

# High Temperature, Radiation Hardened, Single Axis Accelerometers

For Vibration Measurements and Monitoring in Severe Environments

- +550 °F (+288 °C) Temperature Range
- 100 pC/g Sensitivity
- 12 kHz Resonant Frequency
- Survives Integrated Gamma Flux to  $10^8$  Rads
- Survives Integrated Neutron Flux to  $10^{10}$  N/cm<sup>2</sup>
- Electrically Ground Isolated

Models 357B53 (side connector) and 357B54 (top connector) are specifically designed for conducting vibration and shock measurements in demanding environments of high temperature and/or radiation exposure.

The units are structured with a piezoelectric ceramic sensing element, operating in a shear mode geometry, for stable operation in the presence of thermal transients and base bending. Welded, hermetically sealed, titanium construction prevents any influx of dirt or moisture. Electrical ground isolation prevents ground loop problems and noise pick-up from the surface of the monitored device.

Since the output of these accelerometers is at a very high impedance, a high degree of insulation resistance is required of the signal transmission path. Low noise cables are recommended for routine, high temperature applications and hardline cables are advised for radiation environments. The use of an in-line charge converter is recommended to convert the measurement signal to a low impedance voltage for long distance transmission.

As with all PCB® instrumentation, this equipment is complemented with toll-free applications assistance, 24-hour customer service, and is backed by a no-risk policy that guarantees satisfaction or your money refunded.



Model 357B54

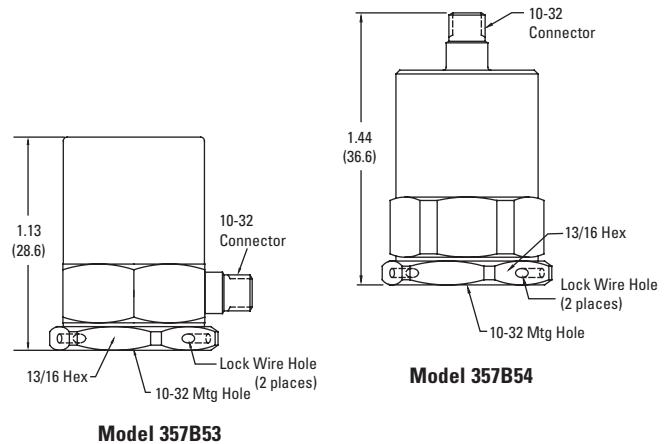


Model 357B53



# Specifications

Model	357B53 & 357B54	
Performance	English	SI
Sensitivity ( $\pm 10\%$ )	100 pC/g	10.2 pC/(m/s <sup>2</sup> )
Measurement Range	$\pm 150$ g pk	$\pm 1470$ m/s <sup>2</sup> pk
Frequency Range (+5 %)	3 kHz	3 kHz
(+10 %)	3.5 kHz	3.5 kHz
(+3 dB)	5.5 kHz	5.5 kHz
Resonant Frequency	$\geq 12$ kHz	$\geq 12$ kHz
Non-Linearity	$\leq 1\%$	$\leq 1\%$
Transverse Sensitivity	$\leq 5\%$	$\leq 5\%$
Environmental		
Overload Limit (Shock)	$\pm 2000$ g pk	$\pm 19,600$ m/s <sup>2</sup> pk
Temperature Range	-95 to +550 °F	-71 to +288 °C
Base Strain Sensitivity	0.0002 g/ $\mu\epsilon$	0.002 (m/s <sup>2</sup> )/ $\mu\epsilon$
Integrated Gamma Flux	$\leq 10^8$ rad	$\leq 10^8$ rad
Integrated Neutron Flux	$\leq 10^{10}$ N/cm <sup>2</sup>	$\leq 10^{10}$ N/cm <sup>2</sup>
Electrical		
Capacitance	750 pF	750 pF
Insulation Resistance (at 70° F [21°C])	$>10^{12}$ ohm	$>10^{12}$ ohm
Insulation Resistance (at 500° F [260°C])	$>10^{10}$ ohm	$>10^{10}$ ohm
Output Polarity	Negative	Negative
Electrical Isolation (Base)	$>10^8$ ohm	$>10^8$ ohm
Physical		
Sensing Element	Ceramic	Ceramic
Sensing Geometry	Shear	Shear
Housing Material	Titanium	Titanium
Sealing	Hermetic	Hermetic
Size (Hex x Height)	3/4 in x 1.13 in	3/4 in x 28.7 mm
Weight	1.80 oz	51 gm
Electrical Connector	10-32 Coaxial Jack	10-32 Coaxial Jack
Mounting Thread	10-32 Female	10-32 Female

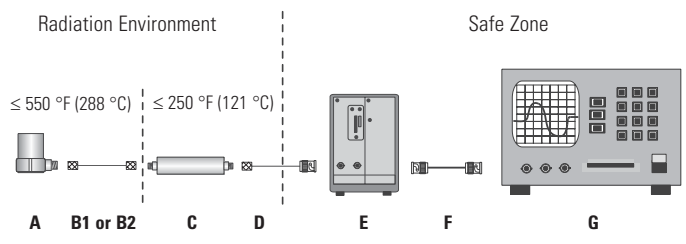


Dimensions shown are in inches (millimeters)

In-line charge converters serve to condition charge output sensor signals for readout, recording, or analysis. They are powered from conventional ICP® sensor signal conditioners. Two specially-designed models are recommended for use with Model 357B53 and 357B54 accelerometers. These models are radiation hardened and maintain operation even when used with lower source resistances — a characteristic of piezoelectric sensors operating at elevated temperatures.

Model Number	Charge Conversion	Integrated Gamma Flux	Integrated Neutron Flux
422E65/A	1 mV/pC	$\leq 10^6$ rad	$\leq 10^{10}$ N/cm <sup>2</sup>
422E66/A	10 mV/pC	$\leq 10^6$ rad	$\leq 10^{10}$ N/cm <sup>2</sup>

- Recommended Components for a Typical Installation**
- A** High temperature, radiation hardened accelerometer.
  - B1** Series 023 hardline cable, (for up to +550 °F (+288 °C)).
  - B2** Series 025JGxxxJG cable assembly, 10-32 plug each end (for up to +390 °F (+199 °C), specify xxx length in feet).
  - C** In-line charge converter, Model 422E65/A or 422E66/A.
  - D** Series 025JGxxxAC cable assembly, 10-32 plug to BNC plug.
  - E** ICP® sensor signal conditioner.
  - F** Model 012A03 output cable, BNC plug each end.
  - G** Readout, recording, or data acquisition device.



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The Vibration Division of PCB® Piezotronics, Inc. specializes in the development, application, and support of shock and vibration sensors, microphones, impact hammers, piezoelectric actuators, and dynamic strain sensors for acceleration measurements, acoustic testing, and structural testing requirements. This product focus, coupled with the strengths and resources of PCB, permits the Vibration Division to offer exceptional customer service, 24-hour technical assistance, and a **Total Customer Satisfaction** guarantee.

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