

# MINIATURE LOW PRESSURE SENSORS

Low Pressure (1" H<sub>2</sub>O to 30" H<sub>2</sub>O) Sensors



## Features

- 0 to 1" H<sub>2</sub>O to 0 to 30" H<sub>2</sub>O Pressure Ranges
- Matched pressure port volumes
- Temperature Compensated
- Calibrated Zero and Span

## Applications

- Medical Instrumentation
- Environmental Controls
- HVAC

## General Description

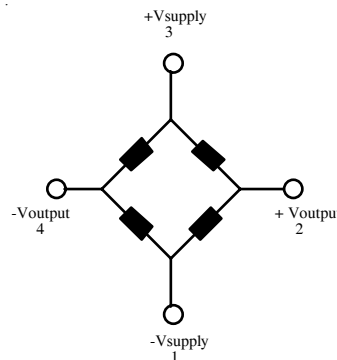
The Millivolt Output pressure sensors is based upon a proprietary technology to reduce all output offset or common mode errors. This model provides a calibrated millivolt output with superior output offset characteristics. Output offset errors due to change in temperature, stability to warm-up, stability 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 output of the device is ratiometric to the supply voltage and operation from any D.C. supply voltage up to +16 V is acceptable.

## Equivalent Circuit

Input Resistance	4.5 kohm
Output Resistance	1.5 kohm



## Pressure Sensor Characteristics Maximum Ratings

Supply Voltage, $V_s$	16 Vdc
Common-mode pressure	10 psig
Lead Temperature (soldering 2-4 sec.)	250°C

## Standard Pressure Ranges

## 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 (non condensing)

## Single in Line Packages-SIP

One Port		Two Ports Same Side	Two Ports Opposite Side
Part Number	Operating Pressure	Part Number	Part Number
	0 - 1 "H <sub>2</sub> O		1 INCH-D2-MV-MINI
2 INCH-G-MV-MINI	0 - 2 "H <sub>2</sub> O	2 INCH-D1-MV-MINI	2 INCH-D2-MV-MINI
5 INCH-G-MV-MINI	0 - 5 "H <sub>2</sub> O	5 INCH-D1-MV-MINI	5 INCH-D2-MV-MINI
10 INCH-G-MV-MINI	0 - 10 "H <sub>2</sub> O	10 INCH-D1-MV-MINI	10 INCH-D2-MV-MINI
20 INCH-G-MV-MINI	0 - 20 "H <sub>2</sub> O	20 INCH-D1-MV-MINI	20 INCH-D2-MV-MINI
30 INCH-G-MV-MINI	0 - 30 "H <sub>2</sub> O	30 INCH-D1-MV-MINI	30 INCH-D2-MV-MINI

## Dual in Line Packages

One Port		Two Ports Same Side	Two Ports Opposite Side
Part Number	Operating Pressure	Part Number	Part Number
2 INCH-GDIP-MV-MINI	0 - 2 "H <sub>2</sub> O	2 INCH-D1DIP-MV-MINI	2 INCH-D2DIP-MV-MINI
5 INCH-GDIP-MV-MINI	0 - 5 "H <sub>2</sub> O	5 INCH-D1DIP-MV-MINI	5 INCH-D2DIP-MV-MINI
10 INCH-GDIP-MV-MINI	0 - 10 "H <sub>2</sub> O	10 INCH-D1DIP-MV-MINI	10 INCH-D2DIP-MV-MINI
20 INCH-GDIP-MV-MINI	0 - 20 "H <sub>2</sub> O	20 INCH-D1DIP-MV-MINI	20 INCH-D2DIP-MV-MINI
30 INCH-GDIP-MV-MINI	0 - 30 "H <sub>2</sub> O	30 INCH-D1DIP-MV-MINI	30 INCH-D2DIP-MV-MINI

## Performance Characteristics for 1 INCH-D2-MV-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		1.0		"H <sub>2</sub> O
Output Span, @ 1 "H <sub>2</sub> O, note 5	80	10	120	mV
Offset Voltage @ zero differential pressure			±500	mV
Offset Temperature Shift (0°C-50°C), note 2			±250	µV
Offset Warm-up Shift, note 3			±100	µV
Offset Position Sensitivity (1g)			±50	µV
Offset Long Term Drift (one year)			±200	µV
Linearity, hysteresis error, note 4		0.05	0.25	%fs
Span Shift (0°C-50°C), @ 1 "H <sub>2</sub> O, note 2			±300	µV

## Performance Characteristics for 2 INCH-Dx-MV-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		2.0		"H <sub>2</sub> O
Output Span, @ 2 "H <sub>2</sub> O, note 5	9.0	10.0	11.0	mV
Operating Range, differential pressure		4.0		mV
Output Span, @ 4 "H <sub>2</sub> O, note 5	18.0	20.0	22.0	mV
Offset Voltage @ zero differential pressure			±500	µV
Offset Temperature Shift (0°C-50°C), note 2			±250	µV
Offset Warm-up Shift, note 3			±100	µV
Offset Position Sensitivity (1g)			±50	µV
Offset Long Term Drift (one year)			±200	µV
Linearity, hysteresis error, note 4		0.05	0.25	%fs
Span Shift (0°C-50°C), @ 2 "H <sub>2</sub> O, note 2			±200	µV

## Performance Characteristics for 5 INCH-Dx-MV-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		5.0		"H <sub>2</sub> O
Output Span, note 5	19.0	20.0	21.0	mV
Offset Voltage @ zero differential pressure			±500	µV
Offset Temperature Shift (0°C-50°C), note 2			±150	µV
Offset Warm-up Shift, note 3			±50	µV
Offset Position Sensitivity (1g)			±10	µV
Offset Long Term Drift (one year)			±100	µV
Linearity, hysteresis error, note 4		0.05	0.25	%fs
Span Shift (0°C-50°C), note 2			±200	µV

## Performance Characteristics for 10 INCH-Dx-MV-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		10.0		"H <sub>2</sub> O
Output Span, note 5	19.0	20.0	21.0	mV
Offset Voltage @ zero differential pressure			±500	µV
Offset Temperature Shift (0°C-70°C), note 2			±150	µV
Offset Warm-up Shift, note 3			±50	µV
Offset Position Sensitivity (1g)			±5	µV
Offset Long Term Drift (one year)			±100	µV
Linearity, hysteresis error, note 4		0.05	0.25	%fs
Span Shift (0°C-70°C), note 2			±200	µV



## Performance Characteristics for 20 INCH-Dx-MV-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		5.0		"H <sub>2</sub> O
Output Span, note 5	19.0	20.0	21.0	mV
Offset Voltage @ zero differential pressure			±500	µV
Offset Temperature Shift (0°C-70°C), note 2			±150	µV
Offset Warm-up Shift, note 3			±50	µV
Offset Position Sensitivity (1g)			±5	µV
Offset Long Term Drift (one year)			±100	µV
Linearity, hysteresis error, note 4		0.05	0.25	%fs
Span Shift (0°C-70°C), note 2			±200	µV

## Performance Characteristics for 30 INCH-Dx-MV-MINI

Parameter, note 1	Minimum	Nominal	Maximum	Units
Operating Range, differential pressure		30.0		"H <sub>2</sub> O
Output Span, note 5	19.0	20.0	21.0	mV
Offset Voltage @ zero differential pressure			±500	µV
Offset Temperature Shift (0°C-70°C), note 2			±150	µV
Offset Warm-up Shift, note 3			±50	µV
Offset Position Sensitivity (1g)			±5	µV
Offset Long Term Drift (one year)			±100	µV
Linearity, hysteresis error, note 4		0.05	0.25	%fs
Span Shift (0°C-70°C), note 2			±200	µV

### 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 THE B-PORT CONFIGURATION.

NOTE 2: SHIFT IS RELATIVE TO 25°C.

NOTE 3: SHIFT IS WITHIN THE FIRST HOUR OF EXCITATION APPLIED TO THE DEVICE.

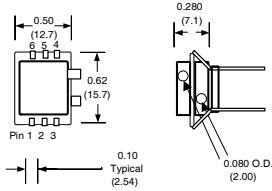
NOTE 4: MEASURED AT ONE-HALF FULL SCALE RATED PRESSURE USING BEST STRAIGHT LINE CURVE FIT.

NOTE 5: THE VOLTAGE ADDED TO THE OFFSET VOLTAGE AT FULL SCALE PRESSURE.

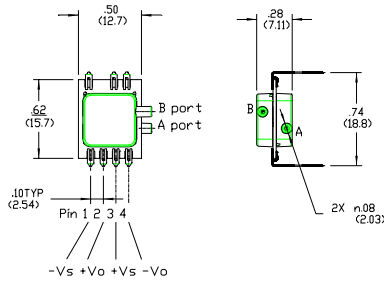
## Physical Dimensions

### Dual in Line (SDXL)\*\*

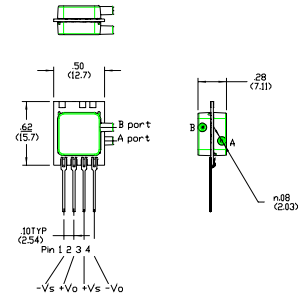
pin 1: +Vout  
pin 2: gnd  
pin 3: -Vout  
pin 5: Vsupply



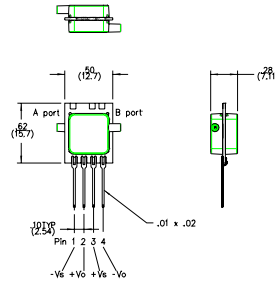
### Dual in Line (DIP)



### Two Pressure Port Same Side



### Two Pressure Port Two Sides



### \*\*SDXL ORDERING INFORMATION

One Port		Two Ports Same Side		Two Ports Opposite Side	
Part Number	Operating Pressure	Part Number	Part Number	Part Number	Part Number
2 INCH-GDIP-MV-SDXL	0-2"H <sub>2</sub> O	2 INCH-D1DIP-MV-SDXL	2 INCH-D2DIP-MV-SDXL	2 INCH-D1DIP-MV-SDXL	2 INCH-D2DIP-MV-SDXL
5 INCH-GDIP-MV-SDXL	0-5"H <sub>2</sub> O	5 INCH-D1DIP-MV-SDXL	5 INCH-D2DIP-MV-SDXL	5 INCH-D1DIP-MV-SDXL	5 INCH-D2DIP-MV-SDXL
10 INCH-GDIP-MV-SDXL	0-10"H <sub>2</sub> O	10 INCH-D1DIP-MV-SDXL	10 INCH-D2DIP-MV-SDXL	10 INCH-D1DIP-MV-SDXL	10 INCH-D2DIP-MV-SDXL
20 INCH-GDIP-MV-SDXL	0-20"H <sub>2</sub> O	20 INCH-D1DIP-MV-SDXL	20 INCH-D2DIP-MV-SDXL	20 INCH-D1DIP-MV-SDXL	20 INCH-D2DIP-MV-SDXL
30 INCH-GDIP-MV-SDXL	0-30"H <sub>2</sub> O	30 INCH-D1DIP-MV-SDXL	30 INCH-D2DIP-MV-SDXL	30 INCH-D1DIP-MV-SDXL	30 INCH-D2DIP-MV-SDXL

