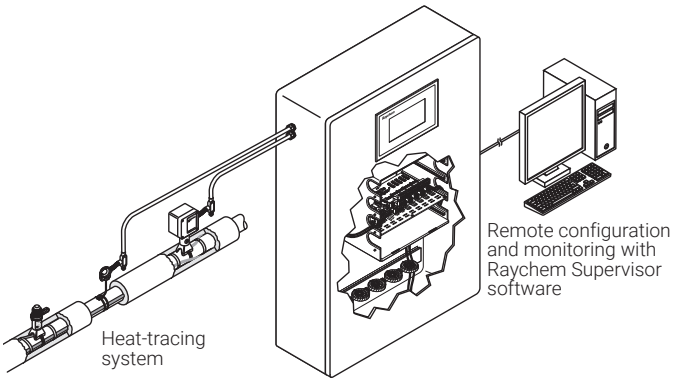
NGC-30

ADVANCED HEAT-TRACING CONTROL SYSTEM



PRODUCT OVERVIEW

The nVent RAYCHEM NGC-30 is a multi-circuit electronic control, monitoring and power distribution system for heat-tracing used in process-temperature maintenance and freeze-protection applications. The NGC-30 system can control up to 260 circuits and monitor up to 1040 temperature inputs with multiple networked panels. The RAYCHEM NGC-30 Controller can accommodate temperature inputs from a variety of sources: hard-wired, from Remote Monitoring Modules (RMM2) or from Power Line Carrier Interface (PLI) transmitters (SES/SPC/700-TT). Each panel can typically control up to 40 individual heat-tracing circuits and is available with power distribution as an option. The RAYCHEM NGC-30 is available with two output types: an electromechanical relay (EMR) or a solid-state relay (SSR). Both types allow circuit switching up to 60 A at 600 Vac with single or three-phase power. Up to four Resistance Temperature Detector (RTD) inputs for each heat-tracing circuit allow for a variety of combinations of temperature control, monitoring, and alarming. Systems can be configured for nonhazardous and hazardous locations. The ability to monitor and configure the controller is available both locally and remotely with the User Interface Unit (UIT2) and the RAYCHEM Supervisor software.

CONTROL

The RAYCHEM NGC-30 measures temperatures with 3-wire, 100-ohm platinum RTDs. The temperature information can be transferred to the RAYCHEM NGC-30 control panel through an RTD directly connected to the RAYCHEM NGC-30 panel, through an optional Remote Monitoring Module (RMM2) or through an optional PLI Module with special transmitters: RAYCHEM SES (Smart-End-Seal), RAYCHEM SPC (Smart Power Connection) or RAYCHEM 700-TT transmitters. Each RMM2 accepts up to eight RTDs. The RMM2s are typically located near the desired measurement location (RTDs). Multiple RMM2s are networked over a single cable to the RAYCHEM NGC-30, significantly reducing the cost of RTD field wiring. With EMRs and SSRs, the RAYCHEM NGC-30 can be configured for On/Off, ambient sensing, and proportional ambient sensing modes. Additionally, with SSRs, the panel can be configured for proportional, power limiting, and soft start modes.

POWER LINE CARRIER INTERFACE TECHNOLOGY

The RAYCHEM Power Line carrier Interface Module (PLI) is an optional part of the RAYCHEM NGC-30 heat-tracing control and monitoring system. When using Power Line Interface Technology, the RTD temperature information and the continuity confirmation are sent back through special transmitters, SES/SPC/700-TT, to the PLI Module and the RAYCHEM NGC-30 controller along the heat-tracing bus wires and the AC power line, meaning the heating cable is also the data cable. Since no additional wiring is required to bring RTD temperature and continuity data back to a central location, installation and maintenance costs of the heat-tracing system are significantly reduced.

The PLI technology is only available in EMR output panels, which allow the signal to be passed through the heating cable and AC power line to the PLI module; this option is not available with SSR output panels.

MONITORING

The RAYCHEM NGC-30 can measure up to 12 control parameters including ground-fault, temperature, and current variables to ensure system integrity. Configurable alarm settings provide options for local or remote alarms. The system can be set to periodically check for heating cable faults, alerting maintenance personnel of a pending heat-tracing problem. This helps avoid costly downtime. Dry contact relays are provided for alarm annunciation back to a Distributed Control System (DCS).

The PLI Module can receive temperature inputs from up to 127 SES, SPC, or 255 700-TT transmitters. Up to four PLI modules can communicate with a RAYCHEM NGC-30 central controller using a single RS-485 bus (a shielded, twisted pair).

GROUND-FAULT PROTECTION

National electrical codes require ground-fault equipment protection on all heat-tracing circuits. Heat-tracing circuits equipped with RAYCHEM NGC-30 controllers do not require additional ground-fault detection equipment, simplifying installation and reducing costs.

LOCAL MONITORING AND CONTROL

The RAYCHEM NGC-30 system is configured with a User Interface Terminal (UIT2) that has an LCD color display with touch screen technology. This UIT2 provides an easy user interface for programming without using keyboards. The UIT2-EX is rated for ordinary and hazardous, indoor or outdoor locations and can be mounted on the panel door. An option is also available to have the User Interface Terminal not mounted on the panel door but located remotely from the panel. The remote stand-alone User Interface Terminal, NGC-UIT2-ORD-R, with a NEMA 4 enclosure is available for mounting remotely in a nonhazardous, indoor or outdoor location.

COMMUNICATIONS

The RAYCHEM NGC-30 units can be networked to a host PC running Windows®-based RAYCHEM Supervisor client-server software for central programming, status review, and alarm annunciation. RAYCHEM NGC-30 units support the Modbus® protocol and are available with an RS-232/RS-485 or 10/100Base-T Ethernet communication interface.

GENERAL

Area of use	RAYCHEM NGC-30-EMR for nonhazardous locations RAYCHEM NGC-30-EMR with Z purge for hazardous locations RAYCHEM NGC-30-SSR for hazardous locations
Approvals	**Nonhazardous Locations** ETL LISTED CONFORMS TO ANSI/UL STD. 508 UL STD. 508A CERTIFIED TO CAN/CSA C22.2 NO. 14 **Hazardous Locations** (EMR purged version) ETL LISTED CONFORMS TO ANSI/UL STD. 508 UL STD. 508A CERTIFIED TO CAN/CSA C22.2 NO. 14 ETL LISTED CONFORMS TO NFPA STD 496 **Hazardous Locations (SSR version)** ETL LISTED CONFORMS TO UL STD 508A ANSI/ISA STD 12.12.01 CERTIFIED TO CSA STD C22.2 NO. 213 CSA STD C22.2 NO. 14
Supply voltage	100 – 240 Vac, +5% / –10%, 50/60 Hz common supply for controller and heat-tracing circuit Up to 600 Vac for heat-tracing circuit when controller is powered from a separate circuit

ENCLOSURE

Protection/materials	NEMA 12 (indoors painted steel) NEMA 4/3R (outdoors, painted steel) NEMA 4X/3RX (outdoors, stainless steel)
Operating temperature NGC-UIT2-ORD installed	Without distribution: –13°F to 140°F (–25°C to 60°C) Below –13°F (–25°C), space heater and thermostat must be used With distribution: 14°F to 140°F (–10°C to 60°C) Below 14°F (–10°C), space heater and thermostat must be used
NGC-UIT2-HAZ installed	With or without distribution: 32°F to 140°F (0°C to 60°C) Below 32°F (0°C), space heater and thermostat must be used
Storage temperature NGC-UIT2-ORD installed NGC-UIT2-HAZ installed	–13°F to 167°F (–25°C to 75°C) –40°F to 149°F (–40°C to 65°C)
Relative humidity	0% to 90%, noncondensing

CONTROL

Heat-tracing circuits	One NGC-UIT2 can configure and monitor up to 260 heat-tracing circuits
Relay types	3-pole, electromechanical (EMR versions) 1-, 2-, or 3-pole solid-state relays (SSR versions)
Voltage, maximum	240 Vac nominal, 50/60 Hz (standard), 600 Vac nominal (optional)
Current, maximum per circuit* *Depending on panelboard amperage rating, the maximum current may not be used on all circuits.	EMR: 30 A @ 104°F (40°C) or 60 A @ 104°F (40°C) SSR: 30 A @ 104°F (40°C) or 60 A @ 104°F (40°C)
Control algorithms	EMR: On/Off, Ambient on/off, PASC (proportional ambient sensing control) SSR: On/Off, Ambient on/off, PASC (proportional ambient sensing control), Proportional (includes soft start for all SSR control modes)
Control range	–99°F to 900°F (–73°C to 482°C)
Dead band	1°F to 50°F (1°C to 50°C) (On/Off control only)

MONITORING

Temperature	Low alarm range High alarm range	–99°F to 900°F (–73°C to 482°C) or OFF –99°F to 900°F (–73°C to 482°C) or OFF
Ground fault	Alarm range Trip range	10 mA to 200 mA 10 mA to 200 mA or OFF
Current	Low alarm range High alarm range	0 A to 100 A (where 0 equals OFF) 0 A to 100 A (where 0 equals OFF)
Voltage	100 – 277 Vac supply voltage to heat-tracing (**Note:** Requires the loss of one circuit)	
Autocycle	Each circuit can be programmed from 1 to 1000 hours or OFF	

TEMPERATURE SENSOR INPUTS

Monitoring	RAYCHEM NGC-30 system can monitor up to 1040 (260 x 4) temperatures
Quantity per circuit	Up to four temperature inputs can be assigned to one circuit
Temperature sources	Hard-wired, optional RMM2 Module, optional PLI module
Temperature inputs per control point	Standard: One input standard per control point Optional: Up to three additional RTDs per control point connected via RMM2 and/or PLI Module
Temperature inputs per NGC-UIT2	Hard-wired: Up to 260 hard-wired temperature inputs, one per circuit RMM2 (optional): Up to 128 RTD inputs via RMM2 Modules. Up to 8 RTDs per RMM2 Module and up to 16 RMM2 Modules per RAYCHEM NGC-30 controller PLI module (optional; RAYCHEM NGC-30 EMR Panel only): Up to 127 RTDs via SES Transmitter (per PLI Module) Up to 127 RTDs via SPC Transmitter (per PLI Module) Up to 255 RTDs via 700-TT Transmitter (per PLI Module) Four PLI Modules per circuit, maximums 1040 RTDs
Types	100 Ω platinum RTD, 3-wire, α = 0.00385 ohms/ohm/°C Can be extended with a 3-conductor shielded cable of 20 Ω maximum per conductor (**Note:** power wire and RTD wire should not be housed in the same conduit).

ALARM OUTPUTS

Relay Outputs	3 SPDT Form C. Rating: 3 A 100 – 277 Vac Each relay may be assigned to alarm outputs

PROGRAMMING AND SETTING

Method	Via NGC-UIT2 (User Interface Terminal)
Units	°F or °C
Digital display	
NGC-UIT2-ORD	8.4 inch LCD color touch screen (17.5 cm X 13.3 cm)
NGC-UIT2-HAZ	10.4 inch LCD color touch screen with interval LED backlight
Memory	Nonvolatile, restored after power loss
Stored parameters (measured)	Minimum and maximum temperatures, contactor cycle count, heater time in use
Alarm conditions	Low/high temperature, low/high current, ground-fault alarm and trip, RTD failure, communications failure, relay failure, relay count, total time heater energized, contactor failure

USER INTERFACE TERMINALS (UITS)

NGC-UIT2-ORD	Area Classification:	Nonhazardous (Unclassified) Locations
	Usage:	NEMA 4 (indoors or outdoors)
NGC-UIT2-HAZ	Area Classification:	Nonhazardous (Unclassified) or Hazardous Locations
	Usage:	NEMA 4 (indoors or outdoors)
NGC-UIT2-ORD-R	Area Classification:	Nonhazardous (Unclassified) Locations • The NGC-UIT2-ORD-R must be installed in a nonhazardous, indoor or outdoor location. • The NGC-UIT2-ORD-R connects to RAYCHEM NGC-30 panels using RS-485 communications wiring.
	Usage:	NEMA 4 (indoors or outdoors)

LANGUAGE SUPPORT

English, Spanish, French, German, Russian, Chinese, Italian, Czech

CONNECTION TERMINALS

Heating cable output	Screw terminals, 20–6 AWG (30 A versions), 14–2 AWG (60 A versions)
Ground	14–4 AWG ground bar
RTD / alarm / communications	28–12 AWG spring clamp terminals

DISTRIBUTION (FOR RAYCHEM NGC-30-EMR ONLY)

Load power	120 / 208 / 240 / 277 / 347 / 480 / 600 Vac	
Circuit breaker amperage rating	120 Vac	20 A, 30 A, 40 A, 50 A
	208, 240, 277, 347, 480, 600 Vac	20 A, 30 A, 40 A, 50 A, 60 A

TYPICAL RAYCHEM NGC-30 LAYOUT

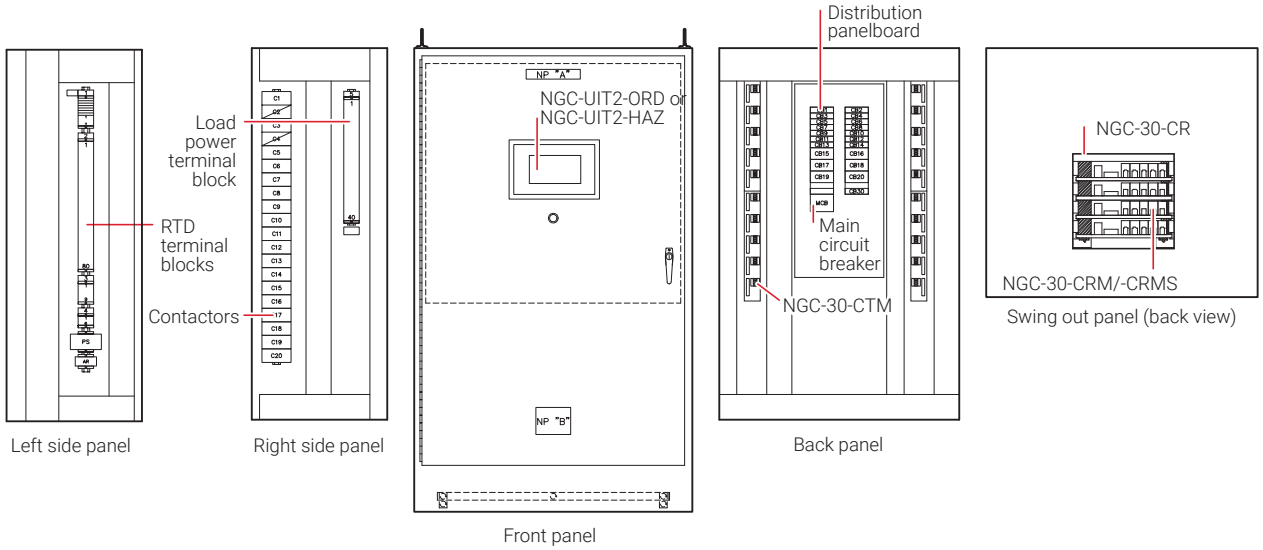
Multipoint temperature control with ground-fault/current/temperature monitoring and optional distribution.

The RAYCHEM NGC-30 is a multipoint electronic control, monitoring, and power distribution system for heat-tracing used in process temperature maintenance and freeze protection applications. The system contains RAYCHEM controllers, multiple individual Electromechanical Relays (EMRs), or Solid-State Relays (SSRs) and an optional assembled circuit breaker panelboard with a main breaker.

The RAYCHEM NGC-30 provides the following alarming features per control point.

- High/low temperature
- Ground fault
- High/low current fault
- RTD failure

The RAYCHEM NGC-30 provides ground-fault monitoring and trip protection for every heat-tracing circuit and fulfills the requirements of national electrical codes.



EMR PANELS

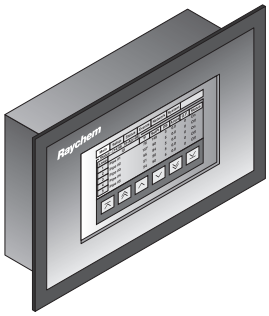
Number of control points	Panelboard size	EMR panel size with or without panelboard (nominal)	
5	12 space	42"H X 36"W x 12"D	(wall mount)
5	18 space	48"H X 36"W x 12"D	(wall mount)
10	18, 20, 24 space	48"H X 36"W x 16"D	(wall mount)
10	30 space	72"H X 36"W x 16"D	(includes 12" floor stands)
15, 20, 25	30 space	72"H X 36"W x 25"D	(includes 12" floor stands)
15, 20, 25	42 space	84"H X 36"W x 25"D	(includes 12" floor stands)
25, 30	42 space	84"H X 36"W x 25"D	(includes 6" floor stands)
35, 40	42 space	90"H X 36"W x 25"D	(includes 6" floor stands)

SSR PANELS

Number of control points	SSR panel size without panelboard (nominal)	
5	36"H X 30"W x 12"D	(wall mount)
10	48"H X 36"W x 16"D	(wall mount)
15, 20	72"H X 36"W x 24"D	(includes 6" floor stands)
25, 30	84"H X 36"W x 24"D	(includes 6" floor stands)
35, 40	90"H X 36"W x 24"D	(includes 6" floor stands)

SYSTEM COMPONENTS

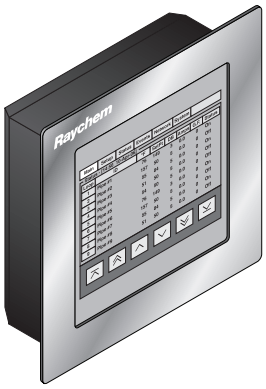
User Interface Terminal (NGC-UIT2-ORD)



The RAYCHEM NGC-30 User Interface Terminals (NGC-UIT2) are panel-mounted displays for use with the RAYCHEM NGC-30 panel. Available in different models, each NGC-UIT2-ORD has a 7 inch x 5 ¼ inch (17.5 cm X 13.3 cm) LCD color display with touch-screen technology, and provides an easy user interface for programming without using keyboards. It has RS-485, RS-232, or 10/100Base-T Ethernet communications ports that allow communication with the RAYCHEM Supervisor software and external Distributed Control Systems. A USB interface is included for easy configuration and firmware upgrades.

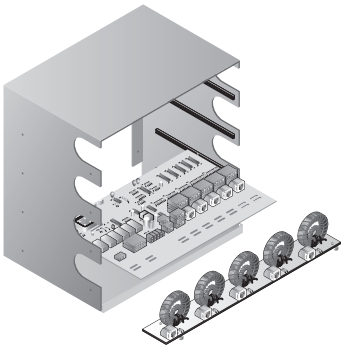
The NGC-UIT2-ORD is designed for use in nonhazardous, indoor or outdoor location installations and is rated for NEMA 4 environments. The NGC-UIT2-ORD is installed locally on the panel door.

User Interface Terminal (NGC-UIT2-HAZ)



Same features as the NGC-UIT2-ORD except it has a 10.4 inch color display and designed for use in nonhazardous and hazardous locations (Class I, Division 2; Groups A, B, C, D).

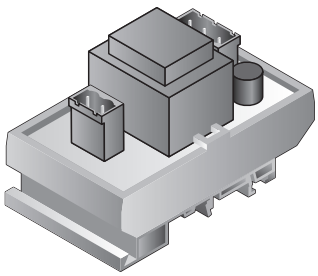
Card Rack Modules (RAYCHEM NGC-30-CRM/-CRMS), Current Transformer Module (RAYCHEM NGC-30-CTM) and Card Rack (RAYCHEM NGC-30-CR)



The Card Rack (RAYCHEM NGC-30-CR) is mounted in a panel and it houses up to four Card Rack modules (RAYCHEM NGC-30-CRM/S). The Card Rack Modules (RAYCHEM NGC-30-CRM/S) with the associated Current Transformer Module (RAYCHEM NGC-30-CTM) provide ground fault and line current information. The Card Rack modules also provide RTD input, alarming and switching of the Electrical Mechanical (RAYCHEM NGC-30-CRM) and Solid State Relays (RAYCHEM NGC-30-CRMS) for five heat tracing circuits.

A typical panel consists of 8 Card Rack Modules wired together via a twisted pair (RS-485) cable for a total of 40 heating cable circuits. Additional panels can be connected to a single User Interface Terminal to create a heat-tracing system of up to 260 circuits.

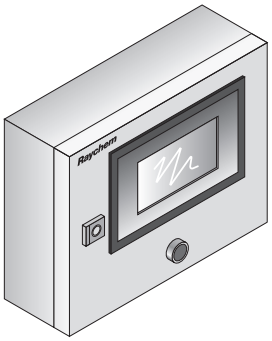
Voltage Monitoring Module (RAYCHEM NGC-30-CVM) (optional)



The Voltage Monitoring Module monitors the actual voltage being used by the RAYCHEM NGC-30-CRM/-CRMS. The RAYCHEM NGC-30-CVM module uses one channel on one CRM/-CRMS board in a panel.

ADDITIONAL SYSTEM COMPONENTS (ORDERED SEPARATELY)

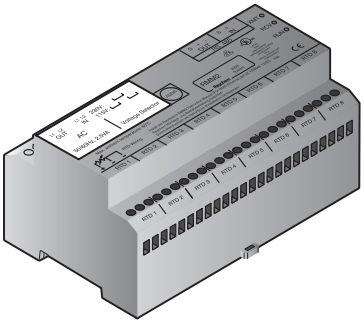
Remote User Interface Terminal (NGC-UIT2-ORD-R)



The Remote User Interface Terminal (NGC-UIT2-ORD-R) is a stand-alone display for use with the RAYCHEM NGC-30 panel. The NGC-UIT2-ORD-R is mounted remotely (in a nonhazardous location) when the RAYCHEM NGC-30 panel is placed in a hazardous or difficult to access location. Like the NGC-UIT2-ORD, it has a 7 inch x 5 ¼ inch (17.5 cm X 13.3 cm) LCD color display with touch-screen technology, and provides an easy user interface for programming without using keyboards. It is rated NEMA 4 (IP 65), and must be mounted in a nonhazardous indoor or outdoor location.

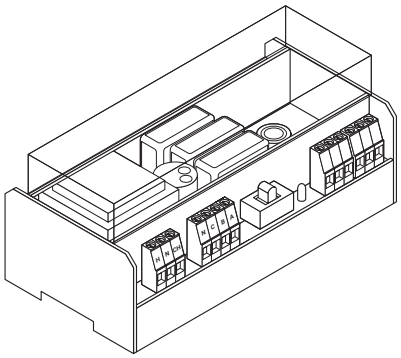
It has RS-485, RS-232, or 10/100Base-T Ethernet communications ports that allow communication with the RAYCHEM Supervisor software and external Distributed Control Systems. A USB interface is included for easy configuration and firmware upgrades.

Remote Monitoring Module (RMM2)



A Remote Monitoring Module (RMM2) is used to collect temperatures for control and monitoring of the heat-tracing system by the RAYCHEM NGC-30 control panel. The RMM2 accepts up to eight RTDs that measure pipe, vessel, or ambient temperatures. Multiple RMM2s communicate with a single NGC-UIT to provide centralized monitoring of temperatures. A single twisted-pair RS-485 cable connects up to 16 RMM2s for a total monitoring capability of 128 temperatures. The RMM2s are placed near desired measurement locations in nonhazardous or hazardous locations.

Raychem Power Line Carrier Interface Module (PLI)



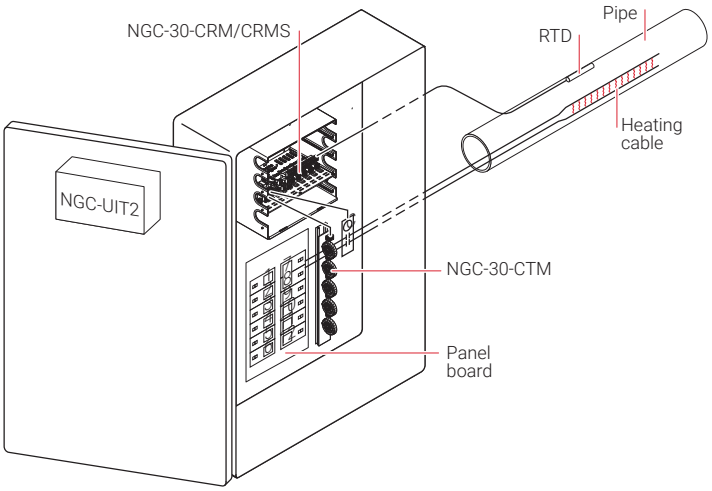
RAYCHEM PLI modules (Power Line Carrier Interface) together with special temperature transmitters provide remote temperature-monitoring capability for heat-tracing control and monitoring systems by communicating the temperature data to the control system over the heat-tracing bus wires and the AC power line, eliminating the need for RTD wiring. Typical savings on the installation costs of a heat-tracing system can be as much as 30% with PLI technology, depending on the specifics of each application.

The PLI module typically resides in the RAYCHEM NGC-30 EMR panel and receives input from special transmitters connected to the heat-tracing. The transmitters provide pipe temperatures from RTDs and continuity confirmation; they are typically located at the front and/or end of the heat-tracing circuit. The PLI special transmitters are: RAYCHEM SES (Smart End Seal), RAYCHEM SPC (Smart Power Connection) and RAYCHEM 700-TT.

The RAYCHEM NGC-30 system can accept up to 127 temperature inputs from SES/SPC transmitters or 255 temperature inputs from 700-TT transmitters, per PLI module. Up to four PLI modules can be connected to one RAYCHEM NGC-30 UIT.

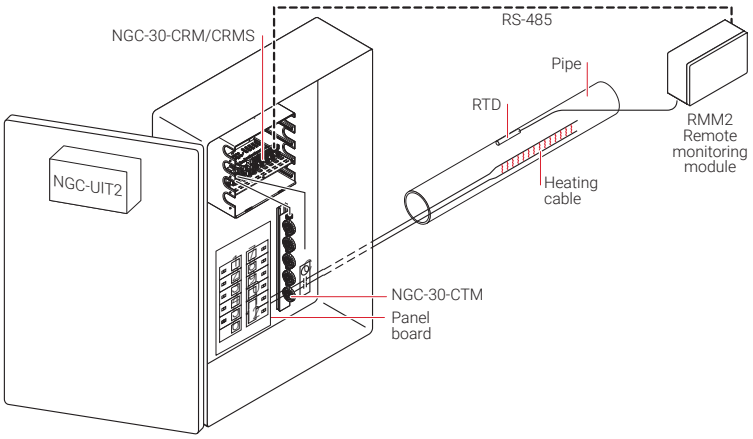
TYPICAL CONFIGURATIONS FOR THE RAYCHEM NGC-30

Individual Controls with Ground-fault Trip/Current/Temperature Monitoring



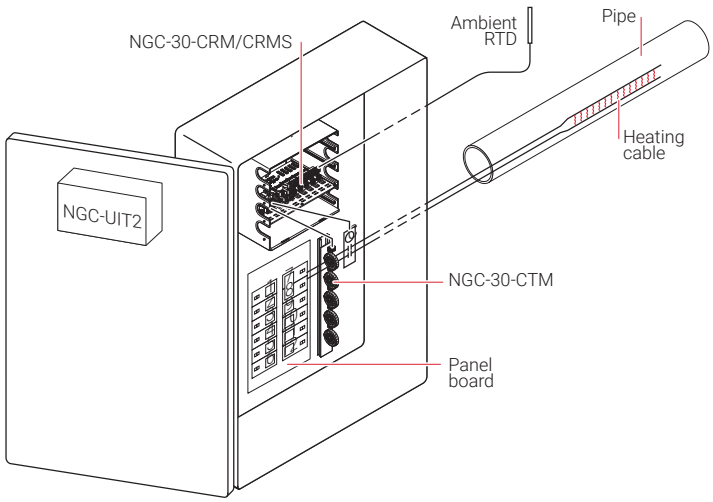
- Monitors ground-fault current and alarms/trip control contactor upon fault
- Monitors heater current and alarms upon low or high current conditions
- Monitors pipe temperature (via RTD inputs wired back to the RAYCHEM NGC-30) and alarms upon low or high current condition

Individual Controls with RMM2 for Ground-fault Trip/Current/Temperature Monitoring with Networked RTDs



- Monitors ground-fault current and alarms/trip control contactor upon fault
- Monitors heater current and alarms upon low or high current conditions
- Monitors pipe temperature (via RTD inputs wired back to the RAYCHEM NGC-30) and alarms upon low or high current conditions
- Using optional RMM2 (remote monitoring modules) mounted in the field, up to 128 RTD inputs can be added to the RAYCHEM NGC-30 system.
- The RMMs allow the RTD cables to be terminated locally and only a single RS-485 twisted wire pair brought back to the panel. This results in a significant reduction in field wiring.

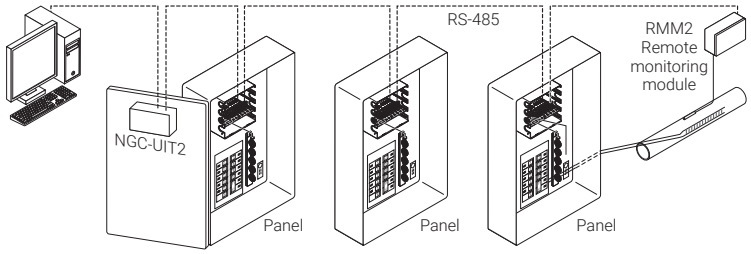
Individual Ambient or PASC Control with Ground-fault Trip/Current/Temperature Monitoring



- Monitors ground-fault current and alarms/trip control contactor upon fault
- Monitors heater current and alarms upon low or high current conditions

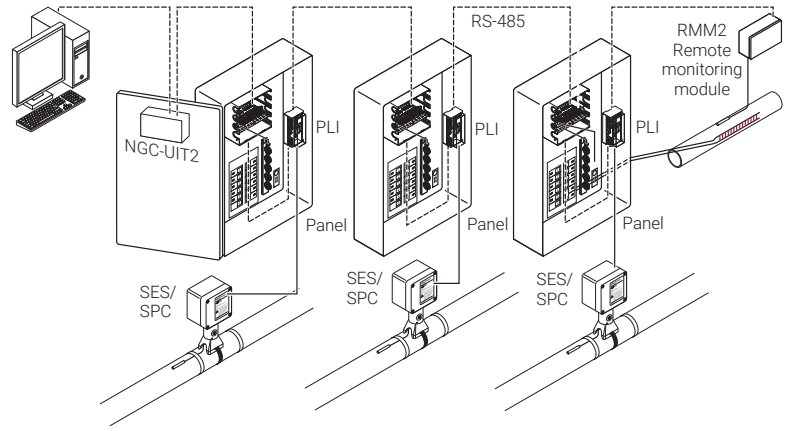
TYPICAL CONFIGURATIONS FOR THE RAYCHEM NGC-30

Multi-panel Configuration with RMM2 Module



- Multiple panels can be ganged together for control using a single User Interface Terminal.
- Communications is accomplished using RS-485 wiring.
- Up to 260 heat trace circuits can be supported using this architecture.
- RAYCHEM Supervisor Software interfaces with the User Interface Terminal via RS-485 or 10/100BaseT Ethernet.

Multi-panel Configuration with PLI and RMM2 Modules



- Multiple panels can be ganged together for control using a single User Interface Terminal.
- Communications is accomplished using RS-485 wiring.
- Up to 260 heat trace circuits can be supported using this architecture.
- Up to 1040 temperature inputs can be monitored with one NGC-UIT2.
- Up to 127 SES/SPC transmitters or 255 700-TT transmitters per PLI and up to 4 PLI modules per RAYCHEM NGC-30 controllers for control or monitoring.
- 700-TT and SES/SPC Transmitters can be used in any combination in the same multi-panel configuration system using one NGC-UIT2.
- The 700-TT and SES/SPC Transmitters cannot be used on the same PLI module. At least two PLI modules are required if a combination of 700-TT and SES/SPC transmitters are used.

REPLACEMENT COMPONENTS

Description	Catalog number	Part number
User Interface Terminal		
User Interface Terminal Nonhazardous (Unclassified) Locations; indoors or outdoors, panel mounting	NGC-UIT2-ORD	10332-013
User Interface Terminal Nonhazardous (Unclassified) and Hazardous Locations; indoors or outdoors, panel mounting	NGC-UIT2-HAZ	10332-022
User Interface Terminal with NEMA 4 Enclosure Nonhazardous (Unclassified) Locations; indoors or outdoor, remote stand-alone mounting	NGC-UIT2-ORD-R	10332-016
RAYCHEM NGC-30 Modules		
Card Rack Module (for EMRs)	NGC-30-CRM	10720-001
Card Rack Module (for SSRs)	NGC-30-CRMS	10720-004
Current Transformer Module	NGC-30-CTM	10720-002
Voltage Monitoring Module	NGC-30-CVM	10720-005
RAYCHEM NGC-30 Auxiliary		
DB9F-DB9F Null Modem Cable 5 ft	NGC-UIT2-RS232	20577020
Remote Monitoring Module	RMM2	051778
Remote Monitoring Module with NEMA 4X Enclosure	RMM2-4X	523420

REPLACEMENT COMPONENTS

Description	Catalog number	Part number
Power Line Carrier Interface: Smart End Seal Transmitter		
120 V temperature/continuity transmitter with pipe-mount power connection enclosure	SPC-P-1	P000001049
208–277 V temperature/continuity transmitter with pipe-mount power connection enclosure	SPC-P-2	P000001050
120 V temperature/continuity transmitter with wall-mount power connection enclosure	SPC-W-1	P000001051
208–277 V temperature/continuity transmitter with wall-mount power connection enclosure	SPC-W-2	P000001052
120 V temperature/continuity transmitter	SES-RTD-1	265212-000
208–277 V temperature/continuity transmitter	SES-RTD-2	677596-000
120 V continuity transmitter	SES-CONT-1	293536-000
208–277 V continuity transmitter	SES-CONT-2	398720-000
120 V Smart End Seal replacement transmitter board	SES-TT-1	815918-000
208–277 V Smart End Seal replacement transmitter board	SES-TT-2	771274-000
Smart End Seal Replacement RTD and stand assembly	SES-RTD-Replace	693618-000
Power Line Carrier Interface: Auxiliary Equipment		
Front End Filter – 480 V	MONI-700-FEF-480 V	922847-000
Front End Filter – 600 V	MONI-700-FEF-600 V	P000000312
PLI Module	PLI	488323-000
RTD lead wire, per 1000 ft reel	MONI-RTD-WIRE	962661-000
RS-485 comm. wire, per 1000 ft reel	MONI-RS485-WIRE	549097-000

ORDERING DETAILS

NGC-30 – Output – No. of Control Points – Enclosure – Voltage – Panelboard – Breaker or SSR or EMR – MCB – Options

NGC-30 – XXX – XX – XXX – XXX/XXX – XX – XX/XX (XX) – XXX – X

Output
- EMR = Electro-mechanical relay
- SSR = Solid-state relay

No. of control points
5, 10, 15, 20, 25, 30, 35, 40

Enclosure
- 12 = NEMA 12 (indoors; painted steel)
- 4 = NEMA 4/3R (outdoors; painted steel)
- 4X = NEMA 4X/3RX (outdoors; stainless steel)

Voltage
- 120 / 208 Vac
- 120 / 240 Vac[1]
- 277 / 480 Vac
- 347 / 600 Vac

Panelboard
0 = none required

# of control points	Panelboard size 120/208 Vac	120/240 Vac	277/480 Vac	347/600 Vac
5	12	12	18	18
10	24	20/30	18/30	18/24
15, 20	30/42	30/42	30/42	30/42
25, 30	30/42	30/42	30/42	30/42
35, 40	42	42	42	42

Options
Country Installed
- US = U.S. and Americas (except Canada) [default]
- CA = Canada

- E = Environmental purge
- H = Electric heater
- N = No UIT installed[2] (a remote NGC-UIT2-ORD-R can be ordered separately)
- PL = PLI Module with 3-pole standard breaker (EMR option panel only)
- U = If EMR, or SSR with panelboard, then NGC-UIT2-ORD installed (ordinary area)
  If SSR without panel, or Z purged, then NGC-UIT2-HAZ installed (hazardous area)
- V = Voltage monitoring (subtracts one control point)
- X = Spare parts
- Z = Z purge (EMR only; Class 1, Division 2 Hazardous Area)
- SP = Special[3]

Main circuit breaker
0 = none required (choose if no panelboard required)

Panelboard size	120/208 Vac	120/240 Vac	277/480 Vac	347/600 Vac
12	50, 100	50, 80, 100	–	–
18	–	–	30, 50 , 70, 125	20, 40, 60, 90
20	–	50, 80, 100	–	–
24	50, 100	–	–	20, 40, 60, 90
30	50, 100, 150, 225	50, 80, 175, 225	50, 70, 125, 175, 225	40, 60, 90, 150, 200
42	50, 100, 150, 225	50, 80, 175, 225	50, 70, 125, 175, 225	40, 60, 90, 150, 200

Breaker or SSR or EMR

Breaker

No. of C.B./No. of poles (ampere rating)

No. of control points	Panelboard size	120 Vac (1P)	208 Vac (2P)	240 Vac (2P)	277 Vac (1P)	480 Vac (2P)	347 Vac (1P)	600 Vac (2P)
5	12	5	5	5				
5	18	5[4]	5[4]	5[4]	5	5	5	5
10	18	–	–	–	10	6	10	6
10	20	10	–	9	–	–	–	–
10	24	10	10	–	–	–	10	10
10	30	–	–	10	–	–	–	–
15	30	15	14	14	15	13	15	13
15	42	–	15	15	–	15	–	15
20	30	20	9	9	20	8	20	8
20	42	–	20	20	–	20	–	20
25	30	25	4	4	25	4	25	4
25	42	25	16	16	25	15	25	15
30	30	30	–	–	30	–	30	–
30	42	–	10	10	–	10	–	10
35	42	35	6	6	35	5	35	5
40	42	40	–	–	40	–	40	–

Note: The quantity of breakers must be equal to the number of control points.

SSR without panelboard
Select no. of output devices (SSRs)/ no. of poles/amperage
- Output devices: 5 – 40
- Poles: 1P or 2P
- Amperage: 30, 60

EMR without panelboard
Select no. of output devices (EMRs)/ amperage
- Output devices: 5 – 40
- Amperage: 30, 60

[1] Single phase
[2] Require remote NGC-UIT-ORD-12
[3] Special - Describe special requirement in detail.
[4] Applies to Canada only

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