

SENSONETICS

SEN-400 MILLIVOLT OUTPUT PRESSURE TRANSDUCER



FEATURES

- 750 – 10,000 PSI
- Plastic Melt
- Food Extrusion
- Fast response time < 100 microsecond
- Excellent Long Term Stability
- Abrasion-resistant diaphragm
- 10x harder than stainless steel
- No harmful mercury or NaK fill
- Virtually no pressure or temperature hysteresis

APPLICATIONS

- Co Extrusion
- Compounding
- Film and sheet
- Pipe and profiles
- Polymer finishing/Laminating
- Rubber Extrusion & Molding
- Wire and Cable Insulating
- Vacuum pressure measurements

SEN-400 MILLIVOLT OUTPUT PRESSURE TRANSDUCER

Sensonetics' revolutionary plastic melt pressure transducer does not require temperature isolation of the sensing diaphragm eliminating the need for mercury, Nak fill or push rod isolation. It uses state of the art Silicon-on-Sapphire technology which has a proven track record in high-performance aerospace pressure applications.

A SEN-400 pressure transducer is interchangeable with those offered by existing suppliers. Elimination of a liquid metal fill (mercury) assures safe use in applications involving food extrusion, food packaging, or extrusion of medical tubing. Any applications where mercury should not be used can easily be converted to a safe pressure transducer. This change will eliminate the expensive cost of toxic waste disposal.

This pressure sensor is highly desirable for chemical applications such as processing photographic film which is extremely sensitive to mercury contamination. Some pressure transducer manufacturers offer Nak as an alternative to mercury but this highly volatile chemical presents fire hazards in event of a diaphragm rupture.

The pressure sensing diaphragm is manufactured from sapphire, a single crystal aluminum oxide which is the hardest of the oxide crystals and is chemically inert. Sapphire is extremely well suited for a pressure diaphragm. It has a modulus of elasticity 30% greater than stainless steel and is five-times more abrasion resistant than tungsten carbide. The sapphire diaphragm is 5 to 8 times thicker than the 4.5 mil stainless steel diaphragms used in mercury-filled transducers. A SEN-400 pressure transducer is ideally suited for abrasive extrusion applications in which thinner mercury-filled devices can wear out and may release mercury into the process. The stiffer diaphragm also provides a response time up to 200 times faster than other diaphragms. Silicon is one of the most desirable materials for critical pressure sensing applications. In Silicon-on-Sapphire technology piezoelectric silicon gauges are epitaxially grown onto the Sapphire diaphragm. This will grow a homogeneous single crystal, radiation-hardened structure. Unlike stainless steel, this structure has virtually no hysteresis and provides excellent repeatability and long-term stability. The sapphire diaphragm can be directly exposed to process media and can withstand operating temperatures up to 700°F.

An optional RTD is available to sense the temperature of the melt stream at the flush diaphragm. Other combined Pressure and Temperature transducers utilize a thermocouple mounted in the stem of the sensor resulting in a measurement of the mounting-well temperature. The thermocouple also degrades with extended exposure to high temperatures. The Silicon RTD on the SEN-400 Pressure and Temperature Transducer is mounted flush on the sapphire diaphragm directly exposed to the melt stream. The ceramic base further isolates the sensor from the mounting well resulting in an accurate measurement of the melt stream making this arrangement ideal for use in plastic melt temperature control.

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SEN-400 SPECIFICATIONS

PERFORMANCE CHARACTERISTICS

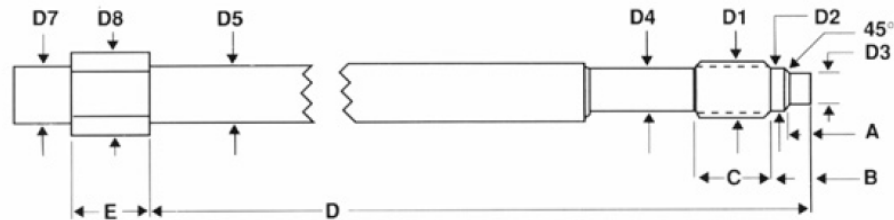
PRESSURE RANGES	750, 1,000, 1,500, 3,000, 5,000, 7,500, 10,000 PSI
COMBINED ERROR	Better than .0.5% FSO
RESOLUTION	Infinite
FREQUENCY RESPONSE	4000 Hz
MAXIMUM PRESSURE	2X Full Scale, 20,000 Maximum
WETTED MATERIAL	Sapphire
CASE MATERIAL	300 Series Stainless Steel and Hastelloy-X
MOUNTING TORQUE	40 in-lbs nominal, 150 in-lbs maximum

ELECTRICAL CHARACTERISTICS

BRIDGE RESISTANCE	2500 Ohm Nominal
FULL SCALE OUTPUT	33.3 mV @ 10 VDC Nominal
ZERO BALANCE	+ 5% FSO
EXCITATION	6-10 VDC, 15 V Maximum
INTERNAL SHUNT (R-CAL)	80% FSO Nominal
INSULATION RESISTANCE	Greater than 100 Meg Ohm @ 50 VDC

TEMPERATURE CHARACTERISTICS

MAXIMUM DIAPHRAGM TEMPERATURE	700°F (370°C)
THERMAL ZERO SHIFT	Better than +0.01% FSO/°F @ 500°F
THERMAL SENSITIVITY SHIFT	Better than +0.007% FSO/°F @ 500°F

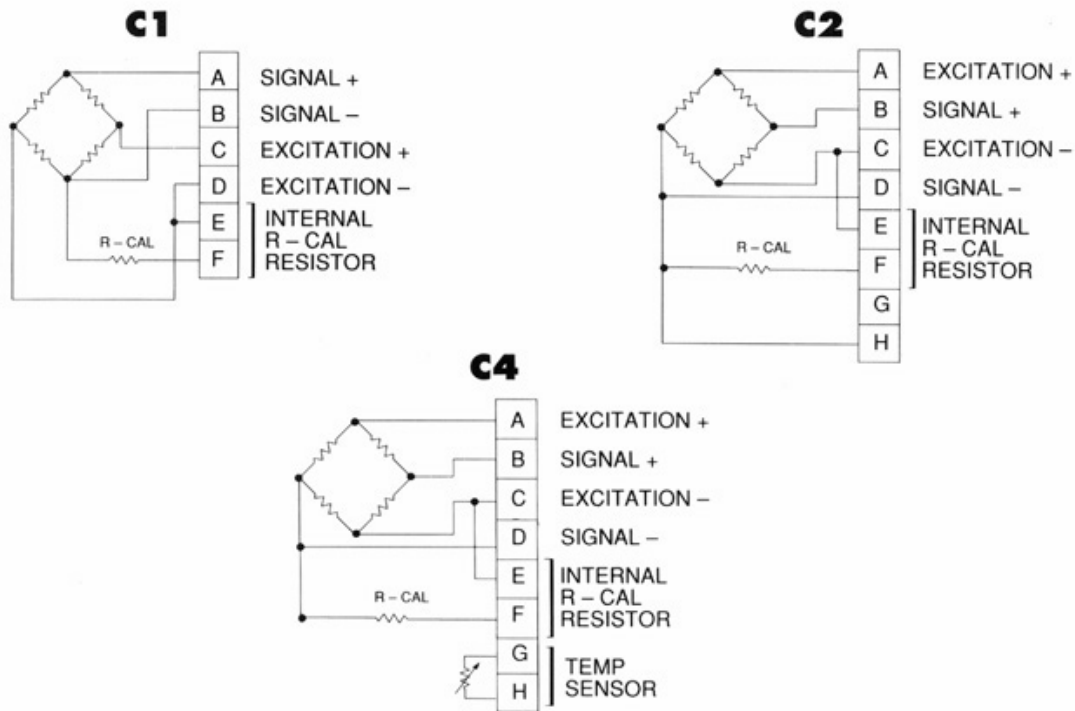


OUTLINE DRAWING	D1	D2	D3	D4	D5	D7	D8	A	B	C	D	E
No. 10 (inches)	1/2 X 20	.400	.305	.420	.500	.500 to .750	3/4 HEX	.209	.44	.62	6 or 12.5	.500

METRIC ADAPTOR AVAILABLE

SEN-400 MILLIVOLT OUTPUT PRESSURE TRANSDUCER

CONNECTOR	NO.OF PINS	R-CAL	TEMP SENSOR	CONNECTOR	MATING CONNECTOR
C1	6	YES	NO	PTIH-10-6P	PT06A-10-6S(SR)
C2	8	YES	NO	PCIH-12-8P	PC06A-12-8S(SR)
C4	8	YES	YES	PCIH-12-8P	PC06A-12-8S(SR)



ORDERING GUIDE for Series 400 Plastic Melt Pressure Transducers

MODEL	RANGE	OUTLINE	STEM LENGTH	CONNECTOR				
SEN-401(no temp sensor)	5 C = 500 psi 7.5C = 750 psi 1 M = 1000 psi	10 = No. 10 (1/2- 20 UNF)	3 = 3 inch	C1 = 6-pin C2 = 8-pin	SEN-401			
SEN-402(with temp sensor)	1.5 M = 1500 psi 3 M = 3000 psi 5 M = 5000 psi 7.5 M = 7500 psi 10 M = 10.000 psi 15 M = 15.000 psi 30 M = 30.000 psi		6 = 6 inch 9 = 9 inch 12 = 12 inch 15 = 15 inch 18 = 18 inch			C4 = 8-pin		
	EXAMPLE							
	SEN-401-		5M-	10-			6-	C1