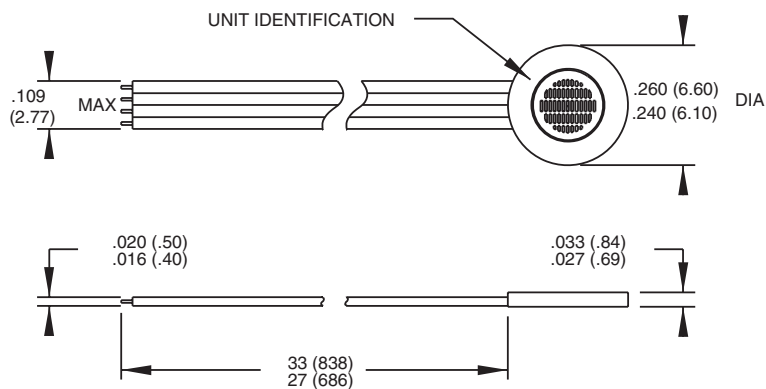


# Piezoresistive pressure transducer

## Model 8515C -15, -50



### Key features

- 15 and 50 psia ranges
- 200 mV full range
- Low profile, 0.030 inch thin
- Absolute reference

### Description

Model 8515C is a rugged, miniature, high sensitivity piezoresistive pressure transducer available in 15 and 50 psia full scale ranges. It is surface-mounted and measures 0.030 inch thin by 0.250 inch diameter (0.76 mm x 6.3mm). Full scale output is 200 mV with high overload capability, high frequency response, very low base strain sensitivity and excellent temperature performance.

Because of its very small size, model 8515C can be installed on curved surfaces with minimal effect on laminar air or hot gas flow. For a flush fit, 8515C and leadwires can be recessed into the mounting surface. A protective screen is provided to protect against particle impingement. 8515C is suitable for use on small-scale models in wind tunnel tests, as well as on aerodynamic surfaces during flight tests. Other uses include helicopter or turbine blade surface pressure measurements.

A rubber fairing, PN 30042, is an available accessory for airflow smoothing for flight test applications. Modified versions are available on special order for wider temperature compensation.

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The following performance specifications are 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.

| Specifications  |   |             |           |
|---|---|-------------|-----------|
| Dynamic characteristics   | Units   | -15         | -50       |
| Range   | psia  | 0–15        | 0–50      |
| Positive sensitivity [1]  | mV/psi typ (min)  | 13.3 (8.67) | 4.0 (2.6) |
| Combined: non-linearity, non-repeatability, pressure hysteresis [2]   | % FSO RSS max   | 0.5         | 0.5       |
| Non-linearity, independent  | % FSO typ   | 0.2         | 0.2       |
| Non-repeatability   | % FSO typ   | 0.1         | 0.1       |
| Pressure hysteresis   | % FSO typ   | 0.1         | 0.1       |
| Zero measurand output [3]   | mV max  | ±20         | ±20       |
| Zero shift after 3X range   | % 3X FSO max  | 0.5         | 0.5       |
| Thermal zero shift  |   |             |           |
| from 0°F to +200°F (-18°C to +93°C), Ref to 75°F (24°C)   | % FSO max   | 2.5         | 2.5       |
| Thermal sensitivity shift   |   |             |           |
| from 0°F to +200°F (-18°C to +93°C), Ref to 75°F (24°C)   | % max   | 3           | 3         |
| Resonance frequency [4]   | Hz  | 180 000     | 320 000   |
| Non-linearity at 3X range   | % 3X FSO  | 1           | 1         |
| Thermal transient response per ISA-S37.10, para. 6.7, procedure I [5]   | psi/°F  | 0.003       | 0.005     |
| Photoflash response   | psi   | 0.25        | 0.8       |
| Warm-up time [6]  | ms  | 1           | 1         |
| Acceleration sensitivity  | psi/g   | 0.0002      | 0.0002    |
| Burst pressure (diaphragm)  | psia min  | 75          | 250       |
| Base strain sensitivity at 250 microstrain  |   |             |           |
| Elastomer mounting [7]  | psi   | 0.004       | 0.013     |
| Rigid mounting [8]  | psi   | 0.007       | 0.023     |
| <b>Electrical</b>   |   |             |           |
| Full scale output   | 200 mV typical (130 mV minimum) at 10.0 Vdc   |             |           |
| Supply voltage [9]  | 10.0 Vdc recommended, 12 Vdc maximum  |             |           |
| Electrical configuration  | Active four-arm piezoresistive bridge   |             |           |
| Polarity  | Positive output for increasing pressure   |             |           |
| Resistance  |   |             |           |
| Input   | 2700 ohms typical, 2000 ohms minimum  |             |           |
| Output  | 1500 ohms typical, 2200 ohms minimum  |             |           |
| 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 |             |           |
| <b>Mechanical</b>   |   |             |           |
| Case material   | Stainless steel 300 series CRES   |             |           |
| Cable, integral [11]  | 4 conductor No. 36 AWG solid S.P.C., ETFE insulated                                   |             |           |
| Dead volume   | 0.0004 cubic inches (0.0065 cc)   |             |           |
| Mounting [7] [8] [10]   | RTV bond to flat surface  |             |           |
| Weight  | 0.08 gram (cable weighs 2.5 grams/meter)  |             |           |
| <b>Calibration</b>  |   |             |           |
| Each unit supplied with an ISO17025 compliant calibration which includes sensitivity, ZMO, Input resistance, output resistance, isolation resistance, linearity, hysteresis, repeatability, accuracy, thermal zero shift and thermal sensitivity shift. |   |             |           |

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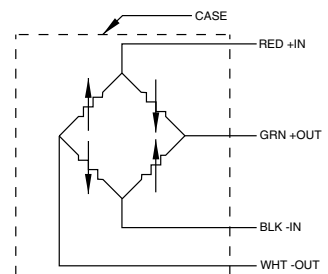
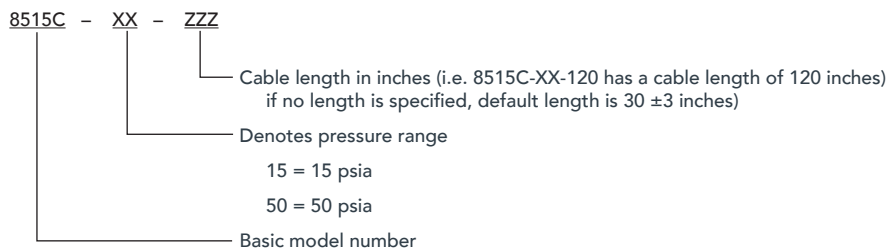
| Accessories |                          |          |
|-------------|--------------------------|----------|
| Options     | Description              | 8515C    |
| 30042       | Mounting pad             | Optional |
| EW862       | 4 conductor ribbon cable | Optional |

| Options |   |  |
|---------|---|--|
| Options | Description                                 |  |
| M30     | Special temp comp -65° to 135°F & Gel       |  |
| M32     | A screen and black grease for blast testing |  |
| M35     | Gel option for improved moisture resistance |  |
| M39     | 5V calibration                              |  |
| M43     | Special temp comp -30° to 170°F & Gel       |  |

## Notes

1. A precise value for sensitivity is measured and provided for each unit.
2. FSO (Full Scale Output) is defined as transducer output from 0 to +FS, which is nominally 200 mV.
3. Zero Measurand Output (ZMO) is the transducer output with 0 psia applied.
4. The cavity in the housing around the diaphragm may result in a low amplitude minor resonance near 70 kHz.
5. Significantly higher thermal transient errors occur if the excitation voltage exceeds 10 Vdc. For sensitive phase change studies, many users reduce the excitation voltage to 5 or even 1 volt.
6. Warm up time is defined as lapsed time from excitation voltage “turn on” until the transducer output is within 1% of reading accuracy.
7. Recommended mounting is .002 to .005 inch thickness of an RTV adhesive, such as Dow Corning Silastic® 738, or General Electric RTV 118.
8. Rigid mounting using cyanoacrylate adhesive. Use of a rigid adhesive makes removal without damage extremely difficult.
9. Use of excitation voltages above 10 Vdc requires manufacture and calibration at that voltage since thermal errors increase with high excitation voltages. If the unit is operated in a vacuum, excitation voltages above 10 volts may damage the unit.
10. Extreme care must be exercised in order to remove a mounted unit without damage. Use of solvents to remove the mounting adhesive may damage joints in the case of the unit.
11. Cable lengths longer than 36 inches include a splice due to test equipment limitations.
12. Maintain high levels of precision and accuracy using Endevco’s factory calibration services. Call Endevco’s inside sales force at 866-ENDEVCO for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.
13. Model number definition:



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



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