# 9200 and 74712 Seismoprobe Velocity Transducers

## Datasheet

Cordant™

141626 Rev. V




## Description

Bently Nevada™ Seismoprobe Velocity Transducer Systems are designed to measure absolute (relative to free space) bearing housing, casing, or structural vibration. The two-wire systems consist of a transducer and appropriate cable.

The Seismoprobe family of velocity transducers is a two-wire design that uses moving-coil technology. It provides a voltage output directly proportional to the transducer's vibration velocity.

Moving-coil transducers are less sensitive to impact or impulsive excitation than solid-state velocity transducers, which are inherently accelerometers with embedded integration electronics.

Moving-coil transducers are less sensitive to impact or impulsive excitation and can represent a good choice for certain applications. Because they don't require external power, they are convenient for portable measurement applications.

For most installations, Bently Nevada's Velomitor family of velocity transducers, which incorporate solid-state technology, provide improved performance and ruggedness for casing velocity measurement applications.

Baker Hughes

## Available Types

Two types of Seismoprobe Velocity Transducer are available:

- 9200: The 9200 is a two-wire transducer suitable for continuous monitoring or for periodic measurements in conjunction with test or diagnostic instruments. When ordered with the integral cable option, the 9200 has excellent resistance to corrosive environments without need of additional protection.
- 74712: The 74712 is a high temperature version of the 9200.

Interconnect cables are available for connecting the 9200 and 74712 transducers to other instruments. These cables are available in various lengths with or without stainless steel armor.

When ordering the 9200 and 74712 Seismoprobe Velocity Transducers, expect approximately a six week lead time. That lead time can vary based on component availability and configuration. For projected lead times for your specific order, contact your local Bently Nevada representative.

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.

# Specifications

Specifications are at approximately +22°C (+72°F) with 25 mm/s (1 in/s) of machine casing vibration at 100 Hz (6000 cpm) with a 10 kΩ load unless otherwise specified.

## Electrical

| | |
|---|---|
| Sensitivity | 20 mV/mm/s (500 mV/in/s), ±5% when properly terminated and oriented at the angle of calibration. |
| Calibration Load | 10 kΩ Terminal "A" to "B" Output taken across pins "A" and "B" |
| Sensitivity Temperature Coefficient | 0.2%/°C |
| Frequency Response-See Theoretical Velocity Seismoprobe Frequency Response on page 11. | 4.5 to 1000 Hz (270 to 60,000 CPM); +0, -3dB typical.<br>10 to 1000 Hz (600 to 60,000 CAM); +0, -3dB typical.<br>15 to 1000 Hz (900 to 60,000 CPM); +0, -3dB typical. |
| Frequency response | From minimum operating frequency (see Ordering Information) to 1 kHz (60,000 cpm); +0, -3dB typical.<br>Please contact Bently Nevada for detailed calibration data. |
| Dynamic operating range | 2.54 mm (0.100 in) peak to peak maximum displacement. |
| Velocity Range | 25 mm/s (1 in/s) (at +22 °C of casing vibration at 100 Hz with a 10 kΩ load. |
| Coil Resistance | 1.25 kΩ ±5% |
| Locked Coil Inductance | 125 mH, typical |
| Amplitude Linearity | ±5% from 0.01 to 5.0 in/s (0.254 to 127 mm/s) at 100Hz (6000CPM) |
| Shock resistance | Withstands 50 g peak maximum acceleration along non-sensitive axis. |
| Transverse sensitivity | ±10% maximum of the sensitive axis sensitivity at 100 Hz and 1.0 in/s (2.54 cm/s) |
| Polarity of output signal | Pin A goes positive with respect to Pin B when the transducer case velocity is towards the connector. |
| Lead wire length | 305 meters (1,000 feet) maximum between Seismoprobe Velocity Transducer and 3300 or Bently Nevada™ 3500 Monitor. Consult manual for frequency roll-off at longer lengths. |

## Environmental Limits

| | |
|---|---|
| Operating and Storage Temperature: | 9200: -29°C to +121°C (-20°F to +250°F).<br>74712: -29°C to +204°C (-20°F to +400°F). |
| Environment | Dust and moisture resistant.<br>Contact your Sales Professional regarding transducer operation in a radiation environment. |
| Relative Humidity | To 95%, noncondensing. 100%, non-submerged, when ordered with integral cable. |
| Maximum Use Altitude | 2000 m (6,561 ft) above sea level. |

Standard installation for these sensors is in a protected enclosure with wiring protected in conduit. Splash boots can be added for additional protection if needed by customer's requirements.

## Mechanical

| | |
|---|---|
| Case and Adapter Material | Anodized aluminum A204 |
| Gasket Material | 9200: Neoprene<br>74712: Silicone |
| **Connector Material** | |
| Top and Side Mount Options | Cadmium-plated aluminum, neoprene, and silver-plated copper |
| Terminal Block Option | Polyphenylene Sulfide with nickel-plated copper contacts. |
| **Mounting Torque** | |
| 1/2-20, 1/4-20, 1/4-28, 5/8-18, or M10X1 mounting base options: | 5.6 N•m (50 in•lb) |
| 8-32 threaded studs | 1.41 N•m (12.5 in•lb) |

## Physical

| | |
|---|---|
| Height | 102 mm (4 in) typical (depending on connector option). |
| Diameter | 41 mm (1.6 in) typical. |
| Weight | 9200 = 300 grams (10.5 ounces) typical.<br>74712 = 480 grams (17 ounces) typical. |
| Seismoprobe Velocity Transducer orientation | All Seismoprobe Velocity Transducers are specified for mounting orientation (see Graphs and Figures on page 11). |

# 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

European Community Directive:

EMC Directive 2014/30/EU

Standards

EN 61326-1; Immunity/emission for Industrial Environments

## RoHS

European Community Directive:

RoHS Directive 2011/65/EU

## China RoHS

Cables associated with the product(s) mentioned in this datasheet have an EFUP designation of 15 years, in accordance with SJ/T 11364-2024.




# 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.

## 74712 and 9200

### cNRTLus

Class I, Division 1, Groups A, B, C and D T6;
Class II, Division 1, Groups E, F and G;
Class III:
Ex ia IIC T6 Ga;
Class I, Zone 0, AEx ia IIC T6 Ga;
Ex ec IIC T6 Gc;
Class I, Zone 2, AEx ex IIC T6 Gc

For Ex/AEx ia:

Ui = 28 $V_{DC}$
Ii = 16 mA
Pi = 1.0 W
Ci = 0
L/Ri = 110 µH/Ω
Li = 131.25 mH

For EX/AEx ec:

V = 24 $V_{DC}$
I = 24 mA

This sensor may only be powered by a power supply unit with a limited energy electric circuit in accordance with CAN/CSA C22.2 No. 61010-1-12 and ANSI/UL 61010-1, or Class 2 as defined in the Canadian Electrical Code C22.1, Section 16-200 and/or National Electrical Code (NFPA 70), article 725.121.

## ATEX/IECEx

II 3G

II 1G



Ex ia IIC T6 Ga

Ex ec IIC T6 Gc

T6, Tamb = -20°C to +40°C

# Ordering Information

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

An isolated base ('06' thru '09', or '11', '12' in Mounting Base Option) is required when '04' Agency Approval Option is selected.

## Two-wire Transducer

### 9200-AA-BB-CC-DD

| **A: Transducer Mounting Angle/Minimum Operating Frequency Option** | |
|---|---|
| **01** | 0 ±2.5, 4.5 Hz (270 cpm) |
| **02** | 45 ±2.5, 4.5 Hz (270 cpm) |
| **03** | 90 ±2.5, 4.5 Hz (270 cpm) |
| **06** | 0 ±100, 10 Hz (600 cpm) |
| **09** | 0 ±180, 15 Hz (900 cpm) |
| **B: Connector/Cable Option** | |
| **01** | Top Mount (no cable) |
| **02** | Side Mount (no cable) |
| **05** | Terminal block top mount (no cable) |
| **10 through 50** | |
| Integral hardline cable (see Figure 7 for example). Option number corresponds to cable length in feet. Standard cable lengths are shown below. Other cable lengths between 7 feet and 50 feet may be available through custom products. When ordering for hazardous area | |
| **10** | 10 feet (3.0 meter) |
| **15** | 15 feet (4.6 meter) |
| **22** | 22 feet (6.7 meter) |
| **32** | 32 feet (9.8 meter) |
| **50** | 50 feet (15.2 meter) |
| **C: Mounting Base Option** | |
| **01** | Circular; 1/4-20 UNC stud |
| **02** | Circular; 1/4-28 UNF stud |
| **03** | Rectangular flange |
| **04** | Circular; with three 8-32 threaded studs on a 44 mm (1.75 in) diameter bolt circle |
| **05** | No base; 1/2-20 UNF-3A stud |
| **06** | Isolated circular 1/4-20 UNC stud |
| **07** | Isolated circular 1/4-28 UNF stud |
| **08** | Isolated rectangular flange |
| **09** | Isolated circular 5/8-18 UNF stud |
| **10** | Circular; M10X1 stud |
| **11** | Isolated circular M10X1 |
| **12** | Isolated circular 1/2-20 UNF-2A |
| **D: Agency Approval Option** | |
| **00** | No Approvals |
| **01** | CSA |
| **04** | ATEX/IECEx |

## Graphs and Figures

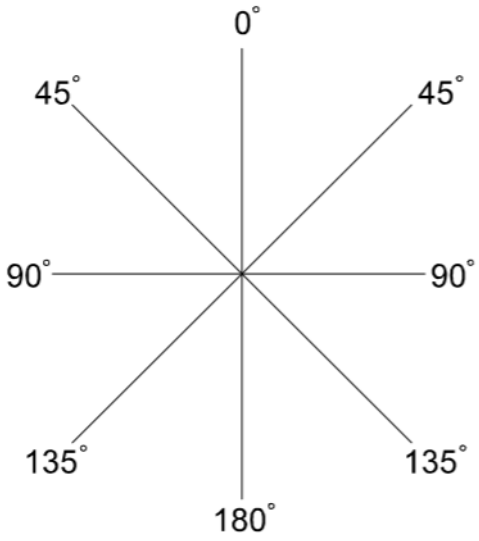
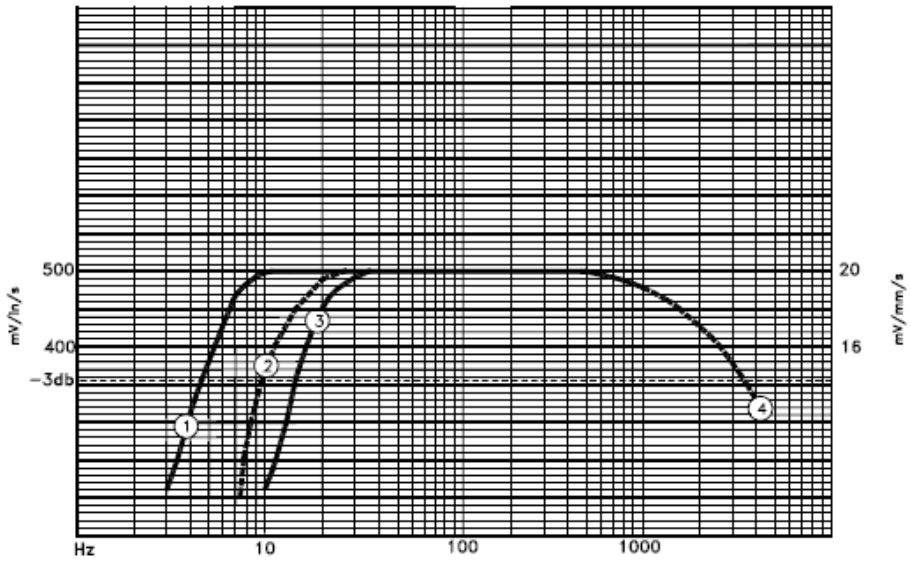


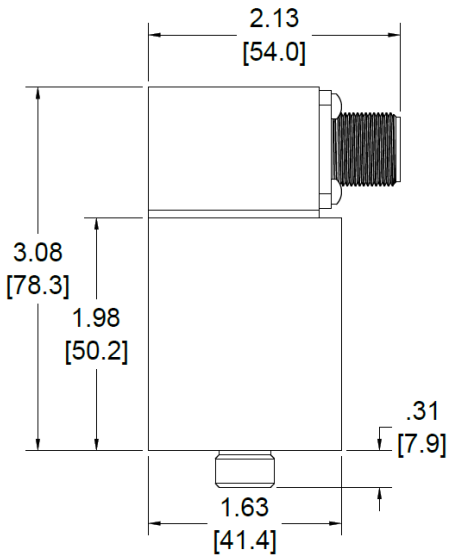

**Figure 1: Seismoprobe Orientation**

All Seismoprobe Velocity Transducers are specified for the mounting orientations shown here. 0° is vertical, as viewed from driver end of the monitored machine.




1. 270 CPM (4.5 Hz)
2. 600 CPM (10 Hz)
3. 900 CPM (15 Hz)
4. All versions

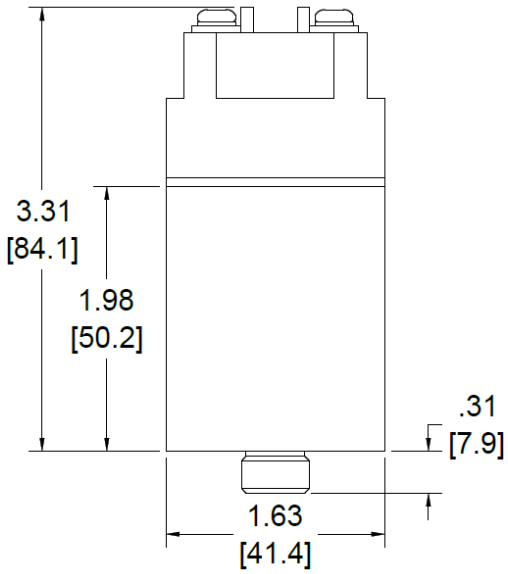
**Figure 2: Theoretical Velocity Seismoprobe Frequency Response**




-02

**Figure 5: Side Mounted Connector**

(9200 Option B-02 or 74712 Option C–04)




-05

**Figure 6: Terminal Block Connector**

(9200 Option B-05 or 74712 Option C–03)