NUCLEAR POWER INSTRUMENTATION
PCB®’s charge accelerometers utilize piezo ceramic sensing elements to directly output an electrostatic charge signal that is proportional to applied acceleration. Charge accelerometers do not contain built-in signal conditioning electronics. As a result, external signal conditioning is required to interface their generated measurement signals to readout or recording instruments. The sensor’s charge output signals can be conditioned with an in-line, fixed charge amplifier.

Since there are no electronics built into charge accelerometers, they can operate and survive exposure to very high temperatures (up to +1200 °F/+649 °C for some models). In addition, charge accelerometers are used for thermal cycling requirements or to take advantage of existing charge amplifier signal conditioning equipment. It is important to note that measurement resolution and low frequency response for charge acceleration sensing systems are dependent upon the noise floor and discharge time constant characteristics of the signal conditioning and readout devices used.
RADIATION HARDENED HIGH TEMPERATURE CHARGE ACCELEROMETERS

HIGH TEMPERATURE CHARGE ACCELEROMETER
MODEL 357B53
- Sensitivity: 100 pC/g
- Measurement Range: ±150 g pk
- Frequency Range: 3 kHz pk
- Electrical Connector: 10-32 coaxial jack

HIGH TEMPERATURE CHARGE ACCELEROMETER
MODEL 357B54
- Sensitivity: 100 pC/g
- Measurement Range: ±150 g pk
- Frequency Range: 3 kHz pk
- Electrical Connector: 10-32 coaxial jack

HARDLINE CABLE, RADIATION HARDENED

10-32 COAXIAL PLUG
MODEL RP

COAXIAL HARDLINE CABLE
MODEL 023XXX

10-32 COAXIAL PLUG
MODEL RP

IN-LINE CHARGE AMPLIFIERS, RADIATION HARDENED

IN-LINE CHARGE AMPLIFIER
MODEL 422E65/A
- Sensitivity: 1 mV/pC
- Voltage Output: ±5 V pk
- Temperature Range (Operating): -65 to +250 °F

IN-LINE CHARGE AMPLIFIER
MODEL 422E66/A
- Sensitivity: 10 mV/pC
- Voltage Output: ±5 V pk
- Temperature Range (Operating): -65 to +250 °F

IN-LINE CHARGE AMPLIFIERS, RADIATION HARDENED
A Model 357B53 or 357B54 – Charge accelerometer
B Model 023RPXXXRP – Cable with 10-32 plug to 10-32 plug
C Model 422E65/A or 422E66/A – In-line charge amplifier
D Model 023RPXXXGA – Cable with 10-32 plug to 10-32 jack
E Model 003C03 – Cable with 10-32 plug to BNC plug
F ICP® sensor signal conditioner
G Model 012A03 – Cable with BNC plug to BNC plug
H Readout, recording, or data acquisition device
XXX = Denote cable length, 010 = 10 feet (Metric lengths available)
RADIATION HARDENED VERY HIGH TEMPERATURE CHARGE ACCELEROMETERS

**VERY HIGH TEMPERATURE CHARGE ACCELEROMETER**
MODEL 357B63
- Sensitivity: 0.53 pC/g
- Measurement Range: ±5000 g pk
- Frequency Range: 10 kHz pk
- Electrical Connector: 10-32 coaxial jack

**VERY HIGH TEMPERATURE CHARGE ACCELEROMETER**
MODEL 357B61
- Sensitivity: 10 pC/g
- Measurement Range: ±1000 g pk
- Frequency Range: 5 kHz pk
- Electrical Connector: 10-32 coaxial jack

**VERY HIGH TEMPERATURE CHARGE ACCELEROMETER**
MODEL 357B69
- Sensitivity: 3.5 pC/g
- Measurement Range: ±500 g pk
- Frequency Range: 6 kHz pk
- Electrical Connector: 10-32 coaxial jack

**HARDLINE CABLE, RADIATION HARDENED**

**10-32 COAXIAL PLUG**
MODEL RP

**COAXIAL HARDLINE CABLE**
MODEL 023XXX

**10-32 COAXIAL PLUG**
MODEL RP

**HARDLINE CABLE, RADIATION HARDENED**

**IN-LINE CHARGE AMPLIFIER**
MODEL 422E65/A
- Sensitivity: (±2%) 1 mV/pC
- Voltage Output: ±5 V pk
- Temperature Range (Operating): -65 to +250 °F

**IN-LINE CHARGE AMPLIFIER**
MODEL 422E66/A
- Sensitivity: (±2%) 10 mV/pC
- Voltage Output: ±5 V pk
- Temperature Range (Operating): -65 to +250 °F

**IN-LINE CHARGE AMPLIFIERS, RADIATION HARDENED**

<table>
<thead>
<tr>
<th>Letter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Model 357B63 or 357B61 or 357B69 – Charge accelerometer</td>
</tr>
<tr>
<td>B</td>
<td>Model 023RPXXXRP – Cable with 10-32 plug to 10-32 plug</td>
</tr>
<tr>
<td>C</td>
<td>Model 422E65/A or 422E66/A – In-line charge amplifier</td>
</tr>
<tr>
<td>D</td>
<td>Model 023RPXXXGA – Cable with 10-32 plug to 10-32 jack</td>
</tr>
<tr>
<td>E</td>
<td>Model 003C03 – Cable with 10-32 plug to BNC plug</td>
</tr>
<tr>
<td>F</td>
<td>ICP® sensor signal conditioner</td>
</tr>
<tr>
<td>G</td>
<td>Model 012A03 – Cable with BNC plug to BNC plug</td>
</tr>
<tr>
<td>H</td>
<td>Readout, recording, or data acquisition device</td>
</tr>
</tbody>
</table>

XXX = Denote cable length, 010 = 10 feet (Metric lengths available)
RADIATION HARDENED VERY HIGH & EXTREME TEMPERATURE CHARGE ACCELEROMETERS

VERY HIGH TEMPERATURE CHARGE ACCELEROMETER

Model 357A100

- Sensitivity: 5 pC/g
- Measurement Range: ±200 g pk
- Frequency Range: 5 kHz pk
- Electrical Connector: 7/16-27 2-pin

VERY HIGH TEMPERATURE CHARGE ACCELEROMETER

Models 357C7X

- Sensitivity: 10 pC/g (71), 50 pC/g (72), 100 pC/g (73)
- Measurement Range: ±1000 g pk (71) ±500 g pk (72) ±300 g pk (73)
- Frequency Range: 4 kHz pk (71) 2.5 kHz (72) 2kHz pk (73)
- Electrical Connector: 7/16-27 2-pin

EXTREME TEMPERATURE CHARGE ACCELEROMETER

Models EX357A9X

- Sensitivity: 3.3 pC/g
- Measurement Range: ±1000 g pk
- Frequency Range: 3.0 kHz pk
- Electrical Connector: 7/16-27 2-pin

HARDLINE CABLE, RADIATION HARDENED

2-socket plug, 7/16-27 THD
Model GN

2-conductor hardline cable
Model 013XXX

2-pin jack, 7/16-27 THD
Model GP

PTFE jacketed cable

DIFFERENTIAL CHARGE AMPLIFIERS

Differential charge amplifier
Model 422M183

- Sensitivity: 6 mV/pC
- Voltage Output: ±5 V pk
- Temperature Range (Operating): -60 to +185 °F

Differential charge amplifier
Model 422M182

- Sensitivity: 4 mV/pC
- Voltage Output: ±5 V pk
- Temperature Range (Operating): -60 to +185 °F

Differential charge amplifier
Model 422M196

- Sensitivity: 10 mV/pC
- Voltage Output: ±5 V pk
- Temperature Range (Operating): -60 to +185 °F

IN-LINE CHARGE AMPLIFIERS, RADIATION HARDENED

A Model 357A100 or 357C71 or 357C72 or 357C73 or EX357A9X – Charge accelerometer
B Model 013GNXXXGP – Cable with 2 socket plug to 2 pin jack
C Model 045M19B – Cable with PY connector to BP connector
D Model 422M182 or Model 422M183 or Model 422M196 – Charge amplifier
E Model 003D03 – Cable with BNC plug to BNC plug
F ICP® sensor signal conditioner
G Model 012A03 – Cable with BNC plug to BNC plug
H Readout, recording, or data acquisition device

XXX = Denote cable length, 010 = 10 feet (Metric lengths available)
RADIATION HARDENED VERY HIGH & EXTREME TEMPERATURE CHARGE ACCELEROMETERS

**VERY HIGH TEMPERATURE CHARGE ACCELEROMETER**

**MODEL 357A100**
- Sensitivity: 5 pC/g
- Measurement Range: ±200 g pk
- Frequency Range: 5 kHz pk
- Electrical Connector: 7/16-27 2-pin

**VERY HIGH TEMPERATURE CHARGE ACCELEROMETER**

**MODELS 357C7X**
- Sensitivity: 10 pC/g
- Measurement Range: ±1000 g pk
- Frequency Range: 4 kHz pk
- Electrical Connector: 7/16-27 2-pin

**EXTREME TEMPERATURE CHARGE ACCELEROMETER**

**MODELS EX357A9X**
- Sensitivity: 3.3 pC/g
- Measurement Range: ±1000 g pk
- Frequency Range: 3.0 kHz pk
- Electrical Connector: 7/16-27 2-pin

**HARDLINE CABLE, RADIATION HARDENED**

**2-SOCKET PLUG, 7/16-27 THD**

**MODEL GN**

**2-CONDUCTOR HARDLINE CABLE**

**MODEL 013XXX**

**2-PIN JACK, 7/16-27 THD**

**MODEL GP**

**PTFE JACKETED CABLE**

**DIFFERENTIAL CHARGE AMPLIFIERS**

**DIFFERENTIAL CHARGE AMPLIFIER**

**MODEL 421B3X**
- Sensitivity: Configurable
- Voltage Output: ±5 V pk
- Temperature Range (Operating): -22 to +185 ºF

**DIFFERENTIAL CHARGE AMPLIFIER**

**MODEL EX682A40**
- Sensitivity: 10 mV/pC
- Voltage Output: ± 2.5 V pk
- Temperature Range (Operating): -60 to +185 ºF

**IN-LINE CHARGE AMPLIFIERS, RADIATION HARDENED**

A Model 357A100 or 357C71 or 357C72 or 357C73 or EX357A9X – Charge accelerometer
B Model 013GNXXXGP – Cable with 2 socket plug to 2 pin jack
C Model 045M21B – Cable with PY connector to pigtails
D Model 421B3X or Model EX682A40 – Charge amplifier
E Model 003ACXXXAD – Cable with pigtails to BNC plug
F ICP® sensor signal conditioner
G Model 012A03 – Cable with BNC plug to BNC plug
H Readout, recording, or data acquisition device

XXX = Denote cable length, 010 = 10 feet (Metric lengths available)
RADIATION HARDENED EXTREME TEMPERATURE CHARGE ACCELEROMETERS

EXTREME TEMPERATURE CHARGE ACCELEROMETER
MODEL EX357E90
- Sensitivity: 5 pC/g
- Measurement Range: ±1000 g pk
- Frequency Range: 3.0 kHz pk
- Output into sensor base

EXTREME TEMPERATURE CHARGE ACCELEROMETER
MODEL EX357E91
- Sensitivity: 5 pC/g
- Measurement Range: ±1000 g pk
- Frequency Range: 3.0 kHz pk
- Output perpendicular to sensor base

EXTREME TEMPERATURE CHARGE ACCELEROMETER
MODEL EX357E92
- Sensitivity: 2.3 pC/g
- Measurement Range: ±1000 g pk
- Frequency Range: 3.0 kHz pk
- Output into sensor base

EXTREME TEMPERATURE CHARGE ACCELEROMETER
MODEL EX357E93
- Sensitivity: 2.3 pC/g
- Measurement Range: ±1000 g pk
- Frequency Range: 3.0 kHz pk
- Output perpendicular to sensor base

PTFE JACKETED CABLE

HARDLINE CABLE, RADIATION HARDENED

IN-LINE CHARGE AMPLIFIER
MODEL 422E35
- Sensitivity: 1 mV/pC
- Voltage Output: ±2.5 V pk
- Temperature Range (Operating): -65 to +250 °F

IN-LINE CHARGE AMPLIFIER
MODEL 422E36
- Sensitivity: 10 mV/pC
- Voltage Output: ±2.5 V pk
- Temperature Range (Operating): -65 to +250 °F

IN-LINE CHARGE AMPLIFIERS, RADIATION HARDENED
A Model EX357E90 or EX357E91 or EX357E92 or EX357E93 – Charge accelerometer
B Model 003EBXXXEB – Cable with 10-32 plug to 10-32 plug
C Model 422E35 or 422E36 – In-line charge amplifier
D 003DXX – Cable with BNC plug to BNC plug
E Model 003C03 – Cable with 10-32 plug to BNC plug
F ICP® sensor signal conditioner
G Model 012A03 – Cable with BNC plug to BNC plug
H Readout, recording, or data acquisition device
XXX = Denote cable length, 010 = 10 feet (Metric lengths available)
MTS Sensors, a division of MTS Systems Corporation (NASDAQ: MTSC), vastly expanded its range of products and solutions after MTS acquired PCB Piezotronics, Inc. in July, 2016. PCB Piezotronics, Inc. is a wholly owned subsidiary of MTS Systems Corp.; IMI Sensors and Larson Davis are divisions of PCB Piezotronics, Inc.; Accumetrics, Inc. and The Modal Shop, Inc. are subsidiaries of PCB Piezotronics, Inc.

IMI Sensors, a division of PCB Piezotronics, Inc. manufactures industrial vibration monitoring instrumentation, such as accelerometers, vibration transmitters and switches that feature rugged stainless steel housings and survive in harsh environments like paper and steel mills, mines, gas turbines, water treatment facilities and power plants. Integrating with portable analyzers and PLC’s, IMI instrumentation helps maintenance departments reduce downtime and protect critical machinery. Visit IMI Sensors at www.pcb.com. PCB Piezotronics, Inc. is a wholly owned subsidiary of MTS Systems Corporation. Additional information on MTS can be found at www.mts.com.

© 2019 PCB Piezotronics, Inc. In the interest of constant product improvement, specifications are subject to change without notice. PCB®, ICP®, Swivel®r, Modally Tuned®, and IMI® with associated logo are registered trademarks of PCB Piezotronics, Inc. in the United States. ICP® is a registered trademark of PCB Piezotronics Europe GmbH in Germany and other countries. SWIFT® is a trademark of MTS Systems Corporation in the United States.

© 2019 PCB Piezotronics, Inc. In the interest of constant product improvement, specifications are subject to change without notice. PCB®, ICP®, Swivel®r, Modally Tuned®, and IMI® with associated logo are registered trademarks of PCB Piezotronics, Inc. in the United States. ICP® is a registered trademark of PCB Piezotronics Europe GmbH in Germany and other countries. SWIFT® is a trademark of MTS Systems Corporation in the United States.