

# 330400 and 330425 Accelerometer Acceleration Transducers

Bently Nevada\* Asset Condition Monitoring

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## 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.

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### Electrical

#### 330400

**Sensitivity:**

10.2 mV/m/s<sup>2</sup> (100 mV/g) ±5%.

**Acceleration range:**

490 m/s<sup>2</sup> (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<sup>2</sup> (50 g) peak.

**Broadband Noise Floor (10 Hz to 15 kHz):**

0.039 m/s<sup>2</sup> (0.004 g) rms.

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#### 330425

**Sensitivity:**

2.5 mV/m/s<sup>2</sup> (25 mV/g) ±5%.

**Acceleration Range:**

735 m/s<sup>2</sup> (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/s<sup>2</sup> (75 g) peak.

**Broadband Noise Floor (10 Hz to 15 kHz):**

0.098 m/s<sup>2</sup> (0.01 g) rms.

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### 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<sup>2</sup>/μstrain (0.005 g/μstrain)

**For serial numbers**

**NOT preceded by the letter "G" (shipped prior to April 2004):**

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

4.9 mm/s<sup>2</sup>/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.

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**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  
Class II, Groups E, F, and G  
Class III  
When installed per dwg 167538  
T4 @ -40°C ≤ Ta ≤ 100°C

Ex nL IIC T4  
AEx nA 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  
Ex ia IIC T4 Ga  
T4 @ -55°C ≤ Ta ≤ 121°C

 II 3 G  
Ex nA IIC T4 Gc  
T4 @ -55°C ≤ Ta ≤ 121°C

**IECEX**

Ex ia IIC T4 Ga  
Ex nA IIC T4 Gc  
T4 @ -55°C ≤ Ta ≤ 121°C

**BRAZIL**

Ex ia IIC T4 Ga  
T4 @ -40°C ≤ Ta ≤ 100°C

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

For further certification and approvals information please visit the following website:

[www.ge-mcs.com/bently](http://www.ge-mcs.com/bently)

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## Compliance and Certification

### EMC

#### Standards:

EN 61326-2-1 Test configurations, operational conditions and performance criteria for sensitive test and measurement equipment for EMC unprotected applications

EN 61326-2-3 Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning

European Community Directives:  
EMC Directive 2004/108/EC

For further certification and approvals information please visit the following website:

[www.ge-mcs.com/bently](http://www.ge-mcs.com/bently)

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## Environmental Limits

### Operating and storage temperature:

-55°C to +121°C (-67°F to +250°F)

### Shock Survivability:

49,050 m/s<sup>2</sup> (5000 g) peak, maximum.

### Relative humidity:

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

### Magnetic Field Susceptibility:

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

### IP Rating:

Equivalent to an IP 68 (Dust tight and watertight). Please note that this is for the sensor only and does not apply to the cable.

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## 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  
316L stainless steel

### Mounting Surface:

32 μinch rms.

### Mounting torque:

4.1 N•m (3.0 ft•lb).

### Case material:

316L stainless steel

### Weight (no cable):

100 g (3.5 oz), typical

### Mounting angle:

Any orientation

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## Ordering Information

### 330400 Accelerometer

#### 330400-AA-BB

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### 330425 Accelerometer

#### 330425-AA-BB

#### A: Mounting Thread Option

**01** ¼-28 UNF integral stud

**02** M8 X 1 integral stud

#### B: Agency Approval Option

**00** None

**05** Multiple approvals (CSA, ATEX, IECEx,)

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

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## 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)

| The following are standard lengths |                  |
|------------------------------------|------------------|
| Feet                               | Metres (approx.) |
| 6                                  | 1.8              |
| 8                                  | 2.4              |
| 10                                 | 3.0              |
| 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

### 130539

3-conductor shielded 18 AWG (1.0 mm<sup>2</sup>) 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<sup>2</sup>) cable with 3-socket plug 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).

### 16710

3-conductor shielded 22 AWG (0.5 mm<sup>2</sup>) 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).

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## 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.)

Graphs and Figures

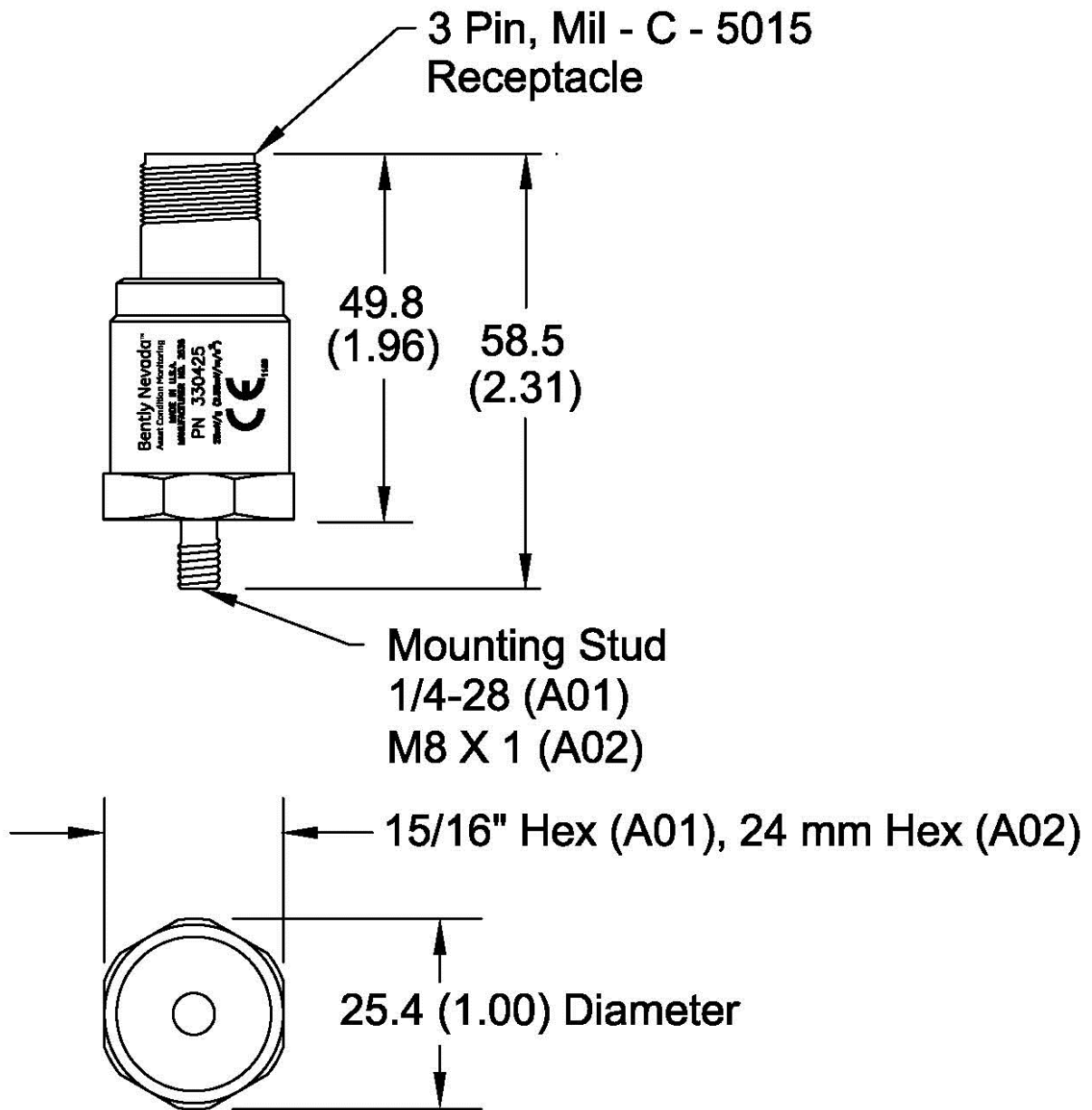


Figure 1: Acceleration Transducer dimensional drawing  
Dimensions are in millimetres (inches)

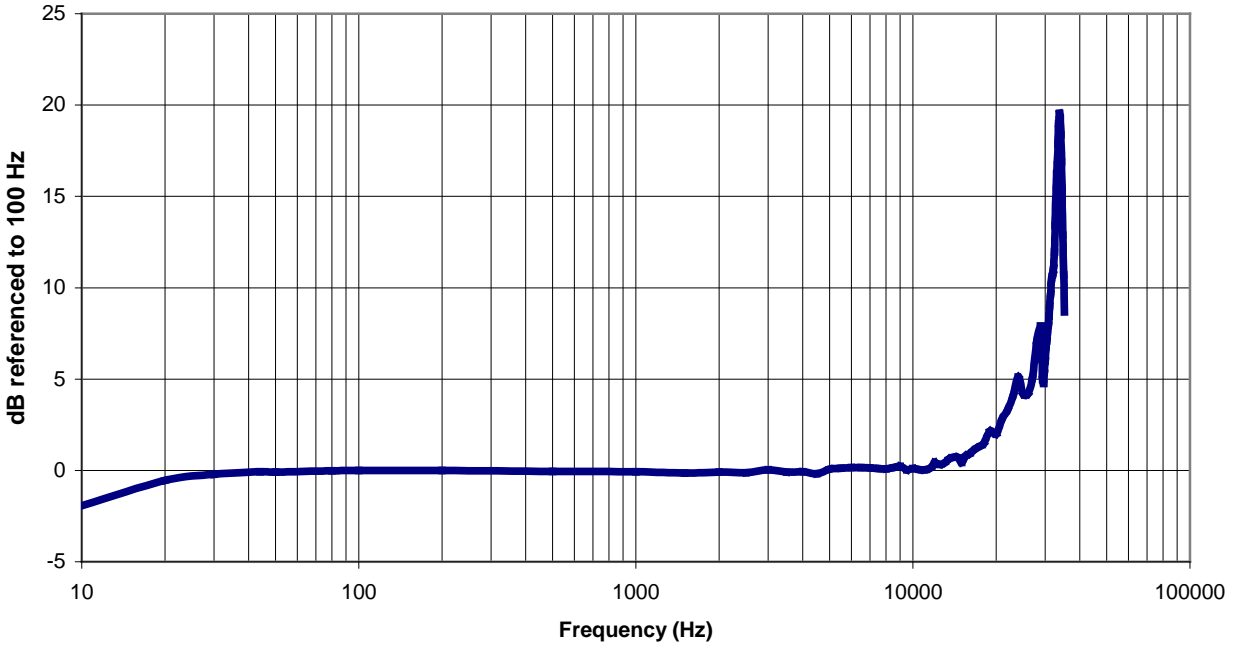


Figure 2: Typical Amplitude Response

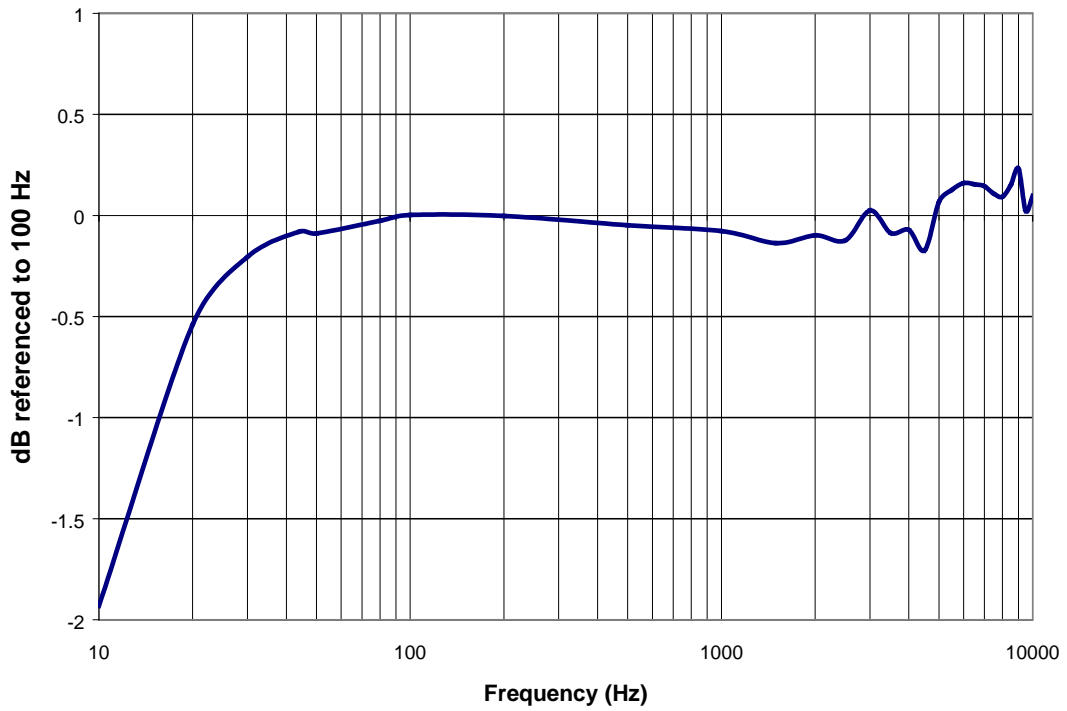


Figure 3: 10 - 10,000 Hz Typical Amplitude Response Detail

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