Miniature Amplified Low Pressure Sensors

Low Pressure (0.5" H_2O to 30 " H_2O) Sensors



Features

- 0 to 0.5" H_2O to 0 to 30" H_2O Pressure Ranges
- Temperature Compensated
- Calibrated Zero and Span

Applications

- Medical Instrumentation
- Environmental Controls
- HVAC

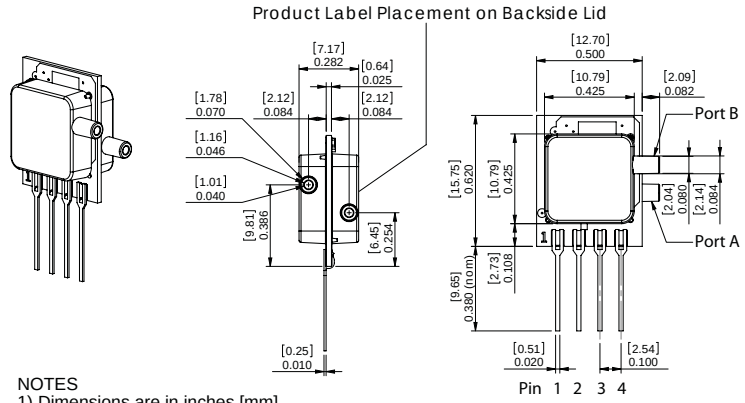
General Description

The Miniature Amplified Output pressure sensor is based upon a proprietary technology to reduce all output offset or common mode errors. This model provides a calibrated amplified 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 and operation from any D.C. supply voltage between 4.5 and 5.5

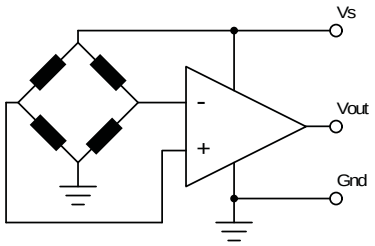
Physical Dimensions



NOTES
1) Dimensions are in inches [mm].
2) For suggested pad layout, see drawing: PAD-01

D1 version, D2 version, G verison

Equivalent Circuit



Pin 1: Vs
Pin 2: Gnd
Pin 3: Vout
Pin 4: Do Not Connect

Approvals

MKT	DATE	MFG	DATE	ENG	DATE	QA	DATE
☐ As Is ☐ With Change		☐ As Is ☐ With Change		☐ As Is ☐ With Change		☐ As Is ☐ With Change	

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Pressure Sensor Characteristics Maximum Ratings

Supply Voltage, Vs	+4.5 to +5.5 Vdc
Common-mode pressure	10 psig
Lead Temperature (soldering 2-4 sec.)	250°C

Environmental Specifications

Temperature Ranges	
Compensated	5 to 50° C
Operating	-25 to 85° C
Storage	-40 to 125° C
Humidity Limits	0 to 95% RH (non condensing)

Standard Pressure Ranges

Part Number	Operating Pressure	Nominal Span	Proof Pressure	Burst Pressure
0.5 INCH-Dx-4V-MINI	± 0.5 inH2O	4 V	100 inH2O	200 inH2O
1 INCH-Dx-4V-MINI	±1 inH2O	4 V	100 inH2O	200 inH2O
1 INCH-G-4V-MINI	0 - 1 inH2O	4 V	100 inH2O	200 inH2O
5 INCH-Dx-4V-MINI	± 5 inH2O	4 V	200 inH2O	300 inH2O
5 INCH-G-4V-MINI	0 - 5 inH2O	4 V	200 inH2O	300 inH2O
10 INCH-Dx-4V-MINI	±10 inH2O	4 V	200 inH2O	300 inH2O
10 INCH-G-4V-MINI	0 - 10 inH2O	4 V	200 inH2O	300 inH2O
20 INCH-Dx-4V-MINI	±20 inH2O	4 V	300 inH2O	500 inH2O
20 INCH-G-4V-MINI	0 - 20 inH2O	4 V	300 inH2O	500 inH2O
30 INCH-Dx-4V-MINI	±30 inH2O	4 V	500 inH2O	800 inH2O
30 INCH-G-4V-MINI	0 - 30 inH2O	4 V	500 inH2O	800 inH2O

For differential pressure D1 is the package with two pressure ports the same side, D2 has two ports the opposite sides.

Performance Characteristics for 0.5 INCH-Dx-4V-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure	-	±0.5	-	inH2O
Output Span, note 5	±1.90	±2.0	±2.10	V
Offset Voltage @ zero differential pressure	2.15	2.25	2.35	V
Offset Temperature Shift (5°C-50°C), note 2	-	-	±120	mV
Offset Warm-up Shift, note 3	-	±10	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±10	-	mV
Linearity, hysteresis error, note 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), note 2	-	-	±2	%FSS

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Performance Characteristics for 1 INCH-Dx-4V-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure	-	±1.0	-	inH2O
Output Span, note 5	±1.90	±2.0	±2.10	V
Offset Voltage @ zero differential pressure	2.15	2.25	2.35	V
Offset Temperature Shift (5°C-50°C), note 2	-	-	±60	mV
Offset Warm-up Shift, note 3	-	±10	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±10	-	mV
Linearity, hysteresis error, note 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), note 2	-	-	±2	%FSS

Performance Characteristics for 1 INCH-G-4V-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure	-	1.0	-	inH2O
Output Span, note 5	3.90	4.0	4.10	V
Offset Voltage @ zero pressure	0.15	0.25	0.35	V
Offset Temperature Shift (5°C-50°C), note 2	-	-	±60	mV
Offset Warm-up Shift, note 3	-	±10	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±10	-	mV
Linearity, hysteresis error, note 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), note 2	-	-	±2	%FSS

Performance Characteristics for 5 INCH-Dx-4V-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure	-	±5.0	-	inH2O
Output Span, note 5	±1.90	±2.0	±2.10	V
Offset Voltage @ zero differential pressure	2.15	2.25	2.35	V
Offset Temperature Shift (5°C-50°C), note 2	-	-	±40	mV
Offset Warm-up Shift, note 3	-	±5	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±5	-	mV
Linearity, hysteresis error, note 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), note 2	-	-	±1	%FSS

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Performance Characteristics for: 5 INCH-G-4V-MINI

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure	-	5.0	-	inH2O
Output Span, NOTE 5	3.90	4.0	4.10	V
Offset Voltage @ zero pressure	0.15	0.25	0.35	V
Offset Temperature Shift (5°C-50°C), NOTE 2	-	-	±40	mV
Offset Warm-up Shift, NOTE 3	-	±5	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±5	-	mV
Linearity, hysteresis error, NOTE 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), NOTE 2	-	-	±1	%FSS

Performance Characteristics for: 10 INCH-Dx-4V-MINI

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure	-	±10.0	-	inH2O
Output Span, NOTE 5	±1.90	±2.0	±2.10	V
Offset Voltage @ zero differential pressure	2.15	2.25	2.35	V
Offset Temperature Shift (5°C-50°C), NOTE 2	-	-	±20	mV
Offset Warm-up Shift, NOTE 3	-	±5	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±5	-	mV
Linearity, hysteresis error, NOTE 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), NOTE 2	-	-	±1	%FSS

Performance Characteristics for: 10 INCH-G-4V-MINI

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure	-	10.0	-	inH2O
Output Span, NOTE 5	3.90	4.0	4.10	V
Offset Voltage @ zero pressure	0.15	0.25	0.35	V
Offset Temperature Shift (5°C-50°C), NOTE 2	-	-	±20	mV
Offset Warm-up Shift, NOTE 3	-	±5	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±5	-	mV
Linearity, hysteresis error, NOTE 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), NOTE 2	-	-	±1	%FSS

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Performance Characteristics for 20 INCH-Dx-4V-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure	-	±20.0	-	inH2O
Output Span, note 5	±1.90	±2.0	±2.10	V
Offset Voltage @ zero differential pressure	2.15	2.25	2.35	V
Offset Temperature Shift (5°C-50°C), note 2	-	-	±20	mV
Offset Warm-up Shift, note 3	-	±5	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±5	-	mV
Linearity, hysteresis error, note 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), note 2	-	-	±1	%FSS

Performance Characteristics for 20 INCH-G-4V-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure	-	20.0	-	inH2O
Output Span, note 5	3.90	4.0	4.1	V
Offset Voltage @ zero pressure	0.15	0.25	0.35	V
Offset Temperature Shift (5°C-50°C), note 2	-	-	±20	mV
Offset Warm-up Shift, note 3	-	±5	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±5	-	mV
Linearity, hysteresis error, note 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), note 2	-	-	±1	%FSS

Performance Characteristics for 30 INCH-Dx-4V-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure	-	±30.0	-	inH2O
Output Span, note 5	±1.90	±2.0	±2.10	V
Offset Voltage @ zero differential pressure	2.15	2.25	2.35	V
Offset Temperature Shift (5°C-50°C), note 2	-	-	±20	mV
Offset Warm-up Shift, note 3	-	±5	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±5	-	mV
Linearity, hysteresis error, note 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), note 2	-	-	±1	%FSS

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Performance Characteristics for 30 INCH-G-4V-MINI

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure	-	30.0	-	inH2O
Output Span, NOTE 5	3.9	4.0	4.1	V
Offset Voltage @ zero pressure	0.15	0.25	0.35	V
Offset Temperature Shift (5°C-50°C), NOTE 2	-	-	±20	mV
Offset Warm-up Shift, NOTE 3	-	±5	-	mV
Offset Position Sensitivity (±1g)	-	±5	-	mV
Offset Long Term Drift (one year)	-	±5	-	mV
Linearity, hysteresis error, NOTE 4	-	0.05	0.25	%FSS
Span Shift (5°C-50°C), NOTE 2	-	-	±1	%FSS

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 THE **B-PORT**.

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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