

# 330525 Velomitor XA Piezo-velocity Sensor

## Datasheet

Bently Nevada Machinery Condition Monitoring

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### Description

The Velomitor XA (eXtended Application) Sensor is a ruggedized version of Bently Nevada's 330500 Velomitor Sensor. Its 316L stainless steel case and unique, weatherproof connector and cable assembly permit mounting without a housing. The Velomitor XA Sensor cable assembly is suitable for use in moist environments, and the Velomitor XA Sensor design meets the requirements of IP-65 and NEMA 4X dust ratings when properly installed with a mating extension cable.

If you are monitoring rotor vibration using a transducer placed on a bearing housing or machine casing, carefully choose a location for each transducer.



Common machine malfunctions like imbalance and misalignment originate in the rotor, causing a change in rotor vibration.

To obtain meaningful measurements, install the transducer in a location that transmits significant rotor vibration.

The location must also conduct rotor amplitude and frequency response that accurately reflect actual machine vibration.

If needed, Bently Nevada provides engineering services that can help you identify the optimum locations for transducers on bearing housings or machine casings. To request assistance, visit [Bently.com](http://Bently.com).



## Specifications

Parameters are specified from +20 to +30 °C (+68 to +86 °F) and 100 Hz unless otherwise indicated.



Operating the unit outside the specified limits may result in false readings or loss of machine monitoring.

Sensitivity	3.94mV/mm/s (100 mV/in/s) ±5%.
Frequency Response	4.5 to 2,000 Hz (270 to 120,000 cpm) ±3.0 dB, 6.0 to 1,000 Hz (360 to 60,000 cpm) ±0.9 dB.
Temperature Sensitivity	-14% to +7.5% typical over the operating temperature range.
Velocity Range	1270 mm/s (50 in/s) peak.
Transverse Sensitivity	Less than 5% of sensitivity.
Amplitude Linearity	±2% to 152 mm/s (6 in/s) peak.
Mounted Resonant Frequency	Greater than 12 kHz.
Broadband Noise Floor (4.5 Hz to 2 kHz)	0.004 mm/s (160 min/s) rms, nominal.
Power Requirements	DC Voltage: -22 to -30 V <sub>DC</sub> Bias Current: 2.5 to 6.0 mA
Output Bias Voltage	-12 ± 3.0 V <sub>DC</sub> , Over Temperature Referenced to Pin A
Dynamic Output Impedance	Less than 2400 Ω
Broadband Noise Floor	Less than 0.004 mm/s (160 μin/s)
Grounding	Case isolated
Maximum cable length	305 metres (1,000 feet) of cable, BN part number 02173007 with no degradation of signal.

## Environmental Limits

Operating Temperature Range	-55 °C to +121 °C (-67°F to +250°F)
Shock Survivability	5000 g peak, maximum
Relative Humidity	To 100% non-submerged; case is hermetically-sealed.
Magnetic Field Susceptibility	<51 min/s/gauss (50 gauss, 50-60 Hz)
Operating Temperature Range	-55 °C to +121 °C (-67°F to +250°F)
Shock Survivability	5000 g peak, maximum
Relative Humidity	To 100% non-submerged; case is hermetically-sealed.
Magnetic Field Susceptibility	<51 min/s/gauss (50 gauss, 50-60 Hz)

## Physical Description

Weight	156 g (5.5 oz), typical
Diameter	28 mm (1.1 in)
Height	73.1 mm (2.88 in)
Case Material	316L stainless steel
Connector	2-pin Mil-C-26482 hermetically-sealed, 316L stainless steel shell.
Mounting Torque	45 N-m (33 ft-lb) maximum
Polarity	Pin A goes positive with respect to pin B when the sensor case motion is toward the connector.
Cable Bend Radius	1.5-in minimum bend radius.



Operating the unit outside the specified limits may result in false readings or loss of machine monitoring.

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Before installing and using this product, read the 330500, 330525, and 330530 Velomitor Sensors User Guide (document 100076).

## Compliance and Certifications

### FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

### EMC

EMC Directive 2014/30/EU

### RoHS

RoHS Directive 2011/65/EU

### Maritime

#### 330400 and 330425 only

ABS 2009 Steel Vessels Rules

1-1-4/7.7,4-8-3/1.11.1,4-9-7/13

## Hazardous Area Approvals

### CSA/NRTL/C

#### 190501 (Agency Approval Options 01 through 04)

Intrinsically Safe	<p>Ex ia IIC T4:            Class I, Div 1, Groups A, B, C, D.            Class II, Group E, F and G            Class III</p> <p>AEx ia IIC T4:            Class I, Div 1, Groups A, B, C, D;            Class II, Groups E, F, G            Class III</p> <p>Install per drawing 167536</p>
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	<p>T4 @ -40 °C ≤ Ta ≤ +100 °C            (-40 °F ≤ Ta ≤ +212 °F)</p>
Intrinsically Safe and Non-Incendive	<p>Ex nL IIC T4            Class I, Division 2, Groups A, B, C and D</p> <p>AEx nA T4            Class I, Division 2, Groups A, B, C and D</p> <p>Install per drawing 167536</p> <p>T4 @ -40 °C ≤ Ta ≤ +100 °C            (-40 °F ≤ Ta ≤ +212 °F)</p>
<b>330400, 330425</b>	<p>Ex ia IIC T4            AEx ia IIC T4            Class I, Div 1 Groups A, B, C and D            Class II, Groups E, F, and G            Class III</p> <p>T4 @ -40°C ≤ Ta ≤ 100°C            Install per dwg 167538</p>
<b>330500</b>	<p>Ex ia IIC T4            AEx ia IIC T4            Class I, Division 1, Groups A, B, C and D            Class II, Groups E, F, G            Class III</p> <p>Install per dwg 167537            T4 @ -40°C ≤ Ta ≤ 100°C</p> <p>Ex nL IIC T4            AEx nA IIC T4            Class I, Div 2, Groups A, B, C, D</p> <p>Install per dwg 167537            T4 @ -40°C ≤ Ta ≤ 100°C</p>
<b>330525</b>	<p>Ex ia IIC T4            AEx ia IIC T4            Class I, Division 1, Groups A, B, C and D            Class II, Groups E, F, G            Class III</p> <p>T4 @ -40°C ≤ Ta ≤ 100°C</p> <p>Ex nL IIC T4            AEx nA IIC T4            Class I, Div 2, Groups A, B, C, D</p> <p>Install per dwg 167539            T4 @ -40°C ≤ Ta ≤ 100°C</p>

### ATEX/IECEx





**190501, 330400, 330425, 330500, 330525**

Equipment must be connected to equipment, which meets the abovelisted entity parameters.

The cables type A or B (in compliance with EN 60079-25) must respect the cable parameters listed with the entity parameters.

**Zone 2 :**

The supply electrical parameters shall not exceed the values mentioned in the tables above.

<b>190501</b>	 II 1 G Ex ia IIC T4 Ga	
	 II 3 D Ex na IIC T4 Gc Ex tc III T130°C Dc  T4@ Ta = -55°C to 121°C	
<b>Entity Parameters</b>	<b>Zone 0/1</b>	<b>Zone 2</b>
	Ui= 30V	Ui= 30V
	Ii= 200mA	Ii= 200mA
	Pi= 0.75W	Pi= 1.14W
	Ci-27.2nF	
	Li= 0	
<b>330400, 330425, 330500, 330525</b>	 II 1 G Ex ia IIC T4 Ga	
	 II 3 D Ex na IIC T4 Gc Ex tc III T130°C Dc  T4@ Ta = -55°C to 121°C	
<b>Entity Parameters</b>	<b>Zone 0/1</b>	<b>Zone 2</b>
	Ui= 28V	Ui= 28V
	Ii= 150mA	Ii= 150mA
	Pi= 0.84W	Pi= 1.26W
	Ci-10.8nF	
	Li= 0	

**Hazardous Area Conditions of Safe Use**

**ATEX/IECEX**

**Zone 0/1:**

## Ordering Information



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

### 330525-AA

A: Agency Approval Option	
0 0	None Required
0 1	CSA/NRTL/C
0 2	SIRA/CENELEC

### 106765-AA Interconnect Cable

A: Length (in meters)	
Minimum length	1 meter(3.3 feet)
Maximum length	25 meters (82 feet)

Order in increments of 3 meters.

## Terminal Housing

Terminal Housing for terminating Velomitor XA Sensor cable to bulk cable listed above. The Terminal Housing provides local connection of the Velomitor XA Sensor signal wires to the monitor field wiring. Each Terminal Housing can accommodate up to 2 Velomitor XA Sensor Cables.

### 106769-AA

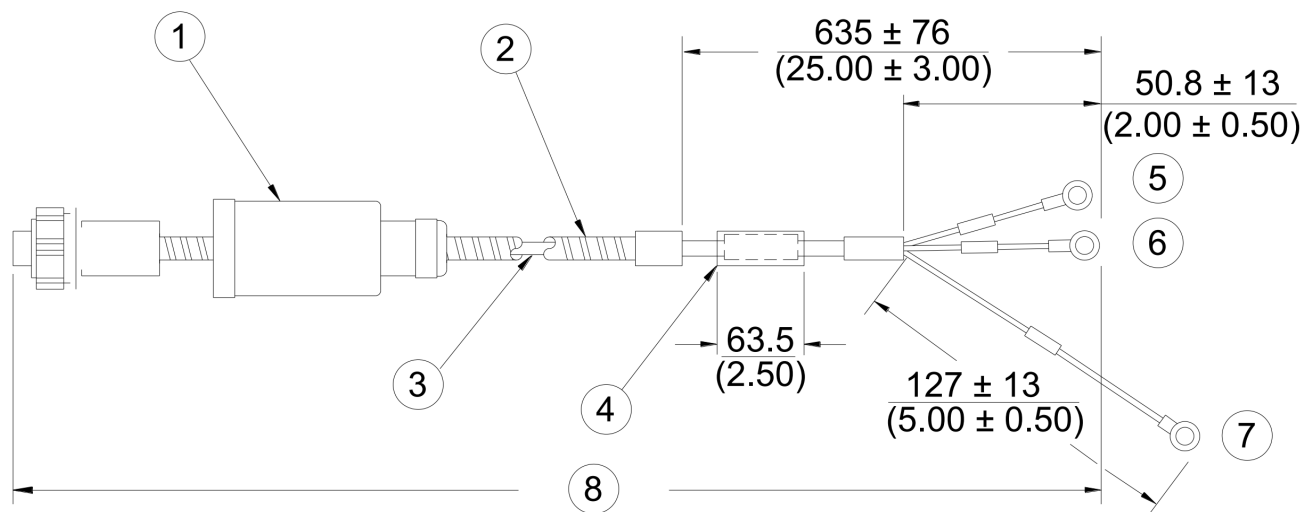
A: Conduit Fitting Option	
0 0	No fittings supplied
0 1	One ¾ NPT fitting
0 2	Two ¾ NPT fittings

## Accessories

100076	330500/330525 Velomitor Sensor and Velomitor XA Sensor User Guide
02173007	Bulk cable; two-conductor twisted,

	shielded. 22 AWG cable without connectors or terminal lugs. Specify length in feet.
103537-01	Terminal Mounting Block. Provides simple field wiring connection and can be mounted inside any standard Proximitor Sensor housing. One terminal mounting block is needed for each Velomitor XA Sensor connection.
03839144	Splash-resistant boot cover for interconnect cable assembly. The boot is made from fluorosilicone elastomer. Boot color is blue.
03839142	Bottom clamp used to secure the boot to the Velomitor XA Sensor case.
03839143	Top clamp used to secure the boot to the interconnect cable assembly.

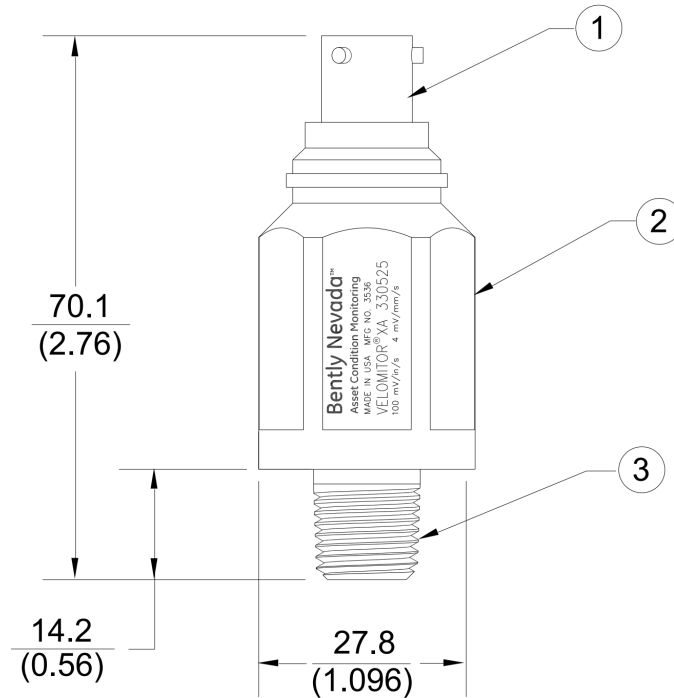
## Graphs and Figures



1. Splash-resistant boot with clamps	5. "A" (white)
2. Stainless steel armor over cable	6. "B" (black)
3. 0.382 mm <sup>2</sup> (22 AWG)	7. "SHLD" (green)
4. Clear shrink tubing	8. Overall length ± 200 (7.8)

**Figure 1: Dimensions for 106765 Cable**

Dimensions are in millimeters (inches)



- 1. MIL-C-26482 receptacle
- 2. 25.4 (100) hexagonal
- 3. 1/4-18 NPT

**Figure 2: Dimensions for 330525 Velomitor XA Piezo-Sensor**

Dimensions are in millimeters (inches)

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