

3500/42M Proximator Seismic Monitor

Datasheet

Cordant™

143694 Rev. AE

Description

The Bently Nevada™ 3500/42M Proximator Seismic Monitor:

- Protects machinery by continuously comparing monitored parameters against configured alarm setpoints to drive alarms.
- Communicates essential machine information to both operations and maintenance personnel.

The 3500/42M Proximator Seismic Monitor is a four-channel monitor that accepts input from proximity and seismic transducers. It conditions the signal to provide vibration and position measurements and compares the conditioned signals with user-programmable alarms.

You can program each channel using the 3500 Rack Configuration Software to monitor and report:

- | | | |
|--------------------|------------------------------|-------------------|
| - Radial vibration | - REBAM | - Thrust position |
| - Acceleration | - Differential expansion | - Shaft absolute |
| - Eccentricity | - Circular acceptance region | - Velocity |



The monitor channels are programmed in pairs and can perform up to two of the listed functions at a time. For example, Channels 1 and 2 can perform one function while channels 3 and 4 perform another or the same function.

Each channel, depending on configuration, typically conditions its input signal to generate various parameters called **static values**. You can configure **alert setpoints** for each active static value and danger setpoints for any two of the active static values.



Baker Hughes

Specifications

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 (Proximitors and acceleration inputs)
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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 & Acceleration ²	10 mV/ (m/s ²) (100 mV/g)
Velocity & Velocity ²	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)
Circular Acceptance Region	See Radial Vibration on page 4.

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 short-circuit 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
Output supply parameters	See Output Supply Parameters on page 14.

Signal Conditioning

Specified at +25 °C (+77 °F) 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



1X and 2X Vector, Not 1X, and Smax parameters are valid for machine speeds of 60 cpm to 60,000 cpm.

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 $\pm 0.33\%$ of full-scale typical $\pm 1\%$ maximum
Frequency Response	
Direct filter	-3 dB at 15.6 Hz
Gap filter	-3 dB at 0.41 Hz

Acceleration

Accuracy	Within $\pm 0.33\%$ of full-scale typical $\pm 1\%$ 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)

Table 1: Frequency Ranges if Both Channels of a Channel Pair are Enabled

Dual Channel Frequency Response			
Output Type	Without Filter	Low or High Pass Filter	With Integration
RMS	10 to 30,000 Hz	10 to 9,155 Hz	10 to 9,155 Hz
Peak	3 to 30,000 Hz	3 to 9,155 Hz	10 to 9,155 Hz

Table 2: Frequency Ranges if a Single Channel of a Channel Pair is Enabled

Single Channel Frequency Response		
Output Type	Without Filter Low or High Pass Filter	With Integration
RMS	10 to 30,000 Hz	10 to 14,500 Hz
Peak	3 to 30,000 Hz	10 to 14,500 Hz

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.

Monitor 3500/42 - AA - BB

A: I/O Module Type

[See I/O Module Types on page 18.](#)

B: Hazardous Area Approval Option

00	None
01	cNRTLus (Class 1, Division 2)
02	ATEX / IECEx / CSA (Class 1, Zone 2)

External Termination Blocks

125808-02	Proximitor ET Block Euro Style Connectors
128015-02	Proximitor ET Block Terminal Strip Connectors
128702-01	Recorder External Termination Block Euro Style connectors
128710-01	Recorder External Termination Block Terminal Strip connectors
140993-01	Shaft Absolute External Termination Block Euro Style connectors
141001-01	Shaft Absolute External Termination Block Terminal Strip

125808-08	Proximitor / Velomitor External Termination Block Euro Style connectors
128015-08	Proximitor/Velomitor External Termination Block Terminal Strip connectors

Cables

3500 Transducer XDCR signal to External Termination Block Cable 129525 - AAAA - BB

A: I/O Cable Length

0005	5 feet (1.5 metres)
0007	7 feet (2.1 metres)
0010	10 feet (3.0 metres)
0025	25 feet (7.6 metres)
0050	50 feet (15.2 metres)
0100	100 feet (30.5 metres)

B: Assembly Instructions

01	Not Assembled
02	Assembled

External Termination Block Cable 129529 - AAAA- BB

A: I/O Cable Length

0005	5 feet (1.5 metres)
0007	7 feet (2.1 metres)
0010	10 feet (3.0 metres)
0025	25 feet (7.6 metres)
0050	50 feet (15.2 metres)
0100	100 feet (30.5 metres)

B: Assembly Instructions

01	Not Assembled
02	Assembled

Spares

176449-02	3500/42M Proximator Seismic Monitor
128229-01	Prox/Seismic I/O Module with internal terminations
128240-01	Prox/Seismic I/O Module with external terminations
00530843	3500/42M Prox/Seismic I/O Module four-pin connector shunt
143489	3500/42M Monitor User Guide
135489-01	I/O Module with Internal Barriers (internal terminations, 4 x Prox/Accel)
135489-02	I/O Module with Internal Barriers (internal terminations, 2 x Prox/Accel and 2 x Velomitor)
135489-03	I/O Module with Internal Barriers (internal terminations, 4 x Velomitor)
138708-01	Shaft Absolute I/O Module with internal terminations
138700-01	Shaft Absolute I/O Modules with external terminations
00517018	3500/42M Shaft Absolute I/O Module 8-pin connector shunt

140471-01	Prox/Velom I/O Module with internal terminations
140482-01	Prox/Velom I/O Module with External Terminations
00561941	3500/42M Prox/Velom I/O Module 10-pin connector shunt
00580434	Internal I/O Module connector header, Euro style, 8-pin Used on I/O modules 128229-01 and 138708-01
00580432	Internal I/O Module connector header, Euro style, 10-pin Used on I/O modules 128229-01 and 138708-01
00502133	Internal I/O Module connector header, Euro style, 12-pin
166M2389	Connector header Push-in-Spring Type (Alternative for PN 00580434)
166M2388	Connector header Push-in-Spring Type (Alternative for PN 00580432)

 For spare front and rear cover plates, please see 3500/05 System Rack datasheet (document 141525)