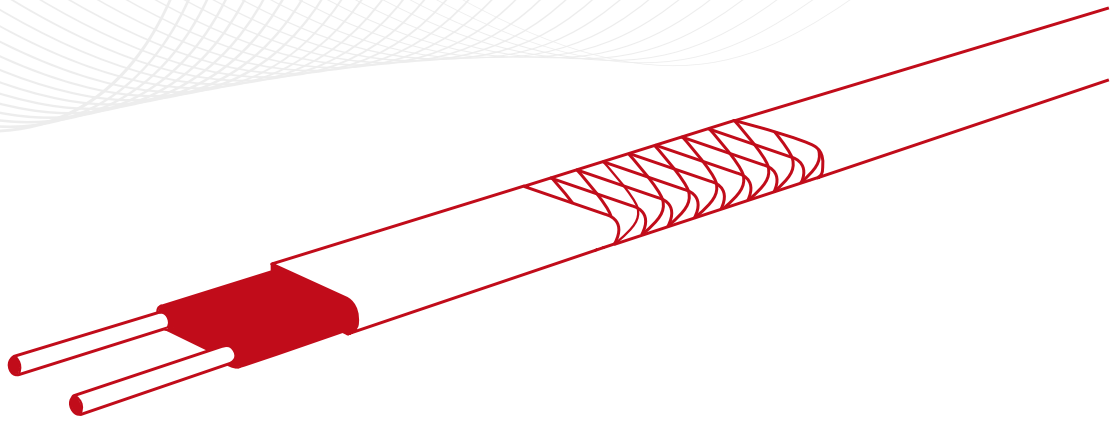


OPERATION MANUAL



ELSR-RAMP

Installation and operation
Self-regulating trace heaters
in open areas (concrete)

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IMPORTANT INFORMATION

- RETAIN FOR LATER USE



Please follow these instructions for proper and safe use of the ELSR-RAMP 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 danger 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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	86430402RAMPX		ELSR-RAMP in open areas (concrete)	
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	Revision: 03	Jonas Schmidt	Date:	30.06.2026

INTRODUCTION

GENERAL INFORMATION

ELSR-RAMP trace heating systems are suitable for heating outdoor and indoor areas

WARRANTY



ATTENTION

In order to fulfil the warranty conditions, the instructions of the respective product manuals must be followed. Please note that these instructions provide information on general installation methods. Always follow the project planning specifications and contact our project office if you have any queries.

INCOMING GOODS

- Compare the delivered goods with purchase order and the delivery slip.
- Inspect the trace heater and components for transport damage.
- Carry out all measurements required for the respective materials (insulation measurement on the trace heaters, etc.)

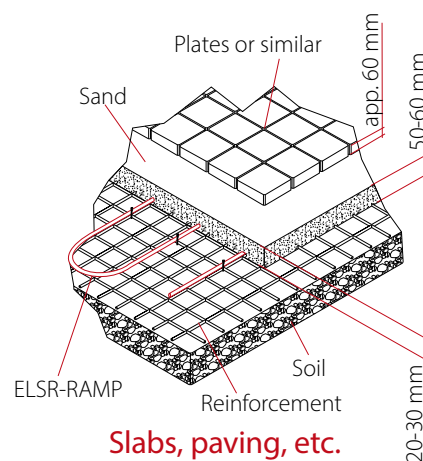
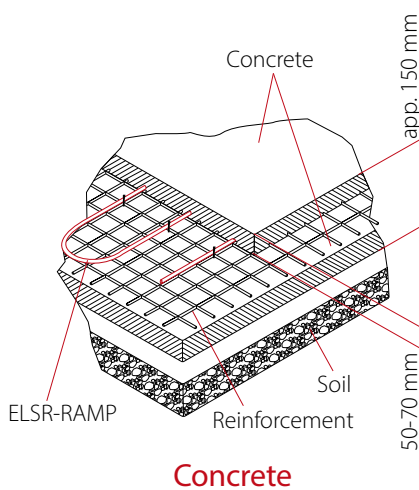
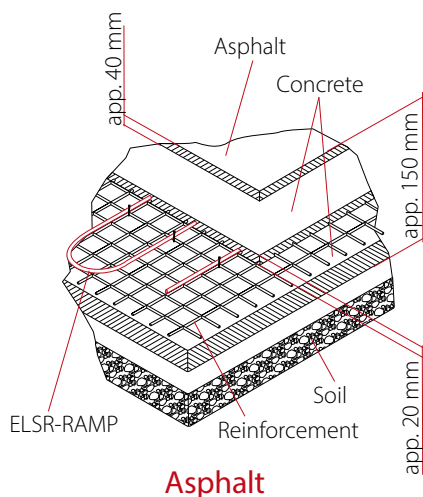


ATTENTION

Ensure that the data sheet for the supplied trace heater 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.

TYPES OF APPLICATION

The ELSR-Ramp trace heater can be used for embedded applications in concrete. Suitable connection cable is type NYY 3G6 or NI2XY-J 3G6.



STORAGE

- The goods have to be stored in a dry environment at an ambient temperature of $-20...+60^{\circ}\text{C}$.
- If measured lengths of the trace heater have to be removed from storage, the end of the remaining trace heater must be protected effectively against penetration of moisture (for example by attaching an original end connection of the trace heater 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 max. allowable length of a heating circuit (according to the corresponding data sheet) for unilateral feed depends on the admissible voltage drop (we recommend not to exceed a voltage drop of 10%) and the utilisation of the circuit Breaker (recommended: 16 A CB with „C“ characterisation, utilisation 80 %).

MOUNTING

SAFETY INSTRUCTIONS

- In accordance with EN 62395-1 or EN 60079-30-1 and EN 60519-10, an RCD (30 mA) is required for each circuit.
- The metal sheathing (protective braiding) must be connected to protective conductor potential.
- When using ELSR trace heaters on metal surfaces, they also have to be protected against indirect contact according to DIN VDE 100, part 410 (or equivalent standards) before operation of the system.
- When using ELSR trace heaters in industrial applications, DIN VDE 0721 Part 1 and DIN VDE 0721 Part 2A3 as well as any local regulations must be complied with in addition to the requirements of the DIN VDE 0100 series of standards.

DANGER

- Prior to installation and maintenance work the relevant heating circuits and plant sections need to be de-energized!
- Prior to accessing plant sections (pipelines, vessels etc.) ensure sufficient cooling down to avoid burns.
- The metallic screen (protective braid or aluminium foil with embedded earth wires), this has to be connected to the potential earth.
- Improper mounting or damage to the electrical trace heating can lead to a danger of short circuit and fire while the system is in operation.
- To ensure safe and error-free operation of eltherm electrical trace heating, only the original initial and medial connecting sets and termination sets specially developed and tested for this purpose may be used.

ATTENTION

- Mounting, testing and maintenance of electrical trace heating systems may only be carried out by qualified employees who have been trained in handling electrical equipment.
- Strict compliance with the relevant standards and safety regulations is a prerequisite for the safety of persons, systems and devices.
- The persons tasked with planning, installation and maintenance have a special responsibility and must be familiar with the exact details of the applicable regulations.
- The instructions must be kept with the system documentation for later use (maintenance, servicing).

PREPARATION OF MOUNTING

- Due to the characteristics of self-regulating heating cables, overheating does not occur when the cables are installed so that they overlap or touch each other.
- A heating circuit should be installed according to the following diagrams, using genuine eltherm accessories.

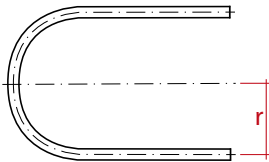
ATTENTION

- Do not use adhesive tapes containing plasticizers (e.g., PVC) to secure the trace heaters.
- When using tie wires, tighten them so that the outer sheath of the trace heater is not damaged.
- Observe the minimum bend radii and installation temperatures specified in the data sheet.
- Make sure that all installation work on the system to be heated has been completed.
- All pressure and material tests, as well as coating and painting work on piping, must be completed. The painting on the pipes must feel dry to the touch.
- Check the conditions of the surface to be heated. It must be free of sharp edges and burrs that could damage the trace heater during installation. If necessary, remove these or, if not, cover them with suitable material.
- Check all materials required for heating to ensure they are complete and free of any transport damage.
- Compare the material list of the delivered components with the design documentation.
- Check whether any special installation instructions are available and whether all necessary materials and tools are on hand.
- Measure and record the electrical resistance and insulation resistance of the heating cable in the designated installation logs. Compare the value with the data in the design documentation and technical specifications for the trace heaters.

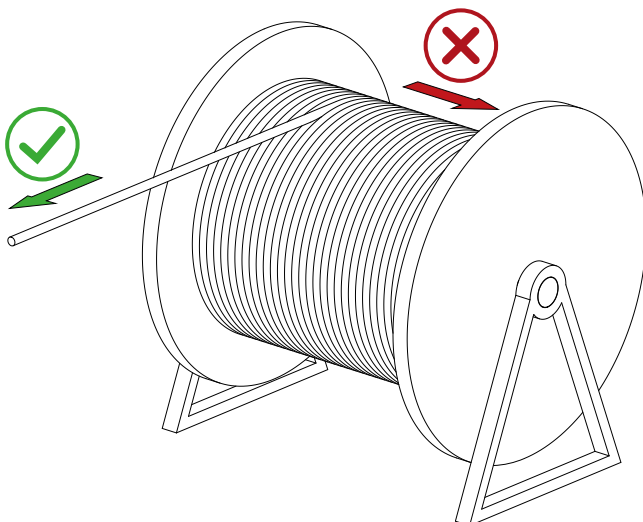
MOUNTING THE TRACE HEATER

WARNING

- Installation must be carried out by personnel trained in the installation of heating cables.
- Do not crush the trace heater or pull it over sharp edges.
- Avoid stepping on or driving over the trace heater at all costs.
- Never use the trace heater as a step loop.
- Remove all unevenness, such as sharp burrs or similar, from the surface to be heated and clean the surface of grease and oil.
- Keep to the lengths 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.
- Mark the installation distances required according to the projection on the surface to be heated.
- When making the electrical connection, ensure that no tensile, shear or torsional forces can act on the connection.
This can be achieved by providing suitable support for the heating cable in the immediate vicinity of the connection.
- The specified minimum bending radius must be observed and adhered to.



Unrolling the heating cable



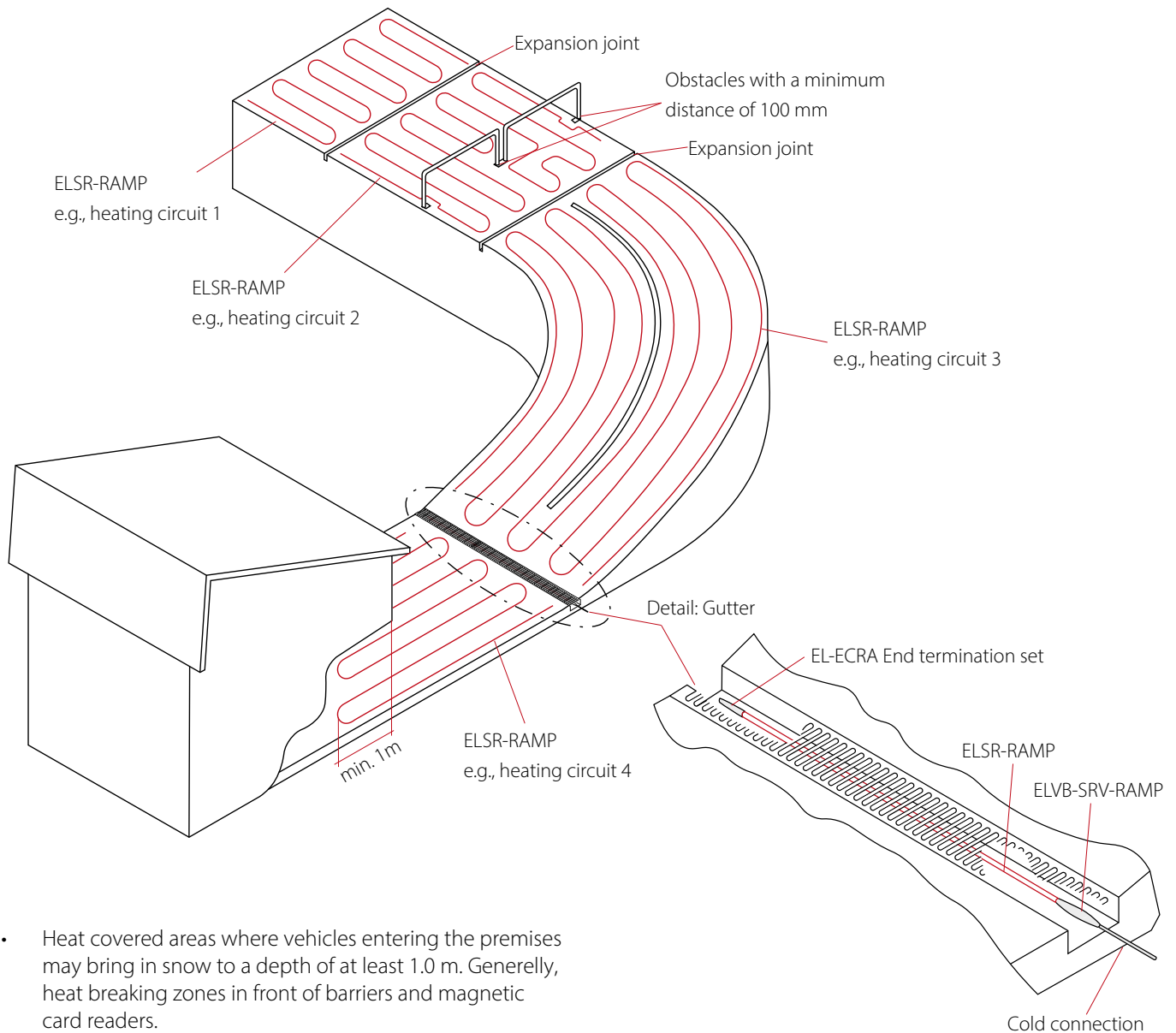
- Use a stable holder to unwind the heating cable.
- Ensure that the unwinding device runs smoothly to prevent damage to the heating cable due to excessive tensile force.
- Unwind the heating cable straight and not sideways over the edge of the reel.

Installation of ELSR-RAMP

- Required tools and supplies: Cable reel, folding rule, side cutters, needle-nose pliers, water pump pliers, utility knife with snap-off blades, heat gun, crimping tool, screwdriver, insulation tester (2500 V DC), cable ties in sufficient quantity and length, insulation test report.
- Before beginning installation, check the heating conductor for continuity using an insulation tester. Test both conductors against the protective braid; the insulation resistance must be at least 20 MΩ! Document the result in the test report.
- Position the trace heater roll on the dispenser, secure the cold connection to the reinforcement using cable ties. Route the cold conductor to the power connection point/control panel.
- Protect the end of the cold connection from moisture; avoid mechanical stress on the transition of the trace heater!
- Starting from the cold connection, secure the trace heater to the reinforcement using cable ties: Observe the installation spacing of the loops relative to the edge and between each other.
- Under no circumstances exceed the maximum permissible heating circuit length! If this occurs, provide an additional heating circuit!
- Immediately install the end termination according to the instructions; be sure to prevent moisture from entering the trace heater. Secure the end termination to the reinforcement using cable ties. Trim the ends of the cable ties along the entire length. Repeat the listed steps for all heating circuits.

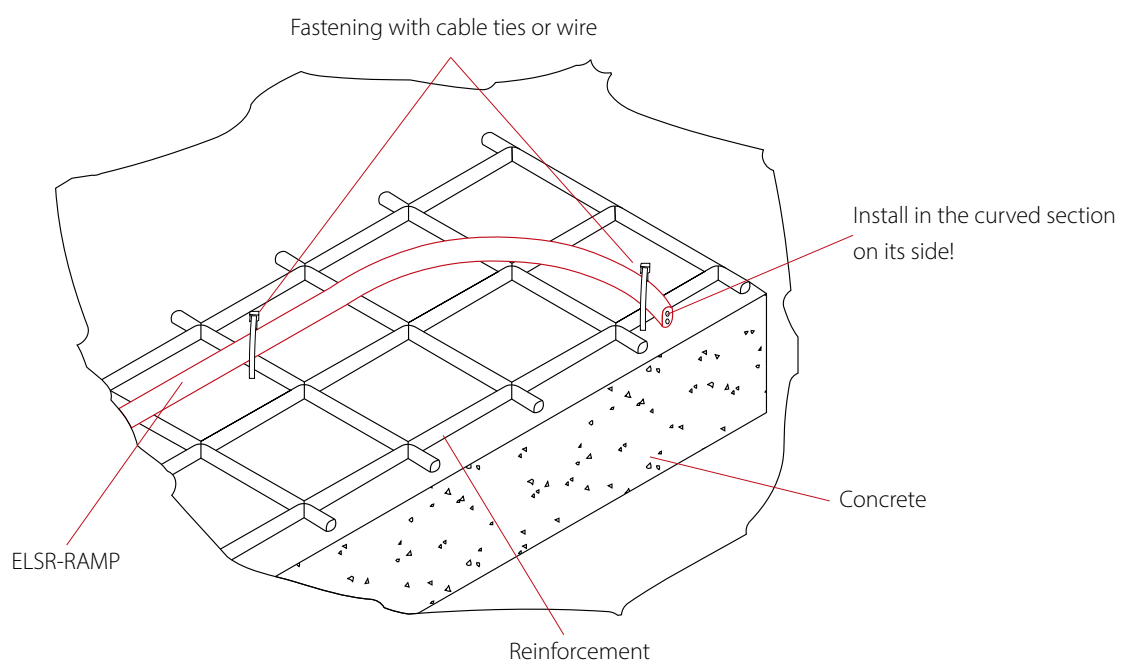
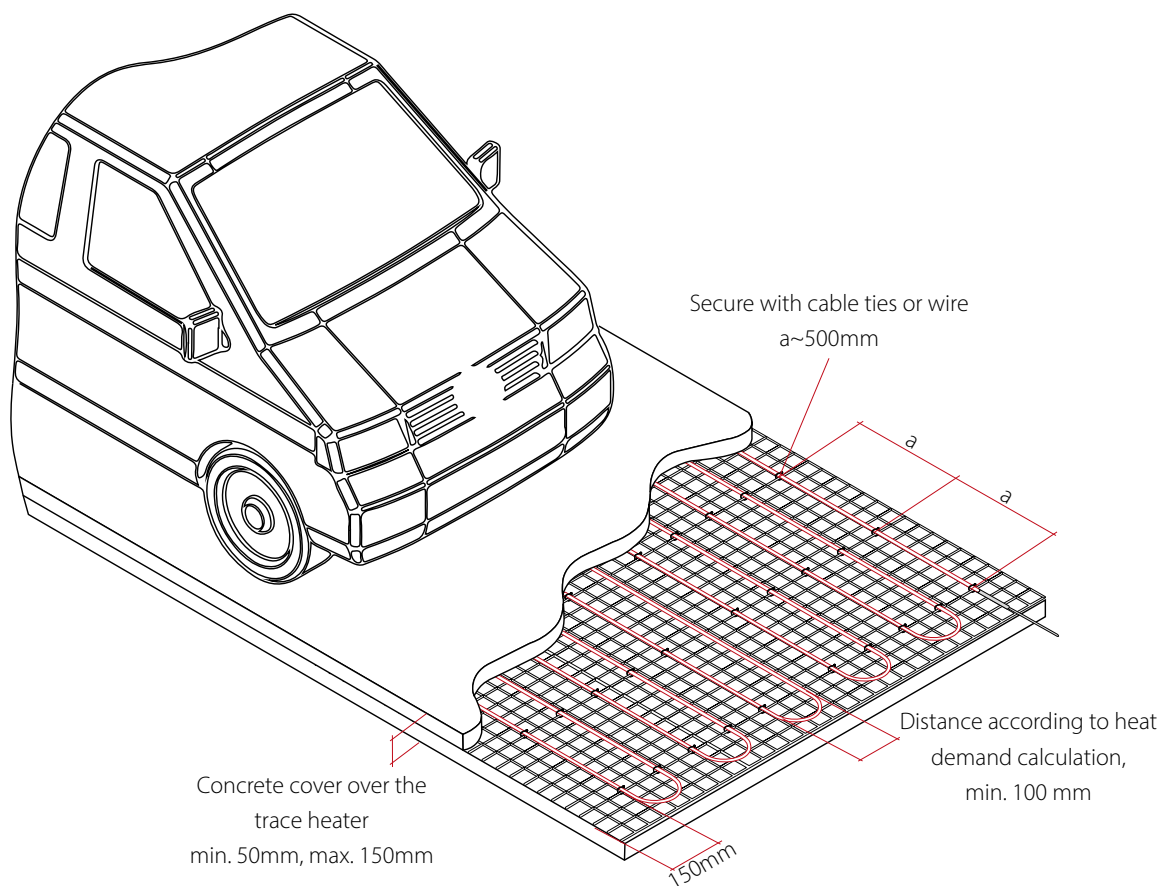
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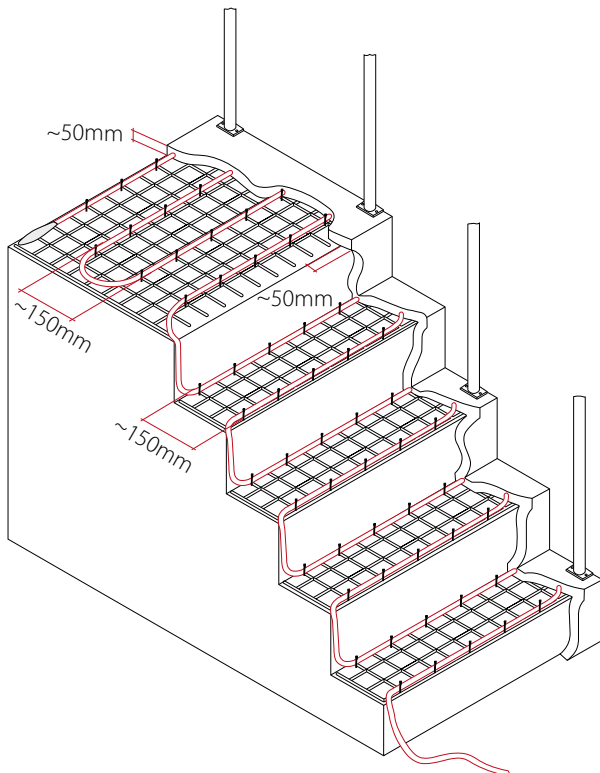
- The cold connection does not necessarily have to be connected to the trace heater on the construction site.
- Connections and terminations made using the eltherm ELVB-SRV-Ramp and EL-ECRA kits can be cast into the concrete!



- Heat covered areas where vehicles entering the premises may bring in snow to a depth of at least 1.0 m. Generally, heat breaking zones in front of barriers and magnetic card readers.
- Installation direction: Install loops as long as possible! In curves, always install in the direction of the curve; this ensures that the installation spacing is maintained.
- Stability of the Subbase: The installed reinforcement must be supported on a sufficiently stable subbase to allow safe foot traffic on the installation surfaces without causing deformation.
- Expansion Joints: Trace heaters must not be routed across expansion joints. A separate heating circuit must be provided on each side of an expansion joint.
- Installation spacing: The loops of the trace heater must be laid on the reinforcing steel mesh/rebar at a spacing of 0.3 m apart. Obstacles must be bypassed at a distance of at least 100 mm. The lateral distance to the wheels of the surfaces to be heated must be 0.15 m.
- Leave areas open where drainage channels, curbs, foundation slabs for barrier systems / magnetic card readers, and similar components will be installed prior to concrete placement. Coordinate details with all involved trades!
- Provide separate heating for drainage channels using appropriate heating conductors.

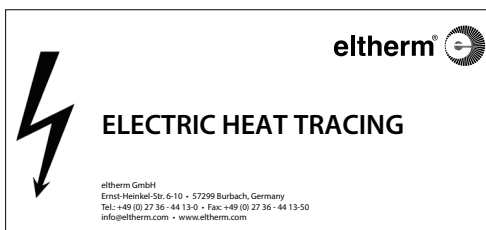
Installation of ELSR-RAMP on the reinforcement of concrete surfaces





Attach type plate

Once the heating circuit has been completed, a weather-resistant, permanently legible identification label containing all relevant system information must be affixed to the junction box or to the connecting line immediately at the point where it enters the junction box.



DANGER

- Electrically heated systems must be marked at appropriate intervals with „Electric Heat Tracing“ warning signs on the thermal insulation.
- Spacing of approximately 5 m on heated surfaces, or at least one warning sign per section, must be maintained

AS BUILT DOCUMENTATION

The layout and routing of all installed trace heaters must be documented in an as-built drawing.

Based on the architectural drawings, the routing of the trace heaters, as well as the location of the sensors, cold connections, and terminations, must be documented with dimensions. The routing of the cold connections toward the corresponding feed-in points must also be documented with dimensions.

INSPECTION OF THE HEATING CIRCUIT

- Perform a visual inspection for any mechanical damage and verify compliance with the installation guidelines (bending radii observed, installation spacing observed, installation depth observed, expansion joints avoided, cable tie ends trimmed, cold-end connection and terminations intact).
- Check whether a heating circuit type plate is attached. The information it contains must be legible.
- Check the insulation resistance.
 - The insulation resistance of each circuit is to be measured between each single bus wire and the protective braid or screen. The measured values are to be noted.
- Check the heating circuit function.
 - The trace heater temperature must be specifically monitored to prevent the trace heater from over heating.

ATTENTION

- Test voltage minimum 500 VDC, recommended 2500 VDC
- Independent of the heating circuit length, the insulation resistance must not be lower than 20 MOhm. In case of a lower insulation resistance, the source of defect has to be determined and eliminated.
- Any damage that has occurred must be repaired immediately. For short heating circuits by replacing the trace heater and for longer trace heater lengths by cutting out the damaged area and inserting a new trace heater section (see assembly instructions for connection set).
- Repeat the tests after the terminal insulation has been applied.
- All additional work performed by other trades in the area of heated surfaces must be supervised, including the installation of drainage channels, the installation of anchor bolts, and the milling of joints to prevent cracking. Refer to as-built drawings and perform insulation testing with a written report. Document any damage found immediately and report it to the site management.

OPERATION & MAINTENANCE

NOTE

Trace heaters ELSR-RAMP generally operate maintenance free. However, it is recommended that the system be checked by qualified personnel in regular intervals for visual damages and insulation resistance.

- During operation of the system, local laws and regulations for the use of electrical trace heaters in hazardous areas as well as all other applicable standards and safety regulations are to be followed.
- The permissible operating conditions according to the rating plate / data sheet must be observed.
- The maximum operating temperature given on the label must not be exceeded.
- Covers and cable entries of connected controllers, junction boxes and connection sleeves must be closed or tightened in accordance with the manufacturer's instructions.

ATTENTION

- Installed trace heaters has to be protected against damage that may occur during repair work on heated components.
- After completion of the repair, the heating circuit will once again need to be tested.
- Readings of ohmic resistance and insulation resistance are to be taken from cold heaters only.
- Temperature control units and controls must be checked annually by trained specialists.

DANGER

- Damaged heating circuits shall not be operated. This is the case when:
- Heater or attached leads show damage or deformation.
- The circuit is electrically defective (open circuit, high leakage current).
- There is a risk of damage to the trace heater as a result of previous work or damage to the heated part of the system.
- After thermal or mechanical overstress.
- After failure of temperature controll.

MARKING (by customer)

NOTE

Customer-side labeling with an identification plate is possible.

NOTES



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