

# Piezoresistive Pressure Transducer

## Model 8515C-15 and -50

**ENDEVCO**  
**MODEL**  
**8515C**

- Mounts on Aerodynamic Surfaces
- 15 to 50 psia, Full Scale
- Low Profile, 0.030 Inch Thin
- Absolute Reference

### DESCRIPTION

The ENDEVCO® 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 (0.76mm 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, the Model 8515C can be installed on curved surfaces with minimal effect on laminar air or hot gas flow. For a flush fit, the 8515C and leadwires can be recessed into the mounting surface. A protective screen is provided to protect against particle impingement. The Model 8515C is suitable for use on small-scale models in wind tunnel tests, as well as on aerodynamic surfaces during flight tests. Other uses are for blast effect studies and helicopter or turbine blade surface pressure measurements.

A rubber fairing, Part Number 30042, is an available accessory for airflow smoothing for flight test applications. Modified versions are available on special order for wider temperature compensation or with rectangular housings.

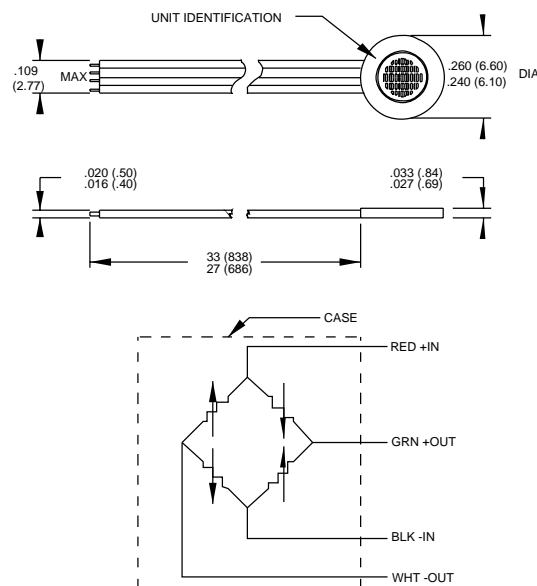
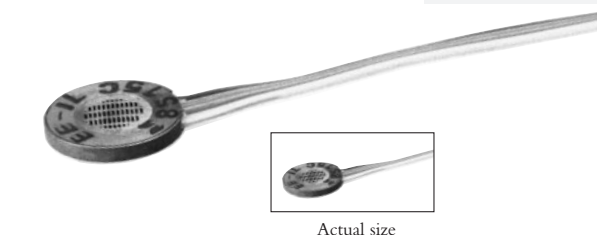
ENDEVCO Model 136 Three-Channel System, Model 4428A or 4430A Signal Conditioner, or OASIS 2000 Computer-Controlled System are recommended as signal conditioner and power supply.

\*Option X: 40°F to 140°F (5°C to 60°C)

### 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	8515C-15	-50
RANGE [1]	psia	0 - 15	0 - 50
SENSITIVITY [2]	mV/psi Typ (Min)	13.3 (8.67)	4.0 (2.6)
COMBINED: NON-LINEARITY, NON-REPEATABILITY, PRESSURE HYSTERESIS [3]			
Non-Linearity, Independent	% FSO RSS Max	0.50	0.50
Non-Repeatability	% FSO Typ	0.20	0.20
Pressure Hysteresis	% FSO Typ	0.1	0.1
ZERO MEASURAND OUTPUT [4]	mV Max	±20	±20
ZERO SHIFT AFTER 3X RANGE	±% 3X FSO Max	0.5	0.5
THERMAL ZERO SHIFT [5]			
From 0°F to 200°F (-18°C to +93°C)	±% FSO Max	2.5	2.5
From 40°F to 140°F (5°C to 60°C)	±% FSO Max	2.5	2.5 X-Option
THERMAL SENSITIVITY SHIFT [5]			
From 0°F to 200°F (-18°C to +93°C)	±% Max	3	3
From 40°F to 140°F (5°C to 60°C)	±% Max	3	3 X-Option



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

# ENDEVCO MODEL 8515C

## Piezoresistive Pressure Transducer

### SPECIFICATIONS—continued

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

	Units	8515C-15	-50
RESONANCE FREQUENCY [6]	Hz	180 000	320 000
NON-LINEARITY AT 3X RANGE	% 3X FSO	1.0	1.0
THERMAL TRANSIENT RESPONSE PER ISA-S37.10, PARA 6.7, PROCEDURE I [7]	psi/°F	0.003	0.005
	psi/°C	0.005	0.009
PHOTOFLASH RESPONSE [8]	Equiv. psi	0.25	0.8
WARM-UP TIME [9]	ms	1	1
ACCELERATION SENSITIVITY	Equiv. psi/g	0.0002	0.0002
BURST PRESSURE (Diaphragm)	psia Min	75	250
BASE STRAIN SENSITIVITY AT 250 MICROSTRAIN			
Elastomer Mounting [10]	Equiv. psi	0.004	0.013
Rigid Mounting [11]	Equiv. psi	0.007	0.023

### ELECTRICAL

FULL SCALE OUTPUT	200 mV typical (130 mV minimum) at 10.0 Vdc
SUPPLY VOLTAGE [12]	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 maximum
Isolation	100 megohms minimum at 50 Volts; leads to case, leads to shield, shield to case
NOISE	5 microvolts rms typical, dc to 50 000Hz; 50 microvolts rms maximum, dc to 50 000Hz

### MECHANICAL

CASE, MATERIAL	Stainless Steel (300 Series CRES)
CABLE, INTEGRAL	Four conductor No. 36 AWG Solid S.P.C., Teflon® insulated leads, 30 ±3 in (760 ±76mm) Ribbon Cable
DEAD VOLUME (+) PORT [6]	0.0004 cubic inches (0.0065 cc)
MOUNTING [10] [13]	RTV bond to flat surface
WEIGHT	0.08 gram (cable weighs 2.5 grams/meter)

### ENVIRONMENTAL

MEDIA	The pressure cavity of this transducer model is designed to be compatible with dry clean gases. When the pressure media is believed to be degrading to the transducer the factory should be contacted for appropriate recommendations. Pressure media is exposed to CRES, epoxy, silicon, and Parylene C
TEMPERATURE [5]	-65°F to +250°F (-54°C to +121°C)
VIBRATION	1000 g pk
ACCELERATION	10 000 g
SHOCK	10 000 g, 100 microsecond haversine pulse
HUMIDITY	The transducer is not recommended for long term operation in humid environments Consult factory for optional protective coating

### CALIBRATION DATA

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

### OPTIONAL ACCESSORIES

30042	MOUNTING PAD
EW862	4 CONDUCTOR RIBBON CABLE

### NOTES

- 1 psi = 6.895 kPa = 0.069 bar.
- A precise value for sensitivity is measured and provided.
- FSO (Full Scale Output) is defined as transducer output from 0 to + full scale pressure, which is nominally 200 mV.
- Zero Measurand Output (ZMO) is the transducer output with 0 psia applied.
- Units can be compensated over any 200°F (93°C) span.
- The cavity in the housing around the diaphragm may result in a low amplitude minor resonance near 70 kHz.
- Significantly higher thermal transient errors occur if the excitation voltage exceeds 10 Vdc.
- 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.
- Warm up time is defined as elapsed time from excitation voltage "turn on" until the output is within 1% of reading accuracy.
- Recommended mounting is .002 to .005 inch thickness of an

RTV adhesive, such as Dow Corning Silastic® 738, or General Electric RTV 118.

11. Rigid mounting using cyanoacrylate adhesive. Use of a rigid adhesive makes removal without damage extremely difficult.
12. Use of excitation voltages other than 10 Vdc requires manufacture and calibration at that voltage since thermal errors increase with high excitation voltages.
13. 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.
14. 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 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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