

Flange heater  
Ø 180mm

## AHFR-BI-plus...

With combination of temperature control, safety temperature limiter and power switching unit for photovoltaic system

**PV own power consumption (Power to Heat)**

- Controllable via Modbus-TCP via LAN
- Controllable via 0-10V analog signal
- 7 linear power levels

**Application**

Auxiliary heating system of drinking water and heating water in photovoltaic systems.

To optimise the own consumption of PV energy.

**Features**

**FH** The heating element is made of three U-shaped heating tubes, each press-fitted into a press-fitting nipple. These are bolted with the immersion tube onto a steel flange.

A food-safe plastic disk serves as insulation.

This heating element is applicable in stainless steel boiler as well as in black steel / black steel enamelled boilers. Select the settings via DIP switch according to the boiler type.

The unheated zone is 70 mm for all types.

**TC** Electromechanical temperature control acc. EN 14597, not fail safe.

**STL** Electromechanical safety temperature limiter acc. EN 14597, fail safe. If nominal value is reached, the limiter switches and stays locked in this position. Reset is performed manually and is only possible after the sensing element is cooled off by approx. 10 K.

- Time factor of sensing element acc. EN 14597
- Operation type TC    Type 2 B    acc. EN 14597
- Operation type STL    Type 2 BK    acc. EN 14597

**Connections**

The flange heater is equipped with three connection sockets. All necessary plugs are included in the scope of delivery. After the first connection or commissioning by an electrician, the device can be completely disconnected from the mains and the connection to the control by pulling out the plug.

**Type summary**

drinking and  
heating water  
Incoloy 825, 2.4858

Type	Order no.	Power range	Immersion length [EL]
AHFR-BI-plus-1.75	012-6791	<b>1.75 kW</b> (0.25 + 0.50 + 1.00 kW)	260 mm
AHFR-BI-plus-3.5	012-6792	<b>3.50 kW</b> (0.50 + 1.00 + 2.00 kW)	360 mm
AHFR-BI-plus-4.4	012-6793	<b>4.40 kW</b> (0.65 + 1.25 + 2.50 kW)	420 mm
AHFR-BI-plus-5.8	012-6794	<b>5.80 kW</b> (0.83 + 1.66 + 3.33 kW)	540 mm

## Function modes

### Analogue mode (0-10V control signal)

The heating element can be regulated with a 0-10V signal in 7 power levels.

At a voltage of 1.25V the device switches to the first heating level. Each following stage needs a voltage rise of 1.25V. At a voltage of 8.75V the device switches to the seventh heating level.

To avoid flickering, a hysteresis of 0.25V is programmed.

### Modbus-TCP

In this function, the device obtains an IP address from a local DHCP server (router). After the heating element has been integrated into the network, it can be regulated in 7 power levels and the temperature of the sensors can be read out.

The power levels can be controlled via a value 0-7 or via a target value specification (here the **ASKOHEAT-F+** independently selects the appropriate power level).

The Modbus registers are described in a separate document.

The Modbus protocol can be downloaded from our homepage [www.askoma.com](http://www.askoma.com)

### Legionella protection

The automatic legionella protection automatically heats up the system daily / weekly or bi-weekly to min. 65°C. If the temperature of 65°C is reached within the interval regardless of the legionella protection program, the interval timer starts from this point on again. The parameters can be configured via Modbus or MQTT.

### Heat pump requirement

If a heat pump is available, the device can be used as an additional heater. The heat pump is controlled via a digital input that activates the full heating output (level 7).

### Emergency operation

The device has a button that can be used to manually switch the full heating output (level 7) on and off at any time. This function is automatically deactivated after 24 hours of continuous operation.

## Energy manager

If the analogue mode (0-10V) is not sufficient, the **ASKOHEAT-F+** should always be connected to a compatible energy manager.

The **ASKOHEAT-F+** receives control and configuration requests via Modbus TCP and delivers current measured values and status information.

ASKOMA offers a separately available energy manager that is optimally tailored to the use case Power to Heat, in connection with the **ASKOHEAT-F+**.

The ASKOMA energy manager locally monitors the energy consumption in the house and activates the **ASKOHEAT-F+** when there is excess energy from the solar system. Compatible, controllable consumers (e.g. large electrical appliances, electric vehicles, etc.) can be monitored and prioritised using the energy manager. An energy generation forecast calculates in advance which energy yield is to be expected. History data is transferred to the cloud and can be conveniently analysed and evaluated there. The current system status can be viewed on the go at any time via cloud.

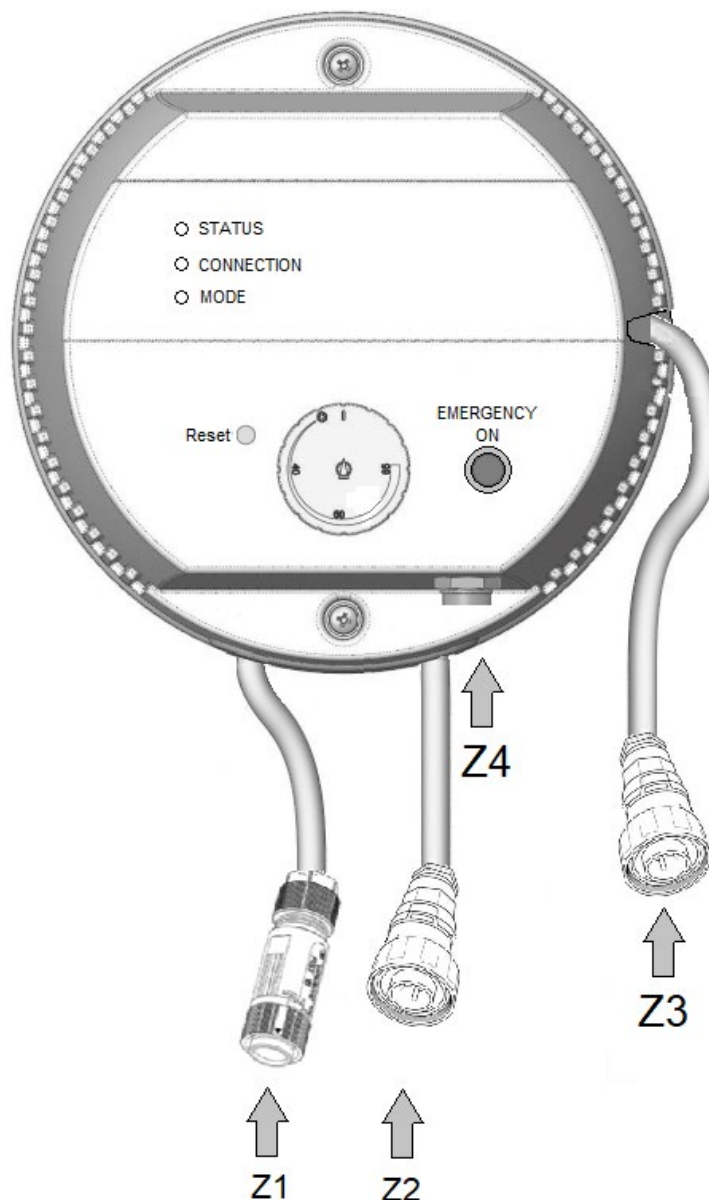
<b>Technical data</b>	The following indications are valid for the above listed standard types. Due to the function, other types might show different data.	
<b>Application range</b>	Adjustable cut-off temperature	0...*...28...85 °C
	Safety cut-off temperature $\vartheta_{\text{off}}$	110 °C (0-9 K)
	Ambient temperature on switching head	max. 50 °C (T50)
	Thermal switching differential	11.0 K $\pm$ 5.5 K
	Ambient temperature for storage and transport	-30...+90 °C
<b>Calibration</b>	Calibration tolerance	$\pm$ 7 K
	Time factor in water	<45 s
<b>Specification</b>	Flange material	St 37
	Outside flange diameter	Ø 180 mm
	Pitch circle diameter	Ø 150 mm / 8 X M12
	Flange seal	EPDM, KTW certification
	Plastic disk	PP-H, FDA certification
	Heating tube	Incoloy 825, 2.4858 Ø8.2 mm
	Immersion tube	Incoloy 825, 2.4858
	Surface load	7 W/cm <sup>2</sup>
	Electrical connection	Spring-type and screw terminal
	Operating pressure	max. 10 bar
	Housing cover	Polycarbonate, RAL 7035 (light gray)
	Protection mode	IP21 acc. EN 60529

**Fitting notes**

The device must be installed horizontally. The heating tubes must be covered entirely by the liquid. The circulation of the liquid shall not be inhibited.

Please note: This heating element is applicable in stainless steel boilers as well as in black steel / enamelled boilers. Select the settings via DIP switch in the housing interior according to the boiler type.

## Connecting plug



### Plug Z1 - mains supply

To supply energy to the heating element and the internal circuit boards  
Wieland RST 5-pin plug, IP66  
Screwed contact max. 2.5mm<sup>2</sup> (up to 1.5mm<sup>2</sup> ferrules can be used)  
Power rating: 250/400V 16A

### Plug Z2 – Temperature sensor

Connection options for the external sensors 1-3  
Bulgin Mini Buccaneer 6-pin plug, IP68  
Screwed contact max 1.0mm<sup>2</sup> (18 AWG)  
Power rating: 250V~ 3A

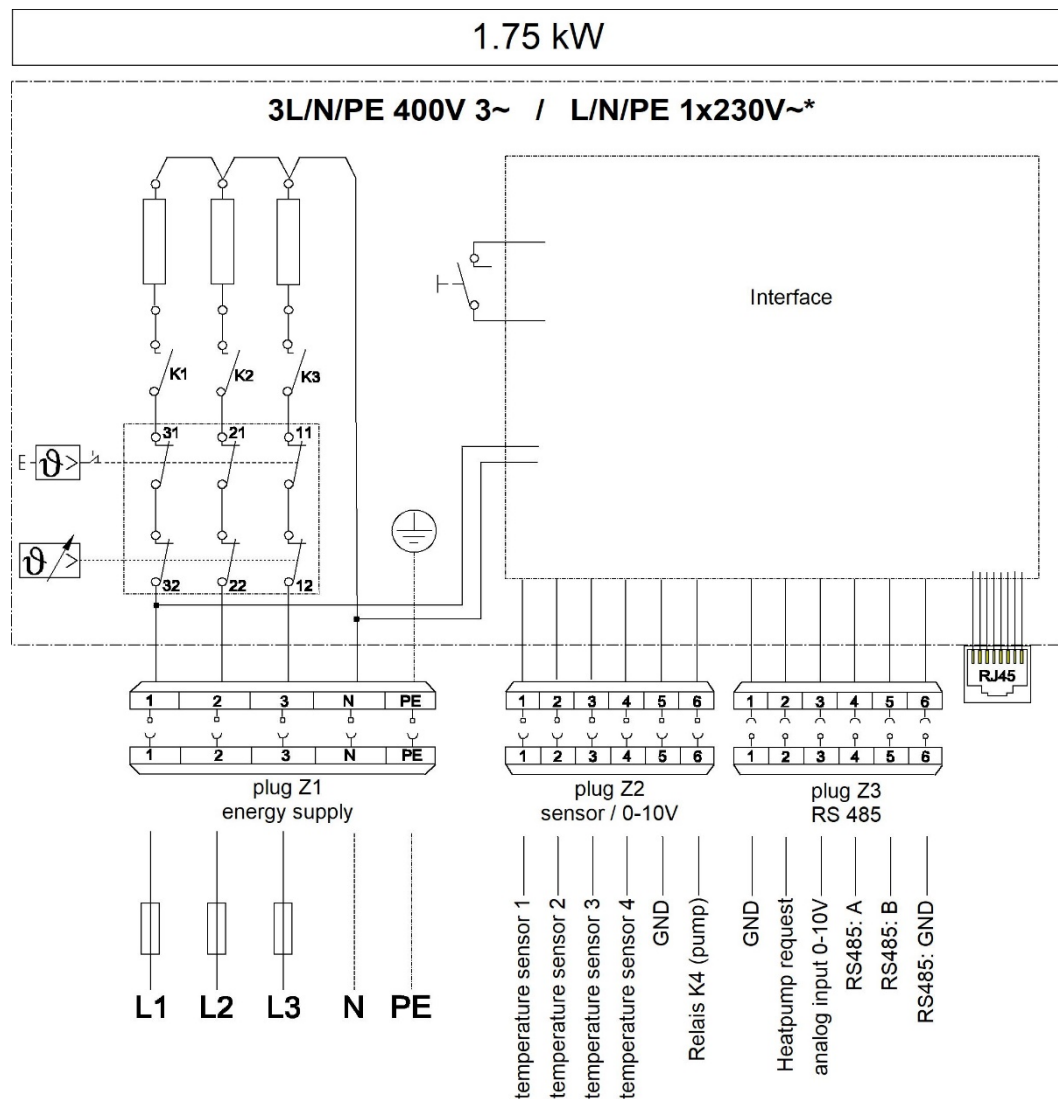
### Plug Z3 – Analogue input & heat pump requirement

Connection options for the analogue signal (0-10V) & the release of the heat pump  
Bulgin Mini Buccaneer 6-pin plug, IP68  
Screwed contact max. 1.0mm<sup>2</sup> (18 AWG)  
Power rating: 250V~ 3A

### Plug Z4 – RJ45 connection socket

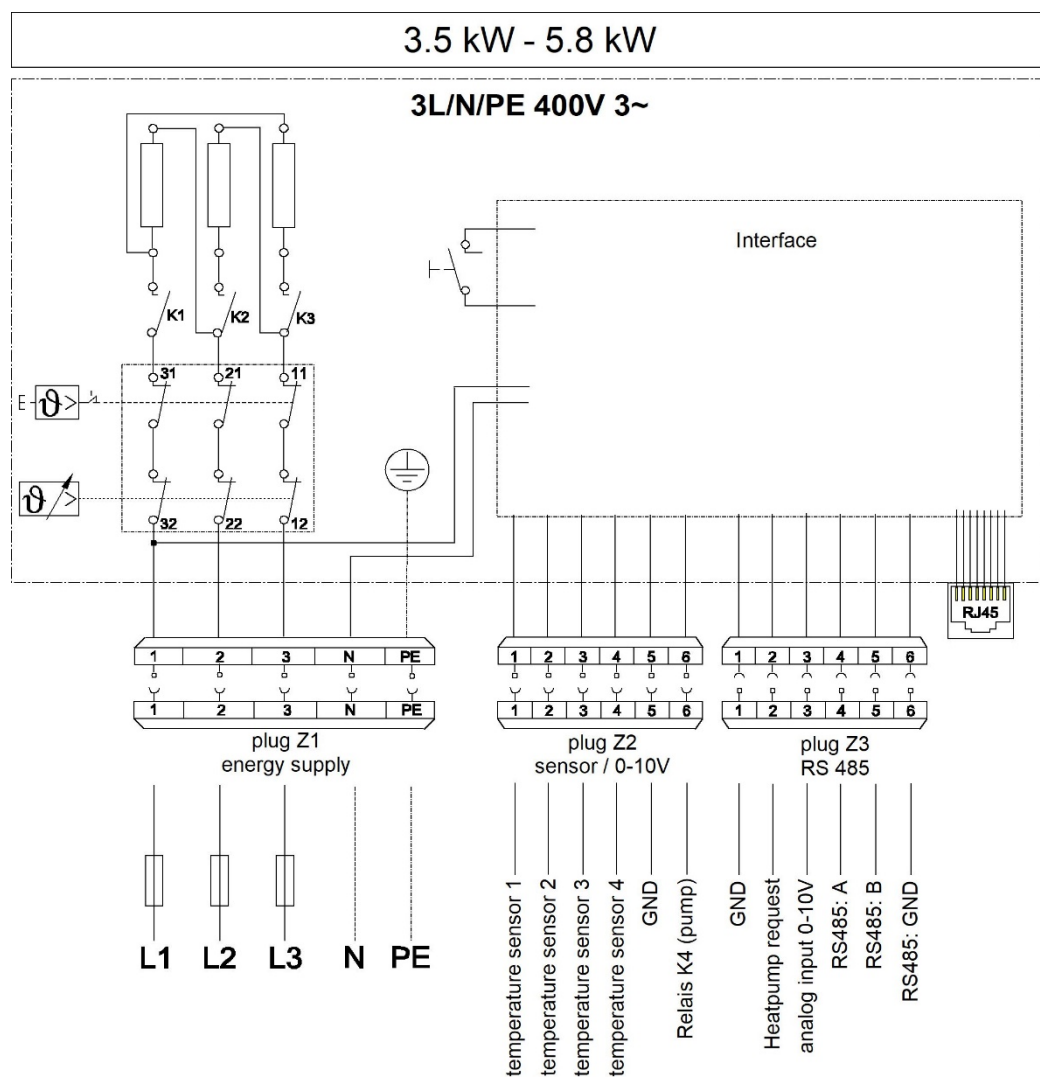
Network connection possible via LAN connection

# Connection diagram

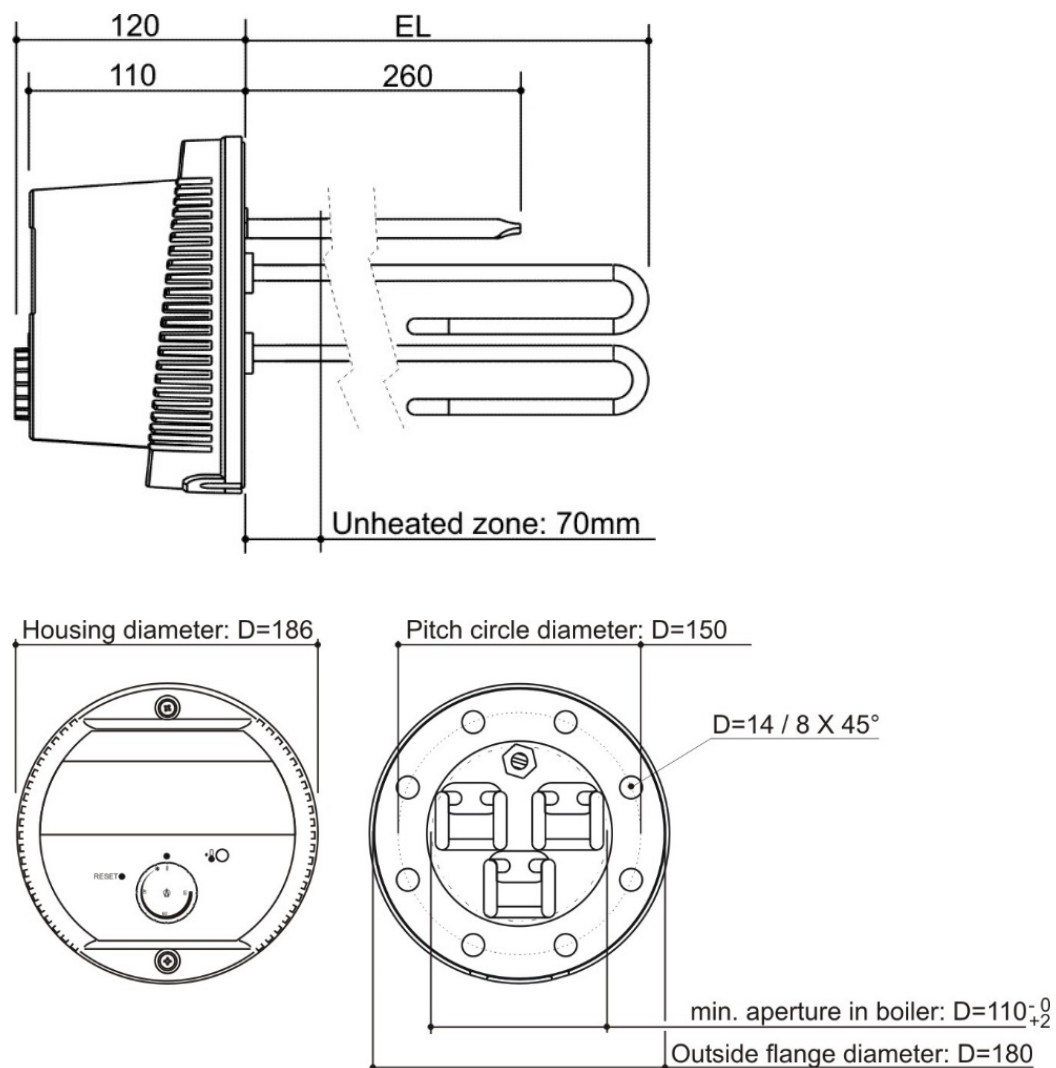


\* for single-phasing (1x230V~) L1, L2 and L3 use external jumper

# Connection diagram



## Dimension drawing



## Temperature sensor

Three additional sensors can be connected to the heating element. The additional sensors must be attached above the heating element. Sensor no. 1 is already included in the immersion tube of the flange heater and can be read out.

The 3 sensors can be ordered as optional accessories with the order number 012-0125.

