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330400 and 330425 Accelerometer Acceleration Transducers

Bently Nevada* Asset Condition Monitoring

Description

These accelerometers are intended for critical machinery applications where casing acceleration measurements are required, such as gear mesh monitoring. The 330400 is designed to address the requirements of American Petroleum Institute Standard 670 for accelerometers. It provides an amplitude range of 50 g peak and a sensitivity of 100 mV/g. The 330425 is identical except it provides a larger amplitude range (75 g peak) and a sensitivity of 25 mV/g.

⚠ **Caution**

If housing measurements are being made for overall protection of the machine, thought should be given to the usefulness of the measurement for each application. Most common machine malfunctions (imbalance, misalignment, etc.) originate at the rotor and cause an increase (or at least a change) in rotor vibration. In order for any housing measurement alone to be effective for overall machine protection, a significant amount of rotor vibration must be faithfully transmitted to the bearing housing or machine casing, or more specifically, to the mounting location of the transducer.

In addition, care should be exercised in the physical installation of the transducer. Improper installation can result in a degradation of the transducer's performance, and/or the generation of signals which do not represent actual machine vibration. Integration of the output to velocity can worsen this. Extreme caution should be exercised if integrating to velocity. For high quality velocity measurements the 330500 Velomitor* Sensor should be used.

Upon request, we can provide engineering services to determine the appropriateness of housing measurements for the machine in question and/or to provide installation assistance.

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Specifications

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

Note: Operation outside the specified limits may result in false readings or loss of machine monitoring.

Electrical

330400

Sensitivity:

10.2 mV/m/s^2 (100 mV/g) ±5%.

Acceleration range:

490 m/s^2 (50 g) peak overall acceleration within the 10 Hz to 15 kHz frequency span. Vibration at frequencies above 15 kHz, especially at the transducers resonance will significantly decrease this range.

Amplitude Linearity:

±1% to 490 m/ s^2 (50 g) peak.

Broadband Noise Floor (10 Hz to 15 kHz):

0.039 m/s2 (0.004 g) rms.

330425

Sensitivity:

2.5 mV/m/s^2 (25 mV/g) ±5%.

Acceleration Range:

735 m/s^2 (75 g) peak overall acceleration within the 10 Hz to 15 kHz frequency span. Vibration at frequencies above 15 kHz, especially at the transducer's resonance, will significantly decrease this range.

Amplitude Linearity:

±1% to 735 m/s2 (75 g) peak.

Broadband Noise Floor (10 Hz to 15 kHz):

0.098 m/s^2 (0.01 g) rms.

Both Units

Frequency Response:

10 Hz to 15 kHz

(600 cpm to 900,000 cpm) ±3dB;

30 Hz to 10 kHz

(1800 cpm to 600,000 cpm) ±10%

Temperature Sensitivity:

-11% to +3% typical over the operating temperature range.

Transverse Sensitivity:

Less than 5% of axial.

Mounted Resonant Frequency:

Greater than 30 kHz.

Amplitude of Resonant Peak:

20 dB maximum.

Base* Strain *Sensitivity:

For serial numbers preceded by the letter "G" (including all new sensors):

49 mm/s^2/µstrain (0.005 g/µstrain)

For serial numbers NOT preceded by the letter "G" (shipped prior to April 2004):

980 mm/s^2/µstrain (0.100 g/µstrain) without Mounting Base (API adapter);

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4.9 mm/s^2/μstrain (0.0005 g/μstrain) with Mounting Base (API adapter) supplied with the accelerometer.

Note: Bently Nevada recommends installing with the Mounting base to minimize base strain sensitivity for serial numbers NOT preceded by the letter "G".

Maximum cable length:

305 metres (1000 ft) with no degradation of signal.

Power requirements:

Input Voltage

-24 ± 0.5 Vdc.

Bias Current:

2 mA nominal.

Output Bias Voltage:

-8.5 ± 0.5 Vdc.

Grounding:

Case isolated.

Hazardous Area Approvals

Multiple approvals for hazardous areas certified by Canadian Standards Association (CSA) in North America and by LCIE in Europe.

North America

Ex ia IIC T4
AEx ia IIC T4
Class I, Div 1 Groups A, B, C & D
When installed per dwg 167538
T4 @ -40°C ≤ Ta ≤ 100°C

Ex nL IIC T4
AEx nL IIC T4
Class I, Div 2 Groups A, B, C & D
When installed per dwg 167538
T4 @ -40°C ≤ Ta ≤ 100°C

European/ATEX

II 1 G
EEx ia IIC T4
LCIE 04ATEX6042X
T4 @ -40°C ≤ Ta ≤ 100°C

II 3 G
EEx nL IIC T4
LCIE 04ATEX6041X
T4 @ -40°C ≤ Ta ≤ 100°C

IECEx

Ex ia IIC T4
IEC Ex LCI 06.0003X
Ex nL IIC T4
IEC Ex LCI 06.0002X
T4 @ -40°C ≤ Ta ≤ 100°C

Brazil

BR-Ex ia IIC T4
MC, AEX-8101-X
T4 @ -40°C ≤ Ta ≤ 100°C

Compliance and Certification

American Bureau of Shipping (ABS) Type approval

Certification Number:

09-HS446965A-PDA

Electromagnetic Compatibility

Electrostatic discharge:

EN 61000-4-2 (1999), Criteria B.

Electrical fast transients:

EN 61000-4-4 (1999), Criteria B.

Radiated Susceptibility:

EN 61000-4-3, Criteria A.

Conducted Susceptibility:

EN 61000-4-6, Criteria A.

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Surge Capability:

EN 61000-4-5, Criteria B.

Magnetic Field:

EN 61000-4-8, Criteria A.

Environmental Limits

Operating and storage temperature:

-55°C to +121°C (-67°F to +250°F)

Shock Survivability:

49,050 m/s^2 (5000 g) peak, maximum.

Relative humidity:

100% condensing, non-submerged. Case is hermetically sealed.

Magnetic Field Susceptibility:

<2.21 mm/s^2/gauss (225 µg/gauss) [50 gauss, 50-60Hz].

Physical

Weight (no cable):

99 g (3.5 oz), typical

Diameter:

23 mm (0.93 in).

Height:

59 mm (2.3 in), including mounting stud.

Connector:

3-pin MIL-C-5015 Receptacle

Mounting Surface:

32 µinch rms.

Mounting torque:

4.1 N•m (3.0 ft•lb).

Case material:

304L stainless steel

Weight (no cable):

100 g (3.5 oz), typical

Mounting angle:

Any orientation

Ordering Information

330400 Accelerometer

330400-AA-BB

330425 Accelerometer

330425-AA-BB

A: Mounting Thread Option

0 1	¼-28 UNF integral stud
0 2	M8 X 1 integral stud

B: Agency Approval Option

0 0	None
0 5	Multiple approvals (CSA, ATEX, Brazil)

Interconnect Cables

Part Number-AA

A: Cable Length Option in feet
For the cables listed below, order in increments of 1.0 ft (305 mm).

Examples:
1 5 = 15 ft (4.57 m)
2 0 = 20 ft (6.10 m)

130539

3-conductor shielded 18 AWG (1.0 mm^2) cable with 3-socket plug and fluorosilicone elastomer boot at one end, terminal lugs at the other end. Minimum length of 2.0 ft (0.6 m), maximum length of 99 ft (30 m). A manual is available to assist with installation of this cable (part number 133080-01).

16925

3-conductor shielded 22 AWG (0.5 mm^2) cable with 3-socket plug at one end, terminal lugs at the other end. Minimum length of 2.0

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ft (0.6 m), maximum length of 99 ft (30 m).

16710

3-conductor shielded 22 AWG (0.5 mm^2) armored cable with 3-socket plug at one end, terminal lugs at the other end. Minimum length of 3.0 ft (0.9 m), maximum length of 99 ft (30 m).

Accessories

127088-01

330400 and 330425 Accelerometer Operations Manual.

00531080

Mating connector for 330400 and 330425 Accelerometers.

37439-01

For use with serial numbers NOT preceded with the letter "G".

Mounting Base, ¼-28 to ¼-28. Reduces base strain sensitivity.

37439-02

For use with serial numbers NOT preceded with the letter "G".

Mounting Base, M8X1 to M8X1. Reduces base strain sensitivity.

43217

Accelerometer Mounting Kit used with extension part number 108576-01 and O-ring part number 04290422 to allow room for the 330400 or 330425 accelerometer.

(See separate datasheet, p/n 141630-01.)

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Graphs and Figures

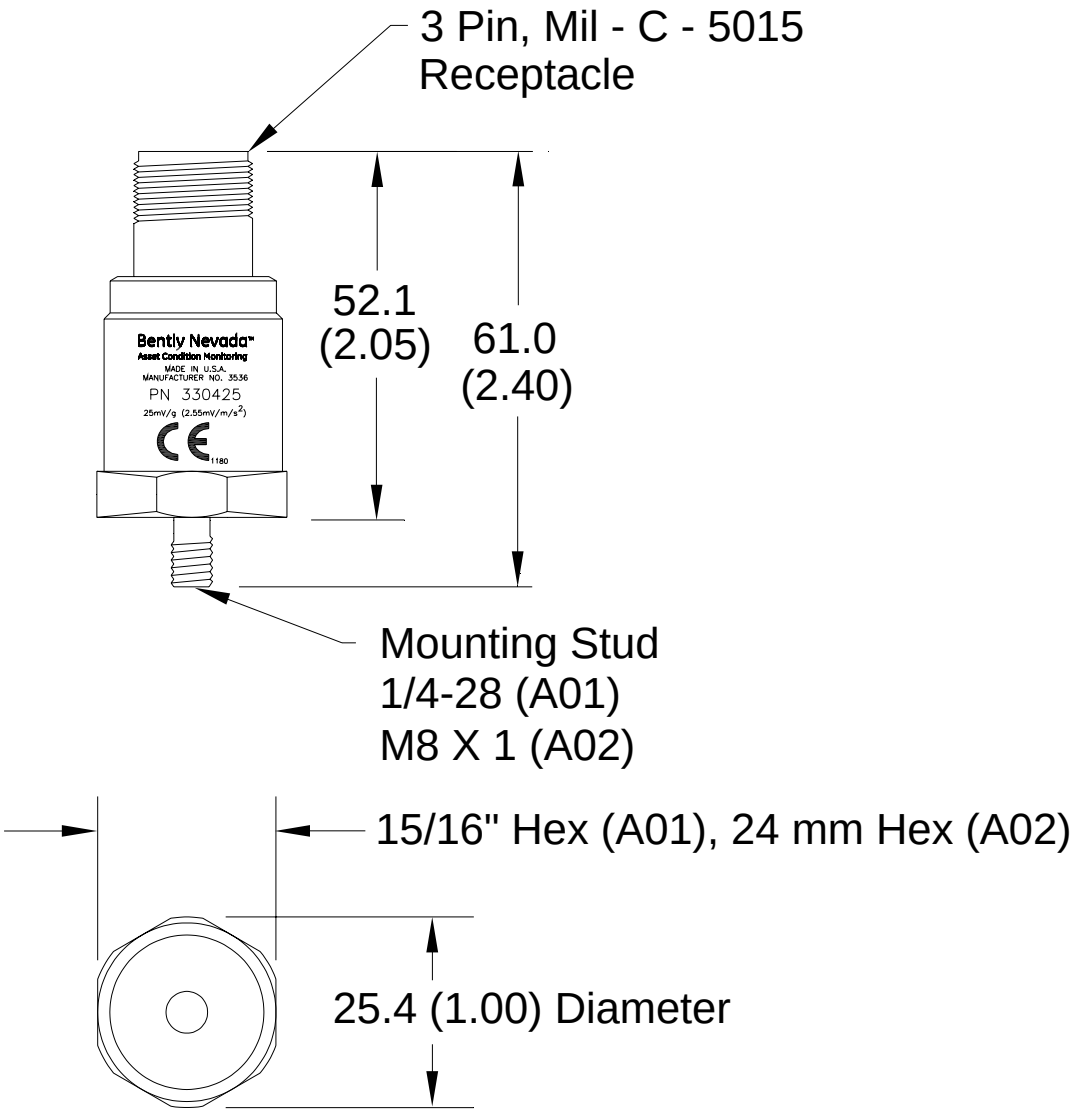

Figure 1: Acceleration Transducer dimensional drawing
Dimensions are in millimetres (inches)

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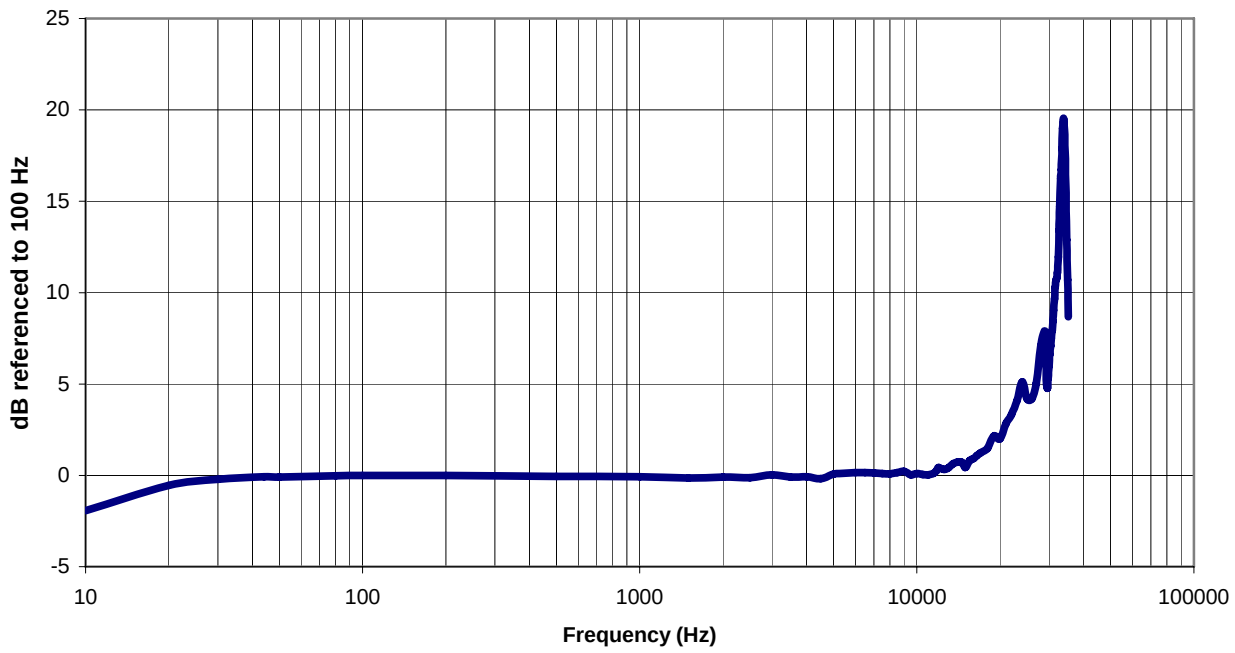

Figure 2: Typical Amplitude Response

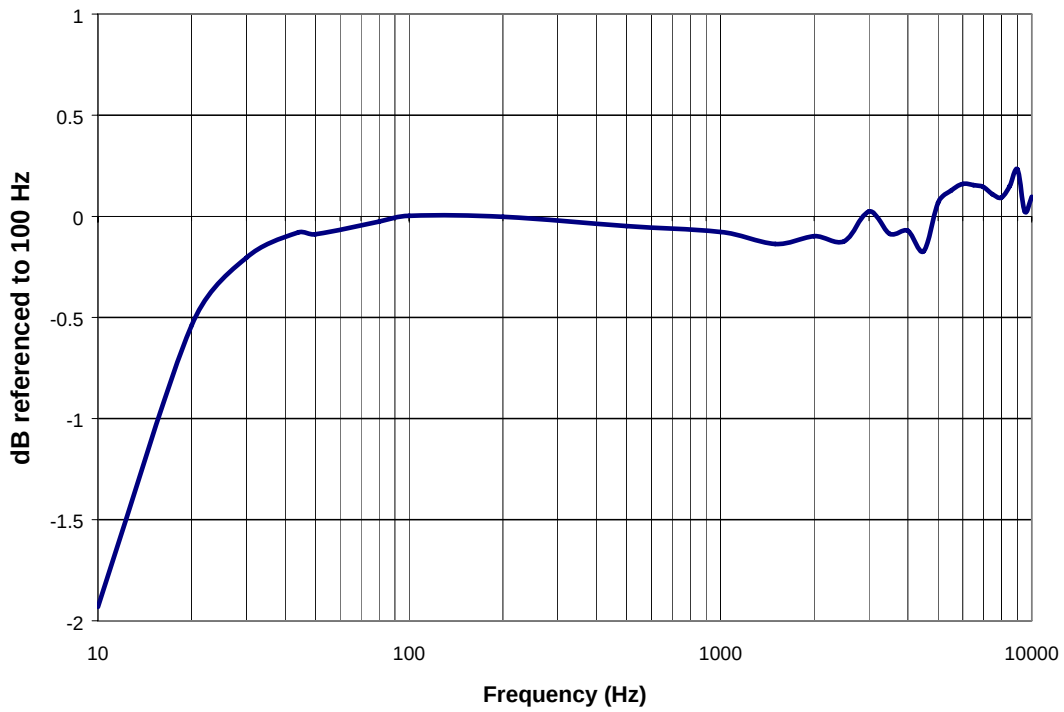

Figure 3: 10 – 10,000 Hz Typical Amplitude Response Detail

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