Piezoresistive Pressure Transducer

Model 8530C-15, -50 and -100

- **15 to 100 psia, 225 mV Full Scale**
- **Absolute Reference**

ENDEVCO MODEL 8530C

DESCRIPTION

The ENDEVCO® Model 8530C is a miniature, high sensitivity piezoresistive pressure transducer for measuring absolute pressure. The volume behind the diaphragm is evacuated and glass sealed to provide an absolute pressure reference. Full scale output is 225 mV with high overload capability and high frequency response. It is available in ranges from 15 psia to 100 psia. The Model 8530B is available for higher pressure ranges.

ENDEVCO pressure transducers feature a four-arm strain gage bridge ion implanted into a unique sculptured silicon diaphragm for maximum sensitivity and wideband frequency response. Self-contained hybrid temperature compensation provides stable performance over the temperature range of 0°F to 200°F (-18°C to +93°C).* ENDEVCO transducers also feature excellent linearity (even to 3X range), high shock resistance, and high stability during temperature transients.

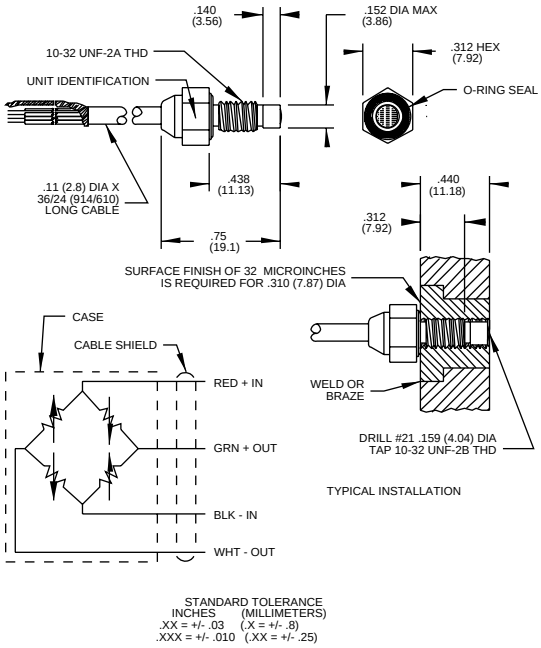
The Model 8530C has been used successfully in many blast test situations. For this application, a protective coating is recommended to eliminate photoflash sensitivity and provide particle impingement protection. This coating does not degrade the superior dynamic response characteristics of the sensor.

The Model 8530C is available with Metric M5X0.8 mounting thread as 8530C-XXM5 on special order. Also available with integral four-pin connector as Model 8530C-XXM37.

ENDEVCO Model 136 Three-Channel System, Model 4428A or 4430A Signal Conditioner, or OASIS 2000 Computer-Controlled System are recommended as signal conditioner and power supply.

*Option X: 40°F to 140°F (5°C to 60°C)

Actual size



SPECIFICATIONS

CERTIFIED PERFORMANCE: All specifications assume +75°F (+24°C) and 10 Vdc excitation unless otherwise stated. The following parameters are 100% tested. Calibration data, traceable to the National Institute of Standards and Technology (NIST), is supplied.

	Units	8530C-15	-50	-100
RANGE [1]	psia	0 - 15	0 - 50	0 - 100
SENSITIVITY [1]	mV/psi Typ (Min)	15.0 (9.3)	4.5 (2.8)	2.25 (1.4)
COMBINED: NON-LINEARITY, NON-REPEATABILITY, PRESSURE HYSTERESIS [2]	% FSO RSS Max	0.50	0.40	0.40
Non-Linearity, Independent	% FSO Typ	0.15	0.1	0.1
Non-Repeatability	% FSO Typ	0.1	0.1	0.1
Pressure Hysteresis	% FSO Typ	0.1	0.1	0.1
ZERO MEASURAND OUTPUT [3]	mV Max	±20	±20	±20
ZERO SHIFT AFTER 3X RANGE	±% 3X FSO Max	0.2	0.2	0.2
THERMAL ZERO SHIFT				
From 0°F to 200°F (-18°C to +93°C)	±% FSO Max	3	3	3
From 40°F to 140°F (5°C to 60°C)	±% FSO Max	3	3	3 X-Option
THERMAL SENSITIVITY SHIFT				
From 0°F to 200°F (-18°C to +93°C)	±% Max	3	3	3
From 40°F to 140°F (5°C to 60°C)	±% Max	3	3	3 X-Option

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Piezoresistive Pressure Transducer

SPECIFICATIONS—continued

TYPICAL PERFORMANCE CHARACTERISTICS: The following parameters are established from testing of sample units.

	Units	8530C-15	-50	-100
RESONANCE FREQUENCY	Hz	180 000	320 000	500 000
NON-LINEARITY AT 3X RANGE	% 3X FSO	1.0	1.0	1.0
ZERO SHIFT WITH MOUNTING TORQUE 15 lbf-in. (1.7 Nm)	% FSO	0.2	0.5	0.5
THERMAL TRANSIENT RESPONSE PER ISA-S37.10, PARA. 6.7, PROCEDURE I [4]	psi/°F	0.003	0.003	0.010
	psi/°C	0.005	0.005	0.018
PHOTOFLASH RESPONSE [5]	Equiv. psi	0.1	0.3	0.6
WARM-UP TIME [6]	ms	1	1	1
ACCELERATION SENSITIVITY	Equiv. psi/g	0.00015	0.00015	0.00015
BURST PRESSURE (Diaphragm)	psia Min	75	250	400
CASE PRESSURE [7]	psia Min	1000	1000	1000

ELECTRICAL

FULL SCALE OUTPUT	225 mV typical (140 mV minimum) at 10.0 Vdc
SUPPLY VOLTAGE [8]	10.0 Vdc recommended, 15 Vdc maximum
ELECTRICAL CONFIGURATION	Active four-arm piezoresistive bridge
POLARITY	Positive output for increasing pressure
RESISTANCE	
Input	2600 ohms typical, 1700 ohms minimum
Output	1500 ohms typical, 2200 ohms maximum
Isolation	100 megohms minimum at 50 Volts; leads to case, leads to shield, shield to case
NOISE	5 microvolts rms typical, dc to 50 000 Hz; 50 microvolts rms maximum, dc to 50 000 Hz

MECHANICAL

CASE, MATERIAL	Stainless Steel (17-4 PH CRES)
CABLE, INTEGRAL	Four conductor No. 32 AWG Teflon® insulated leads, braided shield, gray silicone jacket, 30 ±6 in (760 ±150mm)
DEAD VOLUME (+) PORT	0.0003 cubic inches (0.005 cc)
MOUNTING/TORQUE	10-32 UNF-2A threaded Case 0.438 inch (11.12 mm) long/15 ± 5 lbf-in (1.7 ±0.6 Nm)
WEIGHT	2.3 grams (cable weighs 9 grams/meter)

ENVIRONMENTAL

MEDIA [9]	Internal seals are epoxy compatible with clean dry gas media. Media is exposed to CRES, ceramic, silicon, Parylene C, epoxy, silicone rubber, and the O-Ring. For use in water or corrosive media, contact the factory for modifications and installation precautions which may be taken to extend service life
TEMPERATURE [10]	-65°F to +250°F (-54°C to +121°C)
VIBRATION	1000 g pk
ACCELERATION	1000 g
SHOCK	20 000 g, 100 microsecond haversine pulse
HUMIDITY	Isolation resistance greater than 100 megohms at 50 volts when tested per MIL-STD-202E, Method 103B, Test Condition

CALIBRATION DATA

Data supplied for all parameters in Certified Performance section. Optional calibrations available for all parameters in Typical Performance section.

ACCESSORY

EHR93	O-RING, VITON

OPTIONAL ACCESSORIES

EHR96	O-RING, FLUOROSILICONE
24328	4 CONDUCTOR SHIELDED CABLE

NOTES

1. 1 psi = 6.895 kPa = 0.069 bar.
2. FSO (Full Scale Output) is defined as transducer output change from 0 psia to + full scale pressure.
3. Zero Measurand Output (ZMO) is the transducer output with 0 psia applied.
4. Significantly higher thermal transient errors occur if the excitation voltage exceeds 10 Vdc. For sensitive phase change studies, many users reduce the excitation to 5 Vdc or even 1 Vdc.
5. Per ISA-S37.10, Para. 6.7, Proc. II. The metal screen partially shields the silicon diaphragm from incident radiation. Accordingly, light incident at acute angles to the screen generally increases the error by a factor of 2 or 3.
6. Warm-up time is defined as elapsed time from excitation voltage "turn on" until the transducer output is within ±1% of reading accuracy.
7. Case pressure identifies media containment pressure in the event of diaphragm rupture.
8. For best results when using excitation voltages other than 10.0 Vdc, it is recommended that the transducer be calibrated at the desired excitation during manufacture. Otherwise larger thermal errors may occur, especially at voltages above 10 Vdc.
9. O-Ring, ENDEVCO part number EHR93 PARKER 5-125, compound V747-75 (VITON®) is supplied unless otherwise specified on purchase order. Fluorosilicone O-ring, Endevco part number EHR96 Parker material L677-70, for leak tight operation below 0°F is available on special order.
10. Units can be compensated over any 200°F (93°C) span.
11. Maintain high levels of precision and accuracy using Endevco's factory calibration services. Call Endevco's inside sales force at 800-982-6732 for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.

NOTE: Tighter specifications are available on special order.

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