NGC-20-C-E AND
NGC-20-CL-E

FIELD-MOUNTED ELECTRONIC
HEAT-TRACING CONTROL UNIT

PRODUCT OVERVIEW
The nVent RAYCHEM NGC-20 is an electronic heat-tracing control unit featuring the benefits of local control and the capability for central monitoring. nVent RAYCHEM NGC-20 control unit can be used for single phase circuits up to 25 A and is approved for use in hazardous areas. The nVent RAYCHEM NGC-20 can provide tight temperature control and is available with an IEC 61508-SIL 2 classified safety temperature limiter on board (NGC-20-CL-E). It measures the temperature with up to two RTD(s) connected to the unit. The Safety temperature limiter has a dedicated temperature input.

CONTROL, MONITORING AND ALARM CAPABILITIES
The nVent RAYCHEM NGC-20 offers several different control algorithms including PASC for an optimised electrical heat-tracing control. The nVent RAYCHEM NGC-20 offers alarms for high and low temperature, high and low current, ground-fault current and voltage. The trip and warning level of the ground-fault current is user configurable and can be used as a warning and to isolate circuits. The nVent RAYCHEM NGC-20 control unit provides a dry contact relay for alarm annunciation.

AUTOMATED HEAT-TRACING SYSTEM CHECK
To ensure system integrity the nVent RAYCHEM NGC-20 control unit can be configured to periodically check dormant heating cables for faults. As a consequence maintenance is systematically informed about the status of the heat-tracing system and unexpected and usually expensive downtime of important pipelines can be reduced.

COMMUNICATIONS AND NETWORKING
The nVent RAYCHEM NGC-20 control unit is equipped with a RS-485 interface. Through this interface up to 247 nVent RAYCHEM NGC-20 units can be networked to a single nVent RAYCHEM NGC-U1T2 or to one serial port of standard PC running nVent RAYCHEM Supervisor software.

The nVent RAYCHEM NGC-20 control unit can as well be monitored and/or configured via the nVent RAYCHEM NGC-CMA wireless handheld device. This device is available for hazardous and non-hazardous areas.

INSTALLATION
The nVent RAYCHEM NGC-20 control unit can be installed in the field near the heating application. The nVent RAYCHEM NGC-20 enclosures are manufactured from high impact-resistant, UV stabilized glass-filled polyester suitable for installation indoors or outdoors. One heating cable can be directly connected to the unit. The units can be mounted on the heated surface via an appropriate support bracket.
CONFIGURATION AND COMMISSIONING

The nVent RAYCHEM NGC-20 control unit can be commissioned locally by means of a handheld programming device (nVent RAYCHEM NGC-CMA) or from a central location using the nVent RAYCHEM NGC-UIT or nVent RAYCHEM Supervisor Software. After programming, all settings are permanently stored in the non-volatile memory of the nVent RAYCHEM NGC-20 control unit, avoiding loss of data in the event of power failure or after a long term power shutdown. The nVent RAYCHEM NGC-20 control unit allows the heating and power cable to be connected directly to the unit.

DIMENSIONS (IN MM)

Sample shown is nVent RAYCHEM NGC-20-CL-E Gland included in scoop of delivery - 1 x M25 x 1,5

GENERAL

Application type

nVent RAYCHEM NGC-20-C(L)-E units are approved for use in Hazardous area Zone 1 or Zone 2 (Gas) or Zone 21 or Zone 22 (Dust) and non hazardous areas

APPROVALS

Baseefa08ATEX0184X / IEC Ex BAS 08.004 7X
II 2 GD
Ex e mb ib IIC T * Gb (-40°C≤Tₐ≤+*°C)
*See Table
Ex tb IIIC T * °C Db IP66 (-40°C≤Tₐ≤+*°C)
*See Table

T*: The switching capacity depends on the hazardous area temperature classification (T-Class) and the maximum expected use temperature. Ratings as shown in table below

<table>
<thead>
<tr>
<th>Temperature Class T5</th>
<th>Maximum Ambient Temperature</th>
<th>Maximum Switching Current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+50°C</td>
<td>25 A</td>
</tr>
<tr>
<td></td>
<td>+54°C</td>
<td>20 A</td>
</tr>
<tr>
<td></td>
<td>+56°C</td>
<td>16 A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature Class T4</th>
<th>Maximum Ambient Temperature</th>
<th>Maximum Switching Current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 56°C</td>
<td>25 A</td>
</tr>
</tbody>
</table>

All values as per hazardous area certification. Current ratings are given for a supply voltage of 254 V +/-10%, 50/60 Hz and resistive loads only.

FUNCTIONAL SAFETY APPROVAL

Baseefa08SR0134 SIL2

Conditions of Safe Use
Refer to Hazardous Area Certificate or installation instructions
**ENVIRONMENTAL**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range control unit</td>
<td>From −200°C to +700°C in steps of 1K</td>
</tr>
<tr>
<td>Temperature range limiter</td>
<td>From −60°C to +599°C in steps of 1K (NGC-20-CL-E only)</td>
</tr>
<tr>
<td>Ambient operating temperature</td>
<td>From −40°C to +56°C (ATEX, IEC Ex)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>From −55°C to +80°C (ATEX, IEC Ex)</td>
</tr>
</tbody>
</table>

**ENCLOSURE**

nVent RAYCHEM NGC-20-CL(E) units can be installed directly on the pipe via an appropriate support bracket as long as the maximum permitted ambient temperature is not exceeded. Alternatively, units can be mounted on any stable structure via the moulded holes in the enclosure.

- **Protection**: IP 66 per IEC-60529
- **Material**: Glass fibre reinforced enclosure with internal earth plate on the bottom
- **Entries**:
  - 1 x M25 gland Ø 8 – 17 mm: power IN/heating cable out
  - 3 x M25: digital communication IN/OUT and alarm (all with stopping plugs)
  - 2 x M16: temperature sensor(s) 1 with stopping plug one with rain plug
- **Mounting & installation**: Installation on an appropriate support bracket directly on the heated surface up to temperatures of 230°C. When the temperature of the heated surface is above 230°C, install the control unit to a stable structure nearby the application.
- **Installation position**: Any position allowed, typical use with glands facing down

1 EC-61508 Safety related information is published in the NGC-20 installation instructions INSTALL-130. A copy of the INSTALL-130 can be downloaded from the literature section on sales@thermaluk@nvent.com or can be obtained via your local nVent representative.

**ELECTRICAL DATA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply &amp; own power consumption</td>
<td>100 Vac to 254 Vac +/-10 % 50/60 Hz 20 VA max.</td>
</tr>
<tr>
<td>Connection terminals</td>
<td>Spring-type</td>
</tr>
<tr>
<td>L, N and PE terminals</td>
<td>9 pc (cables with cross section ranging from 0.2 to 6 mm²)</td>
</tr>
<tr>
<td>Alarm output terminals</td>
<td>3 pc (cables with cross section ranging from 0.2 to 2.5 mm²)</td>
</tr>
<tr>
<td>Pt 100 (RTD) terminals</td>
<td>12 pc (cables with cross section ranging from 0.2 to 1.5 mm²)</td>
</tr>
<tr>
<td>RS-485 communication</td>
<td>7 pc (0.2 to 1.5 mm²)</td>
</tr>
<tr>
<td>Internal Earth stud for RTD shield</td>
<td>1 pc (Cable cross section max 6 mm²)</td>
</tr>
<tr>
<td>Contact lifetime main switch</td>
<td>500k operations at 25 A/250 Vac (resistive load)</td>
</tr>
<tr>
<td>Alarm output relay</td>
<td>Contact rated 250 Vac/3 A Relay output is software programmable to open, close or to toggle in case of alarm</td>
</tr>
</tbody>
</table>

**Electromagnetic compatibility**

- EN 61000-6-2-2005 (Gen. Immunity standard for industrial environments)
- EN 61000-6-3:2007 (Gen. Emission standard for residential, commercial and light industrial)
- EN 61000-3-2:2006 (Limits for harmonic current emissions)

**Electrical safety**

- EN 61010-1, Category III, Pollution degree 2

**Vibration & Shock**

- Shock to EN 60068-2-27: 1/2 sine wave of 11 ms duration, 15 g
- Vibration to EN 60068-2-6/sine wave 10 to 150 Hz (p-p), 2 g

**TEMPERATURE SENSORS**

- **Compatible types**: 100 Ω platinum, 3-wire, α = 0.00385 Ω/°C. Can be extended with a three core shielded or braided cable of maximum 20 Ω lead resistance per conductor.
- **Quantity**: Two RTD inputs for the control unit plus one independent temperature input for the safety limiter. All temperature sensors are permanently monitored for “sensor short”, “sensor break”.

**COMMUNICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical network</td>
<td>RS-485 and Bluetooth Class 1</td>
</tr>
<tr>
<td>Protocol/topology</td>
<td>Modbus RTU or ASCII. Multi drop/Daisy chain</td>
</tr>
<tr>
<td>Cable and maximum length</td>
<td>Shielded twisted pair cable, 0.5 mm² (AWG 24) or larger maximum cable length between should be no more than 1200 m</td>
</tr>
<tr>
<td>Maximum quantity of control units in one network</td>
<td>Max. of 247 units per nVent RAYCHEM NGC-UII or per serial communication port</td>
</tr>
<tr>
<td>(Modbus) Network address</td>
<td>Software programmable via nVent RAYCHEM NGC-CMA-NH, nVent RAYCHEM NGC-CMA-EX or nVent RAYCHEM Supervisor</td>
</tr>
</tbody>
</table>
PROGRAMMING AND SETTING

Method
Through handheld programming device nVent RAYCHEM NGC-CMA-NH, NGC-CMA-EX (hazardous area) and a wireless Bluetooth connection or via RS485 interface and nVent RAYCHEM Supervisor software or nVent RAYCHEM User Interface Terminal (NGC-UIT2-ORD) and nVent RAYCHEM software.

Units of measure
°C or °F, software selectable

Memory
Non-volatile, no loss of parameters after the event of power outage or long term shut down, data holding time ~10 years.

LED indicators
Status LEDs are available for:

NGC-20-C-E
Heater, Alarm, RS-485 communication, Bluetooth communication

NGC-20-CL-E
Heater, Alarm, Limiter Tripped, RS-485 communication and Bluetooth

MEASURING RANGES

Temperature range control unit
From –200°C to +700°C in steps of 1K

Temperature range limiter
From –60°C to +599°C in steps of 1K (NGC-20-CL-E only)

Voltage
From 50 Vac to 305 Vac

Load Current
From 0.3 A to 30 A

Ground-fault current
From 10 mA to 250 mA (RCD/ELCB required due to IEC and/or local regulations)

Heater time alarm
From 1 to 1 x 10⁶ hours

Relay cycle alarm
From 0 to 2 x 10⁶ cycl

Ordering information

NVENT RAYCHEM NGC-20 CONTROL UNITS

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Part number</th>
<th>Approvals</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>NGC-20-C-E</td>
<td>Controller</td>
<td>1244-007035</td>
<td>ATEX, IEC Ex, Seguranca, EAC Ex, metrology certificate Russia</td>
<td>2.2 kg</td>
</tr>
<tr>
<td>NGC-20-CL-E</td>
<td>Controller + Limiter</td>
<td>1244-007036</td>
<td>ATEX, IEC Ex, Seguranca, EAC Ex, metrology certificate Russia</td>
<td>2.3 kg</td>
</tr>
<tr>
<td>NGC-20-C-E (for Russia)</td>
<td>Controller</td>
<td>1244-018772</td>
<td>EAC Ex, metrology certificate Russia</td>
<td>2.2 kg</td>
</tr>
<tr>
<td>NGC-20-CL-E (for Russia)</td>
<td>Controller + Limiter</td>
<td>1244-018773</td>
<td>EAC Ex, metrology certificate Russia, SIL2 limiter</td>
<td>2.3 kg</td>
</tr>
</tbody>
</table>

TEMPERATURE SENSORS

Product name
MONI-PT100-260/2 or MONI-PT100-EXE-SENSOR

SUPPORT BRACKET FOR INSTALLATION ON PIPE

Product name
SB-125

Part number & (weight)
1244-066063 (0.5 kg)

BLUETOOTH ENABLED HANDHELD PROGRAMMING DEVICE WITH CUSTOMIZED NVENT RAYCHEM SOFTWARE

Product name
NGC-CMA2-ZONE1 (Hazardous area approved device for use in Zone 1, 21)

Part number & (weight)
1244-018988 (1.25 kg)

Product name
NGC-CMA2-ZONE2 (Hazardous area approved device for use in Zone 2, 22)

Part number & (weight)
1244-006606 (0.6 kg)