ASKOMA

ASKO*HEAT*+
7 levels

Screw-in heater 1½"
Insulated mounting

AHIR-BI-plus...

With combination of temperature control, safety temperature limiter and power switching unit for photovoltaic system
Suitable for installation in ASKO*WALL*+

PV own power consumption (Power to Heat)
- Controllable via Modbus-TCP / -RTU via LAN
- Controllable via 0-10V 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

SH The heating element is made of three U-shaped heating tubes, which are mounted isolated into a 1½" conical brass nipple by food-safe plastic sleeves.
Thanks to the insulated mounting of the heating tubes, the devices are also suitable for enamelled boilers.
The unheated zone is 150 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 OFF 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 screw-in 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]
AHIR-BI-plus-1.75	012-6391	**1.75 kW** (0.25 + 0.50 + 1.00 kW)	400 mm
AHIR-BI-plus-3.5	012-6392	**3.50 kW** (0.50 + 1.00 + 2.00 kW)	600 mm
AHIR-BI-plus-4.4	012-6393	**4.40 kW** (0.65 + 1.25 + 2.50 kW)	700 mm
AHIR-BI-plus-5.2	012-6394	**5.25 kW** (0.75 + 1.50 + 3.00 kW)	750 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 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+* 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

Power to Heat
The **ASKO***HEAT+* can 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
- Carlo Gavazzi EM340
- Optec ECS M3
- Eastron SDM72D-M
- more to follow…

Analog mode (0-10V control signal)
The heating element can be regulated with a 0-10V signal in 7 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.

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.

Minimum temperature
If desired, the **ASKO***HEAT+* 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 **ASKO**HEAT**+** should always .be connected to a compatible energy manager.

The **ASKO**HEAT**+** 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**+**.

The ASKOMA energy manager locally monitors the energy consumption in the house and activates the **ASKO**HEAT**+** when there is excess energy from the solar system. Compatible, controllable consumers (e.g. large electrical appliances, electric vehicles, etc.) can be monitored and prioritized 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**+** 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 Wärmepumpen
- 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	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	11.0 K ± 5.5 K
Ambient temperature for storage and transport	-30...+90 °C

Calibration

Calibration tolerance	± 7 K
Time factor in water	<45 s

Specification

Fitting thread	R 1½" conical
Brass nipple	CuZn40Pb2
Heating tube	Incoloy 825, 2.4858
Surface load	8-9 W/cm²
Electrical connection	Connecting plug with screwed contact
Operating pressure	max. 10 bar
Housing cover	Polycarbonate, RAL 7035 (light gray)
Housing base	Polycarbonate, RAL 7016 (anthracite 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
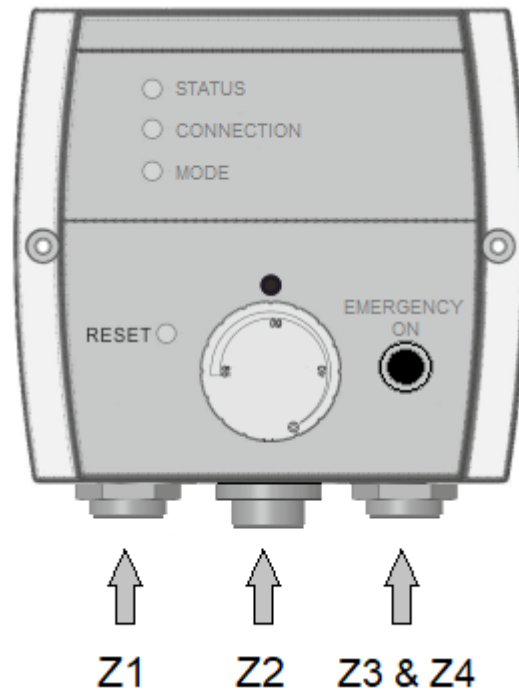
Plug Z1 - mains supply
To supply energy to the heating element and the internal circuit boards
Wieland RST 5-pin plug, IP66
Screwed contact max. 2.5mm² (up to 1.5mm² ferrules can be used)
Power rating: 250/400V 16A

Plug Z2 – Temperature sensor
Connection options for the external sensors 1-4
Circular connector M12 (8-pin) with screw contacts, IP68
Connection size: 0.14mm² - 0.5mm² / AWG 26-20

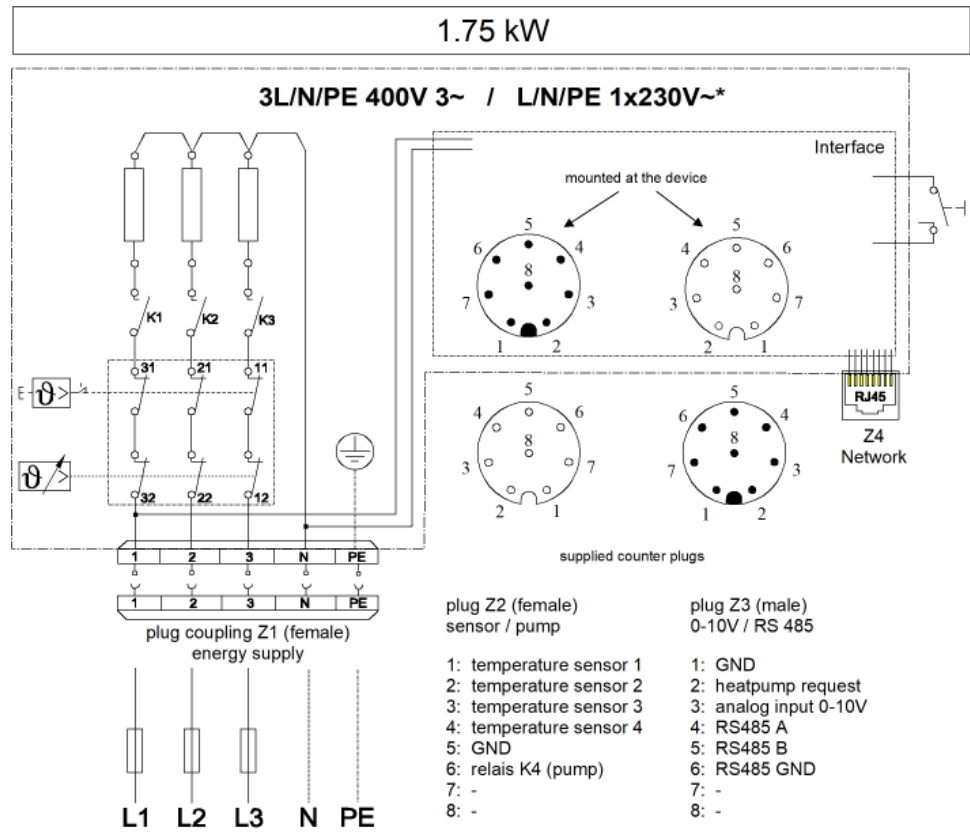**Plug Z3 – Analogue input & heat pump requirement**
Connection options for the analogue signal (0-10V) & the release of the heat pump
Circular connector M12 (8-pin) with screw contacts, IP68
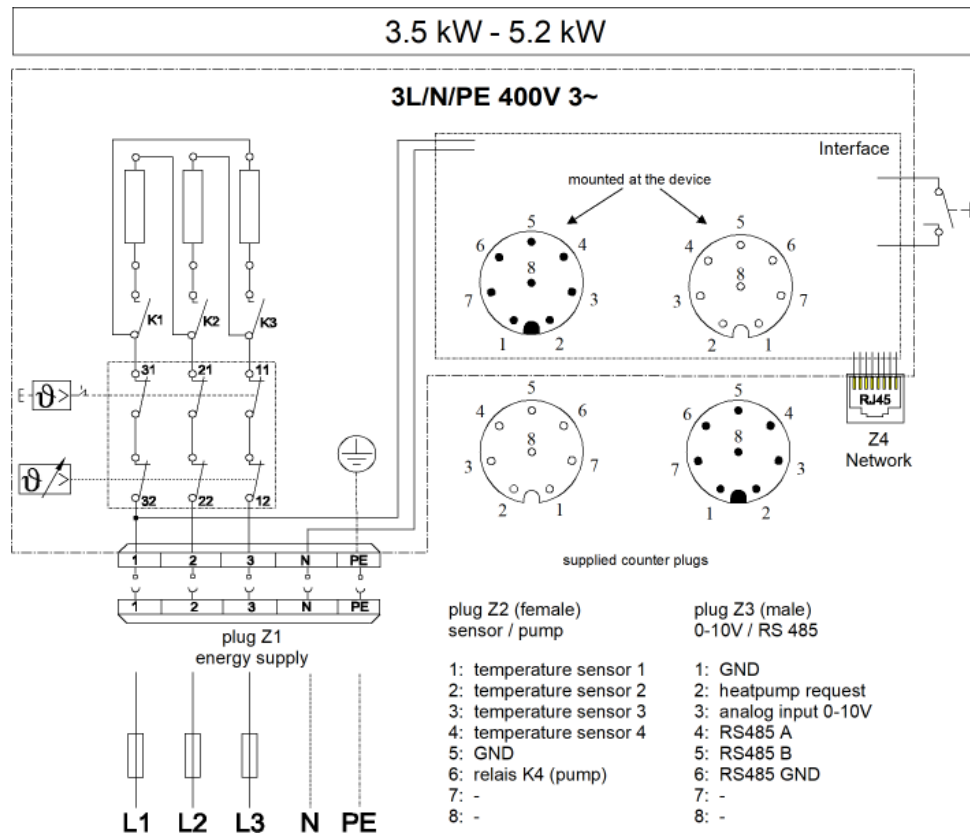Connection size: 0.14mm² - 0.5mm² / AWG 26-20

Plug Z4 – RJ45 connection socket
Network connection possible via LAN connection

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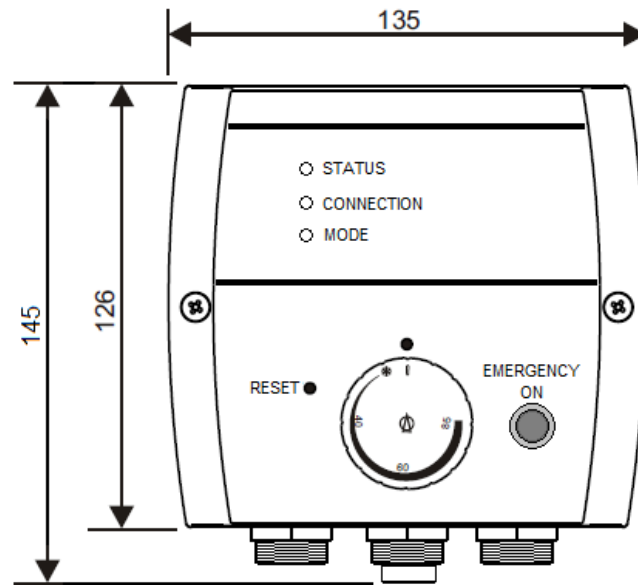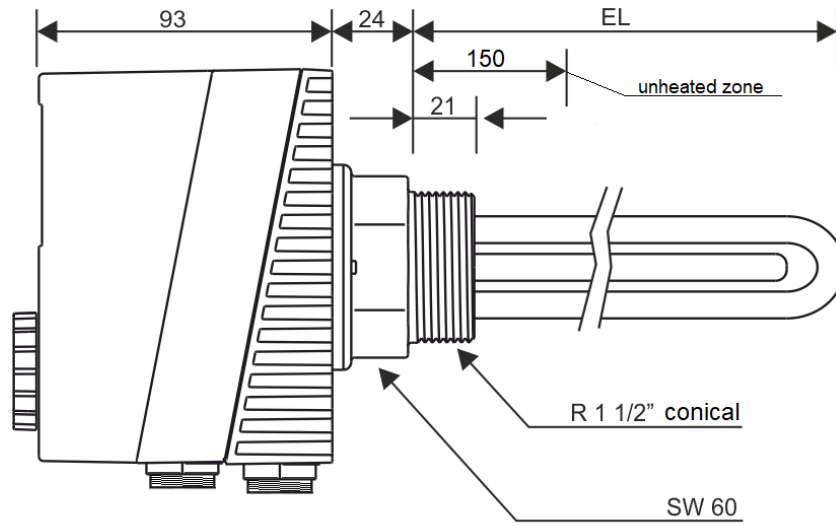
Connection diagram

1.75 kW

3L/N/PE 400V 3~ / L/N/PE 1x230V~*

Interface

mounted at the device

RJ45

Z4
Network

K1 K2 K3

31 21 11

32 22 12

1 2 3 N PE

1 2 3 N PE

plug coupling Z1 (female)
energy supply

supplied counter plugs

plug Z2 (female) sensor / pump	plug Z3 (male) 0-10V / RS 485
1: temperature sensor 1	1: GND
2: temperature sensor 2	2: heatpump request
3: temperature sensor 3	3: analog input 0-10V
4: temperature sensor 4	4: RS485 A
5: GND	5: RS485 B
6: relais K4 (pump)	6: RS485 GND
7: -	7: -
8: -	8: -

L1 L2 L3 N PE

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

3.5 kW - 5.2 kW

3L/N/PE 400V 3~

Interface

mounted at the device

RJ45

Z4
Network

K1 K2 K3

31 21 11

32 22 12

1 2 3 N PE

1 2 3 N PE

plug Z1
energy supply

supplied counter plugs

plug Z2 (female) sensor / pump	plug Z3 (male) 0-10V / RS 485
1: temperature sensor 1	1: GND
2: temperature sensor 2	2: heatpump request
3: temperature sensor 3	3: analog input 0-10V
4: temperature sensor 4	4: RS485 A
5: GND	5: RS485 B
6: relais K4 (pump)	6: RS485 GND
7: -	7: -
8: -	8: -

L1 L2 L3 N PE

Dimension drawing

93 24 EL

150

21

unheated zone

R 1 1/2" conical

SW 60

135

145 126

○ STATUS
○ CONNECTION
○ MODE

RESET ●

* I

EMERGENCY ON

Temperature sensor

The **ASKO***HEAT+* 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.

When using the heating insert in the ASKO*WALL+*
4 separately available sensors can be connected to terminals in the **ASKO***WALL+* junction box. The connection up to the heating insert is already wired.
The 4 sensors can be ordered as optional accessories with the order number 012-0126.
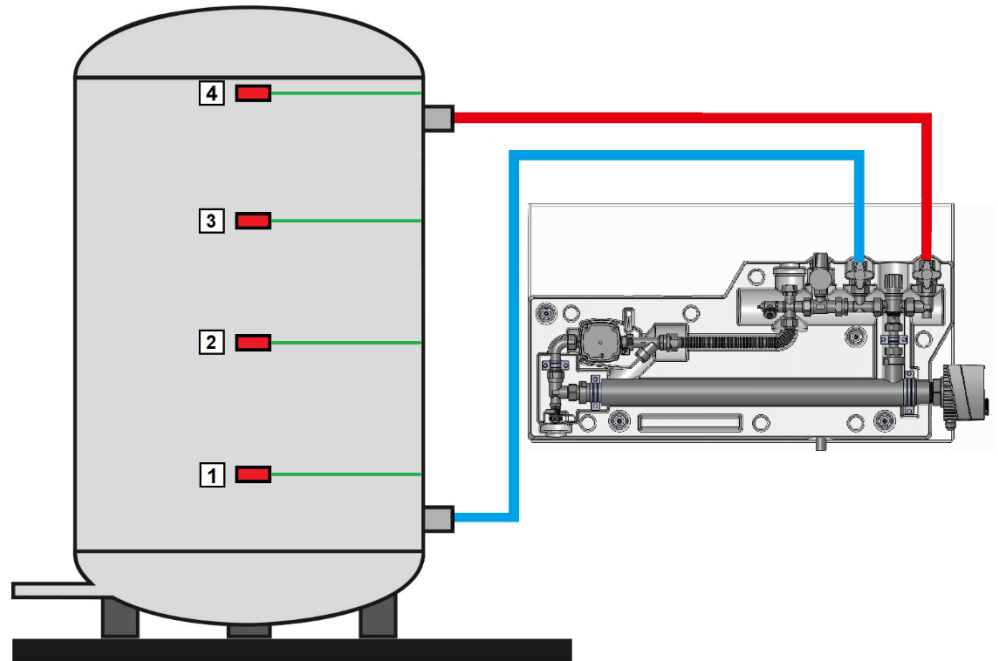
When using the heating element in a storage tank
three additional sensors can be connected to the heating element. The additional sensors must be attached above the heating element. Sensor No. 0 is already included in the screw-in heater and can be read out.
The 3 sensors can be ordered as optional accessories with the order number 012-0125.