

## DATA SHEET

vibro-meter®

## CE311 piezoelectric accelerometer



## KEY FEATURES AND BENEFITS

- From the vibro-meter® product line
- Sensitivity: 50  $\mu\text{A/g}$
- Frequency response: 2 to 8000 Hz
- Temperature range:  $-40$  to  $125^{\circ}\text{C}$
- Long-distance signal transmission
- Integrated electronics
- Integral case insulation
- Available in standard versions and Ex versions certified for use in potentially explosive atmospheres

## APPLICATIONS

- Vibration monitoring in harsh industrial environments and/or hazardous areas

## DESCRIPTION

The CE311 piezoelectric accelerometer from Meggitt's vibro-meter® product line is a vibration sensor designed for the monitoring and protection of machinery in harsh industrial environments and/or hazardous areas.

The CE311 sensor features a symmetrical shear-mode measuring element using polycrystalline material. The sensor uses integrated electronics to provide the required signal processing, eliminating the need for an external signal conditioner (charge amplifier). The electronics also performs charge-to-current conversion in order to provide a current-modulated output signal that is suitable for transmission over long distances.

The CE311 is fitted with an integral cable (twisted pair, shielded) in a hermetically sealed link, protected by a flexible, leak-tight protection tube (stainless-steel hose). More specifically, the sensor and protection tube are hermetically welded to one another, resulting in a system that is fully protected against cooling fluids, lubricants, water, steam and other potential contaminants. This makes the CE311 an extremely reliable device suitable for the long-term monitoring of vibration in many industrial applications.



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## DESCRIPTION (continued)

The CE311 sensor and electronics are insulated from their housings (integral case insulation) and have a sensitivity of 50  $\mu\text{A/g}$ .

The CE311 is available in different versions with various cable lengths for different industrial environments: standard versions for use in

standard (non-hazardous) areas and Ex versions for installation in hazardous areas (see **Ordering information on page 6**).

For specific applications, contact your local Meggitt representative.

## SPECIFICATIONS

### General

Input power supply requirements	: 15 to 28 V <sub>DC</sub> , with a bias (standby) current of 5.5 to 7.5 mA
Signal transmission	: Current-modulated output (2-wire system)
Signal processing	
• Internal	: Integrated electronics (charge-to-current conversion)
• External	: Galvanic separation unit and/or monitoring system electronics

### Operating

(At 23°C  $\pm$  5°C, 73°F  $\pm$  9°F)

Sensitivity	: 50 $\mu\text{A/g} \pm 5\%$
Dynamic measurement range	: 0.004 to 40 g <sub>peak</sub>
Overload capacity (spikes)	: Up to 100 g <sub>peak</sub>
Linearity	: $\pm 1\%$ over dynamic measurement range
Transverse sensitivity	: <3% (measured at 15 Hz with 5 g)
Resonant frequency (mounted)	: 20 kHz typ.
Frequency response	: -3 dB at 2 Hz. < $\pm 5\%$ between 6 and 5000 Hz. < $\pm 10\%$ between 5000 and 8000 Hz.
Capacitance (nominal)	
• Pole to pole	: 10.5 nF for sensor + 105 pF/m of cable
• Pole to casing	: 20.0 pF for sensor + 200 pF/m of cable

### Environmental

Temperature range	
• Continuous operation	: -40 to 125°C (-40 to 257°F)
• Short-term survival (15 minutes max.)	: -55 to 150°C (-67 to 302°F)
Temperature sensitivity error with respect to 23°C (73°F)	: $\pm 5\%$ between -40 and 125°C (-40 to 257°F)
Shock acceleration	: 500 g <sub>peak</sub> (half-sine wave, 1 ms duration)
Corrosion, humidity	
• Sensor	: Stainless steel (1.4441), hermetically welded
• Protection tube	: Stainless steel (1.4541), hermetically welded


Note: The sensor and protection tube are hermetically welded to one another to create a leak-tight assembly that is impervious to 100% relative humidity, water, steam or oil, sea-salt atmospheres and other potential contaminants such as dust, fungus and sand.


Base strain sensitivity	: 0.0015 g/ $\mu\epsilon$ typ.
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## SPECIFICATIONS *(continued)*

### Potentially explosive atmospheres


Available in Ex approved versions for use in hazardous areas

Type of protection Ex ia: intrinsic safety		
Europe	EC type examination certificate	 II 1 G (Zones 0, 1, 2) Ex ia IIC T6...T3 Ga KEMA 04 ATEX 1055
International	IECEx certificate of conformity	Ex ia IIC T6...T3 Ga IECEx DEK 15.0029
North America	cCSAus certificate of compliance	Class I, Division 1, Groups A, B, C, D Ex ia IIC T6...T3 Ga Class I, Zone 0 AEx ia IIC T6...T3 Ga cCSAus 1514310
South Korea	KGS certificate of conformity	Ex ia IIC T6...T3 KGS 17-GA4BO-0324X

Type of protection Ex nA: non-sparking		
Europe	Voluntary type examination certificate	 II 3 G (Zone 2) Ex nA IIC T6...T3 Gc LCIE 09 ATEX 1047 X
International	IECEx certificate of conformity	Ex nA IIC T6...T3 Gc IECEx LCI 10.0021X
North America	cCSAus certificate of compliance	Class I, Division 2, Groups A, B, C, D Ex nA IIC T6...T3 Gc Class I, Zone 2 AEx nA IIC T6...T3 Gc cCSAus 1514310

Type of protection Ex tD: equipment dust ignition protection by enclosure		
South Korea	KGS certificate of conformity	Ex tD A21 IP66 T85°C...T200°C KGS 20-GA4BO-0464X

 For specific parameters of the mode of protection concerned and special conditions for safe use, refer to the Ex certificates that are available from Meggitt SA.

 For the most recent information on the Ex certifications that are applicable to this product, refer to the Ex product register (PL-1511) document that is available from Meggitt SA.

## SPECIFICATIONS *(continued)*

### Approvals

Conformity	: European Union (EU) declaration of conformity (CE marking). EAC marking, Eurasian Customs Union (EACU) certificate/ declaration of conformity.
Electromagnetic compatibility	: EN 61000-6-2:2005. EN 61000-6-4:2007 + A1:2011.
Electrical safety	: EN 61010-1:2010
Environmental management	: RoHS compliant (2011/65/EU)
Hazardous areas	: Ex approved versions (see <b>Potentially explosive atmospheres on page 3</b> )
Russian federal agency for technical regulation and metrology (Rosstandart)	: Pattern approval certificate OC.C.28.004.A N° 59463

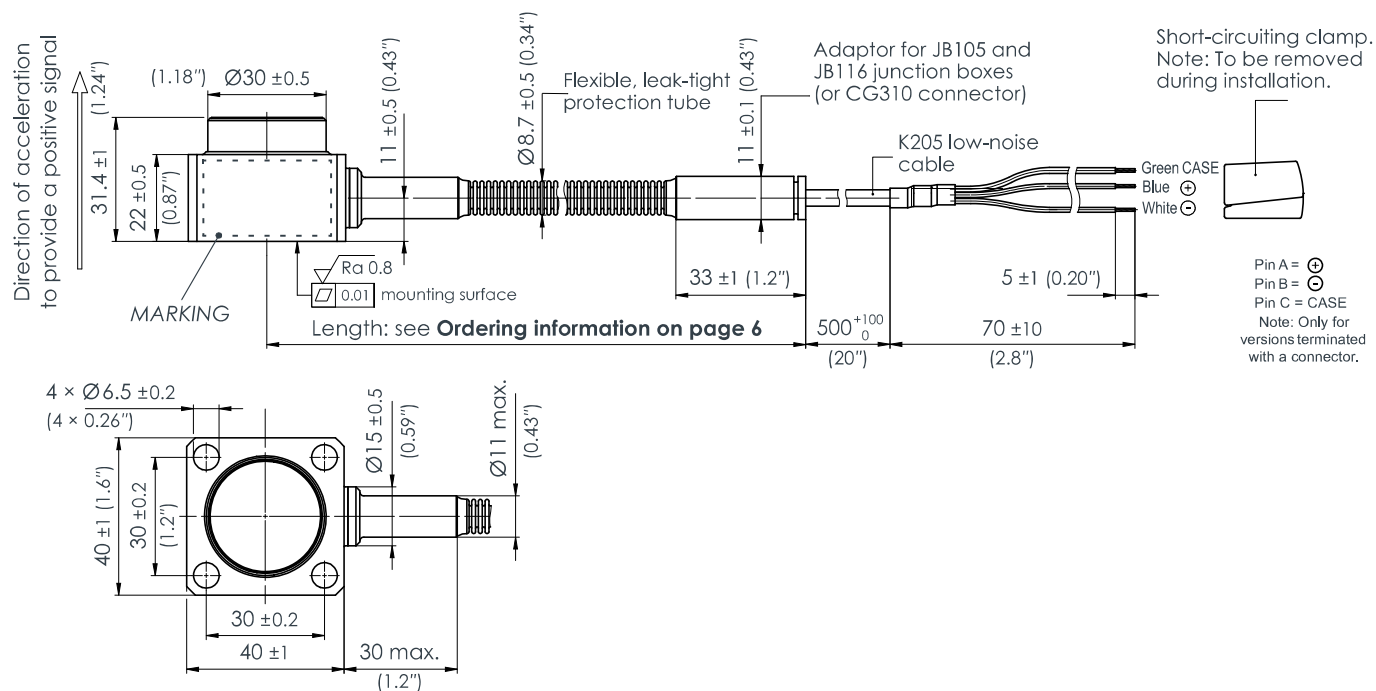
### Calibration

Dynamic calibration at factory at 120 Hz and 5 g<sub>peak</sub> (23°C, 73°F). No subsequent calibration necessary.

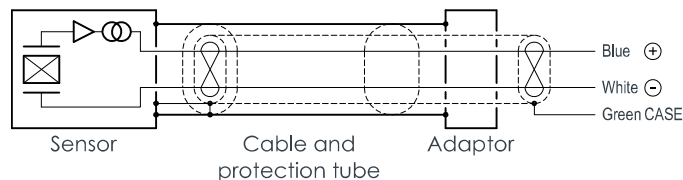
### Mechanical

Dimensions	: See <b>Mechanical drawings on page 5</b>
Connection	: Flying leads
Weight	
• Sensor	: 245 g (0.54 lb) approx.
• Cable/flexible stainless-steel hose (protection tube)	: 135 g/m (0.091 lb/ft) approx.
Mounting	: Four M6 × 35 Allen bolts (hexagonal socket head), 12.9 steel, according to DIN 912 (ISO 4762) with four M6 spring-steel washers, according to DIN 7980. Mounting torque of 15 N•m (11.1 lb-ft). Note: See the Mounting adaptors in <b>Accessories on page 6</b> and refer also to the <i>Vibration measurement chains using CExxx or PVxxx sensors installation manual</i> .

## MECHANICAL DRAWINGS



Wiring diagram



Note: All dimensions are in mm (in) unless otherwise stated.

## ORDERING INFORMATION

To order please specify

Type	Designation	Part number (PNR)
CE311	Different versions of the piezoelectric accelerometer:	
	– Standard version with 3 m integral cable	444-311-000-013
	– Standard version with 6 m integral cable	444-311-000-023
	– Standard version with 12 m integral cable	444-311-000-033
	– Standard version with 20 m integral cable	444-311-000-043
	– Ex version with 3 m integral cable	444-311-000-113
	– Ex version with 6 m integral cable	444-311-000-123

## ACCESSORIES

### Mounting adaptors

MA133	Thermal insulation kit	Refer to the 809-133-000V011 product drawing
TA102	Mounting adaptor	Refer to the 444-310-401D101 product drawing

### Connectors

CG310	3-pin connector	Refer to the 812-310-000F101 product drawing for the male connector (MS3106E14S-7P) Refer to the 812-310-000F201 product drawing for the female connector (MS3106E14S-7S)
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### Junction boxes

JB105	Refer to the data sheet
JB116	Refer to the data sheet

### Transmission cables

K2xx	Refer to the data sheets
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### Galvanic separation units

GS1127	Refer to the data sheet
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