Bently Nevada 3500 Series Service Manual

3500/42-09-05

1. Description

3500/42-09-05

3. Product Information

3500/42-09-05 | Bently Nevada | Proximitor Seismic Monitor

Manufacturer : Bently Nevada

Product No. : 3500/42-09-05

Product type : Proximitor Seismic Monitor

Made in U.S.A

I/O Module Type : 09

I/O Description :Prox/Velom I/O Module with

internal terminations

Transducer Type : Prox/Accel, Velomitor or HTVS

Hazardous Area Approval Option : 05= ATEX / IECEx / CSA (Class 1, Zone 2)

Option B02 is available only with A04, A05,

A06 and A09.

Inputs

Signal: Accepts from 1 to 4 proximity, velocity or acceleration transducer signals

Power consumption: 7.7 watts, typical

Input Impedance

Standard I/O:10 kΩ (Proximitor and acceleration inputs)

Sensitivity

Radial Vibration:

3.94 mV/µm (100 mV/mil) or

7.87 mV/µm (200 mV/mil)

Thrust : 3.94 mV/µm (100 mV/mil) or 7.87 mV/µm (200 mV/mil)

Eccentricity : 3.94 mV/µm (100 mV/mil) or 7.87 mV/µm (200 mV/mil)

Differential Expansion: 0.394 mV/µm (10 mV/mil) or 0.787 mV/µm (20 mV/mil)

REBAM ; 40 mV/µm (1000 mV/mil) or 80 mV/µm (2000 mV/mil)

Acceleration & Acceleration2: 10 mV/ (m/s2) (100 mV/g)

Velocity & Velocity2: 20 mV/ (mm/s) pk (500 mV/ (in/s) pk) or 5.8 mV/ (mm/s) pk (145 mV/ (in/s) pk) or 4 mV/ (mm/s) pk (100 mV/ (in/s) pk)

Shaft Absolute, Radial Vibration: 3.94 mV/µm (100 mV/mil) or 7.87 mV/µm (200 mV/mil)

Shaft absolute, Direct: 3.94 mV/µm (100 mV/mil) or 7.87 mV/µm (200 mV/mil)

Shaft absolute, Velocity:

20 mV/ (mm/s) pk

(500 mV/ (in/s) pk) or

5.8 mV/ (mm/s) pk

(145 mV/ (in/s) pk) or

4 mV/ (mm/s) pk

(100 mV/ (in/s) pk)

Outputs

Front Panel LEDs

OK LED: Indicates when the 3500/42M Proximitor Seismic Monitor is operating properly.

TX/RX LED: Indicates when the 3500/42M Proximitor Seismic Monitor is communicating with other modules in the 3500 rack.

Bypass LED: Indicates when the 3500/42M Proximitor Seismic Monitor is in Bypass Mode.

Buffered Transducer Outputs: The front of each monitor has one coaxial connector for each channel.

Each connector is shortcircuit protected.

Output Impedance: 550 Ω

Transducer Power Supply: -24 Vdc

Recorder: +4 to +20 mA

Values are proportional to monitor full-scale.

The monitor provides individual recorder values for each channel.

Monitor operation is unaffected by short circuits on recorder outputs.

Voltage Compliance (current output):

0 to +12 Vdc range across

load

Load resistance is 0 to 600 Ω.

Front Panel LEDs

Resolution: 0.3662 µA per bit ±0.25% error at room temperature ±0.7% error over temperature range

Update rate approximately 100 ms or less

Shaft Absolute Buffered Outputs: The Shaft Absolute I/O modules have one output for each channel group.

Each output is short circuit protected.

Shaft Absolute Output Impedance: 300 Ω

Signal Conditioning

Specified at +25 ºC (+77 ºF) unless otherwise noted.

Radial Vibration

Frequency Response

Direct filter: User-programmable

Single-pole -3db at 4 Hz to 4000 Hz or 1 Hz to 600 Hz ± 1% accuracy

Gap filter : -3 dB at 0.09 Hz

Not 1X filter: 60 cpm to 15.8 times running speed

Constant Q notch filter Minimum rejection in stopband of -34.9 dB

Smax: 0.125 to 15.8 times running speed

1X and 2X vector filter: Constant Q Filter Minimum rejection in stopband of -57.7 dB

Accuracy

Direct and Gap: Exclusive of filtering Within ±0.33% of full-scale typical ±1% maximum

1X and 2X: Within ±0.33% of full-scale typical ±1% maximum

Smax : Within ±5% maximum

Not 1X: ±3% for machine speeds less than 30,000 cpm ±8.5% for machine speeds greater than 30,000 cpm

Thrust and Differential Expansion

Accuracy: Within ±0.33% of full-scale typical ±1% maximum

Frequency Response

Direct filter: -3 dB at 1.2 Hz

Gap filter: -3 dB at 0.41 Hz

Eccentricity

Accuracy: Within ±0.33% of full-scale typical ±1% maximum

Frequency Response

Direct filter: -3 dB at 15.6 Hz

Gap filter: -3 dB at 0.41 Hz

Acceleration

Accuracy: Within ±0.33% of full-scale typical

±1% maximum Exclusive of filters

Filter Quality

High-pass: 4-pole (80 dB per decade, 24 dB per octave)

Low-pass: 4-pole (80 dB per decade, 24 dB per octave)

Acceleration II

Accuracy: Within ± 0.33% of full scale typical ± 1% maximum Exclusive of filters

Filter Quality

High-pass: 4-pole (80 dB per decade, 24 dB per octave)

Low-pass: 4-pole (80 dB per decade, 24 dB per octave)

Frequency Response

Bias filter: -3 dB at 0.01 Hz

Not OK filter: -3 dB at 2400 Hz

1X and 2X vector filter: Valid for machine speeds of 60 cpm to 100,000 cpm

Velocity and Velocity II

Accuracy: Within ±0.33% of full-scale typical ±1% maximum

+1% -3% with MTL 764(-) Zener External Barrier Exclusive of filters

Velomitor sensor accuracy:

Full Scale 0-0.5: ±3% typical

Full Scale 0-1.0: ±2% typical

Full Scale 0-2.0: ±1% typical

Velomitor sensor accuracy with barriers

Under radiated immunity conditions, add ± 11% for all full scale ranges. The total Velomitor sensor accuracy will be ± 15%.

Frequency Response

Bias: -3dB at 0.01 Hz ; Velocity II only

Not OK filter: -3 dB at 40 Hz; Velocity II only

RMS : 10 to 5,500 Hz, -3 dB

Peak or peak to-peak: 3 to 5,500 Hz, -3 dB

1X and 2X vector filter: Valid for machine speeds of 60 to 100,000 cpm Velocity II only

Filter Quality

High-pass: 4-pole (80 dB per decade, 24 dB per octave)

Low-pass: 2-pole (40 dB per decade, 12 dB per octave)

Monitor Module (Main Board)

Dimensions

(Height x Widthx Depth)

241.3 mm x 24.4 mm x 241.8mm

(9.50 in x 0.96 in x 9.52 in)

Weight 0.91 kg (2.0 lb)