



SMARTFOX

Einschrau bheizkörper

—

An guidance

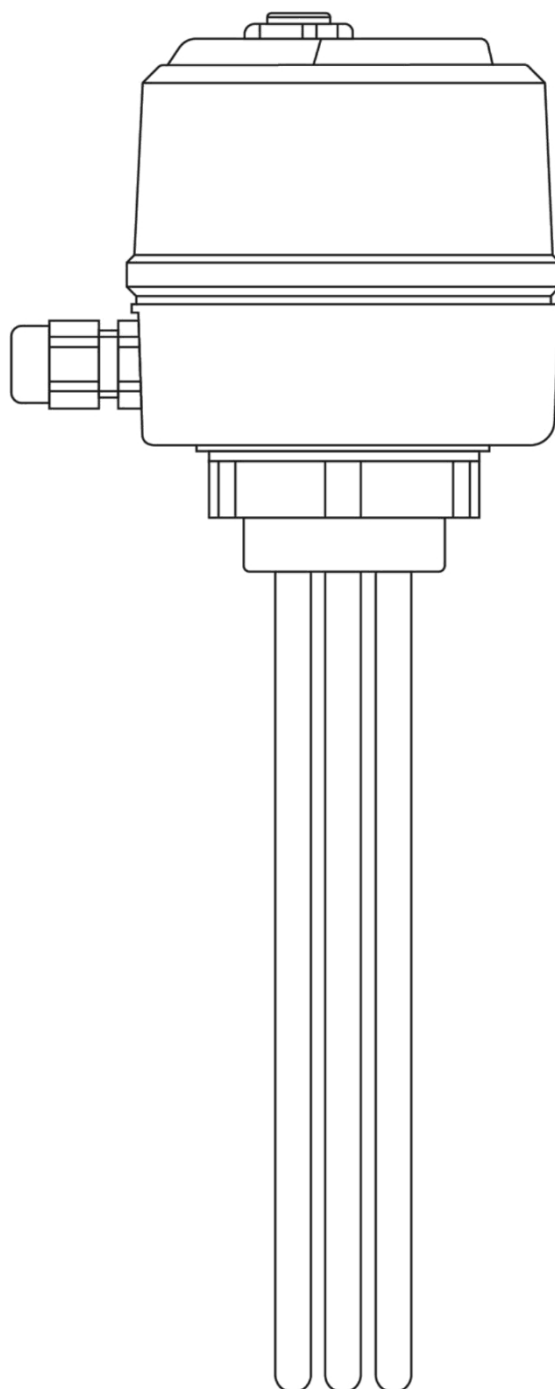


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Version	Date	Description
V1.0	29.08.2022	Preparation Operating Instructions SMARTFOX Screw-in Heater

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 that we cannot accept any liability for any damage that may 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



Before using the appliance / product, read these instructions and safety instructions carefully 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. They contain the information required for proper use. They are 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 may result in electric shock or fire.

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

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 according to ÖVE/ÖNORM EN 60335-1. "Safety of household and similar electrical appliances".

Explanation of symbols & notes



According to EU Directive 2002/96/EC: Disposal must be carried out in a professional and 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 legal requirements 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 sorted by type (plastic waste, metal waste, electrical waste, etc. in accordance with legal requirements). Before disposal, check the recyclability of the components.

Hint! Useful tips to support you during commissioning. The instructions given are not mandatory, but are recommended.

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

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

2. Product overview

SMARTFOX screw-in heater 3kW, 230V

Art. No. 0791732486414

- COMPATIBLE WITH

SMARTFOX power controller 3.5kW, 230V

Art. No. 079173248647



SMARTFOX screw-in heater 4.5kW, 400V

Art. No. 0791732486421

- OR -

SMARTFOX screw-in heater 6kW, 400V

Art. No. 0791732486483

- COMPATIBLE WITH

SMARTFOX power controller 6kW, 400V

Art. No. 0791732486438



SMARTFOX screw-in heater 9kW, 400V

Art. No. 0791732486537

- COMPATIBLE WITH

SMARTFOX power controller 12kW, 230V

Art. No. 0767523866215



Compatible with all SMARTFOX energy managers!

2.1 Technical data

Art. No:	Power	Voltage	Immersion depth e	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	Brass
Operating pressure	max. 10bar

Radiator

Sheath material	2.4858 - Alloy 825
------------------------	--------------------

Connection housing

Material	Polycarbonate / 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. controller (TR) + protection Temp. limiter (STB)
Control temperature (TR)	0-85°C
Switch-off temperature (STB)	110°C-10K
Direct switching	direct (load)

2.2 Scope of delivery

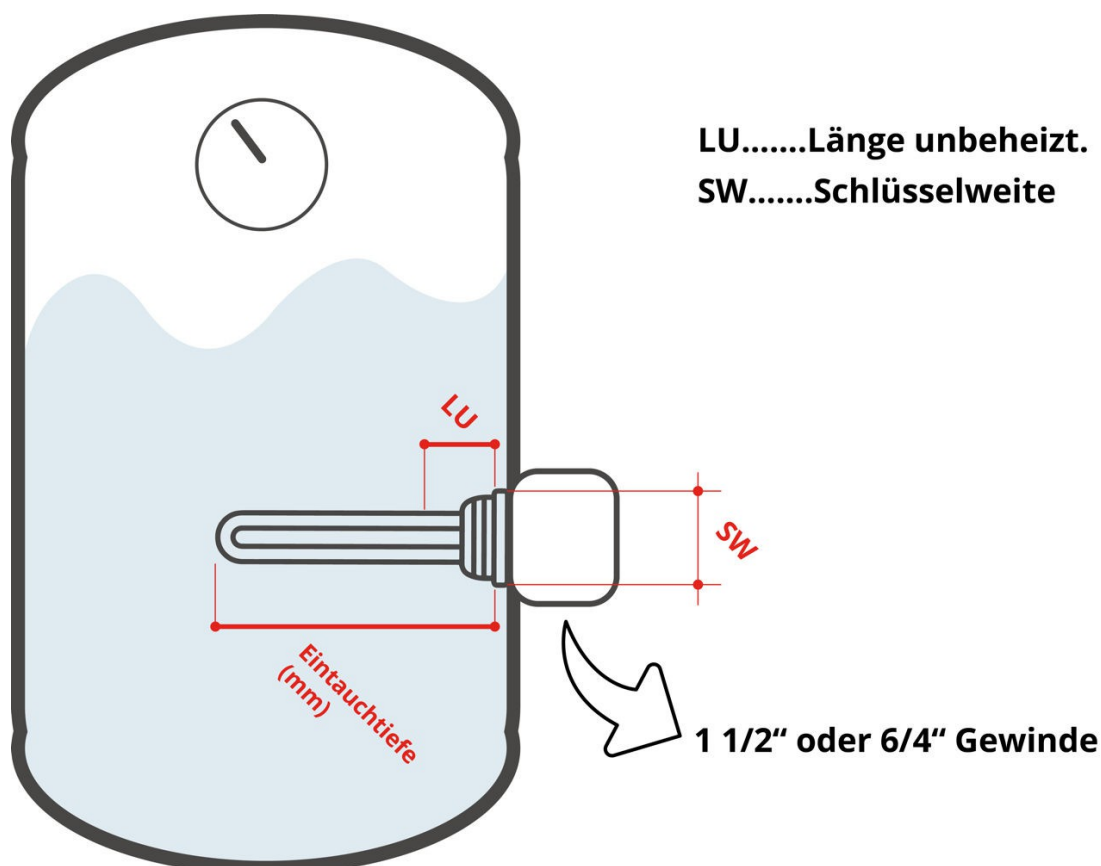
1 pc. SMARTFOX screw-in heating element
1 pc. Operating instructions



3. Installation & Assembly

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

The installation is carried out horizontally in a threaded socket G 1 ½" (6/4") with suitable sealants, preferably in closed water heating systems with a nominal pressure of up to 10bar. The length of the threaded socket must always be smaller than the unheated zone (LU), this can be found in the technical data in the table on page 6. The thermally induced circulation of media in the tank must not be obstructed, e.g. by baffles. The standards and directives applicable at the installation site must be observed during installation. All work may only be carried out by an authorised specialist. When used in water containing lime, from about 12°dH, the screw-in heater must be decalcified regularly. The chloride content should not exceed the limit value of 250 mg/l, according to 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 connected in a defined conductive manner via a resistor. This increases the service life of the protective anode and the screw-in heating element.



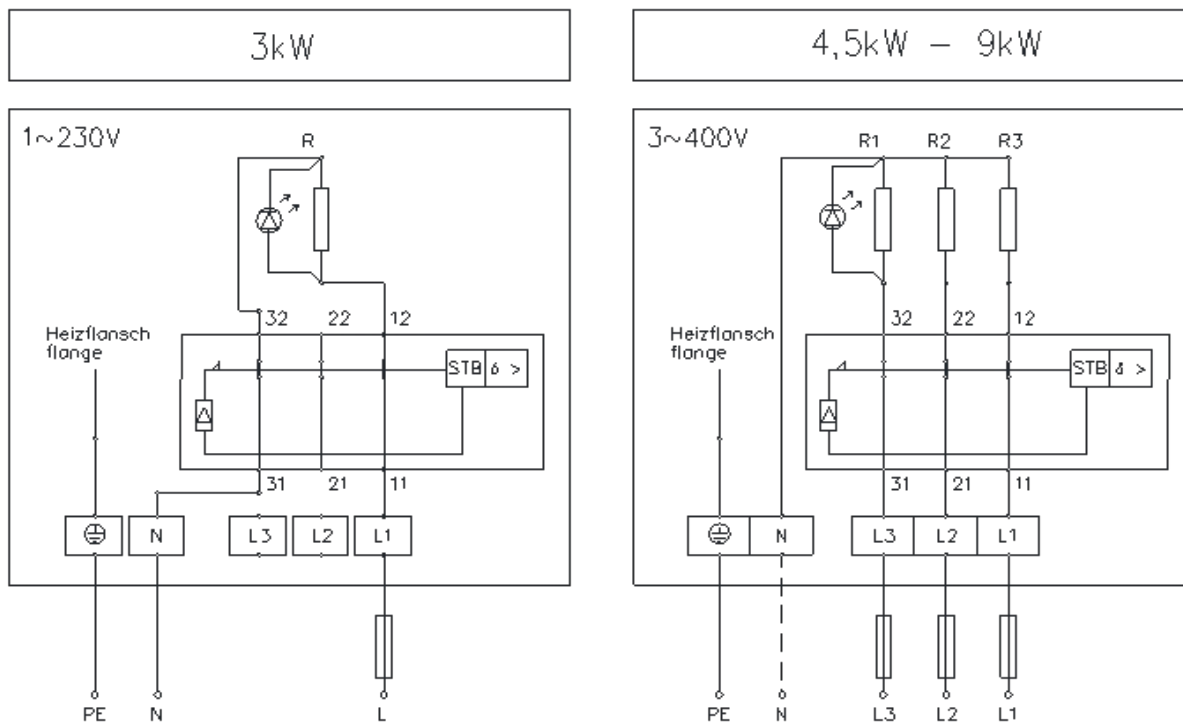
4. Connection & parameterisation

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; the standards and regulations of the local power supply company must be observed. To open, pull off the controller knob towards the front. Then loosen the two fastening screws of the cap.

- Wiring see circuit diagrams

















4.2.1 Parameterisation analogue output 3-phase

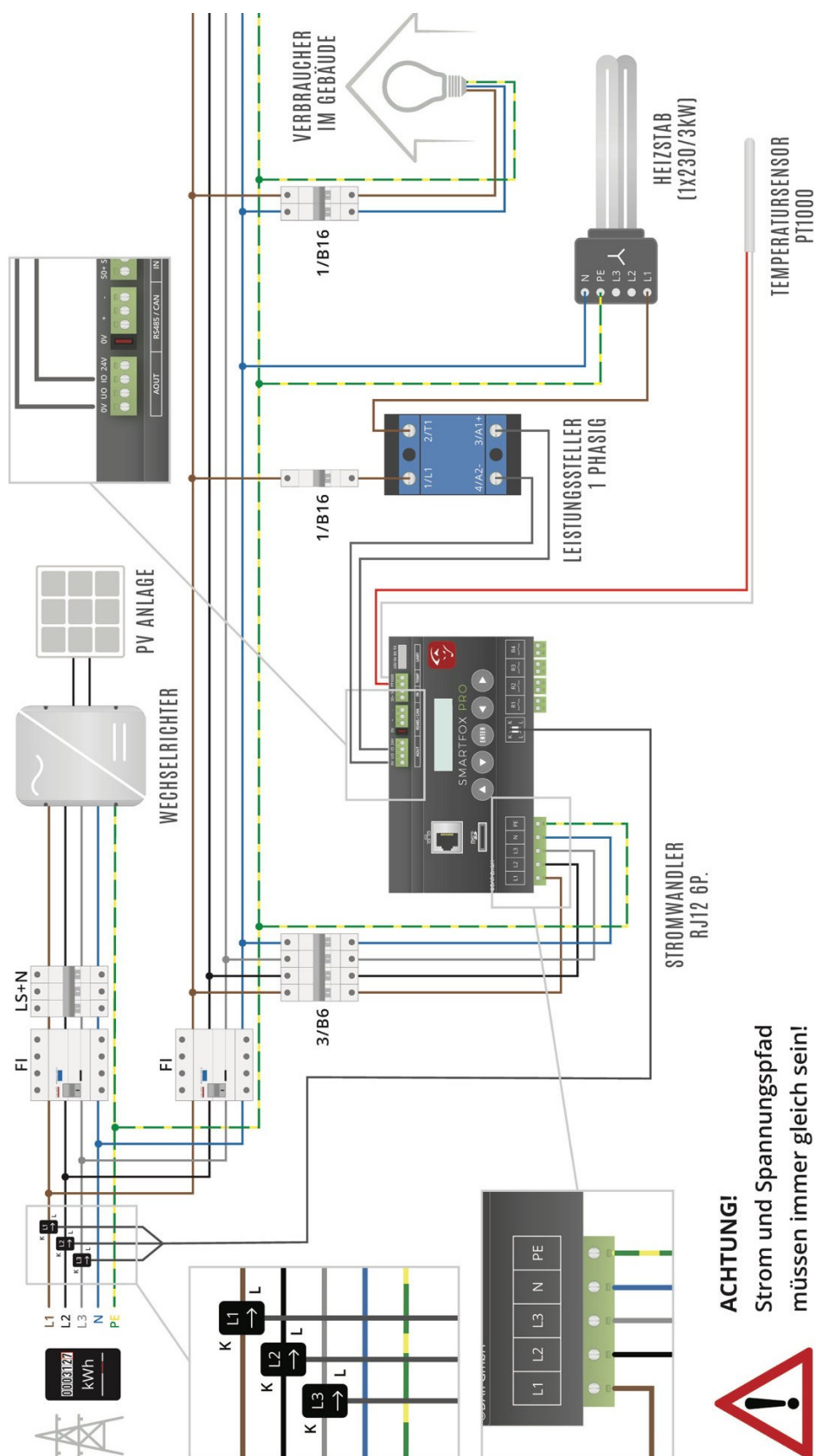
Note! The energy manager is already pre-parameterised for a 6kW heating rod. If a 4.5kW or 9kW heating rod is used, only the "Nominal load" field marked orange must be adjusted. The other parameters are optional.

Analogausgang

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

- 1 ON = analogue output is displayed in the overview
OFF = Analogue output is not displayed in the overview
- 2 The output is shown in the overview with the assigned designation. 3 Analogue output is shown in the diagrams with the selected colour.
- 4 Set the nominal power of the connected consumer (heating rod) here. The setting of the nominal power should be very precise, as this value is used as the basis for the PNUTZ calculation.
- 5 Enter the target value to be controlled (default setting = 0W). In order not to collide with other control systems or to change priorities in the control, the target value can be changed. For example, a target value of -200W is constantly fed into the grid or +200W is constantly drawn from the grid.
- 6 The REGULAR BEHAVIOUR indicates how nimble or sluggish the analogue output reacts. The value can be set between 1 (very nimble) and 10 (very sluggish). By default, the value is set to 3 (nimble).
- 7 Setting of the voltage output. It can be selected between 0-10V & 1-10V. The voltage output is pre-parameterised to 0-10V by default.
- 8 Setting of 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 consumer is actually drawing power. The unit thus determines whether the thermostat of the heating element has switched off. If the analogue monitoring has been triggered, ANALOGÜBERW is shown on the display instead of the value PNUTZ. The function can also be used to switch between two heating rods at the analogue output, see instructions "Analogue relay".
- 10 Select whether a 1-phase or 3-phase power controller is 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 how long the set power must be surplus under P to activate the analogue output. Adjustable between 0 and 99 minutes.

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



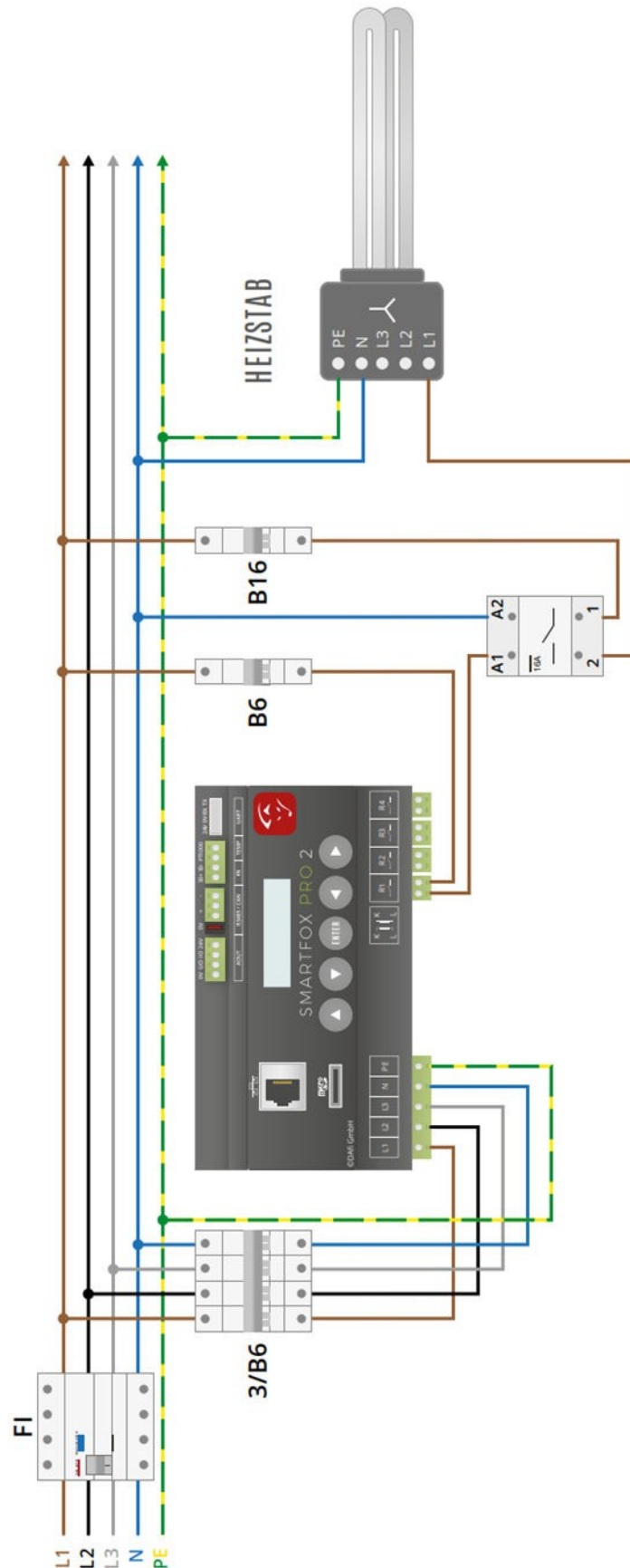
4.3.1 Parameterisation analogue output 1-phase

Note! After parameterisation of the fields framed in orange, the heating rod is ready for use. The remaining fields are preset and can be adjusted as required.

















Analogausgang

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

4.4 Connection SMARTFOX screw-in heater + SMARTFOX Pro via relay & contactor



4.4.1 Relay setting

Aktiviert	EIN		1
Icon			2
Name	Heizstab 3		3
Farbe			4
Regelverhalten	Wärmepumpe		5
Einschaltzyklen pro Tag	999		6
Nennleistung [W]	3000		7
Haltedauer [min]	2		8
			
Einschaltverzögerung [min]	1		9
Ausschaltverzögerung [sek]	0		10
Ausschaltschwelle [W]	0		11
Regelung auf Zielwert	EIN		12
Regelung mit Pnutz	EIN		13

- 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 shown in the overview with the assigned designation. 4 Relay is shown in the diagrams with the selected colour.
- 5 Heat pump: Under the control behaviour heat pump, the relay is activated as soon as the set power P for the selected switch-on delay TD was surplus. If there is still enough surplus after the holding time TH has elapsed, the next cycle is started instead of being switched 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 the relay is deactivated and will not be activated. If the relay is to be activated 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 consumer 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 the relay remains activated after the switch-on condition is fulfilled, adjustable between 1 and 999 minutes. If, for example, a th of 5min is set and the surplus collapses after 3 minutes (switch-on condition no longer fulfilled), the relay remains active for another two minutes.
- 9 "Switch-on delay in min" is the delay time how long the set power must be surplus under P to activate the relay. Adjustable 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 indicates from which value the relay should deactivate again. By default, the relay switches off as soon as the value rises above 0, i.e. there is a reference from the mains. In order to keep the relay active, 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 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 are 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. Function

The sensors of the controller and safety temperature limiter are located in a protective tube between the tubular heating elements. They detect the temperature of the liquid. The setpoint temperature can be adjusted via the control knob. In the event of a fault, the safety temperature limiter switches the radiator off permanently.

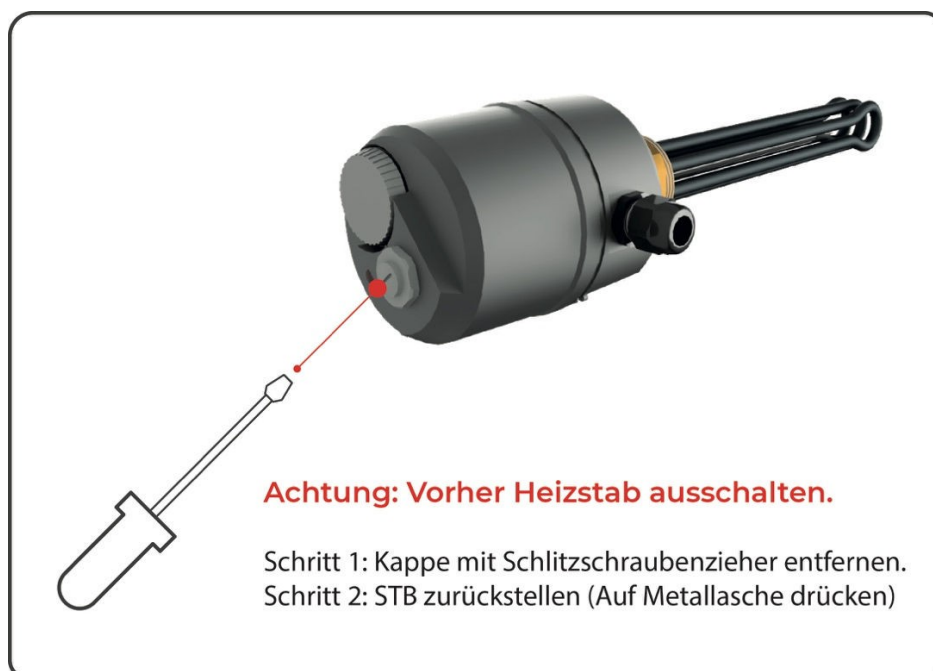
6. Operating instructions

Commissioning is only to be carried out after complete filling. If the STB responds, the cause of the fault must be determined. After the cause of the fault has been eliminated, the STB can be reactivated by pressing the red button firmly after it has cooled down and the upper part of the housing has been removed.

Warning! After professional installation, the STB provides sufficient overtemperature protection, e.g. if the EHK goes 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.

7. Additional functions

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

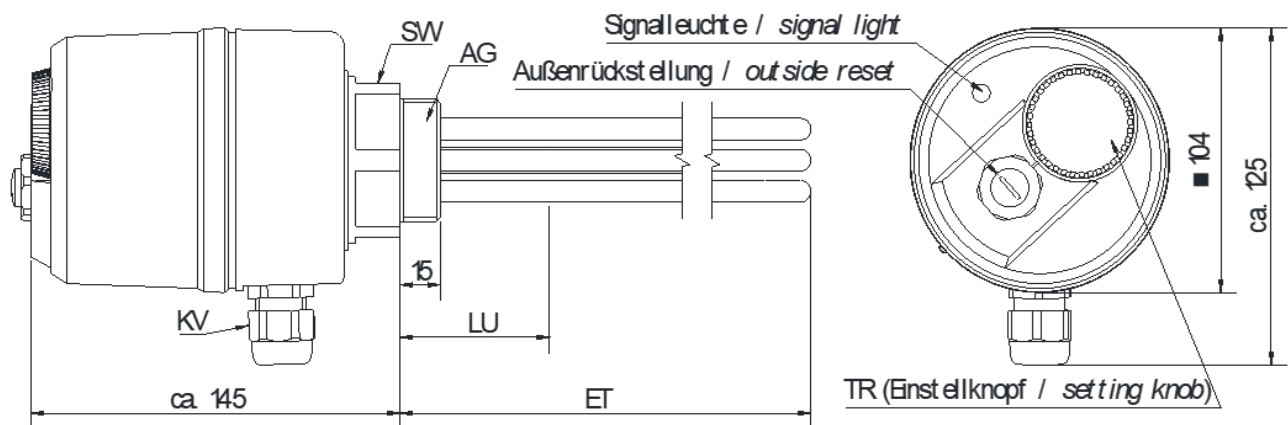


8. Maintenance

Attention! Before maintenance work, make sure that the unit is completely disconnected from the mains!

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

9. Technical drawing



10. Notes




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