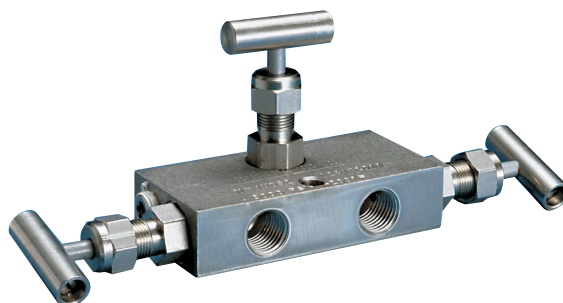


## Anderson Greenwood Instrumentation Manifolds - Three Valve

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

### 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, 316 SS, Hastelloy®

**Seats:**

Metal or soft

**Connections:**

**Instrument:** 1/4" NPT

**Process:** 1/4" NPT

**Pressure (max):**

6000 psig (414 barg)

**Temperature range (min/max):**

-70°C to 1000°F

(-57°C to 538°C)

### 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.

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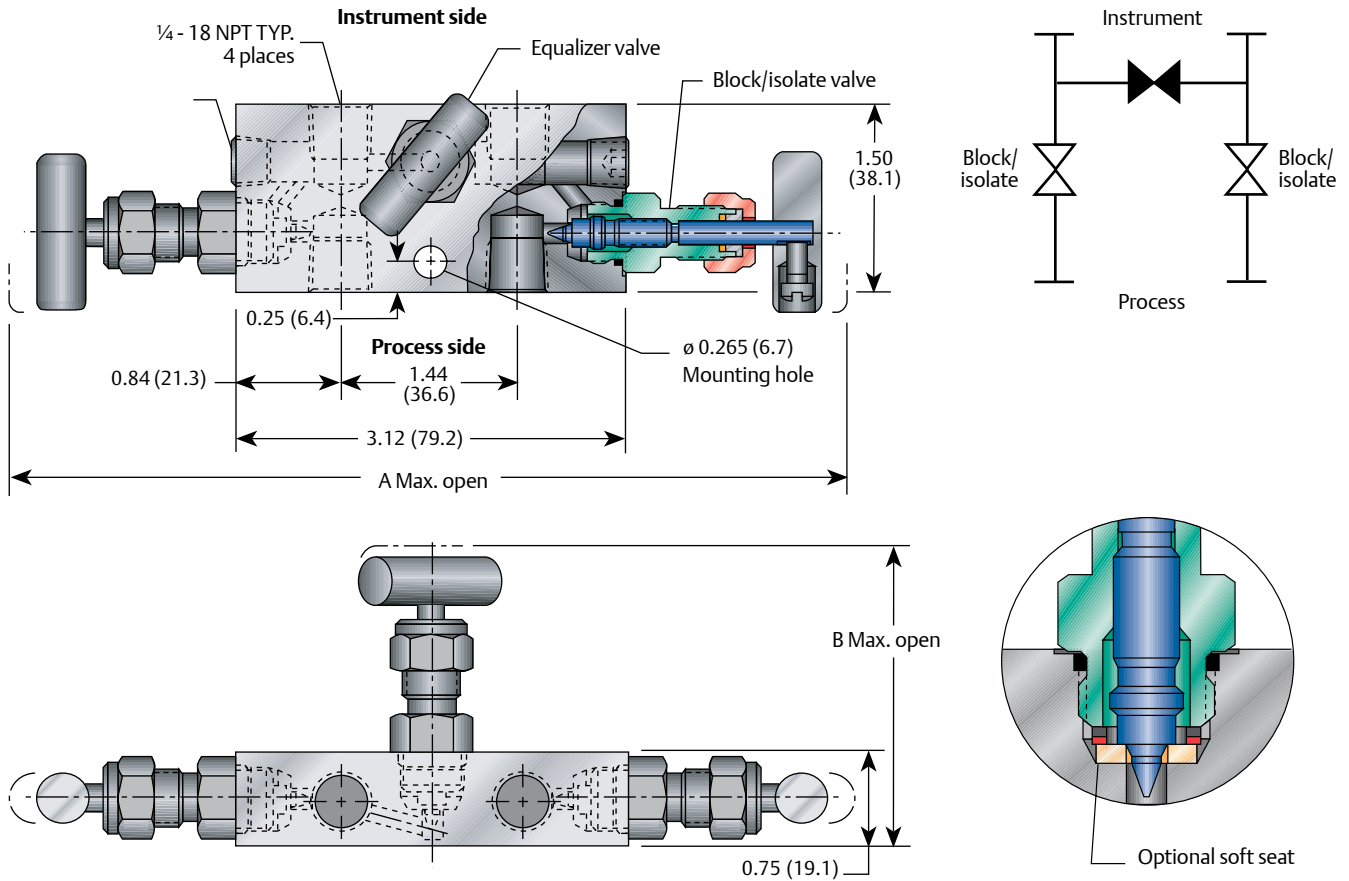
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# MM1 SERIES

## Anderson Greenwood Instrumentation Manifolds - Three Valve

### MM1 Dimensions

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) |
| Graphite | 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 Cv hard seat 0.25 maximum.  
 Valve Cv soft seat 0.24 maximum.

## Anderson Greenwood Instrumentation Manifolds - Three Valve

### 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 <sup>4)</sup>   |
|-------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| CS <sup>1)</sup>  | A108                        | A108                        | A581-303                    | 316                         |
| Brass             | B16                         | B16                         | A581-303                    | 316                         |
| 316 SS            | A276-316                    | A479-316                    | A276-316                    | 316                         |
| SG <sup>3)</sup>  | A276-316                    | A479-316                    | Monel <sup>®</sup> R405     | 316                         |
| SG3 <sup>5)</sup> | Hastelloy <sup>®</sup> C276 | Hastelloy <sup>®</sup> C276 | Hastelloy <sup>®</sup> C276 | Hastelloy <sup>®</sup> C276 |

### Minimum Temperature

|   |               |
|---|---------------|
| Carbon steel  | -20°F (-29°C) |
| Brass and 316 SS O-ring seal                        | -20°F (-29°C) |
| 316 SS, Monel <sup>®</sup> , Hastelloy <sup>®</sup> | -70°F (-57°C) |
| PTFE packed   |               |
| Delrin <sup>®</sup> Seat                            | -40°F (-40°C) |
| 316 SS, Monel <sup>®</sup> , Hastelloy <sup>®</sup> | -70°F (-57°C) |
| Graphite packed                                     |               |

### Pressure and Temperature ratings<sup>6)</sup>

| Seat  | PTFE bonnet                            |  | Graphite bonnet <sup>7)</sup>           |
|---|--|--|---|
|   | CS and SS valves                       | Brass valves                           | SS valves                               |
| Hard  | 6000 psig at 200°F (414 barg at 93°C)  | 3000 psig at 400°F (207 barg at 204°C) | 6000 psig at 200°F (414 barg at 93°C)   |
|   | 4000 psig at 500°F (276 barg at 260°C) |  | 1500 psig at 1000°F (103 barg at 538°C) |
| Delrin <sup>®</sup> and PCTFE <sup>2)</sup> | 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) |  |   |
| <b>O-ring bonnet</b>                        |  |  |   |
| Hard  | 6000 psig at 200°F (414 barg at 93°C)  | 3000 psig at 200°F (207 barg at 93°C)  |   |
| Delrin <sup>®</sup> and PCTFE <sup>2)</sup> | 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)  |   |

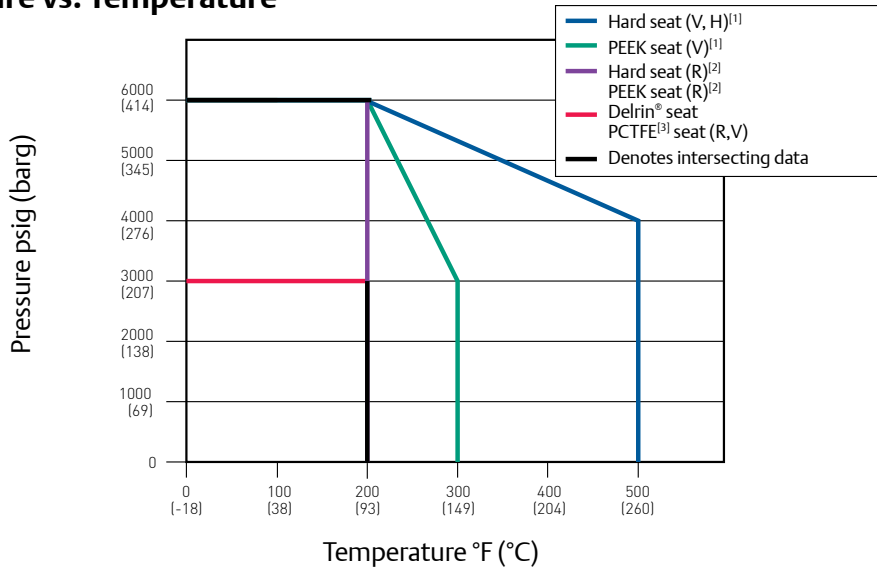
### NOTES

1. CS is zinc TCP plated to prevent corrosion.
2. PCTFE (Polychlorotrifluoroethylene) is the exact equivalent of Kel-F<sup>®</sup>.
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. Graphite packed bonnet comes complete with ball end stem; 316 SS only. 1000°F (538°C)

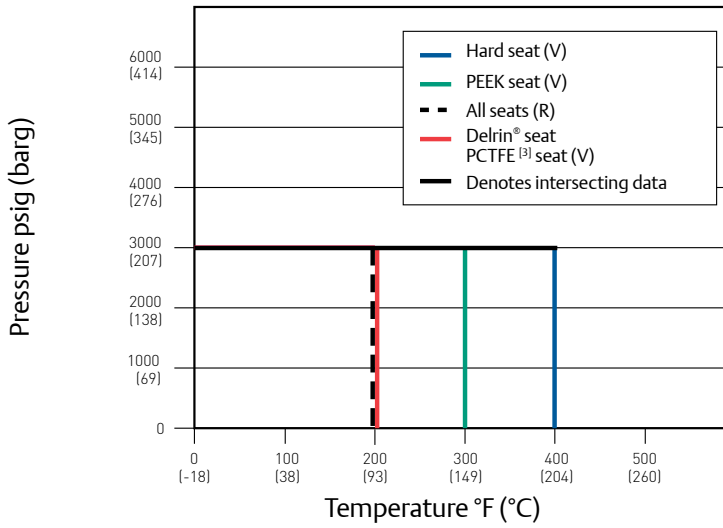
# MM1 SERIES

## Anderson Greenwood Instrumentation Manifolds - Three Valve

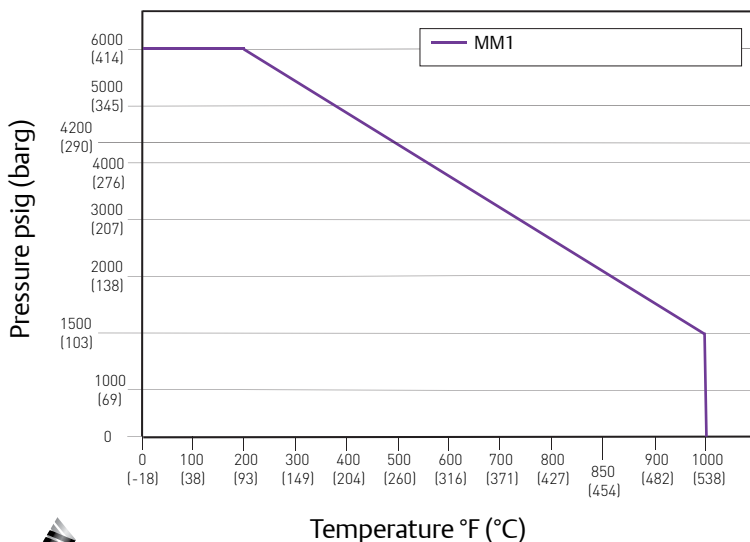
### Pressure vs. Temperature



### Pressure vs. Temperature - Brass valves



### Pressure vs. Temperature - SS valves with Graphite bonnet



**NOTES**

- (V or H) = with PTFE or Graphite bonnet assemblies.
- (R) = with O-ring bonnet assembly.
- PCTFE (Polychlorotrifluoroethylene) is the exact equivalent of Kel-F<sup>®</sup>.

Anderson Greenwood Instrumentation Manifolds - Three Valve

Selection Guide

| MM1          | V                                       | D   | S                                      | -2              | -SG  |
|--------------|---|---|--|-----------------|--|
| BASIC SERIES | PACKING                                 | SEAT  | BODY MATERIAL                          | CONNECTION      | OPTIONS <sup>(1)</sup>   |
| MM1          | V PTFE                                  | D Delrin®   | C CS, A108                             | 2 1/4-inch FNPT | <b>SG</b> (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for chloride conditions ≤ 50 mg/l (ppm)) and NACE MR0103-2005<br><b>SG3</b> (Sour Gas) Meets the requirements of NACE MRO175/ISO15156 (for chloride conditions > 50 mg/l (ppm)) Hastelloy Material used for all wetted materials |
|              | R O-ring                                | K PCTFE (Polychlorotrifluoroethylene) is the exact equivalent of Kel-F® | B Brass B16                            |                 |  |
|              | H Graphite (SS only) 1000°F (538°C) max | E PEEK<br><br>I Integral (body material)                                | S 316 SS, A276-316<br><br>J Hastelloy® |                 |  |

NOTES

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

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