# IECEx Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION
### IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx FMG 24.0009X**



Certificate history:
Issue 0 (2025-01-02)

Status: **Current**

Issue No: 1

Date of Issue: 2025-10-13

Applicant: **eltherm Production GmbH**
Ernst-Heinkel-Straße 6-10
57299 Burbach
**Germany**

Equipment: **ELSR-SH+ Self Regulating Trace Heating Cable Systems**

Optional accessory:

Type of Protection: **Ex 60079-30-1, 'd', 'e', 't'**

Marking: Ex 60079-30-1 db IIC Gb T6...T2
Ex 60079-30-1 eb IIC Gb T6...T2
Ex 60079-30-1 IIIC Db T85°C...T300°C

Approved for issue on behalf of the IECEx Certification Body: **J. E. Marquedant**

Position: **VP, Manager - Electrical Systems**

Signature:
(for printed version)

Date:
(for printed version)

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Certificate issued by:

**FM Approvals LLC**
**One Technology Way**
**Norwood MA 02062**
**United States of America**

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Certificate No.: **IECEx FMG 24.0009X** 

Date of issue: 2025-10-13 Issue No: 1

Manufacturer: **eltherm Production GmbH**
Ernst-Heinkel-Straße 6-10
57299 Burbach
**Germany**

Manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

**STANDARDS** :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

| | |
|---|---|
| IEC 60079-0:2017<br>Edition:7.0 | Explosive atmospheres - Part 0: Equipment - General requirements |
| IEC 60079-1:2014<br>Edition:7.0 | Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d" |
| IEC 60079-31:2013<br>Edition:2 | Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t" |
| IEC 60079-7:2017<br>Edition:5.1 | Explosive atmospheres - Part 7: Equipment protection by increased safety "e" |
| IEC/IEEE 60079-30-1:2015<br>Edition:1.0 | Explosive atmospheres - Part 30-1: Electrical resistance trace heating - General and testing requirements |

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

**TEST & ASSESSMENT REPORTS:**
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

US/FMG/ExTR24.0011/00 US/FMG/ExTR24.0011/01

Quality Assessment Report:

FR/INE/QAR12.0007/08

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**EQUIPMENT:**
Equipment and systems covered by this Certificate are as follows:

Refer to Annex 1 Document

**SPECIFIC CONDITIONS OF USE: YES as shown below:**
Refer to Annex 1 Document

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**Equipment (continued):**

Refer to Annex 1 Document

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**DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)**
Addition of two new power output variants (45 W/m and 75 W/m) and updated 60W/m & 90W/m for improvement to their self-limiting behaviour. Introduction of a new Ex eb/tb rated cable gland (eltherm model code EL-GSR), relevant documentation update, including update to Specific Conditions of Use to improve clarity.

**Annex:**

Annex 1 to IECEx FMG 24-0009X Issue 2.pdf

| | |
|---|---|
| ExTR Reference Number.....: | US/FMG/ExTR24.0011/01 |
| ExTR Free Reference Number .....: | Project ID PR472607 (supplements PR456322) |

## General product information:

ELSR-SH+-... trace heaters are suitable for use on pipes, vessels and associated equipment in areas with combustible gas or dust. They consist of two parallel bus wires (nickel plated copper) which are embedded in a string of conductive polymeric matrix. Different power outputs are achieved by perforating the matrix in defined patterns. The matrix is electrically insulated by a layer of polymeric material, which is covered by a nickel-plated copper braid and finally by a polymeric outer jacket. The free end of each cold lead is either to be connected to the power supply (by means of separately approved junction boxes equipped with approved terminals and approved glands suitable for flat cable) or to be terminated by means of an approved end cap.

ELSR-SH+-... trace heaters are supplied prefabricated or are spliced on site by the manufacturer or by end users. Each prefabricated unit comes with an attached type plate bearing all required information / marking.

**Technical Data**

Material of bus wires: stranded copper 1,23mm$^2$, nickel plated
Matrix material: PFA, carbon black doted
Insulation material: PFA, thickness >= 0.6 mm
Sheath material: PFA, thickness >= 0.4 mm
Protective covering nickel plated copper braid, coverage >70%, cross section > 2mm$^2$
Outer dimensions 14 +- 0.2 mm x 5.5 +- 0.2 mm
Bend radius 25 mm
Nominal voltage see table below
Nominal power see table below
Max. voltage 277 VAC (...-2-BOT only)
Max. current 40 A
Max. exposure temp. 250°C (including integral component EL-ECSH)
Max. maintain temperature 185°C
Min. installation temp. -60°C (including integral component EL-ECSH)
Min. start up temp. -30°C

The model structure is shown below.

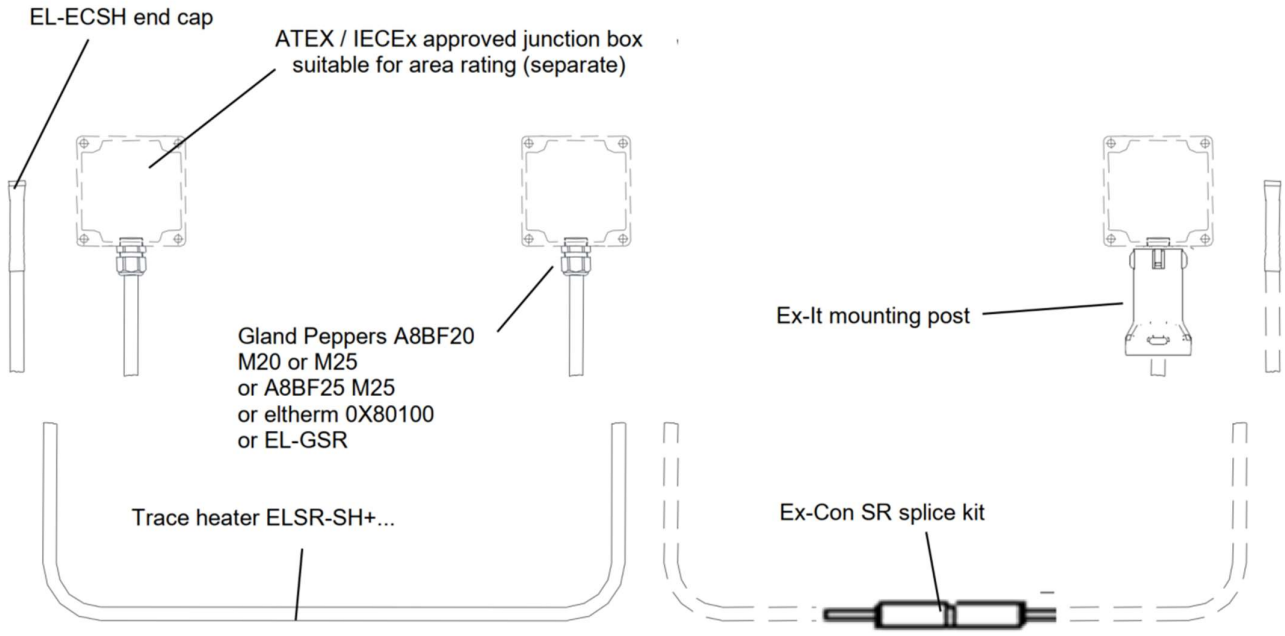
**ELSR-SH+-a-b-c self-regulating heating cable ELSR-SH+ series**

a = power output (15 = 15W/m, 30 = 30W/m, 45 = 45W/m, 60 = 60W/m, 75 = 75W/m, 90 = 90W/m)
b = nominal voltage (1 = 120Vac or 2 = 230Vac [277Vac])
c = type of conductive covering (BOT = Braid and fluoropolymer jacket)

| Electrical Ratings | | |
|---|---|---|
| **Nominal Voltage VAC** | **Nominal Power W/m at 10°C** | **Model Code** |
| 120 | 15 | ELSR-SH+-15-1-BOT |
| 120 | 30 | ELSR-SH+-30-1-BOT |
| 120 | 60 | ELSR-SH+-60-1-BOT |
| 230 | 15 | ELSR-SH+-15-2-BOT |
| 230 | 30 | ELSR-SH+-30-2-BOT |
| 230 | 45 | ELSR-SH+-45-2-BOT |
| 230 | 60 | ELSR-SH+-60-2-BOT |
| 230 | 75 | ELSR-SH+-75-2-BOT |
| 230 | 90 | ELSR-SH+-90-2-BOT |

The components used on the ELSR-SH+ Series Self-regulating Heat Trace Cable Systems are listed below.

- EL-ECSH-Ex end cap
- Ex e gland eltherm 0X80100 (For Ex eb & Ex tb ratings)
- Ex e gland eltherm EL-GSR 40X8045000 (For Ex eb & Ex tb ratings)
- Ex d gland Peppers A8BFNP20M25 (For Ex db & Ex tb ratings)
- Ex d gland Peppers A8BFNP25M25 (For Ex db & Ex tb ratings)
- Ex-Con SR splice kit (For Ex eb & Ex tb ratings)
- Ex-It mounting post (For Ex eb & Ex tb ratings)




**Routine tests:**

1. On 100% of production, the thermal output rating for each shipped length of electric heating cable shall be verified by measurement of the dc resistance, conductance or current at a given voltage and temperature.
2. On 100% of production, each shipped length of heating cable shall be subjected to an a.c. potential equal to 2(E) + 1000 volts [or with a d.c. potential of 1.414(2E + 1000) volts] for a one minute duration, where 'E' equals the rated voltage. As an alternative to these tests, the heating cables may be subjected to a dry spark test at a minimum of 6000 Vac.

**Specific Conditions for Safe Use**

1. The ELSR-SH+-a-b-c series trace heating cables and integral splices shall have a minimum and maximum operating temperature range of -60°C to +250°C.
2. The maximum surface temperature in or on the ELSR-SH+-a-b-c series Trace Heating System is limited to the maximum allowed values by means of controlled design or stabilized design in accordance with IEC/IEEE 60079-30-1. Refer to the table below for the respective temperature classes for the cable systems.
   a. For Stabilized Design -
   The design information from eltherm GmbH and the calculation tool "eltherm designer version 2.0x" shall be such that they ensure temperature stabilization at lower values than the specified maximum surface temperature class selected, T6...T2 or the corresponding maximum surface temperature of the specific gas for EPL Gb, or T85°C...T300°C for the specific dust or fiber for EPL Db.
   b. For Control design -
   The device applied as a temperature limiter for the controlled temperature design shall comply with the requirements of Clause 4.4.3.a) of IEC/IEEE 60079-30-1. The temperature sensors for temperature control or limitation shall be IECEx Certified and comply with the types of protections listed in Clause 1 of EN IEC 60079-0 as EPL Gb or Db equipment. In case of Pt100 sensors connected to intrinsically safe circuits, they shall comply with the applicable requirements of IEC 60079-11.

| Heater | T-Class as per "product classification" | T-Class as per "systems approach" (controlled or stabilized design of heating circuit required by eltherm or by tool eltherm designer V2.0x) |
|---|---|---|
| ELSR-SH+- 15-1-BOT | T3 or T200°C | T4, T5, T6 or Tx with x < 200°C |
| ELSR-SH+- 30-1-BOT | T2 or T230°C | T3, T4, T5, T6 or Tx with x < 230°C |
| ELSR-SH+-60-1-BOT | T2 or T260°C | T3, T4, T5, T6 or Tx with x < 260°C |
| ELSR-SH+- 15-2-BOT | T3 or T200°C | T4, T5, T6 or Tx with x < 200°C |
| ELSR-SH+- 15-2-BOT | T2 or T230°C at 277V | T3, T4, T5, T6 or Tx with x < 230°C |
| ELSR-SH+- 30-2-BOT | T3 or T200°C | T4, T5, T6 or Tx with x < 200°C |
| ELSR-SH+- 30-2-BOT | T2 or T230°C at 277V | T3, T4, T5, T6 or Tx with x < 230°C |
| ELSR-SH+- 45-2-BOT | T3 or T200°C | T4, T5, T6 or Tx with x < 200°C |
| ELSR-SH+- 45-2-BOT | T2 or T230°C at 277V | T3, T4, T5, T6 or Tx with x < 230°C |
| ELSR-SH+- 60-2-BOT | T2 or T230°C | T3, T4, T5, T6 or Tx with x < 230°C |
| ELSR-SH+- 75-2-BOT | T2 or T260°C | T3, T4, T5, T6 or Tx with x < 260°C |
| ELSR-SH+- 90-2-BOT | T2 or T260°C | T3, T4, T5, T6 or Tx with x < 260°C |

3. The ELSR-SH+-a-b-c Trace heaters shall be installed in accordance with the manufacturer's instructions and connected in accordance with IEC 60079-14. The connections shall be made using the following:
   - The end cap to be used for connection is the EL-ECSH model.
   - For Ex e rated system, the splice kit to be used shall be the Ex-Con-SR splice kit
   - (For Ex d rating) an Ex d rated IECEx Certified flameproof enclosure and Ex d Peppers Glands A8BF20M20, A8BF20M25 or A8BF25M25; Gland Peppers A8BF25.
   - (For Ex e rating) an Ex e rated IECEx Certified increased safety enclosure, Ex-It mounting post or Ex e Eltherm Gland M25x1,5 0X80100 or Ex e Eltherm Gland EL-GSR 40X8045000.
   - (For Ex tb rating) an Ex tb rated IECEx Certified enclosure and Ex d Peppers Glands A8BF20M20, A8BF20M25 or A8BF25M25; Gland Peppers A8BF25gland or Ex e Eltherm Gland M25x1,5 0X80100 or Ex-It mounting post or Ex e Eltherm Gland EL-GSR 40X8045000.
4. The ELSR-SH+-a-b-c Trace heaters shall be installed in accordance with the manufacturer's instructions and connected in accordance with IEC 60079-14. The connections shall be made using a suitably rated IECEx Certified flameproof enclosure and gland "d" or a suitably rated IECEx Certified increased safety enclosure and gland "e" or in the case of dust installations using an IECEx Certified and suitably rated "tb" enclosure and gland.
5. Notification shall be given that the design information shall be retained as a record of system documentation for each controlled design system for as long as the system is in use. The set point in the system documentation shall be checked during commissioning of the system.
6. A ground fault protection device must be used with this heating device.