

SMARTFOX

screw-in heater



Instructions

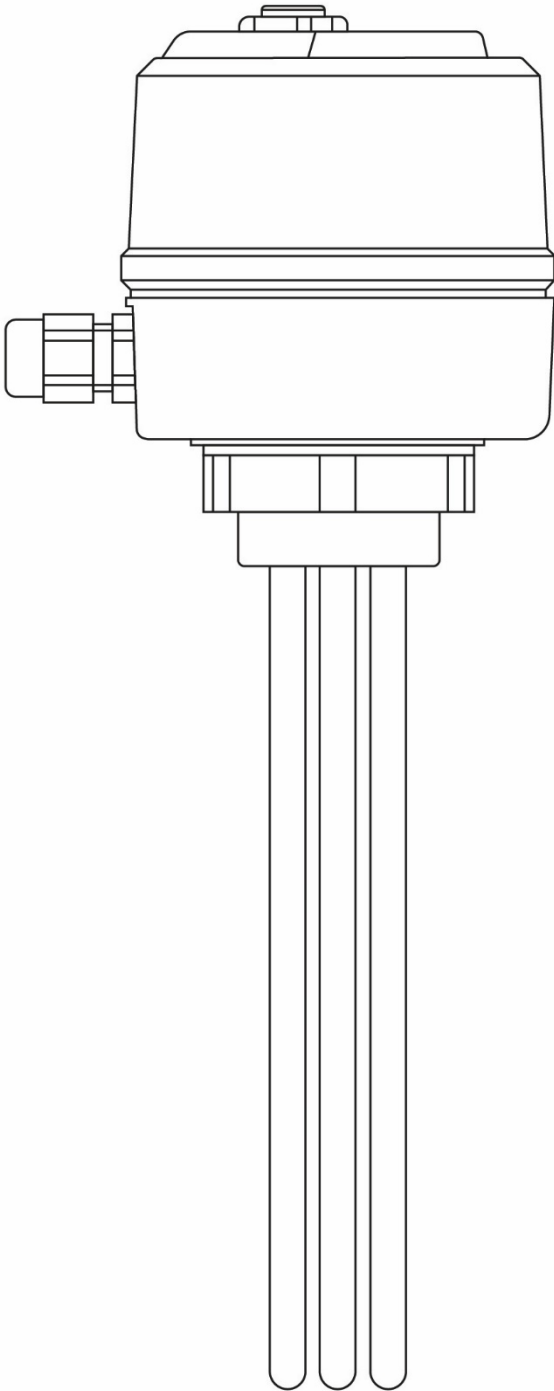


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Version	date	Description
V1.0	29.08.2022	Creation of operating instructions SMARTFOX screw-in heaters

We have checked the contents of this documentation for conformity with the hardware and software described. Nevertheless, deviations, remaining errors and omissions cannot be ruled out, so we accept no liability for any damage that may arise as a result. However, the information in this publication is checked regularly and any necessary corrections are included in subsequent editions. We are grateful for any suggestions for improvement.

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1. Important notes



Read these instructions and safety information carefully before using the appliance/product and keep them for future reference. The manufacturer is not liable for damage caused by incorrect information.

These operating instructions are part of the scope of delivery. It contains the information required for the intended use. It is intended for electrical engineering personnel or specialists who are familiar with the installation, assembly and commissioning of the product described here.

Improper installation and use can lead to electric shock or fire.

Do not install or operate the device/product if it is damaged! Do not modify the device/product and do not carry out any repairs yourself! If further information is required, additional information can be requested (see contact details).

The latest version of these instructions can be [downloaded](#) from www.smartfox.at/downloads or requested by telephone / e-mail. All rights to translation / interpretation and copyright instructions are reserved.

Conformity

The heating elements are unit tested in accordance with ÖVE/ÖNORM EN 60335-1 "Safety of electrical appliances for household and similar use".

Symbols & notes



In accordance with EU Directive 2002/96/EC: Disposal must be carried out properly and in an environmentally friendly manner at an authorised collection point (e.g. local recycling centre) or at the dealer. Do not dispose of in household waste!



CE marking: Product that complies with the statutory provisions or European legal standards and may therefore be traded within the European Community.



Recyclable material.



Dispose of products and packaging in an environmentally friendly manner and according to type (plastic waste, metal waste, electronic waste, etc. in accordance with legal requirements). Check the recyclability of the components before disposal.

Note! Useful tips to help you with commissioning. The instructions listed are not mandatory, but are recommended.

Warning! Non-compliance can lead to malfunctions or damage to the appliance. The instructions given must therefore always be followed and implemented.

Caution! Non-compliance can lead to property damage and personal injury. The instructions given must therefore always be observed and implemented.

2. Product overview

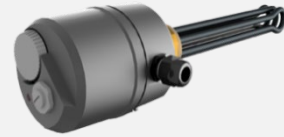
SMARTFOX screw-in heater 3kW, 230V

Art. Nr. 0791732486414

– compatible with –

SMARTFOX power controller 3,5kW, 230V

Art. Nr. 079173248647



SMARTFOX screw-in heater 4,5kW, 400V

Art. Nr. 0791732486421

– or –

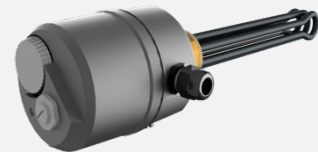
SMARTFOX screw-in heater 6kW, 400V

Art. Nr. 0791732486483

– compatible with –

SMARTFOX power controller 6kW, 400V

Art. Nr. 0791732486438



SMARTFOX screw-in heater 9kW, 400V

Art. Nr. 0791732486537

– compatible with –

SMARTFOX power controller 12kW, 230V

Art. Nr. 0767523866215



Compatible with all SMARTFOX energy managers!

2.1 Technical Data

Art. No:	Performance	Tension	Immersion depth	Unheated length	Screw-in thread (AG)	Surface load
0791732486414	3kW	1~230V	345mm	100mm	G 1 1/2" (6/4")	12,6W/cm ²
0791732486421	4,5kW	3~400V	360mm	100mm	G 1 1/2" (6/4")	11,0W/cm ²
0791732486483	6kW	3~400V	480mm	100mm	G 1 1/2" (6/4")	11,0W/cm ²
0791732486537	9kW	3~400V	660mm	100mm	G 1 1/2" (6/4")	11,0W/cm ²

Screw head

Width across flats	SW60
material	Messing
Operating pressure	max. 10bar

Radiators

Sheath material	2.4858 - Alloy 825
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Connection housing

material	Polycarbonat / RAL7021
Protection class	IP64
Cable gland	M20x1,5 / polyamide PA6 Clamping range 6-12mm ²
Electrical connection	Screw terminal Nominal cross-section 6mm ² (min. 0.5mm ² / max. 10mm ²)

Temperature control

Type	Temp.-Regler (TR) + Schutz Temp.-Begrenzer (STB)
Control temperature(TR)	0-85°C
Switch-off temperature (STB)	110°C-10K
Direct switching	direct (load)

2.2 Scope of delivery

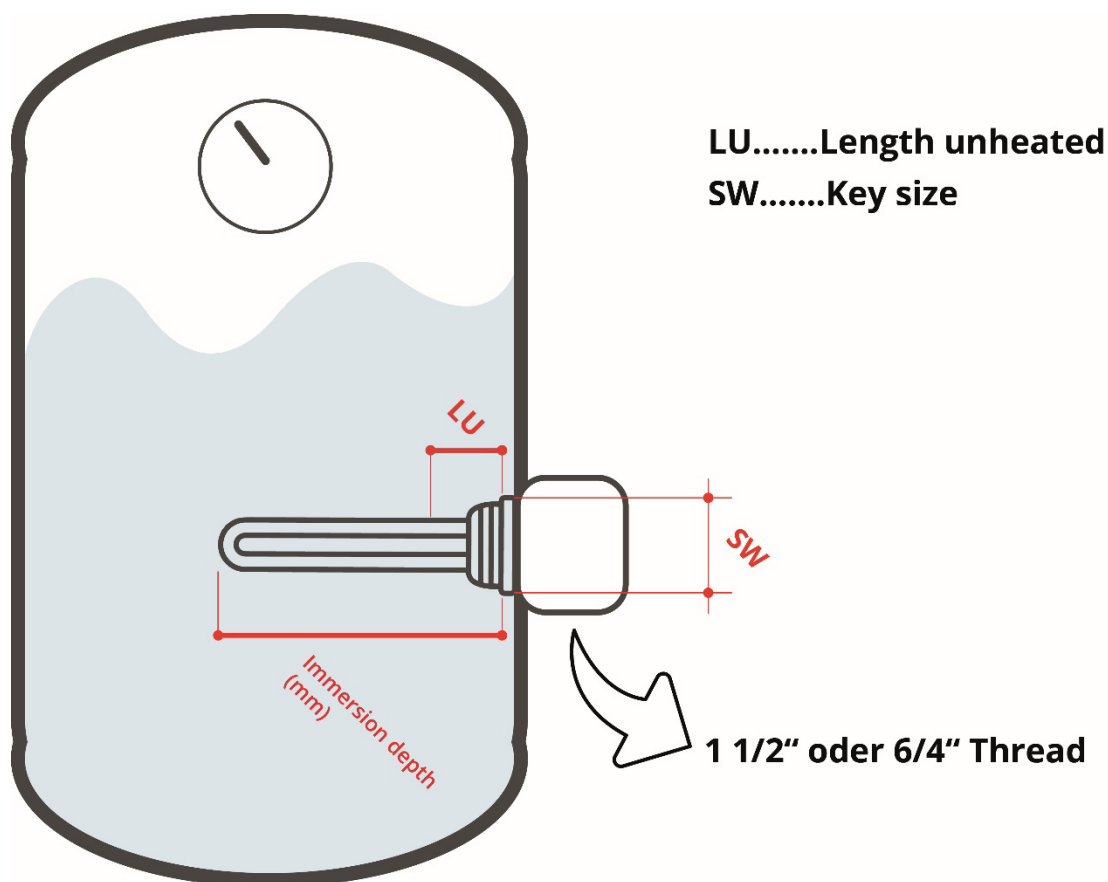
- 1 Stk. SMARTFOX screw-in heater
- 1 Stk. Operating instructions



3. Fitting & installation

The following instructions explain the installation and parameterisation of SMARTFOX screw-in heaters with the SMARTFOX energy management system. Thanks to the intelligent control, the screw-in heater can be regulated continuously based on the available surplus from the PV system. Alternatively, the screw-in heater can be switched on and off by relay and contactor.

It is installed horizontally in a threaded sleeve G 1 1/2" (6/4") with suitable sealants, preferably in closed water heating systems with a nominal pressure of up to 10 bar. The length of the threaded socket must always be less than the unheated zone (LU), which can be found in the technical data in the table on page 6. The thermally induced media circulation in the tank must not be obstructed, e.g. by baffle plates. The standards and guidelines applicable at the installation site must be observed during installation. All work may only be carried out by an authorised specialist. The screw-in heater must be descaled regularly if used in water containing limescale, from approx. 12°dH. The chloride content should not exceed the limit value of 250 mg/l in accordance with the Drinking Water Ordinance. To prevent corrosion damage to enamelled or coated tanks, the tubular heating elements of the screw-in heating element are electrically insulated from the tank and have a defined conductive connection via a resistor. This increases the service life of the protective anode and the screw-in heating element.



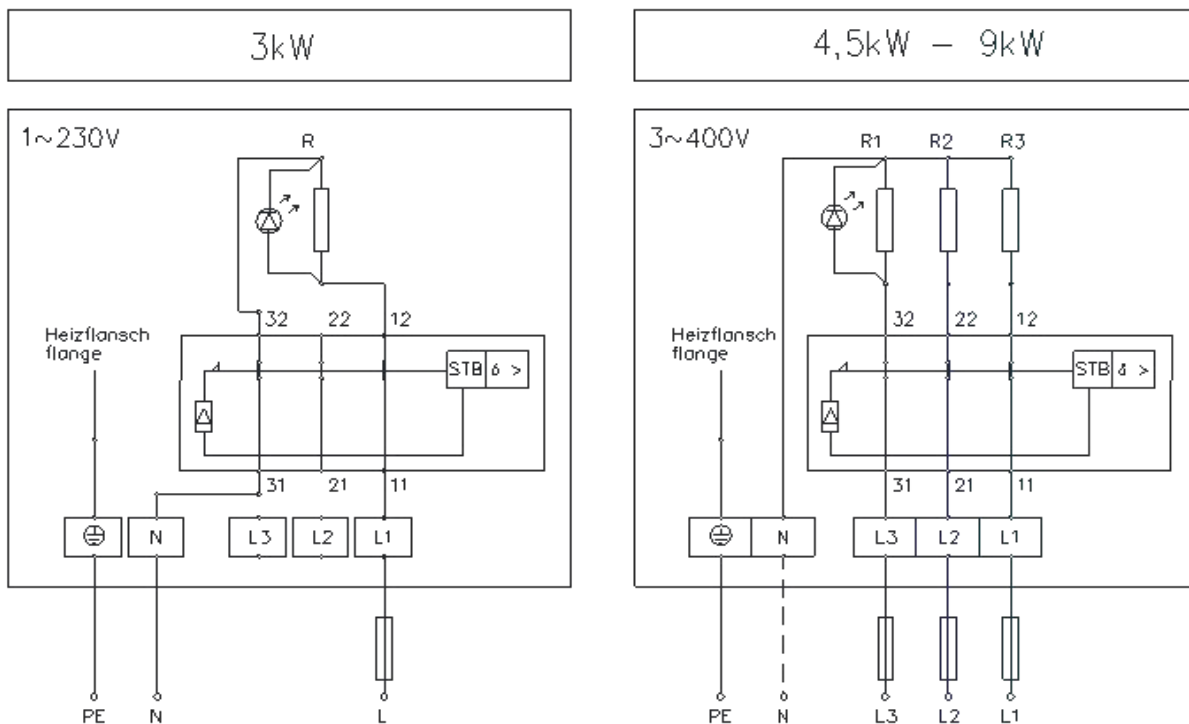
4. Connection & Parameterisation

The energy manager can control the SMARTFOX screw-in heater either 1-phase, 3-phase or directly via a contactor using the power controller.

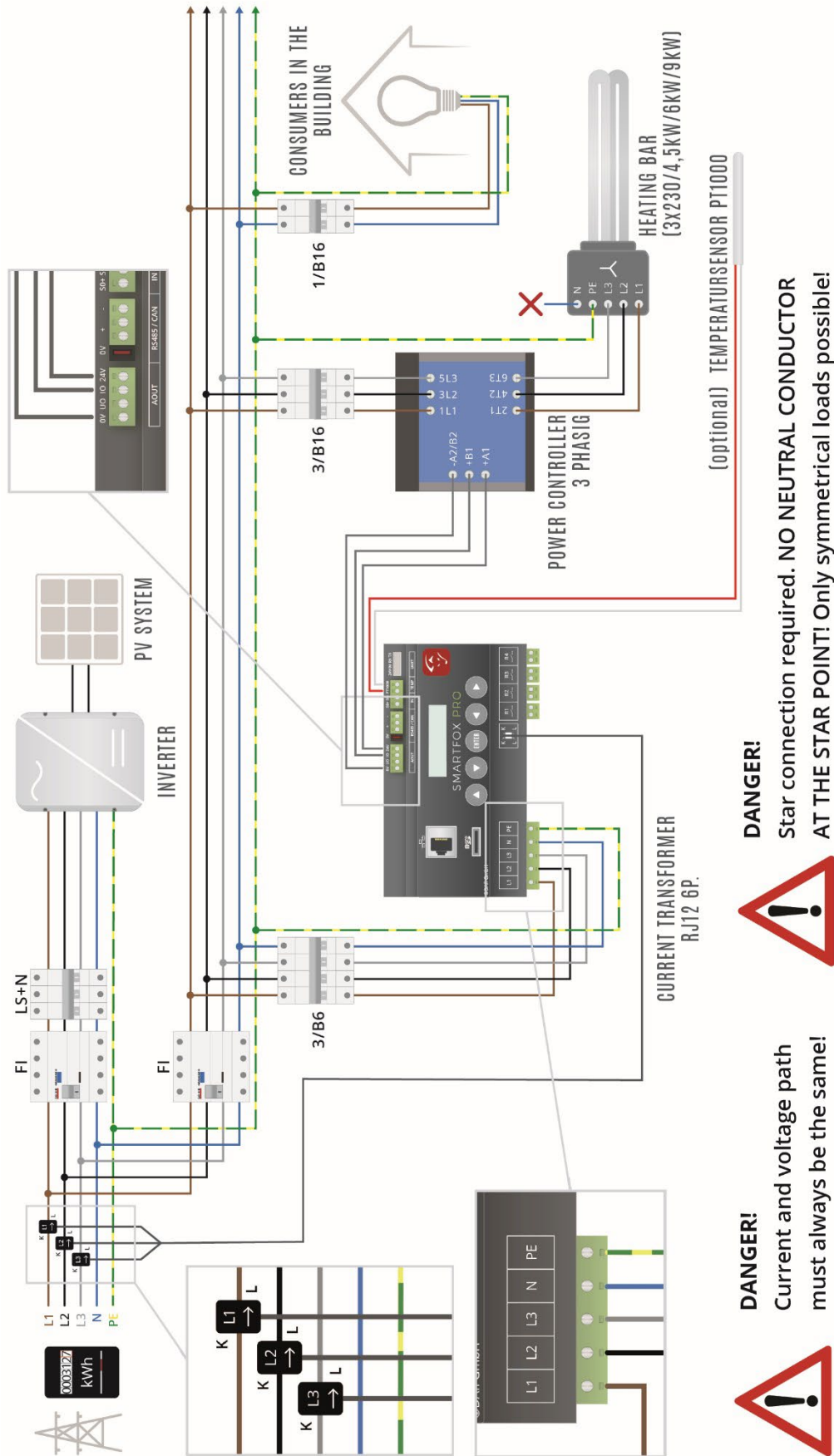
4.1 Electrical connection

The EHK must be connected in conjunction with an RCD (FI) circuit breaker and LS (miniature circuit breaker). The electrical connection may only be carried out by an authorised specialist and the standards and regulations of the local electricity supply company must be observed. To open, pull the controller knob forwards. Then loosen the two fixing screws of the cap.

- Wiring see circuit diagrams




4.2 Connection SMARTFOX screw-in heater + SMARTFOX Pro power controller 3-phase



4.2.1 Parameterisation of analogue output 3-phase

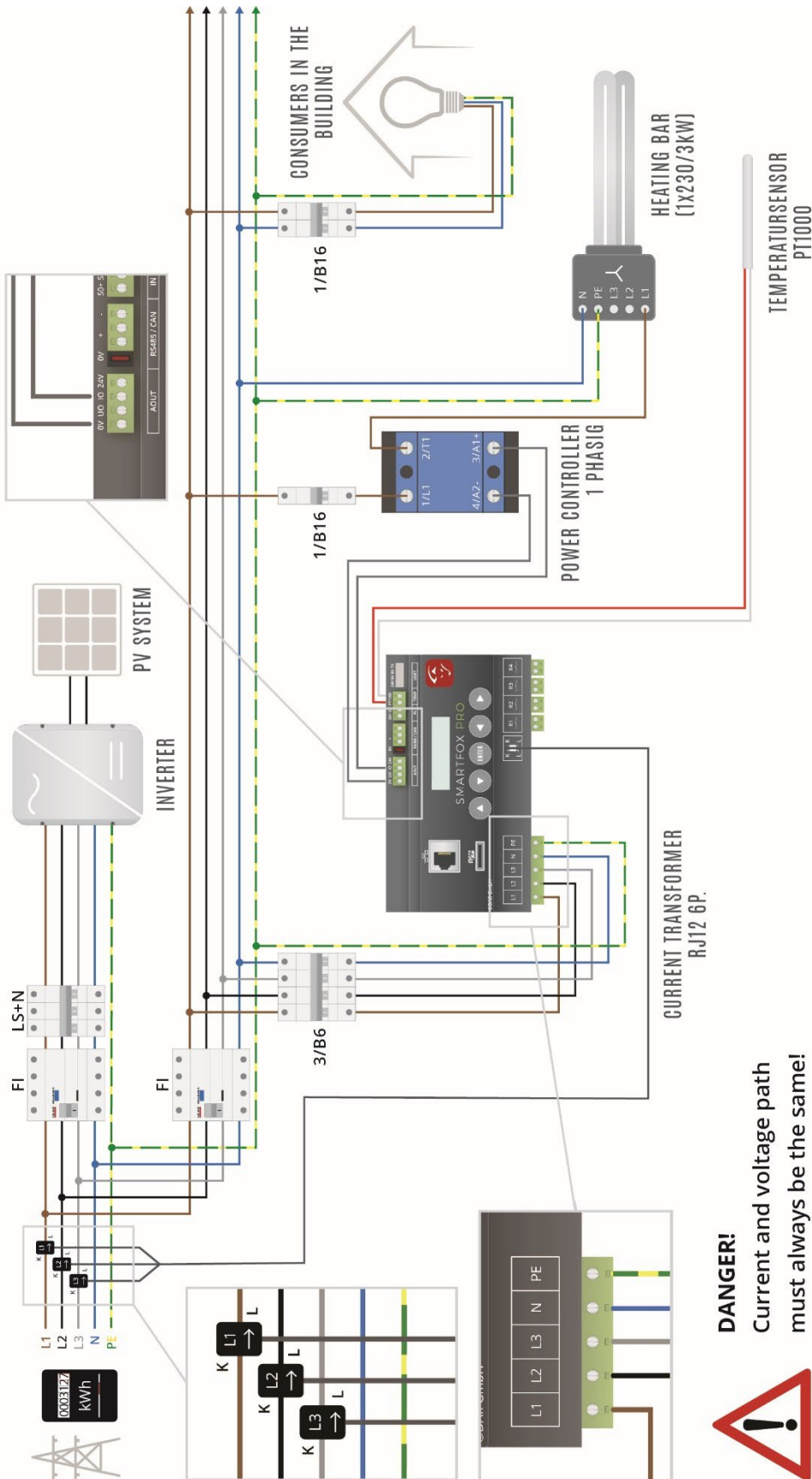
Please note! The energy manager is already pre-parameterised for a 6kW heating element. If a 4.5kW or 9kW heating element is used, only the "Nominal load" field marked in orange needs to be adjusted. The other parameters are optional.

Analogausgang

Aktiviert	EIN	i	1
Name	Boiler	i	2
Farbe		i	3
Nennlast [W]	6000	i	4
Zielwert [W]	-20	i	5
	x		
Regelverhalten	3	i	6
Spannungsausgang	0-10V	i	7
Stromausgang	4-20mA	i	8
Analogüberwachung	EIN	i	9
Leistungssteller	3 phasig	i	10
Einschaltverzögerung [min]	0	i	11

- 1 ON = Analogue output is displayed in the overview
OFF = Analogue output is not displayed in the overview
- 2 The output is displayed with the assigned designation in the overview
- 3 Analogue output is shown in the diagrams with the selected colour.
- 4 Set the nominal output of the connected consumer (heating element) here. The nominal output should be set very precisely, as this value is used as the basis for the PNUTZ calculation.
- 5 Enter the target value to be controlled (default setting = 0W). The target value can be changed so as not to collide with other control systems or to change priorities in the control. For example, a target value of -200W is constantly fed into the grid or +200W is constantly drawn from the grid.
- 6 The CONTROL BEHAVIOUR indicates how quickly or slowly the analogue output reacts. The value can be set between 1 (very fast) and 10 (very slow). The default value is set to 3 (fast)
- 7 Setting the voltage output. You can choose between 0-10V & 1-10V. The voltage output is pre-parameterised to 0-10V as standard.
- 8 Setting the current output. You can choose between 4-20mA and 0-20mA. The current output is already pre-parameterised to 4-20mA.
- 9 If analogue monitoring is activated, the SMARTFOX automatically detects whether the connected load is actually drawing power. The device thus determines whether the thermostat of the heating element has switched off. If analogue monitoring has been triggered, the display shows ANALOGÜBERW instead of the value PNUTZ. The function can also be used to switch between two heating elements at the analogue output, see "Analogue relay" instructions
- 10 Select whether a 1-phase or 3-phase power controller is to be controlled. The setting increases the accuracy of the analogue curve, but has no influence on the control behaviour of the power controller.
- 11 " Switch-on delay in min" is the delay time for how long the set power under P must be excess in order to activate the analogue output. Can be set between 0 and 99 minutes.


Connection SMARTFOX screw-in heater + SMARTFOX Pro - 1-phase power controller



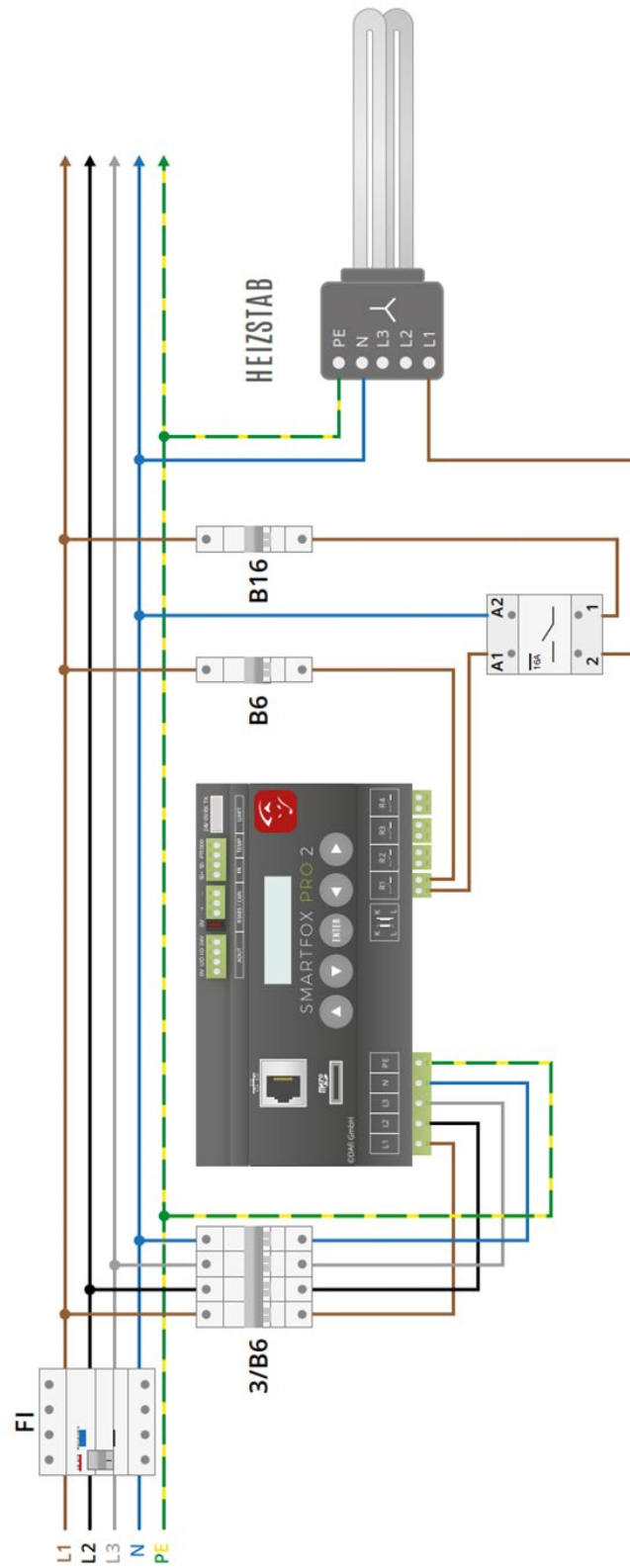
4.2.2 Parameterisation of analogue output 1-phase

Note! Once the fields framed in orange have been parameterised, the heating element is ready for use. The remaining fields are preset and can be adjusted as required.



















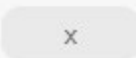










Analogausgang

Aktiviert	EIN	▼	i
Name	Boiler		i
Farbe			i
Nennlast [W]	3000		i
Zielwert [W]	-20		i
	x		
Regelverhalten	3		i
Spannungsausgang	0-10V		▼ i
Stromausgang	4-20mA		▼ i
Analogüberwachung	EIN		▼ i
Leistungssteller	1 phasig		▼ i
Einschaltverzögerung [min]	0		i

4.3 Connection SMARTFOX screw-in heater + SMARTFOX Pro via Relay & contactor



4.3.1 Setting Relay

Aktiviert	EIN		
Icon			
Name	Heizstab 3		
Farbe			
Regelverhalten	Wärmepumpe		
Einschaltzyklen pro Tag	999		
Nennleistung [W]	3000		
Haltedauer [min]	2		
			
Einschaltverzögerung [min]	1		
Ausschaltverzögerung [sek]	0		
Ausschaltsschwelle [W]	0		
Regelung auf Zielwert	EIN		
Regelung mit Pnutz	EIN		

- 1 ON = Relay is displayed in the overview
OFF = Relay is not displayed in the overview
- 2 The output is displayed with the selected icon in the overview.
- 3 The output is displayed with the assigned designation in the overview.
- 4 Relay is shown in the diagrams with the selected colour.
- 5 Heat pump: Under the heat pump control behaviour, the relay is activated as soon as the set power P for the selected switch-on delay TD was surplus. If there is still sufficient surplus after the hold time TH has elapsed, the next cycle is started instead of switching off.
- 6 "Switch-on cycles per day" is the value of how often a relay should be activated per day, adjustable between 0 and 999. 0 means that the relay is deactivated and is not activated. If the relay is to be energised as often as possible, 999 can be selected. The product of "Switch-on cycles per day" times the "Holding time in min." gives the maximum daily running time.
- 7 "Nominal power in watts" is the power value of the load connected to the relay, adjustable from 1 to 9999 watts. The selected value is used as the switch-on threshold.
- 8 "Holding time in minutes" is the minimum time that the relay remains activated after the switch-on condition has been met, adjustable between 1 and 999 minutes. If, for example, a th of 5 minutes is set and the surplus collapses after 3 minutes (switch-on condition no longer fulfilled), the relay remains active for a further two minutes.
- 9 " Switch-on delay in min" is the delay time for how long the set power must be surplus under P in order to activate the relay. Can be set between 0 and 99 minutes.
- 10 Relay switches off after the set time (0 to 999s) has elapsed and the set switch-off threshold has been exceeded.
- 11 The switch-off threshold can be set between -99999W and +99999W and specifies the value at which the relay should switch off again. By default, the relay switches off as soon as the value rises above 0, i.e. there is a draw from the mains. To keep the relay active despite this, a value of +500W can be set, for example, so that a mains supply of up to 500W is accepted.
- 12 On: The target value defined at the analogue output is taken into account. e.g. nominal power 3000W, target value - 200W -> 3200W must therefore be available for the relay to be activated. Off: The defined target value is not taken into account, e.g. nominal power 3000W, target value -200W -> the relay is activated as soon as 3000W surplus is available.
- 13 Decides whether the relay is prioritised over the analogue output or not. On: The relay is prioritised over the analogue output. Off: The analogue output is prioritised over the relay.

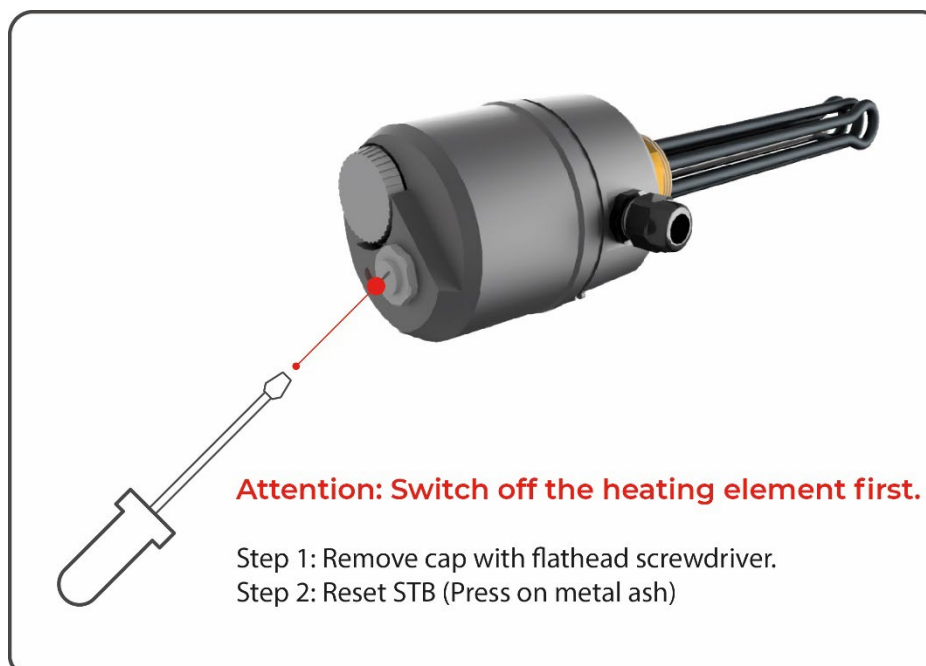
5. Operating instructions

Commissioning should only be carried out after filling is complete. If the STB responds, the cause of the fault must be determined. Once the cause of the fault has been rectified, the STB can be reactivated by pressing the red button firmly after cooling down and removing the upper part of the housing.

Warning! When installed correctly, the STB provides adequate overtemperature protection, e.g. if the EHK runs dry. However, the STB is not a protection against dry operation. For this, other protection systems such as level control systems or similar must be installed.

6. Additional functions

- Signalling device: the LED indicates that the appliance is heating.
- External reset of the STB: after disconnection from the mains, the STB can be reset with a suitable tool by removing the slotted screw in the upper part without removing the cap.

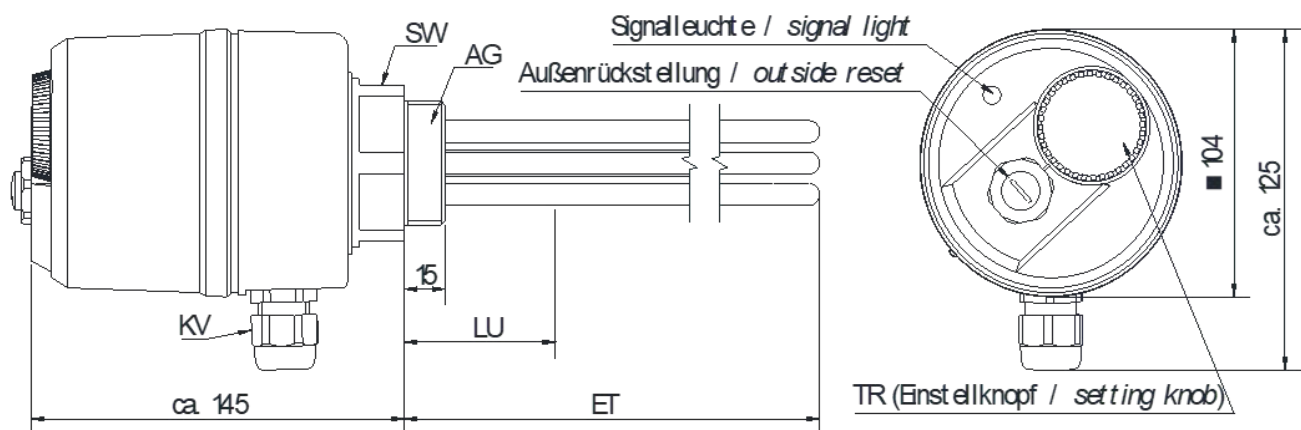


7. Maintenance

Caution! Ensure complete disconnection from the mains before carrying out maintenance work!

Warning! The heating element must be kept free of deposits and sediments. If the water contains limescale, limescale deposits can cause malfunctions or even complete destruction of the screw-in heating element. Regular inspection and descaling is recommended.

8. Technical Drawing





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