



Instruction Manual



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General Safety Instructions and Warnings

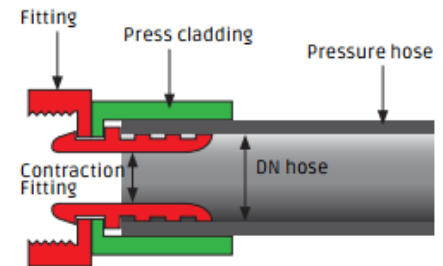
- Carefully review this manual before use.
- As the operating authority, you are legally responsible to prevent direct and indirect risks.
- Perform a risk assessment before using this equipment to ensure your safety and the safety of others.
- Do not remove warning labels.
- Recommendation: Place a 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 contact 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 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.



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

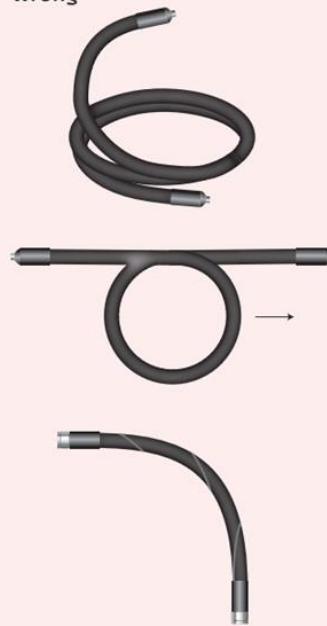
Installation

- Only authorized personnel may install electric heating elements.
- The overall condition of the heater should be checked for signs of damage.
- 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.
- All connections should be checked for tightness.
- Please note that the fittings cause a reduction in the hose throughput.



Pulling on the ends of rolled hoses causes torsional stress and can subject them to bending radii smaller than is permissible. Hoses are not to be twisted.

Wrong



Right



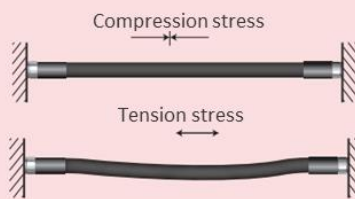
Remedy: unroll the ring of hose rather than pulling it off.

Hose lines should be installed in such a manner that they are free of tensile stress in all operational states; similarly, jamming stress (i.e. axial compression along the length) on short lengths of hose is to be avoided.

Axial compression due to incorrect installation or space-reducing motion degrades the hose's pressure resistance.

Compensation of expansion due to hoses installed in straight sections can lead to their destruction.

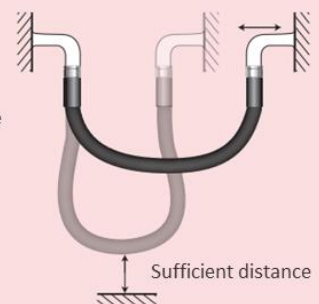
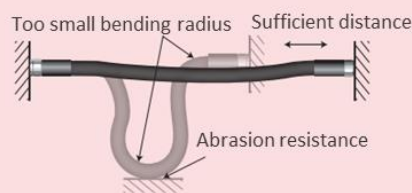
Remedy: place elbow fittings at connecting points.



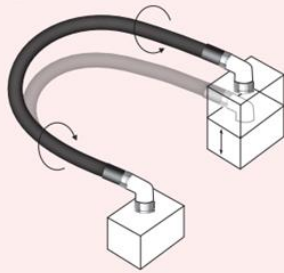
Do install straight sections of hose which are subjected to a large range of motion, make such hose connections in a U-shape.



When connecting hose lines to moving parts, the hose length must be calculated such that the hose's smallest permissible bending radius is not underrun in any possible position and/or that the hose is not subjected to tensile stress.



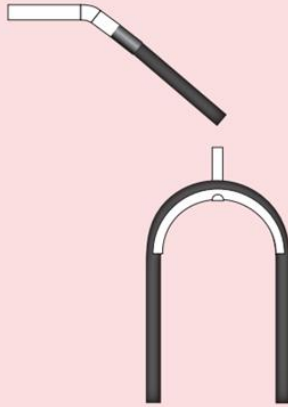
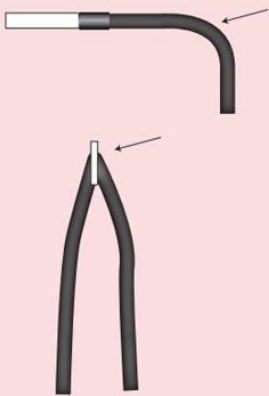
Wrong



Right

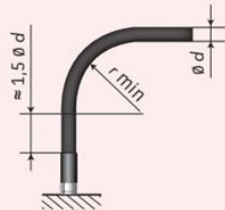


Avoid twisting the hose when connecting it to moving parts, particularly when motion and bending take place in the same plane. This can be achieved through proper installation or design measures (e.g. swivel joint).



The danger of kinking is particularly high for handheld devices.

Remedy: Depending on the operating position, install a elbow or kink protection (e.g. corrugated hose).



For installation in an arc, a hose length should be selected such that the intended bend can be formed beyond a length of $\approx 1.5 d_0$; kink protection may also be necessary (e.g. hard cap).

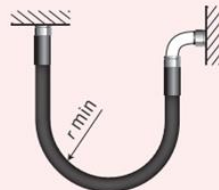


It is disadvantageous to allow free-hanging spans.

Remedy: supports or counterweight rollers.



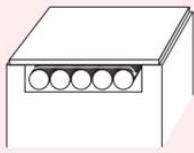
Too small bending radius



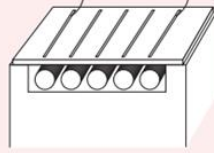
Hose lines should be installed as close as possible to their natural position, whereby their smallest permissible bend radius must be observed.

Additional stresses on the hose can be avoided through the use of suitable fittings and adapters.

Wrong

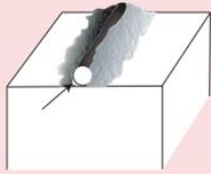


Right



Heat build-up will occur if heating hoses are routed through a closed channel or shaft.

Remedy: hoses may not touch one another. Furthermore, sufficient ventilation is to be provided.



If, for example, powder-like substances, adhesives or other thermally insulating materials accumulate on heating hoses, then overheating will occur at such points.

Remedy: eliminate the cause with regular cleaning to remove such materials.



Heat build-up is caused by incorrect wrapping of the heating hose with other materials. The heating hose will overheat at such points. If the sensor area is wrapped, then the remainder of the hose will cool off.



Bundling or routing that permits contact between hoses will lead to overheating at these points of contact.

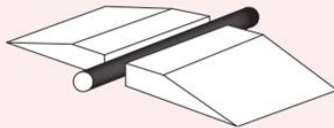
Remedy: route with open space between hoses.



Do not fasten clips or brackets so tightly that they cause the hose's outer braiding to be pressed internally against the heat conductor.

Disregard for this rule can lead to damage of the protective braiding and the hose.

Openly routed hose lines along paths where there is vehicle or pedestrian traffic are to be protected against damage from abrasion and deformation, e.g. by using hose bridges.

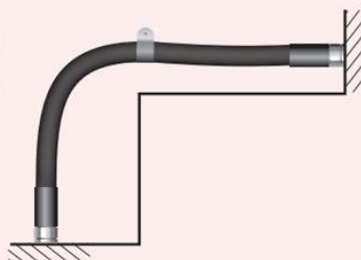
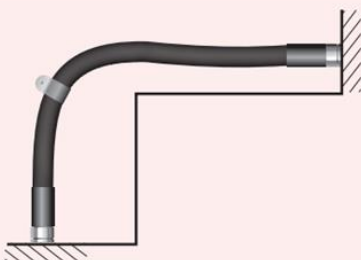


Abrasion resistance



Sufficient distance

Appropriate measures can be taken to arrange and affix hose lines to prevent them from being damaged externally by external mechanical influences. To the extent necessary, hoses are to be secured in place, e.g. by protective jackets. Sharp-edged components should be avoided.



Hose brackets are to be avoided at points where they would prevent the heating hose's natural free movement and length changes.



Heat protection

Where hose lines are exposed to high external temperatures, they must either have sufficient physical separation from the external heat source or be protected by appropriate measures (e.g. shielding).

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.
- **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.

Operation

- Ensure proper grounding of the heating element and the enclosure.
- Always follow security protocols and regulations for handling electrical equipment and applications.
- Before operation, preheat the hose to ensure the medium and connections reach processing temperature. Bending stress and blockages can cause damage if not heated properly.
- 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.

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

IHPs liability for defects in service, product or component expires twelve (12) months whichever comes first 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 heat transfer 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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