AC-43 / AC-42 / AC-41-DH Downhole Accelerometer

Features

- Full Scale ± 2 g (± 0.625, 1, 4, 5 g optional)
- Bandwidth DC to 100 Hz
- MEMS Inertial Sensor
- High shock survivability
- Wide operational temperature range
- High lifetime stability
- Cost effective sensor
- Low power consumption
- Simple test and calibration
- Strong mechanical design
- Fits in 3 inch casing

Outline

The AC-43-DH sensor package is a triaxial accelerometer designed for borehole applications regarding strong motion earthquake survey and monitoring.

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 downhole casing contains the entire sensor system. The sensor is connected through Overvoltage Protection stage to the recorder at the surface with a cable.

Using inclinometer tubes and the provided guiding wheels, the sensor can be oriented before insertion in the tube.
Specifications AC-43 / AC-42 / AC-41-DH Downhole Accelerometer

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

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** H: Horizontal, V: Vertical

Full Scale Range: ± 2 g Std
Optional ± 0.625, ± 1, ± 4 or ± 5 g

Sensor Element
Type: MEMS Inertial Sensor
Dynamic Range:
88.5 dB at 2 g FS (0.1 to 30 Hz)
96.5 dB at 5 g FS
Noise: 150 µg RMS
Nonlinearity: < 0.3 % typ., < 0.6 % for vertical
Cross Axis Sensitivity: < 2 % typ.
Bandwidth: DC to 100 Hz
Span drift: ± 0.8 mg /°C
Offset Drift: 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

Power
Supply Voltage: 7 to 15 VDC, single supply
optional, 7 to 30 VDC
Consumption: 9 mA @12 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
Case: Shielded Ground

Environment/Housing
Housing Type: Aluminium cylinder, fully sealed
Housing Size: Diameter 55 mm, length 420 mm
Weight: 3.5 kg

Index of Protection: IP 68, up to 10 bars water pressure
Temperature Range:
-40 to 85 °C (operating)
-40 to 85 °C (non-operating)
Humidity: 0 to 100 %
Orientation: Using 3” inclinometer casing (Figure 1) with included guidewheels (Figure 2).

Standard AC-43-DH
Full scale ± 2 g,
sensor mating connector and user manual.

Accessories
DH-TUBE
3” inclinometer casing as in figure 1 in sections of 3 meters with coupling elements.
Installation kit:
All required tools and fixation consumables for up to 100 meters of casing.
DH-BALL
Glass Balls for settlement of downhole sensor (25 kg bag)

Ordering Information
Specify:
Type of AC-4x-DH, acceleration full scale, depth of borehole and total cable length.

Figure 1
Figure 2