Foil Strain Sensors

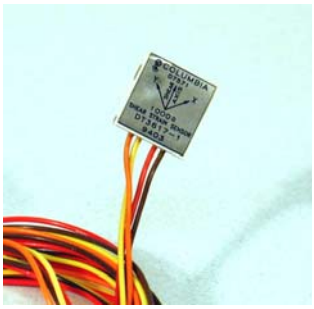
Model DT3617 Series

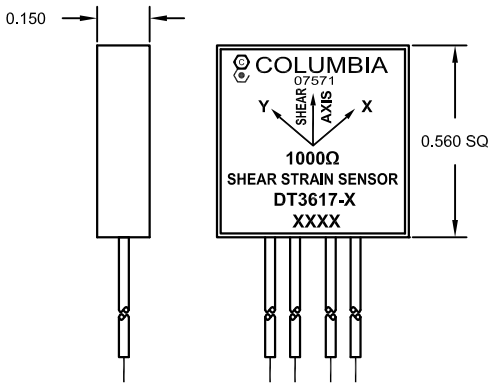
- 90° Rosette Gage
- Self Temperature Compensating
- Two 1000Ω Precision Strain Gage Grids
- Rugged Construction

Columbia Series DT 3617 Strain Sensors are designed for the measurements of planar shear strain forces when the axis of principal strain is identified. Each sensor is a complete, compact, easily installed device utilizing the proven technology of the Columbia DTD 2684 Series Fatigue Monitoring Sensors. The DT 3617 Shear Strain Sensor consists of two 1000Ω precision strain gage grids arranged orthogonally on a one mil polyimide substrate and a matching pair of 1000Ω bridge completion elements. The entire gage configuration is assembled in a rugged, molded silicone rubber package with four, M22759, 26-gage TFE insulated aircraft lead wires. The bottom surface of the sensor is polymide substrate of active strain gage elements and is supplied pre-processed for bonding to the test structure. The top surface of the sensor contains the axis identification marking to assist in aligning the gage with the principal strain axis.

Individual models are available to compensate materials commonly used in aircraft structural fabrication. Columbia Model 5802 Strain Gage Amplifier is designed to amplify the sensor signals providing both strain and temperature outputs.

Note: Exports from the United States are subject to the licensing requirements of the Export Administration Regulations (EAR) and/or the International Traffic in Arms Regulations (ITAR).





SPECIFICATIONS

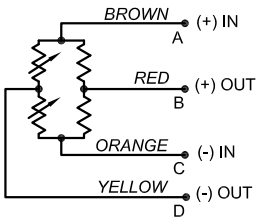
Operational [1]	Series DT3617
Operating Range (Repetitive)	±3500μЄ, 100 Cycles ±2000μЄ, 100,000 Cycles
DC Resistance	1000Ω ±2%
Gage Factor (GF)	2.05 Nominal
Rated Excitation	10.0VDC
Working Range	±2000μЄ
Null Offset [2] (E_z)	0.5Mv/V Maximum
Linearity	±0.75% Full Scale Maximum
Hysteresis, Repeatability	±0.5%
GF Temp. Coeff.	±0.02%/°C
E_z Temp. Coeff.	0.0005mV/V/°C

Environmental [3]	
Temperature Range	-55° to +125°C
Vibration	30g, 10Hz to 2KHz
Humidity	MIL-STD-202 Method 110A
Salt Spray	MIL-STD-202 Method 101D (168 Hours)
Insulation Resistance	100MΩ Minimum @ 500VDC
Dielectric Strength	500VRMS, 60Hz, 1 Minimum
Altitude	Sea Level to 70,000 Ft.
Shock	100g, 11mSec
Flammability	MIL-STD-202 Method 111A
Fluids	Resistance to short term exposure to fuel, lubricating oils and hydrolic fluids

Physical	
Size	0.560" x 0.560" x 0.150" Thick
Encapsulation	Silicone Rubber per MIL-S-23586A Type I, Class 2, Grade A
Weight	Approx. 13gms (Depending on length of leads)
Matrix	0.001" Polyimide
Leads	#26AWG, Teflon Ins, SPC, 12" Minimum

[1] @25°C [2] As supplied (un-mounted) [3] Installed Gage

SCHEMATIC DIAGRAM



A=EXCITATION(+) -BROWN
B=SIGNAL OUT(+) -RED
C=EXCITATION(-) -ORANGE
D=SIGNAL OUT(-) -YELLOW

Ordering Information		
Model	Lead Length	Compensating Material
DT3617-1	24"	Aluminum 7075-T6 or 7050-T73651, IVD
DT3617-2	24"	Steel, AISI 4130 or HP9-4-.20
DT3617-3	24"	Titanium TI-6AL-4V, Annealed
DT3617-4	24"	Carbon/Epoxy MMS 549 Type 1

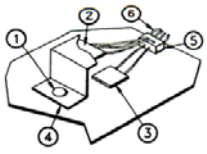


Fig. 1 - Typical Installation of Old Style Strain Gages

1. Bolt or rivet removed from assembly
2. Dummy gage(s) bonded to "Z Tab" of same material as structure.
3. Active gage bonded to structure under test.
4. "Z Tab" mounted to structure with bond or rivet.
5. Strain gage leads interwired and soldered to junction block.
6. Entire unit covered with protective material.

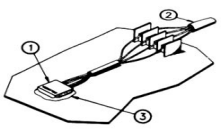


Fig. 2 Installation of Columbia Strain Sensor

1. Strain Sensor bonded to surface under test.
2. Leads connected to wire harness.
3. Coat sensor and wires with waterproofing material.

ADVANTAGES

- Higher level accuracy
- Twice the output
- Less installation time
- No loss of structural integrity
- Optimum temperature compensation

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