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VMS 3000

Machinery Condition Monitoring

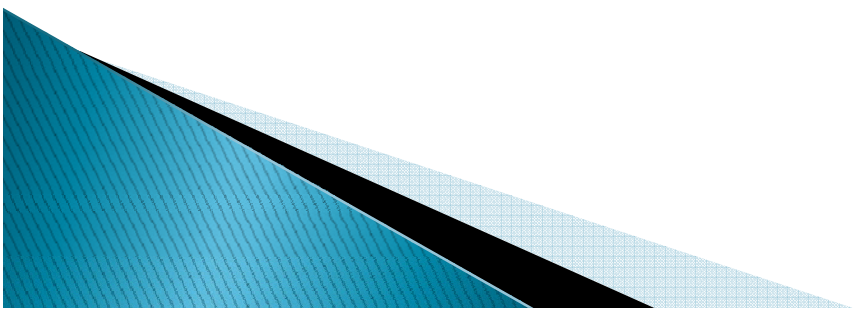
PRODUCT DATASHEET

SAR-VMS-3000

Measures the Vibration and Position plus user configurable Software

Description

- Sarayu SAR-VMS-3000 series Machinery Protection Systems provides continues on-line monitoring suitable for machinery protection, condition monitoring applications. SAR-VMS-3000 has been designed and developed by Sarayu team of highly experienced team with the latest state of the art technology. The System is modular in design with a full flexibility provided to the user to configure his functional requirements by selecting the appropriate functional modules to suit his requirements.
- The user is provided with Industry Standard Euro PCB modules of different functional modules like Non-Contact 4-channel Vibration Measurement module, Communication and Configuration module, Generic DI module, DO module, Tacho Module to mention a few.
- The modules can be plugged and the system will intelligently report the configured Hardware by itself. The powerful configuration user software is provided in addition to the local displaying of data. The data measured are made available on the communication Gateway via USB/Ethernet or RS-485 in MODBUS RTU protocol



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Features

- Industry Standard 19” Rack Size
- Channel Pair Type (Radial Vibration, Thrust Position)
- Transducers Selection.
- Full scale range Selection for Direct.
- Recorder Output selection (Direct, Gap).
- Configurable Channel Pair.
- Set Points for Alert Alarm Limits (Direct and Gap).
- Set Points for Danger Alarm Limits (Direct and Gap).
- Set Points for Alarm Time Delay.
- Set Points for zero Position (Thrust Initial DC Reference).
- Set Points for Trip Multiply.
- Set Points for Clamp Value.
- Latching for Alert Alarm.
- Latching for Danger Alarm.
- Bypass Alarm.
- Hot Swappable Modules
- Digital Communications
- Display Options
- Buffered Outputs
- Key Lock Security

Applications:

- Steam Turbines
- Hydraulic turbines
- Industrial gas turbines
- Aero derivative gas turbines
- Reciprocating compressors
- Centrifugal compressors
- Axial compressors
- Screw compressors
- Turbo-expanders
- Horizontal and vertical centrifugal pumps
- Reciprocating pumps
- Electric motors
- Agitators

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MODULES:

Power Supply module:

No of modules :1 no
Input : 230V, 50Hz/ 24V DC
Output : +12V,-12V, 5V,+24V

Power Supply module

Rack Configuration Module:

No of modules : 1 no
Protocol : MODBUS-RTU/TCPIP
Baud rate : 9600-115200
Address : 1-255

The Rack Configuration Module collects data from all other modules in the rack and reporting to the host PC using modbus protocol on RS485 or TCPIP (Ethernet) Gateway. It supports modbus protocol to configure the Rack.
The Rack Configuration Module needs only one slot position and is always plugged in 1st slot after the power supply. The Rack configuration Module has keylock option, which shows the module is in "RUN" mode or "PROGRAM" mode. Locking switch in the RUN position will restrict unauthorized rack configuration. Locking switch in the PROGRAM position allows remote configuration of the rack.

Rack Configuration module

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MODULES:

Features of rack configuration module:

•Reporting of present configuration to host PC.
•Storing of obtained configuration from host PC.
•User configurable parameter list for communication to SCADA.
•Acquisition of measured parameter from all the modules.
•Supports Modbus protocol and Ethernet Gateway for configure the Rack.
•Module has key lock option for Rack configuration.

Electrical Parameter-Rack Configuration Module			
Communications	Front Panel	Standard	RS232 Serial Communication
		Data rate	115K Baud
		Protocol	MODBUS RTU
		Purpose	Rack configuration
	I/O Module	Standard	RS485 Serial Communication
		Data rate	115K Baud/User selectable
		Protocol	MODBUS RTU
		Purpose	SCADA interface
Controls	Front Panel	Rack RESET Button	Clears latched Alarms
		ADDRESS SWITCH	Used to set the RACK address and Baud rate. 63 possible addresses and 4 possible baud rates can be set
		CONFIGURATION KEYLOCK	Used to place VMS3 rack in RUN mode or PROGRAM mode. RUN mode allows for normal operation of the rack and PROGRAM mode allows for rack configuration.
LED Indication	OK LED	Indicates when the CONFG Module is operating properly.	
	TX/RX LED	Indicates when the CONFG Module is communicating with other modules in the VMS3 rack.	
	CONFIG OK LED	Indicates that the rack has valid configuration.	

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MODULES:

Vibration Measurement Module:

•Channels per module : 4 nos
•Input : Proximeter Transducer
•Input Range : 0 to 40 volts
•Local Display : 5x5 7-Segment

The Vibration Measurement Module is a 4-channel monitor that accepts input from proximity transducers, conditions the signal to provide various vibration and position measurements, and compares the conditioned signals with user-programmable alarms set points to drive alarms.

•The purpose of the Vibration Measurement Module is to provide Machinery protection by continuously comparing monitored parameters with the configured alarm set points to drive the alarms. The user can program each channel of the VMM using the VMS3 Rack Configuration Software to perform any of the following Features:

Features of vibration measurement module:

•Channel Pair Type (Radial Vibration, Thrust Position)
•Transducers Selection.
•Full scale range Selection for Direct.
•Recorder Output selection (Direct, Gap).
•Configurable Channel Pair.
•Set Points for Alert Alarm Limits (Direct and Gap).
•Set Points for Danger Alarm Limits (Direct and Gap).
•Set Points for Alarm Time Delay.
•Set Points for zero Position (Thrust Initial DC Reference).
•Set Points for Trip Multiply.
•Set Points for Clamp Value.
•Latching for Alert Alarm.
•Latching for Danger Alarm.
•Bypass Alarm.

Vibration Measurement module

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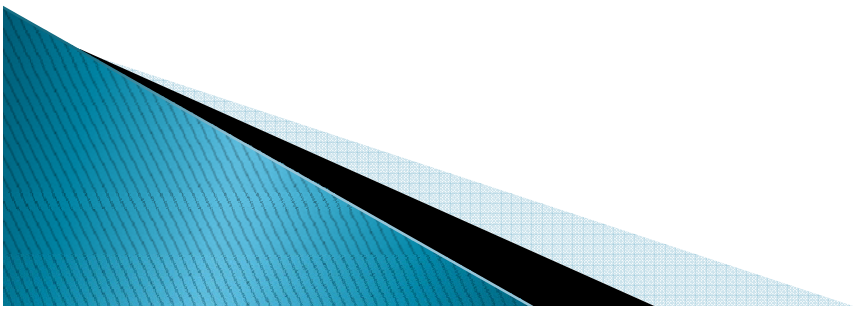
Electrical Parameter-Vibration Measurement Module		
Input Signal	Accepts from 1 to 4 proximity Transducer	8 mV/µm (200 mV/mil).
Recorder Output (Retransmission)	The monitor provides individual recorder values for each channel.	+4 to +20 mA. (Resolution 0.305 uA per bit)
Voltage Compliance	Voltage Compliance for current output	0 to +24 Vdc range across load. Load resistance is 0 to 600 Ω.
Buffered Transducer Outputs	The front of each monitor has one coaxial connector for each channel.	
LED Indication	OK LED	Indicates when the VMM is operating properly.
	TX/RX LED	Indicates when the VMM is communicating with other modules in the VMS3 rack.
	Bypass LED	Indicates when the VMM is in Bypass Mode.
	Alert LED	Indicates when the transducer signal level exceeds the Alert/Alarm 1 set point.
	Danger LED	Indicates when the transducer signal level exceeds the Danger/Alarm 2 set point.
Measurement	Direct (Vibration),Gap Parameters for each channel	
Alarm Setpionts	Alert	From 1 to 60 seconds in 1 second intervals.
	Danger	From 1 to 60 seconds in 1 second intervals.
7 Segment Display	Display Four Channel Parameter (Direct, Gap) And Set points	
Transducer Power Supply	+24 VDC	



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MODULES:

Standard Relay Module:

•Relays per module : 4 nos
•Contacts : NC-C-NO
•Contacts Rating : 250V/5A

Standard Relay module

•The Standard Relay Module provides four relay outputs. These modules can be placed after the VMS3 Rack configuration Module in any of the slots. Each 4-Channel Relay Module can be independently programmed to perform needed operation.

• Each relay utilized on the 4-Channel Relay Module includes “Alarm Drive Logic”. The Alarm Drive Logic is programmed using AND and OR logic, and can utilize alarming inputs (Alerts and Dangers) from any Vibration Measurement Module channel or any combination of channels in the rack. This Alarm Drive Logic uses the VMS-3000 Rack Configuration Software to meet the specific needs of the application.

Features of standard relay module:

•Four Channel Relay Modules.
•Each output of 4-channel Relay Module can be independently programmed.
•The Alarm Drive Logic is programmed using AND and OR logic.
•Each channel is switch selectable for normally energized or normally de-Energized.
•LED indication for each Relay Channel Status.
•Terminals for connecting Relay contacts.

Electrical Parameter of Standard Relay Module			
LED Indication	PWR LED		Power LED indicates when the RLYM is plugged properly in the Rack.
	OK LED		Indicates when the RLYM is operating properly.
	TX/RX LED		Indicates when the RLYM is communicating with other modules in the VMS3 rack.
	CH ALARM LED		Indicates when Relay channel is in an alarm state.
Relay	One Single pole double throw (SPDT) Relay per channel		
Controls	Back panel	Switch	Each channel is switch selectable for normally energized or normally de-energized.
Contact Rating	Max Power		DC-360 W, AC-3000 VA
	Max Current		15 A
	Max Voltage		DC-30 VDC, AC-250 VAC

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