2300 Vibration Monitors

Product Datasheet

Bently Nevada* Asset Condition Monitoring

Description

The 2300 Vibration Monitors provide cost-effective continuous vibration monitoring and protection capabilities for less critical and spared machinery. They are specifically designed to continuously monitor and protect essential medium to low criticality machinery in a wide range of industries including: oil & gas, power generation, water treatment, pulp and paper, manufacturing, mining, cement, and other industries.

The 2300 Vibration Monitors deliver vibration monitoring and high vibration level alarming. They include two channels of seismic or proximity measurement inputs from various accelerometer, Velomitor and Proximitor types, a speed input channel for time-synchronous measurements, and outputs for relay contacts. The 2300/20 monitor features a configurable 4-20 mA output which interfaces more points to a DCS. The 2300/25 monitor features System 1* connectivity for Trendmaster SPA interface which enables users to leverage existing DSM SPA infrastructure.

The 2300 Vibration Monitors are designed for use on a broad range of machine trains or individual casings where the sensor point count fits the monitor's channel count and where advanced signal processing is desired.

Monitor Key Features

2300/20

- Two 4-20mA outputs with internal current loop power supply
- Continuous monitoring and protection
- Two acceleration/velocity/proximity inputs with synchronized sampling for advanced diagnostics
- One dedicated speed channel supporting Proximity probes, Magnetic pickup and Proximity switch type sensors
- Support process variable on all three input channels
- Key measurements (Acceleration pk, Acceleration rms, Acceleration pk/rms, Velocity pk, Velocity rms, Displacement pp, Displacement rms, Speed) real-time provided with alarm configuration
- One measurements group and additional 2 bandpass measurements for separately channel
- LCD and LED for real time value and status display
- Ethernet 10/100 Base-T communication for configuration using Bently Nevada Monitor Configuration software (Included) with RSA encryption
- Local contacts for positive engagement of channel bypass, configuration lockout, and reset
- Two relay outputs with programmable setpoints
- Three buffered transducer outputs (including Keyphasor* signal) providing short circuit and EMI protection. Buffered outputs for each signal are through BNC connectors.
- Modbus® over Ethernet

⚠ **CAUTION:** Two 4-20 mA outputs will **NOT** work with external powered loop.

Recommended for Demonstration Kit

2300/20_KIT-003-02-01

- 1 - 2300/20 Monitor
- 1 - 6 ft. (1.8M) shielded Ethernet cable
- 2 - Accelerometer sensors (200350)
- 2 - 12 ft. (3.6M) accelerometer cables (9571)
- 100M9465-01 BN Monitor Configuration SW/FW DVD

To be ordered separately:

110M7102-01 Power supply for DIN rail mounting, 100/240AC to 24DC/1.3A (-25°C ~70°C, 22.5*99*107 mm)

2300/25

- Trendmaster SPA interface
- Continuous monitoring and protection
- Two Acceleration/Velocity/Proximity inputs with synchronized sampling for advanced diagnostics
- One dedicated speed channel supporting Proximity probes, Magnetic pickup and Proixmity switch type sensor
- Support process variable on all three input channels
- Key measurements (Acceleration pk, Acceleration rms, Acceleration pk/rms, Velocity pk, Velocity rms, Displacement pp, Displacement rms, Speed) real-time provided with alarm configuration
- One measurements group and additional 2 bandpass measurements for separately channel
- LCD and LED for real time value and status display
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- Local contacts for positive engagement of channel bypass, configuration lockout, and reset
- Two relay outputs with programmable setpoints
- Three buffered transducer outputs (including Keyphasor signal) providing short circuit and EMI protection. Buffered outputs for each signal are through BNC connectors.
- Modbus® over Ethernet

Specifications

INPUTS

POWER INPUT	
DC Input	18~36VDC, max 7.5W

CHANNEL TYPES	
ICP Accelerometers	
Configurable Bandpass filter:	0.2 Hz to 20 kHz
Scale Factor range	5 to 1000 mV/g
Full scale range	2 to 80 g peak
Current Sink Source	3.3 mA ± 5%
Open Circuit Voltage	-21 to -24 VDC
Velocity	
Configurable Bandpass filter	0.2 Hz to 20 kHz
Scale Factor range	5 to 1000 mV/in/s
Full scale range	0 to 50 in/s peak
Radial Vibration	
Configurable Bandpass filter	0.2 Hz to 20 kHz
Scale Factor range	5 to 1000 mV/mil
Full scale range	0 to 160 mil peak-peak
Thrust Channel	
Scale Factor range	5 to 1000 mV/mil
Process Variable Channel	
Support most of unit with default on Temperature	
Channel Hardware Specification	
Configurable Upper OK limit	-0.25 to -22 V (greater than lower**OK**)
Configurable Lower OK limit	-0.25 to -22 V (less than upper**OK**)
Accuracy: ±1% of full scale range	
Independent 24-bit ADCs on input channels	
Support Bently transducer or 2/3 wires custom transducer for Accelerometers, Velomitor and Proximitor	
Speed/Keyphasor	
Keyphasor transducers support multiple events per revolution and event ratios for speed inputs up to 20 kHz	
Threshold voltage resolution	0.1VDC
Proximity Transducer Interface	
Supply Voltage	-22.8 to –25.2 VDC
Maximum Rated Current	15 mA
Short Circuit Current	15.1 mA to 23.6 mA
Accuracy	±1% of full scale range
Input Impedance	3-wire Voltage Mode, 10 kΩ
Rpm range	1 to 120,000
Proximity Switch Interface	
Supply Voltage	-10 to -24 VDC
Lower Not Ok limit	-2.75 ±0.05 V
Rpm range	1 to 120,000
Magnetic Pick up	
Input voltage	up to ±125V (250Vp-p)
Rpm range	200 to 120,000
Contact Inputs	
Monitor provides 3 contact capabilities with input terminals	Configuration lock Latched alarm/relay reset function Monitor Alarm/Relay Inhibit
Activate	0 to 10 kΩ
De-activate	150 kΩ to infinite
Button Inputs	
External button to reset latched alarm and relay	
One buried button provides 3 functions	• Display monitor information • LCD contrast adjustment • Reset settings to default

Display Monitor Information	
Reset listed settings to **Default**	• User account name • IP Address • FW/HW version

Jumper between COM & Chassis GND
Jumpers are 2-pin terminal interfaces that connects COM to the Chassis ground (GND).
Alternatively, COM can be connected to an earth ground separately through a terminal.

OUTPUTS

Buffered Output	
Three buffered outputs are available on the monitor through BNC connectors	2 Vibration Outputs 1 Speed Output

Relay	
Relays provide two dry-contact outputs	May be normally energized or de-energized No output feedback determination

Relay circuit specification in Non-Hazardous area:	
Type	Single pole, double throw
Sealing	Epoxy sealed
Contact life	100,000 cycles @ 5 amps 250 VAC 200,000 @ 1 amp, 24 VDC
Insulation resistance	1000 MΩ minimum @ 500 VDC
Relay closed contact resistance	1 Ω maximum
Relay open contact resistance	1 MΩ minimum
Maximum switched contact voltage	250V AC /250V DC
Maximum breaking contact current	6A @250VAC / 6A @24VDC
Maximum switched power	1500VA AC / 150 Watts DC

Relay circuit specification in Hazardous area:	
Maximum switched contact voltage and current	6A @24VAC / 5A @30VAC / 5.8A @24VDC / 4A @30VDC

4-20mA Output (2300/20)
Two 4-20mA outputs with internal current loop power supply 4 to 20mA output values are proportional to the full-scale of the associated measurement Software configuration may determind the varible of each output Voltage compliance: 0 to +12Vdc range across load Load resistance: 0 to 600Ω Resolution: 0.3662uA Accuracy: 1% over operating temperature range Update rate: 100ms Configurable with default 2mA clamp current No output feedback determination ⚠ **CAUTION:** Two 4-20 mA outputs will **NOT** work with external powered loop.

SPA Output (2300/25)	
Input signal range	High AC: 8Vpp Low AC: 1.6Vpp DC GAP: 0 to -20Vdc (max measurable AC signal is 1Vpp)
Accuracy	High/Low AC: ±1% of Full-Scale at 100Hz DC GAP: ±0.5V (measurable AC accuracy: ±20mV)
Frequency response	10Hz to 3000Hz ±5%

LEDs	
OK	Indicates when the monitor is operating properly

Protection fault	Indicates hardware fault that is impacting alarm determination
User inhibit	Indicates the alarm/relays have been intentionally inhibited from operation
Bypass	Indicates user initiated bypass action
Relay status	Indicates if relays have been activated
TX/RX	Indicates the Ethernet status and monitor communicating with remote software
SPEED/AUX channel status	Indicates the speed channel has valid speed signal input OR operating correctly when AUX
Channel Alarm Status	Alert LED: engages if any channel is in alert state Danger LED: engages if any channel is in danger state

LCD Display

Allows viewing machine speed, vibration measurements value, setpoints and configuration information.

COMMUNICATIONS

Ethernet	Ethernet, 10Base-T and 100Base-TX. Conforms to IEEE802.3 RJ-45 for 10Base-T/100Base-TX Ethernet cabling Cable length: 100 meters (328 ft.) maximum

ENVIRONMENTAL LIMITS

Operating Temperature	-30 °C to +65 °C (-22 °F to +149 °F)
Storage Temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Humidity	Up to 95%, non-condensing
Vibration Limitation	3g
Battery Life for Real Time Clock	Powered: 38 years @ 50°C (122 °F) Un-powered: 12 years @ 50°C (122 °F)

COMPLIANCE AND CERTIFICATIONS

General and Electrical Safety

UL Std. No. 61010 (3rd Edition)

CAN/CSA C22.2 No. 61010-1-12

2014/35/EU Low Voltage

EN61010-1: 2010

European Community Directives

LV Directive 2014/35/EU

EMC

EN61000-6-2 Immunity for Industrial Environments

EN61000-6-4 Emissions for Industrial Environments

EN61326-1 Electrical equipment for measurement, control and laboratory use - EMC requirements

HAZARDOUS AREA APPROVAL

For a detailed listing of country and product specific approvals, refer to the Approvals Quick Reference Guide (document 108M1756) located at the following website: www.GEmeasurement.com

CSA/NRTL/C

Class I, Division 2/Zone 2
AEx nA nC [ic] IIC T4 Gc
Class I, Division 2, Groups A,B,C & D; T4

ATEX/IECEx

2300/20

 II 3G

Ex nA nC [ic] IIC T4 Gc

T4@ -30°C ≤ Ta ≤ 65°C (-22°F ≤ +149°F)
2300/25
 II 3G Ex nA nC ic [ic] IIC T4 Gc T4@ -30°C ≤Ta ≤65°C (-22°F ≤ +149°F)

Intrinsic Safety Parameters	
Proximitor Transducer	Uo: 24V; Io: 46mA; Co: 200nF; Lo: 1mH
Accelerometer Transducer	Uo: 24V; Io: 3.3mA; Co: 200nF; Lo: 1mH
SPA POWER (2300/25 Only)	Ui=15V; Ii=150mA; Pi=560mW; Ci=0; Li=0
SPA SIGNAL (2300/25 Only)	Ui=12V; Ii=12mA; Pi=36mW; Ci=0; Li=0

PHYSICAL	
Dimensions (Width x Depth x Height)	127mm x 127mm x 76.2mm (5in x 5in x 3in)
Weight	1.03kg (2.26lbs)
Mounting	Panel mount or DIN rail (adapter included)

Ordering Information

For a detailed listing of country and product specific approvals, refer to the Approvals Quick Reference Guide (document 108M1756) located at the following website: www.GEmeasurement.com.

2300 Series Vibration Monitor

2300/20-AA-BB:Monitor with 4-20ma Outputs
(including DIN rail mount assembly, manual and monitor configuration software)

2300/25-AA: Monitor with SPA Outputs
(including DIN rail mount assembly, manual and monitor configuration software)

AA: Approvals Option

00 None

02 Multiple Explosive Atmosphere Certifications (ATEX/IECEx/CSA)

BB: Software License for System 1 Connection

00 Monitor without License

01 Monitor with License

2300/20_KIT-AAA-BB-CC: Bently Nevada 2300/20 Condition Monitoring System Kit

2300/25_KIT-AAA-BB: Bently Nevada 2300/25 Condition Monitoring System Kit

AAA: Configuration

001 2 Sensors and 1 Housing

1 - 2300/20 or 2300/25 Monitor

1 - 6 ft. (1.8 m) shielded Ethernet cable

1 - Housing Kit: 105M6193-01 (fiberglass housing for nonhazardous area) or 105M6193-02 (stainless steel housing for hazardous area) 12 x 14 in.

2 - Accelerometer sensors (200350)

2 - 17 ft. (5.2 m) cables (9571)

(Excluding Keyphasor sensor and 24 VDC power supply [1])

002 1 Sensor and 1 Housing

1 - 2300/20 or 2300/25 Monitor

1 - 6 ft. (1.8 m) shielded Ethernet cable

1 - Housing Kit: 105M6193-01 (fiberglass housing for nonhazardous area) or 105M6193-02 (stainless steel housing for hazardous area) 12 x 14 in.

1 - Accelerometer sensor (200350)

1 - 17 ft. (5.2 m) cable (9571)

(Excluding Keyphasor sensor and 24VDC power supply[1])

003 2 Sensors

1 - 2300/20 or 2300/25 Monitor

1 - 6 ft. (1.8 m) shielded Ethernet cable

2 - Accelerometer sensors (200350)

2 - 12 ft. (3.6m) cables (9571)

(Excluding Keyphasor sensor and 24VDC power supply[1])

004 2 Velomitors and 1 Housing

1 - 2300/20 or 2300/25 Monitor

1 - 6 ft. (1.8 m) shielded Ethernet cable

1 - Housing Kit: 105M6193-01 (fiberglass housing for nonhazardous area) or 105M6193-02 (stainless steel housing for hazardous area) 12 x 14 in.

2 - Velomitor sensors (330500)

2 - 17 ft. (5.2 m) cable (9571)

(Excluding Keyphasor sensor and 24VDC power supply[1])

005 1 Velomitor and 1 Housing

1 - 2300/20 or 2300/25 Monitor

1 - 6 ft. (1.8 m) shielded Ethernet cable

1 - Housing Kit: 105M6193-01 (fiberglass housing for nonhazardous area) or 105M6193-02 (stainless steel housing for hazardous area) 12 x 14 in.

1 - Velomitor sensor (330500)

1 - 17 ft. (5.2 m) cable (9571)

(Excluding Keyphasor sensor and 24VDC power supply[1])

006 2 Velomitors

1 - 2300/20 or 2300/25 Monitor

1 - 6 ft. (1.8 m) shielded Ethernet cable

2 - Velomitor sensors (330500)

2 - 12 ft. (3.6 m) cable (9571)

(Excluding Keyphasor sensor and 24VDC power supply[1])

BB: Approvals Option

00 None

02 Multiple Explosive Atmosphere Certifications (ATEX/IECEx/CSA

CC: Software License for System 1 Connection

00 Monitor without License

01 Monitor with License

3071/13-AA-BB: System 1 2300 Series Device Import

AA: Not available for 2300 monitor

00

BB: Quantity of 2300 Monitoring Systems
- Numeric [1->n]

Notes:

- 3071/13 is only applicable for 2300 monitors that are installed/purchased without the System 1 device license.
- System 1 software requires a separate order. Refer to the System 1 datasheet (document 108M5214) for detailed ordering information.
- Up to 450 2300 devices can be connected at one time in System 1 16.2.
- AA option is for vbOnline Pro Device.

[1]Provided are3 kinds of power supplies with different temperature and power ranges. Verify Accessories below for the details.

Accessories

106M7607-01	Power supply for DIN rail mounting, 100/240AC to 24DC/1.5ACertifications (ATEX) (-25°C ~70°C, 35*99*95 mm) (One power can drive max 4 monitors)
110M7102-01	Power supply for DIN rail mounting, 100/240AC to 24DC/1.3ACertifications (CID2 by UL) (-25°C ~70°C, 22.5*99*107 mm) (One power can drive max 4 monitors.)
106M6694-01	Power supply for DIN rail mounting, 110/220AC to 24VDC/5ACertifications (ATEX, IECEx, CID2 by UL) (-40°C ~70°C, 40*130*125 mm) (One power can drive max 10 monitors.)
105M6193-02	Stainless Steel Housing for 2300 KIT (can be used in hazardous area)
105M6193-01	Fiberglass NEMA 4X/IP66 weatherproof housing with window in door (includes mounting plate for monitor)

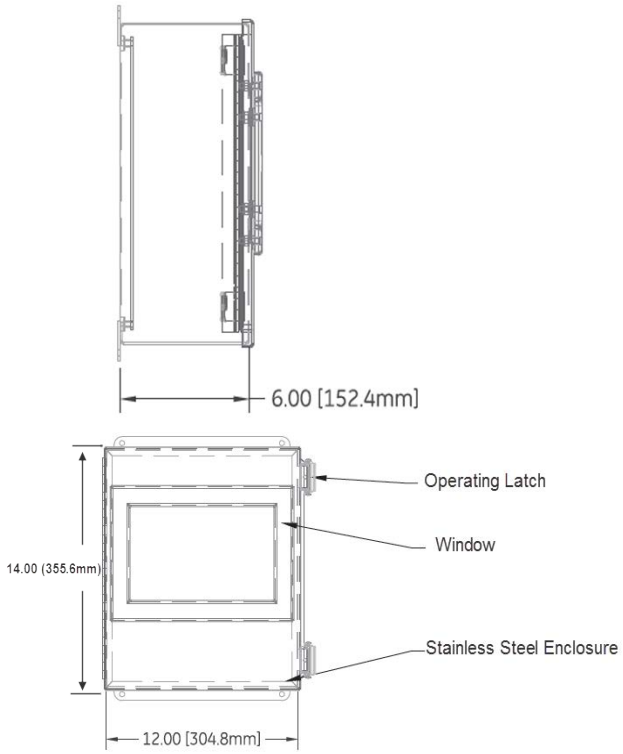
Dimensions:

Width: 338.3 mm (13.3 in)

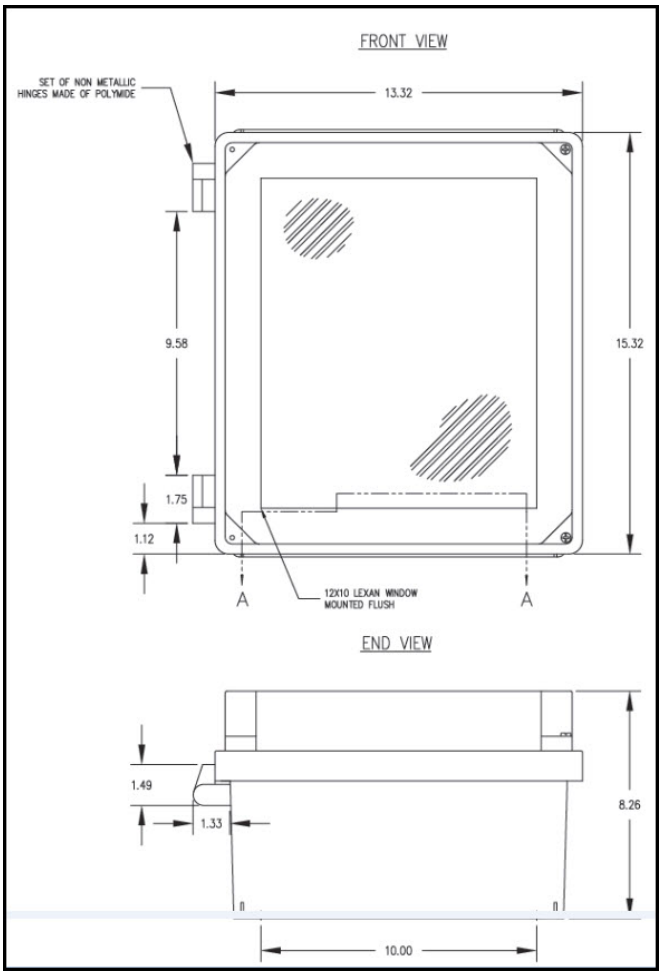
Height: 389.1 mm (15.3 in)

Depth: 209.8 mm (8.2 in)

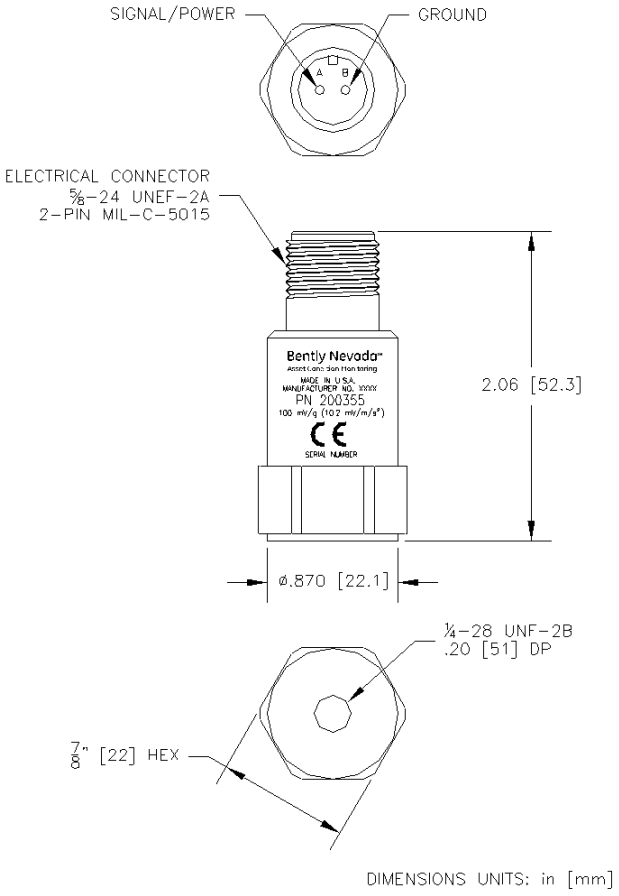
(used in nonhazardous area)



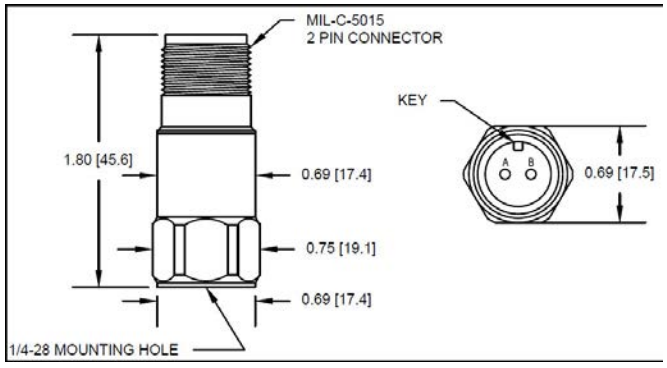
105M6193-02 Weatherproof Housing



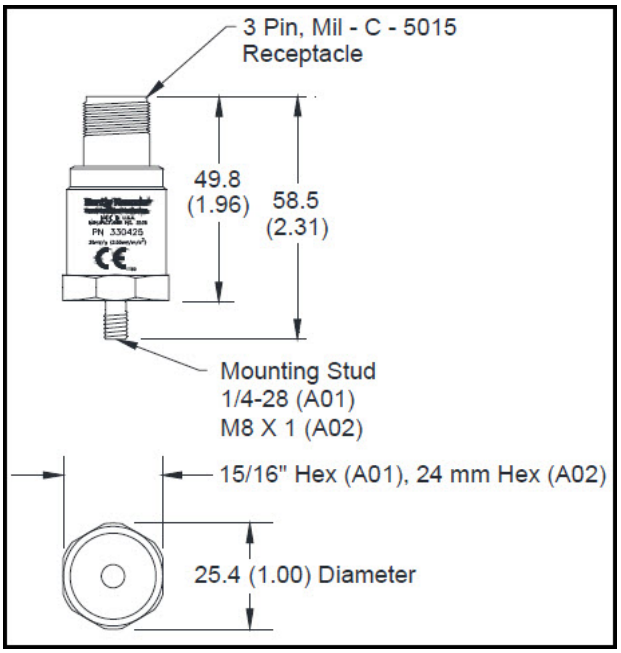
105M6193-01 Weatherproof Housing



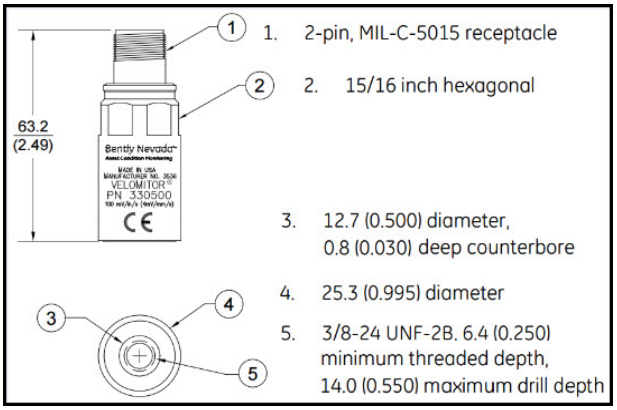
200350 Accelerometer Sensor



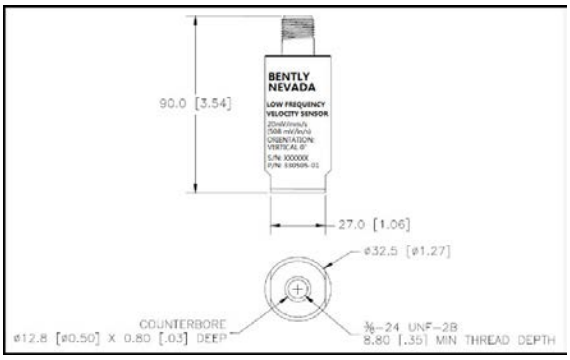
AM3100T2-Z2 Accelerometer Sensor



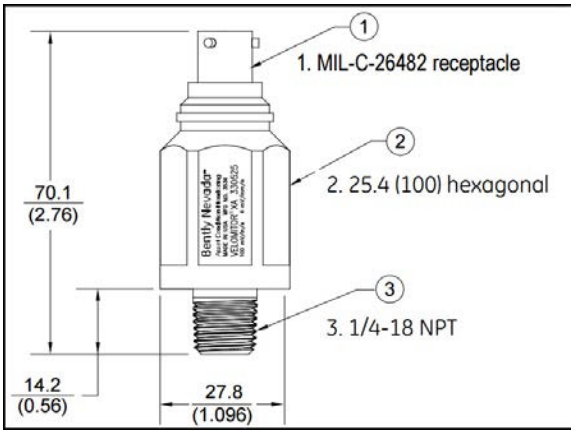
330400/330425 Accelerometer Sensor



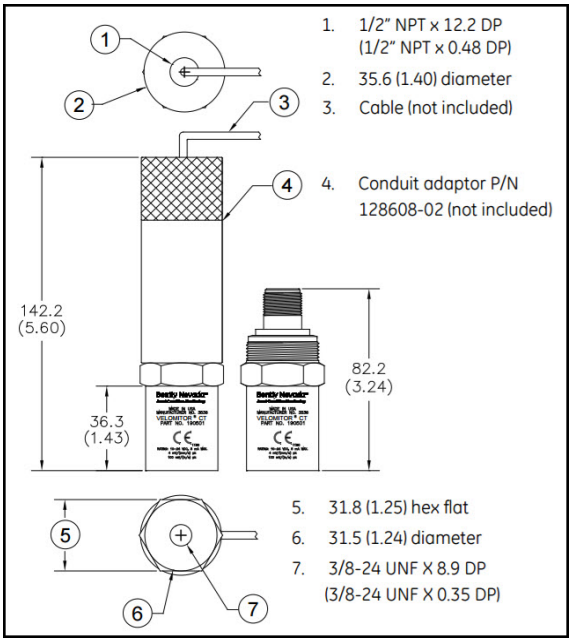
330500 Velomitor



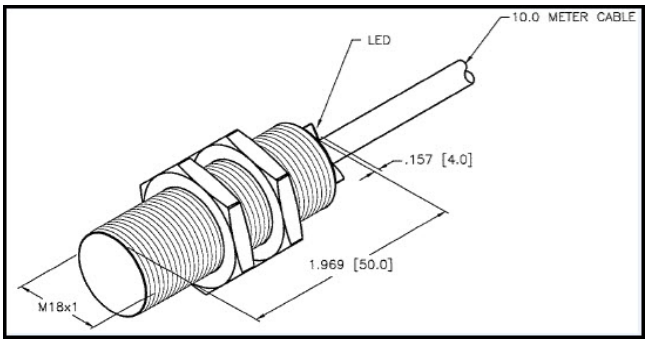
330505 Velomitor



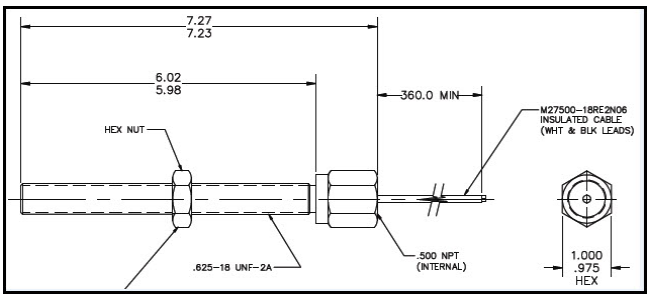
330525 Velomitor



190501 Velomitor



100M0741 Proximity Switch



284947 Magnetic Pickup

Proximity Transducer System

Refer to proximity transducer system datasheet for details.

172036	3300 5mm
141194-01	3300XL 8mm
146256-01	3300XL 11mm
147385-01	3300XL NSV

02120015	Bulk Cable from Proximity sensor to monitor (500 ft.)
9571-AA*	Low cost cable for accelerometer

AA: From "02" to "99" Increments of 1.0 foot

INCREMENTS OF 1.0 FOOT
EXAMPLE: 1 2 = 12 FEET 2 5 = 25 FEET
MIN LENGTH = 2.0 FEET MAX LENGTH = 99 FEET (6)

84661-AA* Armored cable for 2 -wire transducer

AA: From "03" to "99" Increments of 1.0 foot

INCREMENTS OF 1.0 FOOT
EXAMPLE: 1 2 = 12 FEET 2 5 = 25 FEET
MIN LENGTH = 3.0 FEET MAX LENGTH = 99 FEET

CB2W100-AAA Cable for 2 -wire transducer

Note: The CB2W100 cable is not recommended for use with the 200350 Accelerometer. The O-ring will not form a proper seal with the accelerometer.

AAA:

0 1 5	15 ft. (4.8 m)
0 3 2	32 ft. (9.8 m)
0 6 4	64 ft. (19.5 m)
1 1 2	112 ft. (34.1 m)
1 2 5	125 ft. (38.1 m)
1 5 0	150 ft. (45.7 m)
2 0 0	200 ft. (61.0 m)
2 5 0	250 ft. (76.2 m)

Splash Proof Cable for 2 -wire transducer

9571 Mod : 285031-AA*Cable for 2 wire extension with Splash Proof Connection. This cable assembly provides an equivalent IP66 level of protection.

Note: For Proximitor 3300-NSV and Accelerometer 330400 need metal conduit for conducted RF performance.

Note : Cable lengths greater than 30 meters (100 feet) will experience some attenuation of amplitudes at higher frequencies when using the AM3100T2-Z2 Accelerometer.

AA :

16	16 ft. (4.8 m)
32	32 ft. (9.8 m)
64	64 ft. (19.5 m)

286244 Magnetic mounting base ¼-28 threaded hole

Ethernet Cables

138131-AAA Standard 10 Base-T/100 Base-TX Shielded Category 5 Cable with RJ-45 connectors (solid conductor)

AAA: Cable Length

006	6 ft. (1.8 m)
010	0 10 ft. (3.0 m)
025	25 ft. (7.6 m)
040	40 ft. (12.2 m)
050	50 ft. (15.2 m)
075	75 ft. (22.9 m)
085	85 ft. (25.9 m)
100	1 0 0 ft. (30.5 m)

Spares

105M6203-01	35mm DIN rail mount and screws (included with 2300/20 monitor)
106M3210	10 pins 4-20mA output connector
106M2223	5 pins contact input connector (Alarm Reset)
106M3408	5 pins contact input connector (Alarm Inhibit, Config lock)
106M3211	16 pins transducer input connector
106M3212	6 pins relay output connector
106M2231	3 pins power input connector

Accessories

02120015	Bulk Cable from Proximity sensor to monitor (500 ft.)
9571-AA*	Low cost cable for 2-wire transducer

Software

100M9465-01	BN Monitor Configuration SW/FW DVD -BNMC version 5.2 or greater -2300 series monitor firmware (DVD includes 2300 Series Software Guide)

User Manuals

2300 Series Operation and Maintenance Manual (Document 105M0341)

2300 Field Wiring Diagram (Document 106M5801)

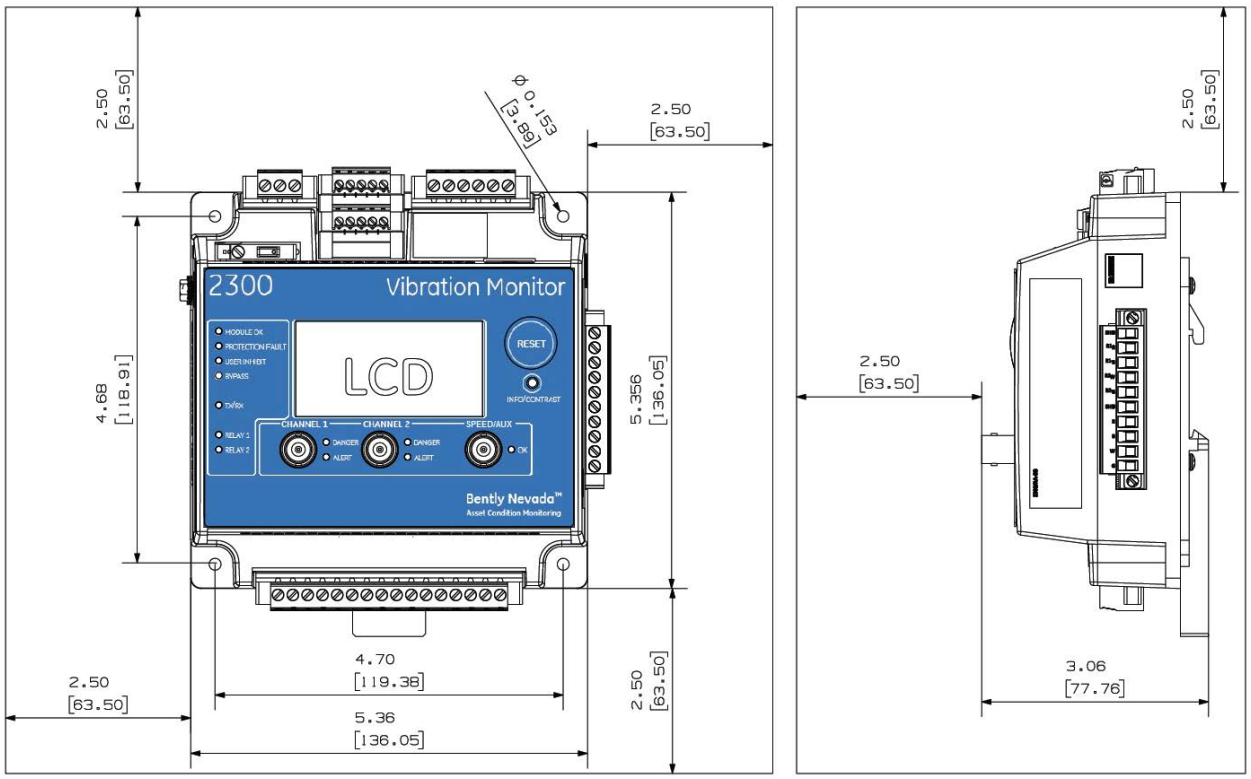
2300 Series Software Guide (Document 107M7626)

2300 Series Monitor Installation Guide (Document 121M3029)
https://www.gemeasurement.com/condition-monitoring-and-protection/distributed-monitoring/bently-nevada-2300-series-vibration

Training Materials Link

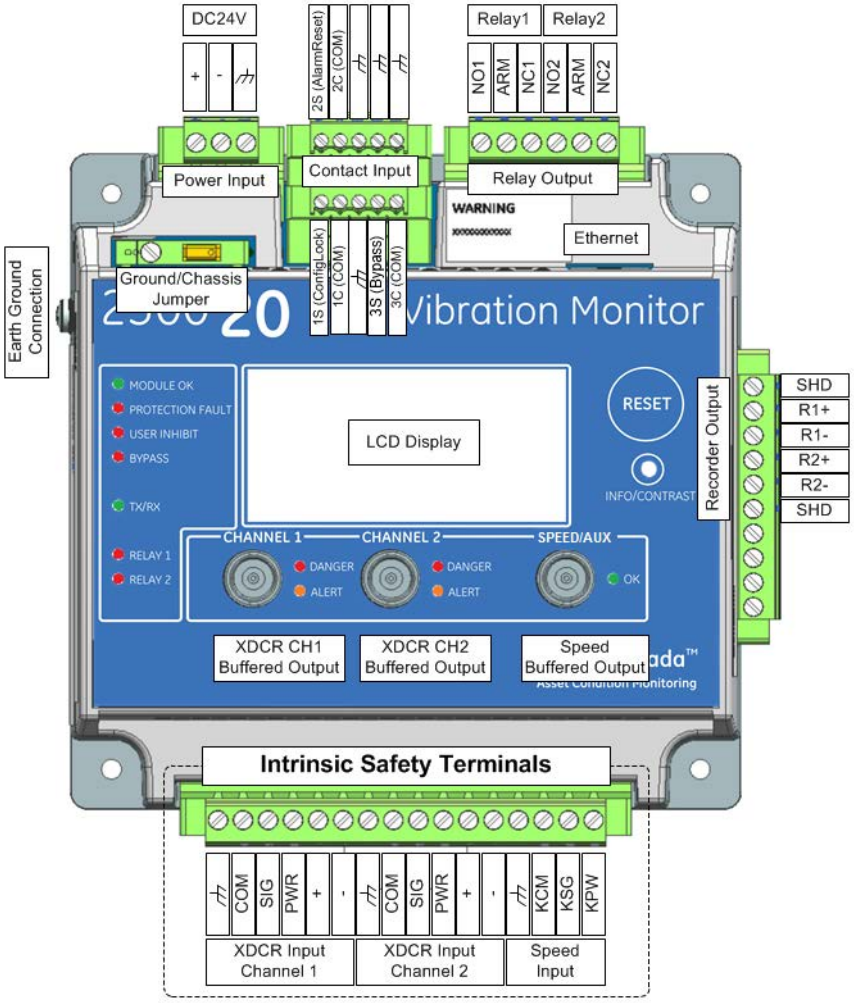
http://ge-energy.turnstilesystems.com/ProgramDetail.aspx/2300Monitor

Graphs and Figures



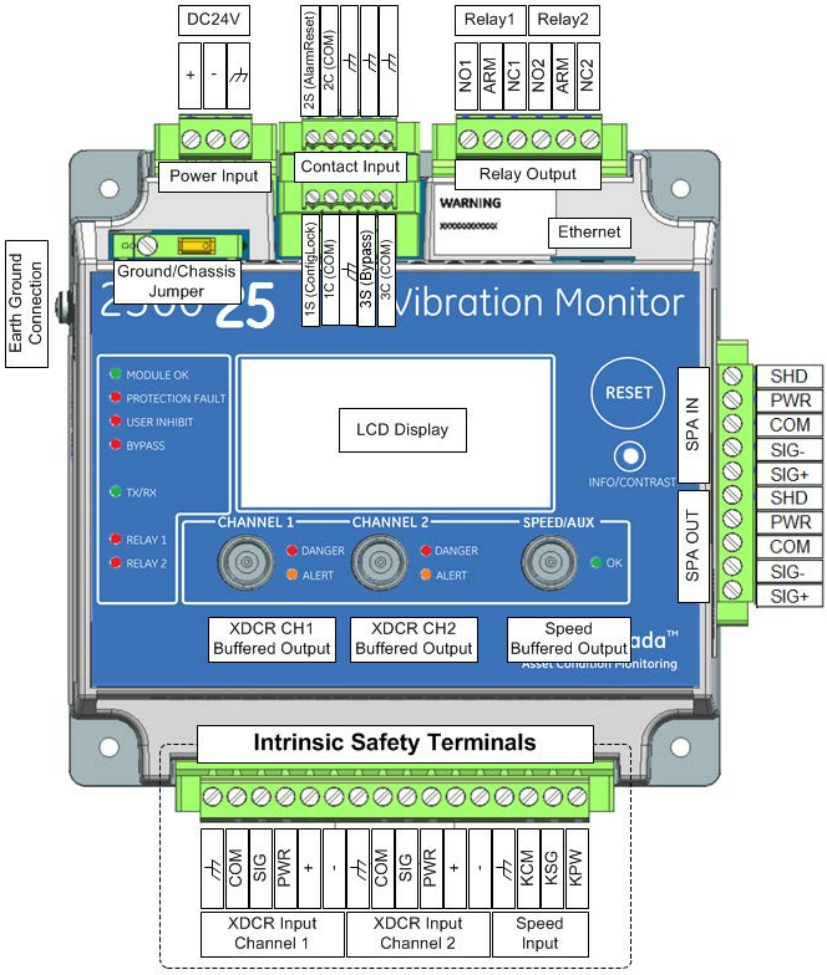
2300 Series Monitor Recommended Clearance

Wiring Diagram



2300/20 Wiring Diagram

Note: 2300/20 and 2300/25 use the same interface connector for recorder output or SPA output.



2300/25 Wiring Diagram

Note: 2300/20 and 2300/25 use the same interface connector for recorder output or SPA output.

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www.GEmeasurement.com