

CERTIFICATE OF CONFORMITY



- ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
- Certificate No:** FM16NUS0004
- Equipment:
(Type Reference and Name)** ELK-AG-NA Series PFA Insulated Trace Heating Cable Systems, ELVB-NA 3/8 Connection kit (09CAAG3) and ELVB-NA M12 Connection kit (09CAAG4)
Electrical Resistance PFA Insulated Heating Cable Systems & Integral Components
- Name of Listing Company:** eltherm production GmbH
- Address of Listing Company:** Ernst-Heinkel Str 6-10
Burbach
57299
Germany
- The examination and test results are recorded in confidential report number:

3052962 dated 19th August 2016
- FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

IEEE 515:2011
- 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.

Certificate issued by:

J. E. Marquedant
Manager, Electrical Systems

19 August 2016

Date

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

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FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
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to US Certificate Of Conformity No: FM16NUS0004

9. Equipment Ratings:

Suitable for use only in an ordinary (unclassified) locations. The maximum voltage rating is 750V ac, maximum current is 40A and maximum resistance per meter is 8Ω. See Specific Conditions of Use.

10. Description of Equipment:

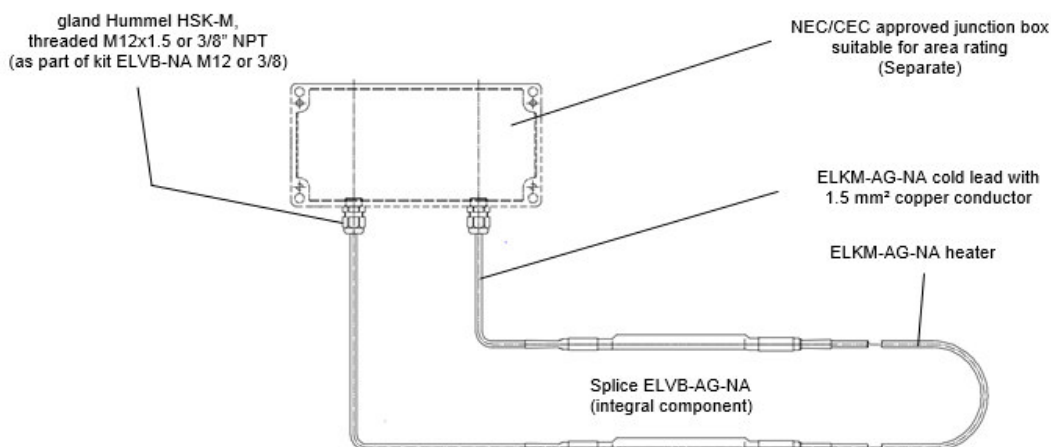
ELK-AG Series heaters consist of a single core series heater with PFA insulation, nickel plated copper braid and PFA outer jacket. The heater is connected to 1.5 mm² cold leads of the same design by integral, crimped splice. The free end of the cold lead is to be connected to the power supply by means of separately approved junction boxes equipped with approved terminals and approved glands with suitable clamping range.

The System Components are as follows: ELKM-AG-NA heater, ELVB-AG-NA splice kit, ELVB-NA (3/8 or M12) Connection Kit & ELKM-AG-NA 0.0117 Cold Lead

Technical Data

Material of conductor:	heater alloy, copper
Range of resistance:	8 Ohm/m to 0.0117 Ohm/m
Tolerance:	±5%
Diameter of conductor:	from 0.4 mm to 1.6 mm depending on resistance
Outer diameter	from 4.7 mm to 6.0 mm (ELKM-AG-NA) depending on resistance
Insulation	PFA, thickness 1.0 mm (ELKM-AG-NA)
Sheath	PFA, thickness 0.8 mm (ELKM-AG-NA)
Bend radius	10 mm (ELKM-AG-NA)
Nominal voltage	750 VAC
Nominal current	40 A
Protective covering	nickel plated copper braid
Resistance of protective coating	< 0.018 Ohm/m
Max. exposure temp.	250°C (95°C for Connection Kit)
Min. installation temp.	-60°C

The system pictorial overview is shown below:



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The products ratings are as shown below:

ELK-AG-NA-a PFA Insulated Heating Cable. ELK-AG-NA Heating Cable System

Maximum Voltage 750V ac; Maximum Current 40A; Maximum Resistance 8Ω/m
Suitable for use in unclassified location
a = resistance (up to 8 ohm/m)

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. Maximum exposure temperature is 250°C.
4. A ground fault protection device must be used with this heating device.
5. The ELK-AG-NA series trace heating cables and integral splices shall have a minimum and maximum operating temperature range of -60°C to +250°C.

ELVB-NA 3/8 Connection kit (09CAAG3)

ELVB-NA M12 Connection kit (09CAAG4)

Maximum Voltage 750V ac; Maximum Current 40A

Specific Conditions of Use

1. These Connection Kits shall only be used with the eltherm GmbH ELK-AG-NA series trace heating system.
2. Minimum installation temperature is -60°C.
3. Maximum exposure temperature is 95°C.
4. A ground fault protection device must be used with this heating device.

11. Test and Assessment Procedure and Conditions:

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

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
19 th August 2016	Original Issue.

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CERTIFICATE OF CONFORMITY



1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** FM16US0124X
3. **Equipment:** ELK-AG-NB & ELK-AG-NC Series PFA Insulated Trace Heating Cable Systems, ELVB-AG-NA Integral Splice Kit and Connection Kits
(Type Reference and Name)
(See Equipment Ratings for further details)
Electrical Resistance PFA Insulated Heating Cable Systems and Integral Components
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:
3052962 dated 19th August 2016
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:
FM Class 3600:2011, FM Class 3615:2006, IEEE 515:2011, IEC/IEEE 60079-30-1:2015, ANSI/ISA 60079-0:2013, ANSI/ISA 60079-1:2013, ANSI/ISA 60079-7:2013
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.
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.

Certificate issued by:

J. E. Marquedant
Manager, Electrical Systems

19 August 2016

Date

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10. Equipment Ratings:

ELK-AG-NC Heating Cable System: Suitable for use in Class I, Divisions 1, Groups A, B, C and D; Suitable for use in Class II, Division 1, Groups E, F, and G; Suitable for use in Class III, Division 1; and Flameproof with Increased Safety for Class I, Zone 1, Group IIC, hazardous (classified) locations. The maximum voltage rating is 750V ac, maximum current 40A and maximum resistance per meter is 8Ω. See Specific Conditions of Use for details of temperature class.

ELVB-AG-NA Splice kit (09CAAG0): Suitable for use in Class I, Divisions 1, Groups A, B, C and D; Suitable for use in Class II, Division 1, Groups E, F, and G; Suitable for use in Class III, Division 1; and Increased Safety for use in Class I, Zone 1, Group IIC, hazardous (classified) locations. The maximum voltage rating is 750V ac, maximum current 40A and maximum resistance per meter is 8Ω. See Specific Conditions of Use for details of temperature class.

EL-HAZELECT Connection Kit (09CA050): Explosionproof for use in Class I, Divisions 1, Groups A, B, C and D; Dustignitionproof for use in Class II, Division 1, Groups E, F, and G; Dustignitionproof for use in Class III, Division 1; and Explosionproof for Class I, Zone 1, Group IIC, hazardous (classified) locations. The maximum voltage rating is 750V ac, maximum current 40A and maximum resistance per meter is 8Ω. See Specific Conditions of Use for details of temperature class.

ELK-AG-NB Heating Cable System: Suitable for use in Class I, Division 2, Groups A, B, C and D; Suitable for use in Class II, Division 1, Groups E, F, and G; Suitable for use in Class III, Division 1; and Flameproof with Increased Safety for use in Class I, Zone 1, Group IIC, hazardous (classified) locations. The maximum voltage rating is 750V ac, maximum current 40A and maximum resistance per meter is 8Ω. See Specific Conditions of Use for details of temperature class.

ELVB-NB 1/2 Connection kit (09CAAG1) and ELVB-NB M16 Connection kit (09CAAG2): Suitable for use in Class I, Division 2, Groups A, B, C and D; Suitable for use in Class II, Division 1, Groups E, F, and G; Suitable for use in Class III, Division 1; Flameproof for Class I, Zone 1, Group IIC, Increased Safety for Class I, Zone 1, Group IIC, hazardous (classified) locations. The maximum voltage rating is 750V ac, maximum current 40A and maximum resistance per meter is 8Ω. See Specific Conditions of Use for details of temperature class.

11. The marking of the equipment (as appropriate) shall include:

- Class I Division 1, Groups A, B, C, D; T* (*Refer to Special Conditions of Use)
- Class I Division 2, Groups A, B, C, D; T* (*Refer to Special Conditions of Use)
- Class II, Division 1, Groups E, F, G, Class III, Division 1; T* (*Refer to Special Conditions of Use)
- Class I, Zone 1, AEx d e IIC T* (*Refer to Special Conditions of Use)
- Class I, Zone 1, AEx d IIC IIC T* (*Refer to Special Conditions of Use)
- Class I, Zone 1, AEx e IIC IIC T* (*Refer to Special Conditions of Use)

12. **Description of Equipment:**

ELK-AG Series heaters consist of a single core series heater with PFA insulation, nickel plated copper braid and PFA outer jacket. The heater is connected to 1.5 mm² cold leads of the same design by integral, crimped splice. The free end of the cold lead is to be connected to the power supply by means of separately approved junction boxes equipped with approved terminals and approved glands with suitable clamping range.

The System Components for various areas are as follows:

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Class I Div 1: ELKM-AG-NA heater, ELVB-AG-NA splice kit, EL-HAZELECT-AG Connection Kit & ELKM-AG-NA 0.0117 Cold Lead

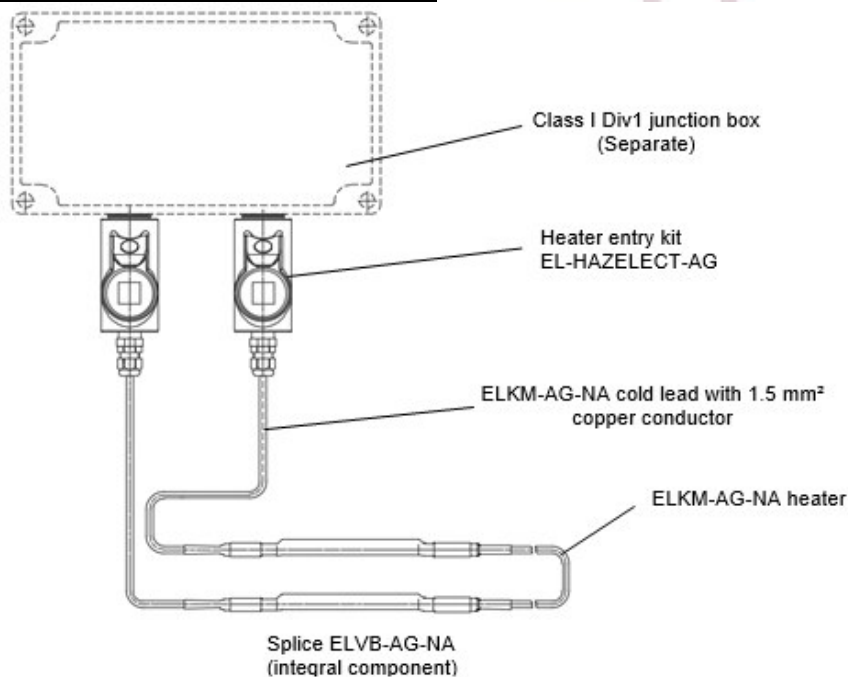
Class I Div 2; Class II Div 1/2 & Class III; Class I Zone 1: ELKM-AG-NA heater, ELVB-AG-NA splice kit, ELVB-NB (1/2 or M16) Connection Kit & ELKM-AG-NA 0.0117 Cold Lead

Technical Data

Material of conductor:	heater alloy, copper
Range of resistance:	8 Ohm/m to 0.0117 Ohm/m
Tolerance:	+ - 5%
Diameter of conductor:	from 0.4 mm to 1.6 mm depending on resistance
Outer diameter	from 4.7 mm to 6.0 mm (ELKM-AG-NA) depending on resistance
Insulation	PFA, thickness 1.0 mm (ELKM-AG-NA)
Sheath	PFA, thickness 0.8 mm (ELKM-AG-NA)
Bend radius	10 mm (ELKM-AG-NA)
Nominal voltage	750 VAC
Nominal current	40 A
Protective covering	nickel plated copper braid
Resistance of protective coating	< 0.018 Ohm/m
Max. exposure temp.	250°C (100°C for the ELVB-NB (1/2 or M16) Connection Units)
Min. installation temp.	-60°C (4°C for the EL-HAZELECT-AG Connection Units)

The respective system pictorial overview is shown below:

Class I Division 1 (Classified) Area



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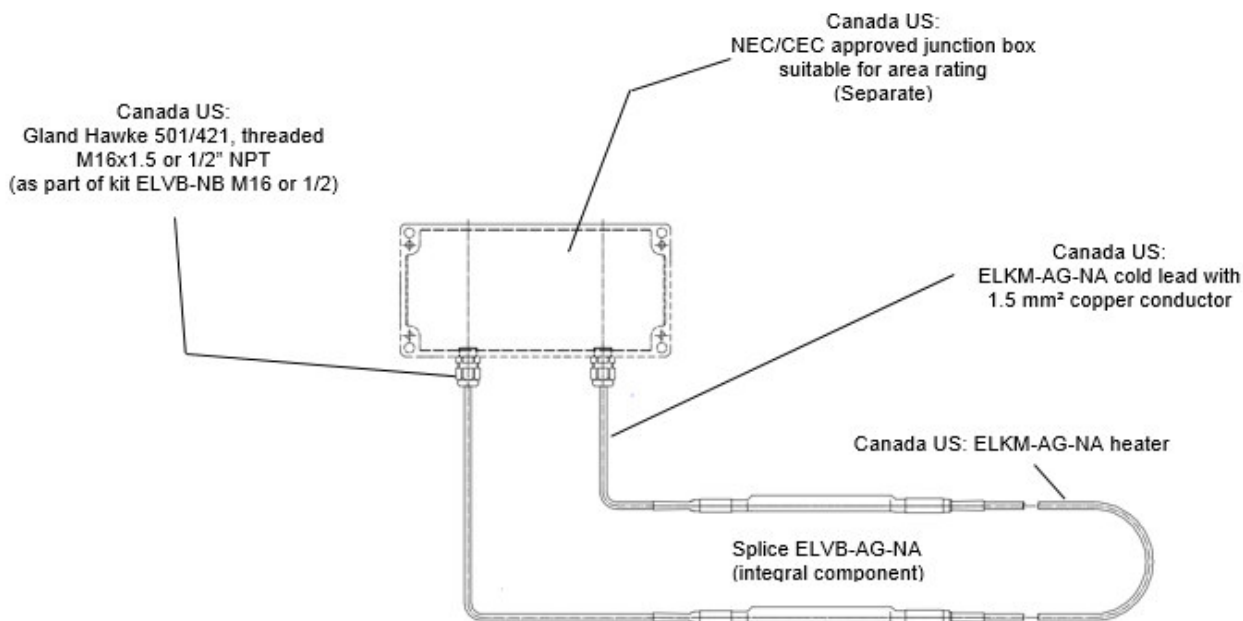
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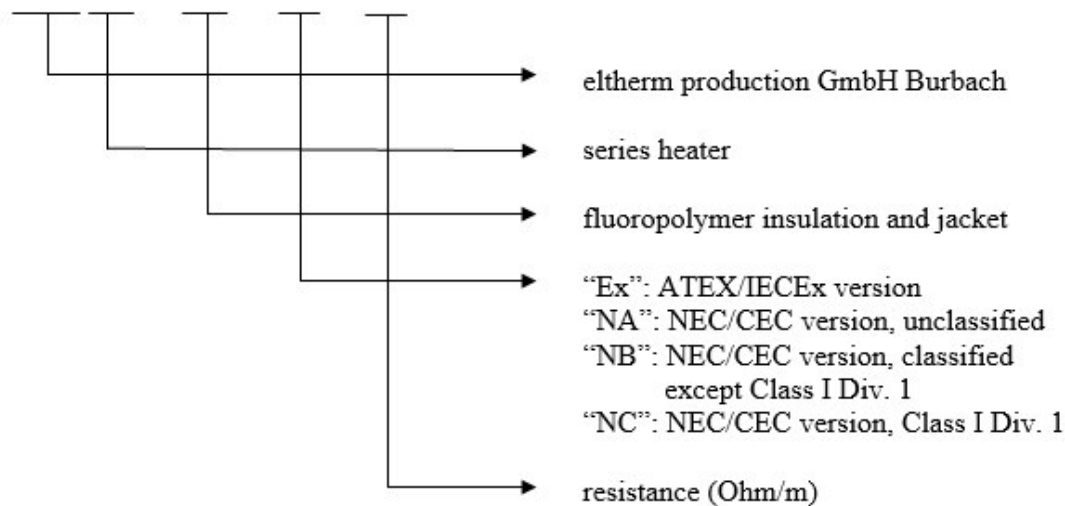
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Other Classified Areas (Except Class I, Division 1)



The model structure of the heating cable is shown below:

E L K - A G -



example: „ELK-AG-Ex 0,4“; „ELK-AG-NB 0.26“

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13. Specific Conditions of Use:

For ELK-AG-NB & ELK-AG-NC 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. Maximum exposure temperature is 250°C.
4. A ground fault protection device must be used with this heating device.
5. The ELK-AG-NC & ELK-AG-NB series trace heating cables and integral splices shall have a minimum and maximum operating temperature range of -60°C to +250°C.
6. The maximum surface temperature in or on the ELK-AG-NB & ELK-AG-NC series Trace Heating System is limited to the maximum allowed values by means of controlled design or stabilized design in accordance with IEEE 515 or IEC/IEEE 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, T2C 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.

For ELVB-AG-NA Splice kit (09CAAG0)

1. This Splice Kit shall only be used with the eltherm GmbH ELKM-AG & ELKM-AG-NA trace heaters and their corresponding Cold Leads.
2. Minimum installation temperature is -60°C.
3. Maximum exposure temperature is 250°C.
4. The Temperature class shall be T2C 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.
5. A ground fault protection device must be used with this heating device.

For EL-HAZELECT Connection Kit (09CA050)

1. This Connection Kit shall only be used with the eltherm GmbH ELK-AG-NC series trace heating system. Optionally it is suitable for use on the ELK-AG-NA & ELK-AG-NB series trace heating system.
2. Minimum installation temperature is 4°C.
3. Maximum exposure temperature is 250°C.
4. The Temperature class shall be T2C 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.
5. A ground fault protection device must be used with this heating device.

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For ELVB-NB 1/2 Connection kit (09CAAG1) & ELVB-NB M16 Connection kit (09CAAG2)

1. These Connection Kits shall only be used with the eltherm GmbH ELKM-AG-NB trace heaters system. Optionally it is suitable for use on the ELK-AG-NA series trace heating system.
2. Minimum installation temperature is -60°C.
3. Maximum exposure temperature is 100°C.
4. The Temperature class shall be T2C 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.
5. A ground fault protection device must be used with this heating device.

14. Test and Assessment Procedure and Conditions:

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

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:

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