

## CSI 9330 Vibration Transmitter



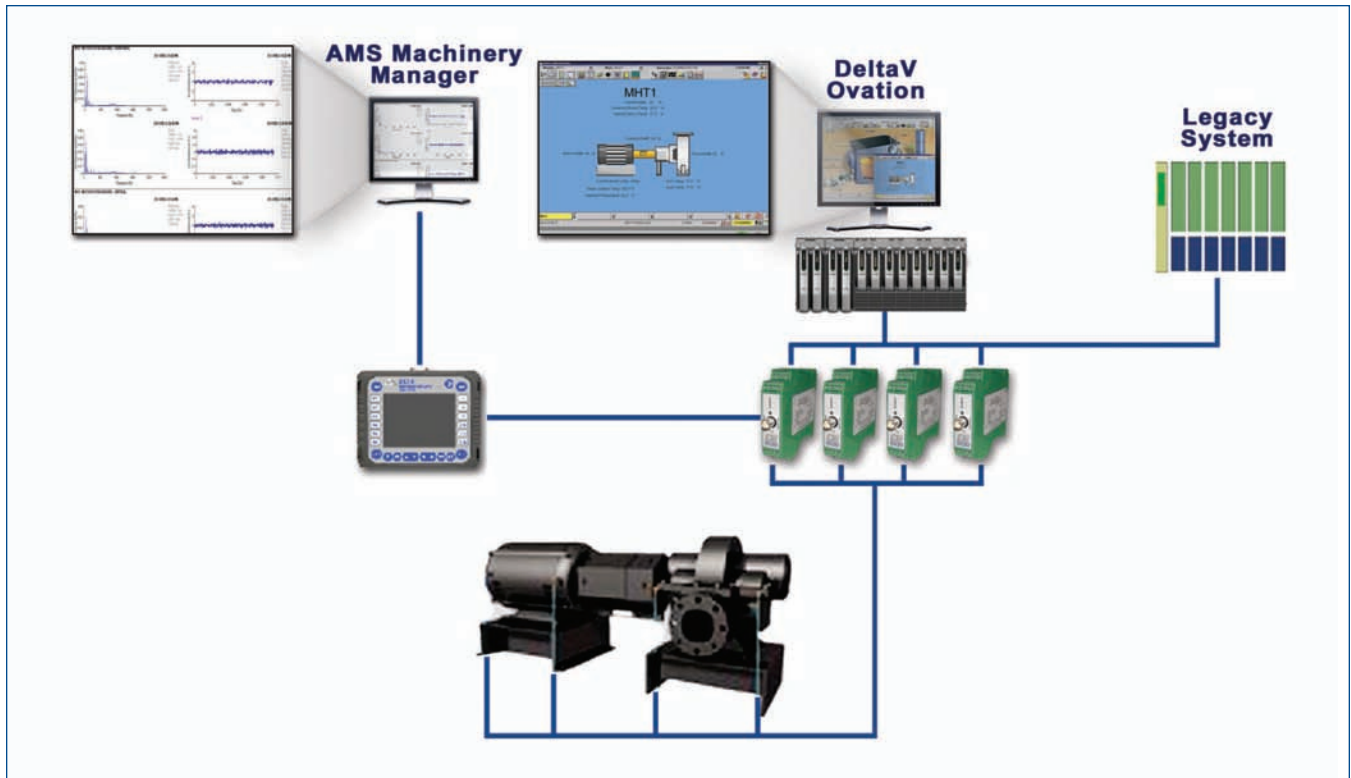
The CSI 9330 interfaces with existing plant monitoring systems while continuously monitoring critical machinery.

- Continuously monitors critical machinery in process applications and other industrial environments
- Interfaces with existing alarm, control and monitoring systems
- Integrates with the CSI 2130 Machinery Health® Analyzer to create a seamless predictive maintenance environment
- CSI 9330VP detects mechanical faults and provides early warning of bearing and gear faults
- CSI 9330VT detects mechanical faults and increases in temperature

### Overview

Gain more visibility to vibration levels in your critical machinery. The CSI 9330 Vibration Transmitter is a continuously-operating vibration transmitter that interfaces with existing plant monitoring systems while automatically detecting vibration levels. When connected to the CSI 2130, you can view the vibration data in AMS Suite: Machinery Health Manager to utilize predictive diagnostics and improve maintenance efficiency. Preserve machinery health while reducing costly downtime.

The rugged CSI 9330 is a quick and easy installation to any machine. Once installed, it converts the analog output of an ICP® accelerometer into a 4-20 mA signal, proportional to monitored vibration. Vibration data is available in plant data historians and/or control systems for trending and analysis with other process parameters. With the CSI 9330, you will gain continuous access to real-time data for early detection of developing mechanical issues.



*The CSI 9330 delivers overall data to any control or automation system using industry standard 4-20mA wiring, while the CSI 2130 connects to the analog vibration output to enable spectrum analysis.*

## Detect Mechanical and Impacting Faults

The CSI 9330 Vibration Transmitter allows for continuous monitoring of a wide variety of plant and mill machinery, including motors, fans, cooling tower fans, pumps, and compressors. The CSI 9330 connects to a standard accelerometer and can be configured to deliver any desired standard vibration and/or temperature value.

The vibration or temperature value can then be delivered to a PLC, SCADA system, or DCS using common 4-20 mA wiring.

The CSI 9330 is available in two configurations. The CSI 9330VT deploys on any measurement location where vibration and/or temperature is desired. It detects mechanical faults such as

imbalance and looseness as well as increases in temperature. The CSI 9330VT delivers a vibration value, such as overall velocity and also a temperature value when connected to an accelerometer that contains an embedded temperature sensor.

The CSI 9330VP deploys on rolling element bearings and gear measurement points. It detects mechanical faults as well as impacting faults due to bearing and gear problems. The CSI 9330VP delivers a vibration value, such as overall velocity, and a PeakVue® value. PeakVue is a patented technology that successfully detects early stage rolling element and gear tooth wear.

## Technical Specifications

### Model 9330VP

Performance		
	English	SI
Overall Vibration Output (Linear Scale)	4-20 mA	
Fault Vibration Output (Log Scale)	4-20 mA	
Zero	4 mA 2% of Span	
Span	16 mA $\pm$ 5 %	
Frequency Response (Overall Vibration)	10 Hz to 1000 Hz	
Frequency Response (Fault)	1000 Hz or 5000 Hz to 10k Hz	
Fault Sample Time Constant	7 Seconds	
Fault Detector Range	50 g pk	
Raw Vibration Output	$\pm$ 0.01% of Input Vibration	
Output Maximum Load Resistance	500 ohm	
Environmental		
Warm Up	< 2 Minutes	
Operating Temperature Range	+32 to + 158°F	0 to + 70°F
Storage Temperature Range	-40 to + 257°F	-40 to + 125°C
Relative Humidity	< 95% (Non-condensing)	
Electrical		
Power Supply Voltage	23-25 VDC	
Power Supply Current	100 mA max	
ICP Input Signal	0-100 mV/g	
ICP Sensor Excitation	18 VDC/4 mA, $\pm$ 1 V/ $\pm$ 1 mA	
Physical		
Case Dimension (W x H x D)	0.9 x 3.9 x 4.5 in	22.5 x 99 x 114.5 mm
Weight	5.2 oz	145.2 grams
Input/Output Electrical Connectors	Removable Screw Terminals	
Raw Vibration Connector	BNC Jack	
Screw Terminal Wire Size	24 - 14 AWG	0.2 - 2.5 mm <sup>2</sup>
DIN Rail Mount	1.38 in	35 mm
Power Indicator	Green LED	

## Model 9330VT

Performance		
	English	SI
Channels	Single	
Input Signal (Vibration)	+/-100 mV/g	+/-10.2 mV/(m/s <sup>2</sup> )
Input Signal (Temperature)	0 to 1.2 VDC	
Output Signal (DC Vibration)	4-20 mA/ 0-5 VDC/ 0-10 VDC	
Output Signal (Temperature)	4-20 mA	
Frequency Range (-3dB) (Acceleration)	180-600k cpm	3-10k Hz
Frequency Range (-3dB) (Velocity)	210-600k cpm	3.5-10k Hz
Frequency Range (-3 dB) (Displacement)	210-60k cpm	3.5-1k Hz
Output Range (DC Acceleration)	0-5 g pk or rms	0-49.03 m/s <sup>2</sup> pk or rms
Output Range (DC Acceleration)	0-10 g pk or rms	0-98.06.03 m/s <sup>2</sup> pk or rms
Output Range (DC Acceleration)	0-20 g pk or rms	0-196.12 m/s <sup>2</sup> pk or rms
Output Range (DC Velocity)	0-0.5 in/s pk or rms	0-12.7 mm/s pk or rms
Output Range (DC Velocity)	0-1.0 in/s pk or rms	0-25.4 mm/s pk or rms
Output Range (DC Velocity)	0-2.0 in/s pk or rms	0-50.8 mm/s pk or rms
Output Range (DC Displacement)	0-25 mil pk-pk	0-0.635 mm pk-pk
Output Range (DC Displacement)	0-50 mil pk-pk	0-1.27 mm pk-pk
Output Range (DC Displacement)	0-100 mil pk-pk	0-2.54 mm pk-pk
Environmental		
Operating Temperature Range	+32 to + 158°F	0 to + 70° C
Storage Temperature Range	-40 to + 257°F	-40 to + 125° C
Relative Humidity	< 95% (Non-condensing)	
Electrical		
Power Supply Voltage	23-25 VDC	
DC power (maximum)	100 mA	
Settling Time	< 2 min	
ICP Sensor Excitation	18 VDC/4 mA, ± 1 V/± 1 mA	
Physical		
Case Dimension (W x H x D)	0.9 x 3.9 x 4.5 in.	22.5 x 99 x 114.5 mm
Weight	6.4 oz	127 grams
Input/Output Electrical Connectors	Removable Screw Terminals	
Raw Vibration Connector	BNC Jack	
Screw Terminal Wire Size	24-14 AWG	0.2-2.5 mm <sup>2</sup>
DIN Rail Mount	1.38 in	35 mm
Power Indicator	Green LED	
Input Fault Indicator	Red LED	
Measurement Status Indicator	Green LED	

## Model 9330PS

### Power Supply

Input Data		
	English	SI
Power Supply Voltage (Auto Sensing)	85 - 264 VAC/ 95-350 VDC	
Input Frequency	45 - 63 Hz	
Inrush Current (@ 25 °C)	< 15A	
Current Consumption	0.3/0.5A (230/120 VAC)	
Input Fuse	1.25A/250V	
Main Buffering	> 20/110ms (120/230 VAC)	
Surge Volatage Protection	Varistor	

Output Data		
Nominal Voltage/ Current	24 VDC/ 1.0A	
10 - 90% Load Tolerance	+/-3%	
Turn On Delay	< 0.5/1s (230/120 VAC)	
Internal Surge Voltage Protection	35 VDC +/-5%	
Parallel Switching	Redundant Systems Only	
Turn Off Delay	< 150 ms	
Ripple Voltage	< 100mVpp	
Maximum Power Loss	0.9/4.5W (No Load/Load)	
DC OK (Active)	24V/20mA	

Environmental		
Operating Temperature Range	-13 to + 158° C	-25 to + 70° C
Storage Temperature Range	-40 to + 188° C	-40 to + 85° C
Relative Humidity	< 95% (Non-condensing)	

General Data		
Insulation Voltage	3 kV	
Conductor Cross Section	AWG 14 - 24	0.2 - 2.5 mm <sup>2</sup>
MTBF	> 500000h	
Efficiency	> 80%	
Weight	7.4 oz	0.21 kg
Dimensions (W x H x D)	0.89 x 3.90 x 4.51 in	22.5 x 99 x 114.5 mm
Display	Green LED	
Shock (3 directions for 18ms)	30 g	

## Model 9330EN

### Enclosure

Physical Characteristics		
	English	SI
Channels (Maximum)	8	
Number of Cord Grips (PGME 07)	15	
Number of Cord Grips (PGME 13)	15	
Enclosure Type	Nema 4X	IP 66
Enclosure Size (With Cord Grips) (H x W x D)	11.5 x 9 x 6.5 in	292 x 229 x 165 mm
Enclosure Weight	5.5 lbs	2.5 kg
DIN Rail	1.38 in	35 mm

## Ordering Information

Model	Product Description
9330	Vibration Transmitter
Code	Transmitter Type
VT	Vibration and Temperature
VP	Vibration and PeakVue
Code	Measurement
S1	Accelerometer
S2	Accelerometer with Embedded Temperature

Typical Model Number: 9330 VT S1

Model	Optional Accessories
9330EN	Enclosure
9330PS	24V Power Supply
Model	Sensor Description
A0322LC	Accelerometer with Screw Mount, Top Exit, 10' Cable
A0322LC-1	Accelerometer with Screw Mount, Top Exit, 30' Cable
A0322RA	Accelerometer with Armor Jacket, Right Angle, 10' Cable
A0322RA-1	Accelerometer with Armor Jacket, Right Angle, 30' Cable
A0322RI	Accelerometer with Yellow Jacket, Right Angle, 10' Cable
A0322RI-1	Accelerometer with Yellow Jacket, Right Angle, 30' Cable
A0322DR	Accelerometer with Red Jacket, Right Angle, 10' Cable
A0322DR-1	Accelerometer with Red Jacket, Right Angle, 30' Cable
A0322DS	Accelerometer with Red Jacket, Low Cost, 10' Cable
A0322DS-1	Accelerometer with Red Jacket, Low Cost, 30' Cable

### Emerson Process Management

#### Asset Optimization Division

835 Innovation Drive  
Knoxville, Tennessee 37932  
T 1(865) 675-2400  
F 1(865) 218-1401

©2011, Emerson Process Management.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.

All rights reserved. AMS, PlantWeb, Machinery Health and PeakVue are marks of one of the Emerson Process Management family of companies. The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are the property of their respective owners.