MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

BENTLY NEVADA

200155-00-CN

LOW-FREQUENCY TRENDMASTER PRO ACCELEROMETER

Used with the applicable 200150, 200155 and 200157 Accelerometers system configuration.

REFERENCE PACKAGE

Selected official pages follow this cover with source pagination retained.

OFFICIAL DOCUMENT

164986 Rev. Y

200150, 200155 and 200157 Accelerometers

Datasheet

Cordant™

164986 Rev. Y

Description

The 20015x Accelerometers are general purpose, wide frequency, case-mounted seismic transducers designed for use with Trendmaster ProTIMs.

The 200150 Accelerometer also operates with the Trendmaster 2000 system. The accelerometer interfaces with the 200100 Dual Acceleration to Velocity flexiTIM Module and the 89130-01 Acceleration-to-Velocity TIM (Transducer Interface Module), as well as the 1900/25 and 1900/27 monitors.

The 20015x Accelerometers feature a hermetically sealed, stainless steel case. This design provides an extremely rugged transducer that is well suited for harsh industrial environments. The transducer's top-mounted, 5-pin connector allows you to easily install and remove the interconnecting signal cable. A 3/8-24 threaded hole on the bottom of the sensor's casing accommodates several mounting options.

The 20015x Accelerometers contain a piezoelectric sensing device that generates a charge when it is subjected to vibration. The accelerometers electronically convert this charge to a differential voltage signal that is proportional to the acceleration that is parallel to the sensitive axis of the transducer.

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If you use the 200155 and 200157 Accelerometers with 1900 monitors or with TIMs other than those listed in Table 1, or if you operate the transducers outside their specified limits, machine monitoring may fail or the data obtained may not be accurate.

The maximum allowed cable length for use with the 200155 is 15.24 m (50 ft.). You can install 20015x accelerometers in a Class I, Zone 0 application without a barrier, if you use them with the wSIM.

Table 1: 20015x Accelerometer Applications

Accelerometer	Used with ProTIM Option	Type of Application
200150	Standard Acceleration-to-Velocity channel type (-01)	General application
200155	Low Frequency Acceleration-to-Velocity channel type (-05)	Fin-Fan, slow rotating shafts
200157	Standard Acceleration-to-Velocity with Acceleration Enveloping channel type (-06)	Roller element bearing and certain types of cavitation effects

Note that the acceleration-to-velocity circuitry in the 200200 and 200250 ProTIMs attenuates frequencies above 1 kHz . You cannot obtain higher frequency data with the 200155 or 200157.

The wider frequency range of the 200155 and 200157 accelerometers may result in increased noise compared to the 200150. We recommend that you use the 200155 transducer for frequencies of interest below 10 Hz. Use the 200157 only if the application requires acceleration enveloping. Use of the 200155 or the 200157 in place of the 200150 may result in faulty readings. Refer to the ProTIM datasheet for the proper frequency response of the system.

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

All specifications are at +25°C (+77°F), unless otherwise specified.

Electrical

Sensitivity @ 80 Hz (± 12%)	10.2 mV/(m/s²) (100 mV/g)

Measurement Range

Accelerometer	Measurement Range in m/s² (g)
200150	±245 (±25)
200155	±196 (±20)
200157	±245 (±25)

Frequency Range Referenced to 80Hz (±10%)

Accelerometer	Frequency Range in Hz (cpm)
200150	10 to 1000 (600 to 60,000)
200155	2.0 to 10,000 (90 to 600,000)
200157	10 to 10,000 (600 to 600,000)

Mounted Resonant Frequency	>20 kHz (>1200 kcpm)
Amplitude Linearity (1 to 10g pk)	±2%
Transverse Sensitivity	≤7%

Settling Time (Within 5% of Bias)

Accelerometer	Settling Time (ms)
200150	≤300
200155(1)	≤2000
200157	≤300

(1) Because of its long settling time, you can use the 200155 only with low frequency acceleration-to-velocity channel types on a ProTIM, DSM, or System 1 system.

Excitation Voltage	4.7 to 5.5 Vdc
Polarity (Acceleration from Base to Connector)	SIG+ positive with respect to SIG-.
Quiescent Current	<800 µA
Output Bias Voltage	+2.5 ± 0.23 Vdc

Broadband Electrical Noise (1 Hz to 15 kHz)

Accelerometer	Measurement Range in mm/s² (mg)
200150	14.7 (1.5)
200155	24.5 (2.5)
200157	14.7 (1.5)

Electrical Isolation	600 Vrms

Environmental

Axial Shock Limit	49,050 m/s² pk (5,000 g pk)
Temperature Range	-40°C to +105°C (-40°F to +221°F)
Sealing (Hermetic)	5X10-8 atm•cc/s (3.1X10-9 atm•in³/s), maximum

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.

cNRTLus

Ex nL IIC T4:
AEx nA IIC T4:
Class I, Div 2, Groups A, B, C, D.

Ex ia IIC T4:
AEx ia IIC T4:
Class I, Div 1, Groups A, B, C, D;
Class II, Div 1, Groups E, F, G;
Class III, Div 1

Install per drawing 177234

T4 @ Ta ≤ 80°C

ATEX/IECEx

177230	II 1 G Ex ia IIC T4 Ga II 3 G Ex na IIC T4 Gc T4@ Ta = -40°C to 80°C
Entity Parameters	See table below

Zone 0/1	Zone 2
Ui= 28 V	Ui= 28 V
Ii= 120 mA	Ii= 120 mA
Pi= 1 W	Pi= 1 W
Ci=0	
Li=121.06 µh	

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.