



**CONNECT AND PROTECT**

# Technical Handbook

Snow melting for ramps, access ways and footpaths

  
nvent

**RAYCHEM**

# Why nVent RAYCHEM?

nVent RAYCHEM Products and services simplify the design and specification of the highest quality products, broadest product portfolio and unrivalled customer support services.

## LARGE TECHNICAL SUPPORT TEAM

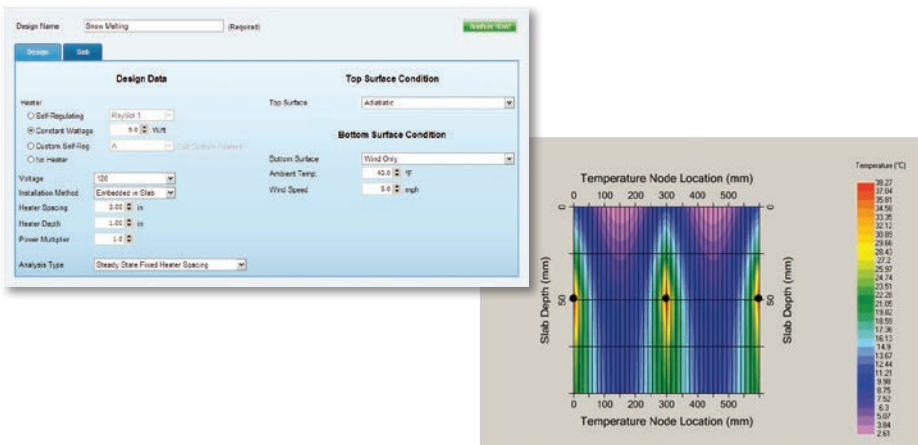
- Site services for efficient project execution.
- Building Information Modelling (BIM) content for system design, project execution, and asset management.
- “On demand” technical advice
- Free design and quotation
- Direct support to specifiers and installers
- Training support on request
- Complete after-sales service
- Also for non-standard applications our team can assist you in finding the right heating solution. Do not hesitate to get in touch with us: Free phone 0800 96 90 13 or Free fax 0800 96 86 24



## ENSURING A SNOW & ICE FREE SURFACE WITH ANY GROUND PROFILE

The ground profile of a heated surface can vary greatly from project to project. As a consequence, the system design and power requirements can also vary significantly.

To ensure the correct amount of power is installed in the ground surface for safety and energy efficiency, nVent RAYCHEM can provide a “Slabheat™” finite element analysis of the surface profile prior to installation. This allows the heater selection, spacing, and depth to be tailored to the precise needs of the ground profile.





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# Why Surface Heating Systems?

Ice and snow on paths, loading bays, driveways, ramps, stairs and other access ways, can present a major problem causing accidents and delays. To help prevent this liability, nVent RAYCHEM provides a complete range of surface heating solutions to prevent snow and ice formation.

The nVent RAYCHEM range of products has been specifically designed to meet the requirements of commercial, industrial, and residential applications. Whether in concrete, sand, or asphalt, a nVent RAYCHEM system exists to provide a fast, reliable, and easy-to-install solution.

Each nVent RAYCHEM heating solution is complete with a Smart control and monitoring unit, providing useful user data and excellent energy efficient performance. The multi-sensor control and monitoring device (VIA-DU-20) is compatible with all ramp snow melting solutions.

## APPLICATION IN CONCRETE

Ambient temperature sensor\*  
VIA-DU-A10 (incl.)

Temperature and moisture sensor  
VIA-DU-S20

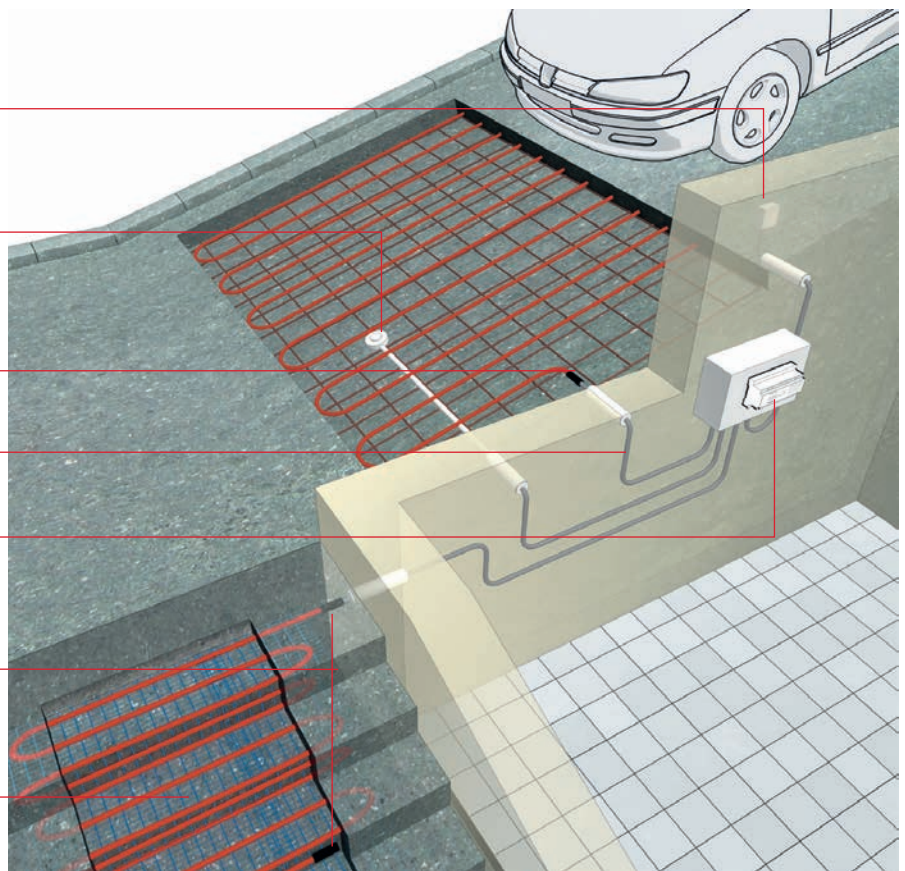
Connection and end seal kit  
(VIA-CE1)

Connection cable (VIA-L1)

Control unit (VIA-DU-20)

Connection and end seal kit (VIA-CE1)

Self-regulating heating cable (EM2-XR), constant wattage heating cable (WINTERGARD-CABLE), and constant wattage heating mat (WINTERGARD-MAT).



\* Optional, only needed when "local detection" is selected.

## NVENT RAYCHEM SOLUTIONS FOR CONCRETE

	Product	Description
Reinforced concrete ramp	EM2-XR	Self-Regulating heating cable for reinforced concrete ramps
Domestic/private garage track heating	WINTERGARD-MAT	Pre-terminated constant wattage heating mat for ramp, pavement and track heating
Stairs; wheelchair access ramps	WINTERGARD-CABLE	Pre-terminated constant wattage heating cable solution for larger concrete areas and stairs

## APPLICATION IN ASPHALT

Ambient temperature sensor\*  
VIA-DU-A10 (incl.)

Temperature and moisture sensor  
VIA-DU-S20

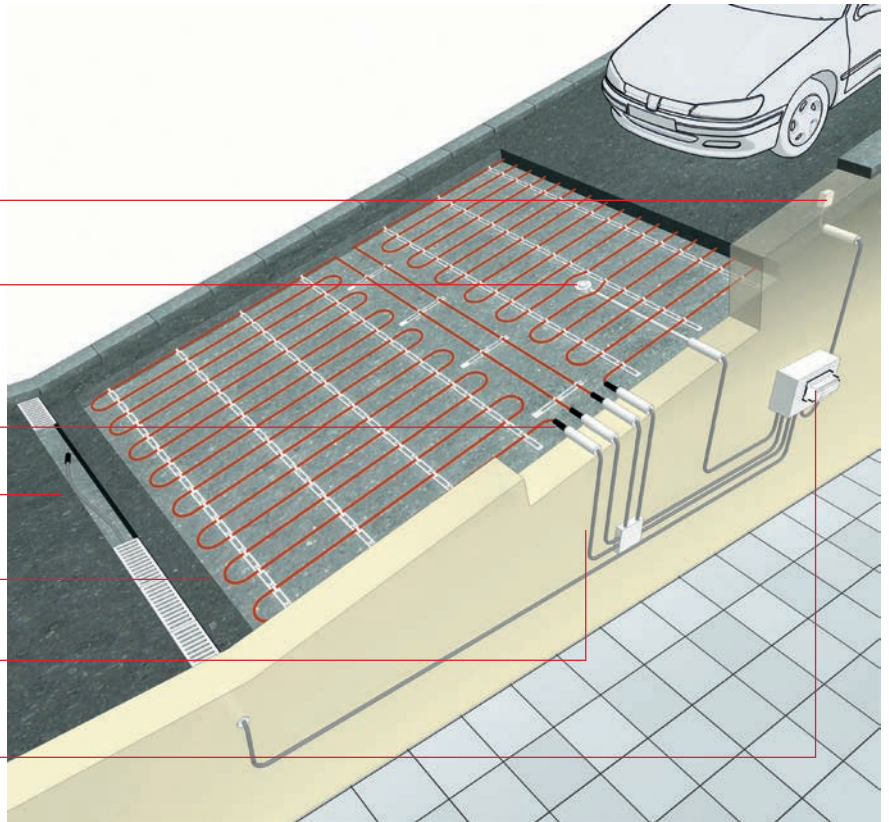
Connection between heater cable and  
cold lead (Pre-engineered)

Self regulating drain heater (GM-2XT)

Mineral-Insulated heating cable (EM2-MI)

Pre-engineered cold lead

Control unit (VIA-DU-20)



\* Optional, only needed when "local detection" is selected.

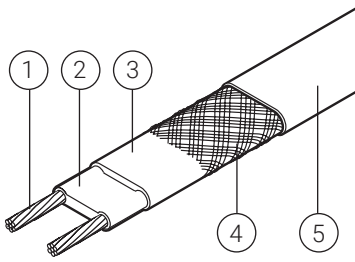
## NVENT RAYCHEM SOLUTIONS FOR ASPHALT

	Product	Description
Loading bay and asphalt layer	EM2-MI	Mineral insulated, high temperature resistant heating cable for asphalt ramps for commercial and bigger areas
Domestic/private garage track heating - small areas	WINTERGARD-MAT WINTERGARD-CABLE	Pre-terminated constant wattage heating cable for small ramps, pavement and track heating

# Self-Regulating Systems

## 1. APPLICATION

**Footpaths, ramps, steps, basement garages, loading platforms.**



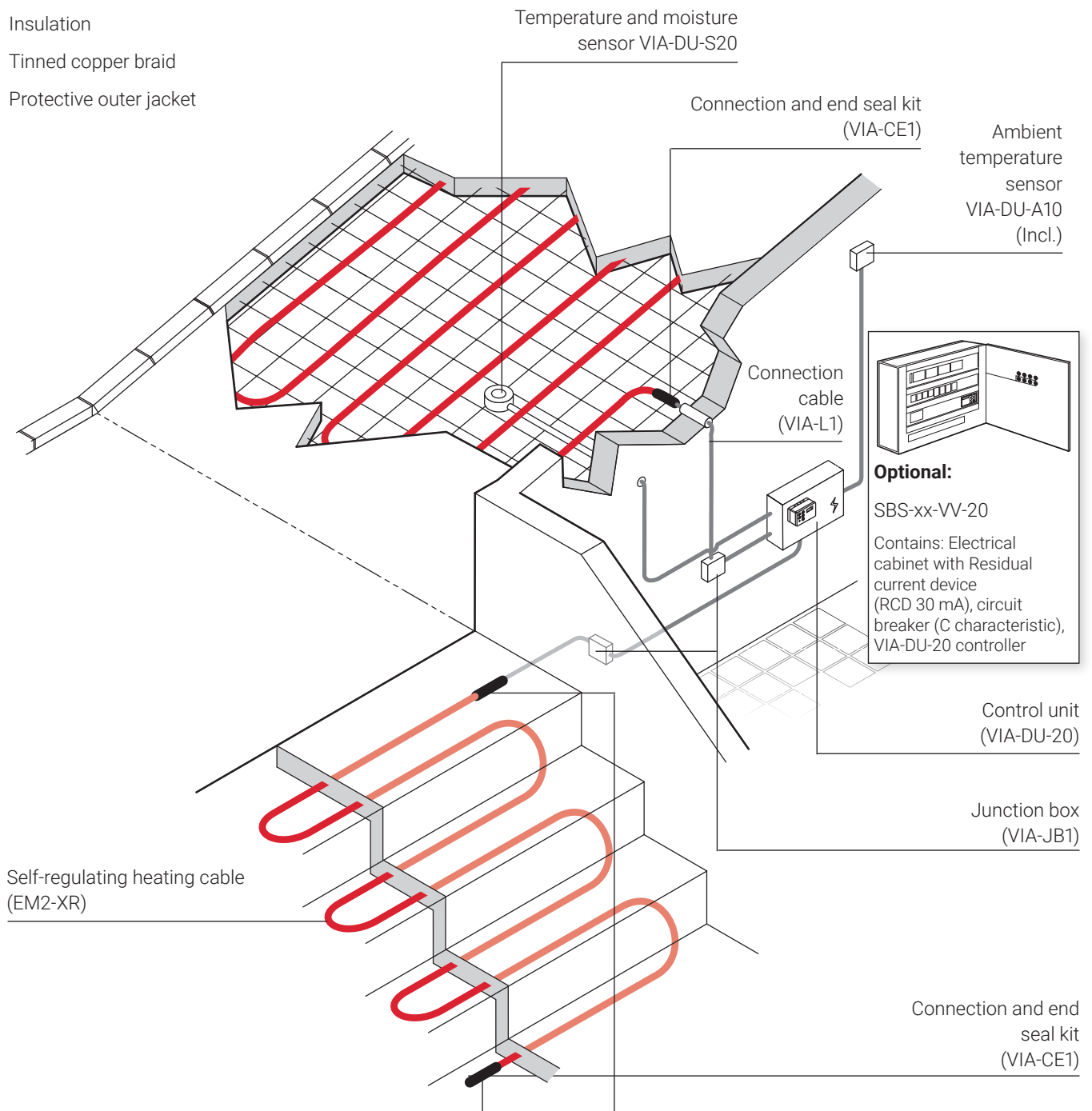
Cable type	EM2-XR
Control	VIA-DU-20 / SBS-XX-VV -20 Control Panel / ACS-30
Power output	90 W/m @ 0°C.

\* At design stage: verify power at start-up temperature

### Composition

1. Large copper conductor
2. Self-regulating heating core
3. Insulation
4. Tinned copper braid
5. Protective outer jacket

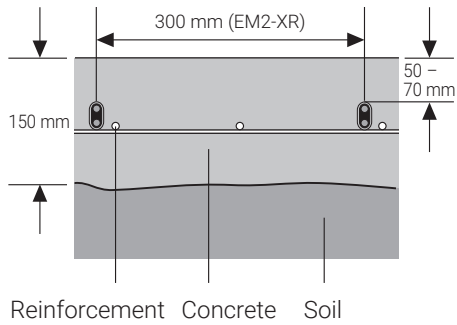
- Unsuitable for use in poured asphalt.
- When laying directly in concrete with a covering of at least 20 mm, an asphalt layer of max. 40 mm can be applied on the concrete surface (max. 250°C)



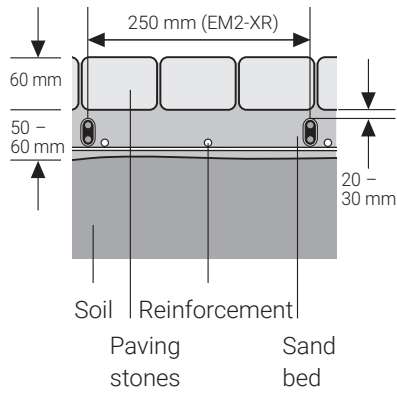


## 2. CABLE SPACING

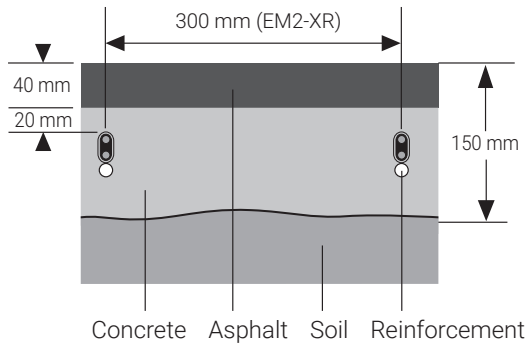
### Concrete



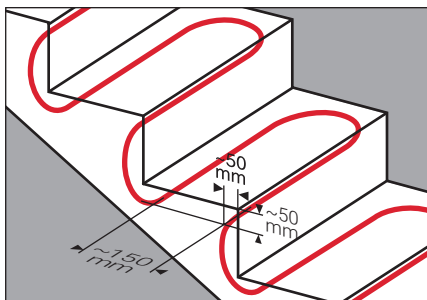
### Sand bed



### Asphalt

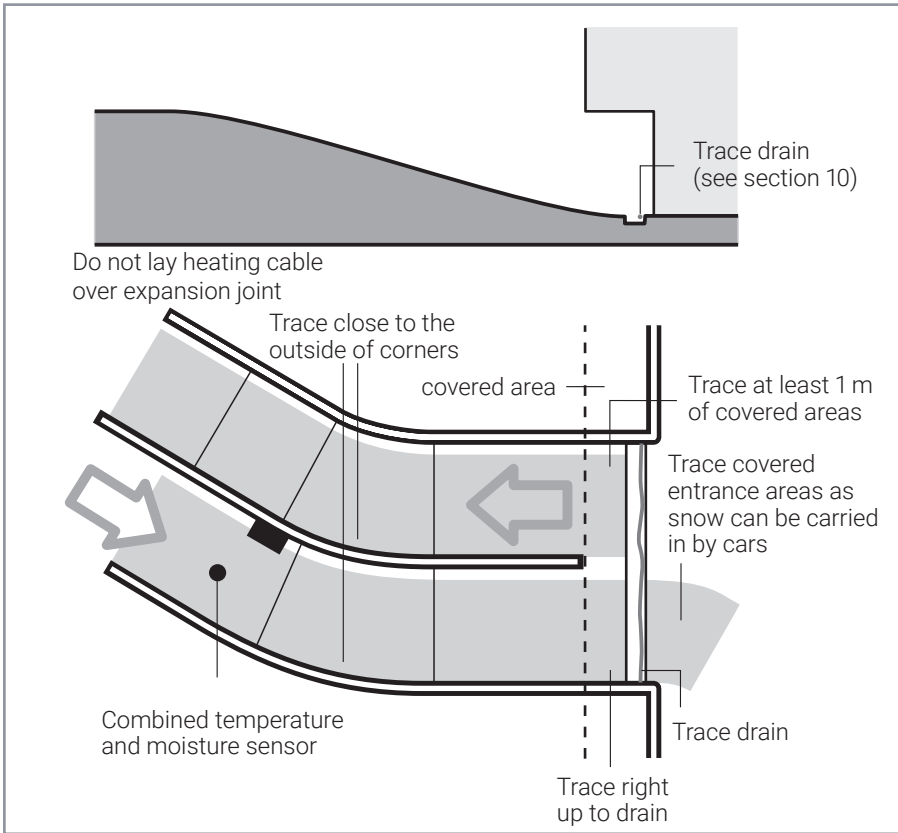


### Concrete stairs





### 3. DETERMINE AREA TO BE HEATED



### 4. DETERMINE AREA TO BE HEATED

#### A. Ramps and paths

$$\text{Heating cable length (m)} = \frac{\text{Total surface to be heated}}{\text{Heating cable length (m)}}$$

#### B. Stairs

$$\text{Heating cable length (m)} = [2 \times \text{stair width (m)} + 0.4] \times \text{number of stairs} + 1 \text{ m (connection)}$$

### 5. ELECTRICAL PROTECTION

#### Max. heating cable lengths

- According to local standards and regulations.
- Residual current device (rcd) 30 mA required, max. 500 m heating cable per rcd.
- Take into account the conductor size and max. permitted voltage drop.  
A higher voltage drop can occur at start-up of heating

#### Power at start-up

- To determine the installed power with the electrical system designer, the nominal current of the series connected fuse or the current value at the system start-up temperature must be taken into account (e.g. 32 A for 55 m of EM2-XR at  $-10^{\circ}\text{C}$ ).

## Maximum circuit lengths

According to local standard and regulations

Residual current device (RCD) 30 mA required, max. 500 m heating cable length per RCD.

Take into account the conductor sizes and max. permitted voltage drop.

Circuit breaker sizing (MCBS to BS EN 60898, Type C)	Max. circuit length: EM2-XR (for start-up at -10°C)
10 A	17 m
16 A	28 m
20 A	35 m
25 A	45 m
32 A	55 m
40 A 50 A	Contact your nVent representative for the most economical solution

## 6. NUMBER OF CIRCUITS

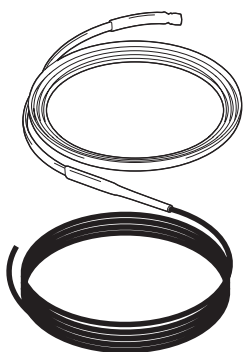
Min. number of heating circuits =  $\frac{\text{Heating cable length (see section 4)}}{\text{max. length of heating circuit (see section 5)}}$

- The heating cable should not be laid over expansion joints.
- The heating cable should be distributed as symmetrically as possible.

## 7. ELECTRICAL CONNECTION

- According to local standards and technical regulations.
- The cross-section is determined according to the nominal current of the circuit-breakers and maximum permitted voltage drop.

## 8. PRE-CONFIGURED HEATING UNITS



- For faster on-site installation, we recommend using prepackaged EM2-XR kits
- A pre-configured kit includes.
  - X m ( required length) of EM2-XR heating cable
  - X m connection cable, suited for heavy duty - VIA-L1 (Maximum of 5 m cold lead connection cable with heater cable lengths over 50 meters.)
  - Connection and end seal pre-installed

Product name	Order reference
Heating unit Viagard	1244-005360

9. INSTALLATION INSTRUCTIONS

**1**

The heating cable should not be applied over expansion joints. Lay a separate heating circuit on either side of the expansion joint.

For cornered ramps, always follow the curve (in this way, you ensure that the laying spacing is maintained).

Trace as close as possible to the outside of corners

The heating cable should preferably be laid in long rather than in short runs.

Trace at least 1 m of covered areas

Heating of the drain

Trace right up to drain

Trace covered entrance areas as snow can be carried in by cars

**1a**

**1b**

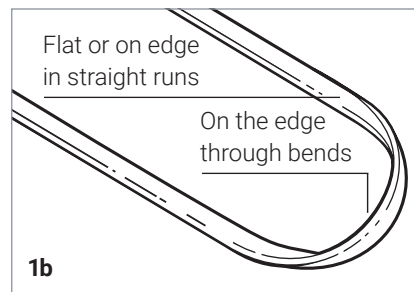
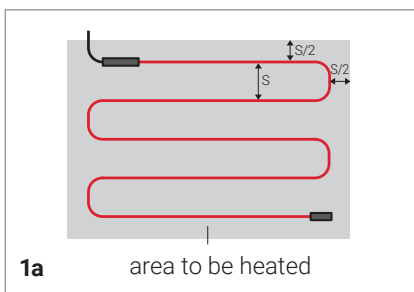
The ground temperature and moisture sensor is to be installed within the heated area at least 2.5 cm away from the heating cables (see diagram).

The sensor must be able to directly detect weather conditions (rain, snow, melted snow and ice).

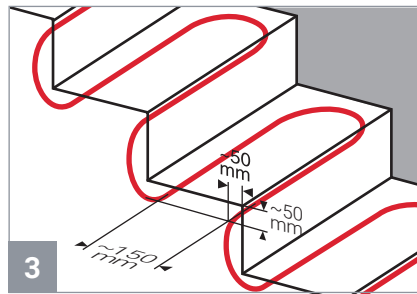
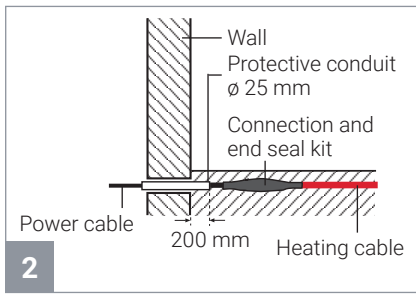
The sensor may not be covered up (e.g. when clearing the snow).

Also heat areas in which vehicles can be expected to brake (e.g in front of barriers, toll booths or magnetic card readers.)

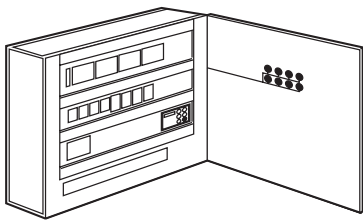
**\* Take care that VIA-DU-S20 is NOT installed in an area which is continuously flooded with water (e.g. drain line), or in an area which is continuously under ice due to external parameters (e.g. freezing of condensation water in cool room).**



Spacing (S)	Concrete	Sand
EM2-XR	300 mm	250 mm



## 10. CONTROL PANELS



Steel enclosure in wall-mounted construction, equipped with master power switch. Combination(s) 30 mA / C32 A, circuit breaker(s), "On" and "Alarm" warning lights. Completely assembled, cabled ready connected and tested. Cable entry points in enclosure floor. Each cabinet is equipped with VIA-DU-20 multi-sensor controller.

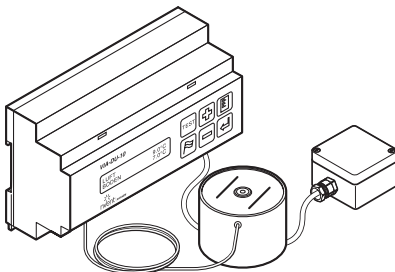
<b>SBS-03-VV-20</b>	Cabinet for 1 to 3 heating circuits (3 x 32 A)	PCN: 1244-000215
<b>SBS-06-VV-20</b>	Cabinet for 4 to 6 heating circuits (6 x 32 A)	PCN: 1244-000216
<b>SBS-09-VV-20</b>	Cabinet for 7 to 9 heating circuits (9 x 32 A)	PCN: 1244-000217
<b>SBS-12-VV-20</b>	Cabinet for 10 to 12 heating circuits (12 x 32 A)	PCN: 1244-000218

\* For ACS-30 Control & Monitoring system, please contact us.

## 11. CONTROL UNITS

The electronic control unit ensures that the surface heating only starts when the temperature falls below a certain threshold and moisture is detected on the relevant surfaces, ensuring efficient energy use.

### VIA-DU-20

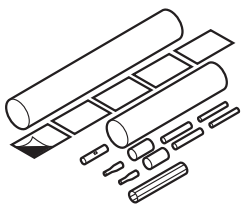


Control unit with combined moisture and temperature sensor and optional ambient temperature sensor.

- DIN-rail mounting
- Sensor cable length: 15 m
- Freezing rain precaution
- Optional BMS connection
- Alarm relay contacts

## 12. COMPONENTS AND ACCESSORIES

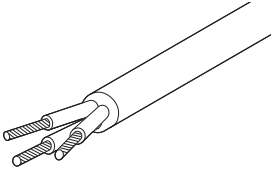
### VIA-CE1



Waterproof connection and end seal

- Sealing compound and heat-shrinkable sleeve
- One kit required per heating cable circuit
- Connection of the heating cable and cold lead cable VIA-L1

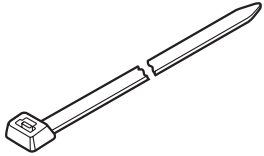
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**VIA-L1**

Temperature-resistant cable (cold lead), 3 x 6 mm<sup>2</sup> copper conductors

- To be installed in conduit
- Maximum length of cold lead for standard connection boxes: 65 m
- Maximum length of cold lead with C 40 A and C 50 A circuit breakers: 5 m (VDE standard)

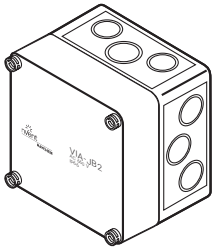
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**KBL-09**

Cable ties for fixing heating cable to reinforced mesh

- One pack required for 30 m of self-regulating heating cable
- Pack of 100 pc
- Length 200 mm
- Width: 3,4 mm

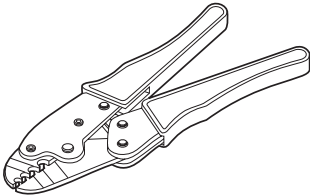
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**VIA-JB2**

Temperature-resistant junction boxes

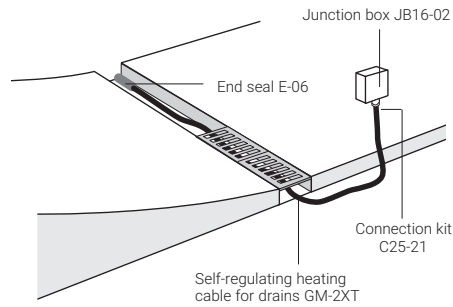
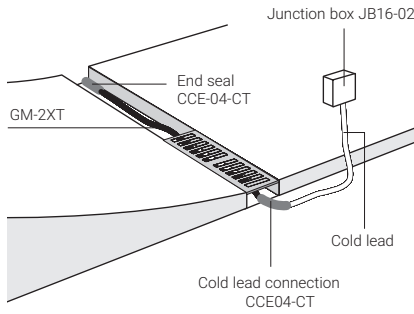
- For heating circuits up to C 50 A circuit-breakers
- Dimensions: 125 x 125 x 100 mm
- Terminals 3 x 16 mm<sup>2</sup>
- IP 66
- 4 x M20/25 + 2 x M32 at opposite sides and 6 x M20/25 at opposite sides

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**VIA-CTL-01**

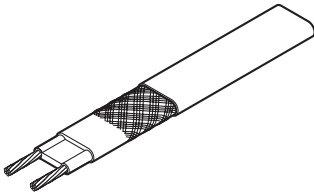
Crimping tool for connectors in VIA-CE1 connection and end seal kit

### 13. DRAIN TRACING



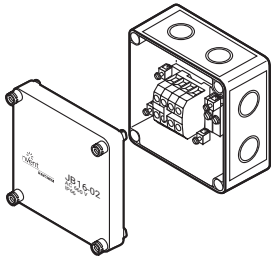
#### GM-2XT

Drain heating cable with oil- and UV-resistant fluoropolymer outer jacket



#### JB16-02

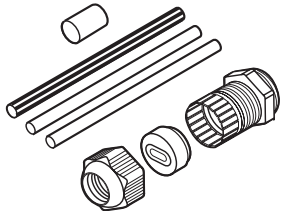
Temperature-resistant junction and connection box  
Dimensions: 94 x 94 x 57 mm



- IP66
- 6 x 4 mm<sup>2</sup> terminals
- 4 Pg 11/16 and 4 M20/25 knock-out entries

#### C25-21

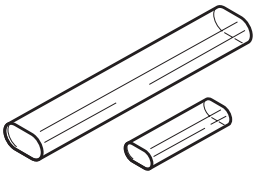
Connection kit for GM-2XT



- Heat-shrink system (M25)

#### E-06

End seal kit for GM-2XT



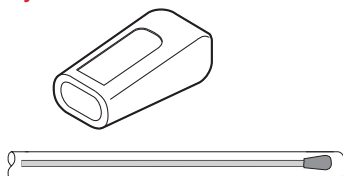
- Heat-shrink system

The drain heating system can be switched via the same control unit as the surface heating system.

- Max. 70 m of GM-2XT can be connected to a 16 A C-type circuit-breaker.
- Residual current device (rcd) 30 mA required.

#### RayClic-E-02

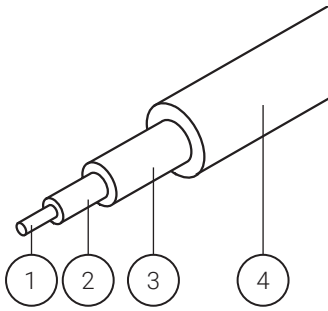
Gel-filled end seal



- For system extensions (to be ordered separately)
- IP 68

# Mineral Insulated Systems

## 1. APPLICATION



Surface heating in asphalt applications.

- Extremely robust
- Long life expectancy
- Installation-ready heating cable
- Proven quality: high temperature withstand capabilities

	Small areas, Footpaths	Large areas, Garage entrances
Typical output requirement	180 W/m <sup>2</sup> (50 W/m)	300 W/m <sup>2</sup> (50 W/m)
Spacing	275 mm	165 mm

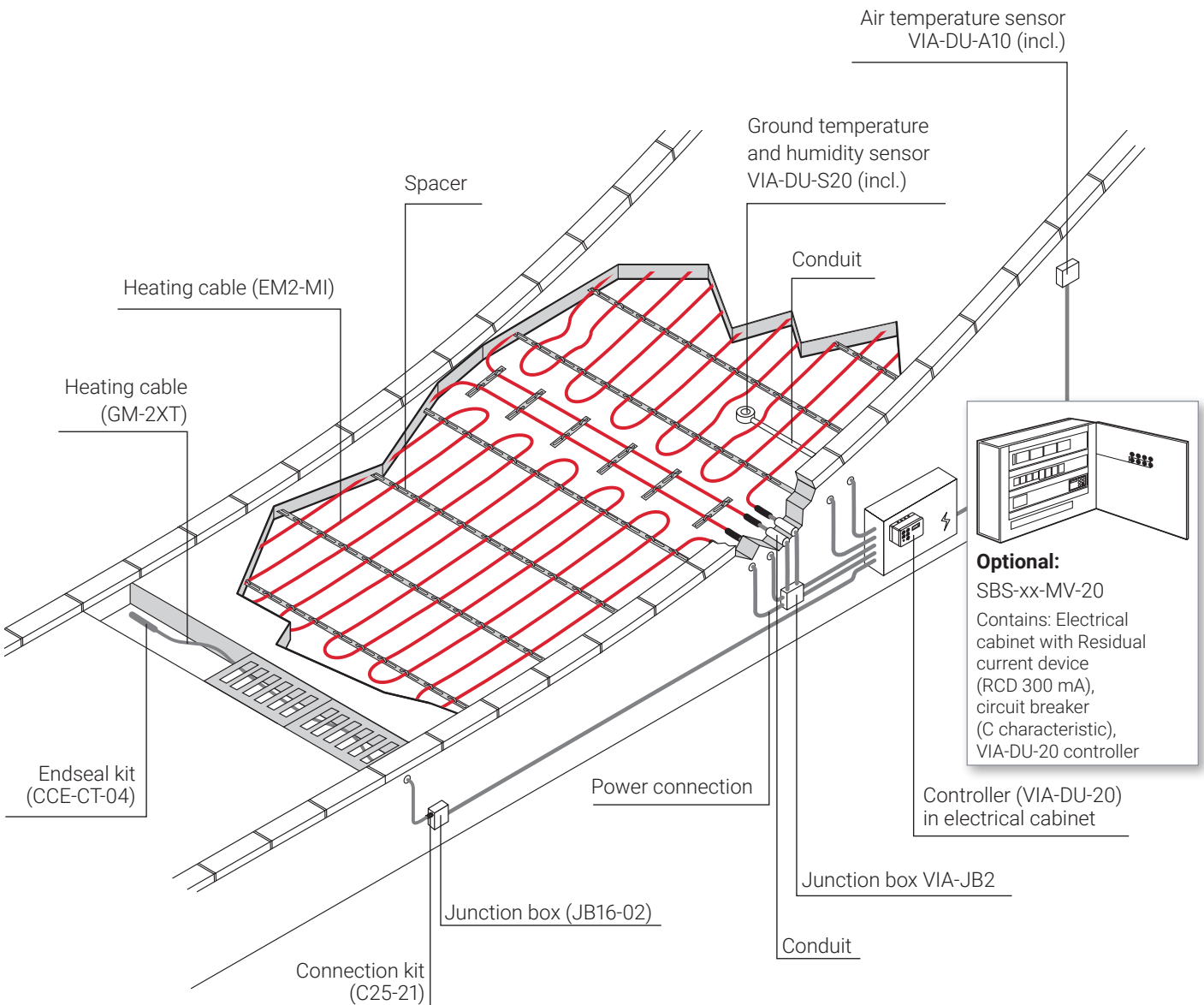
### Construction:

1. Heating element
2. Mineral insulation
3. Protective jacket, copper alloy
4. Heat resistant outer jacket (PVC free)

Heating cable configuration from 26 m to 88 m.  
Cable power output = 50 W/m

### Package contents

- Heating cable with pre-installed power cables (2 x 3 m)
- Installation instructions



**Optional:**  
SBS-xx-MV-20  
Contains: Electrical cabinet with Residual current device (RCD 300 mA), circuit breaker (C characteristic), VIA-DU-20 controller

Controller (VIA-DU-20) in electrical cabinet

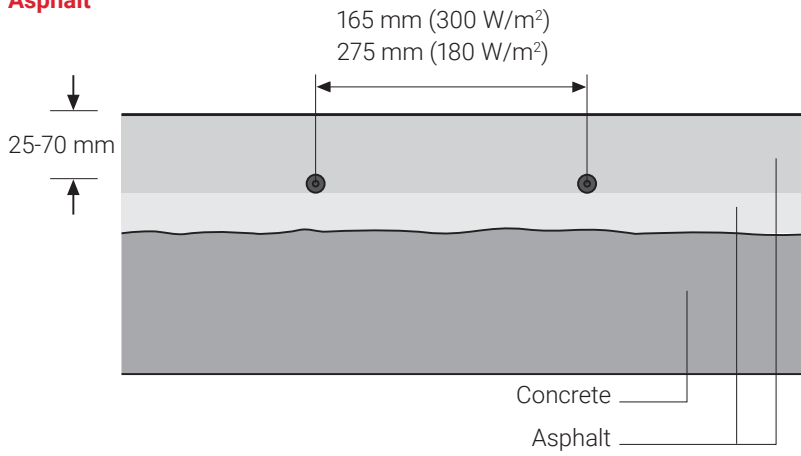
Junction box VIA-JB2

Junction box (JB16-02)

Connection kit (C25-21)

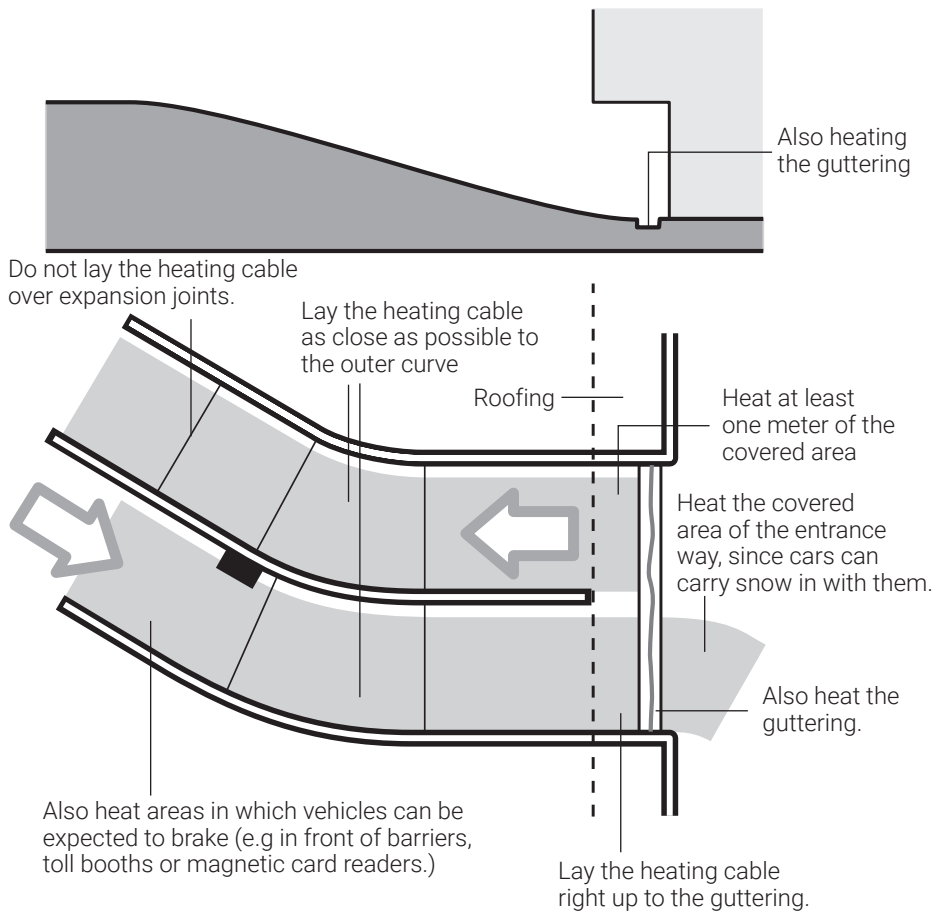
## 2. CABLE SPACING

### Asphalt



The VIA-SPACER enables correct and even spacing of the heater cable.

## 3. DETERMINE AREA TO BE HEATED

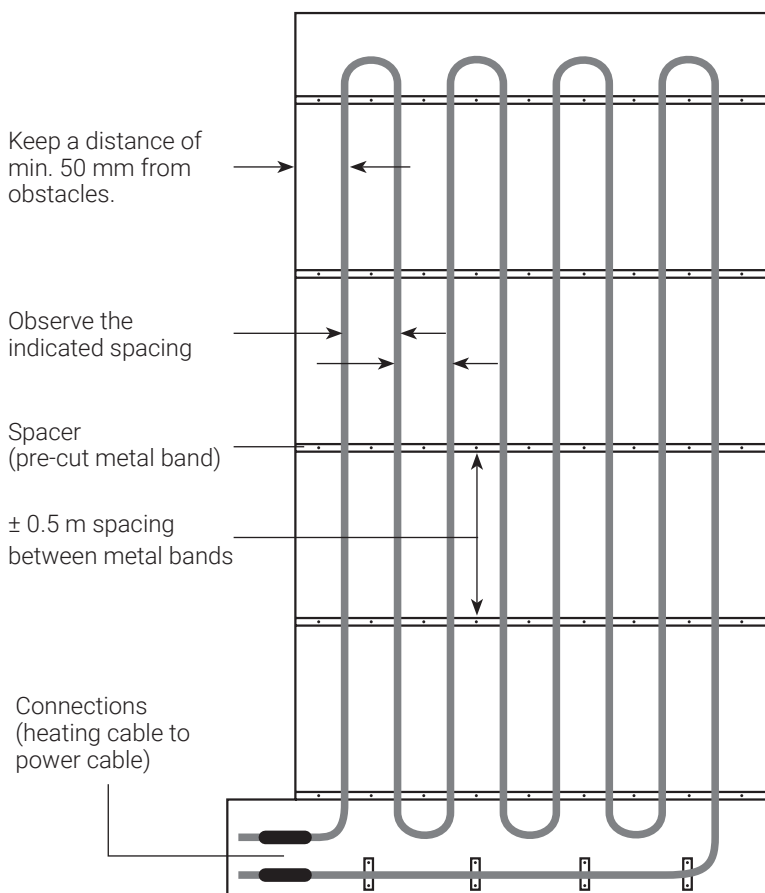




#### 4. LAYING THE HEATING CABLE

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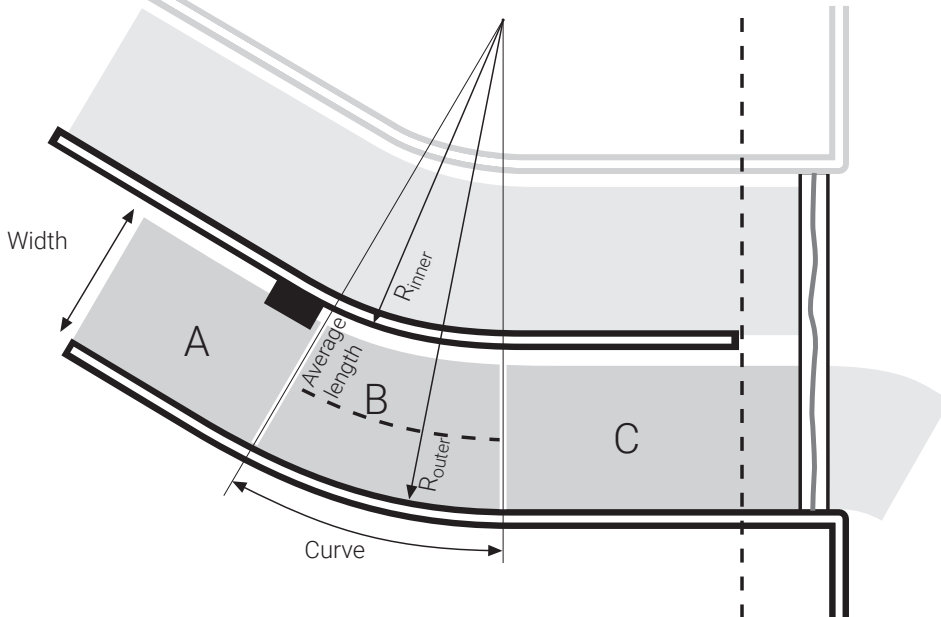
- The spacer rail should be secured to the substrate at 0.5 m intervals.
- The heating cable should be laid parallel to the direction of traffic.
- The spacing should be at least 50 mm. The heating cables must not overlap or crossed.
- Do not shorten or splice the heating cable.
- Do not lay the heating cable over expansion joints.
- Lay the cable in runs to allow both heating cable ends to connect to the same point.
- The heating cable must be completely covered with asphalt, while the power cable must not be in contact with asphalt (lay it in sand or with protective conduit).



## 5. PACKAGE SELECTION

- Divide the heated area into sections.
- Do not lay the heating cable over expansion joints.
- Calculate the surface area of the individual sections.
- Select one or more packages from the table according to the size of the surface.

### Example



- Calculation of the area of sections A, B and C:  
 A: Length x width = 6 m x 3 m = 18 m<sup>2</sup>  
 C: Length x width = 8 m x 3 m = 24 m<sup>2</sup>  
 B: Average length x width = 3.53 m x 3 m = 10.6 m<sup>2</sup>
- Determine the number of strips for a nominal output of 300 W/m<sup>2</sup>  
 Spacing = 0.165 m  
 Ramp width = 3 m  
 Number of strips = 3 / 0.165 => 18 strips
- Selecting the package size  
 Rectangular areas: Necessary min. length = length x number of strips  
 A= 6 m x 18 = 108 m (EM-MI-PACK-48M + EM-MI-PACK-60M)  
 C= 8 m x 18 = 144 m (EM-MI-PACK-60M + EM-MI-PACK-48M + EM-MI-PACK-36M or EM-MI-PACK-60M + EM-MI-PACK-88M (if the area is not broken up by expansion joints))
- Curves:  
 B= EM-MI-PACK-60M or EM-MI-PACK-26M + EM-MI-PACK-36M

## 6. ELECTRICAL PROTECTION



- Observe local standards and regulations.
- Residual current device required. (RCD)
- Take the cable cross-section and max. permitted voltage drop into account.

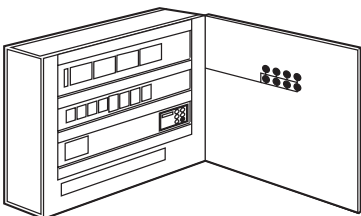
### Order references

	Nominal power (W)	300 W/m <sup>2</sup> spacing 165 m		180 W/m <sup>2</sup> spacing 275 m		Connection cable Cross section (mm <sup>2</sup> )
		Area (m <sup>2</sup> )	Required spacer *(m)	Area (m <sup>2</sup> )	Circuit breaker switch (C Characteristic)	
EM-MI-PACK-26M	1270	4,5	10	7,0	10 A	2,5
EM-MI-PACK-36M	1835	6,0	10	10,0	10 A	2,5
EM-MI-PACK-48M	2450	8,0	25	13,0	13 A	2,5
EM-MI-PACK-60M	2800	10,0	25	15,0	16 A	2,5
EM-MI-PACK-70M	3435	11,5	25	19,0	20 A	2,5
EM-MI-PACK-88M	4290	14,5	25	24,0	25 A	6,0

Min. Activation temperature –10°C, AC 230 V.

When using standard electrical cabinets, use only EM-MI-PACK 26M to 70M (for circuit breaker up to 20A, C characteristic).

## 7. CONTROL PANELS



Steel enclosure in wall-mounted construction, equipped with master power switch. Combination(s) 30 mA / C32 A, circuit breaker(s), "On" and "Alarm" warning lights. Completely assembled, cabled ready connected and tested. Cable entry points in enclosure floor. Each cabinet is equipped with VIA-DU-20 multi-sensor controller.

<b>SBS-03-MV-20</b>	Cabinet for 1 to 3 heating circuits (3 x 20A)	PCN: 1244-000219
<b>SBS-06-MV-20</b>	Cabinet for 4 to 6 heating circuits (6 x 20 A)	PCN: 1244-000220
<b>SBS-09-MV-20</b>	Cabinet for 7 to 9 heating circuits (9 x 20 A)	PCN: 1244-000221
<b>SBS-12-MV-20</b>	Cabinet for 10 to 12 heating circuits (12 x 20 A)	PCN: 1244-000222
<b>SBS-15-MV-20</b>	Cabinet for 13 to 15 heating circuits (15 x 20 A)	PCN: 1244-000223
<b>SBS-18-MV-20</b>	Cabinet for 16 to 18 heating circuits (18 x 20 A)	PCN: 1244-000224

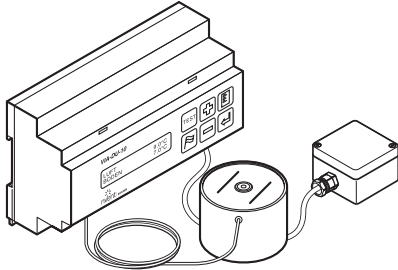
\* For ACS-30 Control & Monitoring system, please contact us.

## 8. CONTROL UNITS

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The electronic control unit ensures that the surface heating only starts when the temperature falls below a certain threshold and moisture is detected on the relevant surfaces, ensuring efficient energy use.

### VIA-DU-20



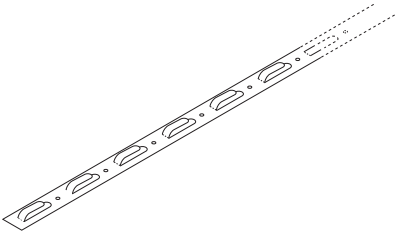
Control unit with combined moisture and temperature sensor and optional ambient temperature sensor.

- DIN-rail mounting
- Sensor cable length: 15 m
- Freezing rain precaution
- Optional BMS connection
- Alarm relay contacts

## 9. COMPONENTS AND ACCESSORIES

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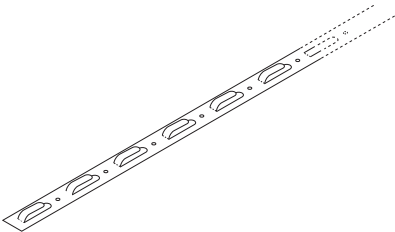
### VIA-SPACER-10 M



Spacer and mounting band (10 m)

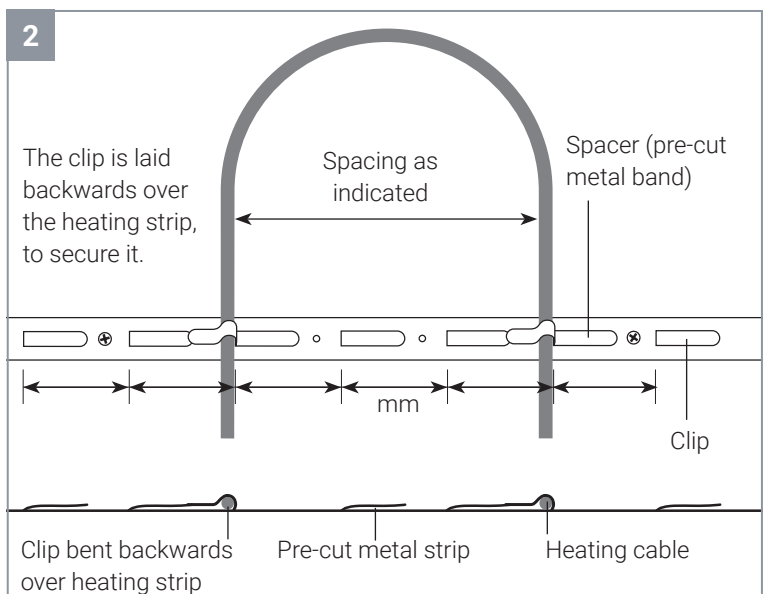
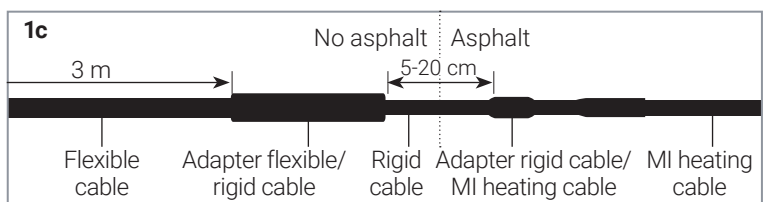
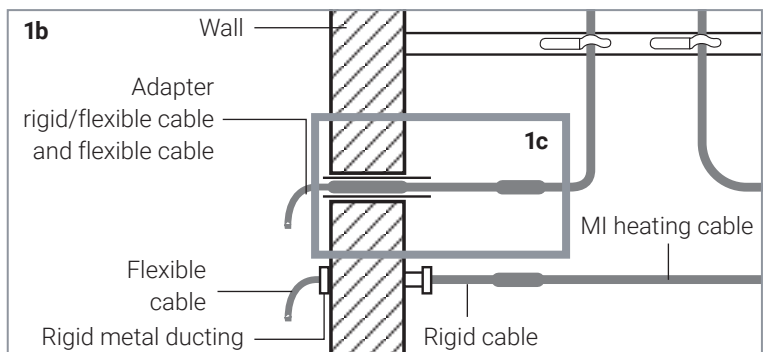
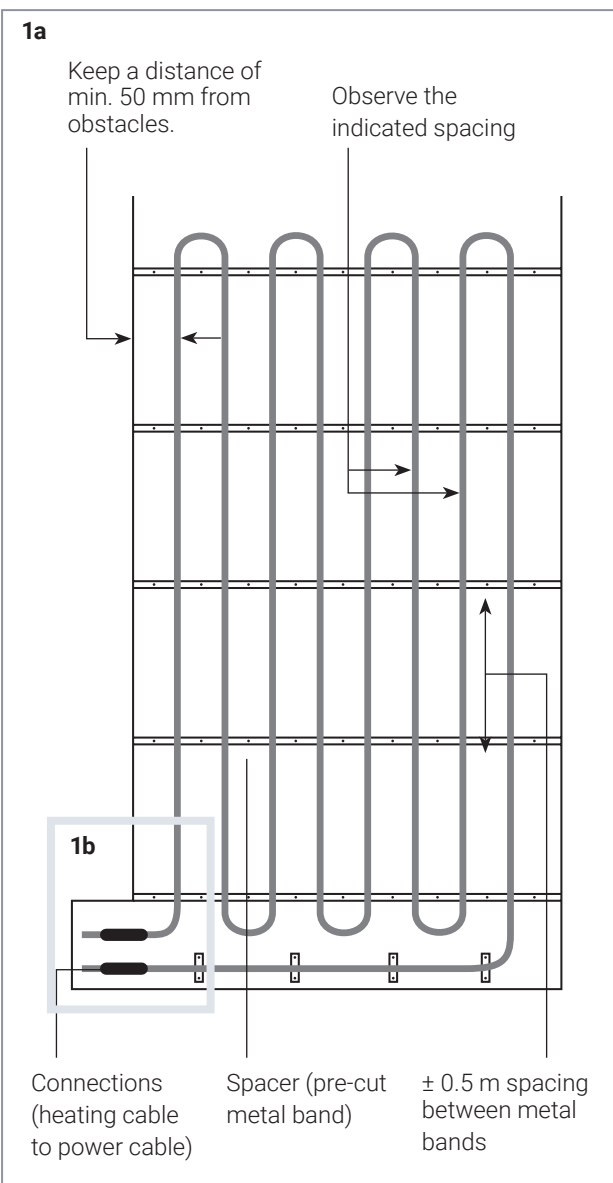
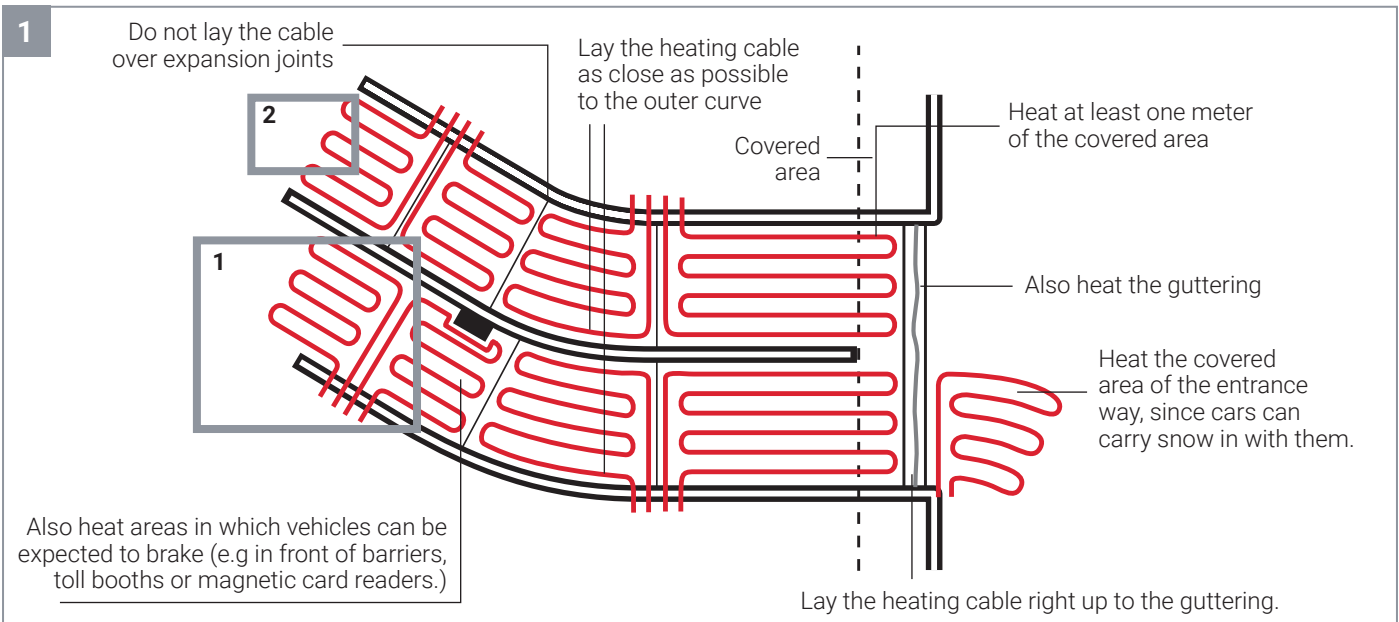
- Required for:  
EM-MI-PACK-26M  
EM-MI-PACK-36M
- Requirement: 2 m/m<sup>2</sup>
- Pre-cut metal strip

### VIA-SPACER-25 M



Spacer and mounting band (25 m)

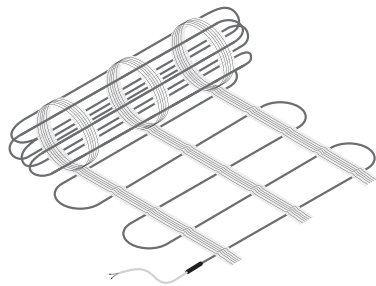
- Required for:  
EM-MI-PACK-48M  
EM-MI-PACK-60M  
EM-MI-PACK-70M  
EM-MI-PACK-88M
- Requirement: 2 m/m<sup>2</sup>
- Pre-cut metal strip



# Polymer Solutions

## Heating WINTERGARD-MAT

### 1. APPLICATION



WINTERGARD-MAT is a constant wattage heating mat for simple, fast, and effective ramp and accessway heating to prevent snow and ice formation. The WINTERGARD-MAT is particularly suited for track heating of ramps, loading bays, and driveways, but also emergency escape routes and pedestrian walkways.

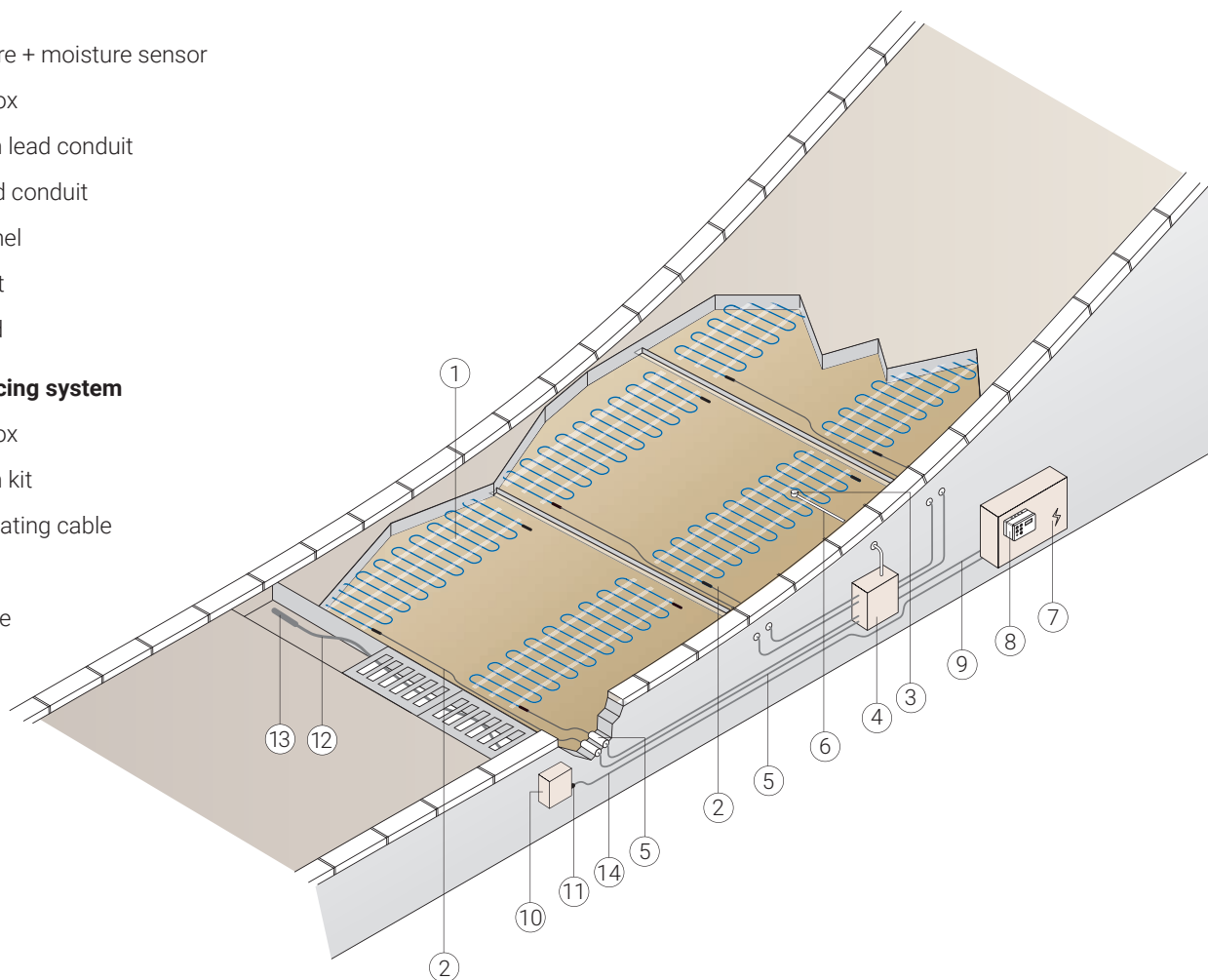
Nominal power	300 W/m <sup>2</sup>
Voltage	230 Vac
Maximum exposure temperature	65°C (in operation)
Rated temperature non-operation	105°C
Short-term temperature resistance	240°C (15 min; for asphalt)
Cable construction	Twin core, constant wattage heating mat, 1 cold lead (5 m)
Control unit	VIA-DU-20
Certification	CE

### 2. DETERMINE AREA TO BE HEATED - TRACK HEATING

1. Surface heating mat
2. Cold lead
3. Temperature + moisture sensor
4. Junction box
5. Connection lead conduit
6. Sensor lead conduit
7. Control panel
8. Control unit
9. Supply lead

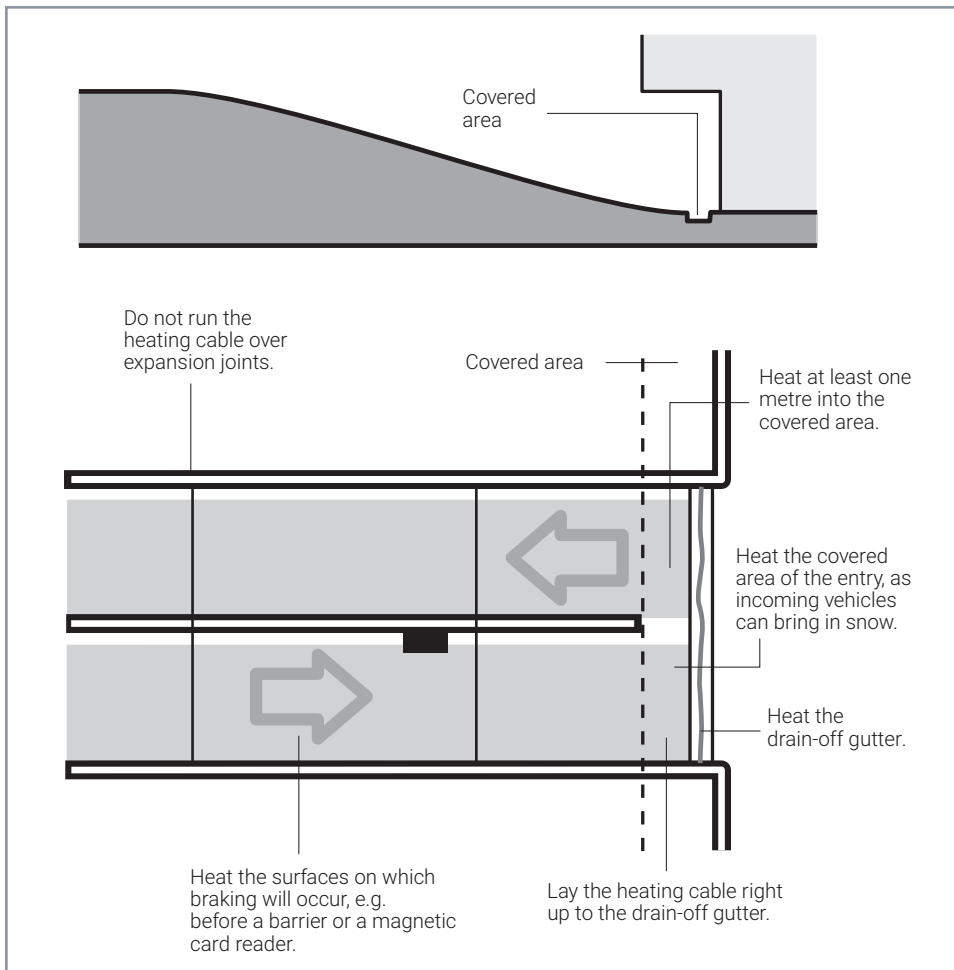
#### Drain heat-tracing system

10. Junction box
11. Connection kit
12. GM-2XT heating cable
13. End seal
14. Power cable

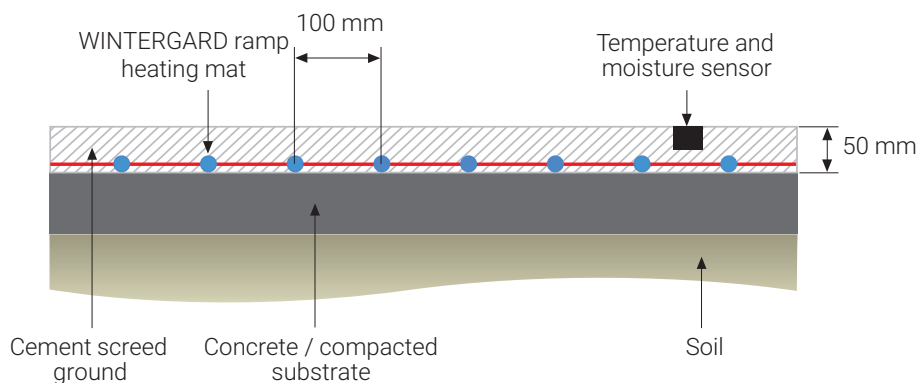


### 3. AREA TO BE HEATED

Determine the exact area to be heated, e.g. wheel tracks. Consider following factors:

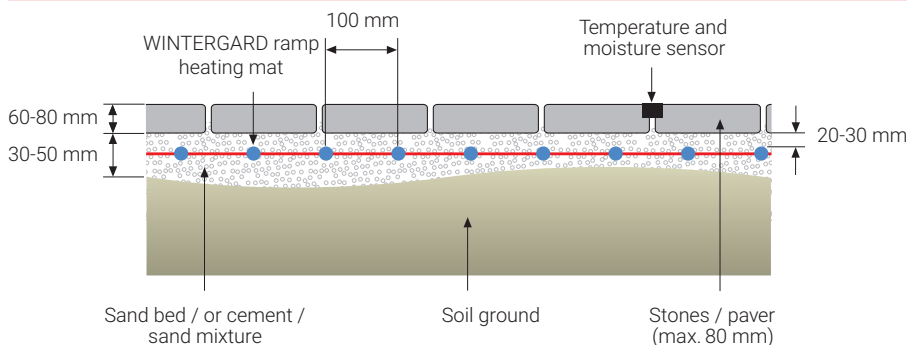


### 4. EMBEDDING IN SCREED, CONCRETE OR ASPHALT



When laying in concrete with a covering of least 25 mm

## 5. EMBEDDING IN SAND BED/PAVERS



Recommended split/gravel sizes for sand bed or cement concrete:

Round grain gravel: Ø 8-16 mm

Grit/Broken grain: Ø 4-8 mm

## 6. PACKAGING AND ORDERING REFERENCES

WINTERGARD ramp heating mat is available in the sizes given below.

- For a quick and easy installation on site
- the pre-terminated kit contains:
  - X m (heating mat length)
  - 5 m power cable
  - Installation manual; commissioning report

Product name	Reference number	Mat size	Surface	Power output @230V	Cable resistance (Ω) Min/Max	EAN code
WINTERGARD-MAT-230V-2M	1244-022751	2 m x 0,6 m	1,2 m <sup>2</sup>	360 W	139.6/161.6	5414506024074
WINTERGARD-MAT-230V-3M	1244-022752	3 m x 0,6 m	1,8 m <sup>2</sup>	540 W	93.1/107.8	5414506024081
WINTERGARD-MAT-230V-4M	1244-022753	4 m x 0,6 m	2,4 m <sup>2</sup>	720 W	69.8/80.8	5414506024098
WINTERGARD-MAT-230V-5M	1244-022754	5 m x 0,6 m	3,0 m <sup>2</sup>	900 W	55.8/64.7	5414506024104
WINTERGARD-MAT-230V-7M	1244-022755	7 m x 0,6 m	4,2 m <sup>2</sup>	1260 W	39.9/46.2	5414506024111
WINTERGARD-MAT-230V-10M	1244-022756	10 m x 0,6 m	6,0 m <sup>2</sup>	1800 W	27.9/32.3	5414506024128
WINTERGARD-MAT-230V-13M	1244-022757	13 m x 0,6 m	7,8 m <sup>2</sup>	2340 W	21.5/24.9	5414506024135
WINTERGARD-MAT-230V-16M	1244-022758	16 m x 0,6 m	9,6 m <sup>2</sup>	2880 W	17.4/20.2	5414506024142
WINTERGARD-MAT-230V-21M	1244-022759	21 m x 0,6 m	12,6 m <sup>2</sup>	3780 W	13.3/15.4	5414506024159

### Ramp lanes and footpaths

Track heating: Determine the length of the lanes and select the closest (but smaller) size



## 7. ELECTRICAL PROTECTION

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### Maximum heating mat sizes

- According to local standard and regulations
- Residual current device (RCD) 30 mA required, max. 50 m heating mat length per RCD.
- Take into account the conductor sizes and max. permitted voltage drop.

Circuit breaker sizing (MCBS to BS EN 60898, Type C)	Max. mat length per heating circuit
10 A	10 m
16 A	16 m
20 A	21 m

## 8. NUMBER OF CIRCUITS

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$$\text{Min. number of heating circuits} = \frac{\text{Total heating mat length}}{\text{Max. mat length of heating circuit}}$$

### Selection of the mat size

- The heating mat should not be laid over expansion joints
- The heating mat should be distributed as symmetrically as possible
- Calculate the obstacle-free length and select the mat or a combination of mats with the closest, but a smaller length size

### Example 1

16 m track heating for 2 tracks = 2 x 8 m; Circuit breaker size 16 A Max:

$$\text{Min. number of heating circuits} = \frac{16 \text{ m}}{16 \text{ m}} = 1 \text{ heating circuit}$$

### Selection heating mats:

Track 1 + 2: EM2-CM-Mat-16 m

### Example 2

Circuit breaker sizes 20 A

50 m track heating for 2 tracks = 2 x 25 m

$$\text{Min. number of heating circuits} = \frac{50 \text{ m}}{21 \text{ m}} = 3 \text{ heating circuits}$$

### Selection heating mats:

Heating circuit 1 Track 1+2: 2 x WINTERGARD-MAT-4 m = 8 m

Heating circuit 2 Track 1: WINTERGARD-MAT-21 m = 21 m

Heating circuit 3 Track 2: WINTERGARD-MAT-21 m

Total: 50 m

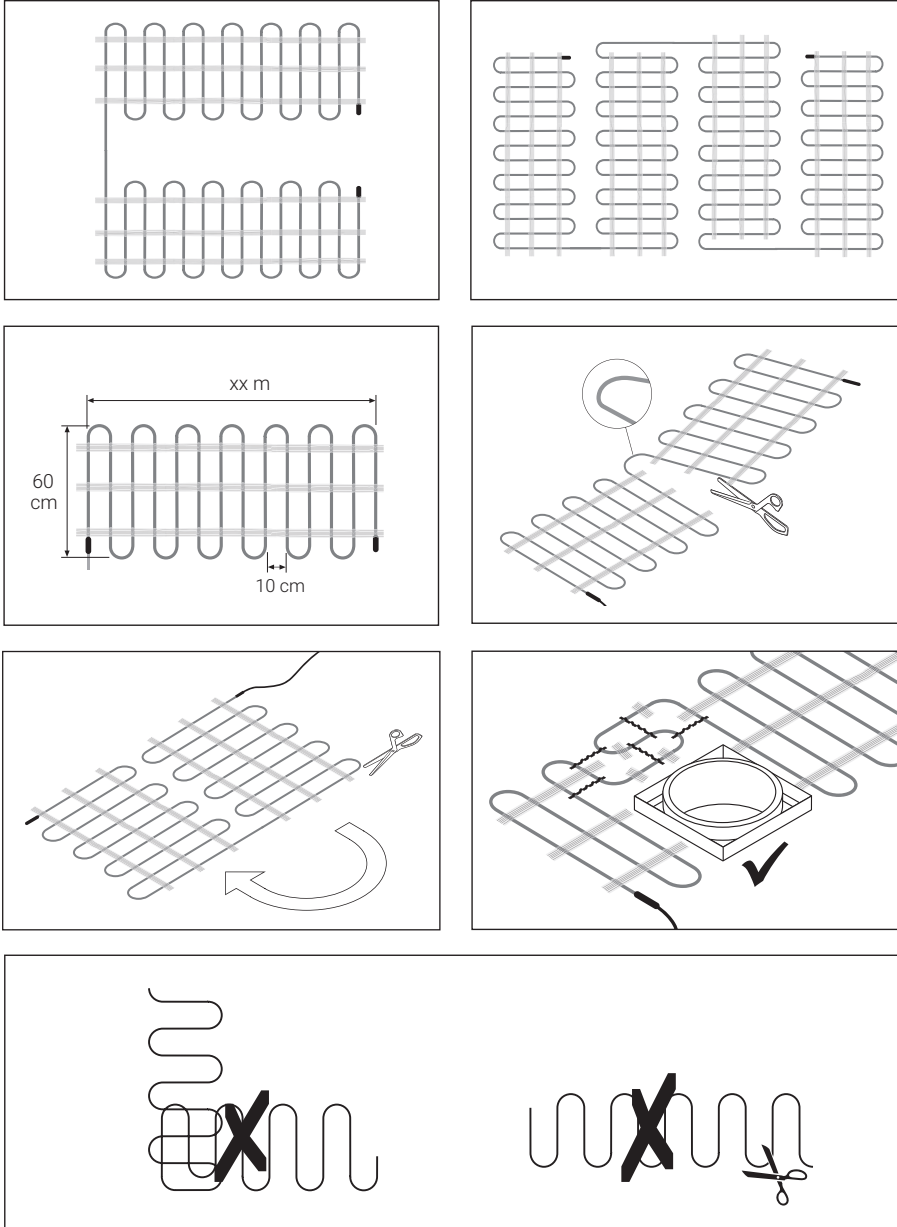
## 9. ELECTRICAL CONNECTION

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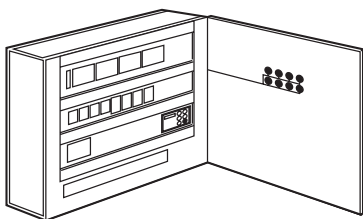
- According to local standards and electrical regulations.
- The cross-section of the power cable conductors is determined according to the nominal current of the circuit breaker and max. permitted voltage drop.

## 10. INSTALLATION

If the heating cable has to be loosened from the mat it is recommended to use the plastic spacer to keep the cable spacing consistent.



## 11. CONTROL PANELS



Steel enclosure in wall-mounted construction, equipped with master power switch. Combination(s) 30 mA / C32 A, circuit breaker(s), "On" and "Alarm" warning lights. Completely assembled, cabled ready connection and testing. Cable entry points in enclosure floor. Each cabinet is equipped with VIA-DU-20 multi-sensor controller.

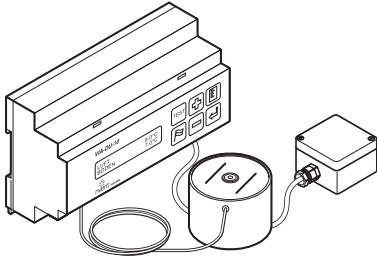
<b>SBS-03-CM-20</b>	Cabinet for 1 to 3 heating circuits (3 x 20 A)	PCN: 1244-006430
<b>SBS-06-CM-20</b>	Cabinet for 4 to 6 heating circuits (6 x 20 A)	PCN: 1244-006431
<b>SBS-09-CM-20</b>	Cabinet for 7 to 9 heating circuits (9 x 20 A)	PCN: 1244-006432
<b>SBS-12-CM-20</b>	Cabinet for 10 to 12 heating circuits (12 x 20 A)	PCN: 1244-006433

## 12. CONTROL UNITS

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The electronic control unit ensures that the surface heating only starts when the temperature falls below a certain threshold and moisture is detected on the relevant surfaces, ensuring efficient energy use.

### VIA-DU-20



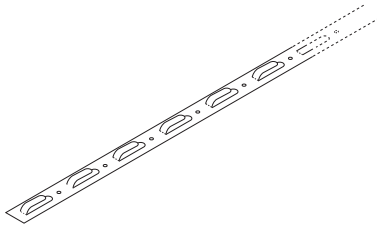
Control unit with combined moisture and temperature sensor and optional ambient temperature sensor.

- DIN-rail mounting
- Sensor cable length: 15 m
- Freezing rain precaution
- Optional BMS connection
- Alarm relay contacts

## 13. COMPONENTS AND ACCESSORIES

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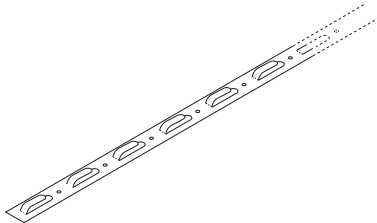
### EM-SPACER-PL



Heating cable spacer

- Length: 5 m; 25 mm grid
- Plastic (for concrete and sand bed installation)

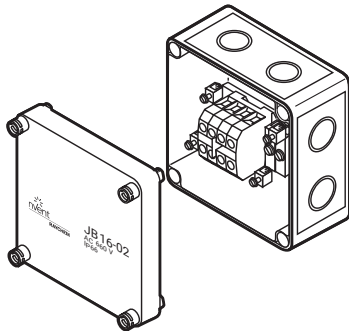
### VIA-SPACER-10M



Spacer and mounting band (10 m)

- Required for: asphalt installation
- Pre-cut metal strip

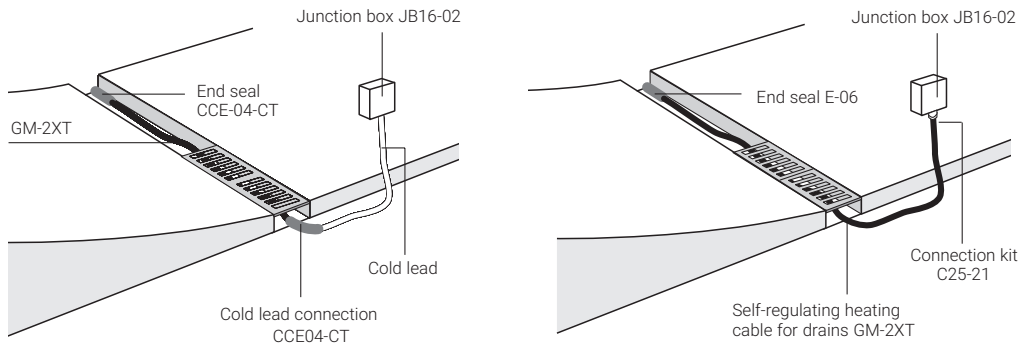
### JB16-02



Temperature-resistant junction and connection box  
Dimensions: 94 x 94 x 57 mm

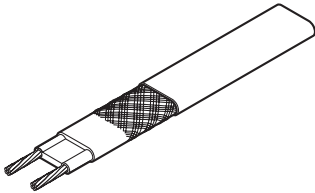
- IP66
- 6 x 4 mm<sup>2</sup> terminals
- 4 Pg 11/16 and 4 M20/25 knock-out entries

## 14. DRAIN TRACING



### GM-2XT

Drain heating cable with oil- and UV-resistant fluoropolymer outer jacket

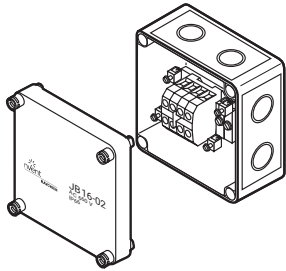


### JB16-02

Temperature-resistant junction and connection box

Dimensions: 94 x 94 x 57 mm

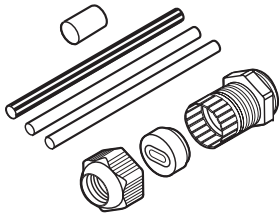
- IP66
- 6 x 4 mm<sup>2</sup> terminals
- 4 Pg 11/16 and 4 M20/25 knock-out entries



### C25-21

Connection kit for GM-2XT

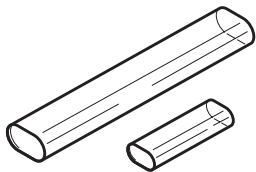
- Heat-shrink system (M25)



### E-06

End seal kit for GM-2XT

- Heat-shrink system



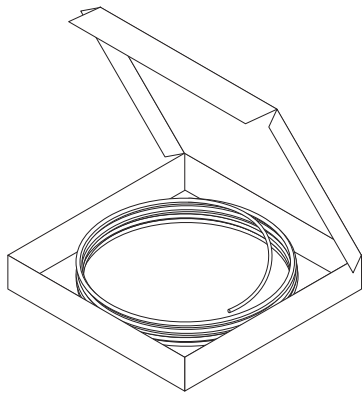
The drain heating system can be switched via the same control unit as the surface heating system.

- Max. 60 m of GM-2XT can be connected to a 16 A C-type circuit-breaker.
- Residual current device (rcd) 30 mA required.

# Polymer Solutions

## Heating WINTERGARD-CABLE

### 1. APPLICATION



WINTERGARD-CABLE is a constant wattage heating cable for simple, fast, and effective ramp and accessway heating to prevent snow and ice formation. Simply install the heater over the required area and connect the cold lead to the power junction box and "Smart" control unit.

The WINTERGARD heating cable is designed for applications where a 3 phase (400 V) supply is available.

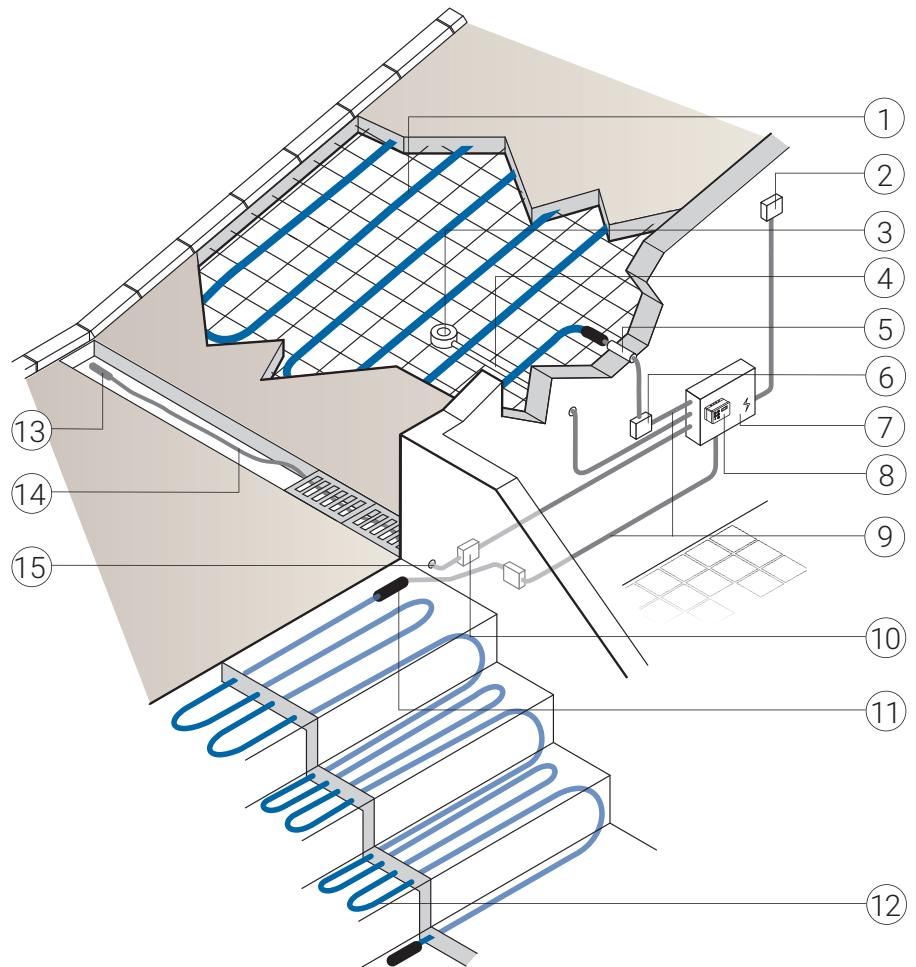
Nominal power	30 W/m
Voltage	230 VAC and 400 VAC
Maximum exposure temperature	65°C (in operation)
Rated temperature non-operation	105°C
Short-term temperature resistance	240°C (15 min; for asphalt)
Cable construction	Twin core, constant wattage heating cable. Pre-terminated with a 4 m 3 core cold lead cable.
Control unit	VIA-DU-20
Certification	CE, VDE

### 2. DETERMINE AREA TO BE HEATED - TRACK HEATING

1. Surface heating cable
2. Junction box
3. Temperature + moisture sensor
4. Sensor lead conduit
5. Power cable conduit
6. Junction box
7. Control panel
8. Smart control unit
9. Supply lead
10. Junction box
11. Power cable - heating cable connection
12. WINTERGARD heating cable

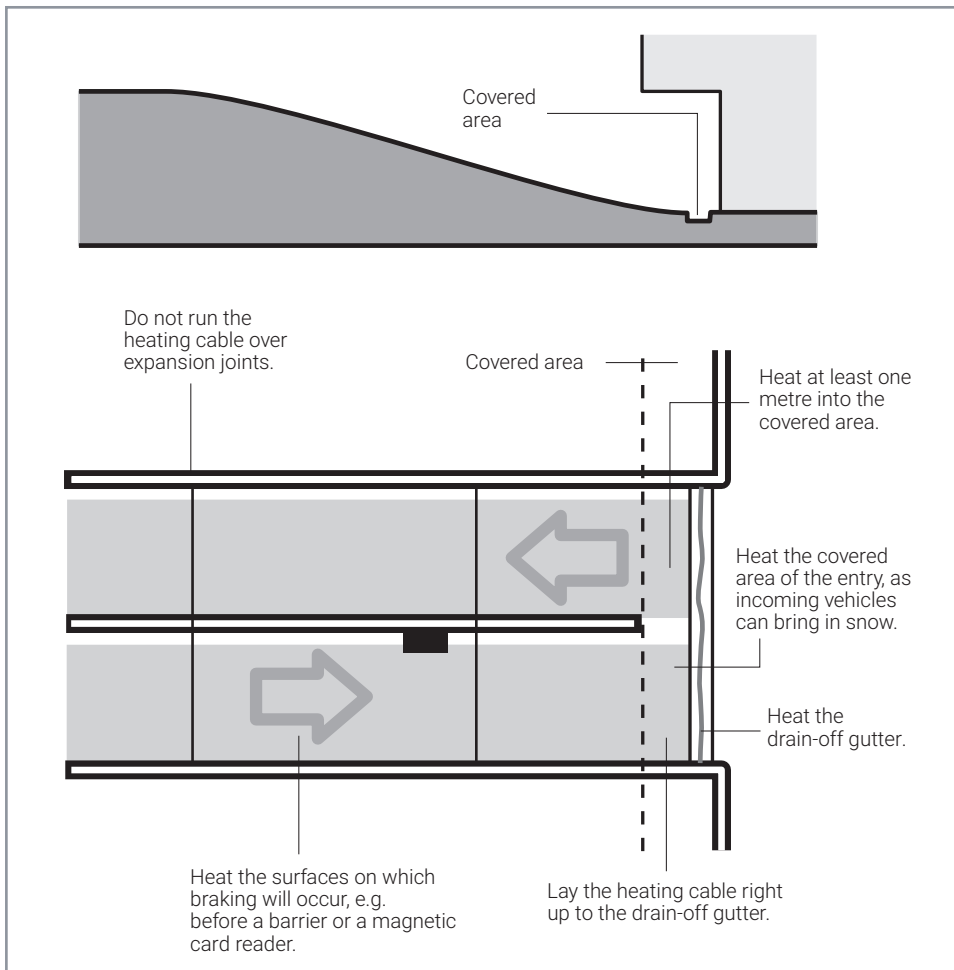
#### Drain trace heating system

13. End seal
14. GM-2XT heating cable
15. Connection kit

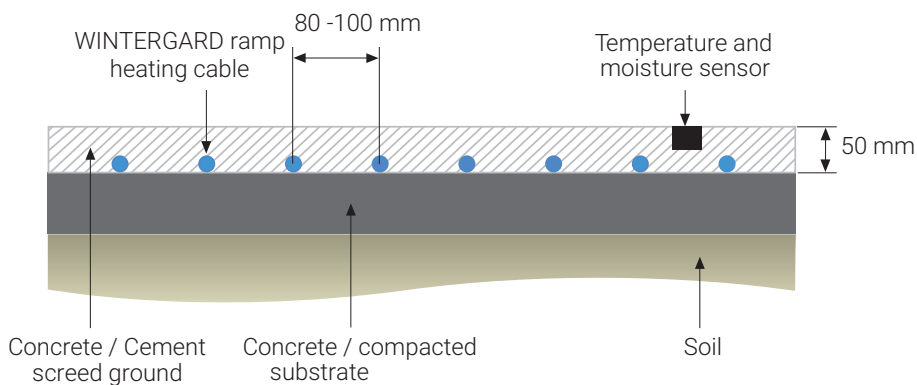


### 3. AREA TO BE HEATED

Determine the exact area to be heated, e.g. wheel tracks. Consider following factors:

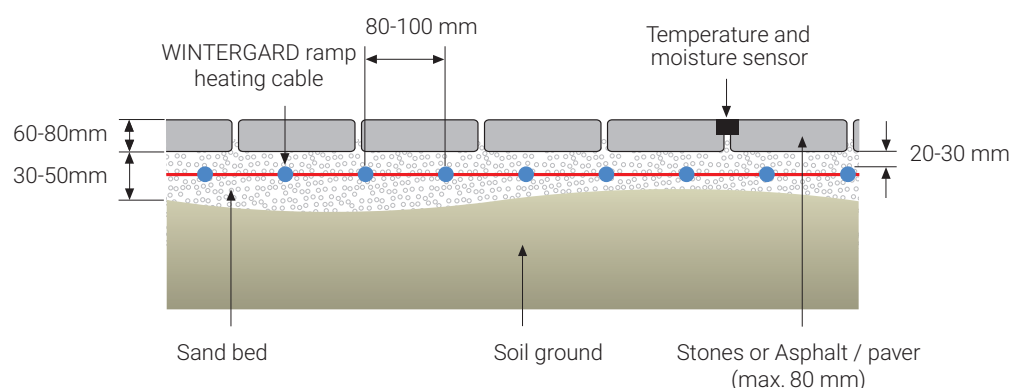


### 4. EMBEDDING IN SCREED, CONCRETE OR ASPHALT



When laying in concrete with a covering of least 25 mm

## 5. EMBEDDING IN SAND BED/PAVERS



Recommended split/gravel sizes for sand bed or cement concrete:

Round grain gravel: Ø 8-16 mm

Grit/Broken grain: Ø 4-8 mm

## 6. PACKAGING AND ORDERING REFERENCES

WINTERGARD ramp heating cable is available in the sizes given below.

- Supply voltage 230 V and 400 V
- Pre-terminated kit contains:
  - Heating cable length;
  - Cold lead length;
  - Installation manual; commissioning report.

Product name - 230 VAC	Reference number	Length (m)	Power output @230V	Cable resistance (Ω) Min/Max	Cold lead conductor	EAN code
WINTERGARD-CABLE-230V-20M	1244-022769	20	600 W	83.8/97.0	3G x 1,5 mm <sup>2</sup>	5414506024241
WINTERGARD-CABLE-230V-29M	1244-022770	29	850 W	59.1/68.5	3G x 1,5 mm <sup>2</sup>	5414506024258
WINTERGARD-CABLE-230V-38M	1244-022771	38	1100 W	45.7/52.9	3G x 1,5 mm <sup>2</sup>	5414506024265
WINTERGARD-CABLE-230V-47M	1244-022772	47	1400 W	35.9/41.6	3G x 1,5 mm <sup>2</sup>	5414506024272
WINTERGARD-CABLE-230V-57M	1244-022773	57	1700 W	29.6/34.2	3G x 1,5 mm <sup>2</sup>	5414506024289
WINTERGARD-CABLE-230V-67M	1244-022774	67	2000 W	25.1/29.1	3G x 1,5 mm <sup>2</sup>	5414506024296
WINTERGARD-CABLE-230V-75M	1244-022775	75	2250 W	22.3/25.9	3G x 1,5 mm <sup>2</sup>	5414506024302
WINTERGARD-CABLE-230V-84M	1244-022776	84	2500 W	20.1/23.3	3G x 1,5 mm <sup>2</sup>	5414506024319
WINTERGARD-CABLE-230V-94M	1244-022777	94	2800 W	17.9/20.8	3G x 1,5 mm <sup>2</sup>	5414506024326
WINTERGARD-CABLE-230V-112M	1244-022778	112	3350 W	15.0/17.4	3G x 1,5 mm <sup>2</sup>	5414506024333
WINTERGARD-CABLE-230V-134M	1244-022779	134	4000 W	12.6/14.5	3G x 2,5 mm <sup>2</sup>	5414506024340
WINTERGARD-CABLE-230V-150M	1244-022780	150	4500 W	11.2/12.9	3G x 2,5 mm <sup>2</sup>	5414506024357
WINTERGARD-CABLE-230V-168M	1244-022781	168	5000 W	10.1/11.6	3G x 2,5 mm <sup>2</sup>	5414506024364

Product name - 400 VAC	Reference number	Length (m)	Power output @400V	Cable resistance (Ω) Min/Max	Cold lead conductor	EAN code
WINTERGARD-CABLE-400V-26M	1244-022761	26	780 W	194.9/225.6	3G x 1,5 mm <sup>2</sup>	5414506024166
WINTERGARD-CABLE-400V-35M	1244-022762	35	1050 W	144.8/167.6	3G x 1,5 mm <sup>2</sup>	5414506024173
WINTERGARD-CABLE-400V-62M	1244-022763	62	1860 W	81.7/94.6	3G x 1,5 mm <sup>2</sup>	5414506024180
WINTERGARD-CABLE-400V-121M	1244-022764	121	3630 W	41.9/48.5	3G x 1,5 mm <sup>2</sup>	5414506024197
WINTERGARD-CABLE-400V-172M	1244-022765	172	5160 W	29.5/34.1	3G x 1,5 mm <sup>2</sup>	5414506024203
WINTERGARD-CABLE-400V-210M	1244-022766	210	6300 W	24.1/27.9	3G x 1,5 mm <sup>2</sup>	5414506024210
WINTERGARD-CABLE-400V-250M	1244-022767	250	7500 W	20.3/23.5	3G x 2,5 mm <sup>2</sup>	5414506024227

## 7. HEATING CABLE LENGTHS

### Tracks and footpaths

$$\text{Heating cable length (m)} = \frac{\text{Total surface to be heated (m}^2\text{)}}{\text{Heating cable spacing (m)}}$$

Calculate the obstacle-free area and select the cable or a combination of cables with a smaller length, but closest in size.

### Stairs

- Heating cable length per step =  $300 \text{ W/m}^2 / 25 \text{ W/m} \times \text{width} \times \text{length}$
- Total heating cable length = Number of steps x heating cable lengths per step + number of steps x step height

## 8. ELECTRICAL PROTECTION

WinterGard-Cable-230V					
Type - Length	Length (M)	Conductor Resistance +/-10% (Min/Max)	Rated Power (230 Vac)	Cold lead connection	Circuit Breaker (230 Vac)
WinterGard-Cable-230V-xM					
WinterGard-Cable-230V-10 m	10	167.5/194.0 Ω	300	3G x 1,5 mm <sup>2</sup>	10 A
WinterGard-Cable-230V-20 m	20	83.8/97.0 Ω	600	3G x 1,5 mm <sup>2</sup>	10 A
WinterGard-Cable-230V-29 m	29	59.1/68.5 Ω	850	3G x 1,5 mm <sup>2</sup>	10 A
WinterGard-Cable-230V-38 m	38	45.7/52.9 Ω	1100	3G x 1,5 mm <sup>2</sup>	10 A
WinterGard-Cable-230V-47 m	47	35.9/41.6 Ω	1400	3G x 1,5 mm <sup>2</sup>	10 A
WinterGard-Cable-230V-57 m	57	29.6/34.2 Ω	1700	3G x 1,5 mm <sup>2</sup>	10 A
WinterGard-Cable-230V-67 m	67	25.1/29.1 Ω	2000	3G x 1,5 mm <sup>2</sup>	10 A
WinterGard-Cable-230V-75 m	75	22.3/25.9 Ω	2250	3G x 1,5 mm <sup>2</sup>	10 A
WinterGard-Cable-230V-84 m	84	20.1/23.3 Ω	2500	3G x 1,5 mm <sup>2</sup>	16 A
WinterGard-Cable-230V-94 m	94	17.9/20.8 Ω	2800	3G x 1,5 mm <sup>2</sup>	16 A
WinterGard-Cable-230V-112 m	112	15.0/17.4 Ω	3350	3G x 1,5 mm <sup>2</sup>	16 A
WinterGard-Cable-230V-134 m	134	12.6/14.5 Ω	4000	3G x 2,5 mm <sup>2</sup>	20 A
WinterGard-Cable-230V-150 m	150	11.2/12.9 Ω	4500	3G x 2,5 mm <sup>2</sup>	20 A
WinterGard-Cable-230V-168 m	168	10.1/11.6 Ω	5000	3G x 2,5 mm <sup>2</sup>	25 A



WinterGard-Cable-400V			
Type - Length	Conductor Resistance +/-10% (Min/Max)	Rated Power (400 Vac)	Circuit Breaker
WinterGard-Cable-400V-xM			
WinterGard-Cable-400V-26 m	194.9/225.6 Ω	780 W	10 A
WinterGard-Cable-400V-35 m	144.8/167.6 Ω	1050 W	10 A
WinterGard-Cable-400V-62 m	81.7/94.6 Ω	1860 W	10 A
WinterGard-Cable-400V-121 m	41.9/48.5 Ω	3630 W	10 A
WinterGard-Cable-400V-172 m	29.5/34.1 Ω	5160 W	16 A
WinterGard-Cable-400V-210 m	24.1/27.9 Ω	6300 W	16 A
WinterGard-Cable-400V-250 m	20.3/23.5 Ω	7500 W	20 A

## 9. NUMBER OF CIRCUITS

$$\text{Min. number of heating circuits} = \frac{\text{Total heating cable length}}{\text{Max. cable length of heating circuit}}$$

### Example 1

#### 20 m<sup>2</sup> ramp with 300 W/m<sup>2</sup> output requirement

Cable Spacing = 300 W / 30 W/m = 10 m of cable per 1 m<sup>2</sup> = 100 mm cable spacing

10 meters of cable per m<sup>2</sup> means 10 x 20 m<sup>2</sup> = 200 m of cable required = 6 kW

Therefore cables required: 1 x 172 m cable

1 x 26 m cable (or optional 35 m cable)

Total cable length 198 m (or 208 m if 35 m cable option is taken)

### Example 2

#### 15 m<sup>2</sup> walkway with 300 W/m<sup>2</sup> output requirement

Cable Spacing = 300 W / 30 W/m = 10 m of cable per m<sup>2</sup> of ramp = 100 mm (approx.) cable spacing

10 m per m<sup>2</sup> means 10 x 15 m<sup>2</sup> = 150 m of cable = 4.5 kW

Therefore cables required: 1 x 121 m + 1 x 35 m = 156 m

## 10. ELECTRICAL CONNECTION

- According to local standards and electrical regulations.
- The cross-section of the power cable conductors is determined according to the nominal current of the circuit breaker and max. permitted voltage drop.

## 11. INSTALLATION

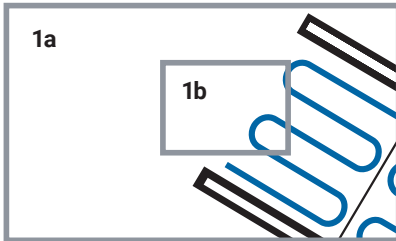
Minimum cable spacing is 8 cm. The heating cable must be secured to the underlying surface to prevent movement during the installation. The cold lead cable should be protected in a conduit. The entire length of heating cable should be covered by wet sand-cement mixture, screed, or dry sand depending on the selected top surface.

1

The heating cable should not be applied over expansion joints. Lay a separate heating circuit on either side of the expansion joint.

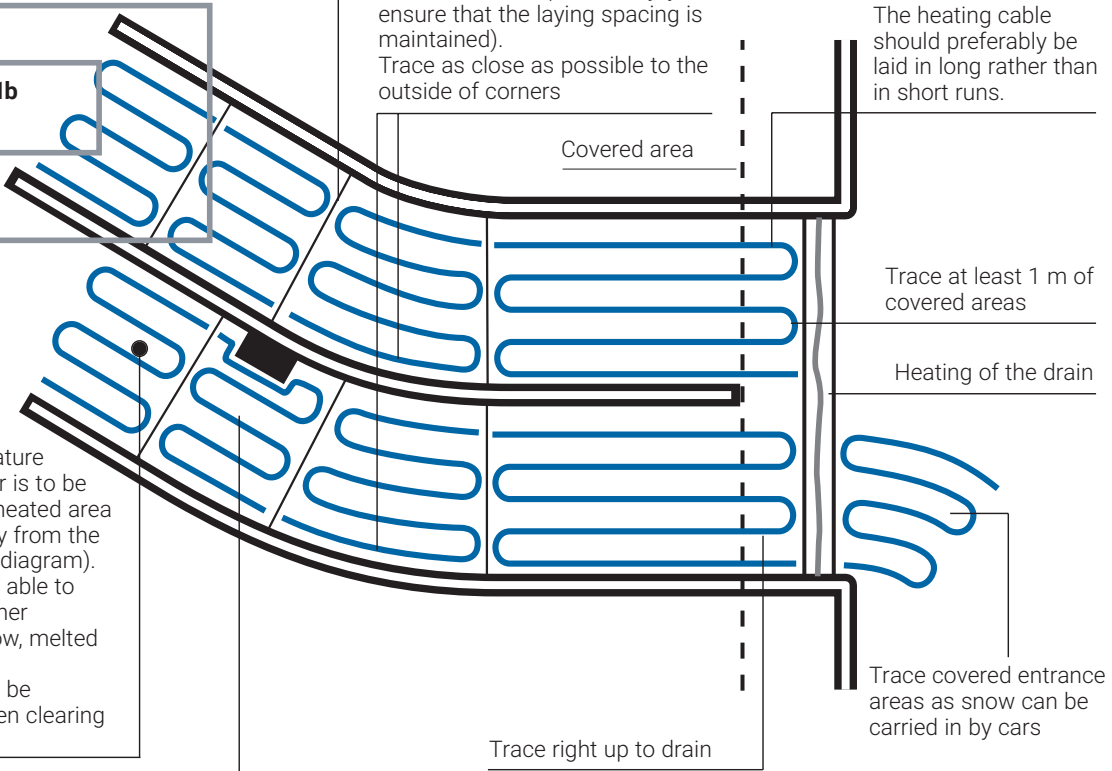
For cornered ramps, always follow the curve (in this way, you ensure that the laying spacing is maintained). Trace as close as possible to the outside of corners

The heating cable should preferably be laid in long rather than in short runs.

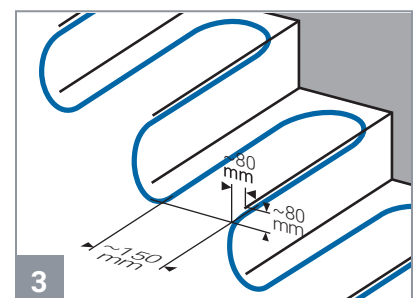
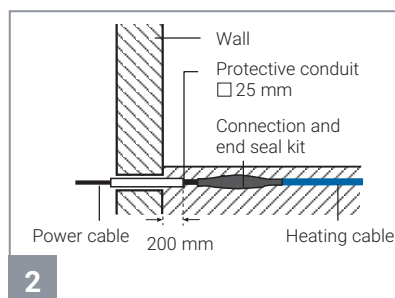
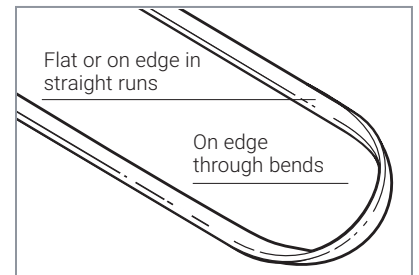
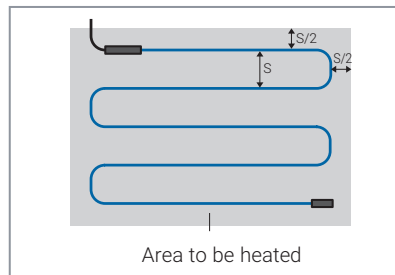


The ground temperature and moisture sensor is to be installed within the heated area at least 2.5 cm away from the heating cables (see diagram). The sensor must be able to directly detect weather conditions (rain, snow, melted snow and ice). The sensor may not be covered up (e.g. when clearing the snow).

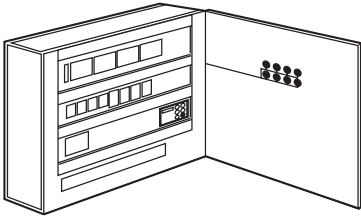
Also heat areas in which vehicles can be expected to brake (e.g in front of barriers, toll booths or magnetic card readers.)



\* Take care that VIA-DU-S20 is NOT installed in an area which is continuously flooded with water (e.g. drain line), or in an area which is continuously under ice due to external parameters (e.g. freezing of condensation water in cool room).



## 12. CONTROL PANELS



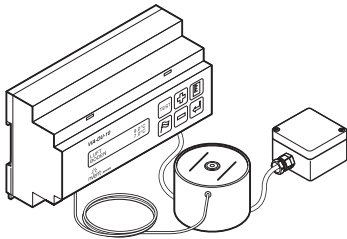
Steel enclosure in wall-mounted construction, equipped with master power switch. Combination(s) 30 mA / C20A, circuit breaker(s), "On" and "Alarm" warning lights. Completely assembled, cabled ready connected and tested. Cable entry points in enclosure floor. Each cabinet is equipped with VIA-DU-20 multi-sensor controller.

- |              |   |
|--------------|---|
| SBS-03-CM-20 | Cabinet for 1 to 3 heating circuits (3 x 20 A)    |
| SBS-06-CM-20 | Cabinet for 4 to 6 heating circuits (6 x 20 A)    |
| SBS-09-CM-20 | Cabinet for 7 to 9 heating circuits (9 x 20 A)    |
| SBS-12-CM-20 | Cabinet for 10 to 12 heating circuits (12 x 20 A) |
| SBS-15-CM-20 | Cabinet for 13 to 15 heating circuits (15 x 20 A) |
| SBS-18-CM-20 | Cabinet for 16 to 18 heating circuits (18 x 20 A) |
- For 400 VAC panels please contact our nVent technical support team

## 13. CONTROL UNITS

The electronic control unit ensures that the surface heating only starts when the temperature falls below a certain threshold and moisture is detected on the relevant surfaces, ensuring efficient energy use.

### VIA-DU-20

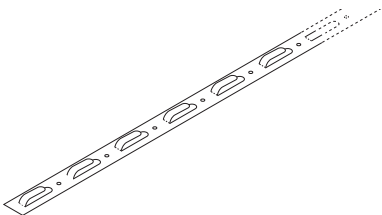


Control unit with combined moisture and temperature sensor and optional ambient temperature sensor.

- DIN-rail mounting
- Sensor cable length: 15 m
- Freezing rain precaution
- Optional BMS connection
- Alarm relay contacts

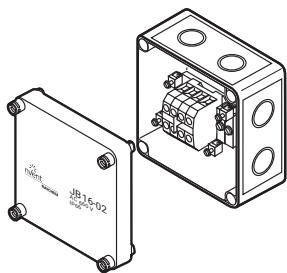
## 14. COMPONENTS AND ACCESSORIES

### VIA-SPACER-10M, VIA-SPACER-25M



- Heating cable spacer
- 2 lengths: 10 m and 25 m (2 m/m<sup>2</sup>)
  - Metal band

### JB16-02

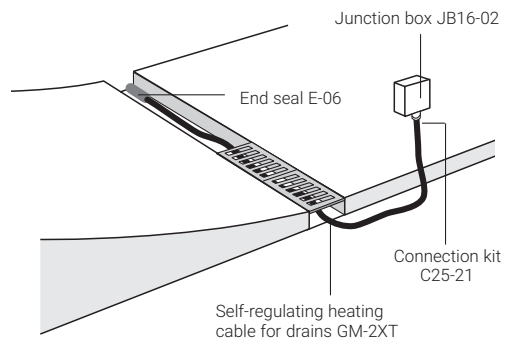
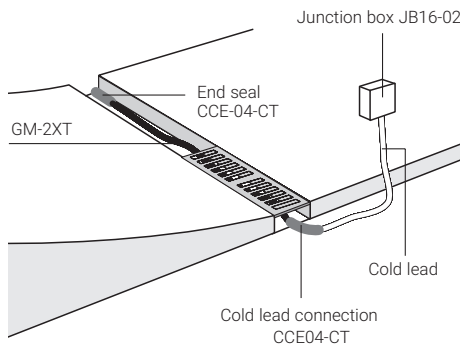


Temperature-resistant junction and connection box

Dimensions: 94 x 94 x 57 mm

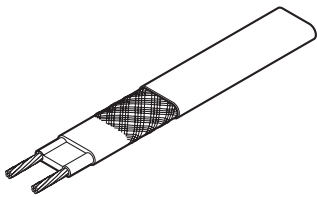
- IP66
- 6 x 4 mm<sup>2</sup> terminals
- 4 Pg 11/16 and 4 M20/25 knock-out entries

## 15. DRAIN TRACING



### GM-2XT

Drain heating cable with oil- and UV-resistant fluoropolymer outer jacket

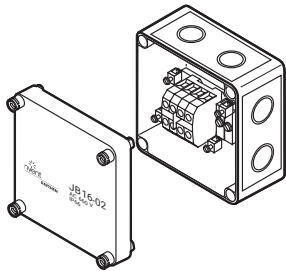


### JB16-02

Temperature-resistant junction and connection box

Dimensions: 94 x 94 x 57 mm

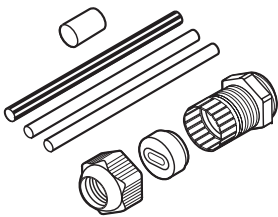
- IP66
- 6 x 4 mm<sup>2</sup> terminals
- 4 Pg 11/16 and 4 M20/25 knock-out entries



### C25-21

Connection kit for GM-2XT

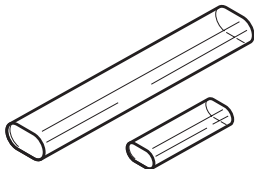
- Heat-shrink system (M25)



### E-06

End seal kit for GM-2XT

- Heat-shrink system

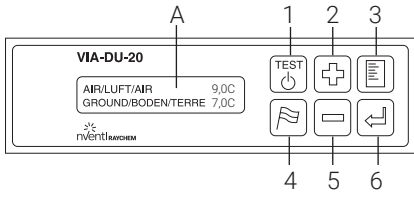


The drain heating system can be switched via the same control unit as the surface heating system.

- Max. 60 m of GM-2XT can be connected to a 16 A C-type circuit-breaker.
- Residual current device (rcd) 30 mA required.

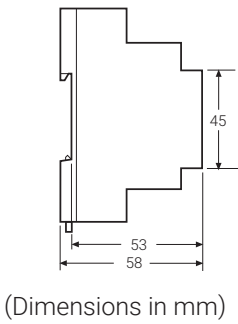
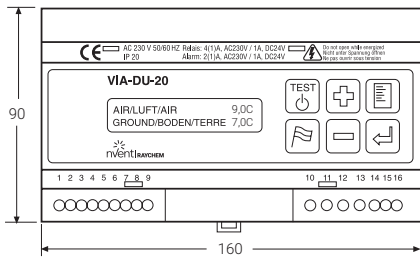
# Control Unit VIA-DU-20

## 1. LAYOUT



A. Display, illuminated (parameter and fault conditions)	
1.	Testing the device / switch on the heating output
2.	Increasing the value selected, changing settings (forwards)
3.	Selecting a menu
4.	Selecting a language
5.	Reducing the value selected, changing settings (backwards)
6.	Confirm the value selected, select the next value and responding to fault messages

## 2. TECHNICAL DATA

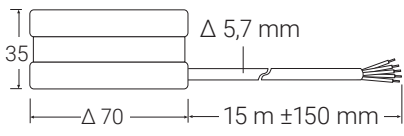


Operating voltage	230 Vac, ±10 %, 50/60 Hz
Power consumption	14 VA max.
Main relay (heating)	I <sub>max</sub> 4(1)A, 250 Vac SPST, volt free
Alarm relay	I <sub>max</sub> 2(1)A, 250 Vac SPDT, volt free
Switching accuracy	±1 K
Display	Point matrix, 2 x 16 places
Assembly	DIN rail
Housing material	Noryl
Terminals	0.5 mm <sup>2</sup> to 2.5 mm <sup>2</sup>
Protection	IP20/class II (Panel mounted)
Weight	750 g
Temperature resistance	0°C to +50°C

Main parameters	
Temperature at which device comes on	1°C to +6°C
Moisture at which device switches on	Off, 1 (moist) to 10 (very wet)
Post-heating period	30 to 120 min. (heating on)
Base temperature	Off, -15°C to -1°C
Freezing rain warning	Local detection, weather service, off
Overruling	Off, on, BMS

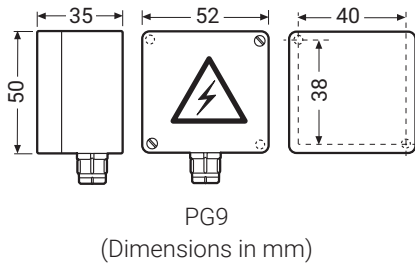
If there is a power failure, all parameters remain saved in the memory

## 3. GROUND TEMPERATURE AND MOISTURE SENSOR VIA-DU-S20



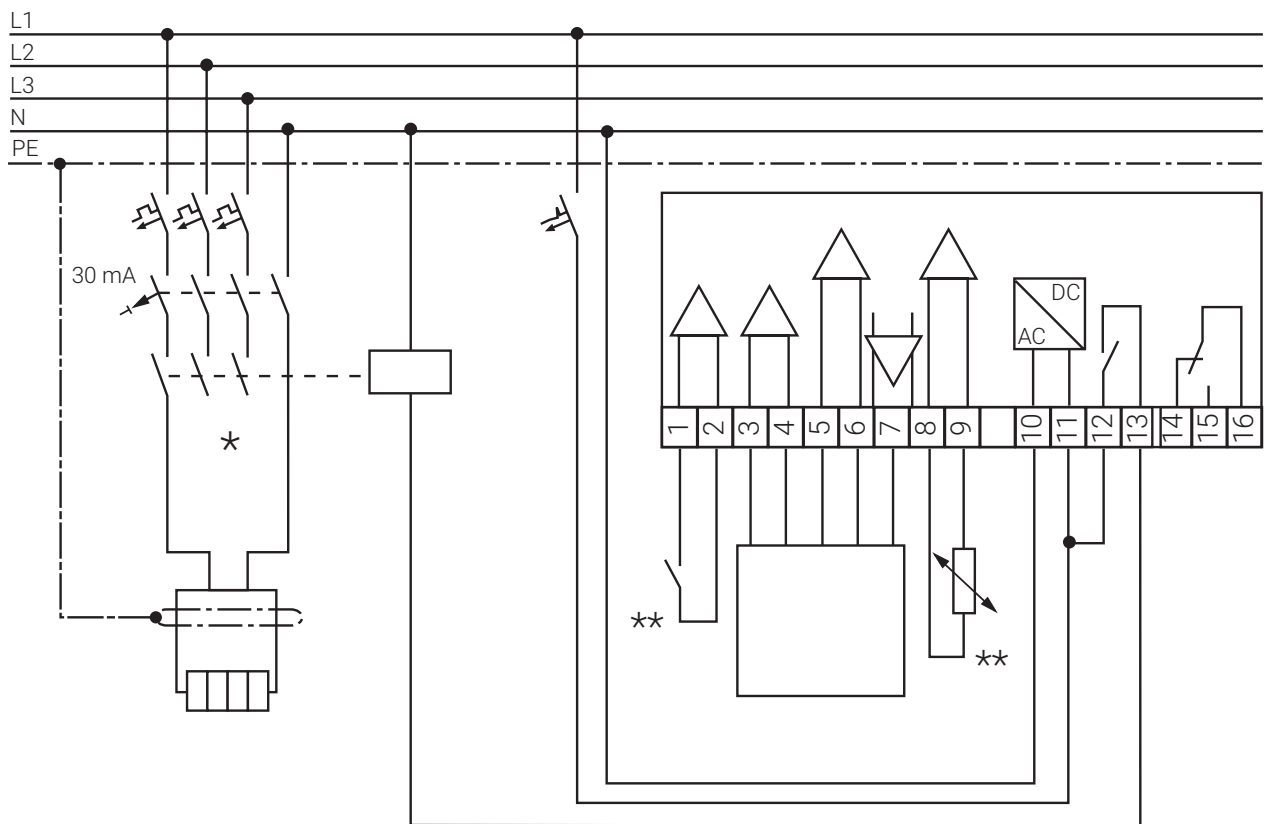
Voltage	8 Vdc (via control device)
Type of sensor	PTC
Protection	IP65
Diameter of lead	5 x 0.5 mm <sup>2</sup> , 5.7 mm diameter.
Length of lead	15 m, can be extended to 50 m (5 x 1.5 mm <sup>2</sup> )
Temperature resistance	-30°C to +80°C

#### 4. AMBIENT TEMPERATURE SENSOR\* VIA-DU-A10



Sensor type	PTC
Ingress protection	IP54
Terminals	1.5 to 2.5 mm <sup>2</sup>
Sensor cable	2 x 1.5 mm <sup>2</sup> , max. 100 m (not included)
Exposure temperature	-30°C to +80°C
Mounting	Wall mounting
* Installation not mandatory if "Sleet precaution" is not set to "Auto".	

#### 5. VIA-DU-20 WITH CONTACTOR



\* Local values, standards and rules require two- or four-pole switching using a electrical protection

\*\* Depending on the application, both one- and three-pole circuit breakers of contactors are possible.

\*\*\* Optional and can be activated in a BMS.

Air temperature sensor will be needed only if in menu sleet precaution the parameter "local detection" has been selected. When weather forecast has been selected you have to connect the volt free contacts of additional device to these terminals.

# Control Panels SBS-XX-VV-20

## 1. DESCRIPTION



The SBS-XX-VV-20 control panel for ice and snow prevention systems provides a totally integrated electrical safety, connection and control solution for nVent RAYCHEM EM2-XR self regulating heating in reinforced concrete surfaces.

The control panel comprises the VIA-DU-20 multi-sensor control unit for energy-efficient ground surface heating, and integrated electrical safety devices. The SBS-xx-VV-20 panels can switch up to 12 maximum circuits of EM2-XR.

The panel also includes electrical circuit protection devices (C-type circuit breakers) and residual current devices for safety and peace of mind. The panels need only be connected to the 400 Vac (3 phase) supply.

## 2. ADVANTAGES

Fast connection of multiple circuits directly into the control panel

- No need for additional connections terminals.

3-12 maximum circuit lengths can be connected and switched by a single panel.

Circuit protection and safety devices integrated into the panel.

- No need for separate safety devices.

Complete system from the manufacturer

- System and components specifically selected for high performance ice and snow prevention system control.

## 3. TECHNICAL DATA

Control	VIA-DU-20 multi-sensor control unit
Power	230 Vac 50/60 Hz
Set temp.	Variable at first set-up
Sensor	Ground temperature, moisture, and ambient temperature sensors
Approval	CE (Approved to IEC 60204-1 and IEC60439-1)
Supply	Dependent on selected panel (63 A-160 A)
RCD	30 mA
Line Circuit breakers	32 A (Type C) per 3 heater circuit group
Approvals	CE marked

## 4. RELATED PRODUCTS

The SBS-xx-VV-20 control panel is compatible with the nVent RAYCHEM pipe frost protection cables:

EM2-XR Self-regulating heater cable (90W/m @ 0°C.)

GM-2XT (For drain line heating.)\*

\* The SBS-XX-VV-20 panel includes an additional circuit connection for drain wire heating capabilities at the edge of heated surfaces or at the lower end of ramps using GM-2XT heating cable. (Maximum drain line circuit length of 15 m.)

# Control Panels SBS-XX-CM-20

## 1. DESCRIPTION

---



The SBS-XX-CM-20 control panel for ice and snow prevention systems provides a totally integrated electrical safety, connection and control solution for nVent RAYCHEM WINTERGARD constant wattage heating mats and cable (230 VAC) for surface snow melting applications. The control panel comprises the VIA-DU-20 multi-sensor control unit for energy efficient ground surface heating, and integrated electrical safety devices. The SBS-xx-CM-20 panels can switch up to 18 maximum circuits of WINTERGARD mats and WINTERGARD cable 230 V. The panel also includes electrical circuit protection devices (C-type circuit breakers) and residual current devices for safety and peace of mind. The panels need only be connected to the 400 Vac (3 phase) supply.

## 2. ADVANTAGES

---

Fast connection of multiple circuits directly into the control panel

- No need for additional connections terminals.

3-18 maximum circuit lengths can be connected and switched by a single panel.

Circuit protection and safety devices integrated into the panel.

- No need for separate safety devices.

Complete system from the manufacturer

- System and components specifically selected for high performance ice and snow prevention system control.

## 3. TECHNICAL DATA

---

Control	VIA-DU-20 multi-sensor control unit
Power	230 Vac 50/60 Hz
Set temp.	Variable at first set-up
Sensor	Ground temperature, moisture, and ambient temperature sensors
Approval	CE (Approved to IEC 60204-1 and IEC60439-1)
Supply	Dependent on selected panel (32 A-125 A)
RCD	30 mA
Line Circuit breakers	20 A (Type C) per 3 heater circuit group
Approvals	CE marked

## 4. RELATED PRODUCTS

---

The SBS-xx-CM-20 control panel is compatible with the nVent RAYCHEM WINTERGRAD-MAT and WINTERGARD-CABLE 230 VAC

- (300 W/m<sup>2</sup>)

GM-2XT (For drain line heating.)\*

\* The SBS-XX-CM-20 panel includes an additional circuit connection for drain wire heating capabilities at the edge of heated surfaces or at the lower end of ramps using GM-2XT heating cable. (Maximum drain line circuit length of 15 m.)



# Control Panels SBS-XX-CW-40

## 1. DESCRIPTION

---



The SBS-XX-CW-40 control panel for ice and snow prevention systems provides a totally integrated electrical safety, connection and control solution for nVent RAYCHEM WINTERGARD 400 VAC cable constant wattage heating cables for surface snow melting applications. The control panel comprises the VIA-DU-20 multi-sensor control unit for energy efficient ground surface heating, and integrated electrical safety devices. The SBS-xx-CW-40 panels can switch up to 18 maximum circuits of WINTERGARD 400 VAC cables. The panel also includes electrical circuit protection devices (C-type circuit breakers) and residual current devices for safety and peace of mind. The panels need only be connected to the 400 Vac (3 phase) supply.

## 2. ADVANTAGES

---

Fast connection of multiple circuits directly into the control panel

- No need for additional connections terminals.

3-18 maximum circuit lengths can be connected and switched by a single panel.

Circuit protection and safety devices integrated into the panel.

- No need for separate safety devices.

Complete system from the manufacturer

- System and components specifically selected for high performance ice and snow prevention system control.

## 3. TECHNICAL DATA

---

Control	VIA-DU-20 multi-sensor control unit
Power	400 Vac
Set temp.	Variable at first set-up
Sensor	Ground temperature, moisture, and ambient temperature sensors
Approval	CE (Approved to IEC 60204-1 and IEC60439-1)
Supply	Dependent on selected panel (32 A-250 A)
RCD	30 mA
Line Circuit breakers	20 A (Type C) per 3 heater circuit group
Approvals	CE marked

## 4. RELATED PRODUCTS

---

The SBS-xx-CW-40 control panel is compatible with the nVent RAYCHEM WINTERGARD-CABLE 400 VAC heating cables:

- (30 W/m)

GM-2XT (For drain line heating.)\*

\* The SBS-XX-CW-40 panel includes an additional circuit connection for drain wire heating capabilities at the edge of heated surfaces or at the lower end of ramps using GM-2XT heating cable. (Maximum drain line circuit length of 15 m.)

# Control Panels SBS-XX-MV-20

## 1. DESCRIPTION

---



The SBS-XX-MV-20 control panel for ice and snow prevention systems provides a totally integrated electrical safety, connection and control solution for nVent RAYCHEM EM2-MI Mineral Insulated heating for surface snow melting applications. The control panel comprises the VIA-DU-20 multi-sensor control unit for energy efficient ground surface heating, and integrated electrical safety devices. The SBS-xx-MV-20 panels can switch up to 18 maximum circuits of EM2-MI. The panel also includes electrical circuit protection devices (C-type circuit breakers) and residual current devices for safety and peace of mind. The panels need only be connected to the 400 Vac (3 phase) supply.

## 2. ADVANTAGES

---

Fast connection of multiple circuits directly into the control panel

- No need for additional connections terminals.

3-18 maximum circuit lengths can be connected and switched by a single panel.

Circuit protection and safety devices integrated into the panel.

- No need for separate safety devices.

Complete system from the manufacturer

- System and components specifically selected for high performance ice and snow prevention system control.

## 3. TECHNICAL DATA

---

Control	VIA-DU-20 multi-sensor control unit
Power	230 Vac 50/60 Hz
Set temp.	Variable at first set-up
Sensor	Ground temperature, moisture, and ambient temperature sensors
Approval	CE (Approved to IEC 60204-1 and IEC60439-1)
Supply	Dependent on selected panel (32 A-125 A)
RCD	300 mA
Line Circuit breakers	20 A (Type C) per 3 heater circuit group
Approvals	CE marked

## 4. RELATED PRODUCTS

---

The SBS-xx-MV-20 control panel is compatible with the nVent RAYCHEM EM2-MI cables:

EM2-MI Mineral-insulated heater cable

- (50 W/m)

GM-2XT (For drain line heating.)\*

\* The SBS-XX-MV-20 panel includes an additional circuit connection for drain wire heating capabilities at the edge of heated surfaces or at the lower end of ramps using GM-2XT heating cable. (Maximum drain line circuit length of 15 m.)

# Product Selection

## PRODUCT FEATURES & SELECTION GUIDE

Product Features	EM2-XR	EM2-MI	WINTERGARD-MAT	WINTERGARD-CABLE
				
Product Description	Self-regulating heating cable	Mineral Insulated constant wattage heating cable	Constant wattage polymeric pre-terminated ramp heating mat system	Constant wattage polymeric pre-terminated heating cable system
Features	Extremely robust self-regulating heating cable for flexible installation under severe site conditions.	Pre-terminated heating cable with exceptional resistance to high temperature asphalt surfaces.	Pre-terminated ramp, walkway, and track heating (roll-out) mat for fast and simple installation.	Pre-terminated constant power heating cable for larger areas & 230 V and 400 V power supplies.
Voltage Rating	230 Vac	230 Vac	230 Vac	230 Vac or 400 Vac
Nominal power output	90 W/m @ 0°C.	50 W/m	300 W/m <sup>2</sup>	30 W/m
Maximum circuit length	85 m	136 m	12.6 m <sup>2</sup> (Mat size = 21 m x 0,60 m)	250 m
Maximum exposure temperature	100°C	250°C	65°C in operation; 105°C rated non-operation, short-term: 240°C (15 min)	65°C; in operation; 105°C rated non-operation, short-term: 240°C (15 min)
Connections & termination	Cut-to-length system for flexible field termination (using nVent RAYCHEM heat-shrink components). Pre-terminated cable lengths (fixed or configured) available. Contact us.	Factory pre-terminated	Factory pre-terminated	Factory pre-terminated
Compatible Controller / Control Panel	SBS-xx-VV-20/ACS-30	SBS-xx-MV-20/ACS-30	SBS-xx-CM-20/ACS-30	SBS-xx-CM-20 (230 Vac); SBS-xx-CW-40 (400 Vac)
Approvals	VDE / CE	VDE / CE	CE	CE
Suitable for installation on reinforcement bar	Highly recommended	Recommended	Not applicable	Recommended
Suitable for installation in direct contact with hot poured asphalt	Not applicable	Highly recommended	Recommended	Recommended
Suitable for embedding in sand sub-level	Recommended	Recommended	Highly recommended	Highly recommended
Cold lead included	When ordered as a pre-configured heating unit. See Page 10 for more information.	3 m (at each end of heater cable)	5 m	5 m
Dual Wire / Single Wire construction	Dual	Single	Dual	Dual

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