



## PHOTOVOLTAIC HEATING ROD

**EN**

### **Photovoltaic heating rod (ROD-550)**

**TECHNICAL DESCRIPTION  
INSTALLATION, OPERATION AND MAINTENANCE  
INSTRUCTIONS  
WARRANTY CONDITIONS**

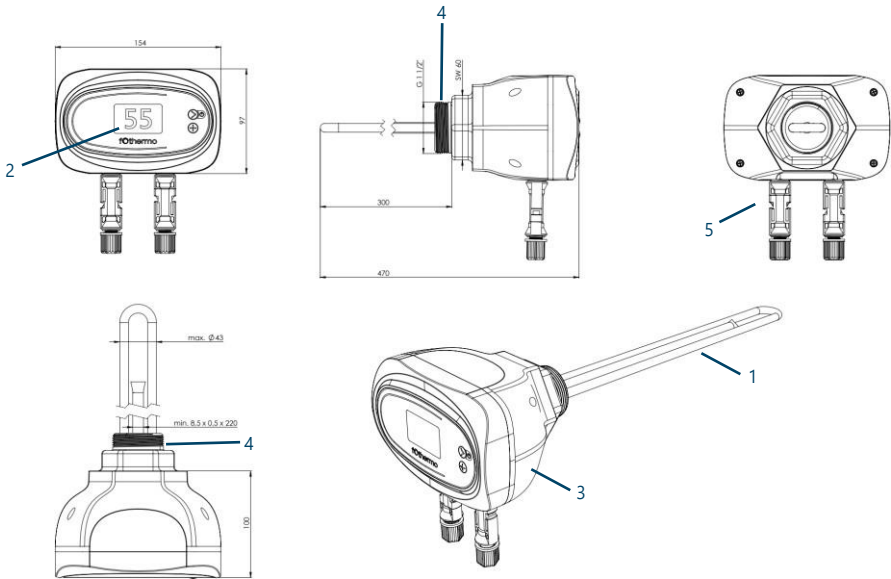
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**IMPORTANT!**

Please read these operating instructions carefully before installing and commissioning the heating rod!

# Technical drawing



EN	
1	Heating rod
2	Electronic & Display
3	Housing
4	Screw-in thread
5	MC4-Plugs

# Specifications

	UNIT	
<b>PHOTOVOLTAIC HEATING ROD</b>		
Product name	-	ROD-550
Max. photovoltaic heating power	W	550
Max. photovoltaic current consumption	A	15,5
IP-class	-	24
Gross weight ( $\pm 3\%$ )	kg	0,8
Max. water temperature	$^{\circ}\text{C}$	85
Integrated MPP tracker	-	✓
Integrated reverse polarity protection	-	✓
Digital display	-	✓
Dimensions housing (length, width, height)	cm	15,4 x 10x 10
Dimensions heating rod (length, width, height)	cm	15,4 x 10 x 47
Screw in diameter	-	G 1½ (M)
<b>PHOTOVOLTAIC INPUT</b>		
Recommended photovoltaic power	$W_p$	300-1200
Max. connected photovoltaic power	$W_p$	2000
Max. Open circuit voltage*[1]	$V_{DC}$	50
Photovoltaic connector	-	MC4

**Note:**

Only 54, 60/120 and 72/144 cell photovoltaic modules should be connected to the heating rod.

All values in the table are approximate \*[1] To ensure the open circuit voltage stays below the max value, please connect photovoltaic module(s) in parallel strings to each MPP-tracker. This value is the maximum input voltage rating of one MPP tracker. Please take the temperature coefficient of the photovoltaic module into consideration.

# Assembly

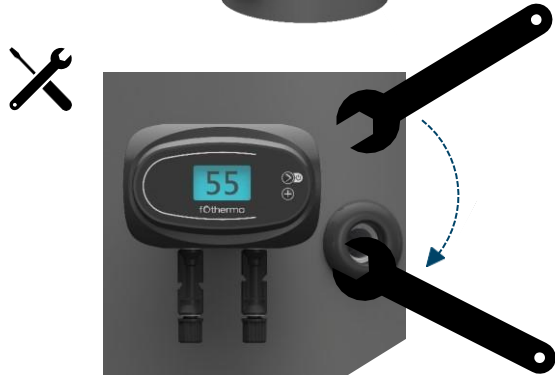
## Step 1:

Before inserting the heating rod into the sleeve, seal the thread of the heating element with sealing material. Then insert the heating rod into the desired socket with a G 1½" thread.



## Step 2:

Screw in the heating rod by hand and tighten it with a wrench. Clockwise.



## Step 3:

If the display is in the wrong position, pull the housing slightly towards you (away from boiler) and turn the heating rod to the desired position. If the heating rod cannot be turned any further, try it in the other direction.



## Further information



Dear clients, thank you for choosing this device!

It will be a trustworthy helper in your household for many years. In the production we have combined high quality materials and innovative technologies. To be sure of its hopeful and trouble-free operation, please read the installation and operating instructions carefully.

**WARNING! Before installation and operation with the appliance, read carefully the present manual!**

### General warnings

Be sure to carefully read the instructions and warnings in this manual before installing and operating the heating rod. The information contained in this manual is intended to familiarize you with the heating rod, the rules of its correct and safe operation, and the minimum requirements for its maintenance and servicing. Furthermore, you are obliged to make this manual available to the qualified persons who will install and potentially repair the appliance. The installation of the heating rod and the verification of its functionality is not within the distributor's warranty obligation nor the manufacturer.

These instructions should always be kept near the appliance for future reference. Compliance with the rules here described is part of the measures for the safe use of the product and is considered part of the warranty conditions.

### Safety instructions

**WARNING!** There is a risk of burns or scalding when using the appliance!

**WARNING!** This appliance may be used by children of age over 3 years old and persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, where they are under supervision or instructed about the safe use of the appliance and understand the dangers. Children must not be allowed to play with the unit! It is absolutely forbidden that children undertake cleaning or servicing of this appliance! Children aged from 3 to 8 years are only allowed to operate the tap connected to the water heater.

**WARNING!** Domestic and drinking water, may ONLY be heated up to a temperature of 65 degrees.

**WARNING!** Water containing lime scale may only be heated to a maximum of 65 degrees.

**IMPORTANT!** Only qualified persons may install the heating rod and connect it to the photovoltaic following the specifications given in this manual and the relevant local regulations. The protective devices provided or recommended by the manufacturer, as well as all other assemblies, are **UNCONDITIONALLY** to be installed!

**IMPORTANT!** Be sure to fill the water heater with water before connecting it to the heating rod! Failure to comply with the electrical connection conditions affects the safety of the appliance, whereby the water heater must not be operated.

**IMPORTANT!** ONLY lime-free water, may be heated to 85°.

### Further important notes

- This device contains a support battery, which is not replaceable. It is necessary for the display to function at night. A defect does not limit the basic functionality.
- This unit may be operated up to an altitude of 4000 m above sea level.

## Technical data

This heating rod can heat water from the public water supply system for several consumers. The water used for heating must comply with the requirements in the normative documents for domestic water, in particular: Chloride content up to 250 mg/l; electrical conductivity more than 100 µS/cm, pH value 6,5-8 for enameled hot water tanks. The thermal insulation consists of CFC-free polyurethane foam.

The maximum electrical power with PV-energy of the heating rod is 550 W. The actual power consumption of the heating element depends on the connected photovoltaic power as well as on the radiation strength provided by the sun. The water is heated up to a maximum of 85 °C. Detailed information can be found in the data sheet or on the nameplate.

## Assembly

The heating rod can be installed only in normal fire safeguarded premises and where temperature cannot fall under 0 °C. The availability of a siphon on the installation for waste waters as during normal usage of the water heater. At the same time the siphon will facilitate the water tank maintenance, prevention and servicing operations when water needs to be drained out of the water tank.

The appliance must be mounted where it is protected against water dispersion or water pouring over, to ensure the housing is not in contact with the water. In order to reduce heat loss, it is recommended to keep minimum distance between the heater and the places where the hot water is used.

The installation site must comply with the requirements of the electrical installation. During installation, provide sufficient distance to adjacent walls and sufficient space under the unit for the water and photo-voltaic connections.

## Connection to the water tank

The heating rod has a screw-in thread with 1½ inch. This is screwed into the sleeve provided for this purpose in your water tank. It must be ensured that the heating rod is pulled as tightly as possible. The display and housing can be adjusted afterwards. For the correct alignment, the MC4 contact plugs must point downwards.

If other accessories, which are not included in the scope of delivery, are to be used in accordance with the

local regulations, they must be installed in accordance with the specifications.

**It is FORBIDDEN** to carry out the electrical connection of the device as long as the fault has not been eliminated!

**WARNING!** It is **STRICTLY FORBIDDEN** to carry out the electrical connection of the heating rod as long as the water tank is completely or partially empty! Before restarting the device, first fill the water tank with water.

## Electrical connection

**WARNING!** Any electrical connection may only be performed when the water heater is filled with water.

**IMPORTANT!** At the PV-input the heating rod is powered by direct current. The heating rod is protected against electric shock "class III" and may only be supplied with safety extra-low voltage (SELV). Only power sources recommended by the manufacturer may be connected. A faulty and/or unsuitable power supply involves a high risk and is likely to cause an accident. The connection cables of the device must be replaced if they are damaged.

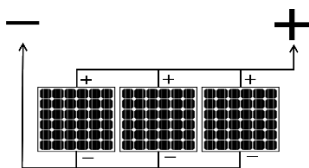
**IMPORTANT!** Photovoltaic modules may **ONLY** be connected in **parallel**. When connecting more than one photovoltaic module, always use a suitable connector for parallel connection. For more information, refer to the illustration "Parallel PV-Connector". Connecting photovoltaic module in series will damage the heating rod.



Parallel PV-Connector



Pay attention to correct polarity when connecting!



Connection of PV-modules in parallel configuration only!  
Serial connection will damage the unit!

The electrical connection of the heating rod is performed using the factory supplied MC4 plugs. Check the functionality of the appliance after the electrical connection has been performed. When all supply connections are removed, the heating rod is completely disconnected from the power sources.

### CONNECTION OF PV-MODULES:

**IMPORTANT!** The installation and electrical parallel connection of PV modules may only be carried out by a qualified person and may not endanger third parties. When installing the photovoltaic modules, the locally prevailing rules and laws must be complied with.

**IMPORTANT!** Keep cables out of the way to avoid tripping over them or getting caught. There is a risk of injury. The cables must be fastened in such a way that no tensile load is applied to the connectors. Furthermore, it must be ruled out that the cables and connectors rub against surfaces and edges (e.g. in wind). The cables must not lie in water permanently.

**IMPORTANT!** Only photovoltaic modules with a maximum of 60 resp. 120 cells, 72 resp. 144 cells and an open-circuit voltage of 50 V may be connected.

- Photovoltaic modules must be connected correctly using the factory supplied MC4 plugs.
- You may connect up to five modules in parallel. Depending on the module, this corresponds to an MPP output of approximately 2000 W<sub>p</sub>.

Dimensioning of the required photovoltaic power:

- The higher the number of hours of sunshine per day, the smaller the required PV power.
- The warmer the water taken from the pipeline, the lower the required PV power.
- Dimension the required photovoltaic power according to the months with the lowest solar radiation in which the photovoltaic water heater will be in operation.

- The greater the amount of hot water consumed per day, the larger the PV power required.

The following table serves as a guideline for dimensioning the photovoltaic power needed depending on the climatic conditions:

Climatic conditions	ROD-550
Countries with low sunshine e.g. Northern and Central Europe	1200 W <sub>p</sub>
Sunny countries e.g. Southern Europe and Africa	600 W <sub>p</sub>

*These values given are guidelines. Depending on the conditions prevailing on site and the specific conditions of consumption, the appropriate design of the photovoltaic output may vary from the values described.*

### Extension of the photovoltaic line:

When extending the photovoltaic cable, the MC4 contact plugs must be properly attached to ensure functionality and safety. Basically, the PV cable should be kept as short as possible.

A length recommendation depending on the connected nominal PV generator power can be found in the following table.

Connected PV-Power	4 mm <sup>2</sup>	6 mm <sup>2</sup>	10 mm <sup>2</sup>
~325 W <sub>p</sub>	≤ 18 m	≤ 27 m	> 27 m
~650 W <sub>p</sub>	≤ 11 m	≤ 16 m	> 16 m
~975 W <sub>p</sub>	≤ 9 m	≤ 13 m	> 13 m

*Recommended cable length (there and back) for different nominal powers and cross-sections*


## Operation

**WARNING!** This appliance may be used by children of age over 3 years old and persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, where they are under supervision or instructed about the safe use of the appliance and understand the dangers. Children must not be allowed to play with the unit! It is absolutely forbidden that children undertake cleaning or servicing of this appliance! Children aged from 3 to 8 years are only allowed to operate the tap connected to the water heater.



## Operation:

### Switch On:


Press the  - button for three seconds.

### Display:


The present water temperature is shown on the display.


- POWER IN: Input power of the PV modules
- VOLTAGE: Input voltage of the PV modules
- USED PV ENERGY: Total PV energy utilized

### Menu Navigation:


Press the  - button briefly. By pressing the button again, you jump to the next page in the menu.

### Settings:

Press the  - button repeatedly. This allows individual adjustments on the unit to be made. Please note: The adjustments are only active when an energy supply is connected to the photovoltaic water heater.

- **CHANGE MAXIMUM TEMP.:** Select the maximum Temperature by  pressing the - button. 65 °C is the factory default.

### Switch off:

Press the  - button for three seconds.

### Noise emission

Noise may be generated inside the device during the heating process, which is caused by lime deposits on the heating element. An increased formation of limescale can be observed at water temperatures above 60°C. This may cause impairment and damage to the heating elements and the water heater.

### Formation of legionella

Due to the small volume of the hot water tanks, the risk of the formation of legionella in the system is almost excluded. Nevertheless, to take precautions, the following measures are recommended:

- Supply of fresh water or regular water withdrawal.
- Heating the water frequently to at least 60 °C.
- It is recommended to change the water after the appliance has not been used for more than one month.

## Maintenance

**IMPORTANT!** Before maintenance and servicing, disconnect the heating rod from all energy sources.

**IMPORTANT!** The cover may only be opened by qualified personnel.

### Repair instructions

All electronic repair work may only be carried out by a qualified electronic technician. There is a risk of injury. Modifying the cables and electronics voids the warranty.


### Cleaning

The outer casing and the plastic parts of the heating rod should only be cleaned with a lightly moistened cotton cloth, free of aggressive and/or scouring agents. Do not clean the appliance with a steam cleaner. The heating rod may only be put back into operation after the moisture has completely vanished.

## Malfunction

In case of a malfunction during the operation of the heating rod, disconnect all live wires from the appliance and contact the manufacturer or your distributor.

## Environmental protection

This device is labelled by the Waste Electrical and Electronic Equipment (WEEE) directive. By ensuring that the appliance is taken to a suitable disposal centre at the end of its service life, you will help to protect the environment and prevent negative effects on the environment and human health. The  -symbol on the water heater indicates that the appliance must not be disposed of with regular household waste at the end of its life. The product must be taken to a disposal centre with special facilities for electrical or electronic equipment. The end-user must comply with local disposal regulations when disposing of the product. For more information on treatment, recovery, and recycling procedures, contact your local city office, your local waste disposal centre, or the retailer from whom you purchased the product.

## Warranty

The warranty of the appliance is only valid under the following conditions:

- The unit is installed in accordance with the installation and operating instructions.

- The appliance is only used for its intended purpose and in accordance with the installation and operating instructions.

The manufacturer's warranty covers the repair of all manufacturing defects that occur during the warranty period. Only professionals authorized by the seller may carry out repairs. The warranty does not cover damage resulting from:

- Improper transport
- improper storage
- improper use
- unsuitable water parameters
- improper electrical voltage which deviates from the rated voltage
- freezing of water
- exceptional risks, accidents, or other force majeure
- failure by disregarding the installation and use instructions
- in all cases when an unauthorized person attempts to repair the appliance.

In the aforementioned cases, the damage will be repaired against payment. The guarantee does not apply to parts and components of the device that are worn out during its normal operation, nor to parts that are dismantled, to lights and signal lamps, etc., to discoloration of external surfaces, to changes in the shape, dimensions, and arrangement of parts and components that have been subjected to an impact that does not correspond to the normal conditions of use of the device. Any missed benefits, material and immaterial damages resulting from temporary inability to use the unit during the period of its repair and maintenance, are not covered by the warranty of the unit.

COMPLIANCE WITH THE REQUIREMENTS SPECIFIED IN THE MANUAL IS A PREREQUISITE FOR THE SAFE OPERATION OF THE PURCHASED PRODUCT AND IS INCLUDED IN THE TERMS OF THE WARRANTY. ANY MODIFICATIONS OR ALTERATIONS TO THE DESIGN OF THE PRODUCT MADE BY THE USER OR PERSONS AUTHORISED BY THE USER ARE STRICTLY PROHIBITED. ANY SUCH ACTS OR ATTEMPTS SHALL VOID THE WARRANTY OBLIGATIONS OF THE MANUFACTURER OR DISTRIBUTOR. THE MANUFACTURER RESERVES THE RIGHT TO MAKE STRUCTURAL CHANGES WITHOUT NOTICE, PROVIDED THAT THE SAFETY OF THE PRODUCT IS NOT AFFECTED. WHEN NECESSARY, OR IN CASE OF MISUNDERSTANDINGS IN CONNECTION REGARDING THE TRANSLATION OR TERMS USED IN THIS LANGUAGE VERSION OF THE INSTALLATION AND OPERATING INSTRUCTIONS, PLEASE USE THE GERMAN VERSION AS THE ORIGINAL AND PRIMARY VERSION.