AC-43 / AC-42 / AC-41 Force Balance Accelerometer

Features

- Full Scale: ± 2 g (± 0.625, 1, 4, 5 g optional)
- Bandwidth DC to 100 Hz
- MEMS Force Balance Accelerometer
- High accelerations measurement
- High shock survivability
- Large temperature range
- High lifetime stability
- Cost effective sensor
- Low power consumption
- Simple test and calibration
- Single Bolt Mounted Enclosure provides up to ± 10° of Leveling Adjustment

Outline

The AC-43 sensor package is a triaxial accelerometer designed for urban and industrial applications regarding strong motion earthquake survey and vibration monitoring as well as alarm and switch systems.

All these applications require rugged sensors with minimum maintenance and a simple method for periodic testing.

The AC-43 accelerometer is based on the modern MEMS (Micro Electro-Mechanical Systems) technology, consisting of sensing cells assembled in a way that optimizes their performances. This combined with the state of the art proprietary circuit design yields this cost effective and reliable accelerometer.

MEMS cells include linear accelerometer sensing elements which measure the capacitance variation in response to any movement or inclination and a factory trimmed interface chip that converts the capacitance variations into analog or digital signal proportional to the motion.

The DC response allows the sensor to be easily repaired, tilt tested or recalibrated in the field. With the help of the TEST LINE the AC-43 accelerometer can be completely tested assuring proper operation.

The AC-43 is typically housed in the standard GeoSIG sealed cast aluminium housing with dimensions of 195 x 112 x 96 mm. The housing also incorporates a single bolt mount with three levelling screws. Stainless steel packaging options are available.

The AC-4x accelerometer is directly compatible with the GeoSIG recorders. It is also designed to be mounted internally in standard GeoSIG recorders.
## General Characteristics

**Application:**
- Strong-Motion earthquake recording
- Vibration monitoring
- Alarm / Switch systems

**Configurations:**

<table>
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<tr>
<th>Configuration</th>
<th>Axes</th>
<th>Alignment*</th>
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</thead>
<tbody>
<tr>
<td>AC-43 or AC-43i*</td>
<td>X - Y</td>
<td>*H: Horizontal, V: Vertical</td>
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<tr>
<td>AC-42-H or AC-42i-H*</td>
<td>X - Y</td>
<td>H - H</td>
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<tr>
<td>AC-42-HV or AC-42i-H*</td>
<td>X (or Y) - Z</td>
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<td>AC-41-V or AC-41i-V*</td>
<td>X (or Y)</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>Z</td>
<td>V</td>
</tr>
</tbody>
</table>

* 1: Internal sensor

**Full Scale Range:**

- ± 2 g Std
- ± 0.625, ± 1, ± 4 or ± 5 g

**Sensor Element**

- **Type:** MEMS Force Balance Accelerometer
- **Dynamic Range:** >85 dB
- **Noise:** < 60 ug RMS
- **Nonlinearity:** < 0.3 % typ., < 0.6 % for vertical
- **Cross Axis Sensitivity:** < 2 % typ.
- **Bandwidth:** DC to 100 Hz
- **Span drift:** 100 ppm/°C
- **Offset Drift:** ± 0.8 mg / °C
- **Full Scale Output:** 0 ± 10 V differential (20 Vpp)
  - optional 2.5 ± 2.5 V single-end (5 Vpp)
  - 0 to 20 mA current loop
- **Measuring Range:** See plot

## Specifications

**Power**

- **Supply Voltage:** 7 to 15 VDC, single supply
  - optional, 7 to 30 VDC
- **Consumption:** 75 mA max. @15 VDC
- **Connector:** Metallic, Shielded, IP67, 12 pins, male
  - optional MIL, Bendix PT07A 14-19P
- **Mating:** Binder / Coninvers type RC
- **Overvoltage Protection:** All pins are protected

**Connector Pin Configuration**

- Pin 1-6: Signal output for axis X, Y, Z
- Pin 7.8: Test Input
- Pin 9-10: + 12 VDC power supply
- Pin 11-12: Not used

**Environment/Housing**

- **Housing Type:** Cast aluminium
- **Housing Size:** 195 x 112 x 96 mm
- **Weight:** 2.0 kg
- **Index of Protection:** IP 65
  - optional IP68
- **Temperature Range:**
  - - 40 to 85 °C (operating)
  - - 40 to 85 °C (non-operating)
- **Humidity:**
  - 0 to 100 % (non-condensing)
  - 40 to 85 °C (operating)
- **Orientation:** Can be configured for mounting in any position
- **Mounting:** Single bolt, surface mount, adjustable within ± 10°

### Standard AC-4x

- **Floor mounted,** Full scale ± 2 g,
  - 2 m cable with cable inlet and recorder mating connector, concrete anchor bolt and user manual on CD

### Options

**Cable & connector:**
- **Cable connector**
  - Metallic, Shielded, IP67, 12 pins, male
  - optional MIL, Bendix PT07A 14-19P
  - Cable with shielded twisted pairs for any length (including mating sensor connector) with open end
  - Cables for connection to GeoSIG recorder
  - Connector on user specification mounted at cable end

**Housing:**
- Watertight IP 68 housing
- Downhole housing (AC-4x-DH)
- Stainless steel protective housing
- As internal sensor

**Mounting:**
- Wall mounted

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