

# INSTRUCTIONS FOR USE OF CAST HEATERS

IMPORTANT: READ THROUGH THE INSTRUCTIONS CAREFULLY BEFORE USE AND KEEP IN A SAFE

Dear customer,

Thank you very much for placing your trust in heating elements from the IHNE & TESCH Group. We have been developing and producing high-quality electrical heating technology of the kind you have opted for since 1932.

## 1. General

Our heating elements are high-quality products made in Germany that have been subjected to rigorous quality checks throughout all stages of development and production. A high degree of vertical integration and the many years of experience of our employees ensure that our high level of performance can be maintained.

This quality standard will give you a guarantee of continued reliable use of the heating elements over long periods of time, provided that the technical information set out below is observed.

If you have any other questions on installing and using the heating elements or any of our other products not covered in the information below, our field service staff and sales engineers will be happy to help.

Our heating systems conform to the applicable provisions of relevant EU directives and Equipment and Product Safety Act and bear the CE mark.

## 2. Applications

Our Cast Heaters are suitable for heating solids (Tools of all kind).

The heating elements are components, not fully operational equipment. The intended use is in industrial electrothermal machinery.

## 3. Safety information

The instructions for use must be read carefully and understood prior to commissioning the heating systems. Incorrect assembly, selecting the wrong heating system and regulating a heating system incorrectly will cause defects and accidents.

For safety reasons, the heating systems may only be used for the applications described in these instructions for use. General operating instructions and safety information must be observed. When assembling the system, the safety instructions relevant to the installation location and generally accepted technical rules and standards must be observed.

Heating systems must not under any circumstances be commissioned if there are visible signs of (transport) damage.

Heating systems must not be commissioned until it has been ensured that the insulation resistance is  $\geq 1 \text{ MOhm}$ .

The surface temperature of the heating systems must not cause the temperature of the material to be heated to rise to a critical level that could, for example, trigger a fire, explosion, the emission of smoke or gas, etc.

It must be ensured that the maximum surface temperatures (see section 5.1 Surface temperature) are not exceeded. Exceedance of these values leads to the melting of the cast body, Liquid metal drips off. This leads to critical conditions up to fire, and there is also a risk of injury.

The heating systems must not be commissioned until they have been mounted such the entire contact surface cannot move.

Operating conditions other than those described in the instructions for use will cause heating systems to malfunction or fail. Special applications must be approved by IHNE & TESCH.

## Caution: Risk of combustion!



High temperatures occur during operation. All surfaces must be cold ( $\leq 40^\circ\text{C}$ ) when performing work on heating systems.

## 4. Connection

### Caution: Electrical connections !



The electrical connection must only be performed by qualified electricians or persons trained in electrical safety. Work on equipment must be carried out with the equipment disconnected from the mains. It must also be ensured that the equipment cannot unintentionally be made live again.

### Note the connection voltage!



Standards and specifications for electrical work must be observed. Particular attention must be paid here to conformity of the operating voltage (as embossed on the equipment) with the supply voltage.

## 4.1 Protective conductor



It is imperative that the protective conductor is connected, where available. Otherwise the connection of the protective conductor of the heating system must be checked as part of the mechanical connection to the machine.

## 4.2 Connecting line



To avoid short circuits, the connecting lines must be routed such that they cannot come into contact with sharp edges or objects. It must be ensured that the terminal area is protected against the penetration of materials (e.g. oils, plastics, moisture, greases and gases).

## Note:

The appropriate connection variant for the terminal area (e.g. cables, stranded wires, connectors, busbars etc.) must be chosen depending on the ambient temperatures.

## 5. Technical data

### 5.1 Surface temperature

The specifications given below are maximum values for the heating side and must not be exceeded:

Heaters with aluminium alloy: 450 °C max.  
Heaters with brass alloy: 650 °C max.

### 5.2 Cast Heaters as Heat-Cool-Systems

#### Caution:

Tubular heaters are cast together with cooling tubes. As a cooling liquid water or heat transfer oil can be used.

With water cooling it is essential to use low-salt and low solid cooling water. Furthermore, all influences supporting corrosion and deposition are to avoid.

The final testing of the heaters includes a pressure test with 40 bar at room temperature.



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## 5.3 Integral thermocouples (option)

### Note:

If heating elements with integral thermocouple are used it is important to ensure the correct polarity and type.

Type	lead identification
Fe-CuNi "L"	red - plus (+) blue - minus (-)
Fe-CuNi "J"	black - plus (+) white - minus (-)
NiCr-Ni "K"	green - plus (+) white - minus (-)

## 6. Fitting

The heaters should have a positive connection to the to be heated material and specifically such that the heaters and the to be heated surface are fixedly connected together.

### Caution:

With non-positive connection destructive surface temperatures may occur on the heaters which can cause damage to the heating forcibly. See 5.1 surface temperatures.

Basically, it should be ensured that no mechanical damage can occur.

The heaters have a to be screwed with a maximum torque (Nm) of the respective screw size with 8.8 resistance to the plant (tight disc spring assemblies on slump).

To ensure the proper fit of the heaters against the to be heated material the clamping elements must be checked on tension, retighten if necessary.

## 7. Operating conditions

### 7.1 Temperatures

The connecting lines must be protected against temperature effects or be designed to withstand them.

#### 7.1.1 Temperature control

Heating systems can absorb moisture during storage or storage in the wrong conditions, so they must be fitted with temperature control with start-up circuitry.

#### 7.2 Protection against accidental contact, dust and moisture

The heating systems must be protected against contact, dust and moisture according to the ambient conditions. During operation, it is particularly important to prevent the ingress of any foreign matter such as oil, water, plastic etc.

#### 7.3 Storage

If storing for a prolonged period of time (several months), it must be ensured through measures within the system that the insulation resistance will drop.

Heating systems must not be commissioned until it has been ensured that the insulation resistance is  $\geq 1$  MOhm.

### Note:

We recommend that heating systems are stored in a dry environment and that a suitable desiccant is added as appropriate.

#### 7.4 Disposal

Disposal must be carried out in accordance with statutory regulations.

## 8. Troubleshooting and remedy of faults

Fault	Possible cause	Remedy
Not heating	No mains voltage present	Check/replace fuse, switch on the switch
	Loose mains connection	Tighten the mains connection
	Torn connection	Replace the heating system
to low heating	Cast Heater faulty	Replace the Cast Heater
	wrong Cast Heater loosely Cast Heater	change Cast Heater, arrange positive fit of Cast Heater
to strong heating	incorrect operating voltage	establish correct voltage
	wrong operating voltage	establish correct voltage
Cast Heater is not to tighten	wrong diameter	check diameter of Cast Heater
	transport-/ storage damage	contact manufacturer
insulation resistance < 1MOhm	moisty Cast Heater	consult manufacturer

Publisher:

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Cast-001 06/2023

**Subject to changes**

