Differential Pressure Manifolds – M1 and M110 3-Valve Manifolds

Product Overview

For Applications Requiring Remote Mounting From Instrument

The M1 is a three-valve manifold designed to mount to the signal lines and instrument when the instrument has connections different than 2 1/8-inches [54 mm] between signal taps such as recording orifice meters, small differential pressure indicators and some differential pressure switches. In these applications, the manifold is often supported by the signal lines but may be AGCO Mount supported (AM).

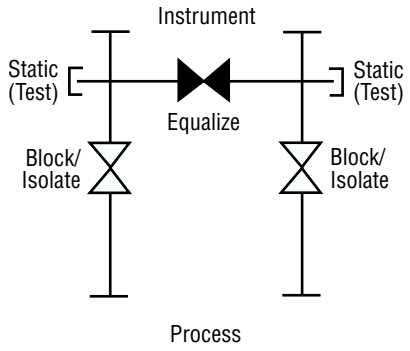
The M1 manifold is available with an integral metal seat or with various replaceable, roddable soft seats. The valve orifice is 3/16-inch [4.8 mm] diameter.

The M110 manifold is a high pressure version of the M1 and is available in 316 SS with integral seats.

Features and Benefits

- **Cost savings/less labor** results when unitizing the manifolding. It eliminates numerous parts used in conventional methods of 'piping up.' Results in cost reduction of 20-30 percent.
- **Roddability characterizes** the M1 with soft seats for services prone to plugging.
- **A protective bonnet cap** increases valve life by protecting against atmospheric contamination; reduces possibility of thread galling by containment of stem lubricant.
- **Fewer leak points** reduce the chances of leakage from a unitized design.
- **Packing is below stem threads.** Galling and corrosion of the stem threads due to exposure to the process fluid is prevented. The packing isolates the stem threads from the process.
- **Replaceable soft seat** design is bubble-tight with a 3/16-inch [4.8 mm] diameter orifice as standard.
- **Increased valve life** is obtained by rolling rather than cutting stem threads. This provides a stronger, more durable thread area.
- **Integral hard backseat** protects against stem blowout and provides a secondary packing seal.
- **Stem packing is adjustable** for leakproof and long service life.
- **Test ports** are 1/4-inch FNPT ports which may be used as test connections.

Differential Pressure Manifolds – M1 Specifications



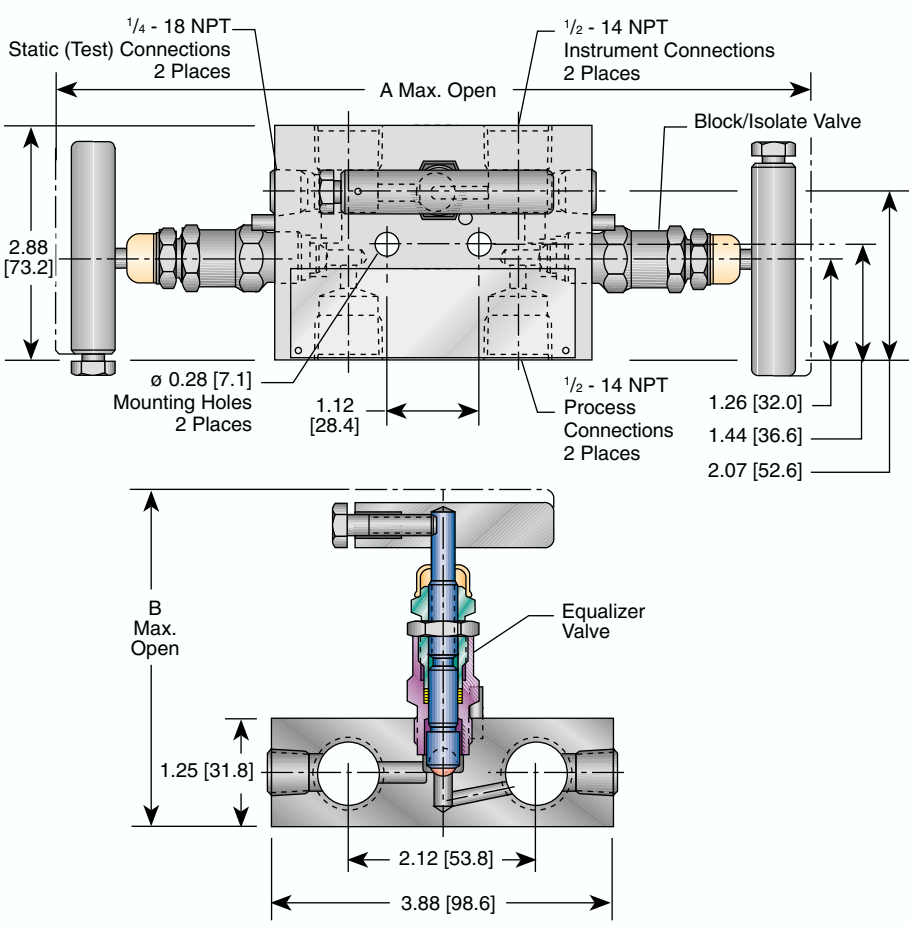
Dimensions, inches [mm]

Packing	A	B
GRAFOIL®/ Low Emissions Graphite	10.38 [263.7]	4.50 [114.3]
Teflon®	9.08 [230.6]	3.85 [97.8]

Notes

1. Approximate valve weight: 4.0 lb [1.8 kg]. 0.187-inch [4.8 mm] diameter orifice. Valve C_v 0.52 maximum.
2. CS parts are zinc cobalt plated to prevent corrosion.
3. SG (Sour Gas) meets the requirements of NACE MR0175-latest revision.

Metal Seat Dimensions, inches [mm]



Standard Materials

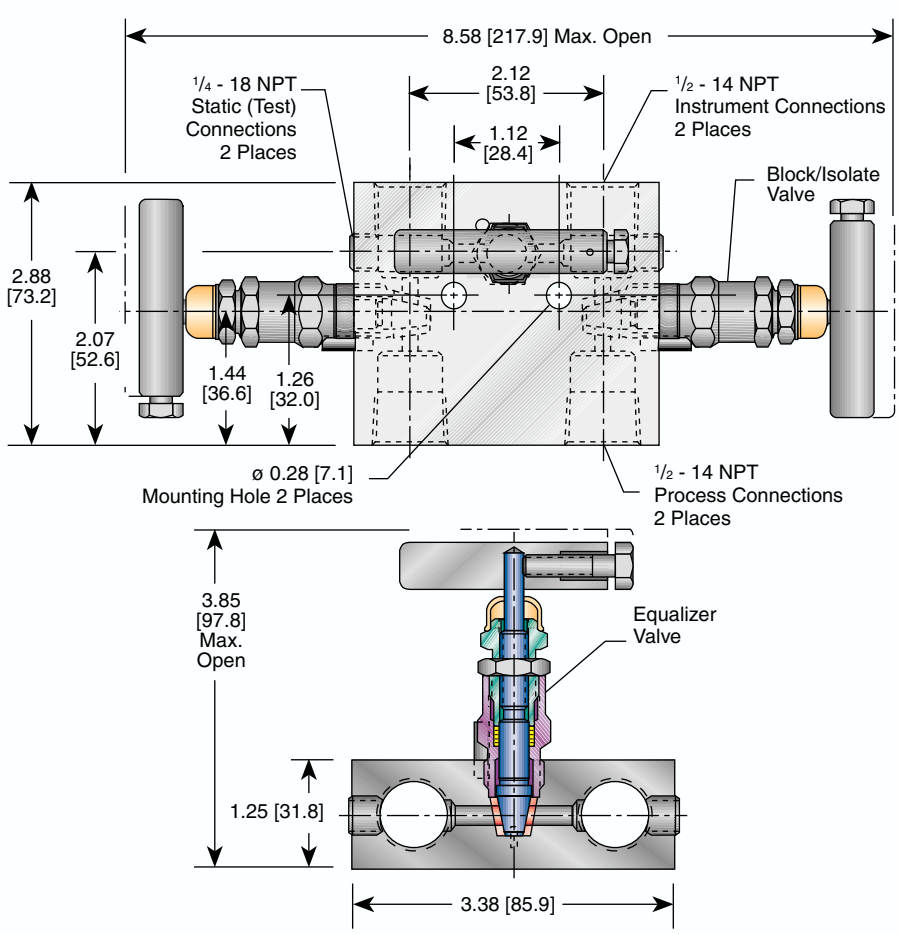
Valve[1]	Packing	Body and Bonnet	Stem and Ball
CS[2]	Teflon®, O-ring	A108 Body A108 Bonnet	A581-303 Stem 17-4PH Ball
CS[2]	GRAFOIL®/Low Emissions Graphite	A105 Body A105 Bonnet	A581-303 Stem 17-4PH Ball
SS	Teflon®, O-ring	A479-316 Body A479-316 Bonnet	A276-316 Stem 316 SS Ball
SS	GRAFOIL®/Low Emissions Graphite	A479-316 Body A479-316 Bonnet	A276-316 Stem 316 SS Ball
Monel®	Teflon®	Monel® 400 Body Monel® R405 Bonnet	Monel® 400 Stem Monel® K500 Ball
Monel®	GRAFOIL®/Low Emissions Graphite	Monel® 400 Body Monel® R405 Bonnet	Monel® 400 Stem Monel® K500 Ball
SG[3]	Teflon®	A479-316 Body A479-316 Bonnet	Monel® 400 Stem Monel® K500 Ball
SG[3]	GRAFOIL®/Low Emissions Graphite	A479-316 Body A479-316 Bonnet	Monel® 400 Stem Monel® K500 Ball

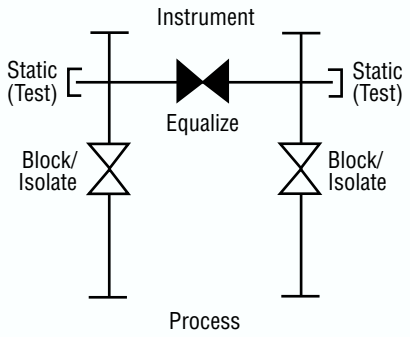
Pressure and Temperature Ratings

Valve	Packing	Ratings
CS[2]	Teflon®, O-ring	6000 psig @ 200°F [414 barg @ 93°C] 4000 psig @ 500°F [276 barg @ 260°C]
CS[2]	GRAFOIL®/ Low Emissions Graphite	6000 psig @ 200°F [414 barg @ 93°C] 1500 psig @ 850°F [103 barg @ 454°C]
SS, SG[3]	Teflon®, O-ring	6000 psig @ 200°F [414 barg @ 93°C] 4000 psig @ 500°F [276 barg @ 260°C]
SS, SG[3]	GRAFOIL®/ Low Emissions Graphite	6000 psig @ 200°F [414 barg @ 93°C] 1500 psig @ 1000°F [103 barg @ 538°C]
Monel®	Teflon®	6000 psig @ 200°F [414 barg @ 93°C] 4000 psig @ 500°F [276 barg @ 260°C]
Monel®	GRAFOIL®/ Low Emissions Graphite	6000 psig @ 200°F [414 barg @ 93°C] 1500 psig @ 800°F [103 barg @ 427°C]

Differential Pressure Manifolds – M1 Specifications

Soft Seat Dimensions, inches [mm]





Standard Materials

Valve[1]	Body and Bonnet	Stem	Packing	Seat
CS[2]	A108 CS	A581-303	Teflon® or Viton® O-ring w/Teflon® backup	Delrin®[4]
SS	A479-316	A276-316	Teflon® or Viton® O-ring w/Teflon® backup	Delrin®[4]
SG[3]	A479-316	Monel® 400	Teflon®	Delrin®[4]

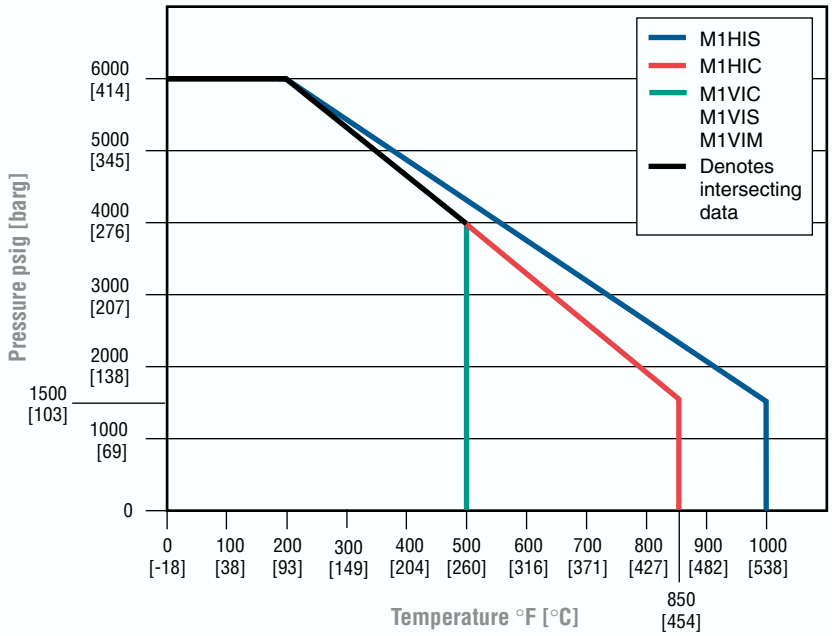
Seat	Pressure and Temperature Ratings	
Delrin® and PCTFE	6000 psig @ 200°F	[414 barg @ 93°C]
PEEK	6000 psig @ 200°F 2000 psig @ 400°F	[414 barg @ 93°C] [138 barg @ 204°C]
Teflon®	1000 psig @ 150°F 200 psig @ 500°F	[69 barg @ 66°C] [14 barg @ 260°C]

Notes

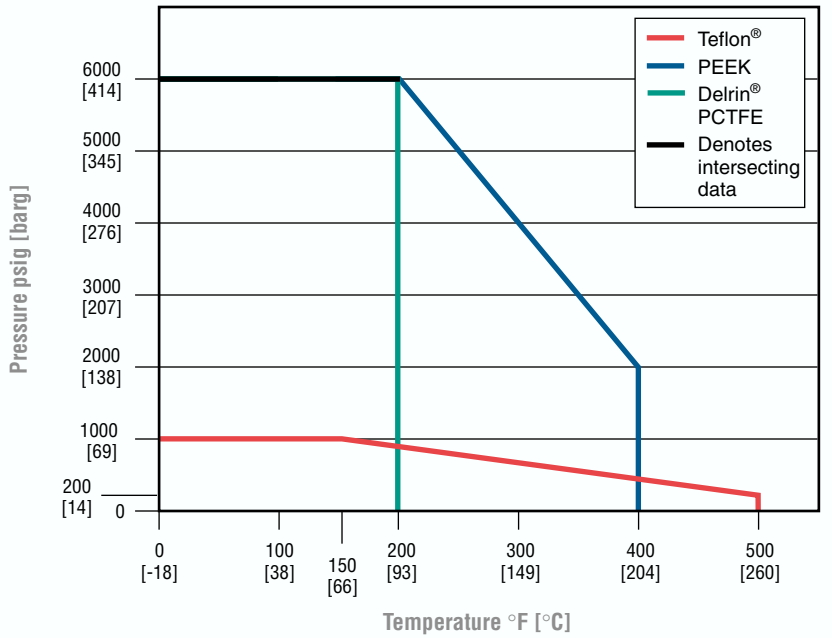
1. Approximate valve weight: 4.0 lb [1.8 kg]. 0.187-inch [4.8 mm] diameter orifice. Valve C_v 0.83 maximum.
2. CS parts are zinc cobalt plated to prevent corrosion.
3. SG (Sour Gas) meets the requirements of NACE MR0175-latest revision.
4. PCTFE (Polychlorotrifluoroethylene is exact equivalent of Kel-F®), PEEK, and Teflon® are also available.

Differential Pressure Manifolds – M1 Specifications

Pressure vs. Temperature – Metal Seat



Pressure vs. Temperature – Soft Seat



Differential Pressure Manifolds – M1 Specifications

Ordering Information Metal Seat; 3/16-inch [4.8 mm] Diameter Orifice

M1 H I S – 4 – SG

Packing

V – Teflon® (patent protected)
H – GRAFOIL®
E – Low Emissions Graphite

Seat

I – Integral (body material)

Body Material [1]

C – CS, A108 (Teflon® packed)
CS, A105 (GRAFOIL® and Low Emissions Graphite packed)
S – SS, A479-316
M – Monel®

Connection

4 – 1/2-inch FNPT

Options

–AL	Arctic Lubricant (low temperature service). Not available for CS valves.
–AM	AGCO Mount Kit for pipestand mounting (page 84)
–BC	Accessory Bracket - Mount Conduit with -AM
–BP	Accessory Bracket Mount Purge Meters with -AM
–BL	Bonnet Lock Device (page 146)
–CL	Cleaned for Chlorine Service.
–OC	Cleaned for Oxygen Service.
–HD	Hydrostatic Testing (100 percent) (MSS-SP-61)
–MS	Monel® Stem
–PHB	Phenolic Black Handle
–SG	Sour Gas meets the requirements of NACE MR0175-latest revision. (SS valves only) (Not available for O-ring packed valves)
–ST	Stellite Ball Ended Stem
–SP	Special options or requirements not otherwise noted by descriptive codes.

Notes

1. Call factory for optional materials.
2. Polychlorotrifluoroethylene is the exact equivalent of Kel-F®.

Differential Pressure Manifolds – M1 Specifications

Notes

1. Polychlorotrifluoroethylene is the exact equivalent of Kel-F®.
2. Call factory for optional materials.

Ordering Information Soft Seat Replaceable, Roddable; 3/16-inch [4.8 mm] Diameter Orifice

M1	V	D	S	– 4	– SG

Packing

V – Teflon® (patent protected)
R – O-ring (Viton®)

Seat

D – Delrin®
V – Teflon®
E – PEEK
K – PCTFE[1]

Body Material[2]

C – A108 CS
S – A479-316 SS

Connection

4 – 1/2-inch FNPT

Options

–AL	Arctic Lubricant (low temperature service). Not available for CS valves.
–AM	AGCO Mount Kit for pipestand mounting (page 84)
–BC	Accessory Bracket - Mount Conduit with -AM
–BP	Accessory Bracket Mount Purge Meters with -AM
–BL	Bonnet Lock Device (page 146)
–CL	Cleaned for Chlorine Service.
–OC	Cleaned for Oxygen Service.
–HD	Hydrostatic Testing (100 percent) (MSS-SP-61)
–MS	Monel® Stem
–PHB	Phenolic Black Handle
–SG	Sour Gas meets the requirements of NACE MR0175-latest revision. (SS valves only) (not available for O-ring packed valves)
–ST	Stellite Ball Ended Stem
–SP	Special options or requirements not otherwise noted by descriptive codes.

Differential Pressure Manifolds – M1 ASME B31.1 Specifications

Ordering Information – Power Industry Applications

M1HP S –4 –XP –SG

Valve Type

M1HP

Body Material [1]

C – CS, A105
S – SS, A479-316

Connection

4 – 1/2-inch FNPT x 1/2-inch FNPT x 1/2-inch FNPT
3TC4 – 3/8-inch Tube Stub x 1/2-inch FNPT x 1/2-inch FNPT[2]
3TB4 – 3/8-inch Tube S.W. x 1/2-inch FNPT x 1/2-inch FNPT
4TC4 – 1/2-inch Tube Stub x 1/2-inch FNPT x 1/2-inch FNPT[3]
4TB4 – 1/2-inch Tube S.W. x 1/2-inch FNPT x 1/2-inch FNPT

Options

–AM AGCO Mount Kit for pipestand mounting (page 84)
–SP Special options or requirements not otherwise noted by descriptive codes.

Notes

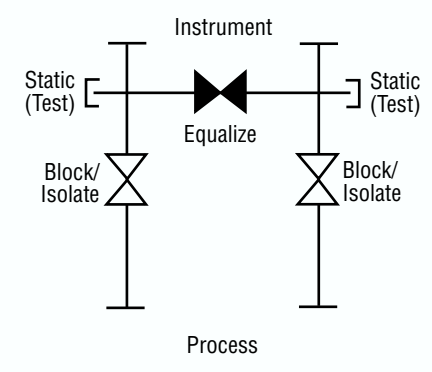
1. All Manifolds come standard with GRAFOIL® packing, integral seats, bonnet locks, and are subjected to hydrostatic testing.
2. Tube Stubs are 6-inch long x 0.065-inch wall.
3. Tube Stubs are 6-inch long x 0.095-inch wall.
4. Manifold ratings:

   SST 6000 psig @ 100°F
   2915 psig @ 1000°F
   [414 barg @ 38°C]
   [201 barg @ 538°C]

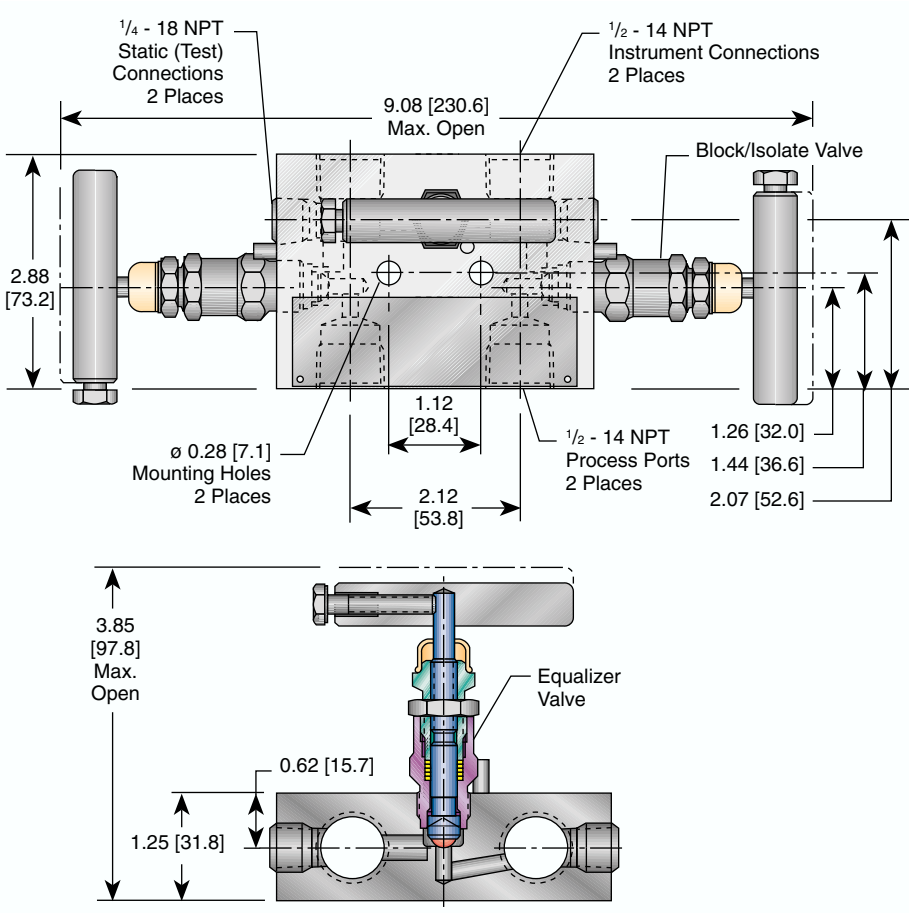
   STL 6170 psig @ 100°F
   3430 psig @ 800°F
   [425 barg @ 38°C]
   [236 barg @ 427°C]

5. See page 148 for Code Requirements.

Differential Pressure Manifolds – M110 Specifications



M110 Dimensions, inches [mm]



Notes

1. Approximate valve weight: 4 lb [1.8 kg]. 0.187-inch [4.8 mm] diameter orifice. Valve C_v 0.52 maximum.
2. SG (Sour Gas) meets the requirements of NACE MR0175-latest revision.

Standard Materials

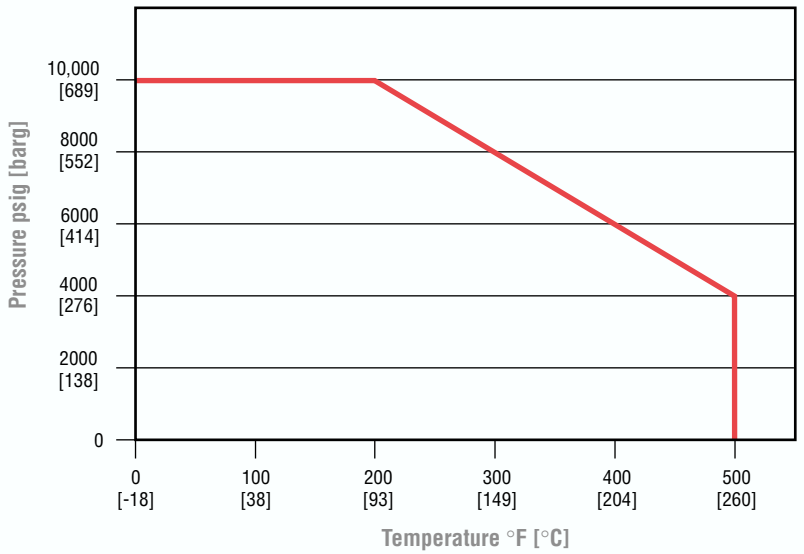
Valve[1]	Body and Bonnet	Stem and Ball	Packing
SS	A479-316 Body A479-316 Bonnet	A276-316 Stem 316 SS Ball	Teflon®
SG[2]	A479-316 Body A479-316 Bonnet	Monel® 400 Stem Monel® K500 Ball	Teflon®

Pressure and Temperature Ratings

Valve[1]	Packing	Pressure and Temperature Ratings	
SS	Teflon®	10,000 psig @ 200°F 4000 psig @ 500°F	[689 barg @ 93°C] [276 barg @ 260°C]
SG[2]	Teflon®	10,000 psig @ 200°F 4000 psig @ 500°F	[689 barg @ 93°C] [276 barg @ 260°C]

Differential Pressure Manifolds – M110 Specifications

Pressure vs. Temperature



Ordering Information

M110 V I S – 4 – SG

Packing

V – Teflon® (patent protected)

Seat

I – Integral (body material)

Body Material

S – SS, A479-316

Connection

4 – 1/2-inch FNPT

Options

–AL	Arctic Lubricant (low temperature service)
–AM	AGCO Mount Kit for pipestand mounting (page 84)
–BC	Accessory Bracket - Mount Conduit with -AM
–BP	Accessory Bracket Mount Purge Meters with -AM
–BL	Bonnet Lock Device (page 146)
–CL	Cleaned for Chlorine Service.
–OC	Cleaned for Oxygen Service.
–HD	Hydrostatic Testing (100 percent) (MSS-SP-61)
–MS	Monel® Stem
–PHB	Phenolic Black Handle
–SG	Sour Gas meets the requirements of NACE MR0175-latest revision.
–ST	Stellite Ball Ended Stem
–SP	Special options or requirements not otherwise noted by descriptive codes.