CERTIFICATE OF CONFORMITY

1. **ELECTRICAL EQUIPMENT PER US REQUIREMENTS**

2. **Certificate No:** **FM23NUS0003X**

3. **Equipment:**
   (Type Reference and Name)
   ELSR-NA Series Self-Regulating Heating Cables
   ELSR-HA Series Self-Regulating Heating Cables
   ELVB-SRAN- ¾" ST Power Termination Kit
   ELVB-SRAH- ¾" ST Power Termination Kit

4. **Name of Listing Company:** **eltherm production GmbH**

5. **Address of Listing Company:**
   Ernst-Heinkel Str 6-10
   Burbach 57299
   Germany

6. The examination and test results are recorded in confidential report number:

   PR457700 dated 23 March 2023

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   ANSI/UL 60079-30-1:2017

Certificate issued by:

J. E. Marquedant
VP, Manager - Electrical Systems

23 March 2023
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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8. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

9. Equipment Ratings:

Suitable for use only in an ordinary (non-hazardous) location. Maximum current rating 40A and Voltage rating is 120Vac or 277Vac. See Specific Conditions of Use.

10. **Description of Equipment:**

ELSR-HA-… and -NA-… 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. The matrix is electrically insulated by a layer of polymeric material, which is covered by a tin 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 certified junction box equipped with certified terminals and glands suitable for flat cable) or to be terminated by means of a certified end cap.

There are two forms of ground connections for each sub-category namely “A” for aluminium foil and “B” for metallic braid.

The ratings of these Self-regulating ELSR-NA Series Heat Trace Cable Systems are shown on the table below.

Type	Design	Voltage	Nominal Power	Max. Temperatures
ELSR-NA-..-1-AO	2 nickel plated stranded copper bus wires (1.23mm²), PE Matrix carbon black doted, PP insulation >0.7 mm, aluminum screen (100%) with embedded earth conductor 1mm², PP sheath >0.5 mm	120VAC	3W/ft, 5W/ft, 7W/ft	60°C/140°F energized 80°C/176°F de-energized
ELSR-NA-..-1-BO	as above except for nickel plated braid (70%; cross section >2mm²) instead of aluminum screen and embedded conductor	as above	as above	as above
ELSR-NA-..-1-BOT	as –BO except for Fluoropolymer sheath > 0.4 mm instead of PP sheath	as above	as above	as above
ELSR-NA-..-2-AO	as NA-..-1-AO	240VAC (max. 277 VAC)	4W/ft, 6W/ft, 8W/ft, 10W/ft	as NA-..-1-AO
ELSR-NA-..-2-BO	as NA-..-1-BO	as above	as above	as above
ELSR-NA-..-2-BOT	as NA-..-1-BOT	as above	as above	as above except

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The ratings of these Self-regulating ELSR-HA Series Heat Trace Cable Systems are shown on the table below.

Type	Design	Voltage	Nominal Power	Max. Temperatures
ELSR-HA-..-1-BOT	2 nickel plated bus wires (1.23mm²), ETFE Matrix carbon black doted, PFA insulation >0.6 mm, nickel plated braid (70%), PFA sheath >0.4 mm	120VAC	3W/ft, 7W/ft, 10W/ft, 15W/ft, 20W/ft	120°C/248°F energized 180°C/356°F de-energized continuous
ELSR-HA-..-2-BOT	as above	240VAC (max. 277 VAC)	as above	as above

Integral Components

The integral components used on the ELSR Series Self-regulating Heat Trace Cable Systems are as follows: End termination kits which include the end caps that is made from a silicone material sealed with a silicone glue and Splice termination kit which includes silicone spacer and various heat shrink sleeves for connecting the cold leads to the respective cables. The details of the respective kits are shown below.

End Termination Kits: EL-ECSH (09CA024) and EL-ECN (09CA022)

Splice Kit: EL-SPN 16 (09CA033)

Power Termination Kits

The Power termination kits used on the ELSR Series Self-regulating Heat Trace Cable Systems include cable glands for flat cables and silicone glue for sealing the cables. The details of the respective kits are shown below. These power termination kits are to be used with end user provided enclosure suitably rated for the installation with the herein identified cables.

ELVB-SRAN-3/4" ST (09CA012)
ELVB-SRAH-3/4" ST (09CA011)

The correlations between the respective kits used on the relevant cables are shown below.

Accessories	ELSR-HA	ELSR-NA
End Termination Kit EL-ECSH	+	-
End Termination Kit EL-ECN	-	+
Power Termination Kit ELVB-SRAH-¾ ST	+	-
Power Termination Kit ELVB-SRAN-¾ ST	-	+
Splice Kit EL-SPN 16	-	+

ELSR-NA-a-b-c self-regulating heating cable ELSR-NA series
Parallel-WS; Max. 40A
a = power output (3=3W/ft, 5=5W/ft, 7=7W/ft at 120V ac; 4=4W/ft, 6=6W/ft, 8=8W/ft, 10=10W/ft at 240V ac)
b = nominal voltage (1 = 120Vac or 2 = 240Vac [277Vac])
c = type of conductive covering (AO = Aluminium foil, embedded wires and PP jacket or BO = Braid and PP jacket, BOT = Braid and fluoropolymer jacket)

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Specific Conditions of Use

1. Power Connections shall only be made using an NRTL Listed Junction Box with minimum Approval rating compatible for the connection of the heating cable.
2. Minimum installation temperature is -60°C.
3. Minimum start up temperature is -30°C.
4. Maximum operating temperature is 60°C when power is on.
5. Maximum exposure temperature is 80°C when power is off.
6. The splice kit to be used for connection is the EL-SPN-16 model. The current limit for ELSR circuits connected via the EL-SPN-16 kit is 15A.
7. The end termination kit to be used for connection is the EL-ECN-Ex model.
8. The suitable power termination kit is ELVB-SRAN-¾ ST. Optionally, ELVB-SREx-20 BR HT, ELVB-SREx- ¾" BR HT, and EL-HAZELECT Connection Kit (09CA051).
9. A ground fault protection device must be used with this heating device.

ELSR-HA-a-b-c self-regulating heating cable ELSR-HA series
Parallel-WS; Max. 40A
a = power output (3=3W/ft, 7=7W/ft, 10=10W/ft, 15=15W/ft, 20=20W/ft)
b = nominal voltage (1 = 120Vac or 2 = 240Vac [277Vac])
c = type of conductive covering (AO = Aluminium foil, embedded wires and PP jacket or BO = Braid and PP jacket, BOT = Braid and fluoropolymer jacket)

Specific Conditions of Use

1. Power Connections shall only be made using an NRTL Listed Junction Box with minimum Approval rating compatible for the connection of the heating cable.
2. Minimum installation temperature is -60°C.
3. Minimum start up temperature is -30°C.
4. Maximum operating temperature is 120°C when power is on.
5. Maximum exposure temperature is 180°C when power is off.
6. The end termination kit to be used for connection is the EL-ECSH-Ex model.
7. The splice kit to be used for connection is the EL-SPN-16 model. The current limit for ELSR circuits connected via the EL-SPN-16 kit is 15A.
8. The suitable power termination kit is ELVB-SRAH-¾ ST. Optionally, ELVB-SREx-20 BR HT, ELVB-SREx- ¾" BR HT, and EL-HAZELECT Connection Kit (09CA051).
9. A ground fault protection device must be used with this heating device.

ELVB-SRAN- ¾" ST Power Termination Kit
ELVB-SRAH- ¾" ST Power Termination Kit
Max Voltage 277V; Max. 40A; Max Power 20W/ft

Specific Conditions of Use

1. Minimum installation temperature is -45°C.
2. Maximum exposure temperature is 80°C.

11. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

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12. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

13. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
23rd March 2023	Original Issue.

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