



Model 8507C-1, -2, -5, -15 Piezoresistive pressure transducer

Features

- 1 to 15 psi
- 300 mV full scale
- Rugged, miniature
- Two compensated ranges available

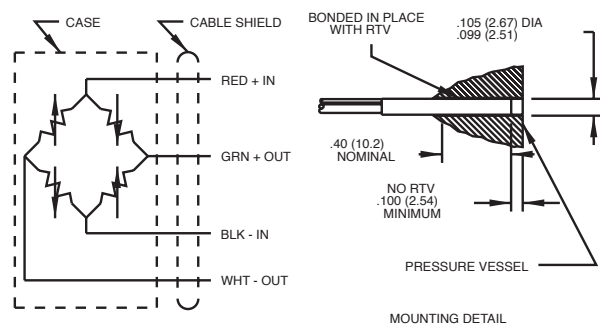
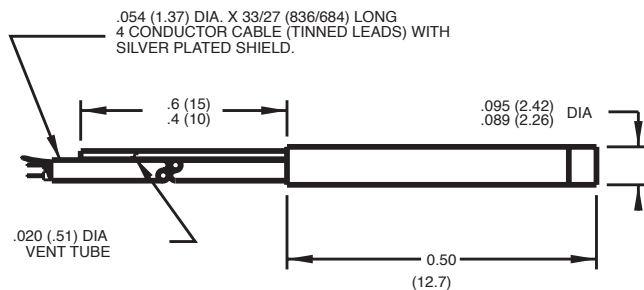
Description

The Endevco® model 8507C is a rugged, miniature, high sensitivity piezoresistive pressure transducer. It has a 0.09 inch (2.3 mm) cylindrical case and is available in ranges from 1 psi to 15 psi with full scale output up to 300 mV. Its high sensitivity combined with high resonance makes it ideal for measuring dynamic pressure.

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 excellent stability during temperature transients.

The model 8507C is designed for installations which do not require threaded mounting and can be installed in locations which are difficult to reach. Its small size permits flush mounting on curved surfaces. Its high sensitivity combined with small size and high resonance frequency makes the model 8507C ideal for use on small-scale models in wind tunnels.

The Endevco model 126, 136, 4430A or 4990A (OASIS) are recommended as signal conditioner and power supply.



STANDARD TOLERANCE
INCHES (MILLIMETERS)
.XX = +/- .03 (.X = +/- .8)
.XXX = +/- .010 (.XX = +/- .25)

Model 8507C

Piezoresistive pressure transducer

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Specifications

The following performance specifications conform to ISA-RP-37.2 (1964) and are typical values, referenced at +75°F (+24°C), 100 Hz and 10 Vdc unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), is supplied.

| | Units | 8507C-1 | -2 | -5 | -15 |
|--|---------------------|--|-------------|------------|------------|
| Range [1] | psig | 0-1 | 0-2 | 0-5 | 0-15 |
| Positive sensitivity [2] | mV/psi | 200 ±50 | 100 +50/-20 | 60 ±20 | 20 ±7 |
| Combined: Non-linearity, Non-repeatability, Pressure hysteresis [3] | | | | | |
| Pressure hysteresis [3] | % FSO RSS max | 1.5 | 1.5 | 0.75 | 0.50 |
| Non-linearity, independent | % FSO typ | 1.5 | 1.0 | 0.50 | 0.20 |
| Non-repeatability | % FSO typ | 0.1 | 0.1 | 0.1 | 0.05 |
| Pressure hysteresis | % FSO typ | 0.1 | 0.1 | 0.1 | 0.1 |
| Zero measurand output [4] | mV max | ±10 | ±10 | ±10 | ±10 |
| Zero shift after 3x range | ±% 3x FSO max (typ) | 0.2 (0.02) | 0.2 (0.02) | 0.2 (0.02) | 0.2 (0.02) |
| Thermal zero shift | | | | | |
| From 0°F to 200°F (-18°C to +93°C) | ±% FSO max | 3 | 3 | 3 | 3 |
| Thermal sensitivity shift | | | | | |
| From 0°F to 200°F (-18°C to +93°C) | ±% max | 4 | 4 | 4 | 4 |
| Resonance frequency | Hz | 55,000 | 70 000 | 85 000 | 130 000 |
| Non-linearity at 3x range | % 3x FSO | 2.5 | 2.5 | 2.0 | 1.0 |
| Thermal transient response per ISA-S37.10, Para. 6.7, Procedure I [5] | psi/°F | 0.003 | 0.003 | 0.003 | 0.003 |
| | psi/°C | 0.005 | 0.005 | 0.005 | 0.005 |
| Photoflash response [6] | Equiv. psi | 0.01 | 0.01 | 0.03 | 0.1 |
| Warm-up time [7] | ms | 1 | 1 | 1 | 1 |
| Acceleration sensitivity | Equiv. psi/g | 0.0002 | 0.0002 | 0.0002 | 0.0002 |
| Burst pressure (diaphragm/reference side) | psi min | 20/20 | 40/40 | 100/50 | 150/50 |
| Electrical | | | | | |
| Full scale output | | 300 ±100 mV at 10.0 Vdc | | | |
| Supply voltage [8] | | 10.0 Vdc recommended, 18 Vdc maximum | | | |
| Electrical configuration | | Active four-arm piezoresistive bridge | | | |
| Polarity | | Positive output for increasing pressure into (+) port (end with screen on it) | | | |
| 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 | | Nickel - iron alloy | | | |
| Cable, integral | | Four conductor No. 36 AWG Teflon® insulated leads, braided shield, PVC jacket, 30 ±3 in (760 ±76 mm) | | | |
| Dead volume (+) port | | 0.00005 cubic inches (0.0008 cc) | | | |
| Mounting | | Bond into #38 drill hole (2.6 mm) using an RTV such as DOW CORNING Silastic® 738; RTV not permitted within 0.10 inch (2.5 mm) of unit's face. | | | |
| Weight | | 0.3 gram (cable weighs 3.6 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, silicon, ceramic, Parylene C, and epoxy. Media in (-) measurand port is exposed to the above and RTV silicone coating. For use in water or corrosive media, contact the factory for modifications and installation precautions which may be taken to extend service life. | | | |
| Temperature [9] | | -65°F to +225°F (-54°C to +107°C) | | | |
| Vibration | | 1000 g pk | | | |
| Acceleration | | 1000 g | | | |
| Shock | | 10 000g, 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. | | | |

Specifications continued on next page

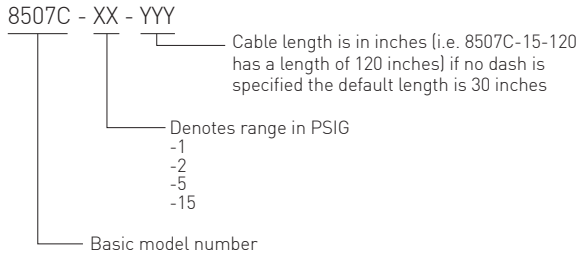
Model 8507C

Piezoresistive pressure transducer

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Model number definition

Data supplied for all parameters in certified performance section. optional calibrations available for all parameters in typical performance section.



Calibration data

Data supplied for all parameters in certified performance section. optional calibrations available for all parameters in typical performance section.

Optional accessories

| | |
|-------|--|
| 22409 | 4 conductor shielded cable |
| 126 | 3 channel bridge amplifier |
| 136 | 3 channel DC amplifier |
| 436 | Rack mount signal conditioner |
| 4430A | Programmable bridge signal conditioner |
| 4990A | OASIS rack system |

Notes

1. Pressure ranges can be considered bidirectional, e.g., an 8507C-5 can be used to measure + or - 5 psig. Sensitivity on the positive direction is typically within 1% of sensitivity in the negative direction. Sensitivity calibration provided with each unit is for the positive direction.
2. 1 psi = 6.895 kPa = 0.069 bar.
3. FSO (Full Scale Output) is defined as transducer output from 0 to + full scale pressure.
4. Zero Measurand Output (ZMO) is the transducer output with 0 psig applied.
5. 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.
6. Equiv. PSI Per ISA-37.10, Para. 6.7, Proc. 1. 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.
7. Warm-up time is defined as elapsed time from excitation voltage "turn on" until the transducer output is within $\pm 1\%$ of reading accuracy.
8. Use of excitation voltages other than 10.0 Vdc requires manufacture and calibration at that voltage since thermal errors increase with high excitation voltages.
9. Units can be compensated over any 200°F (93°C) span from -65°F to +225°F [-54°C to +107°C] on special order.
10. Maintain high levels of precision and accuracy using Endeveco's factory calibration services. Call Endeveco's inside sales force at 800-982-6732 for recommended intervals, pricing and turnaround time for these services as well as for quotations on our standard products.
11. To extend vent tube, use Tygon® micro bore tubing, ".020 I.D X .060 O.D.", -31°C (-25°F) to +85°C (185°F), which is available from Cole-Parmer. For broader temperature range, use silicone tubing.

Note: Tighter specifications are available on special order.

Continued product improvement necessitates that Meggitt (San Juan Capistrano), Inc reserve the right to modify these specifications without notice. Meggitt (San Juan Capistrano), Inc 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 Endeveco synonymous with reliability.

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