Piezoresistive Pressure Transducer

ENDEVCO MODEL 8544

Model 8544

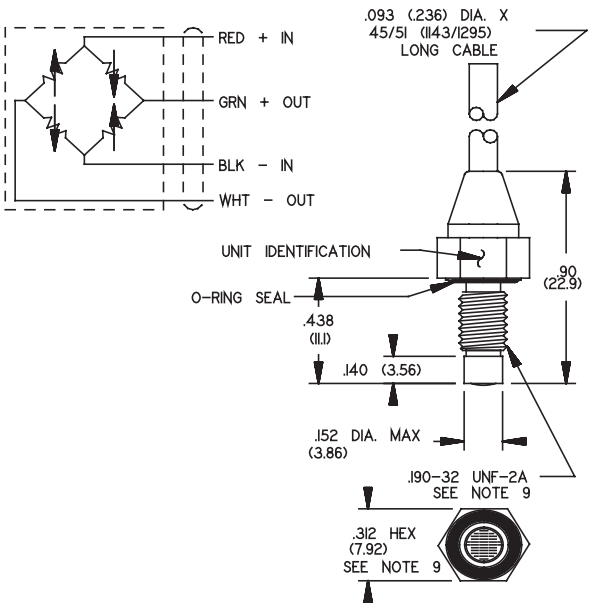
- 400°F (204°C) Continuous
- 450°F (232°C) for 24 Hours
- 15 to 500 psia
- Absolute Reference

Actual size

DESCRIPTION

The ENDEVCO® Model 8544 is a rugged, miniature, high sensitivity pressure transducer designed for high temperature applications up to 400°F. Its excellent linearity (even at 2X range) combined with very high resonance makes it ideally suited for making dynamic pressure measurements. The transducer features an accurate internal sensitivity compensation and zero trim circuit. The unique diaphragm design exhibits very low photoflash sensitivity and high stability during temperature transients.

The 8544 is designed to measure a wide range of static and dynamic pressures. The small diameter suits it to flush mounting for measuring skin pressures on aircraft, inlet distortion pressures in turbine engines or applications where higher temperature will be encountered, e.g. missiles and spacecraft. The diaphragm is compatible with dry gas and most hydraulic fluids.



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	8544-15	-50	-100	-200	-500
RANGE [1]	psia	0 - 15	0 - 50	0 - 100	0 - 200	0 - 500
SENSITIVITY [1]	mV/psi	11.7 +5.6/-3.7	5.2 +8.7/-1.1	1.75 +4.35/-0.6	0.9 +.40/-.30	0.35 +.17/-.11
COMBINED: NON-LINEARITY, NON-REPEATABILITY,						
PRESSURE HYSTERESIS [2]	% FSO RSS Max	0.5	0.5	0.5	0.75	0.75
Non-Linearity, Independent	% FSO Typ	0.25	0.25	0.25	0.4	0.4
Non-Repeatability	% FSO Typ	0.1	0.1	0.1	0.1	0.1
Pressure Hysteresis	% FSO Typ	0.1	0.1	0.1	0.1	0.1
ZERO MEASURAND OUTPUT [3]	mV Max	±20	±20	±20	±20	±20
ZERO SHIFT AFTER 2X RANGE	±% 2X FSO Max	0.2	0.2	0.2	0.2	0.2
	(Typ)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
THERMAL ZERO SHIFT						
From 75°F to +400°F (24°C to +204°C)	±% FSO Max	4.0	4.0	4.0	4.0	4.0
THERMAL SENSITIVITY SHIFT						
From 75°F to +400°F (24°C to +204°C)	±% Max	4.0	4.0	4.0	4.0	4.0

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SPECIFICATIONS—continued

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

	Units	8544-15	-50	-100	-200	-500
RESONANCE FREQUENCY	Hz	140 000	240 000	350 000	450 000	900 000
NON-LINEARITY AT 2X RANGE	% 2X FSO	0.5	1.0	1.0	1.0	1.0
ZERO SHIFT WITH MOUNTING TORQUE 15 lbf-in (1.7 Nm)	% FSO	0.25	0.25	0.25	0.25	0.25
THERMAL TRANSIENT RESPONSE PER ISA-S37.10, PARA. 6.7 PROCEDURE I [4]	psi/°F psi/°C	0.002 0.004	0.004 0.007	0.005 0.009	0.006 0.011	0.006 0.011
PHOTOFLASH RESPONSE [5]	Equiv. psi	0.1	0.2	0.3	0.5	1.0
WARM-UP TIME [6]	ms	1	1	1	1	1
ACCELERATION SENSITIVITY	Equiv.psi/g	0.0004	0.0003	0.0003	0.0007	0.0010
BURST PRESSURE (Diaphragm)	psia Min	30	100	200	400	1000

ELECTRICAL

FULL SCALE OUTPUT	175 mV at 10.0 Vdc
SUPPLY VOLTAGE [7]	10.0 Vdc recommended, 18 Vdc maximum
ELECTRICAL CONFIGURATION	Active four-arm piezoresistive bridge
POLARITY	Positive output for increasing pressure
RESISTANCE	
Input	1600 ±900 ohms
Output	800 ±500 ohms
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. 30 AWG Teflon® insulated conductors, braided shield, Teflon® jacket, 30 inches (1219 mm) length typical
DEAD VOLUME (+) PORT	0.0003 cubic inches (0.005 cc)
MOUNTING/TORQUE	10-32 UNF-2A threaded case 0.75 inch (19.05mm) long/15 ±5 lbf-in (1.7±0.6 N.m)
WEIGHT	3.0 grams (cable weighs 14 grams/meter)

ENVIRONMENTAL

MEDIA	Media in measurand port is exposed to stainless steel case, silicon diaphragm, ceramic, epoxy, RTV and fluorosilicone 0-ring. The measurand port can be exposed to water for weeks without damage.
TEMPERATURE [8]	-65°F to +400°F (-54°C to +204°C)
VIBRATION/ACCELERATION	100 g rms / 1000g
SHOCK	10 000 g, 100 microsecond half-sine pulse

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 ACCESSORY
EHR960 O-Ring, Fluorosilicone
30024 4 Conductor shielded cable

NOTES

1. 1 psi = 6.895 kPa = 0.069 bar.
2. FSO (Full Scale Output) is defined as transducer output from 0 psia to + full scale pressure.
3. Zero Measurand Output (ZMO) is the transducer output with 0 psia applied.
4. Significant 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, Paragraph 6.7, Procedure 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. Use of excitation voltages other than 10.0 Vdc requires manufacture and calibration at that voltage since thermal errors increase with high excitation voltages.
8. The 8540 can be operated at 400°F (204°C) continuously, and at 450°F (232°C) for up to 24 hours.
9. 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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