3500/70M Recip Impulse Velocity Monitor

Datasheet

Cordant™

166766 Rev. T



Description

The Bently Nevada™ 3500/70M Recip Impulse Velocity Monitor is a 4-channel device used as part of the reciprocating compressor solutions package to monitor compressor crankcase and crosshead vibration. The monitor accepts input from seismic transducers, conditions the signal to derive vibration measurements, and compares the conditioned signals with user-programmable alarms.

You can program each channel using the 3500 Rack Configuration Software to perform the following functions:

- Impulse Acceleration
- Acceleration 2
- Recip Velocity
- Low Frequency Recip Velocity

> The monitor channels are programmed in pairs and can perform up to two of the aforementioned 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.

The primary purpose of the 3500/70M Recip Impulse Velocity Monitor is to provide the following:

- Machinery protection for reciprocating compressors by continuously comparing monitored parameters against configured alarm setpoints to drive alarms
- Essential reciprocating compressor machine information for both operations and maintenance personnel

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

Corner Selection	Peak and Integrate 3 dB Corner	RMS 3 dB Corner
High-pass	0.750 - 100 Hz	0.750 - 100 Hz
Low-pass	10 - 1375 Hz	15 - 1375 Hz

Rack Space Requirements

Monitor	1 full-height front slot
I/O Modules	1 full-height rear slot

Physical

Monitor Module (Main Board)	
Dimensions (Height x Width x Depth)	241.3 mm x 24.4 mm x 241.8 mm (9.50 in x 0.96 in x 9.52 in)
Weight	0.91 kg (2.0 lb)
I/O Modules (non-barrier)	
Dimensions (Height x Width x Depth)	241.3 mm x 24.4 mm x 99.1 mm (9.50 in x 0.96 in x 3.90 in)
Weight	0.20 kg (0.44 lb)
I/O Modules (barrier)	
Dimensions (Height x Width x Depth)	241.3 mm x 24.4 mm x 163.1 mm (9.50 in x 0.96 in x 6.42 in)
Weight	0.46 kg (1.01 lb)

Alarms

Alarm Setpoints	Use Rack Configuration Software to set alert levels for each value measured by the monitor and danger setpoints for any two of the values measured by the monitor. Alarms are adjustable from 0 to 100% of full-scale for each measured value. However, when the full-scale range exceeds the range of the transducer, the range of the transducer will limit the setpoint.
Accuracy of alarm setpoints	Within 0.13% of the desired value

Alarm Time Delays

You can program alarm delays using 3500 Rack Configuration Software.

Alert	From one to 60 seconds in one second intervals
Danger	0.1 seconds (nominal) or from one to 60 seconds in one second intervals

Static Values

Static values are measurements used to monitor the machine. The 3500/70M Recip Impulse Velocity Monitor returns static values from the following channels:

Impulse Acceleration	Direct Bias Voltage Six user-adjustable crank angle bands with peak or RMS acceleration in the band

Compliance and Certifications

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

EMC

European Community Directive:

EMC Directive 2014/30/EU

Standards:

EN 61000-6-2; Immunity for Industrial Environments
EN 61000-6-4; Emissions for Industrial Environments

Electrical Safety

European Community Directive:

LV Directive 2014/35/EU

Standards:

EN 61010-1

RoHS

European Community Directive:

RoHS Directive 2011/65/EU

China RoHS

Cables associated with the product(s) mentioned in this datasheet have an EFUP designation of 15 years, in accordance with SJ/T 11364-2024.



Maritime

DNV GL rules for classification – Ships, offshore units, and high speed and light craft

ABS Rules for Condition of Classification, Part 1

- Steel Vessels Rules
- Offshore Units and Structures

Ordering Considerations

- For I/O modules with External Terminations, order the External Termination Blocks and cable separately for each I/O module.
- For the Internal Barriers, refer to the 3500 Internal Barrier datasheet, document 141495.
- External Termination Blocks cannot be used with Internal Termination I/O Modules.

The lower limit for machine speed is 60 RPM in standard product. For machine speeds down to 30 RPM, modification 135M8137-01 is required.

Software Compatibility

3500/01 Configuration Software	Version 5.2 or later
3500/02 Data Acquisition Software	Version 2.50 or later
3500/03 Operator Display Software	Version 1.50 or later
System1 Software	Version 6.90 or later

Firmware Compatibility

3500/70M Firmware	Version 4.21 or later
3500/22M TDI Firmware	Version 1.75 or later
3500/22M USB TDI Firmware	Version 4.05 or later

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.

Recip Impulse / Velocity Monitor 3500/70M - AA-BB

A: I/O Module Type	
01	Prox/Velom I/O Module with Internal Terminations
02	Prox/Velom I/O Module with External Terminations
03	Internal Barrier, Four Accelerometers
04	Internal Barrier, Two Accelerometers, Two Velomitors
05	Internal Barrier, Four Velomitors
B: Agency Approval	
00	None
01	cNRTLus (Class 1, Division 2)
02	ATEX/ IECEx/ CSA (Class 1, Zone 2)

Order the Earthing Module for each rack with internal barriers.

External Termination Blocks

Part Number	Description
128702-01	Recorder External Termination Block Euro Style connectors

Part Number	Description
128710-01	Recorder External Termination Block Terminal Strip connectors
125808-08	Proximitor / Velomitor External Termination Block Euro Style connectors
128015-08	Proximitor / Velomitor External Termination Block Terminal Strip connectors

Cables

3500 Transducer (XDCR) to External Termination (ET) Block Cable

129525 - AAAA-BB

A: I/O Cable Length	
0005	5 feet (1.5 meters)
0007	7 feet (2.1 meters)
0010	10 feet (3.0 meters)
0025	25 feet (7.6 meters)
0050	50 feet (15.2 meters)
0100	100 feet (30.5 meters)
B: Assembly Instructions	
01	Not assembled
02	Assembled

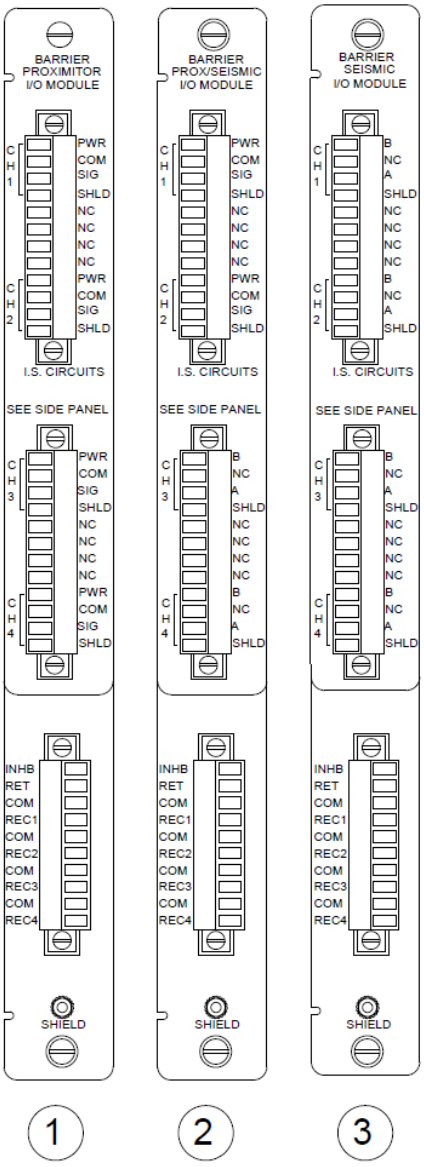
3500 Recorder Output to External Termination (ET) Block Cable

129529-AAAA-BB

A: I/O Cable Length	
0005	5 feet (1.5 meters)
0007	7 feet (2.1 meters)
0010	10 feet (3.0 meters)
0025	25 feet (7.6 meters)
0050	50 feet (15.2 meters)
0100	100 feet (30.5 meters)
B: Assembly Instructions	
01	Not assembled
02	Assembled

Spares

Part Number	Description
176449-09	3500/70M Recip Impulse Velocity Monitor
166226-01	3500/70M Recip Impulse Velocity Monitor User Manual
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
140471-01	Prox/Velom I/O Module with Internal Terminations
140482-01	Prox/Velom I/O Module with External Terminations
00561941	3500/70M Prox/Velom I/O Module ten-pin connector shunt



1. Barrier I/O module to connect four Accelerometer sensors, 135489-01
2. Barrier I/O module to connect two Accelerometer sensors and two Velomitor sensors, 135489-02
3. Barrier I/O module to connect four Velomitor sensors, 135489-03

Figure 3: Barrier I/O Modules