

## DATA SHEET

# vibro-meter®

## CE134 piezoelectric accelerometer



### KEY FEATURES AND BENEFITS

- From the vibro-meter® product line
- Sensitivity: 5  $\mu\text{A/g}$
- Frequency response: 5 to 10000 Hz
- Temperature range:  $-55$  to  $350^{\circ}\text{C}$
- Long-distance signal transmission
- Integrally attached electronics
- Operation over a wide temperature range
- Integral case insulation
- Certified for use in potentially explosive atmospheres
- Available in low-frequency and high-frequency versions

### APPLICATIONS

- Vibration monitoring of turbines, turbo compressors and other industrial machinery
- Suitable for harsh industrial environments and/or hazardous areas

### DESCRIPTION

The CE134 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 CE134 sensor features a centre-mounted symmetrical compression-mode measuring element using ceramic material. The sensor uses integrally attached electronics to provide the required signal processing, eliminating the requirement for an external signal conditioner (charge amplifier). The attached electronics (temperature zone C) also performs charge-to-current conversion in order to provide a current-modulated output signal that is suitable for transmission over long distances. Importantly, this eliminates the need for connectors capable of withstanding the higher temperatures closer to the machinery (temperature zones A and B).

The sensor head is connected to the attached electronics by an integral cable (soft-line, low-noise, shielded) in a hermetically sealed link, protected by a flexible, leak-tight protection tube (stainless-steel hose). More specifically, the sensor head, protection tube and electronics housing



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## DESCRIPTION (continued)

are hermetically welded to one another, resulting in a system that is fully protected against cooling fluids, lubricants, water, steam and other potential contaminants.

The CE134 sensor and electronics are insulated from their housings (integral case insulation) and have a sensitivity of 5  $\mu\text{A/g}$ . The CE134 is available in low-frequency (LF) or high-frequency (HF) versions, with either a bayonet or a threaded connector fitted to the integrally attached

electronics housing. All versions are Ex certified for installation in hazardous areas. See **Ordering information on page 8**.

The CE134 piezoelectric accelerometer is an extremely reliable device that is suitable for the long-term monitoring of vibration in many industrial applications.

For specific applications, contact your local Meggitt representative.

## SPECIFICATIONS

### General

Input power requirements	: 15 to 28 V <sub>DC</sub> , with a bias (standby) current of 5 to 8 mA
Signal transmission	: Current-modulated output (2-wire system)
Signal processing	
• Internal	: Integrally attached 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 (at 120 Hz)	: 5 $\mu\text{A/g}$ $\pm$ 5%
Dynamic measurement range (random)	: 0.001 to 400 g PEAK. Note: The sensor resonance effect is corrected by a filter.
Overload capacity (spikes)	: Up to 1 000 g PEAK (random vibration)
Linearity	: $\leq$ 1% over dynamic measurement range
Transverse sensitivity (measured with 5 g at 15 Hz)	: $\leq$ 5%
Resonant frequency (mounted)	: 23 kHz typ.
Frequency response	
• Low-frequency (LF) version	: -3 dB at 5 Hz. $\pm$ 5% from 10 to 500 Hz (with typical deviations of -10% at 1 000 Hz and -30% at 2 000 Hz).
• High-frequency (HF) version	: -3 dB at 5 Hz. $\pm$ 5% from 10 to 5 000 Hz. $\pm$ 10% from 5 000 to 10 000 Hz.

### Environmental

Temperature range	
• Sensor head	: -55 to 350°C (-67 to 662°F), temperature zone A
• Cable/flexible stainless-steel hose (protection tube)	: -55 to 260°C (-67 to 500°F), temperature zone B
• Attached electronics (signal conditioner)	: -40 to 125°C (-40 to 257°F) for continuous operation and -55 to 130°C (-67 to 266°F) for short-term survival, temperature zone C.

**SPECIFICATIONS** *(continued)*

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Temperature sensitivity error  
with respect to 23°C (73°F) :  $\pm 5\%$  from  $-55$  to  $350^{\circ}\text{C}$  ( $-67$  to  $662^{\circ}\text{F}$ ) for the sensor only  
(with the cable/flexible stainless-steel hose and attached  
electronics at constant temperatures)

Shock acceleration

- Sensor head :  $\leq 2000$  g PEAK (half sine-wave, 1 ms duration)
- Attached electronics :  $\leq 500$  g PEAK (half sine-wave, 1 ms duration)  
(signal conditioner)

Corrosion, humidity

- Sensor head : INCONEL<sup>®</sup> alloy 600, hermetically welded
- Flexible stainless-steel hose : Stainless steel (1.4541), hermetically welded  
(protection tube)
- Attached electronics : Stainless steel (1.4441), hermetically welded



*Note: The sensor head, protection tube and electronics housing 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 :  $\leq 10^{-4}$  g/ $\mu\epsilon$

## 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...T1 Ga LCIE 02 ATEX 6089 X
North America	cCSAus certificate of compliance	Class I, Division 1, Groups A, B, C, D Ex ia IIC T6...T1 Ga Class I, Zone 0 AEx ia IIC T6...T1 Ga cCSAus 70034691
International	IECEx certificate of conformity*	Ex ia IIC T6...T1 Ga IECEx LCIE 14.0058X
United Kingdom	UK type examination certificate*	 II 1 G Ex ia IIC T6...T1 Ga CML 21 UKEX 2540 X
Russian Federation	EAЭC RU certificate of conformity*	0Ex ia IIC T6...T1 Ga X EAЭC RU C-CH.AД07.B.03042/21

Type of protection Ex nA: non-sparking		
Europe	Voluntary type examination certificate	 II 3 G (Zone 2) Ex nA IIC T6...T1 Gc LCIE 09 ATEX 1038 X
North America	cCSAus certificate of compliance	Class I, Division 2, Groups A, B, C, D Ex nA IIC T6...T1 Gc Class I, Zone 2 AEx nA IIC T6...T1 Gc cCSAus 70034691
International	IECEx certificate of conformity*	Ex nA IIC T6...T1 Gc IECEx LCI 10.0002X
United Kingdom	Type examination certificate*	 II 3 G Ex nA IIC T6...T1 Gc CML 21 UKEX 4541 X
Russian Federation	EAЭC RU certificate of conformity*	2Ex nA IIC T6...T1 Gc EAЭC RU C-CH.AД07.B.03042/21

\*Not engraved/marked on the product.

 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). United Kingdom (UKCA) declaration of conformity. 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 4</b> )
Russian federal agency for technical regulation and metrology (Rosstandart)	: Pattern approval certificate OC.C.28.004.A N° 59463

### Calibration

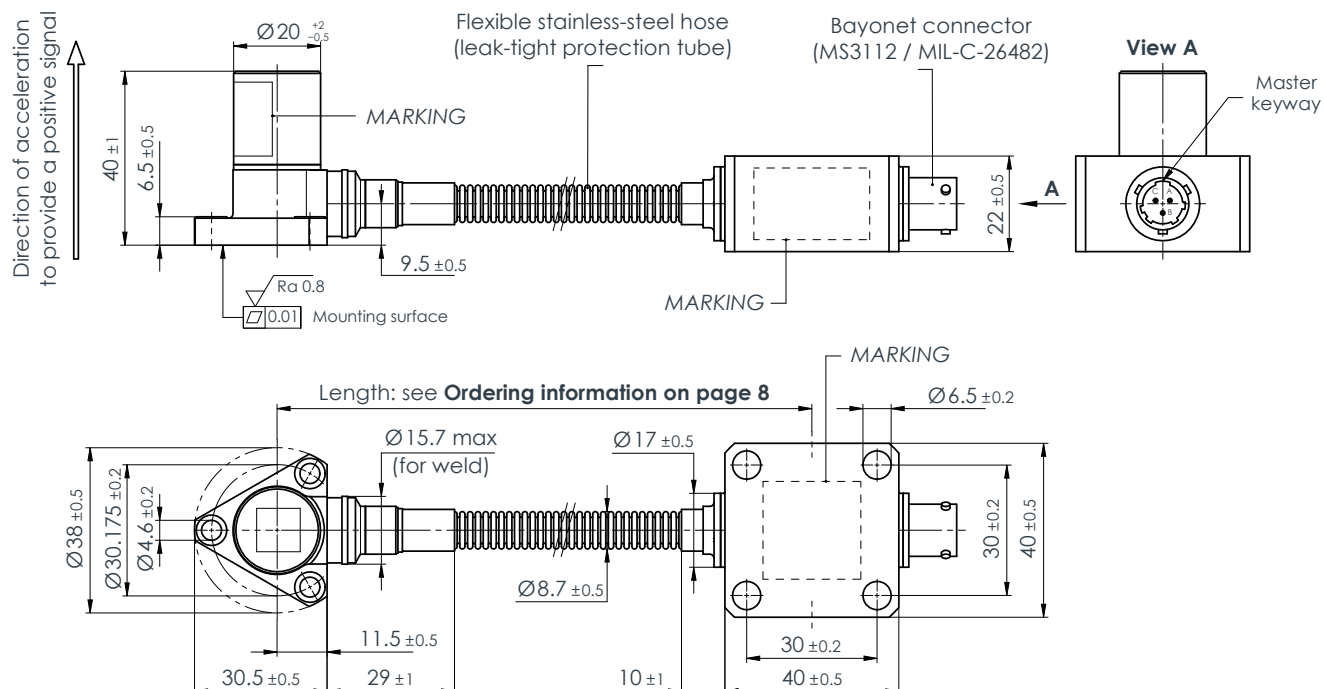
Dynamic calibration at factory at 120 Hz and 5 g PEAK (23°C, 73°F). No subsequent calibration necessary.

### Mechanical

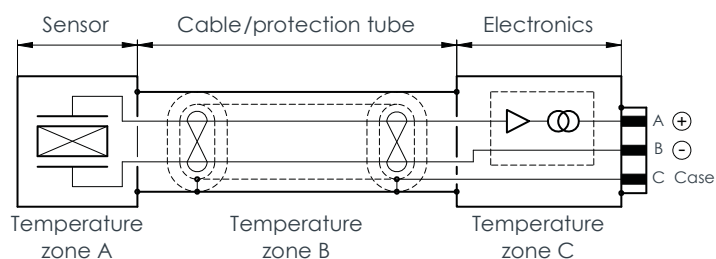
Dimensions	: See <b>Mechanical drawings starting on page 6</b>
Connection	
• Bayonet connector	: Three-contact, circular, stainless-steel connector with bayonet coupling (based on MS3112 / MIL-C-26482). Mates with a CG134 bayonet connector (such as MS3112E08-3S).
• Threaded connector	: Three-contact, circular, stainless-steel connector with threaded coupling (based on EN2997 / MIL-C-83723). Mates with a CG134 threaded connector (such as MIL-C-83723).
Weight	
• Sensor head	: 110 g (0.24 lb) approx.
• Cable/flexible stainless-steel hose (protection tube)	: 135 g/m (0.091 lb/ft) approx.
• Attached electronics (signal conditioner)	: 200 g (0.44 lb) approx.
Mounting	
• Sensor head	: Three M4 × 16 Allen bolts (hexagonal socket head) with three M4 spring-lock washers. Mounting torque of 4.5 N•m (3.3 lb-ft).
• Attached electronics	: Four M6 × 35 Allen bolts (hexagonal socket head) with four M6 spring-lock washers. Mounting torque of 15 N•m (11.1 lb-ft).
	Note: See the Mounting adaptors in <b>Accessories on page 8</b> and refer also to the <i>Vibration measurement chains using CExxx or PVxxx sensors installation manual</i> .

## MECHANICAL DRAWINGS

### CE134 with bayonet connector



#### Wiring diagram



#### Temperature zones

Zone A: -55 to 350°C (-67 to 662°F)  
Zone B: -55 to 260°C (-67 to 500°F)  
Zone C: -40 to 125°C (-40 to 257°F)

#### Notes

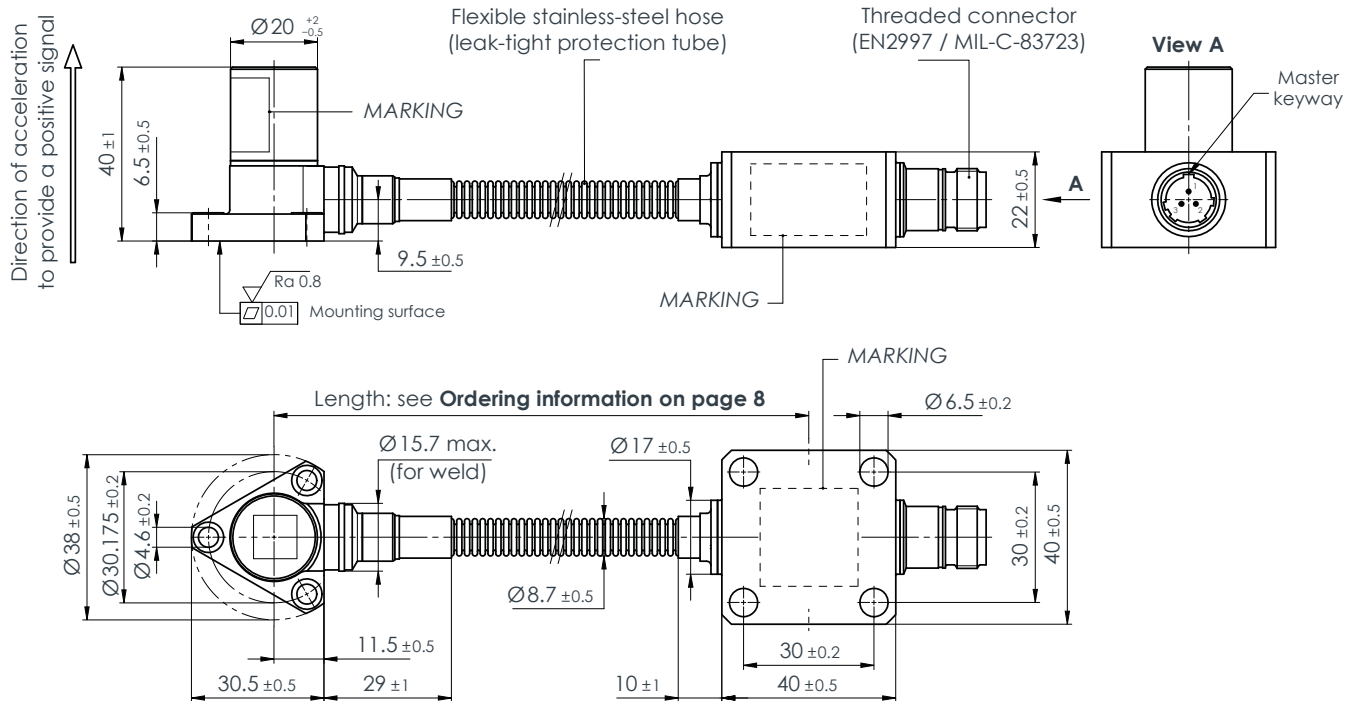
All dimensions in mm (in) unless otherwise stated.

The CE134 with the bayonet connector and the CE134 with the threaded connector are identical except for the type of connector fitted to the integrally attached electronics housing.

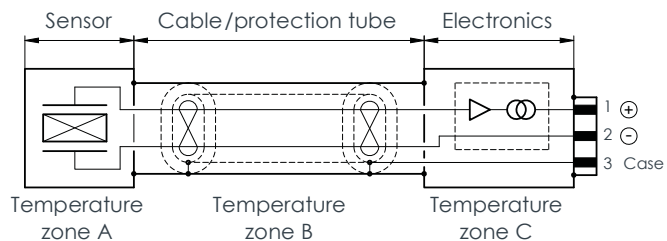
Pins B and C of the bayonet connector must be connected together externally.

## MECHANICAL DRAWINGS (continued)

### CE134 with threaded connector



#### Wiring diagram



#### Temperature zones

Zone A: -55 to 350°C (-67 to 662°F)  
Zone B: -55 to 260°C (-67 to 500°F)  
Zone C: -40 to 125°C (-40 to 257°F)

#### Notes

All dimensions in mm (in) unless otherwise stated.

The CE134 with the threaded connector and the CE134 with the bayonet connector are identical except for the type of connector fitted to the integrally attached electronics housing.

Pins 2 and 3 of the threaded connector must be connected together externally.

## ORDERING INFORMATION

To order please specify

Type	Designation	Cable length	Part number (PNR)
CE134	Different versions of the piezoelectric accelerometer:		
	– Low-frequency (LF) version with bayonet connector	3 m	444-134-000-405
	– High-frequency (HF) version with bayonet connector	3 m	444-134-000-605
	– High-frequency (HF) version with threaded connector	3 m	444-134-000-705
	– High-frequency (HF) version with threaded connector	6 m	444-134-000-715

## ACCESSORIES

### Mounting adaptors

TA102	Mounting adaptor	Refer to the 444-310-401D101 product drawing
TA104	Mounting adaptor	Refer to the 144-136-301D101 product drawing

### Cable assemblies

EC175	Cable assemblies	Cable assemblies with bayonet or threaded connector and flying leads. Refer to the 922-175-000V104 and 922-175-000V154 product drawings
EE139	Cable assembly	Cable assemblies with bayonet connector and flying leads. Refer to the 924-139-000V002 product drawing
EE143	Cable assembly	Cable assemblies with threaded connector and flying leads. Refer to the 924-143-000V002 product drawing

### Connectors

CG134	3-pin connector	Refer to the 812-134-000D031 product drawing for the threaded connector (MIL-C-83723, stainless steel) to be used with K209 cable – suitable for use in non-explosive atmospheres (ordinary applications) Refer to the 812-134-000D041 product drawing for the threaded connector (MIL-C-83723, stainless steel) to be used with K210 cable – suitable for use in potentially explosive atmospheres (hazardous areas) Refer to the 812-134-000D051 product drawing for the bayonet connector (MS3112E08-3S, aluminium) to be used with K209 or K210 cable (non-explosive or potentially explosive atmospheres)
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### Junction boxes

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



## ACCESSORIES *(continued)*

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### Transmission cables

K2xx Refer to the data sheets

### Galvanic separation units

GS1127 Refer to the data sheet

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### Sales offices

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### Local representative

### Head office

Meggitt SA  
Route de Moncor 4  
Case postale  
1701 Fribourg  
Switzerland

Tel: +41 26 407 11 11

Fax: +41 26 407 13 01

[energy@ch.meggitt.com](mailto:energy@ch.meggitt.com)

[www.meggittsensing.com/energy](http://www.meggittsensing.com/energy)

[www.meggitt.com](http://www.meggitt.com)

