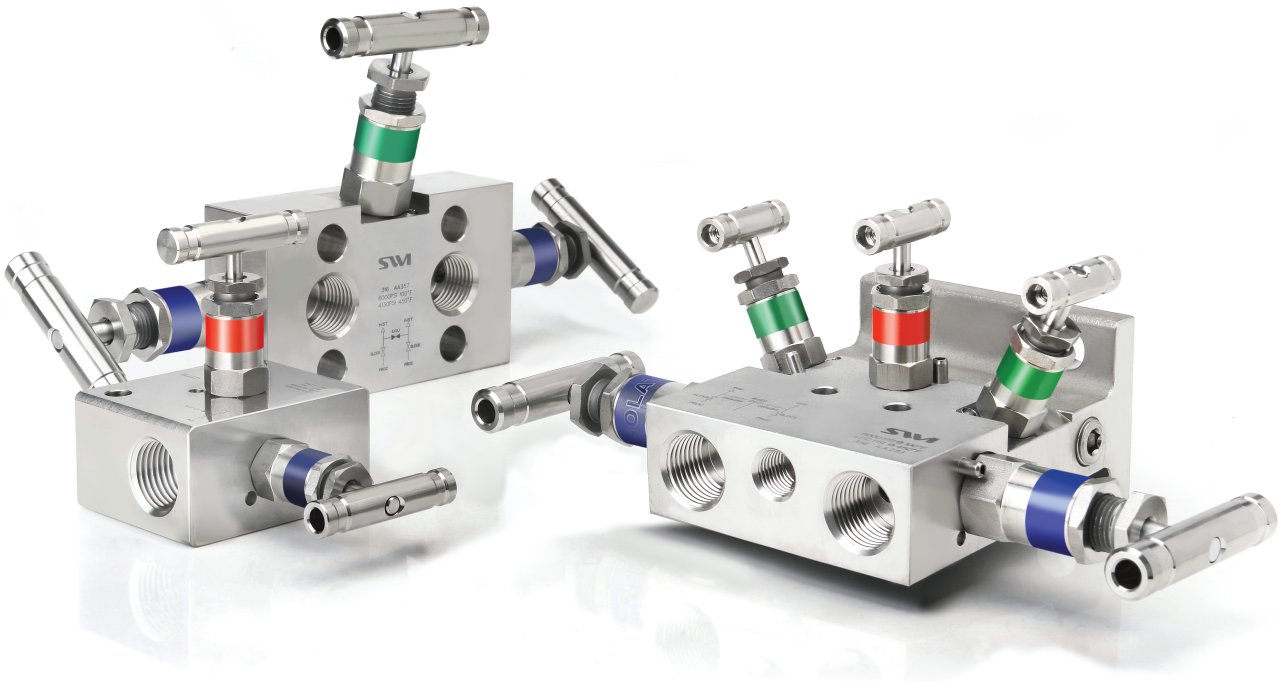
INSTRUMENTATION
MANIFOLDS VALVES

Pressure & Differential Pressure Instrumentation Valves

V11-VM-01, JAN, 2016

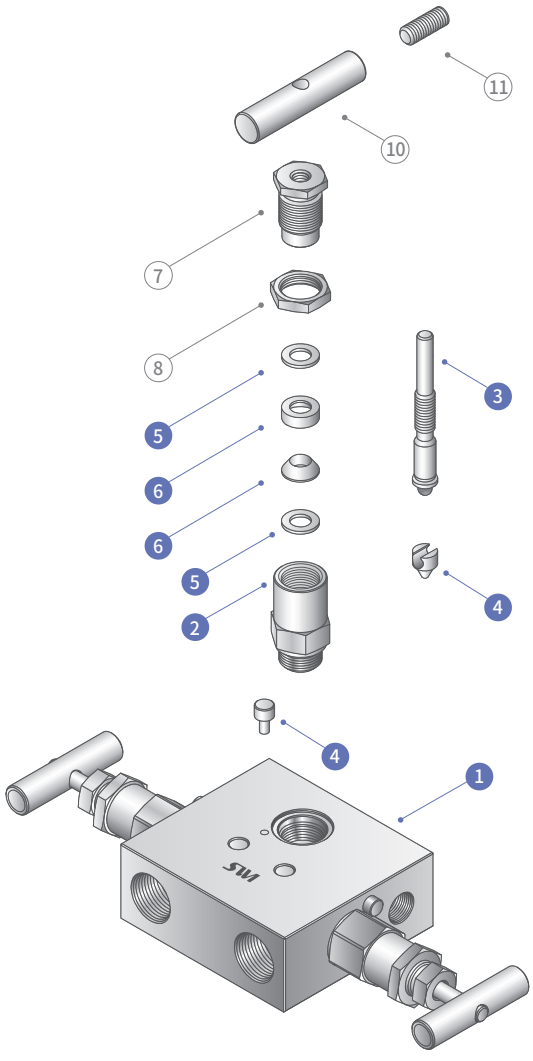


VM Series

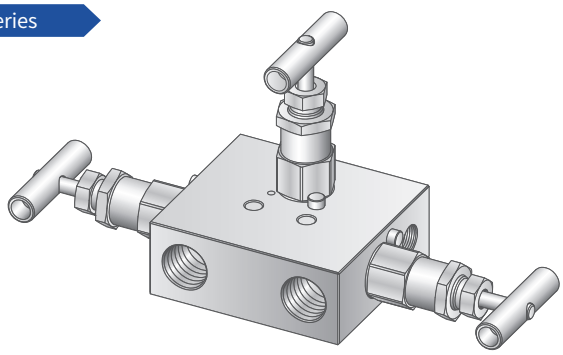
- 2-Valves, 3-Valves, 5-Valves Manifolds designs
- Direct or remote mount manifolds available
- Pressure rating up to 6,000 psig (414 barg) @ 100°F (38°C)
- Temperature rating from -65°F to 1,200°F (-54°C to 649°C) with optional Grafoil packing
- Flange seal grooves meet the design requirements of MSS-SP-99
- Body materials available in 316 stainless steel, carbon steel, and alloy 400
- 100% factory tested

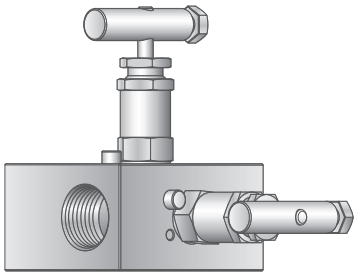
Features

- **Body Design**
  One-piece construction provides strength.
- **Bonnet to Body Seal**
  Metal to metal seal eliminates the need for O-ring seals.
- **Safety Stop Pin**
  316 stainless steel pin prevents detachment of the bonnet from the body due to vibration.
- **Mounting Options**
  2 1/8 in.(54mm) port center lines for direct instrument mounting with flange connections. Remote mounting with female tube fitting and NPT connections.
- **Internal Finish**
  Burr-free threads and internal surface reduce leaks, promoting accurate transmitter readings.
- **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.
- **Mounting Holes**
  All manifolds are supplied with mounting holes as standard to enable bracket mounting.
- **Clean Smooth Internal Surfaces and Threads**



VM3A Series





VM2A Series

Specifications

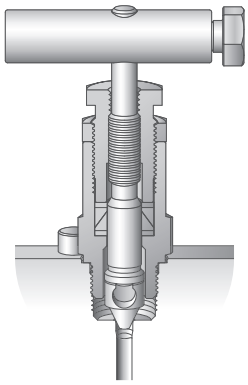
Pressure Rating	6,000 psig (414 barg) @ 100°F (38°C)
Temperature Rating	-65 to 450°F (-54 to 232°C) with PTFE packing up to 1200°F (649°C) with Grafoil packing
Body Material	316 stainless steel and carbon steel, alloy 400
Port Connections	1/4" to 1/2"
Orifice	3.2 mm to 5.0 mm

Materials of Construction

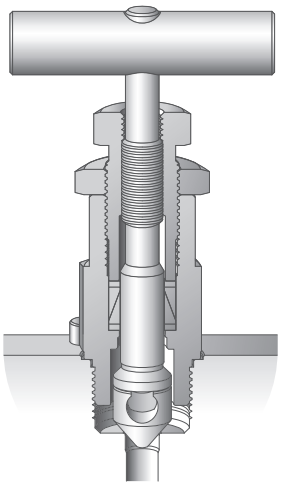
Component		Material		
		Stainless Steel	C. Steel	Alloy 400
1	Body	A276 / 479 Type 316/L	C. Steel	B564 / N04400
2	Bonnet	A276 / 479 Type 316/L	C. Steel	B564 / N04400
3	Stem	A276 / 479 Type 316/L		B564 / N04400
4	Disk (Tip)	A276 / 479 Type 316/L+Stellite No.6		B565 / N05500
5	Packing Washer	A276 / 479 Type 316		
6	Packing	Standard : PTFE / Optional : PEEK, Graphite		
7	Packing Bolt	A276 / 479 Type 316		
8	Locking Nut	A276 / 479 Type 316		
9	Locking Pin	316 stainless steel		
10	Handle			
11	Handle Bolt	A193 B8		

- Wetted parts are listed in Navy
- Carbon steel is galvanized to prevent corrosion

Small - Bonnet Valve
(Orifice - 3.2)



Large - Bonnet Valve
(Orifice - 5.0)



Bonnet Features

- **Packing Bolt**
  allows easy packing adjustment for leaktight.
- **Packing**
  PTFE packing is below stem thread to isolate thread from system fluid. Prevents stem lubricant washout.
- **Polished Stem**
  in packing area enables smooth stem operation and extends packing life.
- **Stem Threads**
  are hard chrome plated and lubricated for maximum service life.
- **Stem Tip**
  Hardened, nonrotating stainless steel tip provides consistent shut off.
- **Back Seating**
  Safety back seating seals in the fully open position, providing a secondary stem seal.
- **Metal Seal Construction**
  coupled with a secondary seal offers leak-free sealing.
- **Stainless Steel Bar Handle**

Orifice

Bonnet Pattern	Orifice in. (mm)	Valve Pattern
Small-Bonnet	0.125 (3.2)	2-Valve Manifolds Block, Bleed Valve / 5-Valve Manifolds Equalization, Bleed Valve
Large-Bonnet	0.196 (5.0)	3-Valve Manifolds Block, Equalization Valve / 5-Valve Manifolds Block Valve

Pressure-Temperature Ratings

Valve Series	Body Material	Packing Material	Temperature Range	Pressure Rating @ 100°F	Pressure Rating @ Max. Temperature
VM	Stainless Steel	PTFE	-65°F to 450°F (-54°C to 232°C)	6,000 psig (414 barg)	4,130 psig @ 450°F (285 barg @ 232°C)
		Graphite	-65°F to 1200°F (-54°C to 648°C)		1,715 psig @ 1200°F (118 barg @ 648°C)
	Carbon Steel	PTFE / Graphite	-20°F to 350°F (-29°C to 176°C)		5,230 psig @ 350°F (360 barg @ 176°C)
	Alloy 400	PTFE	-65°F to 450°F (-54°C to 232°C)	5,000 psig (345 barg)	3,970 psig @ 450°F (274 barg @ 232°C)
		Graphite	-65°F to 500°F (-54°C to 260°C)		3,960 psig @ 500°F (273 barg @ 260°C)

Testing

- Each instrument manifold is tested with nitrogen @ 1,000 psig (69 barg) to max. leak rate of 0.1 SCCM.
- Hydrostatic shell test is performed at 1.5 times the working pressure as an option.
- Other tests are available upon request.

Sour Gas Service

- Valves are available in materials which comply with standard NACE MR-01-75 latest revision relating to metalic materials, offering optimum resistance to sulfide stress cracking.

Cleaning

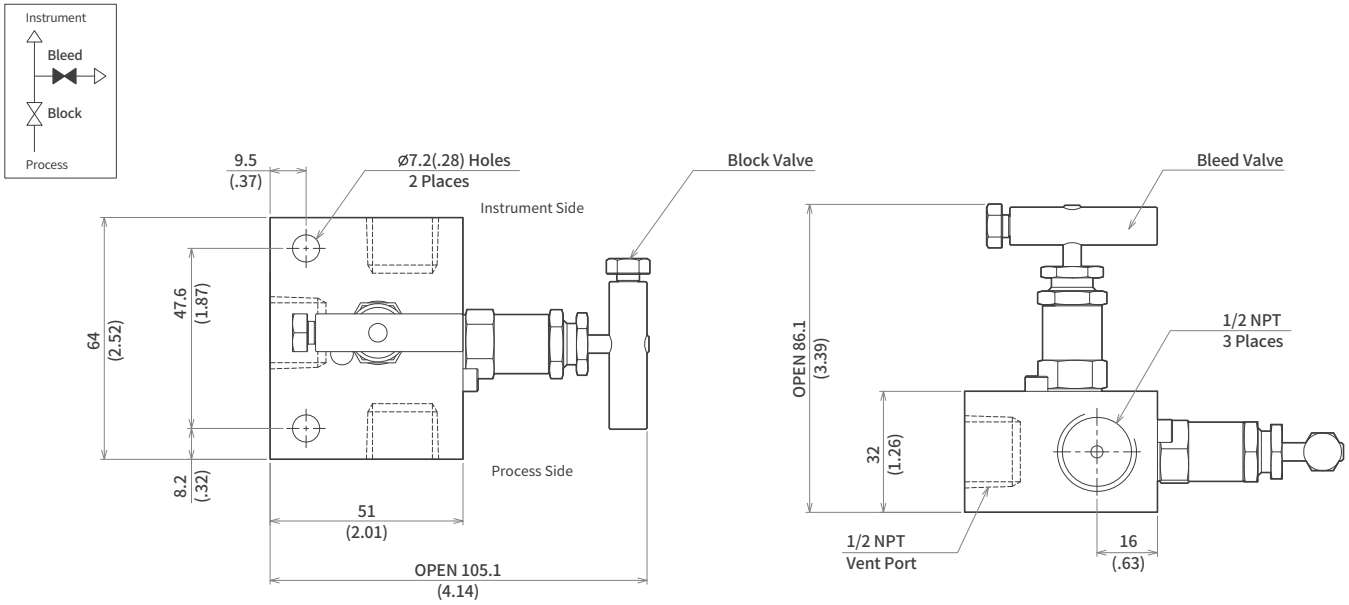
- Every valve is cleaned and packaged in accordance with SWI Valve Cleaning Standard.

Dimensions

• Remote Mounting Series

VM2A-V-8N

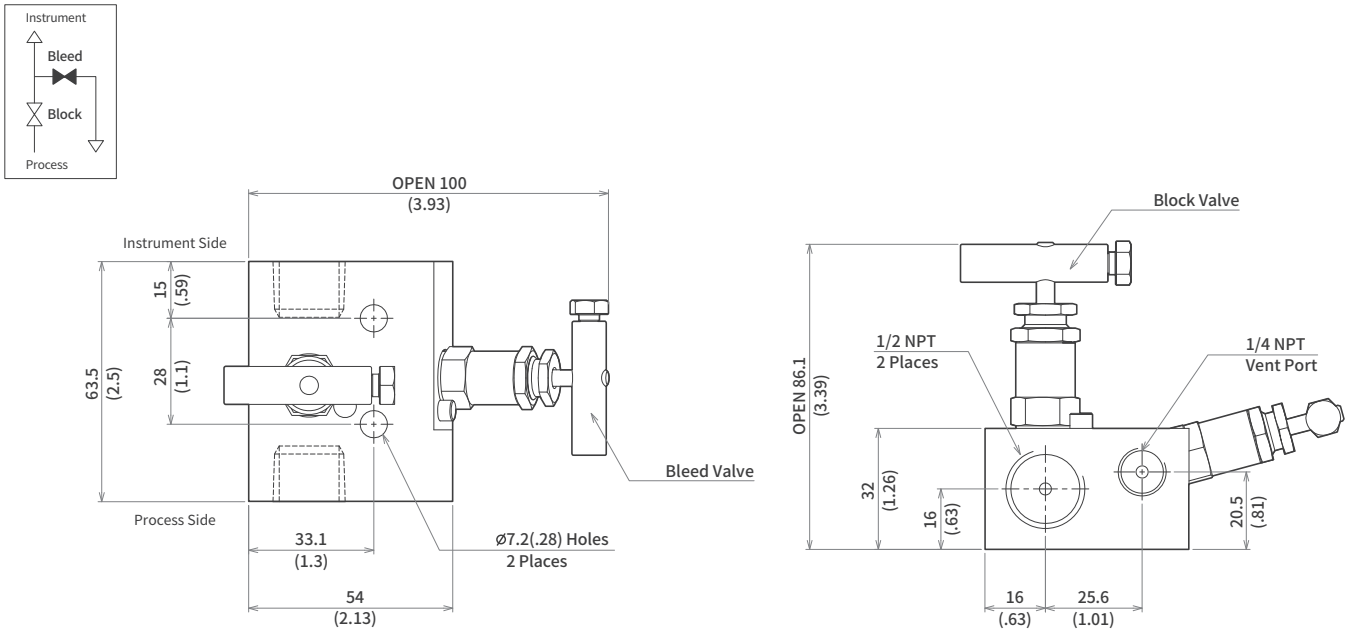
2-Valves Block



• All dimensions are for reference only and are subject to change.

VM2A-VV-8N4N

2-Valves Vertical



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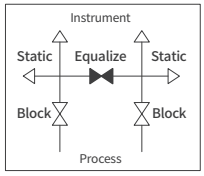
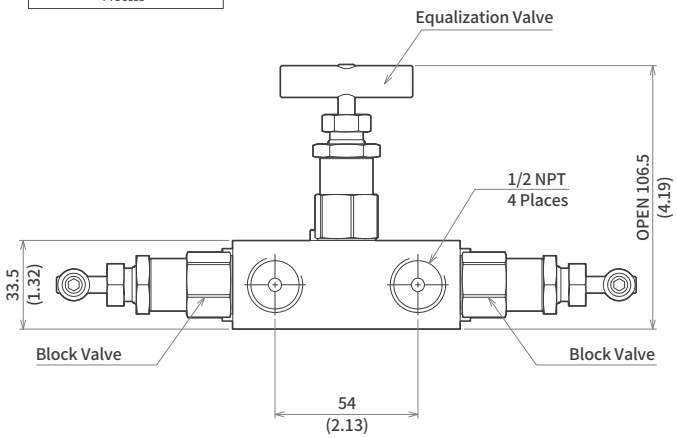
Dimensions

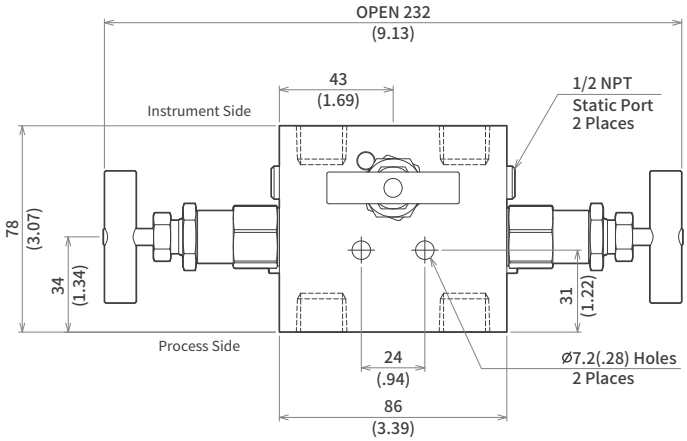
• Remote Mounting Series

VM3A-V-8N

3-Valves Block







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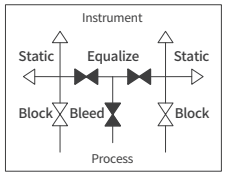
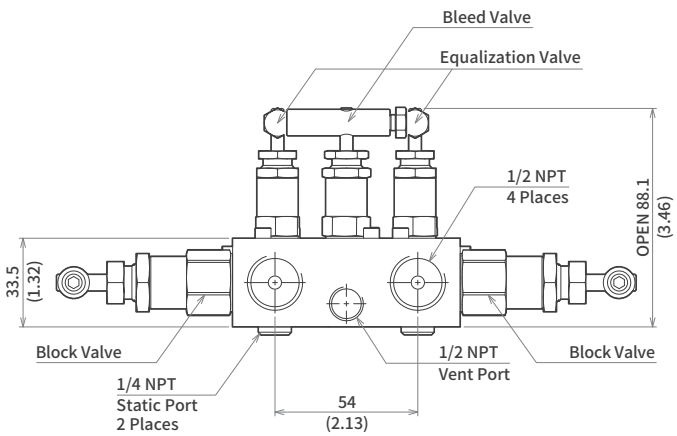
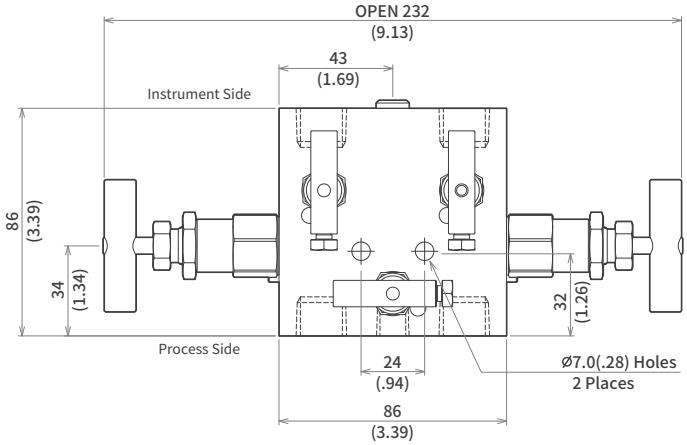
VM5A-V-8N4N

5-Valves Block







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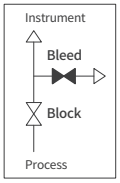
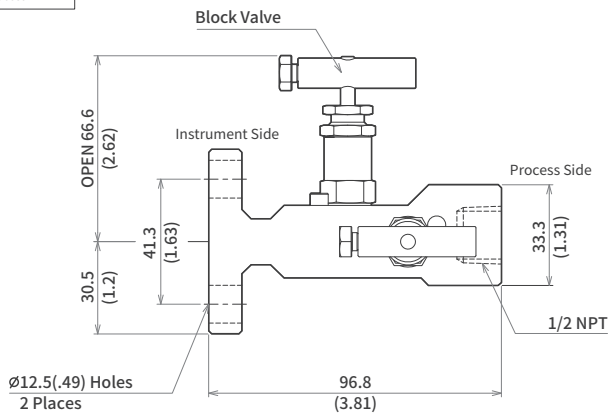
Dimensions

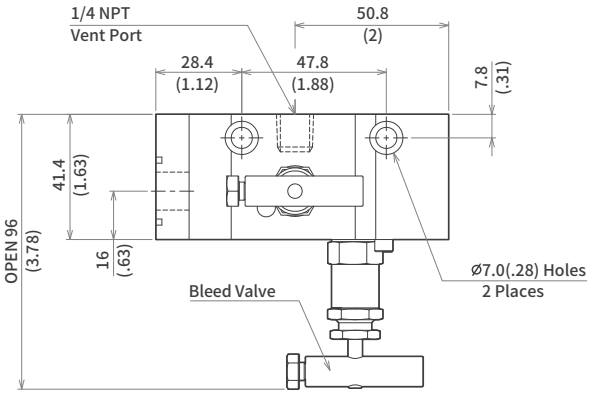
• Direct Mounting Series

VM2A-V1F-8N4N

2-Valves Single Flange







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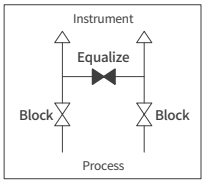
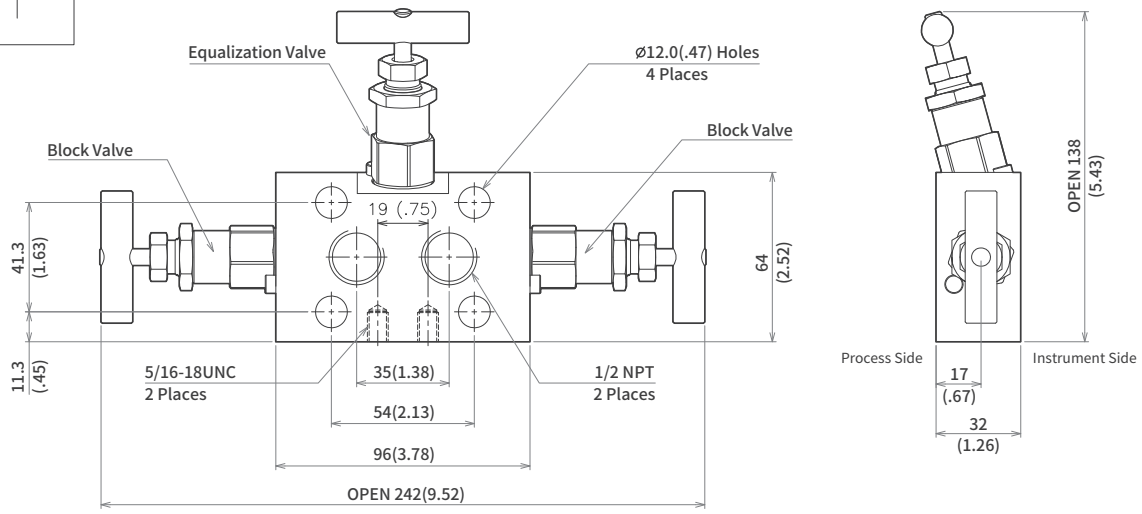
VM3A-V1BF-8N

3-Valves Single Block Flange





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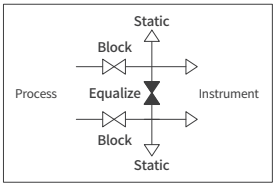
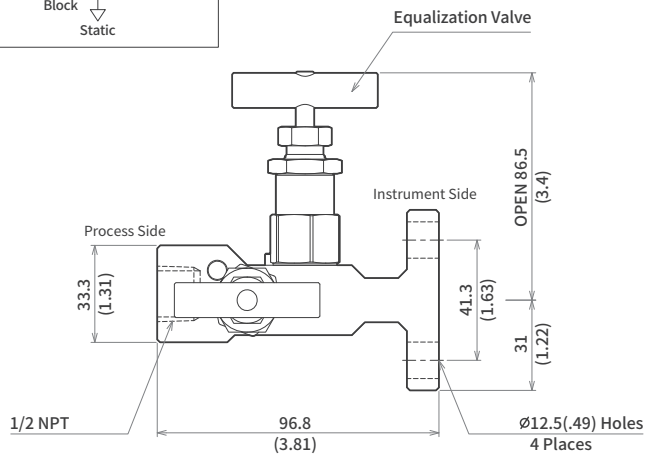
Dimensions

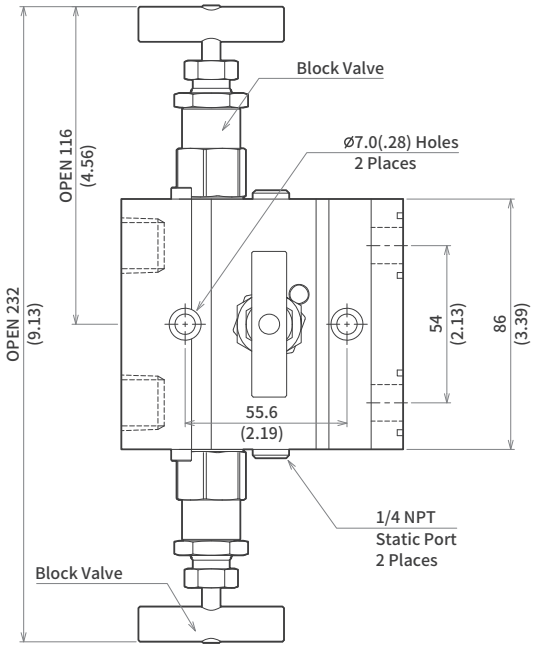
• Direct Mounting Series

VM3A-V1F-8N4N

3-Valves Single Flange







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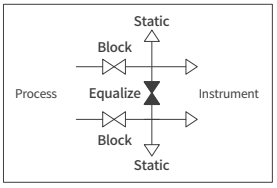
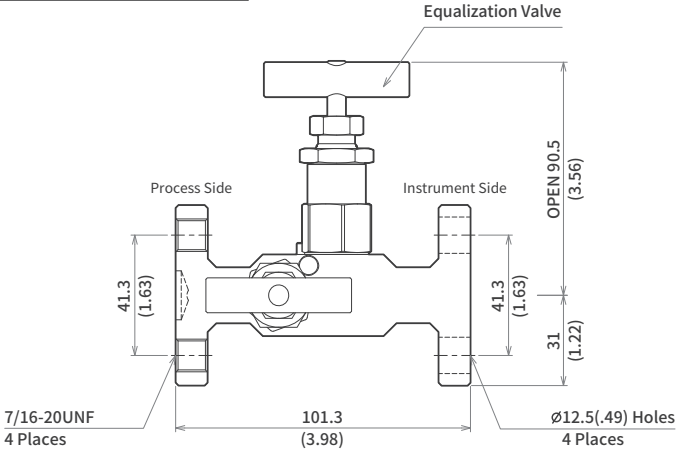
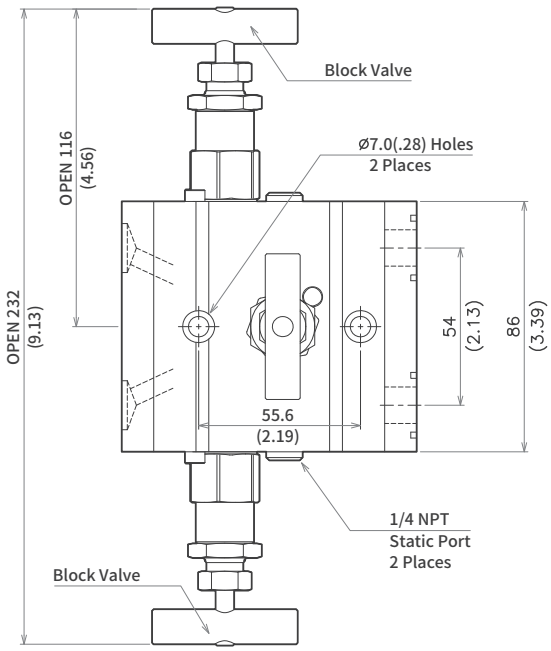
VM3A-V2F-8N4N

3-Valves Dual Flange







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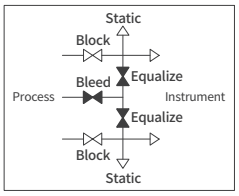
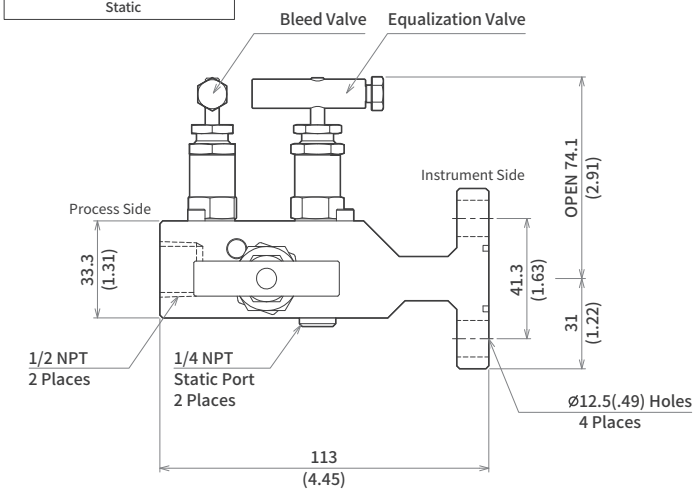
Dimensions

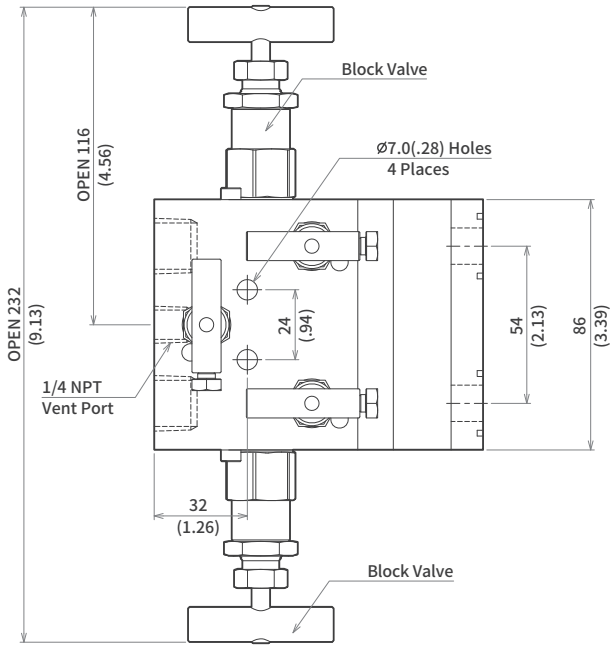
• Direct Mounting Series

VM5A-V1F-8N4N

5-Valves Single Flange







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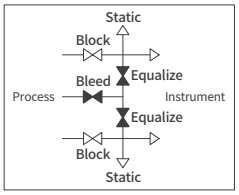
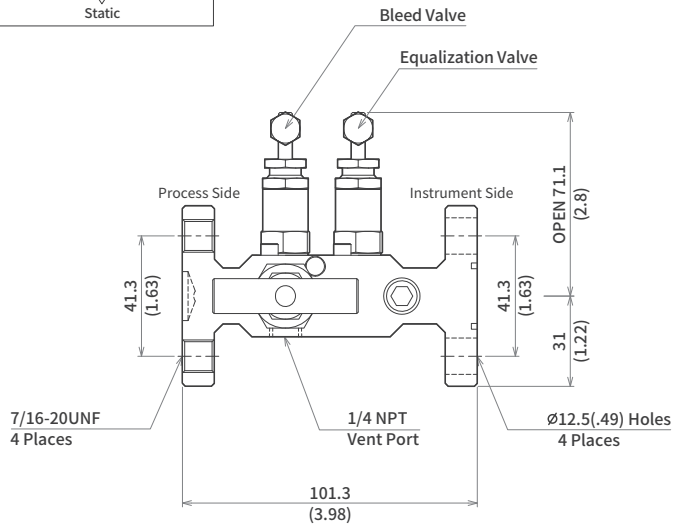
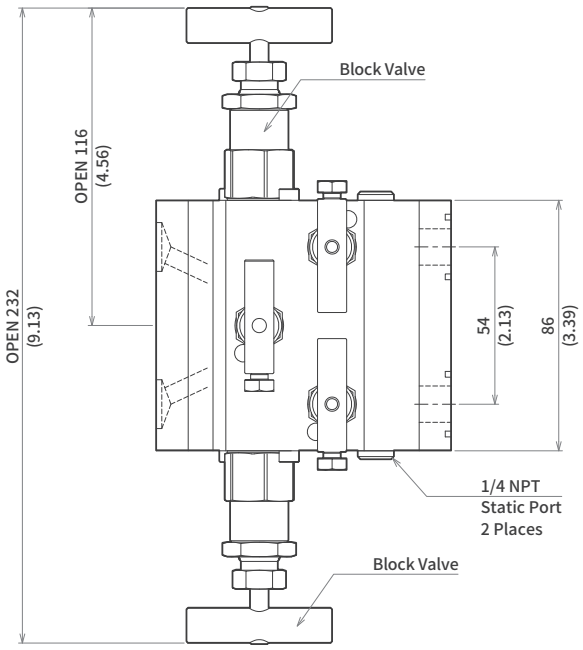
VM5A-V2F-8N4N

5-Valves Dual Flange







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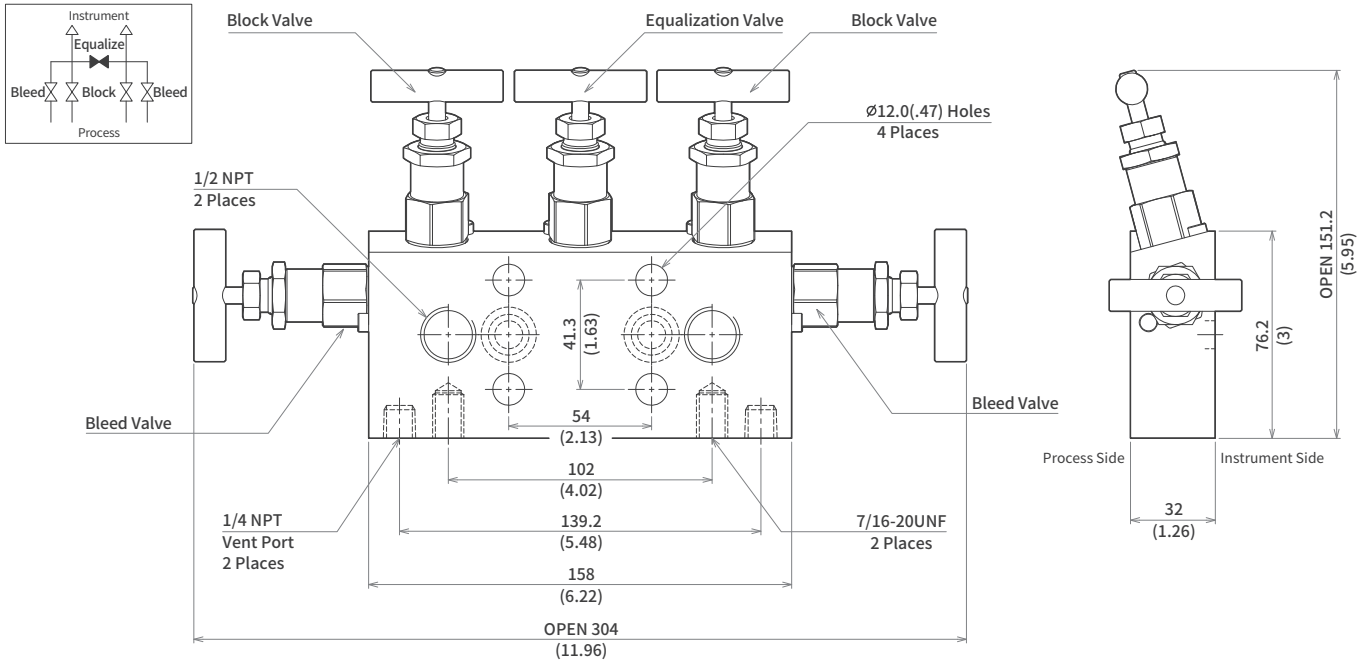
Dimensions

• Direct Mounting Series

VM5A-V1BF-8N4N

5-Valves Single Block Flange



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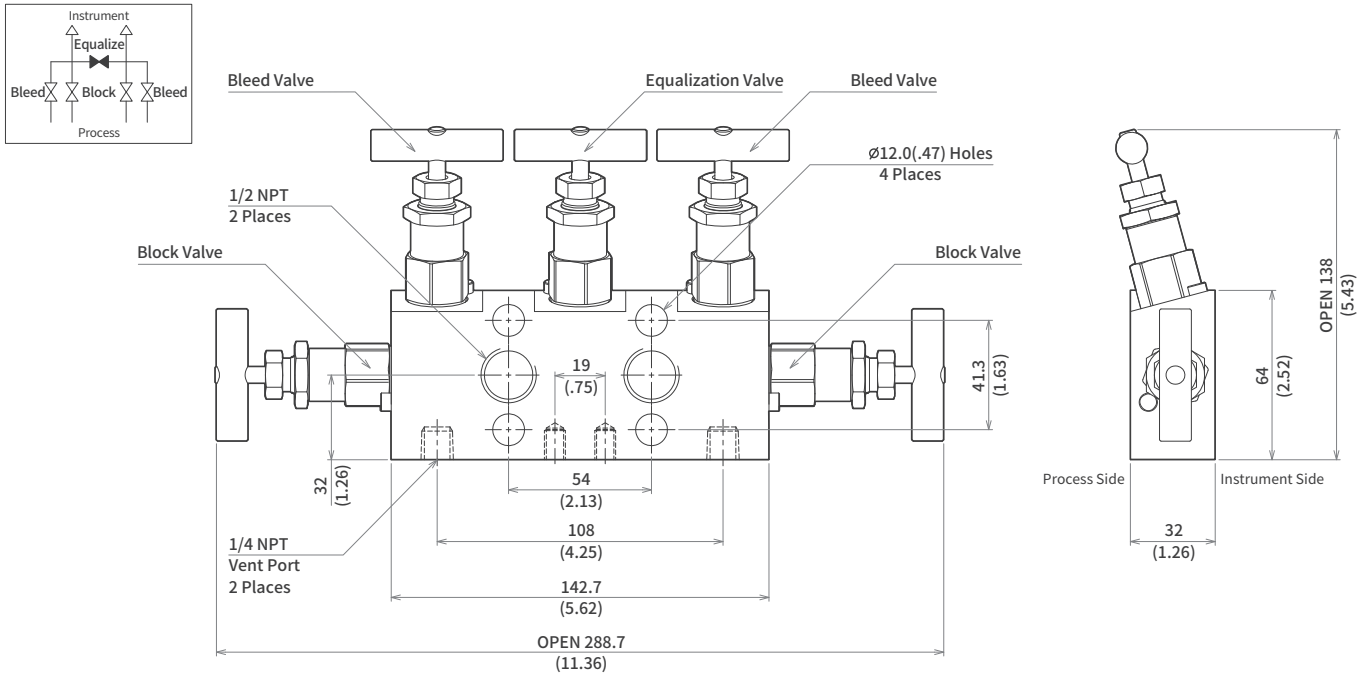
VM5A-VBFS-8N4N

5-Valves Single Block Flange "S" Type



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■ Options

• High-Temperature Packing

- Graphite valve packing material for high-temperature service. (See Pressure - Temperature Ratings, page 3.)
- Includes graphite flange seals on MSS flanges.

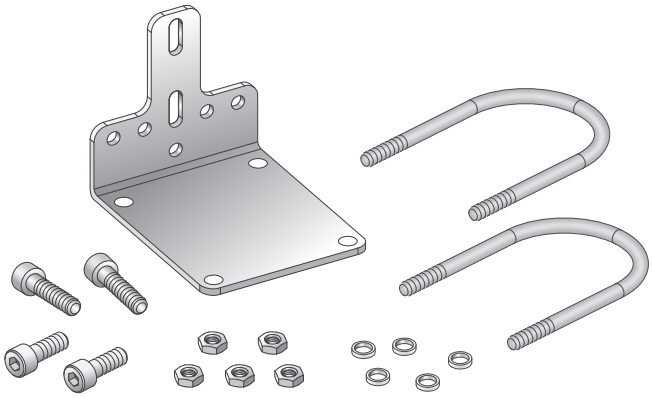
• Flange Seal Materials

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

MSS Flange Seal Material	Material Designator	Lubricant / Sealant	Temperature Rating °F (°C)	Packing Material
Fluorocarbon FKM	—	Silicone base	-20°F to 450°F (-28°C to 232°C)	PTFE
Graphite	-GP	Fluorinated base	-65°F to 1,000°F (-53°C to 537°C)	Graphite
Virgin PTFE	Virgin PTFE	Silicone base	-65°F to 250°F (-53°C to 121°C)	PTFE
Reinforced PTFE	-RPT			PTFE

■ Mounting Kits

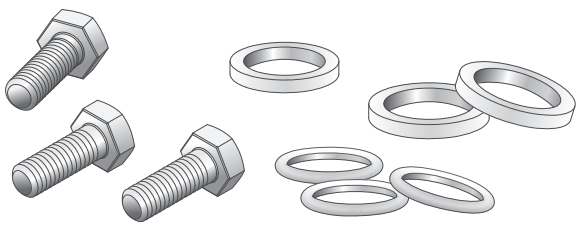
- Kit contains Brackets, U-bolts, Bolt, Nut, and Lock Washers.
- Mounting bracket can be vertically or horizontally mounted.
- Kit material is available in stainless steel and zinc plated carbon steel.
- Ordering Number: **VM-AC-MB-SS**



■ Accessories

• Seal Kits

Kit contains flange seals and stainless steel bolts



Kit Ordering Number

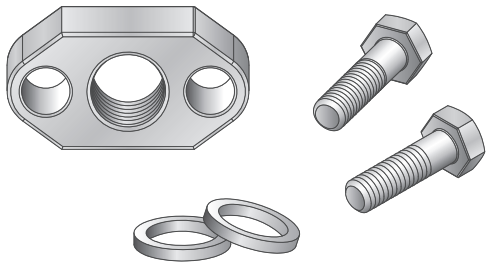
Ordering No.	Seal Material	Temperature Range
VM-AC-SK-XX-V	FKM	-65°F to 250°F (-53°C to 121°C)
VM-AC-SK-XX-G	Graphite	-65°F to 250°F (-53°C to 121°C)
VM-AC-SK-XX-P	PTFE	-65°F to 250°F (-53°C to 121°C)

• For a complete ordering number, replace XX with the desired valve and body shape designator to the basic ordering number.
Ex) VM-AC-SK-3A-V (3-Valve).

Accessories

• Eccentric Flanges

Contains eccentric flange, seals, and bolts

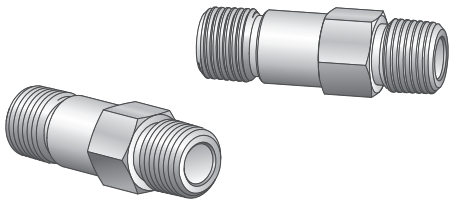


- Used with flange-to-flange manifolds to allow the connection of process flange taps or process root valves.
- Standard is female NPT 1/2 connections.
- Provide an offset connection of 1/16 in. (1.6 mm) from the bolt hole center line.
- Available in stainless steel only.

Ordering Information	
VM-AC-EF-X	Eccentric Flange Female NPT 1/2

• X for a complete ordering number, add the desired seal material designator to the basic ordering number. Ex) VM-AC-EF-G (Graphite).

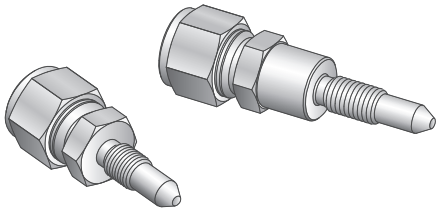
• Concentric and Eccentric Pipe Nipples



- Concentric and Eccentric pipe nipples have male NPT 1/2 and 3.0 in. (76 mm) length.
- The ends of eccentric pipe nipples are offset by 1/16 in. (1.6 mm) from centerline.
- Available in 316 stainless steel and carbon steel.

Ordering Information	
VM-AC-CP-8N-S	Concentric pipe nipple Male NPT 1/2 , 316 stainless steel
VM-AC-EP-8N-C	Eccentric pipe nipple Male NPT 1/2 , carbon steel

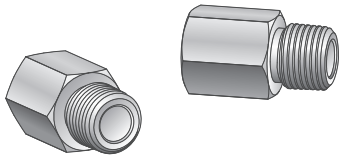
• Calibration Fittings



- Calibration fittings connect directly to the bleed port of differential pressure transmitter.
- Available in 316 stainless steel only.

Ordering Information	
VM-AC-CF-A-S	1/4 Tube Fitting - 1/4-28UNF Thread , 316 stainless steel
VM-AC-CF-B-S	1/4 Tube Fitting - 5/16-24UNF Thread , 316 stainless steel

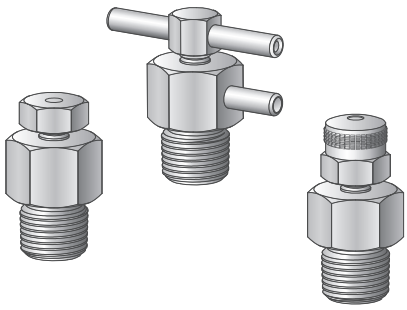
• Gauge Adapters



- Gauge adapters connect to gauge for calibration.
- Available in 316 stainless steel and carbon steel.

Ordering Information	
VM-AC-GA-86-S	Male NPT 1/2 - Female ISO 228/1 3/8 , 316 stainless steel
VM-AC-GA-44-C	Male NPT 1/4 - Female ISO 228/1 1/4 , carbon steel

• Vent Plugs, Bleed and Purge Valves



- Bleed and Purge valves are used to vent to atmosphere and assist calibration.
- Available in 316 stainless steel only.

Ordering Information	
VM-AC-VE-XX-S	Vent plug Male NPT Pipe Thread
VM-AC-BL-XX-S	Bleed valve Male NPT Pipe Thread
VM-AC-PU-XX-S	Purge valve Male NPT Pipe Thread

• For a complete ordering number, replace XX with the desired size designator 8N (1/2 NPT) or 4N (1/4 NPT). Ex) VM-AC-VE-8N (Graphite).

Ordering Information

Code Table :	VM	1	2		3		4	5		6	7	8
Sample Valve Code :		5	A		V1BF		8N	4N		GP	S	VT

Example : INSTRUMENTATION MANIFOLDS VALVE, 5-VALVES, VEE DISK TIP, FEMALE NPT 1/2 " x FEMALE NPT 1/4 ", GRAPHITE PACKING, 316/L STAINLESS STEEL BODY, TRIM, VENT PLUG

1.

Valve Pattern	
2	2 -Valve Manifolds
3	3 -Valve Manifolds
5	5 -Valve Manifolds

2.

Disk (Tip)	
A	Standard
M	Metering
S	Soft-PEEK

3.

Mounting Type		
Remote Mounting	V	Block
	VV	Vertical
Direct Mounting	V1F	Single Flange
	V2F	Dual Flange
	V1BF	Single Block Flange
	V2BF	Dual Block Flange
	VBFS	Single Block Flange "S" Type

4.5.

Process, Instrument and Vent Connection Size & Type							
NPT (ISO / BSP)	Thread (NPS)	1/8	1/4	3/8	1/2	3/4	1
	Designator	2N(R)	4N(R)	6N(R)	8N(R)	12N(R)	16N(R)
Fractional Tube	O.D. (in.)	1/8	1/4	3/8	1/2	3/4	1
	Designator	2	4	6	8	12	16
Metric Tube	O.D. (mm)	3	6	10	12	20	25
	Designator	3M	6M	10M	12M	20M	25M

6.

Packing	
Nil	PTFE-Cone
PK	PEEK-Chevron
GP	Graphite

7.

Material	
S	Stainless Steel 316 / 316L
C	Carbon Steel
M	Monel UNS N04400

8.

Option	
N	NACE MR 0175
Q	BS EN 10204 Type 3.2
FS	Fire safety design
AT	Anti Tamper
VT	Vent Plug

Selecting Valve

When selecting a product, the system design in its entirety must be considered to ensure safe performance.
Proper installation, operation and maintenance, as well as material compatibility, adequate ratings and function are the responsibilities of the system designer and user.

