

# CSI 9330 Vibration Transmitter

- 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-1 detects mechanical faults and provides early warning of bearing and gear faults
- CSI 9330VT detects mechanical faults and increases in temperature

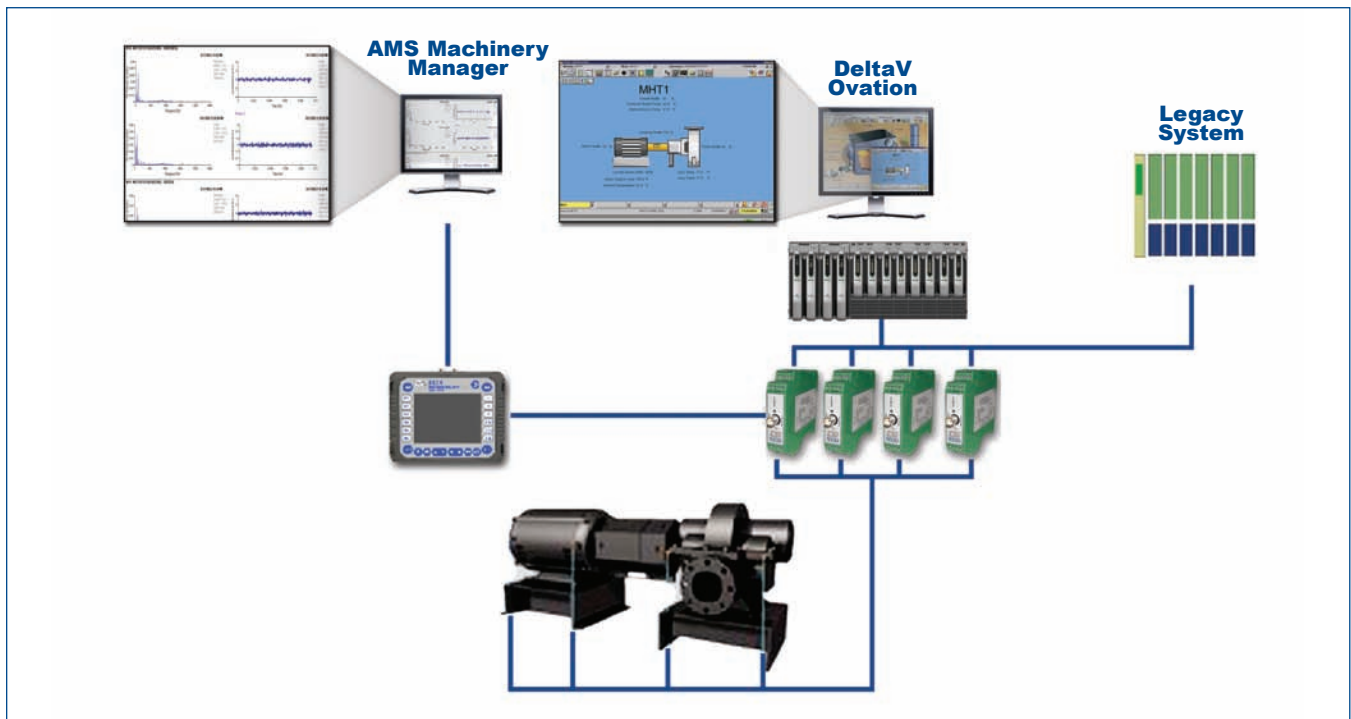


*The CSI 9330 interfaces with existing plant monitoring systems while continuously monitoring critical machinery.*

## 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-1 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-1 delivers a vibration value, such as overall velocity, and a PeakVue™ value. PeakVue is a patented technology that effectively detects early stage rolling element and gear tooth wear.

## Technical Specifications

### Model A9330VP-1

Performance	ENGLISH	SI
Input Signal	100 mV/g	10.2 mV/(m/s <sup>2</sup> )
Frequency Response (± 3 dB)(Overall Vibration)	10 to 1k Hz	10 to 1k Hz
Frequency Response (± 3 dB)(Fault)	1k or 5k to 100 kHz	1k or 5k to 100 kHz <sup>(1)</sup>
Measurement Range (Vibration)	5/10/20 g	49.0/98.1/196.1 m/s <sup>2(2)</sup>
Measurement Range (Velocity)	0.5/1/2 in/sec	12.7/25.4/50.8 mm/sec <sup>(3)</sup>
Measurement Range (Fault Detector)	50 g	50 g
Output Range	4 to 20 mA	4 to 20 mA <sup>(1)(4)</sup>
Sampling Time (± 15 %)	7 sec	7 sec
Span (± 5 %)	16 mA	16 mA
Control Interface		
Power LED	Green	Green
Environmental		
Warm Up	<2 minutes	<2 minutes
Temperature Range (Operating)	32 to 158 °F	0 to 70 °C
Temperature Range (Storage)	-40 to 257 °F	-40 to 125 °C
Electrical		
Supply Voltage	20 to 28 VDC	20 to 28 VDC
Current Consumption	≤ 150 mA	≤ 150 mA
Excitation Voltage (± 1 V)	18 VDC	18 VDC
Constant Current Excitation (± 1 mA)	4 mA	4 mA
Raw Vibration Output	+/-0.01 % of Input	+/-0.01 % of Input
Load Resistance	500 Ohm	500 Ohm

Physical		
Size (Width x Height x Depth)	0.9 in x 3.9 in x 4.5 in	22.5 mm x 99 mm x 114.5 mm
Weight	5.2 oz	145.2 gm
Housing Material	Polyamide	Polyamide
Screw Terminal Wire Size	24-14 AWG	0.2 - 2.5 mm <sup>2</sup>
Electrical Connector (input/output)	Removable Screw Terminals	Removable Screw Terminals
Electrical Connector (Output, Vibration)	BNC Jack	BNC Jack
Din Rail Mount	1.38 in	35 mm

*All specifications are at room temperature unless otherwise specified.*

**NOTES:**

- [1] Internal Dip switch selectable
- [2] Acceleration mode.
- [3] Velocity mode.
- [4] Output current voltage will fluctuate at frequencies below 5 Hz.

**Model 9330VT**

Performance	ENGLISH	SI
Channels	Single	Single
Input Signal (Vibration)	+/-100 mV/g	+/-10.2 mV/(m/s <sup>2</sup> )
Input Signal (Temperature)	0 to 1.2 VDC	0 to 1.2 VDC
Output Signal (DC Vibration)	4-20 mA/ 0-5 VDC/ 0-10 VDC	4-20 mA/ 0-5 VDC/ 0-10 VDC
Output Signal (Temperature)	4-20 mA	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
Ouput Range (DC Acceleration)	0-10 g pk or rms	0-98.06.03 m/s <sup>2</sup> pk or rms
Ouput Range (DC Acceleration)	0-20 g pk or rms	0-196.12 m/s <sup>2</sup> pk or rms
Ouput Range (DC Velocity)	0-0.5 in/s pk or rms	0-12.7 mm/s pk or rms
Ouput Range (DC Velocity)	0-1.0 in/s pk or rms	0-25.4 mm/s pk or rms
Ouput Range (DC Velocity)	0-2.0 in/s pk or rms	0-50.8 mm/s pk or rms
Ouput Range (DC Displacement)	0-25 mil pk-pk	0-0.635 mm pk-pk
Ouput Range (DC Displacement)	0-50 mil pk-pk	0-1.27 mm pk-pk
Ouput Range (DC Displacement)	0-100 mil pk-pk	0-2.54 mm pk-pk

<b>Environmental</b>		
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)	< 95% (Non-condensing)
<b>Electrical</b>		
Power Supply Voltage	23-25 VDC	23-25 VDC
DC power (maximum)	100 mA	100 mA
Settling Time	< 2 min	< 2 min
ICP Sensor Excitation	18 VDC/4 mA, + 1 V/+ 1 mA	18 VDC/4 mA, + 1 V/+ 1 mA
<b>Physical</b>		
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	Removable Screw Terminals
Raw Vibration Connector	BNC Jack	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	Green LED
Input Fault Indicator	Red LED	Red LED
Measurement Status Indicator	Green LED	Green LED

**Model 9330PS Power Supply**

<b>Input Data</b>	<b>ENGLISH</b>	<b>SI</b>
Power Supply Voltage (Auto Sensing)	85 - 264 VAC/ 95-350 VDC	85 - 264 VAC/ 95-350 VDC
Input Frequency	45 - 63 Hz	45 - 63 Hz
Inrush Current (@ 25°C)	< 15A	< 15A
Current Consumption	0.3/0.5A (230/120 VAC)	0.3/0.5A (230/120 VAC)
Input Fuse	1.25A/250V	1.25A/250V
Main Buffering	> 20/110ms (120/230 VAC)	> 20/110ms (120/230 VAC)
Surge Volatage Protection	Varistor	Varistor
<b>Output Data</b>		
Nominal Voltage/Current	24 VDC/ 1.0A	24 VDC/ 1.0A
10 - 90% Load Tolerance	+/-3%	+/-3%
Turn On Delay	< 0.5/1s (230/120 VAC)	< 0.5/1s (230/120 VAC)
Internal Surge Voltage Protection	35 VDC +/-5%	35 VDC +/-5%
Parallel Switching	Redundant Systems Only	Redundant Systems Only
Turn Off Delay	< 150 ms	< 150 ms
Ripple Voltage	< 100mVpp	< 100mVpp
Maximum Power Loss	0.9/4.5W (No Load/Load)	0.9/4.5W (No Load/Load)
DC OK (Active)	24V/20mA	24V/20mA
<b>Environmental</b>		
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)	< 95% (Non-condensing)
<b>General Data</b>		
Insulation Voltage	3 kV	3 kV
Conductor Cross Section	AWG 14 - 24	0.2 - 2.5 mm <sup>2</sup>
MTBF	> 500000h	> 500000h
Efficiency	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	Green LED
Shock (3 directions for 18ms)	30 g	30 g

**Model 9330EN Enclosure**

Physical Characteristics	ENGLISH	SI
Channels (Maximum)	8	8
Number of Cord Grips (PGME 07)	15	15
Number of Cord Grips (PGME 13)	15	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-1	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

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**Emerson Process Management**  
**Asset Optimization**  
 835 Innovation Drive  
 Knoxville, TN 37932  
 T (865) 675-2400  
 F (865) 218-1401  
[www.assetweb.com](http://www.assetweb.com)