

Seismic Transmitter

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

Specifications

Electrical

Sensitivity – Main loop (Signal One)

0.0 to 25.4 mm/s (0 to 1.0 in/s)
± 10%, broadband rms (root mean square)

[4 mA equals 0.0 mm/s and
20 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/s² (100 mV/g) ± 5%

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

2.5 Hz to 10 kHz (150 cpm to 600 kcpm) ± 10%

Linearity

±1%

Output Bias Referenced to Pin B

2.5 V ± 0.1 V

Full Scale Range

196m/s² (20 g's) peak

Velocity Range

420 mm/s (16.5 in/s) peak

Mounted Resonant Frequency

Greater than 12 kHz

Transverse Sensitivity

Less than 5% of sensitivity

Sensing Element Type

Ceramic / Shear

Environmental Limits		Physical	
Operating Temperature Range		Weight	
	-40 °C to +85 °C (-40 °F to +185 °F)		131 g (4.62 oz), typical
Electrical Isolation		Diameter	
	Greater than 10 ⁸ ohms		25.4 mm (1.00 in)
Isolation Breakdown Voltage		Height	
	600 Vrms with less than 1 mA leakage current		66.0 mm (2.60 in)
Shock Survivability		Case Material	
	9.810 m/s ² (1.000 g peak), maximum drop test		316L stainless steel
		Connector	
Note: This part typically mounts directly to the machine via a stub. Customers can use this device with a mag-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 mag-base onto the machine greatly reduces the spike signal so that the unit should not have any issues.			3-pin MIL-C-5015, 316L stainless steel
Sensor Seal		Mounting Hole in Body	
	Hermetically sealed		1/4-28 UNF
Relative Humidity of Transmitter		Mounting Threads	
	To 100% non-submerged		M6 X 1 SI M8 x 1.25 SI ¼-28 UNF
Magnetic Field Sensitivity		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.	
	Less than 20 µm/s/gauss (790 µin/s/gauss) peak Less than 14.7 mm/s ² /gauss (150 µg/gauss) peak [base on 50 gauss, 50 - 60 Hz]	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)		

Compliance and Certifications

EMC

European Community Directives

EMC Directive 2004/108/EC

Standards:

EN 61326-2-3:2006



EN 61326-2-1:2006

Hazardous Area Approvals

North America:

Ex nL IIC T4
AEx nA IIC T4
Class I, Div 2, Groups A, B, C, D
Ex nL IIC T4: Class I, Zone 2
Ex ia, IIC T4
AEx ia IIC T4
Class I, Div 1, Groups A, B, C, D;
Class II, Div 1, Groups E, F, and G;
Class III, Div 1
 $U_i \leq 28V$, $I_i \leq 120\text{ mA}$, $P_i \leq 1W$,
 $C_i \approx 0$, $L_i \leq 121.06\text{ }\mu H$
T4 @ $-40^{\circ}C < T_a < 80^{\circ}C$

Europe:

 II 1 G Ex ia IIC T4 Ga
 II 3 G Ex nA IIC T4 Gc
 $U_i \leq 28V$, $I_i \leq 120\text{ mA}$, $P_i \leq 1W$,
 $C_i \approx 0$, $L_i \leq 121.06\text{ }\mu H$
T4 @ $-40^{\circ}C < T_a < 80^{\circ}C$

IECEX:

Ex ia IIC T4 Ga
Ex nA IIC T4 Gc
 $U_i \leq 28V$, $I_i \leq 120\text{ mA}$, $P_i \leq 1W$,
 $C_i \approx 0$, $L_i \leq 121.06\text{ }\mu H$
T4 @ $-40^{\circ}C < T_a < 80^{\circ}C$

For further certification and approvals information please visit the following website:
www.ge-mcs.com/bently

Ordering Information

Country specific approvals may be available. Please consult your local Customer Care Representative for more information.

For standard orders use the number provided below.

Product Description

Seismic Transmitter

177230-AA-BB-CC

Option Descriptions

AA: 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, ATEX, and IECEx)

Product Description

Interconnect Cable without Armor

16925-AA

Option A description

A: Length in feet

Order in increments of 1 foot (0.3 m)

Minimum length: 12 feet (3.7 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
NOTE: Non-standard/custom lengths can also be ordered at additional cost	

Product Description**Interconnect Cable with Armor****16710-AA****Option A description****A:** Length in feet

Order in increments of 1 foot (0.3 m)

Minimum length: 12 Feet (3.7 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
NOTE: Non-standard/custom lengths can also be ordered at additional cost	

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.comP/N: CA3106R-10SL-3S F97 or P/N:
MS3106R-10SL-3S**Shell****Sunbank Co.**www.sunbankcorp.com**Glenair, Inc.**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):**Sonic/Thermax**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

18 AWG -

P/N: 1100-88T

22 AWG -

P/N: 1100-66T

Beldenwww.belden.com

18 AWG -

P/N: 83336

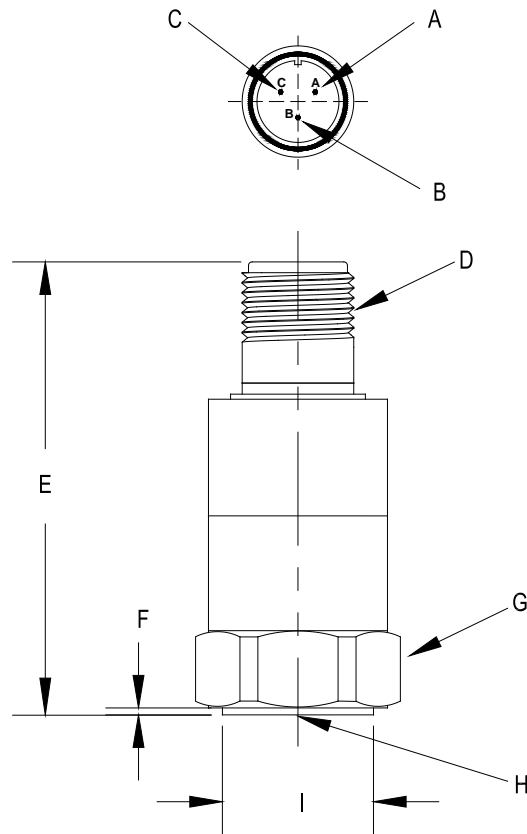
22 AWG -P/N: 83334

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

* Denotes a trademark of Bently Nevada, Inc., a wholly owned subsidiary of General Electric Company.

© 2007 – 2014 Bently Nevada, Inc. All rights reserved.

Printed in USA. Uncontrolled when transmitted electronically.

1631 Bently Parkway South, Minden, Nevada USA 89423

Phone: 775.782.3611 Fax: 775.215.2873

www.ge-mcs.com/bently