



## Engine Health Monitoring Sensors

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PCB® Piezotronics Inc., USA is uniquely positioned in sensor industry to satisfy a wide range of research, test, measurement and monitoring.

Structural Solutions Private Limited, the exclusive representative of PCB group in India is a professional engineering company engaged in offering high-end technology intensive products and system solutions to Indian industry.

### Highlights:

- Qualified to RTCA/DO-160 & MIL-STD-810
- Case isolated to reduce EMI & ground loop interference
- High temperature environments
- ICP® & charge output operations
- Numerous form factors
- Custom designed monitoring sensors

### Highlights:

- Mechanical diagnostics
- Engine balance
- Engine health monitoring
- Combustion instability monitoring

### High Temperature Turbine Instrumentation Overview

Turbine engines' numerous rotating components create a multitude of high amplitude oscillatory and impulsive forces across a broad band of frequencies. Certainly, catastrophic events are indicated by sudden increases in vibration, but the early symptoms of many maintenance problems are also marked by identifiable vibration signatures. Similarly, relatively small amounts of combustion pressure oscillation can cause catastrophic failure of critical downstream engine components. Thus, the turbine engine operating environment presents a multitude of measurement challenges and opportunities. But turbine engines also pose instrumentation reliability problems. Coupled with the engine vibratory environment and challenging flight conditions, engine case temperatures can be in excess of 1200 °F or 649 °C, with internal engine temperatures far exceeding these. Each of PCB's accelerometers, dynamic pressure sensors and associated signal conditioning routinely sustain thousands of trouble-free hours of operation, while accurately measuring minute changes in pressures and accelerations.



# Engine Health Monitoring Sensors



The precursor to implementing monitoring solutions is extensive test and development. The instrumentation requirements for such programs are decidedly different from those of engine health monitoring. To that end, PCB® supplies high temperature accelerometers and dynamic pressure sensors that are tailored to engine test and development programs. Responding to the highly

constrained spaces and high temperatures within which these sensors must reliably operate, PCB® has developed a line of small, high temperature, high frequency range sensors specifically designed for test and measurement applications. The models pictured below are just a sample of the scores of models available.

## Test & Measurement Accelerometers



**Model 357C90**

- 5 pC/g (0.51 pC/m/S<sup>2</sup>) sensitivity
- ±1000 g pk measurement
- 2.5 kHz frequency (±5%)
- 1200°F (649°C) temperature



**Model 357B61**

- 10 pC/g (0.02 pC/m/S<sup>2</sup>) sensitivity
- ±3000 g pk measurement
- 5 kHz frequency (±5%)
- -65 to 900°F (-54 to 482°C) temperature



**Model 357B69**

- 3 pC/g (0.31 pC/m/S<sup>2</sup>) sensitivity
- ±500 g pk measurement
- 6 kHz frequency (±5%)
- -65 to 900°F (-54 to 482°C) temperature



**Model 357M46**

- 3 pC/g (0.31 pC/m/S<sup>2</sup>) sensitivity
- ±2300 g pk measurement
- 12 kHz frequency (±5%)
- -95 to 500°F (-71 to 260°C) temperature

## Engine Vibration Monitoring High Temperature Accelerometers

### 550 °F (288 °C)

**Model 357B81**

- 20 pC/g (2.04 pC/m/S<sup>2</sup>) sensitivity
- ±2000 g pk measurement
- 9000 kHz frequency (±5%)
- -65 to 550°F (-54 to 288°C) temperature

**Model 357B82**

- 50 pC/g (0.02 pC/m/S<sup>2</sup>) sensitivity
- ±1000 g pk measurement
- 6000 kHz frequency (±5%)
- -65 to 550°F (-54 to 288°C) temperature

**Model 357B83**

- 100 pC/g (0.31 pC/m/S<sup>2</sup>) sensitivity
- ±500 g pk measurement
- 6000 kHz frequency (±5%)
- -65 to 550°F (-54 to 288°C) temperature



### 900 °F (482 °C)

**Model 357C71**

- 10 pC/g (1.02 pC/m/S<sup>2</sup>) sensitivity
- ±1000 g pk measurement
- 4000 kHz frequency (±5%)
- -65 to 900°F (-54 to 482°C) temperature

**Model 357C72**

- 50 pC/g (5.1 pC/m/S<sup>2</sup>) sensitivity
- ±500 g pk measurement
- 2500 kHz frequency range (±5%)
- -65 to 900°F (-54 to 482°C) temperature

**Model 357C73**

- 100 pC/g (0.31 pC/m/S<sup>2</sup>) sensitivity
- ±300 g pk measurement
- 2000 kHz frequency (±5%)
- -65 to 900°F (-54 to 482°C) temperature

## Structural Solutions Private Limited

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