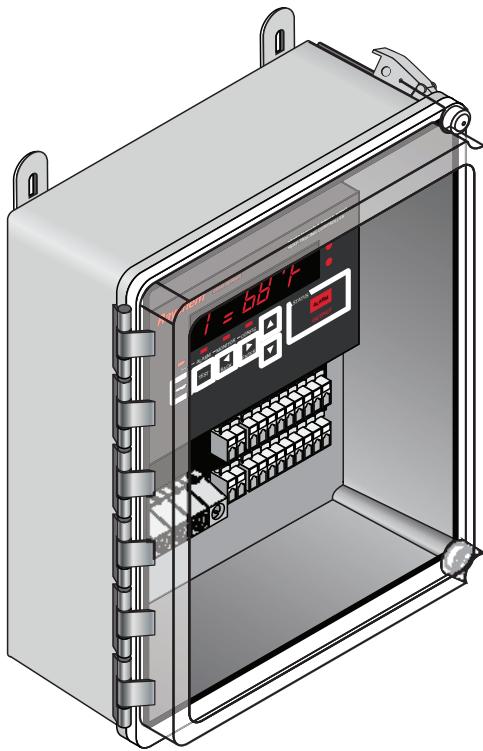


CONNECT AND PROTECT

Single-point heat-tracing control system

PRODUCT OVERVIEW



The nVent RAYCHEM C910-485 is a compact, full-featured, microprocessor-based, single-point commercial heating cable control system with integrated equipment ground-fault protection. The C910-485 provides control and monitoring of electric heating cable circuits for commercial heating applications. The C910-485 can be set to monitor and alarm for high and low temperature, low current, and ground-fault level. The C910-485 includes an RS-485 communication module to remotely configure, control and monitor the heating cable circuits through a building management system (BMS).

Control

The C910-485 measures temperature with one or two 3-wire 100-ohm platinum RTD(s) connected directly to the unit. The controller may be used in line-sensing, ambient-sensing and proportional ambient-sensing control (PASC) modes. The C910-485 may also be connected into the nVent RAYCHEM ACS-30 system for single circuit extensions. When in the ACS-30 system it is controlled by the ACS-UIT3 and has all the application functionality of the ACS-30 system.

Monitoring

A variety of parameters are measured, including ground fault, temperature, and current to ensure system integrity. The system can be set to periodically check the heating cable for faults, alerting maintenance personnel of a heat-tracing problem. Both an isolated solid-state triac relay and a dry contact relay are provided for alarm annunciation back to a building management system (BMS).

Ground-fault protection

National electrical codes require ground-fault equipment protection on all heat-tracing circuits. The C910-485 controllers incorporate ground-fault sensing, alarm, and trip functionality internally. Heating cable circuits equipped with C910-485 controllers do not require additional ground-fault protection equipment, simplifying installation and reducing costs. The C910-485 automatically tests the integrity of the integrated ground-fault circuitry, ensuring protection in the event of a ground fault.

Installation


The C910-485 unit comes ready to install right from the box, eliminating the need for custom panel design or field assembly. The NEMA 4X-rated enclosure is approved for use in indoor and outdoor locations. Wiring is as simple as connecting the incoming and outgoing power wiring (up to 277 Vac) and an RTD.

The C910-485 operator interface includes LED displays and function keys that make it easy to use and program. No additional handheld programming devices are needed. Alarm conditions and programming settings are easy to interpret on the full-text front panel. Settings are stored in nonvolatile memory in the event of power failure.

Communications

The C910-485 supports Modbus® protocol and includes an RS-485 communications interface. nVent RAYCHEM ProtoNode multi-protocol gateways are available to integrate the C910-485 or ACS-30 into BACnet® and Metasys® N2 BMS systems.

GENERAL

| | |
|----------------|--------------------------------------------------------------------------------------------------|
| Area of use | Nonhazardous locations |
| Approvals | Nonhazardous locations |
| |  |
| Supply voltage | 100 Vac to 277 Vac, +5 / -10%, 50/60 Hz Common supply for controller and heat-tracing circuit |

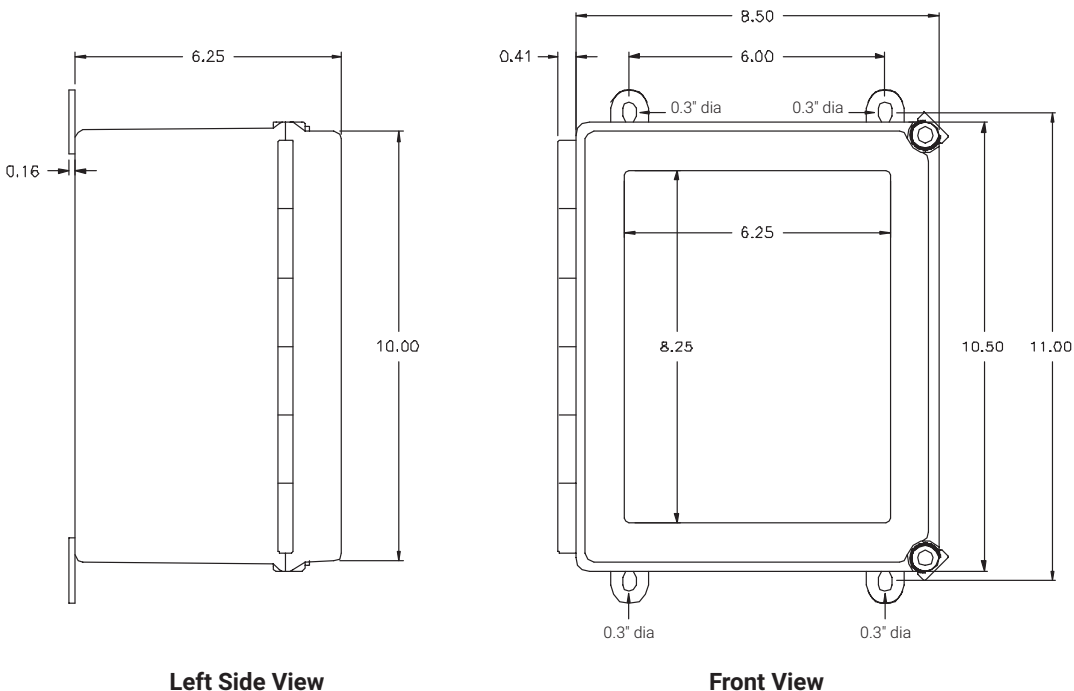
ENCLOSURE

| | |
|-------------------------------------|--------------------------------|
| Protection | Type 4X |
| Materials | FRP |
| Ambient operating temperature range | -40°F to 140°F (-40°C to 60°C) |
| Ambient storage temperature range | -40°F to 185°F (-40°C to 85°C) |
| Relative humidity | 0% to 90%, noncondensing |

CONTROL

| | |
|--------------------|----------------------------------------------------------|
| Relay type | Double-pole, mechanical |
| Voltage, maximum | 277 Vac nominal, 50/60 Hz |
| Current, maximum | 30 A @ 104°F (40°C) derated to 20 A @ 140°F (60°C) |
| Control algorithms | EMR: On/off, proportional ambient sensing control (PASC) |
| Control range | 0°F to 200°F (-18°C to 93°C) |

TYPICAL ENCLOSURE DIMENSIONS (INCHES)



MONITORING

| | |
|--------------|-------------------------------------------------------------------------------------------------------------|
| Temperature | Low alarm range 0°F to 180°F (–18°C to 82°C) or OFF High alarm range 0°F to 200°F (–18°C to 93°C) or OFF |
| Ground fault | Alarm range 20 mA to 100 mA Trip range 20 mA to 100 mA |
| Current | Low alarm range 0.3 A to 30 A or OFF |
| Autocycle | Diagnostic test interval adjustable from 1 to 240 minutes or 1 to 240 hours |

TEMPERATURE SENSOR INPUTS

| | |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Quantity | Two inputs standard |
| Types | 100 Ω platinum RTD, 3-wire, $\alpha = 0.00385$ ohms/ohm/°C Can be extended with a 3-conductor shielded cable of 20 ohms maximum per conductor |

ALARM OUTPUTS

| | |
|-------------------|-------------------------------------------------------------------------------|
| AC relay | Isolated solid-state triac, SPST, 0.75 A maximum, 100 Vac to 277 Vac nominal |
| Dry contact relay | Pilot duty only, 48 Vac/dc, 500 mA maximum, 10 VA maximum resistive switching |

Note: Outputs are configurable as “open on alarm” or “close on alarm”

PROGRAMMING AND SETTING

| | |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Method | Programmable keypad |
| Units | Imperial (°F, in.) or Metric (°C, mm) |
| Digital display | Actual temperature, control temperature, heater current, ground fault, programming parameter values, alarm values |
| LEDs | Heater on, alarm condition, receive / transmit data |
| Memory | Nonvolatile, restored after power loss, checksum data checking |
| Stored parameters (measured) | Minimum and maximum temperature, maximum ground-fault current, maximum heater current, contactor cycle count, time in use |
| Alarm conditions | Low / high temperature, low current Ground-fault alarm, trip RTD failure, loss of programmed values, or EMR failure |
| Other | Password protection |

CONNECTION TERMINALS

| | |
|--------------------------|----------------------------------|
| Power supply input | Screw terminals, 22–8 AWG |
| Heating cable output | Screw terminals, 22–8 AWG |
| Ground | Two box lugs, 14–6 AWG |
| RTD/alarm/communications | 28–12 AWG spring clamp terminals |

MOUNTING

| | |
|-----------|-------------------------------------------------------------------------------------------------------------------------|
| Enclosure | Surface mounting with four fixing holes on 7.25 in x 11.7 in (184 mm x 297 mm) centers Hole diameter: 0.31 in (8 mm) |
|-----------|-------------------------------------------------------------------------------------------------------------------------|

COMMUNICATIONS WITH C910-485

| | |
|----------|------------------------------------------------|
| Protocol | ModBus RTU / ASCII |
| Topology | Multidrop, daisy chain |
| Cable | Single shielded twisted pair, 26 AWG or larger |
| Length | 4000 ft (1.2 km) maximum @ 9600 baud |
| Quantity | Up to 32 devices without repeater |
| Address | Programmable |

ORDERING DETAILS

| C910-485 Single-point Heat-Tracing Control System | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------|------------|
| Description | Catalog number | Part number | Weight/lbs |
| C910-485 controller in an 8" x 10" FRP enclosure with polycarbonate cover. 2-pole 30 A EMR. Controls a single circuit with a 2-pole electromechanical relay. Includes isolated 2-wire RS-485 communication board. (Approved for nonhazardous locations only) | C910-485 | 10170-026 | 15 |
| RTD Sensors | | | |
| 100-ohm platinum RTD with 10 foot stainless steel corrugated sheath | RTD10CS | RTD10CS | 1.0 |
| RTD, ambient, cable style | RTD-200 | 254741 | 0.1 |
| RTD, -100°F to 900°F, pipe mounted | RTD4AL | RTD4AL | 1.2 |
| Protocol Gateways | | | |
| ProtoNode-RER: BACnet MST/IP and Metasys N2 protocol gateway | ProtoNode-RER-1.5K | 2000004256 | 1.3 |

North America

Tel +1.800.545.6258
 Fax +1.800.527.5703
thermal.info@nVent.com



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