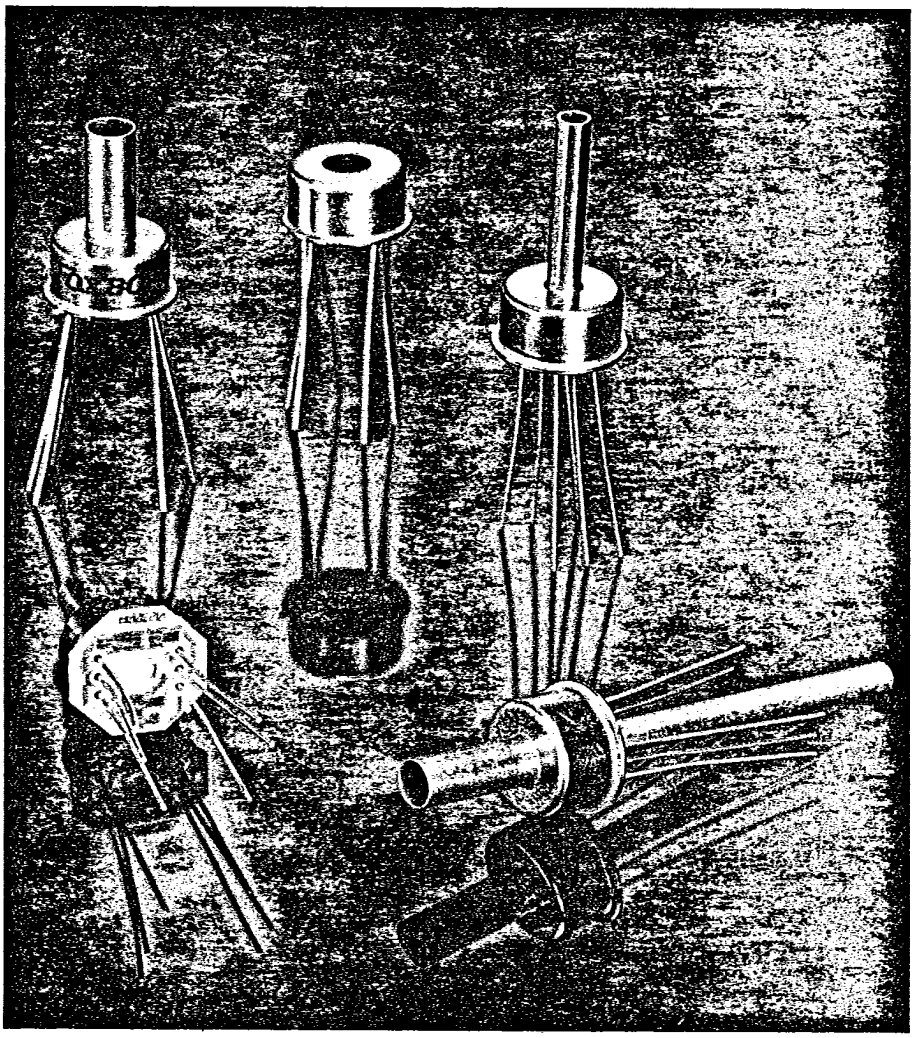
FOXBORO/ICT

LOW RANGE TO-8 PRESSURE TRANSDUCER

MODEL 1805



Features

- 25 mV /PSI (Pressure Range Code: 0B)
- TO-8 printed circuit mounted pressure sensor
- Choice of A, B, or C accuracy grades
- Gage, absolute or differential configurations
- Choice of output options:
  - Span calibration to within ± 2mV (Normalized Output)
  - 2:1 Span Range
- Current or voltage excitation
- Choice of temperature compensation options:
  - Normalized/up to100mV
  - Laser Trim
  - Resistor Trim
  - Uncompensated
- 2-Year warranty

FOXBORO®
Confidence under pressure

The model 1805 is a high performance, low cost TO-8 pressure transducer specifically designed to address low pressure OEM applications. The transducer offers three performance grades and a variety of compensation options, including span calibration to within ± 2mV (normalized output). The 1805 may be specified to operate from either a current or voltage supply.

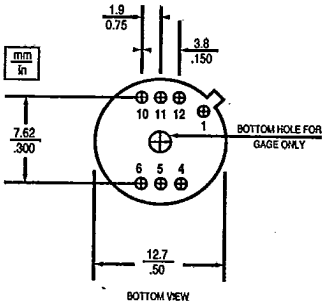
The Model 1805 is a solid state piezoresistive pressure transducer mounted in a standard TO-8 package compatible with printed circuit board mounting. The 1805 is, pin for pin, compatible with other TO-8 pressure transducers.

The 1805 utilizes a piezoresistive silicon element. Resistors are implanted over the diaphragm in the silicon element and connected to form a Wheatstone bridge. The diaphragm is formed by etching the silicon below the resistors. As pressure is applied to the diaphragm, the resistors change in value and produce a linear output signal proportional to the applied pressure. The output of the 1805 can be easily amplified or signal-conditioned as required by the customer.

Applications

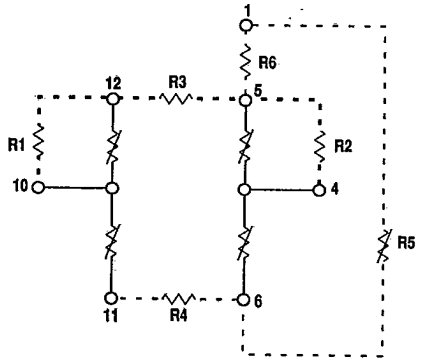
- Pressure-calibration instruments
- HVAC
- Medical Equipment
  - Ventilation Systems
  - Anesthesia Monitors

Electrical Connection



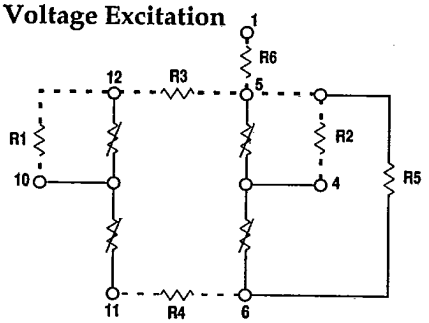
Pin 1 only on laser trim board

Current Excitation



1. Normalized output shown
2. R6 shorted for standard output

Voltage Excitation



1. Normalized output shown
2. R6 open for standard output

The Model 1805 Low Range Pressure Transducer

The Model 1805 is a low range TO-8 sensor designed to complement the standard TO-8 product line. The 1805 is available with either voltage or current excitation. There are four major output and temperature compensation choices available with the 1805:

1. Integral laser trim ceramic board which provides zero and temperature correction.
2. Integral laser trim ceramic board which provides zero and span correction to within ± 2mV (normalized output), as well as temperature correction.
3. Discrete compensation resistors to provide zero and temperature correction.
4. Data printout of compensation resistors.

The 1805 is available in three accuracy grades.

Compensation Choices

Laser Trim Compensation
For maximum convenience, the 1805 can be purchased over a fully temperature compensated range of 100° F. Compensation is accomplished using Foxboro/ICT's in-house laser trim facilities for tighter product performance control and improved ability to respond to customer order requirements.

Normalized Output Option
For those users wishing the maximum in design convenience and sensor Span interchangeability, the Model 1805 may be purchased with a normalized output.

Resistors
For those users wishing the convenience of receiving more complete compensation tools, the standard 1805 has temperature compensation, zero offset resistors, and a data readout for each individual sensor.

Data
To accelerate the temperature compensation task, the 1805 option set includes data-only printouts of pressure and calibration runs performed on each individually serialized sensor. This allows users with custom compensation requirements to enter data individually for each sensor into their system.

Applications

A wide variety of applications exists in medical products, HVAC, and instrumentation, such as hand-held pressure calibrators for low range TO-8 pressure sensors.

High Volume Delivery By Design

For fast delivery, the 1805 is designed around a metal header that reduces product cost, retains the traditional high performance of Foxboro/ICT pressure sensors, and allows the basic product to be stocked by pressure range.

The 1805 is assembled and fully tested for accuracy and temperature compensation resistor values. Once ordered, the product is assembled and quickly delivered per customer requirements.

Performance Specifications

Temperature Compensated Performance	GRADE A Max	GRADE A Min	GRADE B Max	GRADE B Min	GRADE C Max	GRADE C Min	Units
• REFERENCE ACCURACY (L+H+R)							
5 PSI	0.075		0.125		0.25		± % of Span, BFSL
3 PSI	0.075		0.125		0.25		± % of Span, BFSL
Standard Output-Current Excitation:							
5 PSI	150	75	150	75	150	75	mVdc
3 PSI	120	60	120	60	120	60	mVdc
Standard Output-Voltage Excitation:							
5 PSI	75	40	75	40	75	40	mVdc
3 PSI	60	30	60	30	60	30	mVdc
Normalized Output-Current Excitation:							
5 PSI	100 ± 2		100 ± 2		100 ± 2		mVdc
3 PSI	60 ± 2		60 ± 2		60 ± 2		mVdc
Normalized Output-Voltage Excitation:							
5 PSI	40 ± 2		40 ± 2		40 ± 2		mVdc
3 PSI	25 ± 1		25 ± 1		25 ± 1		mVdc
Zero pressure output	± 2		± 2		± 2		mVdc
• TEMPERATURE ACCURACY							
Total Zero temperature error:							
5 PSI	0.5		1		2		± % Span in reference to 27°C
3 PSI	0.75		1.5		3		± % Span in reference to 27°C
Total Span temperature error:							
5 PSI	0.5		1		2		± % Span in reference to 27°C
3 PSI	0.75		1.5		3		± % Span in reference to 27°C
Long-term drift	0.2		0.2		0.2		± % Span per 6 months
Temperature Compensated Range	30° to 130° F (-1° to +54° C)						
Operating Temperature Range	-40° to +250° F (-40° to +121° C)						
Ambient Temperature	-40° to +250° F (-40° to +121° C)						

Electrical Specifications

Input excitation-Current:	≤2.0mA
Voltage excitation-Voltage:	≤15 Vdc
Electrical connections:	Standard TO-8, 6-pin PCB gold plated brass pins 0.018" dia X 0.75" long
Output Common mode voltage:	2 Volts, typical
Input impedance - Current:	2000 min. 8000 max.
Output impedance - Current:	3500 min. 6000 max.
Input impedance - Voltage:	8000 min. 40000 max.
Output impedance - Voltage:	3500 min. 6000 max.
Response time (10% to 90%):	1 millisecond
Insulation resistance:	100 megOhms at 50 Vdc

Physical Specifications

Pressure Overrange Protection:	5x Full scale pressure
Media compatibility Top:	Non corrosive Dry Gasses
Media compatibility-Bottom:	Gases and liquids compatible with materials of construction.
Materials of construction	
Sensor header:	Kovar
Sensor:	Silicon, aluminum
Interconnection pins:	Gold plated brass
Internal wetted parts	
Top:	Nickel, silicon, gold
Bottom:	Nickel, silicon, RTV
Mass:	3 grams (0.11 oz)

Environmental Conditions

Position Effect:	≤ 0.05% of Span Zero shift for 90° tilt in any direction
Vibration:	No change at 10 G's RMS, 20 to 2000 Hz
Shock:	Will withstand 100 G's for 11 milliSeconds
Life:	100 million cycles

Reference Conditions

Media temperature:	27° ± 1°C (80° ± 2° F)
Ambient temperature:	27° ± 1°C (80° ± 2° F)
Vibration:	0.1G (1m/s/s) max
Humidity:	50% ± 10%
Ambient pressure:	12.8 to 16.5 PSI (860 to 1060mBar)
Supply voltage:	1.5 ± 0.0015 mA or 10 ± 0.01 Vdc

Electrical Connections

PIN	Uncompensated Sensor
4	+ Output
5	+ Input
6	- Input
10	- Output
11	- Input
12	+ Input

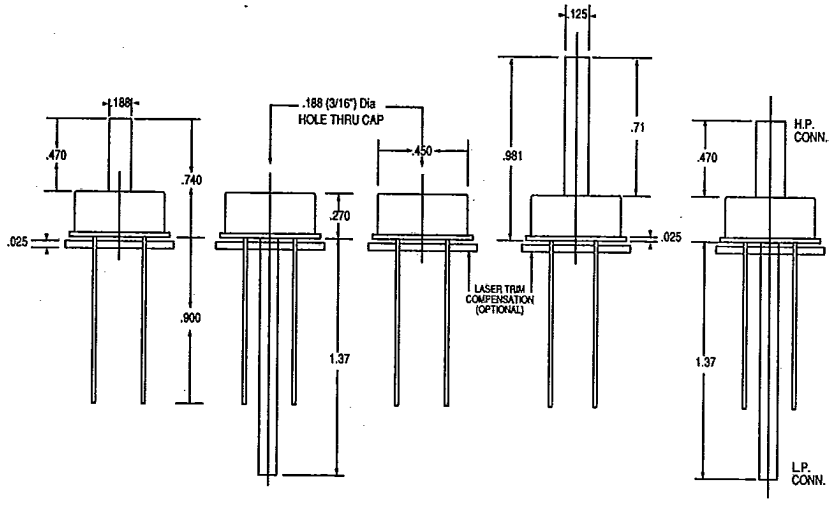
PIN	Resistor Compensated	
	Current Excitation	Voltage Excitation
4	+ Output	+ Output
5	+ Input	N/C
6	- Input	- Input
10	- Output	- Output
11	N/C	N/C
12	N/C	N/C
R6		+ Input

PIN	Laser Trimmed	
	Current Excitation and Standard Output	Voltage Excitation and Normalized Output
1	N/C	+ Input
4	+ Output	+ Output
5	+ Input	NC
6	- Input	- Input
10	- Output	- Output
11	N/C	N/C
12	N/C	N/C

Pressure Applications

a. Top entry positive pressure
b. Bottom entry vacuum
c. Differential pressure: (top=higher pressure)

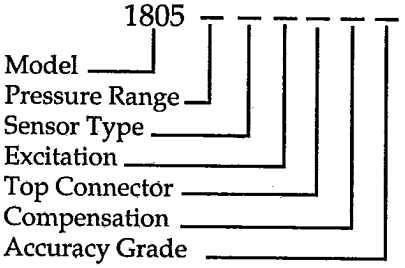
The 1805 Pressure Transducer



Dimensions in inches

Pressure Connections

Ordering Information



Pressure Range

OB = 0 to 0 3 PSI
OA = 0 to 0 5 PSI

Sensor Types

G = Gage Pressure
A = Absolute Pressure
D = Differential Pressure

Power Supply Compatibility

L = 1.5 mA ± 150 UA @ 6 Vdc
K = 10 Vdc ± 10m Vdc @ 0.3mA

Pressure Connection

	TOP	BOTTOM
0 =	3/16" tube	none
1 =	3/16" hole	1/8" tube
2 =	3/16" hole	none
3 =	1/8" tube	none
4 =	3/16" tube	1/8" tube

Note: Transducer recommended for use with noncorrosive, nonconductive fluids or gases.
a. Unidirectional
b. Performance Specifications differ for bottom entry option.

Temperature Compensation

M = Computer printout of resistor values
R = Computer printout of resistor values
L = Laser trimmed, standard output
N = Laser trimmed, normalized output

Accuracy Grade

A = ± 0.075% BFSL (0.15% TB)
B = ± 0.125% BFSL (0.25% TB)
C = ± 0.25% BFSL (0.5% TB)

FOXBORO®

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Foxboro/ICT, Inc.
199 River Oaks Parkway
San Jose, CA 95134
Telephone: (408) 432-1010

Toll-free: 1-800-428-2224
(outside California)
FAX: (408) 432-1860
TWX: 910-338-2109