


## **QAA 023**

### **INSTALLATION MANUAL**

**Commissioning and Installation of  
self-regulating Trace Heaters in  
non-hazardous areas according to IEC EN 62395**

	<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>
	Author	Peter Schmidt
	Revision 9	17.11.2017




<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>	
<b>Autor</b>	Peter Schmidt	
<b>Revision 7</b>	17.11.2017	

## Content

<b>1.</b>	<b>Receipt of Goods .....</b>	<b>3</b>
<b>2.</b>	<b>Storage .....</b>	<b>3</b>
<b>3.</b>	<b>Length of Heating Circuit.....</b>	<b>3</b>
<b>4.</b>	<b>Protective Measures .....</b>	<b>3</b>
<b>6.</b>	<b>Test and Commissioning .....</b>	<b>5</b>
<b>7.</b>	<b>Operation and Maintenance .....</b>	<b>6</b>



<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>	
<b>Autor</b>	Peter Schmidt	
<b>Revision 7</b>	17.11.2017	

## 1. Receipt of Goods

After receipt of the goods check the tape 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 insulation resistance of the heater be checked (see 6. "Test and Commissioning")

**Attention:** Ensure that the data sheet has been supplied. The data sheet is necessary for a correct installation. The installation is not to be done without presence of the data sheet.

**Hazardous Area applications:** Ensure that the corresponding approval certificates are supplied. The number of the certificate must be according to the number printed on the heating tape.

## 2. Storage

The goods have to be stored in a dry place at an ambient temperature of  $-20 \dots +60^{\circ}\text{C}$ . If a dry storage is impossible, the heating tape has to be closed with an end termination set. This is also necessary if a heating circuit cannot be finished at the end of a shift.


## 3. 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%)

## 4. Protective Measures

- Prior to installation and maintenance work the relevant heating circuits and plant sections need to be de-energised!
- Prior to accessing plant sections (pipelines, vessels etc.) ensure sufficient cooling down to avoid burns.
- 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
- Trace heaters ELP should only 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 ground fault protection device (30mA) with the installed heating circuits.
- For use of the cable as trace heater according to IEC EN 62395-1 and IEC EN 60519-10 as well as for use in Hazardous Areas, installation of a residual current device (30mA) is mandatory!
- When using the heating tapes on metal surfaces, they also have to be protected against indirect contact acc. to DIN VDE 100, part 410 (or equivalent standards) before operation of the system.
- The metallic screen (protective braid or aluminium foil with embedded earth wires), this has to be connected to the potential earth.



<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>	
<b>Autor</b>	Peter Schmidt	
<b>Revision 7</b>	17.11.2017	

## 5. Installation Instructions

- Work is only to be done by personnel that has been trained for installation of trace heaters (if applicable: in hazardous areas)
- 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 objects on the surface to be heated
- Clean and degrease the surface
- The installation of a heating circuit has to be carried out using original eltherm accessories acc. to the eltherm installation instructions.

Attention: Do not use adhesive tape with emollients (i.e. PVC)!

Attention: Install according to the min. bending radius and installation temperature stated on the data sheet.

### ELP- types:

Attention: Make sure the tapes will not have contact to each other or cross after installation, for this may lead to overheating and damage of the heating tapes and nearby placed objects!.

### ELSR types:

An overlapping or contacting installation of the heating tape does not cause overheating due to the self-regulating heating characteristic.


- The heating tape is to be fully covered (the entire length) with aluminium foil in order to prevent insulation material slipping between the tape and surface to be heated. If the insulation is covered with a metal cladding, an insulation entry kit has to be used to avoid mechanical damage of the heating tape.
- The connection and end termination of a heating circuit has to be carried out using original eltherm accessories acc. to the eltherm termination instructions. Deviations will void the guarantee

**Attention:** To avoid short circuit, do not connect the two bus wires of the heating tape to each other. Under all circumstances observe the termination and maintenance instructions for the connection and termination of the heating tapes.

**Hazardous Area applications:** Only termination material approved by a notified body may be used with the corresponding heating tape. The required air gap and creeping distances are to be followed according to the corresponding termination instructions.

**Hazardous Area applications:** The free cable end is to be connected either outside the Hazardous Area or to a connection box which is approved according to a standardized type of protection.




<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>	
<b>Autor</b>	Peter Schmidt	
<b>Revision 7</b>	17.11.2017	

- Make sure to attach the trace heater – especially the area next to the electrical connection - to its surroundings in a proper way to avoid pulling stress or torsion on the electrical connection.
- To save energy and to keep process temperatures constant, the application of superior control units are recommended. Please ask our project engineers when in doubt.
- **Hazardous Area applications:** An approved safety temperature limiter is to be used to limit the sheath temperature of the heating tape when
  - ELP- trace heater is used
  - an T3 rated ELSR heater is used in a T4-T6 hazardous area
 Heaters ELP may only be used as a component within a certified system (certification to be initiated by customer).
- **Attention:** Make sure that the trace heaters are never used at or exposed to temperatures above the nominal exposure temperature ratings.
- 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. Test and Commissioning

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 heating tape regarding possible mechanical damages and/or incorrect installation.
- Insulation resistance test
  - The insulation resistance of each heating circuit is to be measured between each single bus wire and the metal sheath (protection braiding). The measurement values are to be noted. Test voltage: min 500 VDC, preferably 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.
  - 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.

<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>	
<b>Autor</b>	Peter Schmidt	
<b>Revision 7</b>	17.11.2017	

## 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 ELSR- ... and ELP-... 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

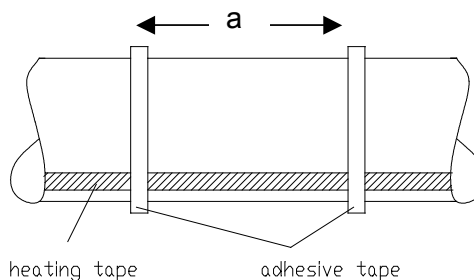


<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>	
<b>Autor</b>	Peter Schmidt	
<b>Revision 7</b>	17.11.2017	

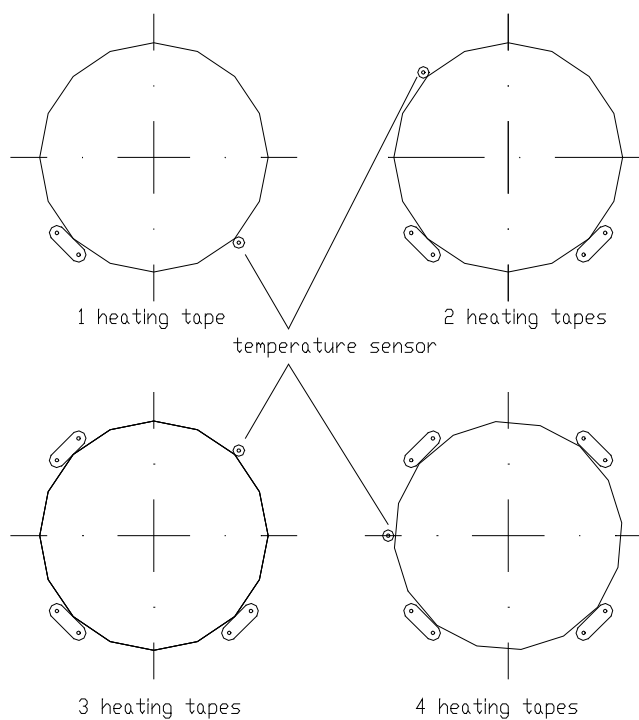
## Installation of Heating Tapes on Pipes

The heating tape is traced and fixed parallel to the pipe axis.

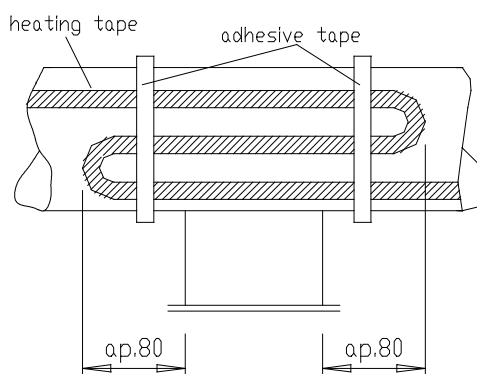
**Hazardous Area:** a max. 300mm




For multiple tracing please follow the drawing.

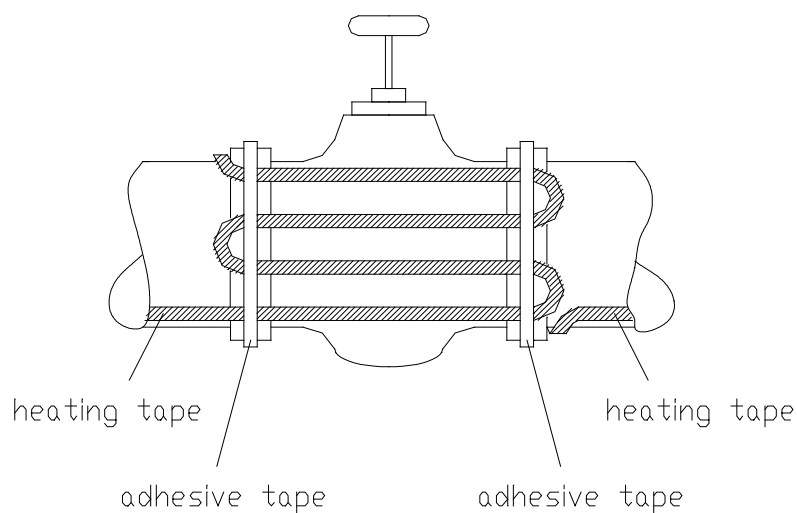


Installation of heating tapes on pipe supports

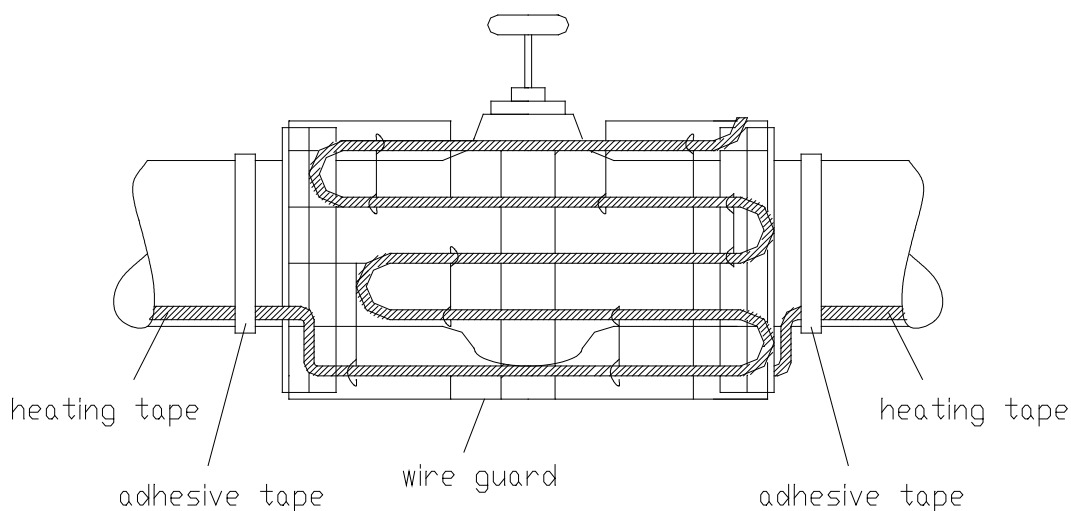



<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>	
<b>Autor</b>	Peter Schmidt	
<b>Revision 7</b>	17.11.2017	

## Installation of Heating Tapes on Valves

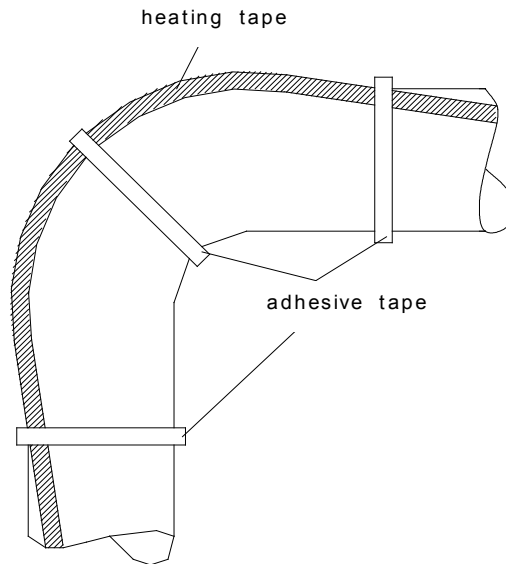


Installation of heating tapes on valves by means of a wire guard for a quick disassembly and re-assembly of the heating during maintenance work at the valve

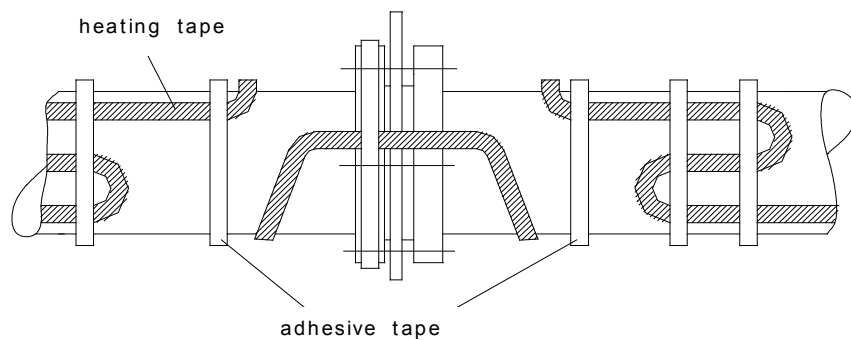
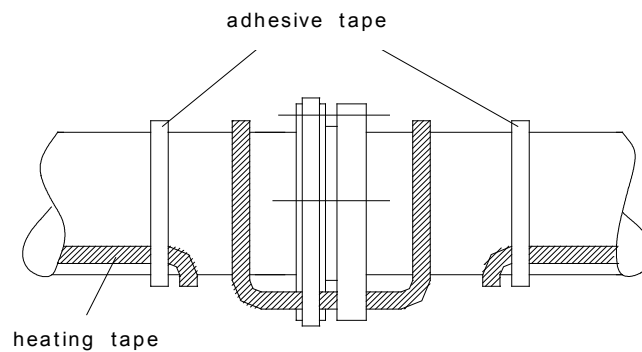



<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>	
<b>Autor</b>	Peter Schmidt	
<b>Revision 7</b>	17.11.2017	

Installation on elbows

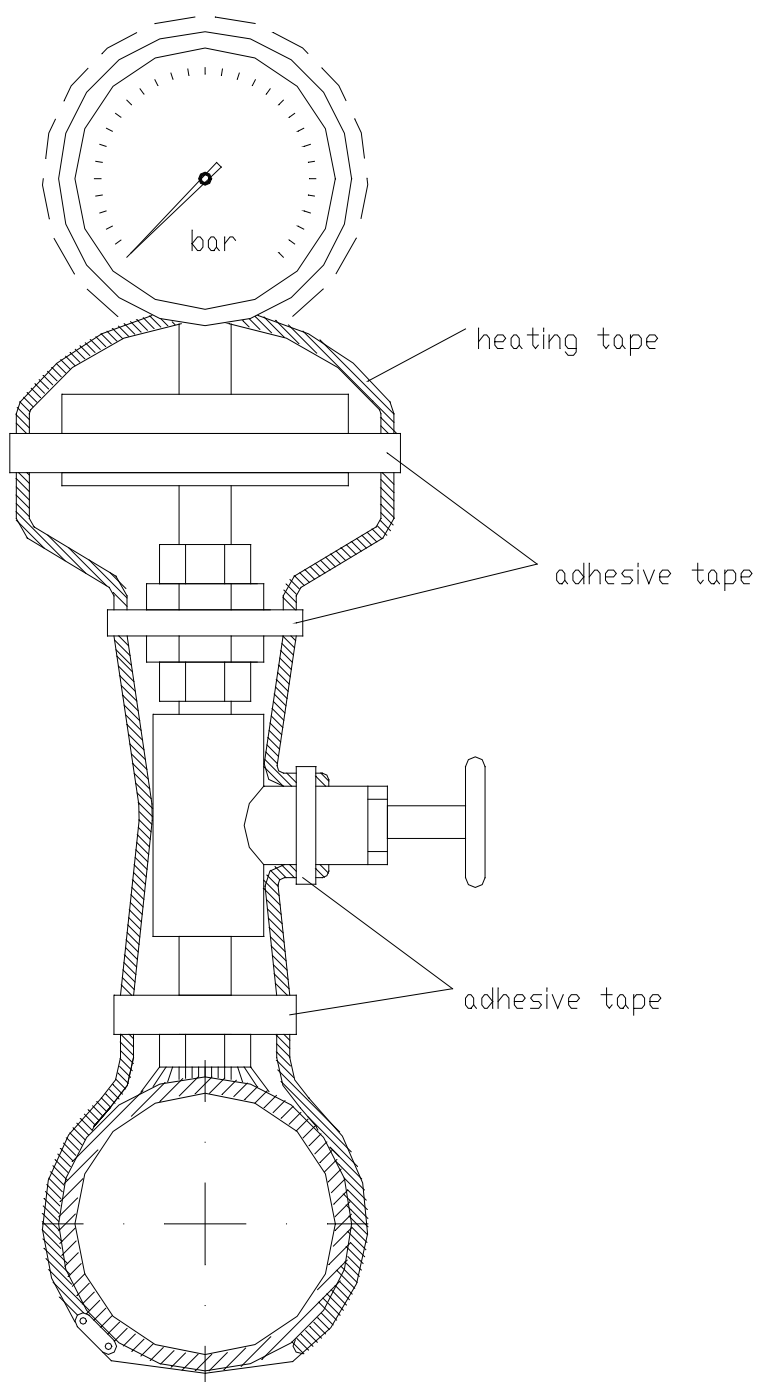



Installation on flanges



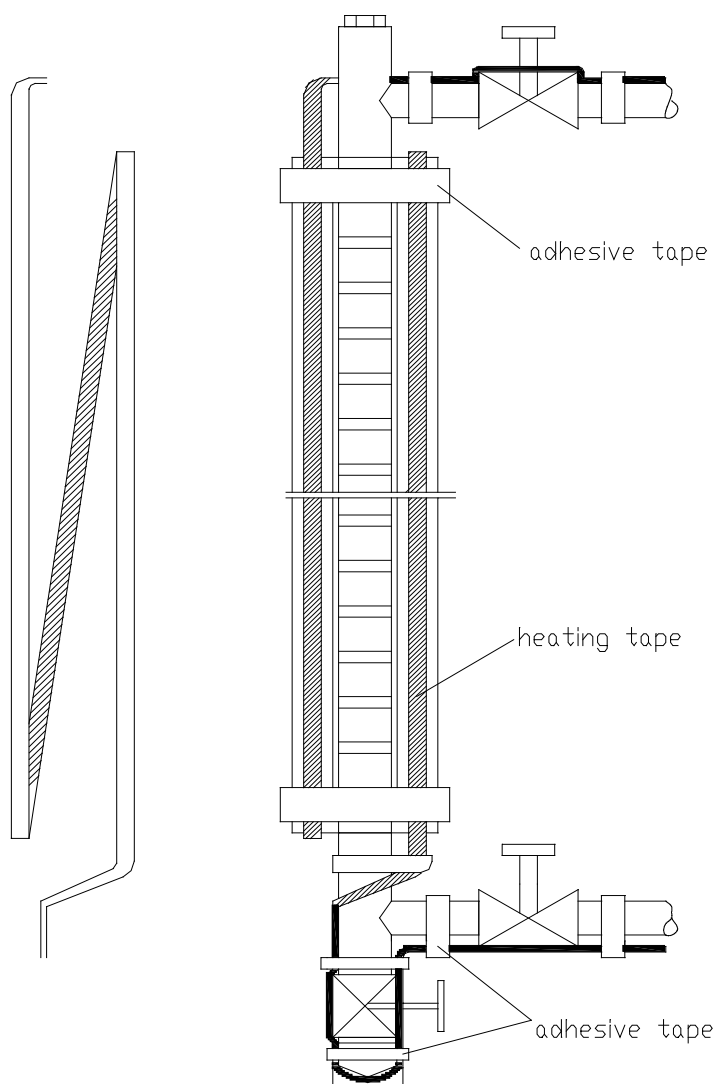
<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>	
<b>Autor</b>	Peter Schmidt	
<b>Revision 7</b>	17.11.2017	

## Installation of Heating Tape on Fittings & Valves



<b>QAA – 023</b>	<b>Installation of Parallel Heating Tapes</b>	
<b>Autor</b>	Peter Schmidt	
<b>Revision 7</b>	17.11.2017	

## Installation of Heating Tapes on Level Indicators



Remark: Attach heating tape with self-adhesive aluminium tape