

EHS-R

REGULATEABLE IMMERSION HEATER



Installation

Table of contents

Safety requirements	4
Maintenance	5
Disposal	5
Functional description	6
Programming	6
Wireless control	6
Wired control (PWM)	6
Installation and connection	7
Dimension drawing	7
Safety temperature limiter (HLSC)	8
Sensor installation, PWM-input	8
Mains connection	9
Heating elements	9
Wireless system	10
Basics	10
Coupling devices	10
Transmitted values	10
Fault codes	10
Forwarding of wireless signals	11
Reset / Coupling	12
LED status indicators	12
Possible LED indications	13
Technical data	14

Safety requirements



All installation and wiring work must only be carried out in a zero volt state. Opening, installing and commissioning the device may only be carried out by competent personnel. All applicable local safety requirements must be adhered to.

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.

- Wiring work or exposing the circuit board of the immersion heater for any purpose must only take place in **dry** rooms.
- It must be possible to isolate the immersion heater from the mains using an omnipolar isolating facility (plug/socket or 2-pole isolator).
- The immersion heater may only be plugged into any power socket using the enclosed connector cable. The connector cable should already be wired up when connecting the immersion heater. The power socket must be fused with at least 16 A.
- No extension cables, power distributors or cable drums may be used.
- Before beginning with installation or wiring work, the immersion heater must be isolated from any voltage and has to be safe from being introduced to any voltage.
- Never pull at the cable and do not unplug the mains connector from the power socket by pulling at the cable.
- The immersion heater can no longer be safely used if visibly damaged, no longer functional or stored for a longer time under adverse conditions. If this is the case, any affected device or utility must be put out of order and must be protected from unintentional reintroduction into usage.
- Heat-sensitive components of systems (e.g. plastic lines) must be safeguarded (e.g. thermal temperature limitation for floor heating), that prevent overheating in the case of failure of a system's components.
- High temperatures may arise on the immersion heater, this must be minded during wiring and installation work. Never touch the immersion heater with wet/moist hands. Wearing isolated shoes during installation is recommended.

Maintenance

When used appropriately, the devices requires no maintenance. Usage of an appropriate **sacrificial anode** in the cylinder is recommended, as well as checking said anode's material integrity more often than usual (at least 2-3 times a 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 cannot be calibrated. Thus applying any compensation is impossible.

The design characteristics of the device must not be changed during repairs. Spare parts must correspond to the original spare 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 must never be treated as ordinary household waste.

- We can undertake the environmentally responsible disposal of devices sold by Technische Alternative 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.

Functional description

The immersion heater **EHS** has two variants:

- **EHS-R**: stagelessly regulatable ranging from 50W to 3000W
- **EHS**: static power range of 0-3000W in increments of 750W

A cascade can be realized by combining an EHS-R (regulatable) with one or several EHS (not regulatable), wherein the EHS-R undertakes fine adjustments, which in turn achieves a stageless regulation of power.

Both variants can be wirelessly controlled by a **CAN-EZ3** to regulate power and interchange values. Alternatively, the immersion heater has a PWM-input for direct regulation of power (wired connection).

Further details regarding the wireless system can be found in the chapter of the same name.

Programming

The immersion heater does not require any programming, its power output is regulated by other devices. If the immersion heater is used together with freely programmable devices, the use of the functions **Energy manager** and **Output control** is recommended (further details in the manuals titled „**Functions**“ of freely programmable controllers).

Wireless control

For wireless control, the immersion heater must be coupled with the device that is intended to control it. If a CAN-EZ3A and an EHS-R have been purchased together in the set **ATON**, the two are coupled by default.

Further details regarding the wireless system can be found in the chapter of the same name.

Wired control (PWM)

To use the EHS-R without a wireless connection (e.g. with a controller UVR16x2), the immersion heater has a PWM-input. 10-90% PWM equate to 0-3000W power, operation begins at 45W (roughly 12% PWM).

Caution: If there is an active wireless connection (device is coupled and signals are received), the PWM-input is **inactive**. If the immersion heater is to be regulated using the PWM-input, the wireless coupling with the EHS-R must be deleted.

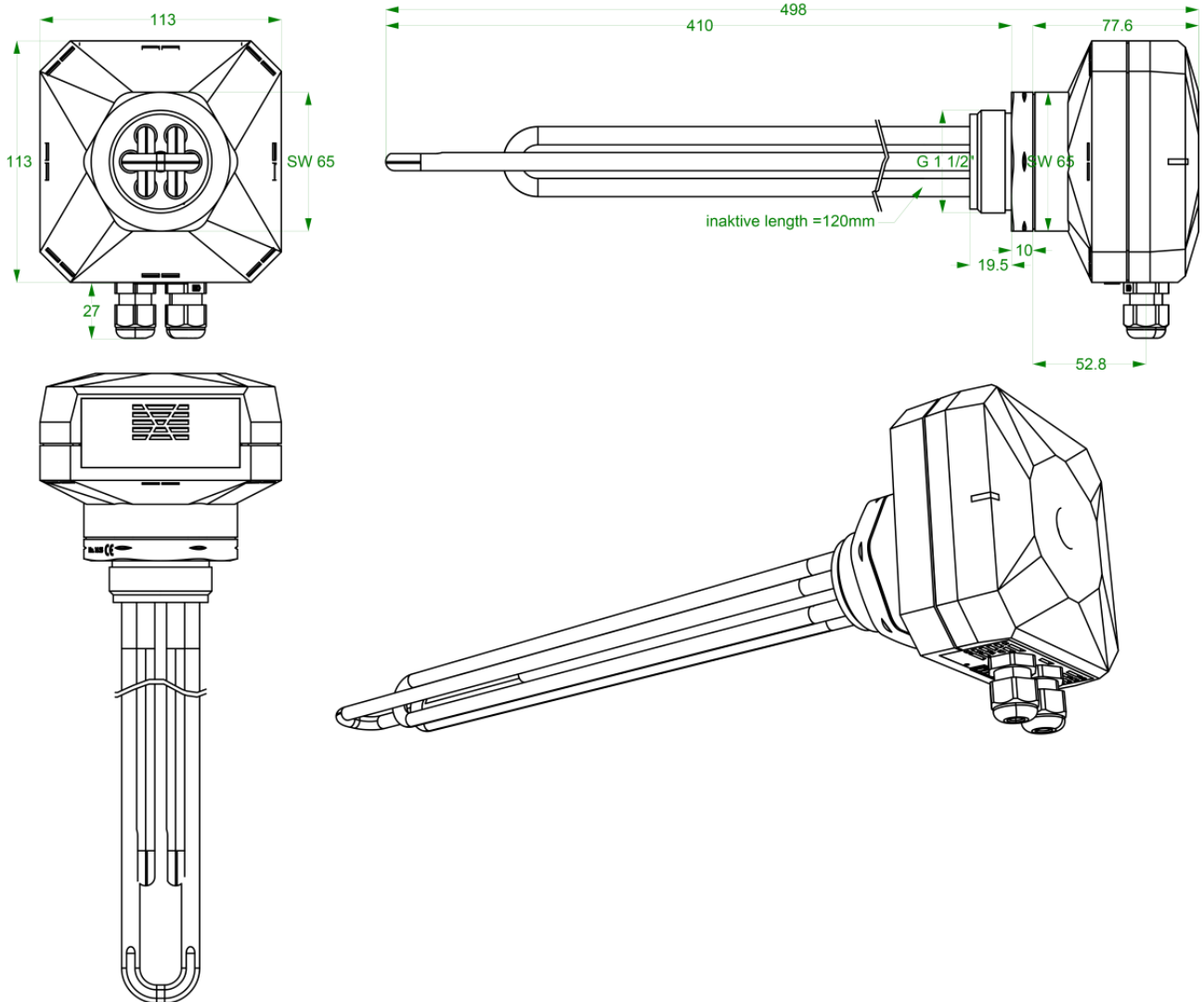
For an illustration of the PWM-input, see chapter „**Sensor installation, PWM-input**“.

Installation and connection



As far as the materials are concerned, the immersion heater is suitable for installation in DHW cylinders. However, due to the electroplating in cylinders, metals less precious than that of the heating elements are damaged. The usage of an appropriate sacrificial anode and its frequent examination (at least 2-3 times a year) are recommended. Otherwise, damages to other entry points into the cylinder or the cylinder itself are at risk.

Dimension drawing



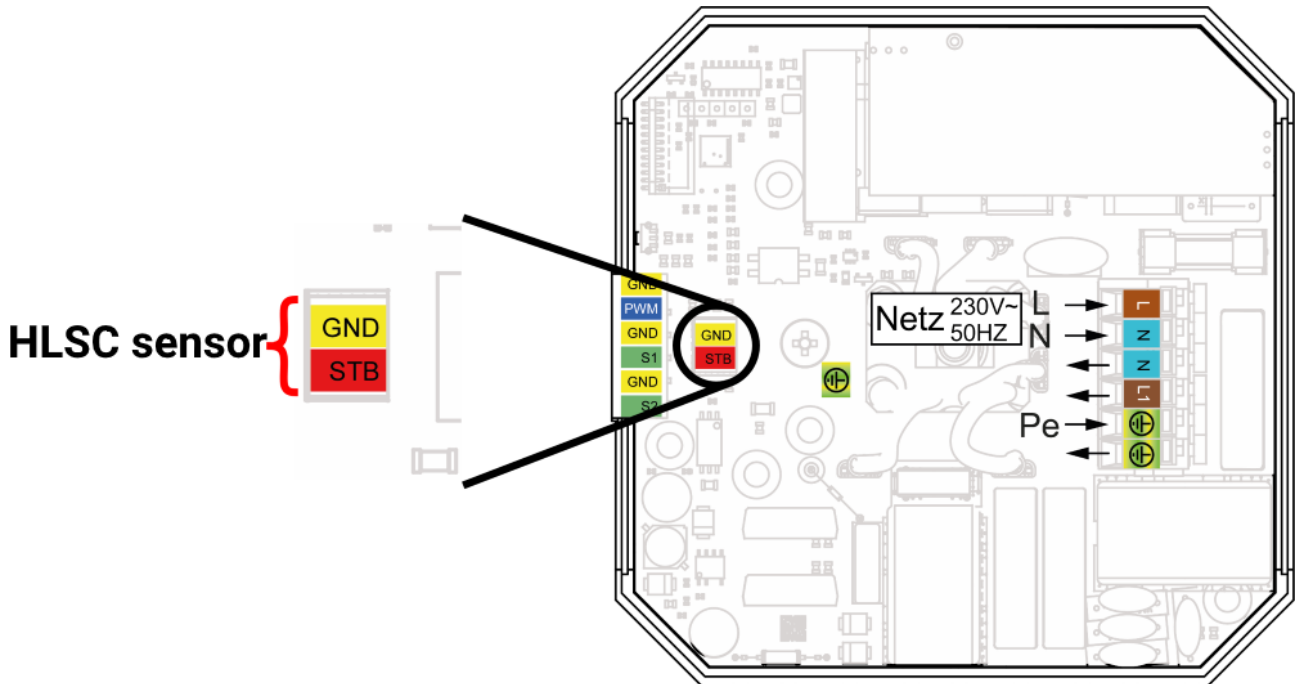
inactive length = distance from the screw head that is not heated (120 mm)

Safety temperature limiter (HLSC)

The EHS-R is equipped with a sensor to limit temperatures. This is a PT1000 sensor located in an immersion pocket between the heating elements. This sensor is installed and connected by default, as illustrated below. („STB“ is the German acronym for „HLSC“).

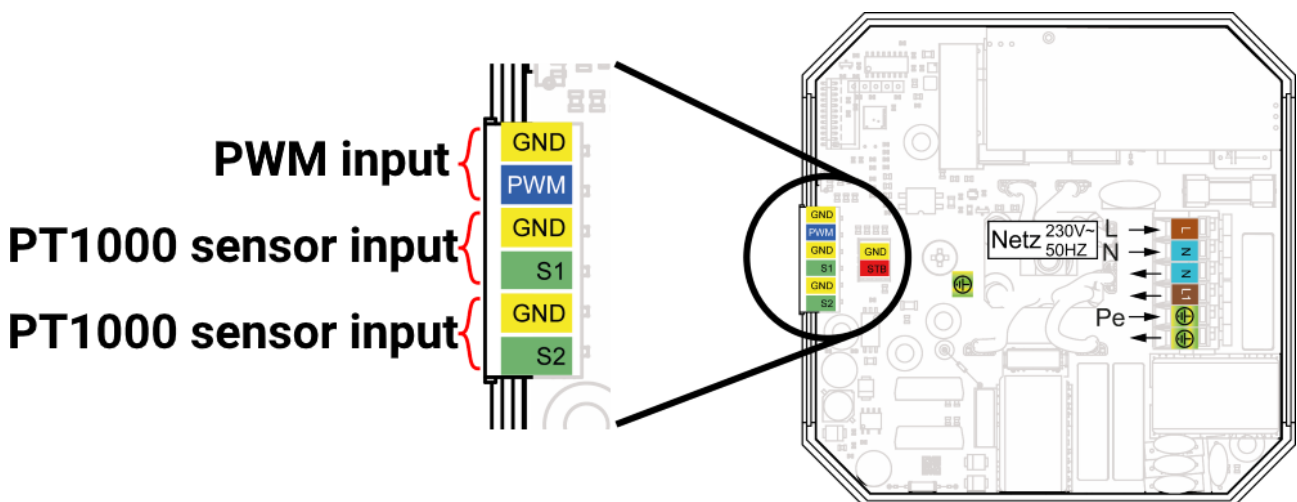
If the HLSC-sensor reaches a temperature of 95°C, the immersion heater is shut off. Only once the temperature on that sensor falls below 90°C, it may be reactivated (hysteresis of 5K).

Additionally, the temperature of the circuit board is monitored. Its maximum permissible temperature is 75°C (hysteresis of 5K).

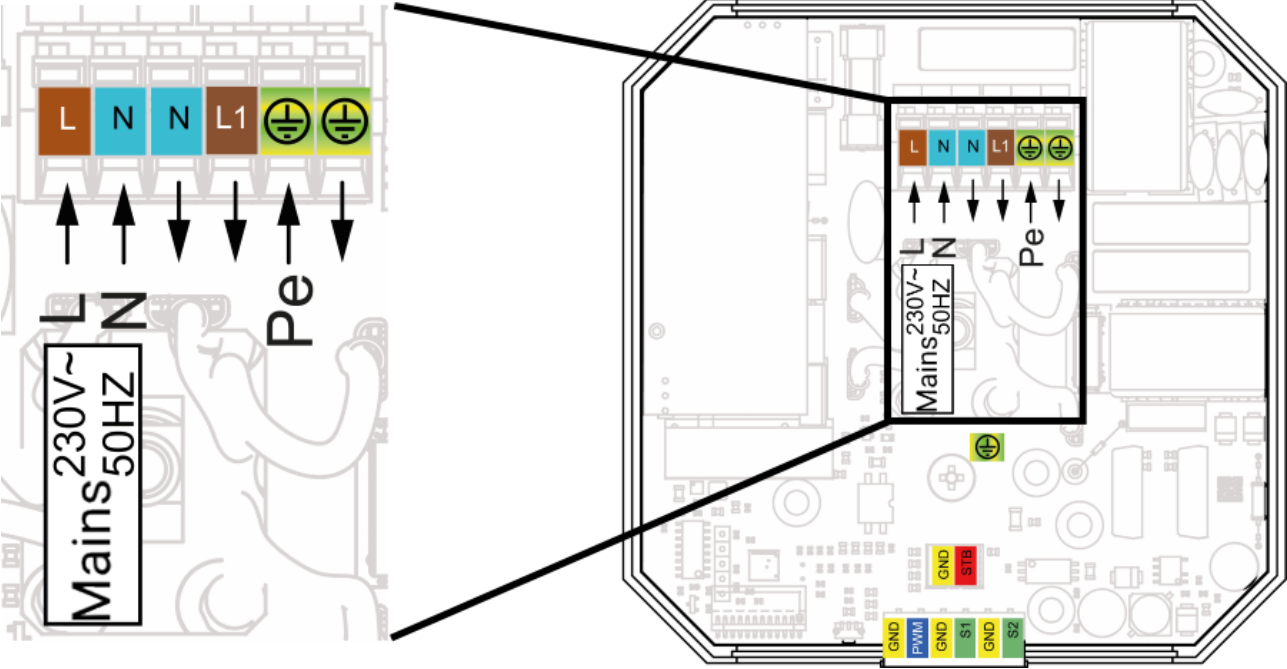


Sensor installation, PWM-input

The EHS-R features 2 sensor inputs which are only suitable for connection of **PT1000 sensors**. The wireless CORA-connection serves to transmit those sensor measurements, among other values. Above it, the interface for **control via PWM** is situated. Further information can be found in the chapter *Wired control (PWM)*.



Mains connection



L	Phase conductor
N	Neutral conductor
Pe	Earth conductor

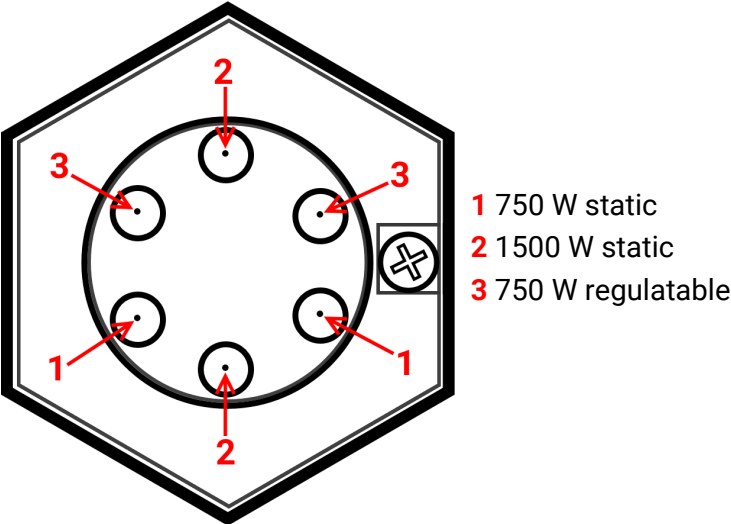
Heating elements

The 3 heating elements are by default connected and correctly wired up. Ensure to retain correct wiring and connectivity after any mounting and maintenance work.

The EHS-R has 3 heating elements:

- 750 W regulatable
- 750 W static
- 1500 W static

The wires of the heating elements (as they are lead out of the screw head and the circuit board) must not be mixed up. The wires can be identified using the screw on the side as an orientation, as illustrated below.



Wireless system

Basics

The wireless system consists of at least two devices (e.g. CAN-EZ3 and EHS-R) that communicate with one another, interchange values and transmit firmware/function data.

The range of the wireless signals is roughly 1000m when unobstructed, but typically 30m in buildings (through roughly two walls/floors, depending on material and thickness). Up to three other compatible wireless devices can be used as a bridge to interchange signals beyond these limitation.

This wireless system **incompatible** with the devices RCV-DL, GBS-F and RAS-F.

Coupling devices

The process of coupling devices consists of two steps:

1. **Allowing** the coupling on the target device
2. **Initiating** the coupling on the operating device

To allow the coupling on the EHS-R (= target device), the button on the casing must be **double clicked** (= 2 clicks within 2 seconds). Following that, coupling is allowed for **5 minutes** (see chapter „Reset / coupling“).

On the operating device, the CORA ID of the EHS-R must be entered.

The coupling process on other devices (operating devices) is detailed in their manuals.

If a CAN-EZ3A and an EHS-R have been purchased together in the set **ATON**, the two are coupled by default.

Transmitted values

The following values are transmitted to the coupled device from the EHS-R (not adjustable):

Timeout	Digital value Yes/No („Yes“ if wireless connection timed out)
Current output	Current power output of the EHS-R
<i>Higher output level</i>	<i>Only used for internal calculation</i>
<i>Lower output level</i>	
Temperature 1	Temperature on sensor input 1 (PT1000-Sensor)
Temperature 2	Temperature on sensor input 2 (PT1000-Sensor)
Temperature HLSC	Temperature of the sensor for safety shutdown (HLSC)
Electronics temperature	Temperature of the circuit board
Fault code	If a fault is detected, the relevant fault code is output via this value

Fault codes

If the variable **Fault code** is set to **0**, no fault is detected. For every detected fault, the corresponding number is added to the variable, as listed below.

Fault codes	Description
+1	Fuse defective
+2	Overtemperature on the HLSC
+4	Overtemperature on the circuitry

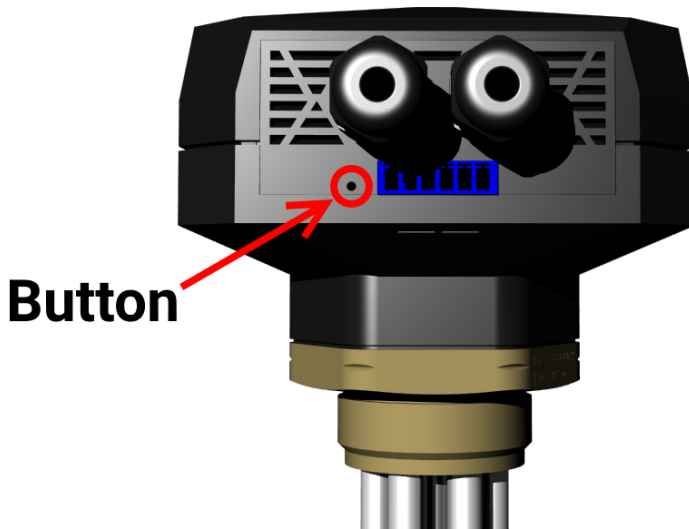
Forwarding of wireless signals

Devices capable of transmitting wireless signals can also forward them. All necessary settings are made on the device that sends out the signals to be forwarded. The EHS-R can be used to forward signals in this manner.

If the immersion heater receives signals to be forwarded, it automatically transmits signals back based on received data. No settings on the EHS-R are necessary in order for it to forward signals.

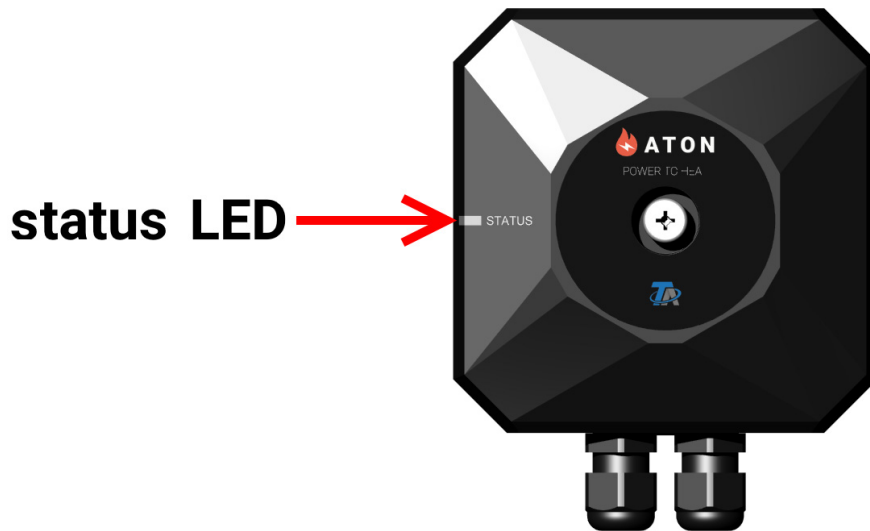
Reset / Coupling

A slim pin must be inserted to push the button.



Double click (two clicks within two seconds)	Coupling allowed for 5 minutes (see chapter „Wireless system“)
10 seconds click	Total reset (hold button, until the LED flashes green for one second)
Single click	Reset (software reboot)

LED status indicators



Possible LED indications

Status LED	Description
Green, continuous	Set output of 0 W is received wirelessly
Green, slow flashing	Set output > 0 W is received wirelessly
Green, fast flashing	Set output > 0 W is received via PWM-input
Alternating red/orange, slow flashing	Fuse defective
Orange, continuous	No wireless signal or PWM-signal received for 2 minutes
Orange, slow flashing	HLSC overtemperature (> 95 °C)
Orange, fast flashing	Electronics/circuitry overtemperature (>75 °C)
Red, continuous	Internal error
Red, slow flashing	Wireless chip error
Red, fast flashing	EEPROM error

Technical data

Power consumption	max. 3000W (depending on 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
Wire size	3 x 1,5 mm ²
Dimensions	see „ <i>Dimension drawing</i> “
PWM-input	max. 10V
Sensor inputs	PT1000

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.

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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 Electromagnetic compatibility
2011/65/EU RoHS Restriction of the use of certain hazardous substances

Employed standards:

EN 60730-1: 2011	Automatic electrical controls for household and similar use – Part 1: General requirements
EN 61000-6-3: 2007 +A1: 2011 + AC2012	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
EN 61000-6-2: 2005 + AC2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 50581: 2012	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

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



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

This declaration is submitted by

A handwritten signature in black ink, appearing to read 'Schneider Andreas', written in a cursive style.

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.

Warranty conditions

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

1. 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 can supply the correct solution for almost every known problem. In this respect, contacting us immediately will help to avoid unnecessary expense and effort in troubleshooting.
2. The guarantee includes free repair (but not the cost of on-site fault finding, removal, refitting and shipping) due to operational and material defects which impair operation. In the event that a repair is not economical in the opinion of Technische Alternative for reasons of cost, the goods will be replaced.
3. Not included is damage resulting from the effects of a voltage surge or abnormal ambient conditions. Likewise, no liability can be accepted if the device defect is due to: transport damage for which we are not responsible, incorrect assembly and installation, incorrect use, failure to observe the operating and installation instructions or incorrect maintenance.
4. The guarantee will become void if repairs or actions are carried out by people who are not authorised to perform them or have not been so authorised by us or if our devices are operated with spare parts, auxiliary parts or accessories that are not considered to be original parts.
5. The defective parts must be returned to our factory with a copy of the proof of purchase and a precise fault description. Processing is accelerated if an RMA number is requested via our homepage www.ta.co.at. The defect must be clarified with our technical support beforehand
6. Services provided under guarantee result neither in an extension of the guarantee period nor in a commencement of a new guarantee period. The guarantee period for fitted parts ends with the guarantee period of the whole device.
7. Further or other claims, especially those for compensation for damage other than to the device itself, insofar as a liability is not legally required, are excluded.

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