SENSONETICS

SEN-100 SILICON-ON-SAPPHIRE PRESSURE TRANSDUCERS

- **Unsurpassed stability at high and widely varying temperatures**
- **-320 to +700°F operating capabilities**
- **Excellent media compatibility**
- **Flight-qualified**
- **Withstands high levels of shock and vibration**
- **Electron-beam welded**
- **On-diaphragm temperature sensor**

APPLICATIONS

- Aerospace
- Flight testing
- Jet engine testing
- Materials testing

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SEN-100 PRESSURE AND TEMPERATURE TRANSDUCER

- Silicon-on- Sapphire Pressure Transducers unsurpassed levels of performance for aerospace and other precision measurements. They provide high (5 mV/V) sensitivity with excellent accuracy and stability over widely varying temperatures ranging to as low as ï 320°F or as high as +700°F and are compatible with virtually all media encountered in unfriendly environments.

- Sensonetics piezoresistive strain gages are epitaxially grown onto a sapphire diaphragm to form a radiation hardened structure with virtually undetectable hysteresis. Since sapphire is a perfect electrical insulator there is no need for diode isolation junctions found in traditional silicon pressure transducers. This feature coupled with sapphireôs modulus of elasticity which is 30% greater than that of stainless steel enables high temperature operation not previously attainable.

- A proprietary hermetic seal between the sapphire diaphragm and the electron beam welded stainless steel case provides the ultimate in temperature coefficient match between internal structures. This hermetic seal allows direct contact with corrosive and conductive media without the use of barrier diaphragms, push rods or transfer fluids.

- Sensonetics pressure transducers are designed to comply with MIL standards for vibration, acceleration, shock, sand, dust, salt, humidity, EMI and other environments. The case is internally stress isolated to inhibit response to mounting torque and other external stresses.

- On diaphragm silicon RTD is constant identical to that of the silicon strain gages and is used as a reference to enhance data error correction when using curve-fitting algorithms or lookup tables. This option may also be used for temperature measurement in some applications.

- Sensonetics pressure transducers enable aircraft and aerospace engineers to perform critical measurements with greater accuracy and over broader temperature ranges then previously possible. SEN-100 Transducers are available in several pressure and vacuum configurations with standard ranges from 0-5 PSI to 0-10,000 PSI and with a choice of three levels of accuracy and stability.

SEN-100 Pressure Transducers are available in the following configurations
Absolute (A) Reference to vacuum (0 PSIA)
Vented Gauge (G) Referenced to atmosphere via small hole in side of case
Sealed Gauge (SG) Referenced to standard atmospheric pressure. Same construction as an absolute transducer .
Wet/Wet Gauge (WG) Referenced to atmosphere via a wet/wet differential configuration with vent tube flush with case. Enables transducer to breathe in condensing humidity applications.
Vacuum (V) Same as vented gauge, except electrical output increases with decreasing pressure (vacuum) .

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SEN-100 PRESSURE AND TEMPERATURE TRANSDUCER

ABSOLUTE, GAUGE AND VACUUM TRANSDUCERS

Model Number	Pressure Range (psi)	Sensitivity (mV/V)	Static Accuracy (%FSO@ 75°F)	Thermal Zero Shift (%FSO/°F)	Thermal Sensitivity (%FSO/°F)	Overall Error Band (%FSO)	Transducer Outline No.
SEN-101	0-5 to 0-15	2-5	±0.25	±0.0175	±0.0175	N/A	7
SEN-102	0-20 to 0-250	5	±0.25	±0.0175	±0.0175	N/A	1
SEN-103	0-250 to 0-10,000	5	±0.25	±0.0175	±0.0175	N/A	5
SEN-104	0-5 to 0-15	2-5	±0.25	±0.009	±0.009	±2	7
SEN-105	0-20 to 0- 250	5	±0.25	±0.009	±0.009	±2	1
SEN-106	0-250 to 0ï 10,000	5	±0.25	±0.009	±0.009	±2	5
SEN-107	0-5 to 0-15	2-5	±0.25	±0.005	±0.005	±1	7
SEN-108	0-25 to 0-250	5	±0.25	±0.005	±0.005	±1	1
SEN-109	0-250 to 0ï 10,000	5	±0.25	±0.005	±0.005	±1	5

1. Includes nonlinearity, hysteresis & non-repeatability using BFSL least squares method. Higher accuracies are available upon request.
2. Transducers SEN-104 through 109 have the indicated static accuracy, thermal zero shift and thermal sensitivity unless overall error band is specified.
3. Includes electrical, mechanical and temperature effect on zero shift and sensitivity over compensated range using BFSL least-squares method.

PERFORMANCE

Pressure Range: See table above
Proof Pressure: 150% FSPR
Burst Pressure: 300% FSPR, 25,000 psi maximum
Accuracy and thermal shift: See table above
Compensated temperature range: See ordering guides for standard ranges from ï 65°to +500°F. Optional ranges available from -65°F to +700°F.

PHYSICAL

Fittings: See outline drawings, Consult factory for special
Connectors: See outline drawings. Consult factory for other connectors or for 26 AWG pigtail lead terminations

ELECTRICAL

Sensitivity: See Table
Excitation: 10 VDC nominal , Consult factory for special
Zero balance: ±2 mV.
Bridge Resistance: 350, 1000, 2500 (standard), or 5000 Ý
Isolation (ambient): Greater than 100 MÝ At 50 V
Temperature sensor: On-diaphragm silicon RTD

MATERIAL

Case: 300 Series SS All welded hermetic seal
Wetted Materials: Case and sapphire (aluminum oxides)
Dimensions: See outline drawings
Weight: Up to 6 oz

ENVIRONMENTAL

Long-term stability: Within ±0.05%FSO over 12 month period
Other: Designed to comply with MIL standards for vibration, acceleration, shock, sand, dust, salt, humidity, RFI, etc

*Consult factory for differential and other models.

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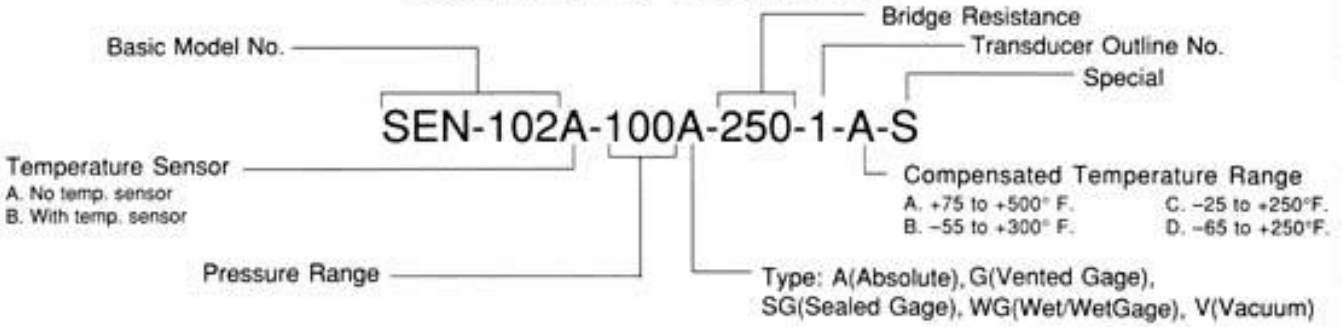
SERIES 100
ORDERING INFORMATION

EXAMPLE OF MODEL NO.



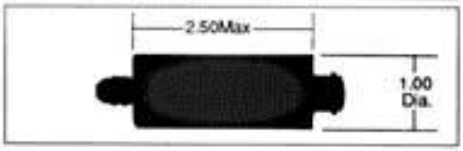
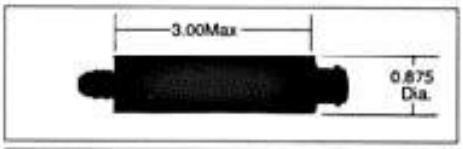
PRESSURE RANGE
(psi full scale)

SUFFIX	5	10	15	25	50	100	200	500	1M	2M	5M	10M
	5	10	15	25	50	100	200	500	1,000	2,000	5,000	10,000

BRIDGE RESISTANCE
(ohms)

SUFFIX	35	100	250	500
	350	1,000	2,500 (standard)	5,000

TRANSDUCER OUTLINE

Transducer Outline No.	Fitting Type	Connector Type	Dimensions (inches)
1	MS-33656-E4	Equivalent to PTIH-10-6P [mates with PT06A-10-6S(SR)]	
5			
7			

PINOUTS AND COLOR CODE

	+Exc.	+Out	−Out	−Exc.	Temp Sensor
Connector	A	B	C	D	E/F
Wire Leads	Red	White	Black	Orange	Green/Green

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