

PERFORMANCE SPECIFICATION
 PIEZORESISTIVE PRESSURE TRANSDUCER
 (8530CM67)

Document Number	Rev	Date	Entered by	Description of Change	Change Accountable Engineer	ECO
78000	NR	2/12/24	NAD	Initial Release of Performance Specification for Piezoresistive Pressure Transducer for 8530CM67	DW	54584

1.0 DESCRIPTION

The ENDEVCO® Model 8530CM67 is a miniature, high sensitivity piezoresistive pressure transducer for measuring absolute pressure. The volume behind the diaphragm is evacuated and glass sealed to provide an absolute pressure reference. It has high overload capability and high frequency response. It is available in ranges from 15 psia to 100 psia.

ENDEVCO® pressure transducers feature a four-arm strain gauge bridge ion implanted into a unique sculptured silicon diaphragm for maximum sensitivity and wideband frequency response. Self-contained hybrid temperature compensation provides stable performance over the temperature range of -30°F to 170°F (-34°C to +77°C). ENDEVCO® pressure transducers also feature excellent linearity (even to 3X range), high shock resistance, and high stability during temperature transients.

The Model 8530CM67 incorporates a protective gel coating to mitigate short term moisture exposure. The unit must be thoroughly dried after exposure to moisture prior to use.

2.0 CERTIFIED PERFORMANCE

All specifications assume +75°F (+24°C) and 10 V_{dc} excitation unless otherwise stated. The following parameters are 100% tested. Calibration data, traceable to the National Institute of Standards and Technology (NIST), is supplied.

		<u>UNITS</u>	<u>-15</u>	<u>-50</u>	<u>-100</u>
2.1	RANGE [1]	psia	0-15	0-50	0-100
2.2	SENSITIVITY	mV/psia			
		Typical	15.0	4.5	2.3
		Minimum	9.3	2.8	1.4
2.3	COMBINED: NON-LINEARITY, NON-REPEATABILITY, PRESSURE HYSTERESIS [2]	%FSO RSS Max	0.5	0.4	0.4
2.3.1	Non-Linearity	%FSO, typical	0.15	0.1	0.1
2.3.2	Non-Repeatability	%FSO, typical	0.1	0.1	0.1
2.3.3	Pressure Hysteresis	%FSO, typical	0.1	0.1	0.1
2.4	ZERO MEASURAND OUTPUT [3]	± mV Max	20	20	20
2.5	ZERO SHIFT AFTER 3X RANGE	± % 3X FSO			
		Maximum	0.2	0.2	0.2
		Typical	0.02	0.02	0.02
2.6	THERMAL ZERO SHIFT From -30°F to +170°F (-34°C to +77°C)	± %FSO Max	3	3	3
2.7	THERMAL SENSITIVITY SHIFT From -30°F to +170°F (-34°C to +77°C)	± % Max	3	3	3

		<u>UNITS</u>	<u>-15</u>	<u>-50</u>	<u>-100</u>
3.0	<u>TYPICAL PERFORMANCE CHARACTERISTICS</u>				
	The following parameters are established from testing of sample units.				
3.1	RESONANT FREQUENCY	kHz	180	320	500
3.2	NON-LINEARITY AT 3X RANGE	% 3X FSO	1	1	1
3.3	ZERO SHIFT WITH MOUNTING TORQUE 15 lb-in (1.7 N-m)	% FSO	0.2	0.5	0.5
3.4	THERMAL TRANSIENT RESPONSE PER ISA-S37.10, PARA. 6.7, PROCEDURE I [4]	psia/°F psia/°C	0.003 0.005	0.003 0.005	0.010 0.018
3.5	PHOTOFLASH RESPONSE [5]	Equiv. psia	0.1	0.3	0.6
3.6	WARM-UP TIME [6]	ms	1	1	1
3.7	ACCELERATION SENSITIVITY	Equiv. psia/g	0.00015	0.00015	0.00015
3.8	BURST PRESSURE (Diaphragm)	psia Min	75	250	400
3.9	CASE PRESSURE [7]	psia Max	1000	1000	1000
4.0	<u>ELECTRICAL</u>				
4.1	FULL SCALE OUTPUT	mV Typical Minimum		225 140	
4.2	SUPPLY VOLTAGE [8]	Vdc Maximum		10 15	
4.3	ELECTRICAL CONFIGURATION		Active four-arm piezoresistive bridge		
4.4	POLARITY		Positive output for increasing pressure		
4.5	RESISTANCE				
4.5.1	Input	Ω Typical Minimum		2600 1700	
4.5.2	Output	Ω Typical Maximum		1500 2200	
4.5.3	Isolation (at 50 V _{dc} leads to case, leads to shield, shield to case)	MΩ Min		100	
4.6	NOISE (dc to 50 kHz)	μV _{RMS} Maximum Typical		50 5	

5.0 MECHANICAL

5.1 CASE, MATERIAL

Stainless steel (17-4 PH CRES)

5.2 CABLE, INTEGRAL

Four conductor 32 AWG Teflon® insulated leads, braided shield, silicone jacket

5.3 DEAD VOLUME

0.0003 in³ (0.005 cm³)

5.4 MOUNTING TORQUE

15 ± 5 lb-in (1.7 ± 0.6 N-m)

5.5 WEIGHT

2.3 grams (cable weighs 9 grams/meter)

5.6 OUTLINE DRAWING

78001

6.0 ENVIRONMENTAL

6.1 MEDIA

Internal seals are epoxy, compatible with clean dry gas media. Media is exposed to CRES, ceramic, silicon, Parylene C, epoxy, silicone and the O-ring.

6.2 TEMPERATURE

-65°F to +250°F (-54°C to +121°C)

6.3 VIBRATION

1000 g_{pk}

6.4 ACCELERATION

1000 g

6.5 SHOCK

20000g (100 μs haversine pulse)

6.6 HUMIDITY

Isolation resistance greater than 100 MΩ at 50 V_{dc} when Tested per MIL-STD-202E, Method 103B, Test Condition B

7.0 CALIBRATION DATA

Data supplied for all parameters in Certified Performance section.

8.0 ACCESSORY

8.1 SUPPLIED

8.1.1 O-ring (fluorocarbon)

P/N EHR93

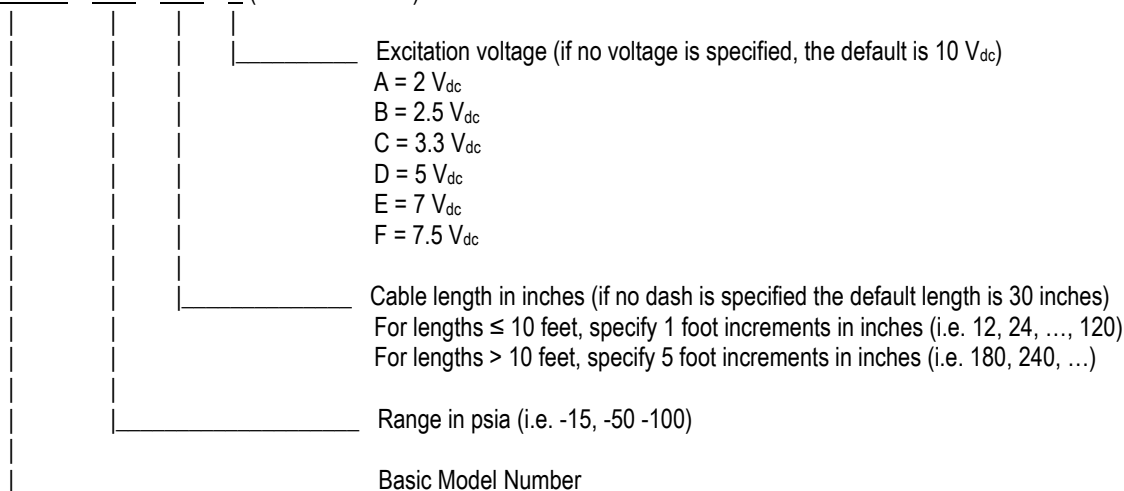
8.2 OPTIONAL

8.2.1 O-ring (fluorosilicone) [9]

P/N EHR96

9.0 NOTES

- [1] 1 psi = 6.895 kPa = 0.069 bar.
- [2] FSO (Full Scale Output) is defined as transducer output from 0 to + full scale pressure.
- [3] Zero Measurand Output (ZMO) is the transducer output with 0 psia applied.
- [4] Significantly higher thermal transient errors occur if the excitation voltage exceeds 10 V_{dc}.
- [5] Per ISA-S37.10, paragraph 6.7, procedure II. 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. This design has been used successfully in many blast test situations. For this type of application, a protective coating is recommended to eliminate photoflash sensitivity and provide particle impingement protection. This coating does not degrade the superior dynamic response characteristics of the sensor.
- [6] Warm-up time is defined as elapsed time from excitation voltage “turn-on” until the transducer output is within ±1% of reading accuracy.
- [7] Case pressure identifies media containment pressure in the event of diaphragm rupture.
- [8] For configurations other than the standard 10 V_{dc}, in addition to the calibration data supplied per paragraph 7.0, sensitivity and ZMO at the respective excitation voltage will also be provided.
- [9] Fluorosilicone O-ring for sustained usage below 0°F (-18°C).
- [10] 8530CM67 – XXX – YYY – E (Model Definition)



Example: 8530CM67-50-120-C has a pressure range of 50 psia, a cable length of 120 inches long, and an excitation voltage of 3.3 V_{dc}.