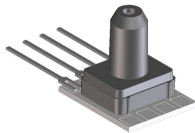


# Miniature Pressure Sensors

## H-Grade

Pressure Sensors



## Features

- 0 to 4" H2O to 0 to 100 PSI Pressure Ranges
- 0.5 % linearity...high accuracy version
- Temperature Compensated
- Calibrated Zero and Span

## Applications

- Medical Instrumentation
- Environmental Controls
- HVAC

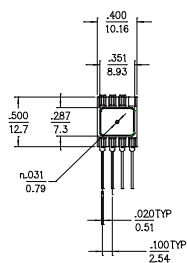
## General Description

The Miniature series pressure sensors are based upon a proprietary technology to reduce the size of the sensor and yet maintain a high level of performance. This model provides a calibrated millivolt output with superior output offset characteristics. Output offset errors due to change in temperature, stability to warm-up, stability to long time period, and position sensitivity are all significantly reduced when compared to conventional compensation methods. In addition the sensor utilizes a silicon, micromachined, stress concentration enhanced structure to provide a very linear output to measured pressure.

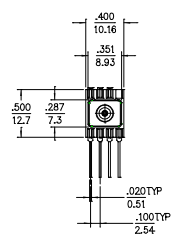
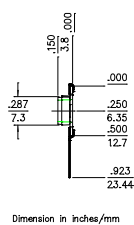
These calibrated and temperature compensated sensors give an accurate and stable output over a wide temperature range. This series is intended for use with non-corrosive, non-ionic working fluids such as air, dry gases and the like. The H-GRADE is a high accuracy version of the millivolt output pressure sensors.

The output of the device is ratiometric to the supply voltage and operation from any D.C. supply voltage.

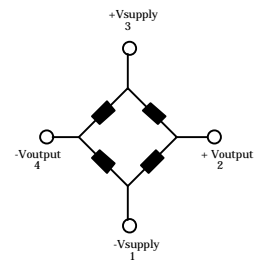
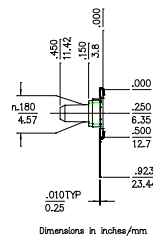
## Physical Dimensions



No Pressure Port



Single Pressure Port

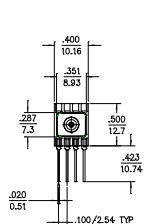


Input Resistance 15 kohm

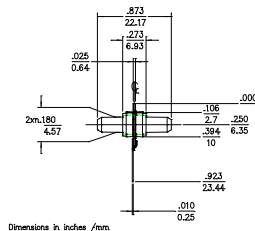
Output Resistance 3.0 kohm

## Equivalent Circuit

Marking:  
 right dot: Red: Prime Grade  
 left dot:  
 L10: yellow  
 0.3: pink  
 1.0: green  
 05: blue  
 15: purple  
 30: orange  
 100: brown



Dual Pressure Port



**Pressure Sensor Characteristics Maximum Ratings**

|  |         |
|--|---------|
| <b>Supply Voltage VS</b>                     | 16 Vdc  |
| <b>Common-mode pressure</b>                  | 50 psig |
| <b>Lead Temperature (soldering 2-4 sec.)</b> | 250°C   |

**Environmental Specifications**

|                           |                                 |
|---------------------------|---------------------------------|
| <b>Temperature Ranges</b> |                                 |
| <b>Compensated</b>        | 0 to (50)70° C                  |
| <b>Operating</b>          | -25 to 85° C                    |
| <b>Storage</b>            | -40 to 125° C                   |
| <b>Humidity Limits</b>    | 0 to 95% RH<br>(non condensing) |

**Standard Pressure Ranges**

| No Pressure Port      |                    | Single Pressure Port   |                       | Dual Pressure Port | Proof Pressure |
|-----------------------|--------------------|------------------------|-----------------------|--------------------|----------------|
| Part Number           | Operating Pressure | Part Number            | Part Number           | Part Number        |                |
| 4 INCH-G-HGRADE-MINI  | 0 - 4 "H2O         | 4 INCH-GF-HGRADE-MINI  | 4 INCH-D-HGRADE-MINI  |                    | 3 PSI          |
| 0.3 PSI-G-HGRADE-MINI | 0 - 0.3 PSI        | 0.3 PSI-GF-HGRADE-MINI | 0.3 PSI-D-HGRADE-MINI |                    | 3 PSI          |
| 10 INCH-G-HGRADE-MINI | 0 - 10 "H2O        | 10 INCH-GF-HGRADE-MINI | 10 INCH-D-HGRADE-MINI |                    | 5 PSI          |
| 1 PSI-G-HGRADE-MINI   | 0 - 1 PSI          | 1 PSI-GF-HGRADE-MINI   | 1 PSI-D-HGRADE-MINI   |                    | 10 PSI         |
| 5 PSI-G-HGRADE-MINI   | 0 - 5 PSI          | 5 PSI-GF-HGRADE-MINI   | 5 PSI-D-HGRADE-MINI   |                    | 20 PSI         |
| 15 PSI-A-HGRADE-MINI  | 0 - 15 PSIA        | 15 PSI-AF-HGRADE-MINI  |                       |                    | 60 PSI         |
| 15 PSI-G-HGRADE-MINI  | 0-15 PSIG          | 15 PSI-GF-HGRADE-MINI  | 15 PSI-D-HGRADE-MINI  |                    | 60 PSI         |
| 30 PSI-G-HGRADE-MINI  | 0-30 PSIG          | 30 PSI-GF-HGRADE-MINI  | 30 PSI-D-HGRADE-MINI  |                    | 60 PSI         |
| 100 PSI-G-HGRADE-MINI | 0-100 PSIG         | 100-PSI-GF-HGRADE-MINI |                       |                    | 150 PSI        |

**Performance Characteristics for 4 INCH-G-HGRADE-MINI**

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---|---------|---------|---------|-------|
| Operating Range, differential pressure      |         | 4.0     |         | "H2O  |
| Output Span, note 5                         | 24      | 25      | 26      | mV    |
| Offset Voltage @ zero differential pressure |         |         | ±0.5    | mV    |
| Offset Temperature Shift (0°C-50°C), note 2 |         |         | ±0.5    | mV    |
| Linearity, hysteresis error, note 4         |         | 0.25    | 0.5     | % fs  |
| Span Shift (0°C-50°C), note 2               |         |         | ±1      | % fs  |

**Performance Characteristics for 10 INCH-G-HGRADE-MINI**

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---|---------|---------|---------|-------|
| Operating Range, differential pressure      |         | 10.0    |         | "H2O  |
| Output Span, note 5                         | 19      | 20      | 21      | mV    |
| Offset Voltage @ zero differential pressure |         |         | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 |         |         | ±0.5    | mV    |
| Linearity, hysteresis error, note 4         |         | 0.25    | 0.5     | % fs  |
| Span Shift (0°C-70°C), note 2               |         |         | ±1      | % fs  |

### Performance Characteristics for 0.3 PSI-G-HGRADE-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---|---------|---------|---------|-------|
| Operating Range, differential pressure      |         | 0.3     |         | PSI   |
| Output Span, note 5                         | 19      | 20      | 21      | mV    |
| Offset Voltage @ zero differential pressure |         |         | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 |         |         | ±0.5    | mV    |
| Linearity, hysteresis error, note 4         |         | 0.25    | 0.5     | %fs   |
| Span Shift (0°C-70°C), note 2               |         |         | ±1      | %fs   |

### Performance Characteristics for 1 PSI-G-HGRADE-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---|---------|---------|---------|-------|
| Operating Range, differential pressure      |         | 1.0     |         | PSI   |
| Output Span, note 5                         | 17.82   | 18.00   | 18.18   | mV    |
| Offset Voltage @ zero differential pressure |         |         | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 |         |         | ±0.5    | mV    |
| Linearity, hysteresis error, note 4         |         | 0.25    | 0.5     | %fs   |
| Span Shift (0°C-70°C), note 2               |         |         | ±1      | %fs   |

### Performance Characteristics for 5 PSI-G-HGRADE-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---|---------|---------|---------|-------|
| Operating Range, differential pressure      |         | 5.0     |         | PSI   |
| Output Span, note 5                         | 59.4    | 60.0    | 60.6    | mV    |
| Offset Voltage @ zero differential pressure |         |         | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 |         |         | ±0.5    | mV    |
| Linearity, hysteresis error, note 4         |         | 0.25    | 0.5     | %fs   |
| Span Shift (0°C-70°C), note 2               |         |         | ±1      | %fs   |

### Performance Characteristics for 15 PSI-G-HGRADE-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---|---------|---------|---------|-------|
| Operating Range, gage pressure              |         | 15.0    |         | PSIG  |
| Output Span, note 5                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero gage pressure         |         |         | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 |         |         | ±0.5    | mV    |
| Linearity, hysteresis error, note 4         |         | 0.25    | 0.5     | %fs   |
| Span Shift (0°C-70°C), note 2               |         |         | ±1      | %fs   |

**Performance Characteristics for 15 PSI-A-HGRADE-MINI**

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---|---------|---------|---------|-------|
| Operating Range, absolute pressure          |         | 15.0    |         | PSIA  |
| Output Span, note 5                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero differential pressure |         |         | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 |         |         | ±0.5    | mV    |
| Linearity, hysteresis error, note 4         |         | 0.25    | 0.5     | %fs   |
| Span Shift (0°C-70°C), note 2               |         |         | ±1      | %fs   |

**Performance Characteristics for 30 PSI-G-HGRADE-MINI**

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---|---------|---------|---------|-------|
| Operating Range, gage pressure              |         | 30.0    |         | PSIG  |
| Output Span, note 5                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero gage pressure         |         |         | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 |         |         | ±0.5    | mV    |
| Linearity, hysteresis error, note 4         |         | 0.25    | 0.5     | %fs   |
| Span Shift (0°C-70°C), note 2               |         |         | ±1      | %fs   |

**Performance Characteristics for 100 PSI-G-HGRADE-MINI**

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---|---------|---------|---------|-------|
| Operating Range, gage pressure              |         | 100.0   |         | PSIG  |
| Output Span, note 5                         | 99.0    | 100.0   | 101.0   | mV    |
| Offset Voltage @ zero gage pressure         |         |         | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 |         |         | ±0.5    | mV    |
| Linearity, hysteresis error, note 4         |         | 0.25    | 0.5     | %fs   |
| Span Shift (0°C-70°C), note 2               |         |         | ±1      | %fs   |

**Specification Notes**

- NOTE 1: ALL PARAMETERS ARE MEASURED AT 12.0 VOLT EXCITATION, FOR THE NOMINAL FULL SCALE PRESSURE AND ROOM TEMPERATURE UNLESS OTHERWISE SPECIFIED. PRESSURE MEASUREMENTS ARE WITH POSITIVE PRESSURE APPLIED TO PORT B.
- NOTE 2: SHIFT IS RELATIVE TO 25°C.
- NOTE 3: SHIFT IS WITHIN THE FIRST HOUR OF EXCITATION APPLIED TO THE DEVICE.
- NOTE 4: MEASURED AT ONE-HALF FULL SCALE RATED PRESSURE USING BEST STRAIGHT LINE CURVE FIT.
- NOTE 5: THE VOLTAGE ADDED TO THE OFFSET VOLTAGE AT FULL SCALE PRESSURE.

**Pressure Response: for any pressure applied the response time to get to 90% of pressure applied is typically less than 100 useconds.**

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