

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

### Features

- Full Scale  $\pm 2$  g (0.5, 1, 3 or 4 g optional)
- Bandwidth DC to 100 Hz optional to 250 Hz
- Dynamic Range > 120 dB
- Offset stability
- Temperature and drift compensation
- Downhole version (AC-63-DH) is also available
- Robust suspension system
- Single Bolt Mounted Enclosure provides up to  $\pm 10^\circ$  of Levelling Adjustment



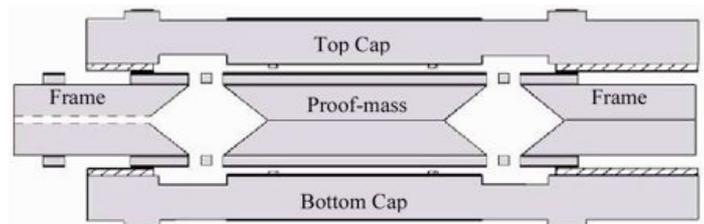
### Outline

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

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:

AC-63 or AC-63i\*:

AC-62-H or AC-62-Hi\*:

AC-62-V or AC-62-Vi\*:

AC-61-H or AC-61-Hi\*:

AC-61-V or AC-61-Vi\*:

	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

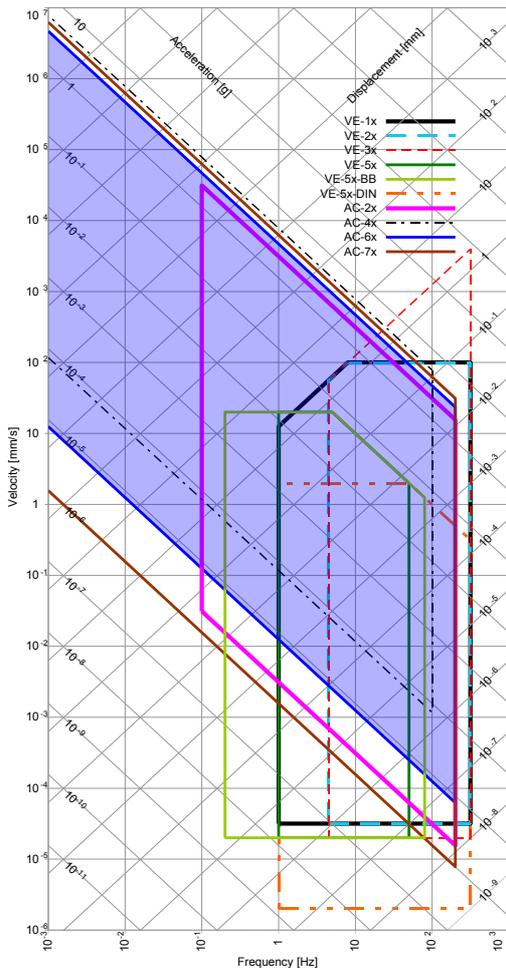
Full Scale Range:  $\pm 2$  g  
optional  $\pm 0.5, \pm 1, \pm 3$  or  $\pm 4$  g

## Sensor Element

Type: Force Balance Accelerometer  
 Dynamic Range:  $>120$  dB effective at  $\pm 3$  g full scale  
 Nonlinearity:  $< 0.1\%$   
 Hysteresis:  $< 0.01\%$   
 Cross Axis Sensitivity:  $< 0.2\%$   
 Bandwidth: DC to 100 Hz  
 optional up to 250 Hz  
 Damping: 0.7 critical  
 Offset Drift:  $100 \mu\text{g} / ^\circ\text{C}$   
 Span Drift:  $75 \text{ ppm} / ^\circ\text{C}$   
 Full Scale Output:  $\pm 10$  V differential  
 optional  $0 \pm 5$  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

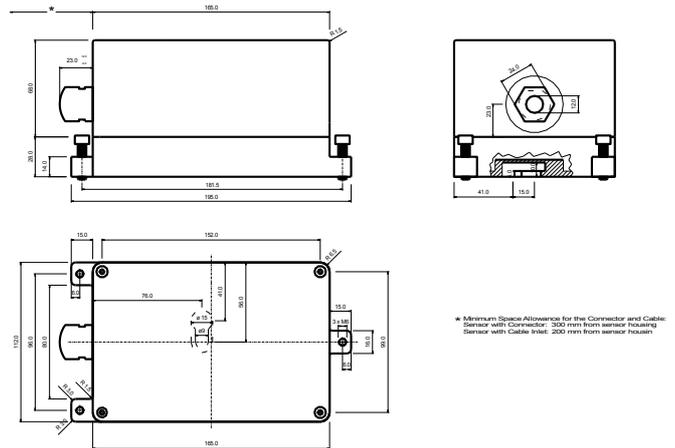
Several options exist. See separate sheet.  
 Surge Protection: All pins are protected

## 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  $\pm 10^\circ$



## Standard AC-6x

Floor mounted, Full scale  $\pm 2$  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