

# Amplified Low Pressure Sensors

1 mbar (0.4 In H<sub>2</sub>O) to 30 In H<sub>2</sub>O Pressure Sensors

## Military Temperature Grade

### Features

- 0 to 1 mbar to 0 to 30 In H<sub>2</sub>O Pressure Ranges
- Ratiometric 4V Output
- Temperature Compensated (-40C to 125C)
- Calibrated Zero and Span

### Applications

- Medical Instrumentation
- Environmental Controls
- HVAC



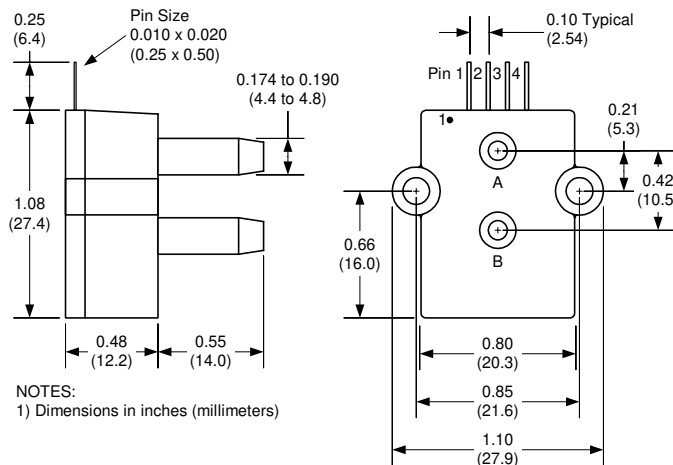
### General Description

The Amplified line of low pressure sensors is based upon a proprietary technology to reduce all output offset or common mode errors. This model provides a ratiometric 4-volt 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 output of the device is ratiometric to the supply voltage over a supply voltage range of 4.5 to 5.5 volts.

### Physical Dimensions



NOTES:  
1) Dimensions in inches (millimeters)

- pin 1: V<sub>supply</sub>
- pin 2: Common
- pin 3: V<sub>output</sub>
- pin 4: do not connect



## Pressure Sensor Ratings

<b>Supply Voltage VS</b>	+4.5 to +5.5 Vdc
<b>Common-mode pressure</b>	-10 to +10 psig
<b>Lead Temperature, max (soldering 2-4 sec.)</b>	250°C

## Environmental Specifications

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

## Standard Pressure Ranges

Part Number	Operating Pressure	Nominal Span	Proof Pressure	Burst Pressure
1 MBAR-D-4V-MIL	±1 mbar	4 V	100 In H2O	200 In H2O
1 INCH-D-4V-MIL	±1 In H2O	4 V	100 In H2O	200 In H2O
1 INCH-G-4V-MIL	0 - 1 In H2O	4 V	300 In H2O	200 In H2O
5 INCH-D-4V-MIL	± 5 In H2O	4 V	200 In H2O	300 In H2O
5 INCH-G-4V-MIL	0 - 5 In H2O	4 V	200 In H2O	300 In H2O
10 INCH-D-4V-MIL	±10 In H2O	4 V	200 In H2O	300 In H2O
10 INCH-G-4V-MIL	0 - 10 In H2O	4 V	200 In H2O	300 In H2O
20 INCH-D-4V-MIL	±20 In H2O	4 V	300 In H2O	500 In H2O
20 INCH-G-4V-MIL	0 - 20 In H2O	4 V	300 In H2O	500 In H2O
30 INCH-D-4V-MIL	±30 In H2O	4 V	500 In H2O	800 In H2O
30 INCH-G-4V-MIL	0 - 30 In H2O	4 V	500 In H2O	800 In H2O

## Performance Characteristics for: 1 MBAR-D-4V-MIL

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		±1.0		mbar
Output Span, NOTE 5	±1.80	±2.0	±2.20	volt
Offset Voltage @ zero differential pressure	2.00	2.25	2.50	volt
Offset Temperature Shift (-40°C-125°C), NOTE 2			±120	mvolt
Offset Warm-up Shift, NOTE 3		±20		mvolt
Offset Position Sensitivity (±1g)		±40		mvolt
Offset Long Term Drift (one year)		±20		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE 2			±4	%span

## Performance Characteristics for 1 INCH-D-4V-MIL

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		±1.0		"H2O
Output Span, note 5	±1.90	±2.0	±2.10	volt
Offset Voltage @zero differential pressure	2.15	2.25	2.35	volt
Offset Temperature Shift (-40°C-125°C), NOTE2			±60	mvolt
Offset Warm-up Shift, NOTE3		±10		mvolt
Offset Position Sensitivity (±1g)		±5		mvolt
Offset Long Term Drift (one year)		±10		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE2			±2	%span

## Performance Characteristics for 1 INCH-G-4V-MIL

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure		1.0		"H2O
Output Span, note 5	3.90	4.0	4.10	volt
Offset Voltage @zero pressure	0.15	0.25	0.35	volt
Offset Temperature Shift (-40°C-125°C), NOTE2			±60	mvolt
Offset Warm-up Shift, NOTE3		±10		mvolt
Offset Position Sensitivity (±1g)		±15		mvolt
Offset Long Term Drift (one year)		±10		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE2			±2	%span

## Performance Characteristics for 5 INCH-D-4V-MIL

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		±5.0		"H2O
Output Span, note 5	±1.90	±2.0	±2.10	volt
Offset Voltage @zero differential pressure	2.15	2.25	2.35	volt
Offset Temperature Shift (-40°C-125°C), NOTE2			±40	mvolt
Offset Warm-up Shift, NOTE3		±5		mvolt
Offset Position Sensitivity (±1g)		±5		mvolt
Offset Long Term Drift (one year)		±5		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE2			±1	%span



## Performance Characteristics for: 5 INCH-G-4V-MIL

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure		5.0		"H2O
Output Span, NOTE 5	3.90	4.0	4.10	volt
Offset Voltage @zero pressure	0.15	0.25	0.35	volt
Offset Temperature Shift (-40°C-125°C), NOTE 2			±40	mvolt
Offset Warm-up Shift, NOTE 3		±5		mvolt
Offset Position Sensitivity (±1g)		±5		mvolt
Offset Long Term Drift (one year)		±5		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE 2			±1	%span

## Performance Characteristics for: 10 INCH-D-4V-MIL

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		±10.0		"H2O
Output Span, NOTE 5	±1.90	±2.0	±2.10	volt
Offset Voltage @zero differential pressure	2.15	2.25	2.35	volt
Offset Temperature Shift (-40°C-125°C), NOTE 2			±20	mvolt
Offset Warm-up Shift, NOTE 3		±5		mvolt
Offset Position Sensitivity (±1g)		±5		mvolt
Offset Long Term Drift (one year)		±5		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE 2			±1	%span

## Performance Characteristics for: 10 INCH-G-4V-MIL

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure		10.0		"H2O
Output Span, NOTE 5	3.90	4.0	4.10	volt
Offset Voltage @zero pressure	0.15	0.25	0.35	volt
Offset Temperature Shift (-40°C-125°C), NOTE 2			±20	mvolt
Offset Warm-up Shift, NOTE 3		±5		mvolt
Offset Position Sensitivity (±1g)		±5		mvolt
Offset Long Term Drift (one year)		±5		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE 2			±1	%span

## Performance Characteristics for 20 INCH-D-4V-MIL

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		±20.0		"H2O
Output Span, note 5	±1.90	±2.0	±2.10	volt
Offset Voltage @ zero differential pressure	2.15	2.25	2.35	volt
Offset Temperature Shift (-40°C-125°C), NOTE 2			±20	mvolt
Offset Warm-up Shift, NOTE 3		±5		mvolt
Offset Position Sensitivity (±1g)		±5		mvolt
Offset Long Term Drift (one year)		±5		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE 2			±1	%span

## Performance Characteristics for 20 INCH-G-4V-MIL

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure		20.0		"H2O
Output Span, note 5	3.90	4.0	4.1	volt
Offset Voltage @ zero pressure	0.15	0.25	0.35	volt
Offset Temperature Shift (-40°C-125°C), NOTE 2			±20	mvolt
Offset Warm-up Shift, NOTE 3		±5		mvolt
Offset Position Sensitivity (±1g)		±5		mvolt
Offset Long Term Drift (one year)		±5		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE 2			±1	%span

## Performance Characteristics for 30 INCH-D-4V-MIL

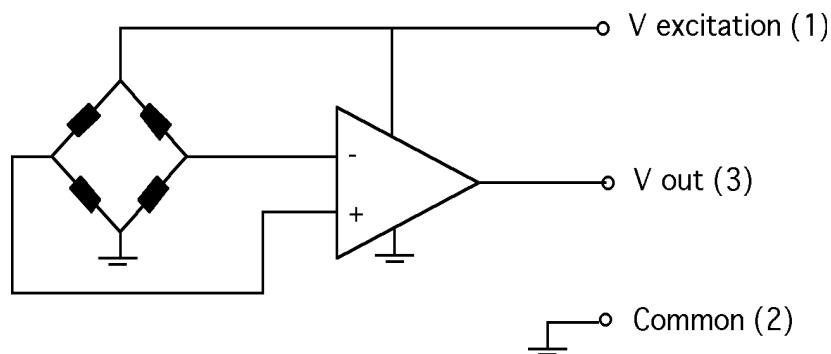
Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		±30.0		"H2O
Output Span, note 5	±1.90	±2.0	±2.10	volt
Offset Voltage @ zero differential pressure	2.15	2.25	2.35	volt
Offset Temperature Shift (-40°C-125°C), NOTE 2			±20	mvolt
Offset Warm-up Shift, NOTE 3		±5		mvolt
Offset Position Sensitivity (±1g)		±5		mvolt
Offset Long Term Drift (one year)		±5		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE 2			±1	%span



## Performance Characteristics for 30 INCH-G-4V-MIL

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure		30.0		"H <sub>2</sub> O
Output Span, NOTE 5	3.9	4.0	4.1	volt
Offset Voltage @ zero pressure	0.15	0.25	0.35	volt
Offset Temperature Shift (-40°C-125°C), NOTE 2			±20	mvolt
Offset Warm-up Shift, NOTE 3		±5		mvolt
Offset Position Sensitivity (±1g)		±5		mvolt
Offset Long Term Drift (one year)		±5		mvolt
Linearity, hysteresis error, NOTE 4		0.05	0.25	%fs
Span Shift (-40°C-125°C), NOTE 2			±1	%span

## Equivalent Circuit



**Pressure Response:** for any pressure applied the response time to get to 90% of pressure applied is typically less than 500 useconds.

### Specification Notes

NOTE 1: ALL PARAMETERS ARE MEASURED AT 5.0 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. NOMINALLY THE OUTPUT VOLTAGE RANGE IS 0.25 TO 4.25 VOLTS FOR MINUS TO PLUS FULL SCALE PRESSURE.

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