Section I – Overview

Introduction

This document contains information on the operation, installation and maintenance of the VPR100 Series Multi Channel Monitoring System. This manual is an overview of the system and references the specific component manuals. User manuals are provided with the system for all configurable internal components.

Description

The PRO VPR100 Series system monitors a machine’s condition based on its level of vibration. The system will initiate shutdowns of a machine if preset vibration levels are reached. The system detects high vibration energy being sensed by the input accelerometers and actuates relays based on alert and alarm set points. The system will indicate the instantaneous vibration levels and relay status at each channel through the display meters. A 4-20mA signal analogous to the percent of full scale vibration (based on the internal transmitters) is provided as an output for external DCS interfacing. The system also supplies outputs for Dynamic Vibration data (Waveforms) transmitted by the accelerometers. The waveforms are obtained from the BNC jacks inside the enclosure, or can be wired from screw terminals identified by “Sensor Output”.

ViPR Model Selection

The VPR100 Series system has numerous options available to customize the ViPR system to specific needs. Below is a guide to help select which VP Series system fits your specific requirements.

<table>
<thead>
<tr>
<th>Display Type</th>
<th>Enclosure Type</th>
<th>Input Channels</th>
<th>Input Source</th>
<th>Output</th>
<th>Enclosure Entry</th>
<th>Enclosure Exit</th>
<th>Example Part Number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>R = Relay with display</td>
<td>D = Display only</td>
<td>1 = 1 Channel</td>
<td>2 = 2 Channels</td>
<td>3 = 3 Channels</td>
<td>4 = 4 Channels</td>
<td>S = Sensor / Signal Conditioner</td>
<td>V = Vibration</td>
</tr>
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</table>

Section II – Installation

The VPR100 Series system is contained within a standard fiberglass junction box enclosure. Mounting brackets are provided for wall-mounting the enclosure. (Wall anchoring screws are not included).

Cables enter and exit the enclosure through conduit fittings on the bottom of the unit. All input and output wiring is connected at the terminal blocks at the bottom of the unit. All outputs are routed through a 1.5” Conduit Fittings. All inputs are routed through a 1.5” Conduit fitting as well. 110 VAC is needed to power the unit through the terminals on the far right side of the enclosure. A 1/2” Conduit Fitting is provided for AC power entry.

NOTE: If there is no sensor wired to the sensor input terminal, the corresponding transmitter for that channel will not power on. This will cause the Output Display to read low or negative values. Be sure to power the system on AFTER the sensor has been connected.

NOTE: If the display fails to output a value after power has been turned on and the sensor has been wired, turn off the unit, wait several seconds and then reapply power. The internal electronics require some time to ramp up and settle before they are fully operational.
Section III – Operation

Configuring Relays

The input to the internal controller comes from the vibration transmitter. They are built with a specific full scale range and frequency band. The Full scale range of the transmitters must be known in order for the controllers to display the correct vibration value. The transmitter will not display any vibration energy present at frequencies outside the filtering range. Refer to PRO VX Transmitter User Manual for specific instructions on calibration and operation.

Example → Full Scale 0 – 0.20 IPS, Frequency Band 20 – 50 Hz.

At 0 IPS, 4 mA flows from the transmitter to the controller
At 0.20 IPS, 20 mA flows from the transmitter to the controller

The monitoring channel provides 2 relay outputs. The system comes from the factory with a specific vibration range in IPS or mm/s. To configure the relay set points, this range must be known. It is recommended that baseline and typical alarm values of vibration are also known before setup is attempted. The relays provided by the internal controller are highly configurable. Refer to PD765 User Manual for detailed programming instructions.

All of the following parameters can be adjusted:

- Relay Operation – Set and Reset points (Hysteresis), On and Off time Delays

Example Setup 1:

A full scale range of 1 IPS has been specified. Baseline Vibration on the machine to be monitored is 0.18 IPS-pk. Alarm and Shutdown levels of vibration are specified as 0.35 IPS-pk and 0.65 IPS-pk respectively.
Using the provided PD765 Process Controller Manual, access the alarm Set point menu. Program “Set 1” as 0.35 and “Set 2” as 0.65. Select relay operation and action as desired. Scaling must then be set so that at an input of 4mA, 0 IPS is displayed by the meter and at an input of 20 mA, the meter will display 1.00. The system will now actuate a SPDT Relay (Relay 1) when the vibration level reaches 0.35 IPS-pk and another SPDT Relay (Relay 2) when the vibration level reaches 0.65 IPS-pk.

**Analog Output**

The analog 4-20 mA signal represents the amount of vibration energy present at each channel based on the internal transmitter’s full scale. I.E. a 12 mA signal from a 0 → 0.20 IPS transmitter represents a vibration level of 0.10 IPS.

The 4-20mA signal is wired to the terminal blocks labeled ‘4-20’. The terminal block marking strip identifies the individual polarity of the terminals. Each channel provides an analog output in order to interface with an external control or indicator. The 4-20mA signal is compatible with most PLC Analog Input Modules.

Manual adjustment of the internal transmitters may be needed upon installation. Refer to PRO SC Transmitter user manual for specific instructions.

**Section IV – Maintenance**

Once the system has been calibrated and installed it requires minimal maintenance. Basic checks to ensure system integrity should be made periodically.

Visual Inspections should include examinations for the following:

- The displays are operational
- No visible electrical burns or smoke inside the enclosure
- Enclosure hinges are free from rust and securely latched
- No moisture or condensation build up inside the enclosure
- Enclosure viewing window is clean and internal components are clearly visible

**Section V – Appendix**

All component manuals are included with the VPR100 Series Documentation Packet.