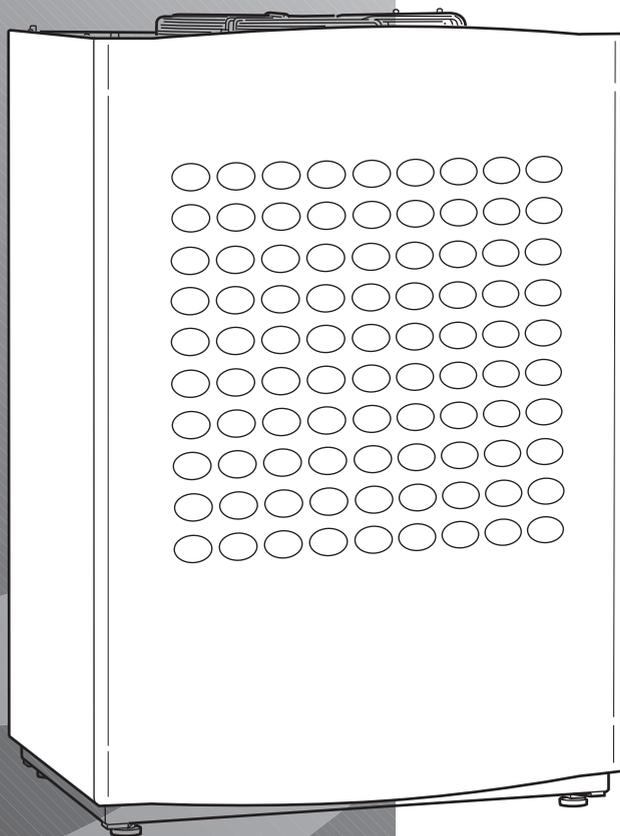


# WORCESTER GREENSOURCE

**Air to Water Outdoor Heat pump**

**6 kW, 7 kW & 9.5 kW**



GB/IE

## USER MANUAL

**Please read carefully prior to  
installation and user guide**



User manual for the Worcester Greensource heat pumps  
Worcester, 16.06.08  
Part number: 8-716-115-328  
Issue: a

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# For the user

## Important information

The Greensource is a family of heat pumps, that extract energy from outdoor air to produce water based heating and, if required, hot water for your house. The sizes available are 6, 7 and 9.5 kW.

The Greensource heat pump can only be used in conjunction with the Worcester Greensource hot water distribution unit.

The heating installation is controlled by a control unit, which is in Greensource hot water distribution unit. The control unit controls and monitors the total system using different settings for heating and hot water. The settings are factory set, however can be adjusted to suit the householders requirements.

When the heat pump has been installed and started there are a number of points you should check regularly. This may concern an alarm triggering or performing basic maintenance actions. Initially you should perform these actions on your own. This manual describes each step in detail. If the problem remains you should contact your installer.

This guide contains a description of the Greensource heat pump, what it consists of, maintenance, settings etc. Operating instructions for Greensource hot water distribution unit are described in its own guide.



### Note

It is important as the user that you read through this guide. Under no circumstances may you make settings that are designed for the installer. This can cause serious malfunction of the heat pump.



### Note

**Only a trained and qualified technician may carry out repairs to this machine. Incorrect repairs can lead to serious risks to the user, and a reduction in savings. Visits from an authorised Service representative to make corrections or adjustments after such a repair, cannot in such cases be carried out free of charge, not even during the warranty period.**

# How a heat pump works

## The heat pump collects heat from the outdoor air

The Greensource heat pump has been manufactured for easy and reliable use as well as to provide your house with inexpensive and environment friendly heating. The easiest way to describe how a heat pump works is to say it works like a refrigerator, backward. In a refrigerator heat is moved from the inside to the outside. In a heat pump the heat, in the outdoor air, is moved into the house. The heat pump is placed on the outside of your house. The heat that is in the air, even at temperatures below zero, is converted by the compressor, heat exchanger and condenser into hot water, which heats your house.

The heat pump will also produce domestic hot water when used in conjunction with the Greensource hot water distribution unit, which has an inbuilt cylinder for DHW and CH.

There may be very cold days when the heat pump requires additional energy, e.g. at very low outdoor temperatures. This is obtained from the inbuilt additional electric heater which is fitted to the hot water distribution unit.

## Technology in and around the heat pump

The heat pump consists of four main parts:

1. **Evaporator**  
Evaporates the refrigerant to gas and at the same time transfers the heat from the air to the refrigerant circuit.
2. **Condenser**  
Condenses the gas to fluid again and releases the heat to the heating system.
3. **Expansion valve**  
Lowers the pressure of the refrigerant.
4. **Compressor**  
Increases the pressure of the refrigerant.

These four main parts are linked in two closed circuits. A refrigerant circulates in the heat pump, which in some parts of the circuit is in a liquid state and in other parts in a gas state. Read more about the properties of the refrigerant in the sidebar to the right.

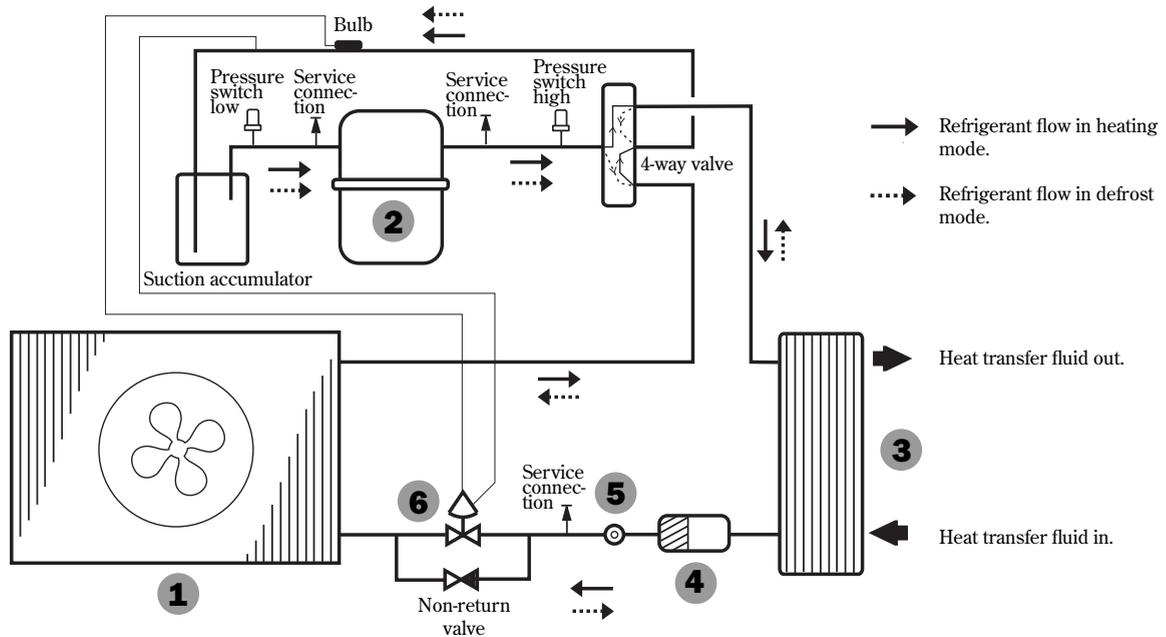
See the detailed description of the technologies used in the heat pump on the next page.



### Note

#### Boiling point in relation to the pressure

The boiling point of different liquids varies with pressure, the higher the pressure, the higher the boiling point. For example, water boils at +100°C at normal pressure. Double the pressure and water boils at +120°C. Half the pressure and water then boils at +80°C. The refrigerant in the heat pump acts in the same way, the boiling point changes when the pressure changes. However, the boiling point of the refrigerant is as low as approximately -40°C at atmospheric pressure. Consequently, it is also suitable for low heat source temperatures.



## The route of the refrigerant through the heat pump in heating mode

- 1** In the outdoor unit, the refrigerant meets the outdoor air in the **evaporator** (heat exchanger). The air is drawn through the evaporator by a fan located on top of the heat pump. The refrigerant, which was previously in a liquid state, will evaporate in this process. The pressure is low and heat is required. Heat is taken from the outdoor air. A sensor in the expansion valve (6) ensures the evaporator utilises as much of the "free energy" as possible before the refrigerant (in a gas state) is led into the compressor.
- 2** The **compressor** increases the pressure of the refrigerant. The temperature of the vapour reaches approximately +100°C. The warm gas is then led into the condenser.
- 3** The **condenser** is the heat pump's heat emitting part. In the condenser, which is a fully brazed heat exchanger in stainless steel, the refrigerant (gas state) meets the water from the heating system (radiators and floor coils). When the warm gas is cooled by the circulating heating water, it changes into a liquid state (condenses). Energy is emitted in this process to the heating system or the hot water. After the condenser, the refrigerant, which is now in liquid form, continues through a drying filter.
- 4** The **drying filter** is used to collect any moisture in the system. After the filter, the refrigerant passes through a sight glass.
- 5** The **sight glass** is used to check the level in the system. There should be no bubbles in the sight glass during normal operations. However, there might be bubbles when the heat pump is started and stopped or during defrosting. After the sight glass, the refrigerant continues on to an expansion valve.
- 6** The refrigerant pressure is lowered in **the expansion valve**. This also causes the temperature to drop. When the refrigerant has left the valve and passes the evaporator it changes to vapour again. This completes the refrigerant circuit. The expansion valve is equipped with a sensor (bulb) just before the compressor. The sensor controls the amount of fluid entering the evaporator.

# Component parts of the heat pump

## Greensource A/W heat pump 6, 7 and 9.5 kW

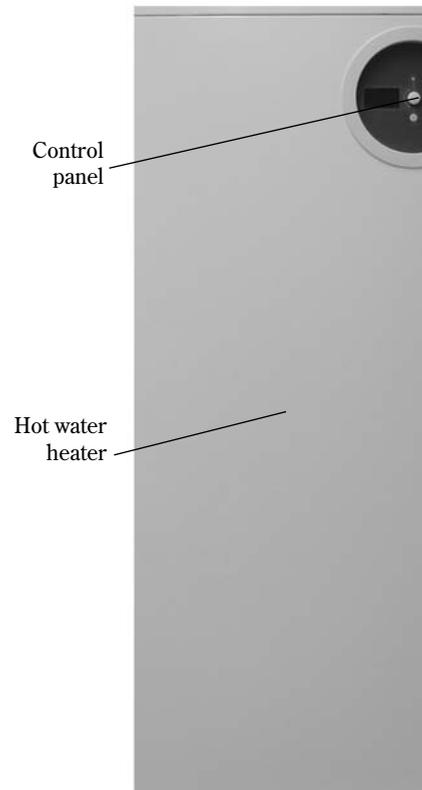
Both the control and the additional electric heater is integrated in the Greensource hot water distribution unit.

The heat pump is installed outside, the hot water distribution unit is installed indoors.

**Greensource outdoor A/W unit**



**Hot water distribution unit**



## Control unit Rego 800

The control unit makes sure the heat pump gives the best energy savings and that it runs for many years. The control unit controls and monitors the heating and hot water supply in your house. The monitoring function is especially important, it shuts down the heat pump in the event of operational disturbances so that no critical parts are damaged.

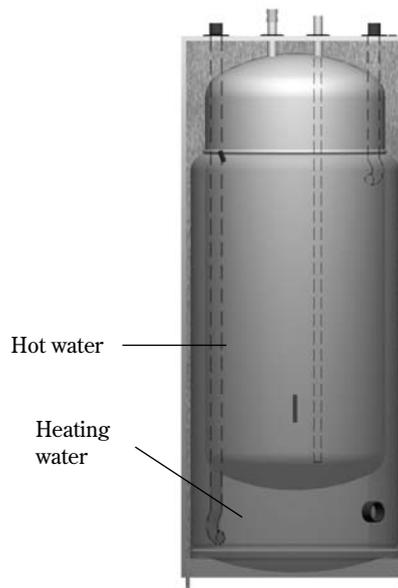
### Additional heat gives more output

Additional heating is required when the heat pump is unable to meet the heating requirements or when it has stopped due to an outdoor temperature that is too low. The additional heat is provided by an additional electric heater inside the hot water distribution unit. Note that when the heat pump is running, the hot water distribution unit only supplies the heat that the heat pump cannot produce. When the heat pump is once more able to meet the heating demand, the additional electric heater is automatically switched off.

### Hot water is given priority over heating water

In a house with water based heating a difference is made between heating water and hot water. The heating water is for radiators and underfloor coils and hot water is for showers and taps.

The heating water passes through the hot water cylinder's outer shell and heats up the hot water heater's inner tank. The control unit makes sure the heating of hot water is given priority over the heating of the heating water.



## Automatic defrosting

Ice may form on the evaporator at outdoor temperatures below +3°C. When ice forms to an extent that it obstructs the air flow through the evaporator automatic defrosting starts. Defrosting is controlled by a four-way valve. The valve reverses the flow of the refrigerant in the circuit so that the hot gas melts the ice on the evaporator fins. See *Refrigerant flow in defrost mode* in the figure under the heading *How a heat pump works*.

There is also a fan defrost function, which means that hot air blows upwards through the fan to prevent it freezing solid.

---

## **The control unit's operating mode**

When a heat pump is installed, it is already factory set to operate when both units are connected. However, the settings can be adjusted to suit the householders requirements.

### **Heat pump with Greensource hot water distribution unit**

When the heat pump is used with the Greensource hot water distribution unit, the control unit sets itself for this operation. This means that the heat pump operates with additional heat from the hot water distribution unit and that the hot water is produced in the hot water distribution unit's hot water heater. A sensor located on the outside of the house sends information about the outdoor temperature to the control unit. The control unit controls heating and hot water production based on the read off current values and the set values.

## The control unit's control method for heating

The control unit controls heating production based on an outdoor sensor or an outdoor sensor in combination with a room sensor.

### Control with an outdoor sensor

Control with an outdoor sensor is the most common method used by the control unit to control the heat pump. A sensor is mounted on the external north face on the wall of the house (the wall that is the coldest and subjected to the least amount of sun). The sensor sends signals to the control unit in the heat pump. Control with an outdoor sensor means that the heat pump automatically regulates the heating in the house depending on the outdoor temperature.

You are able to determine the temperature of the heating system, in relation to the outdoor temperature, with the help of a number of settings (curves) stored in the control unit. The curve indicates the flow temperature for heating water in relation to the outdoor temperature. Selecting a lower curve gives a lower flow temperature and therefore higher energy savings.

### Control with an outdoor sensor and a room sensor

Control with an outdoor sensor supplemented with a room sensor means that you also place a sensor in a reference position inside the house. This is connected to the heat pump and provides the control unit with information about the current room temperature. The signal affects the heat curve's flow temperature. For example, it falls when the room sensor shows a higher temperature than the one set.

A room sensor is used when factors other than the outdoor temperature influence the indoor temperature of the house. For example, this can be when a stove or fan-assisted radiator is used in the house, or if the house is sensitive to the wind or exposed to direct sunlight.



#### Note

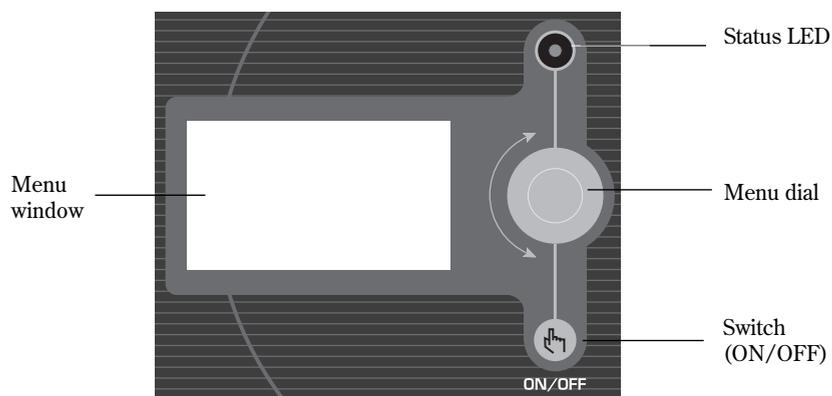
It is only the room where the room sensor is located that can influence regulation of the temperature.

# Control panel

All settings are made in the control panel and any alarms can be viewed in the panel. The control unit is controlled via the panel in accordance with your requirements.

When the heat pump is combined with the hot water distribution unit, the control panel and control unit are in the hot water distribution unit.

## Greensource hot water distribution unit



## Status LED

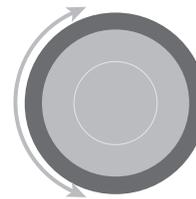
The control cabinet's status LED is on the outside of the unit.

<i>LED lights green:</i>	Switch ON/OFF in ON position.
<i>LED flashes green:</i>	Switch ON/OFF in OFF position.
<i>LED not lit:</i>	No voltage to control unit.
<i>LED flashes red:</i>	An alarm has been triggered and the alarm has not been acknowledged. (See section <i>What to do if a fault occurs.</i> )
<i>LED lights red:</i>	A fault has occurred. Contact the installer. (See section <i>What to do if a fault occurs.</i> )



## Menu dial

The menu dial is used to navigate between the menus and to confirm your selection. You are also able to determine the values of different settings by using the dial. If, for example, you turn the menu dial clockwise the value will increase. Always press the menu dial to confirm your selection.



## Power switch (ON/OFF)

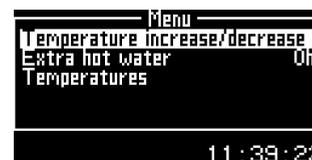
You start and stop the heating installation using the power switch button.



## Menu display

The menu display gives you information and several settings options. You are able to:

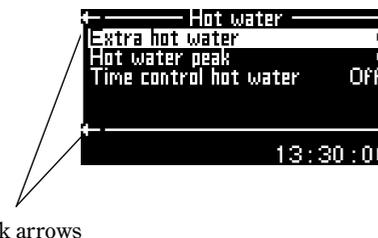
- Select different temperatures for heating and hot water.
- Select time control settings (different heat at different times).
- See alarm causes and receive corrective instructions.



## How to use the control panel

Navigate the menus using the menu dial. Turn the menu dial clockwise to move down through the menus. Turn the menu dial anti-clockwise to move up through the menus. When the desired menu is highlighted, press the menu dial to confirm your selection.

Certain functions have longer names than available space in the menu window. In such cases, the row switches to show the different parts of the text. Example: *Room temperature setting*: First, *Room temperature... is displayed*, this then goes out and *...setting* is displayed for a few seconds, whereupon *Room temperature...* is displayed again. At the top and bottom of each sub menu there are back arrows that take you back to the previous menu. Press the menu dial when these are marked.



Back arrows

## Symbol overview

Symbols for different functions and components that are in operation are displayed in the lower part of the menu window.

				
Compressor	Heating mode	Fan		
				
Hot water mode	Hot water peak	Extra hot water		
				
Timer Control	Holiday operation	Additional heat	Power guard	Alarm

# Menu levels

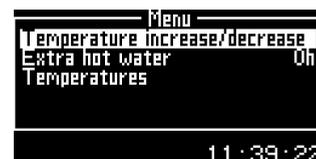
The menus are divided into different levels for different purposes.

<b>Menu</b>	Customer level, here you will find the most common functions.
<b>Advanced menu</b>	Customer level, here you will find further functions.
<b>Installer/Service</b>	Installer/Service level, relevant settings are made here by the installer/service technician.

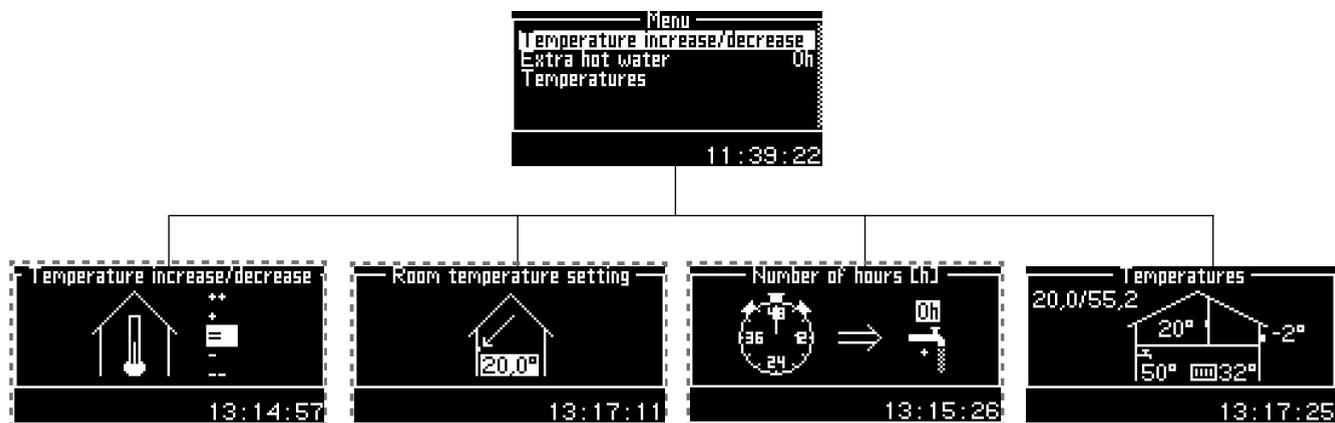
As a user of the heating installation, you only see what is available in the two customer levels.

## Menu

The initial menu in the control unit is called *Menu*. Here you will find the functions most frequently used and the ones you have the most benefit of. The functions available in your heating installation are shown in *Menu*. For example, either *Temperature increase/decrease* or *Room temperature setting* (if you have a room sensor) is shown. *Extra hot water* is only displayed if you have a hot water heater connected.



## Menu overview



 = The menu display is only shown in combination with an extra sensor or in a specific operating mode.

## Set the heating

There are two ways to set the heating level depending on whether the heating installation is supplemented with a room sensor or not.

### Setting the heating, room sensor not installed:

Select *Temperature increase/decrease* in the menu. Select one of the following alternatives:

++	Much warmer	(approximately +1°C)
+	Warmer	(approximately +0.5°C)
=	Unchanged temperature	
-	Colder	(approximately 0.5°C)
--	Much colder	(approximately -1°C)

Then press the menu dial. Select *Save* to confirm your selection.

### Setting the heating, room sensor installed:

1. Select *Room temperature setting* in the menu.
2. Enter the desired room temperature. Min = +10°C, max = +35°C.
3. Select *Save* to save the change or *Cancel* to return without saving.

Under *Advanced menu* you can change how much the room sensor is to affect the heating system, see *Set the desired room temperature*.

## Extra hot water

With the hot water distribution unit you can temporarily increase the temperature of the hot water to approximately 65°C, via the function *Extra hot water*. A higher water temperature gives more hot water when, for example, several people wish to shower. The heat pump uses the additional electric heater to increase the temperature to 65°C.

In *Extra hot water* you choose how long the function should be active. This is what to do:

Select *Extra hot water* in the menu. Turn the dial clockwise to increase the number of hours and reduce by turning it anti-clockwise.

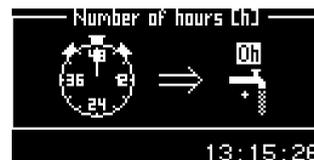
Select *Save* to save the setting or *Cancel* to return without saving.

To find out how much time remains until the *Extra hot water* function switches off, go to *Timers* under *Advanced menu*. You can also change the number of hours during an ongoing *Extra hot water* function.



### Note

You should wait at least twenty-four hours when increasing or decreasing the heating before making a new adjustment.



## Temperatures

There are several different temperature sensors connected to the heating installation. Each sensor plays an important part in the heat pump's daily operations. The current temperatures for the sensors which are most important for controlling heating and hot water production are given under *Temperatures*.

Select *Temperatures* in the menu.

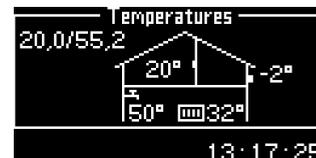
The menu display shows the current temperatures for the following temperature sensors:

 **Flow sensor (T1)**  
Shows the temperature in the heating unit's flow temperature, i.e. the temperature of the heating water that is fed into the heating system. In the example, the sensor shows 32°C.

 **Outdoor sensor (T2)**  
Shows the outdoor temperature. Some deviation may occur due to thermal radiation from the house to the installed outdoor sensor. In the example, the sensor shows -2°C.

 **Hot water sensor (T3)**  
Only shown when there is a hot water heater installed. The sensor shows the temperature in the lower section of the outer container in the hot water heater. The temperature is approximately 5°C lower than the temperature of the hot water inside the inner container. In the example, the sensor shows 50°C.

 **Room sensor (T5)**  
Only shown if a room sensor is installed. The menu shows the temperature in the room where the sensor is installed. In the example, the sensor shows 20°C.



### Note

The values for V and H are also displayed in the window. In the example, V is 20.0°C and H is 55.2°C. V and H are described under *Set the heating*.

# Advanced menu

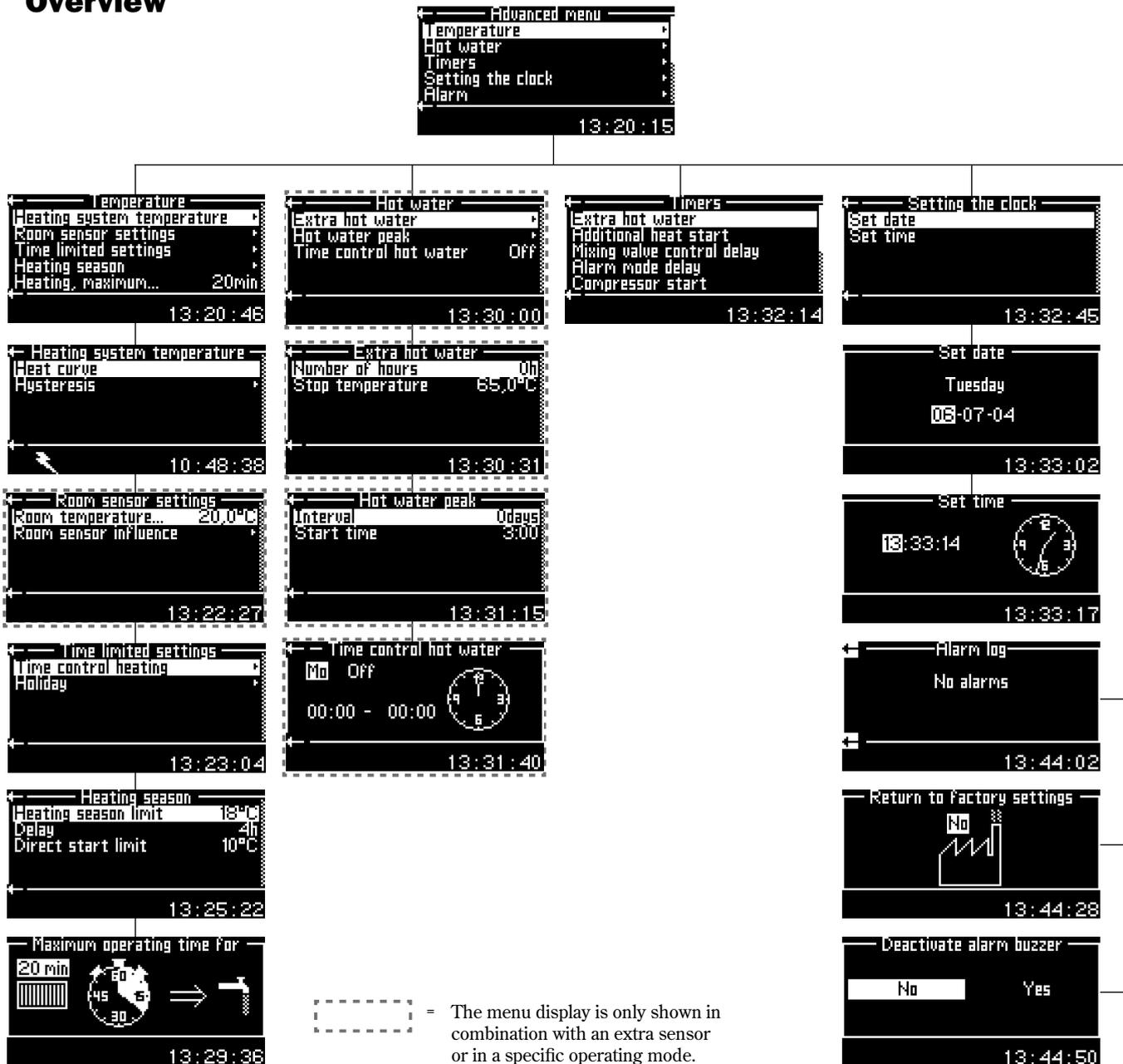
The initial menu in the control unit is called *Menu*. In this menu you will find the functions most frequently used and the ones you have the most benefit of. In addition, there are extra functions that can be used to affect your heating installation. These are provided in the *Advanced menu*. To the right you will find all functions under *Advanced menu*.

- Advanced menu**

  - Temperature
  - Hot water
  - Timers
  - Setting the clock
  - Alarm
  - Access level
  - Return to factory settings
  - Deactivate alarm buzzer
  - Program version

To access *Advanced menu* press the menu dial and keep it pressed in for at least 5 seconds.

## Overview



## Set the heating

The simplest way to set the heating has been described earlier under the heading *Menu*. There is a more controlled way of setting the heating. However, before we explain how to do this it is important to understand the relation between the outdoor temperature and flow temperature. The easiest way to explain the relation is by a *Heat curve*.

### Heat curve

The heat curve is used to set the desired indoor temperature. The heat pump is controlled by the outdoor temperature. When the weather becomes colder the heat pump ensures more heating is produced automatically.

The following example shows that an outdoor temperature of  $-2.5^{\circ}\text{C}$  gives a flow temperature of  $35^{\circ}\text{C}$  at the current heat curve.

#### Flow temperature:

The flow temperature is the temperature of the water that is fed into the heating system.

#### Outdoor temperature:

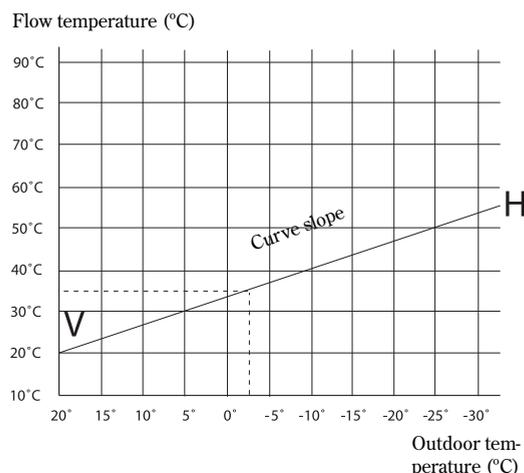
The outdoor temperature determines how much heating the heat pump should produce. The outdoor sensor sends signals to the control unit, which then affects the heat pump.

#### Curve slope:

By offsetting the left (V) and /right (H) end points, the slope of the heat curve can be altered. Use the left end point to adjust the flow temperature at high outdoor temperatures and the right end point to adjust the flow temperature at low temperatures.

#### Adjusting a single value:

You can also adjust a single value on the curve up or down every fifth outdoor degree. You can, for example, create an increase in the heat curve at  $0^{\circ}\text{C}$ .



#### Note

On delivery of the heat pump, the curve slope is set at V=20, H=55.2.

#### Curve slope:

V=22, H=30: Normal basic setting for underfloor heating in concrete.

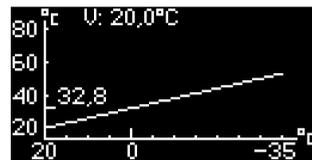
V=22, H=35: Normal basic setting for underfloor heating in wooden joists.

V=20, H=55: Normal basic setting for radiators.

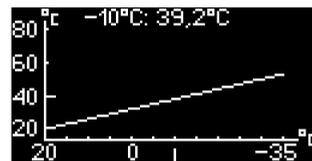
V=20, H>65: Abnormal high setting.

## Set the heat curve

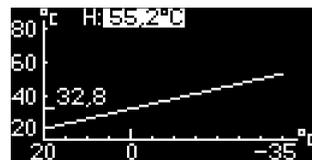
1. Select *Heat curve* in the menu *Heating system temperature*. The current curve is shown here. The value 32.8 is the flow temperature at 0°C.



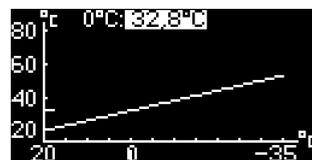
2. Start by finding the value you wish to change. It can be V, H or some other value. To find the correct value, turn the dial clockwise or anti-clockwise. At the top of the display, various outdoor temperatures with corresponding flow values on the curve are shown, at the bottom, a dash can be seen that shows the position on the outdoor temperature axis. Continue turning the dial and you will eventually find the H value. Continue turning the dial even when you see a back arrow.



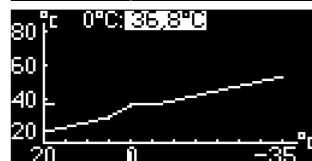
3. The most common adjustment is to increase the H value slightly to obtain more heating in cold weather. In the display you will see that the H value has been located and then marked by pressing the dial. The H value can now be changed by turning the dial. When you are happy with the H value, press the dial and select *Save*.



4. It may also be necessary to change a specific value on the curve, e.g. to increase the heating at temperatures around 0°C. Turn the dial to find the value at 0°C and press the dial to mark the value.



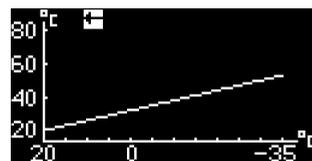
In the example to the right, the value at 0°C has been changed to 36.8°C, i.e. the flow temperature has been increased by four degrees. The dial has been pressed and *Save* has been marked. The changed curve is now saved by pressing the dial.



Recommended values: Increase by 4°C at outdoor temperature of 0°C and by 2°C at outdoor temperature of +5°C.



5. To exit the *Heat curve* function turn the dial until you see a back arrow. Press the dial.

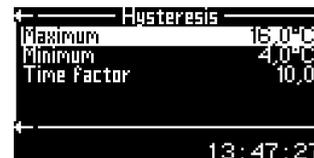


### Note

You should wait at least twenty-four hours when increasing or decreasing the heating before making a new adjustment. Only change one value at a time until you are happy with your temperature settings.

## Hysteresis

Hysteresis settings can be made under *Heating system temperature*. The hysteresis determines when the heat pump (compressor) is to start/stop in relation to the heat curve's value. The compressor continues slightly longer than according to the curve and starts again when the flow temperature has dropped somewhat below the value of the curve. In this way, the heat pump is prevented from starting and stopping continuously.



There is usually no reason to adjust the hysteresis factory settings.

## Set the desired room temperature

If a room sensor is connected to the heat pump you can set the required temperature in the room from the *Room sensor settings* menu. This is carried out in the same way as in *Menu* (initial menu).

You can also set how much the sensor is to affect the heating system by selecting *Room sensor influence* and adjusting the *Change factor*. Min = 0, max = 10. A higher factor gives a greater influence from the room sensor.

After a heat lowering period, e.g. time control or holiday, the room sensor influence is blocked for a set time, factory setting is 4 hours. Min = 0 and max = 24 hours. The function *Blocking time* is under *Room sensor influence* and means that the heat pump is given time to increase the flow temperature more slowly than if the room sensor is allowed to influence.



## Time limited settings

### Time control

The *Time control heating* function can be used to lower or increase the temperature on different week days at chosen times.

1. Select *Time control heating* in the menu *Time limited settings* under *Temperature*.
2. Select *Day and time*.
3. Enter the week day and the time at which time control is to occur. Select *On*.
4. Select *Save* to save the change or *Cancel* to return without saving.
5. Select *Change in temperature* and set the desired value. Min = -20°C, max = +20°C.
6. Select *Save* to save the change or *Cancel* to return without saving.

To remove a time control setting, find the desired setting and select *Off*.



### Note

Time control is not recommended in normal conditions as it can affect consumption negatively.

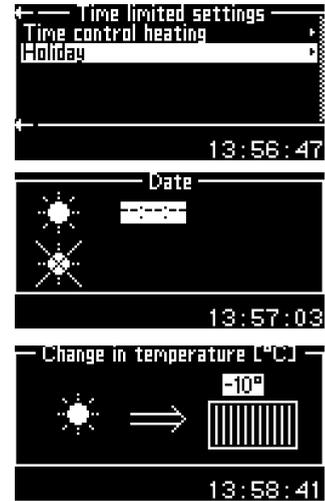


## Holiday

Using the *Holiday* function, you can reduce (or increase) the temperature between two set dates.

1. Select *Holiday* in the menu *Time limited settings* under *Temperature*.
2. Select the start date and end date according to year-month-day.
3. Select *Save* to save the change or *Cancel* to return without saving.
4. Select *Change in temperature* and set the desired value. Min = -20°C, max = +20°C.
5. Select *Save* to save the change or *Cancel* to return without saving.

To cancel the function and remove a time setting, go to *Holiday* and change the end date.



## Heating season

The *Heating season* function means that the heat pump only produces heating water when the outdoor temperature drops below a preset temperature. The preset temperature, *Heating season limit*, can be adjusted (factory setting 18°C, min = 10°C, max = 35°C), as can the delay before activation (factory setting 4 hours, min = 0, max = 24 hours). The delay means that the heat pump does not need to switch off and on as often when the outdoor temperature is close to the limit value.

By increasing the value to above 35°C the heat pump is set to continuous heating season mode.

There is also an adjustable *Direct start limit* (factory setting 10°C, min = 5°C, max = 17°C) that means that the delay is ignored. Heating production starts immediately when the temperature drops below the set value.



### Note

If base heat is required, e.g. in cellars, it may be suitable to increase the *Heating season limit* value.

## Heating, maximum operating time at hot water requirement

This function is provided to satisfy hot water requirement during heat production, when a hot water heater is fitted. The factory setting is 20 minutes, min = 0 and max = 60 minutes.



## Hot water settings

The menus for hot water settings are only displayed when a hot water heater is installed.

### Extra hot water

You can obtain extra hot water by temporarily increasing the temperature of the water in the hot water cylinder. A higher water temperature gives more hot water when, for example, several people wish to shower. The heat pump uses additional electric heater to increase the temperature to the desired value, see point 5. The function *Extra hot water* (number of hours) is also available under *Menu*.

This is what to do:

1. Select *Hot water* in the advanced menu.
2. Select *Extra hot water*.
3. Set the number of hours that the function is to be active.
4. Select *Save* to save the change or *Cancel* to return without saving.
5. Set the desired *Stop temperature*.
6. Select *Save* to save the change or *Cancel* to return without saving.

Read off the remaining time of *Extra hot water* by going to *Timers*.

### Hot water peak

#### Recurring increase in the hot water temperature

The *Hot water peak* menu is used to set the interval for a recurring increase in the hot water temperature. If, for example, you set the value seven days, the temperature is increased once a week to approximately 65°C. You can also specify *Start time* for when the temperature increase is to start, factory setting is 03:00.

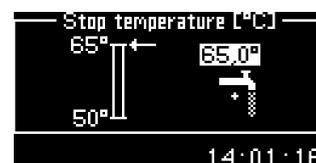
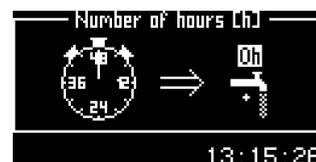
### Time control hot water

The *Time control hot water* function means that you can choose to completely disable hot water heating to save energy. This is primarily effective when peak tariffs are charged. This is done in the same way as other heat pump time controls.



#### Note

When the set time has elapsed you must repeat the setting to get extra hot water again. You can also increase the number of hours during an ongoing *Extra hot water* period.



#### Note

*Time control hot water* can impair hot water production.

## Timers

There are a number of timers in the control unit. The statuses for these are shown in the menu *Timers*. You can only view the timers that are running, i.e. are counting down. Most timers are only of interest to installers and service technicians.

### Extra hot water

Displays the remaining time for requested extra hot water.

### Additional heat start

Displays the countdown of the timer for additional heat delay.

### Mixing valve control delay

Displays the time that the mixing valve function is delayed after the additional heat timer has counted down. Does not apply to electric cassette.

### Alarm mode delay

Displays the remaining time until the additional heat is activated when an alarm is triggered.

### Compressor start

Displays the remaining time of compressor start delay.

### Delay before defrost

Displays the remaining time before defrost is permitted.

### Heating, maximum operating time at hot water requirement

Displays the remaining time before the maximum time in heating mode is reached if there is a simultaneous hot water requirement.

### Hot water, maximum operating time at heating requirement

Displays the remaining time before the maximum time for hot water production is reached if there is a simultaneous heating requirement.

### Hot water peak interval

Displays the time remaining to the next hot water peak.



## Setting the clock

The heat pump has functions that are dependent on both the time and date. Thus it is important that these are correct. To set date and time:

1. Select *Setting the clock* in the advanced menu.
2. Select *Set date* to adjust the setting if it is not correct. The date is set using the menu dial in the order, Year-Month-Day.
3. Select *Set time* to adjust the setting if it is not correct. The time is set using the menu dial.



## Alarm log

You can easily see any alarms and warning windows that may have occurred, see section *What to do if a fault occurs*. The menu provides information about the alarm type and when the alarm occurred. If there is an alarm symbol in the menu window this means the alarm is still active, and some form of action is required. Select *Alarm log* in the advanced menu to access the function.



## Access level

The access level is 0 as standard. This level gives you access to all customer functions within *Menu* and *Advanced menu*.

## Return to factory settings

If you want to restore the factory settings on the heating installation you can easily reset all the settings you have made.

Select *Return to factory settings*. Select *Yes* and then *Save* to save the setting or *Cancel* to return without saving.

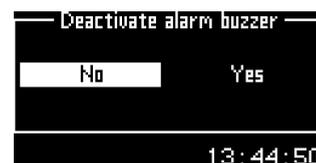
When restoring the factory settings while in any of the customer levels, the settings made by the installer in the Installer/Service level are not affected (see *Menu levels*).



## Deactivate alarm buzzer

When an alarm occurs, an alarm window is displayed and a warning signal sounds. This warning signal is muted if the alarm is acknowledged or if the alarm cause disappears, see section *What to do if a fault occurs*.

The function of the warning signal is to alert the user about a triggered alarm. The function can be deactivated by selecting *Deactivate alarm buzzer*. Select *Yes* and *Save* to save the change or *Cancel* to return to the menu without saving.



## Program version

The program version of the control unit is displayed. Keep this information to hand if you need to contact the installer.



# Maintenance

Your heat pump requires a minimum of maintenance, however, we still recommend some servicing to get optimal performance from your heat pump. Check the following items a few times during the first year. You should then check them once or twice a year:

- Remove dirt and leaves
- Particle filter
- Protective covers
- Evaporator

## Unscrew the protective covers

You must unscrew the outer covers to access some of the maintenance areas.

### To remove the covers from the heat pump:

1. Turn the screws on top of the heat pump a few turns.
2. Rest the cover against your body.
3. Lift the cover upwards to release the lower edge.

## Remove dirt and leaves

Over time leaves and other dirt can enter the heat pump. You can easily remove any dirt through the inspection hatch on the side of the heat pump. Unscrew the left side plate (seen from the front) and use a brush to remove the dirt. Check that the drainage hole is not blocked. Exercise care around the thin aluminium fins as they are fragile. We recommend the use of a watering can with rose attachment to wash the aluminium fins. **Don't use a power washer or brush.**

The plate and drainage hole can be rinsed with water if necessary.

## Protective covers

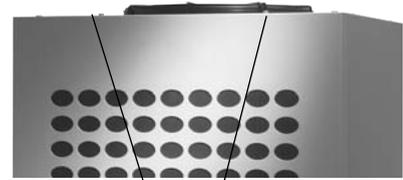
Over time dust and other dirt will collect on the heat pump. You should wipe the outside with a damp cloth if necessary. Scratches and damage to the outer plates should be touched up using an anti corrosive rust-inhibitor. Use normal car polish to protect the paint.



### Warning

For reasons of safety the main power supply must be disconnected before working on the heat pump.

Only an accredited refrigeration company is permitted to work on the refrigerant circuit.

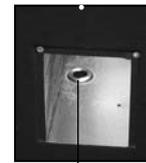


Remove the covers by loosening the screws on top of the heat pump.

### Greensource A/W heat pump



Inspection hatch

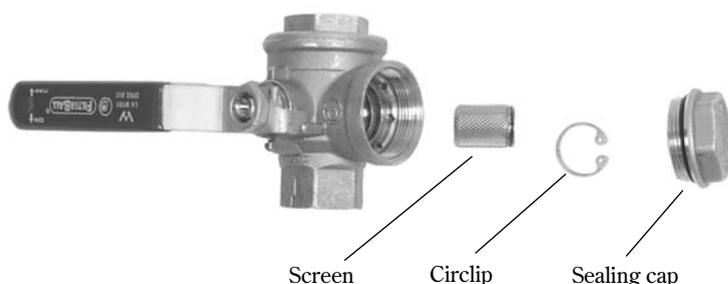


Drainage hole

## Particle filter

It is the particle filter (dirt filter) that ensures no particles or dirt enter the heat pump. Over time the filter can become clogged and must be cleaned. To clean the filter:

1. Shut down the heat pump using the ON/OFF button.
2. Close the valve and unscrew the sealing cap.
3. Loosen the circlip holding the screen in the valve. Use the supplied circlip pliers.
4. Lift out the screen from the valve and wash clean with water.
5. Refit the screen, the circlip and sealing cap.
6. Open the valve and start the heat pump using the ON/OFF button.



### Note

The particle filter is installed on the return pipe.

## Evaporator

If there is a coating (for example dust or dirt) on the surface of the evaporator (coil fins), you should wipe it off. The fins are extremely sensitive. Never wipe, e.g. with a cloth, directly on the delicate fins. Use protective gloves to protect your hands from cuts.

This is what to do:

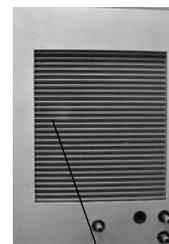
1. Shut down the heat pump using the ON/OFF button.
2. Unscrew the screws and remove the protective grille from the reverse of the heat pump.
3. Spray a degreasing agent on the fins of the evaporator.
4. Rinse off the coating and degreasing agent with water. Do not expose the fins to too high a water spray pressure as this can damage them. When the evaporator is extremely dirty you can rinse the coil from inside the inspection hatch. Any cleaning agent is collected in the drainage hose.

## Snow and ice

In some locations during periods of snow, snow can accumulate inside the protective grille on the rear side. Remove the grille and carefully wash away the snow without damaging the fins.

Also remove any snow or ice from the grille on top of the heat pump. The pump is supplied with defrost functions which can be set by the installer. In the event of any problems, these may need adjusting. Contact your installer.

GreenSource A/W heat pump



Clean the dirt from the coil fins using a degreasing agent and a watering can with rose attachment.



### Warning

During fan defrost, ice can detach from the fan grille and be thrown at high velocity. Do not stand too close and do not look directly into the fan during defrost.

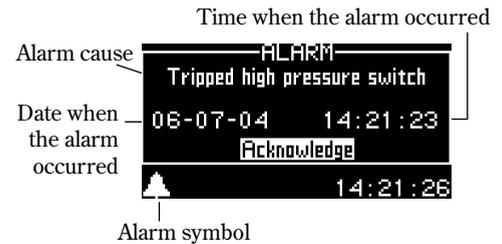
# What to do if a fault occurs

The control unit has an advanced monitoring system that gives alarms if anything unforeseen happens. Most alarms correct themselves. There is never a risk of affecting something when you reset an alarm once or twice. In the event of recurring alarms, contact your installer/service technician.

## Example of an alarm:

When an alarm is triggered, an alarm window is displayed and a warning signal sounds. The alarm window displays the alarm cause and the time and date that the alarm occurred.

When you press the menu dial and *Acknowledge* is marked, the alarm symbol disappears from the menu window and the alarm log, and the warning signal is muted. The heat pump starts again within 15 minutes if heating is required. If the fault has not been rectified the lamp will remain lit and the status LED will stop flashing red and will light red continuously. Should several alarms have occurred on the heat pump, view the alarm log where all alarms are listed. For active alarms, the alarm symbol is lit.



### Note

If you have deactivated the alarm buzzer under *Advanced menu* no warning signal is heard.

## Dimmed menu display

### Possible cause 1: Blown fuse in the house's fuse box/distribution box.

Action:

1. Check the fuses in the house's fuse box.
2. Replace the fuse / reset the circuit breaker if necessary.
3. The heat pump automatically returns to operating mode within 15 minutes after the fault has been rectified.

### Possible cause 2: Glass fuse in the hot water distribution unit has blown.

Action:

1. Contact your installer.

## Emergency operation

On top of the electric box of the hot water distribution unit, there is a switch that lights green during normal operation. If a fault occurs in the control unit and heating production stops, emergency operation can be activated manually using the switch, which then goes out. See the user guide for the Greensource Hot water distribution unit.

The additional electric heater takes over the heating production during emergency operation. Heating can therefore be obtained until the installer or authorised service technician has remedied the fault.

This function must not be confused with Alarm mode, which means that the compressor stops, for safety, due to an active alarm. Heating production is still controlled by the control unit.

## All alarms and warning windows

An alarm can sometimes occur temporarily due to various reasons. However, there is never a risk involved in resetting an alarm. All the alarms that can appear in the menu display are described in this section. The descriptions give you an idea about the nature of the alarm and what you can do to rectify it.

The alarm log (see *Advanced menu*) shows the alarms and warnings that have occurred.

### List of all alarms:

- Tripped low pressure switch
- Tripped high pressure switch
- Sensor failure / short circuit
- Faulty function in 4-way valve
- T6 High hot gas temperature
- Error on electric additional heat
- Fault on additional heat for heating system
- T8 High flow temperature
- Low temperature in condenser
- Tripped motor cut-out compressor
- Tripped motor cut-out fan

### List of all warning windows:

- Is the heat pump fused for this output?
- High temperature difference heat transfer fluid
- The heat pump is now working at its highest permitted temperature
- Additional heat is now working at its highest permitted temperature

## Alarm window

### Tripped low pressure switch

**Possible cause 1: The evaporator is clogged.**

- Action:
1. Clean the evaporator. See *Maintenance*.
  2. Select *Acknowledge*.
  3. Wait for the heat pump to start.
  4. If the fault returns, contact your installer.

**Possible cause 2: Blocked fan.**

- Action:
1. Remove any items that are blocking the fan.
  2. Select *Acknowledge*.
  3. Wait for the heat pump to start.
  4. If the fault returns, contact your installer.

**Possible cause 3: Lack of refrigerant in the refrigerant circuit.**

- Action:
1. Select *Acknowledge*.
  2. Wait for the heat pump to start.
  3. If the fault returns, contact your installer.

**Possible cause 4: Fault in the automatic defrost system or fan motor.**

- Action:
1. Select *Acknowledge*.
  2. Wait for the heat pump to start.
  3. If the fault returns, contact your installer.

**Possible cause 5: Fault in the expansion valve.**

- Action:
1. Select *Acknowledge*.
  2. Wait for the heat pump to start.
  3. If the fault returns, contact your installer.



## Tripped high pressure switch

**Possible cause 1: Air in the heating system.**

- Action:
1. Select *Acknowledge*.
  2. Check whether there is air in the radiators.
  3. Fill the heating system and vent if necessary.

**Possible cause 2: Particle filter is clogged.**

- Action:
1. Select *Acknowledge*.
  2. Check the filter.
  3. Clean the filter if necessary, see *Maintenance*.

**Possible cause 3: Not enough flow over the heat pump.**

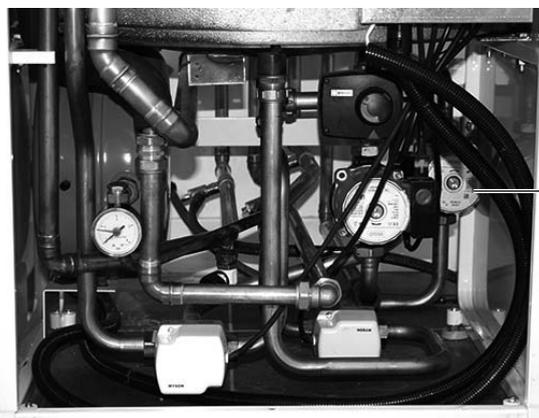
- Action:
1. Select *Acknowledge*.
  2. Check that the heat carrier pump has not stopped. If an existing electric/oil-fired boiler is connected, the heat carrier pump is on one of the pipes.
  3. Check that all the valves are open. In heating systems with thermostat valves these should be fully open and in underfloor heating systems at least half of the coils should be fully open.
  4. Possibly increase the pump speed.
  5. Contact your installer.



**Note**

**Increase the speed of the heat carrier pump:**

Use a screwdriver or a coin to increase the speed of the heat carrier pump. Turn one step anti-clockwise.



Heat carrier pump (Hot water distribution unit)

## Sensor failure / short circuit

All sensors connected to the heating installation can give an alarm in the event of a fault. In the example to the right it is sensor T3, hot water, which has given an alarm. All sensors give alarms in the same way.

**Possible cause 1: Temporary error.**

- Action:
1. Wait and see.

**Possible cause 2: Defective sensor or incorrect connection.**

- Action:
1. Contact your installer.

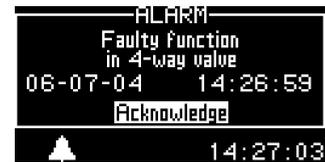


## Faulty function in 4-way valve

**Possible cause 1:** Four-way valve does not work properly.

Action:

1. Select *Acknowledge*.
2. Contact your installer at repeated alarms.



## T6 High hot gas temperature

**Possible cause 1:** The working temperature of the compressor is too high.

Action:

1. Select *Acknowledge*.
2. Contact your installer at repeated alarms.



**Possible cause 2:** Intermittent temperature rise due to abnormal operating conditions.

Action:

1. Select *Acknowledge*.
2. Wait and see. Contact your installer at repeated alarms.

## Fault on electric additional heat (Hot water distribution unit)

**Possible cause 1:** Additional heat overheat protection has tripped.

Action:

1. Select *Acknowledge*.
2. Reset the overheat protection on the additional heat.
3. Contact your installer at repeated alarms.



## Fault on additional heat for heating system

**Possible cause 1:** Additional heater overheat protection has tripped.

Action:

1. Select *Acknowledge*.
2. Reset the overheat protection on the additional heat.
3. Contact your installer at repeated alarms.



## T8 High flow temperature

There is a sensor, T8, in the heat pump, which for reasons of safety, stops the compressor if the flow temperature becomes higher than the set value.

**Possible cause 1:** Not enough flow over the heat pump.

Action:

1. Check that the heat carrier pump has not jammed (see *Tripped high pressure switch*).
2. Check that all the valves are open. In heating systems with thermostat valves these should be fully open and in underfloor heating systems at least half of the coils should be fully open.



**Possible cause 2:** Particle filter is clogged.

Action:

1. Clean the particle filter, see *Maintenance*.

## Low temperature in condenser

The alarm is due to low temperature in the heat pump. A warning window is initially displayed. After 4 repeated warnings (within 2 hours), an alarm is given.



**Possible cause 1: Air in the heating system.**

- Action:
1. Select *Acknowledge*.
  2. Check whether there is air in the radiators.
  3. Fill the heating system and vent if necessary.

**Possible cause 2: Particle filter is clogged.**

- Action:
1. Select *Acknowledge*.
  2. Check the filter.
  3. Clean the filter if necessary.

**Possible cause 3: Faulty heat carrier pump.**

- Action:
1. Check that the heat carrier pump has not stopped (see *Tripped high pressure switch*).
  2. Contact your installer.

**Possible cause 4: Not enough/no flow over the heat pump.**

- Action:
1. Check that the heat carrier pump has not stopped.
  2. Check that all the valves are open. In heating systems with thermostat valves these should be fully open and in underfloor heating systems at least half of the coils should be fully open.

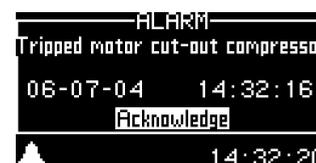
**Possible cause 5: Insufficient water level in the house's heating system.**

- Action:
1. Contact your installer.

## Tripped motor cut-out compressor

**Possible cause 1: Intermittent fault or overload on the power supply.**

- Action:
1. Select *Acknowledge*.
  2. Wait for the heat pump to start.
  3. If the fault returns, contact your installer.



**Possible cause 2: Current level (A) on the motor cut-out is set too low. The current drawn by the compressor varies during summer/winter operations.**

- Action:
1. Contact your installer.

**Possible cause 3: Contactor or cut-out faulty, or loose electrical connections to the compressor.**

- Action:
1. Contact your installer.

**Possible cause 4: Compressor error.**

- Action:
1. Contact your installer.

## Warning windows

### High temperature difference heat transfer fluid

This warning window is displayed when the temperature difference between sensors T8 and T9 becomes too high.



**Possible cause 1: Not enough flow over the heat pump.**

Action:

1. Check that the heat carrier pump has not jammed.
2. Check that all the valves are open. In heating systems with thermostat valves these should be fully open and in underfloor heating systems at least half of the coils should be fully open.

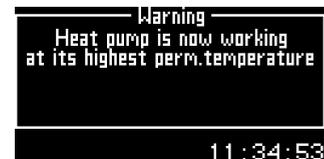
**Possible cause 2: Particle filter is clogged.**

Action:

1. Clean the particle filter.

### The heat pump is now working at its highest permitted temperature

There is a sensor T9 in the heat pump, which for reasons of safety, stops the compressor if the temperature of the return water from the heating system becomes too high. The limit lies at approximately 59°C.



**Possible cause 1: The heat setting is set so high that the heating system's return temperature is too high.**

Action:

1. Reduce the heat curve setting.

**Possible cause 2: The hot water temperature is set too high.**

Action:

1. The warning is given in hot water mode.  
Contact the installer to adjust the hot water temperature.

**Possible cause 3: The underfloor heating or radiator valves are closed.**

Action:

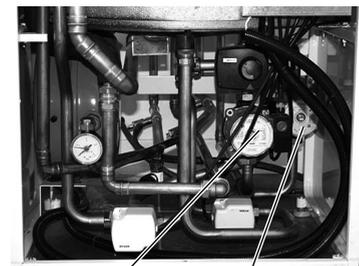
1. Open the valves.

**Possible cause 4: The flow across the heat pump is greater than the flow in the heating system.**

Action:

1. Reduce the speed of the heat carrier pump (see *Tripped high pressure switch*) or increase the speed of the circulation pump for the heating system. Contact your installer for help.

Hot water distribution unit



Circulation pump  
for the heating system

Heat carrier pump

## **Additional heat is now working at its highest permitted temperature**

There is a sensor T9 in the heat pump, which for reasons of safety, stops the compressor and limits the additional heat to the heat pump if the temperature of the return water from the heating system becomes too high. The limit for additional heat lies at approximately 48°C.

**Possible cause 1: The heat setting is set so high that the heating system's return temperature is too high.**

Action: 1. Reduce the heat curve setting.



# Technical information

## Factory settings

The table displays the factory values (F value) of the settings that you, as a customer, (K) can change via the customer menus *Menu* and *Advanced menu*.

Menu	Level	F value
Temperature increase/decrease	K	= (no change)
Room temperature setting	K	20°C
Extra hot water	K	0 h

Advanced menu	Level	F value
<b>Temperature</b>		
Heating system temperature		
—"—\Heat curve	K	V=20,0°C H=55,2°C
—"—\Hysteresis		
—"—\—"—\Maximum	K	16°C
—"—\—"—\Minimum	K	4°C
—"—\—"—\Time factor	K	10
Room sensor settings (T5)		
—"—\Room temperature setting	K	20°C
—"—\Room sensor influence		
—"—\—"—\Change factor	K	5
—"—\—"—\Blocking time	K	4 h
Time limited settings		
—"—\Time control heating	K	Off
—"—\—"—\Day and time	K	
—"—\—"—\Change in temperature	K	-10°C
—"—\Holiday	K	Off
—"—\—"—\Date	K	
—"—\—"—\Change in temperature	K	-10°C
Heating season		
—"—\Heating season limit	K	18°C
—"—\Delay	K	4 h
—"—\Direct start limit	K	10°C
Heating, maximum operating time at hot water requirement		
	K	20 min

### Read the table as follows:

To find the settings for *Holiday* go to the *Advanced menu*, select *Temperature*, then select *Time limited settings* and then *Holiday*.

Advanced menu	Level	F value
<b>Hot water (T3)</b>		
Extra hot water		
—"—\Number of hours	K	0
—"—\Stop temperature	K	65°C
Hot water peak		
—"—\Interval	K	0 days
—"—\Start time	K	03:00
Time control hot water	K	Off
<b>Setting the clock</b>		
Set date	K	
Set time	K	
<b>Alarm</b>		
Alarm log		
—"—\Delete alarm log?	K	No
<b>Access level</b>		
	K	0
<b>Return to factory settings</b>		
	K	No
<b>Deactivate alarm buzzer</b>		
	K	No
<b>Program version</b>		
	K	xx.xx.x

## Technical information

Greensource		6 kW	7 kW	9.5 kW
Emitted/Supplied output at +7/35°	kW	5,5 / 1,5	7,1 / 2,1	8,8 / 2,3
Emitted/Supplied output at +7/45°	kW	5,1 / 1,7	6,9 / 2,5	8,5 / 2,8
Heat carrier flow nominal	l/s	0,19	0,29	0,34
Internal pressure drop heat carrier	kPa	5	6	7
Air flow	m <sup>3</sup> /h	2200	2200	2200
Electrical consumption fan	A	0,44	0,44	0,44
Electrical supply		230V 1N~		
Fuse size <sup>1)</sup>	AT	16	25	25
Compressor		Scroll		
Highest outgoing heat carrier temperature	°C	65	65	65
Refrigerant filling R-407C	kg	2	2,3	2,4
HTF connection, clamping ring	mm	Hose 1 inch internal thread		
Defrost system		Hot gas with four-way valve		
Operating temperature	°C	-20 – +35		
Dimensions (WxDxH) <sup>2)</sup>	mm	820x640x1190		
Weight	kg	140	145	155
Outer casing		Galvanised enamelled plate		

Output data at +7/35° and +7/45° are stated according to the European standard EN 14511.

<sup>1)</sup> aM type fuse, D characteristic MCB.

<sup>2)</sup> Dimensions excl. feet, supplied min 20 mm - max 30 mm depending on adjustment.

## Sound levels

The table describes the sound levels stated in sound pressure level.

### Sound pressure level:

Sound pressure level is defined as the sound level, which at an ear level of 1.8 metres, is perceived one metre from the heat pump. Measured in a sound measurement room without echo at an outdoor temperature of +7°C and 50°C flow temperature.

### Example:

When the heat pump is installed outside with free sound propagation the sound level drops by 6dBa with each doubling of distance.

Heat pump	Sound pressure level L <sub>p</sub> - ear (dBa)
6 kW	49
7 kW	49
9.5 kW	53

Example	Greensource 6 kW
Distance	L <sub>p</sub> - ear (dBa)
1 metres	49
2 metres	43
4 metres	37
8 metres	31

## Sensor table

The table shows all sensor resistance at different temperatures.

Temperature (°C)	kΩ
-40	154.300
-35	111.700
-30	81.700
-25	60.400
-20	45.100
-15	33.950
-10	25.800
-5	19.770
0	15.280
5	11.900
10	9.330
15	7.370
20	5.870
25	4.700
30	3.790
35	3.070
40	2.510
45	2.055
50	1.696
55	1.405
60	1.170
65	0.980
70	0.824
75	0.696
80	0.590
85	0.503
90	0.430

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**EXCELLENCE COMES AS STANDARD**

Worcester, Bosch Group

Cotswold Way, Warndon, Worcester WR4 9SW.

Tel. 01905 754624 Fax. 01905 754619

Worcester, Bosch Group is a brand name of  
Bosch Thermotechnology Ltd.

[www.worcester-bosch.co.uk](http://www.worcester-bosch.co.uk)

## CONTACT INFORMATION

### WORCESTER, BOSCH GROUP:

TECHNICAL: 08705 266241

SERVICE: 0845 7 256206

SPARES: 01905 752571

LITERATURE: 01905 752556

TRAINING: 01905 752526

SALES: 01905 752640

WEBSITE: [www.worcester-bosch.co.uk](http://www.worcester-bosch.co.uk)

