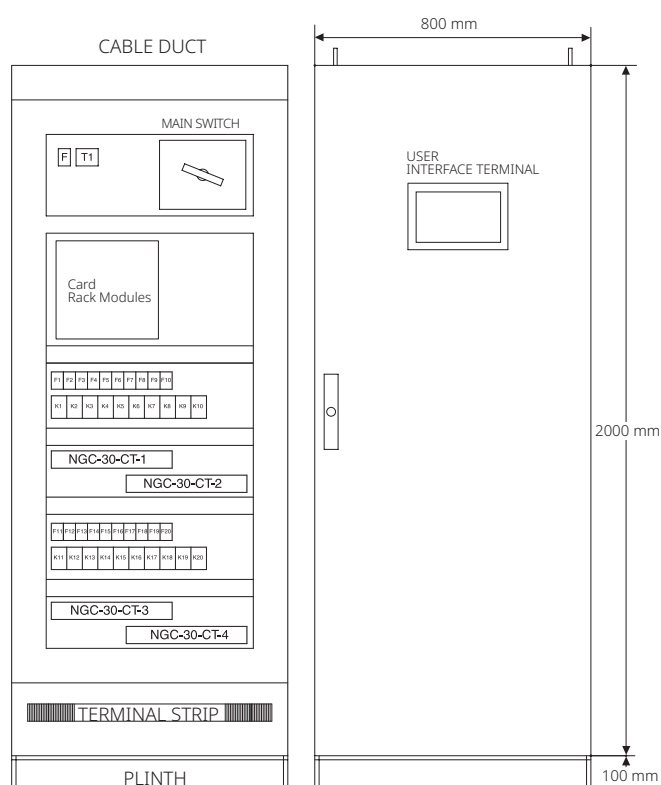


Panel mounted electronic multi-circuit heat-tracing control, monitoring and power distribution system

PRODUCT OVERVIEW



The 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 system consists of multiple components covering a broad range of requirements from simple temperature monitoring to ground fault, voltage and current measurement, bringing valuable information about the status and health of the heat-tracing circuits from the field into a central location. The Raychem NGC-30 system can minimise routine checks by transforming field data into valuable information for maintenance and operations.

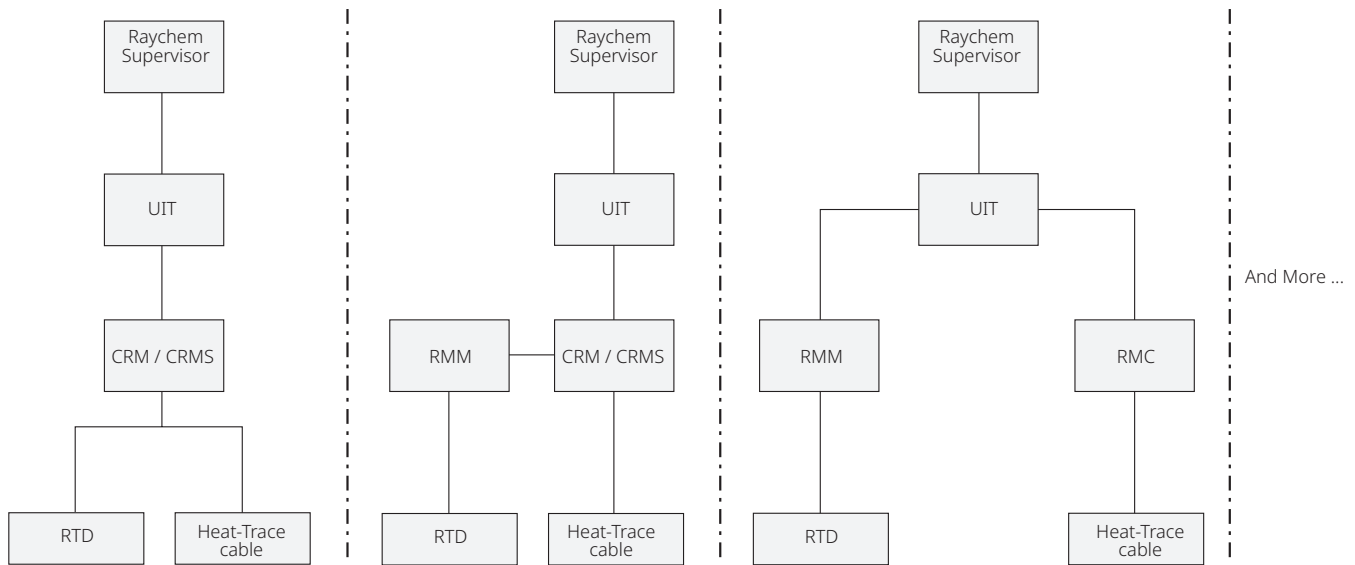
Raychem NGC-30 panel

The Raychem NGC-30 is available as a complete distribution panel system. Typical characteristics for these panels are easy access, pre-wired and all wiring landed on easy accessible terminals. The enclosure is based on industrial standards while the wiring is optimised for maintenance purposes. The panels are equipped with earth leakage circuit breakers and a main circuit breaker. In addition to these standard features the customer can select additional options based upon the heat-tracing monitoring and control requirements. For example the options include types of contactors (solid state or mechanical), number of circuits plus spare required, voltage monitoring, alarm light indications, panel size, cable entry location and other parameters. A Raychem NGC-30 panel system can consist of multiple cabinets which are interlinked via a dedicated communication link. In general the master panel contains the User Interface Terminal (UIT), typically built into the door.

Raychem NGC-30 components

Customers who wish to integrate the Raychem NGC-30 system into their own control panels can obtain the individual components separately. The Raychem NGC-30 system is configurable in different ways depending upon the requirements of the customer. The user interface for the Raychem NGC-30 is the User Interface Terminal (NGC-UIT3-EX). As soon as ground-fault measurement, line current measurements or distributed control requirements become important, the components Card Rack (CR), Card Rack Modules for mechanical relays (CRM) and/or solid state relays (CRMS), Current Transformer Modules (CTM) and Voltage Module (CVM) should be chosen. The Raychem NGC-30 system has two Remote Measurement Modules available. These modules are the RMM3 for temperature measurement and the RMM2-DI for digital inputs. Users who want to build on the known and proven technology used in the MoniTrace 200N-E can continue using the fully compatible components; Remote Monitoring Module (RMM3) and Remote Modules for Control (RMC).

The powerful Raychem Supervisor heat-tracing controller configuration and monitoring PC-software package completes the system. The Client - Server application enables the user to access all information from anywhere in the world, making Raychem Supervisor a strong management tool for the entire Heat Management System.



Examples of various Raychem NGC-30 configurations

The following section gives an overview of the different components used in the Raychem NGC-30 system.

Raychem User Interface Terminal (UIT)



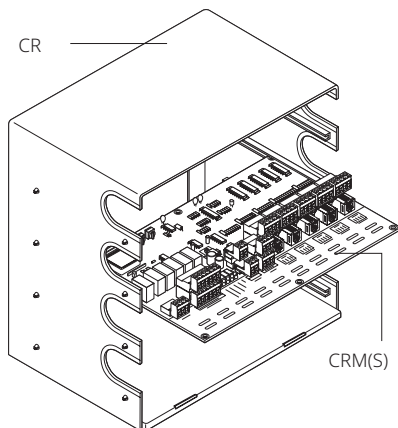
The Raychem User Interface Terminal (NGC-UIT3-EX) is the central part of the Raychem NGC-30 communication. The UIT can be used as well with the Raychem Elexant 5010i and NGC-20 (for more information see the Raychem Elexant 5010i and NGC-20 datasheet).

It covers heat-tracing monitoring, configuration and maintenance purposes. The Raychem User Interface Terminal (NGC-UIT3-EX) consists of a 8.4" LCD colour display using touch screen technology. This provides an easy user interface for programming without the need for keyboards or cryptic labels.

The Raychem UIT communicates via RS-485 to the field and via RS-232/RS-485/Ethernet (selectable) to the Raychem Supervisory Software package as well as the plant process control system. The user interface terminal is available in two different models; the Raychem NGC-UIT3-EX is for direct mounting on the Raychem NGC-30 panel door. The Remote User Interface Terminal (NGC-UIT3-ORD-R) is a panel mounted display (NGC-UIT3-EX) for use with the Raychem NGC-30 panel that allows for the user interface to be mounted remotely.

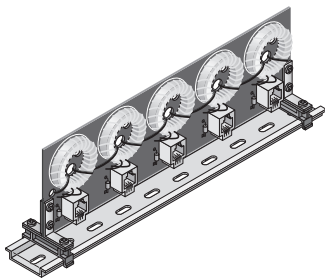
For detailed description see installation instruction RAYCHEM-IM-H86181-NGCUIT3EX.

Card Rack Module (CRM/CRMS)



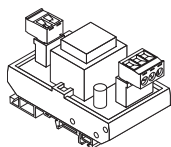
The Raychem Card Rack Module controls up to 5 heat-tracing circuits. The Card Rack Modules are available in two versions, the Raychem NGC-30 CRM (for mechanical relays) and the Raychem NGC-30 CRMS (for solid state relays). Up to four of these Card Rack Modules can be installed in a panel mounted Card Rack. RTD's are either directly connected to the Raychem CRM(S) or alternatively collected via RMM's locally or centralized in the field (distributed architecture). The CRM/CRMS solution can control up to 260 individual heat-tracing circuits and monitor up to 388 temperature inputs (including 128 temperature inputs via RMMs).

Current Transformer Module (CTM)



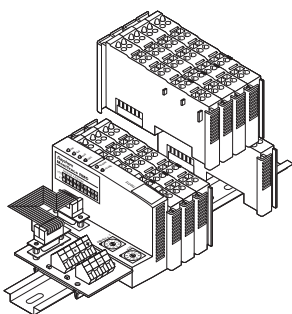
Raychem Current Transformers are an important part of the Raychem NGC-30 system. Raychem CRM in combination with current transformers offer the capability of monitoring and alarming on ground-fault and operating currents. Circuits can be tripped by the controller on high ground-fault currents.

Voltage Module (CVM)



Raychem Voltage modules (CVM), used in combination with a Raychem CRM(S) offer the option to monitor the voltage in the panel. The Raychem CVM module uses one channel on one Raychem CRM board in a panel.

Remote Modules for Control (RMC)

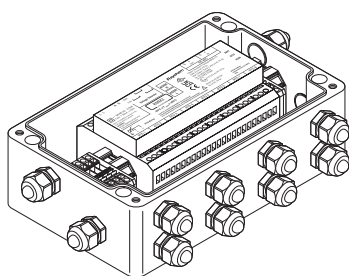


The Raychem NGC-30 system also includes integrated control functionality. Multiple relay outputs to operate contactors of each heat-tracing circuit will be provided by Remote Modules for Control (RMC). Temperature inputs will be provided by Remote Monitoring Modules (RMM) while the control is executed by the UIT.

Raychem RMC units are modular and may be configured with 2 to 40 relay outputs. Each RMC unit also includes two digital inputs (DI) to monitor the status of circuit breakers or power contactors. A single UIT control unit can communicate with up to 10 RMC modules via a single, twisted pair RS-485 cable to provide distributed control of up to 250 heating cable circuits with a maximum of 128 temperature inputs (see Raychem RMM below). For more information refer to the datasheet of Raychem MONI-RMC. Circuits controlled via RMCs, can't be combined with the current transformers (CTM).

The Raychem NGC-30 system also supports building mixed systems of relay outputs via CRM(S) and RMCs, individual circuits can therefore be configured in the most appropriate way.

Remote Monitoring Modules (RMM3) for temperature measurement



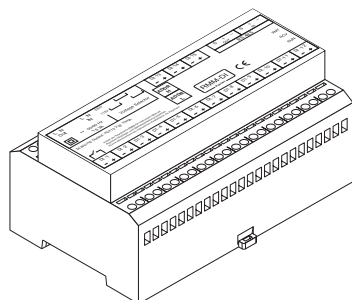
Remote Monitoring Modules (RMM3) provide temperature monitoring capability for the Raychem NGC-30 system.

The RMM accepts inputs up to eight Pt100 temperature sensors that measure pipe or ambient temperatures in a heat-tracing system. Up to 16 RMMs for a total monitoring capacity of 128 temperatures can be connected to the NGC-30 system.

There are two versions available. The RMM3 is without an enclosure.

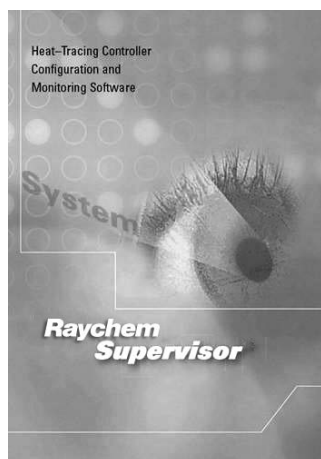
The RMM3-EX-E is build into a Hazardous approved enclosure. For more details see the RMM3 datasheet.

Remote Monitoring Modules (RMM2-DI) for digital input



Remote Monitoring Module for Digital Inputs (RMM2-DI) provides digital input monitoring capability for the Raychem NGC-30 system. The RMM2-DI accepts inputs up to 15 digital inputs per module. Up to 247 RMM-DI modules can be connected to the Raychem NGC-30 system. The RMM2-DI module can be installed in ATEX / UKEx / IECEx Zone 2 hazardous area. For more details see the RMM2-DI datasheet.

Raychem Supervisory Software



The Raychem NGC-30 system integrates seamlessly with the Raychem Supervisor heat-tracing controller configuration and monitoring software. It provides a graphical user interface for Raychem communication and heat-tracing controller products. The software supports the latest Raychem control systems via ModBus® protocol. Raychem Supervisor is a powerful client-server software package that gives the possibility to configure and monitor controllers from almost anywhere in the world, using the latest connectivity technologies. In addition to this functionality Raychem Supervisor includes the following functions:

- Logging & trending
- Configuration of alarms
- Batch & recipe processing
- Scheduled events
- Group displays for monitoring multiple controllers at the same time
- Virtual Private Network (VPN) functionality for monitoring possibility on global basis
- Plant Reference Model for structuring controller on a logical way
- Support of plant documentation reports like plant group, location, line/equipment number, breaker panel, controller panel, user and roles are included.

For more detailed information see Raychem Supervisor datasheet.

PRODUCT SPECIFICATIONS

Technical details

Type	Surface Sensing/Ambient Sensing/PASC (Proportional Ambient Sensing Control)
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Display

Type	LCD is a XGA, colour TFT transfective device with integral LED backlight
Screen size	175 mm x 132 mm
Touchscreen	5-wire resistive touch screen interface for user entry, usable with gloved fingers

Programming and settings

Method	Via touch screen or Raychem Supervisor 2.1 or higher
Language(s)	English, Russian, French, German, Spanish, Czech, Chinese
Memory	Non-volatile, restores after power loss

Enclosure

Protection	UIT: IP 65 (NEMA 4) when mounted in a panel door.
Ambient operating temperature range	UIT: -40°C to 60°C CRM(S): -40°C to 60°C, storage temp -40°C to 75°C

Electrical properties

Connection terminals	UIT and CRM both are equipped with 2.5 mm ² Phoenix style connectors with retaining screws.
Power supply	The NGC-UIT3-EX requires supply voltage of 9-30 V DC, 3.6-1.2 A. The CRM's powered by 12 V DC @ 400 mA per board. For more information about RMC and RMM see datasheets of individual components
Power consumption	UIT: 36 W max, CRM/CRMS: 5 W max.
Power output	CRM and CTM are calibrated for a maximum load of 60 A
Control output	Wired directly to contactor or SSR CRM: SPST 3 A @ 277 V AC max 50/60 Hz CRMS: 12 V DC @ 30 mA max per output

Communications

Hardware (UIT)

Local port/ remote port; Communication port 1 UIT	Isolated RS232/RS-485, selectable. Ports may be used to communicate with (Raychem Supervisor Software) or DCS. The local RS-232 is a non-isolated, 9 pin D sub male; Remote RS-485 #2 is 2-wire isolated, 9 pin D sub male; Data rate is 9600 to 57600 baud; Maximum cable length for RS-485 not to exceed 1200 m (4000 ft). Cable to be shielded twisted pair. Max number of devices 247, Fail safe design with optional termination resistors Max length 1200 m, Data rate to 9600 baud.
Field port; communication port 2 UIT	RS485, used to communicate with external devices like RMM, RMC and NGC-30. typical max. cable length 1200 m, cable to be shielded twisted pair.
LAN UIT	10/100 Base-T Ethernet port with link and activity status LEDs. Protocol Modbus via TCP/IP; can be used to communicate to Raychem Supervisor
USB Port UIT	USB 2.0 Host port type A receptable

Configuration

Temperature (UIT)	Low alarm range High alarm range	-73°C to 482°C or off -73°C to 482°C or off
Ground fault monitoring (UIT, CRM, CT)	Alarm range Trip range	10 mA to 200 mA 10 mA to 200 mA or off
Operating current (UIT, CRM, CT)	Low alarm range High alarm range	1 A to 60 A or off 1 A to 60 A or off
Voltage (CRM, CVM; optional)	Displays supply voltage to heat-tracing (Note: requires one operating current input)	
Autocycle	Each loop can be programmed from 1 to 1000 hours or off	
Temperature sensor inputs	One input standard per control point on CRM, optional temperature inputs via max. 16 RMMs (8 RTDs per RMM)	
Control modes	EMR: line sensing on/off, ambient on/off, PASC (proportional ambient sensing control) SSR: line sensing on/off, ambient on/off, PASC (proportional ambient sensing control), Proportional (includes soft start for all SSR control modes)	
Units	°C or °F	
Deadband	1°C to 10°C	

Alarm outputs

UIT: 3 (3 open collector outputs, to be combined with external relays)

Control outputs

Number of output relays	CRM: 3-pole mechanical CRMS: 1, 2 or 3 pole solid state, normally open (NO)
Current maximum, used in combination with CRM(S) and CTM	SSR: 60 A at 40°C EMR: 60 A at 40°C

Network connection

Number of RMM's	Up to 16, individually addressable, each with up to 8, 3 wire Pt100 inputs
Number of CRM/CTM's	Up to 52 NGC-30-CRM may be connected to one NGC-30-UIT in combination with repeaters. 1 CRM has 5 circuits. In total 260 circuits per NGC-30 system.

APPROVALS

For use in ordinary area (indoors or outdoors) typically panel mounted

Temperature classification

T5

Product certification



For certifications in other regions (FM, CSA, IEx etc.), please refer to the installation manual.

More details about product certification, approvals and conditions of safe use are available in the installation manual at www.chemelex.com.

ORDERING INFORMATION

NGC-30 control system

The NGC-30 is offered as a complete solution, where the control system is already integrated into fully engineered control and power distribution panels. Using standard industrial enclosures, specific care has been taken to design the systems to highest safety standards by enabling optimum access for easy maintenance, as well a clear layout of the functional blocks and terminals. Customers desiring to build their own systems, can use the individual components of the Raychem NGC-30 and integrate them into their own power distribution panels. Below both options are described how to order the NGC-30 system.

Individual components

Product Name	Description	Part Number (Weight)
RMM3	Eight RTD inputs, no enclosure RMM3	1244-022749 (0.7 kg)
RMM3-24VDC	Eight RTD inputs, no enclosure RMM3-24VDC	1244-022782 (0.7 kg)
NGC-UIT3-EX	User Interface Terminal	10332-034 (1.78 kg)
NGC-UIT3-ORD-R	User Interface Terminal with enclosure	10332-035 (8.86 kg)
NGC-30-CRM	Card Rack Module (EMR)	10720-001 (0.68 kg)
NGC-30-CRMS	Card Rack Module (SSR)	10720-004 (0.50 kg)
NGC-30-CTM	Current Transformer Module	10720-002 (0.36 kg)
NGC-30-CVM	Voltage Monitoring Module (CVM)	10720-005 (0.20 kg)
NGC-30-CR	Card Rack	10720-003 (3.66 kg)
PS12	Transformer 12 V DC	1244-001505 (0.18 kg)

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