PRESSURE APPLICATION ADAPTOR FOR EMANT300

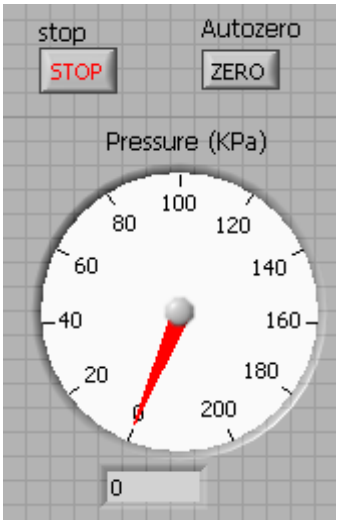
The Pressure Application Adaptor is used for the teaching or demonstrating of PC Based Data Acquisition. Used with the **EMANT300** Low Cost USB Data Acquisition Module, they form a very low cost PC based Manometer. It is ideal for use in hands-on teaching laboratories and projects involving pressure measurements.

FEATURES

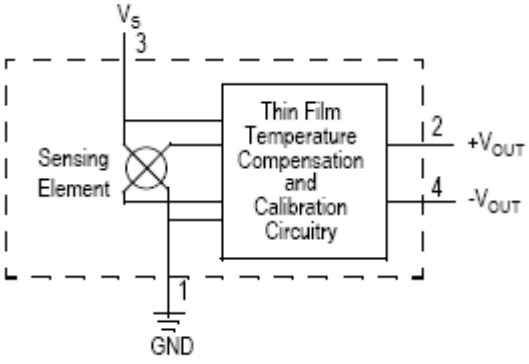
- 200 kPa Freescale MPX2202
- Temperature Compensated Over 0°C to +85°C
- ±0.25% Linearity
- Available in Absolute or Differential Configurations

Examples of project and demonstrations that can be built around this board

- medical diagnostics
  - blood pressure measurement
  - spirometer
- barometer
- altimeter
- pump/motor controllers
- robotics
- level indicators



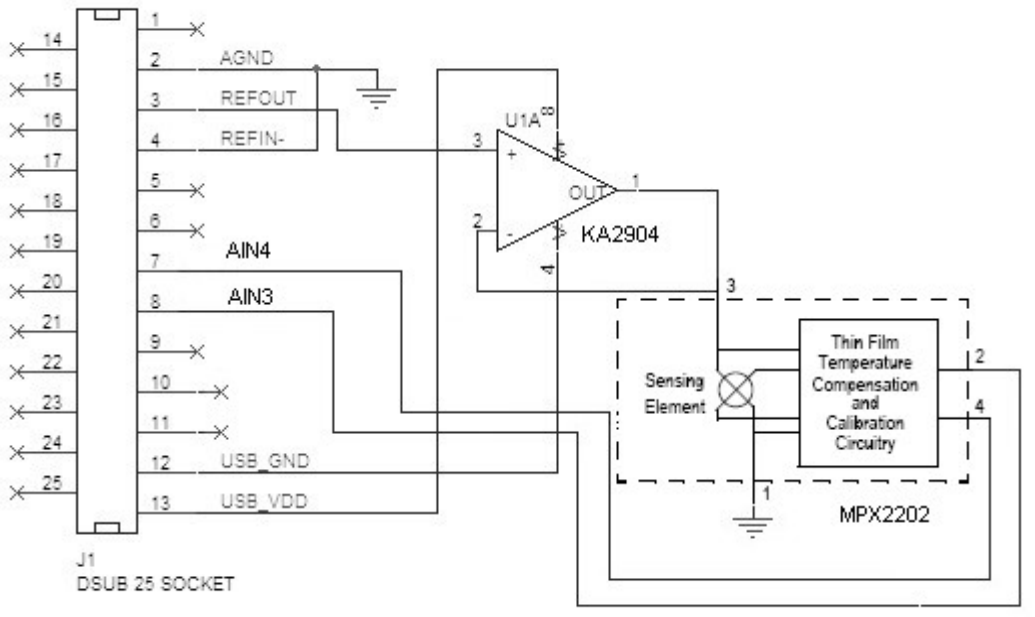
The MPX2202 series device is a silicon piezoresistive pressure sensor that provides a highly accurate and linear voltage output - directly proportional to the applied pressure. The sensor is a single monolithic silicon diaphragm with the strain gage and a thin-film resistor network integrated on-chip. The chip is laser trimmed for precise span and offset calibration and temperature compensation.



The differential voltage output of the sensor is directly proportional to the differential pressure applied. The absolute sensor has a built-in reference vacuum. The output voltage will decrease as vacuum, relative to ambient, is drawn on the pressure (P1) side. The output voltage of the differential or gauge sensor increases with increasing pressure applied to the pressure (P1) side relative to the vacuum (P2) side.

With a 10V excitation, it measures from 0 TO 200 kPA (0 TO 29 psi) giving a 40 mV full scale span. The output is ratiometric when excited by voltages lower than 10V.

In our adaptor design, the sensor is excited at V_{EXC}=2.5V. As the current required at the bridge is much higher than what is available from REFOUT, a simple buffer amplifier is required.



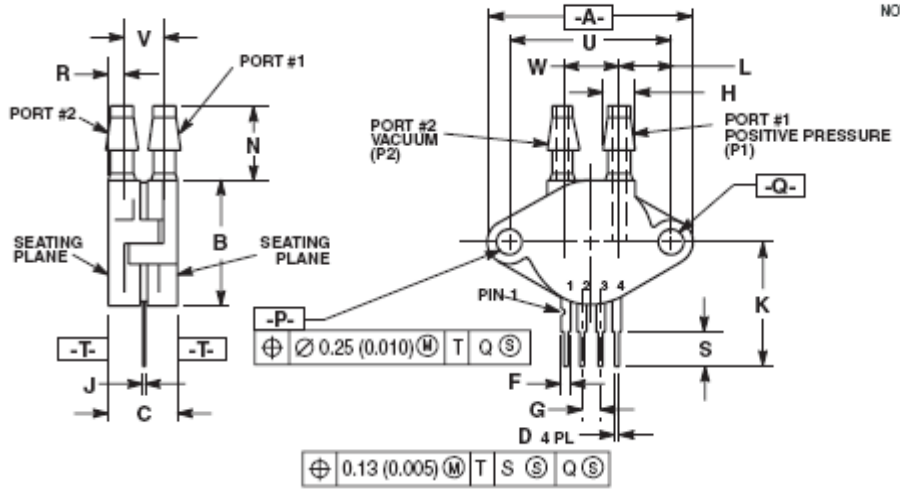
Since the excitation voltage is 2.5V, the full span output is scaled to 10mV. When the input of the EMANT300 is set to this range, the module can measure better than 1uV due to its programmable gain amplifier and the resolution of the ADC.

Thus the pressure in kPa with respect to the voltage output V_O (seen at the differential input AIN4, AIN3) is given by

$$\rho = V_O * 20000$$

Note: Absolute Maximum Pressure (P1 > P2) **800 kPa.** Exposure beyond the specified limits may cause permanent damage or degradation to the device.

Sensor Dimensions (Differential)

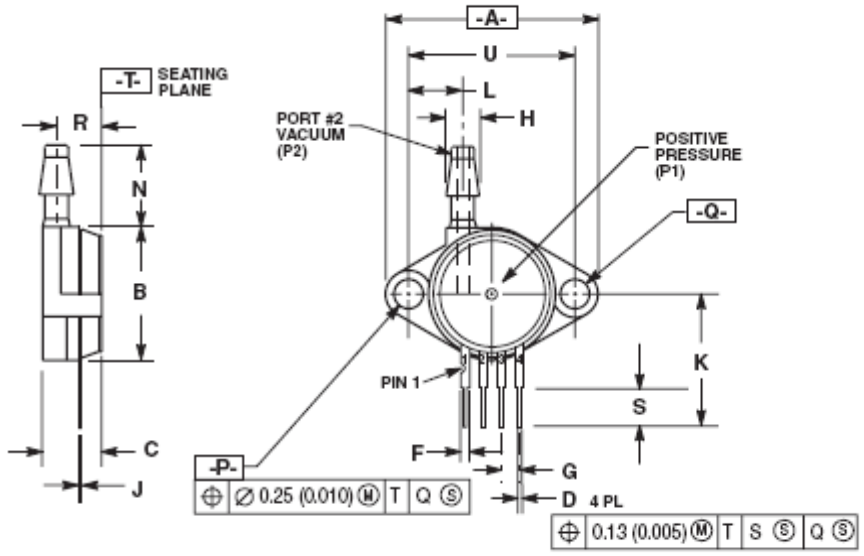


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	1.145	1.175	29.09	29.85
B	0.685	0.715	17.40	18.16
C	0.405	0.435	10.29	11.05
D	0.016	0.020	0.41	0.51
F	0.048	0.064	1.22	1.63
G	0.100 BSC		2.54 BSC	
H	0.192	0.194	4.62	4.93
J	0.014	0.016	0.36	0.41
K	0.695	0.725	17.65	18.42
L	0.290	0.300	7.37	7.62
N	0.420	0.440	10.67	11.18
P	0.153	0.159	3.89	4.04
Q	0.153	0.159	3.89	4.04
R	0.069	0.083	1.60	2.11
S	0.220	0.240	5.59	6.10
U	0.910 BSC		23.11 BSC	
V	0.248	0.278	6.30	7.06
W	0.310	0.330	7.87	8.38

STYLE 1:
PIN 1. GROUND
2. + OUTPUT
3. + SUPPLY
4. - OUTPUT

Sensor Dimensions (Absolute)



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	1.145	1.175	29.09	29.85
B	0.685	0.715	17.40	18.16
C	0.305	0.325	7.75	8.26
D	0.016	0.020	0.41	0.51
F	0.048	0.064	1.22	1.63
G	0.100 BSC		2.54 BSC	
H	0.192	0.194	4.62	4.93
J	0.014	0.016	0.36	0.41
K	0.695	0.725	17.65	18.42
L	0.290	0.300	7.37	7.62
N	0.420	0.440	10.67	11.18
P	0.153	0.159	3.89	4.04
Q	0.153	0.158	3.89	4.04
R	0.230	0.250	5.84	6.35
S	0.220	0.240	5.59	6.10
U	0.910 BSC		23.11 BSC	

STYLE 1:
PIN 1. GROUND
2. + OUTPUT
3. + SUPPLY
4. - OUTPUT