

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 Cartridge 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.

The heating systems must not be commissioned until they have been mounted such that 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 data given below are maximum values at the Cartridge Heater walls and must not be exceeded:

PE/PM type:	400 °C max.
PDE type:	500 °C max.
PDS/PDZ/PDH/PZH/HPS/HPZ type:	750 °C max.

5.2 Bore hole configuration

Caution:

The bore hole must be designed such as to ensure a solid and interlocking installation is assured at all times.

The bore hole must be levelled and free of burrs and any contamination.

Caution:

The bore holes must have different accuracies depending on the power density of the heating element to be installed. Our information on the hole tolerances and the additions for the individual types must be observed.

Please refer to our technical data sheet for Cartridge Heaters for more details.

5.3 Integral thermocouples (option)

Note:

If heating elements with itnegral 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 heater has to be installed secured against shifting (if necessary with clamping/mounting flange).

6.1 Bore holes

Caution:

Through holes facilitate the mounting and dismantling of heaters. They require good bore hole configurations with low roughness depth (see point 5.2.)

Grooves and scores result due to air pockets poor heat conduction and thus a higher Cartridge Heater temperature. This reduces the lifetime of the Cartridge Heater.

The drilling depth must be such that the metal casing of the cartridge heater is completely in the mold.

6.2 Cartridge Heater Position at tool

The distance between the Cartridge Heaters in a tool should not be less than 1.5 times of the Cartridge Heater diameter.

The distance from the tool outwall should be at least 1.0 times of the Cartridge Heater diameter.

6.3 Auxiliary installaion materials

The aids in spray and paste form are used for easy installation and removal of the Cartridge Heaters. The seizure is largely avoided.

Caution: Risk of short circuit !



Spray assembly and assembly paste should not come into contact with the connection of the Cartridge Heaters.

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.

The bottom of

- PE cartridges is enrolled stainless steel lid (ie not tight)
- PDE / PDS / PDZ / PDH / PZH / HPS / HPZ is welded.

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 ≥ 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.

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Subject to changes