

Operation and Maintenance Manual

Electric Hot Water Boiler



ECOTHERM is the leading brand for turnkey hot water, steam & solar systems for hotels, hospitals and the industry.

ECOTHERM amazes its customers with „Individual Heat Transfer Solutions“ for hot water and steam generation. The following advantages mark these solutions:

Individuality

ECOTHERM produces extensive turnkey systems as well as separate components. Each plant is specifically aligned to the customer's individual requirements. The base is our own production facility in Austria and a wide product portfolio, which enables the combination of all relevant energy sources such as oil, gas, electricity and renewable energies.

Premium quality

Amongst others, our High Capacity Water Heaters are made of high-class duplex stainless steel and guarantee a long-life cycle and perfect hygiene. ECOTHERM is certified to ISO 9001 : 2015 with all European standards. Our own test bench assures highest quality and reliability.

Innovation

We are always open to new ideas, we constantly investigate new technologies and we develop path-breaking and future-oriented products. Many patents are the result of the in-house innovation management. With an elaborated 3D visualization, ECOTHERM systems can be guided and controlled at all times.

Premium service

Clients benefit from our extensive service at consulting, planning, engineering, supervision and training. ECOTHERM regularly improves the know-how of its partners and clients with selective trainings.

Efficiency

The ECOTHERM Group, managed by the owner, has slim decision-making structures. Consequent research and development work permanently optimize the energy efficiency and the durability of the products. ECOTHERM turnkey solutions offer an optimal cost-benefit ratio.

Experience

With thousands of installations in the last 30 years in Europe, the Middle East, Asia, North Africa and Central America, ECOTHERM has become the leading brand in technology and innovation for individual hot water, steam and solar solutions. The ECOTHERM team is continuously refreshing their know-how with exceptional trainings and seminars that the ECOTHERM Academy provides.

Reliability

ECOTHERM systems are monitored all around the clock and can be serviced at low cost, quickly and efficiently with an advanced control panel. Our products and plants have low maintenance requirements.

Sustainability

ECOTHERM products help our customers save energy and money. We save valuable resources by using renewable energies. ECOTHERM high-performance plants have minimal space requirements and provide maximum energy savings. When planning new products, ECOTHERM engineers take all the qualitative and economic principles into account in accordance with the ecological principles.

Partnership

We live in a partnership with all our customers, suppliers and employees. This relationship is characterized by honesty, commitment, openness, trust and reliability. The object is a joint long-term success.

Internationality

The international alignment of ECOTHERM with branches in Dubai, Mexico and Hungary and further partners in more than 25 countries is the base for our flexible and efficient project implementation.

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1. Introduction

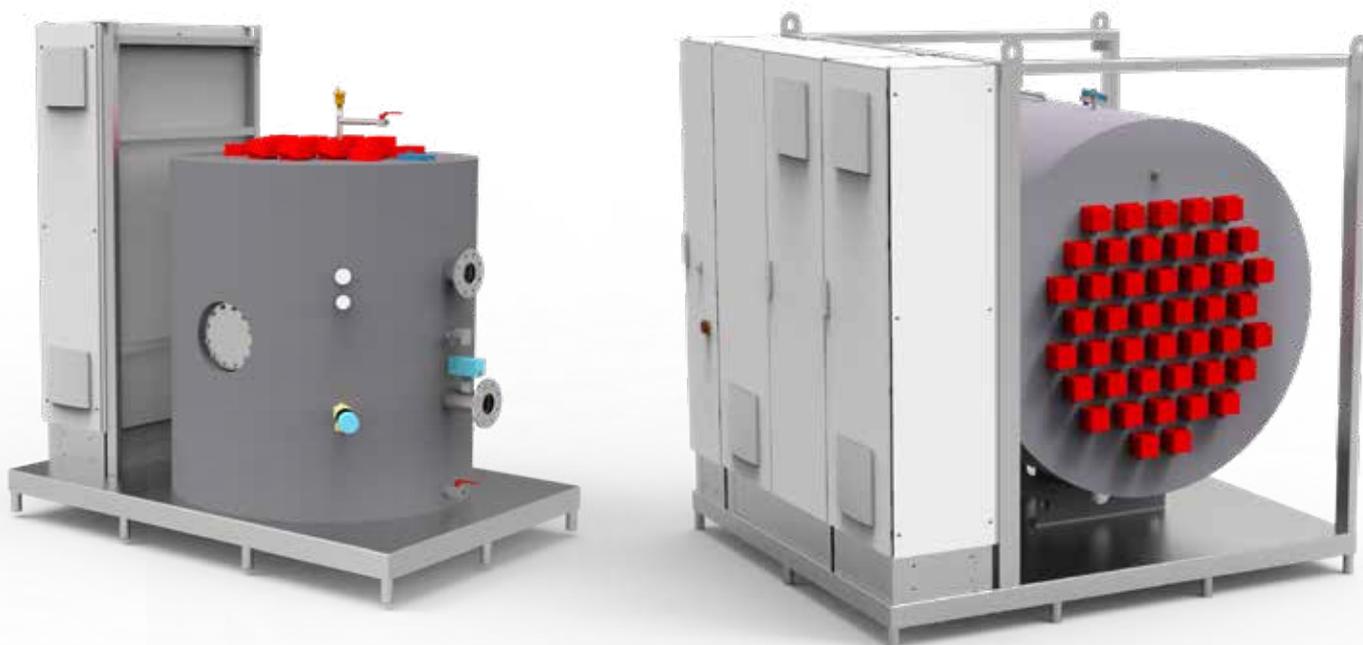
Congratulations!

With the purchase of your electric hot water boiler from ECOTHERM you have opted for a device incorporating the ultimate in hygiene, economy, reliability and functionality. We are convinced that your users will enjoy the benefits of your electric hot water boiler for a long time.

This manual contains vital information on starting-up and service of your ECOTHERM electric hot water boiler.

Please read this information carefully before starting up and familiarise yourself with the operating processes required.

Compliance with all instructions is the basis of smooth and trouble-free operation of the ECOTHERM storage water heater and safeguards your rights in the event of warranty claims.



1.1 Preparing for installation

1.1.1 Transport, handling and unpacking

The electric hot water boiler may only be transported in depressurised condition. Suitable stops should be used to ensure that no deformation or other damage to the outer surfaces or sealing surfaces occurs during transport. The storage tank must not be allowed to strike supports, flanges, etc.

The tank may only be set down and rested upon suitable supports (wooden frame, pallets), which are supplied with the heater. Point loading of the tank wall can lead to impermissible deformations. Transport and storage at temperatures below the frost limit (0°C) are not permitted (frost hazard due to any residual water in the tank).

All openings, such as filler necks, flanges, etc., should be sealed using suitable means, which may only be removed by competent personnel (caution: do not damage sealing surfaces!)

When removing the components from the packaging it is necessary to proceed with great care. If storage tanks are removed from a container, care should be taken that the breathers that protrude from the top of the tank are not damaged or bent when passing the opening.

1.1.2 Non-return valves for cold water supply and circulation connections

Non-return valves must be provided for the secondary domestic cold water supply and circulation connections, in order to avoid possible convectional or expansive back flow of heated water.

1.1.3 Filter recommendations

To avoid damage to pumps by intake of foreign bodies, ECOTHERM recommends that strainers be placed in front of supply connections as follows:

Primary circuit heating water supply:
Strainer mesh size 150 - 200 µm.

Secondary circuit cold water supply:
Strainer mesh size 50 - 60 µm

1.1.4 Tank legs

Tank legs **MUST NOT** - under any circumstances - be screwed or fixed to the floor, otherwise expansion strain will cause cracks, which may lead to leakage. The tank must be placed on the floor, supported by its legs, which must be able to move slightly as the tank expands or contracts. (The screw holes in the base of the legs are for transportation purposes only.)

1.1.5 Copper piping and water borne chloride ions

The following applies to installations with copper piping and water borne chloride ions (> 100 mg/litre):

1.1.5a Isolating connectors

All connections must be electrically isolated from the copper piping using the special isolating flange kits and isolating screw connectors provided.

1.1.5b Non-sacrificial electric anode

Where supplied the non-sacrificial electric anode must be connected to the mains power supply and be operational at all times, in order to inhibit galvanic transport of material away from stainless steel surfaces.

1.1.5c Simple repair of stainless steel tanks

Please note that in the unlikely event of pitting occurring, affected stainless steel areas can be quickly and cheaply repaired to 100% serviceability on site by your local ECOTHERM Support Centre using specialised techniques developed by ECOTHERM. Stainless steel therefore offers the best possible choice for better hygiene, durability and longer life.

2. Safety Instructions & General Information

2.1 Safety instructions

Installation and connection should only be carried out by approved contractors in accordance with applicable regulations and technical specifications.

Approved safety devices shall be installed in the cold water supply.

The operating pressure stated on the rating plate must not be exceeded. With higher line pressure, a pressure reducer should be fitted, whose function can be controlled by a downstream test valve.

The safety valve shall be fitted in the cold water pipe and there should be no means of isolating this valve from the vessel. Fitting of dirt traps or other restrictions in the supply line is not permitted. The safety valve shall be installed to react at the permissible operating pressure at the latest.

The cross section of safety valve piping (max. 2 elbows, max. length 2 m) shall be at least that of the safety valve. The outlet of the safety valve should flow into a tundish to enable observation, and the drainage piping should be arranged to ensure that any blow-off of steam or hot water cannot cause danger to persons present.

The drainage piping after the tundish must be of at least twice the cross section of the valve inlet. Safety valve and drainage pipes shall be designed frost-proof and may not be routed to atmosphere. In the vicinity of the safety valve a warning sign shall be provided bearing the following inscription:

Electrical connection must only be carried by qualified specialist personnel of an accredited electrical contractor. For electrical connection, the ÖVE and TAEV regulations with the appropriate design specifications shall be complied with.

For cleaning and service of the system the electric power supply must be disconnected.

Prior to initial start-up the entire water heater must be carefully flushed and checked for proper installation. Initial start-up may only be performed by an ECOTHERM service engineer.

2.2 Description

Technical data and connection drawing see at our product brochure.

2.3 Delivery

The electric hot water boiler are pre-assembled in the factory for simple on-site installation.



For safety reasons, it is normal for small quantities of water to escape from the safety valve during initial heating. Do not block the safety valve.

2.4 Screw-in elements (EHK)

Used for heating liquids. When used in media other than water, please contact prior consultation.

The installation and commissioning of EHK may only be done by trained and authorized persons.

2.4.1 Labelling

On a key area of the head of the screw-in element are stamped: power, voltage, manufacturer, month of manufacture, VDE mark and / or CE mark.

2.4.2 Voltage and Circuit

The standard setup is the star circuit in 3-phase AC 230/400V. The circuit diagram for the power connector is located in the cap.

On request versions for 1-phase AC 230V, as well as for other voltages are possible.

2.4.3 Thermostats

By default, the screw-in elements are regulated by an external thermostat and safety cut (TRSTB). For screw-in elements <12kW also an integrated thermostat is possible.

The standard design is with 3 pins 5-80 °C, with limiter 105 °C and external knob control for direct connection to 3 x 400V in the circuit diagram.

A thermostat does not detect whether there is sufficient fluid in the system for operation. The customer has to ensure the existence of appropriate devices (level switch etc.). On request the use of other thermostats is possible.

2.4.4 Installation

Before the 1 ½ or 2 ½ threaded head of the screw-in element is threaded, expertly seal or use a seal.

The aluminium casted cap has protection class IP54, only when lid and gland after the introduction of the cable properly are tightened!

After screwing the heating element turning the cap is in the desired position by temporary loosening the two clamping ring bolts before connecting the cable is possible.

2.4.5 Material Tubular Heaters

Incoloy 825 (2.4858) soldered with NiCr Lot in screwing 1.4301.

This nickel-based alloy is one of the most expensive and durable jacket materials and is used in aggressive water mixtures. It replaces the previously used material Incoloy 800 (1.4786) with AgCu soldering in the course of 2003.

2.4.6 Calcification

Calcification of a tubular heater depends upon the lime content (hardness) and the temperature of the water. Damages caused by calcification are excluded from any warranty. According to Austrian standard H 5195-1 (prevention of corrosion and scale formation), paragraph 5.3. certain arrangements have to be taken for softening the water in order to avoid damages to the system due to a certain hardness of the water. We recommend to install an appropriate water softener from 15 °dH. As each consumer knows from advertising, hard water harms the heating element of washing machines.

The same is valid, even if it is not as popular, for EHK for electric hot water boilers.

The limescale acts as a layer of insulation with increasing thickness, which in turn prevents the release of heat to the water. The radiator will overheat and burn out. Is the dip tube at the thermostat sensor also heavily calcified, due to the same reason, in short intervals a permanent switching on and off happens until the thermostat is broken by this continuous exertion.

Severe calcification is also reflected by high current consumption or long warm-up time noticeable.

2.5 Control Panel

Operation, maintenance and possible other work may only be done by specially trained personnel and carried out in accordance with the current safety regulations. All safety measures and local regulations must be enforced before commissioning. Safety devices must be checked for correct installation and a correct operation. All connections, connectors and screws must be checked before the actual operation for tightness and replace if necessary.

Unauthorized handling or conversion of the control panel will void the manufacturer's warranty.

3. Filling & Venting the System

3.1 Commissioning

Commissioning may only take place when the heater has been properly installed in a system and the appropriate limitation devices provided and set up, the set-up conditions have been fulfilled and the installation has been checked for proper fitting, set-up conditions and safe operation.

When starting up, the heater should be continuously observed and checked for any leaks. In normal operation the storage tank may only be operated if equipment required for safety reasons is continuously effective and is not disabled or its function according to the specifications modified during operation. The heater was designed for static operation.

3.2 Flushing the system

Prior to initial commissioning the entire system should be carefully flushed. Foreign bodies in the system impair the working order or safety of the device. Approved safety devices should be fitted in the cold water supply pipe.

3.3 Filling

- Set the pressure of the safety valve (note manufacturer's data). The safety valve must response latest at reaching the defined operating pressure of the storage tank.

- Set the pressure reducing valve to approximately 0.8 times the response pressure of the safety valve (manufacturer's instructions).

- Open the closing valves at hot water water outlet and circulation pipepline at the storage tank.

- Close the drain valve, open the hot water tap valves, open cold water closing valve and slowly fill the storage tank.

- Close the hot water tap valves when clearly water comes out.

- Ventilate safety valve until clearly water comes outs.

- Check the water lines for leakage.

- Check all connections and flange for leakage.

4. Cleaning & Servicing

4.1 Cleaning and servicing of tank vessel

Due to hygienic reasons a periodically cleaning and desludging of the electric hot water boiler is necessary.

Depending on water conditions, on the operating temperature and the hot water consumption, regularly checks of the inner tank vessel (min. 1x/year).

4.1.1 Important checks!

Control the tightness of the flange and the storage tank periodical.

ECOTHERM cannot accept any liability for damage caused by water. After every maintenance of the flange, a new seal must be installed.

Before starting-up the pressure vessels it is absolutely necessary to re-tighten the bolts! Bolt torque setting Nm see at rating plate.

Do not cross thread the bolts. Prior to fitting, check screws for damage to threads.

4.2 Closing and opening the storage tank

Storage tanks must be sealed such that all seals provided are used in accordance with specifications. Sealing surfaces must be clean and undamaged. Screwed sealing plugs may only be carefully and uniformly tightened as far as necessary for sealing. The quoted

tightening torques should be adhered to. The screws may not be released on pressurised storage tanks. Seals and inspection openings on the storage tank may not be opened until the pressure has been equalised with the atmosphere. The pressure equalisation with the atmosphere should take place after the closing of the pressurised supply pipe by loosening or aerating, whilst observing the pressure gauge. After this, the screwed sealing plugs are loosened such that they can still retain the sealing cover. Then this should be opened slightly and loosened until it no longer adheres to its seat.

4.2.1 During maintenance

- Shut closing valves to the storage tanks.
- Drain storage tank via the drainage valve. (Item 1)
- Dismantle the flange. (Item 2)
- Limescale and impurities can be flushed out through the drainage valve. Bigger areas of scaling can be crushed with a wooden stick before rinsing.
- After cleaning, mount flange (and replace gasket). (Item 3)
- After filling and ventilating the system, check all connections for leakage.
- To clean the outer parts a wet fabric is sufficient. Avoid to use abrasive or solvent cleaning agents.



Before starting-up the pressure vessels it is absolutely necessary to re-tighten the bolts!

torque ...xx Nm → look at rating plate

Before opening the flange make sure you have a new gasket ready!

4.3 Servicing

All damaged sealing elements, e.g. worn, cracked and bent screws, broken or otherwise damaged nuts, bent brackets or clamps, damaged seals may no longer be used and should be replaced by others of the same type.

Maintenance tasks that can jeopardise the safety of the storage tank, and measures that change the material properties, e.g. by welding, cold and hot deformation, may only be performed in accordance with the national regulations of the country where the storage tank is installed.

5. Warranty, liability and choice of law

5.1 General

These installation and operating instructions are part of the ECOTHERM electric hot water boiler and shall be handed to user and read carefully to ensure that the safety aspects are observed at all times. In the event of sale and re-sale of the ECOTHERM electric hot water boiler to third parties the installation and operating instructions shall be supplied to the purchaser. We would therefore ask you to keep these instructions safely near the appliance.



ECOTHERM cannot accept any liability arising from improper use, installation or non-compliance with installation and operating instructions.

5.2 Guarantee 5.2.1. Warranty

The company ECOTHERM gives warranty for all delivered items via its terms and conditions. Prerequisite for warranty is to ensure the compliance with the following conditions:

Upon delivery of the package completeness and external or hidden defects must be checked.

If in doubt, immediately contact ECOTHERM.

The warranty period is:

- 5 years on stainless steel products from its own production (see Supplementary Regulations, point 9 Conditions)
- 1 year on everything else (e. g. buffer, tanks purchased material, accessories, etc.).

The warranty covers the free replacement of parts that are proved to be defective due to material defects, manufacturing defects or construction defects.

The warranty does NOT include:

- The cost of dismantling and reassembly
 - consequential damages or loss of profits arising as a result of a defect.
- Warranty cases have no suspensive effect on the deadlines of payments and other accounts receivable.

The warranty becomes void:

- if the referred to warranty-conditions in § 8 and § 9 of the terms and conditions are not met
- if damage is caused by operating or operational errors
- improper treatment and usage
- due to breaches of regulatory or statutory provisions

The hot water storage tanks of ECOTHERM may solely be used for receiving a fluid under Compliance with the operating conditions (see label), which must be within the specified limits. Any other use shall be deemed as not conforming with the intended purpose and shall be excluded from any warranty claims. Prior to installation and start-up of the ECOTHERM storage water heater the technical specification should be checked to ensure safe and proper use.

In the event of the ECOTHERM storage water heater being damaged or functioning unsatisfactorily, please refrain from attempting repairs yourself and instead notify your service agent. Repairs may only be carried out by an ECOTHERM service engineer using only original ECOTHERM spare parts. Non-compliance with these stipulations may affect function and operational safety of the

ECOTHERM storage water heater and will invalidate any warranty claims.

Installation should be carried out in accordance with all applicable regulations and guidelines and also in accordance with manufacturer's specifications by an authorised and qualified installer.

Faulty and improper installation may cause damage to persons, animals and materials for which ECOTHERM cannot accept any liability whatsoever.

For hygienically faultless and safe operation we recommend regular servicing. Contact your nearest ECOTHERM Support Centre for further information. (See Internet www.ECOTHERM.com for current address list)

The details and data published in this technical document reflect the current state of developments. ECOTHERM reserves at the right to modifications serving technical progress at any time, without any obligation whatsoever.

5.2.2 Additional warranty conditions for the stainless steel storage tank

The warranty period of 5 years for the stainless steel storage tank is valid under the following additional conditions:

1. Connections mounted only from state licensed installation company.
2. The assembly of a fine filter in the cold water inlet
3. Only stainless steel dummy plugs and immersion sleeves are used
4. Water of drinking water quality and with a chlorine content of less than 70 mg Cl/L should be used. If the chlorine

content of less than 70 mg Cl/L should be used. If the chlorine content is higher there must be sufficient externally powered anodes in continuous operation

5. Connecting piping of copper or steel are to be separated electrically (electronic separation joint or and electronic separation sleeves with flange connections)

6. The tank legs are left free standing and not screwed to the floor

5.2.3. Liability

As regards direct or indirect damages which arise due to inadequate delivery and performance, we will only be liable in as far as a defect can be proved to have been caused. We assume no liability for consequential damages or loss of profit.

5.2.4 Validity clause

If individual clauses were to invalidate this condition, this does not affect the validity of the remaining conditions.

5.2.5. Choice of law

Austrian law is valid. Place of performance and jurisdiction is Linz, Austria.

6. Technical Data

6.1 Operating conditions

Medium / Fluid	drinking water / heating water	
acceptable min./max. temperature (TS): °C	see rating plate	
acceptable min./max. pressure (PS): bar	see rating plate	
Periphery temperature min./max.: °C	10/50	
Type of load:	static	
Tightness test realised	Date:	inspected from:
Final check realised	Date:	inspected from:

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