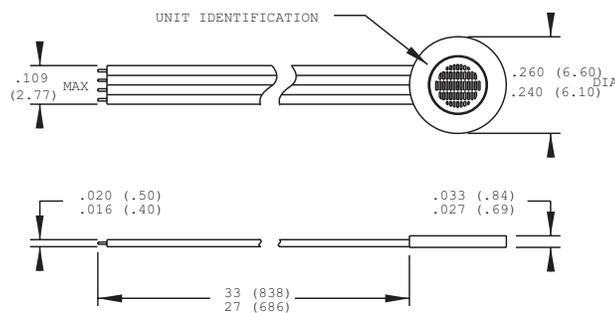


Piezoresistive pressure transducer

Model 8515C



Key features

- 15 to 50 psia ranges
- Low profile, 0.030 inch thin
- Absolute reference
- Adhesive mount

Description

Model 8515C is an ultra-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.

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The following performance specifications are referenced at 75°F (+24°C), 100 Hz, and 10 Vdc excitation, 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	mV/psi typ (min)	13.3 (8.67)	4.0 (2.6)
Combined: non-linearity, non-repeatability, pressure hysteresis	% FSO RSS max	0.5	0.5
Non-linearity	% 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	mV max	±20	±20
Zero shift after 3X range	% 3X FSO max	0.5	0.5
Thermal zero shift [1]			
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 [1]			
from 0°F to +200°F (-18°C to +93°C), Ref to 75°F (24°C)	% max	3	3
Resonance frequency [2]	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 [3]	psi/°F	0.003	0.005
Photoflash response	psi	0.25	0.8
Warm-up time [4]	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 [5]	psi	0.004	0.013
Rigid mounting [6]	psi	0.007	0.023
Electrical			
Full scale output	200 mV typical (130 mV minimum) at 10.0 Vdc		
Supply voltage [7]	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		
Output	1500 ohms typical		
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 300 series CRES		
Cable, integral	4 conductor No. 36 AWG solid S.P.C., Teflon® insulated		
Dead volume [2]	0.0004 cubic inches (0.0065 cc)		
Mounting [5] [6]	RTV bond to flat surface		
Weight	0.08 gram (cable weighs 2.5 grams/meter)		
Environmental characteristics			
Media	The pressure cavity of this transducer model is designed to be compatible with dry, clean gases. Pressure media is exposed to CRES, epoxy, silicon and parylene C.		
Temperature	-65°F to +250°F (-54°C to +121°C)		
Vibration	1000 g		
Acceleration	10 000 g		
Shock	10 000 g, 100 microsecond haversine		
Humidity	For high humidity environments, such as outdoor testing in rain or where moisture may condense on the pressure sensor an optional gel coating is recommended. Please ask for the M35 option. This allows the sensor to be used in a wet environment for up to 4 hours or a humid environment for up to 8 hours. The sensors will stop functioning when they become thoroughly wet, but will work again once allowed to dry for 24 hours.		
Calibration data			
A test report is provided with each sensor which includes, measured sensitivity, non-linearity, hysteresis, non-repeatability, zero measurand output, zero shift after 3X range, thermal zero shift and thermal sensitivity shift.			

Piezoresistive pressure transducer | Model 8515C

Accessories		
Options	Description	8515C
30042	Mounting pad	Optional

Options		
Options	Description	
M32	A screen and black grease for blast applications	
M33	calibrated for 2.5V excitation	
M35	gel coating for protection against humid environments	
M39	calibrated for 5V excitation	

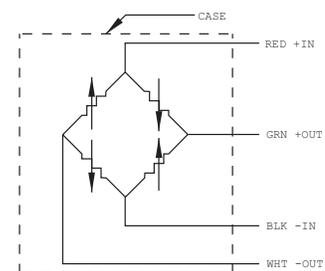
Notes

- 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 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. For sensitive phase change studies, many users reduce the excitation voltage to 5 or even 1 volt.
- Warm up time is defined as lapsed time from excitation voltage “turn on” until the transducer 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.
- Rigid mounting using cyanoacrylate adhesive. Use of a rigid adhesive makes removal without damage extremely difficult. 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.
- 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.
- 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.
- Model number definition:

8515C-XX-ZZZ

— Cable length in inches (i.e. 8515C-XX-120 has a cable length of 120 inches) if no length is specified, default length is 30 ±3 inches)

— Denotes pressure range
 15 = 15 psia
 50 = 50 psia



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



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