


QAA 024

INSTALLATION MANUAL

Installation of Fluoropolymer Insulated Series Trace Heaters in Non-Ex Areas


Types ELK-AE, -AG, ELW-VA, -GS, -GN

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	Revision 5	13.11.2013

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0. Applications

Fluoropolymer insulated series trace heaters are suitable for use on tanks, pipes and pipe attachments like valves, pumps etc. in industrial and commercial environments.

1. Receipt of Goods

On receipt of the goods check the trace heaters and the accessories and compare with the data on the delivery note to ensure that the correct material was supplied. It is recommended that the resistance and the insulation resistance be checked (see 6. Testing).

2. Storage

The goods have to be stored in a dry place at an ambient temperature of $-20 \dots +60^{\circ}\text{C}$. If dry storage is not possible, ends of heating cable or tapes need to be sealed by means of a termination kit. This is to be done also when a heating circuit remains unfinished at the end of a working day.

3. Length of Heating Circuit


The circuit lengths of factory terminated goods are designed by eltherm. For shortening or elongation, please contact eltherm. The design of "off the reel" goods is to be done in accordance with the supplied product data sheet. The given voltage, operating temperature and output per metre must not be exceeded. Cross sections of the cold leads are to be designed to suit the nominal heating circuit current as per applicable local installation codes

4. Protective Measures

- Design and installation of heating circuits is to be made compliant to the standards EN 60519-10 and EN 62395-2 as well as to any other locally applicable codes and standards
- Series trace heaters should be operated with a controller. A controlled or stabilised mode of operation as per EN 62395-2 is to be implemented
- Suitable positioning of the temperature sensors will avoid overheating of pipeline / tank, medium and trace heater. Make sure the sensors are properly attached.
- We highly recommend to use a residual current device (30mA).

For use of the cable as trace heater according to IEC EN 62395-1 and IEC EN 60519-10, a residual current device (30mA) is mandatory!

- When using the trace heaters on metallic surface, this surface also has to be integrated in the leakage current protection acc. to DIN VDE 100, part 410 before operation of the system.
- The protective braid of the trace heaters is to be connected to potential earth.

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- For outdoor use of trace heaters without outer protective sheath, suitable measures have to be taken on site to protect the metallic sheath (protective braid) against mechanical or chemical damage.
- Prior to installation work or maintenance, the relevant heaters need to be disconnected from power supply. If required, heated surfaces need to cool down to become accessible.

5. Mounting Instructions

- Installation is to be done by personnel that has been trained for installation of trace heaters
- Heaters and sensors need to be placed on the designated pipes / tanks in the planned positions in order to avoid overheating of equipment as well as insufficient temperature maintenance
- Remove any sharp irregularities (burrs etc.) from the surface to be heated
- Clean and degrease the surface
- Mark the spacing of the trace heaters on the surface to be heated
- For single conductor trace heaters that are fed from both ends: Arrange cable entry and exit next to each other for the ease of power supply
- Installation of the heating circuit should be done with original eltherm accessories. Firstly, attach the trace heaters to the surface with self adhesive aluminium tape (approx. one patch every 300 mm).

Caution: Take care that the trace heaters are not twisted and that the installed sections do not touch nor cross, as it might otherwise lead to local overheating and destruction of the trace heaters. The minimum bending radius is 10 mm for trace heaters without jacket (ELK-AE, ELW-VA, -GS, GN) and 2.5 x OD for trace heaters with jacket (ELK-AG). Trace heaters with flat cross section are to be bent in the flat plane only.

- The trace heater and its supply lead is to be secured to the heated surface directly before and after the connection sleeve (e.g. by adhesive tape or temperature resistant wire straps)
- Attach heater to pumps, valves and other components in such way that those components are accessible for maintenance or exchange without major mechanical stress for the heater
- The electrical termination of the heating cable/tape is to be done with eltherm termination kits only.

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Suitable accessories:


Trace Heater	Termination Kit	Gland
ELKM-AE	ELVB 26	-
ELKM-AG	ELVB 30, ELVB 30-1	-
ELK-AE, -AG	-	Range 3-7 mm
ELW-GN, -GS, -VA	-	Range 8-13 mm

- The max. operating temperature of the heated device as defined by the plant owner as well as the maximum trace heater temperatures (max. 220°C powered, 260°C unpowered, max. 25 W/m heater output depending on maintenance temperature) must not be exceeded.
- Make sure the heater has a good contact to the surface to be heated. In case of gaps, fill those with thermally conductive and temperature resistant materials.
- The heater should be fully covered (the entire length) with aluminum foil in order to prevent insulation material from slipping between the cable and surface to be heated.
- If thermal insulation with metallic cladding is used, provide an insulation entry kit to protect the supply lead or heating tape against cuts
- Upon completion of the installation, the heating circuit needs to be marked by fitting an appropriate label to the associated junction box or to the trace heater close to the junction box. The label shall be weatherproof and bear relevant information of the installed system including the Ex marking.
- Electrically heated parts have to be identified in reasonable distances with warning labels "Electrical Heating" on the thermal insulation (approx. 5 m distance between each label on pipelines or at least 1 warning label per pipe-branch respectively).

6. Testing

After the completion of a heating circuit and prior to the installation of the thermal insulation, the following steps have to be taken:

- A visual check of the trace heater regarding possible mechanical damages and/or incorrect installation
- Test of the insulation resistance
 - The insulation resistance of each heating-circuit is to be measured between each single bus wire and the metal sheath (protective braid) and is recorded afterwards.
 - Test voltage: min. 500 VDC, max. 2500 VDC (recommended)
 - Irrespective of the heating circuit length, the insulation resistance must not be lower than 20 MOhm. In case of lower isolation resistance the source of the defect has to be determined and removed.

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- Check of the function of the heat circuit (monitor the trace heater temperature to avoid any overheating).
- Possible damages have to be fixed immediately. Short trace heaters may be replaced. Longer trace heaters may be repaired by cutting off the defective part and insert a new piece (refer to Connection Kit Instructions)
- Make sure heating circuit label is in place and information is legible
- All testing procedures have to be repeated after the thermal insulation has been applied.

7. Operation and Maintenance

- 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 as stated on the label, print or in the data sheets (i.e. voltage, amperage, exposure temp., operating temp., IP protection classification) are to be followed accordingly
- The maximum operating temperature given on the label must not be exceeded
- Trace heaters ELK- ... and ELW-... 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.
- Lids and cable entries of junction boxes, thermostats splices etc. to which trace heaters are connected need to be closed and sealed as per manufacturers instructions.
- The opening of controllers, junction boxes and terminations is permitted only when the heating system is not energised
- Installed trace heater has to be protected against damages that may occur during repair work on heated components
- After completion of the repair, the heating circuit will once again need to be tested as shown in paragraph 6 "Testing"
- 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)
 - after thermal or mechanical overstress
 - after failure of temperature controls
 - after damage to the workpiece to which the heater is installed
- Temperature control units and control devices are to be checked at least annually by trained workers or authorized persons.