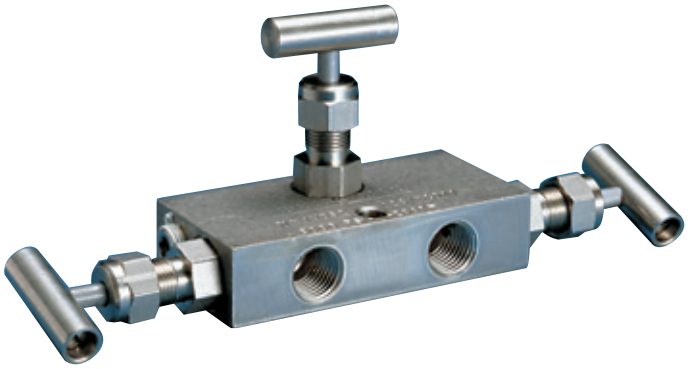
ANDERSON GREENWOOD MM1 DIFFERENTIAL PRESSURE MANIFOLD

A miniature three-valve manifold with the option of metal or soft seats for applications requiring remote mounting from the instrument



FEATURES

- Cost savings of 20-30% when manifolding by eliminating several parts used in conventional methods of 'piping up'.
- Compact design requires minimum space for operation and installation; ideal for installations behind boards and in cabinets.
- Fewer leak points reduce the chances of leakage.
- Unique valve seat can be converted from soft to hard simply by removing two insert washers.
- Rolled stem and bonnet threads increase strength and prevent galling, increasing valve life.
- Back seat stem feature prevents stem blowout.
- PTFE stem seal packing is easily adjusted for leak-proof and long service life.
- O-ring stem seal threads are isolated from process preventing galling and corrosion of the stem threads due to exposure to the process fluid.

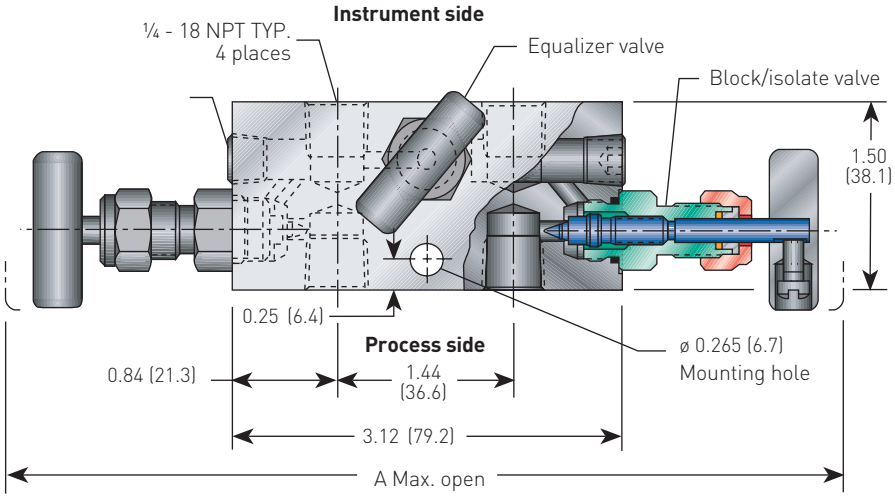
GENERAL APPLICATION

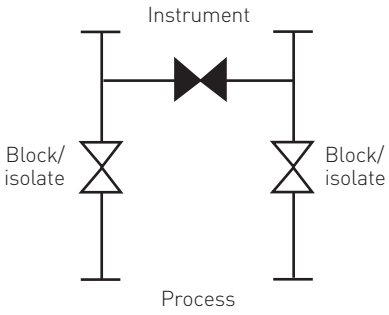
The MM1 is used to set or reset differential pressure switches during initial plant start-up or in assemblies for portable differential pressure test equipment used for any miniature differential pressure measuring device.

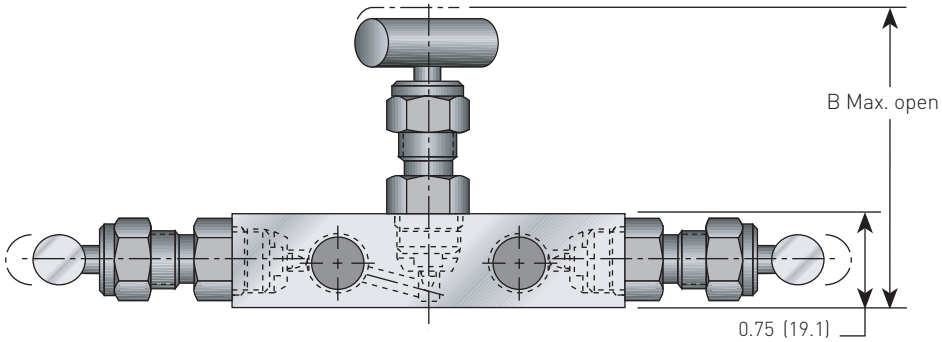
TECHNICAL DATA

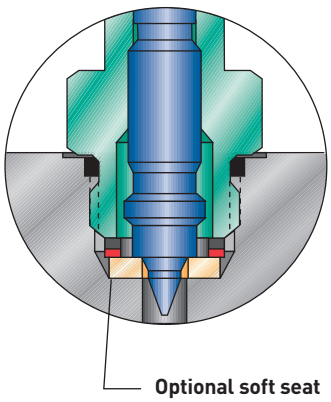
Materials:	CS, Brass, SS, Hastelloy
Seats:	Metal or soft
Connections	
Instrument:	¼" NPT
Process:	¼" NPT
Pressure (max.):	6000 psig (414 barg)
Temperature (max.):	1000°F (538°C)

DIMENSIONS, INCHES (mm)









DIMENSIONS, INCHES (mm)

Packing	A	B
O-ring	5.62 (142.7)	2.00 (50.8)
PTFE	6.82 (173.2)	2.60 (66.0)
Grafoil®	7.76 (197.1)	3.07 (78)

NOTE

1. Approximate valve weight: 1.0 lb (0.4 kg).
   0.136-inch (3.5 mm) diameter orifice.
   Valve C_v hard seat 0.25 maximum.
   Valve C_v soft seat 0.24 maximum.

BONNET ASSEMBLY OPTIONS

The MM1 features mini-valve bonnet assemblies, with a compact design and a one-piece rotating stem which is 'V' tipped with a shoulder for use as a metal or soft seated valve. The stem threads are rolled and lubricated to prevent galling and reduce operating torque. All miniature manifolds and valves feature a unique valve seat which may be converted from soft to metal simply by removing two insert washers.

The mini-valve bonnets come in two designs:
- An adjustable PTFE stem packed bonnet which is suitable for panel mounting via external bonnet threads.
- O-ring bonnet assemblies which use a NBR or FKM O-ring seal below the stem thread.

STANDARD MATERIALS

Valve	Body	Bonnet	Stem	Flow washer[4]
CS[1]	A108	A108	A581-303	316
Brass	B16	B16	A581-303	316
SS	A276-316	A479-316	A276-316	316
SG[3]	A276-316	A479-316	Monel® R405	316
SG3[5]	Hastelloy® C276	Hastelloy® C276	Hastelloy® C276	Hastelloy® C276

MINIMUM TEMPERATURE

Carbon steel	-20°F (-29°C)
316 SS O-ring seal	-20°F (-29°C)
316 SS, Monel, Hastelloy PTFE packed	-70°F (-57°C)
316 SS, Monel, Hastelloy Grafoil packed	-70°F (-57°C)

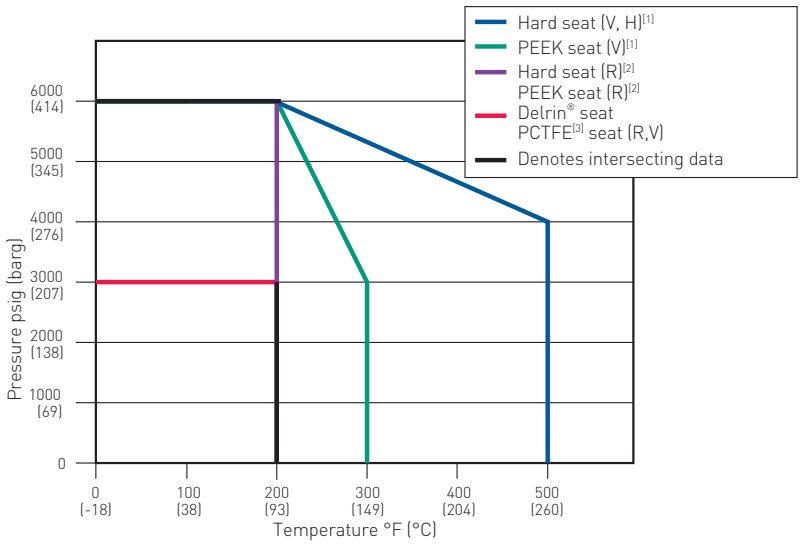
PRESSURE AND TEMPERATURE RATINGS[6]

	PTFE bonnet		GRAFOIL® bonnet[7]
Seat	**CS and SS valves**	**Brass valves**	**SS valves**
Hard	6000 psig at 200°F (414 barg at 93°C) 4000 psig at 500°F (276 barg at 260°C)	3000 psig at 400°F (207 barg at 204°C)	6000 psig at 200°F (414 barg at 93°C) 1500 psig at 1000°F (103 barg at 538°C)
Delrin® and PCTFE[2]	3000 psig at 200°F (207 barg at 93°C)	3000 psig at 200°F (207 barg at 93°C)	
PEEK	6000 psig at 200°F (414 barg at 93°C) 3000 psig at 300°F (207 barg at 149°C)	3000 psig at 300°F (207 barg at 149°C)	
O-ring bonnet			
Hard	6000 psig at 200°F (414 barg at 93°C)	3000 psig at 200°F (207 barg at 93°C)	
Delrin® and PCTFE[2]	3000 psig at 200°F (207 barg at 93°C)	3000 psig at 200°F (207 barg at 93°C)	
PEEK	6000 psig at 200°F (414 barg at 93°C)	3000 psig at 200°F (207 barg at 93°C)	

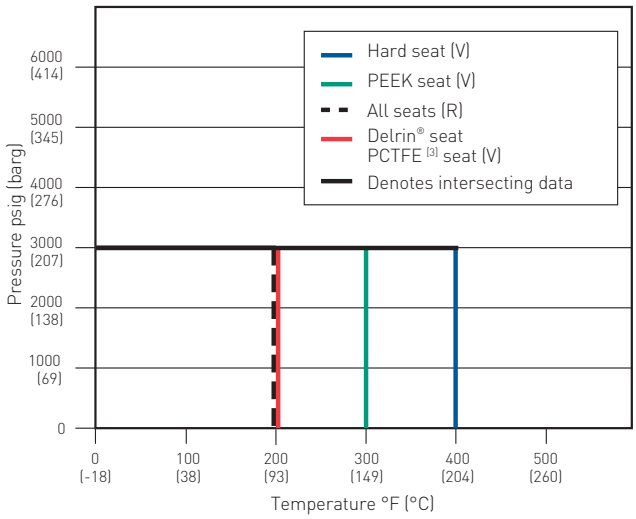
NOTES

1. CS is zinc chromate plated to prevent corrosion.
2. PCTFE (Polychlorotrifluoroethylene) is the exact equivalent of Kel-F®.
3. SG (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions ≤ 50 mg/l [ppm]) and NACE MR0103.
4. Soft seated valves only.
5. SG3 (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions > 50 mg/l [ppm]).
6. Pressure and temperature ratings are not shown on valve body.
7. GRAFOIL® packed bonnet comes complete with ball end stem; SS only. 1000°F (538°C)

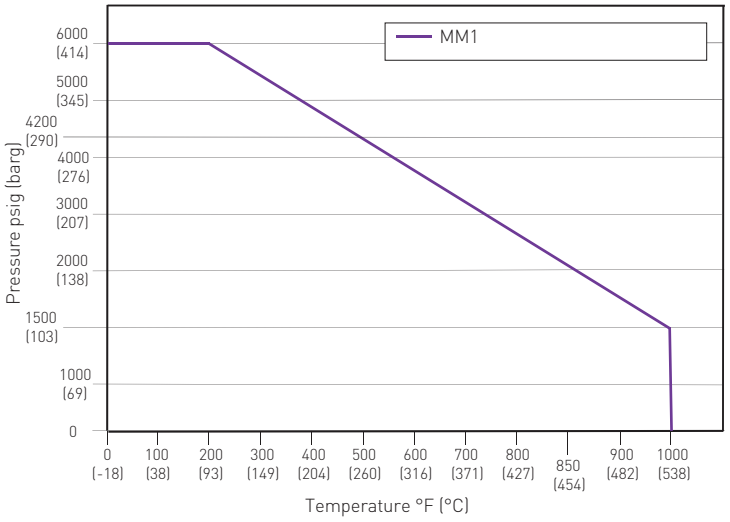
PRESSURE VS. TEMPERATURE



PRESSURE VS. TEMPERATURE - Brass valves



PRESSURE VS TEMPERATURE - SS valves with Grafoil® bonnet



NOTES

1. (V or H) = with PTFE or GRAFOIL® bonnet assemblies.
2. (R) = with O-ring bonnet assembly.
3. PCTFE (Polychlorotrifluoroethylene) is the exact equivalent of Kel-F®.

SELECTION GUIDE

Example:	MM1	V	D	S	-2	-SG
Packing						
V PTFE						
R O-ring						
H Grafoil® (SS only) 1000°F (538°C) max.						
Seat						
D Delrin®						
K PCTFE (Polychlorotrifluoroethylene) is the exact equivalent of Kel-F®.						
E PEEK						
I Integral (body material)						
Body material						
C CS, A108						
B Brass B16						
S SS, A276-316						
J Hastelloy®						
Connection						
2 ¼-inch FNPT						

Options[1]

-SG (Sour Gas) meets the requirements of NACE MR0175-latest revision. (SS valves only) (not available for O-ring packed valves)

-SG3 (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions > 50 mg/l [ppm]).

NOTE

1. Not available with AGCO Mount kit.
2. Delrin® is a registered trademark of E.I. du Pont de Nemours and Company.
3. Grafoil® is a registered trademark of GrafTech International.
4. Hastelloy® is a registered trademark of Haynes International, Inc.
5. Kel-F® is a registered trademark of 3M Company.
6. Monel® is a registered trademark of the Special Metals Corporation.