Emerson EPRO Series Service Manual

A6312

1. Description

Emerson A6312

3. Product Information

www.autronexa.com

Emerson A6312

Speed and Key

Monitor Specifications

The Speed and Key Monitor is designed for high reliability for the plant’s most critical rotating machinery monitoring speed, phase, zero speed and direction of rotation. This 1-slot monitor is used together with the AMS 6500 monitors to build a complete API 670 machinery protection monitor. Applications include steam, gas, compressors and hydro turbo machinery.

The Speed and Key Monitor can be configured for redundant mode where automatic switchover from primary to backup tach is possible. Sensor gap voltage and pulse counting/comparison are monitored to trigger switchover. When the Speed and Key Monitor is operating in redundant mode, the main and failover key or speed displacement sensor must be installed in the same axial plane to ensure phase continuity upon failover.

Speed measurements consist of a displacement sensor mounted internally to the machine with the target being a toothed wheel, a keyway or gear rotating on the shaft. The purpose of the speed measurement is to alarm on zero speed, monitor for reverse rotation and provide a speed measurement to track process conditions for advanced analysis. Key, or phase measurements, also consist of a displacement transducer but must have a once per revolution target, not a toothed wheel or gear for a target. The phase measurement is a critical parameter when looking for machine health changes.

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

Number of Inputs Two, independent

Type of Inputs Eddy current, differential

Emerson Sensor Inputs Part number: 6422/6423/6424/6425

www.autronexa.com

Isolation Galvanically separated from power supply

Input Resistance >100 kΩ

Input Voltage Range 0 to ±27.3 VDC

Input Frequency Range 0 - 20,000 Hz, 65,535 RPM

 Two-channel 3U size plug-in modules decrease 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

 Rear buffered proportional outputs, 0/4-20 mA output

 Self-checking facilities include monitoring hardware, power input, hardware temperature, sensor and cable

 Use with displacement sensor 6422, 6423, 6424 and 6425 and driver CON 011/91, 021/91, 041/91

 6TE wide module used in AMS 6000 19” rack mount chassis

 8TE wide module used with AMS 6500 19” rack mount chassis

Measuring Range

Range Continuously adjustable with the configuration software

Smallest Range 2 V

Largest Range 0 - 30 V

Sensor Power Supply Separate buffered sensor supply

Galvanically separated from all system

voltages and system supply voltage

Open and short circuit proof

Nominal Voltage -26.75 VDC

Available Current Nominal 20 mA, maximum 35 mA

Front Panel Outputs

Green LED’s Two LED’s, indicates channel OK

separately for each channel

Yellow LED’s Four LED’s, indicates alert and danger

separately for each channel

Front Panel Buffered Outputs Two, ±10 V, signal input level reduced

by factor 0.15, >100 kΩ load, frequency

range 0 Hz - 16 kHz (-3 dB)

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 Hot configurable

Speed Measurements with Each Channel Forward and reverse rotation with

trigger wheel (1 - 255 trigger marks),

max. freq. 20 kHz

Pulse Width Time Window 5 - 10 msec

Key Pulse Detection with Each Channel One key mark on the shaft

 Possible with multiple key marks, but

phase will change with each start-up

www.autronexa.com

Zero Speed Monitor with Each Channel Detects zero speed of trigger wheel

with 1 - 255 trigger marks

 Measures time between two pulses

in a configurable range of 1 - 1700

seconds, forward or reverse direction

Both Channels in Combined Use Detects direction of rotation of

two trigger marks of which one

is phase shifted

 Detects a difference between

the speed of two trigger wheels,

difference adjustable in number

of RPM

A6312

40

Rear Outputs Available

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

proportional to main value

 Open/short circuit proof

Permissible Load <500 Ω

Accuracy ±1% of full scale

Settling Time Configurable, 0 - 10 seconds

Pulse Outputs 0 Hz - 20 kHz output for each channel

Open/short circuit proof

Permissible Load >10 kΩ

TTL Pulse Output 0 Hz - 20 kHz output signal

for each channel, 0 - 20 kHz

 Open/short circuit proof

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
A6312
41
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
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)
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
A6312 Relay
Module Dimensions:
PCB/EURO card format according to
DIN 41494, 100 x 160mm (3.937 x 6.300in)
Width: 30mm (1.181in) (6 TE)
Height: 128.4mm (5.055in) (3 HE)

www.autronexa.com

Length: 160mm (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

A6312 Dual-channel Speed and Key Monitor for

use in IMR 6000/10 and IMR 6000/30

www.autronexa.com