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ATON+

ELECTRIC IMMERSION HEATER *EHS-R*
CAN ENERGY METER *CAN-EZ3*

User manual
Installation instructions

Manual Version 1.25 (CAN-EZ3)
Manual Version 1.16 (EHS-R)

English

Table of contents

Safety requirements

All installation and wiring work on the controller must only be carried out in a zero volt state. The opening, connection and commissioning of the device may only be carried out by competent personnel. While doing so, they must observe all local safety requirements.

This device is state of the art and meets all necessary safety regulations. It may only be used in accordance with the technical data and the safety requirements and regulations listed below. When using the device, also observe the statutory and safety regulations apposite to the particular use. Any other use will automatically void all warranty rights.

- Connection work and other exposure of the PCB in the immersion heater casing should only be carried out in a dry interior room.
- It must be possible to isolate the immersion heater from the mains, in accordance with local regulations, using an omnipolar isolating facility (plug/socket or 2-pole isolator).
- The immersion heater should only be connected to a mains socket using the supplied connecting cable. The connecting cable should be fitted before insertion. The mains socket must have at least 16 A fuse protection.
- No extension cables, mains distributors or cable drums should be used.
- Before starting installation or wiring work on equipment, the immersion heater must be completely isolated from the mains and protected against a restart.
- Never pull on the mains cable, or pull the mains plug out of its socket by the cable.
- Safe operation is no longer possible if the immersion heater, or connected equipment shows signs of visual damage, no longer functions or has been stored for lengthy periods in unfavourable conditions. If this is the case, disable the devices or equipment and secure against unintentional use.
- At the immersion heater, high temperatures occasionally occur during operation, which should be taken into consideration during installation/maintenance work. Also never touch the immersion heater with wet/damp hands. Insulated footwear is recommended for installation work.
- The immersion heater may be active at a high output level for a prolonged period of time. Relevant components (e.g. sockets) must be able to withstand current flows of up to 16 A for prolonged periods.

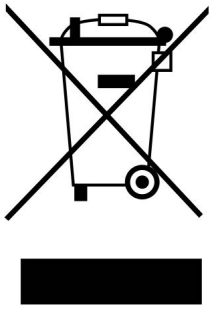
Maintenance

If treated and used correctly, the device itself will not require any maintenance. However, the use of a suitable **sacrificial anode** in the cylinder is recommended, and if the immersion heater is used more often than usual, it is necessary to check whether the material thickness is reduced (at least 2-3 times per year).

No components relevant to long term accuracy are subject to loading if the device is used correctly. Consequently long term drift is extremely low. The device therefore does not require any maintenance and cannot be adjusted.

The structural characteristics of the device must not be changed during repairs. Spare parts must correspond to the original parts and must be used in accordance with the build version.

Disposal



• Devices no longer in use or beyond a state of repair must be disposed of in an environmentally responsible manner by an authorised collection point. They mus never be treated as ordinary household waste.

• We can undertake the environmentally responsible disposal of devices sold by the Technischen Alternative company upon request.

• Packaging material must be disposed of in an environmentally responsible manner.

• Incorrect disposal may result in considerable damage to the environment, as many of the materials used require professional handling.

Introduction

The **ATON** set comprises a **CAN-EZ3A** energy meter and a variable **EHS-R** immersion heater.

These two devices communicate wirelessly with one another. The energy meter and immersion heater are connected at the factory. This means that no wireless connection settings are required. However, information can be found in chapter ***Wireless system***.

The purpose of the **CAN-EZ3A** is to capture energy and calculate surplus output, e.g. in conjunction with PV systems. Relevant values are transmitted wirelessly to the **EHS-R**, which in turn converts possible surpluses into heat, instead of exporting them to the mains, which can be a less favourable option.

The **CAN-EZ3A** is programmed at the factory and this programming is described in more detail in chapter **Work settings**. This programming can, of course, be changed or replaced with your own programming. The energy meter can be fully programmed via the display and control buttons/rotary dial, but we recommend using the PC software **TAPPS2** for this. Programming generated on the PC can be loaded on to the energy meter using the supplied micro SD card.

The **EHS-R** immersion heater **does not require any programming/parameterisation.**

Step-by-step instructions

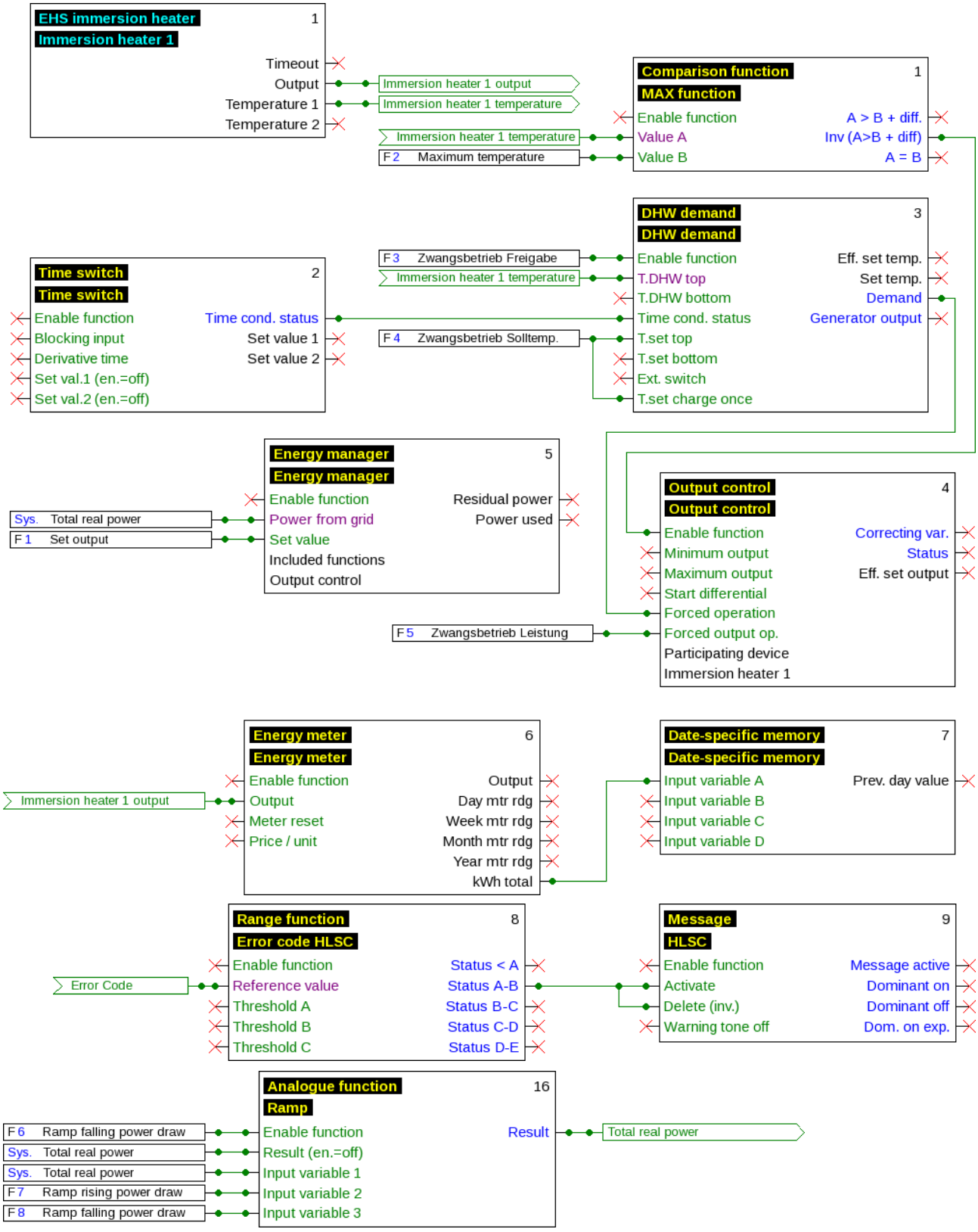
1	Are the work settings on the CAN-EZ3A suitable for the on-site requirements? (See chapter "**Work settings**") If not, adjust the existing programming or generate your own and load it on to the energy meter. (Instructions for the programming software and available function modules under www.ta.co.at)
2	The wireless range (as described in chapter "**Wireless system (x2 wireless)**") should be compared with the on-site conditions.
3	Shut down the control cabinet.
4	Installation of the CAN-EZ3A in the control cabinet.
5	Connect a current transformer to the CAN-EZ3A.
6	Connect voltage terminals to the CAN-EZ3A.
7	Snap the current transformer on to phase conductors, taking into consideration the energy direction. (Current transformer ferrite cores must be clean.)
8	Connect voltage terminals to the phase conductors, taking into consideration the energy direction.
9	Installation of the EHS-R in the cylinder. (Observe information in chapter "**Installation and connection – EHS-R immersion heater**", particularly information regarding the electroplating in the cylinder)
10	As soon as both devices are supplied with power, the wireless connection is established automatically.

Factory settings

The CAN-EZ3A is programmed at the factory and this programming is described in more detail in the following pages. This programming can, of course, be changed or replaced with your own programming. The energy meter can be fully programmed via the display and control buttons/rotary dial, but we recommend using the PC software **TAPPS2** for this.

The **EHS-R does not require any programming/parameterisation.**

Overview of TAPPS2 programming



Functions

A more detailed description of all function modules can be found in the corresponding operating instructions for freely programmable controllers (www.ta.co.at).

The primary functionality comprises the **Output control** of the EHS-R immersion heater and an **Energy manager,** in connection with a **Comparison function.**

- The **Energy manager** receives the measured output via the system value **Total real power** and the set output is specified with the fixed value **F1 Set output**.
  - In the **Energy manager**, **Output control** is stored as an included function. This means that the output to be consumed is specified for **Output control**.
- The purpose of the comparison function is to limit the maximum temperature of the immersion heater. The threshold for this is set via the fixed value **F2 Maximum temperature** (set to 60 °C at the factory).
  - If the maximum temperature at the immersion heater is reached, the comparison function issues an enable for the **Output control** to **OFF.** This blocks operation of the immersion heater.

An **energy meter** also runs, together with a **date-specific memory**. This adds up the consumption of the immersion heater in kWh.

An optional functionality for DHW heating is also integrated. This is *deactivated* at the factory via the fixed value **F3 Forced operation, enable**.

- In the function **Time switch**, a time program is stored (default Mo-Su, 17:00 - 22:00 h). Within the time window, DHW is heated irrespective of the solar yield.
  - The DHW temperature is measured with **Temperature 1*** at the immersion heater. This temperature is increased at sensor input **S1** of the EHS-R.
  - The maximum temperature limit via the comparison function also affects DHW heating.
- The fixed value **F4 Forced operation, set temp.** specifies the set temperature for normal DHW heating and for the functionality *Charge once*.
- The **DHW demand** switches the **Output control** with its *Forced operation***.**

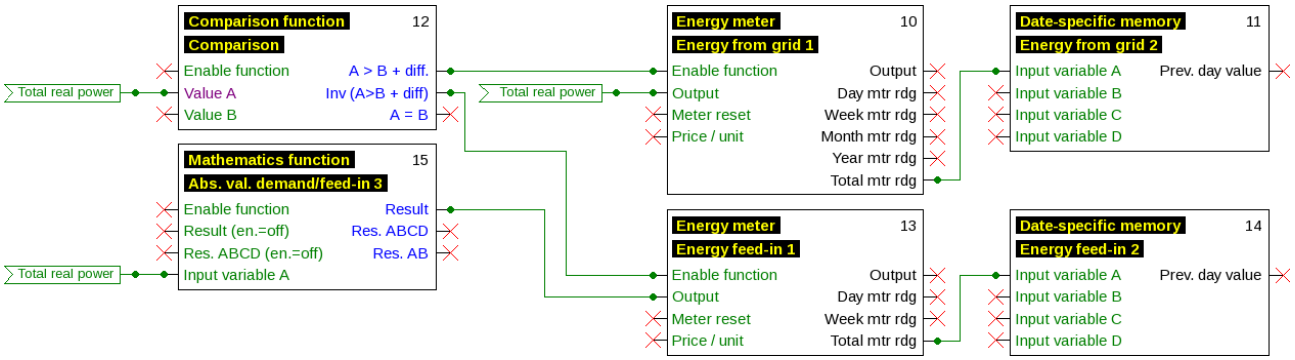
The range function "**Fault code HLSC**" evaluates the fault code and triggers the HLSC (high limit safety cut-out) message if the sensor of the EHS-R for the safety temperature limit exceeds 95 °C.

Once the HLSC fault code has been triggered, the immersion heater must be **restarted** manually before it is permitted to operate again (standard requirement). For this purpose, either power to the immersion heater must be cut briefly or it must be restarted via the CAN-EZ3 (menu item CORA devices).

The analogue function "**Ramp**" is used to slowly ramp up the power consumed by the EHS-R. This function is deactivated at the factory by the fixed value **F6 Enable ramp-up**. If activated, the immersion heater continues to respond as quickly as possible when the energy available to it decreases. However, if energy suddenly becomes available to the immersion heater (e.g. because a larger consumer in the household switches off), the consumed power ramps up slowly by means of the analogue function Ramp. The rate of this ramp-up can be adjusted using the fixed value **F8 Ramp falling power draw** (factory setting: 100 W). The ramp prevents time-delayed cycling so that the immersion heater consumes as little non-surplus power as possible. However, when ramping starts up, any surplus is exported to the grid rather than consumed.

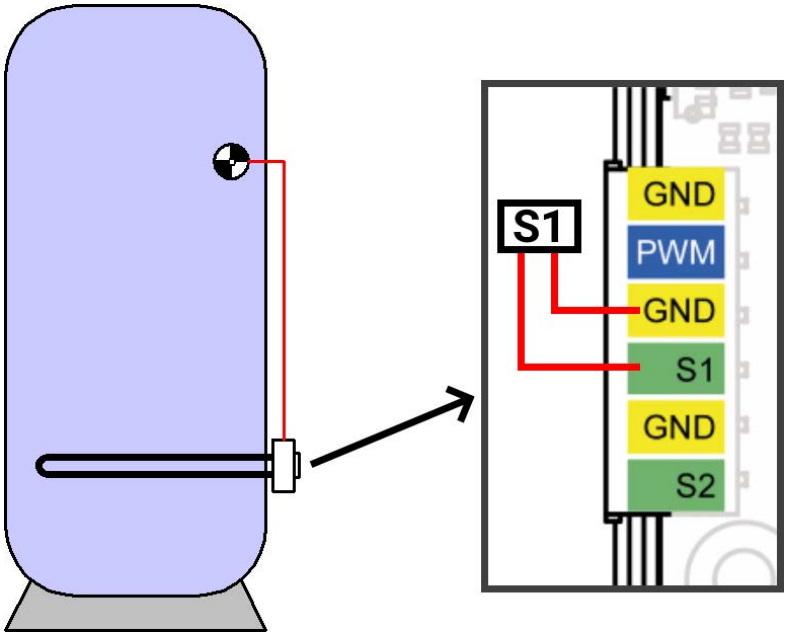
The fixed value **F7 Ramp rising power draw** is intentionally set unrealistically high (factory setting: 30 kW), which means that the ramp is not effective in the direction of increasing power draw. If required, the ramp can also be activated in this direction.

There is also a group of functions with the heading "**Extension for combination with C.M.I.**". These functions make separate records of power exported to the grid via the EHS-R and power drawn via the EHS-R.



Suggested installation

*To ensure that **Temperature 1** gives a practical value, the immersion heater's cylinder sensor **S1** must be installed **at the top** of the cylinder. The immersion heater must be installed horizontally in the cylinder.



Datalogging

The following values are logged at the factory:

Analogue values	Digital values	General
ANALOGUE 1	CORA device: Immersion heater 1 - Temperature 1	
ANALOGUE 2	CORA device: Immersion heater 1 - Current output	
ANALOGUE 3	System value: Electrical power - Total real power	
ANALOGUE 4	Function: Energy meter - Kilowatt hours total	

- EHS-R **Temperature 1** (sensor input S1 of the immersion heater)
- EHS-R **Current output** in kW
- CAN-EZ3A **Electrical power** (total real power)
- Function **Energy meter** (kWh total)

Datalogging on SD card is deactivated at the factory.

Installation and connection

The CAN-EZ3 is installed in a meter box in accordance with local regulations. It can be snapped on to a top-hat rail (DIN support rail TS35 to EN 50022).

The 2-pole connectors of the current transformers are connected to the CAN-EZ3 and folded over the cores. When doing this, pay attention to the correct assignment (I1 - I3) in accordance with the voltage connections and a positive phase sequence.

Caution! The surfaces of the current transformer ferrite cores must be completely clean. Even tiny dust particles or greasy films can severely affect the measuring result. These surfaces must therefore be cleaned with a clean, lint-free cloth or clean fingers before closing.

For voltage measuring, the required wires are connected to the voltage terminals in the CAN-EZ3.

The connection of sensors, and CAN and DL buses is carried out using the supplied connectors

Power supply

The CAN-EZ3 is supplied with power via the voltage measuring connection **U1** (first phase).

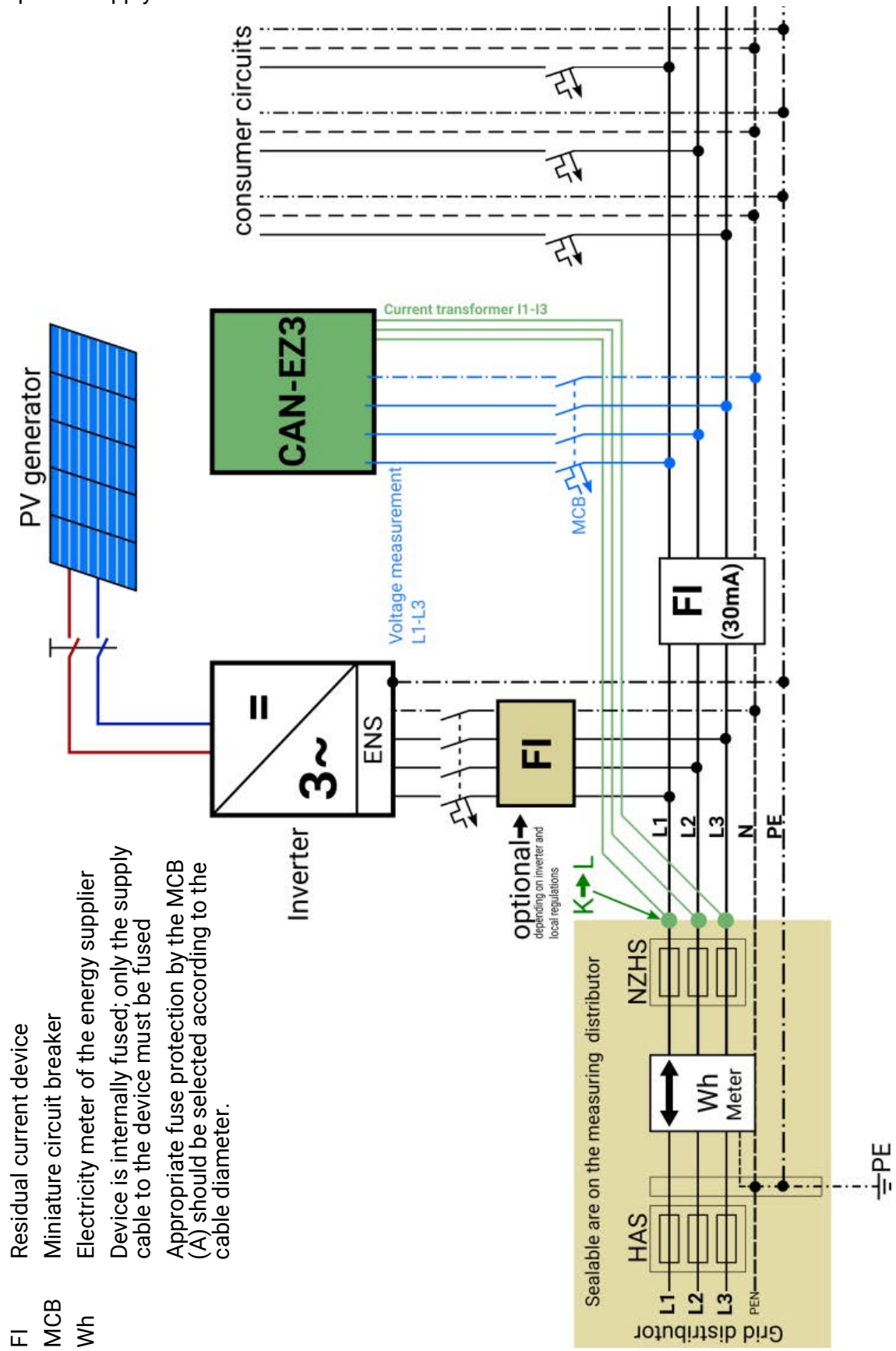
Time stamp

The CAN-EZ3 has a real time clock and, as node 1 in the CAN bus network, can therefore transmit the time and date to other devices.

General connection of the CAN-EZ3

The CAN-EZ3 must always be connected by qualified personnel, taking into account the conditions on site and local safety regulations. The safety requirements on page 5 must also be observed.

The following diagram is only an example of the installation of a CAN-EZ3 in a typical TN-S system with surplus power supply.



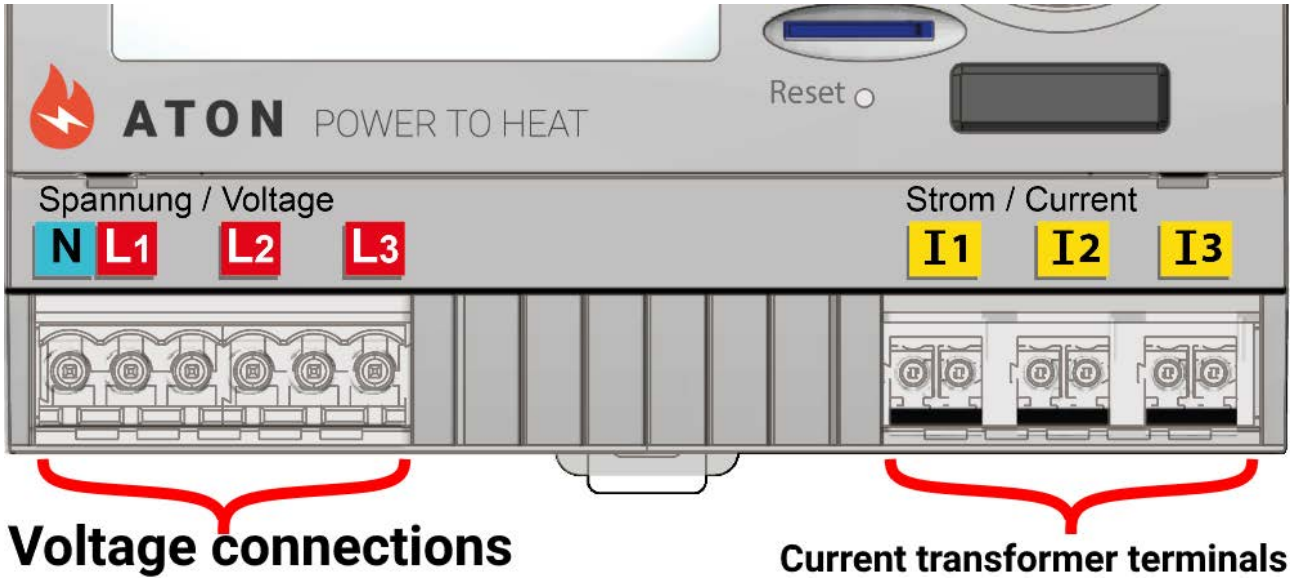
NZHS Normal supply main switches
HAS Grid connection fuses
ENS Device for grid monitoring with associated switching element
FI Residual current device
MCB Miniature circuit breaker
Wh Electricity meter of the energy supplier
Device is internally fused; only the supply cable to the device must be fused
Appropriate fuse protection by the MCB (A) should be selected according to the cable diameter.

DL bus and CAN bus connections

CAN bus (C-L, C-H +12 V, GND)	CAN-Low, CAN-High, +12 V, earth The principles of bus cabling are described extensively in the manuals for the freely programmable controllers and must be observed.
Modbus	Interface for Modbus RTU485 (as master or slave)
DL bus	DL bus interface for DL sensors (e.g. FTS-DL (with intermediate board)) Parameterisation: **DL bus** menu (any **analogue** input) Connection between DL and GND ⊥
Ext. connection Antenna	No screws should be used to secure the antenna cable – press and pull to connect and terminate. The antenna itself is intended for mounting outside the meter box. The antenna should not be fitted directly on metal (e.g. meter box).
S0 output	The connection for S0 signals is located on the device's lower terminal strip (graphic on page 11). This output can emit pulses with **max. 20 Hz** and a pulse duration of at least **25 ms**. Either power drawn from grid or power exported to grid is issued; adjustable in the standard settings.

A flow rate sensor can be connected directly to the CAN-EZ3 without an intermediate board. For this, a ribbon cable, which is available separately, is adjusted to the required length on site. This is done by pressing the 2nd plug onto the cable according to the following drawing.

Electrical measuring



3-phase measuring

All 3 phase conductors (**L1 - L3**) are connected to voltage terminals **L1-L3** and the neutral conductor to the **N** terminal. The 3 external hinged current transformers are connected to terminals **I1 – I3** in the correct sequence and folded over the wires to be measured.

For **single** measurements, it is possible to set the "**Phase simulation**" parameter in the **General settings** to "**Yes**". In this case, the values (voltage / cos phi / output) for **L2** and **L3** are simulated internally using **L1**. Phase simulation is based on a clockwise rotating field, therefore a clockwise rotating field must also be observed for current measurement at **I2** and **I3**.

This results in **less precise** measuring. When phase simulation is activated, phases L2 and L3 are

output as 0. When phase simulation is deactivated, the high-resistance voltage input may result in random values being displayed at **L2** and **L3** due to interference effects. This can be eliminated by additionally routing the neutral conductor **N** to voltage inputs **L2** and **L3**.

1-phase measuring

Only the phase conductor (to voltage terminal L1) and the neutral conductor N are connected. An external hinged current transformer is connected to terminal **I1** and folded over the wire to be measured.

The "**Phase simulation**" parameter is irrelevant for this.

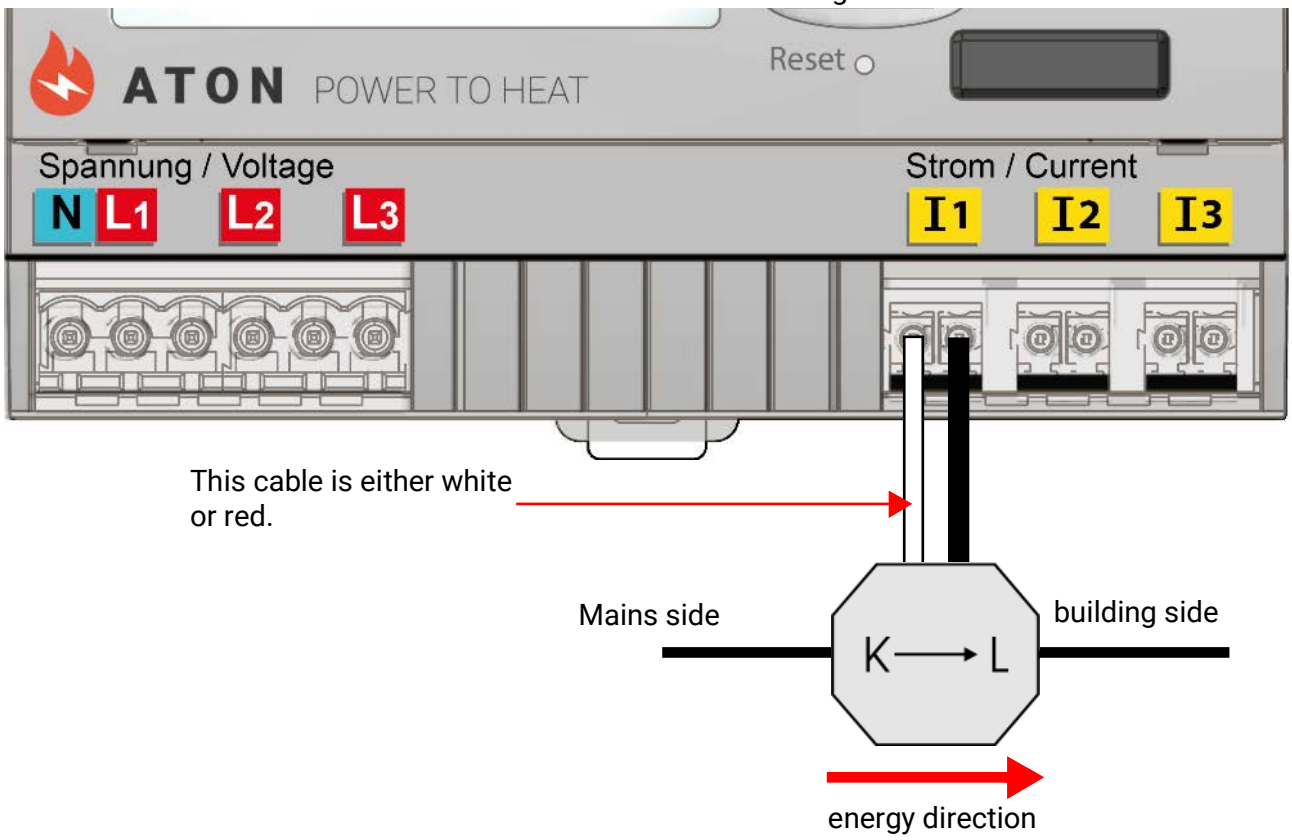
External hinged current transformers

Ensure that the current transformers are assigned correctly (**I1** to **L1**, **I2** to **L2** and **I3** to **L3**) and that the energy direction is observed.

PLEASE NOTE: Before snapping the current transformer onto the phase conductors, they must already be connected to the CAN-EZ3. Otherwise the current transformers can be damaged.

Each external current transformer is labelled with "**K** –> **L**", whereby the **energy direction must be from K to L** for positive metering.

The poles of the cable connecting the electricity sensor and the energy meter must not be swapped. The white cable must be on the left and the black cable on the right.



Each current transformer must be closed carefully by clicking the snap fastener securely into place.

If the energy direction is changed, the energy meter counts in the negative.

Installation and connection

Use in DHW cylinders

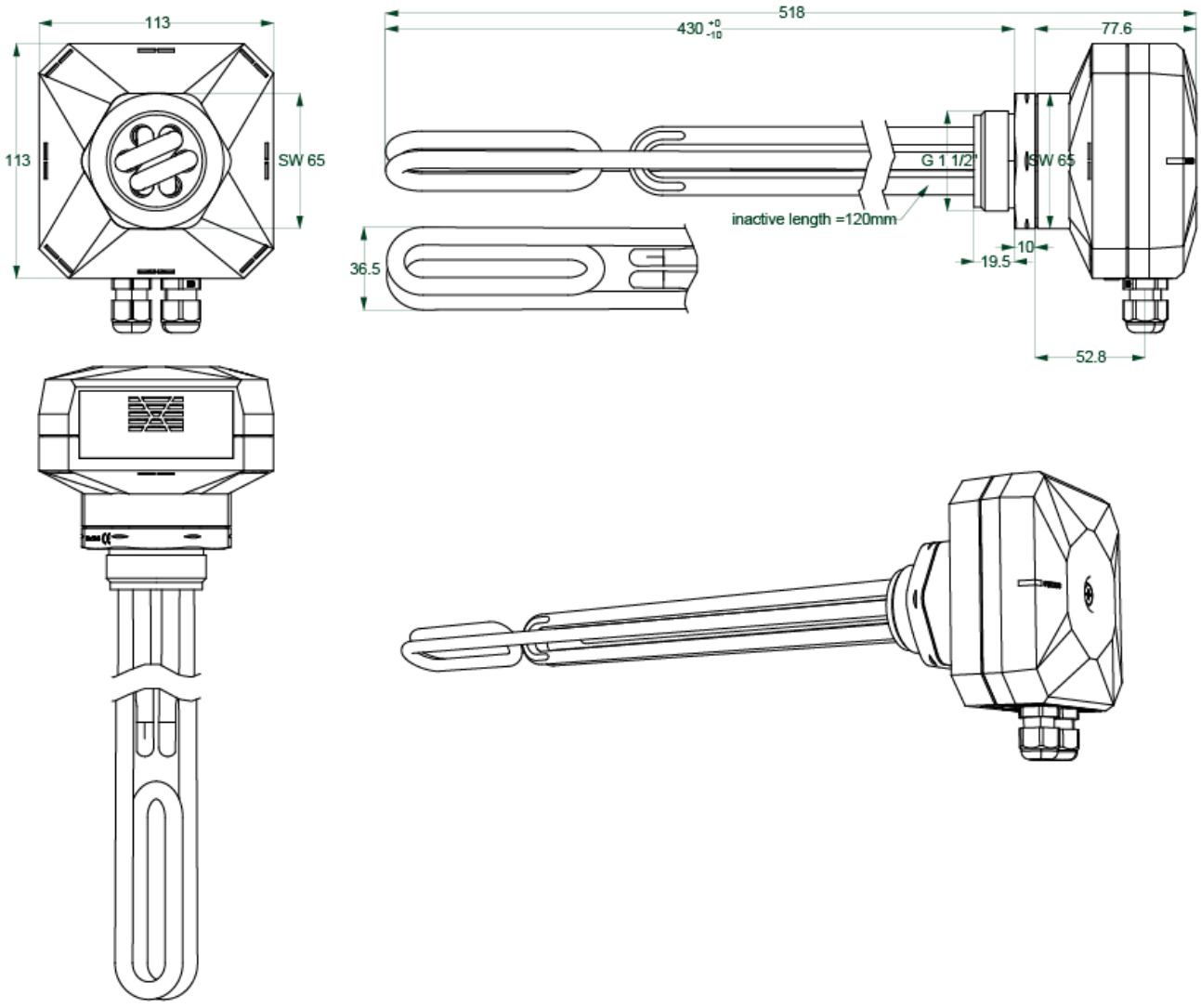
We expressly advise against using our immersion heater in DHW cylinders!

The immersion heater is intended for installation in buffer cylinders in which the same heating water always circulates.

We do not offer any guarantee or warranty in the case of limescale or galvanic corrosion!

Observe the safety requirements on page 3!

Dimensioned drawing



cold zone = distance from threaded head, which is not heated (120 mm)

The immersion heater must be installed horizontally in the cylinder. The ventilation slots must be at the top and bottom.

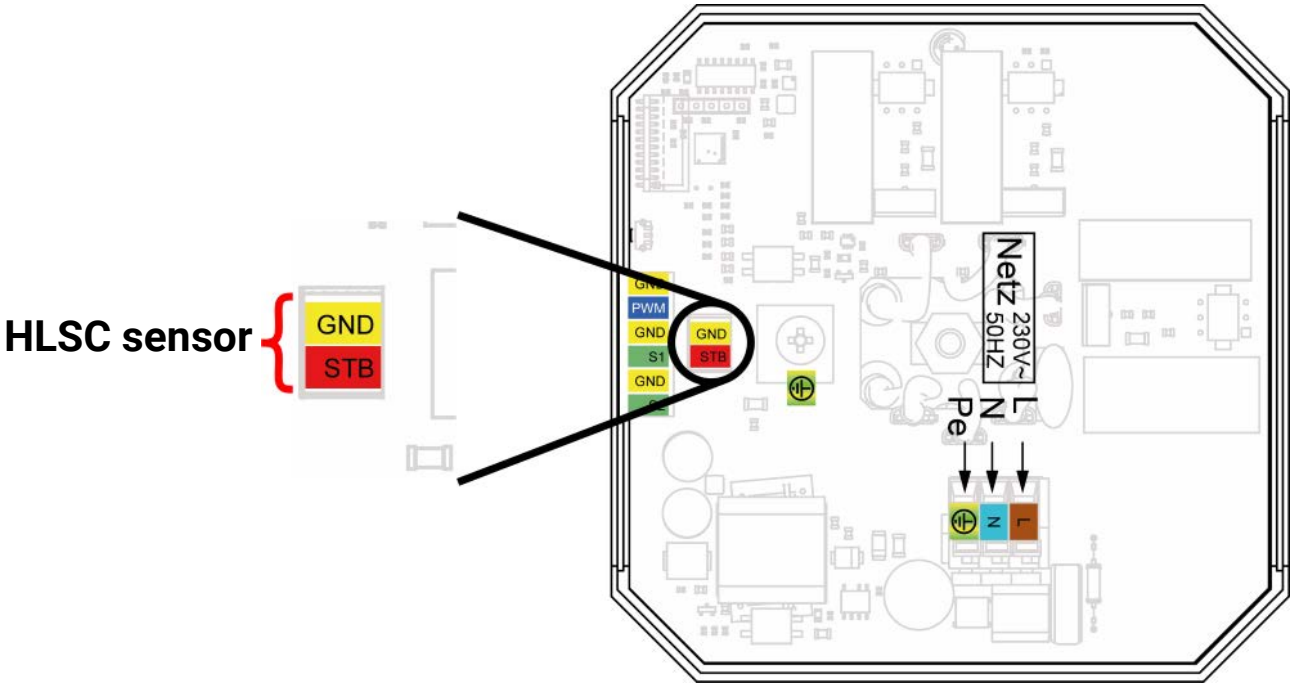
Do not start up the immersion heater if it is not in water.

High limit safety cut-out (HLSC)

The EHS-R has a sensor for the high limit safety cut-out. This is a PT1000 sensor in a sensor well between the heating elements. It is connected at the factory at the connection shown below.

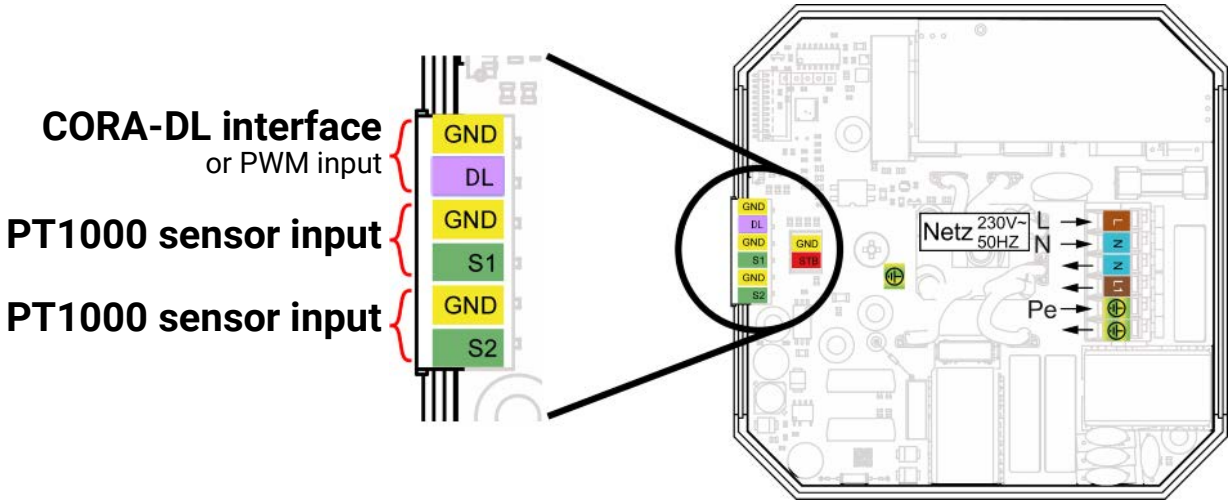
When a temperature of 95 °C is reached at the STB sensor, the immersion heater is deactivated. The immersion heater must then be restarted manually (click button once, disconnect and reconnect power cable of immersion heater, or restart via the CAN-EZ3).

The electronics temperature is also monitored. Their maximum temperature is 75 °C (5 K hysteresis).

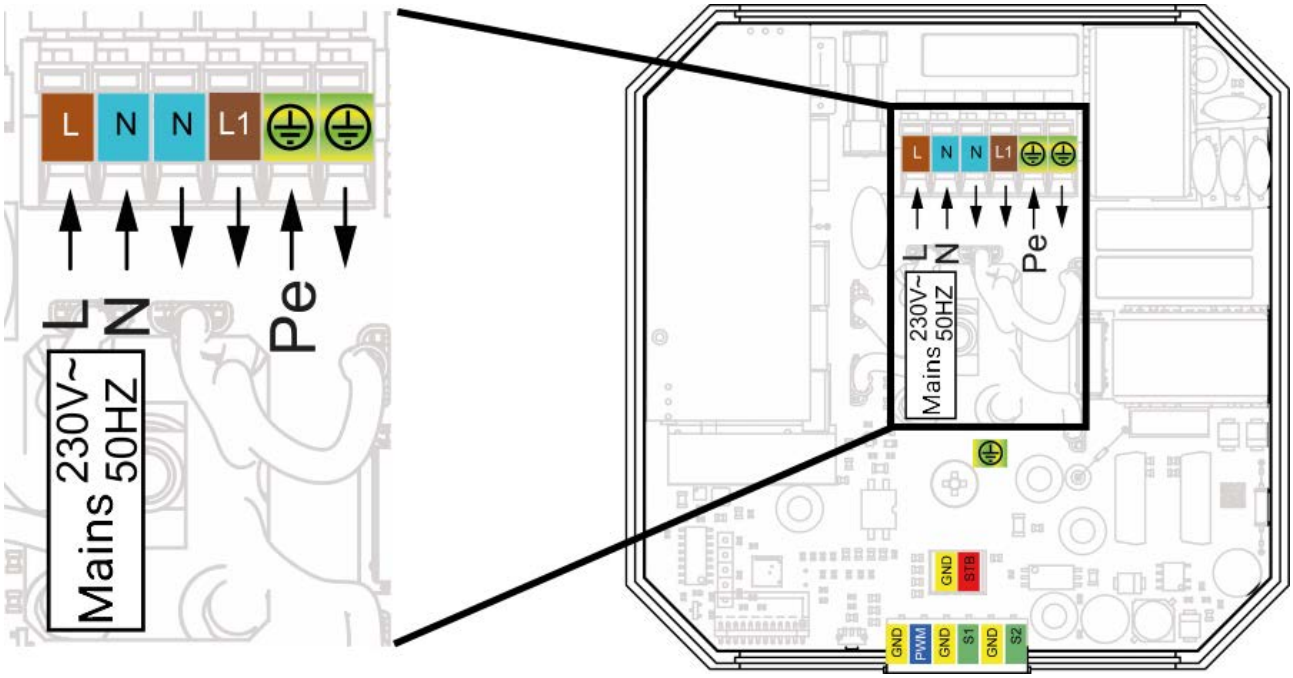


Sensor installation, PWM input

The EHS-R has 2 sensor inputs, which are only suitable for connection of **PT1000 sensors**. The measurements of these sensors are transferred via the CORA wireless connection. This establishes the connection for **PWM control**. More detailed information can be found in the chapter of the same name.



Mains connection



L	Phase
N	Neutral conductor
Pe	Earth conductor

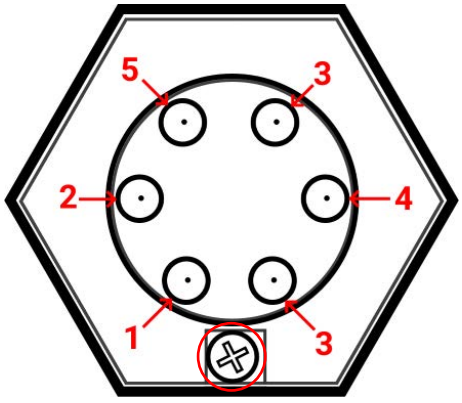
Heating elements

The 3 heating elements are connected at the factory and fully wired. For any installation/maintenance work, ensure correct wiring/connection.

The EHS-R has 3 heating elements:

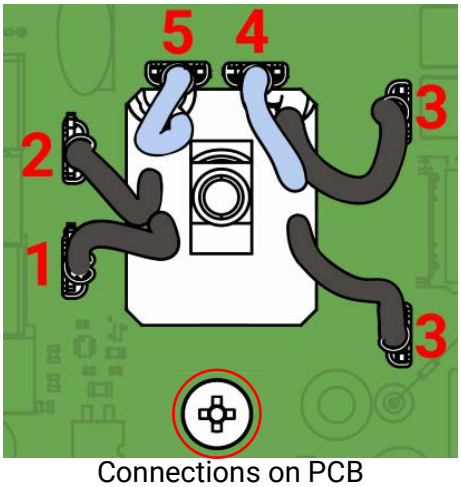
- 750 W controllable
- 750 W not controllable
- 1500 W not controllable

The connections of the heating elements (as they are routed from the threaded head and through the PCB) must not be interchanged. By the orientation of the screw at the edge of the threaded head, the heating elements and their connections can be identified.



Heating elements

1 750 W not controllable
2 1500 W not controllable
3 750 W controllable
4 Neutral conductor 1500 W not controllable
5 Neutral conductor 750 W not controllable



Connections on PCB

The two neutral conductors (**4** and **5**) can be swapped. The two connections of the controllable heating element (**3**) are reverse polarity-protected. For the remaining wires, the polarity must be observed.

Wireless system (CORA)

Principles

The wireless system comprises multiple CORA devices (e.g. CAN-EZ3 and EHS), which communicate with one another, exchange data or transfer firmware. This functionality cannot fully replace the CAN bus.

For the wireless system, the CAN-EZ3 has an external antenna. The antenna itself is intended for mounting outside the meter box. The antenna should not be fitted directly on metal (e.g. meter box).

The wireless range is around 1000 m outdoors, and typically 30 m in buildings (through approx. 2 walls/ceilings, depending on thickness and material). Up to 3 additional wireless devices can be used as a bridge to enable data to be exchanged under deviating conditions.

A CAN-EZ3 can be paired with maximum **12** CORA devices.

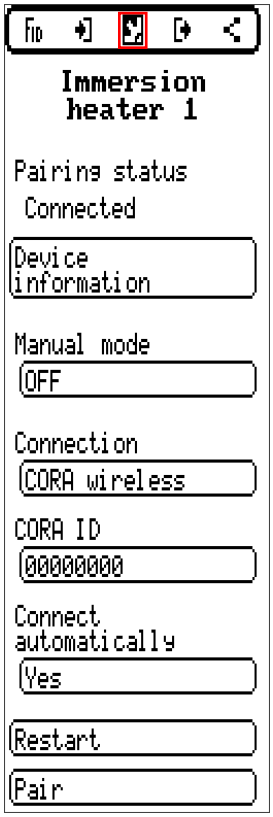
RCV-DL, GBS-F and RAS-F devices **cannot** be used.

Wireless system settings can be found in the main menu item **CORA devices.**

Pairing CORA devices

In the **ATON** set, the included **CAN-EZ3A** energy meter and the **EHS-R** immersion heater are already paired at the factory.

In the main menu, under "**CORA devices**", a **New CORA device** is selected. Once the device type has been selected, additional setting options appear.



Switch to device parameters

Pairing status

Wireless or cable connection

Specify CORA ID from target device...

...and select **Pair**

The target device must have **Allow pairing** enabled. Information about this can be found in the operating instructions for the relevant device.

To pair an additional device, navigate back to the **Devices** menu and create another **New device**.

If **Manual mode** is set to **ON**, the item **Output** appears under it. Here, you can adjust the set output for manual mode.

If **Connect automatically** is set to **Yes**, when the wireless signal is lost, the system automatically attempts to restore the connection.

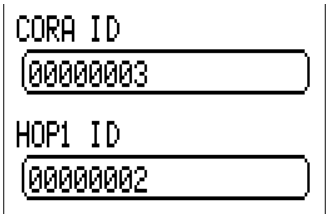
Relaying wireless signals

CORA devices can relay signals from other devices. All required settings for this are carried out at the device, which transmits the signal to be relayed. Pairing with devices that simply relay signals is not required.

During parameterisation of the CORA device, simply enter the CORA ID of the relaying devices under the items **HOP1-3** (depending on how many relays should occur).

RCV-DL, GBS-F and RAS-F devices **cannot** be used.

Example: The **CORA 1** device should control the **CORA 3** wirelessly, but cannot reach it due to the local conditions. However, **CORA 1** can reach **CORA 2**, and **CORA 2** can reach **CORA 3**.



During parameterisation on **CORA 1** (= pairing with **CORA 3**), the CORA ID of **CORA 3** is entered under **CORA ID**, and the CORA ID of **CORA 2** is entered under **HOP1**.

No settings are required on **CORA 2**. This device relays the signals independently.

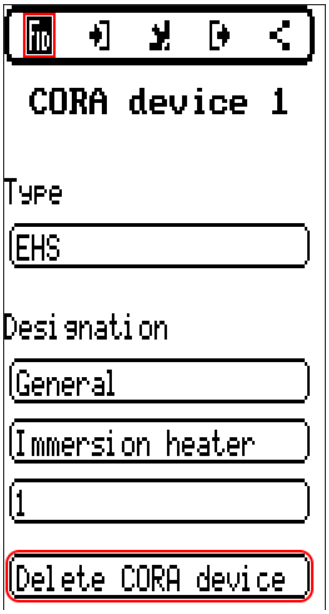
No settings are required on **CORA 3** either.

The only change to the pairing process is that CORA IDs are entered under **HOP1-3**.

To enable additional devices to relay the signal, they should be specified in the corresponding order under **HOP2** and then under **HOP3**. A data packet is sent by the transmitter to HOP1, HOP2, HOP3 and then to the target device (= "CORA ID"), where defined.

The entry **00000000** means that no relaying will occur.

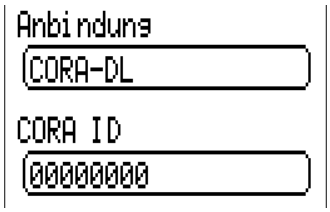
Deleting a pairing



Under the tab **FiD** is the item **Delete CORA device**.

CORA-DL (cable instead of wireless)

From version **1.08,** CORA devices can also be connected to the CAN-EZ3 via a cable. This replaces all functions of the wireless system. A CORA device **cannot be run with a wireless and a cabled connection at the same time.**

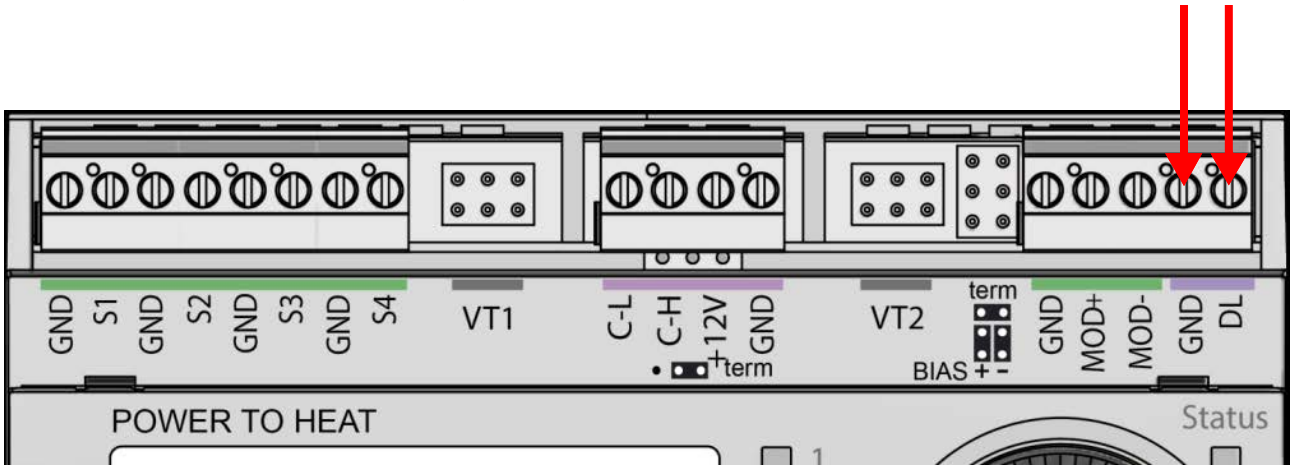


For use with a cable, set "**Connection**" to **CORA-DL** in the parameters of the set CORA device.

Under **"CORA ID",** enter the ID of the device to be connected. This can usually be found on a label on the device.

Installation

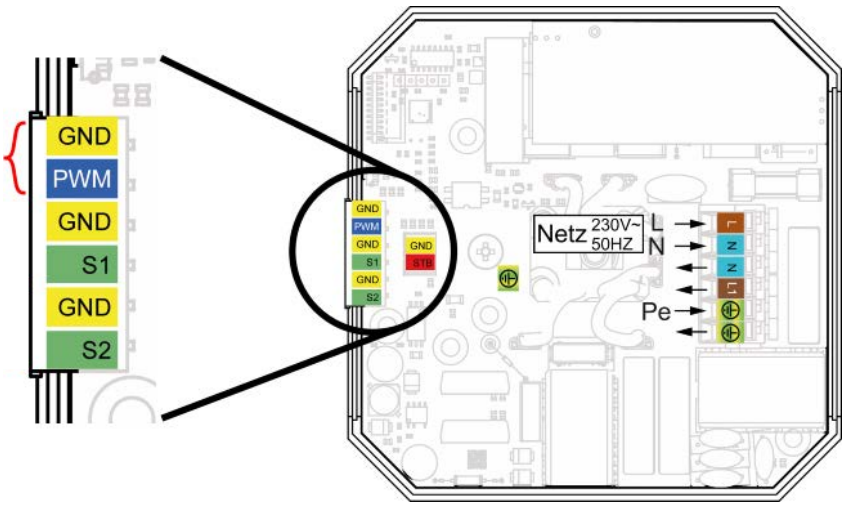
To use a CORA device via CORA-DL, connect it to the DL bus of the CAN-EZ3.



Devices connected via CORA-DL do not affect the DL bus load.

On the immersion heater:

The PWM input on the immersion heater also acts as the CORA-DL interface. The CAN-EZ3A is connected to the PWM input if wireless communication is not being used.



Control via PWM – without wireless connection

To operate the EHS-R without a wireless connection (e.g. in conjunction with controller **UVR16x2** or **CAN-EZ3** and output extension **AO4-DL**), the immersion heater has a PWM input. 10-90% PWM corresponds to 0-3000 W output, but operation only starts at min. 45 W (equates to around 12% PWM).

Important: If an active wireless connection is available (paired and signals being received), the PWM input is **inactive**. If the immersion heater is controlled via the PWM input, the wireless pairing of other devices with the EHS-R must be deleted.

For the PWM input connection graphic, see chapter ***"Sensor installation, PWM input"*.**

Notes on accuracy

The accuracy of all measured energies and energy flows depends on many factors and is to be subject to closer consideration here.

- PT1000 **class B** temperature sensors have an accuracy of +/- 0.55 K (at 50 °C).
- Errors in temperature capture by the x2 device are typically +/- 0.4 K per channel.

For an assumed spread of 10 K, these two measuring errors result in a **maximum** measuring error between the flow and return of +/- 1.90 K = **+/- 19.0 %** for class B and +/- 13.0 % for class A.

- At a lower spread, the percentage measuring error **increases**
- The accuracy of the FTS 4-50DL flow sensor is approx. **+/- 1.5 %**
- The measuring error of electrical energy capture is +/- 3 % (at cos phi = 0.6)

In the **worst case** scenario, the maximum overall measuring error for heat metering therefore equals:

$$1.19 \times 1.015 = 1.208$$

This means heat metering accuracy of **+/- 20.8 %** in the **worst case scenario** (at 10 K spread, **without calibrating** the temperature sensors), although all measuring errors would then skew the results to the **same** extent.

Experience has shown that a worst case scenario **never** actually occurs and in an unfavourable scenario, half of this value can be expected. However, even 10.4 % is not justifiable.

After **calibrating** the temperature sensors (see above), the measuring error of the overall temperature measurement reduces to a maximum 0.3 K. Relative to the spread of 10 K as assumed above, this equals a measuring error of 3 %.

The maximum overall measuring error for the performance factor therefore equals:

$$1.03 \times 1.015 = 1.045$$

At a **10 K spread** and **with calibrated** temperature sensors, heat metering accuracy therefore improves for the **worst case scenario** to **+/- 4.5 %.**

Reset

Pressing the reset button **briefly** (with a narrow-tip pen) restarts the energy meter (= reset).

Total reset: pressing **and holding down** the button triggers a continuous tone, then a single high beep, followed by a total reset.

A **total reset** deletes all function modules, the parameter settings for all inputs and outputs, bus inputs and outputs, fixed values, system values and the CAN bus settings.

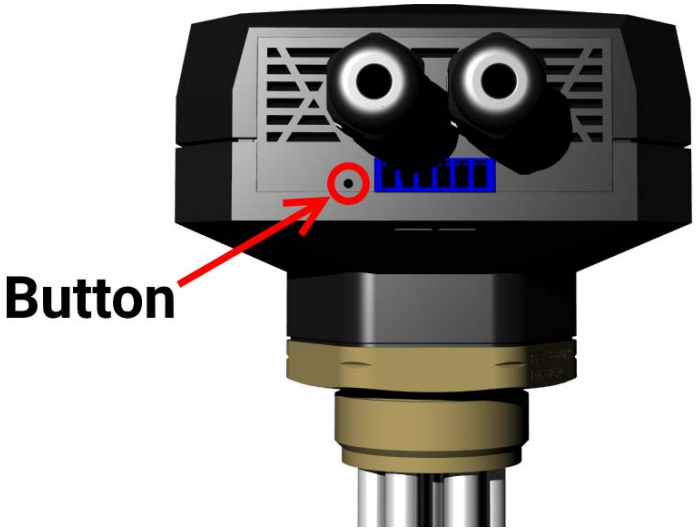
LED status indicators

LED indicators at device start-up

Control indicator	Explanation
Flashing green light	After start-up and hardware initialisation, the CAN-EZ3 waits about 30 seconds to receive all the information necessary for function (sensor values, network inputs)
Steady green light	Normal CAN-EZ3 operation

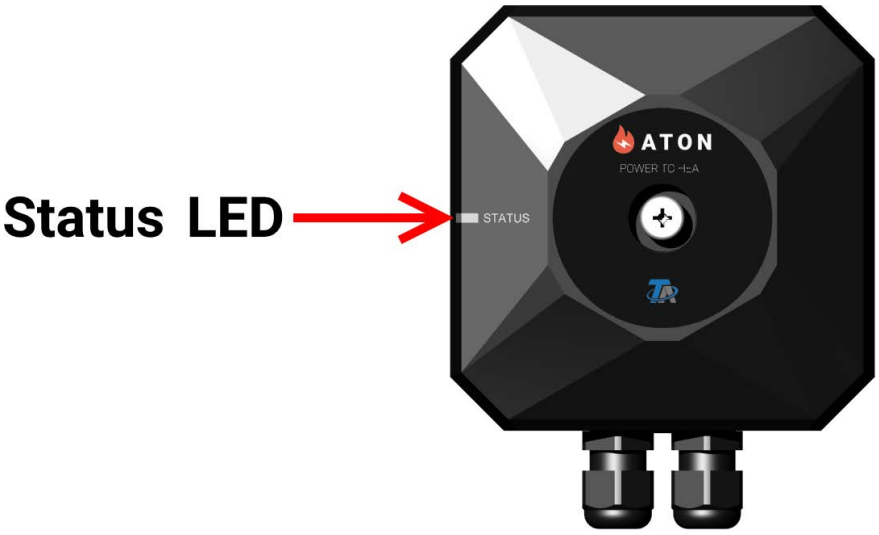
Reset/pairing

The button is pressed using a narrow-tip pen.



Double click (two clicks within 2 seconds)	Allow pairing for 5 minutes (see chapter "Wireless system") The LED flashes green rapidly for 3 seconds to confirm.
10-second click	Total reset (hold until the LED shows a green light for 1 second) After a total reset, pairing is allowed until the first successful pairing attempt, with no time limit.
Click once	Reset (software restart)

LED status indicators



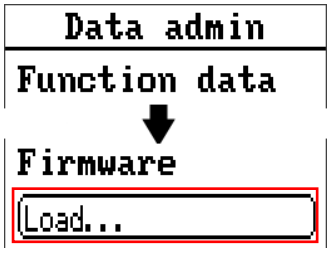
Possible LED indicators

Control indicator	Explanation
Green, steady light	Set output **0 W** is preset wirelessly or via CORA-DL **or** Set output via PWM input **> 0 W** but **< 50 W**
Green, slow flashing	Set output > 0 W is preset wirelessly
Green, quick flashing	Set output > 0 W is preset via PWM input
	If the LED flashes rapidly for only 3 seconds, pairing has been permitted via the pushbutton.
Orange/red alternate, slow flashing	Faulty circuit breaker
Orange, steady light	No wireless signal received for at least 2 minutes and no PWM signal received
Orange, slow flashing	Immersion heater excess temperature (HLSC >95 °C) – a re-start is required (via CORA connection or briefly cut the power supply)
Orange, quick flashing	Casing/PCB excess temperature (>75 °C)
Red, steady light	Internal fault
Red, slow flashing	Wireless chip error
Red, quick flashing	EEPROM error

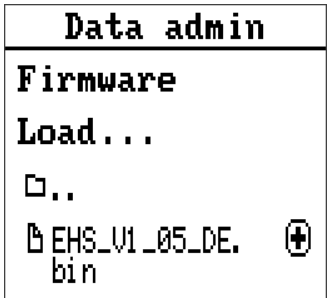
Firmware-Update via CAN-EZ3

The firmware of the EHS-R immersion heater can be updated via a wireless CAN-EZ3 (see chapter "Wireless system" on page 10).

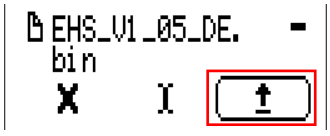
The firmware file of the EHS-R must be located on the SD card of the CAN-EZ3.



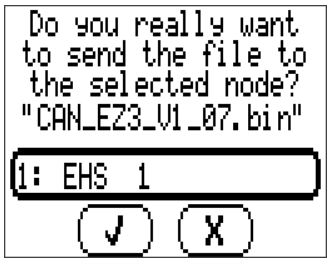
In the Data admin menu, navigate down to Firmware. Select Load... below this.



Select the plus symbol next to the required firmware file (not the file itself).



In the toolbar that appears, select the arrow symbol for sending data.



In the list, select the corresponding device (only paired CORA devices are shown) and confirm with ✓.

The firmware update starts. It may take a few minutes.

Technical data

Important information about the measuring limits of the electrical energy meter:

1. If the effective power value is available as kW only, then cos phi must be observed.
2. The consumer load must lie within the specified power limits.
3. As the power consumption of heat pumps with frequency converters (inverters) is not sinusoidal, there is a risk of over control of the measuring movement resulting in a measurement error. The actual peak current must never exceed 70 A for 50 A current transformers, 140 A for 100 A current transformers and 430 A for 400 A current transformers.

Rated voltage consumer	3 x 400/230V 50 Hz
Power range with 1- or 3-phase connected consumer	Max. **10 kVA** per phase for **50 A** current transformers Max. **20 kVA** per phase for **100 A** current transformers Max. **70 kVA** per phase for **400 A** current transformers
Resolution	10 VA
Maximum cable diameter for current transformers:	10 mm Ø for standard current transformers (50 A) 16 mm Ø for special version of current transformers (100 A)
Accuracy of power measurement	± (**10 W + 3 %** of current power) for **50 A** current transformers ± (**20 W + 3 %** of current power) for **100 A** current transformers ± (**80 W + 3 %** of current power) for **400 A** current transformers
Current transformer cable length	1 m
Sensor inputs 7, 8 (via VT1 and VT2)*	Inputs for flow rate from FTS flow sensors (pulses)
Frequency of wireless system	868.5 MHz
DL bus interface	For electronic sensors via DL-bus
DL bus load	100%
SD card	Micro SD with FAT32 formatting
Dimensions W x H x D	107 x 95 x 64 mm
Max. ambient temperature	0°C bis 45°C
IP rating	IP10
Protection class	II - double insulated

Connections VT1 and DI1 (= input 7) and VT2 and DI2 (= input 8) cannot be used at the same time (e.g. the use of VT1 and DI2 is possible).

Technical data

Power consumption	max. 3000W (depending on specified set output)
Nominal voltage	230V, 50 Hz
Surface heat output	< 10 W/cm^2
Cold zone	120mm (± 10mm)
Screw	G 1 ½“ SW 65
Fuse	6,3A fast (only for adjustable heating element and electronics)
Wire size	3 x 1,5 mm^2
Dimensions	*see **„Dimensioned drawing“***
PWM-input	400 Hz - 4 kHz 9-13 V
Frequency of wireless system	868.5 MHz
Transmission output	-10 dBm
Sensor inputs	PT1000
DL bus load (when using CORA-DL)	10 %
Heating element material	stainless steel 1.4541

Subject to technical modifications as well as typographical and printing errors. This manual is only valid for devices with the corresponding firmware version. Our products are subject to constant technical advancement and further development. We therefore reserve the right to make changes without prior notice.

EU Declaration of conformity

Document- No. / Date:	TA19001, 19.07.2019
Company / Manufacturer:	Technische Alternative RT GmbH
Address:	A-3872 Amaliendorf, Langestraße 124

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Product name:	CAN-EZ3, CAN-EZ3A
Product brand:	Technische Alternative RT GmbH
Product description:	CAN energy meter

The object of the declaration described above is in conformity with Directives:

2014/35/EU	Low voltage standard
2014/30/EU (11/09/2018)	Electromagnetic compatibility
2011/65/EU (01/10/2022)	RoHS Restriction of the use of certain hazardous substances

Employed standards:

EN 60730-1:2021-06	Automatic electrical controls - Part 1: General requirements
EN IEC 61000-6-3:2022-06	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential environments
EN IEC 61000-6-2:2019-11	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments
EN IEC 63000:2019-05	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
EN 300220-2:2018-09	Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz - Part 2: Harmonised Standard for access to radio spectrum for non specific radio equipment
EN 301489-1:2020-06	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services - Part 1: Common technical requirements - Harmonised Standard for ElectroMagnetic Compatibility
EN 301489-3:2019-08	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services - Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz
EN 62479:2011-09	Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

Position of CE - label: On packaging, manual and type label

CE

Issuer:	Technische Alternative RT GmbH A-3872 Amaliendorf, Langestraße 124

This declaration is submitted by

Dipl.-Ing. Andreas Schneider, General manager,
19.07.2019

This declaration certifies the agreement with the named standards, contains however no warranty of characteristics

The security advices of included product documents are to be considered.

EU Declaration of conformity

Document-Nr. / Date:	TA19002, 19/07/2019
Company/Manufacturer:	Technische Alternative RT GmbH
Address:	A-3872 Amaliendorf, Langestraße 124

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Product name:	EHS, EHS-R
Product brand:	Technische Alternative RT GmbH
Product description:	Electronic immersion heater

The object of the declaration described above is in conformity with Directives:

2014/35/EU	Low voltage standard
2014/30/EU (11/09/2018)	Electromagnetic compatibility
2011/65/EU (01/10/2022)	RoHS Restriction of the use of certain hazardous substances

Employed standards:

EN 60730-1:2021-06	Automatic electrical controls - Part 1: General requirements
EN IEC 61000-6-3:2022-06	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential environments
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Position of CE - label: On packaging, manual and type label

CE

Issuer:	Technische Alternative RT GmbH A-3872 Amaliendorf, Langestraße 124

This declaration is submitted by

Dipl.-Ing. Andreas Schneider, General manager,
19/07/2019

This declaration certifies the agreement with the named standards, contains however no warranty of characteristics.

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Warranty conditions

Note: The following guarantee conditions do not in any way limit the legal right to warranty, but rather expand your rights as a consumer.

1. The company Technische Alternative RT GmbH provides a one-year warranty from the date of purchase for all the devices and parts which it sells. Defects must be reported immediately upon detection and within the guarantee period. Technical support knows the correct solution for nearly all problems. In this respect, contacting us immediately will help to avoid unnecessary expense or effort in troubleshooting.

2. The warranty includes the free of charge repair (but not the cost of on site fault-finding, removal, refitting and shipping) of operational and material defects which impair operation the event that a repair is not, for reasons of cost, worthwhile according to the assessment of Technische Alternative, the goods will be replaced.

3. Not included is damage resulting from the effects of over-voltage or abnormal ambient conditions. Likewise, no warranty liability can be accepted if the device defect is due to: transport damage for which we are not responsible, incorrect installation and assembly, incorrect use, non-observance of operating and installation instructions or incorrect maintenance.

4. The warranty claim will expire, if repairs or actions are carried out by persons who are not authorised to do so or have not been so authorised by us or if our devices are operated with spare, supplementary or accessory parts which are not considered to be original parts.

5. The defective parts must be sent to our factory with an enclosed copy of the proof of purchase and a precise description of the defect. Processing is accelerated if an RMA number is applied for via our home page www.ta.co.at. A prior clarification of the defect with our technical support is necessary.

6. Services provided under warranty result neither in an extension of the warranty period nor in a resetting of the warranty period. The warranty period for fitted parts ends with the warranty period of the whole device.

7. Extended or other claims, especially those for compensation for damage other than to the device itself are, insofar as a liability is not legally required, excluded.

Technische Alternative RT GmbH
A-3872 Amaliendorf, Langestraße 124
Tel.: +43 (0)2862 53635 Fax +43 (0)2862 53635 7
E-Mail: mail@ta.co.at --- www.ta.co.at ---