CERTIFICATE OF CONFORMITY

1. **HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS**
2. **Certificate No:** **FM22CA0044X**
3. **Equipment:**
   (Type Reference and Name)
   ELSR-NA Series Self-Regulating Heating Cables
   ELSR-HA Series Self-Regulating Heating Cables
   EL-ECSH-Ex End Termination Kits
   EL-SPN 16 Splice Kits
   EL-HAZELECT-AG 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:

   CSA C22.1:2018, CSA C22.2 No. 0.4:2017, CSA C22.2 No. 0.5:2018, CSA C22.2 No. 130:2016, CAN/CSA 60079-0:2019, CSA C22.2 No. 60079-30-1:2017
8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

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

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
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SCHEDULE

Canadian Certificate Of Conformity No: FM22CA0044X

9. 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.

10. Equipment Ratings:

Suitable for use in Class I, Divisions 1 & 2, Groups A, B, C and D; Class II, Divisions 1 & 2, Groups E, F, and G; Class III, Division 1; Zone 1, Ex 60079-30-1, Group IIC, T6 Gb (for ELSR-NA); T2D/T3 (for ELSR-HA) Hazardous Locations as appropriate.

11. The marking of the equipment shall include:

Class I Division 1, Groups A, B, C, D; T6 (ELSR-NA); T2D/T3 (ELSR-HA) (See Specific Conditions of Use)

Class I Division 2, Groups A, B, C, D; T6 (ELSR-NA); T2D/T3 (ELSR-HA) (See Specific Conditions of Use)

Class II, Division 1, Groups E, F, G; T6 (ELSR-NA); T2D/T3 (ELSR-HA) (See Specific Conditions of Use)

Class III, Division 1; T6 (ELSR-NA); T2D/T3 (ELSR-HA) (See Specific Conditions of Use)

Zone 1, Ex 60079-30-1 IIC T6 Gb (ELSR-NA); T2D/T3 (ELSR-HA) (See Specific Conditions of Use)

12. **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 boxes 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

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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

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 Kits: 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-SREx-20 BR HT (09CA008)
- ELVB-SREx-3/4" BR HT (09CA017)
- EL-HAZELECT (09CAA051)

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

Accessories	ELSR-HA Zone 1 & Cl I Div 2 Grp ABCD Cl II Div 2 Grp EFG Class III	ELSR-NA Zone 1 & Cl I Div 2 Grp ABCD Cl II Div 2 Grp EFG Class III	ELSR-HA Cl I Div 1 Grp ABCD, Cl II Div 1 Grp EFG Class III	ELSR-NA Cl I Div 1 Grp ABCD, Cl II Div 1 Grp EFG Class III
End Termination Kit EL-ECSH	+	-	-	-
End Termination Kit EL-ECN	-	+	-	-
Power Termination Kit Ex ELVB-SREx-20 BR HT	+	+	-	-
Power Termination Kit Ex ELVB-SREx-¾ BR HT	+	+	-	-
Power Termination Kit ELVB-SRAH-¾ ST	-	-	-	-
Power Termination Kit ELVB-SRAN-¾ ST	-	-	-	-
Splice Kit EL-SPN 16	-	+	-	-
Heater Entry Kit EL-HAZELECT Connection Kit (09CA051)	+	+	+	+

13. **Specific Conditions of Use:**

For ELSR-NA Series

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 only power termination kits suitable for Class I, Division 1 classified locations is the EL-HAZELECT Connection Kit (09CA051).
8. The power termination kits suitable for classified locations are the Ex ELVB-SREx-20 BR HT, Ex ELVB-SREx- ¾" BR HT and EL-HAZELECT Connection Kit (09CA051).
9. A ground fault protection device must be used with this heating device.

For ELSR-HA Series

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.

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6. The maximum surface temperature in or on the ELSR-HA-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 CSA C22.2 No. 130-16.

   For Stabilized Design -
   The design information from eltherm GmbH and the calculation tool “eltherm designer version 2.0” shall be such that they ensure temperature stabilization at lower values than the specified maximum surface temperature class selected, T2D to T6 or the corresponding maximum surface temperature of the specific gas for Class I, or T3 to T6 for the corresponding maximum surface temperature of the specific dust or fiber for Class II, Group E & F and Class III, or T3B to T6 or the corresponding maximum surface temperature of the specific dust for Class II, Group G.

   For Control design -
   The device applied as a temperature limiter for the controlled temperature design shall comply with the types of protections that are suitably rated for compatibility with the heating cable system.

7. 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.

8. The end termination kit to be used for connection is the EL-ECSH-Ex model.
9. The only power termination kits suitable for Class I, Division 1 classified locations is the EL-HAZELECT Connection Kit (09CA051).
10. The power termination kits suitable for classified locations are the Ex ELVB-SREx-20 BR HT, Ex ELVB-SREx- ¾” BR HT and EL-HAZELECT Connection Kit (09CA051).
11. A ground fault protection device must be used with this heating device.

For EL-ECSH-Ex End Termination Kit

1. Minimum installation temperature is -60°C.
2. Maximum exposure temperature is 250°C.

For EL-SPN 16 Splice Kit

1. Minimum installation temperature is -25°C.
2. Maximum exposure temperature is 80°C.

For EL-HAZELECT Connection Kit (09CA051)

1. This Power Termination Kit shall only be used with the eltherm GmbH ELSR series trace heating system.
2. Minimum installation temperature is 4°C.
3. Maximum exposure temperature is 200°C.

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

    This Certificate has been issued in accordance with FM Approvals Canadian Certification Scheme.

15. **Schedule Drawings**

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

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

SCHEDULE

Canadian Certificate Of Conformity No: FM22CA0044X

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
23rd March 2023	Original Issue.

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM22US0062X**
3. **Equipment:**
   (Type Reference and Name)
   ELSR-NA Series Self-Regulating Heating Cables
   ELSR-HA Series Self-Regulating Heating Cables
   EL-ECSH-Ex End Termination Kits
   EL-SPN 16 Splice Kits
   EL-HAZELECT 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:

   FM Class 3600:2022, ANSI/UL 60079-0:2020, ANSI/UL 60079-30-1:2017
8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

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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SCHEDULE

US Certificate Of Conformity No: FM22US0062X

9. 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.

10. Equipment Ratings:

Suitable for use in Class I, Divisions 1 & 2, Groups A, B, C and D; Class II, Divisions 1 & 2, Groups E, F, and G; Class III, Division 1; Zone 1, AEx 60079-30-1, Group IIC, T6 Gb (for ELSR-NA); T2D/T3 (for ELSR-HA) hazardous (classified) locations as appropriate.

11. The marking of the equipment shall include:

Class I Division 1, Groups A, B, C, D; T6 (ELSR-NA); T2D/T3 (ELSR-HA) (See Specific Conditions of Use)

Class I Division 2, Groups A, B, C, D; T6 (ELSR-NA); T2D/T3 (ELSR-HA) (See Specific Conditions of Use)

Class II, Division 1, Groups E, F, G; T6 (ELSR-NA); T2D/T3 (ELSR-HA) (See Specific Conditions of Use)

Class III, Division 1; T6 (ELSR-NA); T2D/T3 (ELSR-HA) (See Specific Conditions of Use)

Zone 1, AEx 60079-30-1 IIC T6 Gb (ELSR-NA); T2D/T3 (ELSR-HA) (See Specific Conditions of Use)

12. **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

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US Certificate Of Conformity No: FM22US0062X

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

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 Kits: 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-SREx-20 BR HT (09CA008)
- ELVB-SREx-3/4" BR HT (09CA017)
- EL-HAZELECT (09CAA051)

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

Accessories	ELSR-HA Zone 1 & Cl I Div 2 Grp ABCD Cl II Div 2 Grp EFG Class III	ELSR-NA Zone 1 & Cl I Div 2 Grp ABCD Cl II Div 2 Grp EFG Class III	ELSR-HA Cl I Div 1 Grp ABCD, Cl II Div 1 Grp EFG Class III	ELSR-NA Cl I Div 1 Grp ABCD, Cl II Div 1 Grp EFG Class III
End Termination Kit EL-ECSH	+	-	-	-
End Termination Kit EL-ECN	-	+	-	-
Power Termination Kit Ex ELVB-SREx-20 BR HT	+	+	-	-
Power Termination Kit Ex ELVB-SREx-¾ BR HT	+	+	-	-
Power Termination Kit ELVB-SRAH-¾ ST	-	-	-	-
Power Termination Kit ELVB-SRAN-¾ ST	-	-	-	-
Splice Kit EL-SPN 16	-	+	-	-
Heater Entry Kit EL-HAZELECT Connection Kit (09CA051)	+	+	+	+

13. **Specific Conditions of Use:**

For ELSR-NA Series

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 only power termination kits suitable for Class I, Division 1 classified locations is the EL-HAZELECT Connection Kit (09CA051).
8. The power termination kits suitable for classified locations are the Ex ELVB-SREx-20 BR HT, Ex ELVB-SREx- ¾" BR HT and EL-HAZELECT Connection Kit (09CA051).
9. A ground fault protection device must be used with this heating device.

For ELSR-HA Series

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.

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7. The maximum surface temperature in or on the ELSR-HA-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 ANSI/UL 60079-30-1.

   For Stabilized Design -
   The design information from eltherm GmbH and the calculation tool “eltherm designer version 2.0” shall be such that they ensure temperature stabilization at lower values than the specified maximum surface temperature class selected, T2D to T6 or the corresponding maximum surface temperature of the specific gas for Class I, or T3 to T6 for the corresponding maximum surface temperature of the specific dust or fiber for Class II, Group E & F and Class III, or T3B to T6 or the corresponding maximum surface temperature of the specific dust for Class II, Group G.

   For Control design -
   The device applied as a temperature limiter for the controlled temperature design shall comply with the types of protections that are suitably rated for compatibility with the heating cable system.

8. 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.

9. The only power termination kits suitable for Class I, Division 1 classified locations is the EL-HAZELECT Connection Kit (09CA051).
10. The power termination kits suitable for classified locations are the Ex ELVB-SREx-20 BR HT, Ex ELVB-SREx- ¾” BR HT and EL-HAZELECT Connection Kit (09CA051).
11. A ground fault protection device must be used with this heating device.

For EL-ECSH-Ex End Termination Kit

1. Minimum installation temperature is -60°C.
2. Maximum exposure temperature is 250°C.

For EL-SPN 16 Splice Kit

1. Minimum installation temperature is -25°C.
2. Maximum exposure temperature is 80°C.

For EL-HAZELECT Connection Kit (09CA051)

1. This Power Termination Kit shall only be used with the eltherm GmbH ELSR series trace heating system.
2. Minimum installation temperature is 4°C.
3. Maximum exposure temperature is 200°C.

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

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

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

SCHEDULE

US Certificate Of Conformity No: FM22US0062X

15. **Schedule Drawings**

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

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
23rd March 2023	Original Issue.

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE