Amplified Low Pressure Sensors

1 mbar (0.4 In H2O) to 60 In H2O Pressure Sensors

Features

- 0 to 1 mbar to 0 to 60 In H2O Pressure Ranges
- Ratiometric 4V Output
- Temperature Compensated
- Calibrated Zero and Span

Applications

- Medical Instrumentation
- Environmental Controls
- HVAC

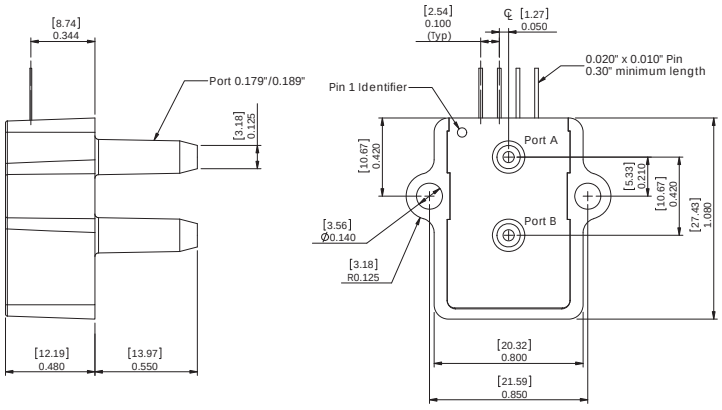
General Description

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.

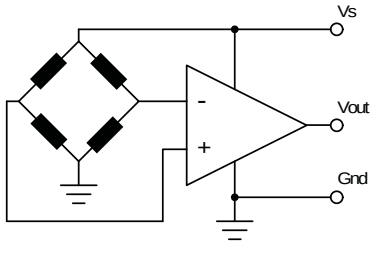
These calibrated and temperature compensated sensors give an accurate and stable output over a wide temperature range. This series is intended for use with non-corrosive, non-ionic working fluids such as air, dry gases and the like.

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



Equivalent Circuit



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 Ratings

Supply Supply Voltage VS	+4.5 to +5.5 Vdc
Common-mode pressure	-10 to +10 psig
Lead Temperature, max (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
1 MBAR-D-4V	±1 mbar	4 V	100 In H2O	200 In H2O
1 INCH-D-4V	±1 In H2O	4 V	100 In H2O	200 In H2O
1 INCH-G-4V	0 - 1 In H2O	4 V	100 In H2O	200 In H2O
2.5 INCH-D-4V	±2.5 In H2O	4 V	200 In H2O	300 In H2O
5 INCH-D-4V	± 5 In H2O	4 V	200 In H2O	300 In H2O
5 INCH-G-4V	0 - 5 In H2O	4 V	200 In H2O	300 In H2O
10 INCH-D-4V	±10 In H2O	4 V	200 In H2O	300 In H2O
10 INCH-G-4V	0 - 10 In H2O	4 V	200 In H2O	300 In H2O
20 INCH-D-4V	±20 In H2O	4 V	300 In H2O	500 In H2O
20 INCH-G-4V	0 - 20 In H2O	4 V	300 In H2O	500 In H2O
30 INCH-D-4V	±30 In H2O	4 V	500 In H2O	800 In H2O
30 INCH-G-4V	0 - 30 In H2O	4V	500 In H2O	800 In H2O
60 INCH-G-4V	0 - 60 In H2O	4V	500 InH2O	800 InH2O

Performance Characteristics for: 1 MBAR-D-4V

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		±1.0		mbar
Output Span, NOTE 5	±1.80	±2.0	±2.20	V
Offset Voltage @ zero differential pressure	2.00	2.25	2.50	V
Offset Temperature Shift (5°C-50°C), NOTE 2			±120	mV
Offset Warm-up Shift, NOTE 3		±20		mV
Offset Position Sensitivity (±1g)		±40		mV
Offset Long Term Drift (one year)		±20		mV
Linearity, hysteresis error, NOTE 4		0.05	0.25	%FSS
Span Shift (5°C-50°C), NOTE 2			±4	%FSS

Performance Characteristics for 1 INCH-D-4V

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

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)		±15		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 2.5 INCH-D-4V

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		±2.5		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			±40	V
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-D-4V

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

Performance Characteristics for: 5 INCH-G-4V

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-D-4V

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

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

Performance Characteristics for 20 INCH-D-4V

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

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

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Performance Characteristics for 30 INCH-D-4V

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

Performance Characteristics for 30 INCH-G-4V

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	V
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 60 INCH-G-4V

Parameter, NOTE 1	Minimum	Nominal	Maximum	Units
Operating Range, gage pressure		60.0		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	V
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 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 SPAN IS THE ALGEBRAIC DIFFERENCE BETWEEN FULL SCALE OUTPUT VOLTAGE AND THE OFFSET VOLTAGE.

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