

**Solutions for Fluid Technology**



**OPERATING AND MOUNTING INSTRUCTIONS**

Tank heaters

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# OPERATING AND MOUNTING INSTRUCTION FOR IMMERSION HEATERS WITH MAGNETIC CLAMP - SERIES VR

## 1. INDICATIONS

Before initial operation, the installation instructions must be read carefully to ensure a trouble-free and safe operation. Installation, operation and maintenance must only be carried out by qualified and authorized personnel. The safety instructions in this operating manual and the safety regulations for the installation and operation of electrical systems must be observed.

## 2. APPLICABLE STANDARDS AND REGULATIONS

VR-tank heaters are designed and tested according to EN 60518-1 and EN 60519-2. The regulations applicable in the particular country must be observed. In Europe for example VDI, DIN, ÖVE, VDE.

## 4. TEMPERATURE CONTROLLERS, TEMPERATURE LIMITERS

In the standard version, temperature controllers and temperature limiters are installed in the connection housing. The corresponding sensors are located in the tank heaters.

## 5. ASSEMBLY

VR-tank heaters can be positioned either horizontally or vertically in the storage tank. The connecting cable is led to the outside through a wall of the storage tank or a suitable opening and secured with a cable gland. In steel tanks, the tank heater can be attached with magnets, which are included in the standard version. The magnets additionally act as tank cleaner. They bind metallic elements in the storage medium and thus protect your system against technical faults. With plastics and stainless steel tanks, the tank heater can be hung with a chain in the tank.

In order to heat the medium in the suction area, VR-tank heaters should be positioned near the suction pipe. The suction pipe in the storage tank must be shortened so

The tank heaters must only be used according to their technical data. Structural modifications are not permitted without prior permission of the manufacturer and will result in the loss of warranty.

## 3. MAIN COMPONENTS OF THE HBE TANK HEATERS

VR-tank heaters essentially consist of the components heating surface and connection housing. The heating elements of these heaters are prewired ready for connection. Optionally, the supply line can be jacketed with a stainless steel hose. The product-specific technical details can be found in the data sheet and in the connection diagram.

that the tank heater is always covered with the medium (please observe the applicable regulations).

The minimum height above the tank heater is 50 mm. To keep the remaining amount of the medium in the storage tank as low as possible, the horizontal installation position is preferred. Depending on the type of the tank heater, the additional screw connection between the stainless steel protective hose and the tank heater connection housing must be checked for tightness before operation and retightened if necessary.

## 6. ELECTRICAL CONNECTION

The electrical connection must only be carried out by authorized personnel and according to the wiring diagram. The supply voltage must comply with the information on the type label. The wire cross-section and the protection must be selected according to the applicable regulations.

## 7. COMMISSIONING

Before switching on the power supply, the tank must be filled with the medium. The tank heater must never be operated without sufficient heat dissipation of the medium. Non-compliance may result in damage to the heater as well as personal injury and machine damage.

## 8. MAINTENANCE

At appropriate intervals, it is necessary to check the tank, in which the tank heater is installed, for contaminations and debris. Any sedimented sludge must be removed to ensure heat dissipation of the heating surface to the medium. If the sludge is not removed, a heat accumulation may cause a burn out of the heating elements. Sludge which has settled at the lower part of the tank can be rinsed. Debris which cannot be removed by rinsing must be mechanically removed or dissolved. Indications for removing the debris can be found in the VDI guidelines 2035 sheet 1 paragraph 6.

When cleaning the tank, make sure that the heating elements are not mechanically damaged. In case of mechanical damage or damage caused by corrosion, the warranty is void.

The terminals must be tightened with the required torque. After one month, it must be secured that the connections have not relaxed. If the connections have loosened, the terminals have to be retightened to avoid increased transition resistance. These resistances can damage the terminals and the tank heater.

If it is necessary to remove the tank heater from the tank e.g. for cleaning purposes, the following points should be observed:

- The power supply must be disconnected.
- The electrical connection cables must be released from the terminals and pulled out of the cable entries on the connection side.
- The cable connection on the tank heater is sealed and must not be loosened.
- The tank heater must be cooled down to a safe temperature.
- The optional screw connection of the stainless steel protective hose must be checked for tightness.

# OPERATING AND MOUNTING INSTRUCTION FOR SCREW-IN RADIATOR – SERIES PTHK/RHK

## 1. USAGE

Screw-in radiators are designed for heating of liquid and gaseous mediums.

## 2. SAFETY INSTRUCTIONS

Before opening of the appliance, it has to be strictly safeguarded that it is free of voltage.

The electric installation should only be made by an approved electrician.

It has to be adhered to the local EVU-prescriptions as well as the appliance-specific VDE, DIN and TÜV prescriptions. In case of non-adherence to these prescriptions, failures in function with sequence-damages and endangering of persons may occur.

## 3. GENERAL

Before beginning of the assembly works and before the first commissioning of the radiator, the assembly and operation instructions have to be read.

If a fitting position or direction of flow to the heated medium is given, it has to be considered accordingly.

Please check whether the radiator shows transport damages.

The radiator must be stored in dry condition (see point 9).

## 4. ELECTRIC CONNECTION

Check whether the connection voltage is in accordance to the voltage of the power rating plate.

Connection protecting-hood of the radiator has to be opened.

By executions with aluminium-hood and rotary-disk, the cable screwing can be turned into the desired position by unloosen the three headless screws situated in the hexagon of the screwing.

Insert cable through cable gland and connect the cable to the provided clamps according to the wiring scheme attached in the hood.

The wire cross sections and the protection must be adapted to the electric power of the radiator and must comply with the relevant provisions – see DIN VDE 0100 part 523 and part 430.

After the electric connection has been installed, it has to be safeguarded that the IP protectionclass indicated on the type-plate is adhered to.

## 5. THERMOSTATS (OPTIONAL)

If the radiator is equipped with a regulator, the adjustment of the desired temperature can be made by turning of the regulator spindle.

If provided with a limiter, the adjustment of the desired limiting temperature can be made by turning of the limiter spindle.

The triggered limiter can be reset by actuation of the reset button. The limiter of the three-pole regulator-/limiter combination is firmly adjusted on 100°C. The regulator can be adjusted manually in the range of 30°C to 80°C.

3-pole thermostats can be applied for direct control up to 9 kW (with 400 V3~). 1-pole thermostats are admissible up to 3 kW (with 230 V~).

When using rotary current and 1-pole thermostats, a control valve must be provided on site.

## 6. COMMISSIONING AND DECOMMISSIONING

Adjust thermostats (if available) to the desired temperature.

The radiator must only be switched on under operating conditions – the medium to be heated must encircle the radiator thoroughly. With continuous flow heater, the indicated volume flow must be achieved.

## 7. MAINTENANCE

Fixing screws have to be tighten up after the first heating up and must be checked regularly for tightness.

Sedimentations on the tube radiator may destroy the radiator and must be removed. The cleaning must be made carefully in that way that the tube surface will not be damaged.

As dry run protection, a 3-pole limiter from Stiebel is available. This one is provided for direct switching up to 12 kW (with 400 V3~). When mounting in horizontal position, it must be considered that the sensor will be fixed at the above lying tube radiator.

The regulation and limitation is also electronically possible by a PT 100 or NiCrNi thermal element.

In particular cases, a readjustment of the regulator or limiter has to be made after the heating phase.

In order to protect the radiator against overheating, we additionally recommend security measures as for example to install a level control (float switch) or a water flow indicator into the system.

Due to residual heat, it must be safeguarded with continuous flow heater that the medium flows on for some time after switch off of the radiator.

Occasionally, the thermostats and the whole wiring should be tested for a proper function.

## 8. PROBLEMS AND SOLUTIONS

### Problem

The radiator does not achieve the necessary power – the nominal temperature is not reached.

### Solution

- Test the fuses
- Control the connecting voltage
- Thermostats and wiring (control) must be tested
- Resistance of the tube radiator should be measured

### Problem

The nominal temperature is significantly exceeded.

### Solution

- Adjustment and function of the regulator must be checked.
- Required medium throughput has to be tested.

## 9. STORAGE

Due to system performance, it must be expected that the insulation resistance decreases when storing over a longer period of time (several months). The radiator may only be put into operation when it has been safeguarded that the insulation resistance is bigger than  $R_{\min}$ .

### Problem

The temperature limiter does not actuate.

### Solution

- Adjustment and function of the regulator must be checked.
- Adjustment of the limiter and function must be checked.
- Required medium throughput must be tested

$$R_{\min} = \frac{2M\Omega}{\text{Number of installed tube radiators}}$$

We recommend to store the radiators in dry condition and to add a suitable drying agent if necessary.

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