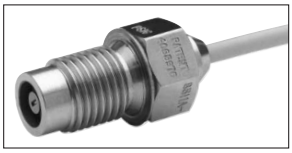
Piezoresistive Pressure Transducer

ENDEVCO MODEL 8511A

Model 8511A-5K, -10K and -20K

- **5000 to 20 000 psi**
- **500 mV Full Scale**
- **Rugged, High Sensitivity**





Actual size

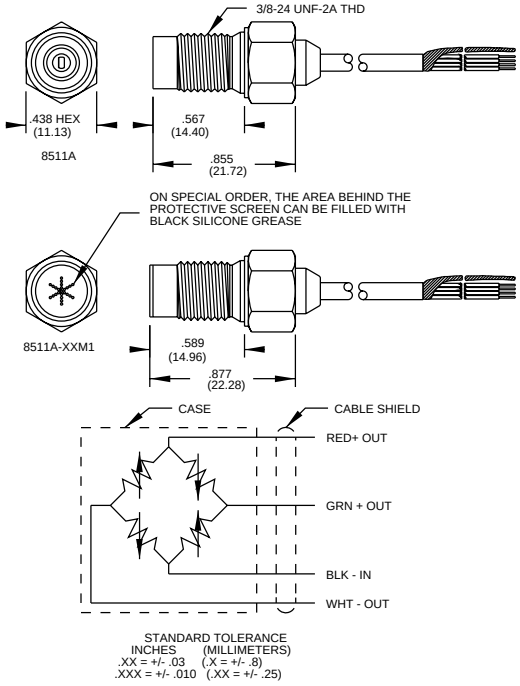
DESCRIPTION

The ENDEVCO® Model 8511A is a rugged, piezoresistive pressure transducer for high pressures. It has a 3/8-inch mounting thread and is available in ranges from 5000 to 20 000 psig.

ENDEVCO pressure transducers feature an active four-arm strain gage bridge diffused into a sculptured silicon diaphragm for maximum sensitivity and wideband frequency response. Self-contained hybrid temperature compensation provides stable performance over the wide 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 8511A is widely used for high pressure applications such as studies of structural loading by shock waves resulting from explosive blasts, pulsations in hydraulic and combustion systems. The Model 8511A is designed to operate in the gage mode, i.e., the back of the diaphragm is referenced to atmospheric pressure. For harsh environments where there is particle impingement, the 8511A-M1 version is available with a protective screen and a black silicone grease coating which further reduces photoflash sensitivity and provides an effective thermal barrier for short duration high temperature service.

ENDEVCO Model 136 Three-Channel System, Model 4430A Signal Conditioner, or Model 68207 BCAS™ Computer Controlled System are recommended as signal conditioner and power supply.



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	8511A-5K	-10K	-20K
RANGE [1]	psig	0 - 5 000	0 - 10 000	0 - 20 000
POSITIVE SENSITIVITY [1]	mV/psi	0.100 ±0.033	0.050 ±0.017	0.025 ±0.008
COMBINED: NON-LINEARITY, NON-REPEATABILITY, PRESSURE HYSTERESIS [2]	% FSO RSS Max	1.5	1.5	1.5
Non-Linearity, Independent	% FSO Max	1.2	1.2	1.2
Non-Repeatability	% FSO Max	0.5	0.5	0.5
Pressure Hysteresis	% FSO Max	1.0	1.0	1.0
ZERO MEASURAND OUTPUT [3]	mV Max	±10	±10	±10
ZERO SHIFT AFTER 3X RANGE	±% 3X FSO Max	0.1	0.2	[4]
THERMAL ZERO SHIFT From 0°F to 200°F (-18°C to +93°C)	±% FSO Max	3	3	3
THERMAL SENSITIVITY SHIFT From 0°F to 200°F (-18°C to +93°C)	±% Max	4	4	4

ENDEVCO MODEL 8511A

Piezoresistive Pressure Transducer

SPECIFICATIONS—continued

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

	Units	8511A-5K	-10K	-20K
RESONANCE FREQUENCY	Hz	>1 000 000	>1 000 000	>1 000 000
NON-LINEARITY AT 3X RANGE [4]	% 3X FSO	0.3	0.8	
PHOTOFLASH RESPONSE [5]	Equiv. psi	12	25	50
WARM-UP TIME [6]	ms	1	1	1
ACCELERATION SENSITIVITY	Equiv. psi/g	0.001	0.002	0.003
BURST PRESSURE (Diaphragm)	psi Min	20 000	30 000	40 000

ELECTRICAL

FULL SCALE OUTPUT	500 mV typical (330 mV min) 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 into (+) port
RESISTANCE	
Input	2000 ±800 ohms
Output	1600 ±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
CABLE, INTEGRAL	Four conductor No. 32 AWG Teflon® insulated leads, braided shield, silicone jacket. 30 ±6 in (760 ±150mm)
DEAD VOLUME (+) PORT	0.004 cubic inches (0.06 cc)
MOUNTING/TORQUE	3/8-24 UNF-2A threaded case 0.567 inch (14.4 mm) long/12 ±2 lbf-ft (16 ±2 Nm)
WEIGHT	11 grams (cable weighs 9 grams/meter)

ENVIRONMENTAL

MEDIA	Internal seals are epoxy and are compatible with clean dry gas media. Media in (+) measurand port is exposed to nickel-iron alloy, Parylene C and epoxy. For use in water or corrosive media, contact the factory for modifications and installation precautions which may be taken to extend service life
TEMPERATURE [8]	-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 B. External case is sealed with epoxy. Circuit within case, vented through cable, is coated with Parylene C.

CALIBRATION DATA

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

ACCESSORIES

22688	COPPER GASKET (-5K, -10K)
22686	WASHER, HIGH PRESSURE (-20K)

OPTIONAL ACCESSORY

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 from 0 to + full scale pressure.
3. Zero Measurand Output (ZMO) is the transducer output with 0 psig applied.
4. Overrange is limited to 40 000 psi for the 8511A-20K. Zero shift and linearity for 2X range is typically ±1% of 2X FSO.
5. Per ISA-37.10, Para. 6.7, Procedure II. Filling the 8511A or M1 version with black silicone grease (available as factory order) reduces these values by a factor of 10.
6. Warm-up time is defined as elapsed time from excitation voltage "turn on" until the transducer output is the ±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. Units can be compensated over any 200°F (93°C) span from -65°F to +250°F (-54°C to +121°C) on special order. The M1 version with factory available silicone grease will withstand 5000°F (2700°C) for up to 100 ms with negligible errors.

NOTE: Tighter specifications are available on special order.

Continued product improvement necessitates that Endevco reserve the right to modify these specifications without notice. Endevco maintains a program of constant surveillance over all products to ensure a high level of reliability. This program includes attention to reliability factors during product design, the support of stringent Quality Control requirements, and compulsory corrective action procedures. These measures, together with conservative specifications have made the name Endevco synonymous with reliability.

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