

# ELK-MI AY 825: Premium Reliability for High Temperatures and Extreme Conditions

## Mineral-Insulated Trace Heating Solutions with Clean Laser Seal Technology

**Manufactured and assembled entirely from high-quality nickel/chromium Alloy 825, eltherm's revolutionary Clean Laser Seal (CLS) Technology guarantees premium reliability and performance in industrial operations.**

**eltherm's proprietary clean laser sealing process ensures a homogeneous, 100% stable system, providing reliable function and maintenance-free assembly.**

CLS offers today's best possible protection from stress corrosion cracking in applications where leachable chlorides, high sulfur content or other highly aggressive chemicals may be present.

Alloy 825 is the material of choice for high temperature maintain process control and thus perfectly suited for use in freeze protection or viscosity control applications subject to periodic high temperature exposure.

### Key Features:

- › Factory terminated laser sealed technology
- › All components in high quality Alloy 825
- › High temperature resistance
- › Highest chemical resistance
- › High power output
- › Flexible single or two conductor configurations
- › Moisture proof, may be immersed in fluids

### Industries served:

- › Chemical/petrochemical
- › Oil and gas
- › Food processing
- › Pharmaceutical
- › Concentrated Solar Power
- › LNG and cryogenic tanks
- › Machinery and plants
- › Power generation



**Clean Laser Seal Technology takes MI Trace Heater Assemblies to the next Level.**

## At a Glance

### Applications



Temperature maintenance



Freeze prevention



Pipelines



Vessels

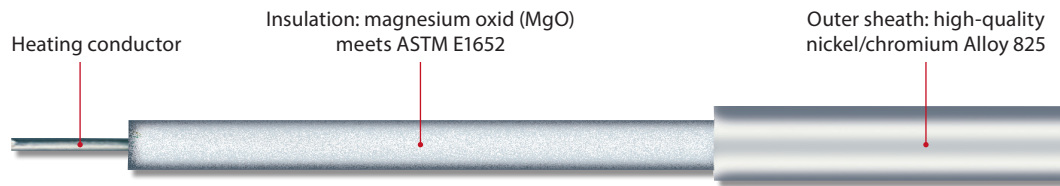
- › Viscosity protection in industrial processes
- › Process temperature maintenance
- › Vendor skids and process modules
- › Heat tracing of instrumentation and sample stations
- › High temperature exposure
- › High watt density requirements
- › Vacuum processes
- › Heat treating processes

### Benefits

- › Purity: no foreign material
- › Full range of resistances
- › Rapid assembly, highly economical
- › No filler holes
- › Insulation (MgO) meets ASTM E1652

# State-of-the-Art Technology, Valuable Benefits

Mineral-Insulated Trace Heating with Clean Laser-Seal Technology: Specifications



## Approvals

	USA	Canada
<b>Manufactured according to</b>	› UL 60079-30-1	› CSA 22.2 130-16
<b>Certification</b>	› FM 18 US0191X	› FM 18 CA0089X
<b>Classification</b>	<ul style="list-style-type: none"> <li>› Class I, Div 1, Groups A,B,C,D</li> <li>› Class I, Div 2, Groups A, B, C, D</li> <li>› Class II, Div 1, Groups E, F, G;</li> <li>› Class III, Div 1</li> <li>› Class I, Zone 1, AEx/Ex d e IIC T1...T6</li> </ul>	



## Technical Data

<b>Model designation</b>	ELK-MI AY 825
<b>System description</b>	Mineral-Insulated Trace Heater
<b>Outer sheath</b>	Alloy 825
<b>Operating temp., max.</b>	1292 °F / 700 °C
<b>Ambient temp. min.</b>	-76 °F / -60 °C
<b>Nominal output</b>	Up to 76 W/ft (250 W/m*)
<b>Nominal voltage</b>	Up to 600 V AC
<b>Cold lead Assembly</b>	Typical 6' (approx. 1.8 m), includes 18" (450 mm) flexible cord (pigtails)
<b>Cable gland</b>	Stainless Steel 1/2" MNPT (or M20 x 1.5) Stainless Steel 3/4" MNPT (or M25 x 1.5)
<b>Min. bending radius</b>	Diameter x 6
<b>Moisture proof</b>	Yes

# Reliability and Safety in 100% Alloy 825

## Mineral-Insulated Clean Laser-Seal Trace Heaters: Configurations

### Configurations

MI heater assemblies are available in the following design configurations:

#### Design B

Single conductor cold lead MI Heater with clean laser seal hot to cold on both ends

#### Design D

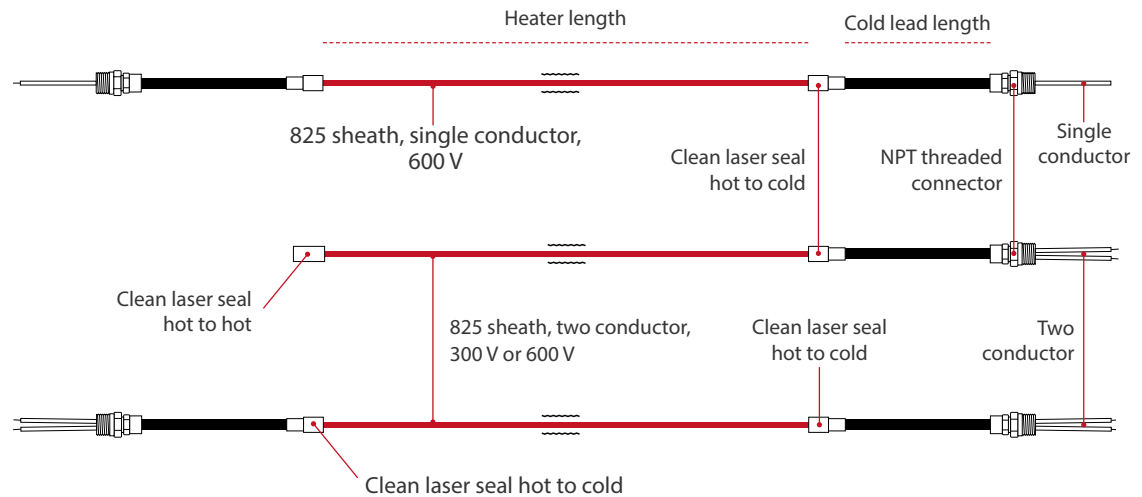
Two conductor cold lead MI Heater with clean laser seal hot to cold on one end. Clean laser seal hot to hot at opposite end

#### Design E

Two conductor cold lead MI Heater with clean laser seal hot to cold on both ends.

eltherm MI-trace heaters consist of a single or two conductor series trace heater connected to mineral-insulated cold leads by means of a clean laser seal (splice). The cold lead cable is terminated in a hermetically sealed pot and supplied with flexible power leads (pigtailed) and ground wire. A compression ring and flameproof stainless steel gland (available in either NPT or metric sizes) is provided

to complete the assembly. MI trace heaters are supplied prefabricated by eltherm and ready for installation. Each unit comes with a type plate bearing all information / markings. Maximum maintain temperatures are derived from the maximum sheath temperature determined by eltherm and are also indicated on the type plate.



### The Catalog Number

A unique catalog number is used to specify MI heaters. From the example on the right:

- › B design is a cold lead on both ends of the cable
- › 30E3H-1S Unique Reference
- › The heater is 400 ft. long
- › Total power output of the heater is 1,200 W
- › The heater output voltage is 120V
- › The cold lead (both ends) is 6 ft. long
- › The cold lead size is 14 A.W.G.
- › The heater assembly has no additional options

**B / 30E3H-1S / 400 / 1200 / 120 / 6 / 14 - 1 - H/L**

↑ Design      ↑ Cable ref.      ↑ Total heated length      ↑ Wattage      ↑ Operating Voltage      ↑ Cold Lead Length      ↑ Number of Conductor

A.W.G.      H indicates 600V  
L indicates 300V

#### Notes:

1. Total heated length means the total length of heater used to make up the unit.  
For example: A 400' design B heater will trace 200 ft. of pipe with a double pass.
2. Tolerance of heater resistance is 10%.
3. Tolerance on heater length is +3% -0%
4. If the lead in length exceeds 25 ft voltage drop should be considered.

#### Determining the Unique Catalog Number:

- › Unless marked with an m after length, the unit of measurement is ft.
- › Cold lead AWG size follows the current CEC or NEC rating and cable design.
- › Special Options may include larger gland requirements or pig-tail lengths etc.
- › There are a number of special options available if required.

# Flexibility for Your Specific Requirements

## MI Clean Laser-Seal Trace Heaters: Cable Specifications & Available Resistances

### 600 V - Single Conductor

eltherm Part No.	Conductor Type	Standard		Metric	
		Dia. inches	Resistance $\Omega$ per ft	Dia. mm	Resistance $\Omega$ per m
30E1H-1S	Nichrome R	0.17	3.0000	4.3	9.842
20E1H-1S	Nichrome R	0.17	2.0000	4.3	6.562
19E1H-1S	Nichrome R	0.17	1.8800	4.3	6.168
16E1H-1S	Nichrome A	0.17	1.6000	4.3	5.249
13E1H-1S	Nichrome A	0.17	1.3000	4.3	4.265
12E1H-1S	Nichrome A	0.17	1.2200	4.3	4.003
10E1H-1S	KP	0.17	1.0000	4.3	3.281
85E2H-1S	KP	0.17	0.8500	4.3	2.789
70E2H-1S	Constantan	0.17	0.7000	4.3	2.297
50E2H-1S	Constantan	0.17	0.5000	4.3	1.640
38E2H-1S	Constantan	0.17	0.3800	4.3	1.247
30E2H-1S	Constantan	0.17	0.3000	4.3	0.984
25E2H-1S	Constantan	0.17	0.2500	4.3w	0.820
20E2H-1S	Constantan	0.18	0.2000	4.4	0.656
17E2H-1S	Constantan	0.18	0.1700	4.3	0.558
15E2H-1S	Alloy 60	0.17	0.1500	4.3	0.492
12E2H-1S	Alloy 60	0.17	0.1200	4.3	0.394
10E2H-1S	Alloy 60	0.17	0.1000	4.3	0.328
80E3H-1S	Alloy 60	0.17	0.0800	4.3	0.262
70E3H-1S	Alloy 60	0.17	0.0700	4.3	0.230
60E3H-1S	Alloy 60	0.17	0.0600	4.3	0.197
40E3H-1S	Alloy 60	0.18	0.0400	4.4	0.131
30E3H-1S	Alloy 60	0.19	0.0300	4.7	0.098
20E3H-1S	Alloy 60	0.20	0.0200	5.1	0.066
10E3H-1S	Copper	0.17	0.01000	4.3	0.033
65E4H-1S	Copper	0.18	0.0065	4.3	0.021
40E4H-1S	Copper	0.19	0.0041	4.8	0.013

### 600 V - Two Conductor

eltherm Part No.	Conductor Type	Standard		Metric	
		Dia. inches	Resistance $\Omega$ per ft	Dia. mm	Resistance $\Omega$ per m
11E0H-2S	Nichrome R	0.22	11.0000	5.6	36.089
90E1H-2S	Nichrome R	0.23	9.0000	5.7	29.527
75E1H-2S	Nichrome R	0.24	7.5000	6.0	24.606
60E1H-2S	Nichrome R	0.23	6.0000	5.8	19.685
40E1H-2S	Nichrome A	0.24	4.0000	6.1	13.123
30E1H-2S	Nichrome A	0.26	3.0000	6.5	9.842
20E1H-2S	Nichrome R	0.26	2.0000	6.5	6.562
14E1H-2S	Constantan	0.26	1.4000	6.5	4.593
10E1H-2S	KP	0.26	1.0000	6.5	3.281
70E2H-2S	Constantan	0.27	0.7000	6.7	2.297
50E2H-2S	Constantan	0.28	0.5000	7.1	1.640
30E2H-2S	Constantan	0.30	0.3000	7.6	0.984
23E2H-2S	Alloy 90	0.28	0.2300	6.9	0.755
20E2H-2S	Alloy 90	0.26	0.2000	6.5	0.656
15E2H-2S	Alloy 90	0.27	0.1500	6.7	0.492
10E2H-2S	Alloy 60	0.28	0.1000	7.1	0.328
70E3H-2S	Alloy 60	0.30	0.0700	7.5	0.230
50E3H-2S	Alloy 60	0.31	0.0500	7.9	0.164
40E3H-2S	Alloy 60	0.33	0.0400	8.3	0.131
30E3H-2S	Alloy 60	0.35	0.0300	8.8	0.098
20E3H-2S	Copper	0.27	0.0200	6.9	0.066
16E3H-2S	Copper	0.28	0.0160	7.1	0.052
13E3H-2S	Copper	0.29	0.0130	7.4	0.043
10E3H-2S	Copper	0.30	0.0100	7.6	0.033

For custom configurations, please consult with eltherm engineering for details.





## eltherm in North America

The eltherm Group with headquarters in Burbach, Germany, services global markets from 14 locations on 5 continents. The company is an engineering solution provider and a one-stop supplier for electrical heat tracing products and systems with in-house production.

All over the world, eltherm is renowned as a turn-key partner for engineering, design, installation and commissioning of electrical heat tracing for industrial plants and facilities. Its production facilities in Burbach and Calgary, Canada are home of the CLS Clean Laser Seal Technology for Mineral-Insulated Trace Heaters featured here. Headquarters of eltherm North America are located in Burlington, Canada.

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