



ELK-MI Stainless Steel: Highest Reliability for High Temperatures and Tough Conditions

Mineral-Insulated Trace Heating Solutions with Clean Laser Seal Technology

Manufactured and assembled entirely from high quality stainless steel, eltherm's revolutionary Clean Laser Seal Technology (CLS) guarantees performance and reliability in all industrial operations.

It 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 in which aggressive chemicals may be present.

Stainless steel is the material of choice for temperature process control and ideally suited for freeze protection or viscosity control applications subject to periodic high temperature exposure.

Industries served

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

Features

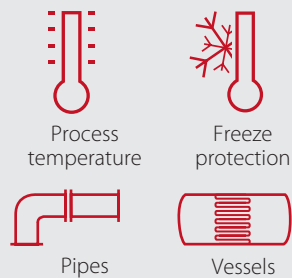
- › Factory terminated laser sealed technology
- › All components in high quality stainless steel
- › High temperature resistance
- › High chemical resistance
- › High power output
- › Flexible single or twin conductor configurations
- › Moisture proof, may be immersed in fluid



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

At a Glance

Applications



- › Viscosity protection in industrial processes
- › Process temperature maintain
- › 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

Approvals



Manufactured according to

- › EN 60079-30-1

Certificates cable

- › EPS 13 ATEX 1 627 U
- › IECEx EPS 14.0013U

Certificates system

- › FM15ATEX0046X
- › IECEx FME 15.0009X

Classification cable

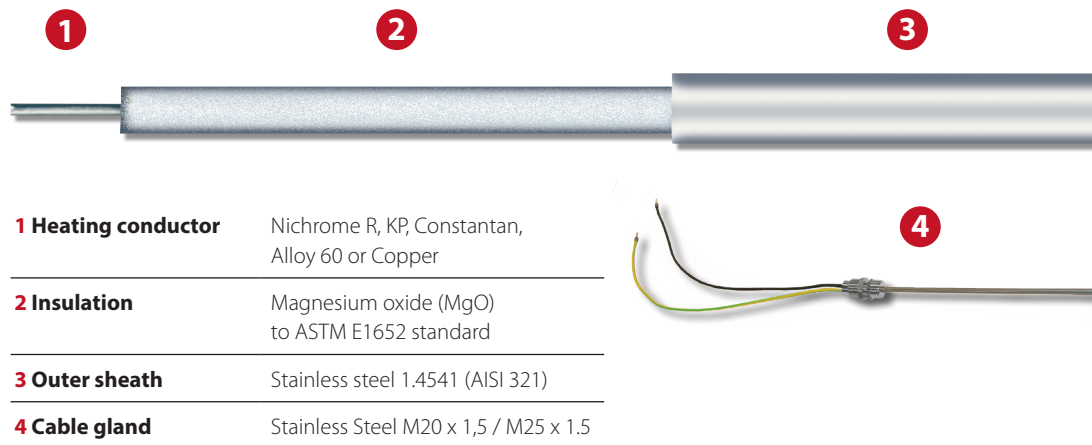
- › II 2 G Ex e IIC Gb II 2D Ex tb IIIC Db

Classification System

- › II 2 G Ex db e IIC T6...T1 Gb
Ta = -60°C to +60°C
- › II 2 D Ex tb IIIC T85°C...T450°C Db
Ta = -60°C to +60°C

ELK-MI VA in Stainless Steel

Mineral-Insulated Clean Laser Seal Trace Heater



1 Heating conductor	Nichrome R, KP, Constantan, Alloy 60 or Copper
2 Insulation	Magnesium oxide (MgO) to ASTM E1652 standard
3 Outer sheath	Stainless steel 1.4541 (AISI 321)
4 Cable gland	Stainless Steel M20 x 1,5 / M25 x 1.5

Technical Data

Process temperature	up to 700 °C
Ambient temperature	-60 °C ... +60 °C
Nominal output	Up to 250 W/m *
Nominal voltage	Up to 500 V AC
Installation temperature	> -60° C
Conductor	Protective connection integrated
IP rating	IP 65
Protection class	I
Bending radius	Diameter x 6
Cold lead	1/2 x 0.50 m **
Cold lead cross section	2.5 mm ² / 6 mm ²

* Depends on operating temperature and application.

** For other specs contact eltherm engineering

MI System Checklist

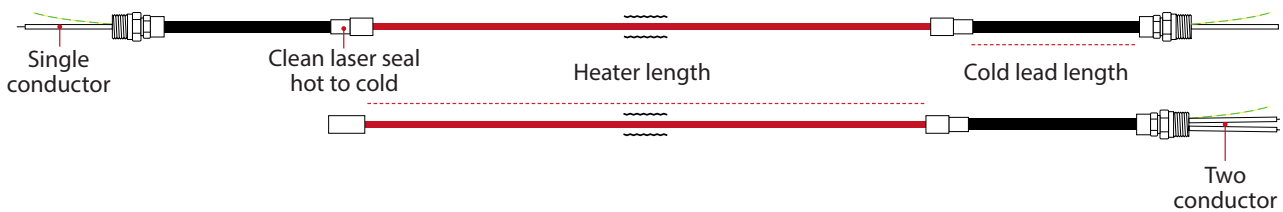
A Trace heater	ELK-MI single conductor or two conductor
B Temperature controller	ELTC-15 electronic temperature controller
C Temperature sensors	ELTF-... temperature sensors and thermocouples
D Junction box	ELAK-3-SP or ELAK-6-SP junction box for 1, 2 or 3 heaters
E Assembly parts	ELMW-... assembly plates and mounting brackets
F Accessories	ELB-... fastening and attachment parts

For further accessories, please refer to the Brochure MI Trace Heaters

ELK-MI VA Stainless Steel: Design Configurations, Resistances and Approvals

MI-trace heaters consist of a single or two conductor series trace heater connected to mineral-insulated cold leads (with 2,0, 2,5, 3,3 or 5,0 mm² copper conductor) by means of a clean laser seal (splice). The outer sheath is made of high quality stainless steel 1.4541 (AISI 321).

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 free end of the cold lead is potted and fitted with a flexible lead (cross section matching that of the cold lead conductor) for power connection and a 1.5 mm² lead for earthing. A compression ring flameproof stainless steel gland 1.4404 (AISI 316L) threaded M20x1.5 or M25x1.5 is fitted at the end of each cold lead and prevented from possible loss by the potted end seal.

Note:

The output per length unit of trace heater and the maximum possible operating temperatures depend on the respective application. For individual cases, we recommend that you contact our engineers – we shall be pleased to advise you. This is just a summary of all available resistances. For further resistances, please contact us. Other cross sections and lengths of cold leads are available upon request. Flexible cold leads available.

Single Conductor

No.	Ω/m @ 20 °C	ø / mm	Radius / mm
1	10,000	3,20	19
2	6,300	3,20	19
3	5,200	3,50	21
4	4,000	3,20	19
5	3,300	3,50	21
6	2,500	3,40	21
7	1,600	3,60	22
8	1,000	3,90	24
9	0,630	4,30	26
10	0,400	4,70	28
11	0,250	5,30	32
12	0,160	6,50	39

Twin Conductor

No.	Ω/m @ 20 °C	ø / mm	Radius / mm
1	36,000	3,70	22
2	24,600	4,00	24
3	19,680	3,80	23
4	13,120	4,40	26
5	9,840	5,10	31
6	6,600	5,00	30
7	4,600	5,30	32
8	3,200	4,00	24
9	2,460	5,00	30
10	1,600	4,70	28
11	1,000	4,40	26
12	0,750	5,10	37
13	0,330	6,70	40

ø = outer diameter; radius = bend radius

Depending on the type of application ELK-MI trace heaters are also available in Alloy 825. For custom configurations please consult with eltherm engineering.

Your **eQ**
for Clean Laser Seal Technology



eltherm globally

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 Clean Laser Seal Technology for Mineral-Insulated Trace Heaters featured here.

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