

AC-73-DH Triaxial Force Balance Downhole Accelerometer

Features

- True Electro-mechanical Force Balance Accelerometer
- Highly robust downhole housing
- Suitable for boreholes > 90 mm
- Dynamic Range 165 dB
- Full Scale range $\pm 0.5, 1, 2, 3$ or 4 g
- Bandwidth from DC to 200 Hz
- Exemplary Offset stability
- Temperature and drift compensation
- Robust suspension system
- Optionally integrated compass

Applications

- Broadband Seismic, Earthquake and Structural measuring and monitoring



Outline

The AC-73-DH sensor package is a true electro-mechanical triaxial downhole accelerometer designed for broadband earthquake monitoring and applications requiring highly sensitive and rugged sensors with minimum maintenance and a simple method for periodic testing.

The rugged mass suspension moving coil system improves the signal to noise ratio. The magnetic system and capacitive position sensors offer symmetrical controls for the accurate electronic centring of the mass. At rest the accelerometer mechanism is in balance and no electrical output is generated. Acceleration of the AC-73-DH will result in an electrical output proportional to the current used to keep the mass centred. This accelerometer output signal is calibrated to "g" gravity so that the current scale factor of the AC-73-DH is in units of milliamps per g. Because of the symmetrical positioning system incorporated with the force balance servo accelerometer principle, the accelerometer can not arbitrarily change its scaling or drift out of calibration.

The AC-73-DH is equipped with electronic offset adjustment features that make its installation very user friendly. This powerful feature allows the users to install the AC-73-DH without mechanical offset adjustment and fine levelling.

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-73-DH accelerometer can be completely tested assuring proper operation and accurate acceleration measurement. This test line is internally connected to the external world only when a given command is sent to the sensor to avoid any noise pick-up through the test input.

The sensor can be powered from 9.5 to 18 VDC source with the advantage that its power input is insulated from the sensor's electronic ground. This avoids ground loops and reduces noise induced through the power supply.



Specifications AC-73-DH

General Characteristics

Configurations:

AC-73-DH:
 AC-72-H-DH:
 AC-72-V-DH:
 AC-71-H-DH:
 AC-71-V-DH:

	Triaxial	Biaxial	Uniaxial	Axes	Alignment**
AC-73-DH	■			X - Y - Z	H - H - V
AC-72-H-DH		■		X - Y	H - H
AC-72-V-DH		■		X (or Y) - Z	H - V
AC-71-H-DH			■	X (or Y)	H
AC-71-V-DH			■	Z	V

** H: Horizontal, V: Vertical

Full Scale Range: ± 2 std., ± 0.5 , 1, 3 or 4 g
 user selectable at field

Sensor Element

Type: True Electro-mechanical Force Balance Accelerometer
 Dynamic Range: 165 dB (per bin rel. full range)
 156 dB (per bin rel. full scale rms)
 134 dB (0.02 - 50 Hz, integrated PSD)
 Nonlinearity: < 0.1 %
 Cross Axis Sensitivity: < 0.5 %
 Bandwidth: DC to 200 Hz
 other bandwidths possible on request
 Damping: 0.7 \pm 0.1 critical
 Offset Drift: 0.0005 g / °C
 Span Drift: 200 ppm / °C
 Full Scale Output: 0 \pm 10 V differential (20 Vpp)
 Hysteresis: < 0.001 % of full scale
 Sensitivity: 2.5 to 20 V/g
 Output impedance: 50 ohms

Power

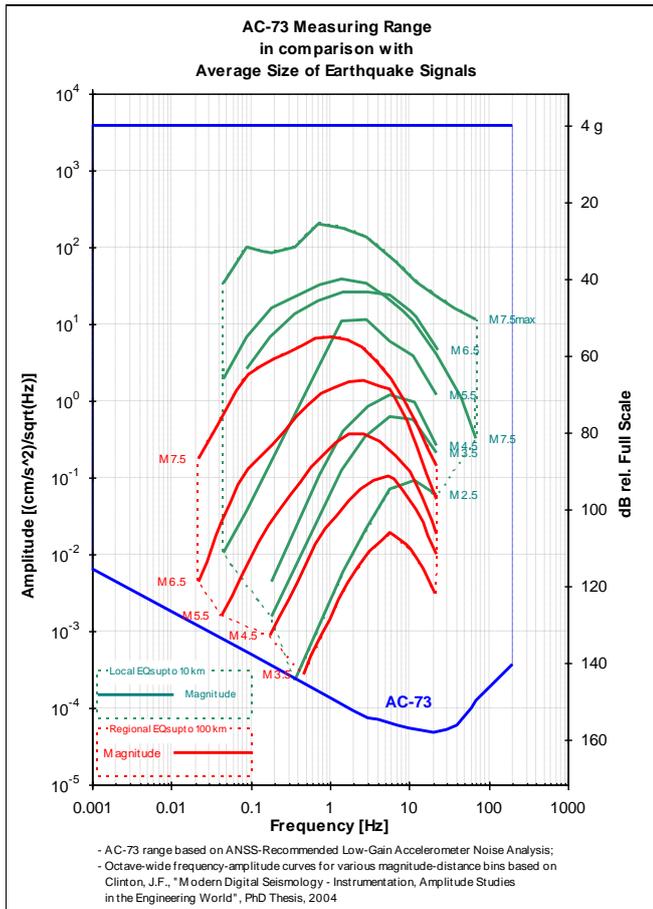
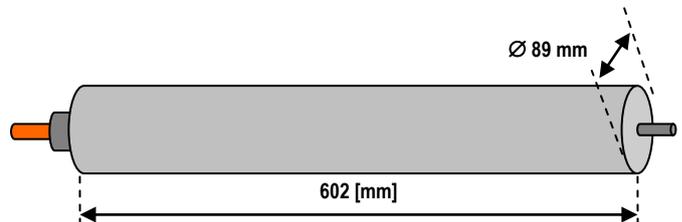
Power input: Insulated
 Supply Voltage: 9.5 to 18 VDC, single supply
 Consumption: 60 mA @ 12 V, excl. options
 Overvoltage Protection: All pins are protected with dual stage barrier.

Connector Pin Configuration

Pin 1-2, 3-4, 5-6: Signal output for axis X, Y, Z
 Pin 7-8: Test input, Digital 0/12 V / GND
 Pin 9-10: 12 VDC insulated power supply input
 Pin 11-12: Reserved
 Case: Shield connection

Environment/Housing

Housing Type: Aluminium
 Optional Stainless Steel
 Housing Size: ϕ 89 mm x 602 mm
 Weight: 5 kg (typical configuration)
 Index of Protection: Watertight upto 10 bar (100 m)
 optional: upto 30 bar (300 m)
 Temperature Range: -20 to 70 °C (operating)
 -40 to 75 °C (non-operating)
 Humidity: 0 to 100 % (non-condensing)



Standard AC-7x-DH

Full scale ± 2 g,
 with cable inlet and user manual on CD

Options

Full Scale Output: - 0 to 20 mA current loop
 Functionality: Built-in options of
 - compass
 - tilt sensor
 - temperature and humidity sensor
 Cable & connector: See separate cable & connector options sheet
 - Frame connector (no cable inlet)
 - Mating connector (for frame connector)
 - Cable with shielded twisted pairs for any length with open end
 - Connector on user specification mounted at cable end
 Housing: - Watertight upto 30 bar (300 m)
 - Stainless steel housing

Ordering Information

Specify: Type of AC-7x-DH, full scale range, and other applicable options