



winkler

# Operating Instructions

**Industrial** Heating Mantle **WHI...**



## Safety Instructions

Please read the operating instructions very carefully before using the industrial heating mantle. Observe the information on the rating plate and the warnings on the appliance. Keep the operating instructions in a safe place, also for later use of the appliance. It must be kept visible during use/operation. The industrial heating mantle may only be operated in accordance with the Occupational Health and Safety Act and the relevant national regulations and regulations of the employers' liability insurance associations (e.g. TRGS526 Technical Rules for Hazardous Substances in Laboratories). Please include this information in your quality management manual as part of the work instructions. Also treat them as operating instructions in accordance with TRGS526 section 4.2.

### Warning labels on the product must not be removed!



#### The industrial heating mantle is a piece of electrical equipment.

The industrial heating mantles may only be operated and maintained by a qualified electrician or persons trained in electrical engineering. Electric shocks can cause dangerous injuries.

To prevent hazards caused by electric current, the industrial heating mantles must be regularly inspected and maintained in accordance with the applicable technical regulations (VDE / BGV A3).

#### A residual current circuit breaker of 30mA must be provided to ensure safe operation.

The residual current circuit breaker must be checked for proper functioning before commissioning and at regular intervals.



#### No moisture protection

The industrial heating mantle has no protection against the ingress of moisture. Penetrating moisture from water, chemical substances or other electrically conductive media that you work with when using the industrial heating mantle can lead to dangerous electric shocks. In the event of spillage, piston breakage or overflowing liquids, the appliance must not be touched.

The residual current circuit breaker (RCCB) integrated in the supply circuit switches off the industrial heating mantle if a residual current > 30 mA flows, so that no dangerous contact voltage can occur on parts that can be touched. The industrial heating mantle must then be disconnected from the mains at all poles.



#### The industrial heating mantle must not be put back into operation after this!

The defective industrial heating mantle must be labeled accordingly and placed in a safe place for storage. Release for further use can only be given by a competent electrician or a person trained in electrical engineering.

It is possible to dry the industrial heating mantle in a drying cabinet. However, it may only be put back into operation when it is completely dry and has been checked by a qualified electrician.



#### Additional information for which the industrial heating mantle must be taken out of operation immediately

Visible heating conductor in the interior (mechanical damage)

Brittle or broken heating element (overheating of the yarn)

In the event of such and similar damage, the industrial heating mantle must be taken out of service immediately and may no longer be used. It must be disposed of in such a way that it can no longer be used.



#### Avoiding overheating

Avoid any overheating of the industrial heating mantle. Overheating can be avoided by operating with suitable temperature controllers/switching units or, in the case of several heating zones, by switching off individual heating circuits. If the liquid level drops, the heating circuits that are not required must be switched off or the total heating power must be reduced.

Industrial heating mantles must not be operated with empty, encrusted or completely empty flasks.

Do not touch the industrial heating mantle when it is switched on or ready for operation. Do not touch the heating surface with metal or electrically conductive objects.



Do not use metal containers, containers with metal parts or electrically conductive containers in the heating surface area.

Do not insert needles or similar into the industrial heating mantles, as this could damage the heating coils or other electrical conductors and/or their protective devices. This can result in electric shocks with serious injuries.

The industrial heating mantle contains a heating element on the inside. This heating element must not be touched when the industrial heating mantle is switched on or is still hot. The upper edge of the industrial heating mantles and the fastening components (e.g. eyebolts) can reach high temperatures. There is a risk of injury from burns.



This industrial heating mantle is not explosion-proof!

It must not be used for heating processes where there is a risk of explosive media or explosive gas-air mixtures. Please note that flammable liquids can also cause a fire if the flask breaks, is overfilled or spilled.

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## 1 General information / checking the heater

Industrial heating mantles for use in industry and laboratories will work to your satisfaction if you observe the following instructions. Our products are high-quality products that are constantly monitored during the production stages and only leave our premises after a final safety inspection. Industrial heating mantles must always be used in accordance with the applicable regulations.

The industrial heating mantles are glass-insulated heating systems for industrial and laboratory use. Due to the high temperature range, the industrial heating mantles are not protected against moisture. The flexible heating elements are adapted to the corresponding vessel shapes and sizes and ensure even heat transfer and gentle treatment of the glass vessels (glass flasks).



All industrial heating mantles are tested and baked before delivery. The resulting discoloration of the glass yarn is due to technical reasons and does not represent a reduction in quality.

## 2 Guidelines and regulations

The following guidelines and regulations were taken into account in the design, production and inspection of the heating tapes:

- Low Voltage Directive 2014/35/EU from 26.02.2014
- Electromagnetic Compatibility Directive 2014/30/EU from 26.02.2014
- EU Directive 2011/65/EU RoHS Directive
- EN 60519-1 / -2 (VDE0721-1) Safety in Electro Heat Installations
- EN 60398 (VDE0721-50) Industrial Electro Heat Installations
- DIN VDE 0100-600 Testing
- DIN VDE 0701-0702 Recurrent Tests

## 3 Intended operation

The construction and design of the industrial heating mantles meet the functional expectations of users. They are ideal for heating liquid, viscous and solid substances in electrically insulating glass vessels (flasks).

When heating, it is important to note that, for physical reasons, the heating element in the industrial heating mantle must have a higher temperature than the medium to be heated in order to ensure that sufficient heat is supplied and the desired temperature is reached in the medium.

If the vessel containing the medium to be heated breaks, there may be direct contact between the two. The same can also happen if liquefied media foam over (boil over).

The optimum location for industrial heating mantles is a sufficiently ventilated room or installation below a fume cupboard dimensioned to suit the industrial heating mantle. This prevents the formation of flammable or potentially explosive gas mixtures and thus a possible hazard.

A stable and fireproof base ensures safe operation and protection of the operator when installing the industrial heating mantle.

In the event of unexpected danger to the user or the process, it should be possible to switch off the power supply remotely (emergency stop switch).

For the safety of the user and operation within the working environment, it is essential to know and observe the

## 4 Basic operating procedures are:

- Proper use of the device only together with faultless, visually integrated and suitable equipment. Permanent supervision of the work process
- Consideration of the physical behavior of materials when heated. Observe the temperature rise in the flask, maximum permissible filling level and maximum mantle temperature (overheating)
- The holder of the industrial heating mantle must have full contact over the entire surface of the flask (heat transfer)
- Inspection sticker (DGUV V3) for electrical appliance inspection must be up to date

Observing the comprehensive operating and safety instructions in this manual will ensure safe operation of the industrial heating mantle at all times.

Questions? We will be happy to advise you on the handling and safety of industrial heating mantles. Talk to our consultants! (Contact see chapter 20)



**Note:**

Please note that industrial heating mantles are not suitable for heating electrically conductive vessels due to relevant regulations.

Only glass vessels (flasks) suitable for the corresponding heating mantle size and shape may be used. The industrial heating mantles may only be operated by qualified electricians or persons trained in electrical engineering. The recognized rules of technology must be observed (VDE, SEV, ÖVE, DIN standards and in particular the accident prevention regulations).

## 5 Standard safety

The operator of the industrial heating mantle must take appropriate measures to ensure that the industrial heating mantle has a secure stand/seat (e.g. installation in a frame or support frame).



**Caution:**

Industrial heating mantles must always be in a horizontal position during operation. Possible superstructures on the glass vessel endanger the stability and must be specially secured.

The industrial heating mantles are not suitable for supporting the dead weight of the glass vessels (flasks). Accordingly, the weight of the flask including the contents and superstructures must be supported by suitable brackets.

## 6 Transport

- Industrial heating mantles must be transported carefully in suitable containers.
- Industrial heating mantles must never be pulled or carried by the connecting cable.
- Care must be taken to ensure that no sharp objects can get into the industrial heating mantle and damage it.
- Before packing for transportation, the industrial heating mantle must have cooled down sufficiently to prevent damage (risk of fire).

## 7 Temperatures

The temperature specified on the type plate of the industrial heating mantle is the maximum permissible surface temperature of the heating element. The user must take appropriate measures (use of suitable controllers and limiters) to ensure that this temperature is not exceeded at any point.



**Caution:**

When operating without temperature control, there is a risk of exceeding the maximum operating temperature.

This may be due to

- Heat build-up with unfilled or only partially filled containers
- Changing fill level and changing ambient conditions (temperatures).

The industrial heating mantles are damaged or even destroyed by impermissibly high temperatures (fire hazard). It should be noted that heaters also exceed the specified temperature range when operated with incorrect or improperly adjusted temperature controllers and temperature sensors. For safety reasons, industrial heating mantles should always be operated with a temperature controller.



**Important:**

The vessel to be heated and the medium must be suitable for the respective max. operating temperature. The regulations of the vessel and medium manufacturers must be observed.

In the case of sensitive or hazardous media, measures must be taken in accordance with the technical requirements to ensure that temperatures do not become too high and cause damage to the medium or the industrial heating mantle.

The temperature sensor must always be positioned at the hottest point, depending on the application.



If a power controller is used, constant personal monitoring with a temperature measuring instrument must be carried out and corrected if necessary.  
During operation, check that the operating temperatures are being maintained and that the entire system is working normally.

### 8 Penetration of medium

If a medium enters the industrial heating mantle due to spillage, destruction of the glass bulb or overflow, a dangerous contact voltage may be present. The residual current circuit breaker (RCCB) > 30 mA integrated in the supply circuit switches off the heating mantle if a residual current flows, so that a dangerous contact voltage cannot occur on the parts that can be touched. However, the industrial heating mantle must still be disconnected from the mains by switching off all poles of the supply line. The industrial heating mantle may then no longer be put into operation and must be stored in a suitable place without further use. It may only be put back into operation after a safety inspection by a qualified electrician (operator) or the manufacturer. The type of overload that has occurred must be determined and its cause eliminated.

### 9 Contamination

The industrial heating mantle must be disconnected from the mains immediately. Then determine what type of contamination has occurred. In conjunction with a competent specialist agency, the industrial heating mantle must be stored immediately in a suitable place and secured against further use.

### 10 Maintenance

Like all electrical equipment, industrial heating mantles must be checked by the operator at regular intervals to ensure that they are in a safe condition (VDE inspection in accordance with BGV A3 and BetrSicherV). Maintenance and servicing must be carried out in accordance with the standards listed under "Safety instructions" and the applicable regulations of the employers' liability insurance associations and other regulations applicable to the application. Damaged devices must be taken out of service immediately and may no longer be used.

### 11 Repairs

Industrial heating mantles are made of special materials that have to meet high requirements in terms of temperature, electrical and chemical resistance. This also includes the connecting cable. Repairs may only be carried out in the factory or by authorized companies. Electrical heating equipment must be installed and operated in such a way that no danger can arise from it even if it is left unattended or accidentally switched on. Suitable safety measures must be taken for this purpose, e.g. operation with a controller and/or limiter. If other regulations apply, the operator must take the appropriate safety measures.

### 12 Types

#### Industrial heating mantle type WHI3... / WHI4... / WHI5....

This heating mantle series is equipped as standard with a type K sensor (sensor type can be changed if required) in the lower heating zone.

<b>WHI3..</b>	3 heating zones	1 sensor type K*	Sensor position lower heating zone	bottom hole 60 mm (standard)**	Tmax. 450°C
<b>WHI4..</b>	4 heating zones	1 sensor type K*	Sensor position lower heating zone	bottom hole 60 mm (Standard)**	Tmax. 450°C
<b>WHI5..</b>	5 heating zones	1 sensor type K*	Sensor position lower heating zone	bottom hole 60 mm (Standard)**	Tmax. 450°C

**Industrial heating mantle type WHI3S... / WHI4S... / WHI5S...**

This heating mantle series is equipped with one type K sensor (sensor type can be changed if required) in each heating zone as standard.

<b>WHI3S..</b>	3 heating zones	3 sensors type K*	one sensor per heating zone	bottom hole 60 mm (standard)**	Tmax. 300°C
<b>WHI4S..</b>	4 heating zones	4 sensors type K*	one sensor per heating zone	bottom hole 60 mm (standard)**	Tmax. 300°C
<b>WHI5S..</b>	5 heating zones	5 sensores type K*	one sensor per heating zone	bottom hole 60 mm (standard)**	Tmax. 300°C

\* the sensor type can be customized if required

\*\* the size of the bottom hole can be customized if required

**13 Commissioning**

Check before commissioning::

1. Do your order details match the type plate?
2. Is the industrial heating mantle suitable for your application according to your technical specifications (type plate, description)?
3. Have measures been taken to prevent excessive temperatures?
4. Does your industrial heating mantle have a safe location?
5. Is it ensured that you can disconnect the industrial heating mantle from the mains in case of danger?
6. Has the flask or vessel been cleaned? Encrusted flasks are poor heat conductors and can cause the flask to break.
7. Is the mains supply line fitted with a residual current circuit breaker (RCD) > 30 mA?



Note:  
 Protect the industrial heating mantle from moisture and wetness.

**Operation**

First insert the appropriate glass vessel into the industrial heating mantle and make sure that the glass vessel is properly seated in the industrial heating mantle. After plugging in the mains plug (residual current circuit breaker), the heating mantle can be switched on.

The switching options can be found in the table "Switching options for the heating mantle".



Note:  
 The industrial heating mantle must be supervised during operation.  
 Observe all notes and specifications in these operating instructions.

**14 Technical Data**

<b>Max. operating temperature:</b>	+300°C / +450°C (depending on type)
<b>Nominal operating voltage:</b>	230 Volt / 50 Hz
<b>Rated current</b>	see type plate
<b>Rated power:</b>	see type plate
<b>Power tolerances:</b>	+15% / -10%
<b>For flask size to be used</b>	see type plate

Dimensions / further technical data can be found in our catalog for chemical and thermal process engineering and our laboratory catalog.



All instructions given in these operating instructions must be checked and observed, otherwise the intended protection of the industrial heating mantle may be impaired. If you have any questions, please contact the manufacturer.

### 15 Maintenance and service

Servicing and maintenance should be carried out at regular intervals in accordance with the standards listed under "Safety instructions" and the regulations applicable to the application. The function of the heating element, the controller and the limiter must be checked and documented at least once a year.

The inspection must be carried out after the industrial heating mantle has cooled down to ambient temperature and has been disconnected from the power supply. The heating mantle should not have any cuts, cracks or stitches. The insulation of the connection cable must not have any visible damage. The heating mantle should be free of dirt, oil, grease or foreign bodies. Warning notices and type plates should be undamaged and clearly legible.

Heating mantles with visible heating conductors have been damaged or overheated.

They must be taken out of service immediately and may no longer be used.

#### 15.1 Repair

Conversions or modifications to the heating mantles may impair their function. Repairs may only be carried out by qualified personnel instructed by Winkler. Only original spare parts and accessories may be used.

Do not attempt to repair a damaged heating mantle yourself!

Instead, send it to our service department.

#### 15.2 Return

For returns, we ask that you always decontaminate the heating mantle beforehand, confirm this in writing and enclose it with the heating mantle as information. If you require a decontamination confirmation, please contact us.

### 16 Warranty

Winkler guarantees the original purchaser of the product for a period of twelve (12) months from the date of delivery (handover of the goods).

In the event of justified complaints, Winkler shall rectify the defect or deliver a replacement. Winkler is entitled to have the defect rectified by a third party.

Details can be found in our General Terms and Conditions at [www.winkler.org](http://www.winkler.org).

### 17 Disposal

Environmental information for industrial customers within the EU:

The WEEE Directive 2012/19/EU aims to prevent waste from electrical and electronic equipment and to reduce such waste through reuse, recycling and other forms of recovery.



The symbol indicates that the product should be disposed of separately from regular commercial/household waste. It is your responsibility to dispose of this product only through the legally prescribed disposal channels or the appropriate collection points designated by the government or local authorities.

Proper disposal and recycling will help prevent potential negative consequences for the environment and human health. If you need more information on how to dispose of your waste equipment, please contact your local authorities, municipal waste disposal services or the dealer where you purchased the product.



## 18 EU Declaration of Conformity

## 19 Contact

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