eltherm®
innovations in heat tracing

Documentation

Parallel – Heating Cable

Type: ELP

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05.01.2018 K. Folkerts

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Content

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Constant Wattage Heating Cable
with Resistance Wire

The installation of this heating cable is highly cost-efficient with any kind of heat tracing application thanks to the single end power input. The heating cable consists of a succession of heating zones (length = contact spacing) and can be cut to length in sections of the contact distance to the required length. When cutting into lengths, the heating circuit is interrupted up to the next contact point and this non-active part can be used as a cold lead. During the design phase, one contact spacing length per planned heating circuit must be calculated additionally.

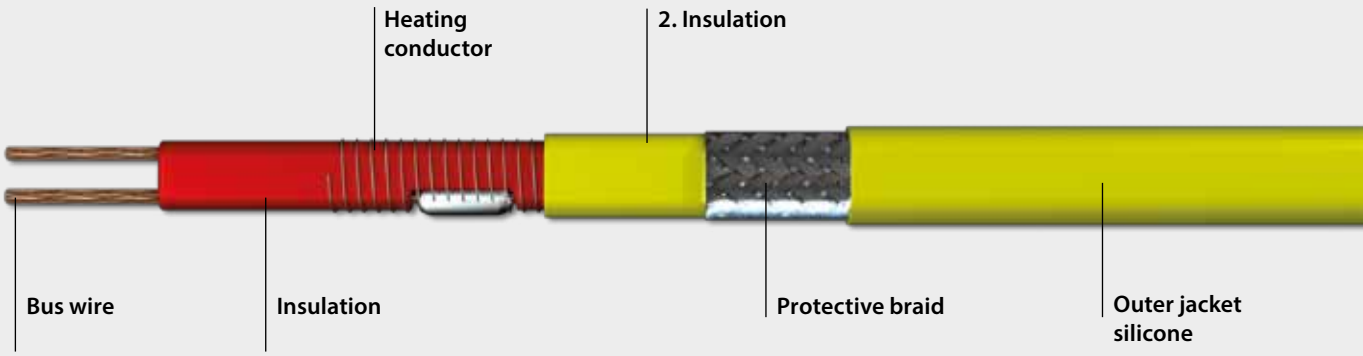
Advantages:

- Single end connection
- Can be cut off the roll
- Constant power output per meter
- Highly flexible

Applications:

- Vessels, piping, valves
- Food processing industry
- Frost protection and temperature maintenance on pumps, etc.

Type **ELP/Si up to 200 °C**



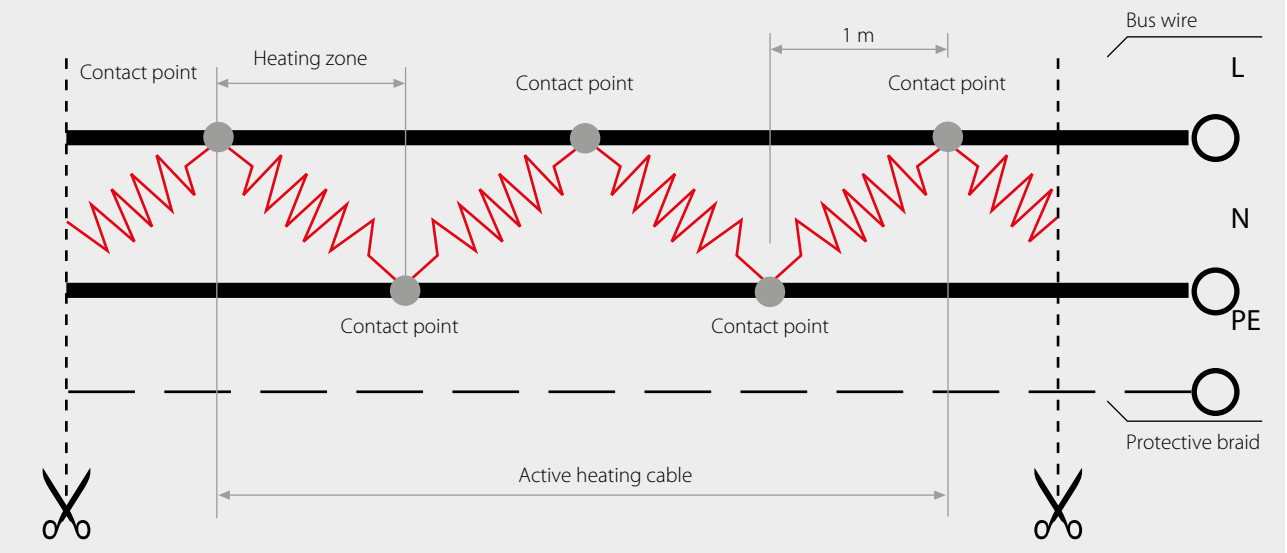
Technical Information

Type ELP/Si up to 200 °C

Data

Insulation	Silicone
Protective braid	Copper
Outer jacket	Silicone
Nominal temperature	200 °C
Moisture proof	Yes
Bending radius, min.	30 mm
Bus wire cross section	2 x 1.5 mm²
Nominal voltage	230 V AC/DC
Installation temp., min.	-60 °C
Start-up temp., min	-60 °C

Cables shall neither intersect nor contact.
Provide protection by means of circuit breaker FI 30.
Please observe the standards IEC 62395-2, EN 60519-10.



Type	Nominal output	Dimensions approx. (mm)	Contact spacing (m)	Art. No.
ELP/Si 10 BO 230	10 W/m	5.25 x 9.75	1.0	0320102
ELP/Si 20 BO 230	20 W/m	5.25 x 9.75	1.0	0320108
ELP/Si 30 BO 230	30 W/m	5.25 x 9.75	1.0	0320114
ELP/Si 40 BO 230	40 W/m	5.25 x 9.75	1.0	0320120

Constant wattage heating cables up to nominal voltages of 120 V or 400 V are available upon request. Bus wire cross section 2 x 2 mm² upon request.

Maximum heating circuit length

Type	W/m	Length (m) at 50 °C	Length (m) at 150 °C
ELP/Si 10 BO 230	10	198	147
ELP/Si 20 BO 230	20	139	102.5
ELP/Si 30 BO 230	30	98	82.5
ELP/Si 40 BO 230	40	73.5	70.5

Heating circuit lengths ELP/Si on the following conditions

- 16 A circuit breaker, 80 % utilisation
- Max. 10 % voltage drop
- Power connection to one (1) heater end

Constant Wattage Heating Cable
with Resistance Wire

These heating cables are particularly suitable for maintaining temperatures of up to +150 °C. Its great flexibility down to - 70°C means that this version is ideal for heat tracing in industrial refrigeration or in countries with very harsh climates.

The heating cable consists of a succession of heating zones (length = contact spacing) and can be cut to length in sections of the contact distance to the required length. When cutting into lengths, the heating circuit is interrupted up to the next contact point and this non-active part can be used as a cold lead. During the design phase, one contact spacing length per planned heating circuit must be calculated additionally.

Advantages:

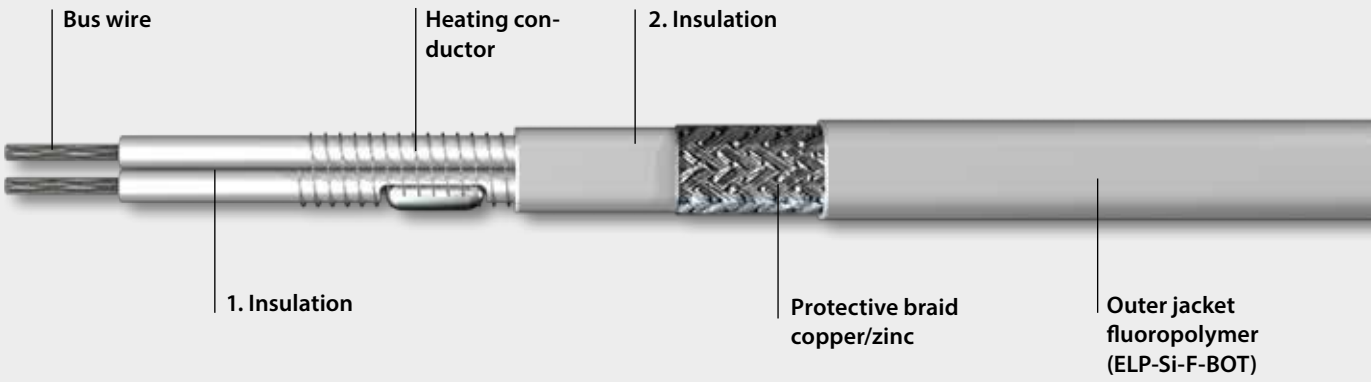
- Single end connection
- Can be cut off the roll
- Constant power output per meter
- Highly flexible

Applications:

- Vessels, piping, valves
- Food processing industry
- Frost protection and temperature maintenance on pumps, etc.
- Filter heating systems

CSTB

Type **ELP/Si-F up to 200 °C**



Technical Information

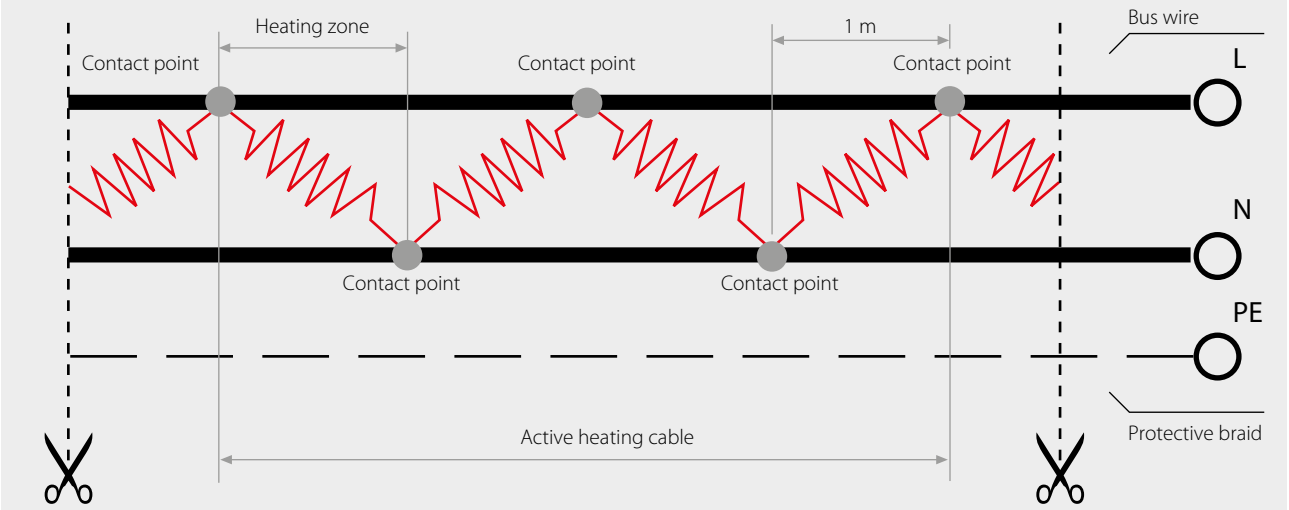
Type ELP/Si-F up to 200 °C

Data ELP/SI-F-B

Insulations	Silicone
Protective braid	Copper/zinc
Nominal voltage	230 V AC/DC or 400 V AC/DC
Dimensions	6.5 x 10.5 mm
Permissible ambient temperature	-70...+200 °C
Bending radius, min.	30 mm
Bus wire cross section	2 mm²
Installation temp., min.	-70 °C
Start-up temp., min	-70 °C

Data ELP/Si-F-BOT

Insulations	Silicone
Protective braid	Copper/zinc
Outer jacket	Fluoropolymer
Nominal voltage	230 V AC/DC or 400 V AC/DC
Dimensions	7 x 10.5 mm
Permissible ambient temperature	-70...+200 °C
Bending radius, min.	30 mm
Bus wire cross section	2 mm²
Installation temp., min.	-70 °C
Start-up temp., min	-70 °C



Maximum heating circuit length

Type	Nominal output (W/m)	Contact spacing (m)	Length (m) at 10 °C	Length (m) at 100 °C	Maximum maintenance temperature °C	Nominal voltage (V)	Art. No.
ELP/Si F 20 B	20	0.7	147	141	150	230	0320210
ELP/Si F 30 B	30	0.7	98	98	140	230	0320211
ELP/Si F 40 B	40	0.6	73.5	73.5	120	230	0320212
ELP/Si F 40 B	40	1.0	128	128	120	400	0320312
ELP/Si F 20 BOT	20	0.7	147	141	150	230	0320220
ELP/Si F 30 BOT	30	0.7	98	98	140	230	0320221
ELP/Si F 40 BOT	40	0.6	73.5	73.5	120	230	0320222
ELP/Si F 40 BOT	40	1.0	128	128	120	400	0320322

Heating circuit lengths ELP/Si-F on the following conditions

- 16 A circuit breaker, 80 % utilisation
- Max. 10 % voltage drop
- Power connection to one (1) heater end

Cables shall neither intersect nor contact. Provide protection by means of circuit breaker FI 30. Please observe the standards IEC 62395-2, EN 60519-10.

Constant wattage heating cables up to nominal voltages of 120 V are available upon request.

Constant Wattage Heating Cable
with Resistance Wire

These parallel heating cables offer tremendous flexibility in use, as they can easily be cut to the required length off the roll, with the assurance of constant power output. There is no need for a connecting cable and input can be unilateral. It is quick and easy to assemble; this saves a lot of time and as a result reduces cost considerably. Since output of up to 60 W/m is possible for lengths laid to piping, ELP parallel heating cables are particularly suitable for piping with high output requirements such as in industrial process technology. The particularly temperature-resistant outer shell and the high level of chemical resistance ensure a long useful life.

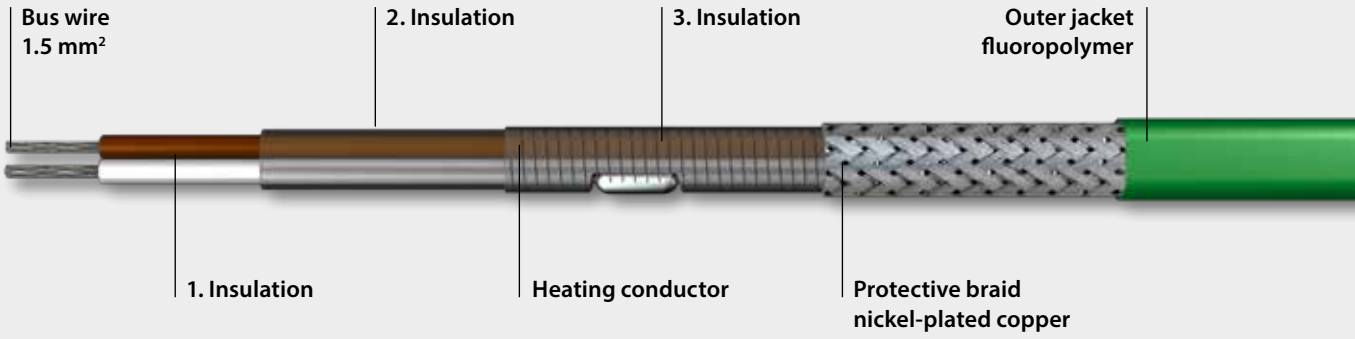
Advantages:

- Single end power input
- Can be cut off the roll
- Constant power output per meter
- Long life cycle
- Laying without exact measuring possible
- High chemical resistance
- UV resistance

Applications:

- Vessels, piping, valves
- Building construction
- Food processing industry
- Paper industry

Type **ELP/FEP up to 200 °C**



Technical Information

Type ELP/FEP up to 200 °C

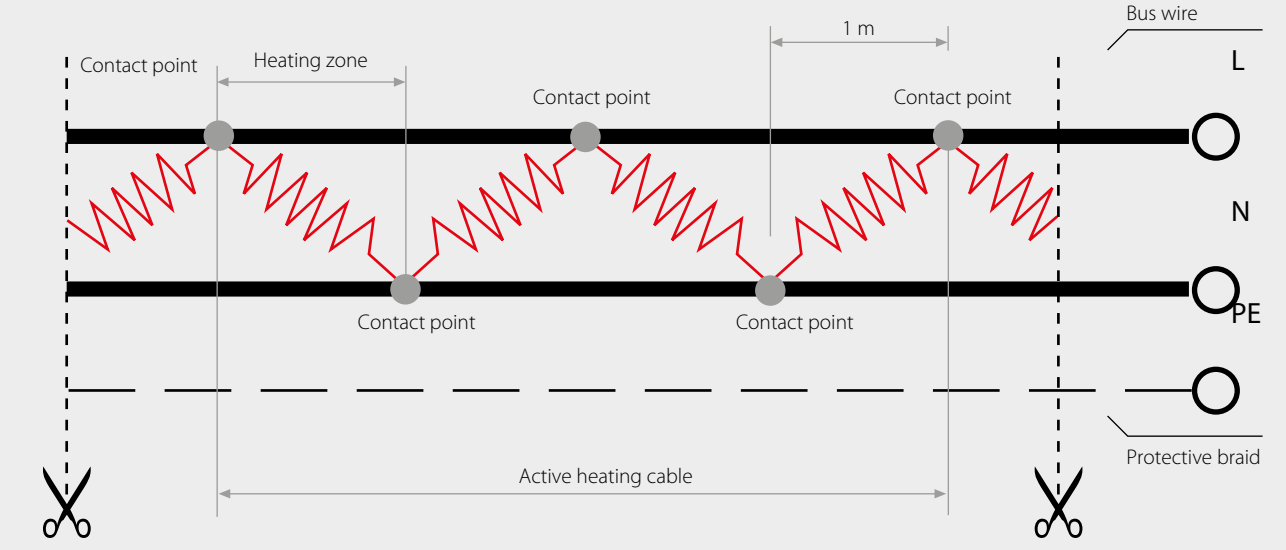
Data

Insulation	Fluoropolymer
Protective braid	Nickel-plated copper
Outer jacket	Fluoropolymer
Nominal temperature	200 °C
Moisture proof	Yes
Bending radius, min.	25 mm
Bus wire cross section	2 x 1.5 mm²
Nominal voltage	230 V AC/DC
Installation temp., min.	-45 °C
Start-up temp., min.	-45 °C

Standards

Manufactured according to	DIN VDE 0721-52 EN 62395-1; 2007-05

Cables shall neither intersect nor contact.
Provide protection by means of circuit breaker FI 30.
Please observe the standards IEC 62395-2, EN 60519-10.



Type	Nominal output	Working temp. max	Dimensions approx. (mm)	Contact spacing (m)	Art. No.
ELP/FEP 15 BO	15 W/m	195°C	8.0 x 5.5	1.0	B033201501
ELP/FEP 30 BO	30 W/m	180°C	8.0 x 5.5	1.0	B033203001
ELP/FEP 45 BO	45 W/m	165°C	8.0 x 5.5	1.0	B033204501
ELP/FEP 60 BO	60 W/m	150°C	8.0 x 5.5	1.0	B033206001

Bus wire cross section 2 x 2 mm² upon request.

Maximum heating circuit length

Type	W/m	Length (m) at 50 °C	Length (m) at 150 °C
ELP/FEP 15 BO	15	161	119
ELP/FEP 30 BO	30	98	82.5
ELP/FEP 45 BO	45	65.5	65.5
ELP/FEP 60 BO	60	50	50

Heating circuit lengths ELP/FEP on the following conditions

- 16 A circuit breaker, 80 % utilisation
- Max. 10 % voltage drop
- Power connection to one (1) heater end

Constant Wattage Heating Cable
with Resistance Wire

These parallel heating cables offer tremendous flexibility in use, as they can easily be cut to the required length off the roll, with the assurance of constant power output. There is no need for a connecting cable and input can be unilateral. It is quick and easy to assemble; this saves a lot of time, and reduces costs considerably as a result. Since output of up to 60 W/m is possible for lengths laid to piping, ELP parallel heating cables are particularly suitable for piping with high output requirements such as in industrial process technology. The particularly temperature-resistant outer shell in Fluoropolymer and the high level of chemical resistance of the Fluoropolymer ensure a long useful life.

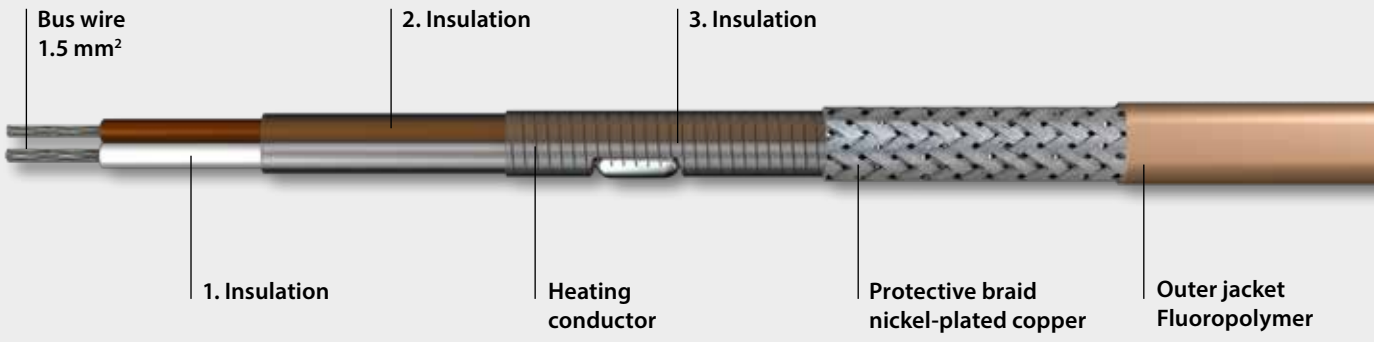
Advantages:

- Single end power input
- Can be cut off the roll
- Constant power output per meter
- Long life cycle
- Laying without exact measuring possible
- High chemical resistance
- UV resistance

Applications:

- Vessels, piping, valves
- Building construction
- Food processing industry
- Paper industry

Type **ELP/PFA up to 260 °C**



Technical Information

Type ELP/PFA up to 260 °C

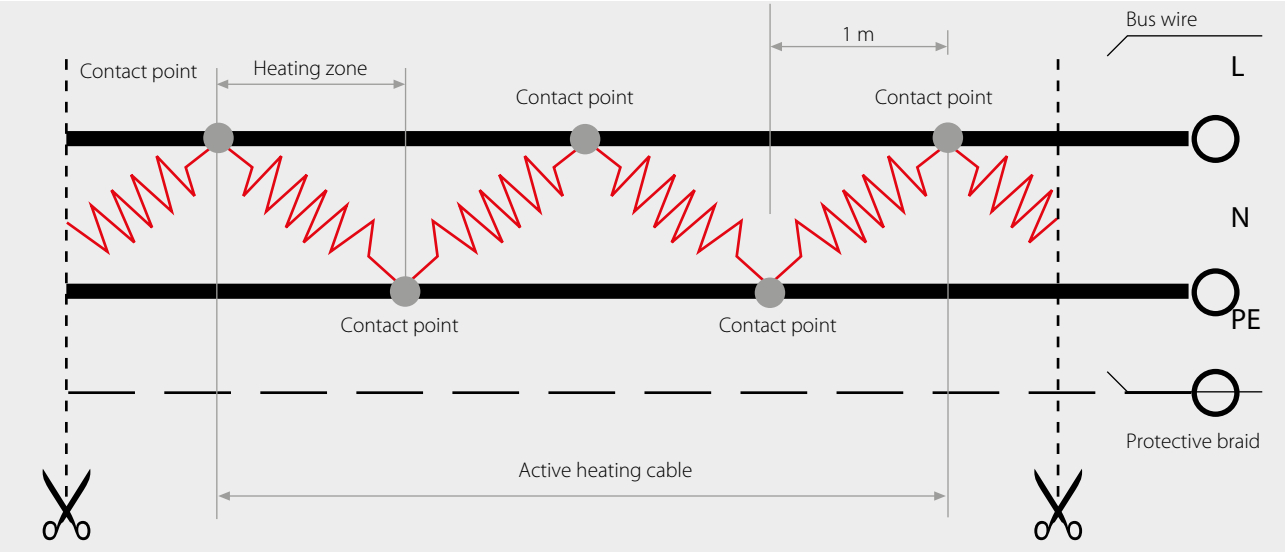
Data

Insulations	Fluoropolymer
Protective braid	Nickel-plated copper
Outer jacket	Fluoropolymer
Nominal temperature	260 °C
Moisture proof	Yes
Bending radius, min.	25 mm
Bus wire cross section	2 x 1.5 mm²
Nominal voltage	230 V AC/DC
Installation temp., min.	-45 °C
Start-up temp., min.	-45 °C

Standards

Manufactured according to	DIN VDE 0721-52 EN 62395-1; 2007-05
Certificates	12ATEX1438U IECEx EPS 12.0009U
Classification	II 2G Ex e IIC Gb II 2D Ex tb IIIC Db

Cables shall neither intersect nor contact.
Provide protection by means of circuit breaker FI 30.
Please observe the standards IEC 62395-2, EN 60519-10.



Type	Nominal output	Working temp. max	Dimensions approx. (mm)	Contact spacing (m)	Art. No.
ELP/PFA 15 BOT	15 W/m	205°C	8.0 x 5.5	1.0	B0332015
ELP/PFA 30 BOT	30 W/m	190°C	8.0 x 5.5	1.0	B0332030
ELP/PFA 45 BOT	45 W/m	175°C	8.0 x 5.5	1.0	B0332045
ELP/PFA 60 BOT	60 W/m	160°C	8.0 x 5.5	1.0	B0332060

Bus wire cross section 2 x 2 mm² upon request.

Maximum heating circuit length

Type	W/m	Length (m) at 50 °C	Length (m) at 150 °C
ELP/PFA 15 BOT	15	161	119
ELP/PFA 30 BOT	30	98	82.5
ELP/PFA 45 BOT	45	65.5	65.5
ELP/PFA 60 BOT	60	50	50

Heating circuit lengths ELP/PFA on the following conditions

- 16 A circuit breaker, 80 % utilisation
- Max. 10 % voltage drop
- Power connection to one (1) heater end

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Types ELSR, ELP

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 … +60°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%)

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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.

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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.

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- 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.

- 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.

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- 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.

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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

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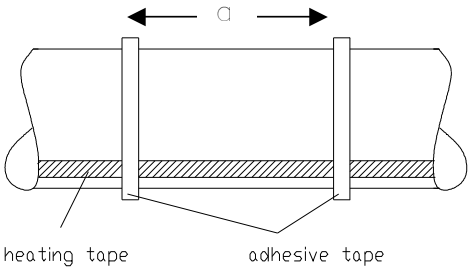
QAA - 023
Installation of Parallel Heating Tapes

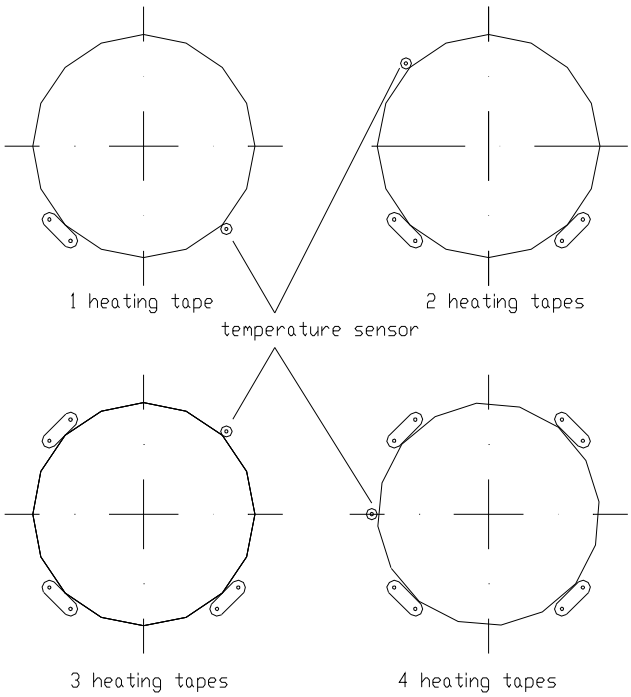
Installation of Heating Tapes on Pipes

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

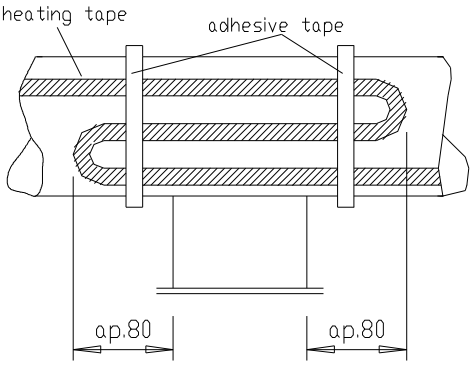
Hazardous Area: a max. 300mm



For multiple tracing please follow the drawing.



Installation of heating tapes on pipe supports



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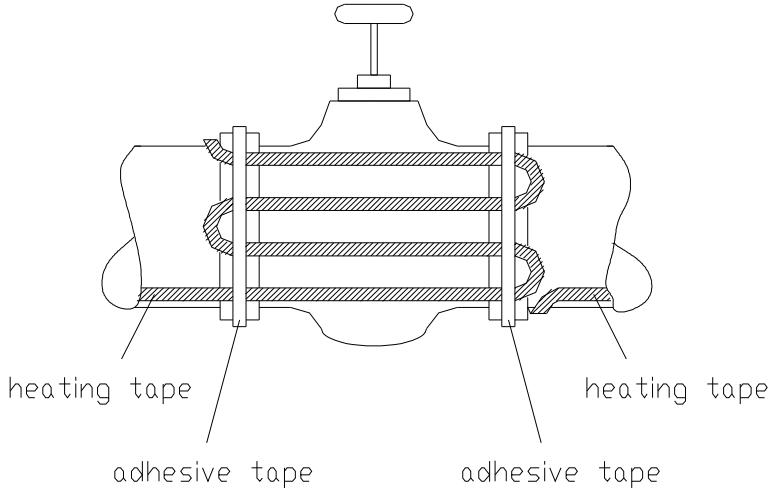
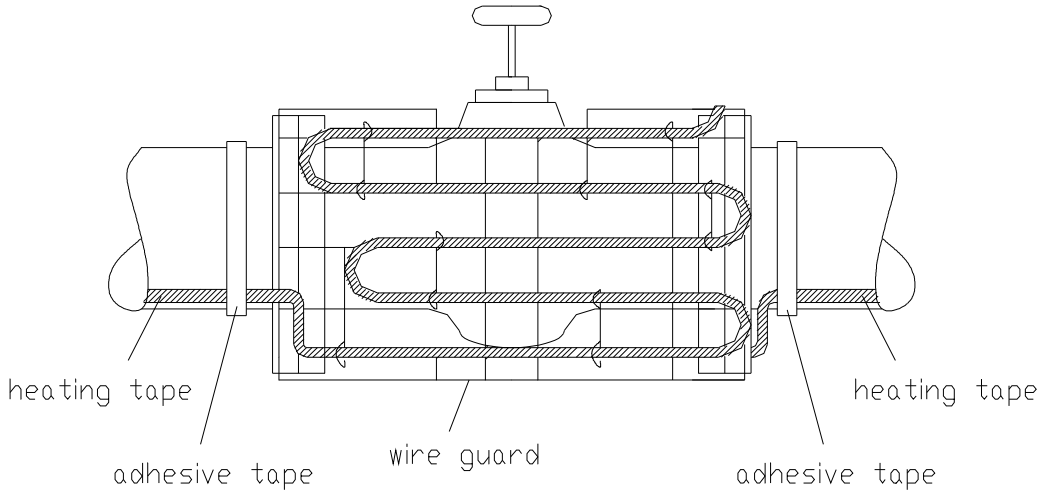
Installation of Heating Tapes on Valves



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



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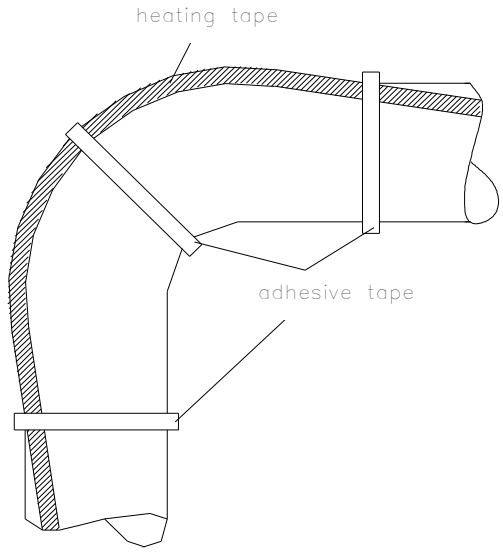
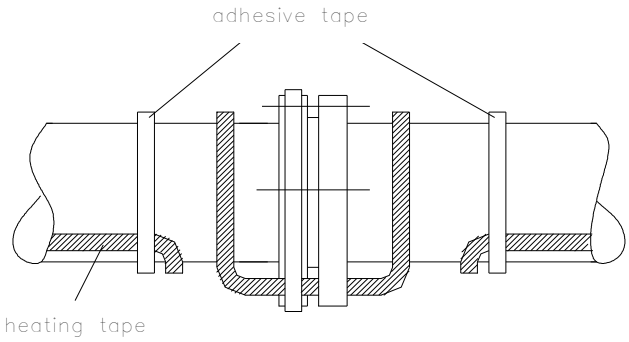
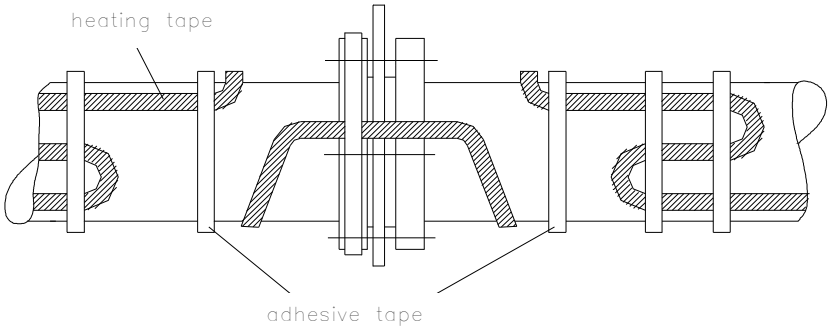
QAA - 023
Installation of Parallel Heating Tapes

Installation on elbows



Installation on flanges





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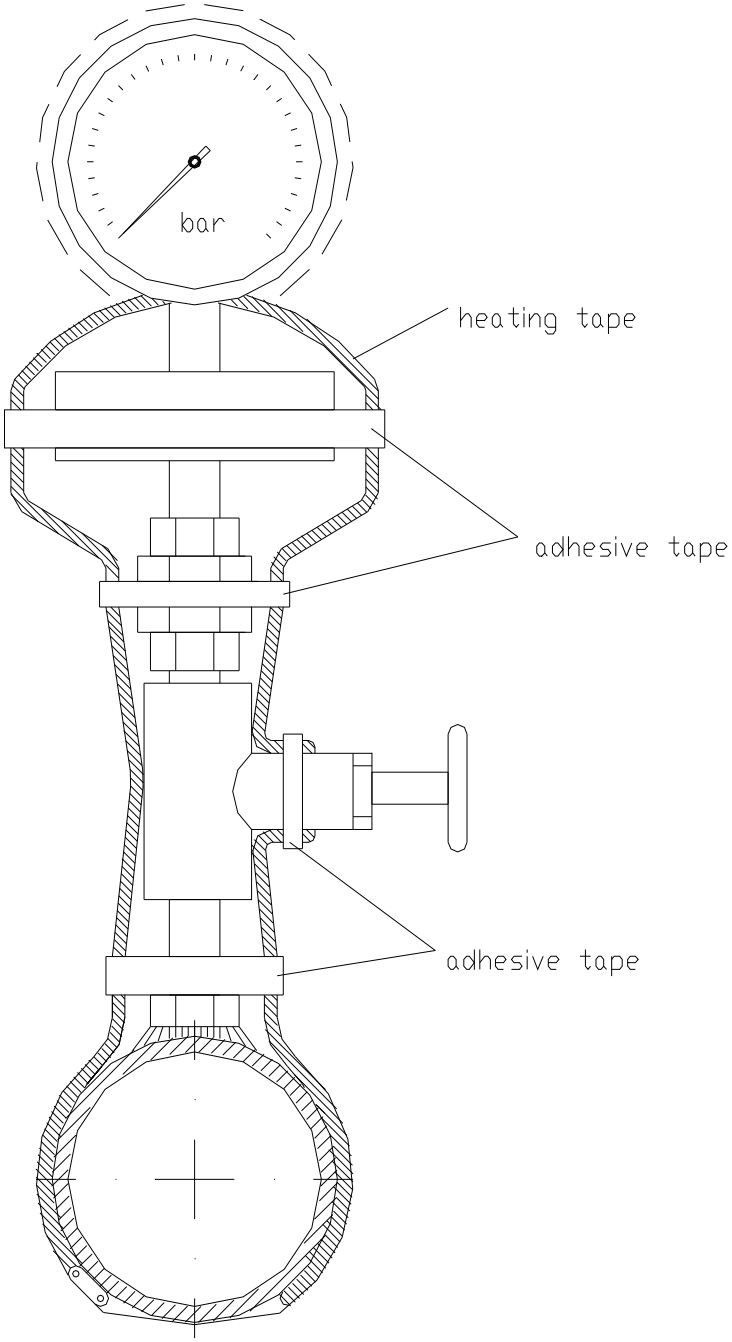
Installation of Heating Tape
on Fittings & Valves



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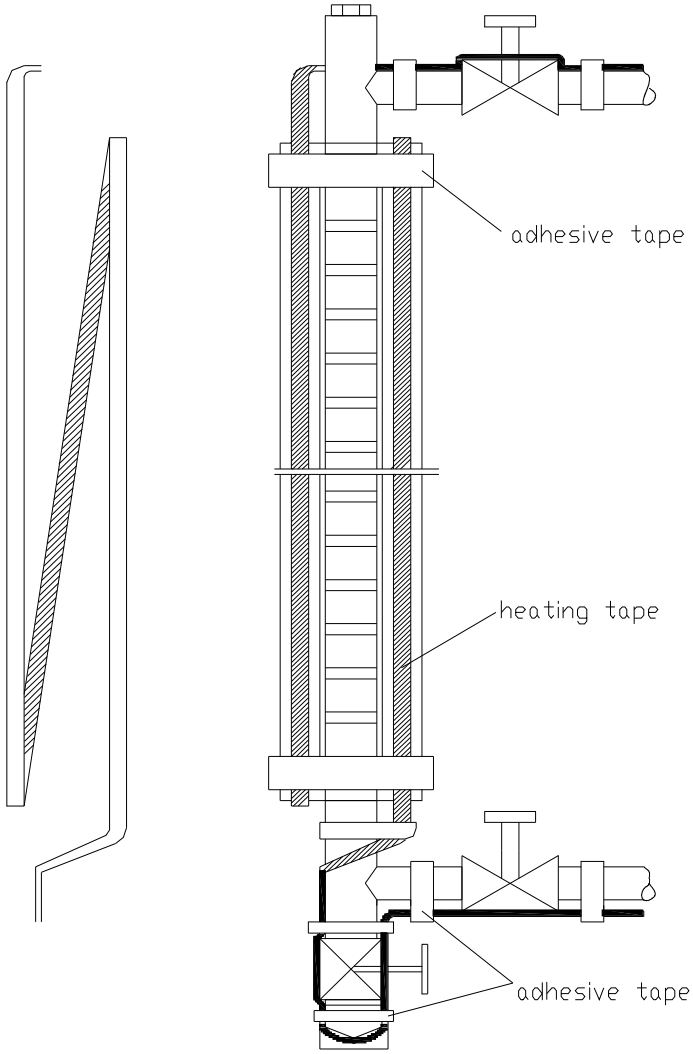
Installation of Heating Tapes
on Level Indicators



Remark: Attach heating tape with self-adhesive aluminium tape

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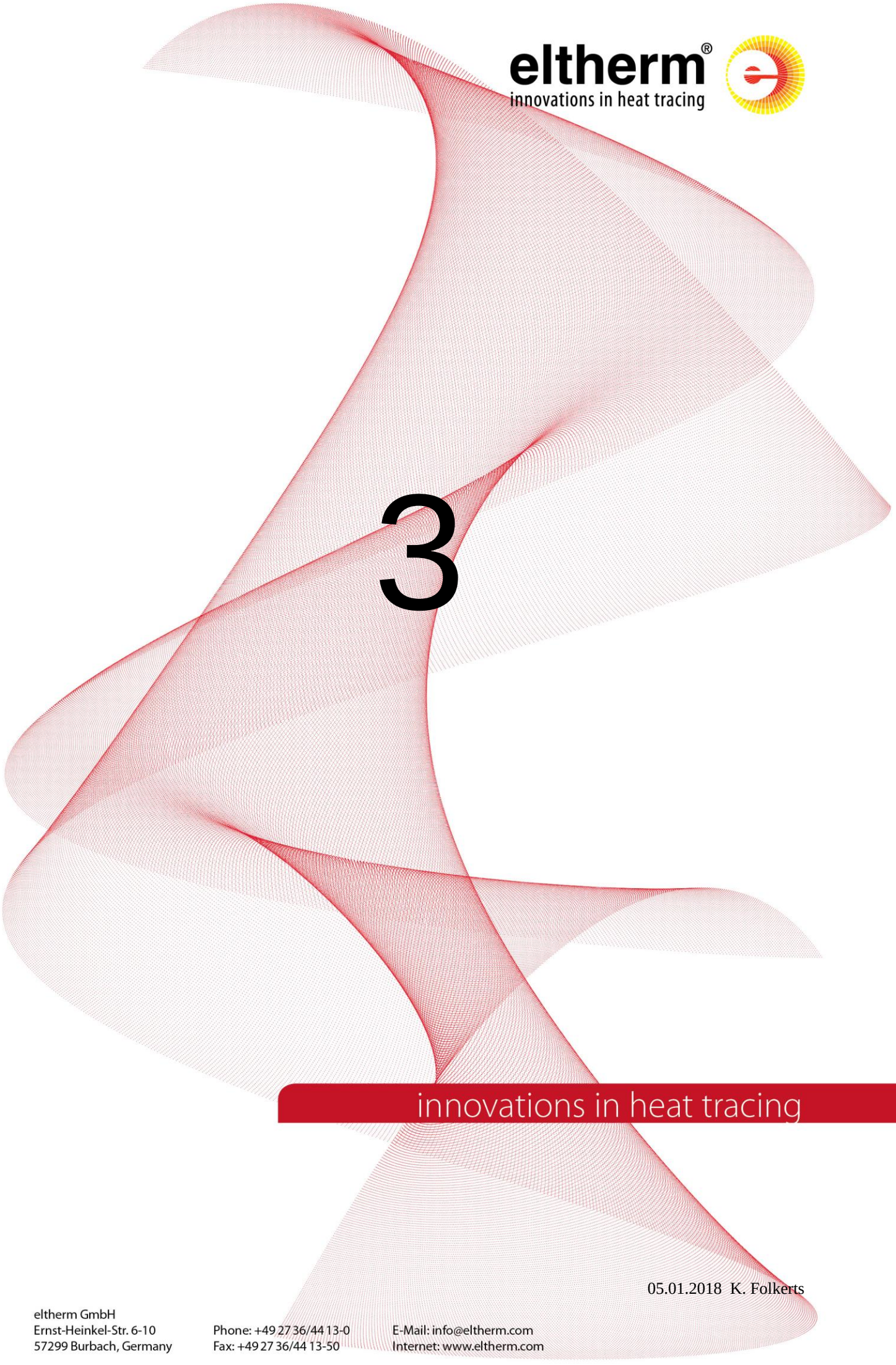

05.01.2018 K. Folkerts

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EU-Konformitätserklärung
EU Declaration of Conformity
UE Déclaration de Conformité

Produkt / *Product* / Produit:
Parallelheizleitung / *constant wattage heating cable* / *parallèle câble chauffant*

Type / *Typ* / *Type*:
ELP-..., EL-Point...

einschließlich zugehörigen An- bzw. Abschlusssets / *including associated termination kit* / *kit de terminaison associé compris*

Type / *Typ* / *Type*:
EL-ECP1, 2, + ; ELVB-ELPA1, 2 ; ELVB EL-Point

Das bezeichnete Produkt stimmt mit den Vorschriften der folgenden europäischen Richtlinien überein / *The designated product is in conformity with the European Directives* / Le produit désigné est conforme à la Directives Européennes:

- 2014/35/EU (Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt)
  2014/35/EU (harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits)
  2014/35/UE (harmonisation des législations des États membres concernant la mise à disposition sur le marché du matériel électrique destiné à être employé dans certaines limites de tension).

- 2011/65/EU inkl. 2015/863/EU (Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten)
  2011/65/EU incl. 2015/863/EU (restriction of the use of certain hazardous substances in electrical and electronic equipment)
  2011/65/UE incl. 2015/863/EU (limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques

Ort, Datum / *Place, Date* / Ville, Date: 57299 Burbach, 24.05.2018

Name / Nom: P. Schmidt
Position : Leiter Entwicklung
R&D Manager
Responsable R&D

Unterschrift / *Signature*: i.V. _____

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