

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.

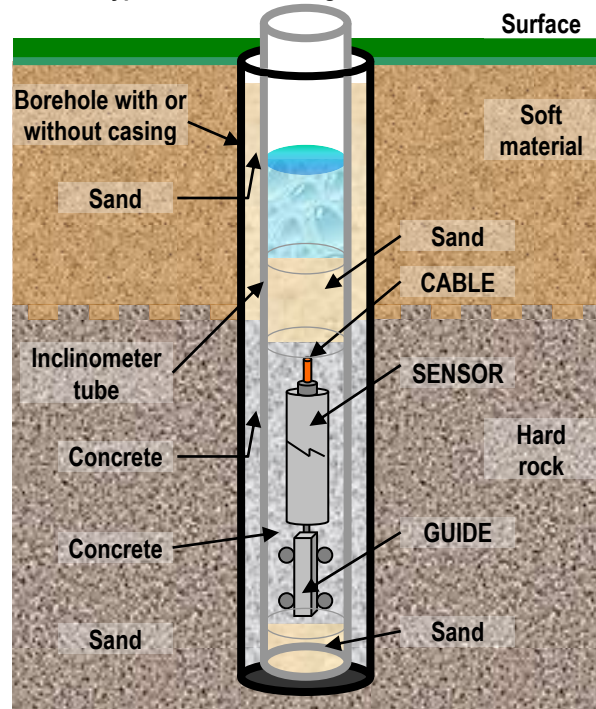
MEMS cells include linear accelerometer sensing elements which measure the capacitance variation in response to any movement or inclination and a factory trimmed interface chip that converts the capacitance variations into analog or digital signal proportional to the motion.

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.

Typical 100 mm casing or hole diameter



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

General Characteristics

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

Configurations:	Triaxial	Biaxial	Uniaxial	Axes	Alignment**
AC-43:	■			X – Y – Z	H – H – V
AC-42-H:		■		X – Y	H – H
AC-42-HV:		■		X (or Y) – Z	H – V
AC-41-H:			■	X (or Y)	H
AC-41-V:			■	Z	V

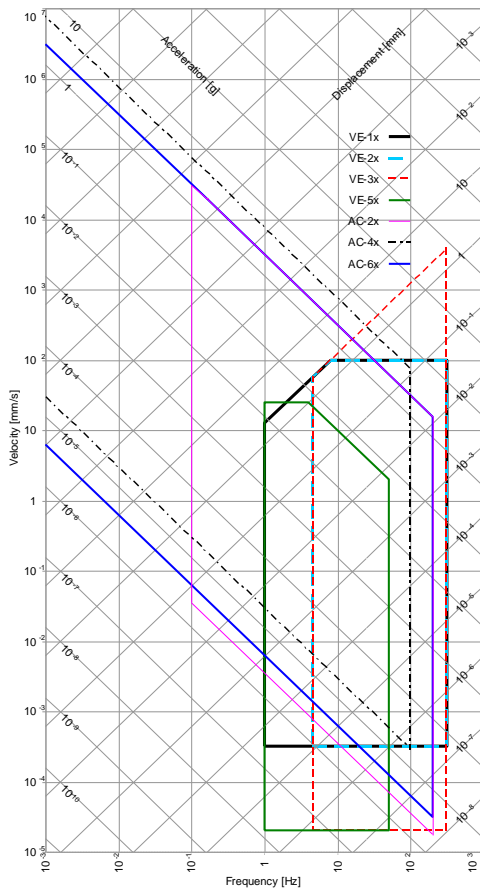
** H: Horizontal, V: Vertical

Full Scale Range: ± 2 g Std
 Optional $\pm 0.625, \pm 1, \pm 4$ 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: $< 110 \mu\text{g}_{\text{RMS}}$ for x and y axis, and $< 225 \mu\text{g}_{\text{RMS}}$ for z axis.
 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: $\pm 0.8 \text{ mg} / ^\circ\text{C}$
 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



Power

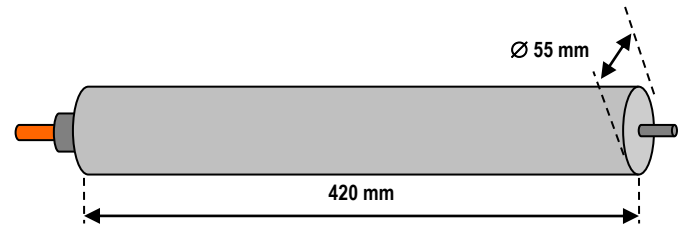
Supply Voltage: 7 to 15 VDC, single supply
 optional, 7 to 30 VDC
 Consumption: 9 mA @12 VDC
 Connector: Metallic, Shielded, IP67, 12 pins, male
 optional MIL, Bendix PT07A 14-19P
 Mating: Binder / Coninvers type RC
 Overvoltage Protection: All pins are protected

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