

# Seismic Transmitter

## Product Datasheet

Bently Nevada\* Asset Condition Monitoring

### Description

The 177230 Seismic Transmitter combines a reliable basic protection solution with the support and service of GE products. The transducer is a simple, loop-powered device whose ease of installation and maintenance may reduce training and service costs. When integrated into the PLC or controls system of an overall plant asset condition monitoring solution, the transducer will help you better manage downtime, optimize maintenance planning, and avoid unforeseen catastrophic failures of machinery assets.

Features of the 177230 Seismic Transducer include:

- Ease of implementation and use
  - Interfaces with PLCs and control systems (like DCS and SCADA)
  - Provides a quick learning curve for operations and maintenance –through a familiar interface similar to that for connecting other PLC or control system inputs
  - Requires no field configuration or adjustments
  - Needs few additional parts for a complete system
  - Includes technical support for customers on how to monitor their equipment
  - Includes self-test
  - Incorporates protected interface
  - Supports a variety of interface cables
- Data Quality
  - Provides accurate and repeatable data
  - Uses simple data format
  - Provides raw vibration signal for verification and analysis
- EHS Compliant
  - Implements safe and ergonomic design
  - Supports access to hazardous areas
- Incorporates robust CM design for reliability
- Implements Industry standard 4 to 20mA loop-powered transmitter



imagination at work

Part Number 177232-01  
Rev. M

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## Specifications

### Electrical

#### Sensitivity – Main loop (Signal One)

0.0 to 12.7 mm/s (0 to 0.5 in/s)  
0.0 to 25.4 mm/s (0 to 1.0 in/s)  
0.0 to 50.8 mm/s (0 to 2.0 in/s)  
± 10% FS, broadband rms (root mean square)  
[4 ± 0.3 mA equals 0.0 mm/s and  
20 ± 2 mA equals 25.4 mm/s]

#### Output Format, Pin A Referenced to Pin B

4 to 20 mA current loop Velocity vibration

#### Excitation Voltage

12 to 30 Vdc (current limited to 40 mA)

**Note:** This product is for use with PLCs, DCS and SCADA systems that have internal power supply that are typically current limited in the range of 30 mA to 35 mA.

#### Settling Time

Less than 15 seconds within 2% of final value

#### Connector Wiring Convention

Pin A: 4-20 mA Positive Loop  
Pin B: 4-20 mA Negative Loop and common for Dynamic Signal  
Pin C: Dynamic Signal in voltage, unbuffered

#### Frequency Response

10 Hz to 1 kHz (600 cpm to 60 kcpm) ± 10%

#### Sensitivity – Dynamic Signal (Signal Two)

10.2 mV/m/s<sup>2</sup> (100 mV/g) ± 20%

#### Output Format, Pin C Referenced to Pin B

Voltage, Acceleration vibration

**Note:** The Dynamic Signal Negative (Pin B) requires isolation from any grounding. If this terminal is grounded, the 4-20 mA loop will short, resulting in no output.

#### Frequency Response

1Hz to 10 kHz ( 60cpm to 600 kcpm) ± 3 dB

#### Linearity

±1%

#### Output Bias Referenced to Pin B

2.5 V ± 0.1 V

#### Full Scale Range

147 m/s<sup>2</sup> ( 15 g's) peak

#### Velocity Range (see Option AA and BB)

0 – 12.7 mm/s (0 – 0.5 in/s)  
0 – 25.4 mm/s (0 – 1.0 in/s)  
0 – 50.8 mm/s (0 – 2.0 in/s)

#### Mounted Resonant Frequency

Greater than 12 kHz

#### Transverse Sensitivity

Less than 5% of sensitivity

#### Sensing Element Type

Ceramic / Shear

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## Environmental Limits

### Operating Temperature Range

-40 °C to +85 °C  
(-40 °F to +185 °F)

### Electrical Isolation

Greater than  $10^8$  ohms

### Isolation Breakdown Voltage

600 Vrms with less than 1 mA leakage current

### Shock Survivability

9.810 m/s<sup>2</sup> (1.000 g peak),  
maximum drop test

**Note:** This part typically mounts directly to the machine via a stud. Customers can use this device with a magnetic base, but must take care not to “snap” the unit onto the machine. This snapping action can create a very large spike signal that can damage the electronics. Rolling the magnetic-base onto the machine greatly reduces the spike signal so that the unit should not have any issues.

### Sensor Seal

Hermetically sealed

### Relative Humidity of Transmitter

To 100% non-submerged

### Magnetic Field Sensitivity

Less than 20  $\mu\text{m/s/gauss}$  (790  $\mu\text{in/s/gauss}$ ) peak  
Less than 14.7 mm/s<sup>2</sup>/gauss (150  $\mu\text{g/gauss}$ ) peak  
[base on 50 gauss, 50 - 60 Hz]

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## Physical

### Weight

131 g (4.62 oz), typical

### Diameter

25.4 mm (1.00 in)

### Height

66.0 mm (2.60 in)

### Case Material

316L stainless steel

### Connector

3-pin MIL-C-5015, 316L stainless steel

### Mounting Hole in Body

1/4-28 UNF

### Mounting Threads

M6 X 1 SI

M8 x 1.25 SI

1/4-28 UNF

**Note:** The above stud adapters are provided with each device. Other adapters are available if needed. Please see the Studs and Adapters section below, or contact the Custom Products Division.

### Mounting Torque

4 to 7 N-m (35.4 to 62.0 in-lbf)

### Connector Wiring Convention

Pin A: 4-20 mA Loop Power  
(Positive with reference to Pin B)  
Pin B: 4-20 mA Loop Return  
(Negative/ return for Dynamic Signal)  
Pin C: Dynamic Signal  
(Unbuffered, referenced to Pin B)

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## Compliance and Certifications

Electromagnetic Compatibility (EMC)

European Community Directives:

EMC Directive 2014/30/EU

Standards:

EN 61326-1

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## Hazardous Area Approvals

For the detailed listing of country and product specific approvals, refer to the **Approvals Quick Reference Guide**, document 108M1756, at [www.GEmeasurement.com](http://www.GEmeasurement.com).

### CSA/NRTL/C (Agency Approval Option 05)

Ex nL IIC T4:

AEx nA IIC T4:

Class I, Div 2, Groups A, B, C, D;

Ex ia IIC T4:

AEx ia IIC T4:

Class I, Div 1, Groups A, B, C, D;

Class II, Div 1, Groups E, F, G;

Class III, Div 1

Install per drawing 177234

T4 @  $T_a \leq 80^\circ\text{C}$

### ATEX/IECEx (Agency Approval Option 05)



II 1 G Ex ia IIC T4 Ga

II 3 G Ex nA IIC T4 Gc

T4 @  $-40^\circ\text{C} \leq T_a \leq +80^\circ\text{C}$

$(-40^\circ\text{F} \leq T_a \leq +176^\circ\text{F})$

## Ordering Information

For the detailed listing of country and product specific approvals, refer to the **Approvals Quick Reference Guide**, document 108M1756, at [www.GEmeasurement.com](http://www.GEmeasurement.com).

### Seismic Transmitter

177230-AA-BB-CC

#### Option Descriptions

AA:	The following are standard lengths	
	Feet	Metres (approx.)
	12	3.6
	15	4.5
	17	5.0
	20	6.0
	25	7.6
	30	9.0
	33	10.0
	50	15.2
	99	30.0
	<b>NOTE:</b> Non-standard/custom lengths can also be ordered at additional cost	

#### Measurement Range

00	0 – 12.7 mm/s (0 – 0.5 in/s)
01	0 – 25.4 mm/s (0 – 1.0 in/s)
02	0 – 50.8 mm/s (0 – 2.0 in/s)

#### BB: Frequency

01	10 Hz to 1 kHz (600 to 60 kcps) rms
02	3 Hz to 1 kHz (180 to 60 kcps) pk

#### CC: Approvals

05	Multiple Approvals (CSA/NRTL/C, ATEX/IECEX)
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### Interconnect Cable without Armor

16925-AA

#### Option A description

A: Length in feet

Order in increments of 1 foot (0.3 m)  
**Minimum length:** 3 feet (0.91 m)  
**Maximum length:** 99 feet (30.2m)  
**Example:** 2 5 = 25 feet

The following are standard lengths	
Feet	Metres (approx.)
12	3.6
15	4.5
17	5.0
20	6.0

25	7.6
30	9.0
33	10.0
50	15.2
99	30.0
<b>NOTE:</b> Non-standard/custom lengths can also be ordered at additional cost	

### Interconnect Cable with Armor

16710-AA

#### Option A description

A: Length in feet

Order in increments of 1 foot (0.3 m)  
**Minimum length:** 3 feet (0.91 m)  
**Maximum length:** 99 Feet (30.2m)  
**Example:** 2 5 = 25 feet

#### Accessories

The parts listed below are possible vendor sources for the supporting hardware. You can use this information as a reference and select the vendor that you wish to use.

#### 3-Pin Connector (MIL-C-5015):

##### Base

##### Cannon (ITT industries):

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

P/N: CA3106R-10SL-3S F97 or  
P/N: MS3106R-10SL-3S

##### Shell

##### Sunbank Co.

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

##### Glenair, Inc.

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

Contact a vendor with above part number and ask for their part that fits your application

#### Wire (3-wire with shield)

3-conductor 18 to 22 AWG cables with a 0.01" minimum outer jacket and inner wire insulation, and 80% minimum coverage shield. Insulation rating should be 600 V minimum.

Mil-W-16878/4 (Type E):

P/N: 83336

**Sonic/Thermax**

22 AWG -P/N: 83334

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

18 AWG -

P/N: 18-TE-1930 (3) SXE

22 AWG -

P/N: 22-TE-1934 (3) SXE

**Standard Wire and Cable Co.**

[www.std-wire.com](http://www.std-wire.com)

18 AWG -

P/N: 1100-88T

22 AWG -

P/N: 1100-66T

**Belden**

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

18 AWG -

**Studs and Adapters:**

89139-01 M-M ¼-28 UNF to ⅜-24 UNF  
Standard Stud

128038-01 M-M ¼-28 UNF to ⅜-24 Hex  
Plate Stud (1-⅜" X 0.25")

146396-01 F-M ¼-18 NPT to ¼-28 Adapter

146394-01 F-M ¼-28 UNF to ¼-18 NPT  
Adapter

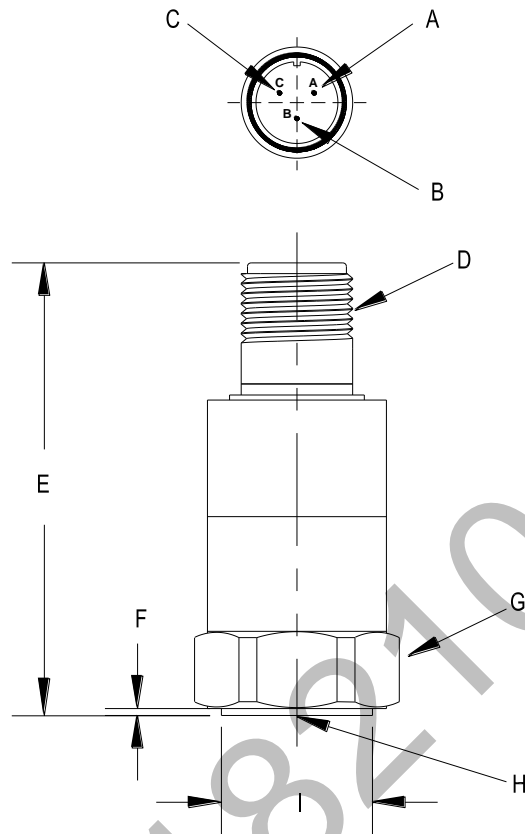
37439-01 F-M ¼-28 UNF to ¼-28 UNF  
Mounting Base

164373 M-M ¼-28 UNF to ¼-28 UNF  
Standard Stud with Brass Tip

135826-01 M-M ¼-28 UNF to M10 X 1.0  
Standard Stud

## Graphs and Figures

Note: All dimensions shown are in millimetres (inches) except as noted.



- A. Positive loop (4-20 mA)
- B. Negative loop (4-20 mA) and common for dynamic signal
- C. Dynamic signal
- D. 3-pin MIL-C-5015, 5/8-24 UNEF-2A
- E. 66.0 mm (2.60 in)
- F. 1.27 mm (0.050 in)
- G. 25.4 mm (1.00 in)
- H. 1/4-28 UNF-2B (English)
- I. 25.1 mm (0.990 in)

**Figure 1: Transducer Mechanical Outline and Dimensions**

Dimensions shown in mm (inches) except as noted

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