460

nVent RAYCHEM

SINGLE-POINT ELECTRONIC CONTROLLER FOR HEAT TRACING SYSTEMS

PRODUCT OVERVIEW

The nVent RAYCHEM 460 is a c-UL-us Listed single-point heat tracing controller designed for pipe freeze protection, flow maintenance and heat loss replacement applications. It includes a 5" inch color touch screen display for intuitive set up and programming right out of the box. The 460 controller may be used with line-sensing or ambient-sensing and Proportional Ambient-Sensing Control (PASC) modes. It measures temperatures with two 2 KOhm / 77°F (25°C), 2-wire Thermistor connected directly to the unit. The controller can also measure ground fault current to ensure system integrity. The controller includes ground fault current sensing and relaying equipment compliant with UL1053 standard.

FEATURES

• 5" color touch screen for easy set-up and programming
• Easy to install push-in cage-clamp wire terminals
• Standalone unit that can be DIN Rail mounted
• Ground fault equipment protection (GFEP) compliant with UL1053
• User-defined settings for ground fault alarm and trip levels
• User-defined high temperature cut-out setting
• User-defined auto-cycle feature to automatically and regularly test the system for any problems
• Energy efficient PASC mode available
• Alarm relay for remote alarm annunciation
• Two temperature sensors that can be used for ambient and line sensing
• Programmable in advance in power-off mode by using external power bank/charger and USB connection

GENERAL

Area of use	Non-hazardous locations
Approvals	

GROUND FAULT PROTECTION

Built-in GFEP. Heat tracing circuit equipped with the 460 controller do not require additional ground fault protection equipment, simplifying installation and reducing costs. It automatically tests the integrity of the integrated ground fault circuitry, ensuring protection in the event of a ground fault.

ELECTRICAL PROPERTIES

Supply voltage	120/208/240/277 VAC, 50/60 Hz
Ambient operating temperature range	32°F (0°C) to 105°F (40°C)
Ambient storage temperature range	-4ºF (-20ºC) to 122ºF (50ºC)
Internal power consumption	9 W maximum
Output relay switching capacity	24 A @ 120/208/240/277 +/-10% Vac; 50/60 Hz
Alarm relay	Single pole single throw relay, volt-free; maximum switching capacity (resistive load only) 1 A/24 VDC, 1 A/24 VAC
Circuit breaker	30 A maximum
Ground fault	30 mA, complies with UL 1053 standard
Real time clock	Automatic daylight saving time and leap year correction
Clock accuracy	+/-10 minutes per year
Keylock	Password protection for parameter settings
USB port	For pre-setup in power off mode; for firmware upgrades

ENCLOSURE

Dimensions	210 mm x 90 mm x 85 mm / 8.26" x 3.5" x 3.34"
Ingress protection class	TYPE 12 – indoor use only
Enclosure material	Polycarbonate
Mounting option	Mountable DIN RAIL, 35 mm
Conduit entries	Two each-1/2 in conduit entries
Cable gland	3 -hole grommet for temperature sensors maximum cable size
	-2 wire: 20 AWG (0,5 mm^2)
Flammability class	DIN EN 60730/VDE 0631-1

TYPICAL DIMENSIONS AND MODULE LAYOUT
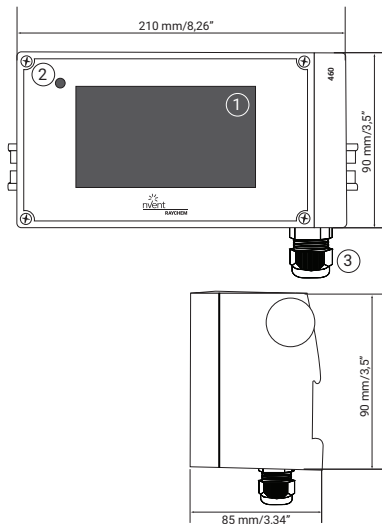
1. Touch screen: size 5" resistive
2. LED Green: Normal operation, heater on: 1.5 sec on/0.5 sec off
   Normal operation, heater off: 1.0 sec on/ 1 sec off
   Alarm condition: 0.2 sec on/1.8 sec off
3. M20 Gland: Sensor ambient/sensor pipe/external alarm

PROGRAMMING

Maintain temperature setpoint	32°F (0°C) to 176ºF (80ºC)

SENSOR

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Temperature sensor type	Thermistor 2 KOhm / 77°F (25°C), 2-wire
Sensor tip dimensions	Ø 0.2" (5 mm) ; length 0.8"(20 mm)
Sensor cable length	10ft (3 m) cable extension up to 328 ft (100 m) / 2 x 16 AWG
Sensor temperature range	-40°F (-40°C) to 194°F (90°C)

MONITORING

Temperature	Low alarm range:	-40°F to 190°F (-40°C to 88°C)
	High alarm range:	32°F to 190°F (0°C to 88°C)
Ground fault	Alarm range:	20 - 200 mA
	Trip range:	20 - 200 mA
Autocycle	Daily/Weekly/Monthly/Never	
Alarm Relay	The alarm relay is used to provide external alarm for any of the following alarm conditions:	

1) Ground fault current

2) Low system temperature

3) High system temperature

4) Temperature sensor failure

5) Internal error

6) Loss of continuity

7) Loss of incoming supply voltage

Audio (buzzer) and visual alarm (LED light, screen display) for any alarm conditions.

MEMORY

Parameters	All parameters are stored in nonvolatile memory, except date and time
Clock back-up time	10 days.

ELECTRICAL SCHEME
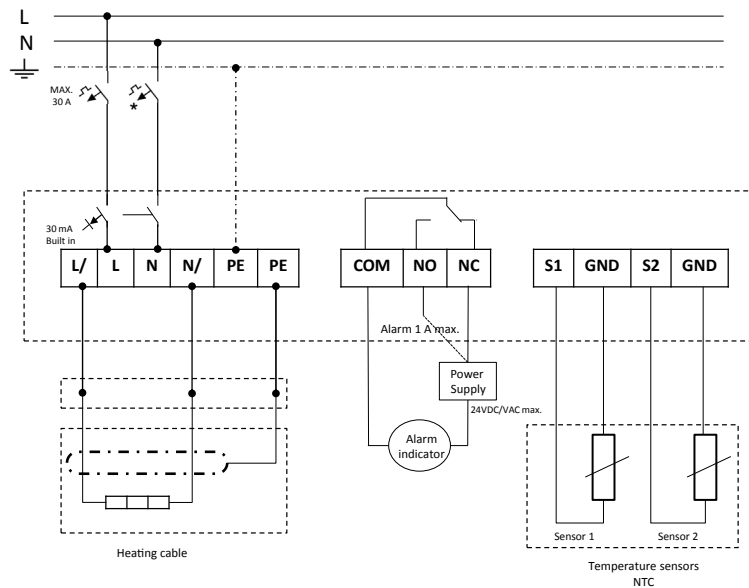
Size power supply terminals	3 x 6 mm² maximum/10 AWG
Size heating cable terminals	3 x 6 mm² maximum/10 AWG
Size alarm terminals	3 x 1,5 mm² maximum/16 AWG
Size sensor terminal - boiler	2 x 1,5 mm² maximum/16 AWG
Size sensor terminal - pipe	2 x 1,5 mm² maximum/16 AWG

ORDERING DETAILS

Description	Catalog	Part Number	Weight
Single-point heat tracing controller for pipe heat tracing systems	460 Controller	P000002338	2.3lbs/1050g
2K NTC Sensor 10 m long	SENSOR-NTC-10M	1244-015847	0.2lbs/90g
Power bank	R-PB-Powersmart	1244-020365	0.33lbs/150g

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RAYCHEM-DS-H60792-460Controller-EN-2007