Amicus Aquastore Heat Pump Water Heater

Installation, Commissioning, User & Maintenance Instructions

Models:
LAAS 8-455-6
LAAS 8-455-9
LAAS 8-455-12

Lochinvar®

LV336080 | March 2025

IMPORTANT INFORMATION

These instructions must be read and understood before installing, commissioning, operating or maintaining the equipment.

Preface

Copyright

Trademarks

Brand names in this manual are registered trademarks of their respective owners.

Warranty

Refer to the appendix Warranty (see 12) for the warranty provisions.

Liability

User

Lochinvar accepts no liability when the water heater is not used correctly and requires the user to:

- Read this manual carefully and obey the instructions.
- Ask your installation engineer for advise about the use of the water heater.
- Make sure that the service and maintenance activities are done by a qualified engineer.
- Store the manual, in good condition, near the water heater.

Installation engineer

Lochinvar accepts no liability when the water heater is not used correctly and requires the installation engineer to:

- Read this manual carefully and obey the instructions.
- Make sure that the entire water heater installation complies with the applicable regulations (on page 5).
- Make sure that the water heater is tested before the installation is taken into use.
- Explain the correct use to the user.
- Notify the user when service and maintenance activities are necessary.
- Make sure that you hand over all applicable manuals.

Supplier

The LAAS water heater is designed in accordance with the applicable regulations. The water heater is delivered with compliancy–marking and all necessary documentation to obey these regulations. See the compliance section.

Lochinvar accepts no liability for claims from third parties when:

- The instructions for the correct installation of the water heater are not obeyed.
- The instructions for the correct use of the water heater are not obeyed.
- The water heater did not have maintenance on the correct maintenance interval.

For more information, refer to the General Terms of Sales. These are available on request, free of charge.

We believe that this manual provides you with accurate and complete descriptions of all relevant components. If you, nonetheless find errors or inaccuracies in this manual, please inform Lochinvar. This helps us to further improve our documentation.

Compliance

To safely produce domestic hot water, the design and construction of the LAAS water heaters is in accordance with:

- CE
  - the European Directive 2014/35/EU on low voltage appliances (LVD)
  - the European Directive 2014/30/EU on Electromagnetic Compatibility (EMC)
  - the European Directives 2011/65/EU and 2015/863/EU on RoHS II and RoHS III
  - the European Directive 2009/125/EC on Ecological Design (ErP)
- UKCA
  - the Electrical Equipment (Safety) Regulations 2016 (UK SI 2016 No. 1101)
  - the Electromagnetic Compatibility Regulations 2016 (UK SI 2016 No. 1091)
  - the RoHS regulations 2012 (UK SI 2012 No. 3032)
  - the Ecodesign for Energy-Releated Products Regulation 2010 (UK SI 2010 No. 2617)

Refer to the appendix Declaration of conformity.

Regulations

The installation of the equipment MUST be in accordance with the relevant requirements of the Building Regulations, I.E.E. Regulations and the bylaws of the local water board.

In addition, the installation should follow the relevant guidance offered in the following documents. It is not practical to list all relevant information due to continuous changes but emphasis is placed on the following documents, as failure to comply with the guidance given will almost certainly result in an unsatisfactory installation:

- British Standards (BS), especially:
  - BS 6700: 1997 - Design, installation, testing and maintenance of services supplying water for domestic use with buildings and their curtilages
  - BS 67074: 1989 Part 1 and 2 - Application, selection and installation of expansion vessels and ancillary equipment for sealed systems
  - BS 7671: 2008 - Requirements for electrical installations, I.E.E. wiring regulations seventeenth edition
  - CP 342: Part 2 1974 - Code of practice for centralized hot water supply-buildings other than dwellings
- CIBSE Guides
- Clean Air Act
- H.S.E Guidance

If the LAAS water heater is to be used in an unvented system installation, the system should follow the guidance given in BS 6700, BS 8558 and must comply with the Building Regulations 1992: Part G3, in England and Wales, P5 in Northern Ireland and P3 in Scotland and the Water Supply (Water Fittings) Regulations 1999, The Water Supply (Water Quality) Regulations (Northern Ireland) 2017 and the Public Water Supplies (Scotland) Amendment Regulations 2017.

A kit of parts is available from Lochinvar.

Note
Manufacturer's notes must not be taken in any way as overriding statutory obligations.

Contact information

In the event of problems with your electricity or water supply connections, please contact your (energy/water) supplier.

About this manual

Scope

This manual gives information about safe and correct use of the water heater and how installation, maintenance and service activities have to be done correctly. You must obey the instructions in this manual.

Caution
Read this manual carefully before you start the water heater. It can cause personal injury and damage to the water heater when you do not read the manual and/or do not obey the instructions.

The purpose of this manual is to:

- describe the working principles and layout of the water heater
- explain the safety devices
- highlight possible hazards
- describe the use of the water heater
- describe the installation, service and maintenance of the water heater

This manual has two parts:

- An User part that describes the correct usage of the water heater.
- An Installation, Maintenance and Service part, that describes the correct installation and maintenance procedures.

Target group

The information in this manual applies to three target groups:

- users
- installation engineers
- service and maintenance engineers

The User part is intended for the (end) users. The Installation, Maintenance and Service part is intended for the installation engineers and the service and maintenance engineers.

Notation conventions

This manual uses the following text conventions:

- Numbers between parentheses e.g. (1), refer to elements in a figure that are described by the text.
- Cross-references to sections, tables, figures etc. are underlined and written as (see "..."). In the digital version, the cross-references function as hyperlinks that can be used to navigate through the manual by clicking on them. Example: Safety (see 2).

This manual contains the following text styles/symbols for situations that may endanger users/engineers, cause damage to equipment or need special attention:

Note
A note gives more information on a topic.

Caution
Obey the caution instructions to prevent damage of the water heater.

Warning
Obey the warning instructions to prevent danger of personal injury, and serious damage to the water heater.

Document identification

Article number	Language	Version
0336080	EN	1.4

Table of Contents

User part

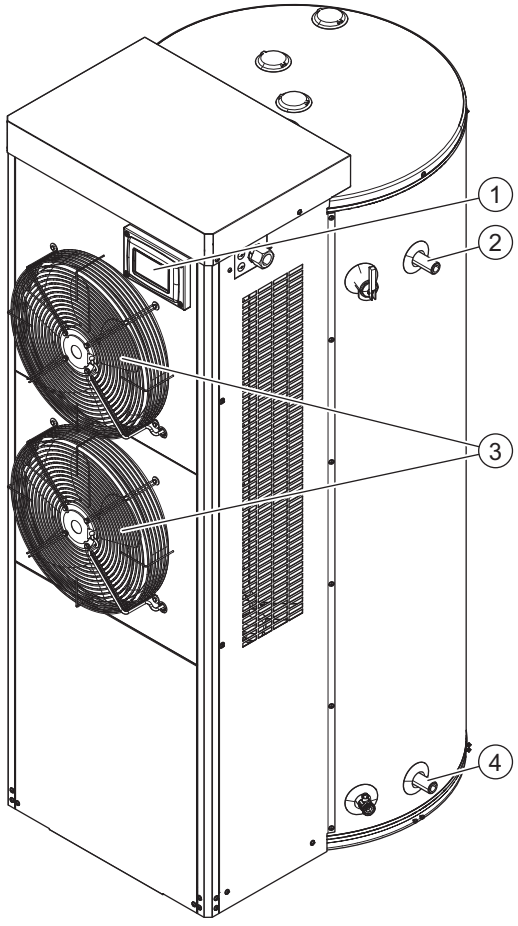
1 Introduction

The LAAS water heater stores and heats water for sanitary purposes.

Air from the installation room is forced through an evaporator by two fans (3) and this thermal energy is transfered to the heat exchanger wrapped around the tank via a refrigerant circuit.

Cold water entering the tank through the water inlet (4) is heated by this heat exchanger assisted by two additional electric elements.

Fig. LAAS water heater



1. Display
2. Water outlet
3. Fans heat exchanger
4. Water inlet

2 Safety

Lochinvar cannot be held responsible for damages or injuries which can be lead back to:

- Failure to follow the instructions provided in this manual.
- Carelessness during use or maintenance of the water heater.

Every user must study the user part of this manual and must follow the instructions in this part of the manual strictly. Do not change the sequence of the described actions. This manual must be available for the user and service engineer at all times.

Warning
If you detect a burning smell:

- Shut off the mains power supply.
- Alert the emergency services.

Caution
Do not store or use chemical substances in the room where the water heater is installed because of the risk of explosion and corrosion of the water heater. Some propellants, bleaching agents and degreasing agents etc. disperse of explosive vapors and/or cause accelerated corrosion. If the water heater is used in a room where such substances are stored or used, the warranty will be void.

Caution
Installation, maintenance and service may only by carried out by a qualified engineer.

Caution
The water heater is not intended for use by persons with reduced physical, sensory or mental capacities, or who lack the necessary experience or knowledge. When the person responsible for their safety is supervising or has explained how the water heater should be used, these persons can use the water heater.

Caution
This water heater is not intended to be used by children under the age of 16. Always supervise children, and make sure that they do not play with the water heater.

Note
Regular maintenance extends the service life of the water heater. To determine the correct service interval, the service and maintenance engineer must do a check on the water heater three months after installation. Based on this check, the best service interval can be determined.

Warning
This device contains fluorinated greenhouse gas, included in the Kyoto protocol.

The type and quantity of refrigerant per circuit is indicated on the product nameplate in accordance with EU regulation 517/2014/EU:F-gas.

The maintenance and refrigerant disposal activities shall be carried out by a qualified service technician.

3 Interface

3.1 Operator interface

The operator interface consists of a (touchscreen) display to navigate through the menu and on which settings, functions, values and errors can be viewed and entered.

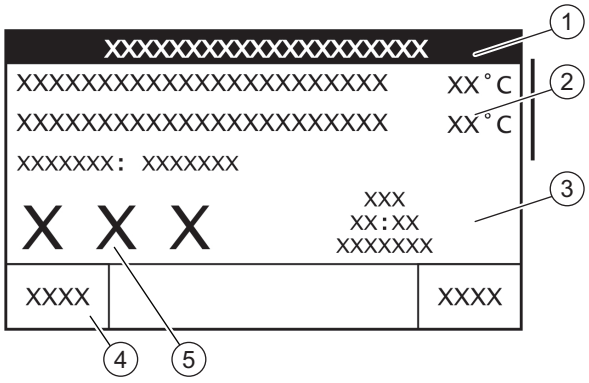
The display is completely menu-driven and enables the user to change settings and to verify the status and history of the water heater.

3.1.1 Display

The display can show two different types of screens:

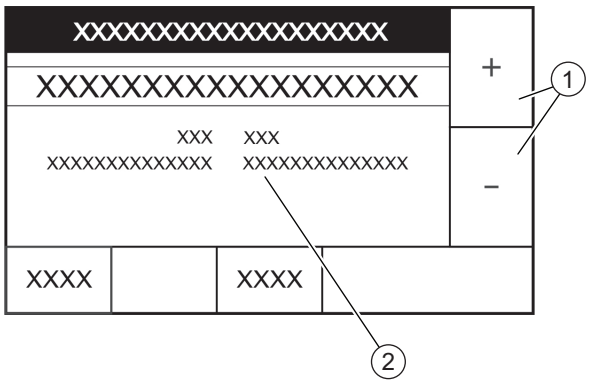
- A home screen that shows texts and symbols to indicate the actual status of the water heater.
- A control screen where more information of the the water heater is shown and where you can change settings.

Fig. Display - Home screen



1. Title bar
2. Status screen
3. Time and program info
4. Control bar
5. Status bar

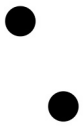
Fig. Display - Control screen



1. Up/Down buttons
2. Minimum and maximum values of the parameter

3.1.2 Symbols on the display

The symbols on the display give visual information about the status of the water heater.

Symbol	Description
	There is a heat demand.
	The water temperature rises.
	End of water heating (standby).
	The water temperature drops.
	The water heater is not able to initiate the heating cycle.
	The heating element icons for a water heater. The open circles represent the heating elements that are not energized with an electric current.
	The heating element icon for a water heater. The filled circles represent the heating elements that are energized with an electrical current.
	The control system is in heating mode.
	The heat exchanger is active.
	Error.
	Warning.

3.1.3 Display buttons

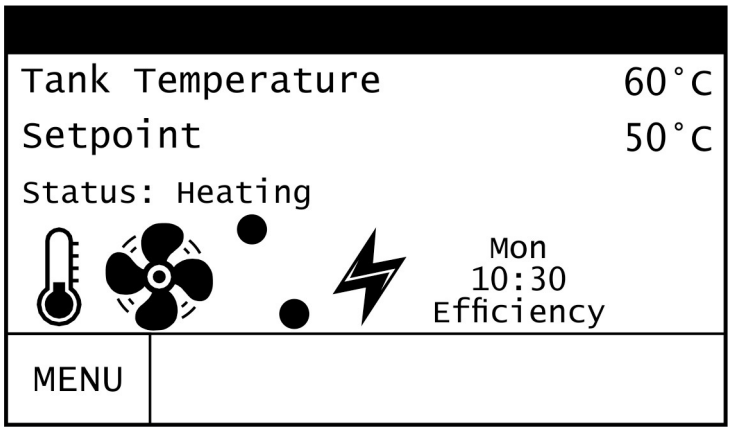
With the buttons on the display, the menu of the water heater can be accessed.

Button	Function
[MENU]	Go to menu
[BACK]	One step back in menu Changed settings will not be saved
[ACCEPT]	Save changed settings
[+]	Value up
[−]	Value down
[>]	Enter the submenu
[▲]	Scroll up / Raise
[▼]	Scroll down / Lower

3.2 Status of the water heater

During operation, the display shows the status of the water heater.

Fig. Display



The following status texts can appear on the display:

Status text	Explanation
Stand-by	The water heater is not heating because there is no heat demand.
Heating	The water heater is heating up water.
Error	The heating cycle is stopped because the controller has detected an error.
Defrosting	Frost has accumulated on the evaporator and the water heater control is performing a defrosting cycle.

3.2.1 Operating modes

The LAAS has 3 operating modes:

- Efficiency mode (see 3.2.1.1)
- Hybrid mode (see 3.2.1.2)
- Electric mode (see 3.2.1.3)

3.2.1.1 Efficiency mode

Efficiency mode is the default, recommended setting. The Efficiency mode is the most energy efficient mode. This mode predominantly uses the heat pump to heat water in the tank. In case of low demand, the upper heating element is not used and the lower heating element will only be used in case the ambient temperature drops below 7°C. For high demand, an anti-cold-water function controls the upper and lower element, but only in case the ambient air temperature is insufficient for recovery. If hot water demands are not met in Efficiency mode, it may be necessary to switch to Hybrid mode.

3.2.1.2 Hybrid mode

Hybrid mode combines high energy efficiency with reduced recovery time. This mode uses the heat pump as the primary heating source. The heating elements will heat water if demand exceeds a predetermined level so that the setpoint temperature can be recovered more quickly

3.2.1.3 Electric mode

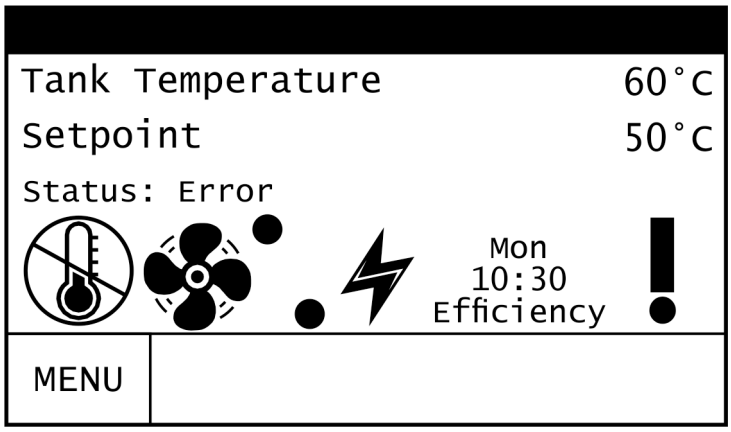
In the Electric mode the water heater functions as a conventional electric unit, relying totally on the heating elements to heat the water in the tank. This mode may be useful in winter to eliminate the output of cold air from the unit.

3.2.2 Error conditions

If there is an error or warning, the screen blinks and it shows a small description of the error or warning.

Press **[BACK]** to return to the Home screen. The Home screen shows the exclamation mark, or a question mark for a warning. For errors, the status changes to Error.

Fig. Error status



When the display shows an error:

1. Switch the isolator between the water heater and the mains power supply off and on to reset the water heater.

Note
Contact your service and maintenance engineer or supplier when the water heater does not restart or when the display shows the error again.

3.2.3 Defrost cycle

The water heaters covered in this manual are equipped with a Defrost cycle to remove frost and/or ice buildup on the evaporator coil. Factors such as air temperature, humidity, air flow, and the condition of the heat pump system influence when and how often the system will enter into a defrost cycle.

Noticing steam around the front of the water heater is a normal part of the defrost cycle as it is functioning to melt the frost or ice accumulation on the evaporator coil.

4 Use

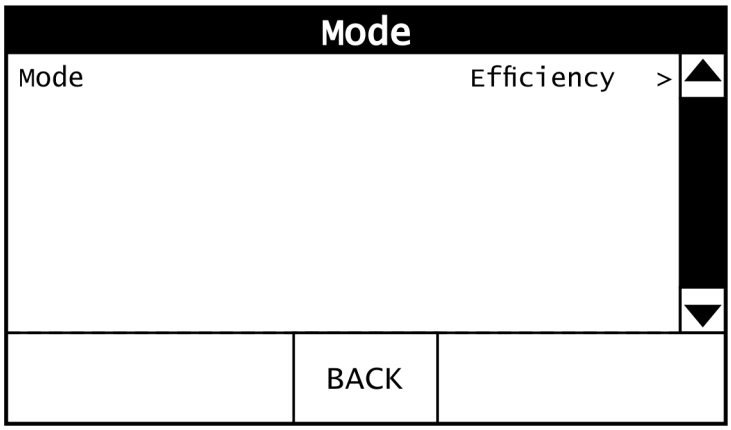
4.1 Turn on the water heater

Caution
Make sure that the water heater is filled with water before you turn on the water heater.

Switch the isolator between the water heater and the mains power supply on to start the water heater.

Select one of the 3 operating modes, use the scroll buttons.

- Efficiency mode
- Hybrid mode
- Electric mode

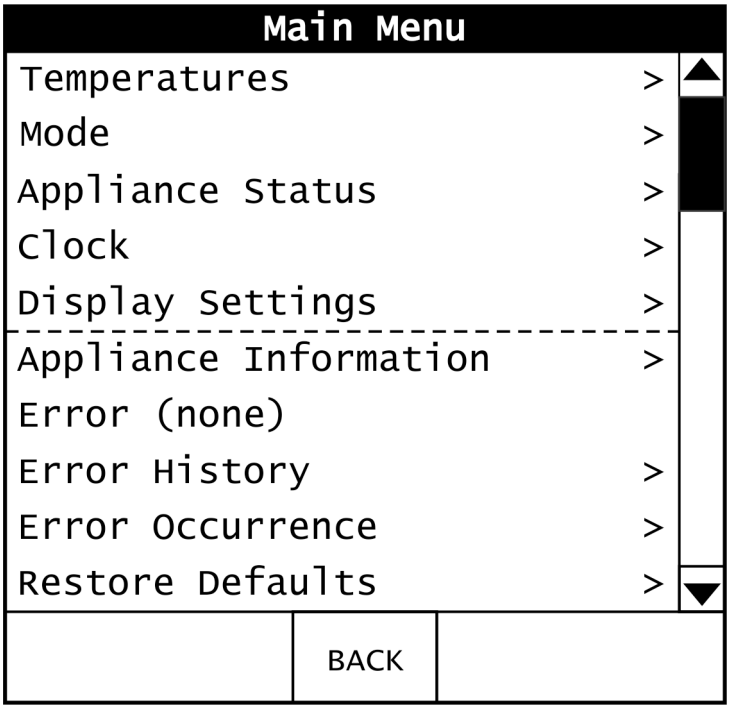


4.1.1 Set the water temperature

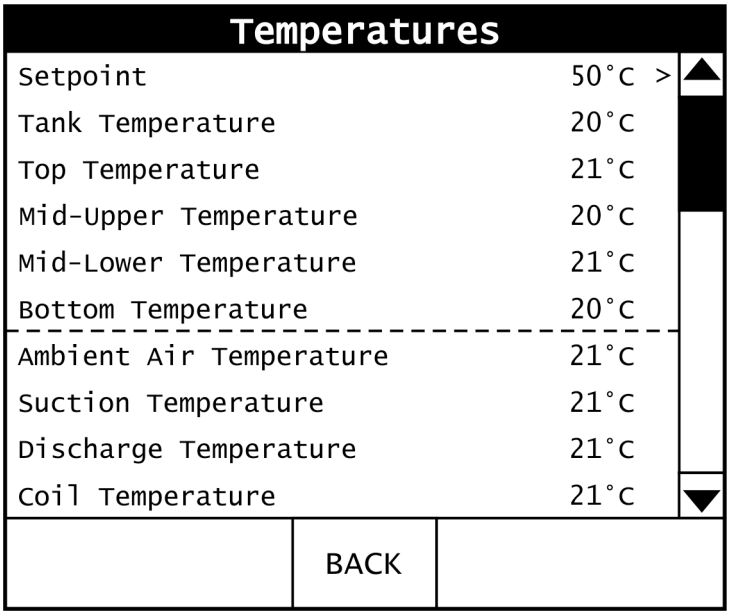
Caution
Preferably set the temperature setpoint to 60 ºC. Harmful scaling and lime build–up will be higher when you set the temperature setpoint to 65 ºC and higher. At lower temperature settings there is a higher risk of high legionella concentrations in the water.

To change the temperature setpoint:

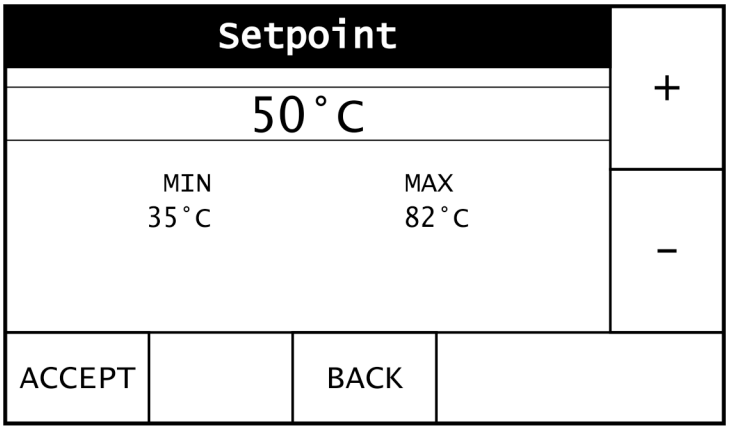
1. Press **[Menu]** to access the main menu.



2. Open the **Temperatures** submenu.



3. Open the **Setpoint** control screen.



4. Change the water temperature setpoint:
   a) Use **[+]** to increase the setpoint.
   b) Use **[-]** to decrease the setpoint.
5. Press **[ACCEPT]** to confirm the value or press **[BACK]** to return to the previous screen.

4.2 Turn off the water heater

4.2.1 Turn off for a short period

To turn off the water heater for less than 2 months, set the water heater isolator switch to the OFF position.

Note
If the water heater stays in the **OFF** position for more than 2 months and no water is drained, air bubbles may be formed in the water heater. This can lead to air in the water pipes.

4.2.2 Turn off for a long period

When the water heater needs to be turned off for more than 2 months, contact your service and maintenance engineer to decommission the water heater.

Installation, Maintenance and Service part

5 Introduction

5.1 About the water heater

The LAAS water heater is intended for heating water for sanitary purpose.

The LAAS is a heat pump water heater with two backup elements. The heat pump heats the water and depending on the operation mode the electric elements assist. The heat pump uses air from the room in which it is installed.

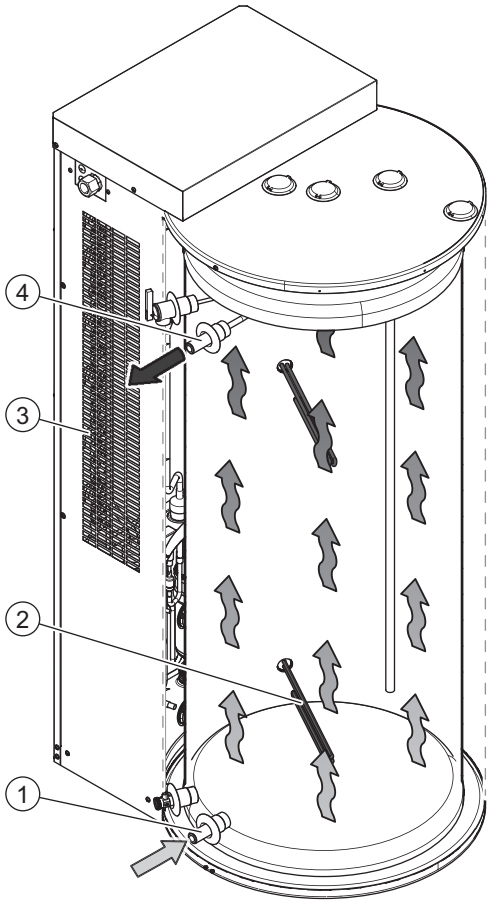
5.2 Working principle

Cold water enters the bottom of the tank through the water inlet (1). Depending on the mode of the water heater the heating elements (2) and a micro channel heat exchanger (3) wrapped around the tank transfer their heat directly to the water and the hot water leaves the tank through the water outlet (4) at the top of the side of the tank. The tank of the water heater has to be completely filled during operation. The tank at least must remain under mains water supply pressure at any time. Fresh cold water is immediately added when hot water is drawn from the water heater.

The water heater is equipped with four temperature sensors. One in the top, one at the bottom and two in the middle, the middle-upper and middle-lower sensor. All four sensors are used to control operation of the heat pump and the electric elements depending on the chosen mode. The displayed measured tank temperature is the mean middle tank temperature.

When the water temperature drops beneath the set temperature, the water heater will be activated and the water is heated.

Fig. LAAS water heater



1. Water inlet
2. Heating elements
3. Heat exchanger
4. Water outlet

6 Safety

6.1 Safety instructions

For safety instructions on the use of the water heater, refer to Safety (see 2) in the User part of this manual.

Warning
Installation, maintenance and service must be carried out by a qualified engineer in compliance with the general and local regulations imposed by the water and power supply companies and the fire brigade.

Warning
The water heater may only be installed on a non-flammable floor or surface.

Warning
Isolate the heater from the mains before you start maintenance or repairs. Leave the water heater electrically isolated until you are ready to commission it.

Warning
The heat exchanger and compressor are under pressure and filled with R-134a refrigerants.

Caution
The water heater may only be moved in an upright position. After unpacking, make sure that the water heater is not damaged.

Caution
Fill the water heater completely before use. Dry firing will damage the water heater.

Caution
The anode protection remains active when the water heater is in OFF mode.

Caution
Water may drip from the discharge pipe of the pressure-relief device. This pipe must be left open to the atmosphere.

Caution
Operate the pressure-relief device regularly to remove lime deposits and to verify that it is not blocked.

Caution
When installing the heater, you need an expansion valve. The expansion valve and associated fittings are not included in the package. The expansion valve must be suitable for a water pressure level of up to 800 kPa. Install the expansion vessel and expansion valve as close as possible to the water heater.

Warning
Never install a stop valve or a non-return valve between the expansion vessel/expansion valve and the water heater.

Caution
The heater is intended to be connected to the water mains permanently. Do not use a hose set to connect the heater.

Caution
The heat exchanger and compressor of this water heater are filled with R-134a refrigerant. Any disposal of refrigerants must be followed by local regulations regarding refrigerants.

Note
Any leakage from the tank and/or connections can cause damage to the immediate environment or floors below the level of the boiler room. Install the water heater above a waste water drain or in a suitable metal leak tray.
The leak tray must have an appropriate waste water drain and must be at least 5 cm deep with a length and width of at least 5 cm larger than the water heater.

Note
The water heater is supplied without a power cable and isolator.
Use a power cable with wires of a suitable diameter based on the cable length and the current.

Note
Select and install an overvoltage category III, all–pole isolator with a contact gap of at least 3 mm. The all–pole isolator must be incorporated in the fixed wiring in accordance with the wiring rules.

6.2 Instructions on the water heater

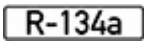
The water heater has some safety instructions on its cover:

- The text "Read the installation instructions before you install the appliance".
- The text "Read the user instructions before putting the appliance into operation".
- The text "Live cables inside! Switch off the power supply completely (on local isolator) to access the electrical components."
- The text "Check all electrical screw connections before commissioning and after service/maintenance."
- The text "A suitable temperature and pressure valve must be fitted in the designated connection."
- The text "A pressure relief valve must be fitted in the cold water supply."
- The text "Warranty is compelled to retract when the appliance is not maintained according to the maintenance instructions and when the water quality does not comply with the regulations as stated in the installation instructions."
- The text "R-134a"

Also the packaging has some safety instructions:

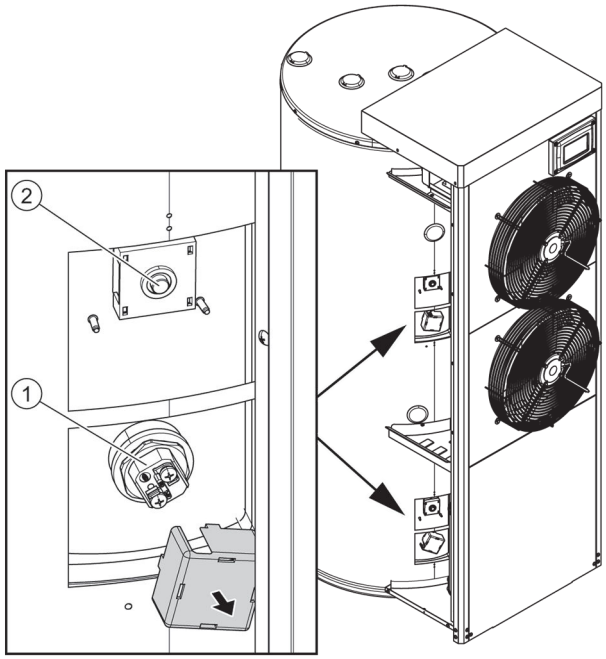
- The text "Read the installation instructions before installing the appliance".
- The text "Read the user instructions before putting the appliance into operation".

- Some safety pictograms:

	CE marked
	UKCA marked
	Packaging in compliance with ISPM 15
	Put the device into a municipal waste collection depot for electrical and electronic equipment (see 6.4.2)
	Refrigerant R-134a

6.3 Safety devices

Fig. Safety thermostat



1. Heating element
2. Safety thermostat - body

Safety devices of the water heater:

Safety thermostats	There is a surface-mounted ECO (Energy Cut Out) control installed for each installed heating element. The ECO high temperature limit switch contacts on each control will open when the tank temperature reaches approximately 93°C. When the upper element ECO switch contacts open (activate), voltage to the main control board (CCB) and user interface module (UIM) is terminated to prevent further heating operation. Voltage will still be present to the water heater, however the UIM on the front of the heater will be blank.
	The lower element ECO switch contacts open (activate) voltage to the lower element only is terminated to prevent further heating operation in the bottom of the tank. The upper element will continue to operate to heat water. The surface-mounted ECO is a manual reset switch. If one or more ECO's activate, the tank temperature must drop below 60°C and electrical power disconnected and restored before an ECO can be reset. To manually reset an ECO, do the following: . Disconnect the power supply to the water heater. . Allow the tank temperature to cool below 60°C. . Remove the control cover from the effected control(s). . Press the manual reset button on each of the effected controls.

	The water heaters covered in this manual are equipped with an Electronic Control system to regulate water temperature inside the storage tank. The control system monitors the temperature from four factory-installed temperature sensors. The operating setpoint is adjusted to regulate water temperature inside the storage tank. This is an adjustable user setting in the control system's Temperatures menu. This and all control system menus are accessed through the user interface module (UIM) located on the front of the water heater.
	The water heaters covered by this manual have three modes of operation. The Operating setpoint for each mode is adjustable: - Efficiency mode: 35°C to 65°C (Factory Setting) - Hybrid mode: 35°C to 65°C - Electric mode: 35°C to 82°C The factory setting is 50°C. See Operating setpoint adjustment for instructions on how to adjust the Operation setpoint and other user settings. Set the Operating setpoint at the lowest setting that produces an acceptable hot water supply. This will always provide the most energy efficient operation.

Safety devices of the installation:

Expansion vessel	The expansion vessel temporarily stores expansion water to keep the pressure in the installation at the correct level.
Expansion valve	The expansion valve prevents excessive pressure in the tank of the water heater.
Pressure-reducing valve	The pressure-reducing valve reduces the water mains pressure, if necessary.
Temperature and pressure relief valve (T&P valve) (1)	The T&P valve prevents excessive pressure and temperature in the tank.

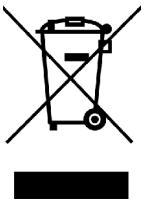
1- All installations have a T&P valve connection. The use of a T&P valve is mandatory.

6.4 Environmental aspects

6.4.1 Recycling

The packaging material is environmentally friendly, recyclable and relatively easy to discard.

6.4.2 Disposal



Old end-of-life appliances contain materials that need to be recycled. When you discard devices at the end of their service life, you must obey local legislation related to waste disposal.

Never discard your old device together with regular waste. Put the device into a municipal waste collection depot for electrical and electronic equipment. If necessary, ask your supplier or your service and maintenance engineer for advice.

6.4.3 Disposal refrigerant

Caution
The heat exchanger and compressor of this water heater are filled with R-134a refrigerant. Any disposal of refrigerants must be followed by local regulations regarding refrigerants.

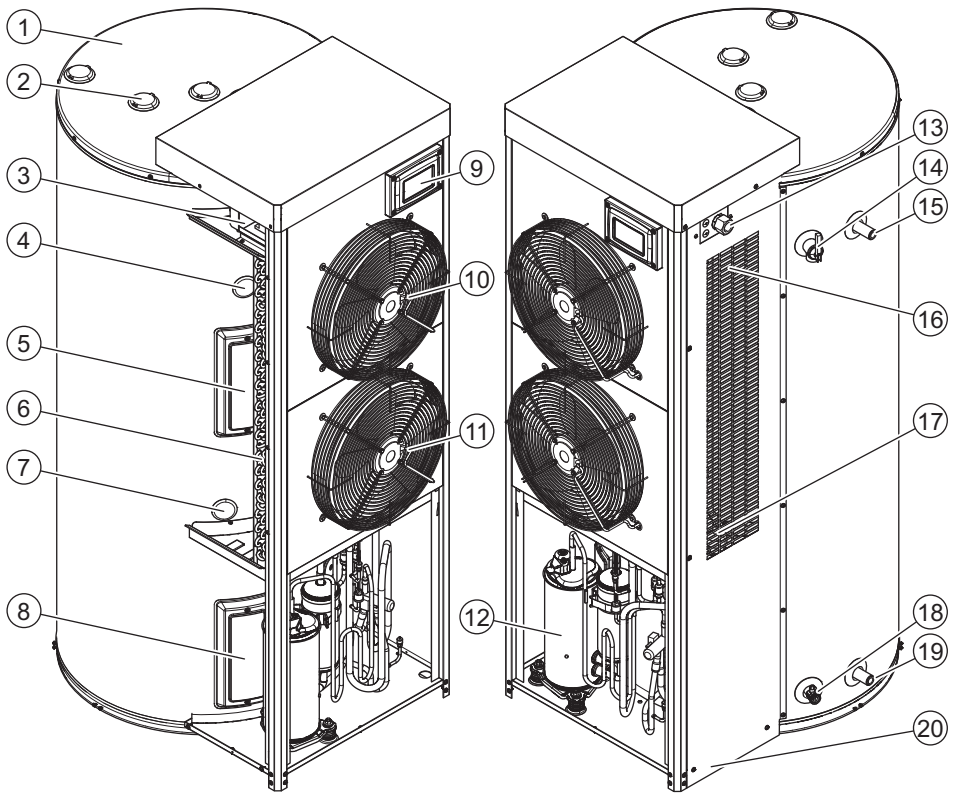
7 Water heater

7.1 Structure of the water heater

The water heater has the following main components:

Tank (1)	The water is stored and heated up in the tank.
Heating elements (5&8)	The water is heated by the heating elements.
Heat exchanger (6, 10&11)	The water is heated by the heat exchanger

Fig. Components water heater



1. Tank
2. Anode
3. Control system
4. Upper tank temperature sensor
5. Upper heating element, ECO, mid-upper tank temperature sensor, service cover
6. Evaporator
7. Mid-lower tank temperature tensor
8. Lower heating element, ECO, lower tank temperature sensor, service cover
9. Display
10. Upper evaporator fan
11. Lower evaporator fan
12. Compressor
13. Electrical conduit access port
14. Temperature-pressure relief valve
15. Water outlet
16. Ambient air sensor
17. Coil temperature sensor
18. Drain valve
19. Water inlet
20. Condensate drain

8 Installation

Warning
The installation must be done by a qualified person, in compliance with general and local applicable regulations (on page 5).

Caution
The water heater may not be used in rooms where chemical substances are stored or used because of the risk of explosion and corrosion of the water heater. Some propellants, bleaching agents and degreasing agents etc. disperse of explosive vapors and/or cause accelerated corrosion. If the water heater is used in a room where such substances are stored or used, the warranty will be void.

Caution
This water heater is designed for indoor use only.

For more safety instructions, refer to Safety instructions (see 6.1).

8.1 Packaging

Lochinvar recommends to unpack the water heater at or near its intended location. Remove the packaging material carefully to prevent damage to the water heater.

8.2 Conditions

Warning
The water heater must be installed on a non-flammable floor and surface.

8.2.1 Ambient conditions

The installation site must be frost-free. If necessary, adjust the installation site to keep it frost-free.

Make sure that the ambient conditions are correct to prevent malfunction of the electronics in the water heater.

Air humidity and ambient temperature	
Air humidity	Max. 93% RH at + 25 ºC
Ambient temperature	Functionality: -7 < T < 43 ºC

8.2.2 Maximum floor load

Refer to the building construction engineer and the general specifications in the appendices (see A) to make sure that the maximum floor load is sufficient for the weight of the water heater.

8.2.3 Water composition

The water must comply with the regulations for drinking water for human consumption.

Water composition	
Water hardness	> 1.00 mmol/l: - German hardness > 5.6° dH - French hardness > 10.0° fH - English hardness > 7.0° e - $CaCO_3$ > 100 ppm
Conductivity	> 125 µS/cm
Acidity (pH value)	7.0 - 9.5

Note
Water quality may adversely affect the efficiency, performance and lifetime of the water heater, refer to Warranty (on page 3). If water specifications differ from the specifications in the table a water treatment specialist should be consulted.

8.2.4 Working clearances

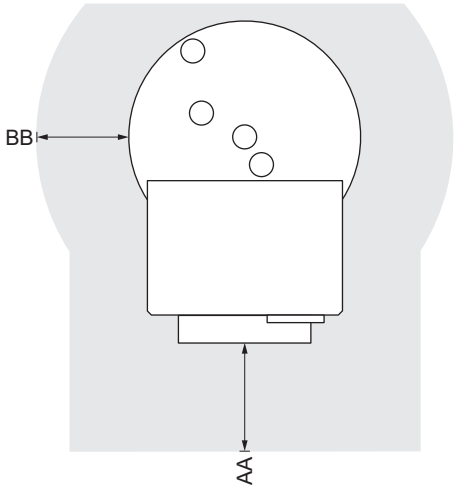
For optimal performance, free unrestricted airflow must be guaranteed. The distance between the front of the appliance and a wall or large objects is preferably as large as possible, but may never be less than 100 cm. Larger distances minimize the risk of recirculation of the blown-off air over the evaporator of the appliance. Recirculation has a negative impact on the heat pump performance.

Warning
The installation of ducts is strictly prohibited.

Make sure that there is sufficient clearance to access the water heater:

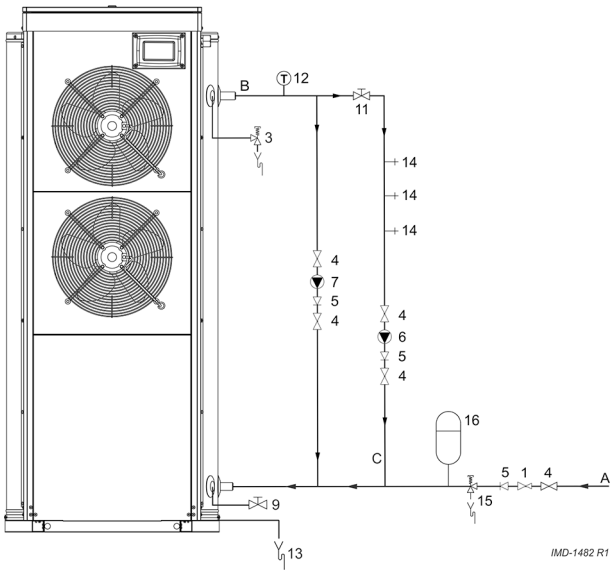
- 100 cm in front of the water heater (AA).
- 60 cm at the left and right side of the water heater (BB).
- 100 cm at the top of the water heater.

Fig. Working clearances



8.3 Installation diagram

Fig. Installation diagram



1. Pressure reducing valve (mandatory)
3. T&P valve (mandatory)
4. Stop valve (recommended)
5. Non-return valve
6. Circulation pump (optional)
7. Shunt pump
9. Drain valve
11. Service stop valve
12. Temperature gauge (optional)
13. Condensate drain tube
14. Draw-off point
15. Expansion valve
16. Expansion vessel

A. Cold water supply
B. Hot water outlet
C. Circulation pipe

Note
Use this installation diagram when you:

- install the water connections (see 8.4)
- fill the water heater (see 8.7.1)
- drain the water heater (see 8.8.2)

8.4 Water connections

8.4.1 Cold water connection

Caution
When installing the heater, you need an expansion valve. The expansion valve and associated fittings are not included in the package. The expansion valve must be suitable for a water pressure level of up to 800 kPa. Install the expansion vessel and expansion valve as close as possible to the water heater.

Warning
Never install a stop valve or a non-return valve between the expansion vessel/expansion valve and the water heater.

Warning
The heater is intended to be connected to the water mains permanently. Do not use a hose set to connect the heater.

Install the cold water connection:

1. When the mains water supply pressure is too high, install a pressure reducing valve (1), refer to the Technical details (see A).
2. Install a non-return valve (5).
3. Install an expansion valve (15).
4. Connect the overflow connection of the expansion valve, to an open waste water pipe.
5. Install an expansion vessel (16).

8.4.2 Hot water connection

Note
Insulate long hot water pipes to prevent unnecessary energy loss.

Note
The use of a T&P valve is mandatory.

Install the hot water connection:

1. Install a stop valve (11) in the hot water outlet pipe for service reasons.
2. Install a T&P valve (3).
3. If applicable, install a temperature gauge (12).

8.4.3 Condensate drain connection

Because of the condensate discharge, it is recommended to place the appliance on a fire-resistant base of +/- 100 mm.

- Condensate discharge must be connected to the sewage system.
- Use flexible PVC pipe or tubing to connect the condensate drain (13) to a suitable drain.
- Do not connect condensate drain lines with other drain or discharge lines into a single (common) pipe or line.
- Slope the condensate drain lines toward the inside floor drain.

8.4.4 Circulation connection

Install a circulation system when an immediate flow of hot water at draw-off points is required. This improves comfort and reduces water wastage.

Note
Connect the circulation pipe (C) to the cold water inlet connection.

Note
Make sure that the circulation pump has the correct capacity for the length and resistance of the circulation system.

Install a circulation pump:

1. Install a circulation pump (6).
2. Install a non-return valve (5) after the circulation pump to make sure that the direction of circulation is guaranteed.
3. Install a stop valve (4) before the circulation pump.
4. Install a stop valve (4) after the non-return valve.
5. Connect the circulation pipe (C) to the cold water inlet, between the water heater and the expansion vessel (16).

8.5 Electrical connections

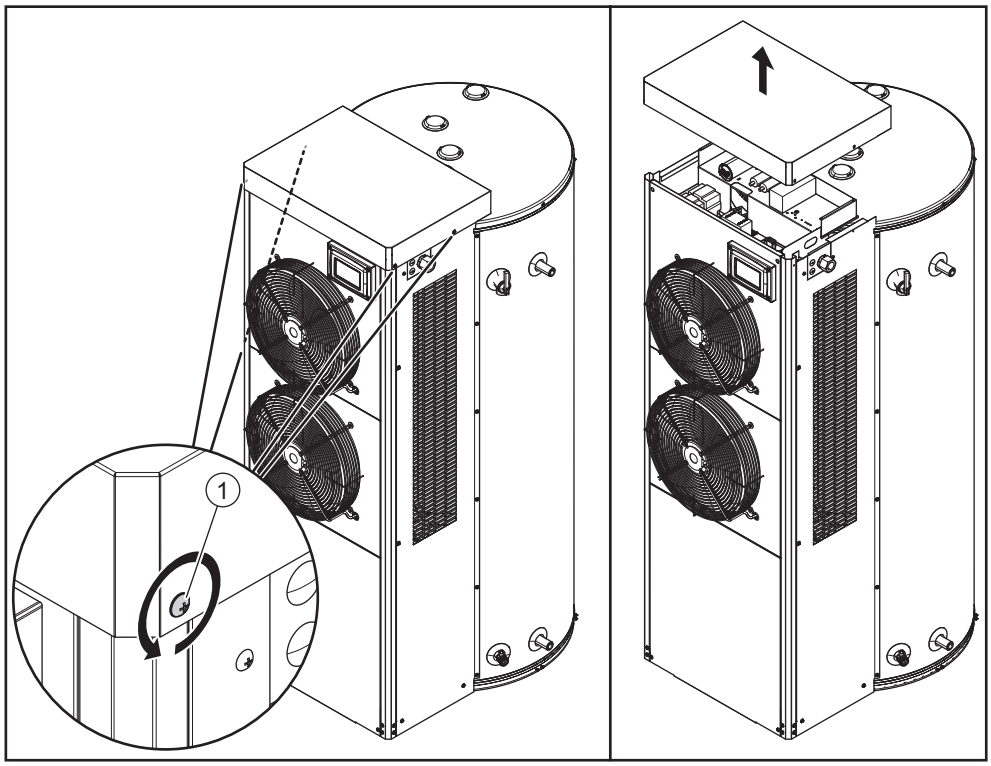
Warning
Leave the water heater electrically isolated until you are ready to commission it.

8.5.1 Preparation

Remove the top cover and control box cover of the water heater to make the electrical section and the terminal block visible. Remove screws (1) 4x.

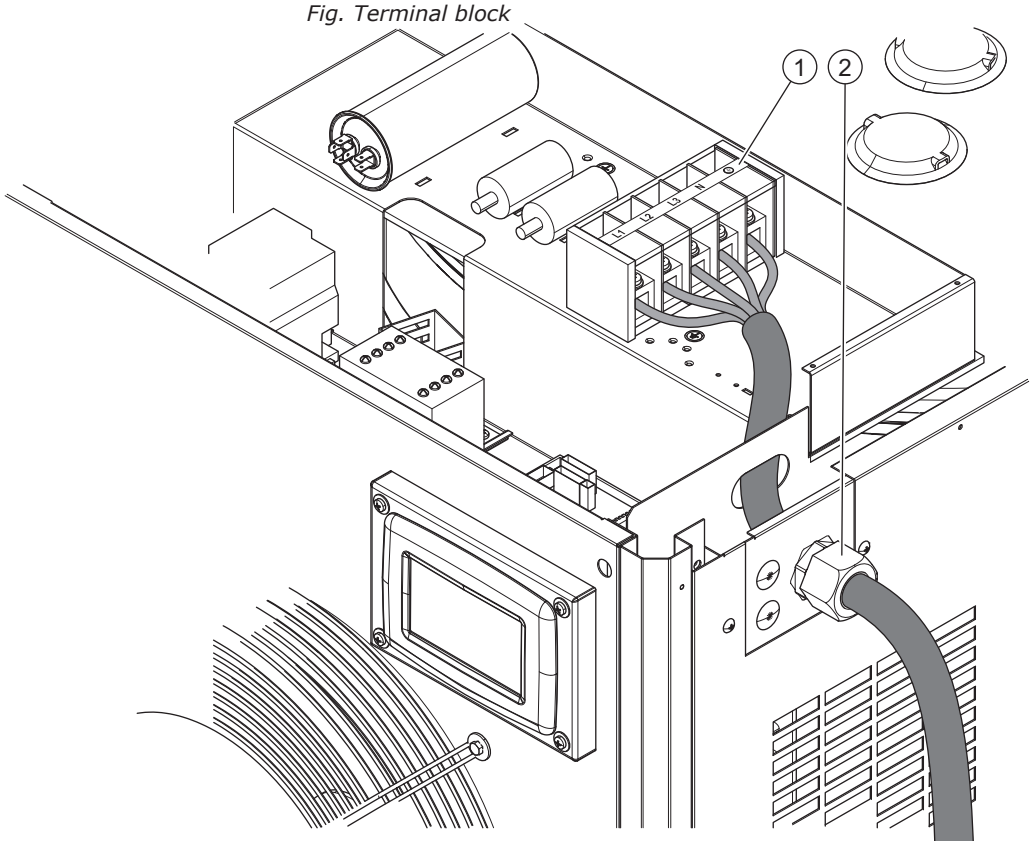
Warning
Live cables inside! Switch off the power supply completely (on local isolator) before opening the top cover to access the electrical components.

Fig. Remove the cover



The mains power connections have to be connected to the terminal block, refer to Structure of the water heater (see 7.1).

Fig. Terminal block



1. Terminal block
2. Cable glands

8.5.2 Mains power

Note
The water heater is supplied without a power cable and isolator.
Use a power cable with wires of a suitable diameter based on the cable length and the current.

Note
Select and install an overvoltage category III, all–pole isolator with a contact gap of at least 3 mm. The all–pole isolator must be incorporated in the fixed wiring in accordance with the wiring rules.

Note
This isolator must be installed in the same room as the appliance, suitably marked and no more than 1 meter away from the water heater.

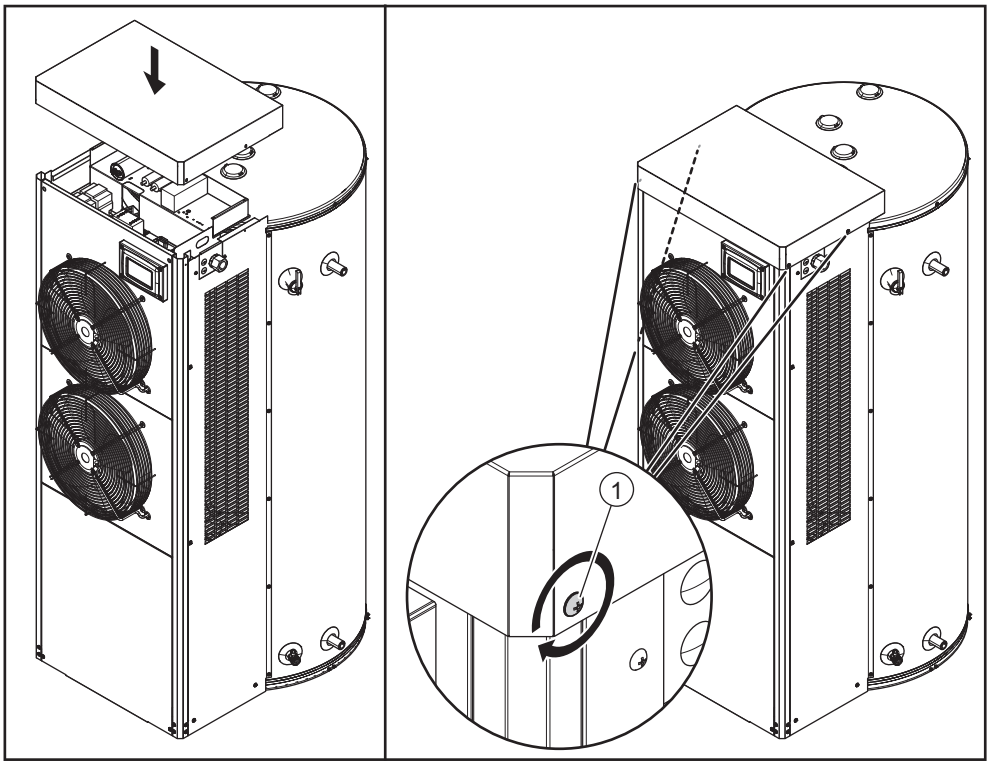
Connect the water heater to the mains power supply:

1. Pull the power cable through the cable gland.
2. Connect the live (L1, L2 and L3) and the neutral (N) and the earth (A) core of the power cable to the terminals of the terminal block.
3. Connect the power cable to the isolator.
4. Secure the power cable in the cable gland.

8.5.3 Finalization

When all connections are made, install the control box cover and the top cover on the water heater. Fasten screws (1) 4x.

Fig. Install the cover



8.6 Ventilation

The LAAS water heater utilizes ambient air for heating sanitary hot water. It extracts heat from the air, cooling down the room where it is installed in. Depending on room size, natural or mechanical ventilation may be required. If the room temperature drops significantly during heat pump operation than ventilation is insufficient.

Ideal ambient temperatures:

- 60 < setpoint ≤ 65°C	15 to 25°C
- 55 < setpoint ≤ 60°C	7 to 35°C
- setpoint ≤ 55°C	1 to 43°C

Maintaining a room temperature above 10°C helps to avoid the defrost cycle being activated and provides for better heater efficiency and performance.

8.7 Commissioning

To commission the water heater:

1. Fill the water heater (see 8.7.1)
2. Turn on the water heater (see 8.7.2)

8.7.1 Filling

Refer to the installation diagram when you fill the water heater:

1. If applicable, open the stop valves (4) of the circulation pipe (C).
2. Make sure that the drain valve (9) is closed.
3. Open the nearest hot water draw-off point (14).

4. Open the stop valve (4) of the cold water supply pipe (A). Cold water flows into the water heater.
5. Fill the water heater until a full water jet flows from the nearest draw-off point. The water heater is completely full.
6. Open all draw-off points to bleed the entire installation of air.
   The water heater is now under water supply pressure.
7. Make sure that no water comes out of the expansion valve (15) or the T&P valve (3). If water comes out:
   - Examine if the water supply pressure is greater than the specified value in the Technical details. If necessary, install a pressure reducing valve (1).
   - Examine if the expansion valve in the protected cold supply set-up is installed correctly and is not defective. If necessary, replace the expansion valve.
8. Close all hot water draw-off points.

8.7.2 Turn on the water heater

Refer to the procedure in the user part to Turn on the water heater (see 4.1).

8.8 Decommissioning

To decommission the water heater:

1. Turn off the water heater (see 8.8.1)
2. Drain the water heater (see 8.8.2)

8.8.1 Turn off the water heater

Refer to the procedure in the user part to Turn off the water heater (see 4.2) and isolate the water heater from the mains power supply.

8.8.2 Draining

Refer to the installation diagram when you drain the water heater:

1. If applicable, close the service stop valve (11) in the hot water pipe.
2. If applicable, close the stop valves (4) of the circulation pipe (C).
3. Close the stop valve (4) in the cold water supply.
4. Open the drain valve (9).
5. Aerate the entire installation of air until the water heater is completely drained.
6. If the water heater needs to be drained completely, disconnect and tilt the water heater in the direction of the drain valve.

9 Settings

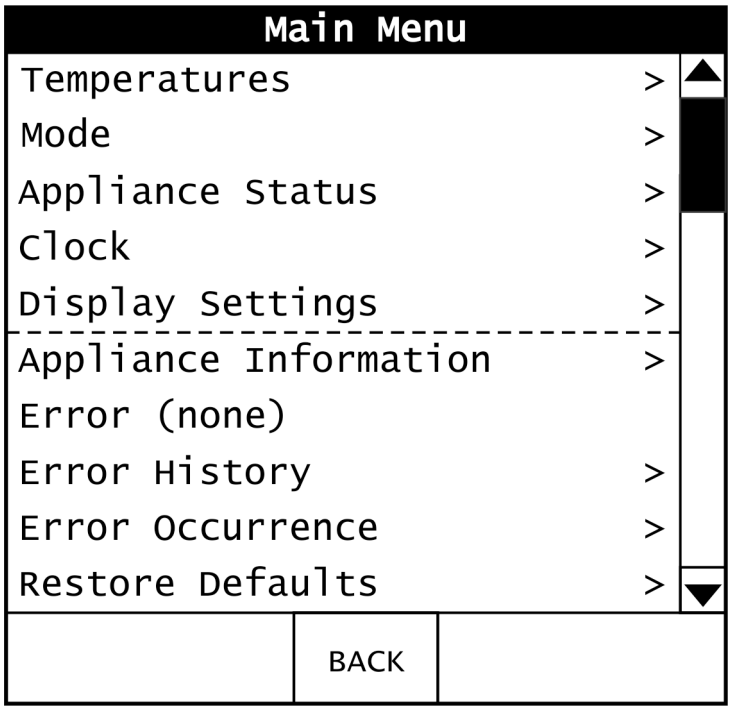
9.1 Display

The display is completely menu-driven and enables the user to change settings and to verify the status and history of the water heater.

For more information about how to use the display, refer to Operator interface (see 3.1).

On the display, press **[MENU]** to enter the main menu.

Fig. Main menu



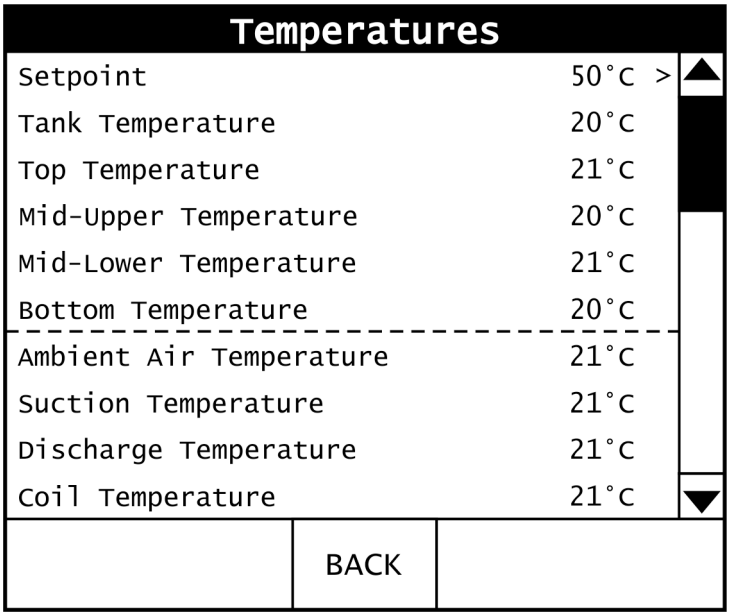
The main menu consists of submenus. Use the scroll bar on the right side to scroll through the menu.

Press on a line with a **[>]** to open that specific submenu. Press **[BACK]** to return to the previous screen.

9.2 Temperatures

The **Temperatures** submenu shows the temperature setpoint and the actual temperatures of different levels or positions of the water heater.

Fig. Temperature submenu



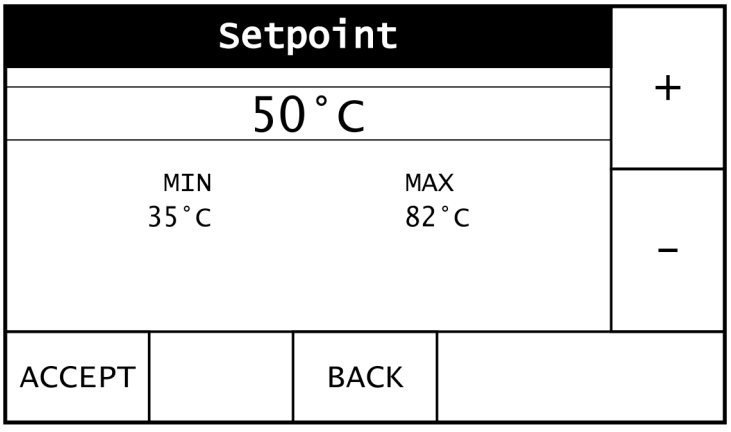
Press on the line with a **[>]** to set the setpoint. Press **[BACK]** to return to the previous screen.

9.2.1 Setpoint

Caution
Preferably set the temperature setpoint to 60 ºC. Harmful scaling and lime build–up will be higher when you set the temperature setpoint to 65 ºC and higher. At lower temperature settings there is a higher risk of high legionella concentrations in the water.

To change the temperature setpoint:

1. From the **Temperatures** submenu open the **Setpoint** control screen.



2. Change the water temperature setpoint:
   a) Use **[+]** to increase the setpoint.
   b) Use **[-]** to decrease the setpoint.
3. Press **[ACCEPT]** to confirm the value or press **[BACK]** to return to the previous screen.

9.3 Modes

The **Mode** submenu shows the Mode to select.

In this menu, you can change the operating mode:

- **Efficiency**
- **Hybrid**
- **Electric**

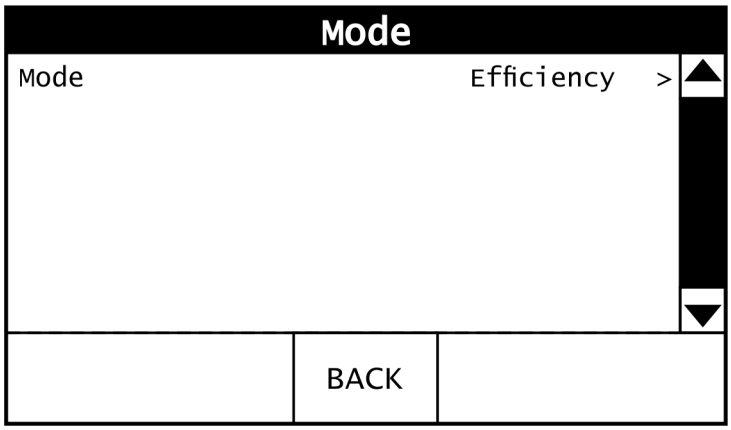


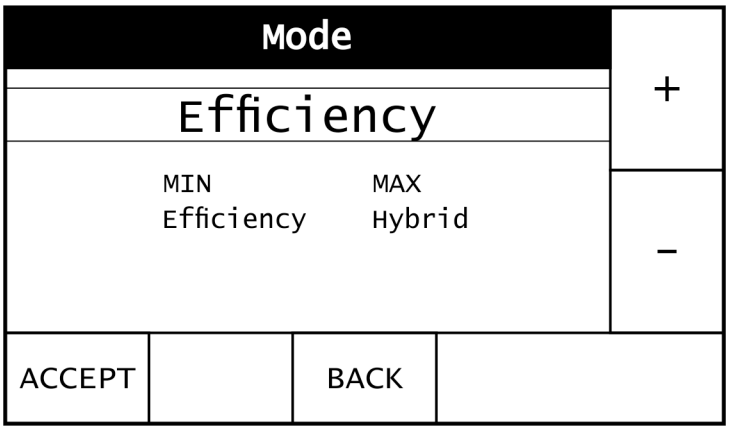
Fig. Mode submenu

9.3.1 Mode submenu

This display emerge by start up of the machine. The machine starts in the **Efficiency** mode

To change the mode:

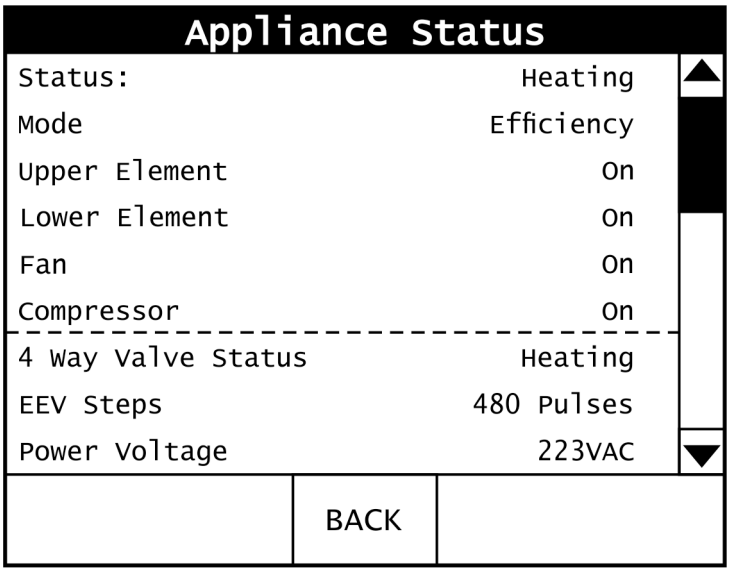
From the **Mode** submenu open the **Mode** control screen.

1. 

2. Change the Mode:
   a) Use **[+]** to change the mode.
   b) Use **[-]** to change the mode.
3. Press **[ACCEPT]** to confirm the Mode or press **[BACK]** to return to the previous screen.

9.4 Appliance status

Fig. Appliance status submenu



The **Appliance Status** submenu shows detailed information of the appliance:

Status	Current status of the appliance.
Mode	Current mode of the appliance.
Upper element	On or Off
Lower element	On or Off
Fan	On or Off
Compressor	On or Off
4 Way valve status	Current status of the 4 Way Valve.
EEV steps	Displays the pulses sent by the CCB
Power voltage	Displays the supply voltage

9.4.1 Operating status

Status	Description
Standby	The water heater is not in an active heating cycle. That is, when: the Tank temperature is at or above the Operating setpoint
Defrosting	Frost has accumulated on the evaporator and the water heater control is performing a defrosting cycle.
Heating	The control system is in Heating mode.
Fault	The control system has detected a Fault condition. Heating operation is disabled until the Fault condition is corrected. Power to the water heater must be cycled off and on at the breaker to reset the control system.

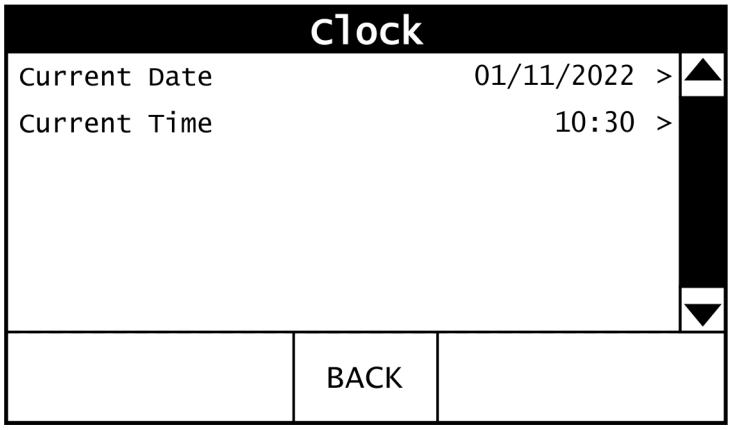
Note
Some faults are automatically reset by the control system and do not require recycling the power.

Note
Cycling power will not reset the control system if the condition that caused the Fault has not been corrected.

9.5 Set the time and day

The **Clock** submenu shows the **Current time** and **Current date** of the system.

Fig. Clock submenu

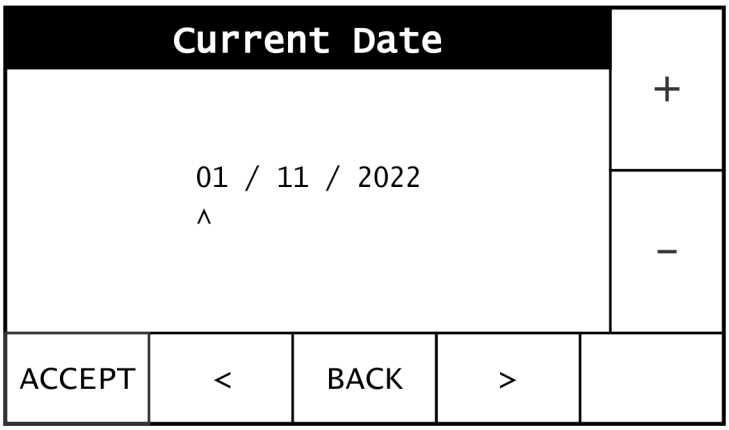


Press on a line with a **[>]** to set the Date or Time. Press **[BACK]** to return to the previous screen.

9.5.1 Current date

To change the date:

1. From the **Clock menu** open the Current date control screen.

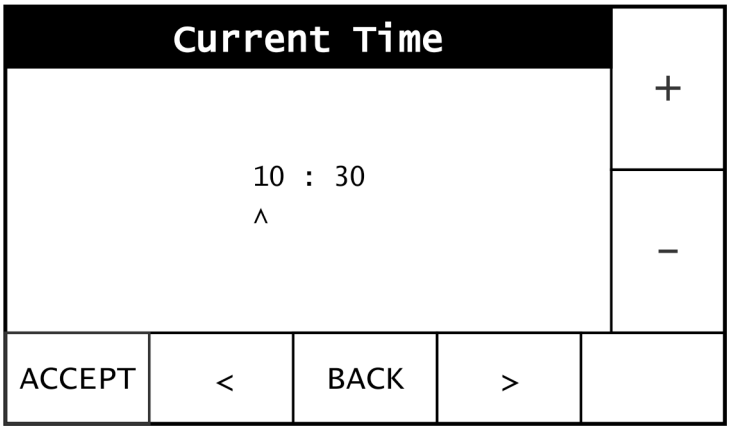


2. Change the setpoint:
   a) The **[^]** indicates which value can be changed.
   b) Use **[+]** to increase the value.
   c) Use **[-]** to decrease the value.
   d) Use **[>]** and **[<]** to move between days, hours and minutes.
3. Press **[ACCEPT]** to confirm the value or press **[BACK]** to return to the previous screen.

9.5.2 Current time

To change the time:

1. From the **Clock menu** open the Current time control screen.

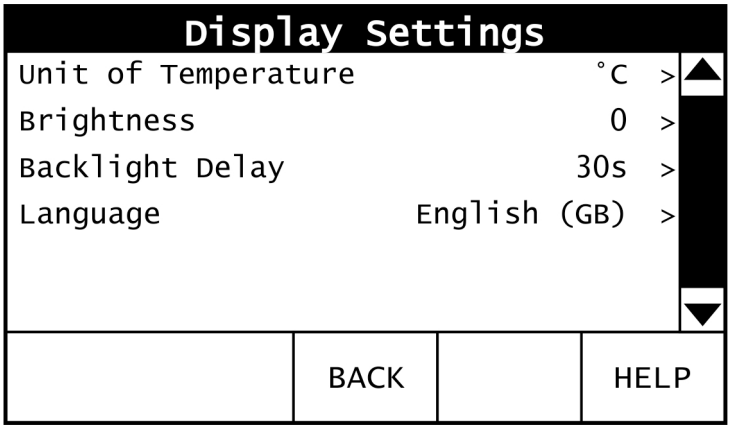


2. Change the setpoint:
   a) The **[^]** indicates which value can be changed.
   b) Use **[+]** to increase the value.
   c) Use **[-]** to decrease the value.
   d) Use **[>]** and **[<]** to move between days, hours and minutes.
3. Press **[ACCEPT]** to confirm the value or press **[BACK]** to return to the previous screen.

9.6 Display settings

The **Display Settings** submenu shows the settings for the unit of temperature, the display brightness, the backlight delay and the language.

Fig. Display settings submenu

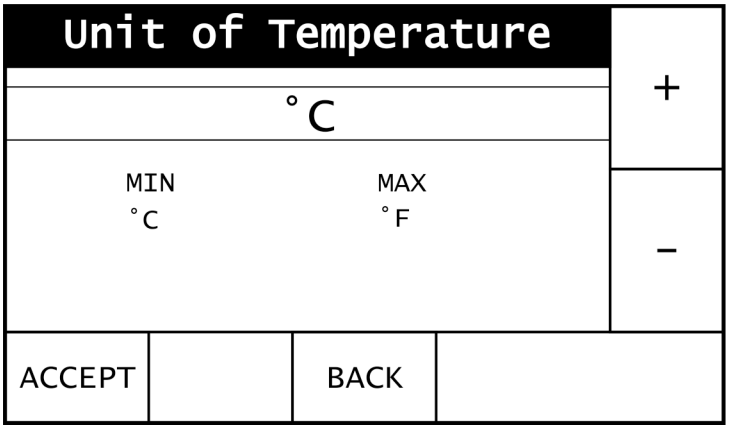


Press on a line with a **[>]** to change the settings.

9.6.1 Set the unit of temperature

To change the unit of temperature:

1. From the **Display Settings** submenu open the Unit of temperature control screen.



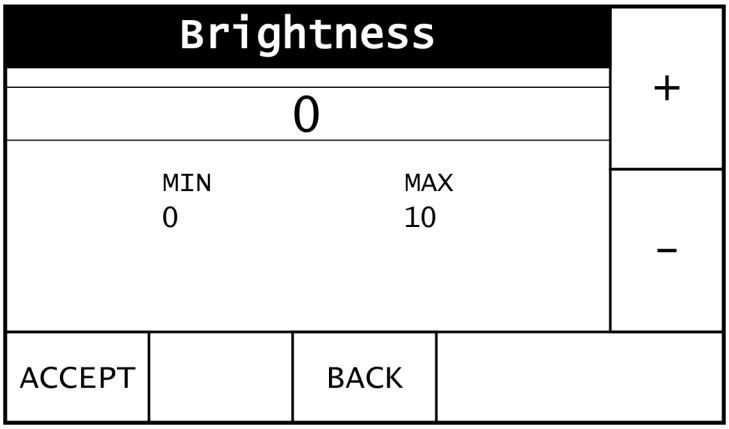
2. Change the setting.
3. Press **[ACCEPT]** to confirm the value or press **[BACK]** to return to the previous screen.

9.6.2 Set the display brightness

By default, the brightness of the display is low (brightness=0). If you set the brightness to 1 or higher, the display backlight becomes brighter when you press a button.

To change the display brightness:

1. From the **Display Settings** submenu open the **Brightness** control screen.



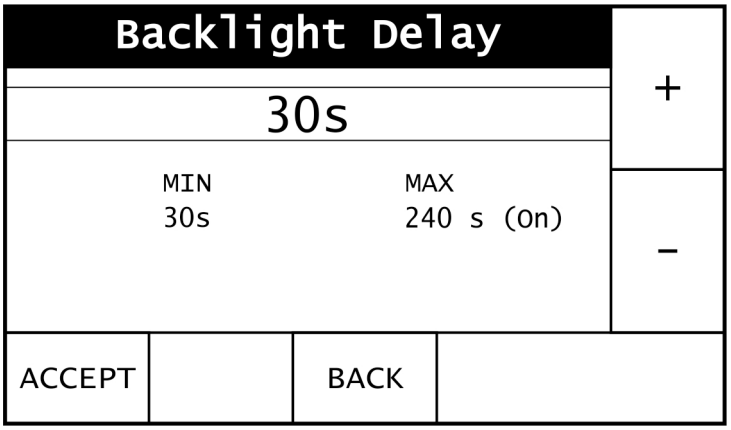
2. Change the setting:
   a) Use **[+]** to increase the brightness.
   b) Use **[-]** to decrease the brightness.
3. Press **[ACCEPT]** to confirm the value or press **[BACK]** to return to the previous screen.

9.6.3 Set the backlight delay

If you set the display brightness to 1 or higher, the display becomes brighter when you press a button. The backlight delay sets how long it takes before the backlight switches back to low level.

To change the backlight delay:

1. From the **Display Settings** submenu open the Backlight Delay control screen.



2. Change the setting:
   a) Use **[+]** to increase the time that the backlight is on.
   b) Use **[-]** to decrease the time that the backlight is on.

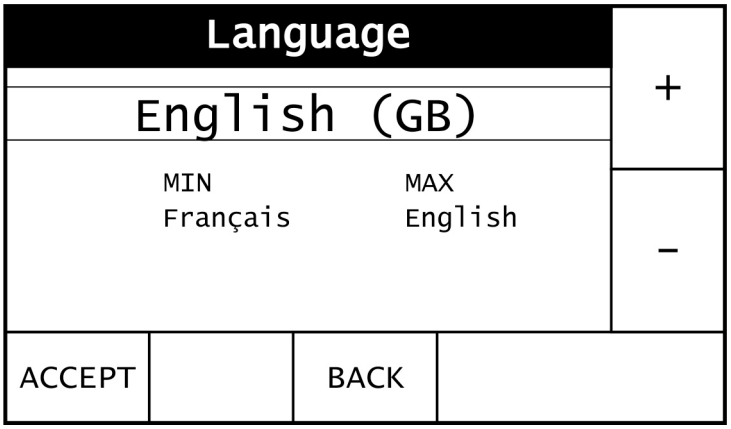
Note
When the backlight delay is set to 240 s (maximum value), the backlight will be continuously on.

3. Press **[ACCEPT]** to confirm the value or press **[BACK]** to return to the previous screen.

9.6.4 Set the language

To change the language:

1. From the **Display Settings** submenu open the **Language** control screen.



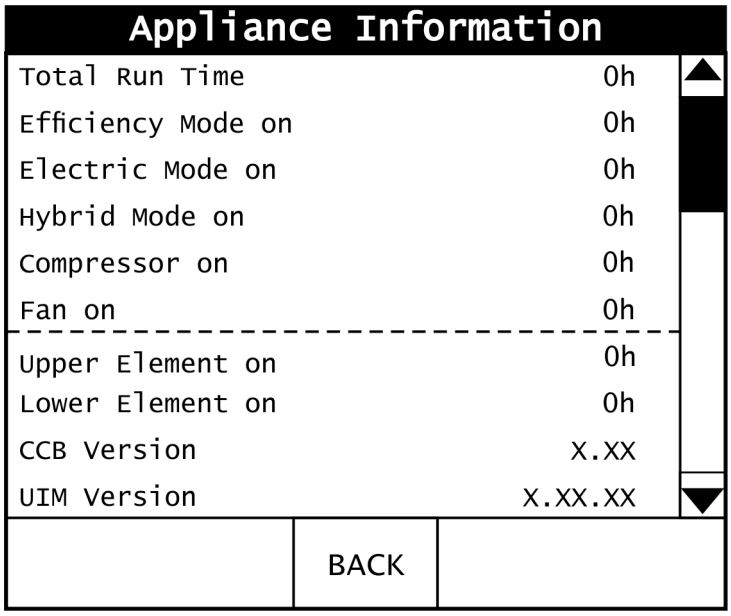
2. Use **[+]** and **[-]** to change the language setting.
3. Press **[ACCEPT]** to confirm the value or press **[BACK]** to return to the previous screen.

   When you press **[ACCEPT]**, the display restarts. This does not influence the control system.

9.7 Appliance information

From the **Main menu**, you can open the **Appliance Information** submenu. The **Appliance Information** submenu shows information about the operating history of the water heater.

Fig. Display - Appliance Information



Total run time	Total time the appliance has been on
Efficiency mode on	Total time the efficiency mode has been on
Electric mode on	Total time the electric mode has been on
Hybrid mode on	Total time the hybrid mode has been on
Compressor	Total time the compressor has been on
Fan on	Total time the fan has been on
Upper element on	Total time the upper element has been on
Lower element on	Total time the lower element has been on
CCB version	Version of the control system software
UIM version	Version of the display software

9.8 Error history

From the **Main menu**, you can open the **Error History** submenu. The **Error History** submenu shows the 9 most recent errors of the water heater and the point of time of

these errors. Press the error to open the information about that specific error. Refer to troubleshooting (see 11).

Fig. Display - Error History

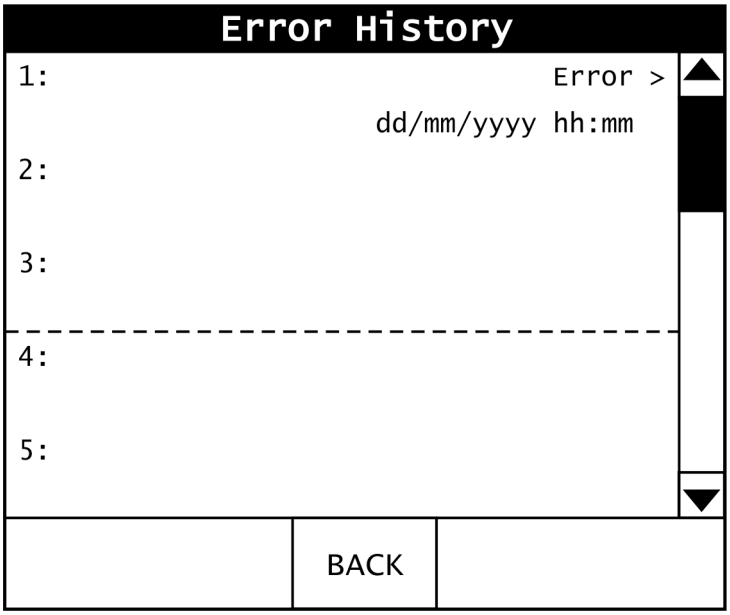


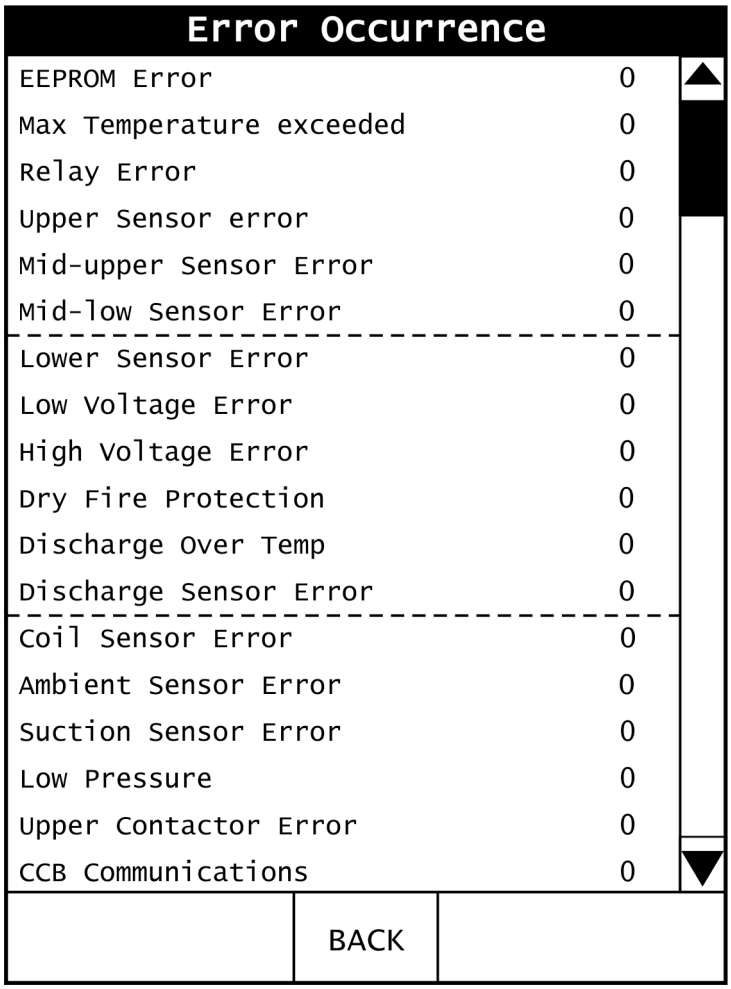
Fig. Display error information

Press **[BACK]** to return to the previous screen.

9.9 Error occurrence

From the **Main menu**, you can open the **Error Occurrence** submenu. The **Error Occurrence** submenu shows the number of errors for each error category.

Fig. Display - Error Occurrence

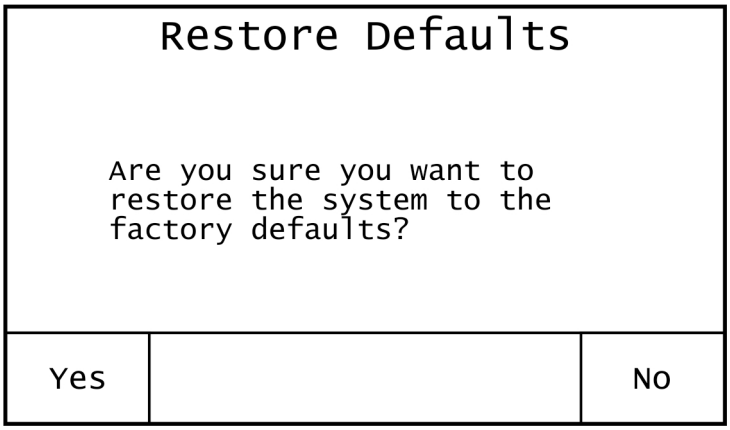


Press **[BACK]** to return to the previous screen.

9.10 Restore default

From the **Main menu**, you can open the **Restore Default** submenu. On the **Restore Default** submenu you can restore the settings to the factory default settings.

Fig. Display - Restore default



Press **[Yes]** to confirm or **[No]** to return to the previous screen.

10 Maintenance

The water heater needs maintenance at least once a year. The maintenance interval is determined by the water quality, the average operation hours each day and the set water temperature.

To determine the correct interval, Lochinvar recommends to do a system check three months after installation.

Note
Do maintenance to maintain an effective and efficient transfer of heat to the water. This significantly increases the service life of the water heater.

Note
When needed, spare parts can be ordered. To be sure that you receive the correct spare parts, look at the data plate for the full serial number and the water heater model. Use this information when you order the spare parts.

Do the following maintenance activities:

- Preparation (see 10.1)
- Water-side maintenance (see 10.2)
- Performance check (see 10.3)
- Finalization (see 10.4)

10.1 Preparation

Isolate the water heater from the mains before you start maintenance tasks.

10.2 Water-side maintenance

To do water side maintenance:

- Inspect the anode (see 10.2.1)
- Descale the tank (see 10.2.2)

10.2.1 Inspect the anode

The life cycle of the anode is determined by the quality and the quantity of the water that flows through the water heater. Inspect the anode at least once a year to make sure that the tank is protected against corrosion.

To inspect the anode:

1. Close the stop valve in the cold water supply.
2. Open the nearest hot water tap to reduce the water pressure in the water heater.
3. Use a wrench to loosen the anode.
4. Take the anode out of the water heater.

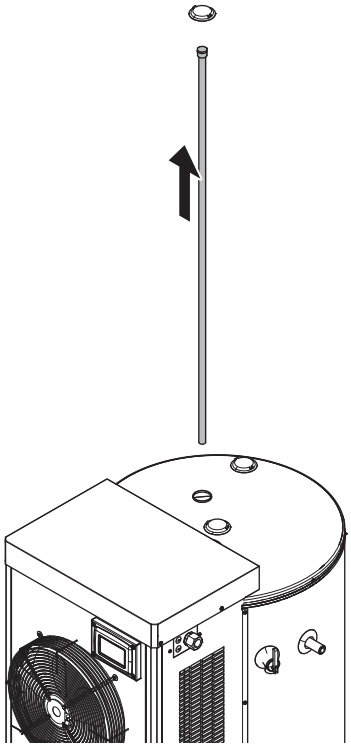
5. Inspect the volume of the anode. When the anode is consumed for 60 % or more, replace the anode.

Note
If the anode needs to be replaced, always use an anode of the same type. Please refer to the type and the serial number on the data plate.

6. Place the anode in the water heater.
7. Use a wrench to fasten the anode. Make sure that the connection is watertight.

Note
Never install an anode isolated from the metal tank.

Fig. Inspect the anode



10.2.2 Descale the tank

Note
Hard water may cause the formation of limescale, which will reduce the operating efficiency and may cause early product failure. Failure of the water heater due to limescale or other deposits would not be classed as manufacturing defect and as such would not be covered under the terms of the warranty (on page 3).

Note
Before reassembly replace the gaskets. You must order these gaskets at your supplier. Look at the data plate for the correct ordering information.

To descale and clean the tank:

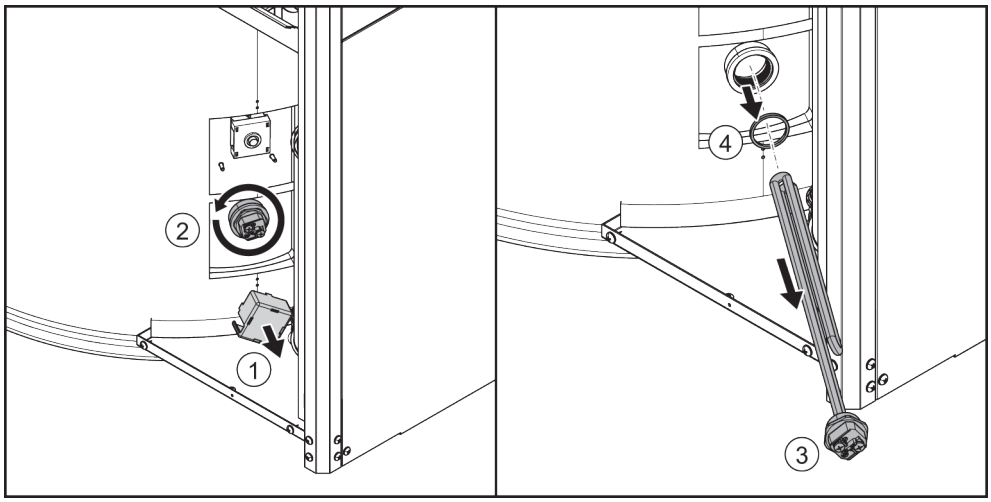
1. Decommission the water heater (see 8.8).
2. Remove the left side plate of the water heater.

Warning
Live cables inside! Switch off the power supply completely (on local isolator) before removing the left side plate to access the electrical components.

3. Remove the lowest service cover.
4. Remove the lowest element cover (1).

5. Remove the lowest heating element:
   a) Loosen electrical wires earth (A) and live (L) on the element.
   b) Loosen the element (2).
   c) Take the element out of the water heater (3).
      Carefully store the element.
6. Inspect the tank on limescale through the opening.
7. When there is limescale:
   Use a descaling agent to remove the scale and contamination. Contact the supplier of your water heater for advice on what descaling agent to use.
8. Clean the heating element.
9. Install the heating element:
   a) Place a new gasket (4).
   b) Place the element in the tank (3).
   c) Tighten the element (2).
   d) Attach the electrical wires earth (A) and live (L) on the element.
10. Install the element cover (1).
11. Install the service cover.
12. Install the left side plate of the water heater.
13. Fill the water heater (see 8.7.1).

Fig. Remove a heating element



10.3 Performance check

Make sure that the resistance value of each element is correct:

1. Remove the left side plate.

Warning
Live cables inside! Switch off the power supply completely (on local isolator) before removing the left side plate to access the electrical components.

2. Remove the service cover.
3. Measure the resistance value between the two connections of each heating element. The value needs to be approximately 15,5 +/- 2 Ohm for 3 kW elements, 11 +/- 1,5 Ohm for 4,3 kW elements and 8 +/- 1 Ohm for 6 kW elements.
4. Replace the heating element when the resistance value is not correct.
   a) Decommission the water heater (see 8.8).
   b) Loosen electrical wires earth (A) and live (L) on the element.
   c) Loosen the element.
   d) Take the element out of the water heater.
   e) Place a new gasket (4).
   f) Place a new element in the tank.
   g) Tighten the element.
   h) Attach the electrical wires earth (A) and live (L) on the element.
5. Make sure that all wiring is installed correctly.
6. Make sure that all electrical screw connections are tightened.

7. Install the service cover.
8. Install the left side plate.
9. If necessary, fill the water heater (see 8.7.1).

10.4 Finalization

When all maintenance activities are done:

1. If necessary, fill the water heater (see 8.7.1).
2. Turn on the water heater (see 4.1).
3. Check if the performance of all components is correct:
   a) Make sure that the water heater operates the operating cycle correctly.
   b) If applicable, make sure that the T&P valve operates correctly.
   Open the T&P valve pressure relief and make sure that water spurts out.

Warning
Hot water can come out of the T&P valve.

   c) Make sure the pressure relief connection of the expansion valve operates correctly.
   Open this pressure relief and make sure that water spurts out.

11 Troubleshooting

11.1 Errors and warnings

The water heater can have three different kinds of errors:

- General errors, which are not displayed
- Displayed errors, which are divided in two different groups:
  - Lock out errors: when the cause is removed, you can reset the error to resume operation. The code is displayed continuously and the exclamation mark blinks.
  - Blocking errors: when the cause is removed, the error resets automatically to resume operation. The code is displayed continuously and the exclamation mark blinks.
- Displayed warnings

Note
It is possible to view the error history of the water heater, refer to Error history.

11.1.1 General errors

Note
For the coding of the connections, refer to the Electrical wiring diagram.

Indication	Cause	Measure
Water leakage	There is a leakage from a threaded water connection.	Tighten the threaded connection.
	There is a leakage from another nearby water heater or pipe segment.	Trace the leakage.
	There is a leakage from the water heater tank.	Contact the supplier of your water heater.

Indication	Cause	Measure
Insufficient or no hot water	The water heater is off.	Turn on the water heater (see 4.1).
	The temperature is set too low.	Set the setpoint higher.
	There is no supply voltage.	Make sure that: - the isolator is in **ON** position. - there is power on the isolator. - there is power to the electrical connector block. The measured voltage must be 400 V_{AC} (-15%, +10%).
	The hot water supply is used up.	Reduce the hot water consumption. Wait until the water heater heats up.
	A safety device is activated.	- Make sure that the voltage between the connections of the heating elements is 230VAC (-15%, +10%). - Refer to indication "A safety device is activated", next page.
Earth leakage circuit breaker is out	There is not enough water in the tank.	- Make sure that the water heater is filled with water.
	One of the heating elements is defective.	- Measure the resistance value between each heating element connection and the outside of the tank. The value must be infinite. - Determine which element is defective.
Abnormal sounds	Normal expansion and contraction of metal parts during periods of heat-up and cool-down	- No action required.
	Sediment buildup on or around the elements.	- Drain and flush the tank as directed. See the draining and suction section.
	The heat pump compressor or fan is running	- No action required
A safety device is activated	The safety thermostat (Q) is activated.	- Make sure the water heater is completely filled. - Tap off water, so the temperature drops in the water heater. - Make sure all connections are connected properly (refer to the wiring diagram). - Use the red button to manually reset the thermostat. - If necessary, replace the safety thermostat (Q).
	The thermal fuse broke the control circuit	- Replace the CCB

11.1.2 Displayed errors

Note
For the coding of the connections, refer to the Electrical wiring diagram.

Note
Contact your service and maintenance engineer if the error persists.

Note
Each error has a code and a description.

Description	Code	Cause	Measure
Relay	786	Water temperature is sensed to be rising when there is no water heating	Recycle electrical power to heater. Replace main control board.
Upper sensor	787	Upper tank temperature sensor is not functioning.	Replace upper tank temperature sensor.
Mid-upper sensor	788	Mid-upper tank temperature sensor is not functioning.	Replace mid-upper tank temperature sensor.
Mid-lower sensor	789	Mid-lower tank temperature sensor is not functioning.	Replace mid-lower tank temperature sensor.
Lower sensor	78A	Lower tank temperature sensor is not functioning.	Replace lower tank temperature sensor.
Low voltage	78B	Power supply voltage is too low.	Check the power supply to the unit and make sure it is higher than 198 VAC.
High voltage	78C	Power supply voltage is too high.	Check the power supply to the unit and make sure it is lower than 252 VAC.
Dry fire protection	78D	Not enough water in tank.	Fill unit completely with water. Open a nearby hot water faucet to permit air in the system to escape. Close the hot water faucet when water starts to flow without air interruptions.
Discharge over temperature	78E	Heat pump discharge temperature is too high.	Contact a qualified installer or service agency for repair. Refer to phone number listed on the technical support label located on the unit.
Discharge sensor	78F	Heat pump discharge temperature sensor is not functioning.	Contact a qualified installer or service agency for repair. Refer to phone number listed on the technical support label located on the unit.
Coil sensor	790	Coil temperature sensor is not functioning.	Contact a qualified installer or service agency for repair. Refer to phone number listed on the technical support label located on the unit.
Ambient sensor	791	Ambient temperature sensor is not functioning.	Contact a qualified installer or service agency for repair. Refer to phone number listed on the technical support label located on the unit.
Suction sensor	792	Heat pump suction sensor is not functioning.	Contact a qualified installer or service agency for repair. Refer to phone number listed on the technical support label located on the unit.
Low pressure	793	Heat pump low pressure switch is open.	Contact a qualified installer or service agency for repair. Refer to phone number listed on the technical support label located on the unit.

CCB Communication	NA	No communication between main control board and UIM.	Contact a qualified installer or service agency for repair. Refer to phone number listed on the technical support label located on the unit.
Upper contactor	794	No communication between the main control board and upper element contactor and or elements.	1. Turn off power at the breaker or disconnect switch and check for loose connections at the contactors, main board, and elements. If error persists proceed to next step. 2. Replace contactor. 3. Replace main control board.
Clock frequency	0C1	Power supply frequency (Hz) is too high or too low.	Check the power supply to the unit and make sure the line frequency is between 56 Hz to 64 Hz.
EEPROM	795	EEPROM failure	Contact a qualified installer or service agency for repair. Refer to phone number listed on the technical support label located on the unit.

12 Warranty

Contact Lochinvar or go to www.lochinvar.ltd.uk for the current warranty terms and conditions.

A Appendices

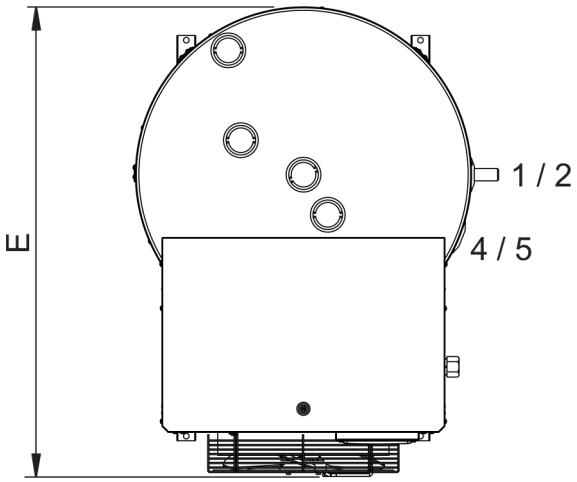
A.1 Technical details

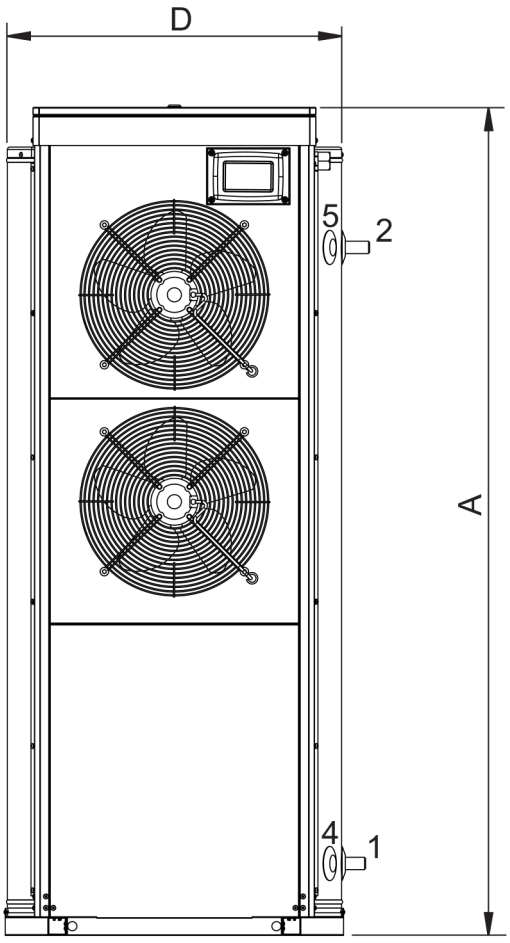
Description	Unit	LAAS 8-455-6	LAAS 8-455-9	LAAS 8-455-12
General				
Contents	l	445	445	445
Empty weight	kg	229	229	229
Filled weight	kg	684	684	684
Maximum floor load	kg	684	684	684
Maximum operating pressure	kPa (bar)	800 (8)	800 (8)	800 (8)
Maximum Control temperature (Heat exchanger)	°C	65	65	65
Maximum Control temperature (Electric)	°C	82	82	82
Operating setpoint - adjustment range (Heat exchanger)	°C	35-65	35-65	35-65
Operating setpoint - adjustment range (Electric)	°C	35-82	35-82	35-82
Operating setpoint - default value	°C	50	50	50
Default value function mode		Efficiency mode		
Ambient temperature range	°C	-7 - 43	-7 - 43	-7 - 43
Number of anodes	-	1	1	1
Heating time ΔT = 45 K	min.	100	85	70
Electrical				
Electrical power consumption	kW	9,1	11,7	15,1
Supply voltage	VAC	400 (-15/+10%)		
Mains frequency	Hz	50 (± 1 Hz)		
Number of phases	-	3φ + N	3φ + N	3φ + N
Power heating elements	kW	6	8,6	12
Load	A	16,9	22,5	30
Number of electric heating elements	-	2	2	2
IP class	-	IP X4		

Description	Unit	LAAS 8-455-6	LAAS 8-455-9	LAAS 8-455-12
Heat exchanger				
Input	kW	2,2	2,2	2,2
Power	kW	8,0	8,0	8,0
Total airflow over evaporator	m³/h	2380		
Refrigerant	-	R-134a		
Chemical name	-	1,1,1,2 Tetrafluoroethane		
Refrigerant weight	kg	1,85		
GWP value refrigerant	-	1430		
CO^2 ton equivalent	ton	2,646		
COP (warm water)	-	< 3,2		
SCOP (warm water)	-	< 3,2		
Sound level (according EN12101-2)	dB(A)	59	59	59

A.2 Dimensions

Size	Description	Unit	LAAS 8-455-6 LAAS 8-455-9 LAAS 8-455-12
Dimensions water heater			
A	Overall height	mm	1770
D	Appliance diameter	mm	785
E	Depth	mm	995
Dimensions connections			
1	Cold water supply connection (female)	" NPT	3/4
2	Hot water outlet connection (female)	" NPT	3/4
4	T&P-valve connection (female)	" NPT	3/4
5	Drain valve connection (female)	" NPT	3/4


E
1 / 2
4 / 5

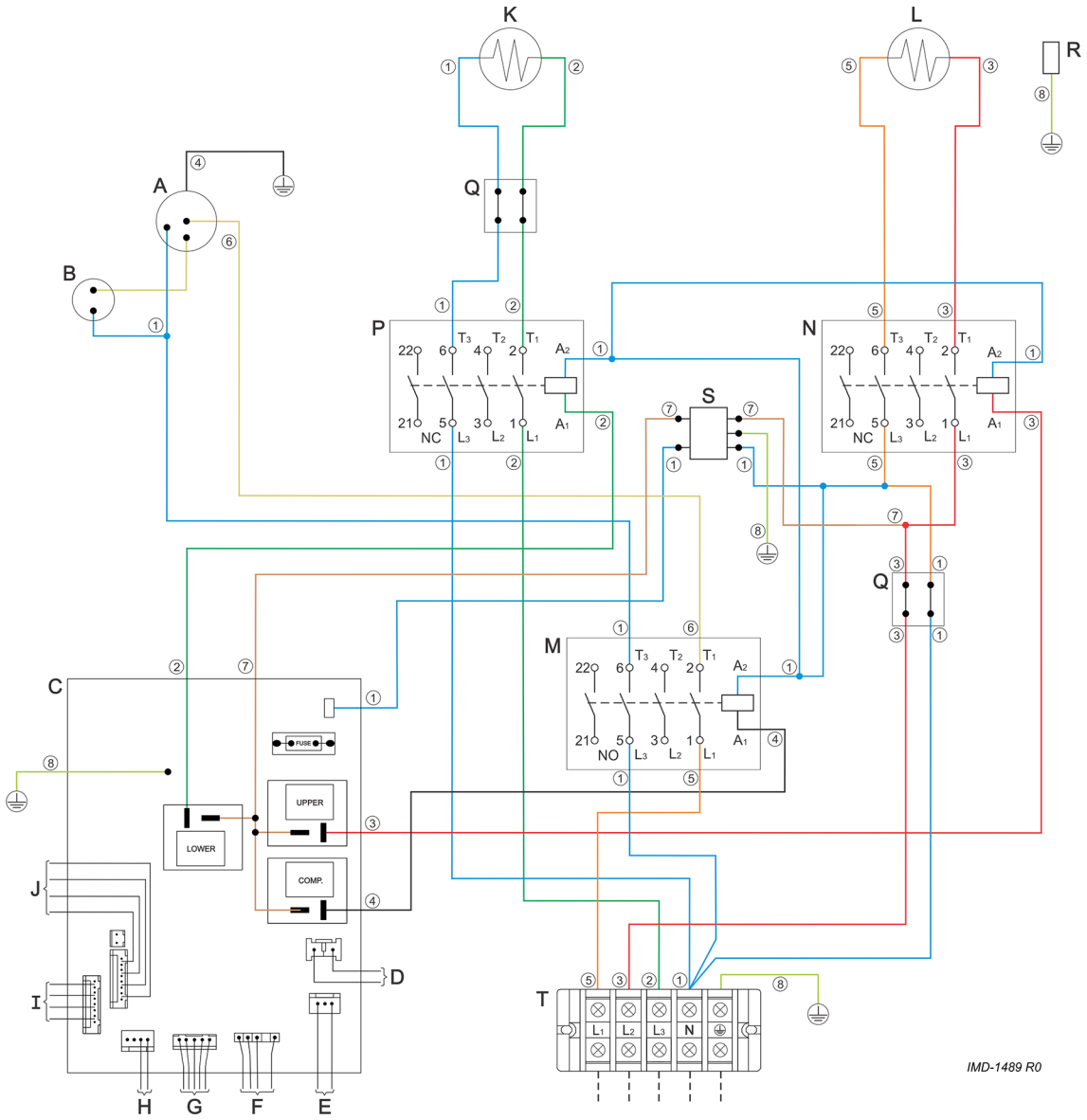

D
5
2
A
4
1

A.3 Energy labeling

Description	Unit	LAAS 8-455-6	LAAS 8-455-9	LAAS 8-455-12
Declared load profile				
Load profile	-	XL	XL	XL
Energy efficiency class (Energy label)	-	A+	A+	A+
Energy efficiency	%	132	132	132
Daily electricity consumption	kWh	6,01	6,01	6,01
Annually electricity consumption	kWh/year	1272	1272	1272
Daily fuel consumption	kWh GCV	0	0	0
Annually fuel consumption	GJ/year	0	0	0
Mixed water 40 °C (according V40)	l	526	526	526
Additional load profile				
Load profile	-	-	-	-
Energy efficiency class (Energy label)	-	-	-	-
Energy efficiency	%	-	-	-
Daily electricity consumption	kWh	-	-	-
Annually electricity consumption	kWh/year	-	-	-
Daily fuel consumption	kWh GCV	-	-	-
Annually fuel consumption	GJ/year	-	-	-
Mixed water 40 °C (according V40)	l	-	-	-
Smart Controls				
Work only during off peak hours	-	-	-	-
Default value setpoint	°C	50	50	50
Sound level (according EN12101-2)	dB(A)	59	59	59

A.4 Electrical wiring diagram

Fig. Electrical wiring diagram



Cable colors

1. Blue
2. Green
3. Red
4. Black
5. Orange
6. White
7. Brown
8. Yellow/Green

Terminal block connections

⏚ Earth

L_1. Phase 1 input

L_2. Phase 2 input

L_3. Phase 3 input

Components

A. Compressor
B. Capacitor compressor
C. Control
D. Fans
E. 4-Way valve
F. Display
G. Electronic expansion valve
H. Lower pressure switch
I. Refrigerant loop sensors
J. Tank temperature sensors
K. Element (bottom/lower)
L. Element (top/upper)
M. Contactor 1
N. Contactor 2
P. Contactor 3
Q. ECO
R. Tank grounding
S. EMC filter
T. Terminal block

A.5 Declaration of conformity

A.5.1 United Kingdom CE

CE

Lochinvar®
HIGH EFFICIENCY BOILERS & WATER HEATERS

Declaration of Conformity

Manufacturer: Lochinvar Limited
8 Lombard Way
The MXL Centre
Banbury - United Kingdom

hereby declares that the following products:

Product description: Heat pump storage water heater

Product family name: AMICUS AQUASTORE

Product models: LAAS 8-455-6, LAAS 8-455-9, LAAS 8-455-12

on the assumption that the installation instructions have been followed are compliant to:

Low Voltage Directive (LVD) - 2014/35/EU
- EN 50106:2008
- EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A2:2019 + A14:2019
- EN 60335-2-21:2003 + A1:2005 + A2:2008
- EN 60335-2-40 + IEC 60355-2-40:2018

Electromagnetic Compatibility Directive (EMC) - 2014/30/EU
- EN 55014-1:2017
- EN 55014-2:2015
- EN 61000-3-2:2019
- EN 61000-3-3:2013

ECO Design Directive (ErP) - 2009/125/EC
- Commission regulation No. 814/2013 based on notices 2014/C - 207/03

Requirements for Restriction of Hazardous Substances (RoHS II/III) Directive - 2011/65/EU en 2015/863/EU

Company: Lochinvar Limited

Date: November 1, 2022

Signature:

T. van der Hamsvoort
Managing Director

A.5.2 United Kingdom UKCA

UK CA

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Electrical Equipment (Safety) Regulations 2016 (UK SI 2016 No. 1101)
- EN 50106:2008
- EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A1:2019 + A2:2019 + A14:2019
- EN 60335-2-21:2003 + A1:2005 + A2:2008
- EN 60335-2-40 + IEC 60335-2-40:2018

Electromagnetic Compatibility Regulations 2016 (UK SI 2016 No. 1091)
- EN 55014-1:2017
- EN 55014-2:2015
- EN 61000-3-2:2019
- EN 61000-3-3:2013

Ecodesign for Energy-Related Products Regulations 2010 (UK SI 2010 No. 2617)
- Commission regulation No. 814/2013 based on notices 2014/C - 207/03

RoHS Regulations 2012 (UK SI 2012 No. 3032)

Company: Lochinvar Limited

Date: November 1, 2022

Signature:

T. van der Hamsvoort
Managing Director

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