Emerson EPRO Series Service Manual

A6110

1. Description

Emerson A6110 Shaft Relative Vibration

3. Product Information

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Emerson A6110 Shaft Relative Vibration
Monitor for AMS 6500
Machinery Health Monitor
The Shaft Relative Vibration Monitor is designed for extremely high reliability for the plant’s most critical rotating machinery. This 1-slot monitor is used together with other AMS 6500 monitors to build a complete API 670 machinery protection monitor. Applications include steam, gas, compressors and hydro turbo machinery.
The main functionality of the Shaft Relative Vibration monitoring module is to accurately monitor shaft relative vibration and reliably protect machinery by comparing vibration parameters against alarm setpoints, driving alarms and relays.
Shaft relative vibration monitoring consists of a displacement sensor either mounted through the bearing case, or mounted internally on the bearing housing, with the rotating shaft being the target.
The displacement sensor is a non-contact sensor measuring shaft position and movement. Since the displacement sensor is mounted to the bearing, the monitored parameter is said to be shaft relative vibration, that is, shaft vibration relative to the bearing case.
Shaft relative vibration is an important measurement on all sleeve bearing machines for predictive and protection monitoring. Shaft relative vibration should be selected when the machine case is massive as compared with the rotor, and the bearing case is not expected to vibrate between zero and production-state machine speeds. Shaft absolute is sometimes selected when the bearing case and rotor mass are more closely equal, where it is more likely that the bearing case will vibrate and impact shaft relative readings.
The AMS 6500 is an integral part of PlantWeb® and AMS software. PlantWeb provides operations integrated machinery health combined with the Ovation® and DeltaV™ process control system. AMS software provides maintenance personnel advanced predictive and performance diagnostic tools to confidently and accurately determine machine malfunctions early.
Transducer Inputs
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Number of Inputs Two, independent or combined
monitoring modes
Type of Inputs Eddy current, differential
Emerson Sensor Inputs Part number: 6422, 6423, 6424, 6425
Isolation Galvanically separated
from power supply
Input Resistance >100 kΩ
Input Voltage Range 0 to -22 VDC
Input Frequency Range Lower cutoff 1 or 5 Hz
 Upper cutoff 50 - 2000 Hz adjustable
Two-channel, 3U size, 1-slot plugin module decreases cabinet space
requirements in half from traditional
four-channel 6U size cards
 API 670 compliant,
hot-swappable module
 Remote selectable limit
multiply and trip bypass
 Front and rear buffered
and proportional outputs,
0/4-20 mA output, 0 - 10 V output
 Self-checking facilities include
monitoring hardware, power input,
hardware temperature, sensor,
and cable
 Use with displacement sensors PR6422,
PR6423, PR6424, PR6425, and driver
CON 011/91, 021/91,041/91
Measuring Range
Range Continuously adjustable with

the configuration software

Smallest Range 0 - 400 mV

Largest Range 0 - 8000 mV

Sensor Power Supply

 0 - 8000 mV Separate buffered sensor supply Galvanically separated from

all system voltages and system

supply voltages

 Open and short circuit proof

Nominal Voltage -26.7 V

Available Current Nominal 20 mA, maximum 35 mA

Front Panel Outputs

Green LED's Two LED's, indicates channel

OK separately for each channel

Red LED's Two LED's, indicates alert and

danger separately for each channel

Front Panel Buffered Outputs

 Two, identical to transducer

sensor inputs

 ±10 V, >100 kΩ load,

freq. range 0.1 - 5

 kHz (-3 dB) 0 - 16 kHz-3 dB ±20%

Mini DIN Configuration Socket

 Module interface connection for

configuration and parameter and

status monitoring

 RS-232

Handle Easily remove card and provide plate

for module and sensor identification

Analysis

Measurement Modes

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 Hot configurable Zero to peak Peak to peak Independent dual-channel

or combined

 dual-channel modes Smax (combined) (DIN 45670A) Smax peak to peak (combined) (DIN 45670B, VDI 2059) Smax 0 to peak (combined)

(VDI 2059)

 True S peak to peak Y. X

(independent)

 (API 670)

Analysis Parameters

 ½x, 1 - 10x and phase angle of same Available via ModBus TCP/IP output

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Rear Outputs Available

Current Mode Outputs 0/4-20 mA output for each channel

proportional to main value

z For example, both outputs are

identical combined for Smax

(combined mode)

z For example, both outputs

are independent for Y and X

(independent mode)

 Open/short circuit proof

Permissible Load <500 Ω

Accuracy ±1% of full scale

Settling Time Configurable, 0 - 10 seconds

Voltage Mode Outputs 0 - 10 VDC output proportional

to main value for each channel

z For example, both outputs are

identical combined for Smax

(combined mode)

z For example, both outputs
are independent for Y and X
(independent mode)
 Open/short circuit proof
Permissible Load >10 kΩ
Rear Buffered Outputs Raw buffered output signal,
AC and DC
 Open/short circuit proof
Frequency Range 0.1 - 16 kHz (-3 dB)
0 - 16 kHz -3 dB ±20%
Permissible Load >10 kΩ
DC Voltage Outputs 0 - 10 VDC output proportional
to the shaft position (gap)
 Open/short circuit proof
Accuracy ±1% of range
Permissible Load >10 kΩ
Alarm Setpoints Alarm Time Delays
Alert Selectable normally open,
normally closed
 0 - 5 second delay per channel
 0 - 36 second delay with
A6740 relay card
 Selectable to be blocked
on channel not OK
 Adjustable range 5 - 100%
of full scale value
 Resolution 1% of full scale value
 Alarm hysteresis on decreasing
signal value, 0 - 20% of full scale value
Danger Selectable normally open,
normally closed
 0 - 5 second delay per channel
 0 - 36 second delay with
A6740 relay card
 Selectable to be blocked
on channel not OK
 Adjustable range 5 - 100%
of full scale value
 Resolution 1% of full scale value
 Alarm hysteresis on decreasing
signal value, 0 - 20% of full scale value
OK Self checking (normally closed):
 Power supply, sensor, cable,
module checking, overload, internal
temperature, system watchdog
Green LED:
 Off when not OK
 During delay time, LED flashes
 Reason for not OK can be
read from communication bus
Limit Multiply Remote, relay input, 1.00-4.99 factor
Trip Bypass Remote, relay input
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Environmental, General
Module IP 00, DIN 40050
Front Plate IP 21, DIN 40050
Climate DIN 40040 class KTF
Operating Temperature 0° - 65°C (32° - 149°F)

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Storage Temperature -30° - 85°C (-22° - 185°F)

Relative Humidity 5 - 95%, non-condensing

Vibration IEC 68-2, part 6

 0.15 mm, 10 - 55 Hz

 19.6 mm/s2, 55 - 150 Hz

Shock IEC 68-2, part 29

 98 m/s2 peak, 16 ms

EMC Resistance EN50081-1 / EN50082-2

Power Consumption Max. 6 W, 250 mA at 24 VDC

Configuration Password protected

A6210 Dimensions:

PCB/EURO card format according to

DIN 41494, 100 x 160mm (3.937 x 6.300in)

Width: 30.0mm (1.181in) (6 TE)

Height: 128.4mm (5.055in) (3 HE)

Length: 160.0mm (6.300in)

Net Weight: app 320g (0.705lbs)

Gross Weight: app 450g (0.992lbs)

includes standard packing

Packing Volume: app 2.5dm3

(0.08ft3

)

Space

Requirements: 1 slot

14 modules fit into each 19” rack

Ordering Information

Model Number Product Description

A6210 Dual-channel Thrust, Differential

Expansion, and Rod Drop Monitor

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