

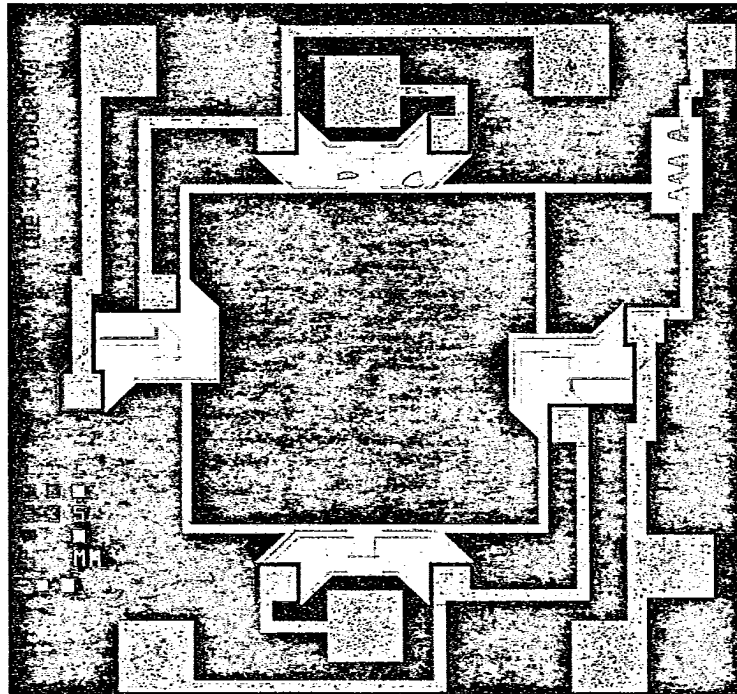
FOXBORO/ICT

PIEZORESISTIVE
PRESSURE DEVICES

MODEL 2010

Features

- Low pressure 5 PSIG/PSIA devices
- Gage and absolute versions
- Choice of A,B, or C Accuracy Grades
- Constant current excitation



The 2010 high performance device family consists of 5 PSI gage and absolute solid state, piezoresistive, semiconductor pressure devices with static accuracies of $\pm 0.075\%$, $\pm 0.15\%$ and $\pm 0.25\%$ BFSL.

The low pressure Model 2010 is a "raw" sensor device intended for use in OEM and high volume applications where the user designs-in the sensor for economy, and control over all packaging, temperature, media isolation, and electrical and mechanical performance aspects of the system.

The 2010 is best suited for designs requiring high accuracy, repeatability, and low hysteresis. Many such applications exist in medical products, industrial, transportation, and consumer markets.

To achieve high device yields in manufacturing, the 2010 employs a square diaphragm, and ion-implanted resistors. This allows more devices per wafer during fabrication and tighter process control over resistor impedances. Most other aspects of the design are derived from familiar Foxboro/ICT piezoresistive sensor technology to speed user time to market, and to take advantage of known sensor operating parameters.

Users are responsible for packaging, media isolation, and temperature compensation. Customers request unique combinations of accuracy grade, output voltage specifications (for choice excitation). Once ordered, the product is packaged in die containers holding approximately 100 per package and delivered.

The main features of the 2010 family are:

- Low pressure operation
- Millivolt output
- Competitive cost
- Choice of three high accuracy grades

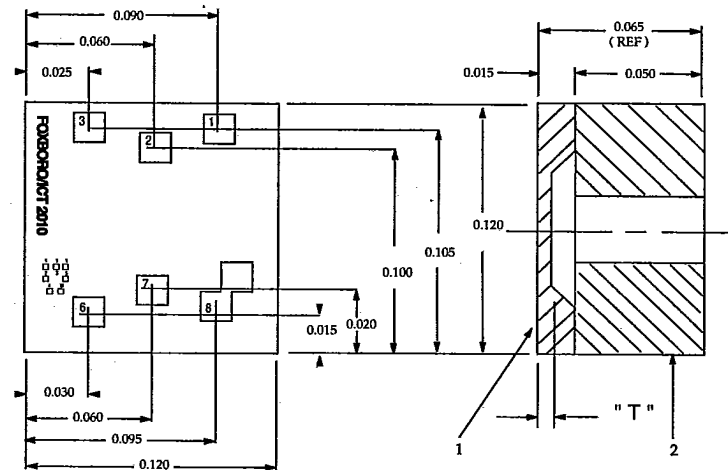
FOXBORO®

Confidence under pressure

Applications

- OEM high volume applications
- Avionics/aerospace
- Medical
- HVAC
- Transportation

The 2010 Family



All dimensions shown in inches

GAGE MODEL

Ordering Information

2010 - OA - X - X
 Model _____
 Pressure Range _____
 Device Type _____
 Accuracy Grade _____

Reference Accuracy Grade

A = $\pm 0.075\%$ (BFSL) / $\pm 0.15\%$ (TB)
 B = $\pm 0.125\%$ (BFSL) / $\pm 0.25\%$ (TB)
 C = $\pm 0.25\%$ (BFSL) / $\pm 0.50\%$ (TB)

Device Type

G = Gage
 A = Absolute Pressure

Pressure Range and Types

OA = 0 to 5 PSI

Warranty

Workmanship

Foxboro/ICT warrants the original purchaser that Foxboro/ICT manufactured Model 2010 devices shall be free from defects in material and workmanship and shall conform to Foxboro/ICT published specifications. The warranty does not apply to any devices which have been subject to modification, additional processing, misuse, neglect or accident.

Installation/Applications

Purchaser retains the responsibility for the applications, corrosion resistance, functional adequacy of the device, and correct installation.

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Performance
Specifications

Accuracy Grade

Performance	A			B			C			Units
	Max	Typ.	Min	Max	Typ.	Min	Max	Typ.	Min	
NL: Non-linearity										
* 0-5 PSIG/A BFSL		0.075			0.125			0.25		± % of Span, BFSL
** 0-5 PSIG/A Terminal Based		0.15			0.25			0.5		± % of Span, BFSL
SPU: Uncomp'd. Span Output:		100			100			100		mVdc; 1 mAdc Excitation, Uncompd.
Z: Bridge Impedance	5500		4000	5500		4000	5500		4000	Ohms
TCR: Temp. Coef. of Cold Impedance		20			20			20		% per 100° F
TCRNL: Temp. Coef. Non-Linearity		-2			-2			-2		% over 160° F
ZU: Uncomp. Bridge Offset	50		-50	50		-50	50		-50	mVdc; 1 mAdc Excitation, Uncompd.
TCZU: Temp. Coef. of Offset	10		-10	10		-10	10		-10	% of Span per 100° F
TCZUNL: Temp. Coef. Non-linearity	1.4		-1.4	1.4		-1.4	1.4		-1.4	% of Span per 160° F
TCGF: Temp. Coef. of Hot Gage Factor		-15			-15			-15		% of Span per 100° F
TCGFNL: Temp. Coef. Non-Linearity		2			2			2		% of Span per 160° F
TCSPAN: Temp. Coef. of Span		5			5			5		% of Span per 100° F

Electrical Specifications

Input excitation:
 Current - Limit: ≤ 2.0 mAdc
 Voltage - Limit: ≤ 15 Vdc
 Effect of excitation change: Output is ratiometric to input excitation.
 Response time: When excited by an 80% (10% to 90%) input pressure change, the maximum time for the output to reach 90% of the final steady-state value is 100 microseconds.
 Pin 8, the chip substrate, to be connected by user to highest potential applied to the sensor.
 Output Common Mode Voltage: 50% of Bridge Voltage

Physical Specifications

Overrange protection: Will withstand pressure overranges up to the following span rating:
 5X front side
 3X back side
 Die size: 0.120" X 0.120" X 0.070" Max
 Materials of construction:
 Sensor: Silicon
 Sensor base: Pyrex
 Interconnection pads: Aluminum (thickness - 10,000 Angstroms) (size - 0.010" X 0.010")

Performance Conditions

Operating temperature range: Media temperature - 50° to 120° C (-65° to 250° F)
 Ambient temperature - 50° to 120° C (-65° to 250° F)
 Overrange effect: Permanent zero shift is less than ± 0.05% of span after applying 2X upper range value.
 Life: 100 million pressure cycles

Reference Conditions

Media temperature: 27° ± 2° C (80° ± 4° F)
 Ambient temperature: 27° ± 2° C (80° ± 4° F)
 Vibration: < 1 m/s/s (0.1 "g") maximum
 Humidity: 50% ± 10%
 Ambient pressure: 860 to 1060 millibar
 Supply voltage: 1.000 ± 0.001 mA

Notes

- Specifications are at Reference Temperature (80° F) and over 0-160° F unless otherwise noted.
- Specifications apply with 1.0 mAdc constant current excitation applied to the full sensor bridge.
- Gage devices fully functional to 5 PSIG when pressure applied to the bottom.
- Non-linearity specifications apply with pressure applied to the top (Resistor) side of the sensor: specifications degraded with positive bottom pressure or top side vacuum.

- * PSIG = Pound Per Square Inch Gage
 ** PSIA = Pound Per Square Inch Absolute