

# AHAR PowerStation Services

## Product Data Sheet

### Over speed Protection System

Model: RAYAN-P10

#### Description

The RAYAN-P10 system is designed for protection of rotating machinery such as turbines, compressors, expanders and motors against over speed event, with safety requirements SIL3/IEC61508 and/or API 670. The RAYAN-P10 consists of three independent modules whose trip outputs are voted in two 2-out-of-3 configuration.

Trip condition can be latched.

The system faults are detected and issue an alarm condition on digital output, system event log and front module LED.

There are several ways to interface RAYAN-P10. The front panel allows the user to view current values, and to perform configuration and test functions.

All of the features and most of the information available from the front panel are also accessible via the Profibus interface.

Finally, the Programming and Configuration Tool (Raylink) is a software that is run on a PC to download log files and manage settings files.

#### Functionality

The system includes three independent Monitoring Modules A, B and C for the calculation of speed input and releasing a trip output if the measured speed, exceeds the user defined set point. Each monitoring module has two trip output relays which are de-energized to trip.



Each trip output contributes in a voting logic and release a voter trip if 2 out of 3 of monitoring modules detect an over speed.

A released trip status can be latched.

Trip is released by shut down of the Trip Circuits (two voter outputs on each over speed set) to the solenoid valve block if:

2oo3 monitoring modules detect over speed condition

2oo3 monitoring modules detect External Trip Condition by user input

The number of over speed detection sets can be increased to two on one 19" rack. It can be used as a solution for two shaft turbines or multiple devices.

#### Key Feature

- Triple Modular Redundancy
- Fast reaction time <15msec
- Two Internal 2oo3 voting relays
- Automatic testing
- Optional Isolated analogue outputs
- External-trip input
- Free floating sensor signal repeater on
- Hot pluggable modules
- Up to two shaft monitoring and trip on one rack
- Alarm management and event logger
- Configuration via PC software (Raylink) and front panel LCD and keypad
- Communication through Profibus

## Specification

### Supply Voltage

Rated value	24VDC The input power shall compatible with IEC61131-2
No. of power inputs	Independent power for each module
permissible range, lower limit	30VDC
permissible range, upper limit	18VDC
Power consumption	12W
Auxiliary Power	24VDC $\pm$ 3VDC

### Sensor Input

No. of input per module	1
Input type	AC Voltage
Input range	0.5 to 70 Vrms.
Accuracy	1Hz
Input impedance	33K $\Omega$
Output sensor supply	24VDC $\pm$ 4VDC
Protection	Short circuit protected
Allowed current	120mA

### External Trip Input

No. of input per system	1
Input type	Contact
Input range	Close for Normal condition/Open to rip
Rated current	250mA
Allowable resistance	<40 $\Omega$

### Voters' shutdown output

Number per system	2 independent voters
Status	Energize @ normal condition/ De-energize to trip
Rated Current	4A @ 30VDC
Rated voltage	250VAC
Max. Switching voltage	400 VAC
Contact material	AgSnO2

Min. Recommended contact load	5V/10mA
Contact Resistance	≤100mΩ @ 1A, 24VDC
Frequency of operation, with/without Load	6/150 min-1
Mechanical endurance	10 × 10 <sup>6</sup> Operations

### Repeater Output

Number per module	1
Rated power source	24 VDC Auxiliaries power supply
Isolated	yes
Min. high level output voltage	16V
high level output current	100mA
Low level output voltage	Open
Short circuit	protected

### Zero speed Output

Number per module	1
Status	Low @ zero speed, High @ speeds higher than zero
Rated power source	24 VDC Auxiliaries power supply
Isolated	yes
Min. high level output voltage	16V
high level output current	100mA
Low level output voltage	Open
Short circuit	protected

### Alarm Output

Number per module	2
Status	Low @ normal condition, High @ alarm detected
Rated power source	24 VDC Auxiliaries power supply
Isolated	yes
Min. high level output voltage	16V
high level output current	100mA
Low level output voltage	Open
Short circuit	protected

**Analog Output**

Number per module	1
Resolution	12 bit
Linearity	±0.1%
Isolated	yes
Output range	4 – 20 mA
Over range	2 – 22 mA
Max Load	500Ω
Short circuit	protected

## Programing

### Configuration software

RayLink	Ver alpha2
Installation Requirements	64 bit operating system

### Communications

Ethernet	For configuration
Profibus	For data monitoring

## Mechanical

Connection technology	Screw terminals
Dimension	
<ul style="list-style-type: none"> <li>Width</li> </ul>	480 mm
<ul style="list-style-type: none"> <li>Height</li> </ul>	140 mm
<ul style="list-style-type: none"> <li>Depth</li> </ul>	360 mm
weight	5Kg
Installation	Rack mountable/Door mountable
IP degree of protection	20

## Environmental conditions

Reference temperature	0 to 50°C
Temperature for storage and transport	-20 to 80°C
Humidity	90% non-condensed

## Approval

EMC	IEC61000-6-2
Temperature	IEC60068-1,2
Damp heat	IEC60068-30
Safety	IEC61508- SIL3