



# Wärme. Mit Sicherheit. Heat. And safety.

**Qualität im Detail.** Die hochwertigen und langlebigen Industrie-Heizsysteme von ELMESS werden vielfältig eingesetzt. So sorgen sie z.B. auch auf einer Bohrinselfür einen reibungslosen und sicheren Ablauf.

*There is quality in the detail.* ELMESS' high-quality and durable industrial heating systems are put to a large variety of uses, for example on oil rigs to ensure that work can be carried out smoothly and safely.

#### Jedes einzelne Produkt von ELMESS: ein Unikat

- Ex-Tauchheizkörper, elektrische Flansch- und Einschraubheizkörper
- Strömungserhitzer für flüssige oder gasförmige Medien einschließlich Dokumentation nach Druckgeräterichtlinie oder ASME
- Gasvorwärmer und Verdampfer: Erhitzer mit Rohrschlange in einem Alu-Block eingegossen, für zuverlässigen und sicheren Betrieb auch bei hohen Drücken
- Luftherhitzer und Heizregister
- Ex-Heizlüfter zur Wandmontage oder in Kompaktbauweise
- Ex-Raum- und Rippenrohrheizgeräte
- Ex-Temperaturregler und Thermostate
- Ex-Niveauewächter

#### Each individual product of ELMESS is unique

- Ex immersion heaters with flange and thread connection
- Flow heaters for fluids or gas including documentation according to PED or ASME
- Gas preheaters or vaporizers: Block type heater with a tube coil cast in an aluminium block, for reliable and safe operation also with high pressures
- Air heaters
- Ex air blower heaters for wall mounting or compact type
- Ex space heaters and finned tube heaters
- Ex temperature regulators and thermostats
- Ex level switches

#### Fordern Sie uns heraus

Senden Sie uns Ihre spezifizierte Anfrage. Wir erstellen Ihnen ein auf Ihren Bedarfsfall zugeschnittenes Angebot. Auch im Internet unter [www.elmess.de](http://www.elmess.de)

#### Challenge us

Send us your specific enquiry. We will make you an offer tailored to your requirements. Also available on the Internet under [www.elmess.de](http://www.elmess.de)

## Ex Immersion Heaters Electrical flange or thread connection heaters



**ELMESS**  
THERMO SYSTEM TECHNIK



- Elektrische Industrieheizkörper • Erhitzer
- Regel- und Steuergeräte
- Electric heaters • Control devices

## Immersion heaters

Ex II 2 G Ex II 2 D



Immersion heaters serve for heating of fluids, air or gas. They are components of machinery and plants, or mounted into tanks or vessels.

According to the individual requirements of our customers, ELMESS-Thermosystemtechnik is offering customized immersion heaters. They are designed and manufactured in high quality industrial design or in explosion proof design according ATEX. This guarantees a maximum of reliability, safety and long lifetime for your plants.

### Main fields of applications:

- Petrochemical, chemical and pharmaceutical industries
- Oil and gas extraction, production and distribution
- Mechanical engineering and plant construction
- Paint industries
- Energy and environmental technologies
- Laboratory and analytical technologies
- Plastics and textile industries
- Packaging technologies
- Industrial gases

### Dates for enquiries:

You will assist us to answer your enquiry within short time, if you give us as much as possible operating data for the required heater with your enquiry:

- Medium (if the medium is not common, please advise density, specific heat, heat conductivity and dynamic viscosity)
- Tank volume or flow rate for flowing media
- Operating temperatures, operating pressure
- Required heating capacity, nominal voltage
- Flange dimensions and rating, mounting thread
- Immersion length, unheated length (e.g. for mounting nozzle)
- Mounting position (horizontal or vertical)
- Ambient temperatures (standard: -20 / +40 °C, special design for -60 / +60 °C)
- Materials for flange, heating bundle, connection box
- Design pressure, design temperature and design code for pressure vessel parts
- Protection (Ex hazardous area classification, IP)
- Special ambient conditions (e.g. outdoor mounting, offshore)

### Typical applications for gas or air heaters:

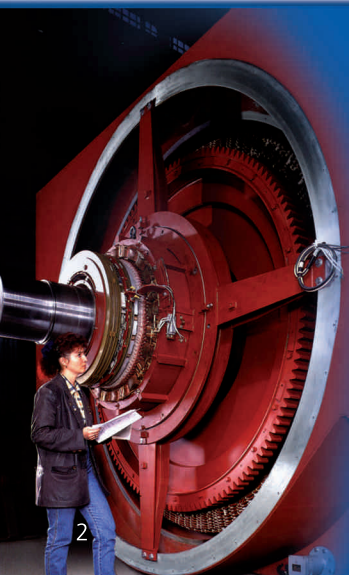
- Motor anticondensation heaters
- Heaters for heating chambers or instrumentation cabinets
- Heating insets for gas heaters.

According to the application, a flow monitor can be necessary to prevent the heater from overheating.

### Typical applications for liquid heaters:

- Lubrication oil systems for gas turbines, compressors, pumps, refrigeration compressors
- Heat transfer oil heaters
- Tanks for oil and fuels
- Tanks for liquids like water or process fluids
- Emergency showers
- Heat exchangers

In order to prevent overheating, liquid heaters always have to be covered with a sufficient liquid level. This must be guaranteed by means of a level switch which is judged by reliability and function or by comparable measures.



## Immersion heaters

Ex II 2 G Ex II 2 D

### Explosion protection:

ELMESS-Thermosystemtechnik is offering explosion protected electrical heaters for fluids or gases in hazardous areas.

Categories Ex II 2G, 3G, 2D or 3D, (zone 1, 2, 21 or 22), with approval according to ATEX, GOST, IECEx or other international standards.

Explosion protected heaters are designed in type of protection "flameproof enclosure" (Ex d) and "increased safety (Ex e). The ingress protection is IP 66.

Heaters for fluids or gas can be supplied with full certificate for the temperature class, depending on the local and operating conditions.

For safe and reliable monitoring of the admissible surface temperatures, heaters have to be equipped with a protection system. This has to be judged regarding function and reliability. According to the application, there have to be temperature, level or flow monitoring devices which have to be connected to the operator's protection system.

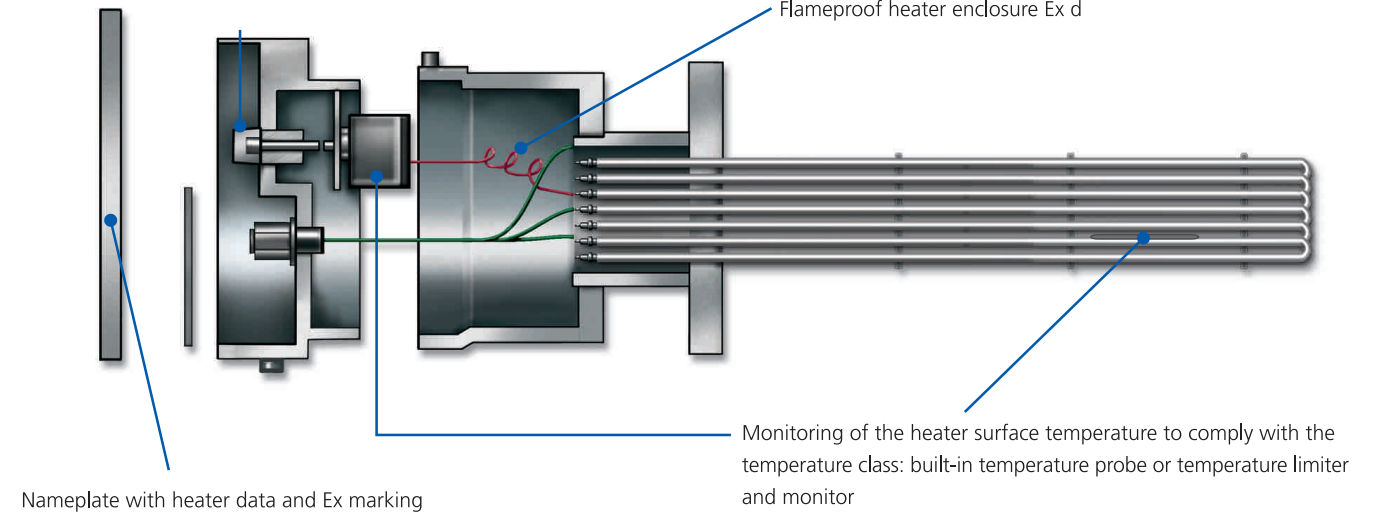
### Materials:

The selection of materials depends on the requirements of the customers, the heated media and ambient conditions. Heating bundle: Stainless steel 321, 316Ti, 316L, incolloy or according to customer's requirements. Flange or thread connection: Carbon steel, stainless steel 321 or 316 or according to customer's requirements. Ex connection box made of cast iron or carbon steel with heavy duty painting for all industrial applications, or stainless steel 316.

### Pressure vessels:

Immersion heaters that are part of a pressure vessel are designed, manufactured and inspected according to the pressure vessel code, Pressure Equipment Directive (PED), ASME VIII or other international codes. The selection of category according to PED should be advised by the customer, according to the conformity assessment.

Heater connection box (Ex e = increased safety)

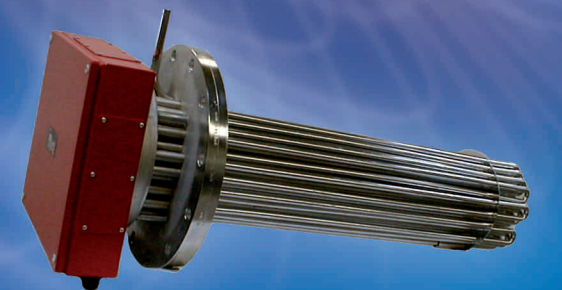


### Specific surface load:

The specific surface load is a measure for the heat transfer onto the heated medium. It must be chosen according to the medium, flow, pressure and mounting conditions as well as the medium temperature and admissible surface temperatures. With a specific surface load which is optimized for the process, a high thermal efficiency will be reached.

Some typical values:

Crude oil, gear oil, bitumen	0,8 ... 1,0 W/cm
Hydraulic oil, lube oil, thermal oil	1,5 ... 2,3 W/cm
Water/glycole	2 ... 4 W/cm
Water	4 ... 8 W/cm
Flowing gas	0,5 ... 3 W/cm
Motor anticondensation heater	0,25... 0,4 W/cm



## Immersion heaters

Ex II 2 G Ex II 2 D

### Design Versions:

#### Ex Cartridge Heater Type DH..M..

Ex d II C

High performance cartridge heater with compact flameproof enclosure and fix mounted connection cable.

#### Applications:

Heating of metal parts or components such as molds, valves, nozzles, extruders or other machine parts, especially in the plastics industries. Hot runner systems, packing machinery, analysis technology, medical devices. Lube oil heaters for small machines



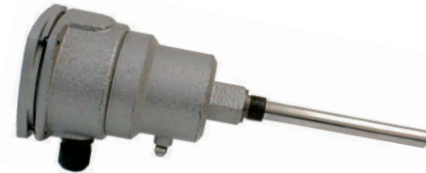
#### Ex Cartridge Heater Type DH..A00..

Ex de II C

High performance cartridge heater with flameproof enclosure and Ex e connection box. Option with built-in RTD Pt100 for overtemperature monitoring, in combination with thermal cutout type eB\*6\*\*\*.

#### Applications:

Lube oil heaters for small compressors, pumps, cooling compressors and other machines.



#### Ex Heater Type DHF..A0..

Ex de II C

Cartridge type heater with withdrawable ceramic heating inset or with heating bundle of tubular heating elements. Flameproof Ex d enclosure with Ex e connection box.

#### Applications:

Heating of tempering systems, e.g. with heat transfer oil, with external temperature monitoring system. Temperature and level monitoring has to be installed by customer.

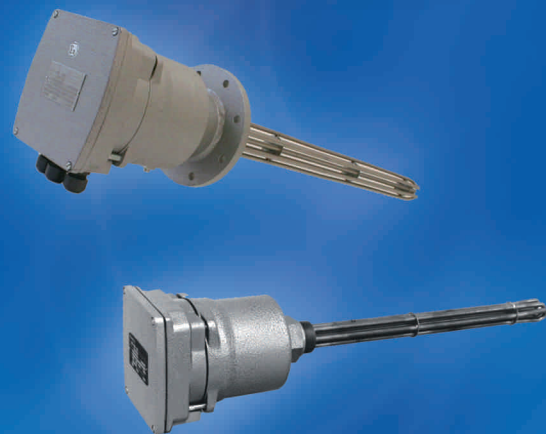


#### Immersion Heater Type DH..B..

Ex d or de IIC

Heaters with a bundle of tubular heating elements or cartridge type with withdrawable heating insets. Flameproof heater enclosure made of cast iron, carbon steel with heavy duty painting or made of stainless steel. For overtemperature protection of the heater and monitoring of the temperature class, a temperature limiter "TSHH" and temperature monitor "TSH" or temperature probes/thermocouples are built-in. Connection box Ex e for easy installation and maintenance on site.

Design variations with flange or thread connection.



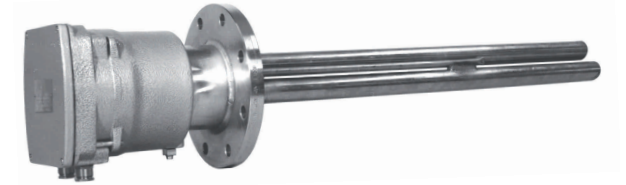
## Immersion heaters

Ex II 2 G Ex II 2 D

### Flanged Heater Cartridge Type DHF..B..

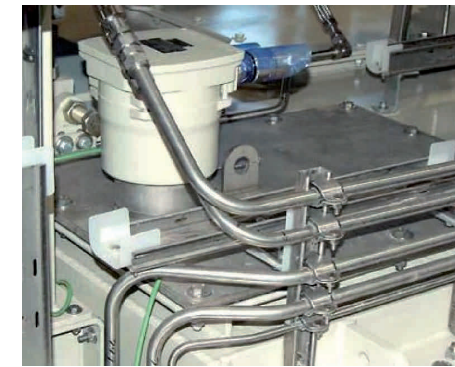
with withdrawable heating inset (ceramic heating inset or tubular heating elements inside the pipe).

The heating inset can be replaced without emptying the tank. Design with special materials for aggressive fluids.



#### Applications:

- Oil tanks
- Lube oil systems
- Heating of aggressive fluids



Typical application:  
Lube oil heater for a gas turbine

### L-shaped heater

Flanged heater for mounting in a tank from top. The heater can be replaced without emptying the tank. Heating bundle of tubular heating elements, made of stainless steel. Riser pipe and mounting flange made of carbon steel or stainless steel. The shape of the mounting flange can be designed according to customer's requirements, e.g. as tank lid. Flameproof enclosure with Ex e connection box.



#### Applications:

- Oil tanks
- Lube oil systems
- Pump sump heater

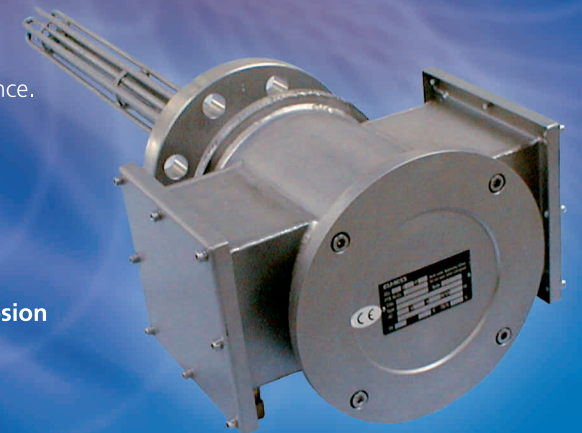
### Heater with stainless steel enclosure

Heaters for fluids or gas as described above are also available with Ex de or Ex d enclosure made of stainless steel 316Ti for advanced corrosion resistance.

#### Applications:

Heaters for offshore applications or other corrosive ambient conditions.

All heaters can also be supplied in top industrial quality without explosion protection.



## Immersion heaters

II 2 G II 2 D

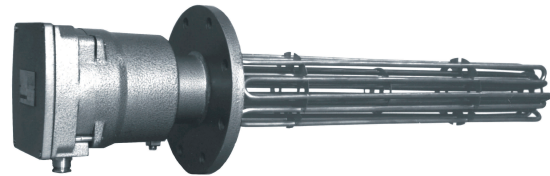
### Liquid Heater Type DHF

Immersion heaters can be certified completely including the temperature class with regard to the local and operational conditions.

Ex-Marking: II 2 G Ex d or de IIC T1...T6  
EC Type Examination Certificate: PTB 08 ATEX 1017 X

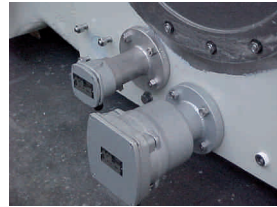
#### Applications:

Lube oil heaters, tank heaters, process heaters



Level monitoring is required for heater protection to guarantee sufficient liquid covering of the heating bundle.

**Typical application: Lube oil heater and level switch built in a compressor**



### Air or Gas Heater Type DHG

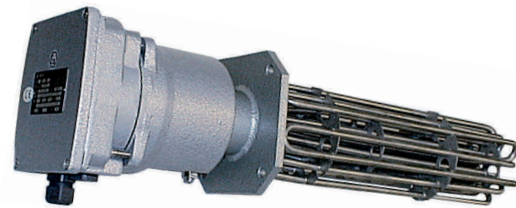
Immersion heaters for heating of stagnant or flowing air or gas. Certification of the temperature class according to the area classification and local and operational conditions.

Ex Marking: II 2 G Ex d or de IIC T1...T4  
EC Type Examination Certificate: PTB 08 ATEX 1040 X.

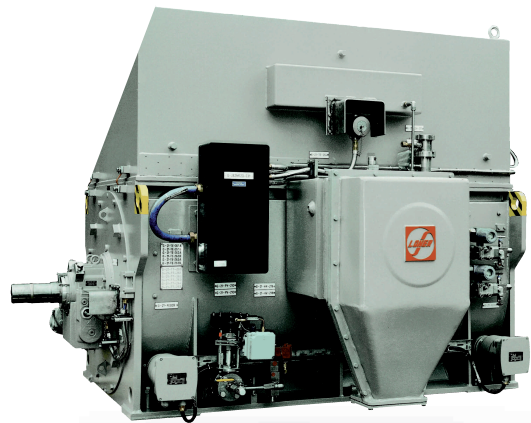
### Motor Anticondensation Heater Type DHG11B./M-..

#### Applications:

Anti condensation heater for the motor housing. Similar heaters are designed for heating of heating chambers, instrument rooms etc.



**Typical application:**  
2 motor anti condensation heaters installed in an electrical motor.



### Immersion Heater Type DH..C..

Ex d or de IIB + H2

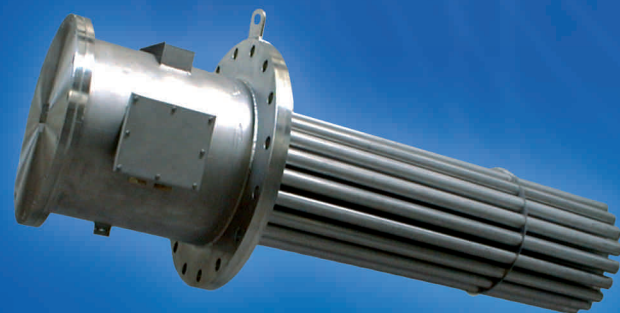
Heater for liquids type DHF..C..

Heater for gas type DHG..C..

Flameproof enclosure, welded type made of carbon steel or stainless steel, with built-in temperature limiter and monitor or thermocouple or RTD. Heater bundle made of tubular heating elements or cartridge type with withdrawable heating insets. Ex e connection box as an option.

#### Applications:

- Process heaters
- Tank or lube oil heaters for large machines



## Immersion heaters

II 2 G II 2 D

### Supplement

#### Explosion protected Level Switch

for horizontal or vertical mounting position, judged regarding safe and reliable function for monitoring of liquid heaters.



#### Thermal Cut-Out Type eB\*6\*\*\*

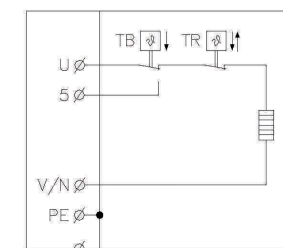
for the safe thermal monitoring of heater surface temperatures. This device can be integrated in the power and temperature control system.



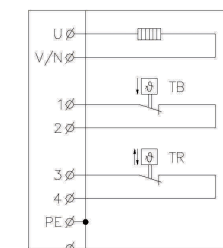
#### Power and Temperature Control

If you need a simple on/off switching cabinet or a comfortable thyristor control panel with cascade loop, ELMESS-Thermosystemtechnik will offer you the appropriate control system for your heating function.

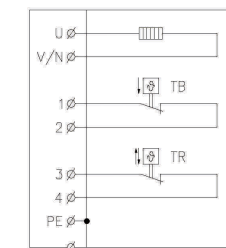
### Typical Wiring Diagrams:



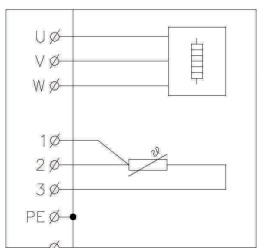
16-1468-40



16-1462-40



16-1461-40



16-1458-40

Subject to technical modifications.

### Electrical Connection (examples):

Electro-mechanical temperature monitoring devices can be wired for direct switching up to 10 A (wiring diagram 16-1468-40).

For higher heating capacities and 3 phases as well as on customer's request, all switching contacts can be wired potential free to terminals. (wiring diagrams 16-1462-40 or 16-1461-40). In these cases, for heater protection and monitoring the temperature class, the switches have to be connected to contactors.

Temperature probes RTD Pt100 or thermocouples (wiring diagram 16-1458-40) have to be connected to a thermal cut-out (ELMESS type eB\*6\*\*\*) and contactors for monitoring of the admissible temperatures.