# Curved Strain Sensors

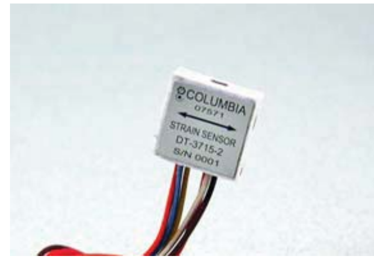
## Model DT3747 Series

- **Strain Outputs**
- **Choice of Cylindrical Mounting Radius**
- **Self Temperature Compensating**

Columbia Series DT3747 sensors were designed to accurately measure strain on curved mounting surfaces. These sensors offer all the accuracy, ruggedness and ease of installation of the flight-qualified Series DTD2684. Similar devices have been utilized to monitor rocket motor expansion. They can also be used in many industrial and military applications involving pipe expansion measurements, explosive body applications, aircraft surface load, and engine monitoring of all types.

Series DT3747 sensors are customized to measure circumferential strain around the diameter of the surface to which it is mounted. The specified mounting radius is custom molded into the body of the sensor providing a method of controlling operator alignment during sensor mounting. Models are available to compensate materials commonly used in aircraft structural fabrication as well as other materials as specified. Columbia Model 5802 Strain Gage Amplifier is also available to power and signal condition the strain output of the sensor.

***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).***



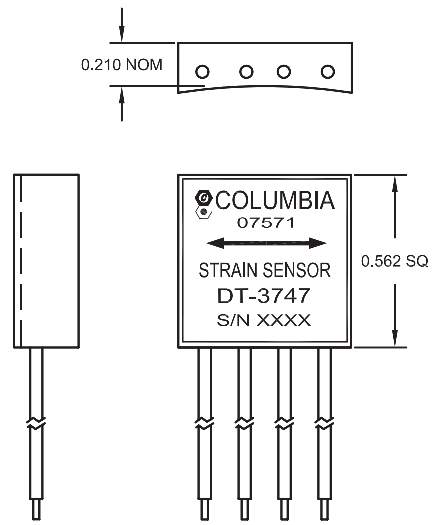

### SPECIFICATIONS

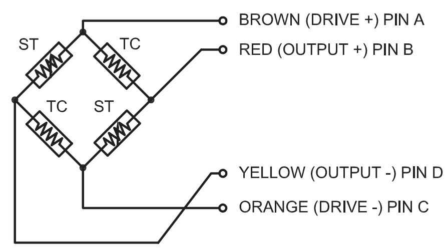
| Operational [1] | Series DT3747 |
|---|---|
| DC Input Resistance | 1000Ω, ±2% |
| DC Output Resistance | 1000Ω, ±2% |
| Sensitivity | 1.025(±1%)mV/V/1000µЄ |
| Rated Excitation Voltage | 10.0VDC |
| Linearity | ±0.5% Max. |
| Zero Strain Offset | ±0.5mV/V Max. |
| Operating Range | -3500 to +5000µЄ |
| Sensitivity Shift | ±0.005% / °F |
| Hysteresis, Repeatability | ±0.013% Max. |
| Zero Shift | ±0.00025mV/V/°F Typ. |
| Creep | <0.5%, 5 Min. @ 5000µЄ |

| Environmental [2] | |
|---|---|
| Temperature Range | -54° to +125°C |
| Vibration | 30g, 10Hz to 2KHz |
| Humidity | MIL-STD-202 Method 103B |
| Salt Spray | MIL-STD-202 Method 101D (168 Hours) |
| Insulation Resistance | 100 Meg. min @ 500VDC |
| Dielectric Strength | 1050VRMS, 60Hz, 1 Min. |
| Altitude | Sea Level to 70,000 Ft. |
| Shock | 100g, 11mSec |
| Flammibility | MIL-STD-202 Method 111A |
| Fluids | Resistance to short term exposure to fuel, lubricating oils and hydrolic fluids |

| Physical | |
|---|---|
| Size | 0.562"Sq (Thickness Varies w/ Specified Mounting Radius) |
| Encapsulation | Silicone Rubber per MIL-S-23586A Type I, Class 2, Grade A |
| Weight | Approx. 15gms (Depending on radius selected) |
| Matrix | 0.001" Polyimide |
| Leads | #26AWG, Teflon Ins, SPC, 24" Nom. |

[1] @25°C [2] Installed Gage




***SCHEMATIC DIAGRAM***

| Ordering Information* | | |
|---|---|---|
| Model | Lead Length | Compensating Material |
| DT3747-1 | 24" | Aluminum 7075-T6 or 7050-T73651, IVD |
| DT3747-2 | 24" | Steel, AISI 4130 or HP9-4-.20 |
| DT3747-3 | 24" | Titanium TI-6AL-4V Annealed |
| DT3747-4 | 24" | Carbon/Epoxy MMS 549 Type 1 |

****Mounting Radius Required upon Ordering***

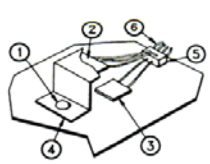



*Fig. 1 - Typical Installation of Old Style Strain Gages*

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.

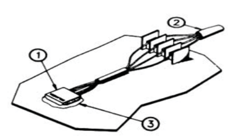



*Fig. 2 Installation of Columbia Strain Sensor*

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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