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. 10 to 1000 Hz (600 to 60,000 CAM); +0, -3dB typical. 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. 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). 74712: -29°C to +204°C (-20°F to +400°F).
Environment	Dust and moisture resistant. 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 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. 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.

High-temperature Two-wire Transducer

Standard Temperature -20°F to +400°F (-29°C to +204°C)

74712-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)
07	0 ±180, 15 Hz (900 cpm)
B: 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
C: Connector Option	
02	Top Mount
03	Terminal block top mount
04	Side mount

D: Agency Approval Option	
00	No Approvals
01	CSA
04	ATEX/IECEx

Interconnection Cables

The standard cable lengths below are available. You can order custom cable lengths in increments of one foot at additional cost. Some cables have a minimum and maximum length. For details, see each part description below.

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

Cable Part Numbers

Part Number	Description
	Use 'NN' in these part numbers to specify the length (in feet) of the cable you want to order.
Standard Cables	
9571-NN	2-conductor twisted, shielded 22 AWG (0.5 mm2) cable with 2-socket moisture-resistant female connector at one end, terminal lugs at the other end (used with monitors or vibration data collectors). Cable operating temperature is -50˚C to 120˚C. Minimum length of 2.0 ft (0.6 m); maximum length of 99 ft (30 m).
84661-NN	2-conductor twisted, shielded 22 AWG (0.5 mm2) armored cable with 2-socket moisture-resistant female connector at one end, terminal lugs at the other end (used with monitors or vibration data collectors). Cable operating temperature is -50˚C to 120˚C. Minimum length of 3.0 ft (0.9 m); maximum length of 99 ft (30 m).
9755-NN	2-wire shielded 22 AWG (0.5 mm2) cable with 2-pin female connectors at each end (connects 9200 or 74712 Seismoprobe Velocity Transducers to Bently Nevada test kits). Cable operating temperature is -70˚C to 150˚C. Minimum length of 1.0 ft (0.3 m); maximum length of 99 ft (30 m).
83968-NN	2-wire straight cable with 2-pin female connector at one end and coaxial connector in the other end (used with instruments with BNC connector input jacks). Minimum length of 2.0 ft (0.6 m); maximum length of 99 ft (30 m).
High-Temperature Cables	
84508-NN	2-wire shielded 22 AWG (0.5 mm2) cable with terminal lugs at each end. Minimum length of 1.0 ft (0.3 m); maximum length of 99 ft (30 m).
84509-NN	2-wire shielded 22 AWG (0.5 mm2) armored cable with terminal lugs at each end. Minimum length of 3.0 ft (0.9 m); maximum length of 70 ft (21 m).
84660-NN	2-wire shielded 22 AWG (0.5 mm2) cable with 2-socket female connector 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).