200350 and 200355 Accelerometers

Datasheet

Cordant™

164804 Rev. T

1.1 Description

The 200350 and 200355 Accelerometers are general purpose, case-mounted seismic transducers designed

for use with Trendmaster Pro Constant Current Direct Input Card, part number 149811-02 and the Seismic Direct Input Card, part number 164746-01.

The 200350 and 200355 Accelerometers are contained within a hermetically sealed, stainless steel case. The design provides an extremely rugged transducer, well suited for harsh industrial environments. Each transducer's top mounted, 2-pin connector (MIL-C-5015) allows for easy installation and removal of the interconnecting signal cable. A ¼-28 threaded hole on the bottom of the casing accommodates multiple mounting options.

The 200350 and 200355 Accelerometers contain a piezoelectric sensing device, which generates charge when subjected to vibration. This charge is then converted electronically to a differential voltage signal, which is proportional to the acceleration that is parallel to the sensitive axis of the transducer.

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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.

1.2 Specifications

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

Safety Caution

Operation outside the specified limits will result in false readings or loss of machine monitoring.

Do not use sensor part number 200350 for negative excitation voltage (-Vex).

Electrical

	200350	200355
Sensitivity	100 mV/g ±20% (10.2 mV/m/s^2 ±20%)	100 mV/g ±5% (10.2 mV/m/s^2 ±5%)
Frequency Range (±3 dB)	30-600,000 cpm (0.5-10,000 Hz)	12-600,000 cpm (0.2-10,000 Hz)
Measurement Range	± 50 g	
Transverse Sensitivity	≤ 7%	≤ 5%
Amplitude Linearity	± 1%	
Mounted Resonant Frequency	1500 kcpm (25 kHz)	1250 kcpm (20.8 kHz)
Broadband Electrical Noise (1-10kHz)	350 µg (3,434 µm/s^2)	50 µg (491 µm/s^2)
Output Bias Voltage	8 to 12 VDC	
Excitation Voltage	18 to 28 VDC	
Constant Current Excitation	2 to 20 mA	

Settling Time (within 1% of bias)	≤ 2.0 sec	≤ 5.0 sec
Output Impedance	< 150 ohms	< 100 ohms
Discharge Time Constant	≥ 0.3 sec	≥ 0.8 sec
Electrical Isolation (Case)	> 10^8 ohms	

Environmental

Operating Temperature Range	-65°F to +250 °F (-54°C to +121 °C)
Shock Survivability	5,000 g pk
Relative Humidity	100% relative, condensing, non-submerged
Enclosure Rating	IP68

Physical

	200350	200355
Hex Size	11/16" (18 mm)	7/8" (22mm)
Height	1.65" (42.4 mm)	2.06" (52.3 mm)
Weight	1.8 oz (51 grams)	3.3 oz (94 grams)
Mounting Thread	1/4-28 Female	
Mounting Torque (Maximum)	2 to 5 ft-lb (2.7 to 6.8 N-m)	

Sensing Element	Ceramic
Sensing Geometry	Shear
Housing Material	Stainless Steel
Sealing	Welded Hermetic
Electrical Connector	2-Pin Mil-C-5015
Electrical Connection Position	Top
Recommended cable length (assuming max vibration of 50g, frequency 10 kHz, and cable capacitance 200 pf/m.) For longer lengths, contact Bently Nevada Tech Support.)	104 ft (31 m)

1.3 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

EMC Directive 2014/30/EU

RoHS

RoHS Directive 2011/65/EU

ATEX

60079-01

60079-07

60079-11

60079-15

ATEX Directive 2014/34/EU

1.4 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.

CSA/NRTL/C

For **200350**:

Intrinsically Safe	Ex ia IIC T4 Class I, Division 1, Groups A, B, C, D AEx ia IIC T4 Class I, Division 1, Groups A, B, C and D T4 @ -54 °C ≤ Ta ≤ +121 °C (-65.2 °F ≤ Ta ≤ 249.8 °F) Per drawing 175825
Intrinsically Safe and Non-Incendive	Ex nL IIC T4 Class I, Division 2, Groups A, B, C, D AEx nA T4 Class I, Division 2, Groups A, B, C and D T4 @ -54 °C ≤ Ta ≤ +121 °C (-65.2 °F ≤ Ta ≤ +249.8 °F) per drawing 17582

ATEX/IECEx

For **200350**:

Ex II 1 G
Ex ia IIC T4 Ga

Ex II 3 G
Ex nA IIC T4 Gc
Ex ec IIC T4 Gc

T4@ Ta = -54°C to 121°C

Entity Parameters:

Zone 0/1	Zone 2
Ui= 28V	Ui= 28V
Ii= 200mA	Ii= 200mA
Pi= 1W	Pi= 1W
Ci=16.2 nF	
Li= 0	

1.5 Hazardous Area Conditions of Safe Use

ATEX/IECEx

Zone 0/1:

Equipment must be connected to equipment, which meets the above listed entity parameters.

The cables type A or B (in compliance with EN 60079-25) must respect the cable parameters listed with the entity parameters.

Zone 2 :

The supply electrical parameters shall not exceed the values mentioned in the tables above.

2.1 Ordering Information

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.

200350 Accelerometer

200350 – AA - BB - CC

A: Mounting Stud	
00	¼-28 SS w/ Brass tip, 0.5”
01	¼-28 to M6 x 1.00 Stainless Steel
02	¼-28 to M8 x 1.25 Stainless Steel
09	No mounting stud
10	1/4 -28 Adhesive Stud Mount
11	M6x1 Adhesive Stud Mount
12	M8x1.25 Adhesive Stud Mount
13	Magnetic Base Kit
B: Tolerance	
00	100 mV/g ± 20% (10.2 mV/m/s^2 ±20%)
C: Approvals	
00	No Approvals
01	CSA, ATEX, IECEx

200355 Accelerometer

200355 – AA – BB - CC

A: Mounting Stud	
00	¼-28 SS w/ Brass tip, 0.5”
01	¼-28 to M6 x 1.00 BeCu
02	¼-28 to M8 x 1.25 BeCu
09	No mounting stud
10	1/4 - 28 Adhesive Stud Mount
11	M6x1 Adhesive Stud Mount
12	M8x1.25 Adhesive Stud Mount
13	Magnetic Base Kit
B: Tolerance	
00	100 mV/g ± 5% (10.2 mV/m/s^2 ±5%)
C: Approvals	
00	No Approvals

2.2 Accessories

168303	200350 and 200355 Accelerometer User Guide
162411	Trendmaster Pro System User Guide
149831	Trendmaster DSM Datasheet
149823	Trendmaster DSM User Guide

Mounting Studs

Dimensional diagrams of all available mounting studs are shown in Graphs and Figures

164373	¼-28 Mounting Stud
164372	M6x1 Mounting Stud
167559	M8X1.25 Mounting Stud

Adhesive Mounting Kits

Adhesive studs are sold in kits containing two threaded studs and two mounting pads. Also in the kit is a packet of acrylic adhesive and materials to mix its two components. A scouring pad and alcohol wipe are provided for preparing the mounting surface.

Temperature Range	-67°F to +250 °F (-55°C to 121 °C)
Cure Time	24 hours

Magnetic Base Kit

The magnetic base has a pull of 35 lbf and it is suitable for placement on both curved surfaces and flat surfaces. The magnet comes supplied with a ¼-28 mounting stud. A dimensional diagram of the magnetic base is shown in Graphs and Figures

286244	Magnetic Base w/ Mounting Stud

Cables

The Splash proof cable is not recommended for the model 200350 accelerometer.

The standard cables are 22 AWG 2-conductor twisted shielded pairs with 2-socket moisture-resistant female connector at one end, terminal lugs at the other end. Cable length is optional and comes in increments of 1 ft between the stated maximum and minimum lengths.

Splash Proof Cable

CB2W100 – AAA

A: Length	
015	15 ft.
032	32 ft.
064	64 ft.
112	112 ft.
125	125 ft.
150	150 ft.
200	200 ft.
250	250 ft.

Standard Cable, No Armor

9571 – AA

A: Length	
02	Minimum length, 2 ft.
99	Maximum length, 99 ft.
XX	Desired length in ft.

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

Non-standard/custom lengths can also be ordered at additional cost

Standard Cable, Armored

84661 – AA

A: Length	
03	Minimum length, 3 ft.
99	Maximum length, 99 ft.
XX	Desired length in ft.
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

Non-standard/custom lengths can also be ordered at additional cost

3. Graphs and Figures

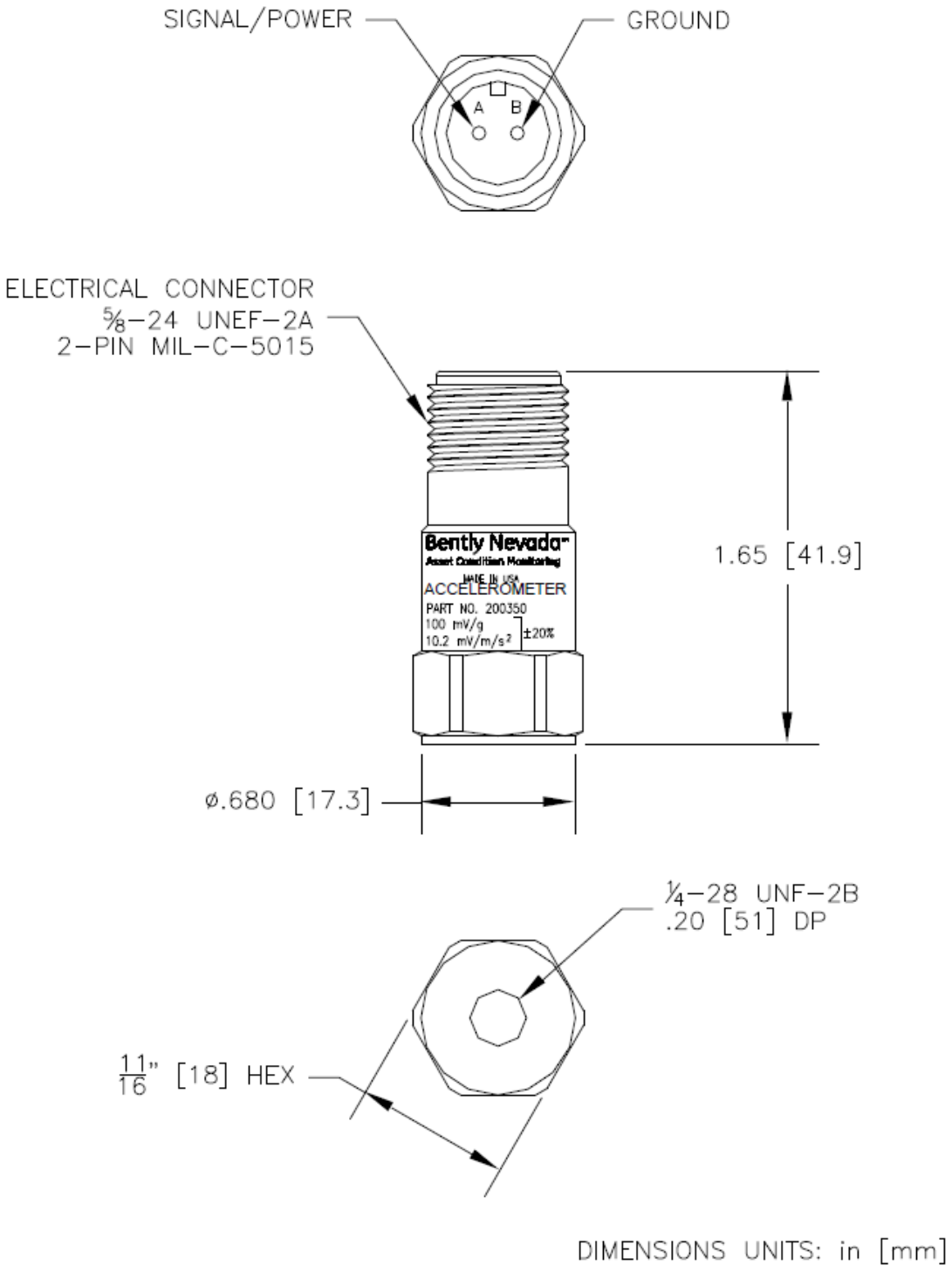


Figure 3 - 1: 200350 Accelerometer Dimensional Drawing

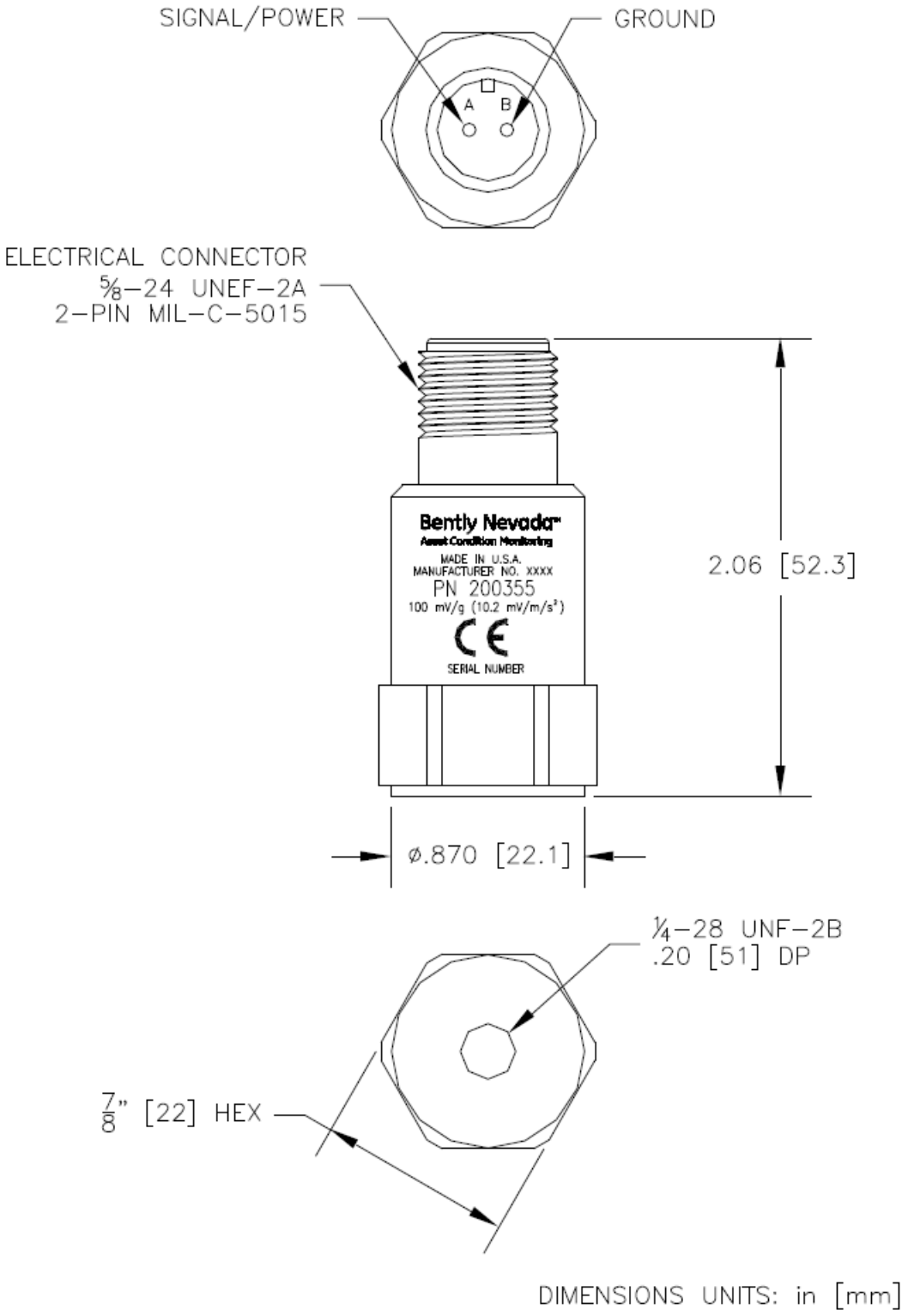


Figure 3 - 2: 200355 Accelerometer Dimensional Drawing

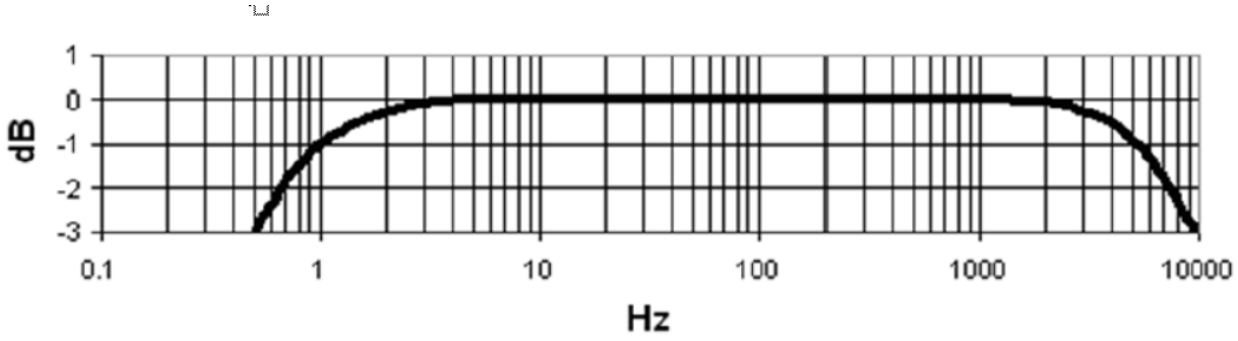


Figure 3 - 3: 200350 Accelerometer Frequency Response

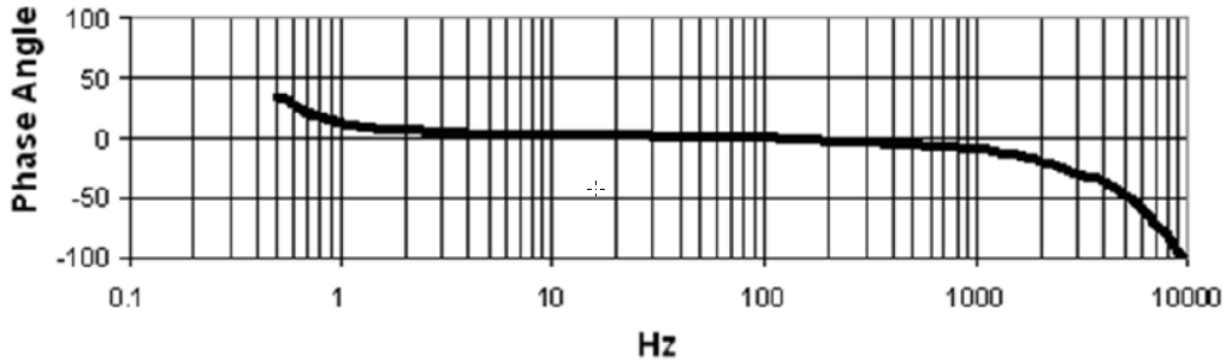


Figure 3 - 4: 200350 Accelerometer Phase

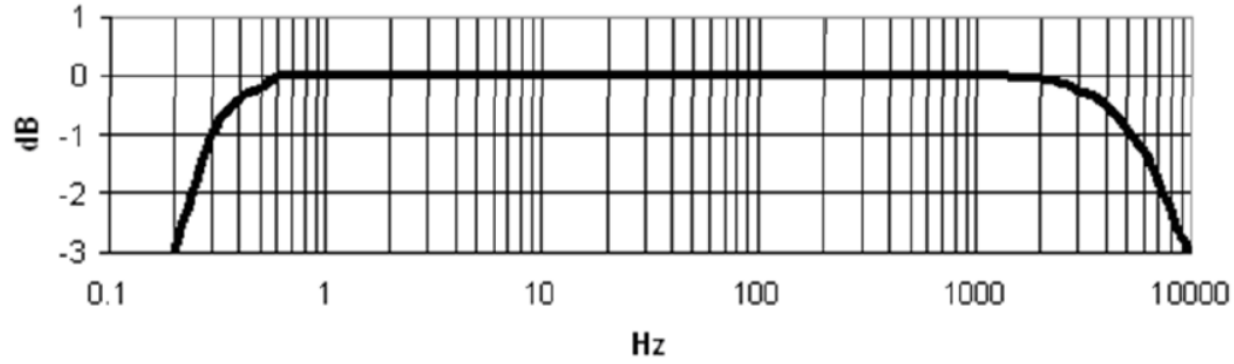


Figure 3 - 5: 200355 Accelerometer Frequency Response

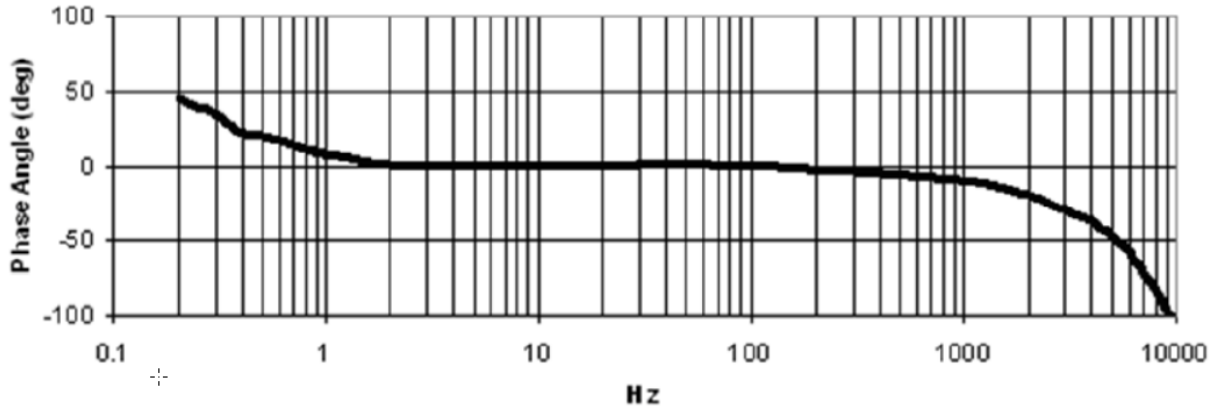


Figure 3 - 6: 200355 Accelerometer Phase

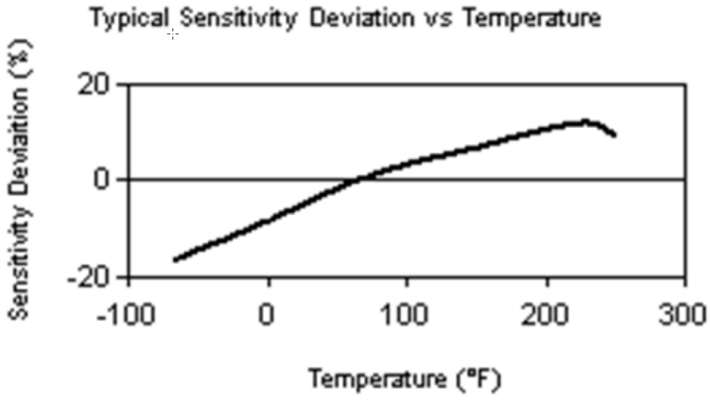
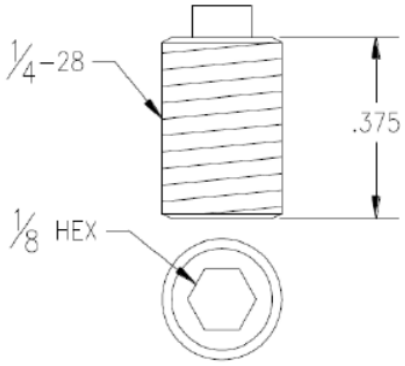


Figure 3 - 7: Temperature Sensitivity Curve



¼-28 Stud

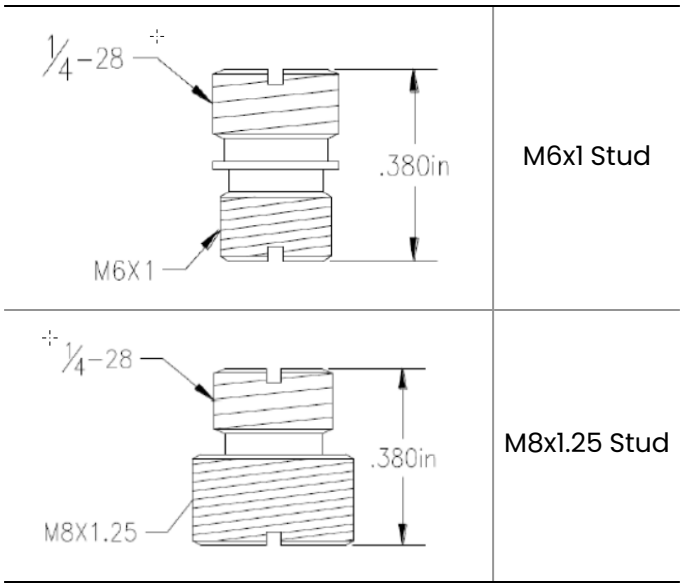


Figure 3 - 8: Mounting Stud Dimensional Drawings

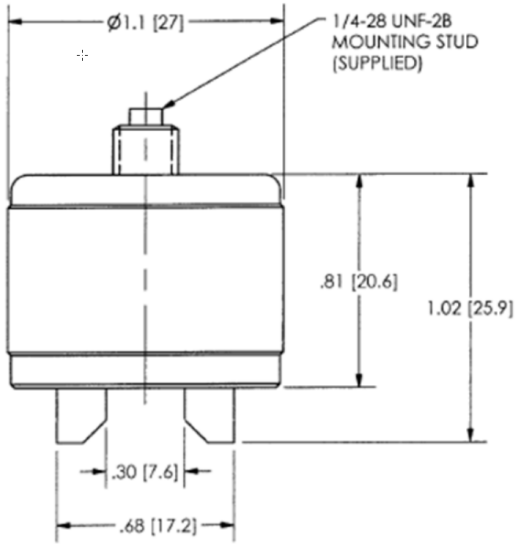


Figure 3 - 9: Magnetic Base Dimensional Drawing

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