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AC-63 / AC-62 / AC-61 Force Balance Accelerometer

Features

- **Full Scale ± 2 g (0.5, 1 or 3 g optional)**
- **Bandwidth DC to 50 or upto 250 Hz**
- **Dynamic Range > 120 dB**
- **Offset stability**
- **Temperature and drift compensation**
- **No installation adjustments required due to Digital Sensor Control (DSC)**
- **Downhole version (AC-63-DH) is also available**
- **Robust suspension system**
- **Single Bolt Mounted Enclosure provides up to ± 10° of Levelling Adjustment**

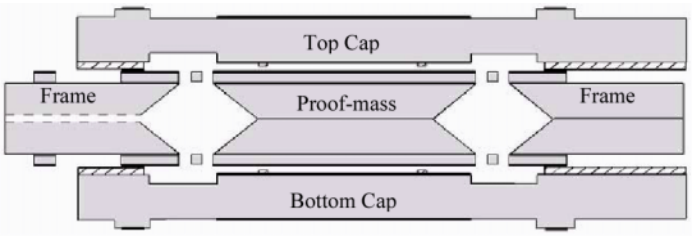
Outline

The AC-63 is a reliable Force Balance Accelerometer based on the latest MEMS (Micro Electro-Mechanical Systems) technology.

The sensor package is designed for applications regarding earthquake and structural monitoring and measuring. All these applications require a high dynamic, rugged sensor with minimum maintenance.

The MEMS accelerometer has a variable capacitor design that is operated in a closed-loop configuration with a custom mixed-signal application-specific integrated circuit (ASIC).

The MEMS accelerometer is a wafer stack composed of four individual wafers bonded together. Within the inner two wafers of the stack, and suspended by silicon springs, is a moving structure called the proof-mass. This forms a differential variable capacitance between the surfaces of the moving proof-mass and the fixed caps. As the accelerometer is subjected to vibration, the proof-mass moves between the fixed plates which, in turn, causes a change in the differential capacitance.



Cross-section of the MEMS accelerometer 4 wafer stack

A Digital Sensor Control (DSC) is used to provide the AC-63 with exceptional user-friendly features. At turn on the DSC nulls all outputs including the vertical channel. This powerful feature allows the users to install the AC-63 and turn it on. Time consuming offset adjustment and instrument levelling are not necessary.

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-63 accelerometer can be completely tested assuring proper operation and accurate acceleration measurement.

Specifications AC-63 / AC-62 / AC-61 Force Balance Accelerometer

General Characteristics

Application: Earthquake and structural monitoring and measuring

Configurations:

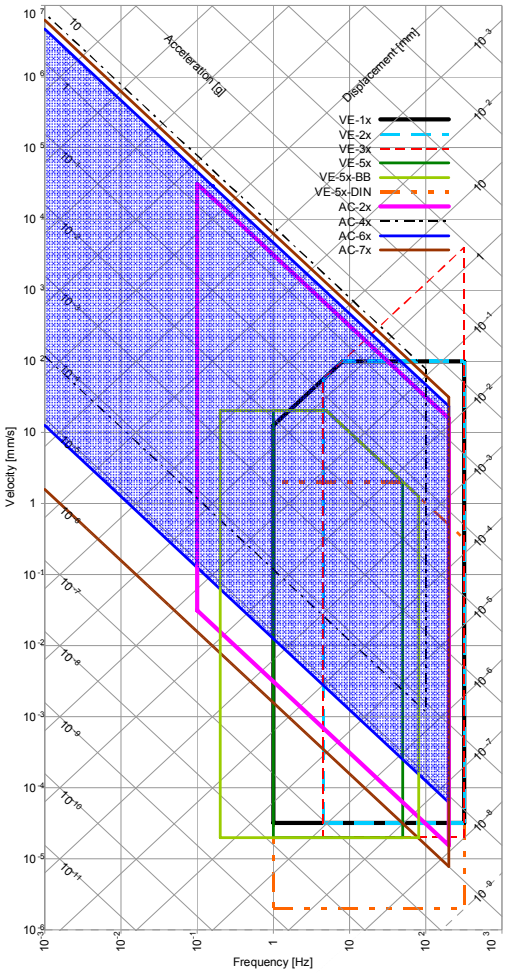
	Triaxial	Biaxial	Uniaxial	Axes	Alignment**
AC-63 or AC-63i*:	■			X – Y – Z	H – H – V
AC-62-H or AC-62-Hi*:		■		X – Y	H – H
AC-62-V or AC-62-Vi*:		■		X (or Y) – Z	H – V
AC-61-H or AC-61-Hi*:			■	X (or Y)	H
AC-61-V or AC-61-Vi*:			■	Z	V

* i : Internal sensor ** H: Horizontal, V: Vertical

Full Scale Range: ± 2 g
optional ± 0.5, ± 1 or ± 3 g

Sensor Element

Type: Force Balance Accelerometer
Dynamic Range: >120 dB effective at ± 3 g full scale
Nonlinearity: < 0.1 %
Hysteresis: < 0.01 %
Cross Axis Sensitivity: < 0.2 %
Bandwidth: DC to 100 Hz
optional upto 250 Hz
Damping: 0.7 critical
Offset Drift: 100 ug / °C
Span Drift: 75 ppm / °C
Full Scale Output: ± 10 V differential
optional 0 ± 5 V single ended
Measuring Range: See plot



Power

Supply Voltage: 9.2 to 15 VDC, single supply
Consumption: 70 mA @12 V

Connector and Cable

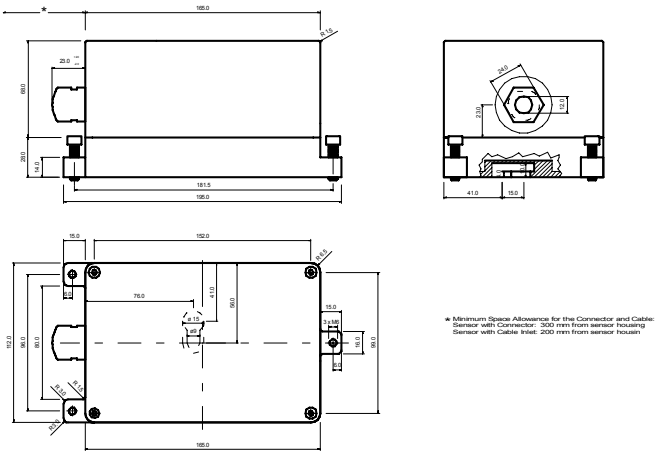
Several options exist. See separate sheet.
Surge Protection: All pins are protected

Connector Pin Configuration

Pin 1-2, 3-4, 5-6 Signal output for axis X, Y, Z
Pin 7-8 Test input, Digital test-pulse (0 – 12 V)
Pin 9-10 +12 VDC Power Supply
Pin 11-12 Auxiliary input (reserved)
Case Shielded ground

Environment/Housing

Housing Type: Cast aluminium
Sealed access cover
Housing Size: 195 x 112 x 96 mm
Weight: 3.0 kg
Index of Protection: IP 65
optional IP 68
Temperature Range: - 20 to 70 °C (operating)
- 40 to 85 °C (non-operating)
Humidity: 0 to 100 % (non-condensing)
Orientation: Can be configured for mounting in any position. See separate sheet.
Mounting: Single bolt, surface mount, adjustable within ± 10°



Standard AC-6x 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-6x-DH)
Stainless steel protective housing
As internal sensor (no housing)
Mounting: Wall mounted