

**Translation**  
**Created for the applicable standards in Germany**

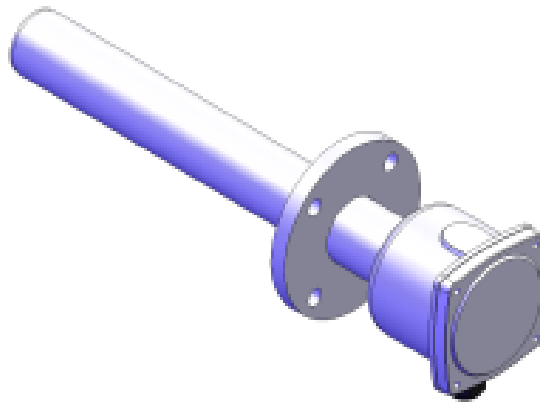
**Only for use in a commercial environment!**

## Instruction manual

**Article-number: 20153106330140**

**Cartridge type heater**

Type		: 93/F53-63
Output	(W)	: 1,000
Output tolerant	(%)	: +5/-10
Voltage		: 400V 2~



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## 1 Information on the product

Designation				<b>: Cartridge type heater</b>
Type				<b>: 93/F53-63</b>
Min/max Temperature				
• At the connection head	(°C)			<b>: -20/+40</b>
• In the connection area	(°C)			<b>: -10/+80</b>
Protection category				<b>: IP 65</b>
Mounting direction				<b>: horizontal</b>
Drawing number				<b>: 233.94.177.0</b>

### Notice

In addition, the cable glands can be used in areas with temperatures between -20 ° C to -40 ° C when on site there is only static loads. Static load means that no other forces (shock, traction, pressure, etc.) act on the properly assembled gland and its correctly fitted cable.

The screw insertion, the cable gland and the inserted cable must be in a resting position. A fixed cable gland is observed. The cable gland must not be considered only as a single component, but the user must take into account at the site, the sum of the prevailing ambient conditions.

At temperatures below -40 ° C, the sealing ring material CR / NBR begins to harden and the strong polyamide PA6 used tend to embrittlement.

## 2 Intended use

The device is served for the warming up of liquids.

The device is used to heat the indicated medium.

The specified operating data must be observed.

Deviations are not permissible.

The electric heating insert of the device can be installed and developed, without the liquid must let down from the container.

### 3 Safety

**The instructions manual include important basic indications, which are to be observed during installation and operating.**

**The instructions manual must be read and understood before installation and commissioning.**

Keep the operating instructions for future reference.

Pass the manual to each subsequent owner and operator.

Do not make any modifications to the product.

Modifications can disable safety devices and cause personal injury and property damage.

**Modifications lead to invalidation of conformity.**

Note the mounting position of the device or direction of flow of the medium to be heated, when they are given.

Carry out periodic inspections in accordance with national regulations.

Check safety-related components before starting up function.

Check monitoring equipment, (eg for temperature, minimum flow or level) when used as a safety device in accordance with the relevant provisions on function.

**Carry out an annual functional test of the safety devices.**

**Depending on the application and environment in a shorter interval.**

**This device is not suitable for use in areas threatened by explosive influences.**



#### **WARNING**

**Hot surfaces**

**Severe burns**

- Do not touch

- Provide insulation

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## 4 Connection and performance data

### Electric data

Power	(W)	: 1,000
Voltage		: 400 V 2~
Cable gland		: M20x1.5

Ambient temperature -20°C to +100°C

### Heating element

Type		: cartridge with ceramic heating insert
Immersion length	(mm)	: 630
Thereof unheated length	(mm)	: 50
Cartridge tube -Ø	(mm)	: 52

### Operating data

Medium		: oil
Operating temperature	(°C)	: 40
Max. allowed. temperature (TS)	(°C)	: 80
Max. allowed. pressure (PS)	(bar g)	: 0.5

### Connection head

Dimensions connection head	(mm)	: 108 x 108 x 90 red (RAL 3000)
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### Materials

Cartridge tube		: steel
Flange		: P250GH
Connection head		: aluminium

### Flange

DIN		: EN 1092-1
Pressure stage		: PN 6
Nominal width		: DN 50

### Temperature monitoring

- Without temperature regulation
- Without temperature limitation

An appropriate temperature regulation and / or temperature limitation is to be planned by the builder/operator

## 5 Mounting instructions



During operation, the environment temperature at the connection head must not fall below **-20°C** and the environment temperature of **+40°C** must not be exceeded.

Should the environment temperature deviate from these values, the device must be switched off. (An appropriate room-temperature control must e.g. be provided).

**The connection head must not be provided with thermal insulation, otherwise the connection area is overheated.**

**Max. permissible temperature at the connection area: 80°C.**

## 6 Mounting

Mounting position: horizontal

### Installation note:

- When installing the device, make sure that it is not damaged. (Heating elements, ...)
- Choose a seal witch is suitable for the medium.
- Choose suitable screws.
- Bolt the device flange with the installation flange.
- Check tightness.
- Re-tighten after the first heating (if necessary).

The device must be fixed tightly.



During operation the heating element must be covered by the medium to be heated, otherwise overheating may occur.

Therefore, the customer must provide **level monitoring** ensuring that the device can only be operated with sufficient covering (50 mm approx.) of the heating elements.

The electrical connection head and the cooling length (the range between flange and connection head) may not be isolated.

The temperature regulation and / or temperature limitation is to be planned / connected by the builder/operator

## 7 Installation

**The work described in the following must be executed by an electrical engineer only.**

To protect the device from damage, we recommend a fault current monitoring device shall be provided.

**TT- and TN systems:** A fault current protection device should be installed. The calculation value of the fault current must be set during commissioning.

**IT system:** An isolation control device has to be used, which interrupts the supply whenever the insulation resistance amounts to no more than 50 Ohm/V, related to the calculation tension.

- The supply voltage must correspond to the voltage indicated on the type plate.
- For the selection of the cross-sections for connection, loads, fusing etc. the relevant legal requirements must be observed (see a. o. VDE 0100, VDE 0298-4).

### Electrical connection

1. Unscrew the cover.
2. Insert the cables through the cable glands into the connection head.
3. Tighten the nut of the cable gland to guarantee the strain relief and the protection mode.  
(Cables and cable glands must be matched to guarantee the required protection mode.)
4. Connect cable according to the wiring diagram.
5. Check connections for tight fit.
6. Screw on cover.

## 8 Initial start-up



Only turn on if the heated length is completely covered by the medium.  
It is advisable provided an on-site level monitoring.

**The connection head should not be isolated, otherwise the connection area can be overheated.**

**Max. permissible temperature at the connection area: 80°C.**

In a closed system, a pressure relief valve must be installed on site.

- Please make sure to have closed the connection head properly.
- Please make sure that the device is covered by the medium according to the requirements.
- Set a temperature controller to the target temperature.
- Guarantee that the temperature controller is duly attached.
- Guarantee that the on-site temperature limitation is duly attached.

By a temperature limitation the medium and the device are protected against to high temperatures.

## 9 Repair of failures

**The work described below must be executed by an electrical engineer only.**

**Failure:** Device does not heat up

- Repair:**
- Check fusing
  - Control the supply voltage
  - The temperature of the temperature controller is set too low.
    - Set temperature controller to the correct temperature.
  - The on-site temperature-limiter switched off circuit.
    - Check reason, remove fault, reset temperature limiter.

- Run the initial start-up procedure for the device after each repair of failures.



## 10 Repair

**Before repairs only hold consultation with the manufacturer.**

Trained personnel in compliance with common regulations do repairs

Use only by manufacturer authorized spare parts.

Improper repairs can result in personal injury and property damage

## 11 Maintenance and servicing

Execute an annual visual check of the device.

We recommend the checking of these tests and controls listed below at short intervals initially.

For perfect operation of the device the following aspects must be checked:

- ✓ measure the insulation values
- ✓ measure the resistance values ( $\Omega$ )
- ✓ measure and check the thermostat and / or limiter function
- ✓ Visual inspection for damage
- ✓ Visual inspection for deposits or incrustations on the heating elements
- ✓ Visual inspection for leaks
- ✓ Visual inspection of the electrical connection area  
(Moisture, rust ... reduce the insulation value and must be removed.)

Deposits or incrustations on the heating elements can destroy the device and must be removed.

The cleaning must be do carefully, so that the surface is not damaged.

**Carry out an annual functional test of the safety devices.**

**Depending on the application and environment in a shorter interval.**

## 12 Dismantling

- Switch off the system and secure to prevent unintentional restart.
- Allow the device to cool to room temperature.
- Uninstall and remove the connecting cable.
- The system must be depressurised.
- Drain the medium first and dispose of it properly

## 13 Storage

The store room must be dry and free of dust.

Make sure that the storing temperatures are between -40°C and +40°C.

Before storing, be sure that there is no humidity penetrated inside the connection area during transport or interim storing.

All openings must be closely locked, in order to prevent a penetration from dust/moisture.

The connection area shall be tightly closed if necessary the cable entries must be equipped with blinds.

Place a drying agent in the connection area to absorb existing humidity.

Use only chemically indifferent drying agents (e.g., silica gel).

Change the drying agent at the specified intervals. Observe the instructions of the drying agent manufacturer.

During storage over a longer periods (several months), it is to be expected that the system-related insulation resistance reduces.

## 14 Disposal

- Remove any problematic deposits in accordance with local regulations.
- Dispose of the device in accordance with local regulations.
- Give metals and plastics sorted for recycling or scrapping.