

# 2271A

Automated Pressure Calibrator

## Product Specifications



# Specifications

## General Specifications

### Mains

|                            |                                      |
|----------------------------|--------------------------------------|
| Power Requirements .....   | 100 V ac to 240 V ac, 47 Hz to 63 Hz |
| Fuse .....                 | T2A 250 V ac                         |
| Max Power Consumption..... | 100 W                                |

### Environment

|                                          |                                                                                                                                           |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Ambient Temperature Range..... | 15 °C to 35 °C                                                                                                                            |
| Storage Temperature.....                 | -20 °C to 70 °C                                                                                                                           |
| Relative Humidity                        |                                                                                                                                           |
| Operating .....                          | <80 % to 30 °C, <70 % to 35 °C                                                                                                            |
| Storage .....                            | <95 %, non-condensing. A power stabilization period of four days may be required after extended storage at high temperature and humidity. |
| Vibration.....                           | MIL-T-28800D CLASS 3                                                                                                                      |
| Altitude (Operation).....                | <2000 m                                                                                                                                   |
| Warmup Time .....                        | 15 minutes after power up or module installation, when items previously stored within Operating Ambient Temperature                       |

### Electromagnetic Compatibility (EMC)

|                     |                                                                                                                                                                                                                                                                                                                                                                |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| International ..... | IEC 61326-1: Controlled Electromagnetic Environment                                                                                                                                                                                                                                                                                                            |
|                     | CISPR 11: Group 1, Class A                                                                                                                                                                                                                                                                                                                                     |
|                     | <i>Group 1: Equipment has intentionally generated and/or uses conductively-coupled radio frequency energy that is necessary for the internal function of the equipment itself.</i>                                                                                                                                                                             |
|                     | <i>Class A: Equipment is suitable for use in all establishments other than domestic and those directly connected to a low-voltage power supply network that supplies buildings used for domestic purposes. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted and radiated disturbances.</i> |
|                     | <i>Emissions that exceed the levels required by CISPR 11 can occur when the equipment is connected to a test object.</i>                                                                                                                                                                                                                                       |
| Korea (KCC) .....   | Class A Equipment (Industrial Broadcasting & Communication Equipment)                                                                                                                                                                                                                                                                                          |
|                     | <i>Class A: Equipment meets requirements for industrial electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and not to be used in homes.</i>                                                                                                                           |
| USA (FCC).....      | 47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103.                                                                                                                                                                                                                                                                            |

### Compliance

|                          |                                                           |
|--------------------------|-----------------------------------------------------------|
| Ingress Protection ..... | IEC 60529: IP20                                           |
| Safety.....              | IEC 61010-1, Installation Category II, Pollution degree 2 |

### Dimensions and Weights

#### Dimensions

|              |                 |                   |
|--------------|-----------------|-------------------|
| Height ..... | 2271A-NPT-STD   | 305 mm (12 in)    |
|              | 2271A-BSP-STD   | 305 mm (12 in)    |
|              | 2271A-NPT-P3000 | 237 mm (9.33 in)  |
|              | 2271A-BSP-P3000 | 237 mm (9.33 in)  |
| Width.....   |                 | 442 mm (17.40 in) |
| Depth .....  |                 | 446 mm (17.55 in) |

#### Weight

|                    |                   |
|--------------------|-------------------|
| Chassis only ..... | 15 kg (33.06 lbs) |
|--------------------|-------------------|

**Communication Interfaces**

Primary remote Interfaces ..... Ethernet, RS232, USB  
 Electrical Measurement Module (EMM)  
 Connection ..... Banana Jack  
 Maximum 30 V dc w.r.t. chassis ground  
 Aux Drivers ..... 4 external Solenoid Drivers  
 24 V dc. 100 % duty cycle when turned, reducing to 40 % shortly after.

**Performance Specifications**

The performance specifications describe the complete instrumental uncertainty of the Product. The specifications include all relevant error components (linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, 1-year drift, and temperature effects). The specifications are provided at a level of confidence of 95 %, k=2, normally distributed for the pressure modules and 99 %, k=2.58, normally distributed for electrical module. Precision uncertainty includes linearity, hysteresis, repeatability, resolution, and temperature effects.

**PM200 Modules**

Specifications are valid from 18 °C to 28 °C. For temperatures from 15 °C to 18 °C and 28 °C to 35 °C, add 0.003 % FS/°C.

**Table 1. PM200 Module Measurement Specifications**

| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Range<br>(SI Units) | Range<br>(Imperial Units)                       | Measurement<br>Mode <sup>1</sup> | 1-Year<br>Instrumental<br>Uncertainty<br>% FS | Precision<br>Uncertainty<br>% FS |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------------------------------------|----------------------------------|-----------------------------------------------|----------------------------------|
| PM200-BG2.5K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -2.5 kPa to 2.5 kPa | -10 inH <sub>2</sub> O to 10 inH <sub>2</sub> O | bi-directional gauge             | 0.2                                           | 0.055                            |
| PM200-BG35K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -35 kPa to 35 kPa   | -5 psi to 5 psi                                 | bi-directional gauge             | 0.05                                          | 0.015                            |
| PM200-BG40K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -40 kPa to 40 kPa   | -6 psi to 6 psi                                 | bi-directional gauge             | 0.05                                          | 0.015                            |
| PM200-BG60K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -60 kPa to 60 kPa   | -8.7 psi to 8.7 psi                             | bi-directional gauge             | 0.05                                          | 0.015                            |
| PM200-BG100K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -100 kPa to 100 kPa | -15 psi to 15 psi                               | bi-directional gauge             | 0.02                                          | 0.01                             |
| PM200-A100K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2 kPa to 100 kPa    | 0.3 psi to 15 psi                               | absolute                         | 0.1                                           | 0.02                             |
| PM200-A200K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2 kPa to 200 kPa    | 0.3 psi to 30 psi                               | absolute                         | 0.1                                           | 0.02                             |
| PM200-BG200K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -100 kPa to 200 kPa | -15 psi to 30 psi                               | bi-directional gauge             | 0.02                                          | 0.01                             |
| PM200-BG250K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -100 kPa to 250 kPa | -15 psi to 36 psi                               | bi-directional gauge             | 0.02                                          | 0.01                             |
| PM200-G400K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 kPa to 400 kPa    | 0 psi to 60 psi                                 | gauge                            | 0.02                                          | 0.01                             |
| PM200-G700K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 kPa to 700 kPa    | 0 psi to 100 psi                                | gauge                            | 0.02                                          | 0.01                             |
| PM200-G1M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 MPa to 1 MPa      | 0 psi to 150 psi                                | gauge                            | 0.02                                          | 0.01                             |
| PM200-G1.4M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 MPa to 1.4 MPa    | 0 psi to 200 psi                                | gauge                            | 0.02                                          | 0.01                             |
| PM200-G2M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 MPa to 2 MPa      | 0 psi to 300 psi                                | gauge                            | 0.02                                          | 0.01                             |
| PM200-G2.5M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 MPa to 2.5 MPa    | 0 psi to 360 psi                                | gauge                            | 0.02                                          | 0.01                             |
| PM200-G3.5M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 MPa to 3.5 MPa    | 0 psi to 500 psi                                | gauge                            | 0.02                                          | 0.01                             |
| PM200-G4M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 MPa to 4 MPa      | 0 psi to 580 psi                                | gauge                            | 0.02                                          | 0.01                             |
| PM200-G7M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 MPa to 7 MPa      | 0 psi to 1000 psi                               | gauge                            | 0.02                                          | 0.01                             |
| PM200-G10M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 MPa to 10 MPa     | 0 psi to 1500 psi                               | gauge                            | 0.02                                          | 0.01                             |
| PM200-G14M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 MPa to 14 MPa     | 0 psi to 2000 psi                               | gauge                            | 0.02                                          | 0.01                             |
| PM200-G20M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 MPa to 20 MPa     | 0 psi to 3000 psi                               | gauge                            | 0.02                                          | 0.01                             |
| Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                                 |                                  |                                               |                                  |
| 1. PM200 gauge mode modules support absolute mode measurement when used with a barometric reference module. Instrumental uncertainty for gauge mode modules used in absolute mode by addition of a barometric reference module is calculated as the uncertainty of the gauge mode module root sum squared with the uncertainty of the barometric reference module. Uncertainty for gauge mode assumes routine zeroing which is default operating mode when used in a chassis. Uncertainty for absolute mode modules includes 1-year zero stability. This specification can be reduced to 0.05 % FS if the PM200 module is zeroed on a continuing basis to remove the 1-year zero stability component. |                     |                                                 |                                  |                                               |                                  |

## PM500 Modules

Specifications are valid from 15 °C to 35 °C.

**Table 2. PM500 Module Measurement Specifications**

| Model        | Range<br>(SI Units)     | Range<br>(Imperial Units) | Measurement<br>Mode <sup>2</sup> | 1-Year<br>Instrumental<br>Uncertainty<br>(% of reading<br>or % FS,<br>whichever is<br>greater) unless<br>otherwise<br>stated | 1-Year Zero<br>Instrumental<br>Drift<br>% FS, RSS with<br>1-Year<br>Instrumental<br>Uncertainty <sup>1</sup> | Precision<br>Uncertainty<br>(% of reading or<br>% FS, whichever<br>is greater) |
|--------------|-------------------------|---------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| PM500-G100K  | 0 kPa to 100 kPa        | 0 psi to 15 psi           | gauge                            | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-G200K  | 0 kPa to 200 kPa        | 0 psi to 30 psi           | gauge                            | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-G250K  | 0 kPa to 250 kPa        | 0 psi to 36 psi           | gauge                            | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-G350K  | 0 kPa to 350 kPa        | 0 psi to 50 psi           | gauge                            | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-G400K  | 0 kPa to 400 kPa        | 0 psi to 60 psi           | gauge                            | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-G600K  | 0 kPa to 600 kPa        | 0 psi to 90 psi           | gauge                            | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-G700K  | 0 kPa to 700 kPa        | 0 psi to 100 psi          | gauge                            | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BG1M   | -0.1 MPa to 1 MPa       | -15 psi to 150 psi        | bi-directional<br>gauge          | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BG1.4M | -0.1 MPa to 1.4 MPa     | -15 psi to 200 psi        | bi-directional<br>gauge          | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BG2M   | -0.1 MPa to 2 MPa       | -15 psi to 300 psi        | bi-directional<br>gauge          | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BG2.5M | -0.1 MPa to 2.5 MPa     | -15 psi to 400 psi        | bi-directional<br>gauge          | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BG3.5M | -0.1 MPa to 3.5 MPa     | -15 psi to 500 psi        | bi-directional<br>gauge          | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BG4M   | -0.1 MPa to 4 MPa       | -15 psi to 600 psi        | bi-directional<br>gauge          | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BG7M   | -0.1 MPa to 7 MPa       | -15 psi to 1000 psi       | bi-directional<br>gauge          | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BG10M  | -0.1 MPa to 10 MPa      | -15 psi to 1500 psi       | bi-directional<br>gauge          | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BG14M  | -0.1 MPa to 14 MPa      | -15 psi to 2000 psi       | bi-directional<br>gauge          | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BG20M  | -0.1 MPa to 20 MPa      | -15 psi to 3000 psi       | bi-directional<br>gauge          | 0.01 or 0.005                                                                                                                | -                                                                                                            | 0.007 or 0.0035                                                                |
| PM500-BA120K | 60 kPa to 120 kPa       | 8 psi to 17 psi           | absolute                         | 0.01 % of<br>reading                                                                                                         | 0.05                                                                                                         | 0.005 % of<br>reading                                                          |
| PM500-A120K  | 0.08 kPa to 120 kPa     | 0.01 psi to 16 psi        | absolute                         | 0.01 or 0.005                                                                                                                | 0.05                                                                                                         | 0.007 or 0.0035                                                                |
| PM500-A160K  | 0.08 kPa to 160 kPa     | 0.01 psi to 23 psi        | absolute                         | 0.01 or 0.005                                                                                                                | 0.05                                                                                                         | 0.007 or 0.0035                                                                |
| PM500-A200K  | 0.08 kPa to 200 kPa     | 0.01 psi to 30 psi        | absolute                         | 0.01 or 0.005                                                                                                                | 0.05                                                                                                         | 0.007 or 0.0035                                                                |
| PM500-A350K  | 0.08 kPa to 350 kPa     | 0.01 psi to 50 psi        | absolute                         | 0.01 or 0.005                                                                                                                | 0.03                                                                                                         | 0.007 or 0.0035                                                                |
| PM500-A700K  | 0.08 kPa to 700 kPa     | 0.01 psi to 100 psi       | absolute                         | 0.01 or 0.005                                                                                                                | 0.025                                                                                                        | 0.007 or 0.0035                                                                |
| PM500-A1.4M  | 0.035 MPa to<br>1.4 MPa | 5 psi to 200 psi          | absolute                         | 0.01 or 0.005                                                                                                                | 0.015                                                                                                        | 0.007 or 0.0035                                                                |
| PM500-A2M    | 0.07 MPa to 2 MPa       | 10 psi to 300 psi         | absolute                         | 0.01 or 0.005                                                                                                                | 0.015                                                                                                        | 0.007 or 0.0035                                                                |

|              |                     |                                                   |                      | (% FS + % of reading) |   | (% FS + % of reading) |
|--------------|---------------------|---------------------------------------------------|----------------------|-----------------------|---|-----------------------|
| PM500-G2.5K  | 0 kPa to 2.5 kPa    | 0 inH <sub>2</sub> O to 10 inH <sub>2</sub> O     | gauge                | 0.03 + 0.02           | - | 0.015 + 0.01          |
| PM500-G7K    | 0 kPa to 7 kPa      | 0 inH <sub>2</sub> O to 30 inH <sub>2</sub> O     | gauge                | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-G14K   | 0 kPa to 14 kPa     | 0 inH <sub>2</sub> O to 50 inH <sub>2</sub> O     | gauge                | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-G20K   | 0 kPa to 20 kPa     | 0 inH <sub>2</sub> O to 80 inH <sub>2</sub> O     | gauge                | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-G35K   | 0 kPa to 35 kPa     | 0 psi to 5 psi                                    | gauge                | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-G70K   | 0 kPa to 70 kPa     | 0 psi to 10 psi                                   | gauge                | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-NG100K | -100 kPa to 0 kPa   | -15 psi to 0 psi                                  | negative gauge       | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-BG1.4K | -1.4 kPa to 1.4 kPa | -5 inH <sub>2</sub> O to 5 inH <sub>2</sub> O     | bi-directional gauge | 0.03 + 0.02           | - | 0.015 + 0.01          |
| PM500-BG2.5K | -2.5 kPa to 2.5 kPa | -10 inH <sub>2</sub> O to 10 inH <sub>2</sub> O   | bi-directional gauge | 0.03 + 0.02           | - | 0.015 + 0.01          |
| PM500-BG3.5K | -3.5 kPa to 3.5 kPa | -15 inH <sub>2</sub> O to 15 inH <sub>2</sub> O   | bi-directional gauge | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-BG7K   | -7 kPa to 7 kPa     | -30 inH <sub>2</sub> O to 30 inH <sub>2</sub> O   | bi-directional gauge | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-BG14K  | -14 kPa to 14 kPa   | -50 inH <sub>2</sub> O to 50 inH <sub>2</sub> O   | bi-directional gauge | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-BG25K  | -25 kPa to 25 kPa   | -100 inH <sub>2</sub> O to 100 inH <sub>2</sub> O | bi-directional gauge | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-BG40K  | -40 kPa to 40 kPa   | -6 psi to 6 psi                                   | bi-directional gauge | 0.01 + 0.01           | - | 0.005 + 0.005         |
| PM500-BG60K  | -60 kPa to 60 kPa   | -9 psi to 9 psi                                   | bi-directional gauge | 0.01 + 0.01           | - | 0.005 + 0.005         |
|              |                     |                                                   |                      | % FS                  |   | % FS                  |
| PM500-BG100K | -100 kPa to 100 kPa | -15 psi to 15 psi                                 | bi-directional gauge | 0.01                  | - | 0.005                 |
| PM500-BG200K | -100 kPa to 200 kPa | -15 psi to 30 psi                                 | bi-directional gauge | 0.01                  | - | 0.005                 |
| PM500-BG250K | -100 kPa to 250 kPa | -15 psi to 36 psi                                 | bi-directional gauge | 0.01                  | - | 0.005                 |
| PM500-BG350K | -100 kPa to 350 kPa | -15 psi to 50 psi                                 | bi-directional gauge | 0.01                  | - | 0.005                 |
| PM500-BG400K | -100 kPa to 400 kPa | -15 psi to 60 psi                                 | bi-directional gauge | 0.01                  | - | 0.005                 |
| PM500-BG700K | -100 kPa to 700 kPa | -15 psi to 100 psi                                | bi-directional gauge | 0.01                  | - | 0.005                 |

## Notes

- The 1 Year Instrumental Uncertainty is specified with a zeroing technique in the Operators Manual. If not adhered to the 1 Year Instrumental Uncertainty is:

$$\sqrt{\left(\frac{1 \text{ year instrumental uncertainty}}{2}\right)^2 + \left(\frac{1 \text{ year zero drift}}{1.73}\right)^2} \times 2$$

- PM500 gauge or bi-directional mode modules support absolute mode measurement when used with a Barometric Reference Module. Instrumental uncertainty for gauge mode modules used in absolute mode by addition of a barometric reference module is calculated as the uncertainty of the gauge mode module root sum squared with the uncertainty of the barometric reference module. Uncertainty for gauge mode assumes routine zeroing which is default operation mode when used in a chassis.

### EM300 Modules

Specifications are valid from 18 °C to 28 °C. For temperatures from 15 °C to 18 °C and 28 °C to 35 °C, add 0.002 % FS/°C.

**Table 3. EM300 Module Measurement Specifications**

All outputs are positive only.

| DC Voltage |            |                                 |
|------------|------------|---------------------------------|
| Range      | Resolution | 1 Year Instrumental Uncertainty |
| 30 V       | 1 mV       | 0.01 % of reading + 2 mV        |
| DC Current |            |                                 |
| Range      | Resolution | 1 Year Instrumental Uncertainty |
| 24 mA      | 1 µA       | 0.01 % of reading + 2 µA        |

### Operating Characteristics

Control Precision (Dynamic Mode)

PM200-BG2.5K..... 0.005 % Range Span  
 PM500 <20 kPa Full Scale ..... 0.002 % Range Span  
 All other Ranges ..... 0.001 % Range Span  
 Control Turndown ..... 10:1 (typical)

To meet the control specifications, supply pressure should not be greater than 10 times the range of the measurement module. Control turndown is defined as the relationship between the provided supply pressure and the appropriate supply pressure for the range. For example, a unit with a 7 MPa (1000 psi) and 700 kPa range (100 psi) with a supply pressure of 7.7 MPa (1100 psi) provides control precision of 0.001 % range because 7 MPa is 10 times greater than 700 kPa. A system with ranges of 20 MPa (3000 psi) and 700 kPa (100 psi) with supply pressure of 22 MPa (3300 psi) will have 0.001 % range control precision on the 20 MPa range but only 0.003 % control precision on the 700 kPa range. Control precision of 0.001 % on the low range can be achieved by reducing the supply pressure.

Low Control Point ..... 1 kPa (0.15 psi) absolute

Settling Time (typical)

PM200-BG2.5K..... 40 seconds  
 All other PM200 ranges ..... 20 seconds  
 PM500 ≤20 kPa Full Scale ..... 45 seconds  
 PM500 >20 kPa Full Scale ..... 30 seconds

Typical settling time is the time required to be within 0.005 % of the setpoint for 10 % steps into volumes of 0 to 50 cm<sup>3</sup> and pressures above 50 kPa (7.25 psi) absolute. Lower absolute pressures require longer settling times depending upon quality of the vacuum pump, diameter and material of tubing used, and test volume.

Maximum Overshoot..... 0.02 % Range Span

#### Pressure Limits

Working Pressure Range..... -97.90 kPa (-14.2 psi) gauge to 20 MPa (3000 psi) gauge  
 Supply Port ..... 23 MPa (3300 psi) gauge  
 Test Port ..... 20 MPa (3000 psi) absolute  
 Reference Port ..... 115 kPa (17 psi) absolute  
 Vent Port ..... 150 kPa (22 psi) absolute

Chassis Supply port relief valve is set to 24.1 MPa (-0/+700 kPa), 3500 psi (-0/+100 psi)  
Exhaust port relief valve is set to ~830 kPa (120 psi).  
Each Pressure Measurement Module (PMM) includes a module-specific pressure protection device.

Clean Dry Air or Nitrogen (Industrial Grade, 99.5 %)

Maximum Particulate Contamination.....≤1.25 micrometer (50 microinches)

Maximum Moisture Content.....-50 °C dew point

Maximum Hydrocarbon Content..... 30 ppm

Exhaust gas will pass through the vacuum supply. Appropriate protections should be taken when operating at higher pressures.

Loop Compliance Voltage..... $\geq 24$  V dc @ 20 mA (without 250  $\Omega$  built in resistor)  
 $\geq 19$  V dc @ 20 mA (with 250  $\Omega$  built in resistor)

Current Limits ..... $\leq 4$  mA  
Conditions ..... Closed  $>1.5$  mA, Open  $<0.5$  mA

|                                |                                                                           |
|--------------------------------|---------------------------------------------------------------------------|
| HART Modes .....               | HART mA measurement with 24 V (Loop)                                      |
| Automatic HART Detection ..... | HART connected with automatic polling                                     |
| HART Selectable Resistor ..... | Built-in 250 $\Omega$ loop resistor. Selectable ON/OFF                    |
| HART Commands.....             | HART universal and common practice commands (no device specific commands) |
| Write Protection .....         | HART Write enable/disable.                                                |