

CM3 PLC Based Circuit Management System

ETL:
Class I, Division 2, Groups A, B, C, D
Temperature Code T4 (135°C)

Description

- The system provides temperature monitoring and control of the trace heating system.
- The system automatically checks the health of the trace heating system.
- Negative trends are noted on a maintenance pending list, while more severe problems are removed from service and alarmed.

Applications

- This heat trace circuit management system (CM3) provides a compact, tightly integrated, factory assembled/tested solution for high density plant locations.
- The unit is based on a standard PLC platform, specifically integrated for use with electric heat trace systems.
- Benefits Include:
 - Optimized process control temperatures
 - Energy conservation
 - Elimination of separate ground fault branch circuit breakers
 - Automated trace heater monitoring
 - Predictive maintenance monitoring

Description of System Functions:

- Temperature Control
 - An RTD based temperature control function optimizes energy consumption, while maintaining tight temperature control on your process piping. High and low temperature alarms will alert you to any upset conditions that could cause problems with your processes.
- Heat Trace Ground Fault Protection
 - The system provides continuous monitoring of ground fault conditions with each circuit, eliminating the need for expensive ground fault protection branch circuit breakers.
 - Separate values can be inserted for alarm and trip functions, alerting you to problems before the problem becomes severe enough to require the heat trace be taken out of service.
 - Adjustable trip values allow you to compensate for normal capacitive ground fault leakage that occurs in cables.
- Predictive Maintenance System
 - Ground fault and load current values are compared to earlier values.
 - Adverse trends in a trace heater will get that circuit put on a maintenance log alert system.
 - This log allows the limited maintenance resources to be optimally deployed.
- Heat Trace Power Output Monitoring
 - Adjustable high and low load current alarms for each heat trace circuit provide a constant monitor of the power output of each heat tracer.
 - A low current alarm can identify the loss of a heater segment before the pipe can plug up and stop the process.
 - A high current alarm can identify a developing short circuit in the tracer allowing the circuit to be taken off line with a minimum of damage to the rest of the heat tracer.
- Automatic Testing
 - The system will continuously test the system, even when it is not in use.
 - This allows any problems to be identified as they occur, rather than allowing problems to cascade over a long period.
 - The unit turns each circuit on at selected intervals and checks for ground fault leakage and load currents.
 - Any problems will be alarmed.



CM340-12-C-P



CM340-4X-SSR

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Features

- Temperature control
 - Heat Trace power control
 - Adjustable control temperature
 - Adjustable high and low temperature alarms
 - Adjustable dead band
- Interface
 - Color touch screen operator interface
 - Displays all alarms
 - Displays actual temperature
 - Displays heat trace circuit status- on or off
 - Displays actual heat trace ground fault and load currents
 - Displays all set points
 - Global programming
 - Intuitive, easy to navigate
- Automated monitoring
 - Testing of heat trace circuit – voltage, current, ground fault
 - Predictive maintenance, trend monitoring of heat trace
- Heat Trace
 - Load switching, 24 Amps, 120 Vac - 600 Vac (EMR)
 - Load switching, 30 Amps, 120 Vac - 600 Vac (SSR)
 - Adjustable ground fault alarm
 - Adjustable ground fault trip
 - Adjustable low current alarm
 - Adjustable high current alarm

- Other
 - High Density – up to 40 circuits
 - NEMA 4, 4X, 12 constructions
 - PLC based system
 - Proven, robust heat trace control program
 - Processor failure alarm
 - RTD sensor probe failure
 - Modbus® RTU communications
 - All data accessible thru communications port

Certifications and Compliances

- EMR Versions
 - Conforms to UL508A, Certified to CSA-22.2 No 14-05
 - Ordinary Locations
 - Hazardous (Classified) Locations (-P option)
 - Class I, Division 2, Groups A, B, C, D
 - Temperature Code T4 (+135°C)
- SSR Versions
 - Conforms to UL508A, Certified to CSA-22.2 No 14-05
 - Ordinary Locations
 - Hazardous (Classified) Locations
 - Class I, Division 2, Groups B, C, D
 - Class I, Zone 2, Groups IIB + H₂
 - Temp Code T4 (+135°C)

Specifications

| | | | |
|--------------------------------------|--|--------------------------------------|--|
| Control power | 120-240 Vac, 1-phase, 50/60 Hz | Auto-Test cycle | 1-720 hrs., adjustable |
| Heat trace load | 120-277 Vac (R2), 120-600 Vac (C), 120-600 Vac (SSR) | Predictive maintenance log | On or Off |
| Processor | Schneider Electric M340 platform | Predictive log trigger values | adjustable |
| Display | Color LED, CFL 75,000h | Sensor inputs | RTD, 100-ohm, platinum, 3-wire |
| Operator interface | Analog touch pad, 1,024 x 1,024 | Ambient Control Option | 1-40, adjustable |
| Programming options | By individual channel or global | Sensor failure mode | On or off for each channel |
| Temperature Units | °F or °C | Alarm contact | Common for all alarms |
| Channel (circuit) activation | On or Off for each channel | Alternate alarm contact | Ground fault only |
| Control temperature set point | -328 to +1392 °F range, adjustable | Ambient temperature | -20°C to +40°C |
| Control dead band | adjustable | Relative humidity, NEMA 12 | 0-85%, non-condensing |
| High temperature alarm | adjustable | Relative humidity, NEMA 4, 4X | 0-100% |
| Low temperature alarm | adjustable | Enclosure options | NEMA 4 polyester powder coated NEMA 4X 304 stainless steel NEMA 12 polyester powder coated |
| Heat trace low current alarm | 1-30 amps, adjustable | | |
| Heat trace high current alarm | 1-30 amps, adjustable | | |
| Ground fault alarm | 1-500ma, adjustable | Approvals | ETL Control: 4000560 |
| Ground fault trip | 1-500ma, adjustable | | |

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EMR Version Output Module Selection Table

| Control Points | Panel Size ① ② | Heat Tracing Load Voltages | | | | | | | |
|----------------|----------------|----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | 120 Vac (2P) | 208 Vac (2P) | 230 Vac (2P) | 240 Vac (2P) | 277 Vac (2P) | 347 Vac (2P) | 480 Vac (2P) | 600 Vac (2P) |
| 8 | A | R2 | R2 | R2 | R2 | R2 | - | - | - |
| 8 | B | C | C | C | C | C | C | C | C |
| 16 | A | R2 | R2 | R2 | R2 | R2 | - | - | - |
| 16 | B | C | C | C | C | C | C | C | C |
| 24 | A | R2 | R2 | R2 | R2 | R2 | - | - | - |
| 24 | B | C | C | C | C | C | C | C | C |
| 32 | A | R2 | R2 | R2 | R2 | R2 | - | - | - |
| 32 | B | C | C | C | C | C | C | C | C |
| 40 | C | R2 | R2 | R2 | R2 | R2 | - | - | - |
| 40 | D | C | C | C | C | C | C | C | C |

① Panel A/B- 768A maximum per panel, 24A maximum per circuit, 60 Hz, 1-Phase
② Panel C/D- 960A maximum per panel, 24A maximum per circuit, 60 Hz, 1-Phase

SSR Version Output Module Selection Table

| Control Points | Panel Size ③ ④ ⑤ | Heat Tracing Load Voltages | | | | | | | |
|----------------|------------------|----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | 120 Vac (1P) | 208 Vac (2P) | 230 Vac (1P) | 240 Vac (2P) | 277 Vac (1P) | 347 Vac (1P) | 480 Vac (2P) | 600 Vac (2P) |
| 4 | A | — | SSR2 | — | SSR2 | — | — | SSR2 | SSR2 |
| 8 | A | SSR | — | SSR | — | SSR | SSR | — | — |
| 8 | B | — | SSR2 | — | SSR2 | — | — | SSR2 | SSR2 |
| 12 | B | SSR | — | SSR | — | SSR | SSR | — | — |
| 12 | B | — | SSR2 | — | SSR2 | — | — | SSR2 | SSR2 |
| 16 | B | SSR | — | SSR | — | SSR | SSR | — | — |
| 16 | C | — | SSR2 | — | SSR2 | — | — | SSR2 | SSR2 |
| 20 | B | SSR | — | SSR | — | SSR | SSR | — | — |
| 20 | C | — | SSR2 | — | SSR2 | — | — | SSR2 | SSR2 |
| 24 | B | SSR | — | SSR | — | SSR | SSR | — | — |
| 32 | C | SSR | — | SSR | — | SSR | SSR | — | — |
| 40 | C | SSR | — | SSR | — | SSR | SSR | — | — |

Note:
③ Panel A- 200A maximum per panel, 30A maximum per circuit, 60 Hz, 1-Phase
④ Panel B- 600A maximum per panel, 30A maximum per circuit, 60 Hz, 1-Phase
⑤ Panel C- 1000A maximum per panel, 30A maximum per circuit, 60 Hz, 1-Phase

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CM3 Enclosure Sizes Dimensions in Centimeters (Inches)

| Panel Size | Height | Width | Depth |
|---------------------|----------|----------|---------|
| EMR Versions | | | |
| A | 183 (72) | 92 (36) | 31 (12) |
| B | 183 (72) | 153 (60) | 31 (12) |
| C | 214 (84) | 92 (36) | 41 (16) |
| D | 219 (86) | 153 (60) | 31 (12) |
| SSR Versions | | | |
| A | 92 (36) | 92 (36) | 41 (16) |
| B | 183 (72) | 92 (36) | 41 (16) |
| C | 214 (84) | 92 (36) | 61 (24) |

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The CM3 Circuit Management System is available in multiple configurations of circuit count, enclosure ratings and power ratings. The selection tables below allow for the proper specifying of the standard systems (example: CM332-4X-R2). For custom configurations or modifications, consult factory.

Catalog Numbering Guide

