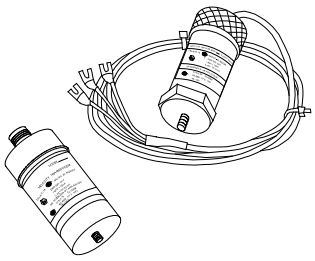
Описание на сейсмозонды. Модели 9200, 74712

BENTLY
Nevada

9200, 74712 Seismoprobe*

Bently Nevada* Asset Condition Monitoring



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, appropriate cable, and an optional velocity-to-displacement converter.

The Seismoprobe family of velocity transducers is a two-wire design that uses moving-coil technology and provides a voltage output directly proportional to the transducer's vibration velocity. Unlike 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. Also, because they require no external power, they are convenient for portable measurement applications.

Note: For the majority of installations, Bently Nevada's Velomitor* family of velocity transducers, which incorporate solid-state technology, represent superior performance and robustness for casing velocity measurement applications.

Two types of Seismoprobe Velocity Transducers 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.

Various interconnect cables are available for connecting the 9200 and 74712 transducers to other instruments or a velocity-to-displacement converter. These cables are available in one-foot (300 mm) increments, with or without stainless steel armor.

One type of velocity-to displacement converter (VDC) is available:
9513: to be used with 9200 and 74712 transducers.

⚠ **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 decrease of the transducer amplitude and frequency, of the transducer amplitude and frequency response, and/or the generation of signals, which do not represent actual machine vibration.

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

Specifications

9200 and 74712 Seismoprobe Velocity Transducers

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 kilo ohm 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.

Frequency Response:

From minimum operating frequency (see ordering information) to 1 kHz (60,000 cpm); +0, -3dB typical.

Please contact BENTLY NEVADA, INC. for detailed calibration data.

Dynamic Operating Range:

2.54 mm (0.100 in) peak to peak maximum displacement.

Shock Resistance:

Withstands 50 g peak maximum acceleration along nonsensitive axis.

Transverse Sensitivity:

±10% maximum.

Polarity of Output Signal

Pin A goes positive with respect to Pin B when the transducer case velocity is towards the connector.

Leadwire Length:

305 meters (1,000 feet) maximum between Seismoprobe Velocity Transducer and 3300 or 3500 Monitor. Consult manual for frequency roll-off at longer lengths.

Compliance and Certifications

EMC
Standards
EN61326-1, Electrical Equipment for Measurement, Control, and Laboratory use, EMC Requirements.

European Community Directives:

EMC Directive 2004/108/EC

EU Declarations of Conformity are available from www.bently.com

Hazardous Area Approvals

North America:

Class I Div 1, Group A, B, C, and D,
Class II Div 1, Group E, F and G,
Class III
When installed per Dwg. CA22000

Europe:

 II 1 G Ex ia IIC T6 Ga

 II 3 G Ex nA IIC T6 Gc

IECEx:

Ex ia IIC T6 Ga
Ex nA IIC T6 Gc

For further certification and approvals information please visit the following website:
www.ge-mcs.com/bently

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.

Note: Contact your Sales Professional regarding transducer operation in a radiation environment.

Relative Humidity:

To 95%, noncondensing.

100%, non-submerged, when ordered with integral cable.

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.

Coaxial Connector Option:

Silver-plated brass, fluoroethylene propylene (FEP), and beryllium copper

Mounting Torque:

½-20, ¼-20, ¼-28, ⅝-18, 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

9200/74712

Height:

102 mm (4 in) typical

(depends on connector option).

Diameter:

41 mm (1.6 in) typical.

Weight:

9200 = 300 grams (10.5 ounces) typical.

74712 = 480 grams (17 ounces) typical.

9513 Velocity-to-Displacement Converter

Electrical

Model 9513 requires:

-18 Vdc.

Output Sensitivity (with a 500 mV/in/s input)

9513-02:

200 mV/mil (8 V/mm) ±5%. (Valid for frequencies above 5 Hz [300 cpm])

9513-09

100 mV/mil (4 V/mm) ±5%. (Valid for frequencies above 5 Hz [300 cpm])

Frequency Range:

Minimum operating frequency to 10 kHz (600,000 cpm).

Output Impedance:

For model 9513-02, 100 Ω.

Output Bias:

5.8 to 9.5 Vdc.

Physical

9513

Height:

38 mm (1.50 in)

Length:

89 mm (3.50 in)

Width:

54 mm (2.12 in)

Weight:

180 g (6.50 oz)

Mounting Holes:

Four 4.8 mm (0.19 in) diameter holes centered in all corners of a rectangle 50.8 mm (2 in) long by 44.5 mm (1.75 in) wide.

Seismoprobe Velocity Transducer Orientation:

All Seismoprobe Velocity Transducers are specified for mounting orientations as shown in Figure 1.

Ordering Information

Note: Country specific approvals may be available. Contact your local customer care representative.

Two-wire Transducer

The 9200 Two-wire Velocity Seismoprobe Transducer can be used with the 9513 VDC, which is ordered separately (see Velocity-to-Displacement Converter).

9200-AXX-BXX-CXX-DXX

A: Transducer Mounting Angle/Minimum Operating Frequency Option

0 1	0 ±2.5, 4.5 Hz (270 cpm)
0 2	45 ±2.5, 4.5 Hz (270 cpm)
0 3	90 ±2.5, 4.5 Hz (270 cpm)
0 6	0 ±100, 10 Hz (600 cpm)
0 9	0 ±180, 15 Hz (900 cpm)
1 1	90 ±10, 10 Hz (600 cpm)

B: Connector Option

0 1	Top Mount
0 2	Side Mount
0 5	Terminal block top mount
0 6	Coaxial connector (for test equipment only)
0 7 thru 5 0	Environmentally resistant with integral cable. Option number corresponds to cable length 7.0 feet (2.1 metres) min., 50.0 feet (15 metres) max. When ordering with approvals, max length available is 32 feet (9.75 metres) max. Ordered in increments of 1.0 ft.

C: Mounting Base Option

0 1	Circular; 1/4-in 20 UNC stud
0 2	Circular; 1/4-in 28 UNF stud
0 3	Rectangular flange
0 4	Circular; with three 8-32 threaded studs on a 44 mm (1.75 in) diameter bolt circle
0 5	No base; 1/2-in 20 UNF-3A stud
0 6	Isolated circular 1/4-in 20 UNC stud
0 7	Isolated circular 1/4-in 28 UNF stud
0 8	Isolated rectangular flange
0 9	Isolated circular 5/8-in 18 UNF stud
1 0	Circular; M10X1 stud
1 1	Isolated circular M10X1
1 2	Isolated circular ½-in 20 UNF-2A

D: Agency Approval Option

0 0	No approvals required
0 1	CSA/NRTL/C
0 2	EUROPEAN
0 4	Multiple Approvals

High-temperature two-wire transducer

The 74712 High Temperature Two-Wire Seismoprobe Velocity Transducer can be used with the 9513 VDC, which is ordered separately (see Velocity-to-Displacement Converter).

74712-AXX-BXX-CXX DXX

A: Transducer Mounting Angle/Minimum Operating Frequency Option

0 1	0 ±2.5, 4.5 Hz (270 cpm)
0 2	45 ±2.5, 4.5 Hz (270 cpm)
0 3	90 ±2.5, 4.5 Hz (270 cpm)
0 4	135 ±2.5, 4.5 Hz (270 cpm)
0 5	180 ±2.5, 4.5 Hz (270 cpm)
0 6	0 ±100, 10 Hz (600 cpm)
0 7	0 ±180, 15 Hz (900 cpm)

B: Mounting Base Option

0 1	Circular; 1/4-in 20 UNC stud
0 2	Circular; 1/4-in 28 UNF stud
0 3	Rectangular flange
0 4	Circular base with three 8-32 studs
0 5	No base; 1/2-in 20 UNF-3A stud
0 6	Isolated circular ¼-in 20 UNC-2B
0 7	Isolated circular ¼-in 28 UNF-2B
0 8	Isolated rectangular flange
0 9	Isolated circular 5/8-in 18 UNF-2A
1 0	Circular M10X1
1 1	Isolated circular base M10X1
1 2	Isolated circular base ½-in 20

C: Connector Option

0 1	Coaxial connector for test equipment only: rated to +165°C (+329°F).
0 2	Top mount
0 3	Terminal block top mount
0 4	Side mount

D: Agency Approval Option

0 0	No approvals required
0 1	CSA/NRTL/C
0 2	EUROPEAN
0 4	Multiple Approvals

Velocity-to-Displacement Converters

For 9200 and 74712 Seismoprobe Velocity Transducers (requires -18 Vdc supply):
9513 -02

200 mV/mil (8 V/mm).

Interconnect Cables

Standard Cables

9571

2-conductor twisted, shielded 22 AWG (0.5 mm^2) cable with 2-socket moisture-resistant female connector at one end, terminal lugs at the other end. (Used with monitors or VDCs). Minimum length of 2.0 ft (0.6 m), maximum length of 99 ft (30 m).

84661

2-conductor twisted, shielded 22 AWG (0.5 mm^2) armored cable with 2-socket moisture-resistant female connector at one end, terminal lugs at the other end. (Used with monitors or VDCs). Minimum length of 3.0 ft (0.9 m), maximum length of 99 ft (30 m).

9755

2-wire shielded 22 AWG (0.5 mm^2) cable with 2-pin female connectors at each end. (Connects 9200 or 74712 Seismoprobe Velocity Transducers to Bently Nevada test kits). Minimum length of 1.0 ft (0.3 m), maximum length of 99 ft (30 m).

83968

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

2-wire shielded 22 AWG (0.5 mm^2) cable with terminal lugs at each end. Minimum length of 1.0 ft (0.3 m), maximum length of 99 ft (30 m).

84509

2-wire shielded 22 AWG (0.5 mm^2) 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

2-wire shielded 22 AWG (0.5 mm^2) 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).

84510

2-wire shielded 22 AWG (0.5 mm^2) armored 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 70 ft (21 m).

87143

2-wire shielded 18 AWG (1.0 mm^2) cable with terminal lugs at each end. Withstands 200 °C (392 °F). Minimum length of 3.0 ft (0.9 m), maximum length of 99 ft (30 m).

Cable

The following are standard lengths	
Feet	**Meters (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	

Part Number-AXX

A: Cable Length Option in feet

For all of the above cables, order in increments of 1.0 ft (305 mm).

Example: **0 9** = 9 ft
1 2 = 12 ft

Accessories

80705-01

Coiled 2-conductor cable with 2-pin connector at one end and BNC connector at the other end (used with instruments with BNC connector input jacks). Coiled length of 0.5 metre (19.6 inches), stretched length of 2 metres (6.5 feet).

46000-01

Magnetic Base for portable mounting of **Seismoprobe** Velocity Transducers.

46122-01

Quick connect for semi-permanent mounting of **Seismoprobe** Velocity Transducers.

02173006

Bulk cable; 2-conductor, twisted, shielded. 18 AWG (1.0 mm^2) cable without connectors or terminal lugs. Specify number of feet. Withstands +200°C (+392°F).

00531061

Mating connector for 9200 and 74712 **Seismoprobe** Velocity Transducers.

00530574

Cable Mounting Clamp

Graphs and Figures

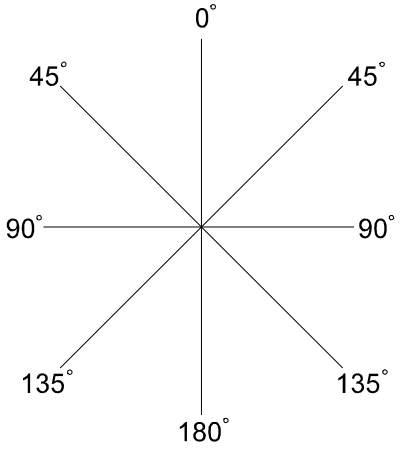


Figure 1: Seismoprobe Orientation
All **Seismoprobe** Velocity Transducers are specified for mounting orientations as shown above: 0° is vertical, as viewed from driver end.

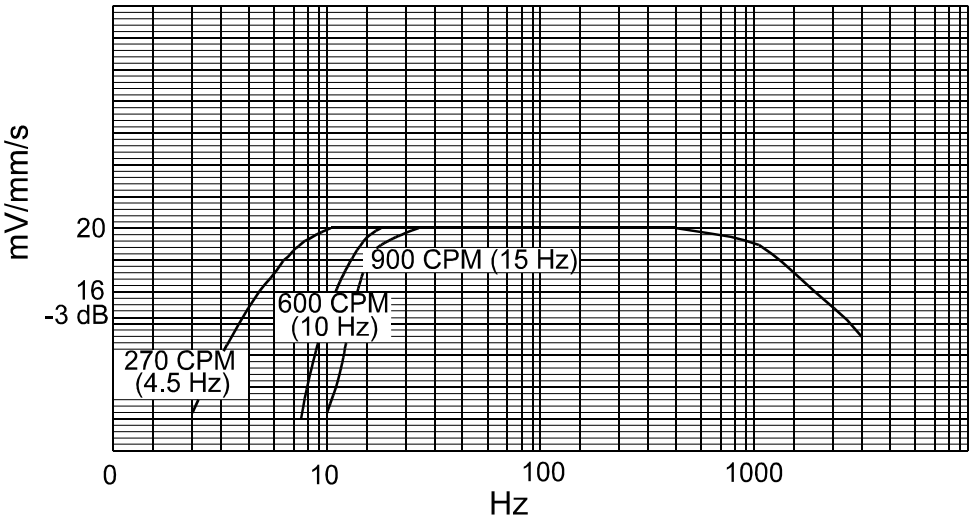


Figure 2: Theoretical Velocity Seismoprobe Frequency Response

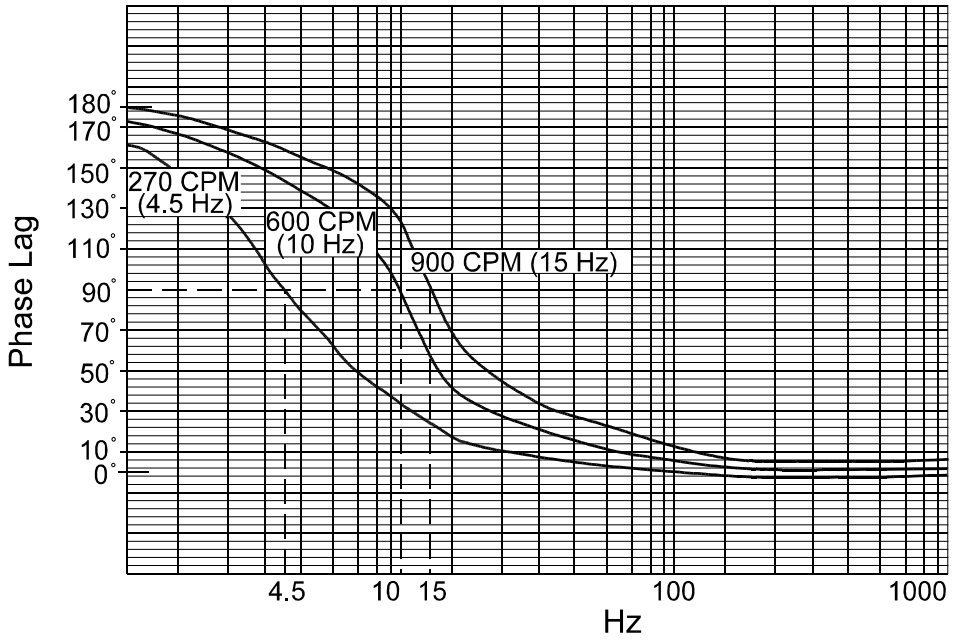


Figure 3: Theoretical Phase Shift between Output and Case Velocity Arial

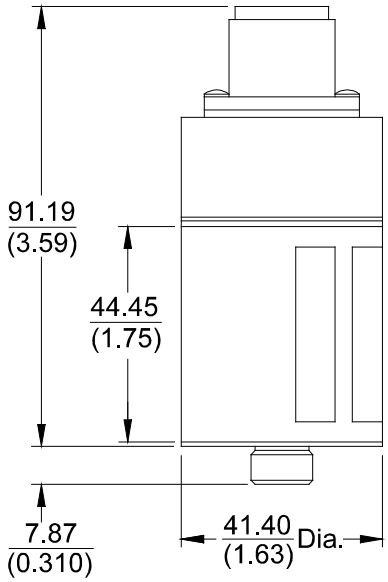


Figure 4: Top Mounted Connector Arial
9200 Option -01 or 74712 Option-02

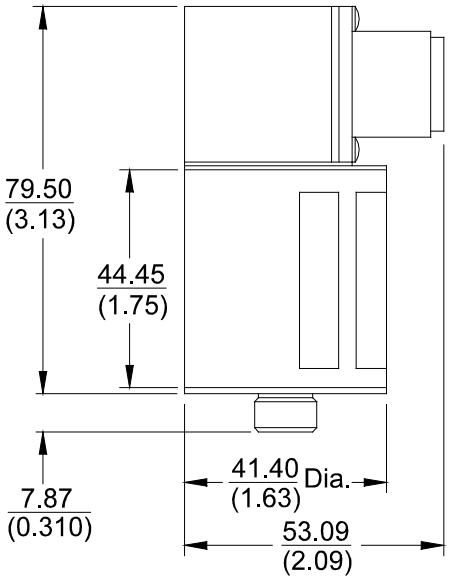


Figure 5: Side Mounted Connector
9200 Option -02 or 74712 Option –04

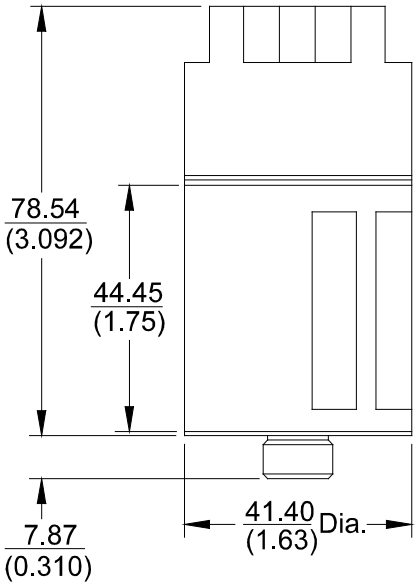


Figure 6: Terminal Block Connector
9200 Option -05 or 74712 Option –03

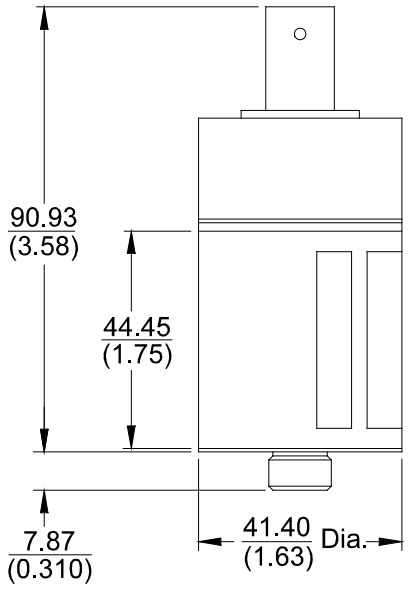


Figure 7: BNC Connector
9200 Option -06 or 74712 Option –01

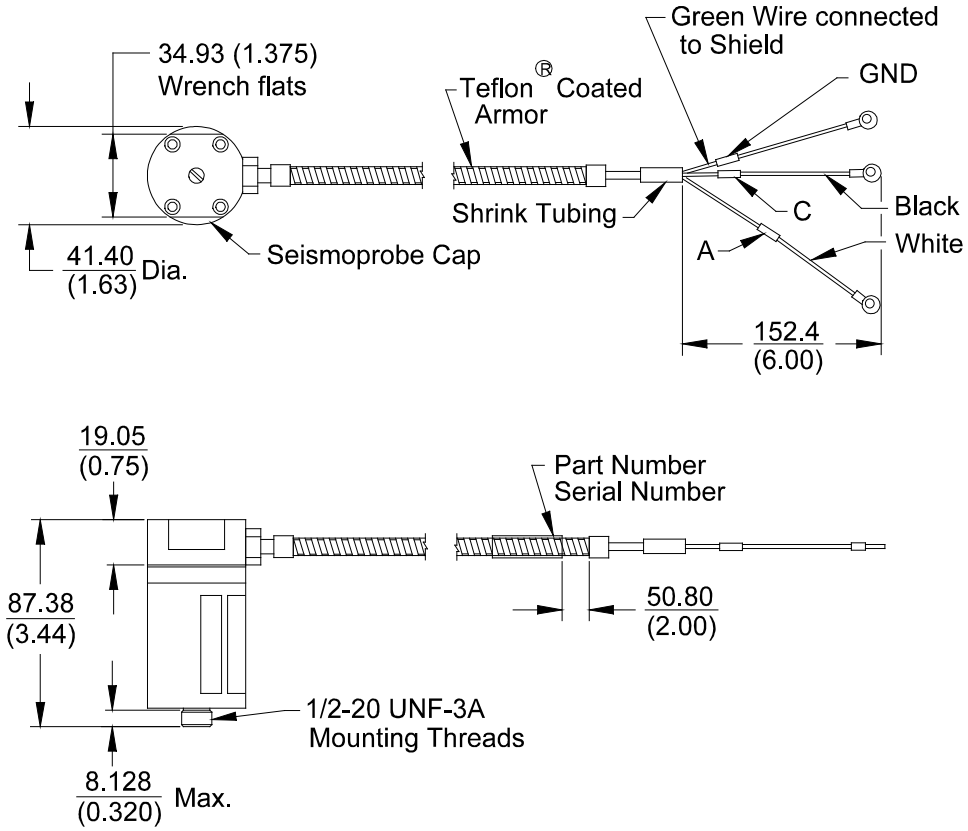


Figure 8: 9200 Connector Options -07 thru –50
All dimensions are in millimeters (inches)

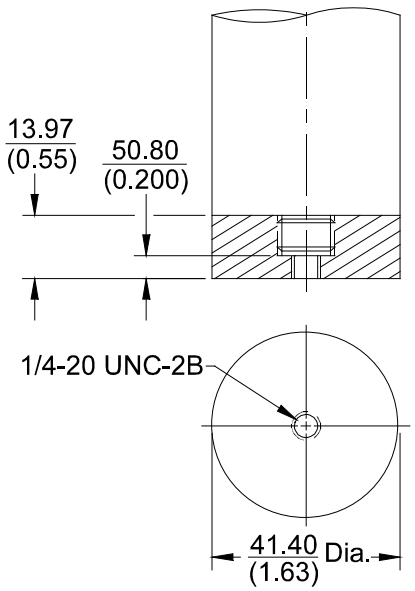


Figure 9: 9200 and 74712 Mounting Base Option -01 or –06
Option -01 Circular 1/4-20 UNC-2B, or
Option -06 Isolated Circular 1/4-20 UNC-2B

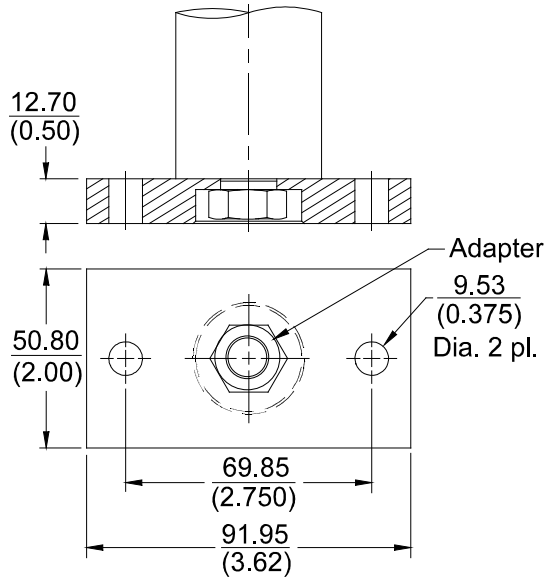


Figure 11: 9200 and 74712 Mounting Base Options -03 or –08
Option -03 Flanged or Option -08 Isolated Flanged

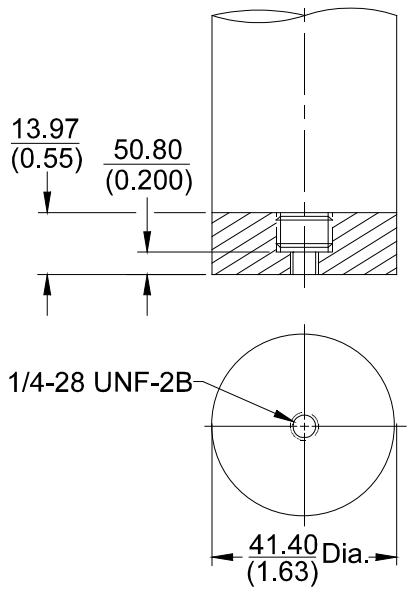


Figure 10: 9200 and 74712 Mounting Base Options -02 or –07
Option -02 Circular 1/4-28 UNF-2B, or
Option -07 Isolated Circular 1/4-28 UNF-2B

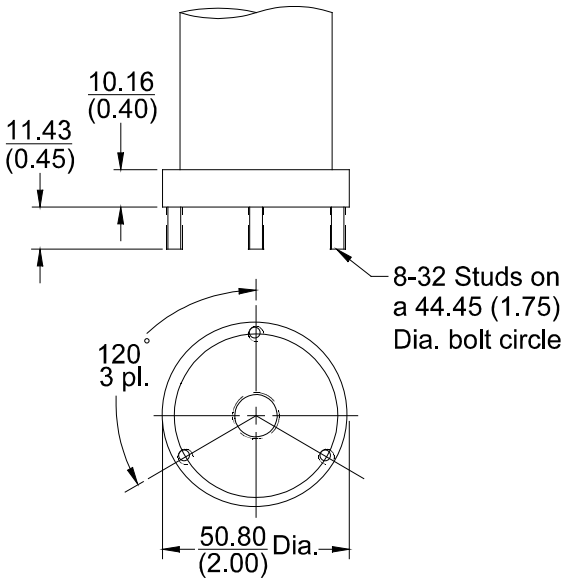


Figure 12: 9200 and 74712 Mounting Base
Option -04 3 each 8-32 studs

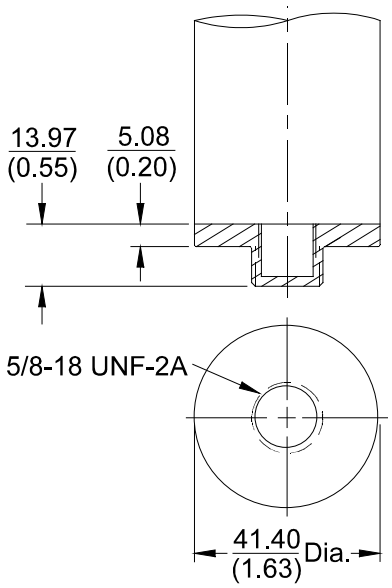


Figure 13: 9200 and 74712 Mounting Base
Option -09 Isolated Circular 5/8-18 UNF-2A Base

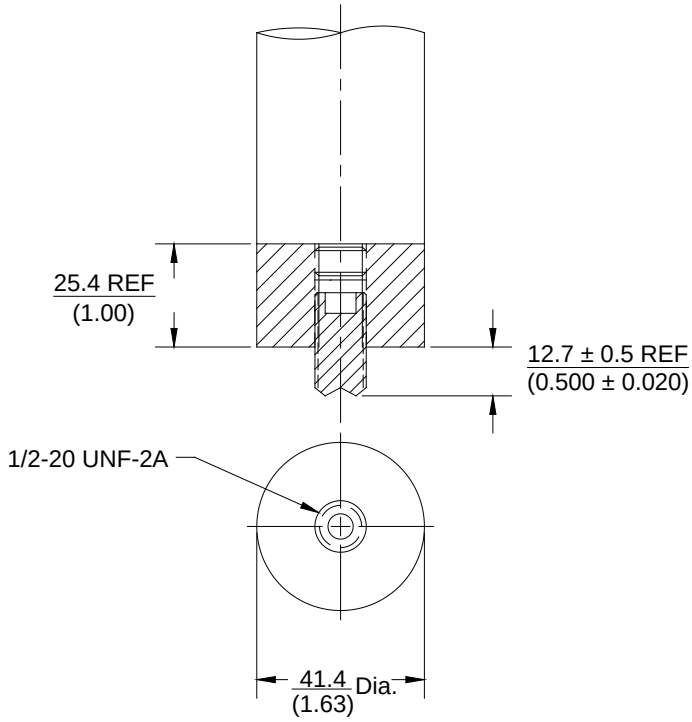


Figure 15: 9200 Mounting Base Option –12
Isolated Circular ½-20 UNF-2A

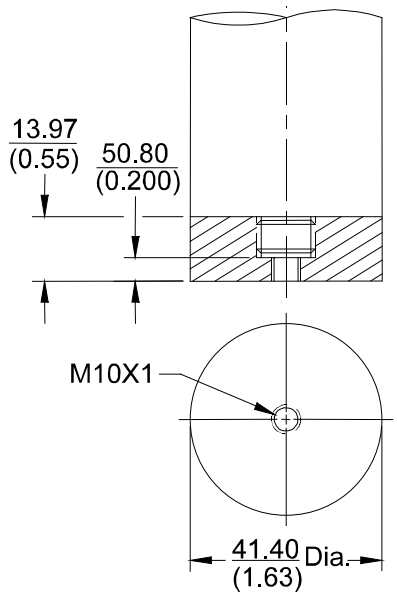


Figure 14: 9200 and 74712 Mounting Base Option -10 or -11 Option -10 Circular M10x1 or **Option-11 Isolated Circular M10X1**

По вопросам продаж и поддержки обращайтесь: btn@nt-rt.ru www.bently.nt-rt.ru

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