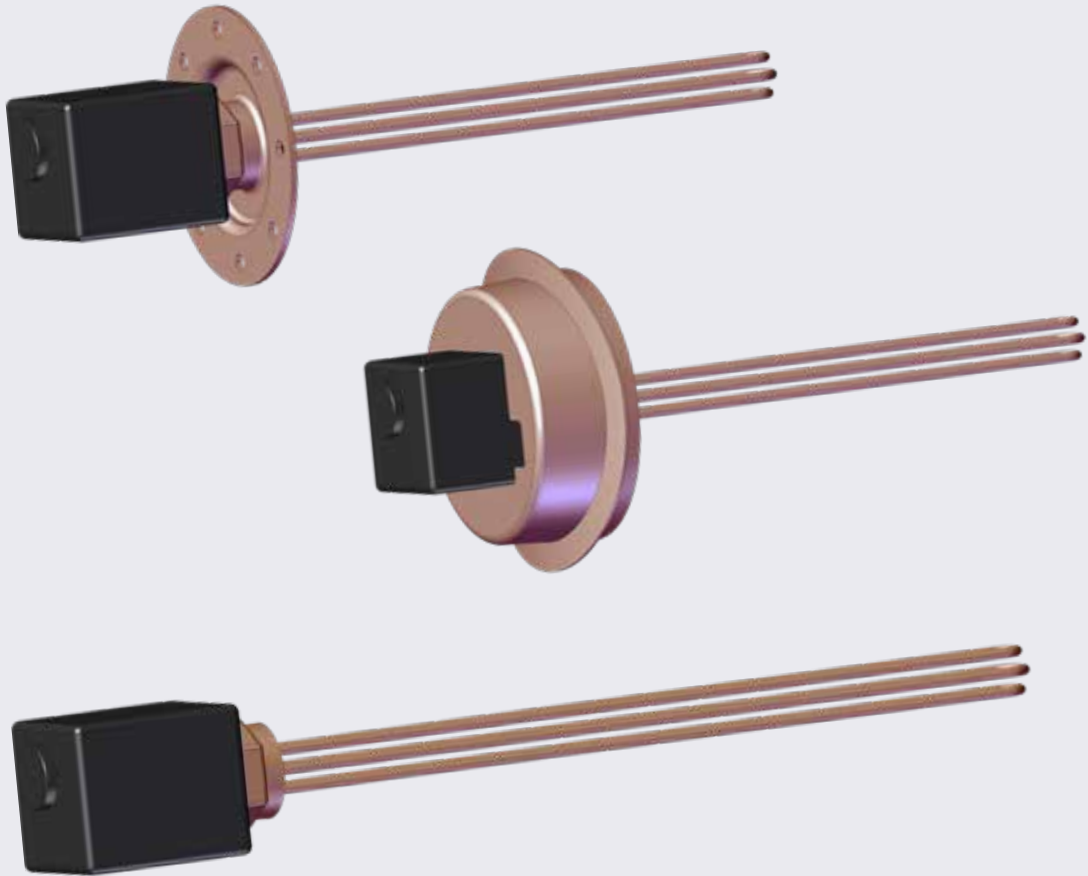


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ait
HEAT PUMPS



Operating Manual

Electric heating elements

Accessory for heat pumps

UK

www.aitgroup.com

83008800cUK



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1 About this operating manual

This operating manual is part of the unit.

- ▶ Before working on or with the unit, read the operating manual carefully and follow it for all activities at all times, especially the warnings and safety instructions.
- ▶ Keep the operating manual to hand at the unit and pass on to the new owner if the unit changes hands.
- ▶ If you have any questions or anything is unclear, ask the manufacturer's local partner or the factory's customer service.
- ▶ Note and follow all reference documents.

1.1 Validity

This operating manual refers solely to the unit identified by the nameplate (→ "Nameplate", page 6).

1.2 Reference documents

The following documents contain additional information with regard to this operating manual:

- Planning & design manual, hydraulic integration
- Operating manual of the heat pump, hydraulic unit or wall-mounted controller
- Operating manual of the heating and heat pump controller
- Brief description of the heat pump controller
- Operating manual of the expansion board (accessories)
- Operating manual of respective tank

1.3 Symbols and markings

Identification of warnings

Symbol	Meaning
	Safety-relevant information. Warning of physical injuries.
	Safety-relevant information. Warning of physical injuries. Flammable materials / flammable (primary) refrigerant
	Safety-relevant information. Warning of physical injuries. Flammable materials / flammable (primary) refrigerant

Symbol	Meaning
	Safety-relevant information. Warning of physical injuries. Danger of fatal injury due to electric current.
DANGER	Indicates imminent danger resulting in severe injuries or death.
WARNING	Indicates a potentially dangerous situation, which can result in severe injuries or death.
CAUTION	Indicates a potentially dangerous situation, which can result in moderate or minor injuries.
IMPORTANT	Indicates a potentially dangerous situation, which can result in property damage.

Symbols in the document

Symbol	Meaning
	Information for qualified personnel
	Information for the owner/operator
✓	Requirement for action
▶	Procedural instructions: Single step action prompt
1., 2., 3., ...	Procedural instructions: Numbered step within a multi-step action prompt. Keep to the given order.
	Additional information, e.g. a tip on making work easier, information on standards
→	Reference to further information elsewhere in the operating manual or in another document
•	Listing
	Secure connections against twisting



1.4 Contact

Addresses for purchasing accessories, for service cases or for answers to questions about the unit and this operating manual can be found on the internet and are kept up-to-date:

- www.ait-deutschland.eu

2 Safety

Only use the unit if it is in proper technical condition and only use it as intended, safely and aware of the hazards, and follow this operating manual.

2.1 Intended use

The unit is designed for household use and is solely intended for the following purposes:

- additional heating generator to support the heating system
- additional heating generator to support the domestic hot water preparation

The unit may only be used in combination with a suitable tank from the manufacturer.

Support of the heating system:

Tank	Electric heating element			
	EHZI 45	EHZ 60	EHZ 75	EHZ 90
TPS 200	•	•	n.g.	n.g.
TPSK 200.2	•	•	n.g.	n.g.
TPS 500.1	•	•	•	n.g.
TPSK 500	•	•	•	n.g.
TPS 750	•	•	•	•
TPS 1000	•	•	•	•
TPSK 1000	•	•	•	•
TPS 1500	•	•	•	•
TPSK1500	•	•	•	•
MFS 600S	•	•	•	•
MFS 830S	•	•	•	•
MFS 1000S	•	•	•	•
ZHZ	•	•	•	•

- = suitable, n.g. = not suitable

Support of the domestic hot water preparation:

Tank	Electric heating element		
	EHZI 45	EHZI 45F	EHZI 45FT
WWS 200	n.g.	n.g.	•
WWS 202	n.g.	•	n.g.
WWS 280	n.g.	n.g.	•
WWS 303.1	n.g.	•	n.g.
WWS 303.2	n.g.	•	n.g.
WWS 430	n.g.	n.g.	•
WWS 405.2	n.g.	•	n.g.
WWS 507.2	•	•	n.g.
WWS 806	•	n.g.	n.g.
WWS 1006	•	n.g.	n.g.
SWWS 404.2	•	•	n.g.
SWWS 506.2	•	•	n.g.
SWWS 806	•	n.g.	n.g.
SWWS 1008	•	n.g.	n.g.

- = suitable, n.g. = not suitable

Limitation of use

Each electric heating element can only be used with soft to medium-hard drinking water up to 14 ° dH (hardness level 2). With harder water, the service life of the electric heating element is reduced. The electric heating element will calcify and thus have a reduced heating capacity. If there is a lot of calcification, the electric heating element will overheat and fail.

- ▶ Intended use includes complying with the operating conditions as well as the operating manual and observing and following the reference documents.
- ▶ When using the local regulations note: laws, standards, guidelines, directives.

All other uses of the unit are not as intended.



2.2 Personnel qualifications

The operating manuals supplied with the product are intended for all users of the product.

The operation of the product via the heating and heat pump control and work on the product which is intended for end customers / operators is suitable for all age groups of persons who are able to understand the activities and the resulting consequences and can carry out the necessary activities.

Children and adults who are not experienced in handling the product and do not understand the necessary activities and the resulting consequences must be instructed and, if necessary, supervised by persons experienced in handling the product and who are responsible for safety.

Children must not play with the product.

The product may only be opened by qualified personnel.

All procedural instructions in this operating manual is solely directed at qualified, skilled personnel.

Only qualified, skilled personnel is able to carry out the work on the device safely and correctly. Interference by unqualified personnel can cause life-threatening injuries and damage to property.

- ▶ Ensure that the personnel are familiar with the local regulations, especially those on safe and hazard-aware working.
- ▶ Ensure that the personnel are qualified to handle flammable (primary) refrigerant.
- ▶ Work on the refrigerating circuit may only be carried out by qualified personnel with appropriate qualifications for refrigeration system installation.
- Work on the electrics and electronics may only be carried out by electrical technicians.
- Any other work on the system may only be carried out by qualified personnel (heating installer, plumbing installer).
- ▶ During the warranty and guarantee period, service work and repairs may only be carried out by personnel authorised by the manufacturer.

2.3 Personal protective equipment

During transport and work on the unit, there is a risk of cuts due to the sharp edges of the unit.

- ▶ Wear cut-resistant protective gloves.

During transport and work on the unit, there is a risk of foot injuries.

- ▶ Wear safety shoes.

When working on liquid-conveying lines, there is a risk of injury to the eyes due to leakage of liquids.

- ▶ Wear safety goggles.

2.4 Residual risks

Injuries caused by electric shock

Components in the unit are energised with life-threatening voltage. Before working on the unit:

- ▶ Disconnect unit from power supply.
- ▶ Secure unit against being switched back on again.

Existing earthing connections within housings or on mounting plates must not be altered. If this should nevertheless be necessary in the course of repair or assembly work:

- ▶ Restore earthing connections to their original condition after completion of the work.

Injuries caused by high temperatures

- ▶ Before working on the unit, let it cool down.

Safety instructions and warning symbols

- ▶ Observe the safety instructions and warning symbols on the packaging and on and in the unit.



2.5 Avoid damage to property

Unsuitable quality of the fill and make-up water in the heating circuit

→ Operating manual of respective heat pump

Drinking water quality

→ Operating manual of respective tank

3 Operation and care



NOTE

The unit is operated via the control panel of the heating and heat pump controller (→ operating manual of the heating and heat pump controller).

3.1 Energy and environmentally-conscious operation

The generally accepted requirements for energy-conscious and environmentally-conscious operation of a heating system also apply to use of a heat pump. The most important measures include:

- No unnecessarily high flow temperature
- No unnecessarily high domestic hot water temperature
- Do not open windows with just a gap or tilt open (continuous ventilation); instead, open wide for a short time (shock ventilation)
- Always ensure that the controller settings are correct

3.2 Care

Wipe down the outside of the unit only using a damp cloth or cloth with mild cleaning product (washing-up liquid, neutral cleaning agent). Never use any harsh, abrasive, acid or chlorine-based cleaning products.

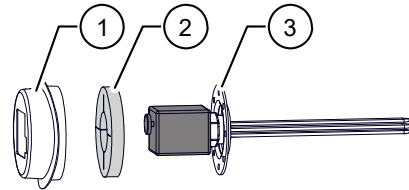
4 Scope of supply

EHZI 45, EHZ 60, EHZ 75, EHZ 90



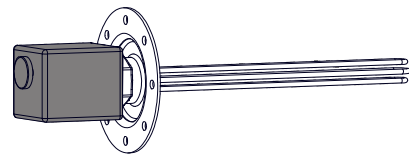
Electric heating element with terminal box

EHZI 45 F



- 1 Flange cover
- 2 Flange insulation
- 3 Electric heating element 4,5kW with terminal box, flange plate and flange gasket

EHZI 45 FT



Electric heating element 4,5kW with terminal box, flange plate and flange gasket

1. Inspect the delivery for outwardly visible signs of damage.
2. Inspect the scope of supply for completeness. Any defects or incorrect deliveries must be reported immediately.

Nameplate

A nameplate is attached to the outside of the unit at the factory.

The nameplate contains the following information:

- Model, item number
- Serial number

The nameplate also contains an overview of the most important technical data.



5 Storage, transport, unpacking

5.1 Storage

- ▶ Store unit protected against:
 - Moisture/damp
 - Frost
 - Dust and dirt

5.2 Transport

Notes on safe transport

- ▶ To prevent damage during transport, always transport the unit to final installation location in its original packaging.

5.3 Unpacking

1. Remove plastic films and cardboard. Ensure that you do not damage the unit.
2. Dispose of the transport and packaging material in an environmentally friendly way and in accordance with local regulations.

6 Mounting

Only a horizontal mounting position of the electric heating element is permissible.

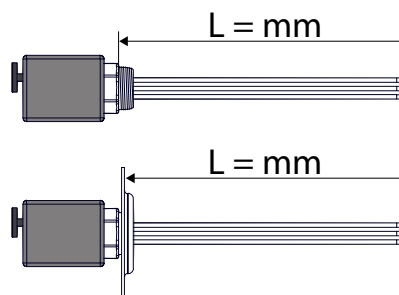
IMPORTANT

Before mounting, check whether the electric heating element is suitable for the respective tank.

→ “2.1 Intended use”, page 4

Electric heating element	Immersion depth L	Thread
EHZI 45 ^{*)}	450	G 1½" AG
EHZI 45F ^{*)}	450	–
EHZI 45FT ^{*)}	450	–
EHZ 60 ^{*)}	500	G 1½" AG
EHZ 75 ^{*)}	600	G 1½" AG
EHZ 90 ^{*)}	700	G 1½" AG

^{*)} Protection type: IP 44 (protection against splashing water)



EHZI 45, EHZ 60, EHZ 75, EHZ 90

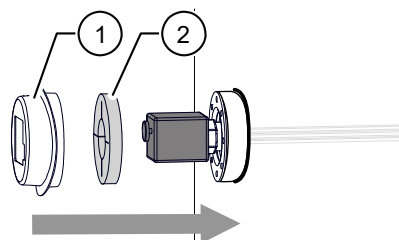
- ▶ Insert the electric heating element into a suitable socket of the tank and screw it tight.
- Operating manual of respective tank

EHZI 45F, EHZI 45FT

1. Unscrew and remove the flange plate of the tank.
2. Insert the electric heating element into the flange opening and screw it tight to the flange.

Only with EHZI 45F:

3. Apply flange insulation (②) and flange cover (①).





7 Electrical installation

Basic information on the electrical connection

- The specifications of the local energy supply company may apply to electrical connections
- Fit the power supply with an all-pole circuit breaker with at least 3 mm contact spacing (per IEC 60947-2)
- Note the level of the tripping current (→ nameplate)
- Comply with the electromagnetic compatibility regulations (EMC regulations)

Electrical connection



NOTE

With the cover removed, the terminal box can be rotated through $\pm 180^\circ$ on the screw head, into the required position.

- Align the housing carefully. Do not damage the seal.

Ensure the seal and the packing cord fit properly between the housing parts, otherwise the degree of protection is no longer guaranteed.

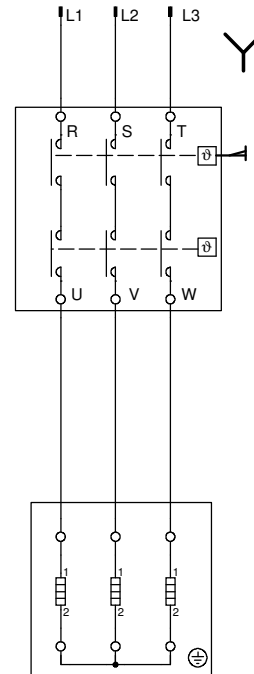
Electric heating element	Rating	Supply voltage (as delivered)
EHZI 45 *)	4.5 kW	3~N/PE/400V/50-60Hz
EHZI 45F *)	4.5 kW	3~N/PE/400V/50-60Hz
EHZI 45FT *)	4.5 kW	3~N/PE/400V/50-60Hz
EHZ 60	6.0 kW	3~N/PE/400V/50-60Hz
EHZ 75	7.5 kW	3~N/PE/400V/50-60Hz
EHZ 90	9.0 kW	3~N/PE/400V/50-60Hz

IMPORTANT

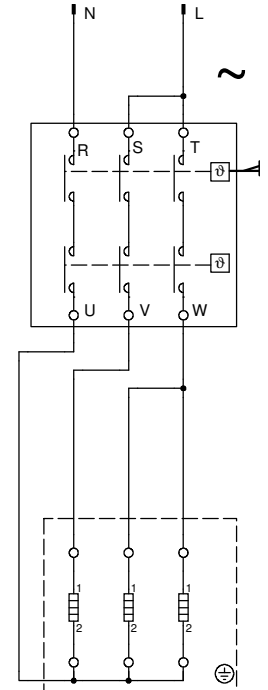
Modification to 1~N/PE/230V/50-60Hz supply voltage is only permissible for the 4.5kW unit types marked with *).

Any additional bridges required must be made of silicone cable 1.5 mm² and are to be provided on site by the customer.

Supply voltage
3~N/PE/400V/50-60Hz
(3-phase current)



Supply voltage
1~N/PE/230V/50-60Hz
(alternating current)



1. Feed the power supply cable from the sub-distribution to the heating and heat pump controller.
 2. Feed the connection cable of the electric heating element to the heating and heat pump controller.
 3. Connect both cables to the heating and heat pump controller according to the terminal diagram.
- Terminal diagram in the operating manual of the heat pump, hydraulic unit or wall-mounted controller



8 Commissioning

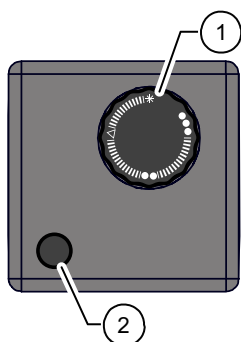
IMPORTANT

Electric heating elements may only be started up if the storage tank is filled. Dry running can cause irreparable damage to the electric heating element.

1. Set the desired set temperature on the temperature controller of the electric heating element.
→ "9 Settings on the electric heating element", page 9
2. Establish the power supply to all units in the heating system.
3. Make the required settings for the electric heating element on the heating and heat pump controller.
→ Operating manual of the heating and heat pump controller

9 Settings on the electric heating element

The electric heating element contains an operating thermostat with temperature controller and a safety temperature limiter.



- 1 Temperature controller of the operating thermostat

Adjustable temperature range:
approx. 15 °C – 80 °C

Symbols:

* Frost protection ($\hat{=}$ ca. 15 °C)

△ $\hat{=}$ approx. 40 °C (+/- 5K)

●● $\hat{=}$ approx. 55 °C (+/- 5K)

●●● $\hat{=}$ approx. 80 °C (+/- 5K)

- 2 Reset button of the safety temperature limiter (under the plastic cover)



MERKNAD

The higher the temperature selected the higher the energy costs.



CAUTION

If the electric heating element is set to a temperature > 55 °C for domestic hot water preparation, there is a risk of scalding.

IMPORTANT

If the electric heating element is set to a temperature > 55 °C for domestic hot water preparation, there is a risk of increased limescale precipitation.

IMPORTANT

Risk of overheating of the underfloor heating.

If the electric heating element is used for support of the heating system, the temperature at the electric heating element must not be set higher than the flow temperature calculated by your qualified heating personnel.



10 Maintenance



NOTE

We recommend that you sign a maintenance agreement with an accredited heating company.

10.1 Maintenance as required

- ▶ Regularly check the filling level of the tank.

IMPORTANT

If the liquid in the tank gradually drops (for example, boiling away), the safety temperature limiter will not protect the heating elements of the electric heating element.

If the heating elements of the electric heating element are dry but the sensor tube of the operating thermostat is still in liquid, this can cause irreparable damage to the electric heating element.

- ▶ Have the electric heating element checked by qualified personnel (heating or cooling system engineers) as required, but at least annually.

11 Faults

The safety temperature limiter is set to a fixed temperature of 95°C.

The safety temperature limiter trips:

- if the electric heating element is switched on dry.
- the temperature level briefly falls below the operating thermostat located in the middle of the electric heating element.
- if the operating thermostat fails and causes the medium temperature to rise to > 95°C.

If the safety temperature limiter has tripped, the electric heating element switches off automatically.

11.1 Unlock safety temperature limiter

If the safety temperature limiter has tripped, the electric heating element and / or the system must be checked by qualified personnel.



CAUTION

The electric heating element may only be unlocked by qualified personnel.

- ▶ Press in the reset button of the safety temperature limiter with a small screwdriver.



12 Dismantling and disposal

12.1 Dismantling

- ▶ Separate components by their materials.

12.2 Disposal and recycling

- ▶ Recycle or ensure proper disposal of unit components and packaging materials in accordance with local regulations.

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The logo for ait Heat Pumps is located in the top right corner. It features the lowercase letters 'ait' in a white, sans-serif font on a dark blue square background. A small blue square is positioned above the 'i'. Below the 'ait' text, the words 'HEAT PUMPS' are written in a smaller, white, uppercase, sans-serif font.

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