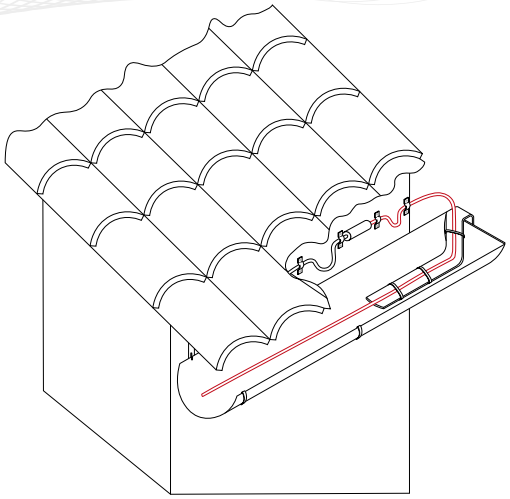
INSTALLATION MANUAL



ELSR

Installation and operation
Gutter heating

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QAA 068
Rev.04

CONTENTS

IMPORTANT INFORMATION

- RETAIN FOR LATER USE

Please follow these instructions for proper and safe use of the ELSR- heating cables.

Please retain these instructions for later reference purposes (for example in the system documentation).

- FOR DISPOSAL

The WEEE logo indicates that this product must not be disposed of with residential waste.

Further information about disposal and recycling of old electrical and electronic devices and where to find collection points is available from your local disposal company or from the manufacturer from which you bought the product.

ATTENTION

Refers to a potentially dangerous situation.
If it is not prevented, there is a risk of damage or malfunction.

DANGER

Refers to an extremely dangerous situation. If it is not prevented there is risk of death or at least a high risk of serious injuries.

NOTE

Important information and instructions for safe, effective and environmentally compatible usage.

WARNING

Refers to a dangerous situation. If it is not prevented there is risk of injury or at least a high risk of material damage.

Proviso
We reserve the right to make technical changes. Changes, errors or misprints shall not form the basis for any claim to compensation for damages. Comply with the applicable and currently valid standards and regulations for safety-related components and systems.

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Author:	Peter Schmidt	Date:	26.07.2006
Revision: **04**	Jonas Schmidt	Date:	18.06.2024

INTRODUCTION

GENERAL INFORMATION

The ELSR self-regulating heating cables are characterised by their particularly efficient design and offer an ideal solution for the reliable frost protection of various outdoor installations such as gutters, downpipes and similar components. Thanks to their intelligent self-regulation, these heating cables automatically adapt to the weather conditions, ensuring effective and energy-efficient heating. This makes them a reliable option for ensuring consistent functionality and lonevity in outdoor areas.

WARRANTY

ATTENTION

To fulfil the conditions of warranty, the instructions from the respective product manuals must be followed.
This manual only provides Information about general and standard installation methods and accordingly no claim to warranty can be derived from it.

INCOMING GOODS

- Compare the delivered goods with the order and the delivery note.
- Inspect the heating cable and the components for transport damage.
- Carry out all necessary measurements for the respective materials (e.g. insulation measurement on the heating cable).

ATTENTION

Ensure that the data sheet for the supplied heating cable is available in addition to these instructions. The information in the data sheet is required for safe installation. Installation must therefore not be carried out without the data sheet.

STORAGE

- The goods have to be stored in a dry enviroment at an ambient temperature of -20...+60 °C.
- If measured lengths of the heating cable have to be removed from storage, the end of the remaining heating cable must be protected effectively against penetration of moisture (for example by attaching an original end connection of the heating cable manufacturer.
- Make certain the goods are stored so they will be protected against mechanical damage.
- While the goods are in storage, avoid contact with chemicals (solvents, petrochemical products, etc).

LENGTH OF HEATING CIRCUIT

The maximum permissible heating circuit length must be designed on the basic of the data sheet for the type of heating cable supplied. It is based on the specified voltage drop (recommended: max. 10%) and the specified utilisation of the fuse (recommended 16 A automatic circuit breaker with C characteristic, 80% utilisation). For use in gutters, the maximum heating circuit lengths must be reduced to 3/4 of the specified value.

MOUNTING

SAFETY INSTRUCTIONS

ATTENTION

- The following steps should only be carried out by persons trained in handling electrical equipment.
- Compliance with the relevant standards and safety regulations is a prerequisite for the safety of persons, systems and devices.
- The persons entrusted with planning, installation and maintenance bear a special responsibility and must therefore be thorougly familiar with the applicable regulations.
- The instructions must be kept with the system documentation for later use (maintenance, servicing).

DANGER

- Before installation, maintenance and assembly work, the relevant heating circuits or system parts must be de-energised!
- The metallic sheathing of the heating cable (Protective braiding or foil shield with embedded protective conductor) must be connected to protective conductor potential.
- Improper installation or damage to the electrical trace heating can lead to a short circuit and fire hazard during operation.
- To ensure safe and fault-free operation of the eltherm electric trace heating system, only the original connection and end termination sets specially developed and tested for this purpose may be used.
- The supply conductors of the heating cable must not be connected to each other, as this will result in a short circuit. It is essential to follow the assembly instrucions enclosed with the connection set.

- When using the ELSR heating cable, the requirements of the DIN VDE 011 series standards and any locally applicable regulations must be observed. In industrial areas, DIN VDE 0721 Part 1, DIN VDE 0721 Part 2A3 and the applicable health and safety regulations must also be observed.
- When designing and installing a heating circuit, all locally applicable regulations must be observed in addition to the EN 60519-10 and EN 62395-2 standards.
- Heaters and sensors must be installed at the intended points on the guttering to prevent overheating of the devices and inadequate temperature maintenance. Ensure that the sensors are correctly installed.
- In accordance with EN 62395-1 or EN 60079-30-1 and 60519-10, an RCD (30 mA) is required for each circuit.
- Metal gutters, snow guards, etc. must be earthed.

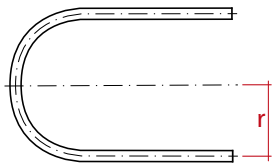
PREPARATION OF MOUNTING

- Do not use adhesive tapes containing plasticisers (e.g. PVC) to secure the heating cable.
- The minimum bending radii and installation temperatures must be observed in accordance with the data sheet.
- Due to the characteristics of the self-regulating heating cables, there is no overheating if the heating cables are installed overlapping or touching.
- The installation of a heating circuit should be carried out in accordance with the following diagrams, using original eltherm accessories.
- Ensure that all installation work on the gutter system to be heated has been completed.
- All coating and painting work on the gutters must be completed. The colour coating of the gutter must be dry to the touch.
- Check the conditions of the gutter surface. It must be free of sharp edges and burrs that could damage the heating cable during installation. If necessary, remove these or, if not, cover them with suitable material.
- Compare the design of gutter (dimensions, structure, type and number of fixtures) with the design data.
- Check all material required for heating for completeness and possible transport damage.
- Compare the material list of the supplied components with the design documents.
- Check whether special installation instructions are available and whether all necessary materials and tools are available.
- Measure and record the electrical resistance and insulation resistance of the heating cable in the installation logs provided. Compare the values with the data in the design documents and technical specifications of the heating cables.

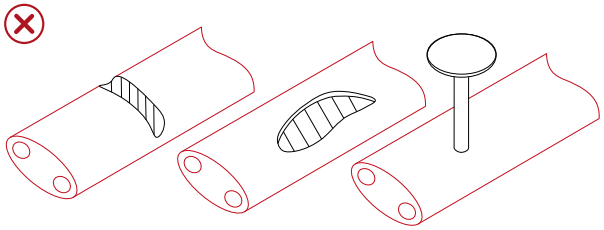
MOUNTING THE HEATING CABLE

⚠ WARNING

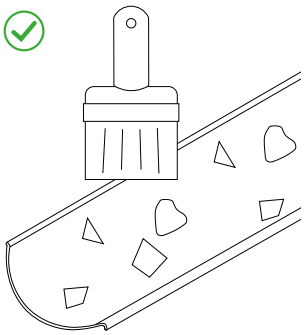
- Do not crush the heating cable or pull it over sharp edges.
- Avoid stepping on or driving over the heating cable at all costs.
- Never use the heating cable as a step loop.
- Keep to the lenghts specified in the project planning for the fixtures.
- The installation must be carried out on the intended system components at the positions specified by the planner in order to prevent system components from overheating and the desired holding temperatures from not being reached.
- The specified minimum bending radius must be observed and adhered to.



- Check all heating cables and their associated components for external damage and electrical defects.
- Damaged and defective heating cables must not be put into operation and must be replaced completely.



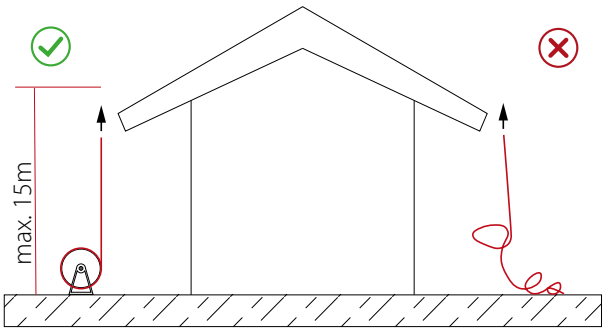
- Remove all uneveness, such as sharp burrs or similiar, from the surface to be heated and clean the gutter completely of grease, oil, chemicals and other contaminants that could damage the heating cable.



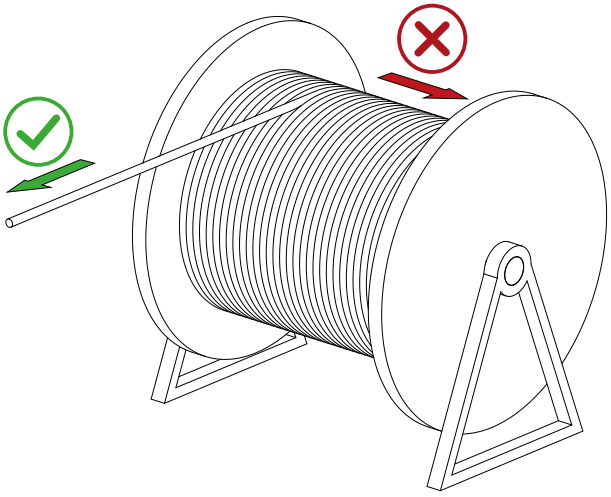
- Mark the installation distances required according to the projection on the surface to be heated.

Unrolling the heating cable

- Use a stable unwinding device to unwind the heating cable.
- Do not exceed the maximum unwinding heigh of 15 metres.

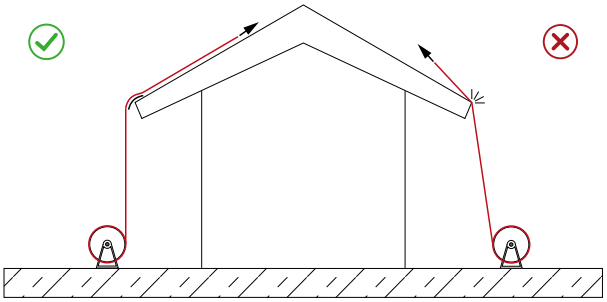


- Ensure that the unwinding device runs smoothly to prevent damage to the heating cable due to excessive tensile force.
- Unwind the heating cable straight and not sideways over the edge of drum.

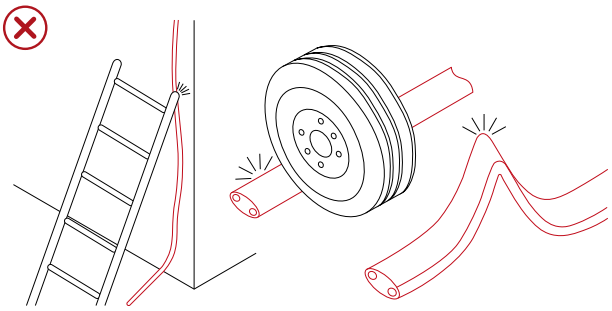


Laying the heating cable

- When laying the heating cable, ensure that it is not pulled over sharp edges. If necessary, use edge protection.



- When laying the heating cable, avoid kinking and crushing the heating cables. This can lead to an electrical defect in the heating cables.

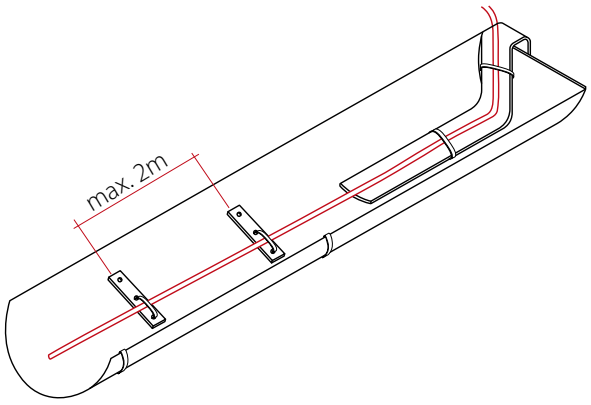


ATTENTION

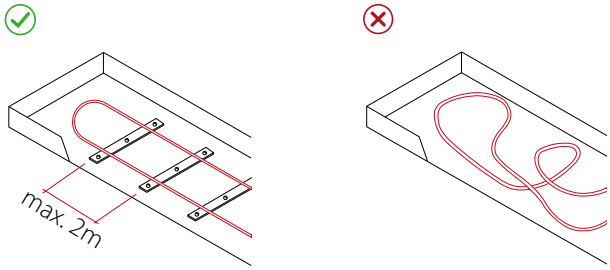
When routing the heating cables, a sufficent distance from hot parts of the building (chimney, pipework, etc.) must be contained so that the maximum permissible ambient temperature of the heating cable is not exceeded.

Fastening the heating cable to gutters

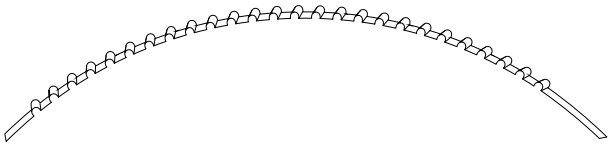
- Lay the ELSR heating cable straight and flat in the gutter.
- Fix the heating cable with installation profiles every 2000 mm at most. The heating cables must not loose in the gutter.



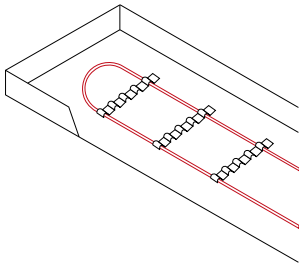
- For channel widths > 200 mm, special geometries and exposed positions, lay the heating cable several times.
- Always observe the project planning.
- Please contact the eltherm project office if you have specific questions about installations or design.



- In the case of multiple installations, a PE installation profile can be used as a spacer. Fastening to the heating cable using cable ties



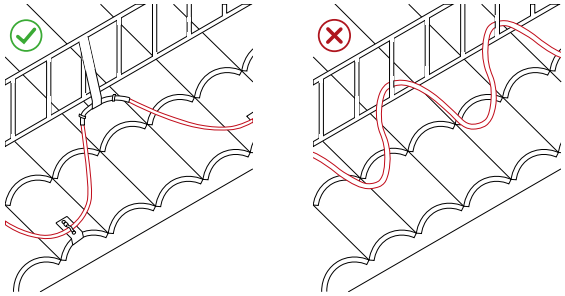
Picture: ELB-22 - PE installation profile



- Further accessories for the installation of ELSR heating cables can be found in the „Accessories“ section.
- For the frost protection of gutters and their attachments suitable temperature controllers can be found in the section „Temperature controller“

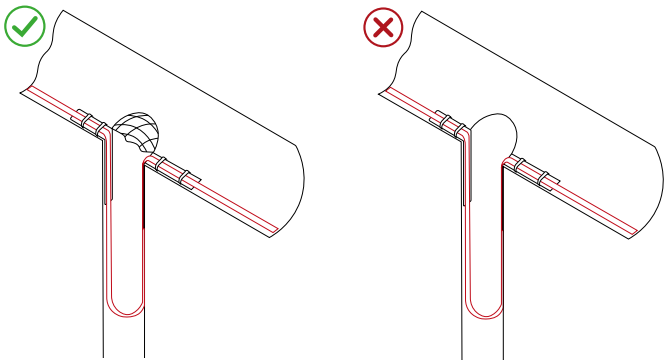
Fastening the heating cable to snow guards

- When heating snow guards and their surrounding roof surfaces, an installation profile must be used to fix them in place and avoid sharp bends.
- Heating cables must not be attached directly to the snow guard!

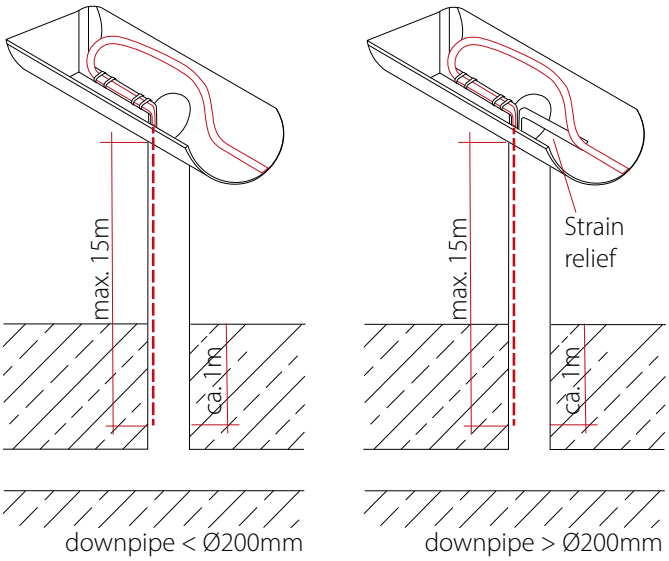


Fastening the heating cable to downpipes

- When heating downpipes using a heating cable loop, a dirt trap must be placed on the downpipe.
- Install the heating cable on a 90 °C installation profile to ensure the minimum bending radii.

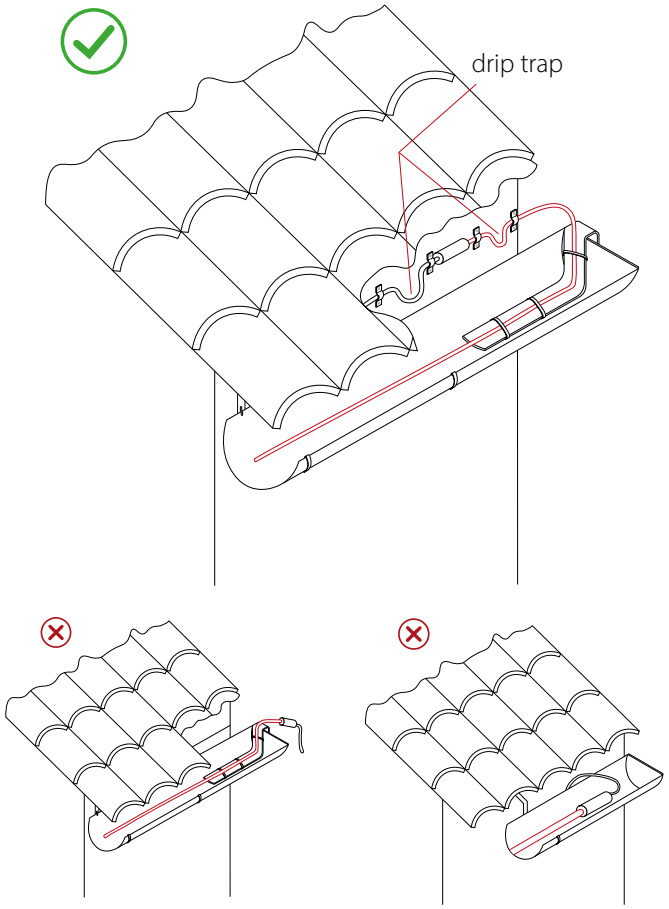


- When heating downpipes using a heating cable stub, the diameter of the downpipe must be taken into account.
- For downpipes < Ø200 mm, a 90° installation profile ist required to ensure the minimum beding radius of the heating cable.
- For downpipes > Ø200 mm, a second 90° installation profile ist required as a strain relief.
- The heating cables may be laid in the downpipe to a maximum depth of 15 m and approx. 1 m underground.



Connection of the heating cable

- The connection of the heating cable must be outside the gutter and protected.
- The connection must be secured against pressure, tensile and shear loads.
- If the connection box is located below the heating cable or the connection box, a drip trap must be installed.



ATTENTION

The connetion and terminations may only be made under dry ambient conditions. If works is interrupted for a longer period of time, unfinished connections and end terminations must be protected against the ingress of moisture!

NOTE

The use of higher-level control devices (frost protection thermostat with or without precipation detection) is recommended to ensure that the heating cable is only operated at correspondingly low ambient temperatures. Usually the required sensors should be located at the coldest point of the building or the point most exposed to precipitation. If you have any questions about effective heating control, please contact our project department.

Attach type plate

- After completion of the heating circuit, a weather-resistant, permanently legible labelling plate with all relevant system information must be attached to the junction box or the connection line directly at the entry to the junction box.

INSPECTION OF THE HEATING CIRCUIT

- Carry out a visual inspection for any mechanical damage and check compliance with the installation guidelines.
- Check whether a heating circuit type plate is attached. The information it contains must be legible.
- Check the insulation resistance.
  - The insulation resistance must be measured and recorded between each individual supply conductor and the metal sheathing (protective braid/sleeve).
- Check the heating circuit function.
  - The heating cable temperature must be specifically monitored to prevent the heating cable from overheating.

ATTENTION

- Test voltage min. 500 VDC, recommended 2500 VDC.
- Irrespective of the heating circuit length, the insulation resistance must not fall below 20 MOhm. If the insulation resistance is lower, the cause of the fault must be determined and rectified.
- Any damage that has occured must be repaired immediately. For short heating circuits by replacing the heating cable and for longer heating circuit lengths by cutting out the damaged area and inserting a new heating cable section (see assembly instructions for connection set).
- The tests must be repeated after thermal insulation has been completed.

OPERATION & MAINTENANCE

NOTE

Heating cables ELSR-... are generally maintenance-free. Nevertheless, a visual inspection and a check of the insulation resistance by trained personnel is recommended at regular intervals (at least once a year before the onset of winter). At the same time, the installed controls should be checked. To avoid possible damage to the heating cable, the gutters should be ckecked for dirt and cleaned if necessary.

DANGER

- When operating the heating cables, the locally applicable regulations for the installation of electrical trace heating systems and all applicable standards and safety regulations must be observed.
- The permissible operating conditions according to type plate / data sheet must be observed.
- The permissible temperatures specified on the rating plate must not be exceeded.
- Covers and cable entries of connected controllers, terminal boxes and connection sleeves must be closed or tightened in accordance with the manufacturer´s instructions.
- Damaged heating circuits must not be put into operation. This is the case at the latest when:
- Heating cables or connections show visible damage or deformation.
- The heating circuit is electrically defective (no continuity, leakage currents too high).
- There is a risk of damage to the heating cable as a result of previous work or damage to the heated part of the system.
- After thermal or mechanical overloading of the heating cable.
- In case of failure of control devices.

ATTENTION

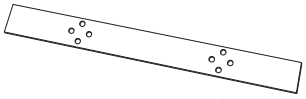
- If repaired work is carried out on heated system components, the heating cable must be protected against damage.
- Once repair work has been completed, the heating circuit must be checked again.
- Measurements of the resistance and insulation resistance of installed heating cables may only be carried out when they are cold.
- Temperature control units and controls must be checked annually by trained specialists.

ACCESSORIES

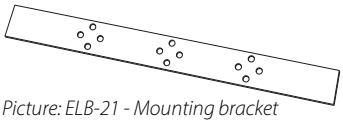
- For the attachment and operation of heating cables to gutters, snow guards and downpipes, the products in the sections „Fastening materials“ and „Temperature controller“ are used as standards.

Fastening material

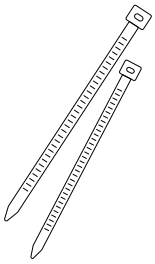
Type	Description	Item no.
ELB-18	Mounting bracket	0930040
ELB-20	Edge protection for downpipes	0930043
ELB-21	Mounting bracket	0930044
ELB-22	PE- installation profile, graid 25 mm	0942000
ELB-16.10	Plastic- tensioning straps 102x2,5 mm	2796000001
ELB-16.20	Plastic- tensioning straps 200x3,6 mm	2796000002
ELB-16.36	Plastic- tensioning straps 360x4,8 mm	2796000003



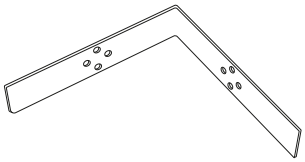
Picture: ELB-18 - Mounting bracket



Picture: ELB-21 - Mounting bracket



Picture: ELB-16.X - Tensioning straps



Picture: ELB-20 - Edge protection

Temperature controller

The frost protection thermostat ELTC-05 and the ice & snow detectors ISD-1 and ISD-1.1 are use as standards for the frost protection of gutters. Other temperature controllers can be used if required by the design!

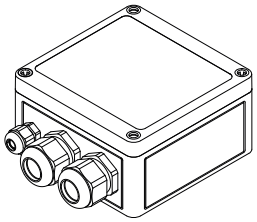


Bild: ELTC-05
Frost protection thermostat

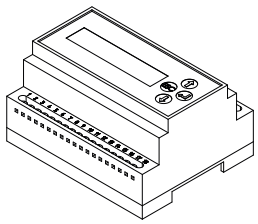
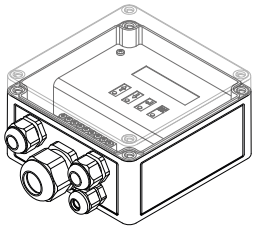


Bild: ISD-1
Ice & snow detector



ISD-1.1
Ice & snow detector

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This document can also be found on the eltherm website.
Visit our download area.

86430402002XX Operation Instruction ELSR in gutters (QAA-068) EN - subject to technical changes without notice.