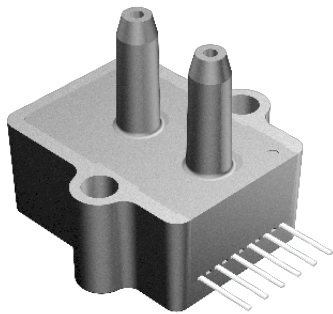


# Millivolt Output Pressure Sensors

Prime Grade  
Pressure Sensors



## Features

- 0 to 0.3 PSI to 0 to 150 PSI Pressure Ranges
- Highest accuracy version
- Temperature Compensated
- Calibrated Zero and Span

## Applications

- Medical Instrumentation
- Environmental Controls
- HVAC

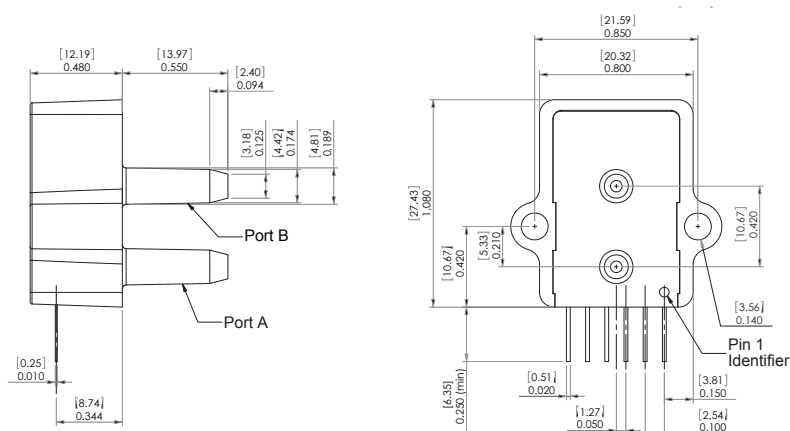
## General Description

The Millivolt Output pressure sensor is based upon a proprietary packaging technology to reduce output offset or common mode errors. This model provides a calibrated millivolt output with excellent output offset characteristics. 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 PRIME GRADE is the highest 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 up to +16 V is acceptable.

## Physical Dimensions



- pin 1: N/C
- pin 2: +V supply
- pin 3: +Voutput
- pin 4: -Vsupply
- pin 5: -Voutput
- pin 6: N/C

## Approvals

| MKT                                                                 | DATE | MFG                                                                 | DATE | ENG                                                                 | DATE | QA                                                                  | DATE |
|---------------------------------------------------------------------|------|---------------------------------------------------------------------|------|---------------------------------------------------------------------|------|---------------------------------------------------------------------|------|
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All Sensors

DS-0096 Rev B

all sensors

e www.allsensors.com

f 408 225 2079

p 408 225 4314

a 16035 Vineyard Blvd. Morgan Hill, CA 95037



## Pressure Sensor Characteristics Maximum Ratings

|                                          |         |
|------------------------------------------|---------|
| Supply Voltage VS                        | 16 Vdc  |
| Common-mode pressure                     | 50 psig |
| Lead Temperature<br>(soldering 2-4 sec.) | 270°C   |

## Environmental Specifications

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

## Standard Pressure Ranges

| Part Number        | Operating Pressure | Nominal Span | Proof Pressure | Burst Pressure |
|--------------------|--------------------|--------------|----------------|----------------|
| 0.3 PSI-D-PRIME-MV | 0 - 0.3 PSI        | 20 mV        | 5 PSI          | 15 PSI         |
| 1 PSI-D-PRIME-MV   | 0 - 1 PSI          | 18 mV        | 5 PSI          | 15 PSI         |
| 5 PSI-D-PRIME-MV   | 0 - 5 PSI          | 60 mV        | 10 PSI         | 30 PSI         |
| 15 PSI-D-PRIME-MV  | 0 - 15 PSI         | 90 mV        | 60 PSI         | 120 PSI        |
| 15 PSI-A-PRIME-MV  | 0 - 15 PSIA        | 90 mV        | 60 PSIA        | 120 PSIA       |
| 30 PSI-D-PRIME-MV  | 0 - 30 PSI         | 90 mV        | 90 PSI         | 150 PSI        |
| 30 PSI-A-PRIME-MV  | 0 - 30 PSIA        | 90 mV        | 90 PSIA        | 150 PSIA       |
| 100 PSI-D-PRIME-MV | 0 - 100 PSI        | 100 mV       | 200 PSI        | 250 PSI        |
| 100 PSI-A-PRIME-MV | 0 - 100 PSIA       | 100 mV       | 200 PSIA       | 250 PSIA       |
| 150 PSI-D-PRIME-MV | 0 - 150 PSI        | 90 mV        | 200 PSI        | 250 PSI        |

## Performance Characteristics for 0.3 PSI-D-PRIME-MV

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 19.8    | 20.0    | 20.2    | mV    |
| Offset Voltage @ zero differential pressure | -       | -       | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | -       | -       | ±250    | µV    |
| Linearity, hysteresis error, note 3         | -       | 0.1     | 0.25    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | -       | -       | ±1.0    | %FSS  |

## Performance Characteristics for 1 PSI-D-PRIME-MV

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 17.82   | 18.0    | 18.18   | mV    |
| Offset Voltage @ zero differential pressure | -       | -       | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | -       | -       | ±250    | µV    |
| Linearity, hysteresis error, note 3         | -       | 0.1     | 0.25    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | -       | -       | ±1.0    | %FSS  |

### Performance Characteristics for 5 PSI-D-PRIME-MV

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 59.4    | 60.0    | 60.6    | mV    |
| Offset Voltage @ zero differential pressure | -       | -       | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | -       | -       | ±250    | µV    |
| Linearity, hysteresis error, note 3         | -       | 0.1     | 0.25    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | -       | -       | ±1.0    | %FSS  |

### Performance Characteristics for 15 PSI-D-PRIME-MV

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero differential pressure | -       | -       | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | -       | -       | ±250    | µV    |
| Linearity, hysteresis error, note 3         | -       | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | -       | -       | ±1.0    | %FSS  |

### Performance Characteristics for 15 PSI-A-PRIME-MV

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero absolute pressure     | -       | -       | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | -       | -       | ±250    | µV    |
| Linearity, hysteresis error, note 3         | -       | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | -       | -       | ±1.0    | %FSS  |

### Performance Characteristics for 30 PSI-D-PRIME-MV

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero differential pressure | -       | -       | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | -       | -       | ±250    | µV    |
| Linearity, hysteresis error, note 3         | -       | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | -       | -       | ±1.0    | %FSS  |



### Performance Characteristics for 30 PSI-A-PRIME-MV

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero absolute pressure     | -       | -       | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | -       | -       | ±250    | µV    |
| Linearity, hysteresis error, note 3         | -       | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | -       | -       | ±1.0    | %FSS  |

### Performance Characteristics for 100 PSI-D-PRIME-MV

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 99.0    | 100     | 101     | mV    |
| Offset Voltage @ zero differential pressure | -       | -       | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | -       | -       | ±250    | µV    |
| Linearity, hysteresis error, note 3         | -       | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | -       | -       | ±1.0    | %FSS  |

### Performance Characteristics for 100 PSI-A-PRIME-MV

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 99.0    | 100     | 101     | mV    |
| Offset Voltage @ zero absolute pressure     | -       | -       | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | -       | -       | ±250    | µV    |
| Linearity, hysteresis error, note 3         | -       | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | -       | -       | ±1.0    | %FSS  |

### Performance Characteristics for 150 PSI-D-PRIME-MV

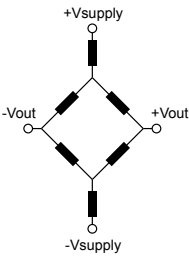
| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 89.1    | 90.0    | 90.1    | mV    |
| Offset Voltage @ zero differential pressure | -       | -       | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | -       | -       | ±250    | µV    |
| Linearity, hysteresis error, note 3         | -       | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | -       | -       | ±1.0    | %FSS  |

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: MEASURED AT ONE-HALF FULL SCALE RATED PRESSURE USING BEST STRAIGHT LINE CURVE FIT.
- NOTE 4: THE SPAN IS THE ALGEBRAIC DIFFERENCE BETWEEN FULL SCALE OUTPUT VOLTAGE AND THE OFFSET VOLTAGE.

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

Equivalent Circuit



|                   |           |
|-------------------|-----------|
| Input Resistance  | 5.0 k ohm |
| Output Resistance | 3.0 k ohm |

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