67 and 68 series valves are CE marked for PED. 62, 63, and 65 series valves follow PED Sound Engineering Practice.

④ See the Swagelok *D60 Series Distribution Block Valves* catalog, MS-02-02.

# Union-Bonnet Needle Valves ASME B16.34 N Series

- ASME Section III Class 1, 2, 3
- 10CFR50 Appendix B/10CFR21 Safety Related

## Features

- 316 stainless steel material
- Ball tip (NB) or regulating (NR) stem
- Swagelok tube fitting, female NPT, tube socket weld, and pipe socket weld connections; contact your authorized Swagelok representative for pipe butt weld and female Swagelok tube fitting end connections.
- End connection sizes from 1/8 to 3/4 in.; contact your authorized Swagelok representative for metric sizes.
- Panel mounting
- Orifice from 0.156 to 0.437 in. (4.0 to 11.1 mm)
- Flow coefficient from 0.35 to 2.4

## Pressure-Temperature Ratings

ASME Class	2200
Material Group	2.2
Material Name	316 SS
Temperature °F (°C)	Working Pressure psig (bar)
-20 (28) to 100 (37)	5280 (363)
200 (93)	4541 (312)
300 (148)	4101 (282)
400 (204)	3767 (259)
500 (260)	3503 (241)
600 (315)	3309 (227)
650 (343)	3256 (224)

## Testing

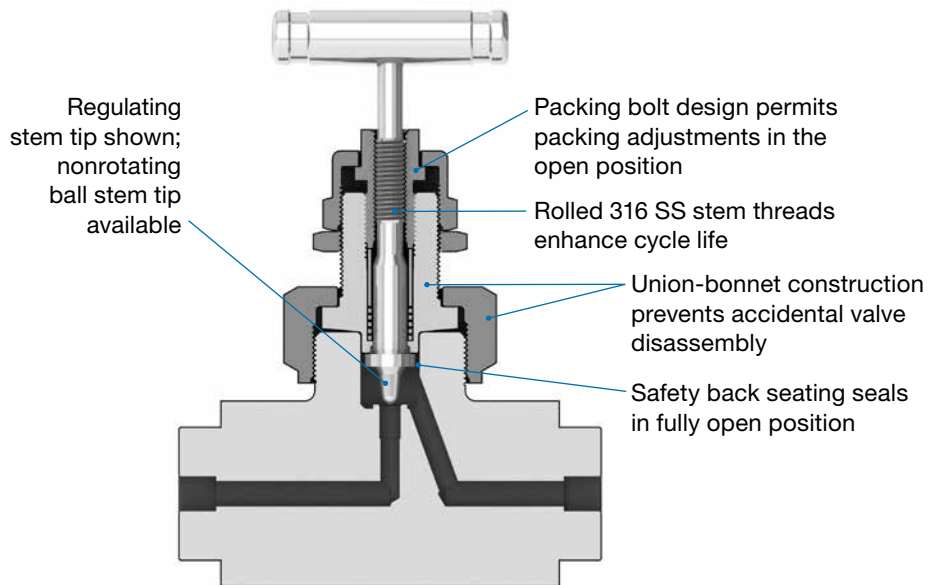
Every ASME B16.34 union-bonnet needle valve is factory tested with nitrogen at 1000 psig (69 bar). Seats have a maximum allowable leak rate of 0.1 std cm<sup>3</sup>/min. Additionally, each valve is shell tested at 1.5 times the rated pressure for a specified time duration to a requirement of no detectable leakage with a liquid leak detector. Each valve is seat tested at 1.1 times the rated pressure.

## Cleaning and Packaging

All ASME B16.34 union-bonnet needle valves are free of foreign material such as dirt, oil, grease, rust, scale, and compounds used during fabrication, prior to shipment. Cleaning agents and processes will not harm surfaces or finishes or affect material properties or valve operation.

Cleanliness of the valves is in accordance with NQA-1 Subpart 2.1 Class B or equivalent (ANSI N45.2.1). Packaging procedures are in accordance with NQA-1 Subpart 2.2 or equivalent (ANSI N45.2.2).

Swagelok



## Materials of Construction

Component	Material Grade / ASTM Specification
Handle, gland, set screw	316 SS / A479
Packing bolt, union nut	316 SS / SA479
Handle pin	17-4 H900 / A564
Lock nut, panel nut	316 SS / A276 or A479
<i>Packing</i>	<i>Grafoil® GTJ</i>
<i>Body, bonnet</i>	<i>316 SS / SA479</i>
<i>NB stem shank and ball, NR regulating stem</i>	<i>316 SS / SA479 or Cobalt based Alloy</i>
<i>Lubricant</i>	<i>High-purity, metal-free, mineral oil-based antiseize</i>

Wetted components listed in *italics*.

- ⚠ **A packing adjustment may be required periodically to increase service life and to prevent leakage.**
- ⚠ **Valves that have not been cycled for a period of time may have a higher initial actuation torque.**
- ⚠ **To increase service life, ensure proper valve performance, and prevent leakage, apply only as much torque as is required to achieve positive shutoff.**
- ⚠ **Optional regulating tip stems are not rated for shut off service.**



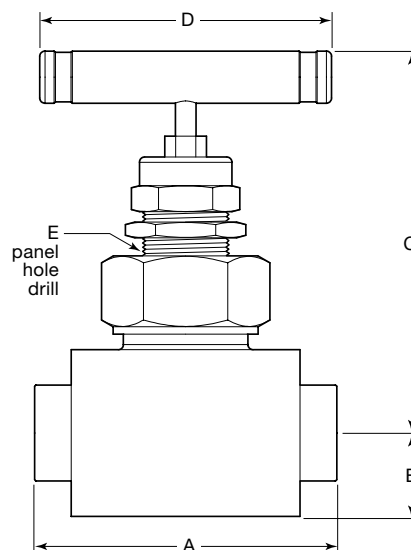
## Dimensions and Ordering Information

Dimensions are for reference only and are subject to change.

Ordering numbers specify a ball stem tip. For a regulating stem, replace **NB** in the basic ordering number with **NR**.

Example: SS-3NRS4-CL2200

See **How to Order**, page 2, for detailed ordering instructions.



End Connections		C <sub>v</sub>	Orifice in. (mm)	Basic Ordering Number	Dimensions, in. (mm)					Weight lb (kg)
Style	Size in.				A	B	C	D	E	
<b>3N Series</b>										
Swagelok tube fitting	1/4	0.35	0.156 (4.0)	SS-3NBS4-CCT	3.70 (94.0)	0.69 (17.2)	3.59 (91.2)	1.75 (44.4)	0.81 (20.6)	1.86 (0.84)
Female NPT	1/8			SS-3NBF2-CCT	3.12 (79.2)	0.69 (17.2)	3.59 (91.2)	1.75 (44.4)	0.81 (20.6)	1.93 (0.88)
<b>6N Series</b>										
Swagelok tube fitting	3/8	0.86	0.250 (6.4)	SS-6NBS6-CCT	3.63 (92.2)	1.00 (25.4)	4.44 (113)	3.50 (88.9)	1.06 (26.9)	4.39 (1.99)
Female NPT	1/4			SS-6NBF4-CCT	3.63 (92.2)	1.00 (25.4)	4.44 (113)	3.50 (88.9)	1.06 (26.9)	4.56 (2.07)
Tube socket weld	3/8			SS-6NBSW6T-CCT	3.63 (92.2)	1.00 (25.4)	4.44 (113)	3.50 (88.9)	1.06 (26.9)	4.48 (2.03)
	1/2			SS-6NBSW8T-CCT	3.63 (92.2)	1.00 (25.4)	4.44 (113)	3.50 (88.9)	1.06 (26.9)	4.54 (2.06)
<b>12N Series</b>										
Swagelok tube fitting	1/2	2.1	0.406 (10.3)	SS-12NBS8-CCT	3.72 (94.5)	1.08 (27.4)	5.24 (133)	3.50 (88.9)	1.31 (33.3)	6.00 (2.72)
	3/4	2.4	0.437 (11.1)	SS-12NBS12-CCT	3.50 (88.9)	1.08 (27.4)	5.24 (133)	3.50 (88.9)	1.31 (33.3)	5.60 (2.54)

Dimensions shown with Swagelok tube fitting nuts finger-tight.

# Bellows-Sealed Valves ASME B16.34 UW Series

- ASME Section III Class 1, 2, 3
- 10CFR50 Appendix B / 10CFR21 Safety Related

## Features

- 316 stainless steel material
- Swagelok tube fitting, female NPT, tube socket weld, and pipe socket weld connections; contact your authorized Swagelok representative for pipe butt weld and female Swagelok tube fitting end connections.
- End connection sizes 1/4 to 3/4 in.; contact your authorized Swagelok representative for metric sizes.
- Panel mounting
- Orifice 0.156 to 0.504 in. (4.0 to 12.8 mm)
- Flow coefficient from 0.40 to 3.1

## Pressure-Temperature Ratings

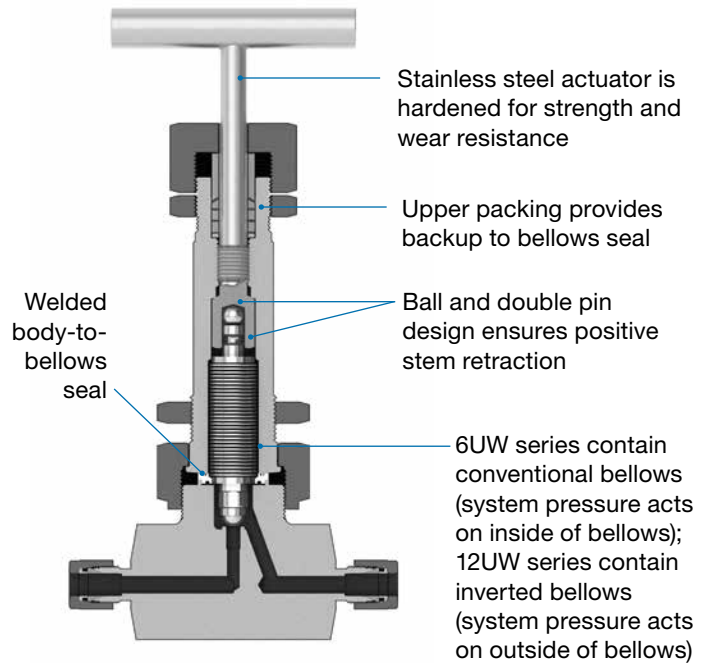
<b>ASME Class</b>	<b>1500<sup>①</sup></b>
<b>Material Group</b>	<b>2.2</b>
<b>Material Name</b>	<b>316 SS</b>
<b>Temperature</b> °F (°C)	<b>Working Pressure</b> psig (bar)
-20 (28) to 650 (343)	2500 (172)

① Class 1500 rating based on the pressure boundary components as defined by ASME Section III, which excludes the bellows. The UW series valve should not be operated above the 2500 psig (172 bar) maximum allowable working pressure (MAWP) of the bellows.

## Materials of Construction

Component	Material Grade / ASTM Specification
Handle, gland, jam nut, panel nut	316 SS / A479
Set screw (6UW)	Alloy steel / ANSI 18.3
Cap nut (12UW)	18-8 SS
Packing (3)	Grafoil GTJ
Spacer	316 SS / A240
Bonnet nut	Silver-plated 316 SS / SA479
Lower seal O-ring	316 SS / A580
Actuator	316 SS / A276
Actuator pin (2)	416 SS
Ball bearing, stem extension	440C SS / A276
<i>Body, bonnet, weld ring, gland nut</i>	<i>316 SS / SA479</i>
<i>Stem adapter</i>	<i>316 SS / A479</i>
<i>Stem tip</i>	<i>316 SS / A276</i>
<i>Bellows (6UW)</i>	<i>347 SS / A269</i>
<i>Bellows (12UW)</i>	<i>316 SS / A240</i>
<i>Lubricant</i>	<i>High-purity, metal-free, mineral oil-based antiseize</i>

Wetted components listed in *italics*.



## Testing

Every ASME B16.34 bellows-sealed valve 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. Additionally, each valve is shell tested at 1.5 times the rated pressure for to a requirement of no detectable leakage with a liquid leak detector. Each valve is seat tested at 1.1 times the rated pressure.

## Cleaning and Packaging

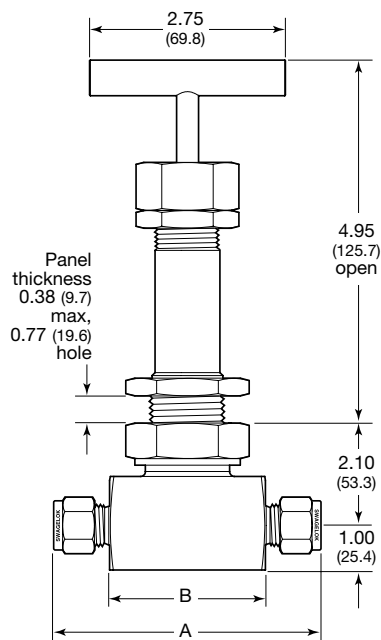
All ASME B16.34 bellows-sealed valves are free of foreign material such as dirt, oil, grease, rust, scale, and compounds used during fabrication, prior to shipment. Cleaning agents and processes will not harm surfaces or finishes or affect material properties or valve operation.

Cleanliness of the valves is in accordance with NQA-1 Subpart 2.1 Class B or equivalent (ANSI N45.2.1). Packaging procedures are in accordance with NQA-1 Subpart 2.2 or equivalent (ANSI N45.2.2).

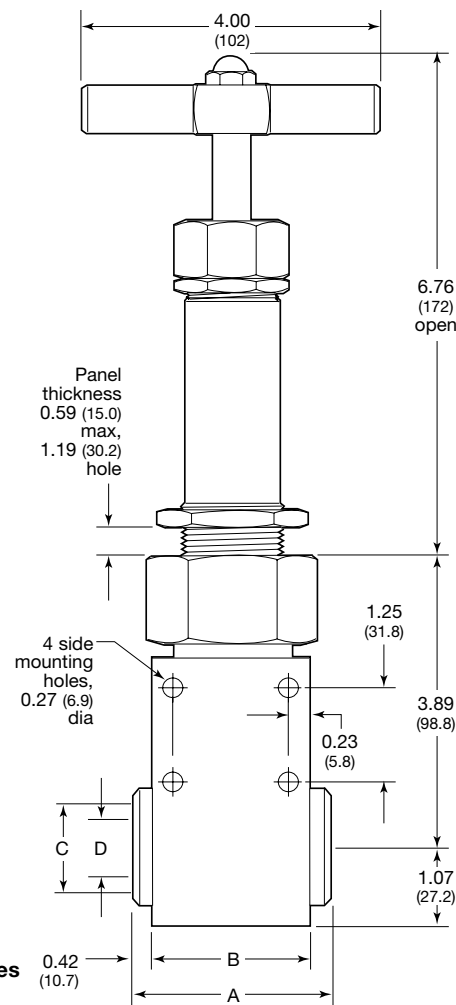
### Dimensions and Ordering Information

Dimensions are for reference only and are subject to change.

See **How to Order**, page 2, for detailed ordering instructions.



**6UW Series**



**12UW Series**

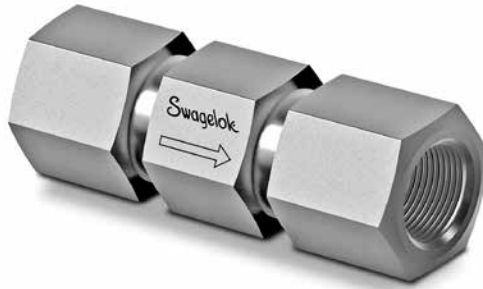
End Connections		C <sub>v</sub>	Orifice in. (mm)	Basic Ordering Number	Dimensions, in. (mm)				Weight lb (kg)
Style	Size in.				A	B	C	D	
<b>6UW Series</b>									
Swagelok tube fitting	3/8	1.0	0.300 (7.62)	SS-6UW-CCT	3.63 (92.2)	2.69 (68.3)	—	0.38 (9.6)	4.81 (2.18)
<b>12UW Series</b>									
Swagelok tube fitting	3/4	2.4	0.438 (11.1)	SS-12UW-CCT	3.03 (77.0)	2.10 (53.3)	—	0.76 (19.3)	7.30 (3.31)

Dimensions shown with Swagelok tube fitting nuts finger-tight.

**⚠ To increase service life, ensure proper valve performance, and prevent leakage, apply only as much torque as is required to achieve positive shutoff.**

# Inline Check Valves ASME B16.34 CP Series

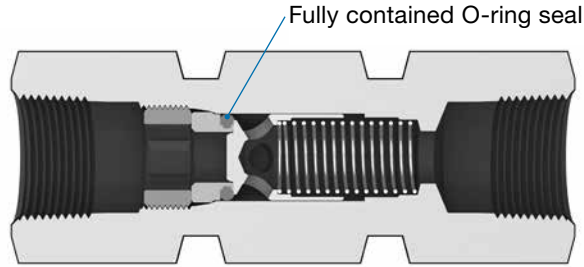
- ASME Section III Class 1, 2, 3
- 10CFR50 Appendix B / 10CFR21 Safety Related



## Features

- 316 stainless steel material
- 1/2 in. female NPT end connections; contact your authorized Swagelok representative for metric end connections.
- Fixed cracking pressures from 1/3 to 25 psi (0.03 to 1.8 bar); adjustable cracking pressures from 3 to 600 psi (0.21 to 41.4 bar)

### CP Series (Fixed Cracking Pressure)



Compact, one-piece body

## Materials of Construction

Component	Material Grade/ ASTM Specification
<i>Body, insert, poppet</i>	316 SS / SA479
<i>Insert lock screw</i>	316 SS / A276 or A479
<i>O-ring</i>	Ethylene propylene (EP)
<i>Spring</i>	302 SS / A313
<i>Adjusting screw, locking screw (CPA series)</i>	316 SS / A276
<i>Lubricant</i>	Hydrocarbon-based, PTFE-free synthetic

Wetted components listed in *italics*.

## Pressure-Temperature Ratings

Temperature rating is limited by seal materials.

<b>ASME Class</b>	<b>900</b>
<b>Material Group</b>	<b>2.2</b>
<b>Material Name</b>	<b>316 SS</b>
<b>Temperature</b> °F (°C)	<b>Working Pressure</b> psig (bar)
-20 (28) to 100 (37)	2160 (148)
200 (93)	1860 (128)
300 (148)	1680 (115)

## Testing

Every ASME B16.34 inline check valve is factory tested for crack and reseal performance with a liquid leak detector.

Check valves with fixed cracking pressures, CP series, are cycled six times prior to testing. Every valve is tested to ensure it seals within 5 s at the appropriate reseal pressure.

Check valves with adjustable cracking pressures, CPA series, are tested at two pressure points. Every valve is tested at a low-pressure setting and at a high-pressure setting. All valves must seal within 5 s at the appropriate reseal pressure.

Each valve is shell tested at 1.5 times the rated pressure for a time duration specified by code or customer requirements.

## Cleaning and Packaging

All ASME B16.34 inline check valves are free of foreign material such as dirt, oil, grease, rust, scale, and compounds used during fabrication, prior to shipment. Cleaning agents and processes will not harm surfaces or finishes or affect material properties or valve operation.

Cleanliness of the valves is in accordance with NQA-1 Subpart 2.1 Class B or equivalent (ANSI N45.2.1). Packaging procedures are in accordance with NQA-1 Subpart 2.2 or equivalent (ANSI N45.2.2).

## Technical Data

Cracking pressure—the inlet pressure at which the first indication of flow occurs (steady stream of bubbles).

Reseal pressure—the pressure at which there is no indication of flow.

Back pressure—the differential pressure between the inlet and outlet pressures.

**⚠ For valves not actuated for a period of time, initial cracking pressure may be higher than the set cracking pressure.**

Series	Maximum Flow Coefficient (C <sub>v</sub> )	Nominal Cracking Pressure <sup>①</sup> psi (bar)	Maximum Back Pressure at 70°F (20°C) psig (bar)
<b>Fixed Cracking Pressure</b>			
8CP	1.20	1/3, 1, 10 and 25 (0.03, 0.07, 0.69, and 1.8)	2160 (148)

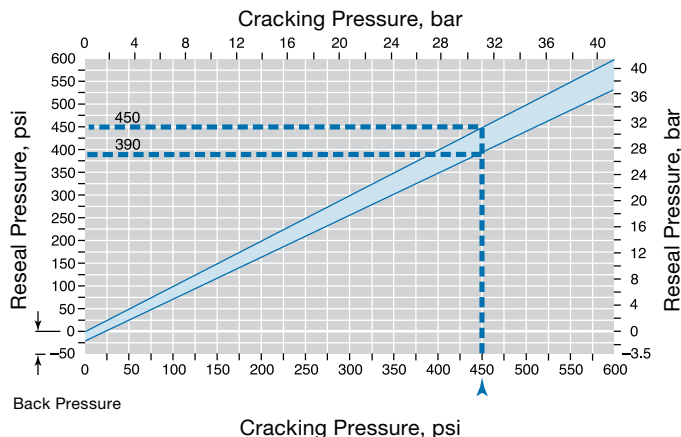
① Other cracking pressures are available; contact your authorized Swagelok sales and service representative.

### Cracking and Reseal Pressures at 70°F (20°C)

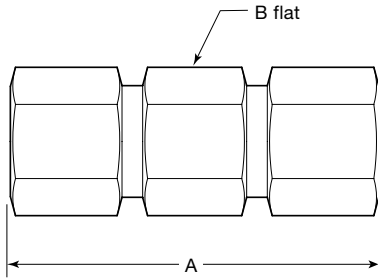
#### 4CP and 8CP Series

Nominal Cracking Pressure psi (bar)	Cracking Pressure Range psi (bar)	Reseal Pressure psi (bar)
1/3 (0.03)	Up to 3 (0.21)	Up to 20 (1.4) back pressure
1 (0.07)	Up to 4 (0.28)	Up to 20 (1.4) back pressure
10 (0.69)	7 to 13 (0.49 to 0.90)	Up to 10 (0.69) back pressure
25 (1.8)	21 to 29 (1.5 to 2.0)	5 (0.35) or more inlet pressure

#### 4CPA Series



## Dimensions and Ordering Information



End Connections		Basic Ordering Number	Dimensions, in. (mm)		Weight lb (kg)
Style	Size		A	B	
<b>Fixed Cracking Pressure, CP Series</b>					
Female NPT	1/2 in.	SS-8CP4-CCT	3.71 (94.2)	1 5/16	1.00 (0.45)

**⚠ Check valves are designed for directional flow control only. Swagelok check valves should never be used as code safety relief devices.**

Dimensions are for reference only and are subject to change.

See **How to Order**, page 2, for detailed ordering instructions.

For a complete ordering number:

- Insert a cracking pressure designator after the series designator in the basic ordering number.

Cracking Pressure psi (bar)	Designator
<b>Fixed, CP Series</b>	
1/3 (0.03)	-1/3
1 (0.07)	-1
10 (0.69)	-10
25 (1.8)	-25

Example: SS-8CP4-**1/3**-CCT

## 2- and 5-Valve Manifolds ASME B16.34 V Series

- ASME Section III Class 1, 2, 3
- 10CFR50 Appendix B / 10CFR21 Safety Related



### Features

- 316 stainless steel material; one-piece construction
- Grafoil stem packing
- 3/8 and 1/2 in. female Swagelok tube fitting and 1/2 in. female NPT end connections
- Metal-to-metal body-to-bonnet seal eliminates the need for O-ring seals
- 316 stainless steel pin prevents detachment of the bonnet from stem operation or vibration
  - Design is vibration tested to MIL-STD 167-1, Sections 5.1.2.4.2 through 5.1.2.4.6
- Small-bonnet valve orifice 0.125 in. (3.2 mm); large-bonnet valve orifice 0.156 in. (4.0 mm)

### Pressure-Temperature Ratings

<b>ASME Class</b>	<b>1800</b>
<b>Material Group</b>	<b>2.2</b>
<b>Material Name</b>	<b>316 SS</b>
<b>Temperature</b> °F (°C)	<b>Working Pressure</b> psig (bar)
-20 (28) to 100 (37)	4320 (297)
200 (93)	3715 (255)
300 (148)	3355 (231)
400 (204)	3083 (212)
500 (260)	2867 (197)
600 (315)	2707 (186)
650 (343)	2664 (183)

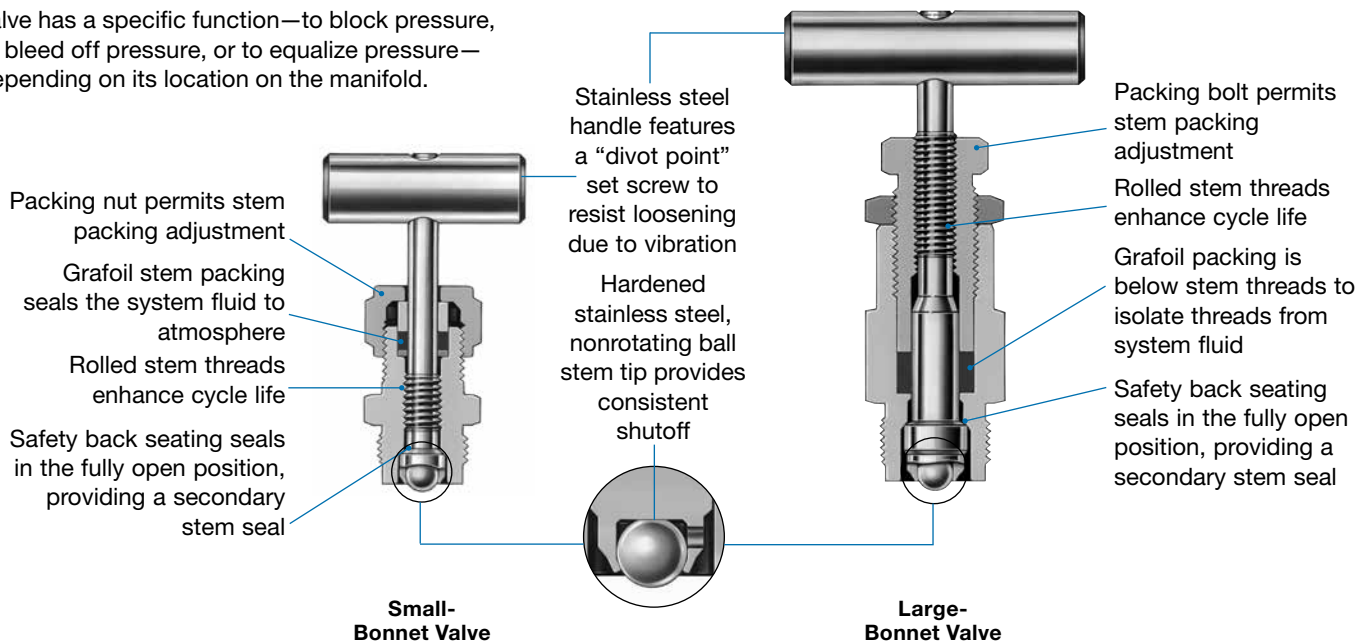
### Materials of Construction

Component	Material Grade / ASTM Specification
Handle, set screw, packing bolt, packing nut, upper gland, stop pin	316 SS / SA479
Jam nut	316 SS / SA276
<i>Body, bonnet, ball tip</i>	316 SS / SA479
<i>Lower gland</i>	316 SS / A240 or A167
<i>Packing</i>	<i>Grafoil</i>
<i>Stem</i>	316 SS / A276
<i>Lubricant</i>	<i>High-purity, metal-free, mineral oil-based antiseize</i>

Wetted components listed in *italics*.

### 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.



## Testing

Every ASME B16.34 60 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. Additionally, each valve is shell tested at 1.5 times the rated pressure to a requirement of no detectable leakage with a liquid leak detector. Each valve is seat tested at 1.1 times the rated pressure.

## Cleaning and Packaging

All ASME B16.34 manifolds are free of foreign material such as dirt, oil, grease, rust, scale, and compounds used during fabrication, prior to shipment. Cleaning agents and processes will not harm surfaces or finishes or affect material properties or valve operation.

Cleanliness of the valves is in accordance with NQA-1 Subpart 2.1 Class B or equivalent (ANSI N45.2.1). Packaging procedures are in accordance with NQA-1 Subpart 2.2 or equivalent (ANSI N45.2.2).

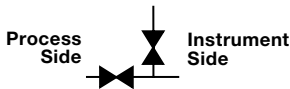
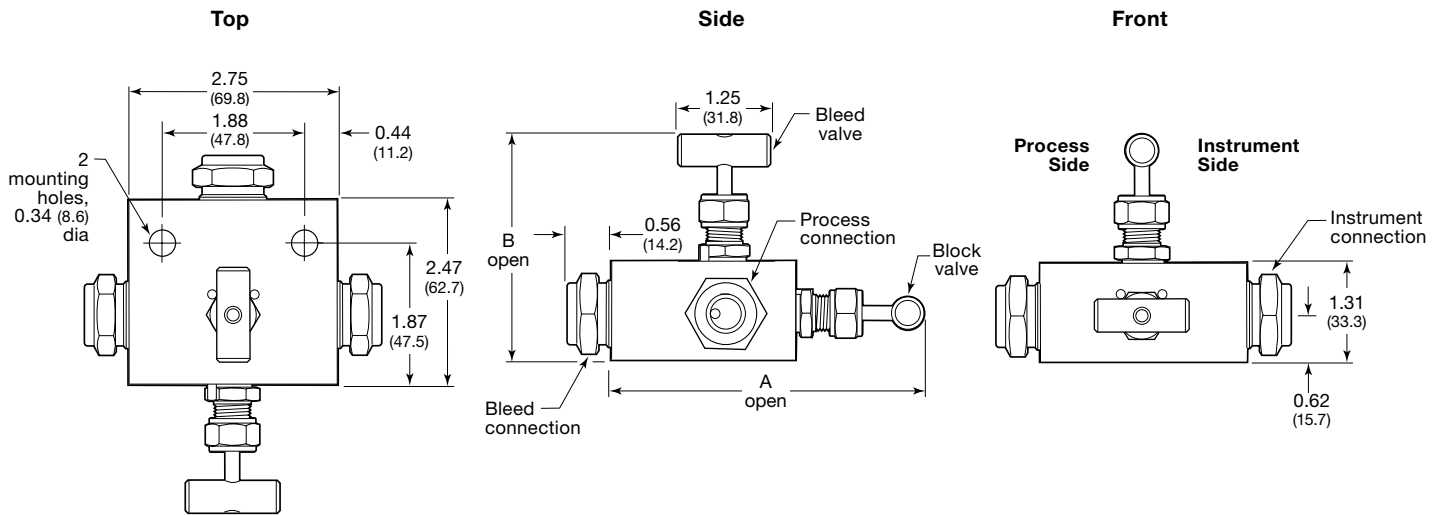
## Dimensions and Ordering Information

Dimensions are for reference only and are subject to change.

See **How to Order**, page 2, for detailed ordering instructions.

- ⚠ **A packing adjustment may be required periodically to increase service life and to prevent leakage.**
- ⚠ **Valves that have not been cycled for a period of time may have a higher initial actuation torque.**
- ⚠ **To increase service life, ensure proper valve performance, and prevent leakage, apply only as much torque as is required to achieve positive shutoff.**

### 2-Valve Manifolds

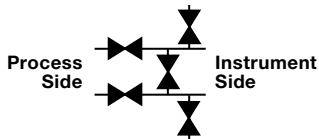
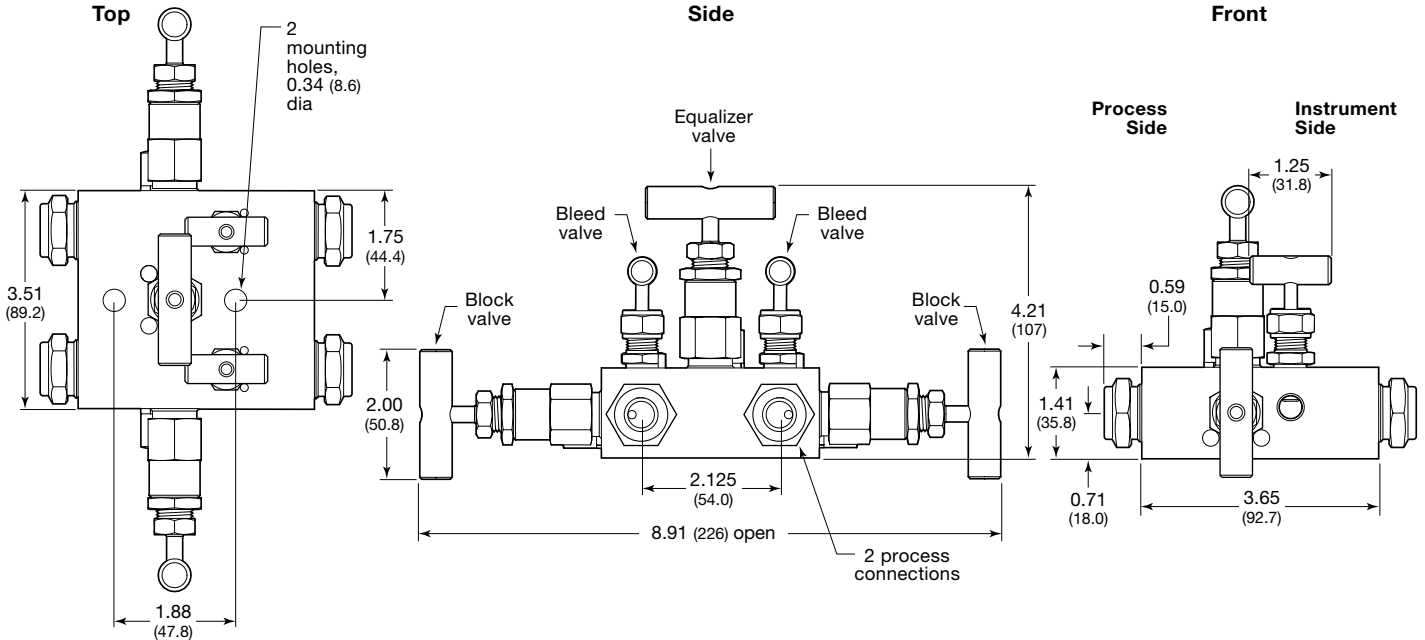


End Connections	Basic Ordering Number	Dimensions, in. (mm)		Weight lb (kg)
		A	B	
3/8 in. female Swagelok tube fitting	SS-V2BFS6-CL1800	4.21 (107)	3.05 (77.5)	2.78 (1.26)



## Dimensions and Ordering Information

### 5-Valve Manifolds



End Connections	Basic Ordering Number	Weight lb (kg)
3/8 in. female Swagelok tube fitting	SS-VB5NBFS6-CL1800	6.21 (2.82)

#### 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.

#### ⚠ WARNING

Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, 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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