

NELSON™

Microprocessor Based Voltage Monitoring System

Specification – Application Information

Type VM-1



Alarm Silence Switch

Alarm Reset

NEMA 4 or 4X
Enclosure

Voltage:
85 VAC to 300 VAC

Ambient Temperature:
-40°F to 130°F

Standard Versions:
24 Circuit Maximum
48 Circuit Maximum

Description of Voltage Monitoring System

This voltage monitoring system (referenced to as “VM-1”) continually monitors the supply voltage to both series and parallel styles of electric heat tracing cables and panels. This system can monitor voltage at the individual branch breaker, voltage return from parallel heating cables supplied with an integral monitoring wire or act as an annunciator panel for control system alarm status. When used in conjunction with ground fault branch breakers, the VM-1 serves as an automatic alarm system for any ground fault condition.

Description of System Components

The voltage monitoring system is mounted in a NEMA 4 or 4X enclosure that can be wall or rack mounted. The unit is normally located in close proximity to the breaker panel feeding the heat tracing system. The system is available in configurations up to 48 circuits and is environmentally hardened for use in various plant locations. All standard versions of the VM-1 can be installed in

Division 2 hazardous locations without any special considerations. Individual VM-1 systems throughout a facility can be connected to a central PC running RS-485 host communications software. Alarm status and alarm acknowledgement can be accessed from the central location

Scanner Board

The system is controlled by a microprocessor-based scanner that systematically interrogates all circuit parameters and compares actual vs programmed data. The scanner board is environmentally hardened to allow the system to be installed in operating sections of the facility subject to high ambient temperatures. The scanner receives data from the voltage input cards via a data bus connection. Output information is continually displayed through the door of the enclosure by the display unit. Each scanner board can handle from 12 to 24 circuits

Display Unit

The display unit is visible through a protective Plexiglas panel in the door of the assembly. All indicators are LED to provide visibility in all light conditions. The unit displays

the circuit being monitored on 0.5 inch read outs and heater system status of each circuit on large easy-to-see bar lights.

Voltage Input Cards

The voltage input cards monitor the voltage supply status of each connected device. Each voltage input card monitors up to 12 devices for voltage status. Wiring is connected to PCB terminal strips mounted directly on each voltage input card. Each individual circuit is designed to operate on voltages from 120 through 277VAC.

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SPECIFICATIONS

Ambient Temperature:

-40° to +55°C (-40° to +130°F)

Relative Humidity:

0-95% maximum, non-condensing, PC boards are conformed coated and special connectors are used.

Enclosures:

NEMA 4, powder coated steel
NEMA 4X, Stainless Steel

Display:

Single line numeric LED circuit indication. LED bar indicators for Alarm status

Power Input:

120VAC, 1.0A

Voltage Range:

85 to 300VAC

Alarm Output Rating:

AC/DC Contact, 12-120V @ 0.1A maximum

Communications:

RS-485, Modbus® Protocol

User-Definable Options:

Alarm Silence Timeout

Adjustable, 20 min to 24 hrs

Alarm Reset Function:

Selectable, Manual or Automatic

Alarm Delay Function:

Adjustable, 5 sec to 5 min

Voltage Frequency:

Selectable, 60Hz or 50Hz

Scanning Speed:

Selectable, Normal or Fast

SELECTION TABLE

The selection table below allows for the proper specifying of the standard systems (example: VM-1-16-N4).

VM-1**YY**

Number of Circuits (Groups of 4)

24 (12 to 24 Circuit Max)

48 (12 to 48 Circuit Max)

ZZ

Type of enclosure

N4 = NEMA 4

SS = Stainless Steel

Product Family

APPROVALS

FM

Ordinary Locations

Hazardous (Classified) Locations

Class I, Division 2, Groups A,B,C,D

Class II, Division 2, Group E

**CSA**

Ordinary Locations

Hazardous (Classified) Locations

Class I, Division 2, Groups A,B,C,D



Nelson Heat Tracing Systems products are supplied with a limited warranty. Complete Terms and Conditions may be found on Nelson's website at www.nelsonheaters.com.

**NELSON HEAT TRACING SYSTEMS**

P.O. Box 726 • Tulsa, OK 74101 • 918-627-5530 • Fax: 918-641-7336 • www.nelsonheaters.com
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319-SA-010
September 2005