

### Flange heater Ø 180mm

### AHFR-BI-plus...

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

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

- Controllable via Modbus-TCP
- Controllable via Modbus-RTU via RS485
- Controllable via 0-10V analog signal
- 3 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. Thanks to the insulated installation of the round heating rods, the units are also suitable for glass lined storage tanks. 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 four 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-7.5	012-6797	<b>7.5 kW</b> (3 x 2.5 kW) / 3x400V	420 mm
AHFR-BI-plus-9.0	012-6798	<b>9.0 kW</b> (3 x 3.0 kW) / 3x400V	490 mm

## Function

### Modbus-TCP / -RTU

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 3 power levels and the temperature of the sensors can be read out.

The power levels can be controlled via a value 0-3 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 <http://www.askoma.com>.

### Power to Heat

The **ASKOHEAT-F+** can communicate via its RS485 interface with a Smart meter installed at the house connection point. If energy is available which is fed into the mains, the heating insert starts to convert the energy into heat at the correct heating power level.

No energy is drawn from the grid for this. All other consumers in the house are supplied with energy first.

The following energy meters are available for this purpose:

- ASKOMA bidirectional meters RTU and RTU III
- ASKOMA consumption meter RTU II
- Carlo Gavazzi EM340
- Optec ECS M3
- Eastron SDM72D-M
- Alpha-ESS Smart Grid Value
- CHNT DTSU666
- more to follow...

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

The heating element can be regulated with a 0-10V signal in 3 power levels.

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

### 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.

For this function, the connection to a LAN network is necessary.

### 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 3).

### Emergency operation

The device has a button that can be used to manually switch the full heating output (level 3) on and off at any time. This function is automatically deactivated after 24 hours of continuous operation.

### Minimum temperature

If desired, the **ASKOHEAT-F+** can ensure a minimum temperature in the storage tank. If a minimum temperature is defined and this function is activated, the unit will automatically reheat if the temperature falls below it. A frost protection function or ensuring a basic temperature can thus be made possible.

### Low Tariff

If the device is connected to a network with Internet access, it can reach and maintain an adjustable target temperature in a freely selectable time window. If no or little PV energy is available, the storage tank can be reheated at night.

## Energy manager

If the analog 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 / -RTU 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.

## Control via Third-party devices

The **ASKOHEAT-F+** can also be integrated via a variety of energy management systems from well-known manufacturers.

- Solarmanager
- SENEK V2 / V3
- E3DC
- Smartfox Pro
- Loxone Smart Home
- Kostal Smart Energie Meter
- SMA Sunny Home Manager (UDP)
- TQ Smart Meter EM420 / EM300
- Bartl Wärmepumpen
- more to follow...



SENEC

LOXONE

KOSTAL



## Web interface

The web interface for parameterization of the device can be done by entering the IP address in a browser or the addresses <http://askoheat-eth> / <http://askoheat.local>

## Technical data

The following indications are valid for the above listed standard types. Due to the function, other types might show different data.

### Application range

Temperature setting range thermostat	0...*...28...85 °C
Safety cut-off temperature $\vartheta_{off}$	110 °C (0-9 K)
Ambient temperature on switching head	max. 50 °C (T50)
Thermal switching differential thermostat	11.0 K $\pm$ 5.5 K
Switching differential Electronically	adjustable (min. 5K)
Ambient temperature for storage and transport	-30...+90 °C

### Calibration

Calibration tolerance	$\pm$ 7 K
Time factor in water	<45 s

### Specification

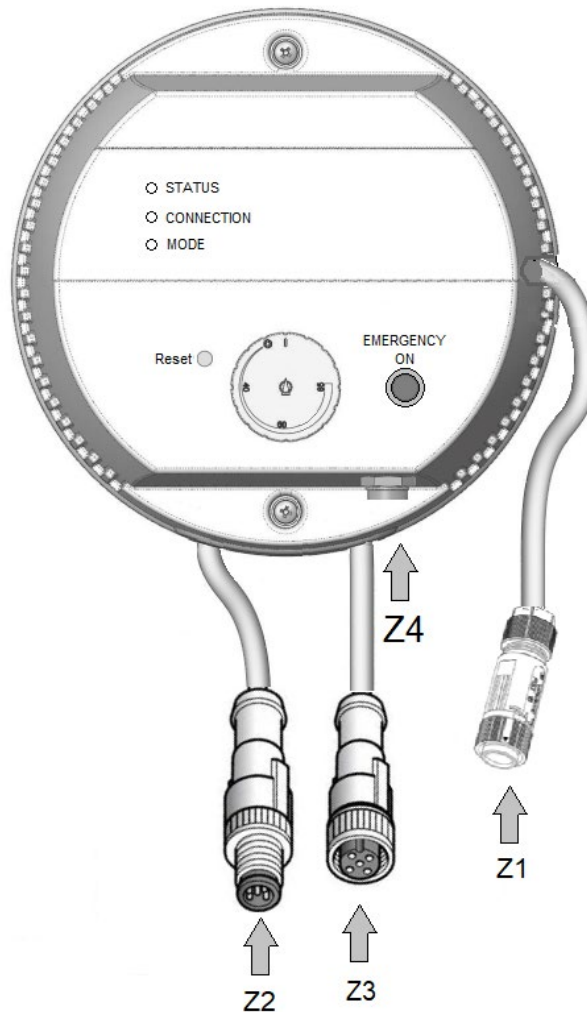
Flange material	St 37
Outside flange diameter	Ø 180 mm
Pitch circle diameter	Ø 150 mm / 8 X M12
Flange seal	EPDM, KTW certification
Plastic disk	PP-H, FDA certification
Heating tube	Incoloy 825, 2.4858 Ø8.2 mm
Immersion tube	Incoloy 825, 2.4858
Surface load	7 W/cm <sup>2</sup>
Electrical connection	Plug with screw contacts
Operating pressure	max. 10 bar
Housing cover	Polycarbonate, RAL 7035 (light gray)
Protection mode	IP41 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  
Connection cable 2m, 2.5mm<sup>2</sup>  
Power rating: 250/400V 16A

### Plug Z2 – Temperature sensor

Connection options for the external sensors 1-3  
Circular connector M12 (8-pin) with screw contacts, IP68  
Connection size: 0.14mm<sup>2</sup> - 0.5mm<sup>2</sup> / AWG 26-20

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

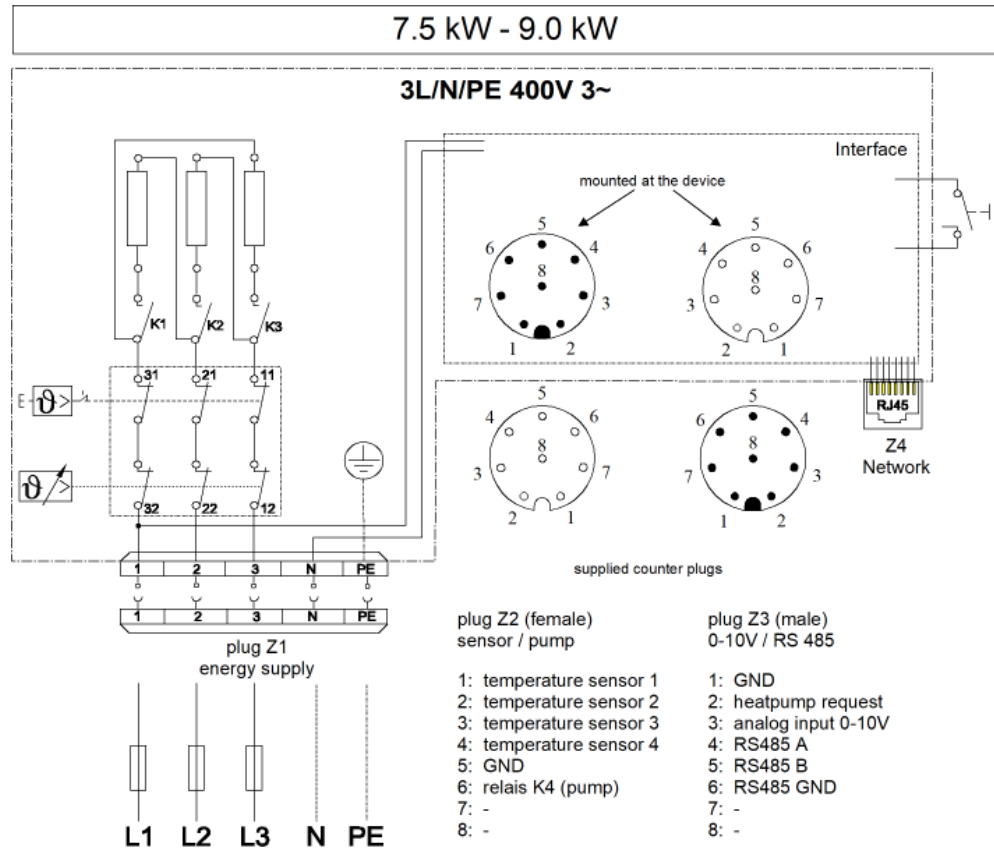
Connection options for the analogue signal (0-10V) & the release of the heat pump  
Circular connector M12 (8-pin) with screw contacts, IP68  
Connection size: 0.14mm<sup>2</sup> - 0.5mm<sup>2</sup> / AWG 26-20

### Plug Z4 – RJ45 connection socket

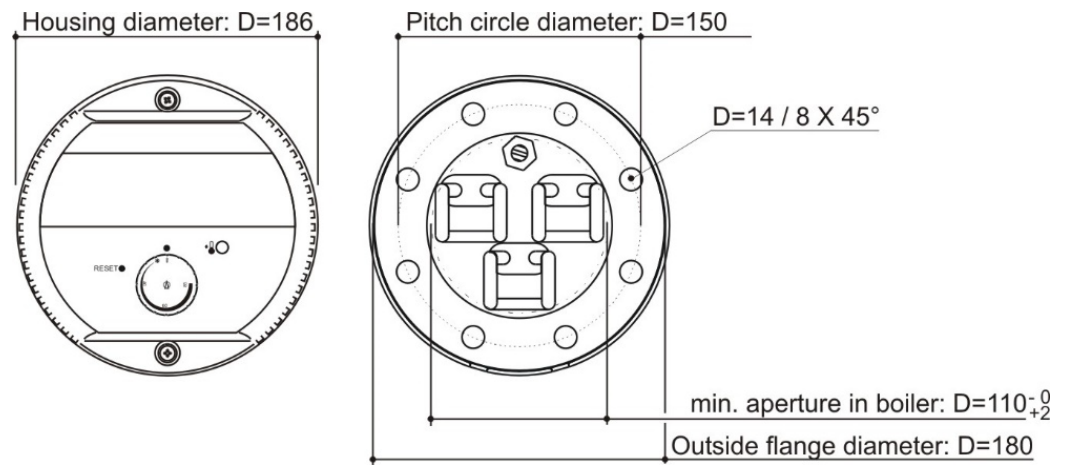
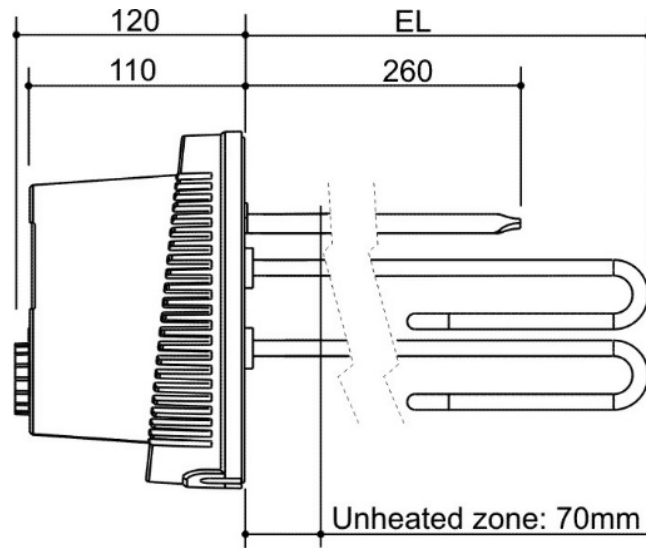
Network connection possible via LAN connection

All plugs required for the connection are included in the scope of delivery.

# 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. 0 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.

