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General Safety Instructions and Warnings

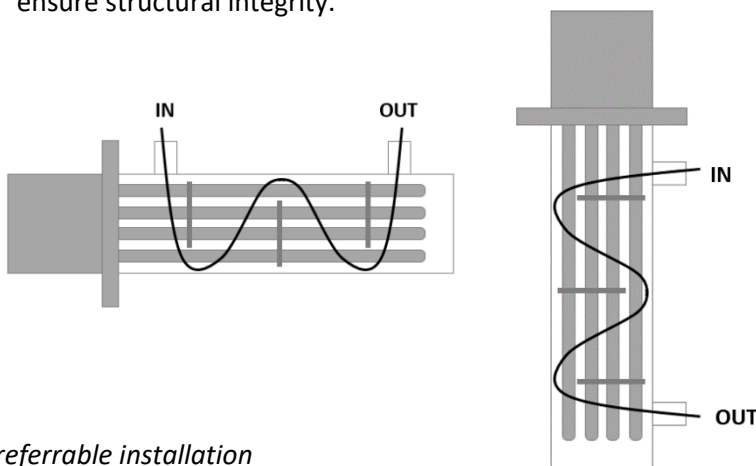
- Carefully review this manual before use.
- As the operating authority, you are legally responsible to prevent direct and indirect risks.
- Perform a risk assessment before using this equipment to ensure your safety and the safety of others.
- Do not remove warning labels.
- Recommendation: Place a warning sign “Caution: electrical heating, burn danger” on the outside, close to the heater.
- Only authorized personnel should handle heating elements and conduct installation and maintenance.
- Wear safety goggles, protective gloves, and high-temperature clothing when handling electrical heating elements.
- If a heater is ordered and designed with removable insulation, open conductors or without insulated power cables, the customer is responsible for the safety of the facility and personnel according to current regulations.
- Ensure proper installation with perfect surface to the medium being heated.
- Utilize adequate thermal control measures.
- Never use in explosive or hazardous environments when not designed according to ATEX directive.
- Avoid touching with energized heating elements.
- Do not exceed maximum operating temperatures that the heater is designed for.
- Maintain appropriate spacing between heating elements. Heating elements may never overlap.
- Do not use damaged heating elements.
- All our heating elements are designed for industrial use.
- IHP recommends using a Residual-current Circuit Breaker (RCD) for all installations.
- Always protect leads and connections against the ingress of liquids and gases to avoid short circuits.
- Always make sure the heaters are cool when handling.
- **Warning!** Without a temperature regulator, the heater must be continuously monitored, with regular checks and prompt intervention if needed.
- The customer must ensure that the through-flow heater is used in accordance with the Pressure Equipment Directive PED (2014/68/EU).



For additional security information tailored to special applications, please contact our sales office.

Installation

- Only authorized personnel may install electric heating elements.
- The overall condition of the heater should be checked for signs of damage.
- Do not attach ropes, slings, or any other lifting equipment to the heater terminal box or offset sleeve assembly. Doing so could cause serious damage to the construction and will invalidate the warranty.
- The equipment requires the following five criteria to heat.
 - Control cabinet connect to supply
 - The flow system is active
 - The controller has sensor connected
 - The controller's temperature set point must exceed the ambient value
 - The overheating limitation is not active
- Install the connections away from sharp edges to prevent short circuits, and always ensure that the leads are protected from heat.
- After installing the power connections, verify both the grounding and electrical insulation.
- Always verify the tightness of all connections with a torque wrench, especially after transport, to ensure structural integrity.



Preferrable installation

- Mechanically mount the through flow heater on a stable surface as indicated on the specification (horizontal or vertical).
- Mount medium pipes to the through flow heater via the flanges or thread, with a torque wrench.
- Start the medium flow (do NOT start the heater).
- Make sure there is no air inside the heater or pipes before you continue.
- Be sure to inspect the pressure in holding tank, pumps, pipes and vessel so that you are within the allowed pressure.
- Make sure the system is fully filled with non-flammable liquid and no leaks or dripping is present.
- Make sure the temperature sensor is working. Ensure that all trip devices are functioning correctly.
- In case of manual reset thermostat: make sure the thermostat is not activated.
- Make sure the control system is active.
- Isolate the heater.

Start heating

- Energize the control panel.
- Conduct a functional check of all trips and safety shutdowns.
- Ensure that the correct process medium and flow rate are available and flowing through the heater. If the heater is for heating a liquid, it is essential that there is no air within the system before energizing the heater.
- The heating elements must always be covered by the design process fluid while energized.
- Set the process control device to the required temperature.
- Turn on power to the heater.
- Immediately check that the line current drawn by the heater is correct.
- Allow the process temperature to stabilize.
- Check the temperature and adjust the control device until the desired temperature is achieved.

Stop heating

- Change the set point by pressing the arrow “down” on the regulator to 0°C.
- Make sure the circulation will continue until temperature is safe to handle.

Temperature control

- The heater should be regulated using an appropriate temperature control system.
- The sensor should match the temperature range for which the heater(s) is designed.
- For long durability, we recommend a gradually controlled heating.
- Bulb and capillary thermostats, as well as bimetals, have limited lifespans and are not recommended for process temperature control, as they may respond too slowly or fail—potentially causing the heater to remain off or overheat.
- **Note:** If a failure could result in a dangerous situation because of the heated medium, an additional temperature limiter or controller must be installed besides the temperature regulator.
- Always connect the sensor to the temperature control system before activating the heater.
- Pay attention to the correct polarization (+/-) when using thermocouples.
- Make sure that thermocouple/sensor leads are protected from the heat source.
- Ensure functionality of control and limiting devices before use.
- Should the limiter detect a temperature over the set point the heater will not be allowed to be energized again until the temperature drops under the set point.
NOTE: Before turning the heater back on, it's important to figure out and fix what caused it to overheat.
- Ensure that the operating temperature matches with both the power consumption and the maximum temperature capability of the installed sensor.
- For high temperatures, we advise gradually heating up in stages until reaching the maximum working temperature.

Operation

- Ensure proper grounding of the heating element and the enclosure.
- Always follow security protocols and regulations for handling electrical equipment and applications.
- Never operate heating elements above the designed working temperature.
- The operating instructions can only highlight risks directly associated with overheating during operation. As the operating authority, you are legally obligated to reduce indirect risks as well.
- Do not touch heating elements while in use. **Risk of injury!**
- Please maintain a safe distance between the heating element and flammable materials during use.
- Heating elements have a specific temperature it can reach and several factors affect how hot it actually gets. These include the material being heated (how well it conducts heat), the rate of material flow (throughput), the surrounding air temperature (ambient temperature), and the type and thickness of insulation used.



Maintenance and care

- Maintenance and care are carried out in accordance with the standards outlined in the 'General Safety Instructions and warnings'
- No equipment should be energized when maintenance is performed.
- The operation of the temperature control and safety limiting device must be verified and the surface and connection cable should be visually inspected for damage and tightened correctly at least once per year.
- Regularly check the application area and the heater, ensuring both are kept clean.
- Inactive or stored heaters may absorb moisture, leading to a decrease in electrical insulation. The heating elements can be restored by either dried in oven or gradually raising the temperature.
- Electrical maintenance on all electrical equipment must only be performed by authorized personnel.
- After 50 hours of operation:
 1. Check that all the heater electrical connections are properly tightened.
 2. Check that the heater to vessel / tank bolting is correctly tightened. Use a torque wrench.
 3. Visually inspect the heater for any signs of leakage /overheating.
 4. Check heating element insulation resistance readings.
 5. Check to ensure that all heater phases remain balanced.
- Monthly maintenance:

Use a wiper with an alcoholic based cleaning agent on the through flow heater body.
Never perform cleaning when the system is live!
- Yearly maintenance:
 1. Disconnect the flanges from inlet and outlet flanges.
 2. Open the drain plug and empty through flow heater body from fluid.
 3. Disconnect the heater from the pressure tube via the vessel flange and make a visual overview of the internal pressure body, heater rods and gaskets if any. If there are any changes in colour or sign of damages contact IHP for consultancy before recommissioning the product.

4. Assemble the heater and the pressure tube and counter torque the bolts.
5. Assemble the through flow heater to the inlet and outlet flanges counter torque the bolts.
6. Close the drain plug.
7. Recommission the electrical wires if disconnected.
8. Restart the flow and bleed the system free from air.
9. Restart the heating system.

Storage

- Keep stored in a dry location at room temperature.

Malfunction

- If any damage or malfunction is detected, the heater must be immediately disconnected and taken out of service.



Disposal

- Dispose heaters appropriately in a recycling center. For further information please contact the local waste management.

CE statement

The CE declaration of conformity is not included in the scope of delivery but can be provided upon request.

In accordance with our company policy, our products are CE-marked, indicating compliance with the recognized declaration within the European Economic Area (EEA) and EEC Directives.

Since our products are provided as components according to customer specifications for installation by them as part of a final product, we cannot control the installation and conditions of the products. The customer will be responsible for determining the suitability for use and compliance with EEC directives when the sold product is integrated into the final product.

Warranty

IHP's liability for defects in service, product, or component expires twelve (12) months from the earlier of notification of delivery or completion of delivery.

Any alterations or modifications made to the product will void your warranty.

For more info: <https://ihpheating.com/delivery/>

In short, the warranty does not cover problems or damages resulting, **among other reasons**, from:

- Failure to comply with the operating limits.
- Wear caused by lack of maintenance, impact, inexperienced installation / commissioning personnel.
- Corrosion or fouling
- Damage caused by debris in the process
- Overheating due to improper flow if the heater is not designed for it.
- Overheating and damage to electrical connection boxes without appropriate on-site protection.
- Failure to comply with the documents sent to your company via e-mail, national and local regulations concerning installation operating and maintenance requirements for electrical equipment to be used in a potentially explosive atmosphere



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