



Installation and Operation Manual
**Heating Element with Thermostatic Head,
three-phase model with fixed wiring, for utilizing
surpluses from photovoltaic systems.**

1 - General Information

1.1 - Application

The electric heating element is intended for DHW heating in a hot water storage tank or for heating of heating water in thermal stores of a heating system. The heating element is designed for utilizing surpluses from single- and three-phase PV systems.

1.2 - Installation

Screw the electric heating element into the appropriate connection (socket) equipped with a G 6/4" F thread so that the cable gland points vertically downwards. For sealing, we recommend using sealing yarn, hemp, Teflon tape or thread sealant allowing disassembly.

1.3 - Maintenance

Clean the exterior of the heating element with a soft cloth and a suitable detergent. Never use abrasive cleaners or solvents.

If the element is used in extra hard water, it is recommended to remove sediments at least once a year.

Disconnect the element from the mains before cleaning. Then drain water from the tank and dismount the heating element. Scratch the hard deposits on the heating rod with a plastic or wooden spatula and flush with water. Be careful not to damage the protective nickel layer on the heating rod. Then reinstall the body according to this instruction manual, fill the tank with water, air-bleed and pressurize it. Check the threaded connection for leaks. Finally, re-connect the heating element to the mains.

1.4 - Disposal

IMPORTANT INFORMATION ON PROPER DISPOSAL OF E-WASTE AS REQUIRED BY THE EC DIRECTIVE 2002/96/EC (WEEE)

Do not dispose of this product as unsorted municipal waste. Please dispose of this product by returning it to the point of sale or to your local municipal collection point for recycling.

Respecting these rules will help to preserve, protect and improve the quality of the environment, protect human health and utilize natural resources prudently and rationally.

The crossed out wheeled bin with marking bar, printed either in the Manual or on the product itself, identifies that the product must be disposed of at a recycling collection site.



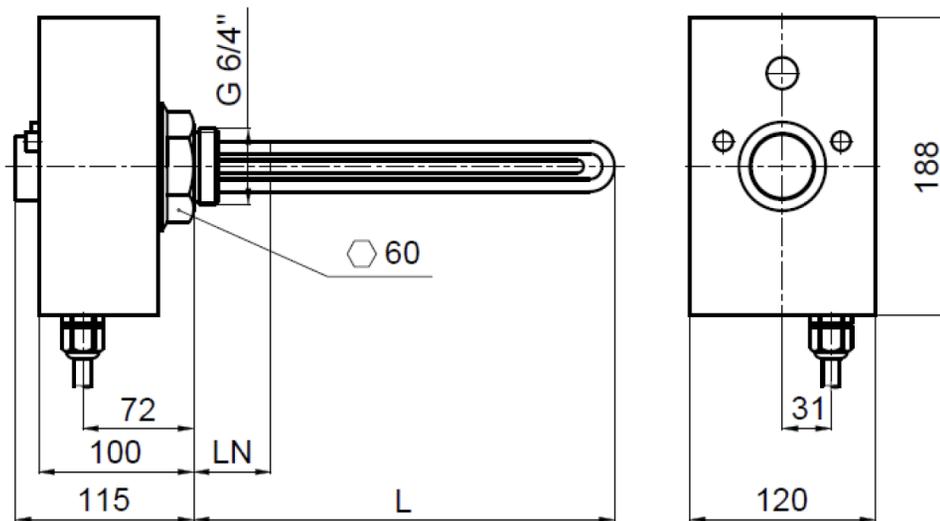
WEEE Registration Number: 02771/07-ECZ

2 - Heating Element with Thermostatic Head, three-phase, fixed wiring

2.1 - Technical Description

The electric heating element consists of a nickel-plated heating rod with G 6/4" M thread, an operating thermostat adjustable between 0 ± 5 °C and 90 ± 3 °C (the lower limit is factory set to circa 15 °C as a frost protection and the upper limit is set to 60 °C for use in hot water storage tanks) with 5 ± 1.5 °C switching difference, a manual reset safety capillary thermostat set to 99 °C and ± 0 °C, ± 6 °C tolerance, 7×2.5 mm² power supply cable and LEDs showing the state of the heating element. The power supply cable is 2 m long.

2.2 - Dimensions



| | element type | output [kW] | electrical wiring | LN-non-heating end [mm] | L-heating element length [mm] | code |
|---------|--------------|-------------|-------------------|-------------------------|-------------------------------|-------|
| 3×230 V | ETT-F2-3.0 | 3 | 3/N/PE AC 230V | 180 | 370 | 20232 |
| | ETT-F2-5.0 | 5 | 3/N/PE AC 230V | 180 | 500 | 20234 |

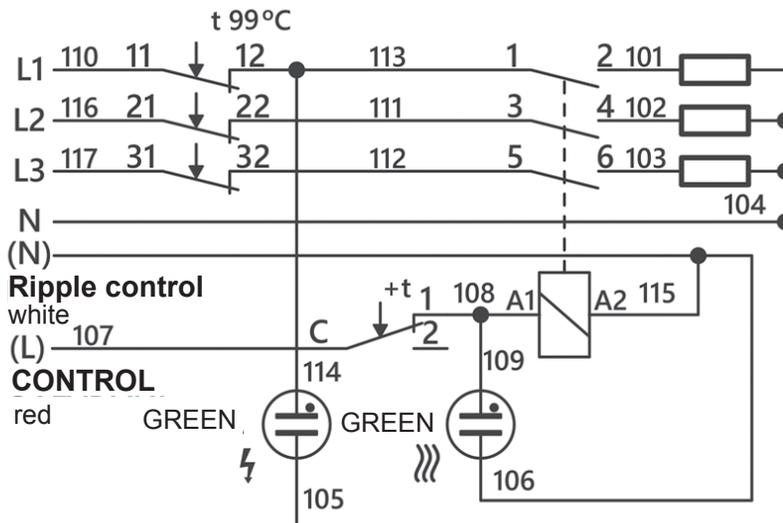
2.3 - Connection to the Mains

The electric heating element shall be wired to a terminal box or electrical switchboard, 3/N/PE AC 400/230V, fixed wiring. The installation shall meet valid rules and standards and shall be done by an authorized person only.

The wire marked HDO is intended to control the heating element by Ripple control. Should this connection remained unused, both the centre blue wires (N and HDO) shall be joined together in the terminal box or electrical switchboard.

The wire marked OVLÁDÁNÍ (L) is intended to control the heating element with a heating system controller. This wire shall be joined with the controller-switched line. In such a case, the temperature set with the thermostat knob shall be higher than that set by the controller. Should this connection remained unused, this wire shall be joined together with the L1 line in the terminal box or electrical switchboard.

2.4 - Wiring Diagram



2.5 - Commissioning, Operation and Possible Faults

WARNING!

THE OUTGOING HOT WATER SHALL NOT BE LEAD THROUGH COMMON PLASTIC PIPES. THE PIPING SHALL BE RESISTANT TO TEMPERATURE OF 100 °C MIN. IF PLAIN COMMON PLASTIC PIPING IS USED, ITS SERVICE LIFE IS SIGNIFICANTLY REDUCED UNDER TEMPERATURES OVER 60 °C. WHEN COMBINED WITH IMPROPER PIPE FIXING THAT RESTRICTS DILATATION OR EVEN MAKES IT IMPOSSIBLE, THE PIPE SERVICE LIFE MIGHT BE JUST SEVERAL HOURS!

Prior to commissioning, please make sure the water in direct contact with the heating element does not exceed the values given in the chart below. The manufacturer bears no responsibility for defects (e.g. limescale deposits on the heating element) caused by adverse operating conditions.

Table of limit values for total dissolved solids in hot water

| Description | pH | Total dissolved solids (TDS) | Ca | Chlorides | Mg | Na | Fe |
|-------------|---------|------------------------------|---------|-----------|---------|----------|----------|
| Max. value | 6.5-9.5 | 600 mg/l | 40 mg/l | 100 mg/l | 20 mg/l | 200 mg/l | 0.2 mg/l |

2.5.1 - DHW Heating in a Hot Water Storage Tank

In order to heat water in the hot water storage tank, open the cold water inlet, fill the tank with water and airbleed it by opening the hot-water tap. Set the thermostat knob to the desired temperature. Both the green LEDs will be lit on the heating element. As soon as the desired water temperature is reached, the green lamp marked  will go out. The lit green LEDs show that the heating element is energized and switched on. If the green LED marked  is out, the heating element is switched off by the adjustable thermostat.

It is recommended to set the thermostat knob to 60 °C. This temperature guarantees the best operation of the heating element and at the same time, it offers:

- protection against Legionella
- cost reduction
- slower deposit formation

2.5.2 - Heating Water for Space Heating in a Thermal Store

Fill the heating system with heat transfer fluid, air-bleed it and pressurize to the working pressure. Set the thermostat knob to the desired temperature.

Should a temperature above 60 °C be set, the limiting spring under the knob shall be removed.

Steps:

- Pull the knob off the shaft,



- There are 2 limit springs inside the knob. Remove the upper one. It is fitted in the groove 17 and limits the adjustable temperature to 60 °C. (Just one spring will remain in the knob, fitted in the groove 37. It limits the min. adjustable temperature to 15 °C)



- Re-fit the knob on the thermostat shaft.

This modification will increase the adjustment range to 15 - 90 °C.

Two green LEDs will be lit on the heating element. As soon as the desired water temperature is reached, the green lamp marked  will go out. The lit green LEDs show that the heating element is energized and switched on.

If the green LED marked  is out, the heating element is switched off by the adjustable thermostat.

2.5.3 - Heating Element State during Operation

Heating element state during operation is shown by the LEDs with the following meaning.

| Colour | Marking | Description |
|--------|---|--|
| Green |  | The heating element is OK, energized and ready for operation |
| Green |  | The heating element is heating |

When the safety temperature is reached, the safety thermostat will cut off the heating element from power supply. In this state, no LED is lit. The safety thermostat requires manual reset. After the tank cools down, unscrew the lid on the heating element housing and press the button beneath to reset the thermostat. The green LED marked  is lit and the heating element is ready for use again. Repeated occurrence of this condition indicates a fault in the heating element. In such a case, disconnect the heating element from the mains and call a service provider.

2.5.4 - Possible faults

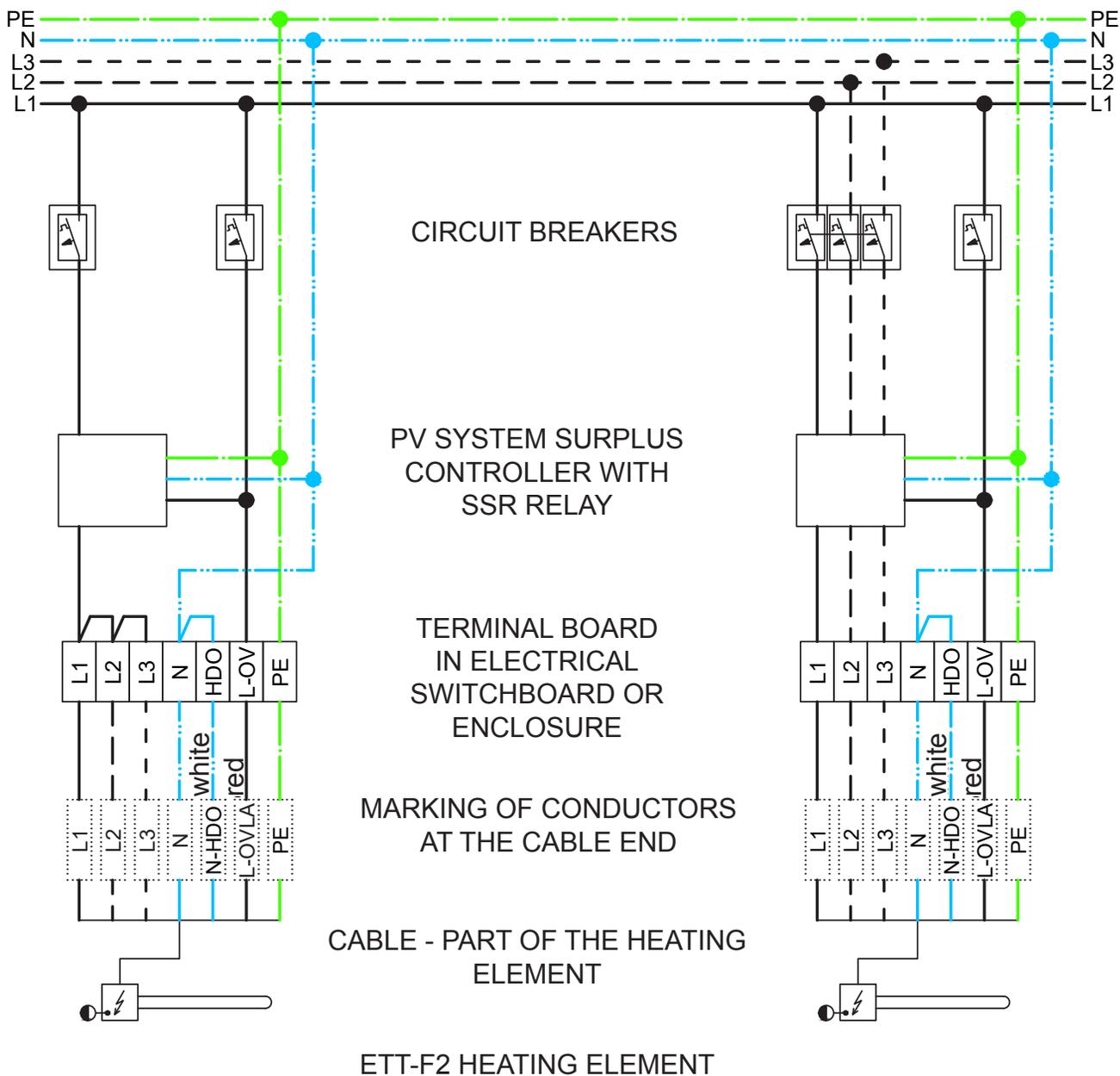
If the heating element is controlled by a heating controller and while the green LED marked  is lit, the second green LED marked  doesn't light up, then probably the desired temperature set with the knob of the adjustable thermostat is lower than that set on the controller. Set the thermostat knob to a higher desired temperature. If this does not help and the second green LED marked  doesn't light up, call a service provider. If the tank gets overheated without using any other heat source (the adjustable thermostat probably does not turn off the heating element when the set temperature is reached - the green LED marked  is on until both the LEDs go out), call a service provider.

If the heating element shows signs of another defect, disconnect it from the mains immediately and call a service provider.

3 - Heating Element Wiring Examples

VARIANT WITH SINGLE-PHASE PV SYSTEM

VARIANT WITH THREE-PHASE PV SYSTEM



WARRANTY CERTIFICATE

Heating Element with Thermostatic Head, three-phase, fixed wiring

Type:

Serial number:

Shop:

Purchase date:

WARRANTY CONDITIONS

1. The warranty period is 24 months from the date of purchase.
2. The product will be installed and commissioned by a competent company or a person trained by the manufacturer.
3. When claiming warranty, this Warranty Certificate must be submitted together with the purchase receipt.
4. The warranty is valid only when the technical conditions set by the Manufacturer, installation manual and instructions in the documentation and on the product itself are maintained.
5. The warranty does not cover defects caused by external conditions or improper operation conditions, defects caused by usual wear and tear, further when the product is not used in compliance with its purpose and when the defect was caused by mechanical damage, improper handling, tampering by a third person, improper installation, improper stocking, natural disaster etc.

COMMISSIONING

Company:

Date:

Rubber stamp print and signature of the installer:

