



4-131

Vibration Transducer



Applications

- Industrial Turbines
- Turbine-Driven Machinery
- Power Generators
- Gas Pumping Systems

Features

- Friction-free design for long life
- Self-generated, high level, low impedance output
- Operates to +700°F (+900°F versions are available)

Velocity Sensors

Description

The friction-free moving elements in CEC's 4-131 Vibration Transducers assure long life and reliability. Designed for industrial applications on fixed turbines, you can use this instrument in turbine hot sections where high temperatures cause problems with other transducers. The system is simplified due to the low impedance, high level output that can drive AC meters, recorders, and control electronics without using special amplifiers.

The frictionless design also allows measurement of extremely low vibration levels, critical when monitoring precision balanced turbine systems. The low level is limited only by system noise.

These transducers use a seismic mass magnet suspended by springs and a coil attached to the case. The output signal results from relative movement between the magnet and coil when the case vibrates. The air damped system operates above its natural frequency, so the output signal is proportional to velocity. The sealed case prevents damage to the instrument when used in difficult environments.



4-131 Vibration Transducer

Performance Specifications

Sensitivity:	(refer to table 1) mV/in/sec $\pm 3\%$ at 80 Hz and $+77^\circ\text{F}$ ($+25^\circ\text{C}$) $\pm 4^\circ\text{F}$ at 0.5 in/sec (ips), load impedance is $10,000 \Omega \pm 2\%$
Dynamic Range	
Frequency:	15 Hz to 2000 Hz
Amplitude:	0.07 inch peak-to-peak, maximum
Acceleration:	0.2 g to 50 g
Acceleration Threshold:	0.01 g peak
Linearity:	$\pm 6\%$ along straight line between 0.1 & 1.0 ips at 80 Hz & 77°F
Frequency Response:	$\pm 15\%$ of reference sensitivity through the frequency range
Temperature Range:	-65°F to $+700^\circ\text{F}$ (-54°C to $+371^\circ\text{C}$) $+900^\circ\text{F}$ available on special order
Thermal Coefficient of Sensitivity:	$\pm 0.02\%/^\circ\text{F}$ from reference $+77^\circ\text{F}$
Sensitivity Shift with Position:	10% maximum
Damped Resonant Frequency:	Less than 15 Hz nominal
Excitation:	Self-generating
Insulation Resistance:	$100\text{K} \Omega$, minimum
Polarity:	Pin 1 is positive when the case is moved upward
Shock:	50 g's maximum in any direction
Weight:	5.8 oz. nominal
Cross Axis:	Must not exceed 2 g's maximum in continuous operation
Coil Resistance:	450 to 550Ω @ $77^\circ\text{F} \pm 4^\circ\text{F}$

Approvals

North American:
 Intrinsically Safe Class I, Division 1, Groups A, B, C & D
 Hazardous Locations (without barrier)
 Class I, Division 2, Groups A, B, C, & D

European:
 EEx ia IIB or IIC T1...T6
 EEx nA II T1...T6 X

Ordering Information

In keeping with CEC's policy of continuing product improvement, specifications may be changed without notice.

Optional Accessories

1. Cable and connector assembly P/N 169500-XXXX (length is identified in inches; e.g.: 60-inch cable is P/N 169500-0060)
2. Connector P/N 173960

Table 1

Part Number	Sensitivity	Max Temp
4-131-0001	135 mV	$+700^\circ\text{F}$ ($+371^\circ\text{C}$)
4-131-0103	150 mV	$+700^\circ\text{F}$ ($+371^\circ\text{C}$)
4-131-0107	145 mV	$+700^\circ\text{F}$ ($+371^\circ\text{C}$)
4-131-0116	200 mV	$+700^\circ\text{F}$ ($+371^\circ\text{C}$)
4-131-0123	135 mV	$+900^\circ\text{F}$ ($+482^\circ\text{C}$)

