



# **SENSONETICS**

*Sensing today...with tomorrow's technology*

## **SEN-100 SILICON-ON-SAPPHIRE PRESSURE TRANSDUCERS**



- **Unsurpassed stability at high and widely varying temperatures**
- **-320 to +750°F operating capabilities**
- **Excellent media compatibility**
- **Flight-qualified**
- **Withstands high levels of shock and vibration**
- **Electron-beam welded**
- **On-diaphragm temperature sensor (optional)**

### ***APPLICATIONS***

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

# SILICON –ON- SAPPHIRE PRESSURE TRANSDUCERS

\* Silicon-on- Sapphire Pressure Transducers unsurpassed levels of performance for aerospace and other precision measurements. They provide high (5mV/V) sensitivity with excellent accuracy and stability over widely varying temperatures ranging to as low as –320°F or as high as +750°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 homogeneous single-crystal radiation-hardened structure with virtually undetectable hysteresis or non-repeatability. 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 sapphire’s 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. The seal also allows direct contact with corrosive and conductive media without use of barrier diaphragms or transfer of 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 than previously possible. Series 100 Transducers are available in several pressure and vacuum configurations with standard ranges from 0-5psi to 0-10,000 psi and with a choice of three levels of accuracy and stability

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

# SERIES 100 SPECIFICATIONS

## ABSOLUTE, GAGE 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 0-10,000	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 0-10,000	5	±0.25	±0.005	±0.005	±1	5

1. Includes nonlinearity, hysteresis & non-repeatability using BFSL least squares method. Higher accuracies 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  
 Compensated temperature range: See ordering guides  
 For standard ranges from -65° to +500°F Optional ranges  
 Available from -320 to +750°F.

### ELECTRICAL

Sensitivity: See Table  
 Excitation: 5 to 20VDC  
 Zero balance: ±2mV.  
 Bridge configuration: 4 active arm piezoresistive strain gage  
 Gage bridge  
 Bridge Resistance: 350,1000, 2500(standard), or 5000Ω  
 Isolation (ambient): Case isolated, Greater than 100MΩ  
 At 50V  
 Temperature sensor: On-diaphragm silicon RTD (optional)

### PHYSICAL

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

### 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 12month period  
 Other: Designed to comply with MIL standards for vibration,  
 acceleration, shock, sand, dust, salt, humidity, RFI, etc

\*Consult factory for brochures on differential and other models.  
 Specifications subject to change without notice

# SERIES 100

## ORDERING INFORMATION

### EXAMPLE OF MODEL NO.



### PRESSURE RANGE

(psi full scale)

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

### BRIDGE RESISTANCE

(ohms)

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

### 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			

### PINOOTS AND COLOR CODE

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