

# Type CM-1 Microprocessor Based Heater Cable Monitoring System

## cETLus:

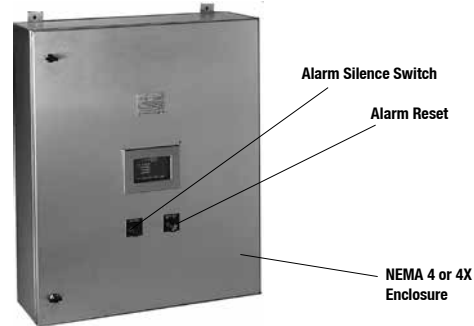
Class 1, Division 2, Groups B, C, D  
Temperature Code: T3C (160°C)  
-40°C ≤ Tamb ≤ +40°C  
Temperature Code: T3A (180°C)  
-40°C ≤ Tamb ≤ +55°C

## Applications

- This heater cable monitoring system (referenced to as “CM-1”) continually monitors the status of both series and parallel styles of electric heat tracing cables and panels.
- This system monitors the supply voltage and current flow to each heating device. With the addition of continuity monitoring devices (referenced to as “CMD”), this system monitors both bus wires in parallel styles of heating cable.
- When used in conjunction with ground fault branch breakers, the CM-1 serves as an automatic alarm system for any ground fault condition.

## System Components

- The cable 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 CM-1 can be installed in Division 2 hazardous locations without any special considerations.
- Individual CM-1 systems throughout a facility can be connected to a central PC running RS-485 host communications software.
- Alarm status and alarm acknowledgment 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 sensor 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 4 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.
- Sensor Cards
  - The sensor cards monitor the electrical parameters of each heating circuit.
  - Each sensor card monitors up to 4 circuits for voltage, current and continuity.
  - An adjustable potentiometer allows the low current alarm level to be set for each circuit.
  - Heater power wiring is connected to 30 amp terminal blocks mounted directly on each sensor card.
  - Each individual circuit is designed to operate on voltages from 120 through 277 Vac.
- Continuity Monitoring Device
  - For continuity monitoring, parallel types of heating cables require the attachment of a bus monitor device at the end of each heater circuit.
  - This device is totally passive and generates no electrical noise or signals that might interfere with other equipment located in the same general area.



- The scanner board looks for this device on each scan cycle to verify bus wire integrity over the entire length of cable.

## Features

- Ambient Temperature: -40° to +55°C (-40° to +130°F)
- Relative Humidity: 0-95% maximum, non-condensing, PC boards are conformal 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
- Current Range: 0.05 to 30.0A
- Continuity: Requires additional CMD device for each monitored circuit
- Alarm Output Rating: AC/DC Contact, 12-120V @ 0.1A maximum
- Control Input: Requires Dry Contact from control device(s) or -V Control Input Option
- Communications: RS-485, Modbus® Protocol

## Certifications and Compliances:

- UL Standard: 508A Ed. 2
- CSA Standard: C22.2 No. 14-13, C22.2 No. 213-16
- ETL Listed: 101081616DAL-001
- Other Standards: ANSI/ISA 12.12.01-2015

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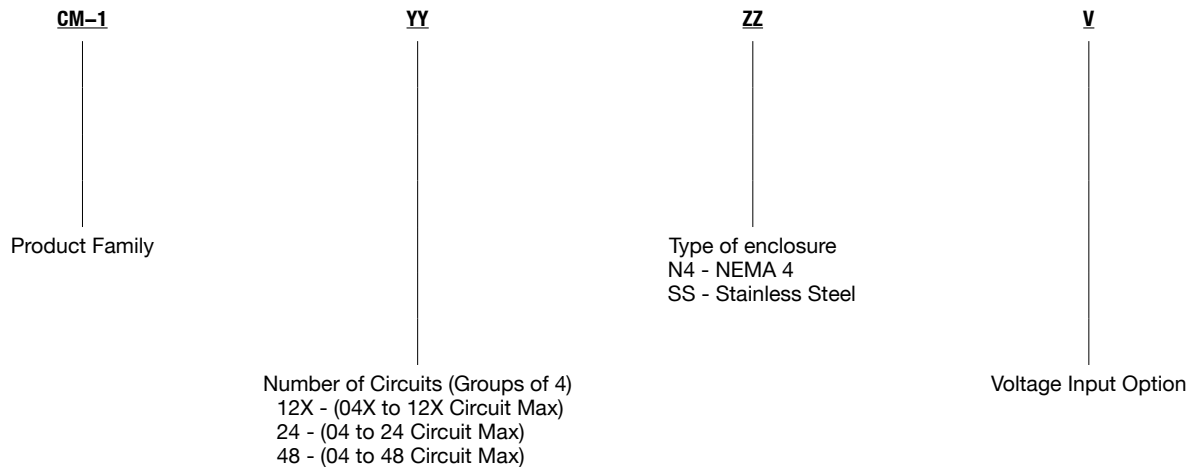
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The selection below table allows for the proper specifying of the standard systems (example: CM-1-04-N4).

## Catalog Numbering Guide



CONTROL AND MONITORING SYSTEMS: CABLE MONITORING

**NELSON**<sup>TM</sup>