

Model 8511A-5K, -10K, -20K Piezoresistive pressure transducer

Features

- 5000 to 20 000 psig
- Rugged
- High sensitivity
- Temperature compensated



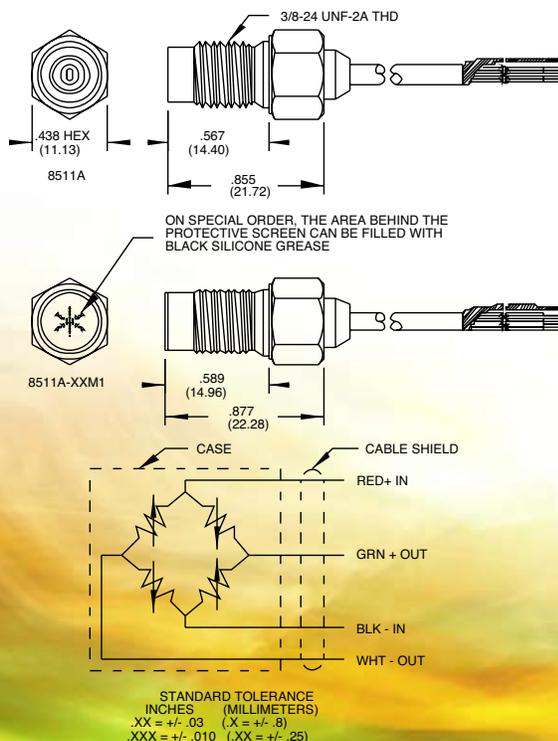
Description

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, 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. For harsh environments where there is particle impingement, an optional 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 models 136 Three-Channel System, model 4428A or 4430A Signal Conditioner, or OASIS 2000 Computer-Controlled System are recommended as signal conditioner and power supply.



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Endevco

Specifications

The following performance specifications conform to ISA-RP-37.2 (1964) and are typical values, referenced at +75°F (+24°C) and 100 Hz, unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), is supplied.

Dynamic characteristics	Units	8511A-5K	-10K	-20K
Range [1]	psig	0-5000	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 typical	1.5	3.0	3.0
Non-Linearity, Independent	% FSO typical	1.2	2.5	2.5
Non-Repeatability	% FSO typical	0.5	0.5	0.5
Pressure Hysteresis	% FSO typical	1.0	1.0	1.0
Zero measurand output [3]	mV Max	±25	±25	±25
Zero shift after 2x range	±% 2X 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
Resonance frequency	Hz 1.5	>1 000 000	>1 000 000	>1 000 000
Non-linearity at 3x range [4]	% 3X FSO	0.3	0.8	[4]
Photoflash response [5]	Equiv. psi -5k	12	25	50
Warm-up time [6]	ms 20v	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 (270 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 ohms min
Output	1000 min
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 ±3 in (760 ±76mm) 0.004 cubic inches (0.06 cc)
Dead volume (+) port	
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	Media in (+) measurand port is exposed to nickel-iron alloy, Parylene C and epoxy. Internal seals are epoxy and are compatible with clean dry gas media.
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

A calibration certificate is supplied with each unit.

Notes

- 1 psi = 6.895 kPa = 0.069 bar.
- FSO (Full Scale Output) is defined as transducer output from 0 to + full scale pressure.
- Zero Measurand Output (ZMO) is the transducer output with 0 psig applied.
- Overrange is limited to 40 000 psi for the 8511A-20K
- Per ISA-37.10, Para. 6.7, Procedure II. Filling the 8511A or M1 - G option version with black silicone grease (available as factory order) reduces these values by a factor of 10.
- Warm-up time is defined as elapsed time from excitation voltage "turn on" until the transducer output is the ±1% of reading accuracy.
- Use of excitation voltages other than 10.0 Vdc requires manufacture and calibration at that voltage since thermal errors increase with high excitation voltages.
- 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.

Accessories

22688	Copper gasket (-5k, -10k)
22686	Washer, high pressure (-20k)

Optional accessory

24328	4 conductor shielded cable screen grease
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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.