330525 Velomitor XA Piezo-velocity Sensor

Datasheet

Bently Nevada Machinery Condition Monitoring

141633 Rev. M



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 measuring a machine housing to determine where to install transducers, consider what kinds of data you need to obtain. Most common machine malfunctions (imbalance, misalignment, and so forth) originate at the rotor and cause a change in rotor vibration. The location you select on the housing must accurately conduct rotor vibration to the transducer.

Install the transducer carefully. If you don't, the transducer may not accurately detect vibrations and can transmit invalid data. Bently Nevada provides engineering services to accurately measure machine housings and to install transducers.

Bently Nevada
a Baker Hughes business

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_{DC} Bias Current: 2.5 to 6.0 mA
Output Bias Voltage	-12 ± 3.0 V_{DC}, 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.

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

For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from Bently.com.

CSA/NRTL/C

190501 (Agency Approval Options 01 through 04)	
Intrinsically Safe	Ex ia IIC T4: Class I, Div 1, Groups A, B, C, D. Class II, Group E, F and G Class III AEx ia IIC T4: Class I, Div 1, Groups A, B, C, D; Class II, Groups E, F, G Class III Install per drawing 167536 T4 @ -40 °C ≤ Ta ≤ +100 °C (-40 °F ≤ Ta ≤ +212 °F)
Intrinsically Safe and Non-Incendive	Ex nL IIC T4 Class I, Division 2, Groups A, B, C and D AEx nA T4 Class I, Division 2, Groups A, B, C and D Install per drawing 167536 T4 @ -40 °C ≤ Ta ≤ +100 °C (-40 °F ≤ Ta ≤ +212 °F)
330400, 330425	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 T4 @ -40°C ≤ Ta ≤ 100°C Install per dwg 167538
330500	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 Install per dwg 167537 T4 @ -40°C ≤ Ta ≤ 100°C Ex nL IIC T4 AEx nA IIC T4 Class I, Div 2, Groups A, B, C, D Install per dwg 167537 T4 @ -40°C ≤ Ta ≤ 100°C
330525	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

	T4 @ -40°C ≤ Ta ≤ 100°C Ex nL IIC T4 AEx nA IIC T4 Class I, Div 2, Groups A, B, C, D Install per dwg 167539 T4 @ -40°C ≤ Ta ≤ 100°C

ATEX/IECEx

190501, 330400, 330425, 330500, 330525

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

Hazardous Area Conditions of Safe Use

ATEX/IECEx

Zone 0/1:

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.

Ordering Information

For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from 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.

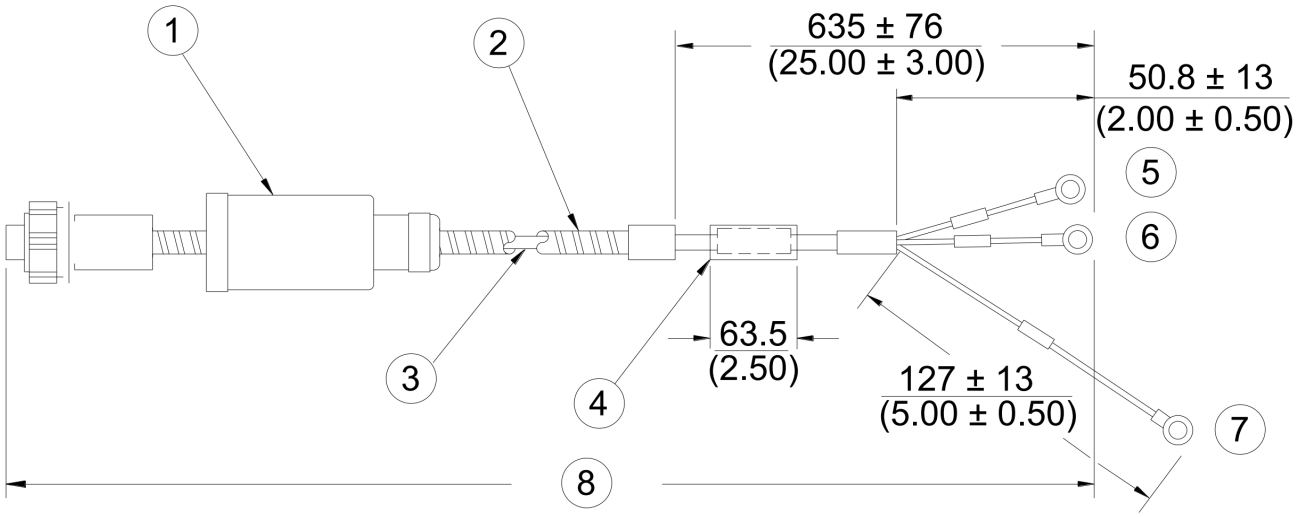
106769-AA

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 SensorUser 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.

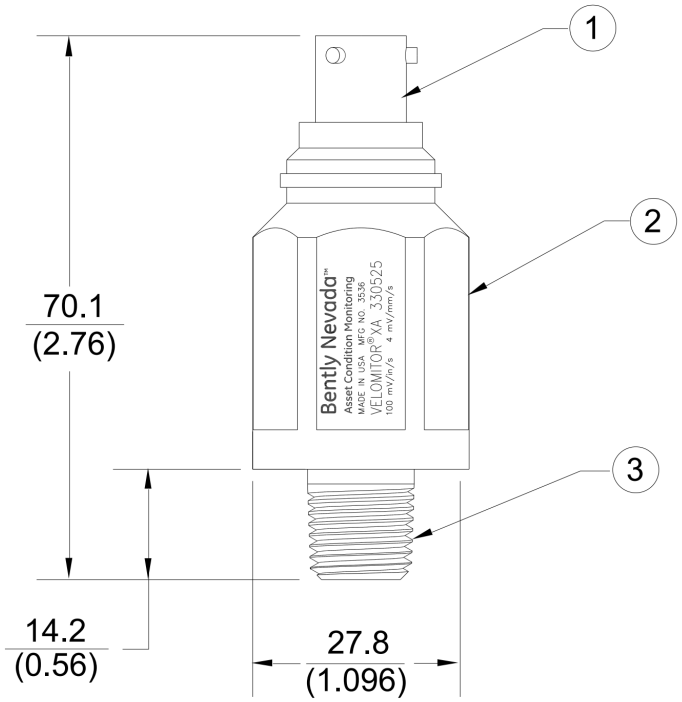
Graphs and Figures



1. Splash-resistant boot with clamps	5. “A” (white)
2. Stainless steel armor over cable	6. “B” (black)
3. 0.382 mm² (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)

Copyright 2020 Baker Hughes Company. All rights reserved.

Bently Nevada, Orbit Logo, Velomitor, Proximitor and System 1 are registered trademarks of Bently Nevada, a Baker Hughes Business, in the United States and other countries. The Baker Hughes logo is a trademark of Baker Hughes Company. All other product and company names are trademarks of their respective holders. Use of the trademarks does not imply any affiliation with or endorsement by the respective holders.

Baker Hughes provides this information on an "as is" basis for general information purposes. Baker Hughes does not make any representation as to the accuracy or completeness of the information and makes no warranties of any kind, specific, implied or oral, to the fullest extent permissible by law, including those of merchantability and fitness for a particular purpose or use. Baker Hughes hereby disclaims any and all liability for any direct, indirect, consequential or special damages, claims for lost profits, or third party claims arising from the use of the information, whether a claim is asserted in contract, tort, or otherwise. Baker Hughes reserves the right to make changes in specifications and features shown herein, or discontinue the product described at any time without notice or obligation. Contact your Baker Hughes representative for the most current information.

The information contained in this document is the property of Baker Hughes and its affiliates; and is subject to change without prior notice. It is being supplied as a service to our customers and may not be altered or its content repackaged without the express written consent of Baker Hughes. This product or associated products may be covered by one or more patents. See Bently.com/legal.

1631 Bently Parkway South, Minden, Nevada USA 89423
Phone: 1.775.782.3611 or 1.800.227.5514 (US only)
Bently.com