

## H-6810

### Pressure Measurement Bench

### Description

The **Model H-6810** Pressure Measurement Bench consists of various components designed to demonstrate practical measurements. It can be used to test and calibrate other pressure instruments and consists of the following:

- Test Bench
- Pressure Transducers
- Test Gauge
- Dead Weight Tester
- Vacuum-Pressure Air Pump
- Manometers

### Specifications

#### Test Bench:

This bench is 62"H x 48"W x 30"D and is manufactured of 14 gauge 1.5 x 1.5 inch square mechanical tubing frame with a 14 gauge pan formed base, control panel and end sections. The top is 1-1/16" wood core Formica with black plastic "T" molding and the instrument panel is 14 gauge steel. It comes complete with 4 swivel casters (2 locking). The bench is finished in instrument tan texture and the panel is finished in white enamel.

#### Pressure Transducer:

The bench is equipped with three pressure transducers, each with a digital display. The transducers featured are:

#### 1. Semiconductor on Diaphragm

##### Pressure Transducer Chemical Vapor Deposition (CVD)

Excitation: 10 VDC  
Output: 0-100mV  $\pm 1$ mV for 0-100 psig input  
Accuracy: 0.25% FS (Linearity, Hysteresis & Repeatability)  
Zero Balance:  $\pm 2$  mV



**MODEL H-6810** Pressure Measurement Bench  
Dimensions: 62"H x 48"W x 30"D  
Shipping Weight: 600 lbs.

Operating Temperature: 0 to 160°F (-18 to 71°C)

Compensated Temperature: 30 to 160°F (-1 to 71°C)

Total Thermal Effects: 1% FS max

Proof Pressure: 200%, 13000 PSI max

Input/Output Resistance:

15,000 ohms nominal

Response Time: 1 msec

Gage Type:

Stainless steel diaphragm, silicone oil filled semiconductor sensor

Shock: 50 G @ 11 msec

Wetted Parts:

316 SS fittings

(SS and Viton  $\geq$  2000 PSI)

17-4 SS diaphragm

Pressure Cavity: 0.075 cubic inches

#### 2. Solid State Piezo Resistive

##### Pressure Transducer (Piezo Resistive)

Excitation: 10 VDC (16 VDC max.) @2 mA

Output: 0-100 mV for 0-100 psig input  
Sensitivity: 5 PSI—5 mV/V; 15 PSI—10 mV/V  
Input Impedance: 8 K ohm  
Output Impedance: 5 K ohm  
Linearity: BFSL % FS  
Hysteresis & Repeatability:  $\pm 0.1\%$  full scale  
Zero Balance:  $\pm 2.0$  mV  
Operable Temperature Range: -40 to 185°F  
Compensated Temperature Range: 32 to 122°F (0 to 50°C)  
Thermal Zero Effect:  $\pm 2.0\%$  mV typ.;  $\pm 4.0$  mV max  
Thermal Sensitivity Effect:  $\pm 1.5$  mV typ.;  $\pm 3.0$  mV max  
Operable Overpressure: Min. 2.5 x full scale  
Gage Type: Solid State Piezo-Resistive  
Diaphragm Material: .10 inch Square Silicon Sensor Chip  
Pressure Port: Tube Fitting (TY-316-100 for gage units)  
Response Time: 1 mS

#### 3. Semiconductor on Bending Beam

##### Pressure Transducer

Excitation: 5 VDC (6 VDC max.)  
Output: 0-100 mV (10 mV/V)  $\pm 1\%$  for 0-100 psig input  
Input Impedance: 150  $\pm 50\Omega$   
Output Impedance: 115  $\pm 25\Omega$   
Accuracy:  
100 to 5000 psi = 0.25% BFSL,  
All other ranges = 1% BFSL  
Zero Balance:  $\pm 5$ mV  
Operable Temperature Range: -60 to 200°F (-51 to 93°C)  
Compensated Temperature Range: 30 to 160°F (-1 to 71°C)  
Thermal Zero Effect:  $\pm 0.05\%$  Rdg/°F (0.1% Rdg/°C)  
Thermal Sensitivity Effect:  $\pm 0.01\%$  Rdg/°F (0.02% Rdg/°C)  
Proof Pressure: 2 x full scale

All Hampden units are available for operation at any voltage or frequency

**Hampden**  
ENGINEERING CORPORATION

## H-6810

### Pressure Measurement Bench

Burst Pressure: 5 x full scale minimum  
Fatigue: > 160 million cycles  
Gages: Semiconductors on Bending Beam  
Body/Diaphragm Material: 316 L SS  $\leq$  50 psi; -15-5 PH SS > 50 psi  
Pressure Port: Flush  
Electrical Connection: 36" (0.9 m) Shielded PVC Cable, 4 leads

#### 4. Displays (3-required)

Typical Display:

7-segment LED, 14.2mm, .56" high digits  
Number of Digits: 5 digits  
Range: -99999 to +99999  
Led Indicators: 2 status indicators

Accuracy (25°C):

Full Scale or Reading: 0.01% FS  
 $\pm$  Number of Counts: 1  
Span TEMPCO:  
0.003% of reading/°C- except load cell  
(0.0015% rdg./°C) & FR ( $\pm$ 1 ppm/°C typical)  
Zero TEMPCO: 0.1 counts/°C

Conversion:

Patented A/D conversion method  
(US patent no. 5,252,780)  
Update Rate: 60/sec. @ 60 Hz; 50/sec. @ 50 Hz  
Output Update Rate (UDM): 56/sec. @ 60 Hz; 47/sec. @ 50 Hz  
Display Update Rate (UDM): 3.5/sec. @ 60 Hz; 3/sec. @ 50 Hz

Noise Rejection:

Common Mode voltage from DC to 60 Hz safety rated to 250 VAC; 4.2 kVp per high voltage test  
CMR (DC to 60 Hz): 130 dB  
NMR (50/60 Hz line): 90 dB with minimum filtering

Operating Power:

Frequency 47 to 440 Hz and DC, consumption, 5.3 Watts maximum

Standard:

Universal power supply  
85 to 264 VAC,  
90 to 370 VDC

Excitation:

Selectable with shorting jumpers on power supply printed circuit board (normal setting 10 VDC)

Outputs:

5 VDC,  $\pm$ 5%, 100 mA max.,  
10 VDC,  $\pm$ 5%, 120 mA max.,  
24 VDC,  $\pm$ 5%, 50 mA max.

Isolation (power ground):

Safety rated to 250 VAC, 4.2kV peak per high voltage test

#### Test Gauge, Bourdon Tube Type

Case:

Solid Aluminum with Epoxy-coated Finish

Lower connection: Green Finish

Back connection: Black Finish

Window: Glass

Movement: Stainless steel

Bourdon Tube: 316 Stainless Steel

Connection: 316 Stainless Steel

Fitting: 1/2" NPT

Dial Size:

4-1/2" with White background, black graduations & mirror band.

Mounting: Panel back connection with panel connector

Range: 0-400 psi

Figure Interval: 20

Minor Graduation: 2

Accuracy:  $\pm$ 0.25% FS

Ring:

Mounting Flange with hinged cover ring secured by knurled screw.

Safety Features:

Solid Front with Pressure Relief Back.

#### Dead Weight Tester

This unit consists of a dead weight gauge mounted on an aluminum base with self-contained pump for producing pressure and comes complete with weights, gauge adapters, hand jack and hand set. It is designed to test spring gauges, calibrate Bourdon gauges or other instruments, pressure testing of small vessels, and measuring gas pressures with high accuracy.

Pressure: 0-500 psi

Intervals: 1 psi

Guaranteed Accuracy:  $\pm$  1/10 of 1% of rated pressure

#### Vacuum-Pressure Air Pump

Vacuum/Pressure Pump with 1/6 H.P. motor. Max. gauge pressure of 412kPag (60 psig) or vacuum of 24"Hg (81kPag). Separate vacuum and pressure gauges, graduated from 0 to 30"Hg (0 to 102kPag) and 0 to 100 psig (0 to 690kPag) respectively. Durable air seal between piston and cylinder. Only maintenance required is semi-annual replacement of felts.

Free Airflow: 34 liters/Min.

#### Manometers

One each incline-tube general purpose laboratory manometer and U-tube general laboratory manometer. Both are panel mounted.

This unit comes complete with operating instructions and technical reference data.

#### Options

- Volume Chamber
- Six Point Manifold
- 0-10 Volt DC Analog Outputs for digital meters

All Hampden units are available for operation at any voltage or frequency

**Hampden**  
ENGINEERING CORPORATION