OPERATOR'S MANUAL

438R VIBRATION SWITCH: 24 VDC

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LIST OF ACRONYMS, ABBREVIATIONS, AND ENGINEERING SYMBOLS AND UNITS OF MEASURE

A	Acceleration: g's peak
A	Amp
AC	Alternating Current
ALM	Alarm
AMP	Ampere
ANA	Analog
C1	Circuit 1
C2	Circuit 2
C3	Circuit 3
C4	Circuit 4
COM	Common
CPM	Cycles Per Minute

continued -

a. The 4034 Velocity Transducer Installation and Specifications is also applicable to the 4034-350, the only difference being the upper temperature limit of 350F for the 4034-350 versus 160F for the 4034.

List of Acronyms, Abbreviations, and Engineering Symbols and Units of Measure - continued

D	Displacement: Inches peak to peak
d	Displacement: Mils peak to peak
DC	Direct Current
F	Fahrenheit
FS	Full Scale
g	Gravity
GND	Ground
Hz	Hertz (Cycles per Second)
INSTR	Instrument
in/sec	Inches per Second Vibration Units of Velocity
MAX	Maximum
mA	Milliamp
Mils	Vibration Units of Displacement
mV	Millivolts
mV/g	Millivolt/g Force
NORM	Normally
PLC	Programmable Logic Controller
REM	Remote
RPM	Revolutions Per Minute
R31	Potentiometer No. 31 to adjust the 20 mA DC
R32	Potentiometer No. 32 to adjust the 4 mA DC
R37	Potentiometer No. 37 to adjust the gain
R39	Potentiometer No. 39 to adjust the AC Output
R60	Potentiometer No. 60 to adjust shutdown time delay
R63	Potentiometer No. 63 to adjust alarm time delay
R66	Potentiometer No. 66 to adjust shutdown setpoint
R67	Potentiometer No. 67 to adjust alarm setpoint
S1	Switch to field adjust the state of the relays, full scale and AC Output
sec	Second
Shut	Shutdown
Stpt	Setpoint
TB	Terminal Block
TB1-1	Terminal Block 1 Location 1
TB1-7	Terminal Block 1 Location 7
TB1-8	Terminal Block 1 Location 8
TB1-9	Terminal Block 1 Location 9
UNC	Unified National Course
V	Velocity: Inches per second peak
VAC	Volts Alternating Current
VDC	Volts Direct Current
W	Watt

1.0 INTRODUCTION

The Vitec 438R[a] Vibration Switches are an economical approach to accurate and reliable vibration protection for rotating machinery. The 438R is a sophisticated vibration monitoring system and, therefore, requires some care during installation.

Installation and operation of this unit will be simple and easy if the instructions are followed.

READ THIS MANUAL THOROUGHLY TO AVOID ANY INSTALLATION-RELATED PROBLEMS

1.1 Receiving and Handling

This section covers acceptance and warranty.

1.1.1 Acceptance

Inspect this equipment thoroughly before accepting from the transportation company. If any of the goods are missing or damaged, have the express agent make the proper notation on the freight bill or express receipt. Request the carrier to make an inspection. Claims for loss or damage in shipment must not be deducted from the Vitec invoice, nor should payment of the Vitec invoice be withheld awaiting adjustment of such claims since the carrier guarantees safe delivery.

If definite damage has been incurred in your shipment, contact Customer Service at Vitec for assistance.

1.1.2 Warranty

The seller warrants that the goods manufactured by it will be free from defects in material or workmanship for one year from the date of the invoice for the material. For this warranty to be in effect, the specific item claimed to be defective must be returned to the seller, transportation prepaid, no later than five days after the expiration of the warranty period. The seller's liability for incidental and consequential damages is expressly excluded. This warranty shall not apply to any goods that have been subjected to misuse, improper installation, repair, alteration, neglect, accident, use exceeding the published maximum ratings, or damage during shipment. The foregoing warranty is in lieu of all other warranties, expressed or implied, including those of merchantability or fitness for any purpose not expressly set forth herein.

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a. In this Manual, the Vitec 438R means the 24 VDC version.

2.0 PRODUCT DESCRIPTION

The 438R consists of a transducer, an interconnecting cable assembly and electronics enclosure, as shown in Figure 1 on page 6. The 438R measures the vibration level of rotating equipment using a velocity or acceleration transducer mounted to your machine and located up to 1,000 feet from the 438R electronics enclosure. Refer to the Transducer Installation and Specifications in Appendices 1 through 6 for the maximum allowable cable length for specific transducers. The 438R is ideally suited for applications where the electronics should be easily accessible but the point to be monitored is in a dangerous or inconvenient area, such as a cooling tower fan, overhead conveyor or remote pumping station. The 438R is also used in applications where the point to be monitored has a rounded surface such as a bearing block. Enclosures are available for wet, corrosive or explosive environments and transducers for temperatures up to 550 F.

The 438R provides two solid state relay, or transistor, closures when preset vibration levels are exceeded, thereby offering protection from excessive vibration. One provides an alarm or warning, the second provides for shutdown or "trip".

The 438R measures vibration in terms of the velocity of vibration. Those familiar with setpoints given in displacement (mils) can convert to velocity (in/sec) via the Displacement, Velocity and Acceleration Conversion Chart and Formulas shown in Figure 2 on page 7.

The 438R also includes two electrical outputs that are very useful. A 4 - 20 mA signal proportional to the overall vibration level will allow the unit to be connected to a remote device for purposes of reading or recording the vibration level. Common applications include connections to meters, data loggers, recorders or Programmable Logic Controllers (PLC's).

An AC output signal is also provided. This signal is proportional to the actual vibration being measured by the transducer. Common applications for this signal include connection to an oscilloscope to view the raw transducer signal or connection to a real-time analyzer for analysis of the vibration being measured. For Velocity Transducer input units the AC output signal is 100 mV/in/sec. For Acceleration Transducer input units the AC output signal is switch selectable for 100mV/in/sec or 100 mV/g.

3.0 ELECTRICAL INSTALLATION

Proper electrical installation is essential. A little care here will assure a trouble-free installation. Follow the wiring diagram in Figure 3 on page 8. Make special note of the following:

1. The system requires a good instrument earth ground. Do not use the machine itself as a ground, as it normally will not provide proper grounding.