

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Selected official pages for procurement and maintenance review

PRODUCT BRAND

Bently Nevada

PRODUCT MODEL

330500 Velomitor

330500 Velomitor - Piezoelectric vibration velocity sensor
Selected manufacturer pages; verify exact configuration.

OFFICIAL SOURCE

Datasheet 141632 Rev. T

[Open current manufacturer source](#)

AMIKON PRODUCT SUPPORT

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Amikon Limited prepared this independent reference package. Selected manufacturer pages follow with their original content and pagination visible.

330500 Velomitor Piezo-velocity Sensor

Datasheet

Bently Nevada Machinery Condition Monitoring

141632 Rev. T



Description

Bently Nevada Velomitor Piezo-velocity Sensors are designed to measure absolute (relative to free space) bearing housing, casing, or structural vibration. The 330500 is a specialized piezoelectric accelerometer that incorporates embedded integrated electronics in a solid-state design.

Because the 330500 incorporates solid-state electronics and has no moving parts, it does not suffer from mechanical degradation and wear, and can be mounted vertically, horizontally, or at any other angle of orientation



Most common machine malfunctions (unbalance, misalignment, etc.) occur on the rotor and originate as an increase (or at least a change) in rotor vibration. For any individual casing measurement to be effective for overall machine protection, the system must continually transmit a significant amount of rotor vibration to the machine casing, or mounting location of the transducer.

In addition, be careful to install the accelerometer transducer on the bearing housing or machine casing. Improper installation may decrease the transducer amplitude and frequency response and/or generate false signals that do not represent actual vibration. Refer to the appropriate instruction manuals and Application Notes.

Upon request, Bently Nevada provides engineering services that can identify the appropriate machine housing measurements and installation assistance if needed.





If you integrate the 330500 Velomitor output to measure displacement, electrical noise from interference and the transducer circuit can be amplified. The noise can degrade performance of 330500 transducers and produce inaccurate displacement data.

Specifications

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



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

Electrical

Sensitivity	3.94 mV/mm/s (100 mV/in/s) $\pm 5\%$.
Frequency Response	4.5 Hz to 5 kHz (270 cpm to 300 kcpm) ± 3.0 dB. 6.0 Hz to 2.5 kHz (360 cpm to 150 kcpm) ± 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	$\pm 2\%$ to 152 mm/s (6 in/s) peak.
Mounted Resonant Frequency	Greater than 12 kHz.
Output Bias Voltage	-12 ± 3.0 V _{DC} , over temperature referenced to Pin A.
Dynamic Output Impedance	Less than 2400 Ω
Broadband Noise Floor (4.5 Hz to 5 kHz)	0.004 mm/s (160 μ in/s) rms, nominal
Grounding	Case isolated

Maximum Cable Length	305 m (1,000 ft) of cable, part number 02173006, with no degradation of signal.
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Environmental Limits

Operating Temperature Range	-55°C to 121°C (-67°F to 250°F)
Shock Survivability	5,000 g peak, maximum
Relative Humidity	To 100% non-submerged; case is hermetically-sealed.
Base Strain Sensitivity	0.005 in/s/mstrain.
Magnetic Field Susceptibility	<51 min/s/gauss (50 gauss, 50-60Hz).

Physical

Weight	142 grams (5.0 oz), typical.
Diameter	25.3 mm (0.995 in).
Height	63.2 mm (2.49 in).
Case Material	316L stainless steel.
Connector	2-pin Mil-C-5015 hermetically-sealed, 316L stainless steel shell.
Mounting Torque	32-46 kg cm (24-40 in-lb) max.
Polarity	When the sensor case motion is toward the connector, Pin A becomes positive with respect to pin B.
Recommended cable length (assuming max vibration of 50g, frequency 10 kHz, and cable capacitance 200 pf/m.) For longer lengths, contact Bently Nevada Tech Support.)	208 ft (63m)

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

DNV rules for classification – Ships

DNV rules for classification – High speed and light craft

DNV offshore standards

Hazardous Area Approvals



For the detailed listing of country and product-specific approvals, refer to the [Approvals Quick Reference Guide \(108M1756\)](#).

For additional technical documentation, please log in to bntechsupport.com and access the Bently Nevada Media Library.

CSA/NRTL/C

330500	Ex ia IIC T3 AEx ia IIC T3 Class I, Division 1, Groups A, B, C and D Class II, Groups E, F, G Class III Install per dwg 167537 $-55^{\circ}\text{C} \leq T_{\text{amb}} \leq 121^{\circ}\text{C}$ Ex ec IIC T3 Gc Ex tc IIIC T200°C Dc Class I, Div 2, Groups A, B, C, D Install per dwg 167537 $-55^{\circ}\text{C} \leq T_{\text{amb}} \leq 121^{\circ}\text{C}$
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ATEX/IECEx

330500

330500	 II 1 G Ex ia IIC T3 Ga  II 3 D Ex ec IIC T3 Gc Ex tc IIIC T200°C Dc $-55^{\circ}\text{C} \leq T_{\text{a}} \leq +121^{\circ}\text{C}$												
Entity Parameters	<table><tr><th>Zone 0/1</th><th>Zone 2</th></tr><tr><td>Ui= 28V</td><td>Ui= 28V</td></tr><tr><td>Ii= 100mA</td><td>Ii= 100mA</td></tr><tr><td>Pi= 0.84W</td><td>Pi= 0.84W</td></tr><tr><td>Ci=10.8nF</td><td></td></tr><tr><td>Li= 0</td><td></td></tr></table>	Zone 0/1	Zone 2	Ui= 28V	Ui= 28V	Ii= 100mA	Ii= 100mA	Pi= 0.84W	Pi= 0.84W	Ci=10.8nF		Li= 0	
Zone 0/1	Zone 2												
Ui= 28V	Ui= 28V												
Ii= 100mA	Ii= 100mA												
Pi= 0.84W	Pi= 0.84W												
Ci=10.8nF													
Li= 0													

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 \(108M1756\)](#).

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Velomitor Piezo-velocity Sensor 330500-AA-BB

A: Mounting Thread Adaptor Option

00	No adapter
01	1/2-20 UNF
02	M8 x 1
03	1/4-28 UNF
04	1/4-20 UNC
05	Unavailable for 330500.

Note: For 1/4-18 NPT mounting, order 330525.

06	5/8 – 18 UNF
07	3/8 – 16 UNC
08	1/2 – 13 UNC

B: Agency Approval Option

00	Not required
01	CSA/US/C
02	ATEX (European)
04	Multiple approvals (CSA, ATEX)

Interconnection Cables

Standard Cable Lengths

Feet	Meters (approximate)
6 ft	1.8 m
8 ft	2.4 m
10 ft	3.0 m
12 ft	3.6 m
15 ft	4.5 m
17 ft	5.0 m
20 ft	6.0 m
25 ft	7.6 m
30 ft	9.0 m
33 ft	10.0 m
50 ft	15.2 m
99 ft	30.0 m

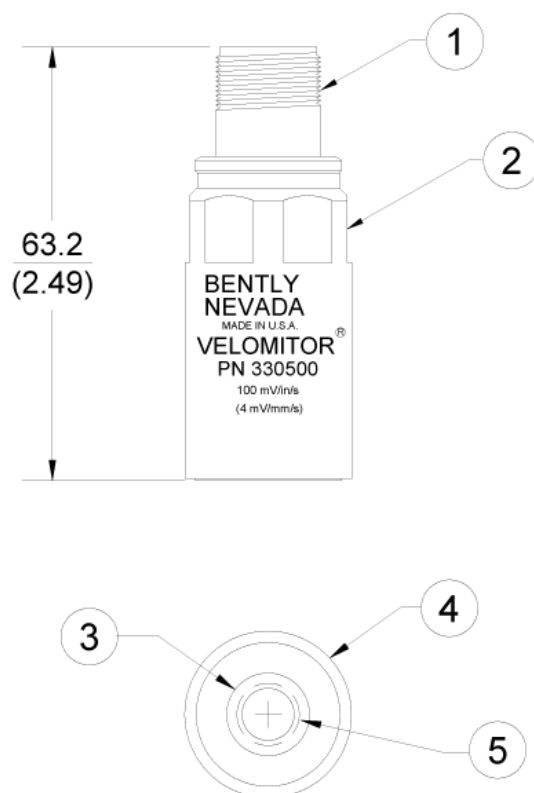
Custom Cable Part Numbers

You can order custom cable lengths in increments of 1.0 ft (305 mm) at additional cost. Some cables have a minimum and maximum length.



Use 'NN' in these part numbers to specify the length (in feet) of the cable you want to order.

Graphs and Figures



1. 2-pin, MIL-C-5015 receptacle
2. 15/16 inch hexagonal
3. 12.7 (0.500) diameter, 0.8 (0.030) deep counterbore
4. 25.3 (0.995) diameter
5. 3/8-24 UNF-2B, 6.4 (0.250) minimum threaded depth, 14.0 (0.550) maximum drill depth

Figure 1: Velomitor Piezo-Velocity Sensor Dimensional Drawing

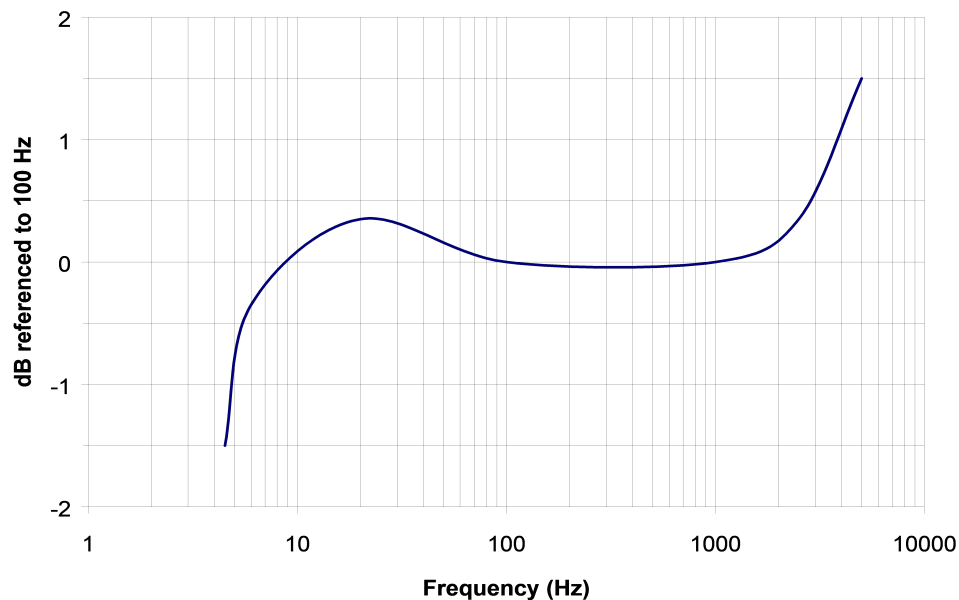


Figure 2: Typical Amplitude Response

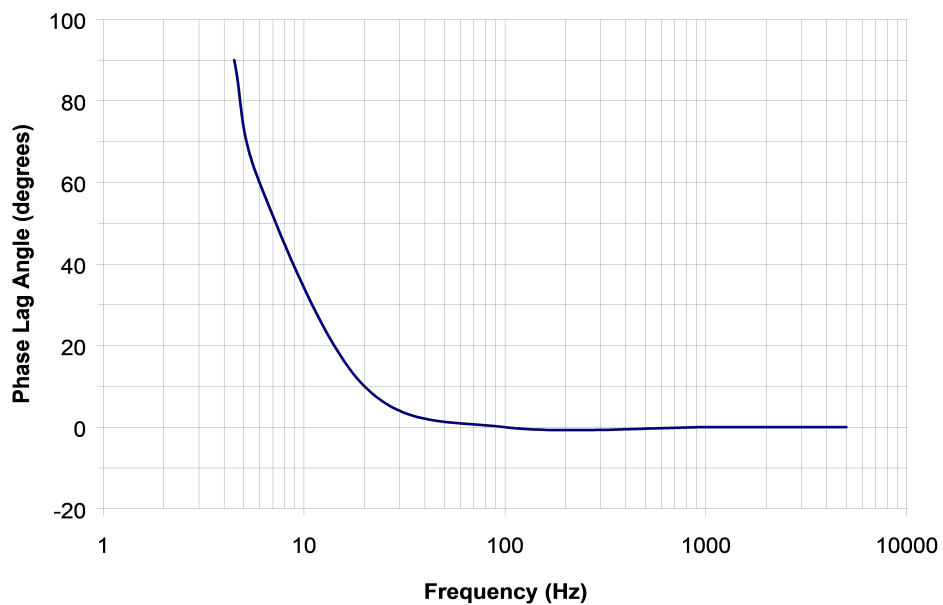


Figure 3: Typical Phase Response

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