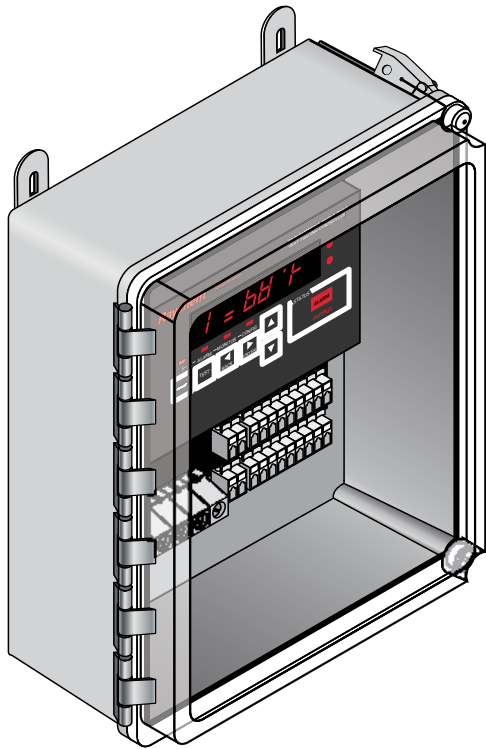# C910-485

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 ACS-30 system for single circuit extensions. When in the ACS-30 system it is controlled by the ACS-UIT2 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. 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)

LEFT SIDE VIEW

FRONT VIEW
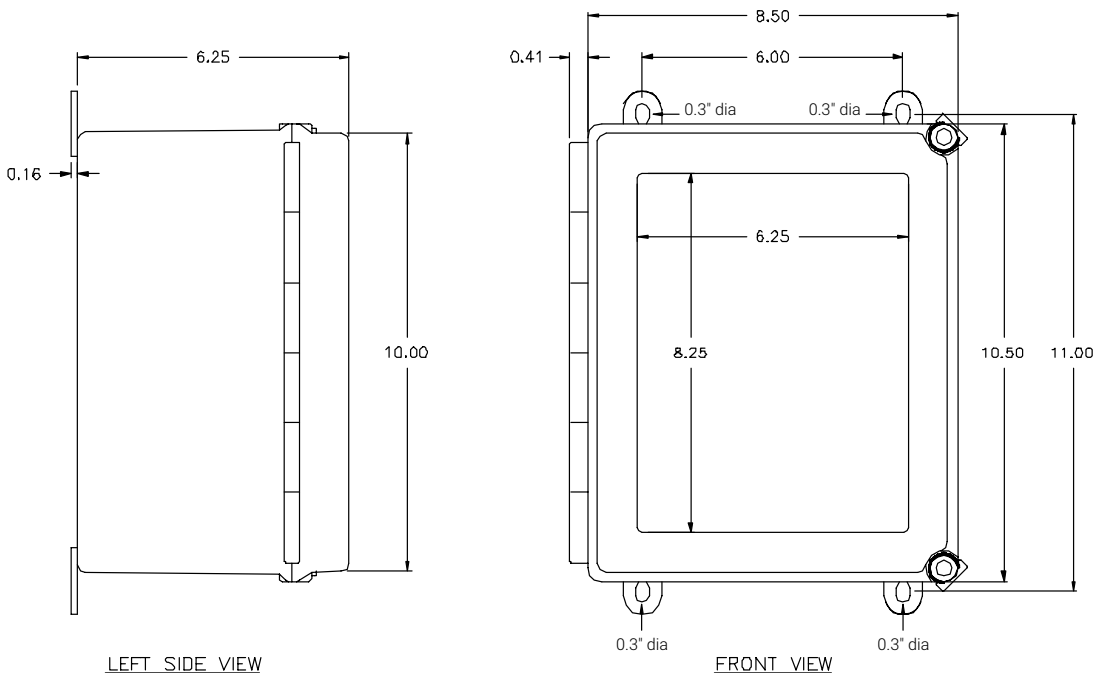
MONITORING

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, α = 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 / ASCI I
Topology	Multidrop, daisy chain
Cable	Single shielded twisted pair, 26 AWG or larger
Length	4000 ft (1.2km) maximum @ 9600 baud
Quantity	Up to 32 devices without repeater
Address	Programmable

ORDERING DETAILS

RAYCHEM C910-485 Single-point Heat-Tracing Control System			
Description	Catalog number	Part number	Weight/lbs
RAYCHEM 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-wite 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			
RAYCHEM ProtoNode-RER: BACnet MST/IP and Metasys N2 protocol gateway	ProtoNode-RER	P000002008	1.3

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