ASKOHEAT-F+ 2.0
7 levels

012-6821

Flange heater Ø 180 mm
Including control unit

AHF180-TI-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 via LAN
- Controllable via Modbus-RTU via RS485
- Controllable via 0-10 V analog signal
- 7 linear power levels

CE

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

Control unit

The heater is supplied with a control unit, the RC+ housing (Remote Control).

All control signals and optional temperature sensors are connected to this control unit.

The status of the radiator is shown on the display. Errors, IP address or the heating status can be displayed if necessary.

The control unit is connected to the radiator, a 2,9m connection cable is included.

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*	*Connection voltage*	*Immersion length [EL]*
AHF180-TI-plus-1.75	012-6821	**1.75 kW**	1x230 V~ / 3x400 V~	260 mm
AHF180-TI-plus-3.5	012-6822	**3.50 kW**	3x400 V~	360 mm
AHF180-TI-plus-4.4	012-6823	**4.40 kW**	3x400 V~	420 mm
AHF180-TI-plus-5.8	012-6824	**5.80 kW**	3x400 V~	540 mm

Control unit

The **ASKO***HEAT*-F+ 2.0 has an external control unit with display, the **ASKO***HEAT*-RC+.
The display of the control unit shows the IP address, the heater status, the temperature in the tank and the current heating power.

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.

Function

Modbus-TCP / -RTU
In this function, the device obtains an IP address from a local DHCP server (router). After the device 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 **ASKO***HEAT*-F+ 2.0 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 **ASKO***HEAT*-F+ 2.0 can communicate via its RS485 interface with a smart energy 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 mains or an existing battery for this purpose. All other consumers in the house are supplied with energy first. All other consumers in the house are supplied with energy beforehand. If the self-consumption by other consumers in the house increases, the **ASKO***HEAT*-F+ 2.0 regulates back, or switches off completely.

The following energy meters are available for this purpose:

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

Analog mode (0-10 V control signal)
The heating element can be regulated with a 0-10 V signal in 7 power levels.
To avoid flickering, a hysteresis of 0.25 V 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 **ASKO***HEAT*-F+ 2.0 can be used as an additional heater. The heat pump is controlled via a digital input that activates the full heating output (level 7).

Minimum temperature
If desired, the **ASKO***HEAT*-F+ 2.0 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 (0-10 V) is not sufficient, the **ASKO***HEAT*-F+ 2.0 should always be connected to a compatible energy manager.

The **ASKO***HEAT*-F+ 2.0 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 **ASKO***HEAT*-F+ 2.0.

The ASKOMA energy manager locally monitors the energy consumption in the house and activates the **ASKO***HEAT*-F+ 2.0 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 **ASKO***HEAT*-F+ 2.0 can also be integrated via a variety of energy management systems from well-known manufacturers.

- Solarmanager
- SENEC V2 / V3
- E3DC
- Smartfox Pro
- Loxone Smart Home
- Kostal Smart Energie Meter
- SMA Sunny Home Manager (UDP)
- TQ Smart Meter EM420 / EM300
- Bartl heat pumps
- more to follow…

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

Adjustable cut-off temperature thermostat	0…❄…28...85 °C
Safety cut-off temperature ϑ_{off}	110 °C (0-9 K)
Ambient temperature on switching head	max. 50 °C (T50)
Thermal switching differential thermostat	11.0 K ± 5.5 K
Switching differential Electronic	Adjustable (min. 5K)
Ambient temperature for storage and transport	-30...+90 °C

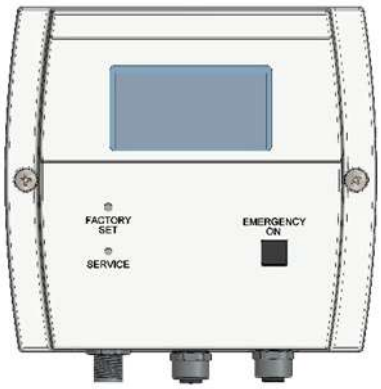
Calibration

Calibration tolerance	± 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 Ø 8.2 mm
Immersion tube	Incoloy 825, 2.4858
Surface load	7 W/cm²
Electrical connection	Connecting plug with screwed contact
Operating pressure	max. 10 bar
Housing cover	Polycarbonate, RAL 7035 (light grey)
Protection mode	IP41 acc. EN 60529

Connections



ASKO*HEAT***-RC+**

X1 – RJ12 connection socket
Interface to heater **ASKO***HEAT***-F+ 2.0**

X2 – M12 socket for control signals
Switch-on signal oft he heat pump
Analog signal 0-10 V
EW-lock (digital input)
Output signal (5VDC) for circulating pump

X3 – M12 connector for temperature sensor
Connection options for optional sensors 1 to 4

X4 – M12 connector RS485 interface
Communication via RS485 interface

X5 – RJ45 socket
Network connection via LAN port

ASKO*HEAT***-F+ 2.0**

Z1 – mains supply
To supply energy to the heating element and the internal circuit boards

Z5 – RJ12 connection socket
Interface to control unit **ASKO***HEAT***-RC+**

Supplied plugs / Connecting cable

Z1 – Power supply heater
Wieland RST 5-pin plug, IP66
Power rating: 250/400 V 16A
Screwed contact max. 2.5 mm²
(up to 1.5 mm² ferrules can be used)

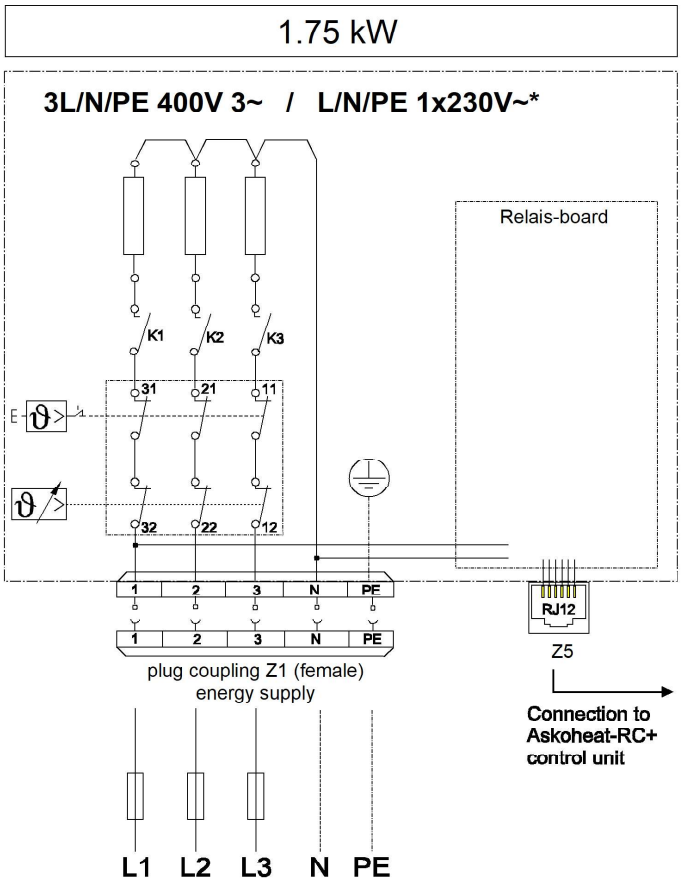
Z5 / X1 – Communication
Plug-in RJ12 communication cable 2,9 m

X2: cicular connector M12 (female)
8-pin (A-coded) with screw contacts, IP68
Connection size: 0.14 mm² - 0.5 mm² / AWG 26-20

X3: cicular connector M12 (male)
3-pin (A-coded) with screw contacts, IP68
Connection size: 0.14 mm² - 0.5 mm² / AWG 26-20

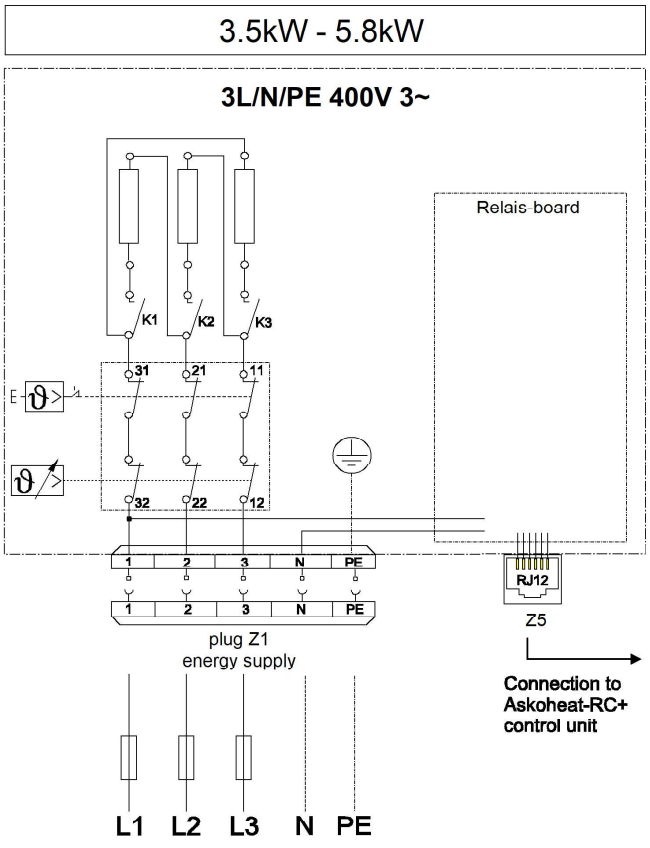
X4: cicular connector M12 (male)
8-pin (A-coded) with screw contacts, IP68
Connection size: 0.14 mm² - 0.5 mm² / AWG 26-20

Connection diagram
Valid for item:
012-6821



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

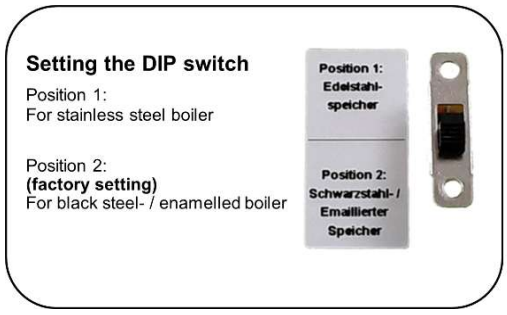
Connection diagram
Valid for item:
012-6822
012-6823
012-6824



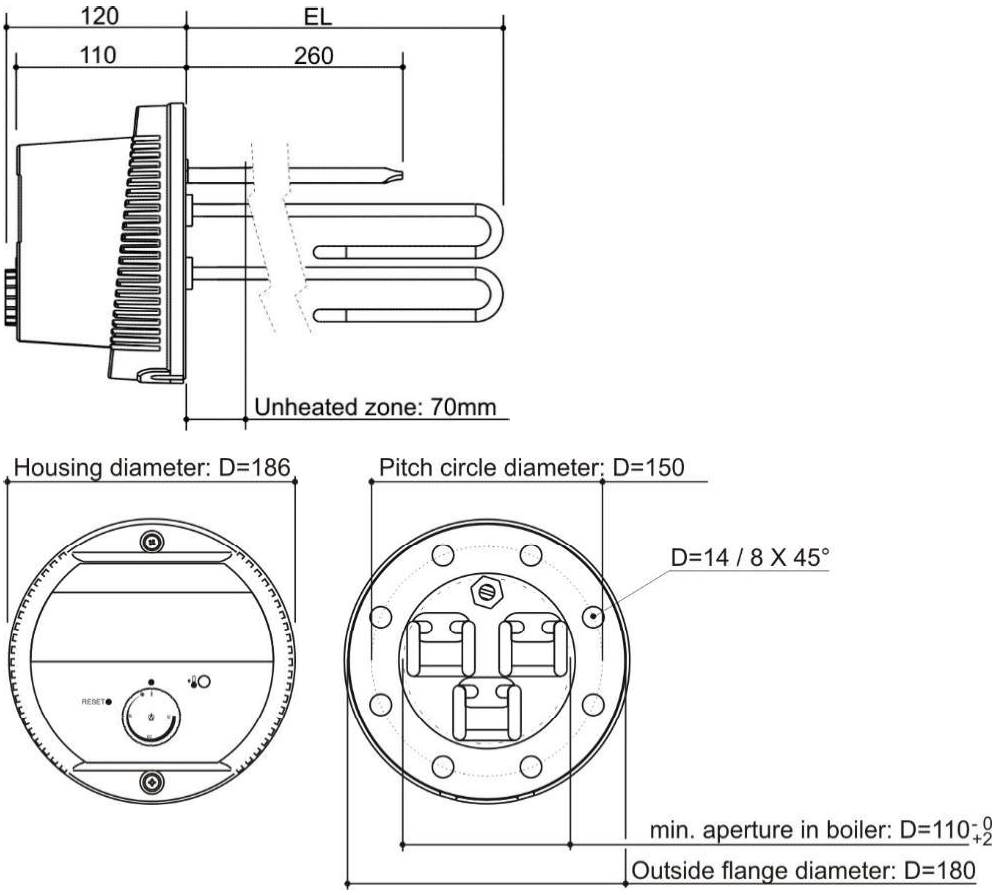
Fitting notes

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.



Dimension drawing



Temperature sensor

The **ASKO***HEAT*-RC+ heating element is capable of evaluating four sensor temperatures. The hot water stratification of the storage tank can be displayed and controlled using these four temperatures. The temperature data can be displayed in the app as the current measured value and can be recorded in the cloud as history data.

Three additional sensors can be connected to the RC-device. The additional sensors must be attached above the heating element. Sensor No. 0 is already included in the flange heater and can be read out.
The 3 sensors can be ordered as optional accessories with the order number 012-0128.