REF TEK 131A-02/BH BOREHOLE ACCELEROMETER

SPECIFICATIONS

KEY FEATURES:
State-of-the-Art MEMS Accelerometer
Low Noise
Sensitivity and Offset Stable
Available in Triaxial, Uniaxial, and Borehole Models

APPLICATIONS:
Free Field Reference
Building Arrays
Structural Monitoring
Site Response
Aftershock Studies

Ordering Information

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Model 131 Series

REF TEK MEMS FORCE-BALANCE ACCELEROMETERS

The 131B Accelerometer is available in either a single channel model 131B-01/1 or a low noise triaxial model 131B-01/3. Both models provide excellent dynamic range, useful when used with 24-bit digitizers like the REF TEK 130 Series.

The case design allows for a wedging system to be attached for installation instead of using conventional back-filling methods for securing orientation of the accelerometer. The orientation can be monitored by an optional internal digital compass. Additionally, by using the wedge system, the sensor is retrievable for your reinstallation needs.

The 131A-02/BH Triaxial Borehole Accelerometer offers a powerful combination of low noise and excellent stability for subsurface monitoring of ground motion.

Related Sub-systems:
Strong Motion Accelerographs, 130-SMHR & 130-SMA
Accelerometers, 147-01 & 131B
Broadband Seismometers, 151B-120, 151B-60, 151B-30

Specifications subject to change without notice. Rev. 4.0

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### 131A-02/BH Borehole Accelerometer Specifications

The 131A-02/BH Accelerometer provides the industry standard analog output of -10V to 10V full scale. The performance of the accelerometer includes exceptional linearity over a broad dynamic range, excellent bias stability, and little hysteresis errors or offset drift problems that are usually associated with other accelerometer designs.

The 131A-02/BH electronics employ three sensors mounted orthogonally in a rigid internal frame and anchored to the case. Provisions are built-in for mounting the internal digital compass. The modular electronics design consumes low power, only 60mA @ 12 VDC.

#### Environment:
- Operating Temp: -25 to 60°C
- Storage Temp: -40 to 85°C
- Humidity: 0-100% non-condensing

#### Mechanical:
- Case: Powdercoat paint over gold alodine aluminum, gasket sealed access cover
- Size: 3” (7.6cm) dia. x 12” (30.5cm) long
- Weight: 9.4 lbs (4.3 kg)

#### Power:
- Voltage: 10 - 15 VDC
- Current: 60mA @ 12 VDC (100mA with compass installed)

### 131B-01/1 Uniaxial Accelerometer Specifications

The 131B-01/1 shown here is ±4g full scale with 2 μg²/Hz noise level and is best suited for structural applications (building, bridge, dam monitoring) when the project requires accelerometers in uniaxial configuration.

#### Environment:
- Operating Temp: -25 to 60°C
- Storage Temp: -40 to 85°C
- Humidity: 0-100% non-condensing

#### Mechanical:
- Case: Powdercoat paint over gold alodine aluminum, gasket sealed access cover
- Size: 3” x 3.3” x 3.2” (7.6cm x 8.4cm x 8.1cm)
- Weight: 1 lbs (-0.5 kg)

#### Mounting:
- Two bolts on one of two axes

### 131B-01/3 Triaxial Accelerometer Specifications

The 131B-01/3 model is a ±4g full scale accelerometer with 2μg²/Hz noise level and is best suited for structural applications (building, bridge, dam monitoring) when the project requires accelerometers in triaxial configuration.

#### Environment:
- Operating Temp: -25 to 60°C
- Storage Temp: -40 to 85°C
- Humidity: 0-100% non-condensing

#### Mechanical:
- Case: Powdercoat paint over gold alodine aluminum, gasket sealed access cover
- Size: 4.1” x 4.0” x 4.0” (10.4cm x 10.2cm x 10.2cm)
- Weight: 2 lbs (~1 kg)

#### Power:
- Voltage: 10 - 15 VDC
- Current: 60mA @ 12 VDC (100mA with compass installed)

### Configuration:

#### Triaxial

- Full-scale Range: ±4g
- Dynamic Range: > 112 dB @ 1 Hz
- Full-scale Output: ±10V; 20 VPP
- Type: Force-balance
- Self Noise: 2 μg²/Hz
- Linearity: ±1% of full scale
- Cross Axis Sensitivity: < 0.005% of full scale
- Frequency Response: DC > 500 Hz
- Damping: 0.6 - 0.7
- Output Impedance: 100 ohms
- Shock: 500g, 5 msec
- Self-test Response: Logic level input will produce 0.6g positive output
- Lightning Protection: Built-in surge protection
- Supply Voltage: 10 - 16 VDC
- Supply Current: 60 mA typical

#### Uniaxial

- Full-scale Range: ±4g
- Dynamic Range: > ±3g
- Full-scale Output: ±10V
- Type: Force-balance
- Self Noise: 2 μg²/Hz
- Linearity: ±1% of full scale
- Cross Axis Sensitivity: < 0.005% of full scale
- Frequency Response: DC > 500 Hz
- Damping: 0.6 - 0.7
- Output Impedance: 100 ohms
- Shock: 500g, 5 msec
- Self-test Response: Logic level input will produce 1g positive output
- Lightning Protection: Built-in surge protection
- Supply Voltage: 10 - 16 VDC
- Supply Current: 20 mA typical

### Electronic Compass Data Sheet

- Orientation: Monitor by internal digital compass
- Compass Resolution: ± 0.1°
- Compass Sensitivity: ± 0.5°
- Self Test: Logic level input will produce 0.5g positive output
- Zero Offset: ≤ 25 μg
- Case: Electrically isolated

### Mechanical

- Size: 3” (7.6cm) dia. x 12” (30.5cm) long
- Weight: 9.4 lbs (4.3 kg)
- Weight with Clamp: 20 lbs (9.1 kg)
- Direction of Acceleration: Marked on the case
- Watertight Integrity: 1000 psi
- Material: Stainless steel type 316
- Connector Type: Impulse
- Interconnection: 2300 feet max. (701m)