Index

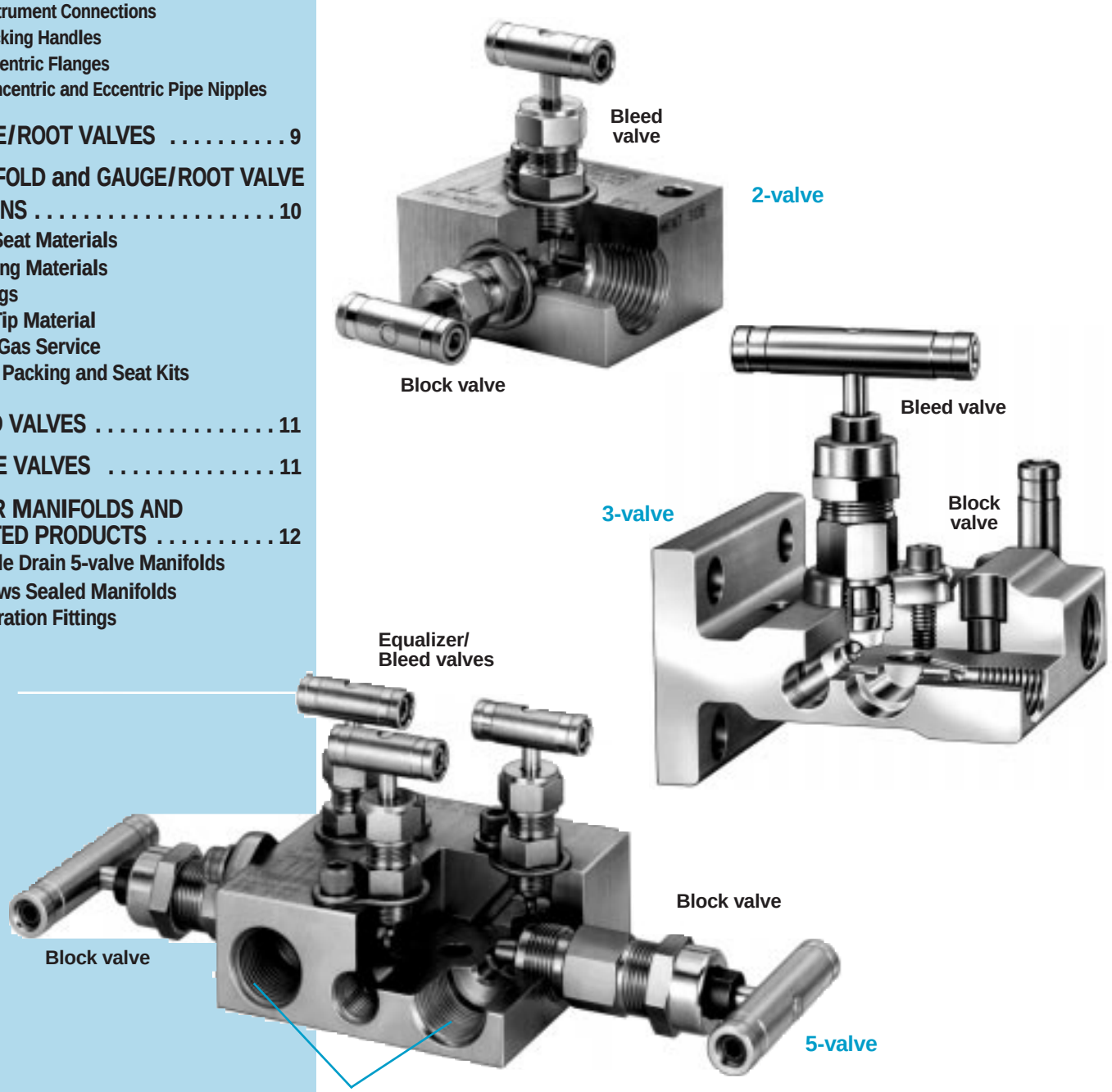
MANIFOLDS

MANIFOLDS

Features

- Pressure ratings are equivalent to ANSI B16.34 Class 2500.
- Manifolds are machined and cleaned to reduce the potential for seat leakage due to valve generated particulate.
- Each valve on every manifold is factory tested.
- Stainless steel bonnet lock plate restricts accidental valve disassembly.
- 4:1 burst factor
- Metal-to-metal bonnet-to-body seals eliminate need for O-rings.
- 316 stainless steel construction withstands heavy-duty service.
- Gageable female Swagelok® tube fitting, flange, and female NPT end connections are available for system versatility.
- Flange seals and bolts are included.
- Sour gas service option conforms to NACE standard MR0175.
- Manifolds with optional Grafoil® packing meet the external leakage requirements of fire testing to API 607.

Manifold Bodies



2 1/8 in. (54 mm) port centerline; to accommodate other centerlines, see Manifold Accessories/Options section on page 8.

Valve Designs

Features

2-valve manifold valves and 5-valve manifold equalizer/bleed valves

1 Rugged, stainless steel handle.

2 Rolled, hard chrome plated stem threads
- provide increased service life.

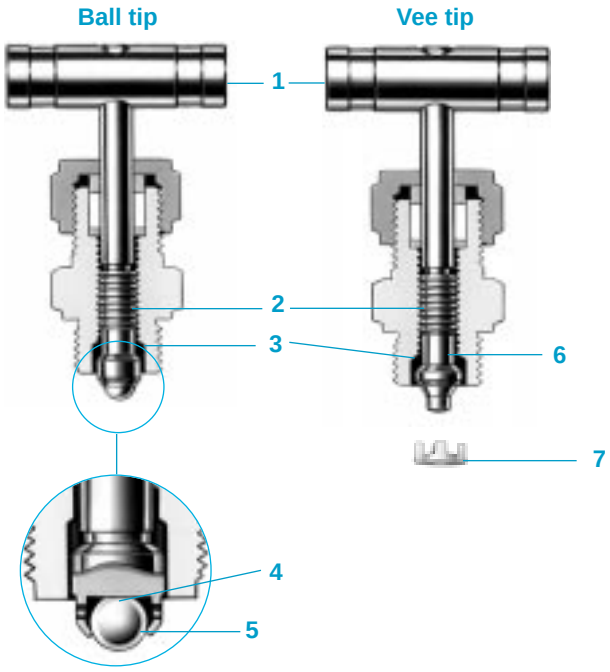
3 Safety back seating
- prevents stem blow-out
- provides secondary stem seal.

4 Ball flat bearing
- resists transverse rotation
- provides a consistent mating seal at the ball tip and valve seat.

5 Hardened 316 stainless steel ball tip
- does not rotate against seat upon closure
- promotes leak-tight shut-off
- is available in optional materials for system compatibility or severe service.

6 One piece stem
- provides backlash-free operation of valves, protecting gauges and instruments from a pressure surge.

7 Vee stem soft seat
- is replaceable for easy maintenance
- is available in a variety of materials.



3-valve manifold valves and 5-valve manifold block valves

1 Rugged, stainless steel handle.

2 Packing bolt
- permits packing adjustments in open or closed positions.

3 Rolled, hard chrome plated stem threads
- increase service life.

4 Packing below stem threads
- isolates stem threads from system fluid
- prevents lubricant washout.

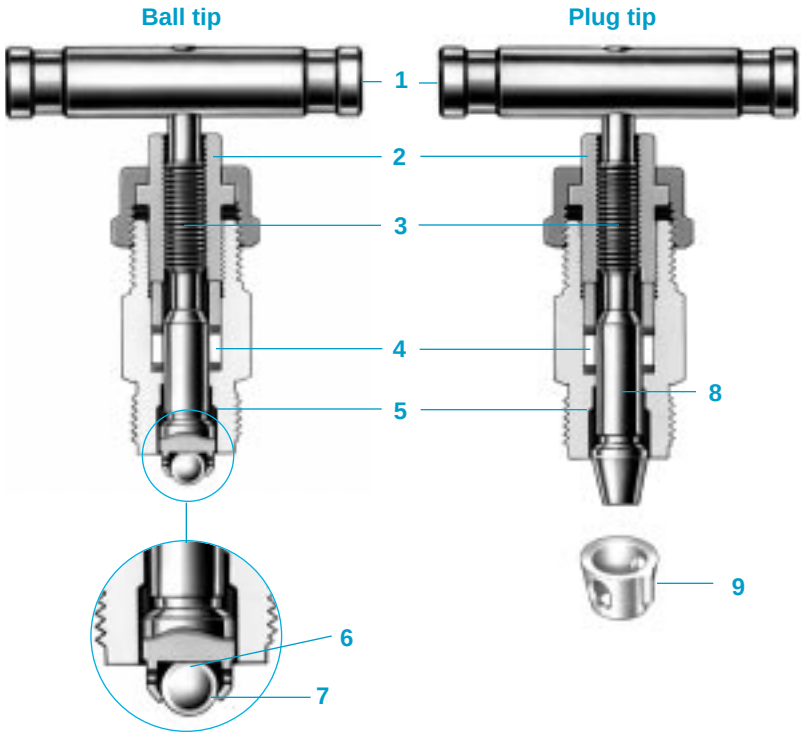
5 Safety back seating
- prevents stem blow-out
- provides secondary stem seal.

6 Ball flat bearing
- resists transverse rotation
- provides a consistent mating seal at the ball tip and valve seat.

7 Hardened 316 stainless steel ball tip
- does not rotate against seat upon closure
- promotes leak-tight shut-off
- is available in optional materials for system compatibility or severe service.

8 One piece stem
- provides backlash-free operation of valves, protecting gauges and instruments from a pressure surge.

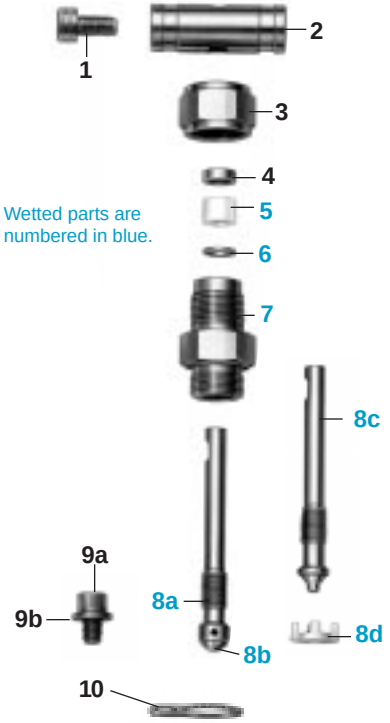
9 Plug tip seat
- offers full-flow 1/4 in. (6.4 mm) orifice which allows for excellent response
- is roddable to permit easy cleaning
- is replaceable for easy maintenance
- is available in a variety of materials for system compatibility.



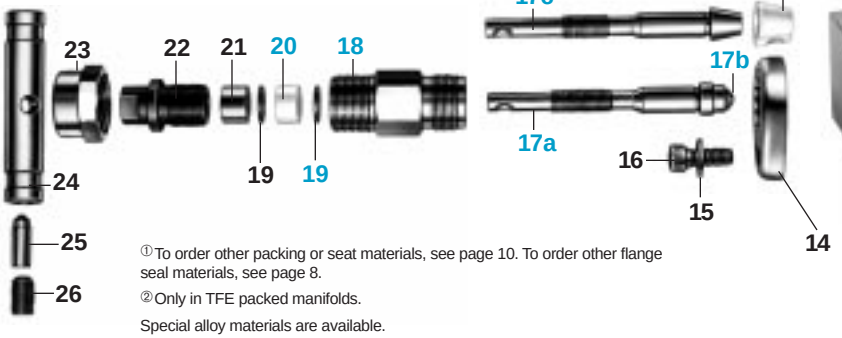
Materials of Construction

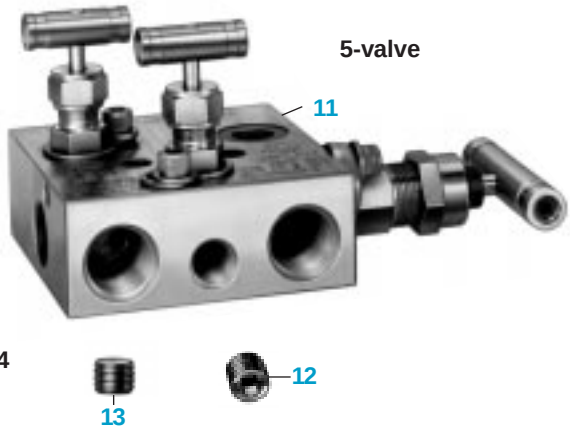
Materials for pressure containing wetted parts are selected from those listed in ANSI B31.1. The pressure-temperature ratings are consistent with ANSI B16.34 for standard class valves and are based on ANSI B16.34 Class 2500. Ratings for plug tip designs are based on specific seat materials. For additional information, see *Technical Bulletin no. 4*, *Valve Pressure - Temperature Ratings.*

	Component	Grade/ASTM Specifications		
		2-valve	5-valve	3-valve
2-valve manifold valves and 5-valve manifold equalizer/bleed valves	**1** cap screw	stainless steel		—
	2 handle			
	3 lock nut			
	4 upper gland			
	5 packing①	TFE/D1710 or Grafoil		
	6 lower gland	316SS		
	7 bonnet	316SS/A479		
	8a stem (ball tip)	316SS/A276		
	8b ball (ball tip)			
	8c stem (vee tip)			
	8d soft seat (vee tip)①	acetal/D4181		
	9a cap screw	stainless steel		
	9b washer			
	10 lock plate			
all manifolds	**11** manifold body	316SS/A479		
5-valve manifolds	**12** 1/4″ body pipe plugs (1/4″ hex key)	—	316SS/A276	
3-valve and 5-valve manifolds	**13** 1/4″ purge port plugs (2) (1/4″ hex key)			
3-valve manifold valves and 5-valve manifold block valves	**14** lock plate		stainless steel	
	15 washer			
	16 cap screw			
	17a stem (ball tip)		316SS/A276	
	17b ball (ball tip)			
	17c stem (plug tip)			
	17d soft seat (plug tip)①		acetal/D4181	
	18 bonnet		316SS/A479	
	19 packing supports②		reinforced TFE	
	20 packing①		TFE/D1710 or Grafoil	
	21 gland		stainless steel	
	22 packing bolt		416SS/A582	
	23 lock nut		stainless steel	
	24 handle			
	25 handle pin		17-4PH stainless steel	
	26 set screw			
flange ended manifolds	flange seal(s) (2)① (1 on 2-valve manifolds)	fluorocarbon FKM or Grafoil		
	bolts (4) (2 on 2-valve manifolds)	B8M/A193		
Lubrication: TFE packed manifolds: hydrocarbon base Grafoil packed manifolds: tungsten disulfide and fluorocarbon based				



Wetted parts are numbered in blue.





① To order other packing or seat materials, see page 10. To order other flange seal materials, see page 8.

② Only in TFE packed manifolds.

Special alloy materials are available.

Ordering Information/Technical Data

Manifolds assembled with fluorocarbon FKM flange seals have a minimum temperature rating of –20°F (–28°C).
All other manifolds have a minimum temperature rating of –65°F (–53°C).

Manifold Design	End Connection in.		Stem Tip	Seat	Packing	Flange Seals	Manifold Ordering Number	Orifice				Pressure Rating		Pressure Rating at Maximum Temperature④	
								Block Valves		Equalizer/ Bleed Valves					
	Process	Instrument						in.	mm	in.	mm	psig at 100°F	bar at 37°C	psig at °F	bar at °C
2-valve	1/2 female NPT		ball	integral 316SS	TFE	—	SS-M2BF8	0.125	3.2	0.125	3.2	6000	413	4130 at 450	284 at 232
					Grafoil		SS-M2BF8-G							3380 at 850	232 at 454
			vee		TFE		SS-M2VF8							4130 at 450	284 at 232
					Grafoil		SS-M2VF8-G							3380 at 850	232 at 454
			vee with soft seat	acetal②	TFE		SS-M2DVF8							4130 at 450	284 at 232
	1/2 female NPT	flange	ball	integral 316SS		FKM③	SS-M2BF8-FL								
					Grafoil	Grafoil	SS-M2BF8-FL-G							3760 at 600⑤	259 at 315⑤
			vee		TFE	FKM③	SS-M2VF8-FL							4130 at 450	284 at 232
					Grafoil	Grafoil	SS-M2VF8-FL-G							3760 at 600⑤	259 at 315⑤
			vee with soft seat	acetal②	TFE	FKM③	SS-M2DVF8-FL							4130 at 450	284 at 232
	1/2 female Swagelok tube fitting	flange	ball	integral 316SS			SS-M2BFS8-FL								
					Grafoil	Grafoil	SS-M2BFS8-FL-G							3760 at 600⑤	259 at 315⑤
			vee		TFE	FKM③	SS-M2VFS8-FL							4130 at 450	284 at 232
					Grafoil	Grafoil	SS-M2VFS8-FL-G							3760 at 600⑤	259 at 315⑤
			vee with soft seat	acetal②	TFE	FKM③	SS-M2DVFS8-FL							4130 at 450	284 at 232
3-valve①	flange		ball	integral 316SS	TFE	FKM③	SS-M3NBFL	0.141	3.6	0.141	3.6	6000	413	4130 at 450	284 at 232
					Grafoil	Grafoil	SS-M3NBFL-G							3760 at 600⑤	259 at 315⑤
			plug	acetal②	TFE	FKM③	SS-M3PDFL	0.250	6.4	0.250	6.4			1000 at 250	68 at 121
	1/2 female NPT		ball	integral 316SS			SS-M3NBF8	0.141	3.6	0.141	3.6			4130 at 450	284 at 232
					Grafoil	—	SS-M3NBF8-G							1715 at 1200	118 at 648
			plug	acetal②	TFE		SS-M3PDF8	0.250	6.4	0.250	6.4			1000 at 250	68 at 121
	1/2 female NPT	flange	ball	integral 316SS		FKM③	SS-M3NBF8-FL	0.141	3.6	0.141	3.6			4130 at 450	284 at 232
					Grafoil	Grafoil	SS-M3NBF8-FL-G							3760 at 600⑤	259 at 315⑤
			plug	acetal②	TFE	FKM③	SS-M3PDF8-FL	0.250	6.4	0.250	6.4			1000 at 250	68 at 121
	3/8 female Swagelok tube fitting	flange	ball	integral 316SS			SS-M3NBFS6-FL	0.141	3.6	0.141	3.6			4130 at 450	284 at 232
					Grafoil	Grafoil	SS-M3NBFS6-FL-G							3760 at 600⑤	259 at 315⑤
			plug	acetal②	TFE	FKM③	SS-M3PDFS6-FL	0.250	6.4	0.250	6.4			1000 at 250	68 at 121
	1/2 female Swagelok tube fitting	flange	ball	integral 316SS			SS-M3NBFS8-FL	0.141	3.6	0.141	3.6			4130 at 450	284 at 232
					Grafoil	Grafoil	SS-M3NBFS8-FL-G							3760 at 600⑤	259 at 315⑤
			plug	acetal②	TFE	FKM③	SS-M3PDFS8-FL	0.250	6.4	0.250	6.4			1000 at 250	68 at 121
	1/2 female Swagelok tube fitting		ball	integral 316SS			SS-M3NBFS8	0.141	3.6	0.141	3.6			4130 at 450	284 at 232
					Grafoil	—	SS-M3NBFS8-G							1715 at 1200	118 at 648
			plug	acetal②	TFE		SS-M3PDFS8	0.250	6.4	0.250	6.4			1000 at 250	68 at 121
5-valve①	1/2 female NPT		ball	integral 316SS	TFE	—	SS-M5NBF8	0.156	4.0	0.125	3.2	6000	413	4130 at 450	284 at 232
					Grafoil		SS-M5NBF8-G							3380 at 850	232 at 454
			plug	acetal②	TFE		SS-M5PDF8	0.250	6.4	0.250	6.4			4130 at 450	284 at 232
	1/2 female NPT	flange	ball	integral 316SS		FKM③	SS-M5NBF8-FL	0.156	4.0	0.125	3.2				
					Grafoil	Grafoil	SS-M5NBF8-FL-G							3760 at 600⑤	259 at 315⑤
			plug	acetal②	TFE	FKM③	SS-M5PDF8-FL	0.250	6.4	0.250	6.4			4130 at 450	284 at 232
	1/2 female Swagelok tube fitting		ball	integral 316SS			SS-M5NBFS8	0.141	3.6	0.125	3.2				
					Grafoil	—	SS-M5NBFS8-G							3380 at 850	232 at 454
			plug	acetal②	TFE		SS-M5PDFS8	0.250	6.4	0.250	6.4			4130 at 450	284 at 232

①Vent port connections are 1/2 in. female NPT on pipe to pipe manifolds, and 1/4 in. female NPT on pipe to flange and female Swagelok to flange manifolds.

②250°F (121°C) is an allowable temperature rating for fluids compatible with acetal. Acetal is rated to 200°F (93°C) with water and steam.

③Fluorocarbon FKM

④Extreme or rapid temperature fluctuations may require packing bolt adjustments to maintain a leak free seal.

⑤Rating is for liquid service. For light gas service the rating is 4130 psig at 450°F (284 bar at 232°C).

Approximate Manifold Weight

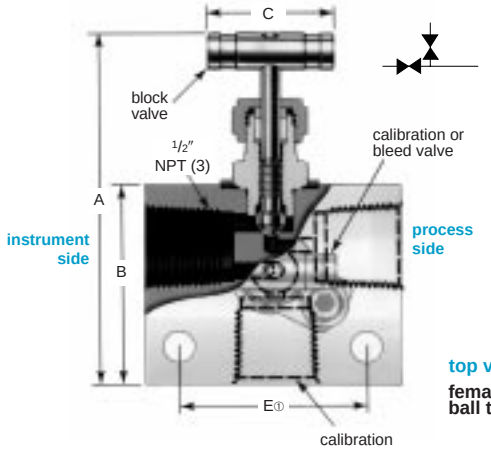
Type	lb	kg
2-valve	2	0.9
3- and 5-valve	5	2.25

Testing

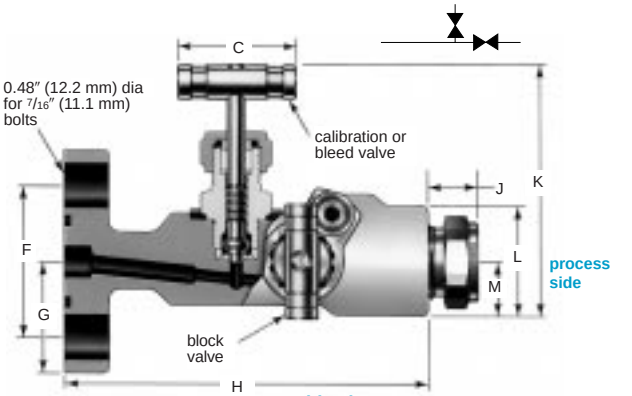
Standard Production Test – Each valve on every manifold is factory tested with nitrogen at 1000 psig (68 bar). The test is performed to a maximum allowable leak rate of 0.1 std cm^3/min at the seat. The packing and body seals are tested for no visible leakage using a liquid leak detector. Optional testing is available upon request.

Dimensions

2-valve

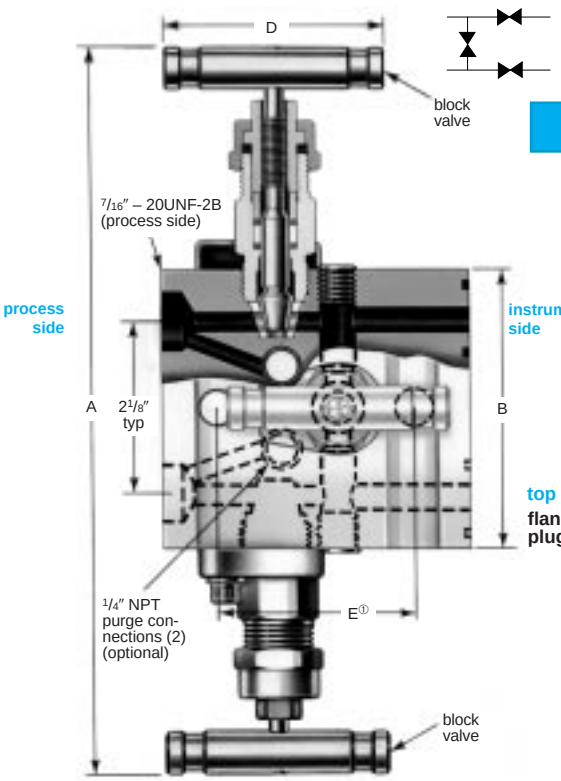


top view
female NPT to female NPT ball tip

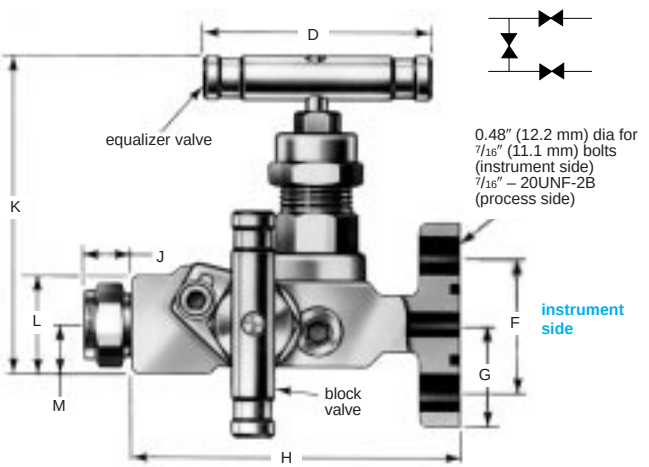


side view
female Swagelok to flange vee tip with soft seat

3-valve

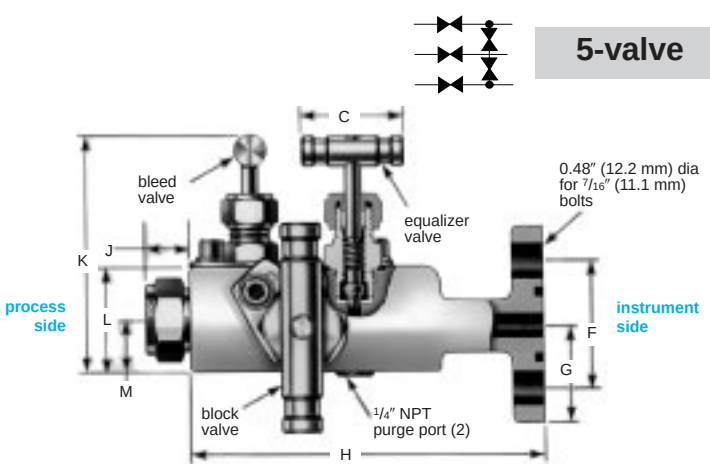


top view
flange to flange plug tip

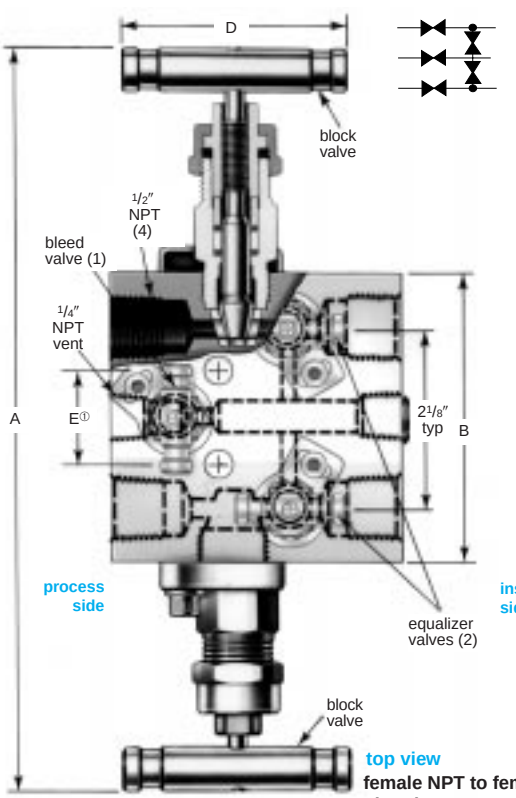


side view
female Swagelok to flange

5-valve



side view
female Swagelok to flange vee tip with soft seat



top view
female NPT to female NPT plug tip

① 11/32 in. (8.73 mm) dia mounting holes (2)

Dimensions are for reference only, subject to change.

Ordering Information/Dimensions

Manifold Design	End Connection in. Process	End Connection in. Instrument	Stem Tip	Manifold Ordering Number①	Dimensions, Inches (mm) A Open	B	C	D	E②	F	G	H	J	K Open	L	M
2-valve	½ female NPT		ball	SS-M2BF8	3.75 (95.3)	2.03 (51.6)	1.25 (31.8)	—	1.88 (47.8)	—	—	2.50 (63.5)	—	3.06 (77.7)	1.31 (33.3)	0.63 (16.0)
				SS-M2BF8-G												
			vee	SS-M2VF8	3.81 (96.8)									3.09 (78.5)		
				SS-M2VF8-G												
			vee with soft seat	SS-M2DVF8												
	½ female NPT	flange	ball	SS-M2BF8-FL	3.38 (85.6)	1.63 (41.4)				1.63 (41.4)	1.22 (31.0)	3.81 (96.8)	—	2.78 (70.6)	1.13 (28.7)	0.56 (14.2)
				SS-M2BF8-FL-G												
			vee	SS-M2VF8-FL	3.44 (87.4)									2.84 (72.1)		
				SS-M2VF8-FL-G												
			vee with soft seat	SS-M2DVF8-FL												
	½ female Swagelok tube fitting	flange	ball	SS-M2BFS8-FL	3.38 (85.6)								0.50 (12.7)	2.78 (70.6)		
				SS-M2BFS8-FL-G												
			vee	SS-M2VFS8-FL	3.44 (87.4)									2.84 (72.1)		
				SS-M2VFS8-FL-G												
			vee with soft seat	SS-M2DVFS8-FL												
3-valve③	flange		ball	SS-M3NBFL	8.94 (227)	3.39 (86.1)	—	2.50 (63.5)	2.19 (55.6)	1.63 (41.4)	1.22 (31.0)	3.75 (95.3)	—	3.65 (92.7)	—	0.56 (14.2)
				SS-M3NBFL-G												
			plug	SS-M3PDFL	9.19 (233)									4.00 (102)		
	½ female NPT		ball	SS-M3NBF8	8.94 (227)				1.13 (28.7)	—	—	3.09 (78.5)			1.31 (33.3)	
				SS-M3NBF8-G												
			plug	SS-M3PDF8	9.19 (233)									4.39 (111)		
	½ female NPT	flange	ball	SS-M3NBF8-FL	8.94 (227)				2.19 (55.6)	1.63 (41.4)	1.22 (31.0)	3.81 (96.8)		3.65 (92.7)	1.13 (28.7)	
				SS-M3NBF8-FL-G												
			plug	SS-M3PDF8-FL	9.19 (233)									4.00 (102)		
	⅜ female Swagelok tube fitting	flange	ball	SS-M3NBFS6-FL	8.94 (227)									3.65 (92.7)		
				SS-M3NBFS6-FL-G												
			plug	SS-M3PDFS6-FL	9.19 (233)									4.00 (102)		
	½ female Swagelok tube fitting	flange	ball	SS-M3NBFS8-FL	8.97 (228)								0.56 (14.2)	3.65 (92.7)		
				SS-M3NBFS8-FL-G												
			plug	SS-M3PDFS8-FL	9.19 (233)									4.00 (102)		
	½ female Swagelok tube fitting		ball	SS-M3NBFS8	8.94 (227)				1.13 (28.7)	—	—	3.38 (85.9)			1.31 (33.3)	
				SS-M3NBFS8-G												
			plug	SS-M3PDFS8	9.19 (233)									4.37 (111)		
5-valve	½ female NPT		ball	SS-M5NBF8	8.94 (227)	3.38 (85.8)	1.25 (31.8)	2.50 (63.5)	1.13 (28.7)	—	—	3.44 (87.4)	—	3.06 (77.7)	0.94 (23.9)	0.58 (14.7)
				SS-M5NBF8-G												
			plug	SS-M5PDF8	9.19 (233)									3.13 (79.5)		
	½ female NPT	flange	ball	SS-M5NBF8-FL	8.94 (227)					1.63 (41.4)	1.22 (31.0)	4.47 (114)		3.09 (78.5)		0.56 (14.2)
				SS-M5NBF8-FL-G												
			plug	SS-M5PDF8-FL	9.19 (233)									3.16 (80.3)		
	½ female Swagelok tube fitting		ball	SS-M5NBFS8	8.94 (227)					—	—	3.38 (85.9)	0.56 (14.2)	3.06 (77.7)		0.58 (14.7)
				SS-M5NBFS8-G												
			plug	SS-M5PDFS8	9.19 (233)									3.13 (79.5)		

Dimensions are for reference only, subject to change.

Dimensions shown with Swagelok nuts finger-tight where applicable.

①For more Ordering Information, see page 5.

②11/32 in. (8.73 mm) diameter mounting holes (2).

③To order Bottom Purge Ports, see Manifold Accessories/Options page 8.

Ordering Information/Dimensions

Manifold Design	End Connection in. Process	End Connection in. Instrument	Stem Tip	Manifold Ordering Number①	Dimensions, Inches (mm) A Open	B	C	D	E②	F	G	H	J	K Open	L	M
2-valve	½ female NPT		ball	SS-M2BF8	3.75 (95.3)	2.03 (51.6)	1.25 (31.8)	—	1.88 (47.8)	—	—	2.50 (63.5)	—	3.06 (77.7)	1.31 (33.3)	0.63 (16.0)
				SS-M2BF8-G												
			vee	SS-M2VF8	3.81 (96.8)									3.09 (78.5)		
				SS-M2VF8-G												
			vee with soft seat	SS-M2DVF8												
	½ female NPT	flange	ball	SS-M2BF8-FL	3.38 (85.6)	1.63 (41.4)				1.63 (41.4)	1.22 (31.0)	3.81 (96.8)	—	2.78 (70.6)	1.13 (28.7)	0.56 (14.2)
				SS-M2BF8-FL-G												
			vee	SS-M2VF8-FL	3.44 (87.4)									2.84 (72.1)		
				SS-M2VF8-FL-G												
			vee with soft seat	SS-M2DVF8-FL												
	½ female Swagelok tube fitting	flange	ball	SS-M2BFS8-FL	3.38 (85.6)								0.50 (12.7)	2.78 (70.6)		
				SS-M2BFS8-FL-G												
			vee	SS-M2VFS8-FL	3.44 (87.4)									2.84 (72.1)		
				SS-M2VFS8-FL-G												
			vee with soft seat	SS-M2DVFS8-FL												
3-valve③	flange		ball	SS-M3NBFL	8.94 (227)	3.39 (86.1)	—	2.50 (63.5)	2.19 (55.6)	1.63 (41.4)	1.22 (31.0)	3.75 (95.3)	—	3.65 (92.7)	—	0.56 (14.2)
				SS-M3NBFL-G												
			plug	SS-M3PDFL	9.19 (233)									4.00 (102)		
	½ female NPT		ball	SS-M3NBF8	8.94 (227)				1.13 (28.7)	—	—	3.09 (78.5)			1.31 (33.3)	
				SS-M3NBF8-G												
			plug	SS-M3PDF8	9.19 (233)									4.39 (111)		
	½ female NPT	flange	ball	SS-M3NBF8-FL	8.94 (227)				2.19 (55.6)	1.63 (41.4)	1.22 (31.0)	3.81 (96.8)		3.65 (92.7)	1.13 (28.7)	
				SS-M3NBF8-FL-G												
			plug	SS-M3PDF8-FL	9.19 (233)									4.00 (102)		
	⅜ female Swagelok tube fitting	flange	ball	SS-M3NBFS6-FL	8.94 (227)									3.65 (92.7)		
				SS-M3NBFS6-FL-G												
			plug	SS-M3PDFS6-FL	9.19 (233)									4.00 (102)		
	½ female Swagelok tube fitting	flange	ball	SS-M3NBFS8-FL	8.97 (228)								0.56 (14.2)	3.65 (92.7)		
				SS-M3NBFS8-FL-G												
			plug	SS-M3PDFS8-FL	9.19 (233)									4.00 (102)		
	½ female Swagelok tube fitting		ball	SS-M3NBFS8	8.94 (227)				1.13 (28.7)	—	—	3.38 (85.9)			1.31 (33.3)	
				SS-M3NBFS8-G												
			plug	SS-M3PDFS8	9.19 (233)									4.37 (111)		
5-valve	½ female NPT		ball	SS-M5NBF8	8.94 (227)	3.38 (85.8)	1.25 (31.8)	2.50 (63.5)	1.13 (28.7)	—	—	3.44 (87.4)	—	3.06 (77.7)	0.94 (23.9)	0.58 (14.7)
				SS-M5NBF8-G												
			plug	SS-M5PDF8	9.19 (233)									3.13 (79.5)		
	½ female NPT	flange	ball	SS-M5NBF8-FL	8.94 (227)					1.63 (41.4)	1.22 (31.0)	4.47 (114)		3.09 (78.5)		0.56 (14.2)
				SS-M5NBF8-FL-G												
			plug	SS-M5PDF8-FL	9.19 (233)									3.16 (80.3)		
	½ female Swagelok tube fitting		ball	SS-M5NBFS8	8.94 (227)					—	—	3.38 (85.9)	0.56 (14.2)	3.06 (77.7)		0.58 (14.7)
				SS-M5NBFS8-G												
			plug	SS-M5PDFS8	9.19 (233)									3.13 (79.5)		

Dimensions are for reference only, subject to change.

Dimensions shown with Swagelok nuts finger-tight where applicable.

①For more Ordering Information, see page 5.

②11/32 in. (8.73 mm) diameter mounting holes (2).

③To order Bottom Purge Ports, see Manifold Accessories/Options page 8.

Manifold Accessories/Options

Flange Seal and Bolt Kits

Kits contain the necessary number of flange seals, 316SS bolts, lubricant, and assembly instructions. To order, see the chart below.

Flange Seal Material	Kit Ordering Number		Flange Seal Lubricant	Flange Seal Ratings		Part Number Designator
	2-valve Manifold	3 and 5-valve Manifolds		°F	°C	
fluorocarbon FKM	SS-MK-M2V	SS-MK-M3V	silicone base	– 20 to 450	– 28 to 232	—
Grafoil	SS-MK-M2G	SS-MK-M3G		– 65 to 600①	– 53 to 315①	– G
PEEK	SS-MK-M2PK	SS-MK-M3PK	fluorocarbon base	– 65 to 600②	– 53 to 315②	– PK
virgin TFE	SS-MK-M2R	SS-MK-M3R	silicone base	– 65 to 250	– 53 to 121	– T
reinforced TFE	SS-MK-M2T	SS-MK-M3T				– TRL

Universal Mounting Bracket Kit

Kit contains stainless steel bracket, U-bolts, cap screws, nuts, lock washers, and instructions.

Ordering Number: **SS-MB-MBK**

Steam-Trace Block Kit

Includes 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.

Ordering Numbers:

S-MB-M3SK (3-valve manifolds with flange ends)

S-MB-M5SK (all 3- and 5-valve manifolds without flange ends)

Bottom Purge Ports (process side) (3-valve manifolds)

Ports are 1/4 in. female NPT. Available on 3-valve manifolds with these connections:

- flange to flange
- pipe to flange
- Swagelok to flange
- Swagelok to Swagelok

To order, add **-XB** as a suffix to the manifold Ordering Number.

Example: SS-M3NBF8-FL-**XB**

Swagelok Long Reducer

The Swagelok long reducer permits connections of 3/8 in. tubing to manifolds with 1/2 in. tubing connections.

Locking Handles

These handles lock out manifold block valves during instrument commissioning, decommissioning, or system maintenance. They fit all valves on 3-valve manifolds and block valves on 5-valve manifolds.
To order, add **-LH** as a suffix to the manifold Ordering Number.

Example: SS-M3NBF8-FL-**LH**

Instrument Connections

The options described below are available on flange ended manifolds.

Longer Bolt Option for mounting manifolds to coplanar differential pressure instruments

To order, add **-LGB** as a suffix to the manifold Ordering Number.
Example: SS-M3NBF8-FL-**LGB** (includes longer mounting bolts)
2- and 5- valve manifolds are modified to accomodate longer bolts, resulting in a decreased maximum pressure rating.
2750 psig at 100°F (189 bar at 37°C)
2000 psig at 450°F (137 bar at 232°C)
Ratings for 3-valve manifolds remain unchanged.

Centerline option

The mounting holes on the instrument flange are elongated to allow centerline installations between 2 1/8 in. and 2 1/4 in. This option is available on 3- and 5-valve manifolds. These manifolds have a maximum pressure ratings of:
3600 psig at 100°F (248 bar at 37°C)
2480 psig at 450°F (170 bar at 232°C)

To order, add **-EH** as a suffix to the manifold Ordering Number.

Example: SS-M5NBF8-FL-**EH**

Eccentric Flanges

Eccentric flanges are available with Swagelok tube fittings, pipe butt weld, or Female NPT end connections in stainless steel and carbon steel. The connection is offset 1/16 in. from the bolt hole centerline.

Concentric and Eccentric Pipe Nipples

Concentric and eccentric pipe nipples are used with eccentric flanges to adapt to different flange tap spacings. The ends of the eccentric nipples are offset 1/16 in. from the centerline. They have 1/2 in. male NPT ends and are available in 316 stainless steel.

For additional information on eccentric flanges and concentric and eccentric pipe nipples, see *Manifold Accessories catalog, MS-02-49.*

① Rating is for liquid service. For light gas service, the rating is –65°F to 450°F (–53°C to 232°C).

② Rating is for liquid service. For light gas service, the rating is –65°F to 550°F (–53°C to 287°C).

Manifolds assembled with Grafoil packing and flange seals meet the external leakage requirements of fire testing to API 607.

GAUGE/ROOT VALVES

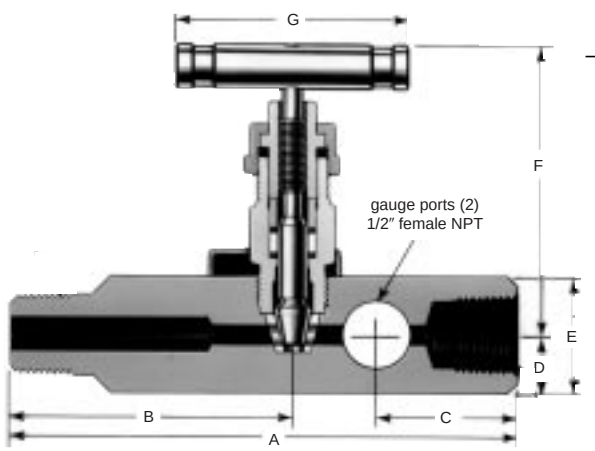
Gauge/Root valves simplify the installation of pressure switches, gauges, and differential pressure transmitters. Multiple outlets can accommodate a variety of gauge positions and handle orientations. Gauge/root valves facilitate the construction of block-and-bleed assemblies where a purge valve, sampling line, or a test pressure source is required.

Features

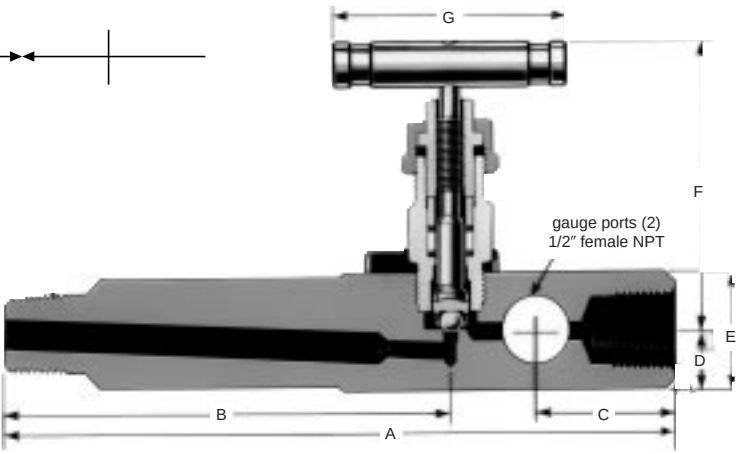
- Each valve is factory tested.
- Pressure ratings are equivalent to ANSI B16.34 Class 2500.
- Sour gas service option conforms to NACE standard MR0175.
- 316 stainless steel construction.
- Metal-to-metal bonnet-to-body seals eliminate the need for O-rings.
- Valves are machined and cleaned to reduce the potential of seat leakage due to valve generated particulate.
- Stainless steel bonnet lock plate prevents unintentional valve disassembly.
- Lagging extension body provides insulation clearance (ball tip design).
- Schedule 160 pipe wall or heavier on valve inlet fitting.
- Roddable plug tip design.
- Gauge/root valves assembled with Grafoil packing meet the external leakage requirements of fire testing to API 607.
- 4:1 burst factor

Materials of Construction

Gauge/root valves utilize the same components as those listed on page 4 for 3-valve manifolds.



Plug tip valve and short body



Non-rotating ball tip valve and lagging extension body

Technical Data/Dimensions/Ordering Information

Materials for pressure containing wetted parts are selected from those listed in ANSI B31.1. The pressure-temperature ratings are consistent with ANSI B16.34 for standard class valves and are based on ANSI B16.34 Class 2500. Ratings for plug tip designs are based on specific seat materials. For additional information, see *Technical Bulletin no. 4, Valve Pressure - Temperature Ratings.*

Inlet in.	Outlet in.	Stem Tip	Seat	Packing	Ordering Number	Orifice		Pressure Rating		Pressure Rating at Maximum Temperature③		Dimensions, Inches (mm)						
						in.	mm	psig at 100°F	bar at 37°C	psig at °F	bar at °C	A	B	C	D	E	F	G
1/2 male NPT	1/2 female NPT	ball	integral 316SS	TFE	SS-6PNBGM8-F8	0.156	4.0	6000	413	4130 at 450	284 at 232	5.38 (137)	2.97 (75.4)	1.50 (38.1)	0.63 (16.0)	1.25 (31.8) square	3.56 (90.4)	2.50 (63.5)
				Grafoil	SS-6PNBGM8-F8-G					1715 at 1200	118 at 648							
				TFE	SS-6PNBGM8L-F8②					4130 at 450	284 at 232	7.25 (184)	4.88 (124)				3.38 (85.9)	
				Grafoil	SS-6PNBGM8L-F8-G②					1715 at 1200	118 at 648							
		plug	acetal①	TFE	SS-6PNDGM8-F8	0.250	6.4			1000 at 250	68 at 121	5.38 (137)	2.97 (75.4)				3.56 (90.4)	
3/4 male NPT	1/2 female NPT	ball	integral 316SS	TFE	SS-6PNBGM12-F8	0.156	4.0			4130 at 450	284 at 232							
				Grafoil	SS-6PNBGM12-F8-G					1715 at 1200	118 at 648							
		plug	acetal①	TFE	SS-6PNDGM12-F8	0.250	6.4			1000 at 250	68 at 121							
		ball	integral 316SS	TFE	SS-6PNBGM12L-F8②	0.156	4.0			4130 at 450	284 at 232	7.25 (184)	4.88 (124)				3.38 (85.9)	
				Grafoil	SS-6PNBGM12L-F8-G②					1715 at 1200	118 at 648							

Dimensions are for reference only, subject to change.

① 250°F (121°C) is an allowable temperature rating for fluids compatible with acetal. Acetal has a temperature rating of 200°F (93°C) with water and steam.

② Valve has a lagging extension body [approximately 4.0 in. (102 mm)] for insulation clearance.

③ Extreme or rapid temperature fluctuations may require packing bolt adjustment to maintain a leak free enclosure.

MANIFOLD and GAUGE/ROOT VALVE OPTIONS

Packing Materials

PEEK packing with ball tip stem

Add **-PK** as a suffix to the Ordering Number.
Examples: SS-M3NBF8**-PK**
SS-6PNBGM8-F8**-PK**

UHMWPE packing with ball, plug, or vee tip stem

Add **-P** as a suffix to the Ordering Number.
Examples: SS-M3NBF8**-P**
SS-6PNBGM8-F8**-P**

Soft Seat Materials

for use with vee or plug tip stems

PEEK and PFA

Replace the D in the Ordering Number with
P for PEEK
T for PFA.
Examples: SS-M3P**P**F8
SS-6PN**P**GM8-F8

Manifold Ratings

Product	Seat	Packing	Flange Seal (if applicable)	Pressure Rating at Maximum Temperature		Pressure at 100°F (37°C)	
				psig at °F	bar at °C	psig	bar
2-valve manifolds	316SS	PEEK	PEEK	3760 at 600	259 at 315	6000	413
	316SS	TFE	FKM①	4130 at 450	284 at 232	6000	413
	316SS	UHMWPE	PEEK	4910 at 250	338 at 121	6000	413
	acetal③	UHMWPE	PEEK	2500 at 250④	172 at 121④	6000	413
	PEEK	PEEK	PEEK	200 at 600②	13 at 315②	6000	413
	PEEK	UHMWPE	PEEK	1600 at 250	110 at 121	6000	413
	PFA	TFE	FKM①	1500 at 250	103 at 121	6000	413
	PFA	UHMWPE	PEEK	1500 at 250	103 at 121	6000	413
3 and 5-valve manifolds, Gauge Root	316SS	PEEK	PEEK	3760 at 600	259 at 315	6000	413
	316SS	TFE	FKM①	4130 at 450	284 at 232	6000	413
	316SS	UHMWPE	PEEK	4910 at 250	338 at 121	6000	413
	acetal③	UHMWPE	PEEK	1000 at 250③	68 at 121③	6000	413
	PEEK	PEEK	PEEK	200 at 600②	13 at 315②	6000	413
	PEEK	UHMWPE	PEEK	1600 at 250	110 at 121	6000	413
	PFA	TFE	FKM①	100 at 400	6.8 at 204	750	51
	PFA	UHMWPE	PEEK	450 at 250	31 at 121	750	51

Sour Gas Service

Materials are selected in accordance with NACE Standard MR0175 requirements for sulfide stress cracking resistant materials. Stems are alloy 400. Wetted 316 stainless steel parts are annealed.

Add **-SG** as a suffix to the Ordering Number.
Examples: SS-M3NBF8**-SG**
SS-6PNBGM8-F8**-SG**

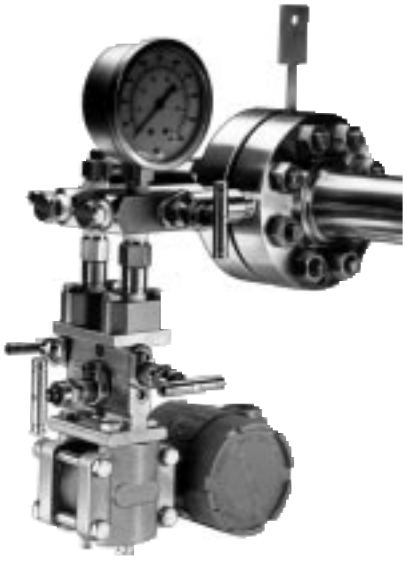
For information on the use of stainless steel instrument tube fittings in sour gas service, see the NACE MR0175 Specification.

Stellite Ball Tip Material

Add **-STE** as a suffix to the Ordering Number.
Examples: SS-M3NBF8**-STE**
SS-6PNBGM8-F8**-STE**

Stem Packing and Seat Kits

Available from your Swagelok representative.



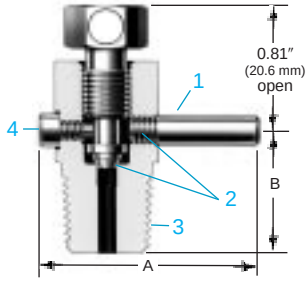
① Fluorocarbon FKM
② Rating is for liquid service. For gas service (flange ended manifolds), the rating is 400 psig at 550°F (27 bar at 287°C).
③ Acetal homopolymer
④ 250°F (121°C) is an allowable temperature rating for fluids compatible with acetal. Acetal is rated to 200°F (93°C) with water and steam.

BV SERIES BLEED VALVES and P SERIES PURGE VALVES

BV series bleed valves and P series purge valves are manual bleed, vent, or drain valves. They can be used to vent signal line pressure to atmosphere before removal of an instrument or to assist in calibration of control devices.

Caution: When installing a BV series bleed valve or P series purge valve, *position the vent tube/hole so that system fluid is directed **away** from operating personnel. The vent hole on the purge valve rotates with the cap, changing the direction of discharge as the cap is turned. **Always open bleed or purge valves slowly.*** These valves contain **no packing**, therefore some fluid weepage will occur when the valves are opened. Operating personnel ***must*** take suitable measures to protect themselves from exposure to system fluids.

Dimensions



1 Vent tube directs excess liquid or gas from system lines.

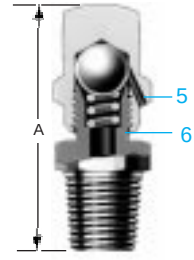
2 Chrome plated stem threads and stem tip extend valve cycle life.

3 Male NPT and SAE end connections allow installation into a variety of systems.

4 Back stop screw prevents accidental disassembly of stem.

5 Vent hole bleeds excess liquid or gas from system lines.

6 Cap is crimped to valve body preventing accidental disassembly.



Bleed Valves

Inlet		Outlet		Basic Ordering Number	Dimensions, Inches (mm)	
Type	Size	Type	Size		A	B
male NPT	1/8	tube stub	3/16	-BVM2	1.38 (35.1)	0.75 (19.1)
	1/4			-BVM4		
	3/8			-BVM6	1.50 (38.1)	0.88 (22.4)
	1/2			-BVM8		
male ISO tapered	1/4			-BVM4RT	1.38 (35.1)	0.75 (19.1)
	1/2			-BVM8RT	1.50 (38.1)	0.94 (23.9)
male SAE/J514 7/16-20①	1/4			-BVST4	1.38 (35.1)	1.06 (26.9)
male SAE/J514 3/4-16①	1/2			-BVST8	1.50 (38.1)	0.63 (16.0)

Purge Valves

Inlet		Basic Ordering Number	Dimensions, Inches (mm)
Type	Size		A
fractional Swagelok tube fitting	1/8	-4P-2	1.84 (46.7)
	1/4	-4P-4	1.94 (49.3)
	3/8	-4P-S6	2.03 (51.6)
	1/2	-4PS8	2.19 (55.6)
metric Swagelok tube fitting	6 mm	-4PS6MM	1.97 (50.0)
	8 mm	-4PS8MM	
female NPT	1/8	-4PF2	1.56 (39.6)
	1/4	-4P-4F	1.72 (43.7)
	3/8	-4PF6	1.81 (46.0)
	1/2	-4PF8	1.97 (50.0)
male NPT	1/8	-4P-2M	1.62 (41.1)
	1/4	-4P-4M	1.81 (46.0)
	3/8	-4P-6M	1.84 (46.7)
	1/2	-4PM8	2.09 (53.1)
male SAE/J514 7/16-20①	1/4	-4PST4	1.66 (42.2)
male SAE/J514 9/16-18①	3/8	-4PST6	1.72 (43.7)
male SAE/J514 3/4-16①	1/2	-4PST8	1.81 (46.0)
tube adapter	1/4	-4P-4T	1.88 (47.8)
	3/8	-4PT6	1.94 (49.3)
	1/2	-4PT8	2.16 (54.9)

Note: Dimensions shown with Swagelok nuts finger-tight, where applicable.

How to Order

Add **SS** for 316 stainless steel, **S** for carbon steel, **B** for brass, or **M** for alloy 400 (bleed valves are not available in brass), as a prefix to the Basic Ordering Number.
Example: **SS-**BVM4

Bleed and purge valves are available in alloy 400.

Dimensions are for reference only, subject to change.

Materials of Construction

Bleed valves

316 stainless steel and carbon steel; carbon steel bodies are zinc plated.

Purge valves

316 stainless steel, brass, and carbon steel.

Technical Data

Bleed Valves

Body Material	Temperature Range		Pressure Rating	
	°F	°C	psig at 100°F	bar at 37°C
316SS	– 65 to 850	– 53 to 454	10 000②	689②
carbon steel	– 20 to 450	– 28 to 232		

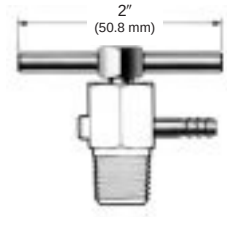
Purge Valves

Body Material	Temperature Range		Pressure Rating	
	°F	°C	psig at 100°F	bar at 37°C
316SS	– 65 to 600	– 53 to 315	4000	275
brass	– 65 to 400	– 53 to 204	3000	206
carbon steel	– 65 to 350	– 53 to 176		

Testing

Bleed Valve

Every bleed valve is tested with nitrogen at 100 psig (68 bar) for no visible leakage at the seat using a liquid leak detector.



Options

Bleed Valve

Stainless Steel Handle

Add **-SH** as a suffix to the valve Ordering Number. Example: SS-BVM4**-SH**

Barbed Vent Tube (3/16″ OD)

Add **-C3** as a suffix to the valve Ordering Number. Example SS-BVM4**-C3**

Purge Valve

TFE Ball

TFE ball shuts off leak-tight with little effort. The cap is removable for easy ball replacement. Maximum pressure rating is 200 psig at 100°F (13 bar at 37°C). Maximum temperature is 350°F (176°C). Add -TFE as a suffix to the valve Ordering Number. Example: SS-4P4M**-TFE**

① Adapts to SAE straight thread boss and MS16142 boss; male SAE bodies are supplied with a fluorocarbon FKM O-ring.

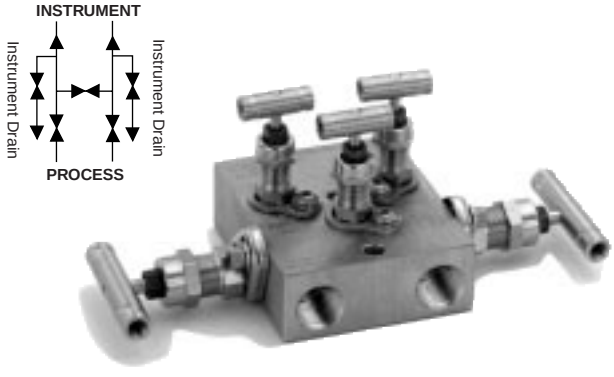
② Valves with SAE end connections have a maximum pressure rating of 9100 psig (627 bar).

OTHER MANIFOLDS and RELATED PRODUCTS

Double Drain 5-valve Manifolds

The MB5-valve manifold is a standard 3-valve manifold equipped with two additional integral instrument drain valves. The compact design allows safe bleeding and calibration of differential pressure instruments. The MB5 manifold can reduce installation costs and the number of potential leak points in typical instrument control loop systems. Features, Materials of Construction, Technical Data, and Dimensions are the same as standard 5-valve manifolds.

To order, replace the M5 with **MB5** in the manifold Ordering Number. Example: SS-**MB5**NBF8



Calibration Fittings

Swagelok tube fittings speed transmitter calibration by reducing the number of steps in the traditional calibration process.

Bellows Sealed Manifolds

3-and 5-valve manifolds featuring bellows sealed valves are available, where packless valves are preferred.

Delrin – TM DuPont
Grafoil – TM Union Carbide
Stellite – TM Stoody Deloro Stellite, Inc.
Swagelok, Whitey – TM Swagelok Co.

Safe Component Selection
When selecting a component, the total system design must be considered to ensure safe, trouble-free performance. Component 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.

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