3500/42M Proximitor Seismic Monitor

Datasheet

Cordant™

143694 Rev. AE

Description

The Bently Nevada™ 3500/42M Proximitor 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 Proximitor 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 (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/s^2) (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)
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 ±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)

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