



RAYCHEM

Raystat

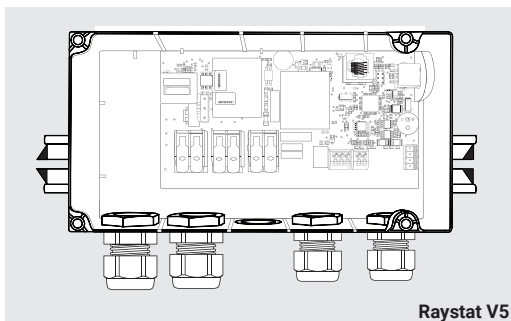
Version 5 (EU)

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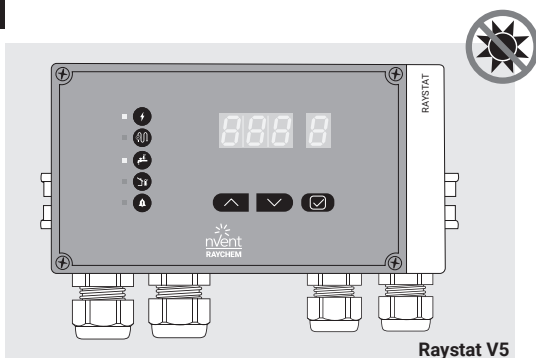
PART 1 INSTALLATION MANUAL

1.1 PRODUCT OVERVIEW

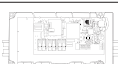
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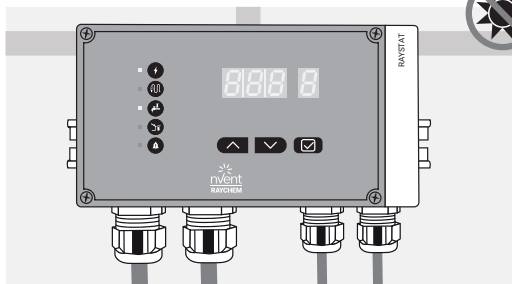


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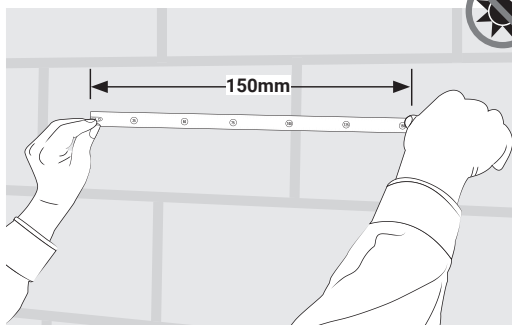
			
	 1x	 1x	 1x
	 2x M25; 2x M20	 1x	 1x
	 1x	 2x	 2x
	 PCN: 1244-020365	 PCN: 1244-015847	

1.2 INSTALLATION INSTRUCTIONS

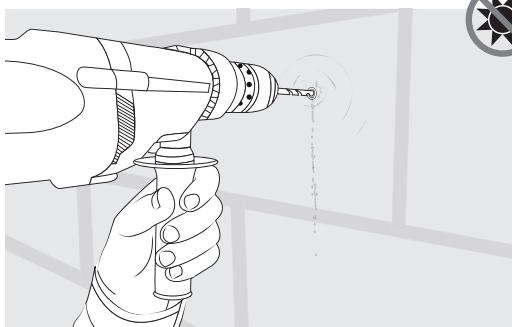
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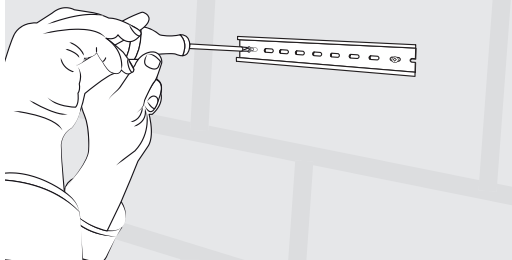
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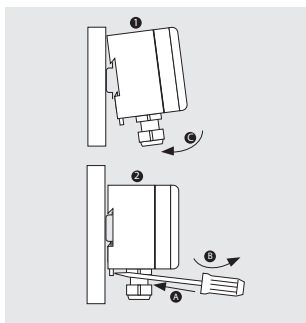
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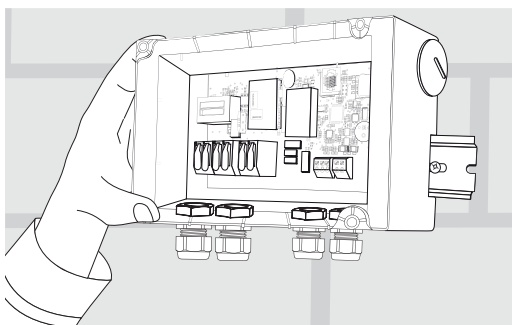
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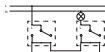
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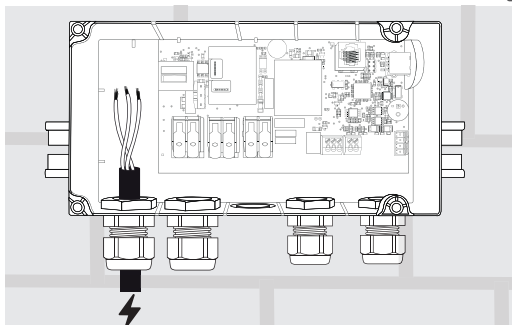
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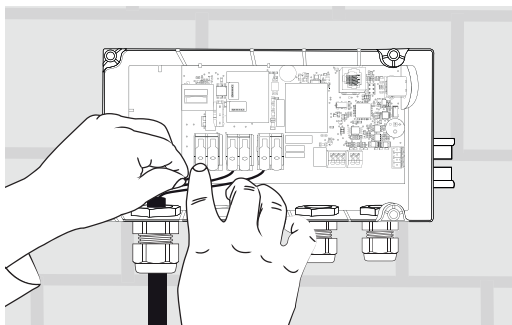
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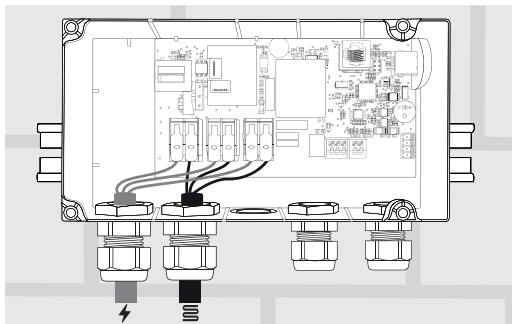
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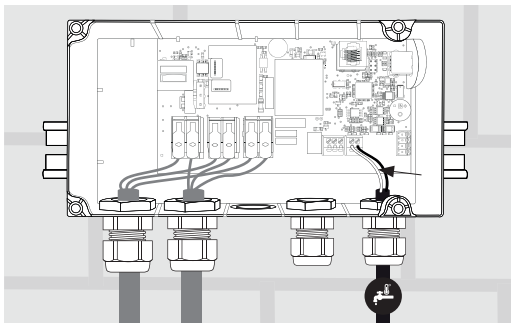
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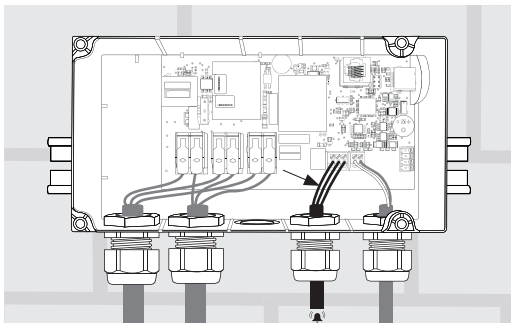
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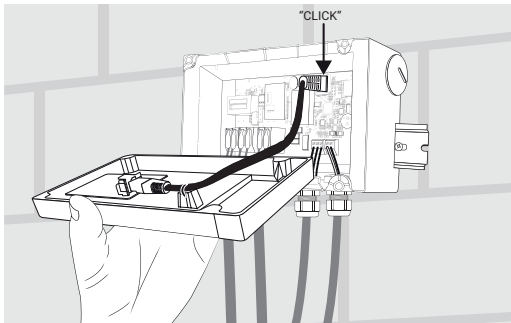
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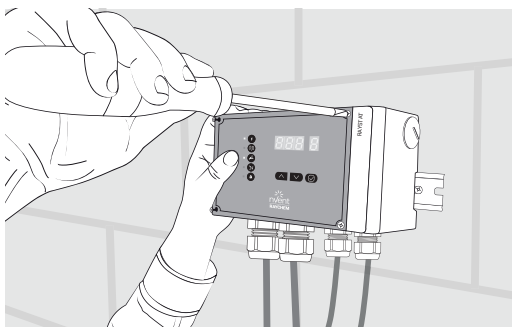
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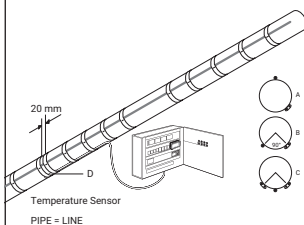
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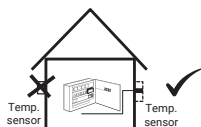
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14.1

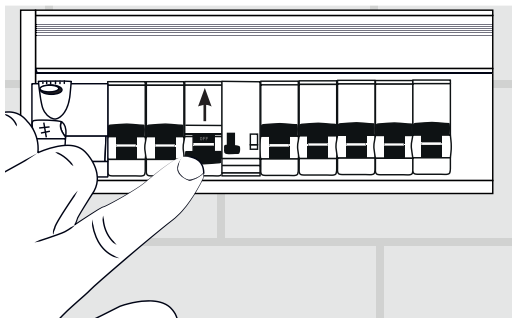


14.2



AIR = PASC

15



RCD / FI 30 mA - C 20 A : ON

QUICK START ➡ 64

1.3 INSTALLATION NOTES

The installation and, if necessary, the maintenance and the disassembling must be carried out by a qualified electrical installer.

The installation must be compatible with local regulations.

Check the maximum circuit length for your circuit breaker in the next table:

Maximum circuit length at 230 VAC and for 5°C start-up temperature C-characteristic circuit breaker

Multiple units on multiple power points can be used if longer heating cables are required. We recommend to use nVent RAYCHEM SBS-FP-xx16A panels to operate 3, 6, 9 or 12 heating circuits

	10XL2-LH	15XL2-LH	26XL2-LH	31XL2-LH
Circuit breaker	(Plum)	(Green)	(Blue)	(Purple)
C 10A	128 m	96 m	73 m	57 m
C 13A	166 m	125 m	94 m	74 m
C 16A	204 m	153 m	116 m	91 m
C 20A	238 m	188 m	142 m	114 m

The nVent RAYCHEM Raystat V5 has a removable top lid. Both top and bottom of the box have electronic parts and are connected to each other by an Ethernet connector cable. The unit is delivered with top lid and back part dismantled.

Warning: For over voltage protection (e.g. in case of thunderstorm) we recommend the use of an external over voltage protection device.

Care and maintenance

Clean the Raystat V5 with a soft damp cloth only, do not use any solvents. Do not pour water directly on the device. Do not use a water hose or a high pressure cleaner. Avoid installing the controller in rooms with high humidity and condensation. To operate the user interface, it must be clean and dry. For outdoor installation it will be recommended to use a sun & rain cover.

Description

nVent RAYCHEM Raystat V5 is an electronic control thermostat with display, advanced alarm facilities and the capability of switching large currents (25 A). The Raystat V5 is designed to control nVent heating cable systems. Heating cable can be controlled (switched ON/OFF) either directly by the Raystat V5 or via a contactor.

Direct switching of heating cables is possible for heating loads up to 25 A. For heating loads above 25 A indirect switching via a suitably rated contactor controlled by a Raystat V5 is necessary.

Installation and all wiring must be in accordance with applicable regulations. The device must be installed in non hazardous areas only. nVent offers other controls for use in hazardous areas.



The sensor must be installed. Attention: The sensor position on pipe or in Air needs to match the operation mode PiPE or Air. (PASC / ambient temperature measurement control). A wrong assignment can led to a frozen pipe.

An alarm terminal makes remote signalling of errors possible. During commissioning of the unit it is recommend to simulate sensor functionality in PIPE sensing mode, since the AIR/PASC mode is not suitable for this test due to delay in the PASC algorithm. The unit can be pre-programmed in power-off mode by external power bank (to be ordered separately) connected via A-A-USB cable and USB connection.

Technical data

Product application	nVent RAYCHEM Pipe freeze protection heating cables only
Electrical properties	
Supply voltage	180-253 VAC; 50/60Hz
Power consumption	5,3 W max
Power output relay (heating cable)	25 A / 230 VAC
Power supply terminals	3 x 6 mm ² max
Heating cable terminals	3 x 6 mm ² max

Alarm terminals	3 x 1,5 mm ² max
Sensor terminal - Pipe	2 x 1,5 mm ² max
Alarm relay	Single pole double throw relay, volt-free; Max. switching capacity (resistive load only) 1 A/30 VDC 0.5 A/125 VAC, Max.: 60 VDC/ 125 VAC
Settings	All settings are stored in non-volatile memory
Operating temperature	–40°C to +40°C ambient
Selectable temperature	PiPE: 0°C ... +90°C (PT 100 Sensor Module: –40°C ... +250°C: SM-PT100-1; PCN: 1244-022441) Air (PASC): 0°C ... +30°C
Enclosure	
Material	Polycarbonate
Dimensions	210 mm x 90 mm x 85 mm
Ingress protection class	IP 65
Weight	990 g
Mounting	DIN-Rail mountable 35 mm
Entries	2 x M25 and 2 x M20
Storage temperature	–40°C to +50°C
Flammability class	D category (DIN EN 60730/VDE 0631-1)
Standard Sensor (included in the box)	
Temperature sensor type	Standard NTC 2,0 kOhm at 25°C, 2 wires
Sensor tip dimensions	Ø 5 mm; length 20 mm
Sensor cable length	5 m; extendable up to 150 m , 2 x1,5 mm ²
Temperature range	–40°C to +90°C

Sensor data	Temperature	Resistance in kOhm
	-40°C	32,34
	-35°C	24,96
	-30°C	19,48
	-25°C	15,29
	-20°C	12,11
	-15°C	9,655
	-10°C	7,763
	-5°C	6,277
	0°C	5,114
	+5°C	4,188
	+10°C	3,454
	+15°C	2,862
	+20°C	2,387
	+30°C	1,684
	+40°C	1,211
	+50°C	0,8854
	+60°C	0,6587
	+70°C	0,4975
	+80°C	0,3807
Approval	CE/UKCA mark; EMC According to EN 50081-1/2 for emission and EN50082 - 1/2 for immunity Temperature for ball pressure +100°C test (DIN EN 60730/VDE 0631-1) Rated impulse voltage: Overvoltage category III (DIN EN 60730/ VDE 0631-1)	

Sensor installation for higher temperature ranges:

For higher temperature ranges up to 250°C a PT100 type of sensor can be connected by using the sensor-Plug-In Module SM-PT-100-1 (PCN: 1244-022441). A reset of the unit is needed to recognize this new hardware module and to activate the new temperature range.

Sensor			
	Standard	With SM-PT100-1 Module	
	(included in box)	HARD-78	MONI-PT100-260/2
Temperature sensor type	NTC 2 KOhm / 25°C, 2-wire	PT100	PT100
Sensor tip dimensions	Ø 5 mm, length 20 mm	Ø 6 mm, length 50 mm	Ø 6 mm, length 50 mm
Sensor cable length	5 m	3 m	2 m
Cable extension	Up to 150 m, min. 2 x 1,5 mm ²	Up to 150 m, 3 x 1,5 mm ²	Up to 150 m, 3 x 1,5 mm ²
Temperature range	-40°C to +90°C	-40°C to +150°C	-50°C to +260°C

OPERATION

The Raystat V5 has a LED user screen interface: The unit will switch to the main screen after 2 minutes of non-interaction on the parameter input screens.

Quick install

When the unit is powered up for the first time, a quick setup must be executed before the unit is ready to start. The Quick start helps to set all important settings, the unit will go in main screen mode automatically when done. Quick start is sufficient for normal operations. More settings are available in the Setup menu for special installation conditions.

The Quick start will only start if no pre-setting is done.

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PARAMETER SETTING ➡ 71

Parameter overview :

PARAMETER	Operation Mode: PiPE	Operation Mode: Air = PASC	Description	Factory settings	Parameters
SP1	✓	✓	SET Temperature	+3°C	0°C ... +90°C
SP2	✓	✓	Operation mode selection	---	PiPE / Air
SP3		✓	Lowest ambient temperature	-20°C	-30°C ... 0°C
SP4		✓	Average pipe diameter level	2 ≥ DN 25 / 1"	01 = Ø < DN 25 / 1" 02 = Ø ≥ DN 25 / 1" 03 = Ø ≥ DN 50 / 2"
SP5	✓	✓	Heater operation in sensor failure mode	ON	ON/OFF
SP6	✓	✓	Heater operation via external contactor	No	Yes/No
SP7	✓		Hysteresis	1 K	0 K ... 5 K
SP8	✓		Low temperature alarm	0°C	OFF/-40°C
SP9	✓		Higher temperature alarm	+65°C	OFF/+65°C
SP10	✓	✓	Alarm sound status	ON	ON/OFF
SP11	✓	✓	TEST program	OFF	ON/OFF
SP12	✓	✓	KEY LOCK – Pass code	OFF	OFF/code 036
SP13	✓	✓	RESET	000	Code 012

Error codes :

Error Code	Error description	Remedy
Er 2.1	Sensor open	1. Check sensor cable connection 2. Verify operation of unit 3. Replace unit if cable ok & error still exists
Er 2.2	Sensor short	1. Check sensor connection 2. Replace sensor 3. Replace unit if sensor ok & error still exists
Er 3.1	High temperature alarm	1. Verify heating system and sensor position 2. Verify menu settings of high temperature alarm
Er 4.1	Low temperature alarm	1. Verify heating system and sensor position 2. Verify menu settings of low temperature alarm
Er 6.x	Internal error	Replace unit

Error codes will be displayed after a time delay of 10 min.

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