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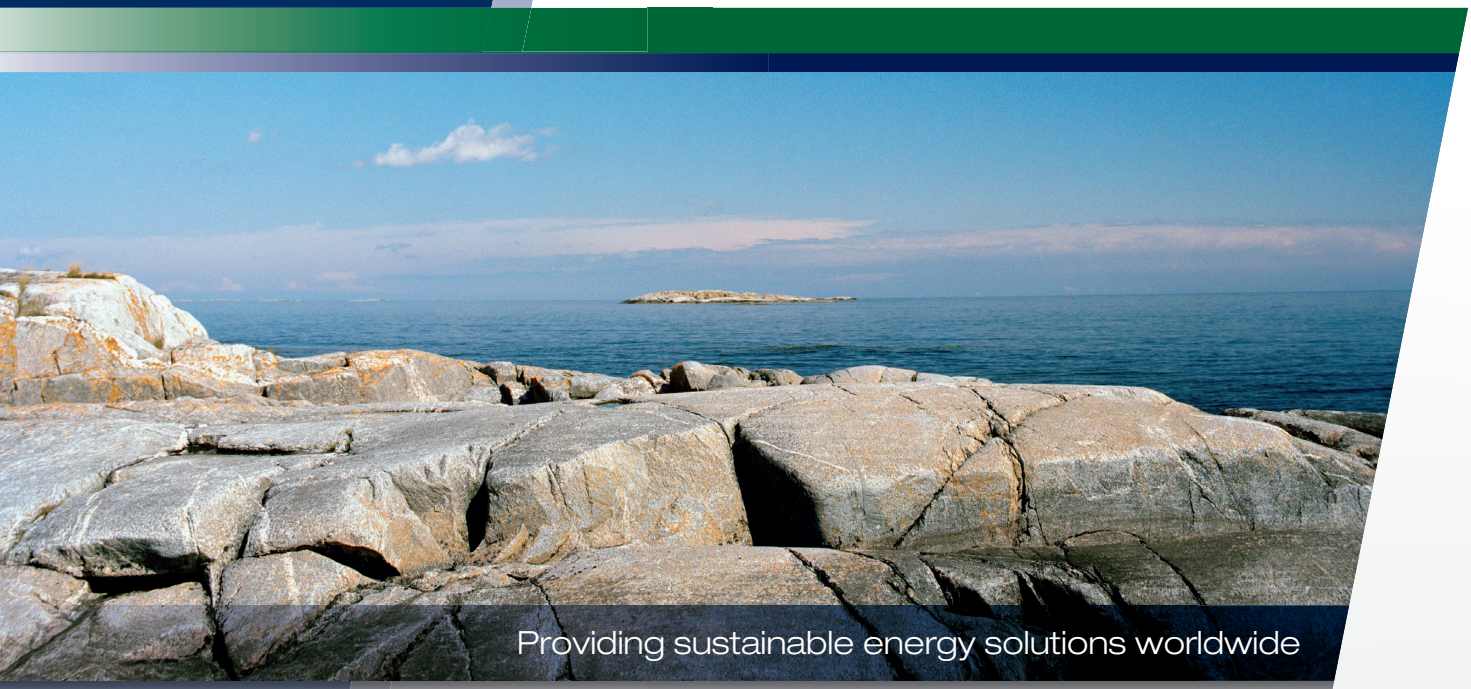


Installation and Maintenance Manual

CTC EcoZenith i550 Pro

3x400 V/ 1x230 V/ 3x230V

IMPORTANT
READ CAREFULLY BEFORE USE
KEEP FOR FUTURE REFERENCE

Installation and Maintenance Manual

CTC EcoZenith i550 Pro

162 205 57-5 2019-11-27

Table of Contents

Quick reference

Fill in the information below. It may come in useful if anything should happen.

Product:	Manufacturing number:
Installer:	Name:
Date:	Tel. no.:
Electrical installer:	Name:
Date:	Tel. no.:

Congratulations on buying your new product

You have just bought a CTC EcoZenith i550 Pro, which we hope you will be very pleased with. In the following pages you can read about how to operate and maintain your product. One part contains general information and one part has been written for the installer. Keep this manual containing the installation and maintenance instructions. You will be able to enjoy the benefits of your EcoZenith for many years, and this manual provides all the information you will need.

The Complete System

The CTC EcoZenith i550 Pro is a complete system which meets your home's heating and hot water requirements. It is equipped with a unique control system that monitors and controls your entire heating system regardless of how you choose to tailor it.

The CTC EcoZenith i550 Pro has a control system that:

- monitors all hot water and heating system functions;
- monitors and controls your heat pump, solar panels, additional heat, buffer tank, pool, etc.;
- allows for individual settings;
- indicates desired values, for instance, temperatures and energy consumption;
- facilitates settings in a simple and structured manner.

Your CTC EcoZenith i550 Pro has built-in finned copper coils which provide plenty of hot water and another finned copper coil to handle the heat from solar panels. The product also has a so-called cellar heat feature during the summer and a floor feature which maximizes the primary flow temperature.

Using the integrated night reduction function, you can set and change the temperature in the property during a 24-hour period, day by day, in blocks or as a vacation function.

Service-friendly

Easily accessible electrical components, along with effective troubleshooting functions in the control program, make the EcoZenith easy to service. It is supplied with a room sensor as standard, which is equipped with LED lights that flash in the event of a fault.

EcoZenith is fully-equipped for connection to the CTC EcoPart 600M series and CTC EcoPart 400 series of ground source heat pumps, the CTC EcoAir 400 series of outdoor air heat pumps, CTC EcoAir 520M, CTC EcoAir 510M 230V 1N~, CTC EcoAir 614M and CTC EcoAir 622M, as well as solar panels, water-jacketed stoves, and any additional boilers. The EcoZenith can control a number of combinations and provide you with an extremely flexible, eco-friendly and energy-saving heating system.

Check list

The check list must be completed by the installer.

- In the event of a service, this information may be called for.
- Installation must always be done according to the installation and maintenance instructions.
- Installation must always be carried out in a professional manner.
- Following installation, the unit should be inspected and checked for functionality.

Following installation, the unit must be inspected and functional checks performed as indicated below:

Pipe installation

- ☐ EcoZenith filled, positioned and adjusted in the correct manner according to the instructions.
- ☐ EcoZenith positioned so that it can be serviced.
- ☐ Capacity of the charge/radiator pump (depending on type of system) for the flow required.
- ☐ Open radiator valves and other relevant valves.
- ☐ Tightness test.
- ☐ Bleed the system.
- ☐ Safety valve function test.
- ☐ The waste pipe is connected to the draining gutter.

Electrical installation

- ☐ Compressor, direction of rotation (if heat pump installed).
- ☐ Power switch
- ☐ Correct tight wiring
- ☐ Requisite sensors for applicable system
- ☐ Outdoor sensor
- ☐ Room sensor (optional)
- ☐ Accessories

Information for the customer (adapted to current installation)

- ☐ Start-up with customer/installer.
- ☐ Menus/controls for selected system
- ☐ Installation and maintenance manual supplied to the customer
- ☐ Checks and filling, heating system
- ☐ Trimming information, heat curve
- ☐ Alarm information
- ☐ Mixing valve
- ☐ Safety valve function test
- ☐ Warranty conditions
- ☐ The installation certificate has been completed and posted.
- ☐ Information on procedures for fault registration

_____ _____

Date / Customer Date / Installer

Important to remember!

Check the following points in particular at the time of delivery and installation:

- The CTC EcoZenith i550 Pro must be transported and stored in an upright position. When moving the product, it can be placed temporarily on its back.
- Remove the packaging and check before installation that the product has not been damaged in transit. Report any transport damage to the carrier.
- Place the CTC EcoZenith i550 Pro on a solid foundation, preferably made of concrete. If the product needs to be placed on a soft carpet, base plates must be placed under the adjustable feet.
- Remember to leave a service area of at least 1 m in front of the product. Space is also needed around the product for installation of insulation and plastic top cover. See the chapter on Transportation, unpacking and installation in the section for the installer. The CTC EcoZenith i550 Pro must not be lowered beneath floor level.
- Check for missing parts.
- The product must not be installed where the ambient temperature is higher than 60°C.
- CTC EcoAir 510M 230V 1N~ must have Software HP PCB 20160401 or later.
- CTC EcoAir 520M 400V 3N~ must have Software HP PCB 20160401 or later.
- To control CTC EcoPart 600M, CTC EcoZenith i550 Pro must have software version 20190620 or later.

Scope of delivery

Standard delivery

- Multitank CTC EcoZenith i550 Pro
- Additional package with:
  - Installation and Maintenance Manual
  - Outdoor sensor
  - Room sensor
  - Safety valve 9 bar (tap water)
  - Safety valve 2.5 bar (radiator system)
  - Drainage valve
  - Adapter between the drainage valve and the connection sleeve
  - Sensor, 2 off (to and from pipes)
  - Current sensor, 3 off
  - Cover washer for connections, upper and lower tank, 8 off
  - Cover washer for solar coil connections, 2 off
  - Insulation for connection sleeves that are not used
  - Sensor labelling
  - Screw 4.2 x 14 graphite grey, 25 off + 2 extra
  - Screw 4.2 x 14 zinc grey, 4 off + 2 extra
- Additional package with rear insulation sections and plastic top

Safety instructions

Turn off the power with an omnipolar switch before doing any work on the product.

The product must be connected to protective earth.

The product is classified as IPX1. The product must not be rinsed with water.

When handling the product with a hoist ring or similar device, make sure that the lifting equipment, eyebolts and other parts are not damaged. Never stand under the hoisted product.

Never jeopardise safety by removing bolted covers, hoods or similar.

Any work on the product's cooling system should be carried out by authorised personnel only.

The product's electrical systems should only be installed and serviced by a qualified electrician.

-If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Safety valve check:
-Safety valve for boiler/system to be checked regularly.

The product must not be started if it is not filled with water; instructions are in the "Pipe installation" section.

WARNING: Do not switch on the product if there is a possibility that the water in the heater is frozen.

This device can be used by children from the age of eight years and above and by people with reduced physical, sensory or mental ability or lack of experience or knowledge if they have been taught, either with supervision or with the instructions provided, how to use the device safely and understand the risks involved. Children should not play with the device. Cleaning and maintenance should not be carried out by children without supervision.

If these instructions are not followed when installing, operating and maintaining the system, Enertech's commitment under the applicable warranty terms is not binding.

1. CTC EcoZenith i550 Pro design

This chapter illustrates the main components and describes the subsystems which, in different configurations, form part of the main system. For more information about the EcoZenith configurations, refer to the “Pipe

Fresh Water Connections
The property’s fresh water supply is connected here. The cold water is fed down to the lower part of the coiling, where it is preheated.

Bivalent Mixing Valve
The automated mixing valve ensures that an even heat is continuously supplied to the radiator system. The valve has double ports and takes the warm radiator water from the solar and heat pump heated water in the lower part of the tank first.

Top Connection
For connection of expansion vessel and/or safety valve.

Upper tank
In the upper part of the tank, the warm water in the coil is heated up to the desired temperature.

Control System
The EcoZenith is equipped with an intelligent control system which controls and monitors all parts of the heating system. The EcoZenith ensures that the most economical way of heating the house and the hot water is prioritised.

Upper Tank Connections
The upper part of the tank, the additional part, can be heated by heat pump and connected to heat sources such as electric, gas, oil and pellet boilers. Heat from a wood boiler is delivered to this part. Connections are placed symmetrically on both sides of the tank.

Finned Coil for Hot Water
The EcoZenith is equipped with a well dimensioned finned copper coil and does not contain any heater which can rust. A low temperature can be maintained without the risk of legionella bacteria.

Heat Distribution Pipes
The heat distribution pipes ensure that heat from the solar coil is directed to the upper tank and that, after hot water is drawn off, cooled water is directed to the lower part of the tank to be heated again by solar energy or heat pump.

Immersion heaters in Upper Part of Tank
Built-in upper immersion heater. When connected to a heat pump, the immersion heater acts as additional heat.
(The uppermost immersion heater is an accessory).

Insulated tank divider
Between the tank’s upper and lower tank is an insulated tank divider. This provides high temperatures in the upper tank for good hot water capacity and low temperatures in the lower tank for best operating economy.

Lower tank
In the lower part of the tank, hot water is preheated in the coil by the solar- or heat pump-heated water.

Lower Tank Connections
The heat pump and solar system are connected to the lower tank. Water to be heated by wood boiler is taken from here, and heat which is to be stored in a buffer tank is also taken from this part. Connections are placed symmetrically on both sides of the tank.

Solar Coil Connections
The well dimensioned, 10 m long, finned coil can be connected directly to the solar panels.

Insulation
The tank is insulated by 90-mm-thick molded polyurethane foam for minimum heat loss.

Lower immersion heater
Built-in lower immersion heater.

2. CTC EcoZenith i550 Pro function

The CTC EcoZenith i550 Pro is a multi-tank with almost unlimited possibilities.

The EcoZenith is intended for houses and properties with water-borne heat. The multi-tank features include intelligent control, a water volume of 540 litres, bivalent mixing valve, two hot water coils, a solar coil and two 9 kW immersion heaters giving a total of 18 kW. You can easily add another immersion heater as an accessory to provide total power of 27 kW, controlled by the EcoZenith.

The control is specially adapted to simultaneously control up to three of CTC's heat pumps, but it will also control and optimise the following:

- Pool
- Energy storage in buffer tanks
- Three heating circuits simultaneously
- Solar panels and bore hole recharging
- Cooling (passive cooling), floor or fan convector
- Hot water circulation with time control
- Charging of extra domestic hot water tank
- Connected wood boiler, gas/oil boiler and pellets

The CTC EcoZenith is well-insulated with 90 mm PUR and is well provided with connection options on both sides, ensuring clean and easy pipe installations. It also provides for extensions and additions to the system in the future.

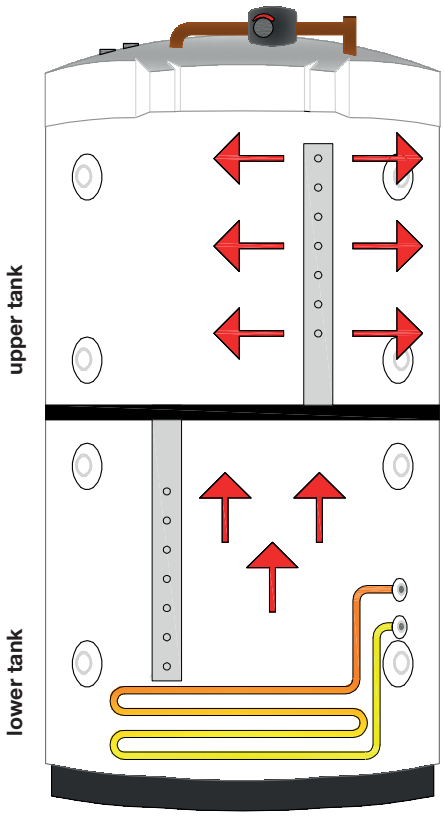
The CTC EcoZenith i550 Pro is divided into two tanks which are isolated from each other in order to be able to hold different temperatures in the two tanks. This provides for optimal function and operating economy.

The upper and the lower tanks are connected by heat distribution pipes which are especially developed for the solar energy to be able to form layers optimally in the entire volume of the tank and act as flow-through of the tank on wood operation, for instance. See figure.

See also Immersion heaters Menu in the Detail Description Menus chapter ("Installer/Settings/Electric heaters")

See also Lower tank Menu in the Detail Description Menus chapter: "Installer/Settings/Lower tank"

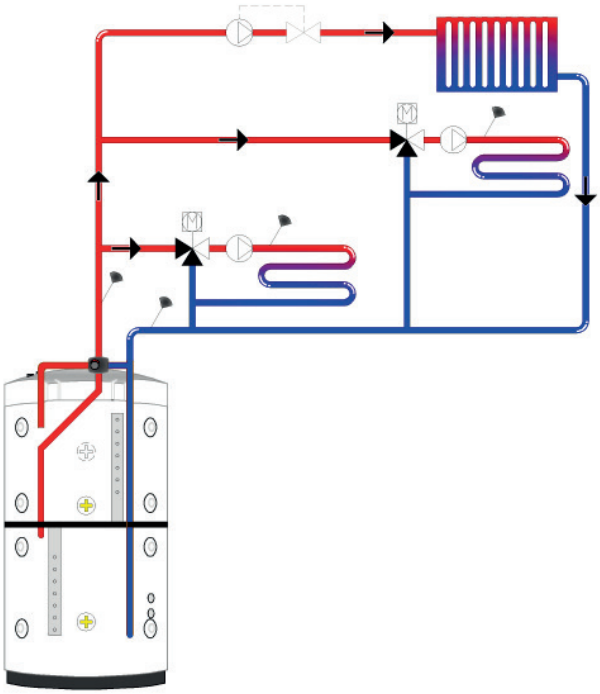
Remember that menus which have not been defined cannot be seen.



2.1 Heating System

The EcoZenith is equipped with a bivalent mixing valve, which always delivers an even temperature, without variation, to the heating system. The bivalent mixing valve is controlled by an outdoor sensor and, optionally, by a room sensor.

When operating with outdoor sensor alone, the desired curve inclination and adjustment are set. These values differ from home to home and should be adjusted to suit your needs.



A room sensor that is correctly positioned provides more comfort and more heating system savings. The room sensor picks up the current indoor temperature and adjusts the heat, for example when it is windy outside and the house is losing heat, which the outdoor sensor is unable to register. During solar insolation, or other instances when heat builds inside the house, the room sensor can also reduce the heat, thus saving energy. Another way to save energy is to use the night reduction function, which reduces the indoor house temperature at certain times or periods, for example during the night or when you are away on holiday.

The EcoZenith can control up to three heating systems, each with its own room sensor. For instance, one radiator circuit plus two floor heating circuits. The bivalent mixing valve always attempts to use the energy from the lower tank first; this is especially important when a heat pump or solar panel is connected to the EcoZenith. This ensures the system delivers good operating economy and that the upper tank stays warm to provide an abundance of hot water.

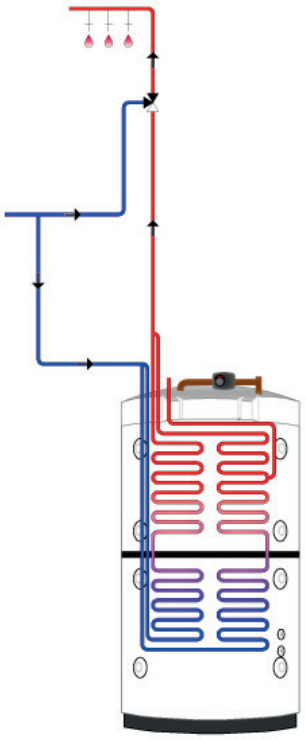
See also Heating system Menu in the Detail Description Menus chapter (Installer/Settings/Heating circuit 1-3).
See also Room temperature Menu in the Detail Description Menus chapter. You access the menu directly from the main menu.

2.2 DHW

The final heating of the hot water takes place in the upper tank. It also acts as additional heating for the heating system when the lower tank is not sufficient.

The hot water is heated using two finned copper tube coils of approx. 40 metres connected in parallel. The coils preheat the water in the lower tank and the water reaches maximum temperature in the upper tank. The low inner volume and high rate of water turnover in the copper coil prevents build-up of bacteria.

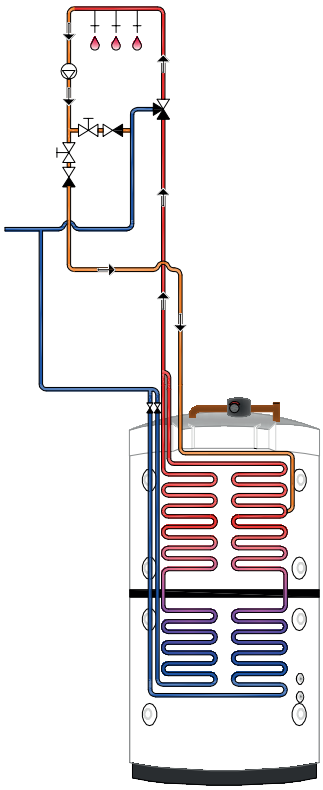
With double coils, high draw-off flows can be obtained, as the heat conduction area is finned, on the inside as well as the outside. For more information on settings and tips, please see the DHW chapter.



2.2.1 Hot Water Circulation

The hot water coil has a connection for hot water charging, which can be used to heat an external cold water tank when greater tap capacity of DHW is required, and allows connection of hot water circulation. This means that hot water is always available at the tap. To save energy the HWC pump can be time controlled from the EcoZenith.

See also Upper tank Menu in the Detail Description Menus chapter (Installer/Settings/Upper tank).

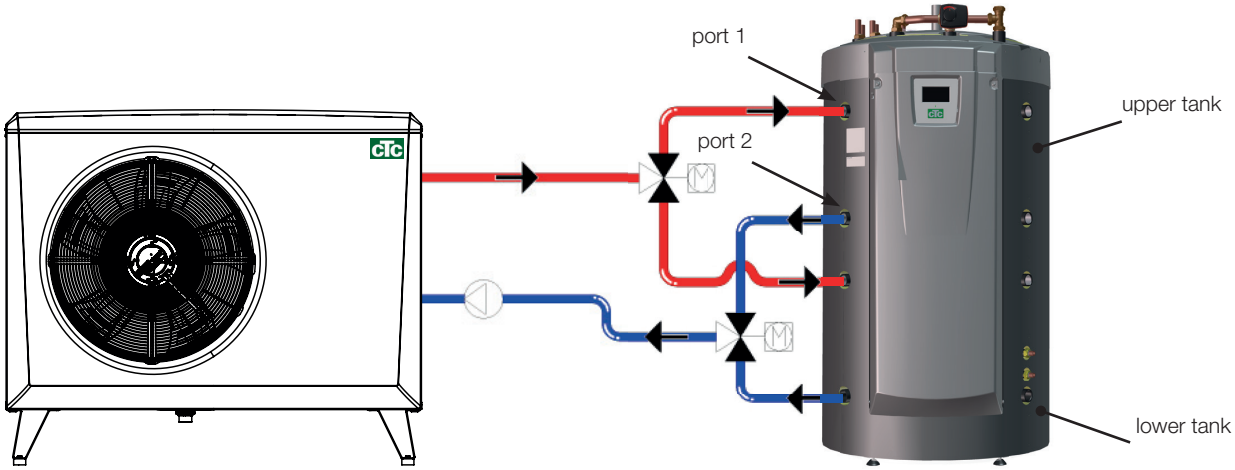


2.3 Heat pump

The EcoZenith is designed with two parts in order to ensure the heat pump operates to maximum possible economy.

The heat pump is connected via two diverting valves to the EcoZenith and ensures that the heat is directed into the upper and lower tanks, respectively. For instance, when the heat pump pumps towards the upper tank, the diverting valves send the flow to the two uppermost connections, so that the flow enters port 1 and exits through port 2.

The heat pump operates in two different ways, depending on whether it is the upper tank or the lower tank being charged.



2.3.1 Upper tank

The final hot water heating takes place in the upper tank. This means that, with a high upper tank temperature, an ample hot water supply is obtained. The upper tank has a factory-set stop temperature of 55°C, which means that the heat pump will work to achieve this temperature in the upper tank. When hot water is being drawn off and the temperature in the upper tank falls to 5°C below the stop temperature, the heat pump starts up and raises the temperature towards the set stop temperature.
The stop temperature can be adapted to hot water needs and to the heat pump model installed.
When there is also a need for heat in the house, the diverting valves will automatically reverse direction and the heat pump continues to heat the lower tank as soon as the stop temperature 55°C in the upper tank has been reached. If the upper tank has not reached the stop temperature 55°C within the factory-set 20 minutes of charging, the diverting valves reverse the direction and the heat pump charges the lower tank. This is to prevent loss of temperature in the heating system.

See also Upper tank Menu in the Detail Description Menus chapter (Installer/Settings/Upper tank)

Pressure/level switch

In some cases, extra protection is required due to local requirements or provisions. For example, the requirement in some areas is for the system to be installed within a water catchment area. The pressure/level switch is connected to blocks K22/K23/K24/K25 and then defined under the Advanced/Define system/Def Heat pump menu. If there is a leak, the compressor and brine pump stop and the Flow/level switch alarm appears on the display.

2.3.2 Lower tank

In the lower tank the heat pump operates to provide heat to the heating system.
Heat pump operation is of so-called floating condensation type. However, the lower tank never drops below the set lowest temperature.

Floating condensation operation is where the heat pump heats to the temperature required by the heating system. This temperature varies depending on the outdoor temperature and which set inclination and adjustment (the heat curve for the house) has been chosen. If a room sensor is installed, this will affect the temperature required in the system. During spring and autumn, when it is not so cold outside, a lower temperature is needed for the heating system, but during winter a higher temperature is needed to maintain the desired indoor temperature.

Savings from a heat pump are directly linked to the COP value. COP means the output divided by the supplied power. COP 4 therefore means, for instance, that the heat pump delivers 4 kW and uses 1 kW $(\frac{4}{1} = 4)$

The lower the temperature the heat pump needs to deliver, the higher the COP value obtained from the heat pump, as this will involve the compressor working to better advantage.
Therefore, the heat pump heats only to the lower tank temperature the heating system requires. This saves compressor life and maximizes operating economy. The immersion heater, which is factory installed in the lower tank, is blocked as long as the heat pump is operating.

The immersion heater is only brought into use if the heat pump is blocked for any reason.

See also Lower tank Menu in the Detail Description Menus chapter (Installer/Settings/Lower tank) and the DHW chapter.

2.3.3 More Than One Heat Pump.

If more than one heat pump is installed, heat pumps two and three are connected to the lower tank only.

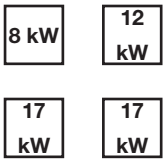
Only one of the heat pumps alternates between DHW and heating operation.

2.3.4 Prioritisation of heat pump operation

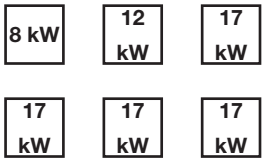
When the CTC EcoLogic controls two or more heat pumps of different sizes, the connected heat pumps are divided into two different categories: small or large heat pumps. Dividing the available heat pumps into two different size categories means it is possible to change the output in small steps and in this way achieve modulating operation.

When, for example, a need for power occurs, a large heat pump is switched on at the same time as a small heat pump is switched off, and vice versa when reducing power. Within both the small and large groups reciprocal heat pump operation is prioritised according to accumulated operation time.

When there is a mixture of different types of heat pumps, air/water and bedrock/ground source pumps are prioritised according to current outdoor temperature.



In the example above, 8 kW and 12 kW are classed as small, while the two 17 kW machines are classed as large.



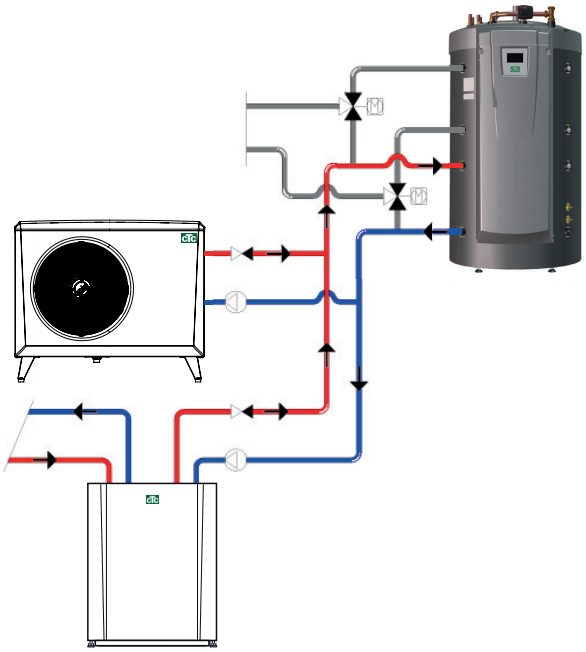
In the example above, 8 kW and 12 kW are classed as small, while the four 17 kW machines are classed as large.

2.3.5 Different Heat Pumps

The EcoZenith can control different types of heat pumps, the CTC EcoAir (outdoor air heat pump) and the CTC EcoPart (bedrock/ground source heat pump). The desired outdoor temperature at which the CTC EcoAir is prioritised over the CTC EcoPart is set in the “Installer/Settings/Heat pumps 1, 2, 3” menu under “Prio EcoAir/EcoPart”. This means that the operating economy can be maximised, as at a high outdoor temperature a greater energy yield is obtained from the CTC EcoAir than from the CTC EcoPart. This combination is excellent in installations where, for example, bedrock/ground source heat pumps are designed with too much focus on “saving” etc. An air/water heat pump may then be used to allow the bedrock more time to “recover” and to provide increased output of the installation.

Remember that only one heat pump can be connected via the diverting valves and charge hot water in the upper tank.

See also Heat pump Menu in the Detail Description Menus chapter (Installer/Settings/Heat pump A1-A3)



2.3.6 Speed-controlled charge pump (accessory)

Each heat pump should be provided with a separate charge pump that is controlled in tandem with its respective heat pump. If a speed-controlled PVM charge pump (accessory from CTC) is connected to the heat pump and controlled from the EcoZenith, the flow will be automatically set without any adjustment needed via the control valve. In the upper tank the speed of the charge pump will be controlled so that the heat pump always delivers its highest possible temperature into the top of the EcoZenith. This provides for quick access to hot water when the heat pump starts.

Towards the lower tank the speed-controlled charge pump will work for a fixed difference between flow and return from the heat pump.

If a speed-controlled charge pump is not installed, the flow has to be adjusted manually, and the difference between incoming and outgoing water from the heat pump will vary, depending on the operation conditions during the year.

In cases where an air/water heat pump is installed and the outdoor temperature is less than +2°C, the charge pumps are started in order to protect against frost. If a speed-controlled charge pump is installed, the pump will only work at 25% of its maximum capacity. This provides for increased savings on the charge pump's operating economy, and the heat losses in the EcoZenith are reduced compared to a conventional on/off charge pump.

See also Heat pump Menu in the Detail Description Menus chapter (Installer/ Settings/Heat pump A1-A3)

2.4 Wood Boiler

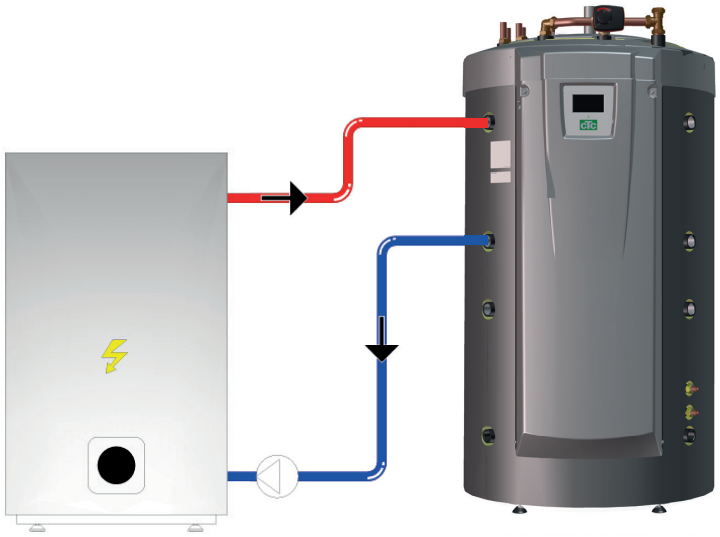
The EcoZenith can be connected to a wood boiler.The primary flow from the wood boiler is connected to the top of the EcoZenith and the return flow to the wood boiler is connected to the lowest connection on the lower tank. When firing is started and the flue gas sensor and/or boiler sensor reaches a set value (menu "Installer/Settings/Wood boiler" factory-set "100/70°C"), the control goes into wood operation status when the temperature of the lower tank is above or equal to its reference value (setpoint). When the flue gas sensor is below the set value, wood operation status is interrupted. It is recommended the wood boiler be provided with a charge system. A charge system such as Laddomat 21 is recommended for optimum performance. The charge pump in the charge system must be controlled from the wood boiler. In special cases, such as operation with a water-jacketed stove, the charge pump may be controlled from the EcoZenith without installing a charge system

If the wood-fired system needs more water than the 540 litres contained in the product, the system needs to be supplemented with an accumulator tank.

See also Wood Boiler Menu in the Detail Description Menus chapter (Installer/ Settings/Wood boiler)

2.5 Additional boiler (pellets, oil, gas, electricity)

The EcoZenith can control an external additional boiler (pellets, oil, gas, electricity). The additional boiler is connected to the upper tank. Use the menu to select whether the external additional boiler should have high or low priority. If high priority is selected, the external additional boiler is activated before the immersion heater(s); when low priority is selected, the immersion heater(s) is/are activated first.



After a certain delay, which is factory set at 120 minutes, the unit with low priority is also started and helps the heat source with high priority.

If the immersion heaters are the lowest prioritised additional heat, the following must also be fulfilled in order for them to start: The temperature in the upper tank must be 4°C below the setpoint for the additional heat.

If the external boiler is the lowest prioritised additional heat, the following must also be fulfilled in order for it to start: The temperature in the upper tank must be 3°C below the setpoint for the additional heat and the immersion heaters must have moved along to the desired value (100% of set value) or to 6 kW in the first two hours after a power failure.

The EcoZenith handles start and stop of the charge pump between the external boiler and the EcoZenith.

The charge pump starts when there is a need for an external boiler.
If a temperature sensor is installed and an extra boiler is defined, the charge pump starts when an external boiler has reached the set temperature (factory set at 30°C).
The charge pump stops when there is no need for an external boiler. A stop delay of the charge pump can be set so that the charge pump runs even if the external boiler is turned off

See also External Boiler Menu in the Detail Description Menus chapter (Installer/Settings/Ext boiler)

2.6 Solar Energy

The EcoZenith contains a 10 m long 18 mm finned and internally grooved solar coil which manages approx. 10 m² of solar panel. On larger solar panel installations, the solar energy is connected via an external heat exchanger (see figure 2). The heat exchanger is connected to the upper and lower connections on the lower part of the CTC EcoZenith (either side is possible). If a greater number of panels is connected, one or more buffer tanks can also be installed in the system. More information on function and control of buffer tanks can be found in the Extra Buffer Tank section.

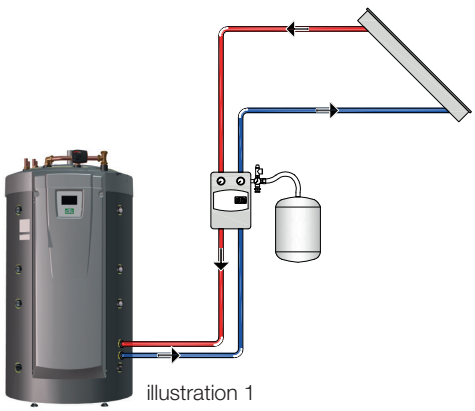


illustration 1

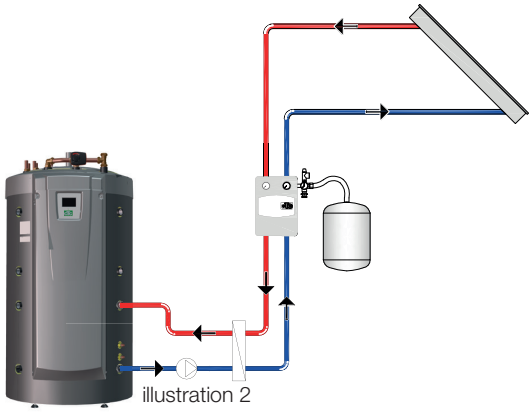
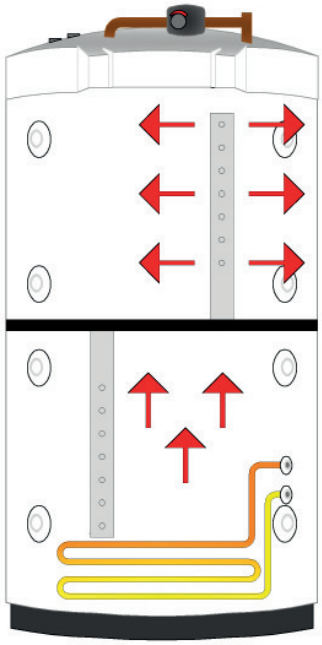


illustration 2

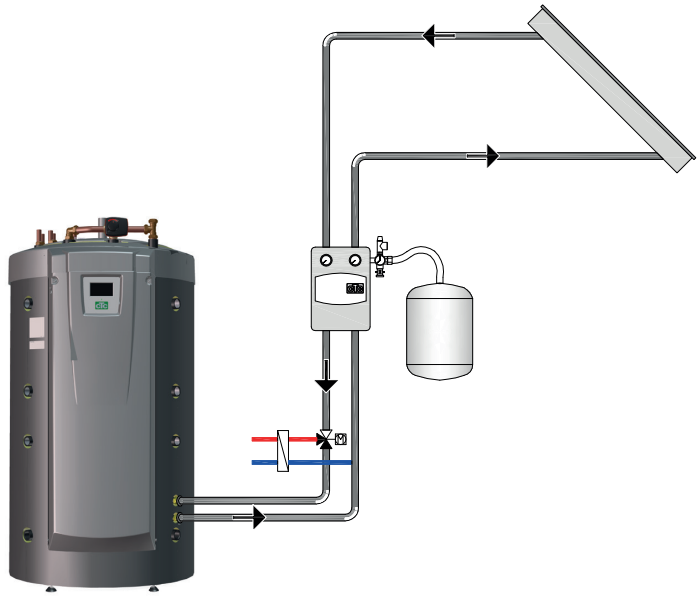
If the solar panels produce a temperature which is more than 7 degrees (factory-set) higher that the sensor (B33), the charge pump starts and transfers the solar energy to the lower tank. The speed-controlled PWM pump controls the flow so that it always delivers a temperature which is 7°C higher. This means that if solar panel output rises, the charge pump will increase the flow, and if solar panel output decreases, the charge pump will reduce the flow. When the temperature in the lower tank increases or the solar panel loses temperature, and the difference between the temperature in the solar panel and the lower tank is below 3 degrees (adjustable), charging stops. Charging will not restart until the solar panel is again 7 degrees warmer than the lower tank.



When the temperature in the lower tank rises and becomes warmer than the upper tank, by the laws of physics, heat will rise into the heat distribution pipe and layer itself into the right temperature level in the upper tank through perforated holes in the distribution pipes. The colder temperature in the upper tank will, in the same way, sink down and distribute itself in its temperature zone in the lower tank through the distribution pipe which descends into the lower tank. Based on the factory setting, the sun will heat the lower tank in the EcoZenith to 85°C before the charging is stopped.

See also Solar Panels Menu in the Detail Description Menus chapter (Installer/Settings/Solar panels)

2.7 Recharging Bedrock/Ground

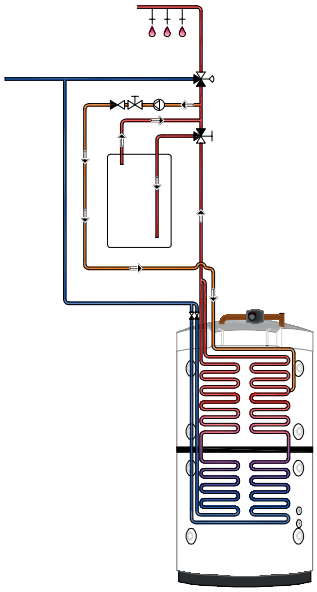


If a liquid-water heat pump is connected, a diverting valve can be installed on the solar circuit and connected to the brine circuit (the loop in the bore hole or the ground heat loop). The solar panel temperature should be factory set at 60°C warmer than the brine temperature in order for charging to start. When the difference between the temperature in the solar panel and the brine circuit falls to 30°C, charging is stopped. If the brine circuit becomes warmer than the factory-set value of 18°C, recharging will also be interrupted, as the temperature then becomes too high for the heat pump to work.

Safety measures for the collector/solar system are available.

See also Protection Collector Menu in the Detail Description Menus chapter (“Installer/Settings/Solar panels/Protection collector”) and also Winter Mode Menu in the Detail Description Menus chapter (“Installer/Settings/Solar panels/Winter mode”)

2.8 External Hot Water Tank



An external water heater can be connected to the EcoZenith. This results in a greater stored hot water volume, which contributes to higher hot water capacity.

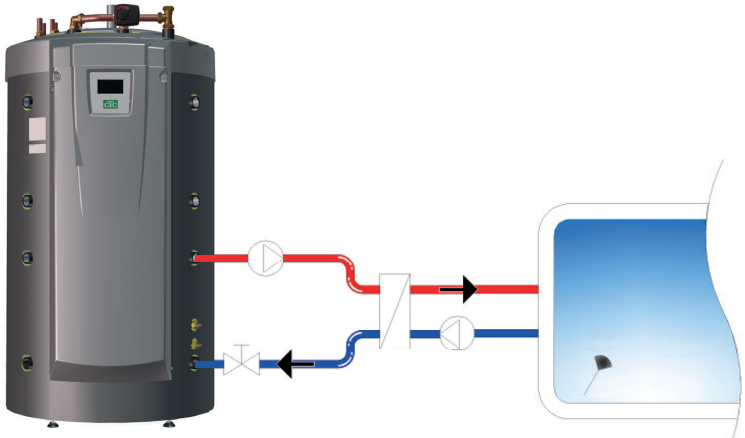
The incoming cold water first passes through the EcoZenith where it is heated before it flows into the hot water tank and out to the property's taps. This means that, when the temperature from the EcoZenith is no longer sufficient, the entire volume of the hot water tank is still there to be used.

When the temperature in the upper tank of the EcoZenith is factory set 5°C warmer than in the external hot water tank, the charge pump starts. The heat from the upper tank charges the hot water tank until the increase in temperature in the latter does not exceed one degree per three minutes.

When hot water is stored below 60°C, heating of the hot water tank at regular intervals is necessary to eliminate the risk of Legionella. This function is built into the EcoZenith. First the upper tank is heated as far as possible using the heat pump. For the water heater to reach 65°C during 1 hour, the immersion heater is allowed to engage to raise the temperature over the final degrees. The factory setting for this is every fourteen days.

See also Upper tank Menu in the Detail Description Menus chapter (Installer/Settings/Upper tank)

2.9 Pool



A pool is connected to the EcoZenith's lower tank. Between the EcoZenith and the pool, a heat exchanger is installed to separate the liquids.

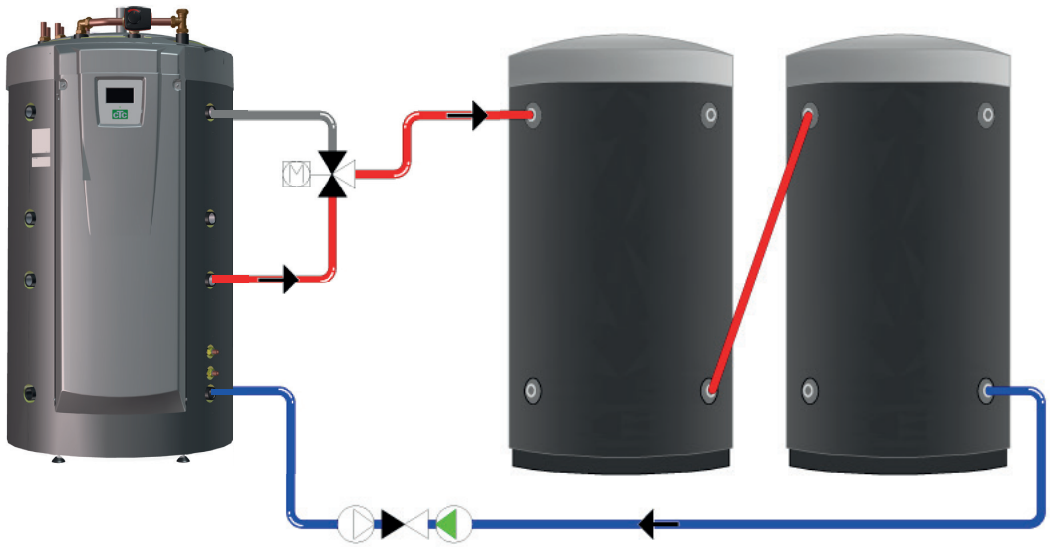
A sensor in the pool starts and stops the pool's charge pumps in order to maintain the set temperature in the pool (factory set at 22°C), and the temperature is allowed to fall by one degree before the charge pump starts again. It is also possible to set the pool priority to high or low, which determines whether or not additional heat can be used for heating the pool.

See also Pool Menu in the Detail Description Menus chapter (Installer/Settings/Pool)

2.10 External Buffer Tank

The EcoZenith can be connected to one or more buffer tanks. This is mainly used when connecting wood and solar energy systems where the volume in the EcoZenith is not sufficient. Via the accessory “Charging External Storage Tank”, warm water can be sent both from the lower tank to the buffer tank(s) and from the buffer tank(s) back to the EcoZenith. In other words, both charging and recharging of the energy are possible.

See also External Storage Tank Menu in the Detail Description Menus chapter (Installer/Settings/Ext storage tank) and HP Charging Menu in the Detail Description Menus chapter (Installer/Settings/Ext storage tank/HP charging).



2.10.1 Solar Operation Control

When solar energy is activated, the transfer to the buffer tank(s) is performed in two ways depending on whether heating is needed for the heating system.

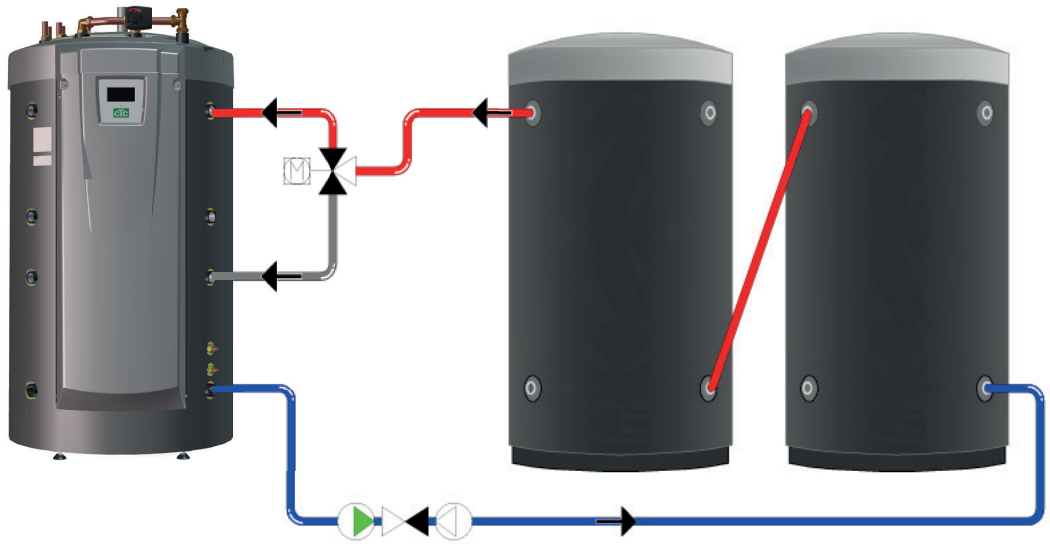
When heating is not needed for the heating system, the sun charges the EcoZenith in order to achieve a high temperature and a large quantity of hot water. The solar panels charge the EcoZenith until the sensor of the lower tank reaches the factory-set 80°C before the circulating pump starts up and transfers hot water from the EcoZenith connection in the lower tank into the top of the first buffer tank. Charging continues until the sensor in the lower tank has fallen 3 degrees (transfer starts at 80 degrees and stops at 77 degrees). The lower tank must be at least 7 degrees warmer than the buffer tank for charging to be allowed to start. This applies independently of whether there is a need for heating or not.

When there is a need to heat the house, the transfer will be controlled by the reference value (setpoint) in the lower tank. When the sun has heated the lower tank to 7 degrees above the reference value, the transfer starts, provided that the lower tank is also 7 degrees warmer than the buffer tank. Efficiency of the solar panels increases when they work towards a low water temperature, which is the case in spring and autumn, as there is no great need for heating during either of these seasons. The temperature levels stated above can be adjusted.

2.10.2 Wood Operation Control

The wood boiler charges the EcoZenith until the sensor of the lower tank reaches the factory-set 80°C, before the charge pump starts up and transfers hot water from the lower tank into the top of the first buffer tank. Charging continues until the sensor in the lower tank has fallen 3 degrees (transfer starts at 80 degrees and stops at 77 degrees). The lower tank must be at least 7 degrees warmer than the buffer tank for charging to be allowed to start, based on the factory-set values.

2.10.3 Recharging from Buffer Tank to EcoZenith



Recharging from Buffer Tank to the EcoZenith is always performed to the upper tank, if possible. If charging to the EcoZenith's upper tank is not possible due to too low a temperature difference, the controller checks if charging to the lower tank is possible. The condition for recharging is a 7 degree temperature difference.

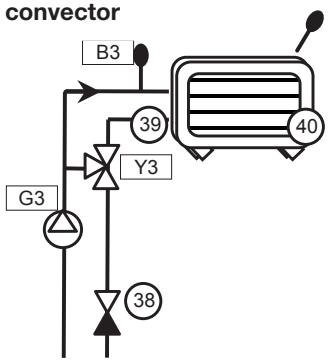
Charging from the buffer tank to both the upper and the lower tanks in the EcoZenith is stopped when the temperature difference has fallen to a difference of 3 degrees. The temperature levels stated above can be adjusted.

2.11 Cooling CTC EcoComfort

CTC EcoComfort is an accessory which utilises the cool temperatures of the bore hole to create a cool indoor climate in summer. The extent to which you can cool a property depends on several factors, such as the rock temperature available for the case in point, the size of the house, the capacity of the fan convectors, the living area layout, etc.

NB: Remember to insulate pipes and connections against condensation

Fan convector



Separate heating/radiator system and cooling system (fan convector)

CTC EcoZenith i550 Pro simultaneously manages a radiator system for heating and a separate system for cooling. This can be relevant if you want to cool a part of a property using e.g. a fan convector at the same time as need to heat another part.

Desired room temperature

The desired room temperature is set on the EcoZenith display. The water mix is automatically adjusted to achieve the right temperature for the amount of cooling needed (room sensor deviation). The greater the deviation, the colder the water fed into the system. Depending on the system in question, temperatures are not permitted to become too cold (as this can result in damage due to damp).

NOTE: For cooling it is recommended that the room temperature be set a few degrees higher than the set temperature for heating operation. Given that the room temperature tends to increase as the outdoor temperature increases, the cooling function will cut in.

Note too that cooling capacity depends, among other things, on bore hole temperature, bore hole length, flows and fan convector capacity, and will vary during the warm part of the year.

See CTC EcoComfort manual for more information.

See also Cooling Menu in the Detail Description Menus chapter (Installer/Define system/Cooling)

3. The House Heating Curve

The House Heating Curve

The heating curve is the central part of the product's control system. It is the heating curve which determines the compensated flow temperature requirements for your property dependent upon the outdoor temperatures. It is important that the heating curve is correctly adjusted, so that you achieve the best operation and economy possible.

One property requires a radiator temperature of 30 °C when the outdoor temperature is 0 °C, whilst a different property requires 40 °C. The difference between different properties is determined by the radiator surface area, the number of radiators and how well insulated the house is.

> The set heating curve always takes priority. The room sensor can only increase or decrease the heat beyond the set heating curve to a certain extent. Where operating without a room sensor, the selected heating curve determines the flow temperature supplied to the radiators.

Adjustment of Default Values for the Heating Curve

You define the heating curve yourself for your property by setting two values in the product control system. This is achieved by selecting the options Inclination or Adjustment under the Installer/Settings/Radiator system menu. Ask your installer to help you set these values.

It is extremely important to set the heating curve and, in some cases, unfortunately, this process may take several weeks. The best way of doing this, upon the initial start-up, is to select operation without any room sensor. The system then operates using the outdoor temperature reading and the property's heating curve only.

During the adjustment period it is important that:

- the night reduction function is not selected.
- all thermostat valves on the radiators be fully opened. (This is to find the lowest curve for the most economical use of the heat pump.)
- the outdoor temperature is not higher than +5 °C. (If the outdoor temperature is higher when the system is installed, use the factory set curve until the outdoor temperature falls to a suitable level.)
- the radiator system is operational and correctly adjusted between different circuits.

Appropriate Default Values

During installation you can seldom achieve a precise setting for the heating curve instantly. In this case, the values given below may provide a good starting point. Radiators with small heat-emission surfaces require a higher primary flow temperature. You can adjust the gradient (heating curve gradient) for your heating system under the Installer/Settings/Radiator system menu.
Recommended values are:

Floor heating only	Inclination 35
Low temperature system (well insulated houses)	Inclination 40
Normal temperature system (factory setting)	Inclination 50
High temperature system (older houses, small radiators, poorly insulated)	Inclination 60

Adjusting the heating curve

The method described below can be used to adjust the heating curve correctly.

Adjustment if it is too cold indoors

- If the outdoor temperature is **lower** than 0 degrees:
  Increase the Inclination value by a couple of degrees.
  Wait 24 hours to see if any further adjustment is required.
- If the outdoor temperature is **higher** than 0 degrees:
  Increase the Adjustment value by a couple of degrees.
  Wait 24 hours to see if any further adjustment is required.

Adjustment if it is too warm indoors

- If the outdoor temperature is **lower** than 0 degrees:
  Decrease the Inclination value by a couple of degrees.
  Wait 24 hours to see if any further adjustment is required.
- If the outdoor temperature is **higher** than 0 degrees:
  Decrease the Adjustment value by a couple of degrees.
  Wait 24 hours to see if any further adjustment is required.

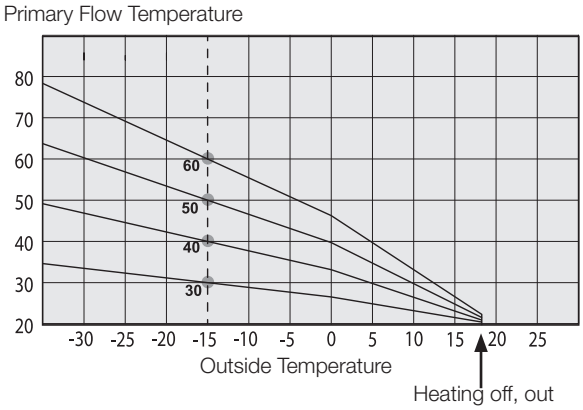
If the values set are too low, this may mean that the desired room temperature is not being reached. You then need to adjust the heating curve, as necessary, following the method shown above.
When the basic values have been set more or less correctly, the curve can be finely adjusted directly using the Room temp. shown on the home menu screen.

Examples of Heating Curves

You can see in the diagram below how the heating curve changes with different Inclination settings. The gradient of the curve shows the temperatures that the radiators require at different outdoor temperatures.

Curve Inclination

The inclination value which is set is the primary flow temperature when the outside temperature is –15 °C.

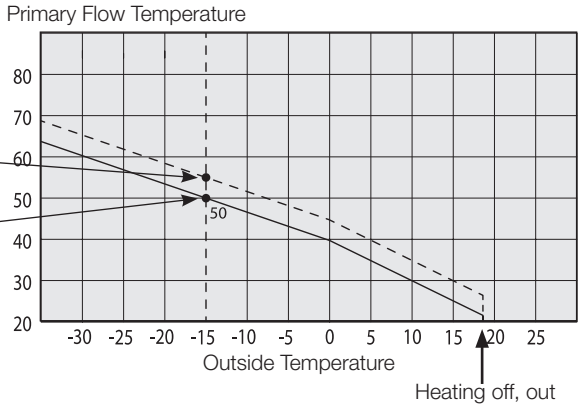


Adjustment

The curve can be parallel displaced (adjusted) by the desired number of degrees to adapt to different systems/ houses.

Inclination 50 °C
Adjustment +5 °C

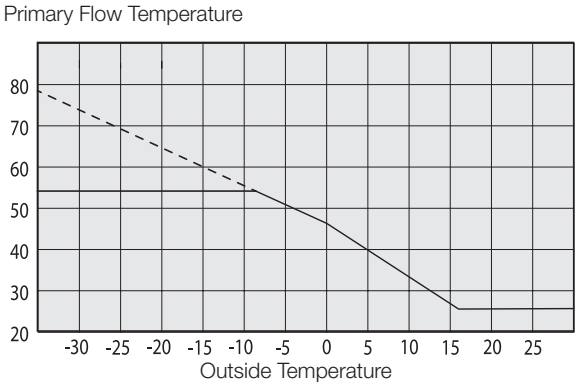
Inclination 50 °C
Adjustment 0 °C



An example

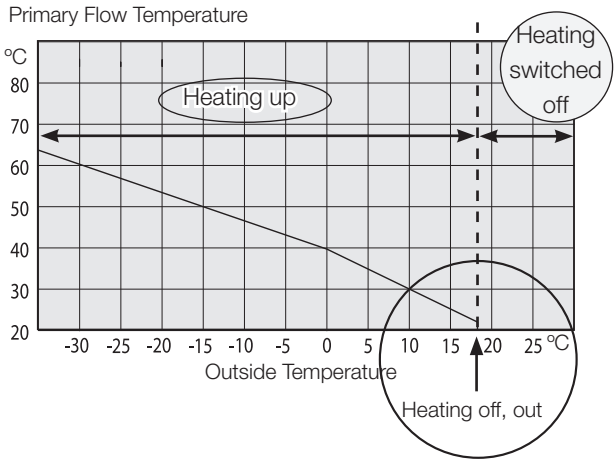
Inclination 60 °C
Adjustment 0 °C

In this example, the maximum outgoing primary flow temperature is set at 55 °C.
The minimum permitted primary flow temperature is 27 °C (e.g. summer-time basement heating or the floor circuits in a bathroom).



Summer-time operation
All properties have internal heat gains (lamps, oven, body heat, etc.), which means that the heating can be switched off when the outdoor temperature is lower than the desired room temperature. The better insulated the house is, the earlier the heating from the heat pump can be switched off.

The example shows the product set at the default value of 18°C. This value, **"Heating off, outside"**, can be changed in the Advanced/Settings/Heat System menu. In systems with a radiator pump, the radiator pump stops when the heat is switched off. The heating starts up automatically when it is required again.



Automatic or remote-controlled summer period
The factory setting causes "summer" to commence automatically at 18ºC, as "Heating mode" is set to "Auto".

Heating, mode **Auto (Auto/On/Off)**
Auto means automatic.

On means that the heating is on. For systems with a mixing valve and a radiator pump, the mixing valve operates to the primary flow setpoint and the radiator pump is on.

Off means that the heating is switched off. For systems with a radiator pump, the radiator pump is switched off.

Heating, ext. mode **- (- /Auto/On/Off)**
Facility for remote control of whether the heating is to be on or off.

Auto means automatic.

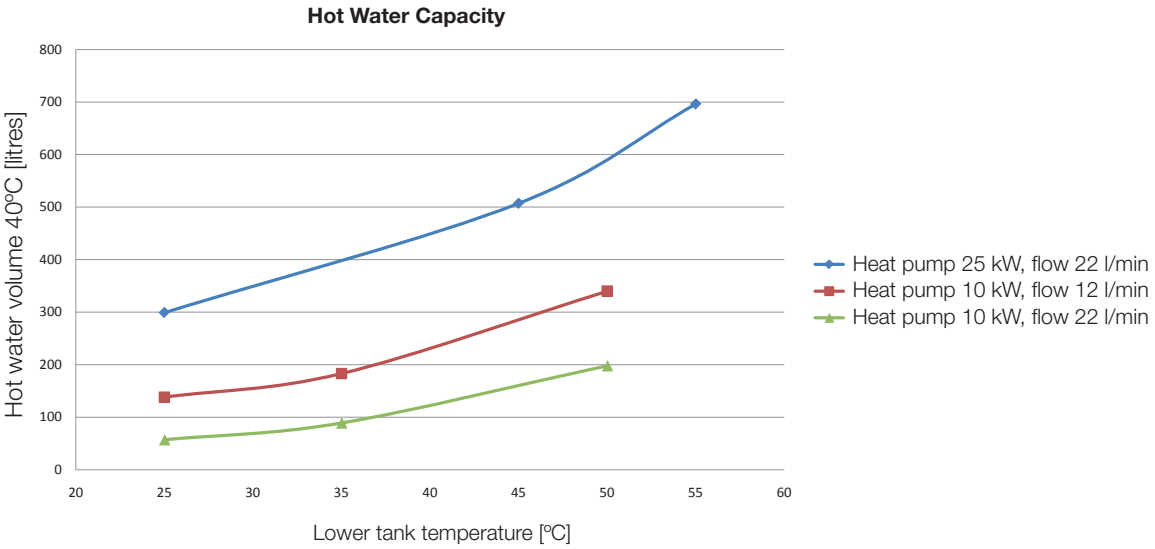
On means that the heating is on. For systems with a mixing valve and a radiator pump, the mixing valve operates to the primary flow setpoint and the radiator pump is on.

Off means that the heating is switched off. For systems with a radiator pump, the radiator pump is switched off.

- No selection means no function when activated.

4. DHW

The CTC EcoZenith i550 Pro has a total of approx. 40 m finned copper coils for the heating of hot water. These coils preheat the water in the lower tank and the water then runs through the upper tank for the final temperature increase. These two coils running parallel through the EcoZenith allow high flows with low pressure differential, creating excellent conditions for good hot water capacity and comfort.



Operating Economy

Many want to gain maximum benefit from the heat pump's low operating costs. Many people want to utilize the low operating cost of the heat pump to a maximum. If the EcoZenith is allowed to run on lower temperatures, this results in lower hot water capacity but greater savings.

A heat pump is more efficient (has a higher COP value) when it produces lower temperatures. For the sake of operating economy, this means that the lower tank of the EcoZenith, which services the needs of the radiators, should have as low a temperature as possible. A floor heating system uses low temperatures, which benefits heat pump operation.

Solar energy operation also gives the best yield at lower temperatures. For example, on a cloudy day the solar panels do not heat up to the same extent, but still deliver their energy to the lower part of the tank, as the temperature in there is low.

The EcoZenith is designed so that the temperature can be low in the lower tank where the preheating of the hot water takes place, and higher in the upper tank in order to further raise the temperature of the hot water. The need for hot water controls the temperature in the upper tank first. For best operating economy, start with a low temperature setting, for instance, the factory setting, and increase the temperature progressively if there is not enough hot water. Remember that setting the temperature higher than a temperature the heat pump can produce means that the immersion heater(s) will kick in and heat instead. This has an adverse effect on operating economy.

For higher hot water demands, it can be more economical to set a higher temperature in the lower tank instead of exceeding the temperature limit for the heat pump in the upper tank. However, this is less beneficial to heat pump operation for the radiator requirement because of the higher operating temperature. Furthermore, where solar panels have been installed, some of the solar energy will not be exchanged in the lower tank.

Additional Domestic Hot Water

There is a possibility of increasing the product's hot water capacity at certain periods, with or without the help of the immersion heater(s). You can either select extra domestic hot water immediately or schedule selection on a weekly basis. When the function is activated, the product starts producing extra hot water. The hot water is produced by the compressor working at maximum temperature, known as full condensation. In the "Installer/Settings/Upper tank" menu you can also select the immersion heater(s) to help to produce extra hot water. Remember that the function "extra hot water" means that more energy is consumed, especially if the immersion heater(s) is/are used. See also in the "Installer/Settings/Lower tank/Timer lower tank" menu.

Extra Domestic Hot Water Tank

Another way of improving the hot water capacity is to install an extra hot water tank. The EcoZenith is prepared for controlling this, which provides the possibility of utilising heat pump energy to heat the extra domestic hot water tank. This means that there is a large buffer with hot water, heated by the heat pump, while the benefits in terms of operating economy using low temperature in the lower tank are maintained.

Important to remember:

- Avoid running hot water at the highest flow capacity. If you run a bath at a rather slower rate instead, you will get a higher temperature.
- Remember that a poor mixing valve or a poor shower mixer can affect the hot water temperature.

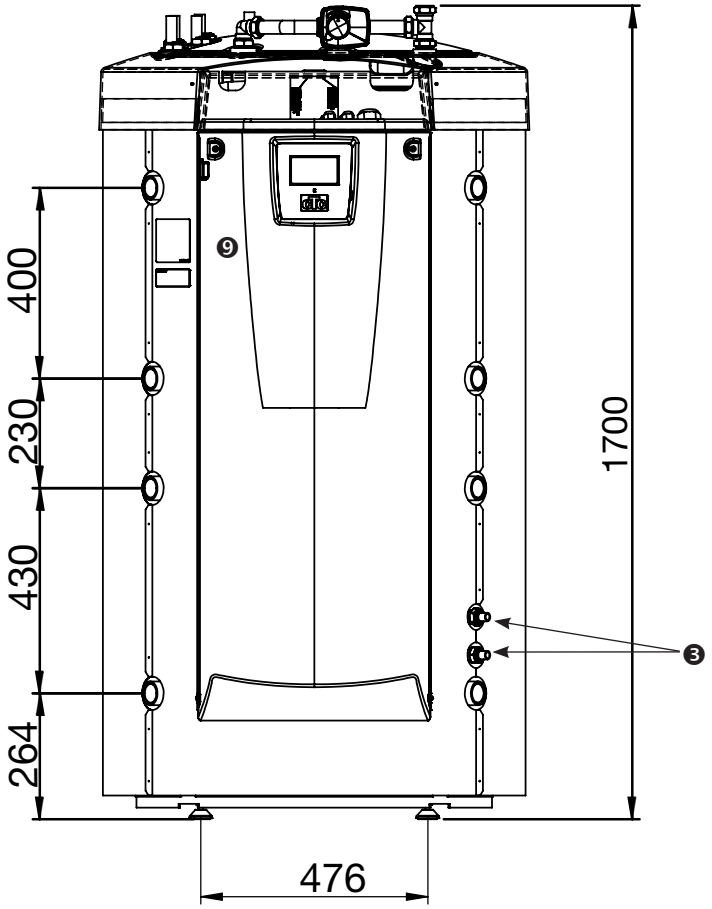
5. Technical data 3x400V, 1x230V

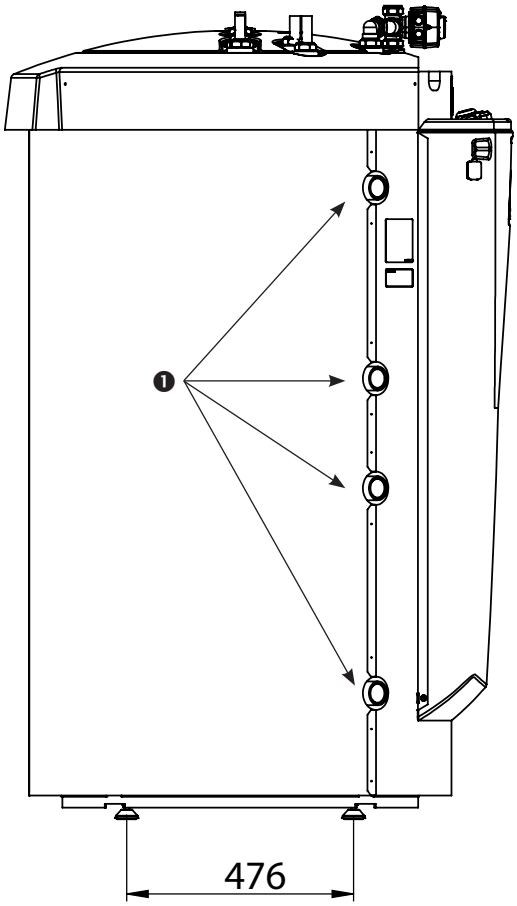
CTC EcoZenith i550 Pro		3x400V	1x230V
Main dimensions on delivery	mm	750x950x1700	
Main dimensions when installed	mm	886 x 1067 x 1700	
Weight	kg	256	
IP class		IPX1	
Insulation (polyurethane, PUR)	mm	90	
Kvs value mixing valve 17-28kW (option mix. valve 27-45kW)	m3/h	6.3 (10)	
Temperature thermostat overheating protector device	°C	92-98	
Domestic hot water capacity (40°C, 22 l/min) Tank temp 55°C, HP (Heat pump 25 kW) allowed Tank temp 65/55°C, electric power 24kW allowed	 l l	 >600 523	
Pressure differential at flow 40l/min	bar	0.7	
Volume tank	l	540	
Volume domestic hot water coil	l	11.4	
Max operating pressure tank	bar	2.5	
Max operating pressure domestic hot water coil	bar	9	
Domestic hot water coil (finned)	m	2x18.6	
Domestic hot water coil circulation (finned)	m	0.6	
Solar coil (finned)	m	10	
Electrical data		400V 3N~	230V 1N~
Power immersion heaters (option)	kW	9+9 (+9)	9
Power limitation, immersion heaters		3 kW/step + 0,3 kW/step	3 kW/step
Display Memory Back-up batteries Clock		4.3 inches, colour, touch Maintains the memory in the event of a power failure Not needed Realtime controlled	
Current monitor, built-in		Yes	
Current draw at different powers of immersion heaters			
3 kW	A	4.4	13
6 kW	A	8.7	27
9 kW	A	13.0	40
12 kW	A	17.4	
15 kW	A	21.7	
18 kW	A	26.1	
21 kW	A	30.4	
24 kW	A	34.8	
27 kW	A	39.1	

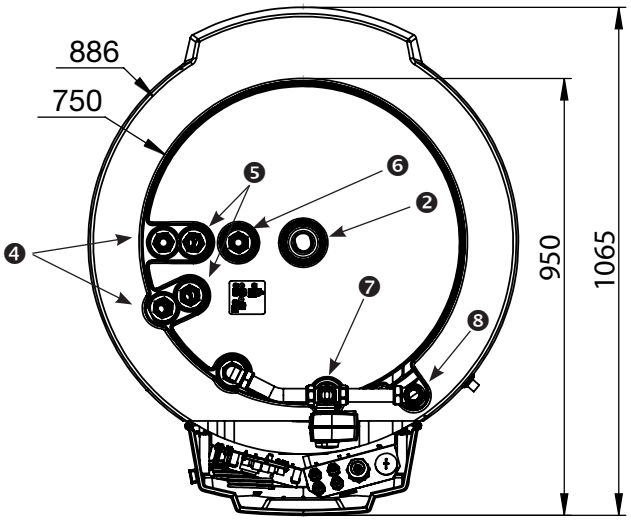
5.1 Technical data 3x230V

CTC EcoZenith i550 Pro		3x230V
Main dimensions on delivery	mm	750x950x1700
Main dimensions when installed	mm	886 x 1067 x 1700
Weight	kg	256
IP class		IPX1
Insulation (polyurethane, PUR)	mm	90
Kvs value mixing valve 17-28kW (option mix. valve 27-45kW)	m3/h	6.3 (10)
Temperature thermostat overheating protector device	°C	92–98
Domestic hot water capacity (40°C, 22 l/min) Tank temp 55°C, HP (Heat pump 25 kW) allowed Tank temp 65/55°C, electric power 24kW allowed	 l l	 >600 523
Pressure differential at flow 40l/min	bar	0.7
Volume tank	l	540
Volume domestic hot water coil	l	11.4
Max operating pressure tank	bar	2.5
Max operating pressure domestic hot water coil	bar	9
Varmvattenslinga (kamfläns)	m	2x18.6
Varmvattenslinga cirkulation (kamfläns)	m	0.6
Solar coil (finned)	m	10
Electrical data		230V 3N~
Power immersion heaters (option)	kW	7.05+7.05 (+7.05)
Power limitation, immersion heaters		2.35 kW/step
Display Memory Back-up batteries Clock	4.3 inches, colour, touch Maintains the memory in the event of a power failure Not needed Realtime controlled	
Belastningsvakt, inbyggd		Yes
Strömförbrukning vid olika elpatronseffekter		
2.35 kW	A	5.90
4.70 kW	A	11.80
7.05 kW	A	17.70
9.40 kW	A	23.60
11.75 kW	A	29.50
14.10 kW	A	35.39
16.45 kW	A	41.29
18.80 kW	A	47.19
21.15 kW	A	53.09

6. Measurements

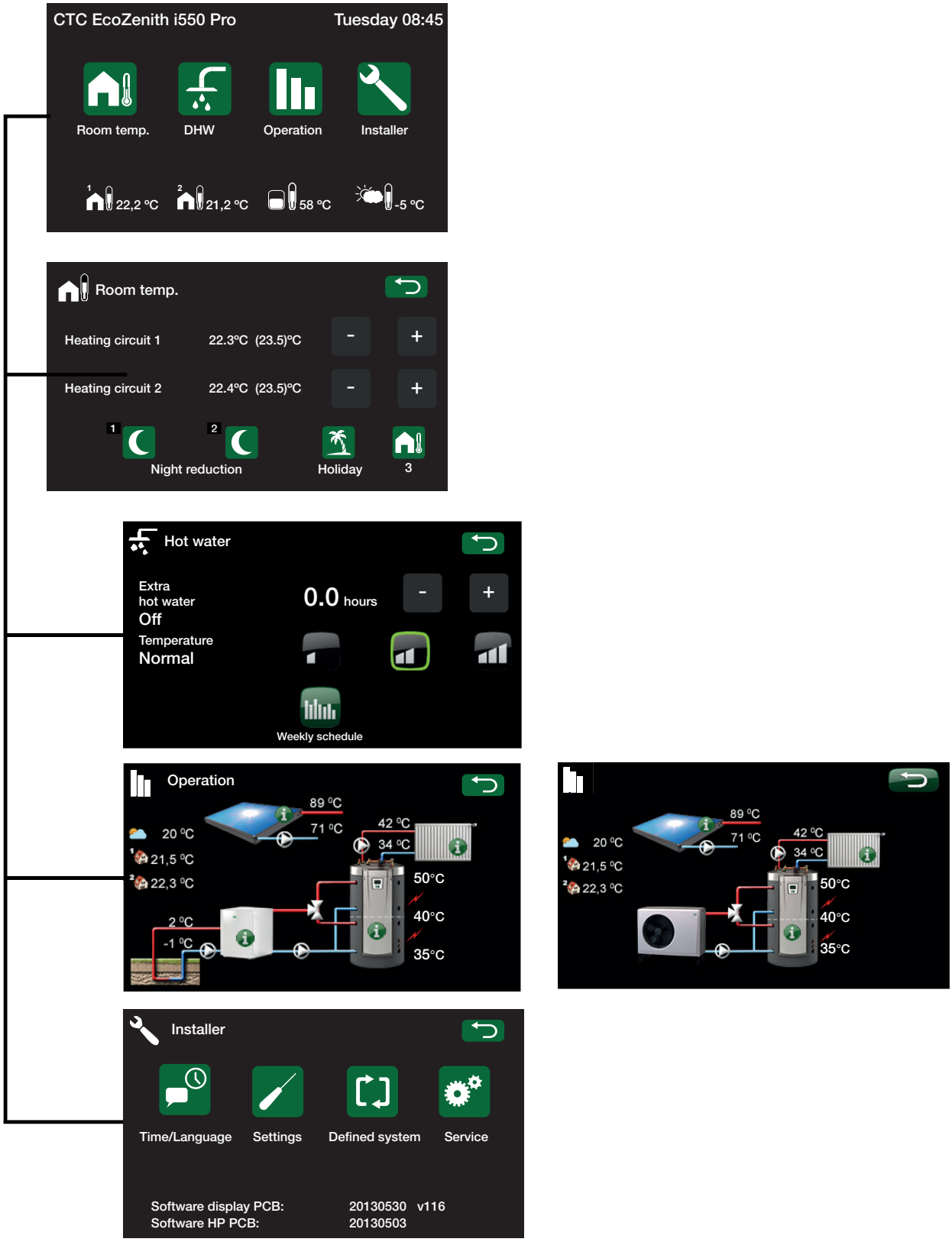






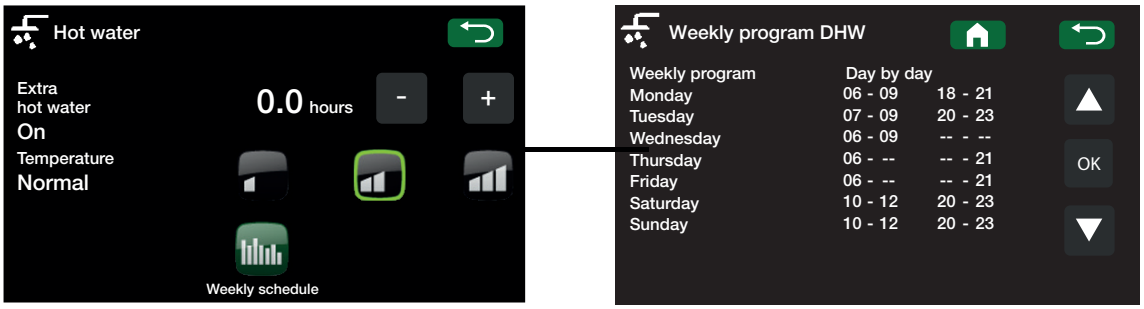
1. Connection heating, G 1 1/4" inside
2. Expansion vessel/Top con/Lifting socket, G 1 1/4" inside
3. Solar coil, Ø18mm
4. Cold water, Ø22mm
5. Domestic hot water, Ø22mm
6. Domestic hot water circulation, Ø22mm
7. Radiator primary flow, spring clip 28mm
8. Radiator return, spring clip 28mm
9. Connection elecric (behind the front)

7. Menu overview

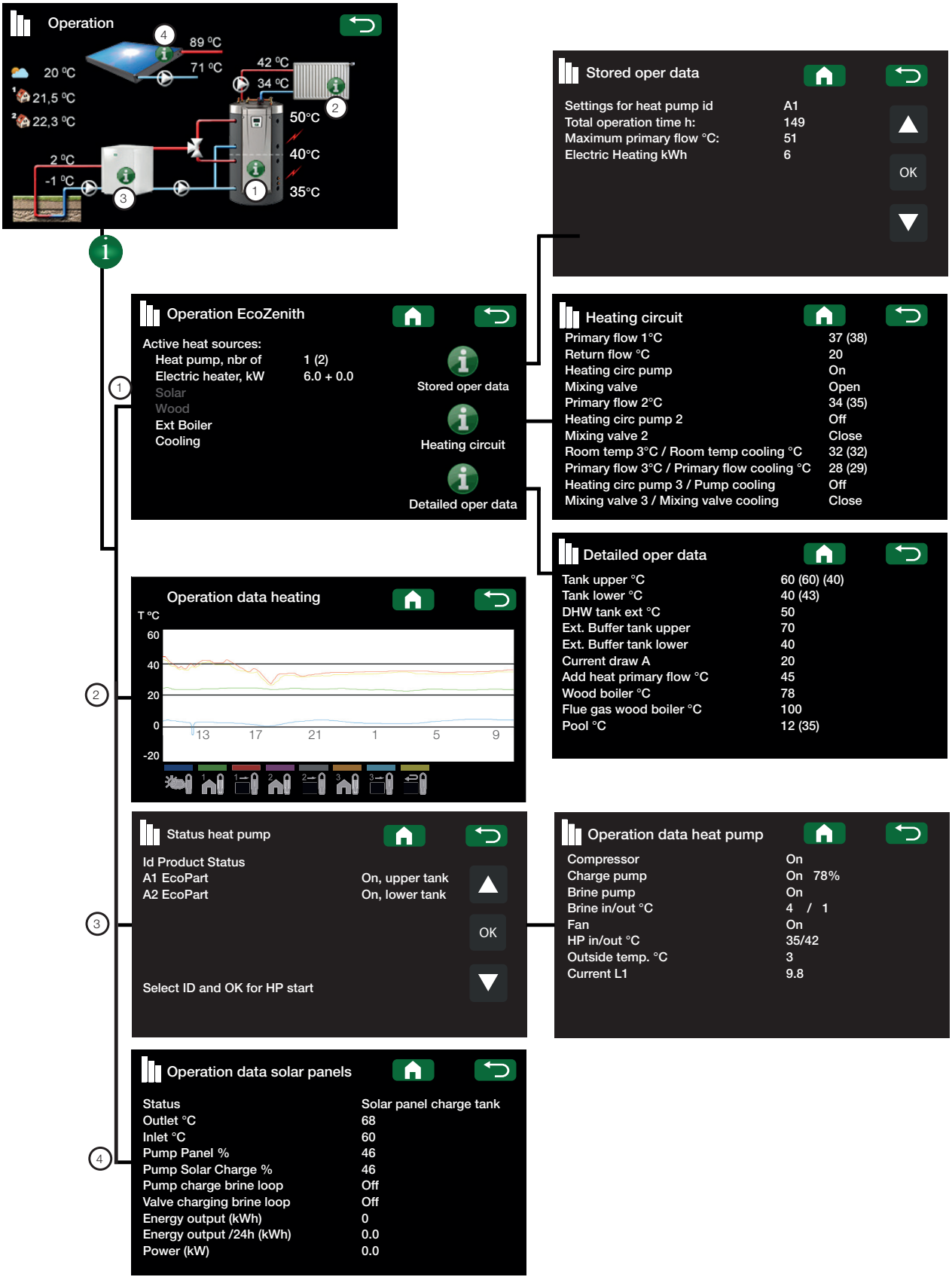


7.1 Room temp.

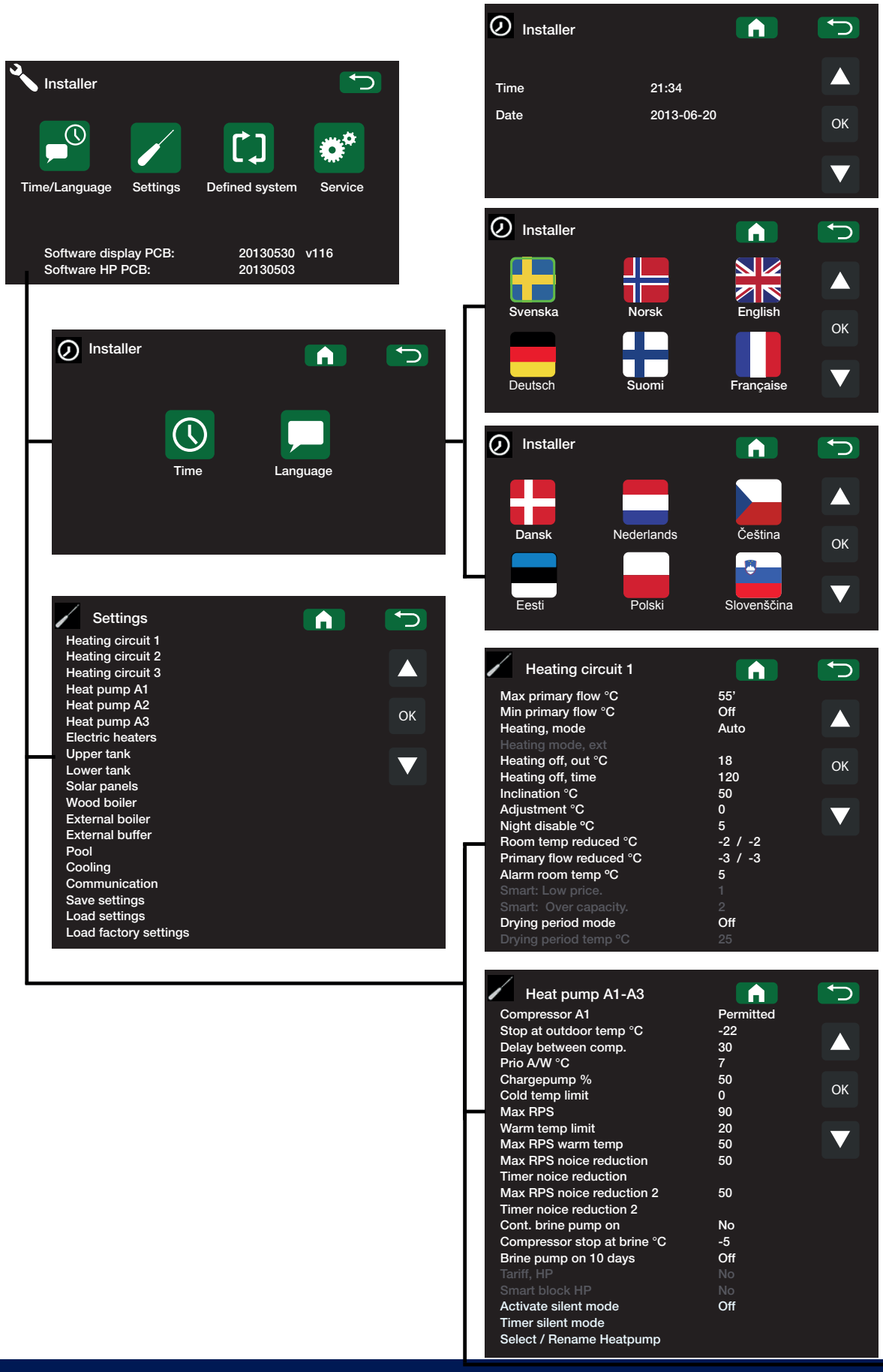
7.2 DHW



7.3 Operation

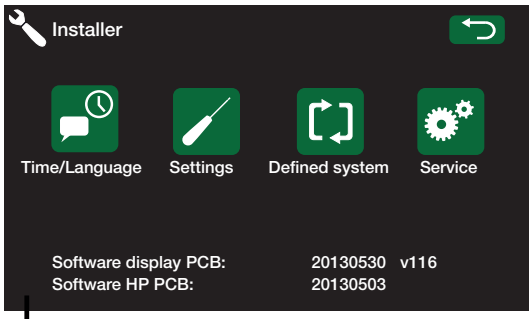


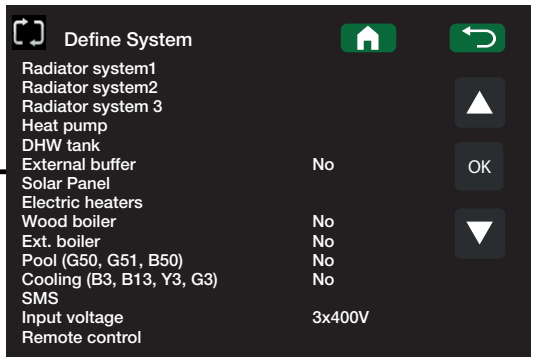
7.4 Installer (Time/Language – Settings)

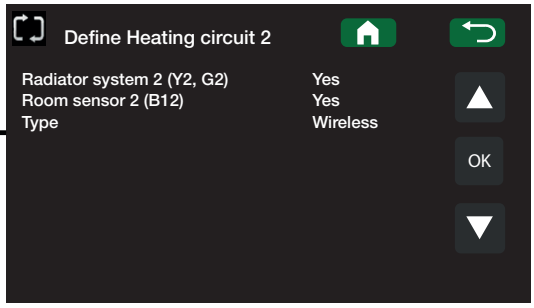


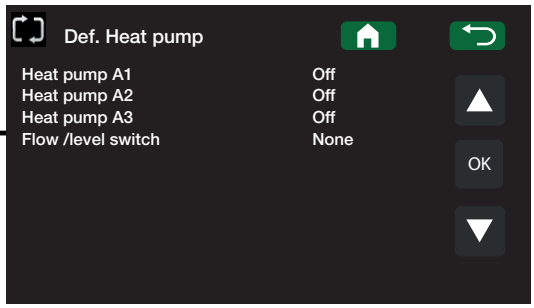

Elec. heater
Upper el.heater(s) kW 9
Lower el.heater kW 9
Lower el.heater °C 30
Delay mixing valve 180
Main fuse A 20
Conversion factor curr. sensors 1
Tariff, EL No
Smart block immersion No
Smart block mixing valve No
OK
Upper tank
Stop temp HP °C 55
Start/stop diff °C 5
Extra DHW stop temp °C 60
Max time upper tank 20
Max time lower tank 40
Min temp °C 45
Add heat upper tank °C 55
Periodic extra DHW, days 14
Max temp diff end DHW °C 3
Stop DHW diff max 3
Run time DHW circ. 4
Time DHW circ 15
Diff start ext DHW buffer 5
Timer DHW circulation
Smart: Low price. 10
Smart: Over capcity. 10
OK
Lower tank
Tank max. °C 55
Tank min. °C 25
Diff. tank vs primary °C 0
Start/stop diff tank °C 5
Timer setpoint 50
Timer lower tank
Smart: Low price. 10
Smart: Over capcity. 10
OK
Solar panels
dT max solar °C 7
dT min solar °C 3
Min speed pump % 30
Max lower tank °C 85
Max temp brine °C 18
dT max ground °C 60
dT min ground °C 30
Solar test tank min 4
Test frequency min 30
Winter mode Off
Flow l/min 6
Protection collector
OK
Wood boiler
Start at flue gas temp °C 100
Start boiler temp °C 70
Boiler temp hyst °C 10
Block HP No
Recharge delayed Off
OK
Ext Boiler
Ext boiler diff °C 5
Minimum temp ext. boiler ° C 30
Delay. Charge pump (min) 0
Delay. Stop ext. boiler (min) 0
Priority Low
Delay priority low 120
OK
External buffer
dT lower ext °C 7
dT start upper °C 7
dT stop upper °C 3
Charge start lower °C 80
dT start lower °C 7
dT stop lower °C 3
dT setpoint lower °C 7
HP charging
OK
Pool
Pool temp °C 22.0
Pool diff. °C 1.0
Pool prio. °C Low
Smart low price. °C 1
Smart over capcity. °C 2
OK
Cooling
Room temp. cooling °C 25
Condense pipe secured No
Smart low price. °C 1
Smart over capcity. °C 2
Ext. Blocking None
OK

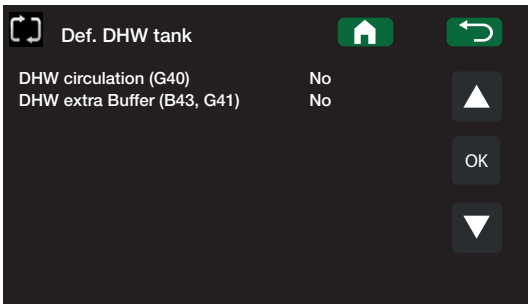
7.5 Installer – Define system

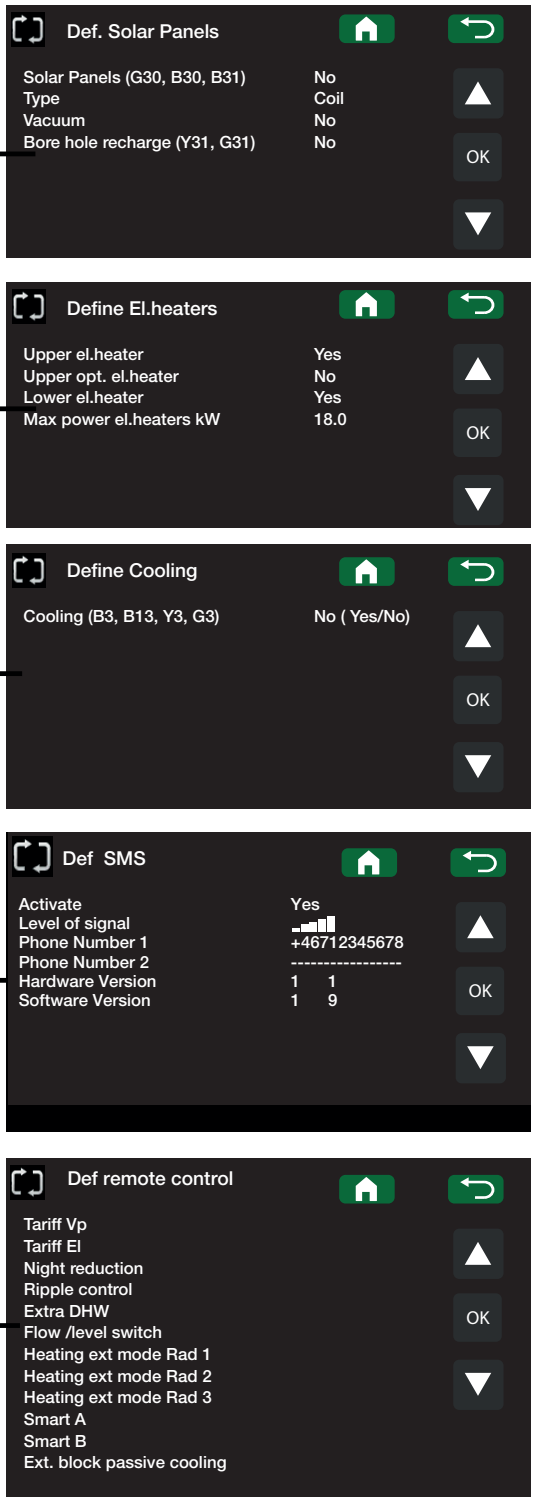




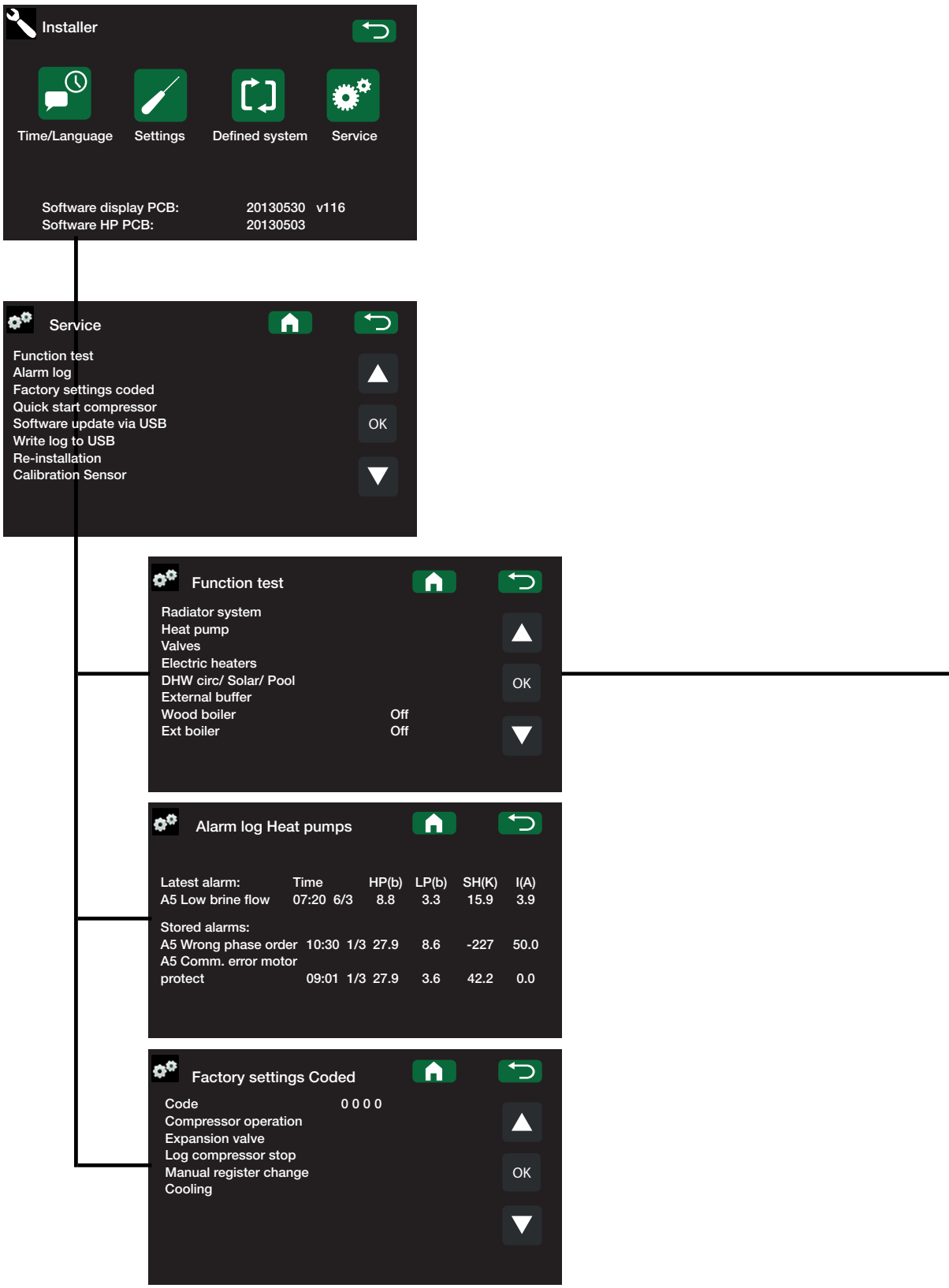







Def. Solar Panels
Solar Panels (G30, B30, B31) No
Type Coil
Vacuum No
Bore hole recharge (Y31, G31) No
OK
Define El.heaters
Upper el.heater Yes
Upper opt. el.heater No
Lower el.heater Yes
Max power el.heaters kW 18.0
OK
Define Cooling
Cooling (B3, B13, Y3, G3) No (Yes/No)
OK
Def SMS
Activate Yes
Level of signal
Phone Number 1 +46712345678
Phone Number 2 ----------
Hardware Version 1 1
Software Version 1 9
OK
Def remote control
Tariff Vp
Tariff El
Night reduction
Ripple control
Extra DHW
Flow /level switch
Heating ext mode Rad 1
Heating ext mode Rad 2
Heating ext mode Rad 3
Smart A
Smart B
Ext. block passive cooling
OK

7.6 Installer – Service



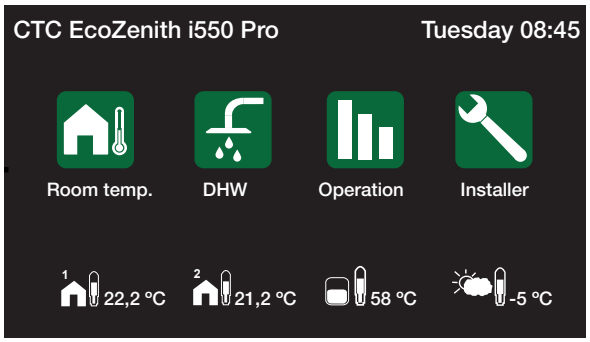

Heating circuit
Mixing valve1 Closes
Rad.pump1 Off
Mixing valve2 Off
Rad.pump2 Off
Mixing valve3 Off
Rad pump3 Off
LED room sensor Off
OK
Test el.heaters
Upper el.heater L1 Off
Upper el.heater L2 Off
Upper el.heater L3 Off
Upper opt. el.heater Off
Lower el.heater Off
OK
Heat pump to test
Heat pump to test 1
Go to menu test
OK
Test DHW circ/ Solar/ Pool
DHW circulation pump (G40) Off
DHW tank pump (G41) Off
Solar panel pump (G30) 0
Solar heat exchanger pump (G32) 0
Solar charge borehole (Y31/G31) Off
Pool pumps and valve (G50/G51) Off
OK
Test heat pump
HP Compr. Off
HP Brine p./Fan Off
HP Charge p 0
Manual defrosting Off
Compressor heater Off
Heating condenser bowl Off
Heating cabel Off
4-way valve (Y11) Off
OK
Test external buffer
Pump to tank (G43) Off
Pump from tank (G45) Off
3-way valve (Y40) Upper tank
OK
Test valves
3-way valve (Y21) Down
OK

8. Detail Description Menus

All settings can be configured directly on screen using the straightforward control unit. The large icons operate as buttons on the touch display.
Operational and temperature information is also displayed here. You can easily enter the different menus to find information on the operation or to set your own values.

8.1 Start menu

This menu is the system's start menu. This provides an overview of the current operational data. The system returns to this menu if no buttons are pressed within 10 minutes. All other menus can be accessed from this menu. The display switches to screensaver mode after approx. ten minutes. Touch the screen to wake it up.



Room temp.
Heating system settings for raising or lowering the temperature indoors and for scheduling temperature changes.

DHW
Settings for DHW production.

Operation
This shows current and historical operational data for the system.

Installer
This is where the installer configures the settings and service for your system.

Room temperature heating system 1
If room sensor 1 is defined, the room temperature in question is displayed here.

Room temperature heating system 2
If room sensor 2 is defined, the room temperature in question is displayed here.

Tank temperature
This shows the current water temperature in the upper tank.

Outdoor temperature
This displays the current outdoor temperature.

Home
The Home button takes you back to the Start menu.

Return
The Return button takes you back to the previous menu level.

OK
The OK button is used to mark and confirm text and options in the menus.

Night reduction
This schedules a temperature reduction at night if selected.

Holiday
This is used to reduce the room temperature permanently, e.g. during holidays when the house is unoccupied.

Weekly program
This is used to reduce the temperature for a few days, for instance if you commute every week.

Time/Language
This is used to set the date, time and the language you want the menu to be displayed in.

Settings
The settings for all heat pumps and operation of the system are usually configured by the installer.

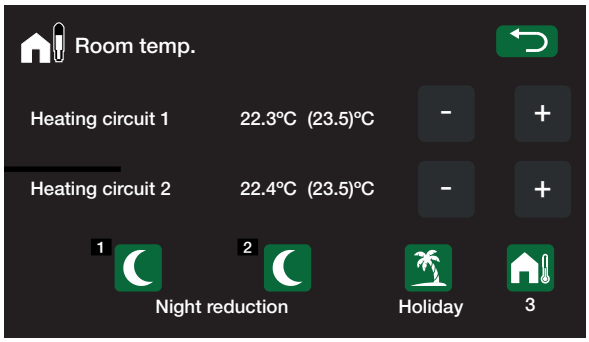
Define system
This is used to adjust/modify the system's structure.

Service
Installer settings. These are configured by the appropriate technical person.

8.2 Room temp.

This is used to set the desired room temperature. The plus and minus buttons are used to set the desired temperature, displaying the so-called “setpoint” temperature in brackets. The actual value is shown in front of the brackets.
If heating circuit 3 or cooling is installed, the symbol for room temperature is displayed with the text “3” at the bottom right of the menu.
If you want to schedule a temperature reduction, you can continue to the Night reduction or Holiday submenus.
You can select *Room sensor No* in the *Installer/Define system/Heating system* menu. This can be done for each heating system if it is difficult to find a position for the room sensor, if the floor heating system has separate room sensors, or if you use a fireplace or open stove. The alarm LED on the room sensor still functions as normal.
If you use the fire or open stove only occasionally, the firing process can affect the room sensor and reduce the temperature supplied to the radiators. It can then get cold in other parts of the house. The room sensor can temporarily be deselected during the firing process. The EcoZenith then provides heating to the radiators using the set heating curve. The radiator thermostats reduce the heating supplied to the section of the house where a fire is burning.
When holiday reduction is activated, V appears after the brackets, *e.g. 24 (25) V*

When night reduction is active, NR appears after the brackets, *e.g. 24 (25) NR*

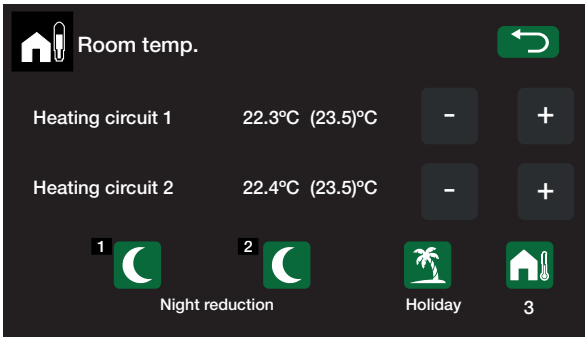


> The thermostats of the radiators must be fully open and well operating when the system is tuned.

8.2.1 Setting without a room sensor

If a room sensor has not been installed (this can be selected from the Installer/Define system/Heating circuit menu), the room temperature is adjusted by changing the house’s temperature needs to match differing outdoor temperatures.
Proceed as follows:

- Increase or decrease heating circuit 1 by a few steps
- Wait 24 hours before making the next adjustment (if the indoor temperature is still not correct).
- NOTE: The value displayed is the ratio between curve inclination and curve adjustment and has a breakpoint at an outdoor temperature of 0°C.



The above menu shows heating circuit 1 without a room sensor (top line) and heating circuit 2 with a room sensor (bottom line). On adjustment of heating circuit 1 (top line), the water temperature to the radiators is changed in relation to the outdoor temperature. The changes automatically take the heating circuit characteristics into account.

8.2.2 Outdoor Sensor/Room Sensor Faults

If a fault occurs with an outdoor sensor, an outdoor temperature of -5°C is simulated so that the house does not get cold, and the product emits an alarm.
If a fault occurs with a room sensor, the EcoZenith automatically switches to operating according to the set curve, and the product emits an alarm.

8.2.3 Night reduction temperature

This menu is used to activate and set a night reduction temperature for each defined heating system. Night reduction means that you reduce the temperature indoors during scheduled periods, for example at night or when you are at work.

The value by which the temperature is reduced – *Room temp. reduced/ Primary flow reduced* – can be set in the *Installer/Settings/Heating circuit* menu.

The options in the night reduction menu are *Off, Day by day* or *Block*. If you select *Off*, no reduction is made at all.

Day by day menu

You use this menu to schedule a reduction on the days of the week. This schedule is repeated every week.

Example 1:
Monday 06-09 18-21

On Monday the timer comes on from 06–09 and 18–21; normal operation applies apart from these times.

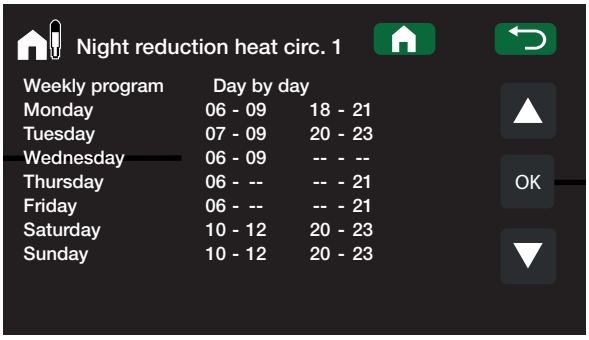
Example 2:

Thursday 06 - -- -- - 21
The timer comes on from 06–21 on Thursdays.

The time on the left must be lower than the time on the right for the interval to be valid.

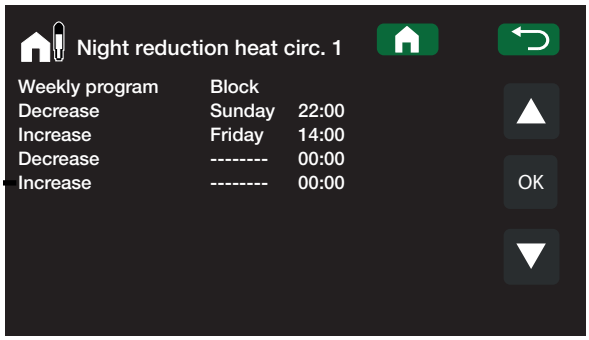
Block

This menu allows you to set a reduction for a few days during the week, for example, if you are working elsewhere on weekdays and at home at weekends.



The time on the left must be lower than the time on the right for the interval to be valid.

Reducing a heat pump's temperature at night is a comfort setting which generally does not reduce energy consumption.



On Sunday at 10 pm, the temperature is lowered by the set value in the *Room temp. reduced* menu (in the *Installer/Settings* menu). On Friday at 2 pm the temperature is increased to the set value again.

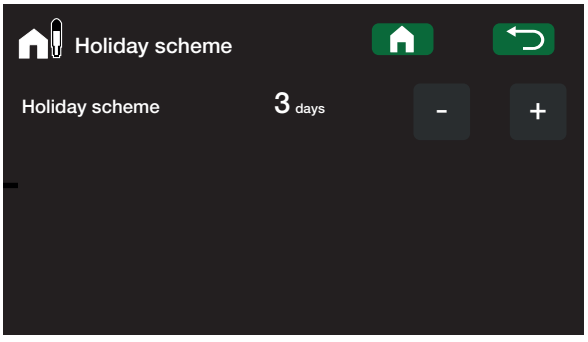
8.2.4 Holiday

You use this option to set the number of days that you want the set temperature to be constantly reduced. For example, if you want to go on holiday.

The value by which the temperature is reduced – *Room temp. reduced/ Primary flow reduced* – can be set in the *Installer/Settings/Heating circuit* menu.

You can apply this setting for up to 300 days.

The period starts from the time for which the setting has been made.



When holiday is enabled, hot water production is stopped. Temporary extra hot water and the weekly program for extra hot water are stopped. The heat pump only operates in the lower tank.

When both the Night reduction and Holiday settings are used, the Holiday function overrides the Night reduction setting.

8.3 DHW

You use this to set the DHW comfort level you want and extra DHW.

Temperature

You set the values for this option which apply to the heat pump's normal operation. There are three modes:

Economic – Small hot water requirement. (Factory-set DHW tank temperature: 50°C)

Normal – Normal hot water requirement. (Factory-set DHW tank temperature: 55°C)

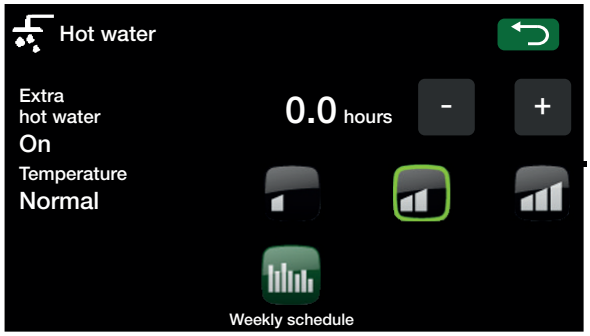
Comfort - Large DHW requirement. (Factory-set DHW tank temperature: 60°C)

The temperature can also be changed in the menu Installer/Settings/Upper tank/Stop temp HP. If this is done, the green frame around the icon for this menu disappears.

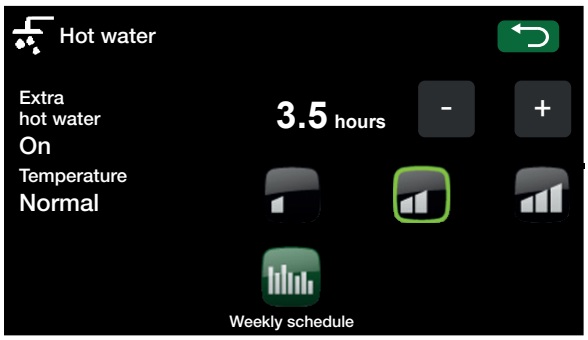
Extra hot water

Select this option if you want to activate the *Extra DHW* function. When the function is activated (by setting the number of hours) the heat pump immediately starts to produce extra DHW. You also have the option to schedule hot water production for certain times using the *Weekly program* function (recommended).

The temperature is also determined by how the setting has been performed in the Installer/Settings/Upper tank/Extra DHW stop temp °C menu.



> Tip: Start by setting the *Economic* mode and if you find that you are not getting enough hot water, increase it to *Normal*, and so on.



The example above shows that *Extra DHW* is *On* for 3.5 hours.

8.3.1 Weekly program DHW

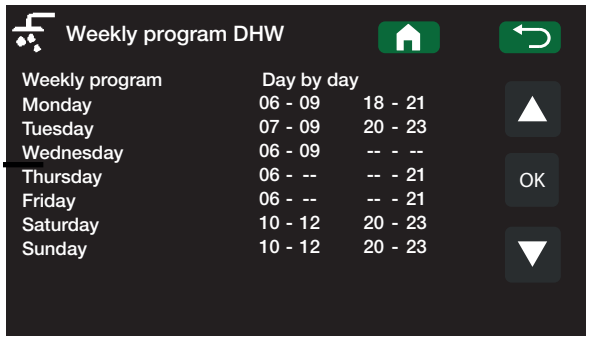
You can use this menu to schedule periods during weekdays when you want extra hot water. This schedule is repeated every week. If you want an additional period some day, e.g. in the evening, you can program recurring times.
Options for the weekly program are *Off* or *Day by day*.

Off

No scheduled hot water production.

Day by day

A weekly schedule which you program yourself. This is used if you always know when you repeatedly need extra hot water, for instance in the morning and evening.

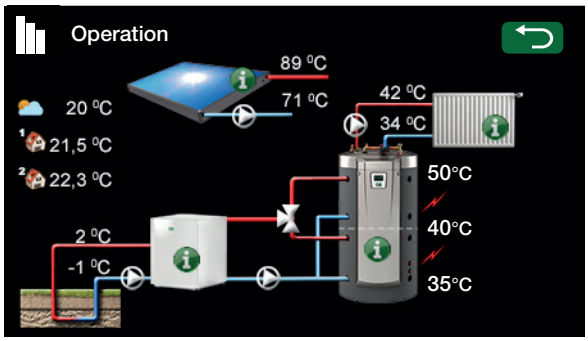


The time on the left must be lower than the time on the right for the interval to be valid.

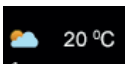
> Tip: Set the time about one hour earlier than when you need the hot water as it may take some time to heat.

8.4 Operation

This menu displays current temperatures and the operational data for your heating system.

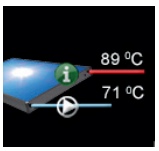


Information
Press the information button to display the operational data for the relevant item.

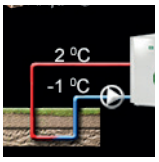


Outside Temperature
Shows the outdoor temperature.

Indoor temperature.
Shows the room temperature for room sensors 1 and 2, if these have been defined.



Temperature of solar panels
The current temperatures for the solar panel's primary (89°C) and return (71°C) flow are shown next to this symbol.



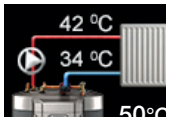
Brine temperature
This symbol is shown if one or more CTC EcoPart heat pumps are connected to the system. The current temperature (2°C) of the coolant from the collector in the heat pump and return temperature (-1°C) of the coolant back in the collector hose are shown next to this symbol.

EcoZenith
The current temperature (50°C) in the upper tank, and the current temperature (40°C) in the lower tank, respectively, as well as (35°C) in the solar coil are shown next to this symbol.

Electric heater operation
This symbol shows whether the electric heater operation in the upper and lower tank, respectively is active.

Heat pump, EcoAir
This symbol is shown if one or more CTC EcoAir heat pumps are connected to the system.

Heat pump, EcoPart
This symbol is shown if one or more CTC EcoPart heat pumps are connected to the system.



Primary flow radiators
The current primary flow temperature (42°C) supplied to the house's radiators is shown to the left of the symbol.

Return radiators
The current return flow temperatures (34°C) of the radiator water is shown under the primary flow temperature.

8.4.1 Operation EcoZenith

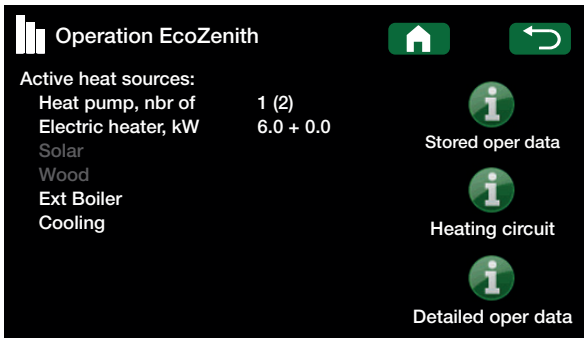
This is where the operating status and current temperatures in your heating system are displayed.

Units which are currently emitting heat.

Displays the various heat sources which are connected to the EcoZenith.

- White text: the unit is currently emitting/producing heat.
- Greyed out text: the unit is **not** currently emitting/producing heat.

- **Heat pump, nbr of** **(0...3)**
  Displays the number of heat pumps in operation.
- **Electric heater, kW**
  Displays the current electric heater power.
- **Solar**
  Indicates whether solar panels are supplying heat.
- **Wood**
  Indicates whether a wood boiler is supplying heat.
- **Add heat**
  Indicates whether an external boiler is supplying heat.
- **Cooling**
  Indicates whether cooling is in fact cooling the system.



The first figure indicates the current operational value, and the value in brackets indicates the setpoint which the heat pump is trying to achieve.

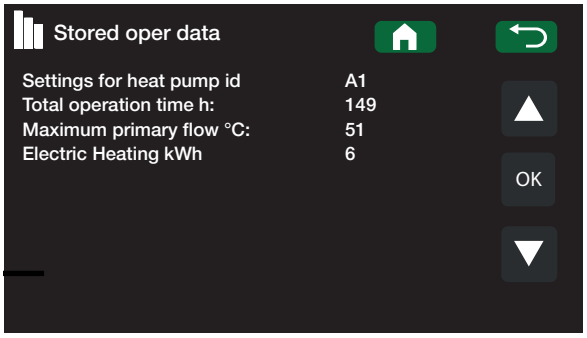
8.4.1.1 Stored operation data

This menu shows the historical operating values for the system.

Total operation time h: **14196**
Shows the total time the product has been powered.

Maximum primary flow °C: **51**
Shows the highest temperature supplied to the radiators. The value may indicate the temperature requirements of the heating system/house. The lower the value during the winter period, the more suitable it is for the heat pump's operation.

Electric Heating kWh
Shows the total energy consumed by the product's electric heaters This is an indirect energy measurement, based on the operating periods of the immersion heaters.



8.4.1.2 Operation data Heating circuits 1-3

This menu displays current temperatures and the operation data for the selected circuits.
The first figure indicates the current temperature, and the value in brackets indicates the setpoint which the heat pump is trying to achieve.

Primary flow 1°C 37 (38)
This shows the temperature supplied to heating circuit 1 (sensor B1) and the temperature that the circuit is trying to achieve. This value will vary during the year according to the parameters set and the current outdoor temperature.
When holiday reduction is activated, V appears after the brackets, *e.g. 24 (25) V*

When night reduction is active, NR appears after the brackets, *e.g. 24 (25) NR*

Return flow °C 20
This shows the temperature (sensor B7) of the water that comes back from the heating circuit(s).

Heating circ pump 1 (On/Off)
Shows the operating status of the radiator pump (G1).

Mixing valve (Open/Close)
Indicates whether the mixing valve (Y1) increases (opens) or reduces (closes). Once the correct temperature has been reached, the mixing valve's motor then shuts down.

Primary flow 2 °C 37 (38)
This shows the temperature supplied to heating circuit 2 (sensor B2) and the temperature that the circuit is trying to achieve.

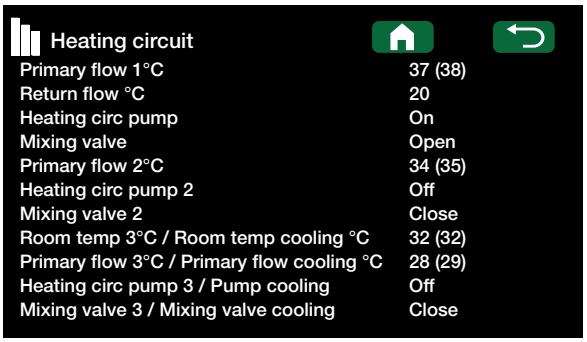
Heating circ pump 2 (On/Off)
Shows the operating status of the radiator pump (G2).

Mixing valve 2 (Open/Close)
This indicates whether the mixing valve (Y2) increases (opens) or reduces (closes) the heat supplied to heating circuit 2. Once the correct temperature has been reached, the mixing valve's motor then shuts down.

Room temp 3°C / Room temp cooling °C21.9 (23.0)
Depending on whether radiator circuit 3 or cooling is activated, this indicates the room temperature for heating circuit 3/ cooling (Room sensor B13). It does not indicate whether combined heating/cooling has been selected.

Primary flow 3°C / Primary flow cooling 32 (32)
This shows the temperature (sensor B3) supplied to heating circuit 3, or the temperature supplied to the fan convector if cooling has been activated. The value in brackets is the temperature the circuit is trying to achieve. It does not indicate whether combined heating/cooling has been selected.

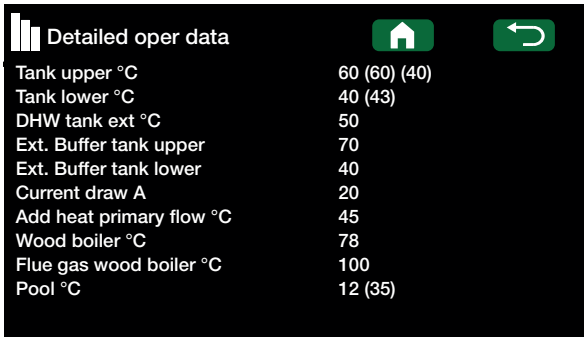
Heating circ pump 3 / Pump cooling (On/Off)
Shows the pump's (G3) operating conditions.



Heating circuit 1 is always the hottest, and other circuits are mixed down to lower temperatures.

Mixing valve 3 / Mixing valve cooling(Open/Close)
Indicates whether the mixing valve (Y3) increases (opens) or reduces (closes). Once the correct temperature has been reached, the mixing valve's motor then shuts down.

8.4.1.3 Detailed oper data



Tank upper °C **60 (60)(40)**
The first value indicates the current temperature in the tank. The first set of brackets indicates the temperature the heat pump is trying to achieve. For an air/water heat pump the value may vary with the outdoor temperature. The second set of brackets indicates the temperature the electric heaters are trying to achieve.

Tank lower °C **40 (43)**
Indicates the current temperature in the lower tank, plus the temperature the system is trying to achieve.

External DHW tank °C **50 (60) (40)**
Indicates the current temperature in the external DHW tank, plus the temperature the system is trying to achieve.

When Legionella Prevention Increase is active, L is shown, *e.g. 59 (60) (40) L*

Ext. buffer tank upper ºC **70**
Indicates the current temperature in the upper part of the buffer tank.

Ext. buffer tank lower ºC **40**
Indicates the current temperature in the lower part of the buffer tank.

Current draw A **20**
Indicates the value of current in amps for the phase with the greatest load (the house phase).

Ext. boiler °C **45**
Indicates the current temperature in the external boiler.

Wood boiler °C **78**
Indicates the current temperature supplied by the wood boiler.

Flue gas wood boiler °C **100**
Displays current flue gas temperature in the connected wood boiler.

Pool °C **24 (28)**
Indicates the current temperature in the pool, plus the temperature the system is trying to achieve.

8.4.2 Operation data heating system

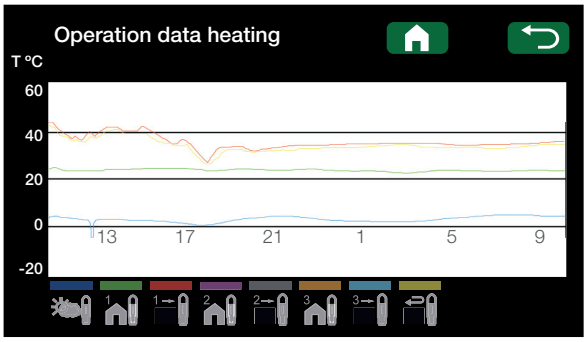
This shows operation data for heating circuits 1–3 for the last 24 hours. The furthest point to the right is the present, while the data for the last 24 hours is displayed to the left. The time "rolls" forward.

The blue curve is the current outdoor temperature.

The green/red/orange curves are room temperatures 1–3.

The red/grey/blue curves are primary flow temperatures 1–3.

The yellow curve is the radiator circuit's/circuits' return temperature.



8.4.2.1 Heat pump status

EcoPart = CTC EcoPart 400

EcoPartM = CTC EcoPart 600M

EcoAir = CTC EcoAir 400

EcoAirM= CTC EcoAir 600M

EcoAirM= CTC EcoAir 500M

This menu shows the current status of defined heat pumps. Heat pumps A1-A3 (EcoAir, EcoAirM or EcoPart) can have the following statuses:

Blocked in menu
The heat pump's compressor is not permitted in the *Installer/Settings/Heat pump* menu.

Communication error HP
The EcoZenith cannot communicate with the heat pump.

On, upper tank
The heat pump is heating the upper tank.

Off, start delay
The heat pump's compressor is not running and is prevented from starting due to the start delay.

Off, ready to start
The heat pump's compressor is not running and is ready to start.

Flow on
The heat pump and fan are started before the compressor. Shown for EcoAir heat pumps.

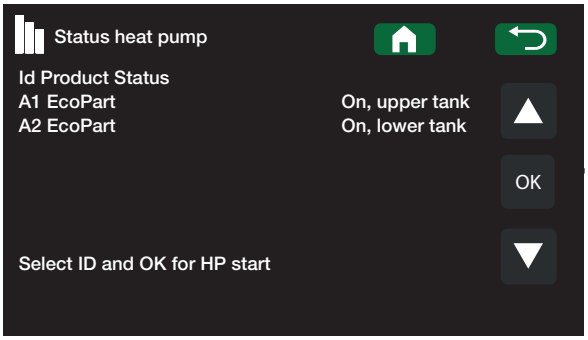
On, lower tank
The heat pump is supplying heat.

Defrosting
The heat pump defrosts. Shown for EcoAir heat pumps.

Blocked
The heat pump has stopped due to a temperature or pressure that has reached its maximum value.

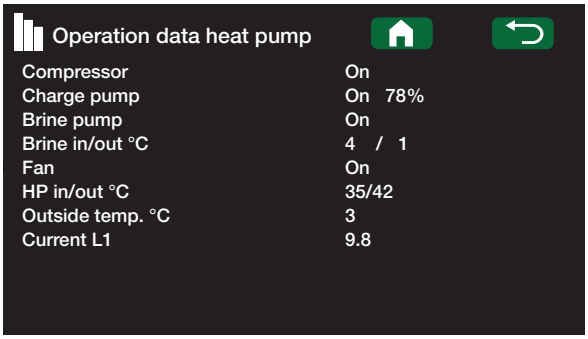
Off, alarm
The heat pump is off and is emitting an alarm signal.

Function test
The compressor is function tested.



The illustration above shows an example of the status for two defined heat pumps.

8.4.2.2 Operation data heat pump



This menu is intended for servicing and advanced troubleshooting, and displays information about the heat pump that has been selected from the previous menu (“Heat pump status”).

Compressor **On (On/Off)**
Shows whether the compressor is operating or not.

Charge pump **On/78% (On/Off/0 to 100)**
Shows the charge pump’s operational status and flow as a percentage.

Brine pump **On (On/Off)**
Indicates whether the brine pump is on or off. Shown for EcoPart heat pumps.

Brine in/out °C **4/1 (-99...99)**
This shows the brine pump’s incoming and outgoing temperatures. Shown for EcoPart heat pumps.

EP			
EP(M)	Heatpump		
	1	2	3

Fan **On (On/Off)**
Shows the pump’s operational status. Shown for EcoAir heat pumps.

EA	Heatpump		
EA(M)	1	2	3

HP in/out °C **35/42 (0 to 99/0 to 99)**
Shows the heat pump’s return and primary flow temperatures.

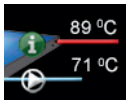
Outside temp °C **3 (-50 to 50)**
Shows the outside temperature (sensor B15). Shown for EcoAir heat pumps.

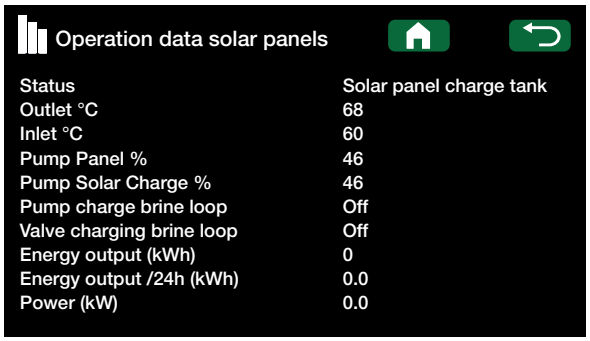
EA	Heatpump		
EA(M)	1	2	3

Current L1 **9.8 (0.0 to 50.0)**
Show the current for phase L1 to the compressor. Phases 2 and 3 are not measured in the product.

EP			
	Heatpump		
EA	1	2	3

8.4.3 Operation data solar panels





This menu shows information about solar panels (if defined in the *Installer/Define system/Solar panels* menu).

Status **Solar panels charge tank**
Shows status for solar panels:

- **Off**
  Solar panels are in operating mode Off.
- **Solar panel charge tank**
  The solar panels are charging the Ecozenith's tank
- **Solar panel update. Vacuum**
  The solar panels are charging the hot water system.
- **Solar panel charge ground source**
  The solar panels are charging the ground source.

From solar panels °C **68 (-99...99)**
This shows the temperature of the flow supplied from the solar panels (sensor B31).

To solar panels °C **60 (-99...99)**
This shows the temperature of the flow supplied to the solar panels (sensors B30).

Pump Panel % **46 (0...100)**
This shows the current charge as a percentage of maximum capacity for the pump (G30).

Pump Solar Charge % **46 (0...100)**
This shows the current charge as a percentage of maximum capacity for the pump (G32). Only displayed if the solar panel is connected via a heat exchanger to the EcoZenith.

Pump charge brine loop **(On /Off)**
This shows the operating mode for the pump (G31) for recharging the bedrock.

Valve charging Brine loop **(On /Off)**
This shows the mode for the valve (Y31) for recharging the bedrock.

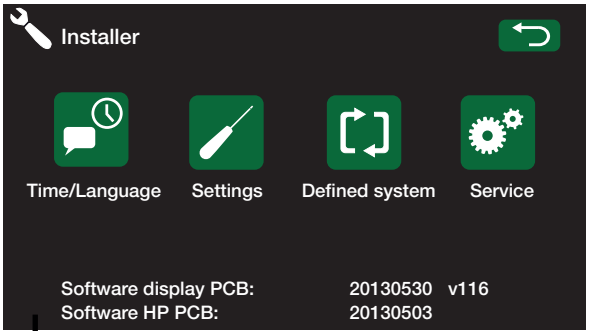
Energy output (kWh) **0**
Displays total energy output.

Energy output/24 hours (kWh) **0.0**
Displays energy output for the last 24 hours.

Power (kW) **0.0**
Displays the current power.

8.5 Installer

This menu includes four submenus: Time/Language, Settings, Defined system, and Service.

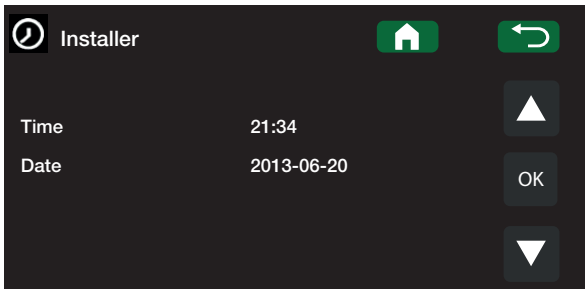


8.5.1 Time/Language

This is used to set the time, date and language. The clock saves the settings in the event of a power cut. Summer/winter time is changed automatically.

Time and date settings

Click on the time symbol.
Press “OK” to highlight the first value and use the arrows to set the correct value.

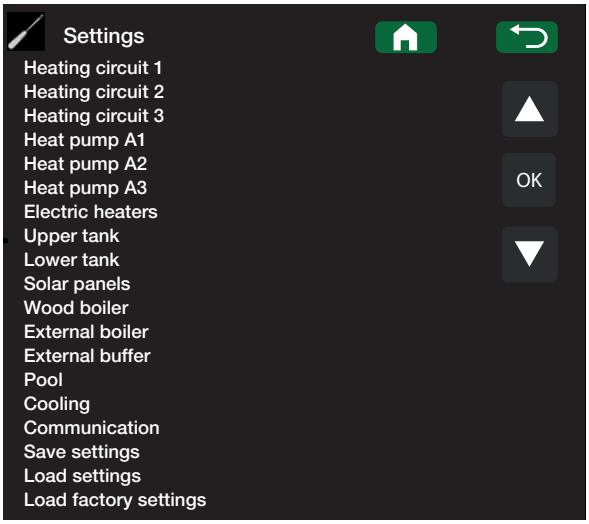


Setting the language

Click on the language symbol.
Select the language you want by clicking on the screen.
The language selected is highlighted by a green ring.

8.5.2 Settings

This is used to set the parameters for your home's heating requirements. It is important that this basic setting is right for your home. Values which are set incorrectly may mean that your property is not warm enough or that an unnecessarily large amount of energy is being used to heat your property.



8.5.2.1 Heating circuits 1-3

Max. primary flow °C **55 (30 to 80)**
Maximum permitted temperature supplied to the respective heating system.

Min. primary flow °C **Off (Off/15 to 65)**
Minimum permitted temperature supplied to the respective heating system.

Heating mode **Auto/On/Off**
Switching of heating season or summer season can take place automatically (auto) or a selection can be made here to set the heating to be on or off.

Auto = the switch between heating season (On) and (Off) (also known as summer mode) takes place automatically.

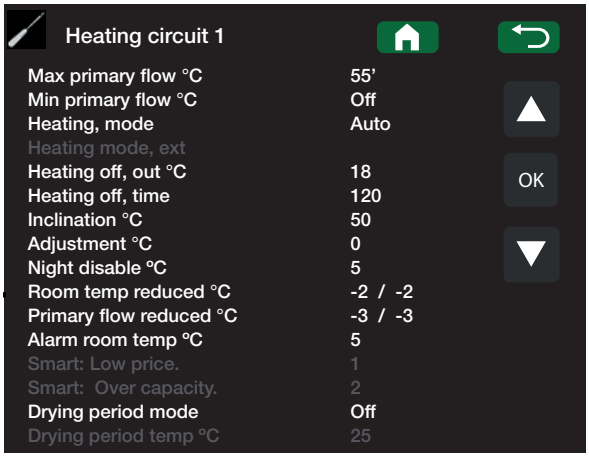
On = Continuous heating season, the radiator pump circulates constantly.

Off = There is no heating, the radiator pump does not run (is turned over).

Heating mode, ext
Switching between heating and summer mode can be controlled remotely. Enter here what will happen during external control Remote control.

Find out more in section entitled Define/Remote control/ Smart Grid

Heating off, outside °C **18 (2 to 30)**
Outside temperature limit (B15) at which the house no longer requires heating. The radiator pump stops, and the mixing valve remains closed. The radiator pump is activated daily for a short period to prevent it from jamming. The system restarts automatically when heating is required.



Heating off, time **120 (30 to 240)**
When the outside temperature (sensor B15) falls to the limit at which heating is required again, “Heating off, out °C” must remain this low or lower for this many minutes before heating the house is permitted again.

Inclination **50 (25 to 85)**
Inclination means the temperature your property needs at different outdoor temperatures. See more detailed information in the “The House Heating Curve” chapter. The value set is the outgoing flow temperature to radiators when the outdoor temperature is -15 °C.

Curve adjustment **0 (-20 to 20)**
The adjustment means that the temperature level can be raised or lowered at a specific outdoor temperature.

Night reduction of ºC **5 (-40...40)**
When the outdoor temperature is lower than this, the night reduction stops as too much energy is consumed and it takes a long time to increase the temperature.This menu overrides remote control.

Room temp. reduced °C **-2 / -2 (0...-30)**
The menu is displayed if room sensors for the respective heating system are installed. You define here how many degrees the room temperature will be reduced by during the various scheduled reduction periods. The first digit shows Night reduction, the second digit shows Holiday reduction.

Primary flow reduced °C **-3 / -3 (0...-30)**
The menu is displayed if room sensors for the respective heating system are not installed. This is used to set the number of degrees by which the primary flow temperature for the respective heating system will be reduced during the various scheduled reduction periods. The first digit shows Night reduction, the second digit shows Holiday reduction.

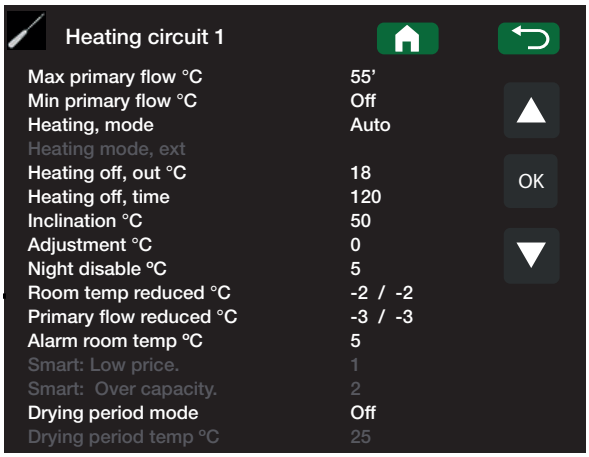
Alarm room temp ºC **5**
When the room temperature is too low alarm message is sent to the CTC SMS

Smart low price ºC **1**
Setting to increase curve adjustment at energy price low price, via Smart Grid.

Find out more in section entitled Define/Remote control/ Smart Grid

Smart high capacity ºC **2**
Setting to increase curve adjustment at energy price high capacity, via Smart Grid.

Find out more in section entitled Define/Remote control/ Smart Grid



Tip: Find out more about these settings in the “The House Heating Curve” chapter.

For example:
“Inclination 50” means that the temperature of the water supplied to the radiators will be 50°C when the outdoor temperature is -15°C, if the adjustment is set to 0. If the adjustment is set to +5, the temperature will be 55°C instead. The curve is increased by 5°C at all outdoor temperatures, i.e. the curve is parallel offset by 5°C.

Example:
As a general rule, a Primary flow reduced value of 3 to 4 °C is equivalent to a reduction of approximately 1°C in room temperature in a normal system.

Floor function mode **Off (Off/1/2/3)**

Floor drying function for newly-built properties.
The function limits the calculation of primary flow temperature (setpoint) for "The House Heating Curve" to the schedule below.

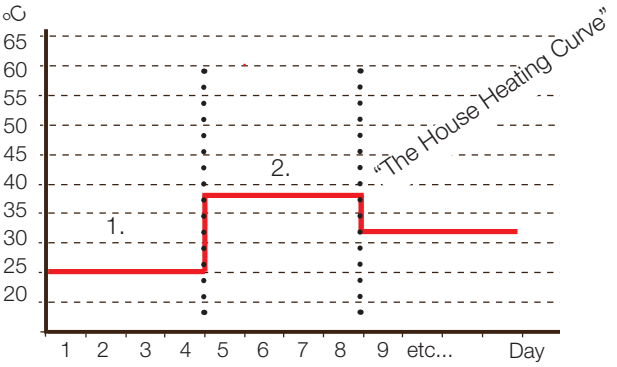
Mode 1

Floor drying function for 8 days.

1. The (setpoint) of the radiator system is set to 25ºC for 4 days.

2. On Days 5–8, the value set in "Floor function temp. ºC" is used.

(From Day 9 onwards the value is calculated automatically according to "The House Heating Curve")



Example for Mode 1 with "Floor function temp. 38ºC".

Mode 2

Floor drying function for 10 days + stepped increase and decrease.

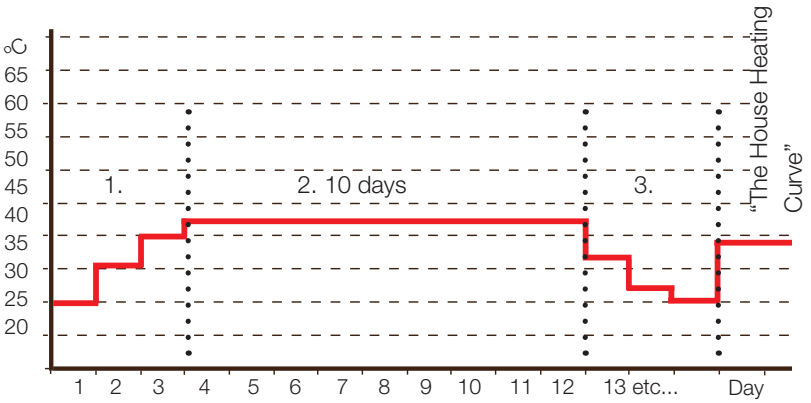
1. Stepped increase start: The (setpoint) of the radiator system is set to 25ºC. The (setpoint) is then raised by 5ºC each day until its (setpoint) is equal to the "Floor function temp. ºC".

The final step may be less than 5ºC.

3. Stepped decrease: After the stepped increase and 10 days at an even temperature, the temperature (setpoint) is reduced to 25ºC in daily 5ºC stages.

The final step may be less than 5ºC.

(Following the stepped decrease and one day at the (setpoint) of 25ºC the value is calculated automatically according to "The House Heating Curve".)



Example for Mode 2 with "Floor function temp. 37ºC".

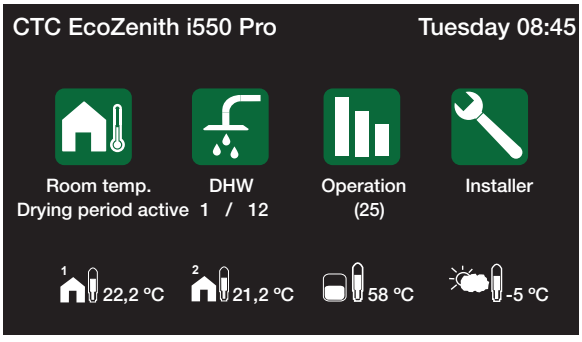
Mode 3

In this mode, the function starts in

Mode 1 and this is then followed by Mode 2 and finally by "The House Heating Curve".

Floor function temp. ºC **25 (25...55)**

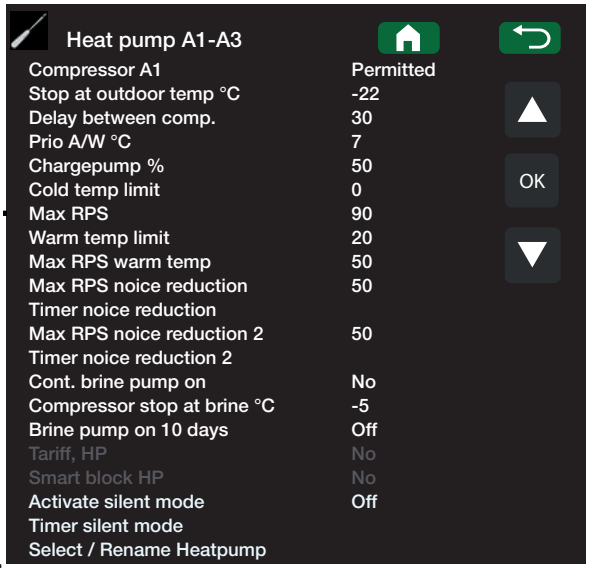
Here you set the temperature for Mode 1/2/3 as shown above.



Example for operation data Mode 2, Day 1 of 12 with current (setpoint) 25ºC.

8.5.2.2 Heat pump A1-A3

In the “Heat pump” menu you make settings for the heat pumps which have been defined.



Compressor **Blocked (Blocked /Permitted)**

The heat pump is supplied with a blocked compressor. Permitted means that the compressor is allowed to operate.

Stop at outdoor temp °C **-22 (-22 to 10)**

This menu is displayed only if the heat pump is an EcoAir model, and includes settings for the outdoor temperature at which the compressor is no longer permitted to operate. The heat pump starts 2°C above the set value.

EA	Heatpump		
EA(M)	1	2	3

Delay between HP **30 (5 to 180)**

This is used to set the delay time before the second heat pump in the system is allowed to start, when the first heat pump is already operating. This value is also valid for the amount of time that will pass before the third heat pump is allowed to start, when the first and second heat pumps are operating, and so on.
NB: Only indicated for heat pump A1.

Prio EcoAir/EcoPart °C **7 (-20...15)**

This temperature setting controls the prioritisation between the EcoAir air/water heat pump and the EcoPart liquid/water heat pump, if both of these are connected to the EcoZenith. The factory value is 7°C; this means that the EcoAir is prioritised for outside temperatures from 7°C and warmer.
NB: Only indicated for heat pump A1.

EP			
EP(M)			
EA	Heatpump		
EA(M)	1		

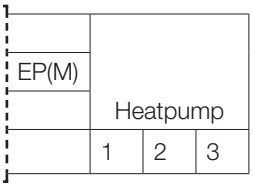
Charge pump % **50 (20...100)**

The charge pump’s speed can be adjusted. The temperature through the heat pump can be read in “Operation data/ operation data compressor”.

EP(M)			
	Heatpump		
EA(M)	1	2	3

Max rps **90***

Setting the maximum speed of the compressor.



Cold temp limit (T2ºC) **0**

Temperature limit for winter power. When the outdoor temperature is this or lower, the compressor speed is adjusted up to speed R2.

Max. rps (R2 rps) **90***

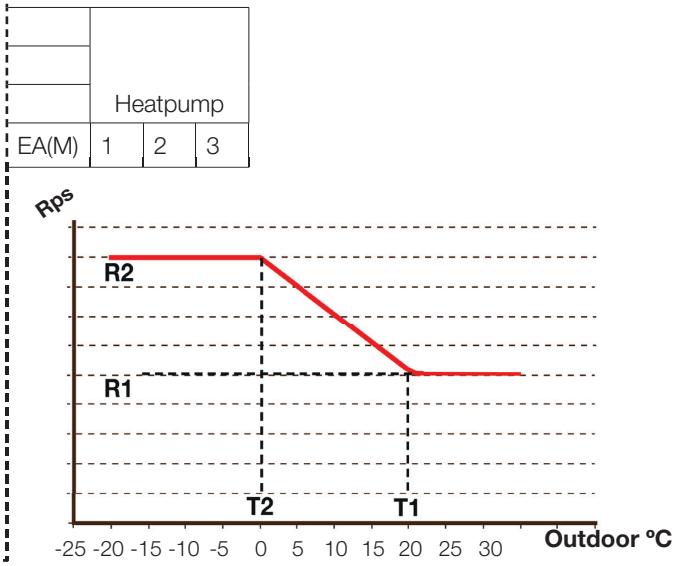
Compressor power in cold weather. Sets the maximum speed of the compressor at outdoor temperature T2

Warm temp limit (T1ºC) **20**

Temperature limit for summer power. When the outdoor temperature is this or higher, the compressor speed is adjusted up to speed R1. The heat pump starts and stops at the actual value and setpoint value.

Max rps warm temp (R1 rps) **50**

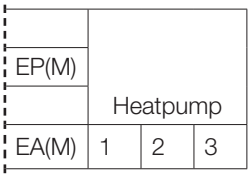
Maximum compressor power in warm weather. Sets the maximum speed of the compressor at outdoor temperature T1.



Max rps noice reduction **50 (50 to 100*)**

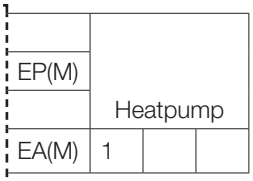
Max. rps on noise limitation. The compressor's maximum speed when noise limitation is active.

NB: You should note that the maximum output of the heat pump will fall and the need to add heat may increase.



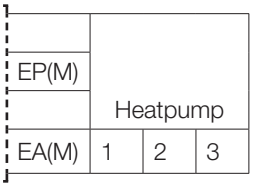
Timer noice reduction

In the Timer noice reduction menu, schedules can be set during which the compressor speed is limited in order to lower the noise level. E.g. at night. To start a schedule for a specific heat pump, a value must be entered in the menu *Max rps noice reduction* above.



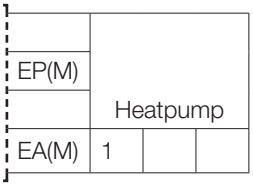
Max rps noice reduction 2 **50 (50 to 100*)**

Here you can set an additional noise reduction scheme for max rps.



Timer noice reduction 2

Here you can set an additional scheduled noice reduction scheme. If two noice reduction schemes are active at the same time, the schedule with the lowest set rps value applies.



*The value may vary depending on the heat pump model.

Cont. brine pump on **No (No/Yes)**
Setting for whether the brine pump is permitted to run all the time or permitted to start and stop.Applies to EcoPart heat pumps only.

Compressor stop at brine °C **-5 (-7 to 10)**
This menu defines the brine temperature at which the compressor will be stopped.
Applies to EcoPart heat pumps only.

Brine pump on 10 days **Off (Off/On)**
After installation is complete, you can choose to run the brine pump constantly for 10 days to remove air from the system.
Applies to EcoPart heat pumps only.

EP			
EP(M)			
	Heatpump		
	1	2	3

Tariff HP **No (No/Yes)**
Find out more in section entitled “Define/Remote control”.

Smart block HP **No (No/Yes)**
This is used when a dual tariff is used with lower energy costs at set hours of the day. Find out more in section entitled Define/Remote control/Smart Grid.

Activate silent mode **Off (Off/On)**
Applies to CTC EcoAir 600M heat pumps only.

Silent mode means that the compressor’s maximum speed is limited to 50 rps and the fan speed to 35 %.

NB: You should note that the maximum output of the heat pump will fall and the need to add heat may increase.

	Heat pump		
EA(M)	1	2	3

Timer silent mode
Applies to CTC EcoAir 600M heat pumps only.

In the *timer silent mode* menu, schedules can be set during which the compressor speed and fan speed are limited in order to lower the noise level. E.g. at night.

Activate silent mode must be set to *On* in the menu above in order to start a schedule for the specific heat pump.

	Heat pump		
EA(M)	1		

Select/Rename Heat pump **(A1/A2/A3)**
When CTC EcoZenith i550 is to control more than one heat pump, the names of heat pumps 2 and 3 must be changed. On delivery, the heat pumps are set to A1.

For more information, see the manuals for:

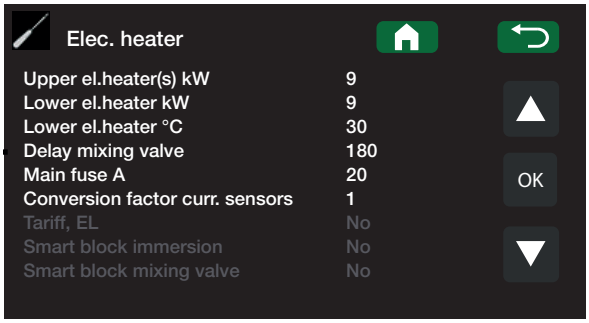
CTC EcoPart 600M

CTC EcoAir 520M/510 230V 1N~

CTC EcoPart 400 and CTC EcoAir 400 name is changed with CTC Basic Display

EP(M)	Heat pump		
EA(M)	1	2	3

8.5.2.3 Elec. heaters



In the "Elec. heater" menu you can make settings affecting the operation of the immersion heaters.

El.heater upper kW **9 (0.3...18**
Here you select the power that the upper immersion heaters are allowed to emit.

El.heater lower kW **9 (3...9)**
Here you select the power that the upper immersion heaters are allowed to emit

El.heater lower °C **50(30...60)**
Setting of temperature for the lower immersion heater. The lower immersion heater is only allowed to operate when the heat pump is blocked for some reason.

Delay mixing valve **180 (30...240/Off)**
This is where the mixing valve delay is set - the period before it draws energy from the upper part of the tank. The mixing valve can be blocked so that it never retrieves energy from the upper part of the tank.

When “Ripple control” or “Smart blocking mixing valve” is activated, the valve is blocked so that it cannot open to draw energy from the upper tank. If the mixing valve to the upper tank has opened when these are activated, it can continue to draw energy from the upper tank.

Main fuse A **20 (16...100)**
The property’s main fuse size is set here. This setting and the fitted current sensors ensure the fuses are protected when using appliances which generate temporary power peaks, for example, cookers, ovens, engine heaters, etc. The product temporarily reduces power drawn where this type of equipment is being used.

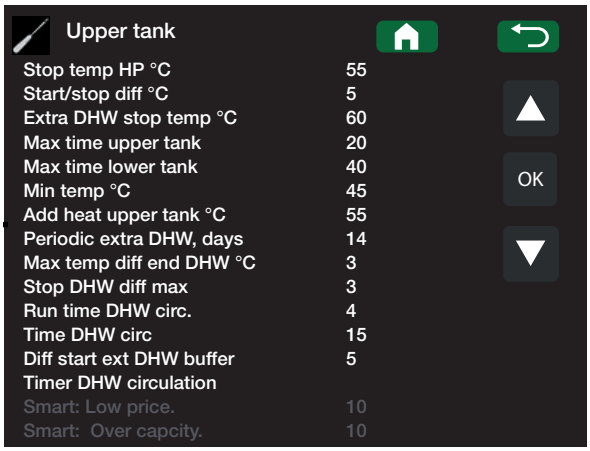
Conversion factor current sensor **1:1 (1 to 10)**
This menu contains the factor the current sensor is to use. This setting is only performed if the connection has been installed for a current sensor for higher currents.

Example: User (set) value 2 => 16 A will be 32 A.

Tariff El. **No (Yes /No)**
Find out more in section entitled “Define/Remote control”.

Smart blocking el. **No (Yes/ No)**
Find out more in section “Define/Remote control/Smart Grid”.

8.5.2.4 Upper tank



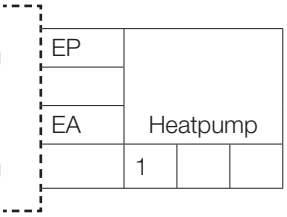
In the “Upper Tank” menu you make settings which affect the operation of the upper part of the tank.

Stop temp. HP °C **55 (20 to 60)**
At the selected temperature, the heat pump stops charging the upper tank.

Start/stop diff °C **5 (1 to 7)**
Hysteresis before the heat pump starts charging the upper tank.

Extra DHW stop temp. °C **60 (20 to 62)**
This menu is used to specify the setpoint for the heat pump to charge hot water.

Max time upper tank **20 (5...60)**
This is the maximum time spent by the heat pump charging the upper tank if it is needed in the lower tank.



Max time lower tank **40 (10...120)**
This is the maximum time spent by the heat pump charging the lower tank if it is needed in the upper tank.

Min. temp. °C **45 (35 to 55)**
This menu is used to specify the lowest permitted temperature in the upper tank.

Add heat upper tank °C **55 (45...80)**
Stop temperature for additional heat from immersion heater/external boiler. Used when the EcoZenith is in additional heating status, and only when the mixing valve delay has counted down. The mixing valve delay does not apply if HP is not available.

Periodic extra DHW, days **14 (0 to 30)**
The menu defines the interval for the periodic increase of the external hot water tank (13) (at 65°C to protect against legionella).

Max. temp. diff. interrupted DHW °C **3 (2 to 7)**
If there is a heating requirement, hot water charging is interrupted earlier than the time at which the maximum temperature has been reached, in order to avoid the compressor stopping while hot water is swapped for heating.

Stop DHW diff. max. **3 (2 to 10)**
Hot water charging is normally interrupted in the hot water sensor, but this can also occur in the condensation temperature which is calculated based on the heat pump’s internal pressure sensor. The condensation temperature is significantly increased during hot water charging. This menu relates to the value from the maximum permitted condensation temperature that interrupts hot water charging. If there is a heating requirement, the system then diverts to charging the heating system.

Run time DHW circ. **4 (1 to 90)**
The operating time the domestic hot water circulation should take place during each period. Applies if DHW circulation has been defined in the *Installer/Defined system/DHW tank* menu.

Cyclic time DHW circ. **15 (5 to 90)**

The cyclic time for domestic hot water circulation. DHW circulation must have been defined in the *Installer/ Defined system/DHW tank* menu.

Diff start ext DHW buffer **5 (3...15)**

This menu is used to select the temperature difference at which the charging of the external DHW tank is required to start. The difference is specified against the setpoint that is set in the *Stop temp. HP °C* menu.

Timer DHW circulation

This menu displays the scheduled weekday periods when the DHW circulation pump is to run. This schedule is repeated every week.

Example:

Monday 06-09 18-21

On Monday the timer comes on from 06–09 and 18–21; normal operation applies apart from these times.

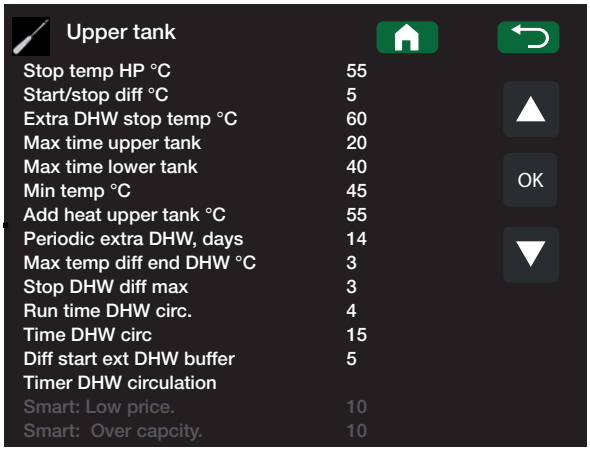
The time on the left must be lower than the time on the right for the interval to be valid.

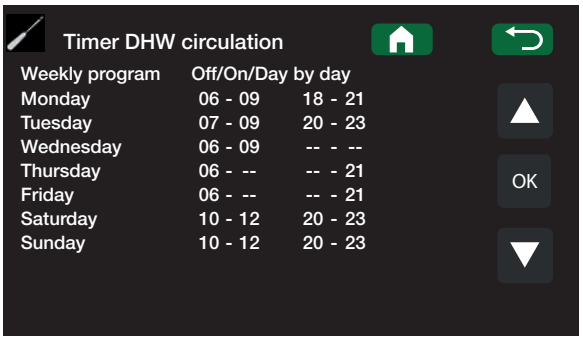
Smart low price ºC **10 (Off, 1...30)**

Find out more in section entitled Define/Remote control/ Smart Grid

Smart high capacity ºC **10 (Off, 1...30)**

Find out more in section entitled Define/Remote control/ Smart Grid





The time on the left must be lower than the time on the right for the interval to be valid.

8.5.2.5 Lower tank

In the “lower tank” menu you make settings which affect the operation of the lower part of the tank.

Tank max. °C **55 (20 to 70)**
This menu is used to set the highest temperature required for the lower tank.

Tank min. °C **25 (5 to 60)**
This menu is used to set the lowest temperature required for the lower tank.

Diff. tank and prim. flow °C **0 (0 to 15)**
This menu is used to set the difference between the temperature in the tank and the outgoing primary flow temperature to the heating system, if required.

Start/Stop diff. tank °C **5 (3 to 10)**
The hysteresis between the heat pump’s start and stop conditions in charging the lower tank.

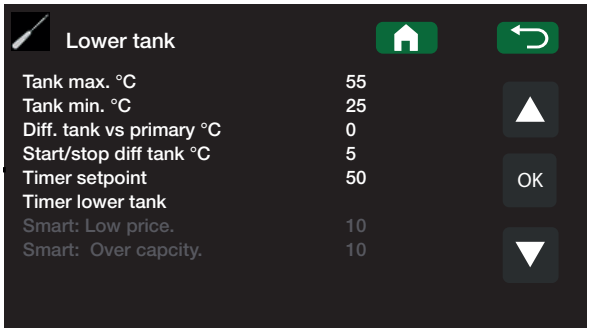
Timer setpoint **50 (20 to 60)**
This menu is used to specify the setpoint that is active during the period of time set by the timer.

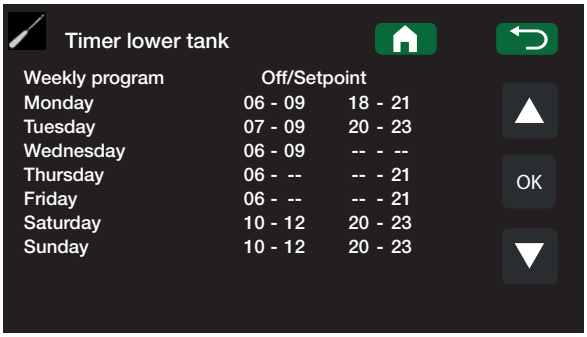
Timer lower tank
This menu is used to schedule the weekday periods you require the lower tank to be heated. This schedule is repeated every week.

Example:
Monday 06-09 18-21
On Monday the timer comes on from 06–09 and 18–21; normal operation applies apart from these times.

Smart low price ºC **10 (Off, 1...30)**
Find out more in section entitled Define/Remote control/ Smart Grid

Smart high capacity ºC **10 (Off, 1...30)**
Find out more in section entitled Define/Remote control/ Smart Grid





The time on the left must be lower than the time on the right for the interval to be valid.

8.5.2.6 Solar panels

dT max. solar °C **7 (3 to 30)**
Here you can set the temperature difference determining when charging of solar energy is started.
Type defined as “Coil”. When the solar panel is this many degrees warmer than the solar coil in the EcoZenith, the solar panels’ circulation pump (G30) starts.
Type defined as “Heat exchanger”. When the solar panel is this many degrees warmer than the lower tank in the EcoZenith, the solar panels’ circulation pumps (G30) start.
Solar is always charged primarily in the lower tank. If enough solar energy and temperature are present, they are transferred to the upper tank via the heat distribution pipes.

dT min. solar °C **3 (2 to 20)**
When the temperature difference above falls to this set value, the circulating pump (G30) for the solar panels stops and the solar energy charge to the lower tank is terminated.

Min. speed pump % **30 (30 to 100)**
Here you set the minimum permissible rpm, in percentage, for the solar panels' circulating pump.

Max lower tank °C **85 (10...95)**
The maximum permitted temperature in the lower tank. Charging of the lower tank ceases once the set temperature has been reached.

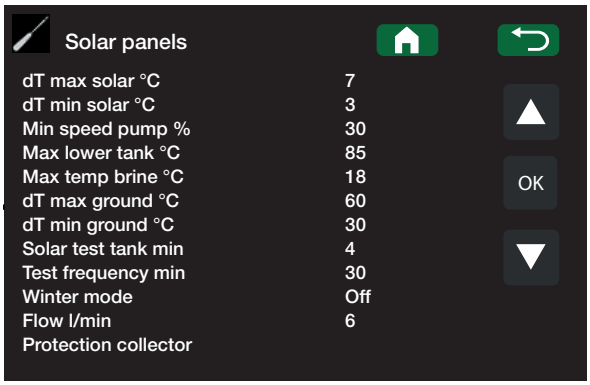
Max. brine °C **18 (1 to 30)**
Setting for maximum permitted brine temperature. This menu shows if the function "recharge the bore hole" has been selected in the "Def Solar Energy" menu. Solar charging of the bore hole ceases when this value has been reached.

dT max. bedrock °C **60 (3 to 120)**
Setting for start conditions for solar charging of bedrock. Specifies the temperature difference (solar panels–bedrock) at which charging begins.

dT min. bedrock °C **30 (1 to 118)**
Setting for stop conditions for solar charging of bedrock. Specifies the temperature difference (solar panels–bedrock) at which charging stops.

Solar test tank min **4 (1 to 20)**
(Only used if vacuum solar collectors have been defined). Once every 30 minutes (factory setting) to check whether tank charging is possible. The test is carried out at the set time interval. If sufficient temperature is obtained, tank charging continues; otherwise the system switches to charging the bedrock again.

Test frequency min **30 (0 to 180)**
Specifies the frequency at which the Solar Test function should perform. By setting 0 as a value the solar test will take place constantly.



Smart low price ºC **1**
Setting to increase curve adjustment at energy price low price, via Smart Grid.

Find out more in section entitled Define/Remote control/ Smart Grid

Smart high capacity ºC **2**
Setting to increase curve adjustment at energy price high capacity, via Smart Grid.

Find out more in section entitled Define/Remote control/ Smart Grid

Winter mode **Off (Off/On)**

Winter mode is a setting which does not permit the EcoZenith to check whether charging of solar energy to the lower tank is possible.
In winter, the EcoZenith normally retains a higher temperature and the sun emits less energy and lower temperatures. To check whether charging of solar energy to the tank is possible, water must circulate in the system and the temperatures must be compared. If the check indicates that charging is not possible, energy will have been used unnecessarily by having the water circulate. The winter mode setting prevents this check
“Off” Deactivates the Solar Test Tank function. Charging is carried out to the bore hole only.
"No" Permits the Solar Test Tank function, and charging of the EcoZenith is possible.

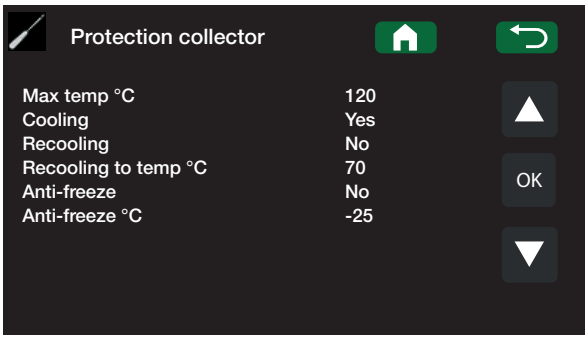
Flow l/min **6 (1 to 50)**

The flow circulating through the solar panels should be indicated here. (This can be read from the flow meter in the system unit.) The flow should be read when pump G30 is running at 100%. NB: The flow is used as the basis for calculating the power and cumulative energy. Incorrect flows will therefore produce incorrect values in these parameters.

Protection collector

Max. temp. °C **120 (110 to 150)**

Protects the solar panels from high temperatures by allowing circulation in the solar panels even though the maximum temperature has been reached in the respective tank. For safety reasons, the temperature in the EcoZenith is never allowed to exceed 95°C.



Emergency cooling **No (Yes/No)**

Permits circulation to the EcoZenith as well as the bore hole. This is in order to prevent excessively high temperatures in the solar panels. Applies once the maximum permitted temperature has been reached. For safety reasons, the temperature in the EcoZenith is never allowed to exceed 95°C.

Re-cooling **No (Yes/No)**

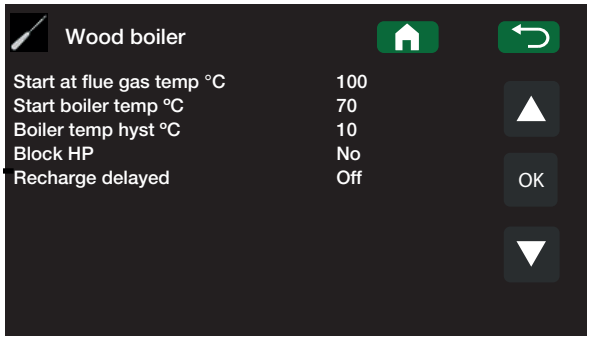
This option may be activated when the emergency cooling function has been activated. The function means that the system endeavours reduce the temperature in the hot water and buffer tank to the set setpoint (set in the *Re-cooling to temp.* menu). This means that the solar panels are used as cooling elements for a short period of time.

Re-cooling to temp. °C **70 (50 to 80)**
This option may be activated when the *Re-cooling* function has been activated. The function means that the system endeavours reduce the temperature in the hot water tank and buffer tank to the set setpoint.

Anti-freeze **No (No/Yes)**
As there is a risk of blocks of ice forming in the solar panels, circulation may be started to reduce the risk of frost damage.

Anti-freeze temp °C **-25 (-30...-7)**
Specifies the temperature at which frost protection should be activated. The menu is displayed when the *Anti-freeze* function has been activated.

8.5.2.7 Wood Boiler



Wood status means that the charge pump (G6) from the wood boiler can be started automatically. This is done when the flue gas sensor (B8) and/or boiler sensor (B9) have reached the set temperatures. However, CTC/ Enertech AB recommends that the automatic charger (19) be used.

Start at flue gas temp °C **100 (Off, 50 to 250)**
Wood status is activated when the flue gas temperature (B8) exceeds the set value in this menu and the temperature in the EcoZenith's lower tank (B6) is equal to or above its setpoint. "Wood" status is deactivated when the flue gas temperature drops below the set value in this menu.
If "Off" is selected, the charge pump is only started at boiler temperature (B9).

Start boiler temp ºC **70 (50 to 80)**
Wood status is activated when the boiler temperature exceeds the set value in this menu and the temperature in the EcoZenith's lower tank (B6) is equal to or above its setpoint..

Boiler temp hyst ºC **10 (5 to 20)**
The number of degrees below "Start boiler temp ºC" that the temperature has to fall for the charge pump (G6) to stop.

Block HP No (Yes/No)
Yes = heatpump blocked in status wood boiler
No = heatpump and wood boiler allowed to deliver theenergy simultatiously.

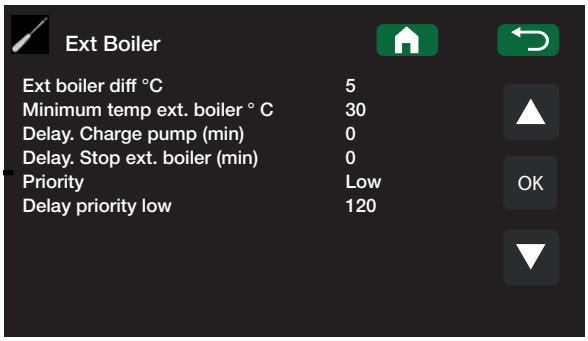
Recharge delayed **Off (Off, 1...120)**
Delay of External buffer tank recharge when wood burning. Unit: minutes.

Off = Temperature differences between CTC EcoZenith i550 and the External buffer decide whether charging the External buffer or recharging from the External buffer.

1...120 = When charging of the External buffer ceases, recharging is not allowed to start before this delay time in minutes.

8.5.2.8 Ext Boiler

In this menu settings for the external additional boiler are made.



Ext boiler diff °C **5 (3...20)**
Here you set how much the temperature is allowed to drop below the stop temperature before the external boiler starts again.

Lowest temp ext. boiler °C **30(10 to 80)**
Here you set the start temperature at which the circ. pump starts charging. (Displayed only if the temperature sensor in the boiler has been defined.)

Delay circ. pump (min) **0(0 to 20)**
Here you can set a stop delay for the charge pump. The charge pump continues to circulate water at the set time after the external boiler has been turned off. Only applies to boilers with very small water volumes in order to avoid overtemperature.

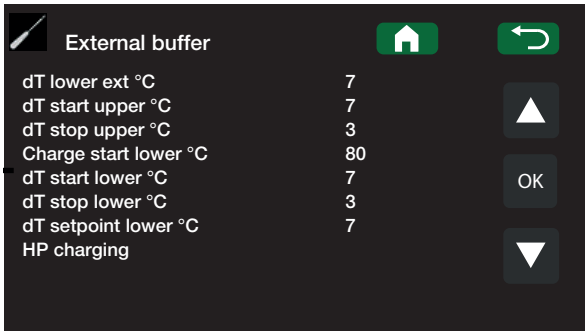
Delay stop ext. boiler (min) **0(0 to 240)**
If an external boiler is no longer needed, shutting it off can be delayed. This is used to avoid operating times too short (risk of corrosion). The boiler is kept hot according to the set time. Can be set up to 4 hours.

Priority **Low (Low/High)**
“Low” The external boiler is prioritized after the immersion heater(s).

“High” The external boiler is prioritized over the electric heater(s) if both heat sources are defined in the system.

Delay priority low **120(30...240)**
Delay of the heat source which has been given “low” priority. For instance, if the external boiler has the priority “High”, the immersion heater(s) then get(s) the priority “Low” and is/are delayed the set number of minutes before being permitted to engage and assist in operation. NOTE: Irrespective of the setting, the immersion heater in the upper tank is used for extra domestic hot water increase.

8.5.2.9 External buffer



Settings for the external buffer tank are made in this menu.
The buffer tank is charged from the lower tank of the EcoZenith but can be recharged in both the upper and the lower tanks.

dT lower ext °C **7 (3...30)**
The temperature difference between the lower tank of the EcoZenith and the lower part of the external buffer tank which controls the conditions for starting the transfer from the EcoZenith to the external buffer tank. This setting applies to charging of solar energy when a heating need is present on the radiator system.

dT start upper °C **7 (3...30)**
The temperature difference between the upper tank of the EcoZenith and the upper part of the external buffer tank which controls the conditions for starting the recharging from the external buffer tank to the upper tank in the EcoZenith.

dT stop upper °C **3 (1...30)**
The temperature difference between the upper tank of the EcoZenith and the upper part of the external buffer tank which controls the conditions for stopping the recharging from the external buffer tank to the upper tank in the EcoZenith.

Charge start lower °C **80 (20...90)**
The temperature in the lower tank of the EcoZenith at which transfer to the external buffer tank should start.

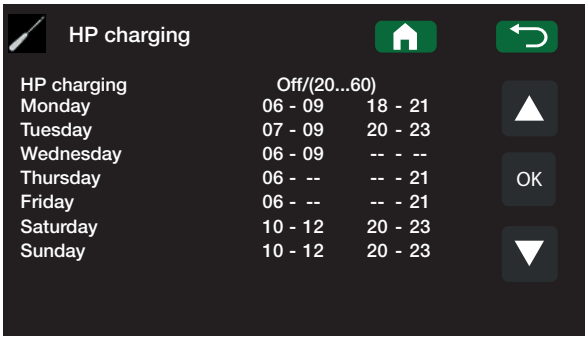
dT start lower °C **7 (3...30)**
The temperature difference between the lower tank of the EcoZenith and the external buffer tank which controls the conditions for starting the recharging from the external buffer tank to the lower tank in the EcoZenith.

dT stop lower °C **3 (1...30)**
The temperature difference between the lower tank of the EcoZenith and the external buffer tank which controls the conditions for stopping the recharging from the external buffer tank to the lower tank in the EcoZenith.

dT setpoint lower °C **7 (2...50)**
Setting of the number of degrees by which the lower tank of the EcoZenith must exceed its reference value to start transfer to the external buffer tank. This setting applies to charging of solar energy when a heating need is present on the radiator system.

HP charging **Off (20...60)**

Charging an external buffer tank with heat from a heat pump is mainly of relevance when there are different tariffs for electricity over a 24 hour period. In such an instance, the buffer tank(s) can be charged when the tariff is low. The lower tank of the EcoZenith will work towards the set temperature during those periods which are scheduled and then transfer heated radiator water to the buffer tank(s), provided that the latter has/have a lower temperature.



8.5.2.10 Pool

Pool temp °C **22 (5 to 58)**

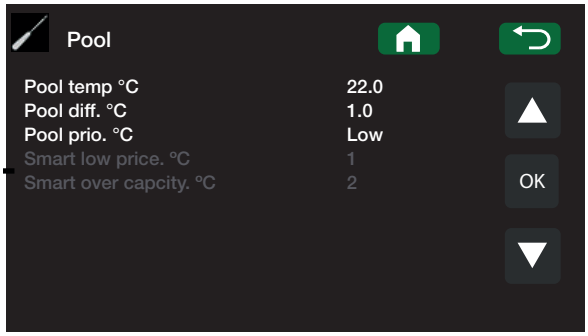
The required pool temperature is set in this menu.

Pool diff. °C **1.0 (0.2 to 5.0)**

The permitted difference between the stop and start temperature in the pool is specified here.

Pool prio. °C **Low (Low/High)**

The priority between pool heating and the heating system is specified here. If the Low setting is selected, the pool is not charged when additional heating is being used.



Smart low price ºC **1 (Off, 1...5)**

Find out more in section entitled Define/Remote control/ Smart Grid

Smart high capacity ºC **2 (Off, 1...5)**

Find out more in section entitled Define/Remote control/ Smart Grid

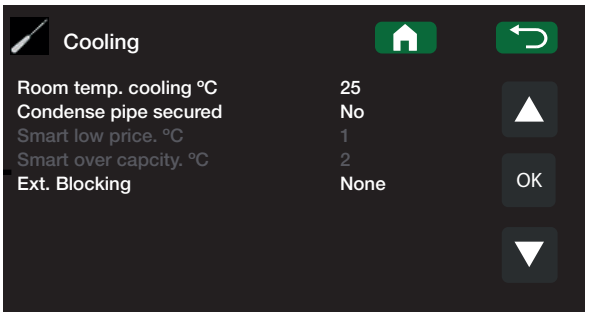
8.5.2.11 Cooling

Room temperature cooling **25 (18 to 30)**

This is used to set the desired room temperature for cooling.

Condense pipe secured **No (Yes/No)**

If a condense pipe for the system has been secured, significantly lower temperatures are permitted at various points in the system. WARNING Build-up of condensation in the house structure can lead to damp and damage from mildew. In the event of doubt, contact an expert surveyor for an assessment.



Smart low price ºC **1 (Off, 1...5)**

Find out more in "Define/Remote control/Smart Grid".

Smart overcap. ºC **1 (Off, 1...5)**

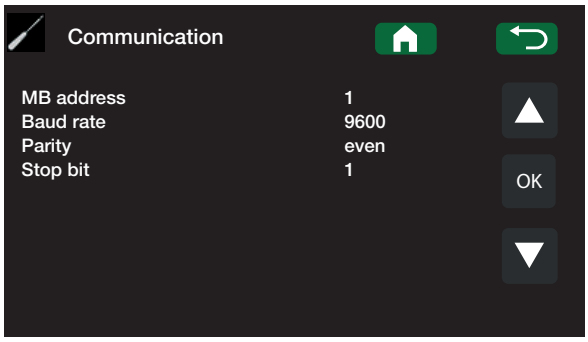
Find out more in "Define/Remote control/Smart Grid".

See CTC EcoComfort manual for more information.

8.5.2.12 Communication

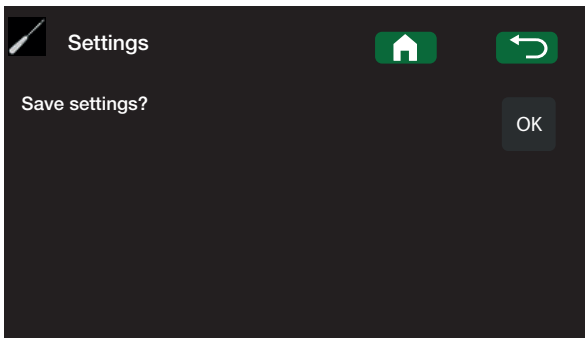
These settings are not used during normal operation and are not described in these instructions.

- MB address
- Baudrate
- Parity
- Stop bit



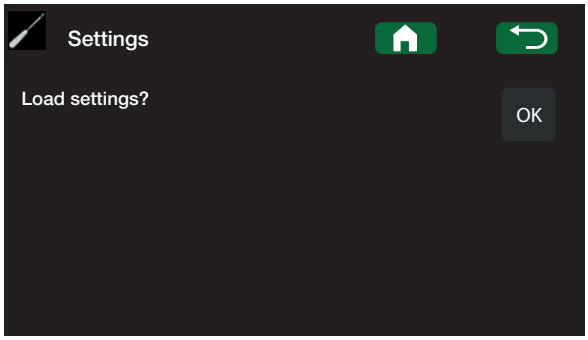
8.5.2.13 Save settings

Here you can save your own settings. Confirm using the “OK” button.



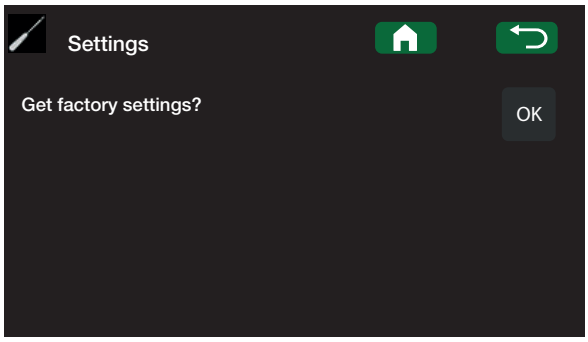
8.5.2.14 Load settings

The saved settings can be reloaded.



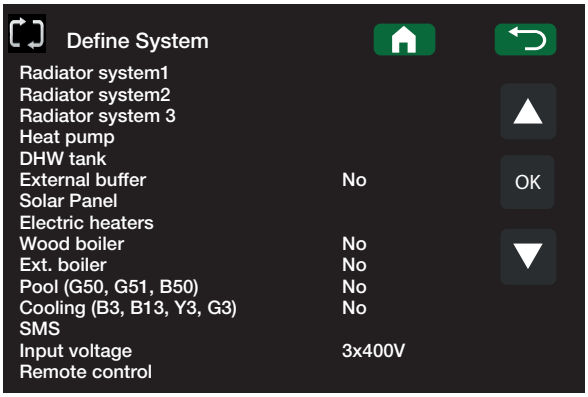
8.5.2.15 Load factory settings

The product is supplied with the factory values set. They can be restored by activating this function. Press OK to confirm. However, the language and product are retained.



8.5.3 Define System

The menus are used to specify to the EcoZenith the components and subsystems which make up the heating system.



8.5.3.1 Def heating circuit 1

Room sensor 1 (B11) **No (Yes/No)**

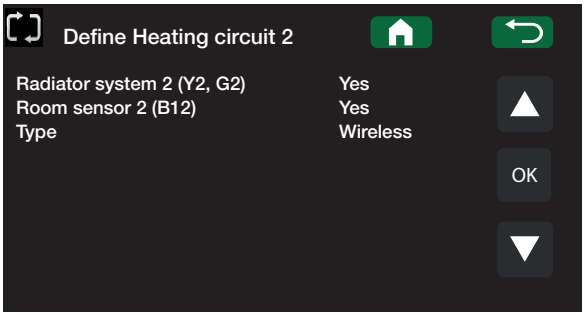
Specify whether the room sensor (B11) should be connected to the system.

Wired or wireless **Wired/Wireless**

Select whether the room sensor for heating system 1 is permanently connected (wired) or wireless.

8.5.3.2 Def heating circuit 2 (3)

If heating circuit 3 has been defined, there is no cooling.



Heating circuit 2 (Y2, G2) **No (Yes/No)**

Select whether or not further heating systems should be connected.

Room sensor 2 (B12) **No (Yes/No)**

Select whether the room sensor for heating system 2 (3 and 4) should be connected to the system. Displayed if the heating circuit in question has been defined.

Wire or wireless Wireless (Wire/Wireless)

Select whether the room sensor for the respective heating system 1 is permanently connected (wired) or wireless.

8.5.3.3 Def. heat pump

Heat pump A1-A3 **Off (On/Off**

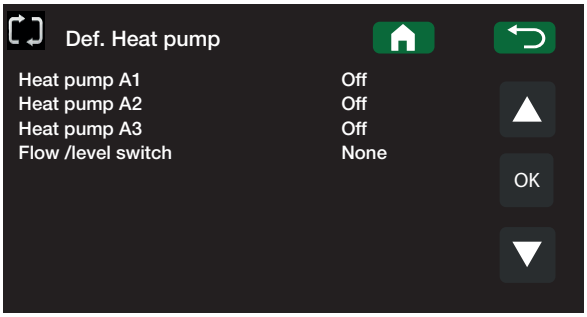
Select the heat pumps to connect to the system.

Flow/level switch **None (None/NC/NO)**

Select the type of level switch installed in the system.

“NC” and “NO” stand for Normally Closed and Normally Open, respectively. Flow/level switch must first be defined in Remote control

Find out more in “Define/Remote control/Smart Grid”.



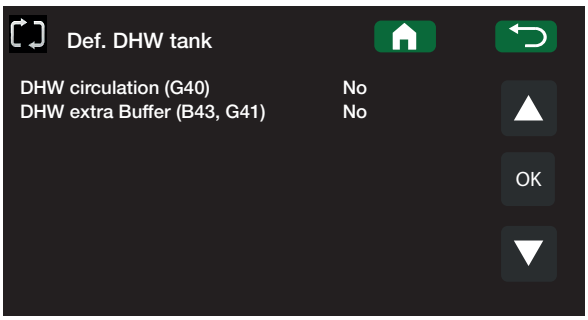
8.5.3.4 Def. DHW tank

DHW circulation (G40) **No (Yes/No)**

Specify whether the circulation pump (G40) is connected to the hot water system.

External DHW tank (G41, B43) **No (Yes/No)**

Specify whether the circulation pump (G41) and sensor (B43) are connected to the hot water system.



8.5.3.5 Def. ext buffer tank

Selected if an external buffer tank with charge pumps (G43) and (G45) and sensors (B41) and (B42) has been connected to the system.

8.5.3.6 Define solar panels

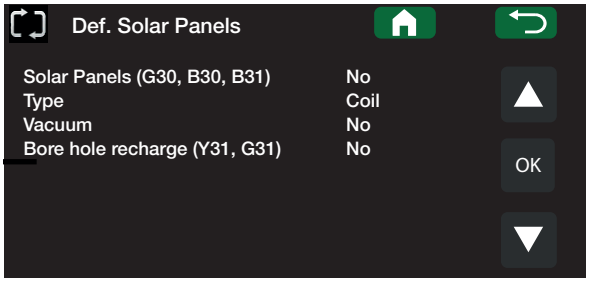
Solar panels (G30, B30, B31) **No (Yes/No)**
Specify whether the circulation pump (G30) and sensors (B30 and B31) are connected to the system.

Type **Coil (Coil/Heat exchanger)**

- "Coil" Heat exchange occurs via the built-in coil in the EcoZenith.
- "Heat exchanger" Heat exchange occurs via an external heat exchanger in larger solar energy systems.

Vacuum collector **No (No/Yes)**
Specify whether the solar panels are vacuum or flat solar panels.

Bore hole recharge (Y31, G31) **No (No/Yes)**
There is an option of recharging the bore hole using energy from the solar panels when the ordinary heating and domestic hot water needs have been met. Specify whether diverting valve Y31 and circulation pump G31 have been connected to the system.



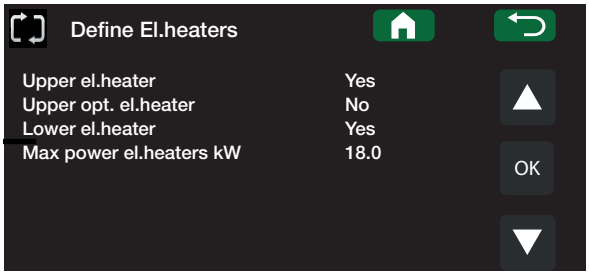
8.5.3.7 Define el.heaters

Upper el.heater **Yes (No/Yes)**
This is for selecting whether the upper immersion heater (EL 1-3 a/b) should be involved in operation.

Upper opt. el.heater **No (No/Yes)**
This is for selecting whether the upper optional immersion heater (E5) should be involved in operation (accessory).

Lower el.heater **Yes (No/Yes)**
This is for selecting whether the lower immersion heater (E1/E4) should be involved in operation.

Max power el.heaters kW **18 (0...27)**
This is for selecting the maximum power which all immersion heaters are to emit together.



8.5.3.8 Define wood boiler

Wood boiler (03) **No (No/Yes)**
This is for selecting whether a wood boiler is installed in the system.

8.5.3.9 Define external boiler

Ext boiler (04) **No (No/Yes)**
Selected if an external boiler (04) has been connected to the system.

Sensor external boiler **No (No/Yes)**
Selected if the sensor in the external boiler is connected to the system. If the sensor is not installed, the boiler's charge pump starts at the same time as the boiler.

8.5.3.10 Def. Pool

Pool (G50, G51, B50) **No (No/yes)**
Selected if a pool with circulation pumps (G50) and (G51) and sensors (B50) has been connected to the system.

8.5.3.11 Def cooling

If cooling has been defined there is no heating circuit 3.

Cooling **No (No/Yes)**
This is for selecting whether cooling has been installed.

See CTC EcoComfort manual for more information.

> A room sensor must always be used in that part of the property which is to be cooled, as it is the room sensor which determines/controls cooling capacity.

8.5.3.12 Def. SMS

Activate **No(Yes/No)**
If *"Yes"*, the menus below will be displayed.

Level of signal
The level of signal of the GSM reception is shown here.

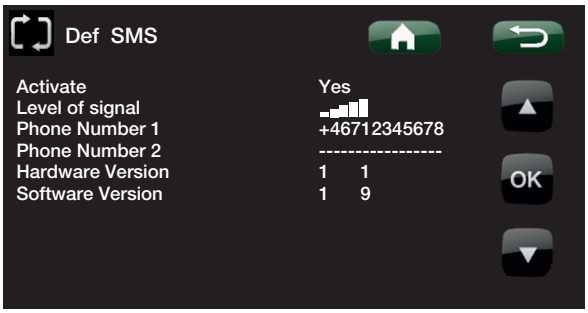
Phone Number 1
The first activated phone number is shown here.

Phone Number 2
The second activated phone number is shown here.

Hardware Version
The hardware version of the SMS equipment is shown here.

Software version
The software version of the SMS equipment is shown here.

NB: For more information on the SMS function, see the "CTC SMS" manual.



8.5.3.13 Input voltage

Input voltage **3x400V**
The value is set here to indicate whether the heat pump is connected at 3x400V, 1x230V or 3x230V.
3x400V is factory set.

8.5.3.14 Define Remote Control

The remote control function in CTC's products provides a wide range of opportunities to adjust the heating externally. The function is available in CTC EcoHeat, CTC GSi 8 / 12 / 16, CTC GS 6-8, CTC EcoZenith i250, CTC EcoZenith i550 PRO, CTC EcoLogic Pro/Family. This section covers the remote control, although not all of the functions are available in all products. There are four programmable inputs that can activate the following functions:

- Heat pump tariff
- Immersion heater tariff
- Night reduction
- Ripple control
- Additional domestic hot water
- Flow/level switch
- Heating from HS1
- Heating from HS2
- Heating from HS3*
- Heating from HS4*
- Smart A
- Smart B
- Reduced*, Forced* and Customised* ventilation as well as Away mode*
- Passive cooling.

Terminal blocks – inputs

There are two programmable 230V inputs and two low-voltage ports on the relay card (A2).

Designation	Terminal block name	Connection type
K22	A14 & A25	230 V
K23	A24 & A25	230 V
K24	G33 & G34	Low voltage (<12V)
K25	G73 & G74	Low voltage (<12V)

Open terminal block = no external effect. (Normal NO).

Closed terminal block = function activated externally.

Example:

Night reduction is normally activated on terminal block K24.

Open terminal block K24 = "normal heating"

Closed terminal block K24 = Temperature reduction in accordance with night reduction

The function is activated when pole positions G33 and G34 on the PCB are short-circuited

Applies to the CTC EcoVent 20 ventilation product (accessory for CTC EcoHeat, CTC GSi 8 / 12 / 16, CTC GS 6-8, CTC EcoZenith i250).

*The number of heating systems varies between different products. The maximum is four heating systems.

NB: Enertech AB is NOT responsible for the required heat being produced if the remote control has blocked the heating over a long period.

8.5.3.15 Remote control procedure

Assign input

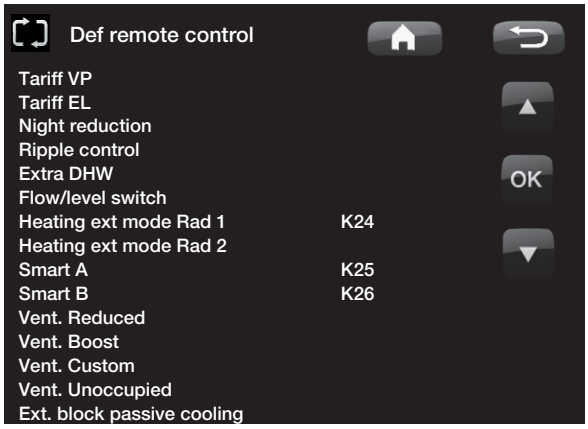
First of all, an input is assigned to the function or functions to be controlled remotely.

This is done in *"Advanced/Define system/Remote Control"*.

Example

In the example, there is manual control of whether the heating is to be on or off in Heating System 1 (HS1)*.

First of all, *"Heating ext mode Rad 1"* is assigned input K24.



Example in which "Heating, ext. mode HS1" has been assigned terminal block "K24" for remote control.

*The number of heating systems varies between different products. The maximum is four heating systems.

NB: Enertech AB is NOT responsible for the required heat being produced if the remote control has blocked the heating over a long period.

Activate/select function.

When an input is assigned, the function must be activated or set in the Settings menu.

In the example with remote controlled "Heating, ext. mode", K24 is assigned. A selection is then made of what is normal mode (arrow 1).
Normal mode was selected here as:

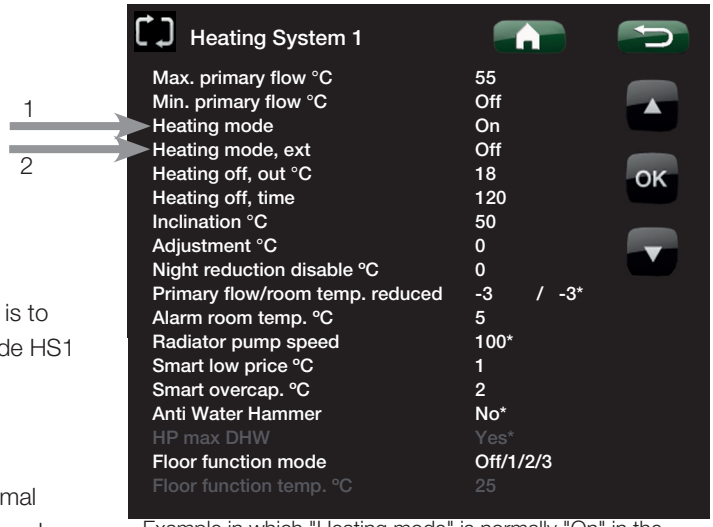
Heating, mode (On)

When this has been done, you programme what is to happen at Remote Control/Heating, external mode HS1 (closed input, arrow 2).

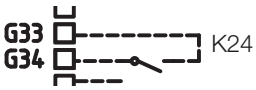
Arrow 2 indicates the selection "Off".

So in this example the heating is always on. (Normal mode) The radiator pump is switched on continuously, the mixing valve operates to maintain its "setpoint value".

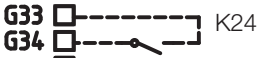
But when K24 is closed, the radiator pump stops and the mixing valve closes. The heating remains switched off until you choose to start heating up by opening K24.



Example in which "Heating mode" is normally "On" in the heating season, but when terminal block K24 is closed "Off" is activated and the heating is switched off.



Open terminal block = "On" (in this example)



Closed terminal block = "Off" (in this example)

*Individual function. This function is not present in all products.

NB: Enertech AB is NOT responsible for the required heat being produced if the remote control has blocked the heating over a long period.

The functions in remote control.

HP tariff
When electricity suppliers use a differentiated tariff, you have the opportunity to block the heat pump when the electricity tariff is high.

Electricity tariff*.
When electricity suppliers use a differentiated tariff, you have the opportunity to block the immersion heater(s) when the electricity tariff is high.

Night reduction
Night reduction means that you reduce the temperature indoors during scheduled periods, for example at night or when you are at work.

Ripple control
Disconnecting the compressor and immersion heater during a certain period which is defined by the electricity supplier (special equipment).

Ripple control is a device which an electricity supplier can fit with the aim of disconnecting high current draw equipment for a short period of time. The compressor and electrical power are blocked when ripple control is active.

Additional Domestic Hot Water
Select this option if you want to activate the *Extra DHW* function.

NB: Enertech AB is NOT responsible for the required heat being produced if the remote control has blocked the heating over a long period.

Flow/level switch
In some cases, extra protection is required due to local requirements or provisions. For example, the requirement in some areas is for the system to be installed within a water catchment area. The pressure/level switch is defined in the Advanced/Define system/Def. Heat pump menu. If there is a leak, the compressor and brine pump stop and the Flow/level switch alarm appears on the display.

Heating, ext. mode HS1

Heating, ext. mode HS2

Heating, ext. mode HS3*

Heating, ext. mode HS4*
With remote controlled "Heating, etc. mode", "On" is selected if the heating is to be on or "Off" if the heating is to be switched off. "Auto" mode can also be selected.

Read more in the section entitled "Your home's heating curve".

Smart A

Smart B
Smart Grid offers an opportunity to control from the outside whether heating is to be calculated as normal price, low price or overcapacity. The heat pump and immersion heater can also be blocked in a way similar to "Ripple control".

Reduced, Forced**** and **Customised** ventilation** as well as **Away mode****.

Ext. block passive cooling
Refer to section Settings/Cooling/Ext. Block.

*The number of heating systems varies from product to product. The maximum is four heating systems.

**Applies to the CTC EcoVent 20 ventilation product (accessory for CTC EcoHeat, CTC GSi 8 / 12 / 16, CTC GS 6-8, CTC EcoZenith i250).

NB: Enertech AB is NOT responsible for the required heat being produced if the remote control has blocked the heating over a long period.

8.5.3.16 Smart Grid

The "Smart Grid" function selects different heating options depending on the price of energy using accessories from the energy supplier.

Smart Grid is based on the energy price being calculated as

- Normal price
- Low price
- Overcapacity
- Blocking

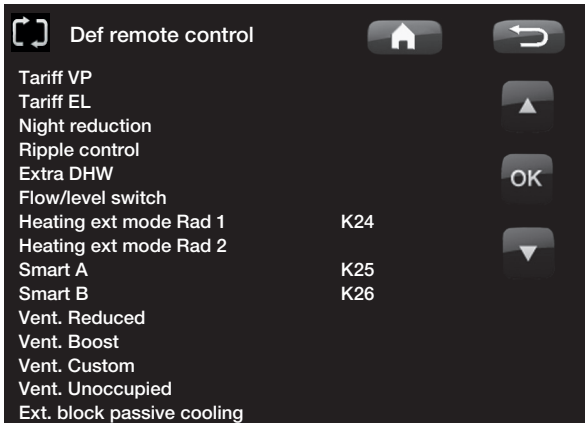
Room temperature, pool temperature and hot water temperature, etc. are given different heating temperatures depending on the energy price.

Procedure:
First of all, Smart A and Smart B are assigned a separate input in the Advanced/Define/Define Remote Control menu.

Activation then takes place based on the terminal blocks' closure and settings for each function.

- Normal price: (Smart A: Open, Smart B: Open). No effect on the system.
- Low price mode: (Smart A: Open, Smart B: Closed).
- Overcapacity mode: (Smart A: Closed, Smart B: Closed).
- Blocking mode: (Smart A: Closed, Smart B: Open)

In each function that can be controlled there is a choice of temperature change for low price mode and overcapacity mode.



Example in which Smart A has been assigned low voltage input K25 and Smart B has been assigned low voltage input K26.

NB: Enertech AB is NOT responsible for the required heat being produced if the remote control has blocked the heating over a long period.

Factory setting for low price is 1ºC increase* in temperature.

Factory setting for overcapacity is 2ºC increase* in temperature.

*Upper and lower tank have range of settings from 1-30

The following can be controlled:

- Room temperature heating systems 1-4**
- Primary flow temperature heating systems 1-4**
- DHW-tank/Upper tank/Lower tank***
- Pool
- Cooling

Comment re. cooling

When active cooling = setpoint has not been reached.

E.g. 26.0 (25.0)

In these cases Smart Grid "Normal mode" is activated for the heating systems. (Smart low price or smart overcapacity is not activated).

The reason for this is to avoid a conflict between heating and cooling. For example, if there is a standard 2 ºC difference between heating and cooling, you do not want to heat and cool at the same time.

* With cooling, the setpoint is reduced to room cooling.

** The number of heating systems varies from product to product. The maximum is four heating systems.

*** Varies from product to product. Not valid for CTC EcoLogic PRO/Family

NB: Enertech AB is NOT responsible for the required heat being produced if the remote control has blocked the heating over a long period.

Low price mode: (A: Open, B: Closed).

- With room sensor: Room temp. (setpoint) increased by 1ºC (Factory setting, Smart low price ºC)
- Without room sensor: Primary flow (setpoint) increased by 1ºC (Factory setting, Smart low price ºC)
- Upper tank: Setpoint increased by 10ºC (Factory setting, Smart low price ºC)
- Lower tank: Setpoint increased by 10ºC (Factory setting, Smart low price ºC)
- Pool: Pool temp. increased by 1ºC (Factory setting, Smart low price ºC)
- Hot water set to temperature in accordance with "Hot Water Comfort"
- Cooling. Room temperature is reduced by 1ºC (Factory setting, Smart low price ºC) (EcoZenith 550; Heating System 2 is not affected)

Blocking mode: (A: Closed, B: Open).

- The heat pump and immersion heater can be blocked in accordance with the settings in heat pump and immersion heater.
- **Smart blocking hp No (Yes/No)**
  Blocks heat pump
  Advanced/Settings/Heat pump
- **Smart blocking immersion heater No (Yes/No)**
  Blocks immersion heater
  Advanced/Settings/Immersion heater
- **Smart blocking mixing valve No (Yes/No)**
  Blocks bivalent mixing valve so that it does not pass 50%. If the mixing valve has passed 50% when blocking starts, the mixing valve remains in the upper tank. If demand falls and the mixing valve closes, it may not open more than 50%.

NB: Enertech AB is NOT responsible for the required heat being produced if the remote control has blocked the heating over a long period.

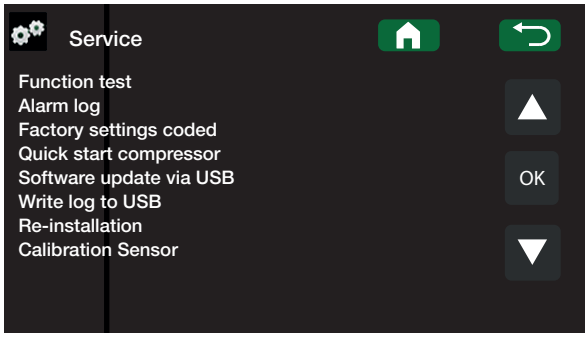
Overcapacity mode: (A: Closed, B: Closed).

- With room sensor: Room temp. (setpoint) is increased by 2ºC (Factory setting, Smart overcap. ºC)
- Without room sensor: Primary flow (setpoint) is increased by 2ºC (Factory setting, Smart overcap. ºC)
- Upper tank: Heat pump
  The heat pump only operates in the lower tank.
- Upper tank: Immersion heater
  Setpoint is "Min. temp ºC + increase of 10ºC (Factory setting, Smart overcap. ºC)
- Lower tank: Heat pump
  The heat pump only operates in the lower tank. Calculated setpoint increases by 2ºC (Factory setting, Smart overcap. ºC)
- Pool: Pool temp. is increased by 2ºC (Factory setting, Smart overcap. ºC)
- Hot water set to temperature in accordance with "Electric boiler extra DHW ºC
- Cooling. Room temperature is reduced by 2ºC (Factory setting, Smart overcap. ºC)
  (EcoZenith 550; Heating System 2 is not affected)

NB: Enertech AB is NOT responsible for the required heat being produced if the remote control has blocked the heating over a long period.

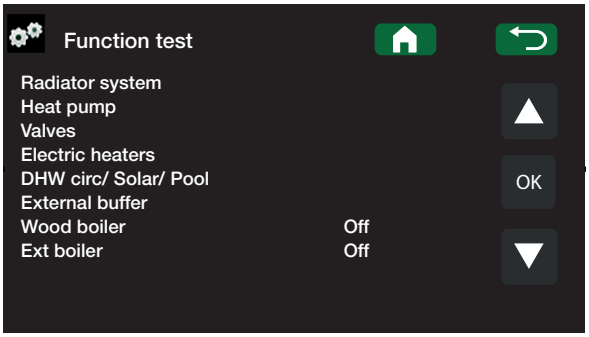
8.5.4 Service

NB: This menu is intended for the installer only.



8.5.4.1 Function test

From this menu, the installer can test the connection and function of separate components of the heating system. When this menu is activated, all control functions are stopped. The only protection against incorrect operation are the pressure sensors and the electric heater's overheating protection device. When you exit the menu, the heat pump returns to normal operation. A return to normal operation follows after 10 minutes' inactivity.



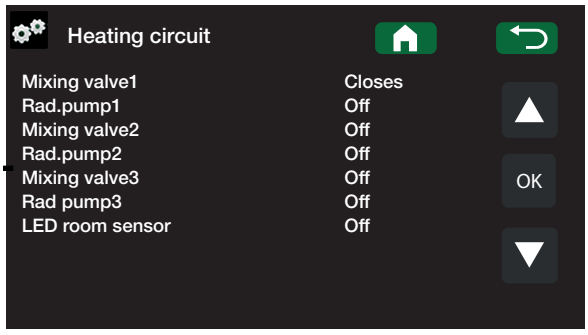
When you exit the menu, the heat pump returns to normal operation.

Heating System

Mixing valve (1-3) **Closes/Opens**
Opens and closes the respective mixing valve.

Rad.pump (1-3) **Off /On**
Starts and stops the respective radiator pump.

LED room sensor **Off /On**
The room sensor alarm functions can be controlled from here. When activated, the respective room sensor's red LED comes on steady.

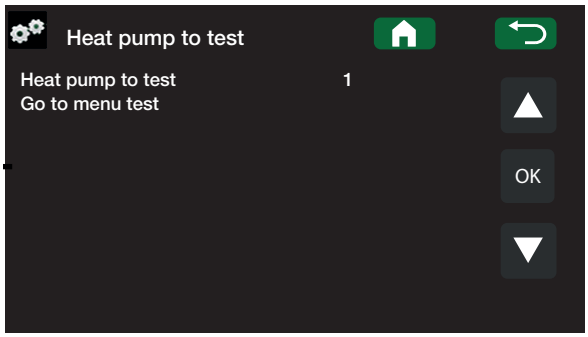


Heat pump to test

Select which heat pump is to be tested.

Heat pump to test **1 (2/3)**

Go to menu test



Test Heat pump

HP Compr **Off (Off/On)**

When the compressor is being function tested, the brine and charge pump are also operating so that the compressor does not trigger its pressure switches.

HP Brine p. /Fan **Off (Off/On)**

Function test brine pump.

HP Charge p. **0 (0...100)**

Function test charge pump 0-100%.

Manual defrosting **Off (Off/On)**

When “Manual defrosting” is being function tested, a defrosting cycle will be performed on the EcoAir product. Defrosting cannot be stopped once it has been started and the defrosting programme will be completed.

Compressor heater **Off (Off/On)**

Function test compressor heater.

Heater condensation tray **Off (Off/On)**

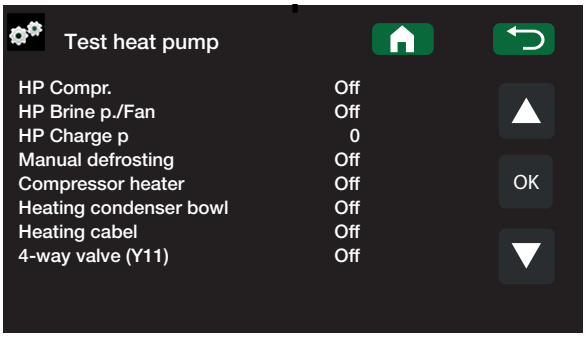
Function test of the condensation tray’s heater.

Heating cable **Off (Off/On)**

Function test heating cable.

4-way valve (Y11) **Off (Off/On)**

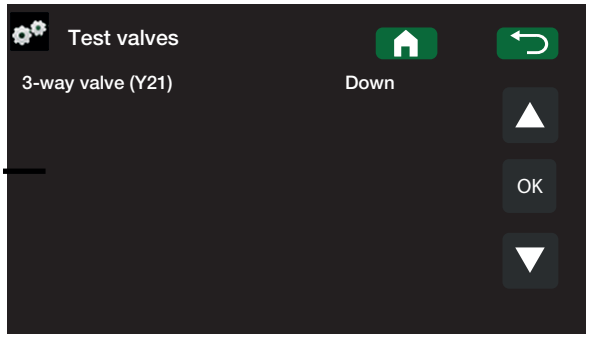
Function test 4-way valve (Y11). Available mounted on CTC EcoAir.



Test Valves

The following valves are function tested from this menu:

3-way valve (Y21) **Down/Up**



Test Elec.heater

This is where connected electric heaters are tested by switching them on and off.

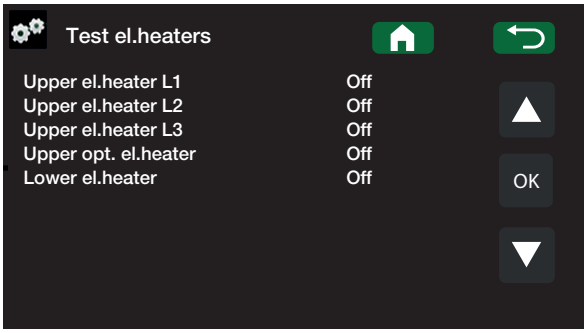
Upper el.heater L1 Off (Off/Low/High/Low+High)

Upper el.heater L2 Off (Off/Low/High/Low+High)

Upper el.heater L3 Off (Off/Low/High/Low+High)

Upper opt. el.heater Off (Off /On)

Lower el.heater Off (Off/Low/High/Low+High)



Test DHW circulation/Solar/Pool

The following pumps/valves are function tested from this menu:

DHW circulation pump (G40) On (Off/On)
Switches the circulation pump on and off.

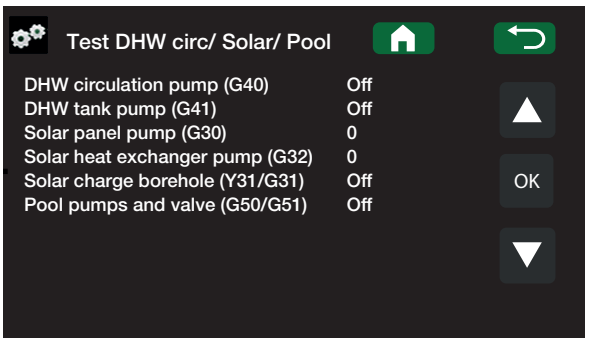
DHW tank pump (G41) On (Off/On)
Switches the circulation pump on and off.

Solar panel pump (G30) 0 (0...100)
Tests the circulation pump to to full speed (rpm).

Solar heat exchanger pump (G32) 0 (0...100)
Tests the solar heat exchanger pump up to full speed (rpm).

Solar charge borehole (Y31, G31) Off (Off/On)
Tests the diverting valve (Y31) and solar heat exchanger pump (G31).

Pool pumps and valve (G50, G51) Off (Off/On)
Tests the pool pumps and valve (G50, G51).



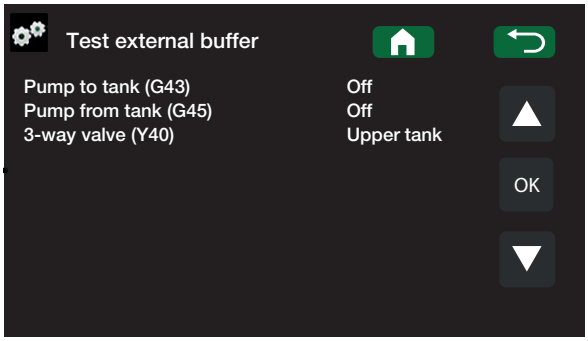
Test external buffer

The external buffer tank is function tested from this menu.

Pump to tank (G43) Off (Off/On)
Switches the circulation pump on and off.

Pump from tank (G45) Off (Off/On)
Switches the circulation pump on and off.

3-way valve (Y40) Upper tank/Lower tank
Tests the exchange function between the upper and lower tank.



Test wood boiler

The wood boiler is function tested from this menu.

Wood boiler Off (Off/On)
Switches the wood boiler on and off.

Test ext. boiler

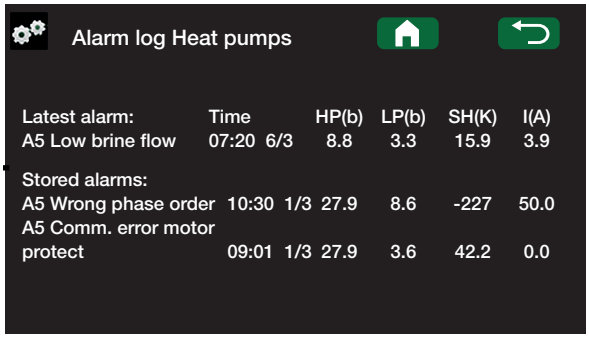
An external boiler is function tested from this menu.

Ext boiler Off (Off/On)
Switches the external boiler on and off.

8.5.4.2 Alarm log Heat pumps

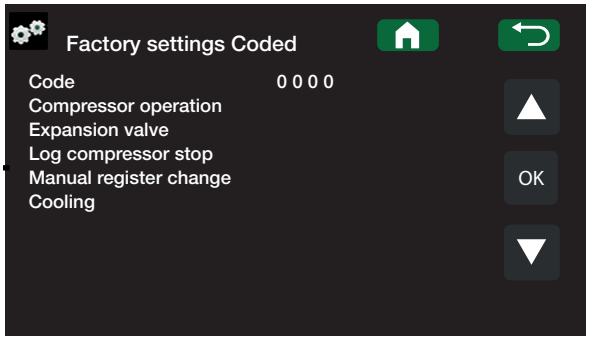
Here you can read information about the latest alarms from the heat pump that sounded the alarm. The latest alarm is displayed at the top and the four latest alarms are shown under *Stored alarms.*

An alarm which reoccurs within an hour is ignored so as not to fill up the log. If all the alarms are the same, this can indicate that there is an intermittent fault, e.g. a loose contact.



8.5.4.3 Factory settings Coded

This menu is intended to set the manufacturer's operational and alarm limits. A 4-digit code must be specified to be able to amend these limits. However, you can also take a look without any code to see what options feature in the menu.



! NB: Only an authorised service engineer is allowed to log in to the Factory settings coded option. Severe operational problems and faults may occur affecting the product if values are amended without authorisation. Note that in such cases the warranty terms do not apply.

8.5.4.4 Quick start Compressor

The delay normally prevents compressor start earlier than 10 min. after compressor stop. The delay is also activated in the event of a power failure, or the first time after production is started. This function speeds up this process.

8.5.4.5 Software update via USB

This is only for service engineers. This option can be used to update the software in the display via USB. The software update process is complete when the start menu appears.

8.5.4.6 Write log to USB

This is only for service engineers. This function can be used to save logged values to a USB memory stick.

8.5.4.7 Re-installation

This command re-launches the installation sequence. See the chapter on “First start”.

8.5.4.8 Calibration Sensor

Primary flow 1 °C (B1) **0.0 (-3.0 to 3.0)**
Correction of primary flow sensor B1.

Primary flow 2 °C (B2) **0.0 (-3.0 to 3.0)**
Correction of primary flow sensor B2.

Primary flow 3 °C (B3) **0.0 (-3.0 to 3.0)**
Correction of primary flow sensor B3.

Room temperature 1°C (B11) **0.0 (-3.0 to 3.0)**
Correction of room sensor B12.

Room temperature 2°C (B12) **0.0 (-3.0 to 3.0)**
Correction of room sensor B12.

Room temperature 3°C (B13) **0.0 (-3.0 to 3.0)**
Correction of room sensor B13.

Outdoor temperature °C (B15) **0.0 (-3.0 to 3.0)**
Correction of outdoor sensor (B15).

Out from solar panels °C (B31) **0.0 (-3.0 to 3.0)**
Correction of temperature sensor on solar panels for outgoing temperature.

Into solar panels °C (B30) **0.0 (-3.0 to 3.0)**
Correction of temperature sensor on solar panels for incoming temperature.

! NB: The power to the product must not be interrupted, under any circumstances, during the update process.

! NB: Turn off the power and always restart the product after the program update! Several minutes may pass before the display communicates clearly after restart.

9. Parameter list

Heating System	Factory setting	User (set) value
Max primary flow °C	55	
Min primary flow °C	Off	
Heating off, out °C	18	
Heating off, time	120	
Inclination °C	50	
Adjustment °C	0	
Room temp red	-2	
Primary flow reduced	-3	

Heat pump		
Delay between comp.	30	
Prio A/W °C	7	
Cont. brine pump on	No	
Compressor stop at brine °C	-5	

Elec. heater	Factory setting	User (set) value
Electric heater(s)	9*	
El.heater lower kW	9*	
El.heater lower °C	50	
Delay mixing valve	180	
Main fuse A	20	
Conversion factor curr. sensors	1	

*  =0 k W

Upper tank	Factory setting	User (set) value
Stop temp HP °C	55	
Start/stop diff °C	5	
Extra DHW stop temp °C	60	
Max time upper tank	20	
Max time lower tank	40	
Additional heat upper tank °C	55	
Min temp °C	45	
Periodic increase DHW, days	14	
Max temp diff end DHW °C	3	
Stop DHW diff max	3	
Run time DHW circ.	4	
Cyclic time DHW circ.	15	
Diff start ext DHW buffer	5	

Heating buffer tank	Factory setting	User (set) value
Tank max °C	55	
Tank min °C	25	
Diff tank vs. prim. flow °C	0	
Start/Stop diff tank °C	5	
Timer setpoint	50	

Solar panels	Factory setting	User (set) value
dT max solar °C	7	
dT min solar °C	3	
Min rpm pump %	30	
Max lower tank °C	85	
Max brine °C	18	
dT max ground °C	60	
dT min ground °C	30	
Winter mode	Off	

Protection function	Factory setting	User (set) value
Max temp °C	120	
Emergency cooling	Yes	
Re-cooling	No	
Recooling to temp °C	70	
Frost protect.	No	
Anti-freeze °C	-25	

Wood Boiler	Factory setting	User (set) value
Start at flue gas °C	100	

Ext Boiler	Factory setting	User (set) value
Ext boiler diff °C	5	
Lowest temp ext boiler	30	
Delay circ. pump (min)	0	
Tariff add heat	Off	
Delay stop ext boiler	0	
Priority	Low	
Delay priority low	120	

External Buffer Tank	Factory setting	User (set) value
dT lower ext °C	7	
dT start upper°C	7	
dT stop upper °C	3	
Charge start lower °C	80	
dT start lower °C	7	
dT stop lower °C	3	
dT setpoint lower °C	7	
HP charging	Off	

Pool	Factory setting	User (set) value
Pool temp ºC	22	
Pool diff ºC	1.0	
Pool priority ºC	Low	

Cooling	Factory setting	User (set) value
Room temp. cooling ºC	25	
Condense pipe secured	No	
Ext. Blocking	None	

9.1 Define system

Define system	Factory setting	User (set) value
External buffer	No	
Wood Boiler	No	
Pool	No	
Cooling	No	
Input voltage	3x400 V	

Def heating circuit	Factory setting	User (set) value
Define heating system 1		
Room sensor 1 (B11)		
Wire or wireless		
Define heating system 2		
Heating circuit 2 (Y2, G2)		
Room sensor 2 (B12)		
Wire or wireless		
Define heating system 3		
Heating circuit 3 (Y3, G3)		
Room sensor 3 (B13)		
Wire or wireless		

Def. heat pump	Factory setting	User (set) value
Flow/level switch	None	

Def. DHW tank	Factory setting	User (set) value
DHW circulation (G40)	No	
External DHW tank (B43, G41)	No	

Def Solar panels	Factory setting	User (set) value
Solar panels (G30, B30, B31)	No	
Type	Only DHW	
Vacuum	No	
Bore hole recharge (Y31, G31)	No	

Define el.heaters	Factory setting	User (set) value
Upper el.heater	Yes	
Upper opt. el.heater	No	
Lower el.heater	Yes	
Max power el.heater kW	18	

Define external boiler	Factory setting	User (set) value
Define ext. boiler	No	
Sensor ext. boiler	No	

Define Remote Control	Factory setting	User (set) value
Tariff Hp		
Tariff El		
Night reduction		
Ripple control		
Extra DHW		
Flow /level switch		
Heating ext mode Rad 1		
Heating ext mode Rad 1		
Heating ext mode Rad 1		
Heating ext mode Rad 1		
Smart A		
Smart B		
Ext. block passive cooling		

10. Operation and Maintenance

Once your new EcoZenith has been installed, you and your installer should together check that the system is in perfect operating condition. Let the installer show you where the switches, controls, fuses etc. are, so that you know how the system works and how it should be maintained. Bleed the radiators after around three days of operation and top up with water if required.

CTC EcoZenith i550 Pro

The EcoZenith is prepared for connection to a CTC heat pump, wood boiler, other additional boiler, solar energy, passive cooling, bore hole charging and pool. The EcoZenith operates fully automatically. The control system turns on additional heat when needed, adapts to wood burning when this occurs, switches to summer mode, etc. A more detailed description on how the EcoZenith is built and works can be found in the “EcoZenith’s function” chapter.

Safety Valve for Tank and Radiator System

Check regularly that the valve is working properly by manually turning the valve knob. Check that water is coming out of the safety valve discharge. The overflow pipe outlet must always be open. Warning Hot water can drip from the safety valve.

Draining the tank

The tank should be disconnected from the power source when it is being drained. The drain valve is packaged separately and can be connected directly onto one of the lower connections, if one is free, or to a low lying pipe. When draining the whole system, the mixing valve should be fully open, i.e. turned anticlockwise as far as it will go. Air must be supplied to the closed system.

Operation Stop

The product is turned off with the safety switch. If there is a risk of the water freezing, all the water should be drained from the tank and the radiator system. The domestic hot water coils, which contain about eleven litres, are emptied by feeding a hose all the way down the cold water connections and then siphoning out the water.

Current Monitor

The EcoZenith has a current monitor which measures current up to 100 A. If the system is fitted with a current sensor, the property’s main fuses are continuously monitored to ensure they are not overloaded. If this should happen, electric stages are disconnected from the immersion heater(s).

Mixing Valve

The mixing valve is operated automatically from the control system, so that the correct temperature, irrespective of the season, reaches the heating system. However, where a fault occurs, you can operate the valve yourself by pulling out the knob on the motor and turning it anticlockwise to increase the temperature or clockwise to reduce it.

! Remember to reset the mixing valve to automatic mode.

Room Sensor

A room sensor, which should always be fitted (up to three room sensors can be connected), ensures that the temperature in the room is always suitable and stable. For the sensor to provide the correct signals to the control unit, radiator thermostats should always be fully open in the area where the room sensor is located. When adjusting the system, always do so with all radiator thermostats fully open. The thermostats can be individually adjusted after a few days in the various rooms.

You can select operation without room sensors in the menu “Installer/Define system /Heating circuit 1, 2 and 3/Room sensor No”. This can be done if it is difficult to find a location for the room sensor, if you have several apartments, if the floor heating system has separate room sensors, or when using a fire place or open stove. The alarm LED on the room sensor still functions as normal. If you use the fire or open stove only occasionally, the firing process can affect the room sensor and reduce the temperature supplied to the radiators. It can then get cold in the rooms in other parts of the house. The room sensor can temporarily be deselected during the firing process. The EcoZenith then provides heating to the radiators using the set heating curve. Refer to the chapter on the “House heating curve”. The radiator thermostats are closed in the section of the house where a fire is burning.

"Summer Cellar Heat"

You will often want some background heating in basements/recreation rooms/bathrooms in the summer months, to avoid raw, damp air. The EcoZenith takes care of this by setting the minimum permitted primary flow temperature to a suitable temperature (15 to 65°C). See under the menu “Installer/Settings/heating circuit 1, 2 and 3/Min primary flow °C”. This means that the temperature supplied to the radiators does not fall below a selected temperature, for example 30°C. Functional radiator thermostats or shut-off valves are required in the rest of the house in order for this to work. These shut off the heating in the rest of the house. The function can also be used for floor heating in the bathroom where a warm floor is required during the summer.

Night reduction

With night reduction you have the option of automatically varying the temperature in the house throughout the day, every day of the week. More information can be found in the chapter “Detail description menus/Night reduction”.

11. Troubleshooting/measures

The CTC EcoZenith i550 Pro is designed to provide reliable operation and high levels of comfort, as well as have a long service life. Various tips are given below which may be helpful and guide you in the event of an operational malfunction.

If a fault occurs, you should always contact the installer who installed your unit. If the installer believes the malfunction is due to a material or design fault, then they will contact Enertech/CTC to check and rectify the issue. Always provide the product's serial number.

The Heating System

If the set room temperature is not obtained, check:

- that the radiator system is correctly adjusted and is functioning normally. that radiator thermostats are open and the radiators are equally warm all over. Touch the entire radiator surface. Bleed the radiators.
- that the EcoZenith i550 Pro is in operation and that no error messages are displayed.
- that there is sufficient electrical power available. Increase if necessary.
- that the product is not set to the "Max. allowed primary flow temperature" mode with a too low value.
- that "Inclination" has been set high enough. Increase as required. You can find out more on this in the "House Heating Curve" chapter. See also the "Installer/Settings/Heating circuit 1, 2 and 3" menu.
- that the temperature set back is not maladjusted.
- that the mixing valve on the EcoZenith is not in the manual position.

If you do not have radiator thermostats on the upper floor, you may need to install them.

If the heat is not even, check

- that the placement of the room sensors is appropriate for the house.
- that the radiator thermostats don't interfere with the room sensor.
- that no other heat sources/cold sources interfere with the room sensor.
- that the mixing valve on the EcoZenith is not in the manual position.

Avoid placing the room sensor close to the stairway due to the uneven air circulation.

Outdoor Sensor/Room Sensor Faults

If a fault occurs with an outdoor sensor, an outdoor temperature of -5°C is simulated so that the house does not get cold. An alarm appears in the display window. If a fault occurs with a room sensor, the EcoZenith automatically switches to operating according to the set curve. An alarm appears in the display window.

Resetting after Alarm

You reset the alarm by pressing the reset button on the panel. If several alarms are triggered, they are displayed one after the other. An outstanding fault cannot be reset without being rectified first. Some alarms are reset automatically if the fault disappears.

Current Monitor (protection for main fuses)

The CTC EcoZenith i550 Pro has a built-in current monitor. If the system is installed with current sensors (included), there is constant monitoring to prevent overload of the main fuses of the house. If this should happen, electric stages are disconnected from the EcoZenith. The product's immersion heaters may be restricted where high heating requirement levels are combined with, for example, single-phase engine heaters, cookers, washing machines or tumble dryers. This may result in inadequate heating or hot water temperatures.

If immersion heaters in the EcoZenith are restricted, this is shown in plain text on the display. Ask the electrician if the fuse size in the house is correct.

Sound Problems

Sudden pressure changes in the tap water system may cause noise. This is due to pressure surges which occur when, for instance, an older type of instant closing mixer is turned off quickly. The fault is not in the EcoZenith, and the problem can be easily rectified by replacing the mixer with a soft-closing one. If an unusual sound comes from hard-closing dishwasher and washing machines, this can be remedied using a shock arrestor. A shock arrestor can also be an alternative to soft-closing water taps. Minimizing pressure surges benefits the whole of the tap water system throughout the property.

If you hear a rasping sound from the product, check that it has been properly bled. Bleed via the product's safety valve or specially fitted bleed valve, so that any air can be evacuated. Top up with water where required, so that the correct pressure is achieved. If this noise recurs, call a technician to check the cause.

Don't forget that the radiators may also need bleeding.

If you have no radiator thermostats on the first floor, you may need to install some.

11.1 Information messages

Information messages are displayed when appropriate and are intended to inform users about various operational situations.

[I013] Start delay
The compressor is not allowed to start too quickly when it has stopped. The delay is usually at least 10 minutes.

[I002] Heating off, heat circ. 1

[I005] Heating off, heat circ. 2

[I006] Heating off, heat circ. 3
Shows for each heating system that the product is operating in summer mode when only hot water is required, not heating.

[I011] Ripple control
Shows that ripple control is active. Ripple control is a device which an electricity supplier can fit with the aim of disconnecting high current draw equipment for a short period of time. The compressor and electrical power are blocked when ripple control is active.

[I008] Tariff, HP off.
Shows that Tariff HP is not active.

[I010] Tariff, EL off.
This is used when a dual tariff is used with lower energy costs at set hours of the day. The heat pump can then take advantage of reduced primary energy costs.

[I003] Compressor blocked
The compressor is set to be shut down, e.g. before drilling or digging has been carried out for the collector loops. The product comes with the compressor switched off. This option is selected under the Installer/Settings/ Heat pump 1, 2 and 3 menu.

[I012] High curr. reduced elec.

- The property's main fuses risk being overloaded due to the fact, for instance, that several appliances requiring power are being used simultaneously. The product reduces the immersion heaters' electrical output over time.
- 2h max 6kW. Electrical heaters are limited to 6 kW for 2h after powering on. The text is displayed if >6 kW is required during the product's first 2 hours of operation. This applies after a power cut or a new installation.

[I021] Ext. Ctrl Heating 1

[I022] Ext. Ctrl Heating 2

[I023] Ext. Ctrl Heating 3
The remote control affects whether the heating is to be on or off. If the heating is switched off, the information "Heating from heating system 1/2/3"

[I017] Smart: Block

[I018] Smart: Over capacity.

[I019] Smart: Low price.
The product is operated on the basis of "Smart Grid". Also see: "Define system / Remote control / Smart Grid".

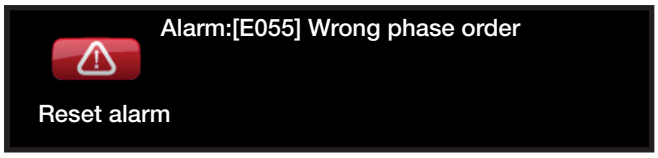
[I030] Driver block under voltage

The heat pump has stopped due to under voltage. The product will make a new attempt to start.

[I031] Driver block larm

The heat pump has stopped due to a driver fault; for example over voltage or too high temperature. The product will make a new attempt to start.

11.2 Alarm messages



If a fault occurs with a sensor, for instance, an alarm is triggered. A message appears on the display with information about the fault.

You reset the alarm by pressing the “Reset alarm” button on the display. If several alarms are triggered, they are displayed one after the other. An outstanding fault cannot be reset without being rectified first. Some alarms are reset automatically if the fault disappears.

Alarm Text	Description
[E055] Wrong phase order	The compressor motor in the connected heat pump must rotate in the right direction. The heat pump checks that the phases are connected correctly; otherwise, an alarm is triggered. In this case, two of the phases to the heat pump need to be changed. The power supply to the heat pump must be switched off when rectifying this fault. This fault generally only occurs during installation.
[Exxx] Alarm sensor	An alarm is displayed if a fault occurs with a sensor that is not connected or has short-circuited and if the value is outside the sensor’s range of measurement. If this sensor is significant to the system’s operation, the compressor of the heat pump stops. In this case, the alarm is reset manually after the fault has been rectified. For the sensors below, the alarm is reset automatically after correction: [E002] Sensor B9 Boiler [E007] Sensor B6 Buffer tank [E012] Sensor B5 DHW Tank [E016] Sensor B30 Solar In [E017] Sensor B31 Solar Out [E019] Sensor B50 Pool [E020] Sensor B8 Boiler [E030] Sensor B15 out [E031] Sensor B1 prim flow 1 [E032] Sensor B2 prim flow 2 [E033] Primay flow sensor 3 (B3) [E064] Sensor B7 return [E074] Sensor B11 Room 1 [E075] Sensor B12 Room 2 [E076] Sensor B13 room 3 [E079] Sensor B33 Solar tank [E120] Ext boiler sensor B17 [E141] Sensor ext buffer (B41) [E142] Sensor ext buffer (B42) [E143] Sensor ext DHW (B43) and for heat pumps A1-A3: [E003] Sensor brine in [E005] Sensor brine out [E028] Sensor HPin [E029] Sensor HPout [E036] Sensor high pressure [E037] Sensor discharge [E043] Sensor low pressure [E080] Sensor suction gas

Alarm Text	Description
[E057] Motor protect high curr.	High current has been detected to the compressor. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E058] Motor protect low curr.	Low current has been detected to the compressor. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E035] High pressure switch	The refrigerant's high pressure switch has been triggered. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E041] Low brine temp	Incoming brine temperatures from borehole/ground loop are too low. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer to check the dimensions of the cold side.
[E040] Low brine flow	Low brine flow is very often due to air in the collector system, particularly just after installation. Collectors which are too long can also be a cause. Check also that the brine pump is set to the correct speed. Press reset and check whether the alarm recurs. Also check the brine filter that has been installed. If the fault recurs, contact your installer.
[E063] Communication errorPCB,	This message is displayed when the display(A1) card cannot communicate with the relay card(A2).
[E027] Communication error HP,	This message is displayed when the display(A1) card cannot communicate with the HP control card (A5).
[E056] Comm.error motor protect	This message is displayed when the HP control card(A5) cannot communicate with the motor protection(A4).
[E044] Stop, high compr temp	This message appears when the compressor temperature is high. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E045] Stop, low evaporation	This message appears when the evaporation temperature is low. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E046] Stop, high evaporation	This message appears when the evaporation temperature is high. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E047] Stop, low suct gas exp.v	This message appears when the suction gas temperature is low. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E048] Stop, low evapor exp.	This message appears when the expansion valve's evaporation temperature is low. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E049] Stop, high evapor exp.	This message appears when the expansion valve's evaporation temperature is high. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E050] Stop, low superheat exp.	This message appears when the expansion valve's superheat temperature is low. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E013] EVO off	This message appears when there is a fault with the expansion valve control. Contact your installer.
[E052] Phase 1 missing **[E053] Phase 2 missing** **[E054] Phase 3 missing**	This message appears in the event of a phase failure. Check the product's fuses. If this does not help, the installation should be checked by an authorised person.

Alarm Text	Description
[E010] Compressor type?	This message appears if there is no information about the compressor type. Contact your installer.
[E026] Heat pump	This message appears if the heat pump is in alarm mode. Contact your installer.
[E061] Max thermostat	If the heat pump has been stored in an extremely cold place, the max thermostat may have been triggered. You reset it by pressing in the button on the electrical switchboard behind the front panel. Always check that the max thermostat has not been triggered during installation.
[E001] Risk of freezing	Alarm indicating that the temperature of the outgoing water from the heat pump (HP out) is too low for defrosting. The water volume in the system may be too low. The flow may be too low. (Applies to EcoAir)
[E163] Defrost max time duration	The heat pump has not been able to end Defrosting during set time. Ensure that any ice on the evaporator has disappeared.
[E087] Driver **[E088] Driver: 1 -** **[E109] Driver: 29** **Driver fault.**	Press reset and check whether the alarm recurs. If the fault recurs, contact your installer and tell them the error code number where applicable.
[E117] Driver: Offline	Communication error. The electrical connection box and driver of the heat pump are not communicating.

12. Transportation, unpacking and installation

This section is intended for the technician responsible for one or more of the installations necessary for the CTC EcoZenith i550 Pro to perform according to the property owner's wishes. Take your time going through functions and settings with the property owner and answer any questions. Both you and the EcoZenith i550 Pro benefit from a user who has completely understood how the system operates and should be maintained.

12.1 Transportation

Transport the unit to the installation site before removing the packaging.
Handle the CTC EcoZenith i550 Pro in one of the following ways:

- Forklift
- Lifting eye which is fitted in the socket in the middle of the top of the CTC EcoZenith i550 Pro.
- Lifting band around the pallet. NB: Can only be used with the packaging on.
- Remember that the product has a high centre of gravity and should be handled with caution.

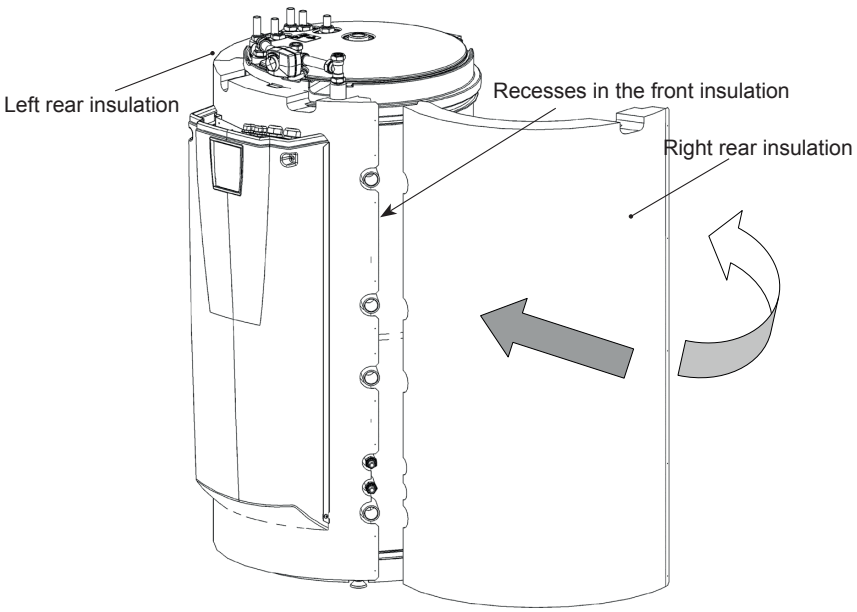
! The product must be transported and stored in an upright position

12.2 Unpacking

When the CTC EcoZenith i550 Pro has been placed at the installation site, the packaging can be removed. Check that the product has not been damaged in transit. Report any transport damage to the carrier.

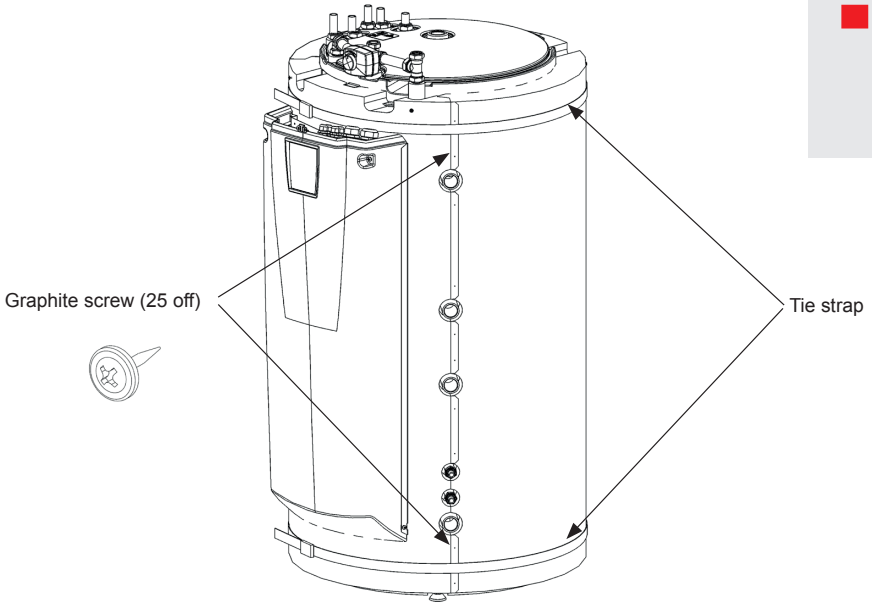
12.3 Fitting rear insulation and plastic top cover

The rear insulation sections and top cover should be fitted before the CTC EcoZenith i550 Pro is placed against a wall or in a corner for pipe and electrical connection. These parts are delivered separately and they are easier to fit if there is space around the unit. Begin with the left rear insulation. Turn out the insulation, locate it in the recesses in the front insulation and then turn it in against the tank. Repeat this procedure for the right rear insulation. Note that the right rear insulation needs to be turned out quite a lot for it to locate easily in the recesses.

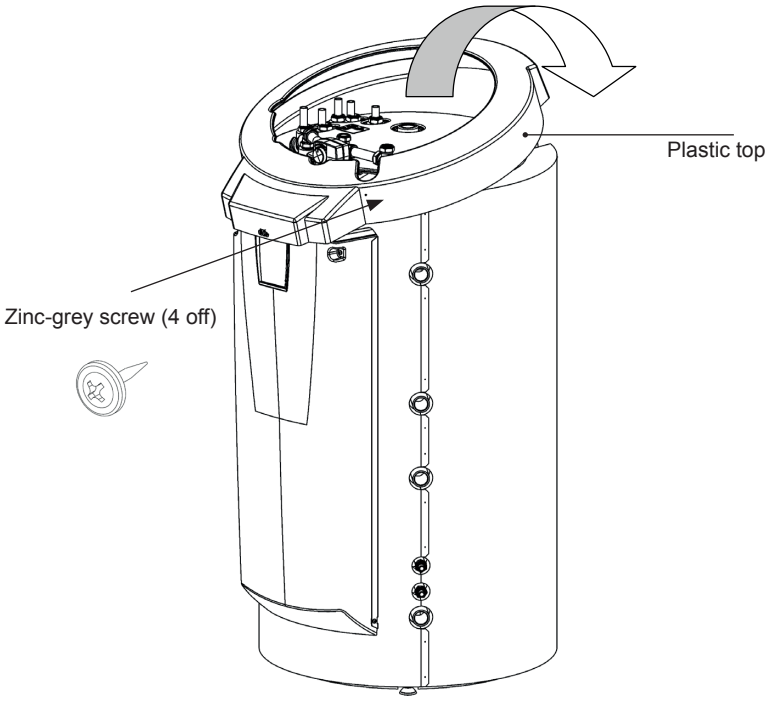


When the rear insulation is in place, tension bands can be used to hold it firmly against the tank. Attach the insulation sections to each other using the 25 graphite-grey screws provided. The screw positions have been pre-drilled.

The tension bands can scratch the surface of the insulation. Use a piece of cardboard or similar to protect it.



Fit the plastic top at the front and tip it backwards to locate it under the mixing valve actuator. Fit the 4 zinc-grey screws provided in the pre-drilled holes. Ensure that the plastic top cover is correctly aligned with the front.

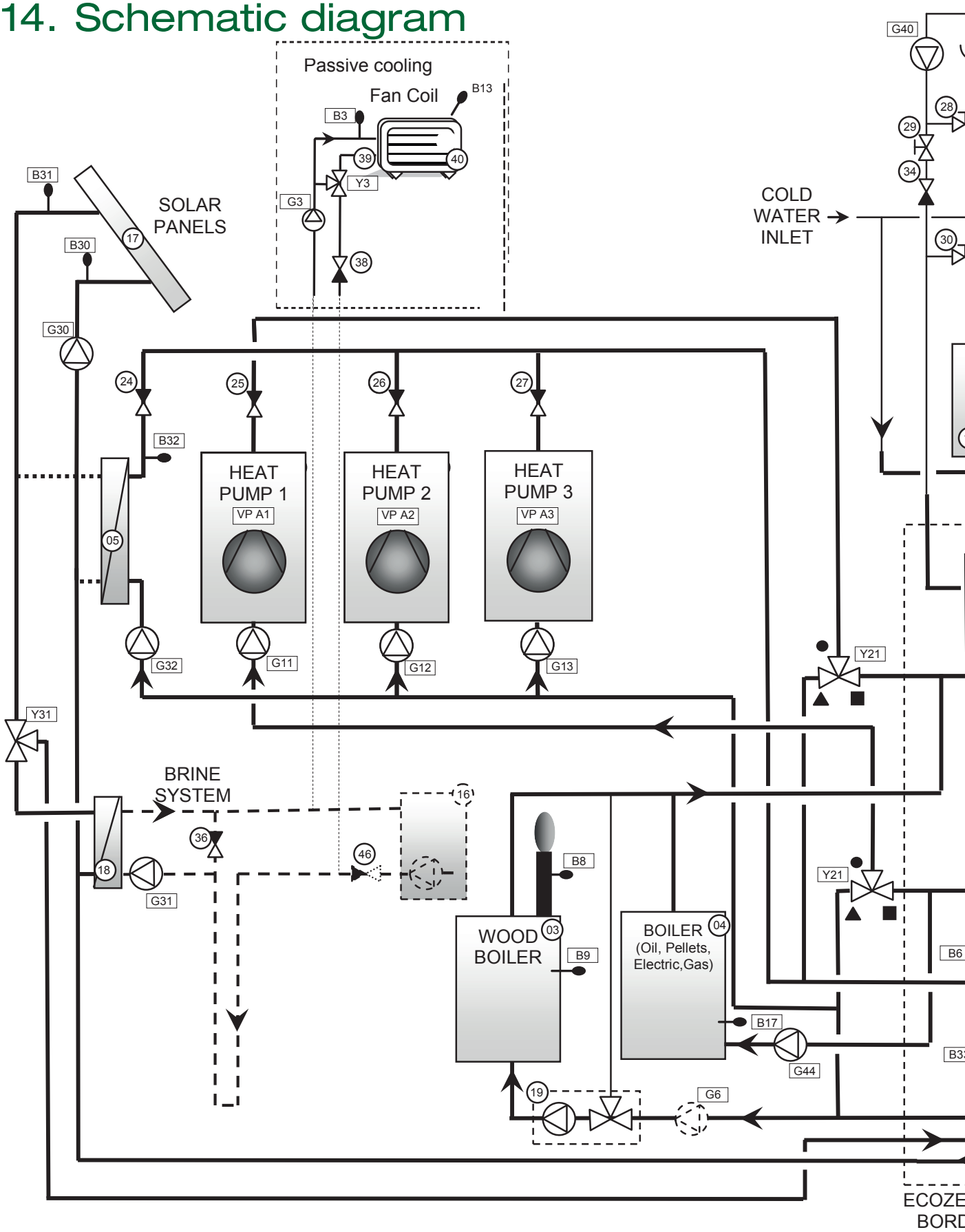


13. Parts list

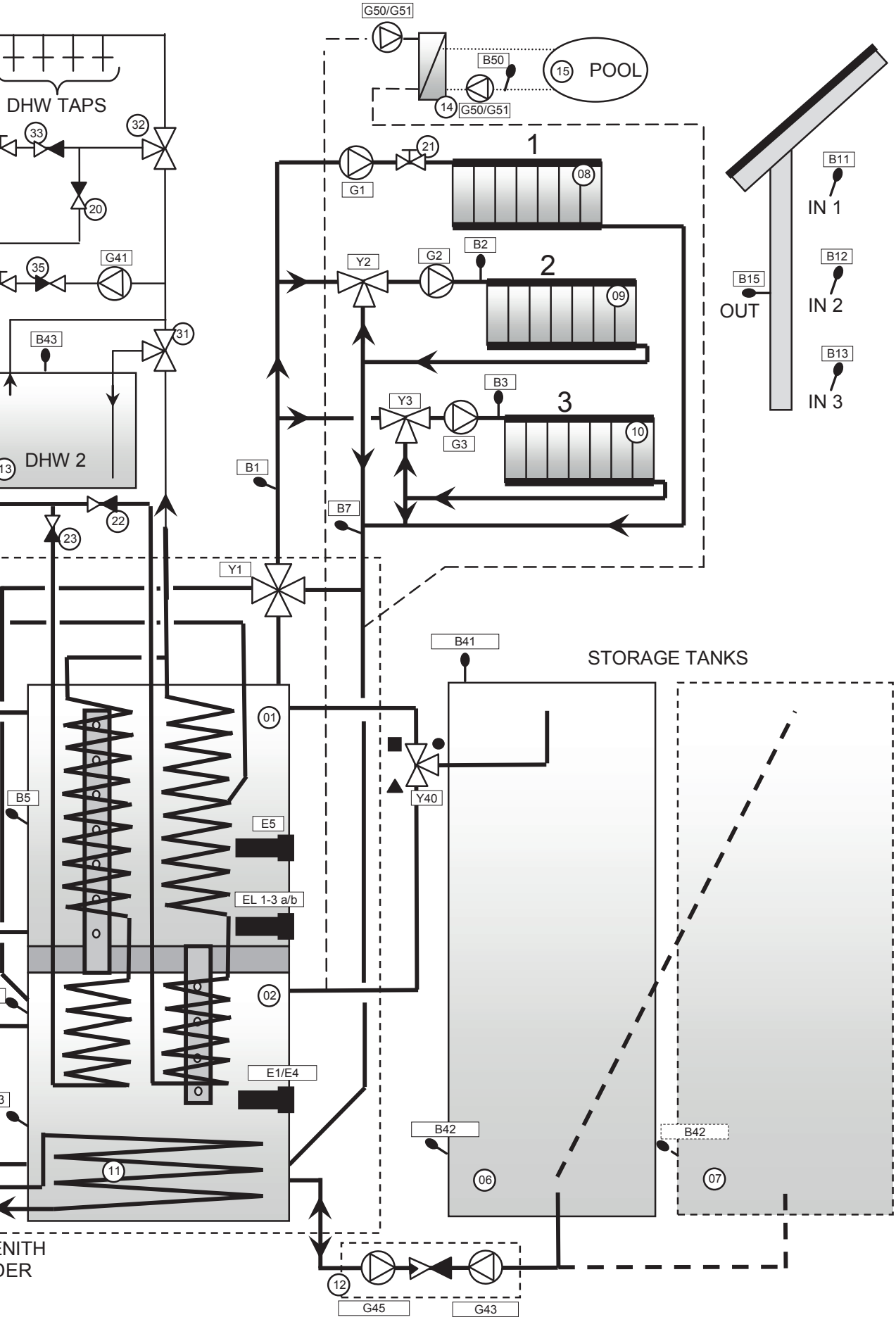
01. CTC EcoZenith i550 Pro upper tank
02. CTC EcoZenith i550 Pro lower tank
03. Wood Boiler
04. External boiler (pellets, oil, gas, electricity, other)
05. Plate heat exchanger – solar heat
06. Storage tank 1
07. Storage tank 2
08. Radiator system 1
09. Radiator system 2
10. Radiator system 3
11. Finned coil – solar heat
12. Charge equipment - external storage tank
13. External DHW tank
14. Plate heat exchanger - pool
15. Pool
16. Fluid/water heat pump (CTC EcoPart)
17. Solar collector (flat panel or vacuum tube)
18. Plate heat exchanger – recharging bore hole
19. Charge equipment, such as Laddomat 21
20. Non-return valve, DHW system
21. Electric shut-off valve, radiator system 1
22. Non-return valve, DHW system
23. Non-return valve, DHW system
24. Non-return valve, solar heat
25. Non-return valve, heat pump 1
26. Non-return valve, heat pump 2
27. Non-return valve, heat pump 3
28. Control valve, DHW system
29. Control valve, DHW system
30. Control valve, DHW system
31. Diverting valve - manual, external DHW tank
32. Mixing valve, DHW system
34. Non-return valve, DHW system
35. Non-return valve, DHW system
36. Non-return valve, brine system
37. Heat exchanger passive cooling (CTC EcoComfort)
38. Non-return valve passive cooling
39. Pipe for floor cooling/fan convector
40. Fan convector
41. Non-return valve, low pressure drop (only for passive cooling)
HP A1. Heat pump 1
HP A2. Heat pump 2
HP A3. Heat pump 3
E1/E4. Immersion heater - lower tank
EL 1-3 a/b. Immersion heater - upper tank 1
E5. Immersion heater - upper tank 2
B1. Sensor, primary flow to radiator system 1

B2. Sensor, primary flow to radiator system 2
B3. Sensor, primary flow to radiator system 3 Alternative: Sensor, primary flow CTC EcoComfort (Cooling)
B5. Sensor, tank upper
B6. Sensor, lower tank
B7. Sensor, radiator return
B8. Sensor, flue gas wood boiler
B9. Sensor, wood boiler
B11. Room sensor 1
B12. Room sensor 2
B13. Room sensor 3. Alternative: Room sensor, CTC EcoComfort (passive cooling)
B15. Sensor, outside
B17. Sensor, external boiler
B30. Sensor, solar collector return
B31. Sensor, primary flow solar collector
B32. Sensor, solar energy charging
B33. Sensor, solar coil
B41. Sensor, external storage tank upper
B42. Sensor, external storage tank lower
B43. Sensor, external DHW tank
B50. Sensor, pool
G1. Circulation pump, radiator system 1
G2. Circulation pump, radiator system 2
G3. Circulation pump, radiator system 3 Option: Circulation pump, CTC EcoComfort
G6. Circulation pump, flue gas controlled
G11. Circulation pump, heat pump A1
G12. Circulation pump, heat pump A2
G13. Circulation pump, heat pump A3
G14. Circ. pump integrated in the accessory CTC EcoComfort
G30. Circulation pump, solar panel
G31. Circulation pump, recharging bore hole
G32. Circulation pump, plate heat exchanger – solar heat
G32. Circulation pump, plate heat exchanger – solar heat
G40. Circulation pump, DHW
G41. Circulation pump, external DHW tank
G43. Cirkulation pump, external storage tank charging
G44. Circulation pump, external boiler
G45. Circulation pump, external storage tank discharging
G50/G51. Circulation pump, pool and pool charging
Y1. Mixing valve, radiator system 1
Y2. Mixing valve, radiator system 2
Y3. Mixing valve, radiator system 3
Y21. Diverting valve, heat pump - in
Y22. Diverting valve, heat pump - out
Y31. Diverting valve, recharging bore hole
Y40. Diverting, charging/discharging storage

14. Schematic diagram



This is only a schematic diagram. The system in question must be designed in accordance with current standards.


G50/G51
B50
15
POOL
14
G50/G51
DHW TAPS
33
32
20
G41
35
B43
31
DHW 2
13
22
23
21
G1
1
08
B2
Y2
G2
2
09
B3
Y3
G3
3
10
B1
B7
Y1
B11
IN 1
B12
IN 2
B15
OUT
B13
IN 3
B41
STORAGE TANKS
01
B5
Y40
E5
EL 1-3 a/b
02
E1/E4
11
B42
06
B42
07
12
G45
G43

15. Pipe installation

The installation must be carried out in accordance with current heating and hot water standards. The product must be connected to an expansion vessel in an open or closed system. Do not forget to flush the radiator system clean before connection. Perform all the installation settings based on the description in the chapter on “First start”. See the chapter on the EcoZenith’s functions in the section for the property owner for more information on the function of the various parts of the system.

This chapter contains the main connections for the EcoZenith, plus additional installations such as heat pumps, tanks, solar energy, pool, passive cooling, bore hole charging, DHW circulation and external gas, oil or pellet boiler. The instructions for the relevant additional product should be followed.

Refer also to the “Electrical installation” chapter.

Connections, placement and dimensions

See Technical data in the section for the property owner.

Pipe connections on the unit

Connect the pipes as shown in the schematic diagram for pipe connections. Also refer to Technical data in the section for the property owner for connection dimensions and placement. If annealed copper pipe is used, fit support sleeves.

Circulation pumps - radiator system

The circulation pumps are fitted to the primary flow piping from the EcoZenith to the respective radiator systems and receive their power supply from the EcoZenith, see chapter on Electrical installation.

Mixing valve

Install a mixing valve where there is outgoing hot tap water in order to avoid the risk of scalding at the property’s hot tap water points.

Safety valves

The EcoZenith safety valves for the tap water circuit and boiler are packaged separately. Connect the waste pipes to the waste system directly to the floor gully or, if the distance is more than two metres, to a funnel. Water can drip from a connected waste pipe. The waste pipe must incorporate a fall towards the floor gully, be installed so that there is no risk of freezing and be left open to the atmosphere/without pressure. The length of the waste pipe may not exceed two metres, unless in these cases it exits into a funnel.

Filling valve – radiator system

Fit a filling valve between the cold water connection and the radiator return pipe, or between the cold water pipe and the expansion pipe. The filling valve must be provided with a non-return valve (to prevent backflow).

Drainage valve

Fit the drain valve (separate package) to one of the EcoZenith's lower connections. The adapter for this is provided in the package. The drain valve can also be fitted into a low lying pipe.

Manometer – system pressure

Fit a manometer to the expansion pipe or radiator return pipe.

Expansion vessel connection

The EcoZenith is best connected to a closed expansion vessel. If an open system is used, the distance between the expansion vessel and the highest placed radiator must not exceed 2.5 m, in order to avoid introducing oxygen into the system.

Insulation

To ensure best efficiency, make sure that after installation you insulate all pipe parts, pipe unions and used and unused plugged connections. Use the insulation parts provided, and supplement these with insulation of Armaflex type having minimum 10-15 mm thickness, or equivalent. Make sure the insulation at the connections reaches all the way to the EcoZenith's own insulation and that it has no gaps, so as to prevent any loss of heat.

15.3.1 CTC EcoZenith i550 Pro - Radiator system

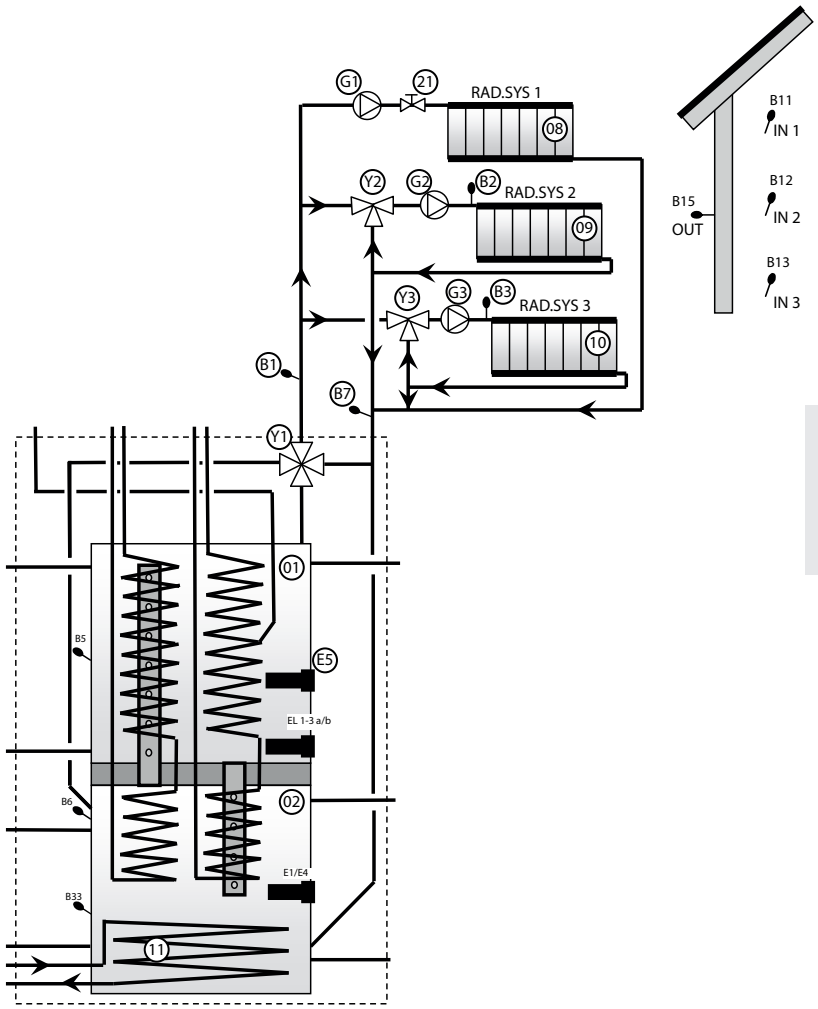
The CTC EcoZenith i550 Pro can be connected to three different radiator systems (heating circuits) with separate room sensors.

Mixing valve (Y1) is the main mixing valve and feeds radiator system 1. Mixing valves (Y2) and (Y3) for radiator systems 2 and 3 are sub-mixers. This means that mixing valve (Y1) controls the maximum temperature to mixers (Y2) and (Y3).

For one or two sub-mixing valves (radiator systems 2 and 3) to be operative when radiator system 1 is not operative, valve (21) must be connected to radiator pump (G1) so that the valve closes when the radiator pump for radiator system 1 is not operative. This is useful, for example, if floor heating in a bathroom is preferred during the summer.

Note that the expansion vessel and safety valve for the heating system are not included in the schematic diagram.

See also Heating circuit Menu in the Detail Description Menus chapter. (Installer/ Settings/Heating circuit 1-3)



Valve 21 must be connected if radiator system 2 or 3 is used.

15.3.2 CTC EcoZenith i550 Pro - Heat pump

Heat pump 1 is connected to diverting valves for changing between the upper and lower tanks. Heat pumps 2 and 3 are connected directly to the lower tank for supplying radiators.

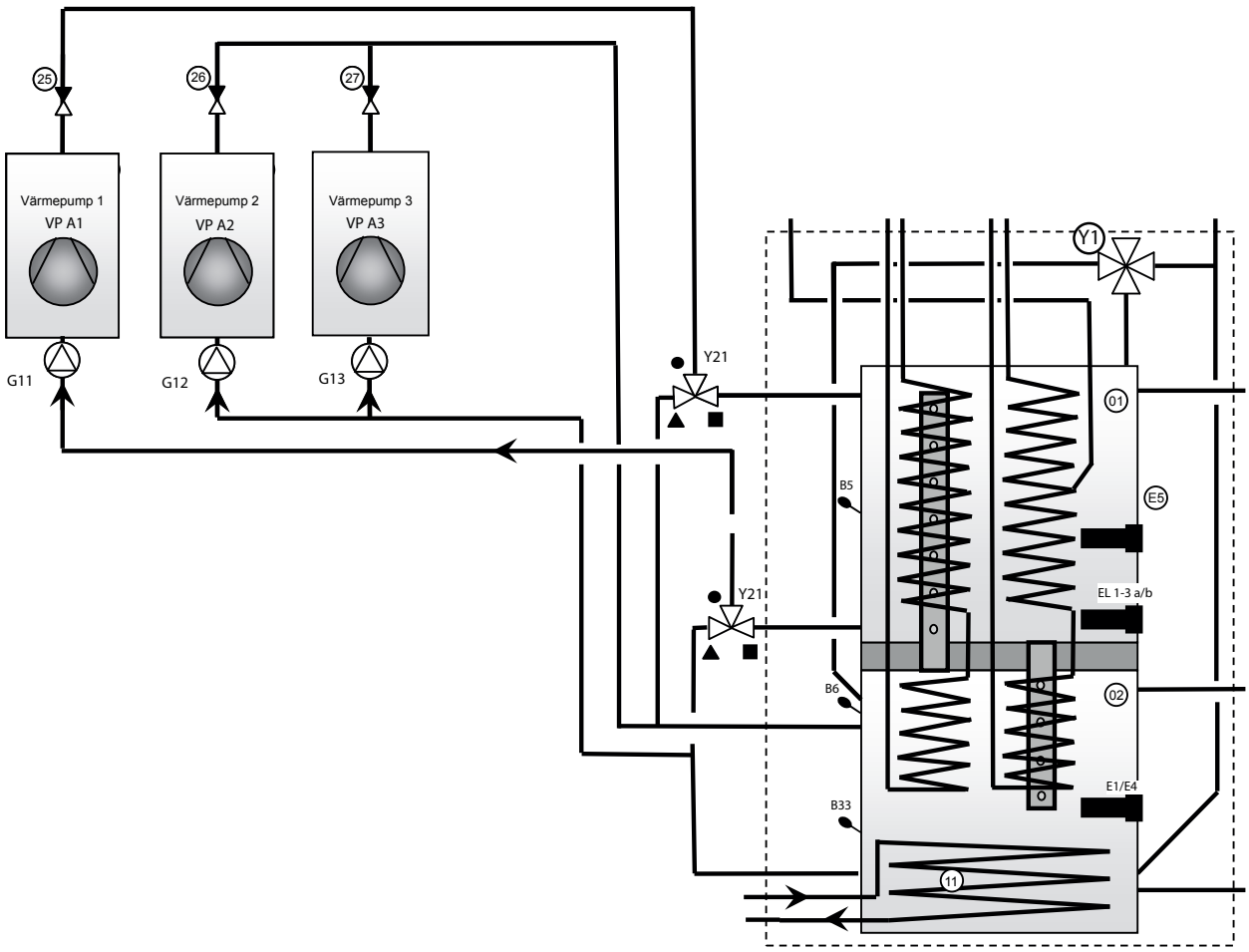
Ensure that the ports on the diverting valves (Y21) are set as in the schematic diagram. The ports ● must always be connected to heat pump 1.
If it is necessary to swap ports (■ and ▲), two jumpers in the actuator must be reconnected. See the chapter on Electrical installation for more information.

Note that when connected in series, the last heat pump must be in terminated position. I.e., on the last heat pump, dipswitch 2 must be in the ON position. On the other heat pumps it should be in the OFF position For more information, refer to the Installation and Maintenance instructions of the respective heat pump.

The diverting valves (Y21) and the circulation pumps (G11), (G12) and (G13) are CTC accessories.

See also Heat pump Menu in the Detail Description Menus chapter. (Installer/ Settings/Heat pump A1-A3)

> **!** Only heat pump 1 may be connected to the diverting valves.



15.3.3 CTC EcoZenith i550 Pro - Solar energy

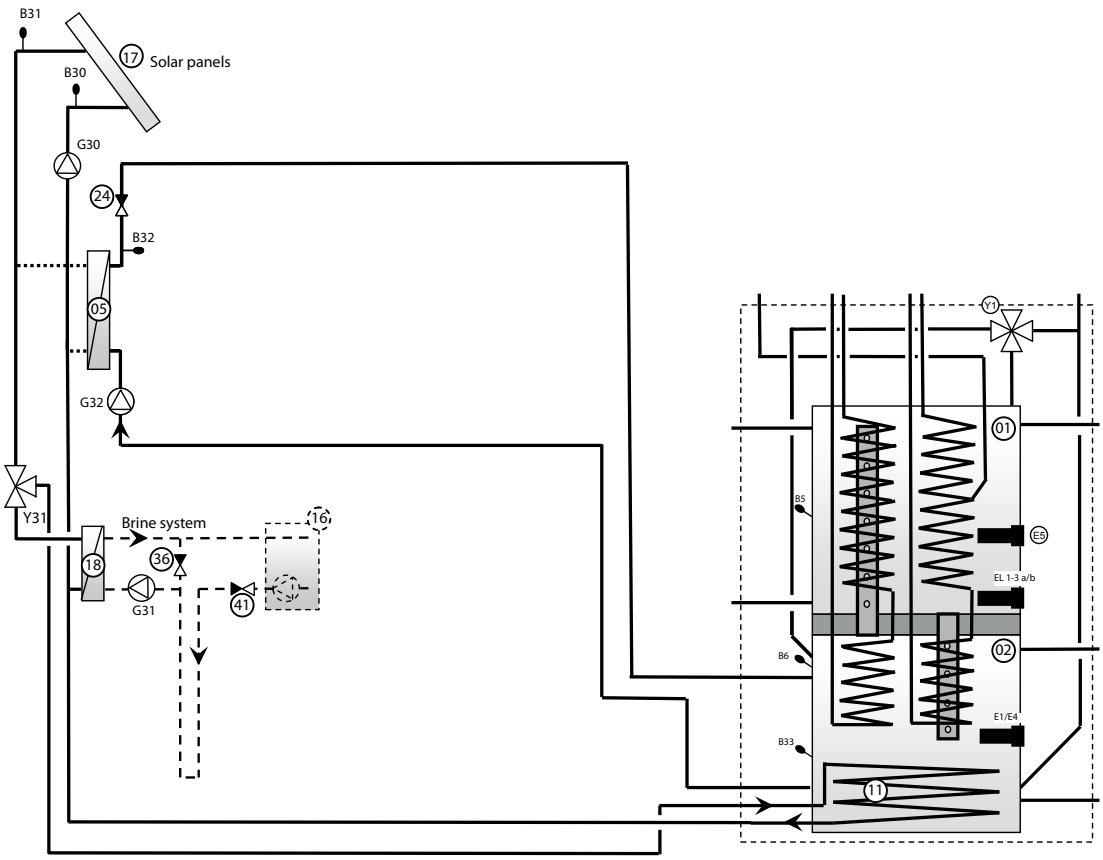
Solar panels (17) can be connected directly to the EcoZenith's inbuilt solar coil (11).

The solar coil is the finned type. The fluid is pumped from the coil by a speed controlled solar pump (G30). In a larger system with several panels of more than about 10m², the panels are connected to an intermediate heat exchanger (05) and the changing solar energy is pumped to the EcoZenith's lower tank by a speed controlled pump (G32). The pumps are powered by a separate source and their speed is controlled by the EcoZenith. See the chapter on Electrical installation for more information.

The diverting valve (Y31, plate heat exchanger (18), charge pump for recharging bore holes (G31) and non-return valves (36) and (41) are used for recharging bore holes/energy wells with solar energy. The EcoZenith also starts the brine pump in the fluid/water heat pump (CTC EcoPart) when recharging is taking place. This means that the charge pump for recharging the bore hole (G31) is then needed to compensate for the pressure drop across the plate heat exchanger (18), thus ensuring, in combination with the brine pump, sufficient flow through the heat collector and exchanger.

Speed controlled pumps (G30), (G31) and (G32), diverting valve (Y31) and plate heat exchanger (05), (18) are CTC accessories.

See also Solar panels Menu in the Detail Description Menus chapter. (Installer/Settings/Solar panels)



15.3.4 CTC EcoZenith i550 Pro - Domestic hot water

Figure 1 Shows how domestic hot water circulation can be connected to the EcoZenith. The domestic hot water is circulated by pump (G40). New domestic hot water from the finned coil is mixed in by the mixing valve (32), and cooled water is released down to the coil for reheating. Only a part of one coil in the upper tank is used for circulation. The non-return valves (22), (23), (33) and (34) are needed to ensure that circulation proceeds as intended. The control valves (28) and (29) make it possible to set the correct flow rate in the circuit

Figure 2 Shows how an external DHW tank is connected. The manual diverting valve (31) is set to allow domestic hot water to pass via the external DHW tank. The sensor (B43) detects when the temperature drops in the external DHW tank and starts the pump (G41). Cooled domestic hot water is pumped via the non-return valve (35) and control valve (30) down to the part of the coil used for circulation. The water is heated in the coil and is stored in the external DHW tank. When the sensor (B43) reaches its setpoint, the pump stops. The manual diverting valve is used to include or exclude the external tank, as desired, in operation. When drawn off, the domestic hot water passes through the entire coil and then via the external DHW tank. The non-return valves (22), (23) and (35) are needed to ensure that circulation proceeds as intended. The control valve (30) allows the desired flow of the circuit to be adjusted.

See also Upper tank Menu in the Detail Description Menus chapter. (Installer/ Settings/Upper Tank)

Note that the safety valves for the tap water system are not entered in the schematic diagrams.

Figure 1 Hot Water Circulation

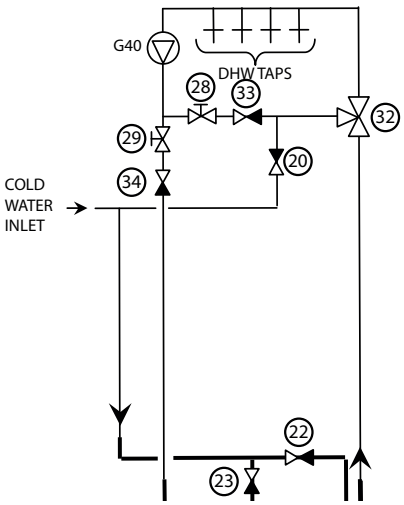
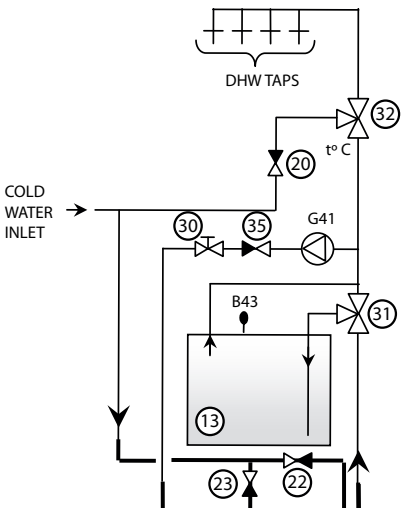


Figure 2 External DHW tank



15.3.5 CTC EcoZenith i550 Pro - Wood boiler

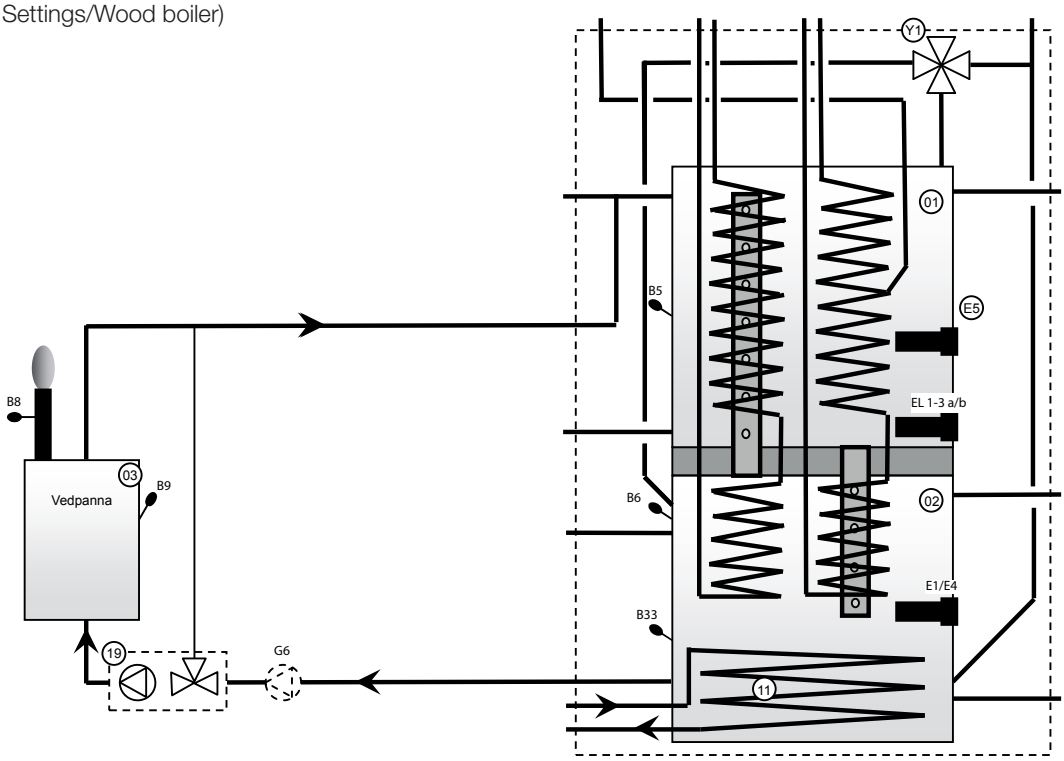
The upper and lower connections are used for connecting a wood boiler to the EcoZenith. This means that the flow from the wood boiler passes through the entire EcoZenith. The flue gas sensor (B8) signals to the EcoZenith's control system that the wood is burning. Charging from the wood boiler is controlled from the EcoZenith via a charge pump or by external charge equipment, such as Laddomat 21. The charge pump in the charge system must be controlled from the wood boiler.

See also Wood Boiler Menu in the Detail Description Menus chapter. (Installer/ Settings/Wood boiler)

15.3.5.1 Pump controlled by flue gas temperature

The pump (G6) is controlled by the temperature of the flue gas sensor (B8) and/ or boiler sensor (B9). The pump starts when the flue gas sensor (B8) and/or boiler sensor (B9) senses the set temperature for wood boiler/stove operation. The pump has no on/off delay, which means that if the water volume around the stove or boiler in question is excessive, the circulation may initially cool down the EcoZenith. If sensors (B8) and/or (B9) are installed, the EcoZenith can enter wood status. This is particularly important when the installation consists of both wood and solar heat, since this affects discharging to storage tanks.

See also Wood Boiler Menu in the Detail Description Menus chapter. (Installer/ Settings/Wood boiler)



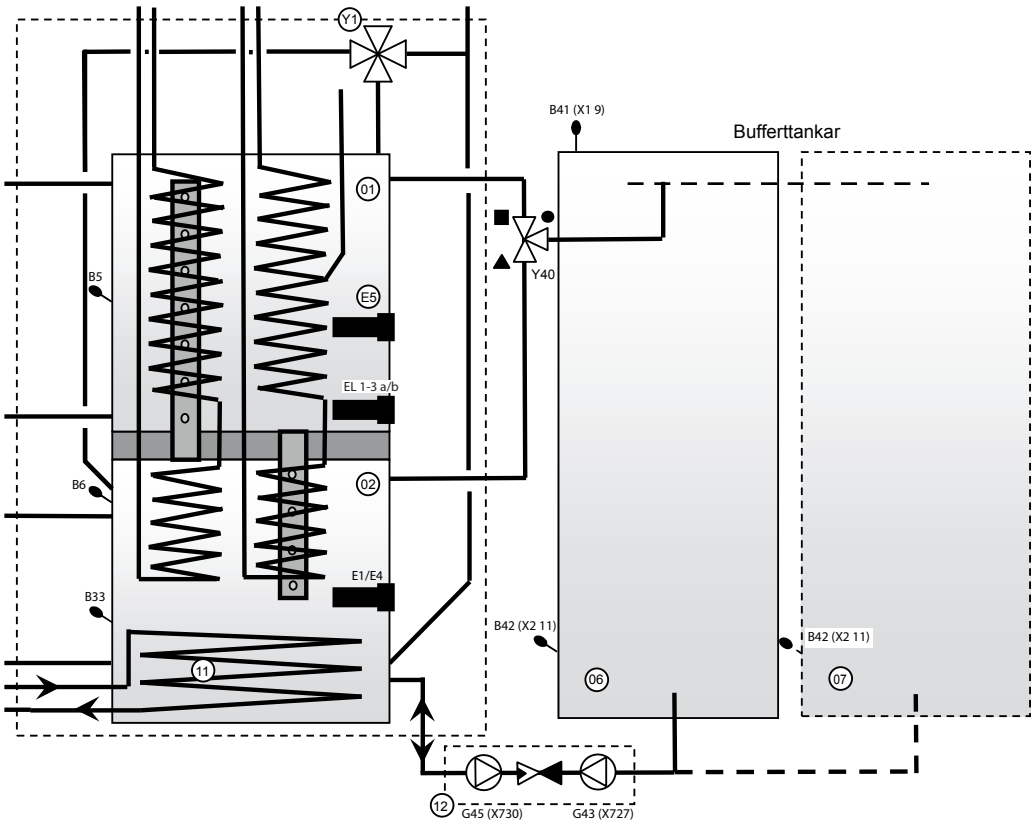
NB: Connecting with charge group (19) reduces the risk of condensation forming and corrosion in the hearth.

15.3.6 CTC EcoZenith i550 Pro - Storage tanks (buffer tanks)

One or more storage tanks can be connected to increase the water volume; this is done most commonly in connection with wood or solar energy operation.

The 3-way valve (Y40) is connected to the upper connection from both the EcoZenith's upper and lower tanks and then to the top of the first storage tank. Ensure that the ports on the diverting valve (Y40) are set as in the schematic diagram. If it is necessary to swap ports (■ and ▲), two jumpers in the actuator must be reconnected. See the chapter on Electrical installation for more information. If several storage tanks are used, they must be connected in series. The return from the storage tanks goes to the lower connection on the EcoZenith's lower tank via the charge equipment (12). The charge equipment and diverting valve are "External tank charging" accessories. The sensors (B41) and (B41) are used to control the charging and discharging of the storage tanks.

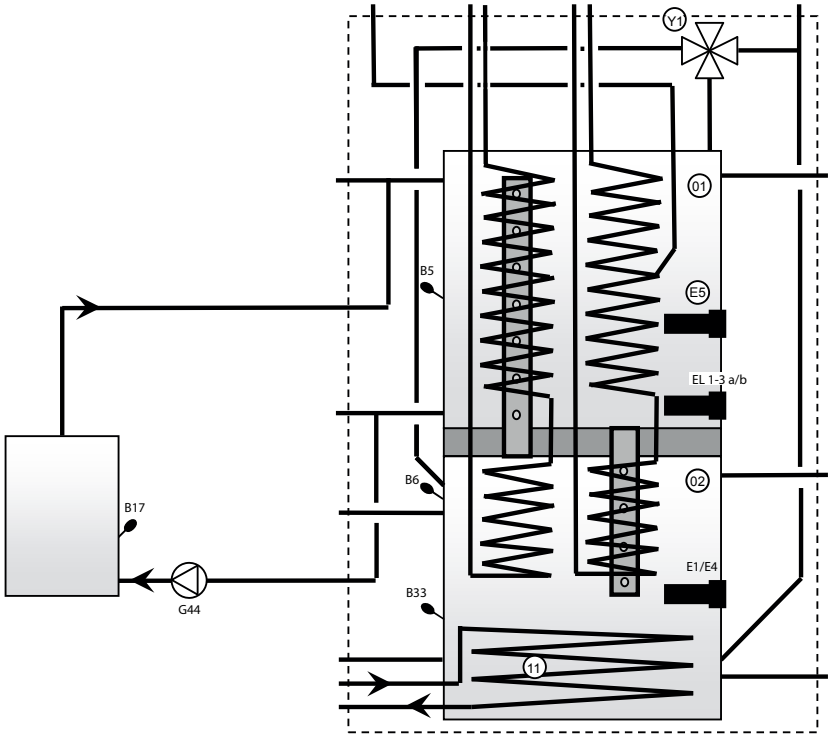
See also External buffer Menu in the Detail Description Menus chapter. (Installer/Settings/External buffer)



15.3.7 CTC EcoZenith i550 Pro - External boiler

An external boiler (oil, pellets, electric or gas) is connected to the EcoZenith's upper tank connections. Circulation is undertaken by the pump (G44), which is controlled by the EcoZenith. The sensor (B17) senses the boiler temperature in the external boiler.

See also External Boiler Menu in the Detail Description Menus chapter (Installer/Settings/Ext boiler).
For electrical connections see the Electrical installation and Installation of external boiler chapters.

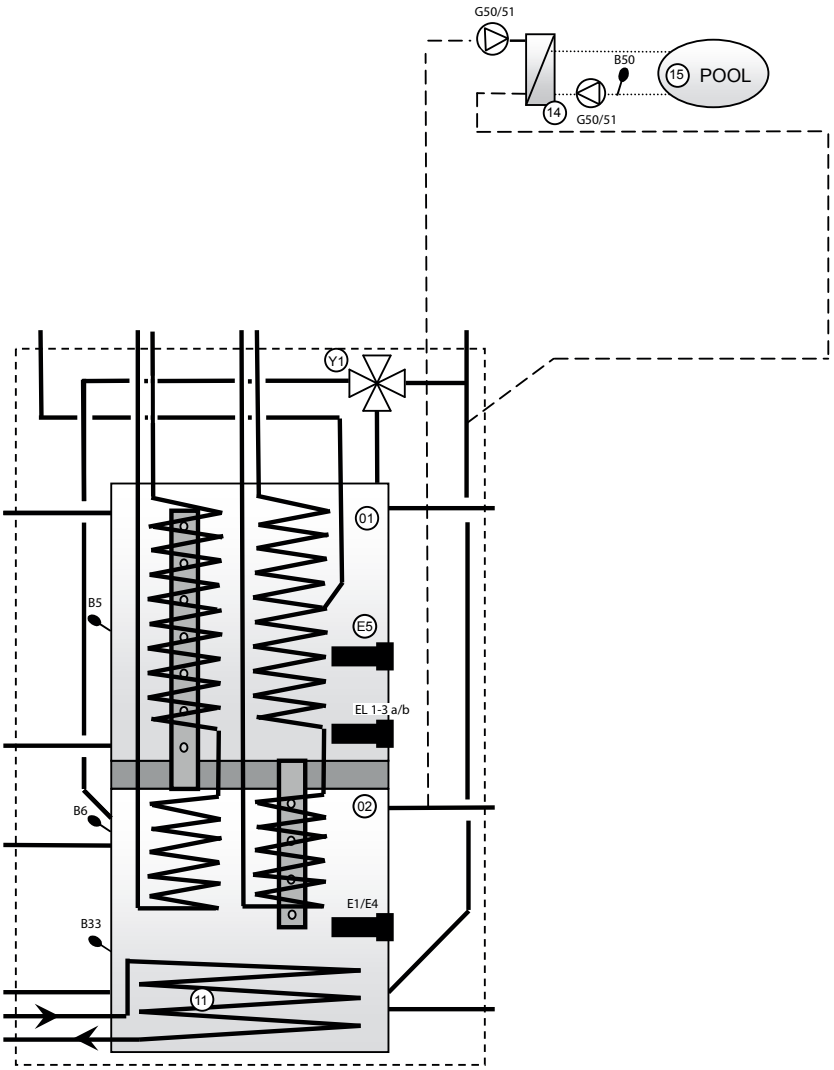


! NB: Connecting with charge group reduces the potential risk of condensation forming and corrosion in the hearth.

15.3.8 CTC EcoZenith i550 Pro - Pool

A pool is connected to the EcoZenith's lower tank. This means that the pool is heated by the same energy source as the radiator system prioritises, for example, heat pump or solar panel. One pump (G50/G51, at the top of the drawing) circulates radiator water from the upper connection on the EcoZenith's lower tank (02) to the pool heat exchanger (14), on to the radiator system's return pipe and back to the EcoZenith's lower tank. One pump (G50/G51, the lower one in the drawing) circulates pool water between the heat exchanger (14) and the pool (15). The sensor (B50) senses the pool temperature and starts the circulation pumps at the setpoint.

See also Pool Menu in the Detail Description Menus chapter (Installer/ Settings/Pool)



15.3.9 EcoZenith - CTC EcoComfort (Cooling)

CTC EcoComfort is an accessory which utilises the cool temperatures of the bore hole to create a cool indoor climate in summer. By connecting EcoComfort to the separate fan convectors, its water is cooled using the bedrock's cooler collector water. The heat in the house is supplied to the bore hole in the bedrock.

CTC EcoComfort comes supplied pre-connected from the factory and is easy to connect to the system.

The cooling function is controlled entirely from your EcoZenith where you can also perform your own settings as to when and how you want cooling to take place.

See also Cooling Menu in the Detail Description Menus chapter (Installer/ Define system/Cooling)

This type of cooling function is energy efficient, as only circulation pumps circulate the cool water. The capacity is however slightly lower compared to what is known as active cooling where the compressor, which requires more energy, is operated to generate cooling.

The system can be connected to separate fan convectors.

If separate fan convectors are connected, provided the system is insulated against condensation and there is a condensate collector in the fan convectors, much lower temperatures may be permitted.

See CTC EcoComfort manual for more information.

16. Electrical installation

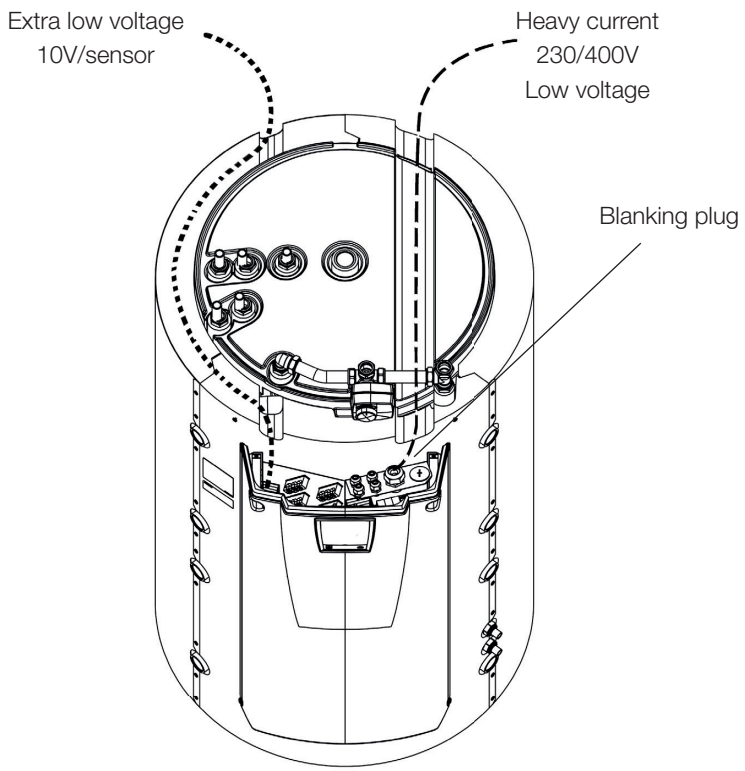
This chapter describes how the various electrical components are connected in line with the designations reproduced in schematic diagrams and wiring diagrams.

Installation and connection in the EcoZenith must be undertaken by an authorised electrician. All wiring must be installed according to applicable regulations. An omnipolar safety switch should be installed. The EcoZenith is factory set to (3 + 6) + (3 + 6) kW power output.
An additional 9 kW electric heater is available as an accessory. Electrical connections are made behind the product's front panel. Undo the screws on the front (4 screws), bend out and put the front to one side (disconnect any network cables on the front printed circuit card for easier access). The terminal blocks and the earth, neutral and phase terminals are located on the circuit card. Connection cables are inserted in the cable ducts on the unit's top cover, which exit at the same height as the bottom of the electrical connections box.

It is important to keep heavy current and extra low voltage cables apart in order to avoid interference problems; this applies outside the product also.

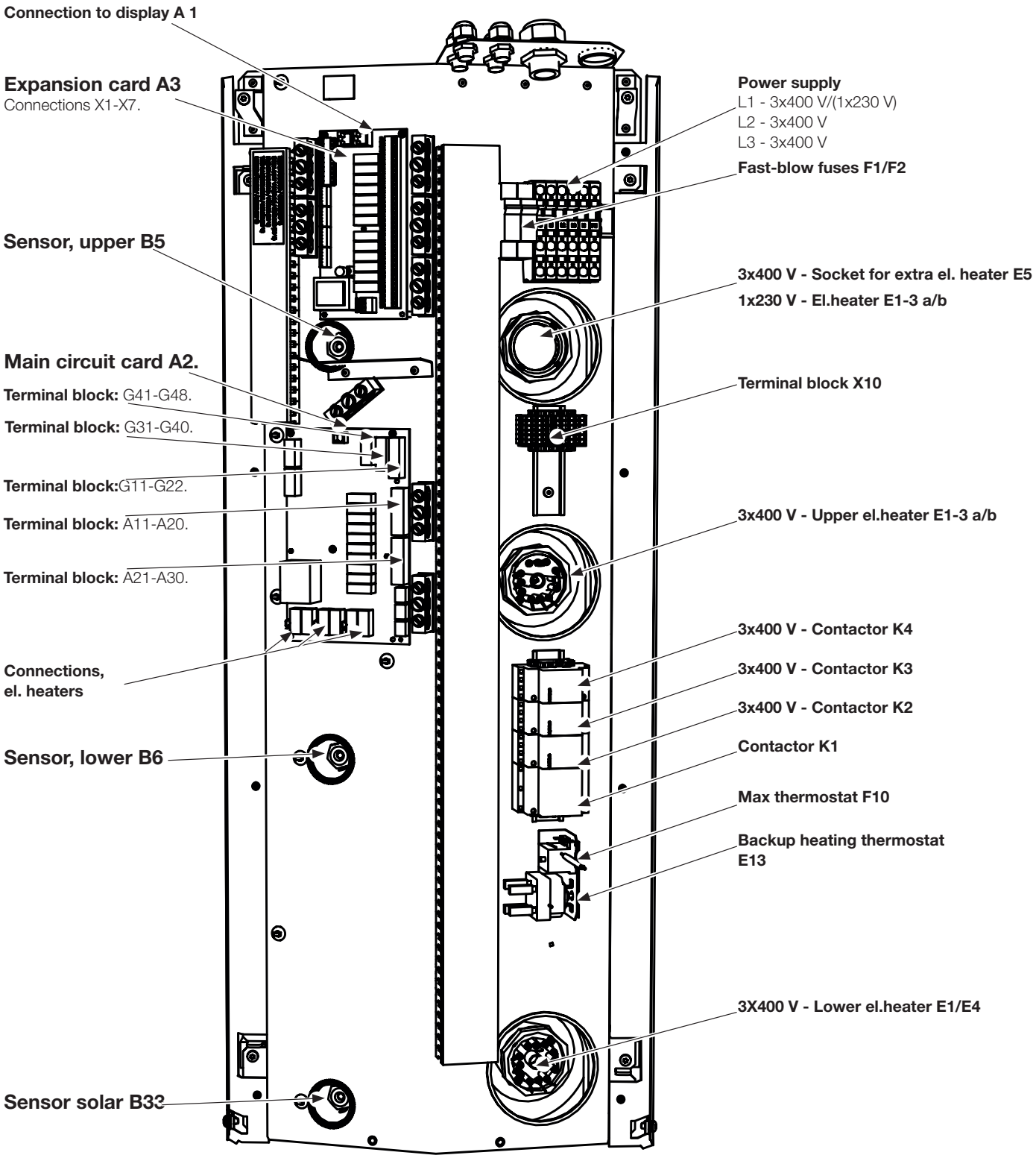
- Heavy current power cables must be routed in the cable duct in the insulation on the top of the unit and on the right side of the unit in the space between the side insulation and the top insulation (marked with broken lines).
- Extra low voltage cables are to be routed on the left side of the unit in the space between the side insulation and the top insulation (marked by a dotted line).

For higher currents and thicker cables, replace the blanking plug (see drawing) with an appropriate cable gland with strain relief.



! It is important to keep heavy current and extra low voltage cables apart in order to avoid interference problems; this applies outside the product also.

16.1 Positioning of electrical components



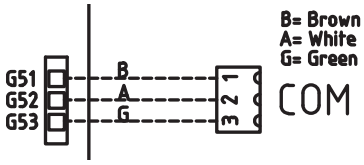
16.2 Safety switch

The installation should be preceded by a omnipolar safety switch (Category III), which ensures disconnection from all electric power sources.

16.3 Heat pump power supply

NB: The heat pump is powered separately.
Not from the CTC EcoZenith i550 Pro.

16.4 Communication between the EcoZenith and CTC EcoAir/CTC EcoPart



Detailed illustration from wiring diagram

The communication cable used is an LiYCY (TP) which is 4-conductor shielded cable, where the communication-bearing conductors are of twisted pair type. This should be installed between the terminal blocks in the EcoZenith: G51 (Brown), G52 (White), G53 (Green) and heat pump A1, from which the other heat pumps can be connected in series.

16.5 Low voltage 230V /400V (Heavy current)

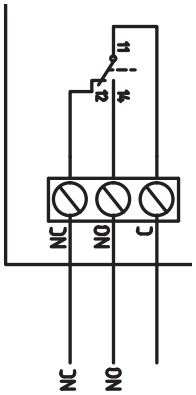
Supply

400 V 3N ~ 50 Hz and protective earth
The size of the group fuse is given in the Technical data chapter in the section for the property owner.
Connected to the blocks marked L1, L2, L3, N, PE

Max thermostat

If the heat pump has been stored in an extremely cold place, the max thermostat may have been triggered. It is reset by pressing in the button on the thermostat behind the front panel.
Always check on installation that the max thermostat has not tripped.

Alarm 1-pole alternating relay (Output for alarm to an external unit)



230 V 1N ~
Connected to the circuit card:
ALARM
NC
NO

(G1) Circulation pump, radiator system 1

230V 1N ~

Connected on the circuit card/ block:

Phase:	pole A31
Zero:	pole A33
Earth:	pole PE

Check that the pump is correctly connected by test running it in menu *Installer/ Service/Function test* in the control system.

(G2) Circulation pump, radiator system 2

230V 1N ~

Connected on the circuit card/ block:

Phase:	pole A36
Zero:	pole A34
Earth:	pole PE

Check that the pump is correctly connected by test running it in menu *Installer/ Service/Function test* in the control system.

(G3) Circulation pump, radiator system 3 / Alternatively circulation pump for CTC EcoComfort (Cooling), accessory

230V 1N ~

Connected to the expansion card X6/terminal block:

Phase:	X6 pole 15
Zero:	X6 pole 17
Earth:	X6 pole 16

Check that the pump is correctly connected by test running it in menu *Installer/ Service/Function test* in the control system.

(G6) Circulation pump, flue gas controlled

230V 1N ~

Connected to the expansion card X7/terminal block:

Phase:	X7 pole 21
Zero:	X7 pole 23
Earth:	X7 pole 22

Check that the pump is correctly connected by test running it in menu *Installer/ Service/Function test* in the control system.

(G11, G12, G13) Charge pumps, VPA1, VPA2 and VP A3

230 V 1N~

The charge pumps can be controlled by the EcoZenith.

The charge pumps can be connected to the circuit card/terminal block:

(G11) Charge pump 1

WILO Stratos Para

GRUNDFOS UPM GEO 25-85

Relay output 8 A		A12
PWM+:	brown	G46
GND:	blue	G45

(G12) Charge pump 2

WILO Stratos Para

GRUNDFOS UPM GEO 25-85

Powered separately		
PWM+:	brown	G48
GND:	blue	G47

(G13) Charge pump 3

WILO Stratos Para

GRUNDFOS UPM GEO 25-85

Powered separately		
PWM+:	brown	G75
GND:	blue	G76

Check that the pump is correctly connected by test running it in menu *"Installer/Service/Function test"* in the control system.

(G30, G32) Solar pumps

The solar PWM pumps (G30 and G32) of model WILO Stratos PARA differ from the other PWM pumps. If the PWM control signal is interrupted, the solar pumps stop, whereas the other PWM pumps work at 100% power if the signal is interrupted.

(G30) Circulation pump, solar collector - Wilo Stratos Para

230 V 1N~

The circulation pump is connected to the following terminal blocks:

(G30) Circulation pump, expansion card X5:

Note the cable colours!

PWM+:	white	X5 pole 1
GND:	brown	X5 pole 2

Check the function by test running the pump in menu *"Installer/Service/ Function test"* in the control system.

(G30) Circulation pump, solar collector - Grundfos UPM3 Solar

230 V 1N~

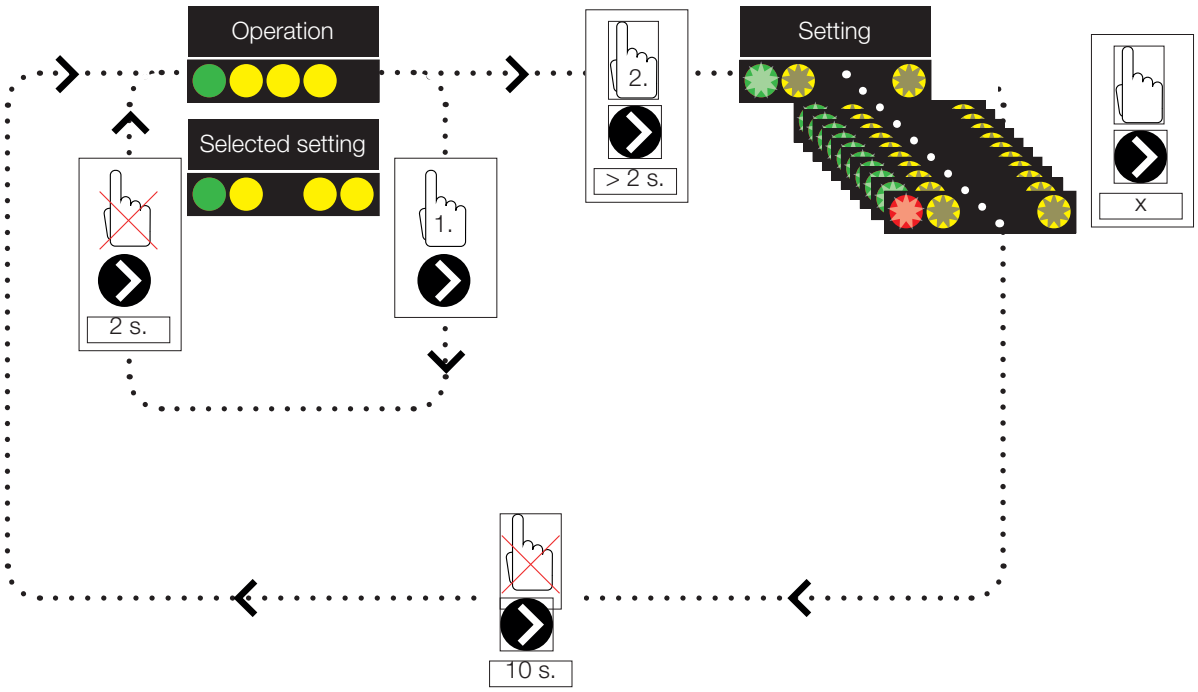
The circulation pump is connected to the following terminal blocks:

(G30) Circulation pump, expansion card X5:

Note the cable colours!

PWM+:	brown	X5 pole 1
GND:	blue	X5 pole 2

Check the function by test running the pump in menu *"Installer/Service/ Function test"* in the control system.



1. Briefly press the circulation pump arrow to show the operating mode to which the pump is set. After 2 seconds, the operational information screen will be displayed again.

2. Pressing the circulation pump arrow for 2 seconds will cause the LEDs to flash and the mode setting can then be changed. Press repeatedly until the desired mode flashes. After 10 seconds, the operational information screen will be displayed again.

Operation:

	Standby (flashing)
	0% - P1 - 25%
	25% - P2 - 50%
	50% - P3 - 75%
	75% - P4 - 100%

Selecting mode setting

Control Mode	Mode	xx-75	xx-105	xx-145	
Constant Curve		4.5 m	4.5 m	6.5 m	
Constant Curve		4.5 m	5.5 m	8.5 m	
Constant Curve		6.5 m	8.5 m	10.5 m	
Constant Curve		7.5 m	10.5 m	14.5 m	

Control Mode	Mode	xx-75	xx-105	xx-145	
PWM C Profile					
PWM C Profile					
PWM C Profile					
PWM C Profile					

Alarminfo:

	Blocked
	Supply voltage low
	Electrical error

(G32) Circulation pump, plate heat exchanger – solar energy - Wilo Stratos Para

230 V 1N~
The heat exchanger pump is connected to the following terminal blocks:
(G32) Pump, expansion card X5:
Note the cable colours!

PWM+:	white	X5 pole 3
GND:	brown	X5 pole 4

Check the function by test running the pump in menu *"Installer/Service/ Function test"* in the control system.

Solar recharging borehole, charge pump (G31)

230V 1N~

Phase:	X6 pole 8
Zero:	X6 pole 11
Earth	X6 pole 10

Pole 8 is connected to an external connection box which distributes voltage to the solar diverting valve (Y31) and the Recharge Bore Hole charge pump (G31). Refer to the wiring diagram.

Check the function by test running the pump in menu *"Installer/Service/ Function test"* in the control system.

Solar recharging borehole, diverting valve solar (Y31)

230V 1N~
NB: It is important to connect the phase voltage to L (pole 9); refer to the wiring diagram.
The diverting valve is connected to the following terminal blocks:
(Y31) Diverting valve, expansion card X6:

Relay output 8 A:	Open to bore hole	X6 pole 8	also controls Charge pump – recharging bore hole (G31)
Phase:	Open Tank	X6 pole 9	
Zero:		X6 pole 11	

Valve 582581001 (see image) must only be connected with relay output, X6 pole 8 and neutral, X6 pole 11.

582581001 22 3/4"

Pole 8 is connected to an external connection box which distributes voltage to the solar diverting valve (Y31) and the Recharge Bore Hole charge pump (G31). Refer to the wiring diagram.

Check functionality by test running the valve under the Installer/Service/ Function Test menu in the control system.

(G40) Circulation pump for DHW

230 V 1N~

The circulation pump is connected to the following terminal blocks: (G40) Circulation pump, expansion card X6:

Phase:	X6 pole 1
Zero:	X6 pole 3
Earth:	X6 pole 2

Check that the pump is correctly connected by test running it in menu *"Installer/Service/Function test"* in the control system.

(G41) Circulation pump external DHW tank

230 V 1N~

The pump is connected to the following terminal blocks:
(G41) Charge pump, expansion card (X7):

Phase:	X7 pole 19
Zero:	X7 pole 20
Earth:	X7 pole 22

Check that the pump is correctly connected by test running it in menu *"Installer/Service/Function test"* in the control system.

(G43) Circulation pump, external storage tank charging

230 V 1N~

The circulation pump is connected to the following terminal blocks: (G43) circulation pump, expansion card X7:

Phase:	X7 pole 27
Zero:	X7 pole 29
Earth:	X7 pole 28

Check that the pump is correctly connected by test running it in menu *"Installer/Service/Function test"* in the control system.

(G45) Circulation pump, external storage tank discharging

230 V 1N~

The circulation pump is connected to the following terminal blocks: (G43) circulation pump, expansion card X7:

Phase:	X7 pole 30
Zero:	X7 pole 32
Earth:	X7 pole 31

Check that the pump is correctly connected by test running it in menu *"Installer/Service/Function test"* in the control system.

(G44) Circulation pump, external boiler

230 V 1N~

The circulation pump is connected to the following terminal blocks: (G44) Circulation pump, expansion card X7:

Zero:	X7 pole 26
Relay output	X7 pole 24

Check that the pump is correctly connected by test running it in menu *"Installer/Service/Function test"* in the control system.

(G50) and (G51) Circulation pumps, pool

230 V 1N~

Both pumps (G50) & (G51) are connected to the following terminal blocks:

Pumps pool (G50) and (G51), expansion card X7:

Phase:	pole 33
Zero:	pole 35
Earth:	pole 34

Pole 33 is connected to an external connection box which distributes voltage to the charge pump (G50) and circulation pump (G51).

Check the function by test running the pump in menu *"Installer/Service/Function test"* in the control system.

(Y1) Mixing valve, bivalent, radiator system 1

230V 1N ~.

1.5 m cable 1.5 mm², neutral, open, close.

Connected on the circuit card/block:

Black cable	Open:	pole A27
Brown cable	Close:	pole A28
Blue cable	Zero:	pole A29
Red cable	Limit position:	pole A22
White cable	Limit position:	pole A21

Check that the open and close signals are correctly connected by testing the motor in menu *"Installer/Service/Function test"* in the control system.

(Y2, Y3) Mixing valves, radiator systems 2-3. (Y3) Optional mixing valve for CTC EcoComfort (cooling).

230V 1N~

1.5 m cable 1.5 mm², neutral, open, close.

The mixing valve motors are connected to the PCB/terminal block.

(Y2) Mixing valve 2

Open:	pole A15
Close:	pole A16
Zero:	pole A17

(Y3) Mixing valve 3 / Optional Mixing valve 2 in CTC EcoComfort.

Expansion card X6

Open:	X6 pole 12
Close:	X6 pole 13
Zero:	X6 pole 14

Check that the open and close signals are correctly connected by testing the motor in menu *"Installer/Service/Function test"* in the control system.

(Y21) Diverting valves, DHW

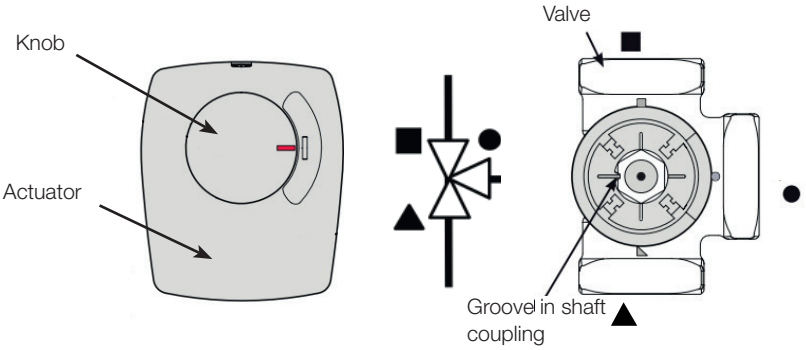
230 V 1N~.
2.5 m cable 1.5 mm²
When relay output A18 is supplied with power, flow should be to the upper tank for hot water charging. When it is not supplied with power, flow should be to the lower tank
The diverting valves are connected to the following terminal blocks:
(Y21) Diverting valves, DHW

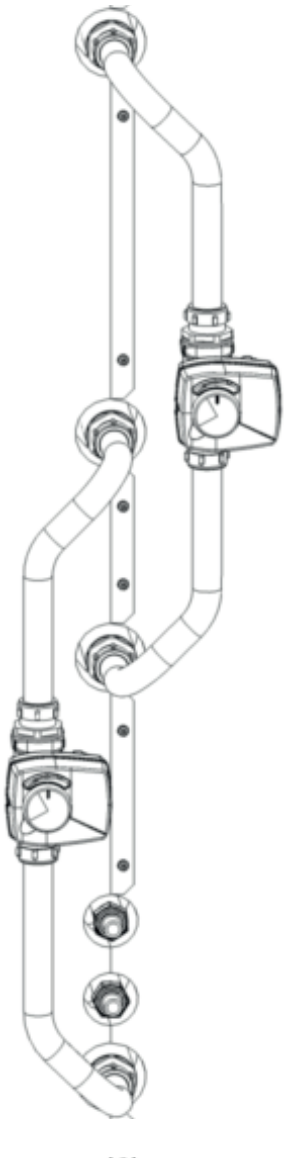
Relay output (black):	pole A18
Phase (brown):	pole A19
Neutral (blue):	pole A20

Check the function by test running the diverting valve in menu *"Installer/ Service/Function test"* in the control system.

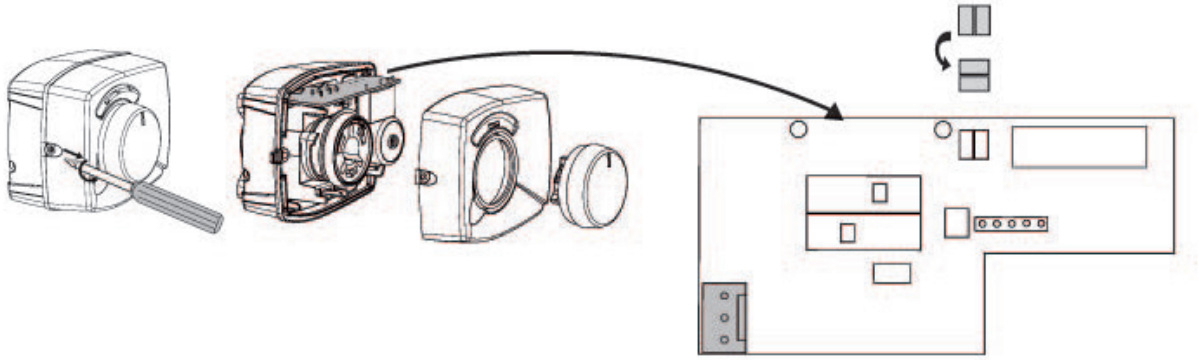
In the "DOWN" position on the function menu, port ▲ should be open (turn the knob on the motor clockwise, CW). In the "UP" position, port ■ should be open (turn the knob on the motor counterclockwise, CCW).
The motor is fitted to the diverting valve by a screw. To unfasten the motor: remove the knob by pulling it off, unfasten the screw and remove the motor. To prevent faults, turn the actuator and diverting valve to the starting position for fitting as shown in the figures. Pull out the knob on the actuator and turn to the central position.

Port ● should be completely open; ports ■ and ▲ should be partially open. Ensure that the groove in the white shaft coupling is in position as shown in the figure. The diverting valve and actuator can then be fitted together as shown in the figure, or turned in 90-degree steps relative to each other.



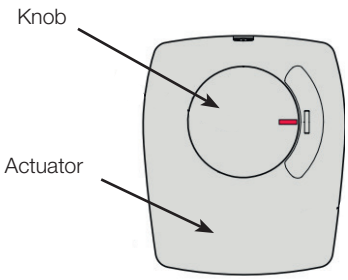


If ports ▲ and ■ have been shifted during the hydraulics connection, the motor can be reconnected to change its direction of rotation. This is done using two jumpers inside the motor. **NOTE: the direction of rotation cannot be changed by swapping the black and brown cables.**



(Y40) Diverting valve external storage tank

230 V 1N~.
2.5 m cable 1.5 mm²
The diverting valve is connected to the following terminal blocks: (Y40) diverting valve, expansion card X6:

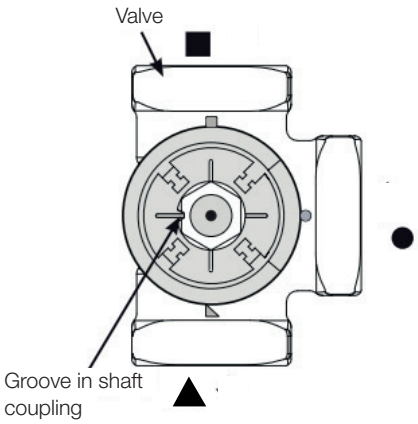


(Y40) Diverting valve, charging/discharging buffer storage

Relay output (black):	X6 pole 4
Phase (brown):	X6 pole 5
Neutral (blue):	X6 pole 7

Check the function by test running the diverting valve in menu *"Installer/ Service/Function test"* in the control system.

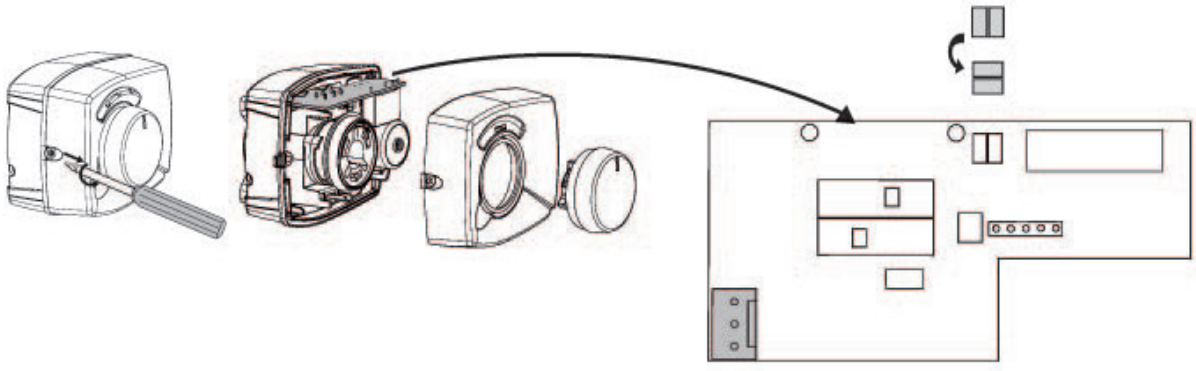
In the "DOWN" position on the function menu, port ▲ should be open (turn the knob on the motor clockwise, CW). In the "UP" position, port ■ should be open (turn the knob on the motor counterclockwise, CCW).
The motor is fitted to the diverting valve by a screw. To unfasten the motor: remove the knob by pulling it off, unfasten the screw and remove the motor. To prevent faults, turn the actuator and diverting valve to the starting position for fitting as shown in the figures. Pull out the knob on the actuator and turn to the central position.



Port ● should be completely open; ports ■ and ▲ should be partially open. Ensure that the groove in the white shaft coupling is in position as shown in the figure. The diverting valve and actuator can then be fitted together as shown in the figure, or turned in 90-degree steps relative to each other.

If ports ▲ and ■ have been shifted during the hydraulics connection, the motor can be reconnected to change its direction of rotation. This is done using two jumpers inside the motor.

NOTE: the direction of rotation is not changed by shifting the black and brown cables.



16.6 Sensor (Safety Extra-Low Voltage (SELV))

The sensors that form part of each system solution should be fitted to the circuit card/terminal block as follows: All sensors are temperature sensors.

Room sensors (B11, B12, B13)
(B13) Optional room sensor for CTC EcoComfort (Cooling).

Room sensors should be installed at head height in open areas of the property with good air flow and where a representative temperature can be expected (not close to sources of heat or cold). If you are unsure of where to place a sensor, hang it by a loose cable and test different positions.

Connection: 3-conductor cable, min. 0.5 mm², between sensor and control box. The cables are connected as shown in the table above.

On start-up, an alarm is given if the sensor is incorrectly connected. Test the alarm sensor LED by testing the function in menu *Installer/Service/Function test*.

In the control system you can select whether or not to have the room sensor operational. If the room sensor is deselected, the heating level is controlled by the outdoor sensor/primary flow sensor. The alarm lamp on the room sensor still functions as normal. A room sensor does not, however, need to be installed if the function is deselected.

Room sensor cable connection:

(B11) Room sensor 1

block no.	G17	alarm output
block no.	G18	GND
block no.	G19	input

(B12) Room sensor 2
Optional room sensor for CTC EcoComfort (cooling), accessory.

block no.	G20	alarm output
block no.	G21	GND
block no.	G22	input

(B13) Room sensor 3, expansion card X4

block no.	19	alarm output
block no.	20	input
block no.	21	GND

Outdoor sensor (B15)

The outdoor sensor should be fitted to the outer wall of the house, preferably in a north-northeastern or north-northwestern direction. The sensor should be placed out of direct sunlight. However, where this is difficult to achieve it can also be shielded from the sun by a screen. Remember that the sun rises and sets at different points at different times of the year.

The sensor should be placed about three-quarters of the way up the wall so that it senses the correct outdoor temperature and so that it is not affected by a heat source such as a window, infra-heating, air ventilation outlet, etc.

Connection: 2-conductor cable (min. 0.5 mm²) between the sensor and control box.
The sensor is connected to terminal blocks G11 and G12 of the control module. Connect to the outdoor sensor at the arrows.

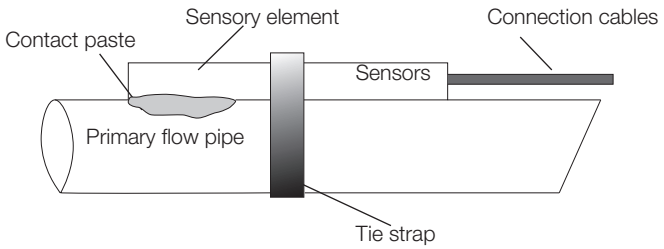
NB: Strip the wire ends and fold them double if light cable is used.
It is important that the contact in the connections is good.

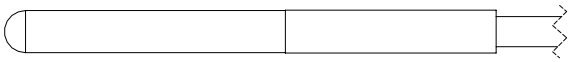
16.6.1 Sensor connection

Mount the sensor on the pipe. The sensing part is towards the end of the sensor.

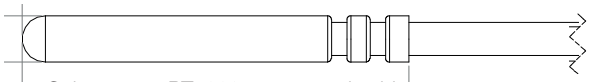
- Attach the sensor using the tie strap provided.
- Ensure that the sensor makes good contact with the pipe.
- **NOTE:** Apply contact paste to the end part of the sensor between the sensor and the pipe to ensure good contact.
- **NOTE:** Insulate the sensor using pipe insulation, for example. This prevents the measurement from being affected by the ambient temperature.
- Connect the cables to the CTC EcoLogic's connection block. If the cable is too short, join extra length to it.

Insulate the sensor using pipe insulation, for example. Do not attach the sensor cable permanently until you have tested where the best location is.





Sensor NTC 22k, white cable



Solar sensor PT1000, grey or red cable

Primary flow sensor (B1, B2, B3). (B3) Optional primary flow sensor for CTC EcoComfort (cooling).

The sensors sense the outgoing temperature to the radiators.
Secure the primary flow sensor to the pipe using straps or similar. Most important is the position of the tip of the sensor as this is the part that detects the temperature. The sensor must be insulated to prevent the ambient temperature from affecting the measurement. For optimum function, use contact paste.

(B1) Sensor, primary flow to radiator system 1
Position: on the primary flow to heating system 1.
The sensor is connected to the PCB in positions G13 and G14.
Sensor type: NTC 22k

(B2) Sensor, primary flow to radiator system 2. Optional primary flow sensor for CTC EcoComfort (cooling), accessory.

Position: on the primary flow to heating system 2 after radiator pump G2. For cooling, on the primary flow
The sensor is connected to the circuit card in positions G15 and G16.
Sensor type: NTC 22k

(B3) Sensor, primary flow to radiator system 3

Position: on the primary flow to heating system 3 after radiator pump G3.
The sensor is connected to expansion card X3 in positions 13 and 14.
Sensor type: NTC 22k

Other sensors

(B5) Sensor, upper tank(factory fitted)

Placement: in the tank's uppermost sensor pipe.
The sensor is connected to the circuit card in positions G63 and G64
Sensor type: NTC 22k

(B6) Sensor, lower tank(factory fitted)

Placement: in the tank's middle sensor pipe.
The sensor is connected to the circuit card in positions G65 and G66
Sensor type: NTC 22k

(B7) Return sensor heating system

Position: on the return pipe from the heating system.
The sensor is connected to the PCB in positions G31 and G32.
Sensor type: NTC 22k

(B8) Flue gas sensor

Position: in a sensor pipe or on the flue gas jacket surface on the wood boiler.
The sensor is connected to the PCB in positions G35 and G36.
Sensor type: NTC 3.3k

(B9) Sensor, wood boiler

Position: in a sensor pipe or jacket surface on the wood boiler.
The sensor is connected to the PCB in positions G61 and G62.
Sensor type: NTC 22k

(B17) Sensor external boiler

Position: in a sensor pipe or jacket surface on the boiler.
The sensor is connected to the PCB in positions G71 and G72.
Sensor type: NTC 22k

(B30) Sensor in to solar panels

Position: on the return pipe into the solar panels.
The sensor is connected to expansion card X1 in positions 3 and 4.
Sensor type: PT1000

(B31) Sensor, primary flow solar collector

Position: on the pipe out from the solar collectors, as close to the solar collector as possible, or in a sensor pipe or similar in the solar collector.
The sensor is connected to expansion card X1 in positions 1 and 2.
Sensor type: PT1000, red cable (>150°C)

(B32) Sensor, solar energy charging

Position: on the pipe exiting the solar heat exchanger
The sensor is connected to the circuit card in positions X1 5 and X1 6
Sensor type: PT1000, grey cable

(B33) Sensor, solar coil (factory fitted)

Placement: in the tank's lowest sensor pipe.
The sensor is connected to the circuit card in positions G67 and G68
Sensor type: NTC 22k

(B41) Sensor, external storage tank upper

Position: in the sensor pipe or jacket surface on the upper part of the tank
The sensor is connected to the circuit card in positions X3 9 and X3 10
Sensor type: NTC 22k

(B42) Sensor, external storage tank lower

Position: in the sensor pipe or jacket surface on the upper part of the tank
The sensor is connected to the circuit card in positions X3 11 and X3 12
Sensor type: NTC 22k

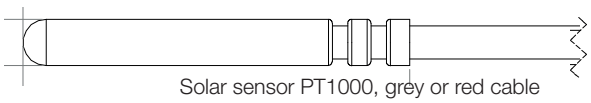
(B43) Sensor, external DHW tank

Position: in the sensor pipe or jacket surface on the external DHW tank
The sensor is connected to the circuit card in positions X2 7 and X2 8
Sensor type: NTC 22k

(B50) Sensor, pool

Position: on the return pipe between the pool pump and pool.
The sensor is connected to expansion card X3 in positions 15 and 16.
Sensor type: NTC 22k

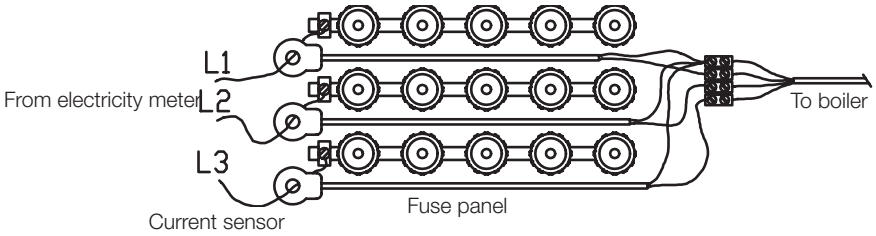
Sensor NTC 22k, white cable



Solar sensor PT1000, grey or red cable

16.7 Current sensor connection

The three current sensors, one for each phase, are fitted on the fuse panel in the following manner.
Each phase from the electricity distribution board supplying the EcoHeat is channelled through a current sensor before termination at the relevant terminal. Then connect to the boiler based on the terminal board diagram. This allows the phase current to be sensed all the time and compared with the value set for the heat pump's load switch. If the current is higher, the control unit drops to a lower heat output. If it is still too high, further reduction in output takes place. When the current has dropped below the set value again, the output will increase.
This means that the current sensors, along with the electronics, prevent more power being supplied than the main fuses can tolerate. The current sensors' holes for cables are 11 mm in diameter.



16.8 Settings made by the installation electrician.

The following settings shall be made by the installation electrician after installation:

- Select main fuse size
- Select effect limitation
- Check room sensor connection
- Check that the sensors connected indicate reasonable values.
- Carry out the following checks:

Check room sensor connection

1. Scroll down and select the option *LED room sensor* in menu *"Installer/ Service/Function test/Heating circuit"*.
2. Select "On". Check that the room sensor LED lights up. If not, check the cables and connection.
3. Select "Off". If the LED goes off, the check is complete.

Check connected sensors

If any sensor is incorrectly connected, a message will appear on the display, e.g. "Alarm sensor out". If several sensors are incorrectly connected, the different alarms are displayed on different rows. If no alarm is displayed, the sensors are connected correctly. Note the the alarm function of the room sensor (LED) cannot be detected on the display. It must be checked on the room sensor. The current sensor connection has no alarm, but the current value can be read in the "Operation data" menu.

16.9 Installing a backup power supply

The DIP switch on the PCB is used to set the backup power supply. The DIP switch is marked "RESERV" (BACKUP).

When the switch is set to ON, the step is actively operating in backup heating mode.

3x400 V

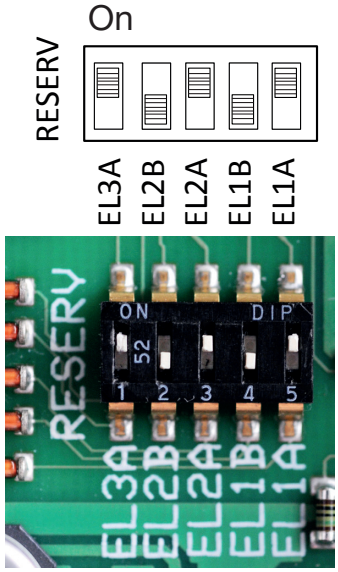
Switch	5	4	3	2	1
Phase	L3	L2	L2	L1	L1
Current	10 A	10 A	2.6 A	10 A	1.3 A
Power	1.2 kW	2.3 kW	0.6 kW	2.3 kW	0.3 kW

1x230 V

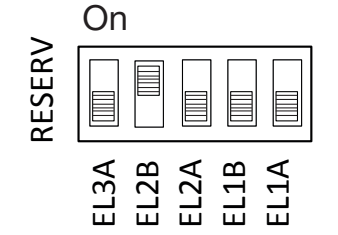
Switch	-	4	3	2	1
Phase	-	L2	L2	L1	L1
Current	-	8.7 A	8.7 A	8.7 A	13 A
Power	-	2.0 kW	2.0 kW	2.0 kW	3.0 kW

3x230V

Switch	5	4	3	2	1
Phas	-	L2-L3	L2-L3	L1-L3	L1-L3
Current	-	9.3 A	5.6 A	9.3 A	5.6 A
Power	-	2.3 kW	1.2 kW	2.3 kW	1.2 kW



Factory settings 3X400



Factory settings 1x230 and 3x230

17. Installation of optional immersion heater

The CTC EcoZenith i550 Pro has two 9 kW immersion heaters, both factory installed. A third 9 kW immersion heater can also be installed thus giving total installed heating power of 27 kW. The third immersion heater is a CTC accessory and is connected as follows:

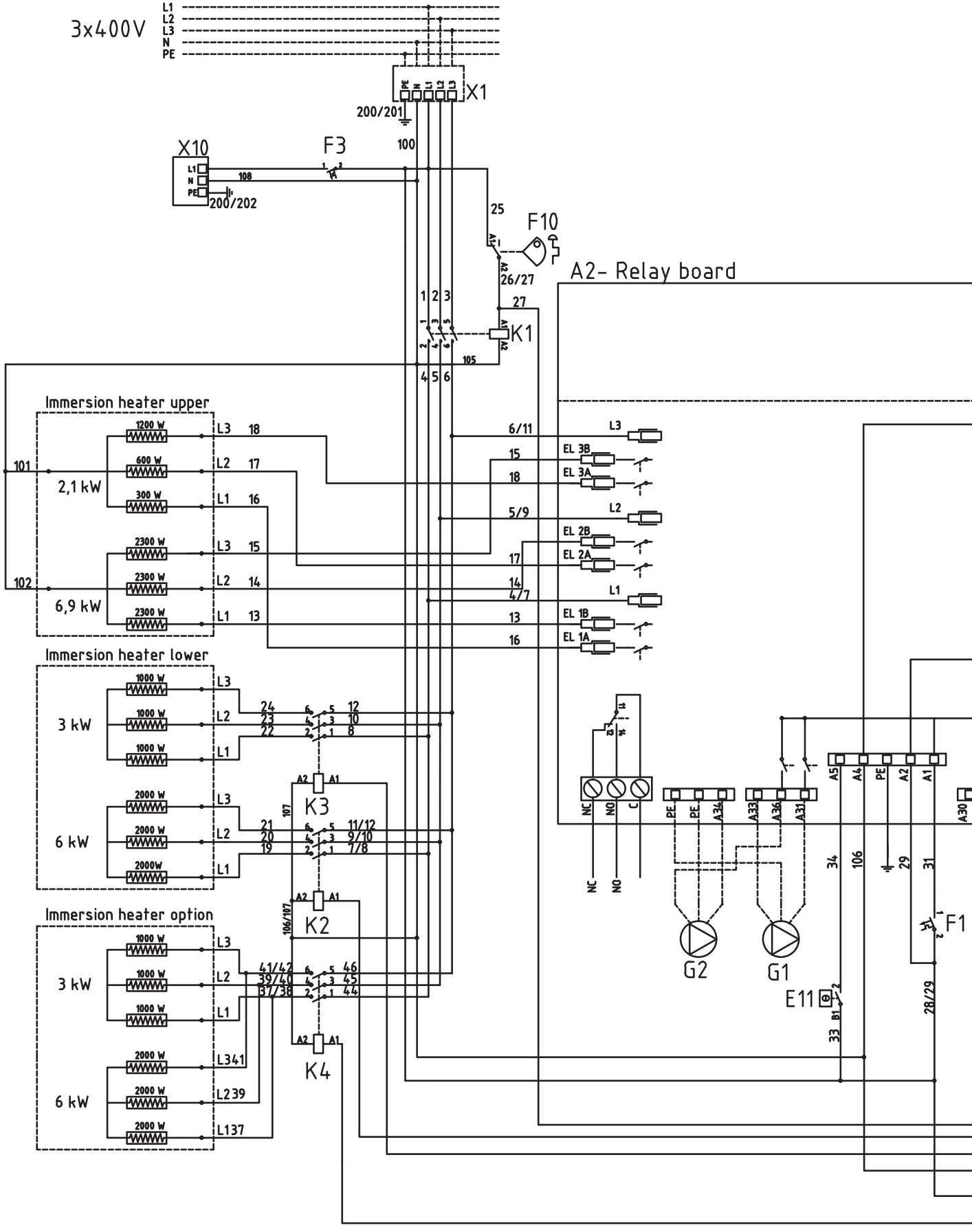
1. Disconnect the electrical supply to the EcoZenith.
2. Drain the EcoZenith of water if required.
3. Remove the four screws holding the plastic front, two at the top and two at the bottom, and then remove the plastic front. Ensure that the display cable is disconnected before removing the front completely. The cable is disconnected by pressing in the pin on the connector and pulling the cable downwards.
4. Remove the 2” plug from where the upper immersion heater (15) shall be installed.
5. Install the immersion heater using a new, greased flat gasket. Recommended tightening torque - 220 Nm.
6. The cabling for the heater is coiled and strapped. Remove the strapping and connect the white cables marked 6 kW to the brown end cable sleeve on the heater, and connect the black cables marked 3 kW to the black end cable sleeve on the heater.
7. Fill the EcoZenith with water and ensure that there are no leaks.
8. Fit the front.
9. Switch on the electricity supply.
10. Define the immersion heater in the menu Installer/Define system/Def El. heaters/upper el.heater 15
11. Test the immersion heater connections in the menu Installer/Service/Function test/Test el.heaters
12. Set immersion heater operation in the menu Installer/Settings/Electric heaters
13. The upper immersion heater (15) is now ready for use.

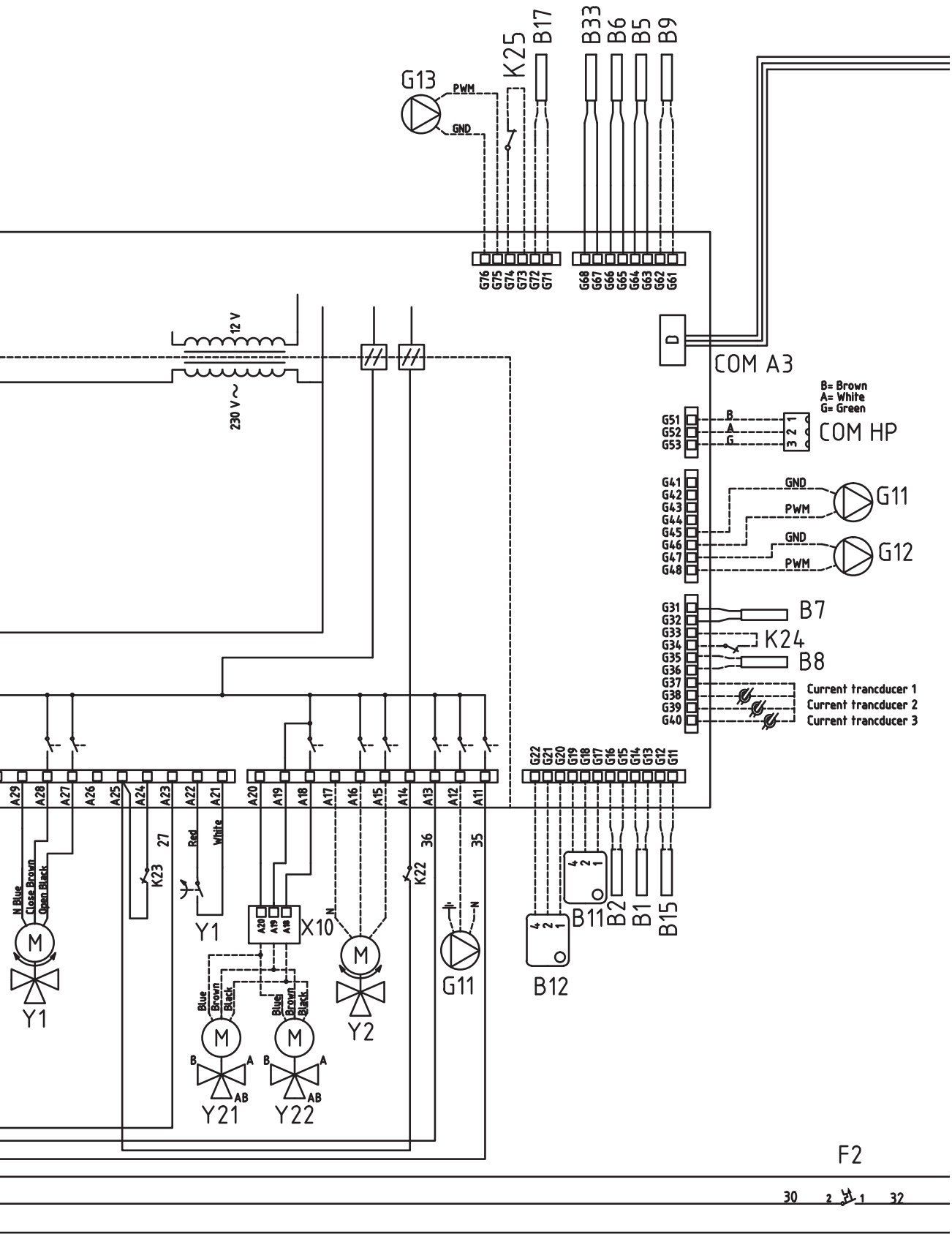
18. Installation of additional boiler

The CTC EcoZenith i550 Pro is able to control either a third immersion heater or an external additional boiler. Under no circumstance may these be connected at the same time. To connect an additional boiler, the electrical reconnection must be undertaken in the EcoZenith's wiring. Please note that all electrical reconnection and installation in the EcoZenith must be performed by an authorised electrician. All wiring must be installed according to applicable regulations.

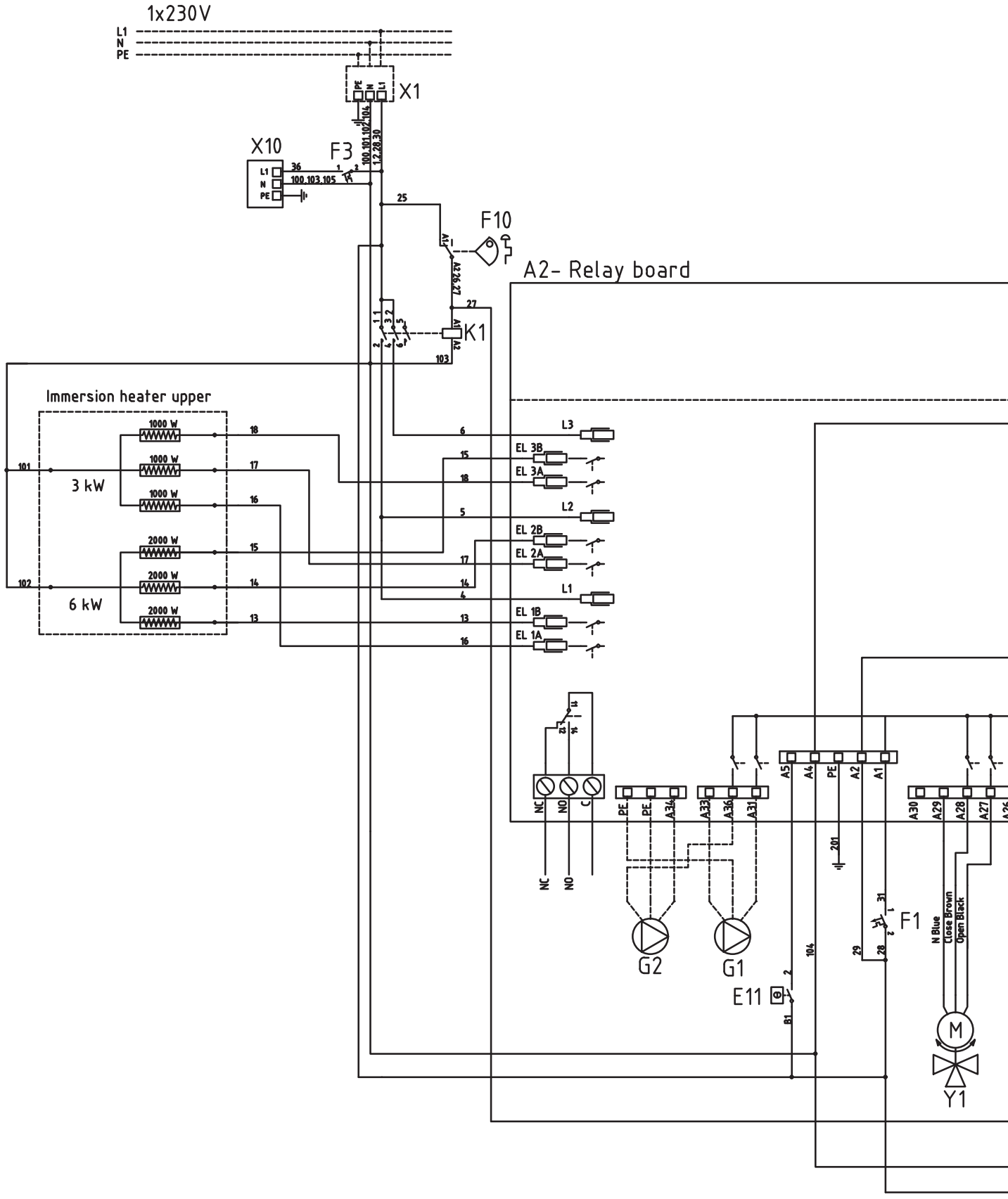
1. Disconnect the electrical supply to the EcoZenith.
2. Make the hydraulic connections for the additional boiler and pump.
3. Remove the four screws holding the plastic front, two at the top and two at the bottom, and then remove the plastic front. Ensure that the display cable is disconnected before removing the front completely. The cable is disconnected by pressing in the pin on the connector and pulling the cable downwards.
4. Make the electrical connections for the pump and sensor as indicated in the wiring diagram.
5. Disconnect the cable from output X7 18. Make sure the cable cannot possibly come into contact with live parts and thereby cause a fault. The cable end must be provided with an end cap or similar anti-touch blanking, or else the cable can be completely removed.
6. Connect a relay for starting the additional boiler to output X7 18. Refer to the wiring diagram for details.
7. Fit the front.
8. Switch on the electricity supply.
9. Define the additional boiler in the Installer/External boiler menu
10. The additional boiler (04) is now ready for use.

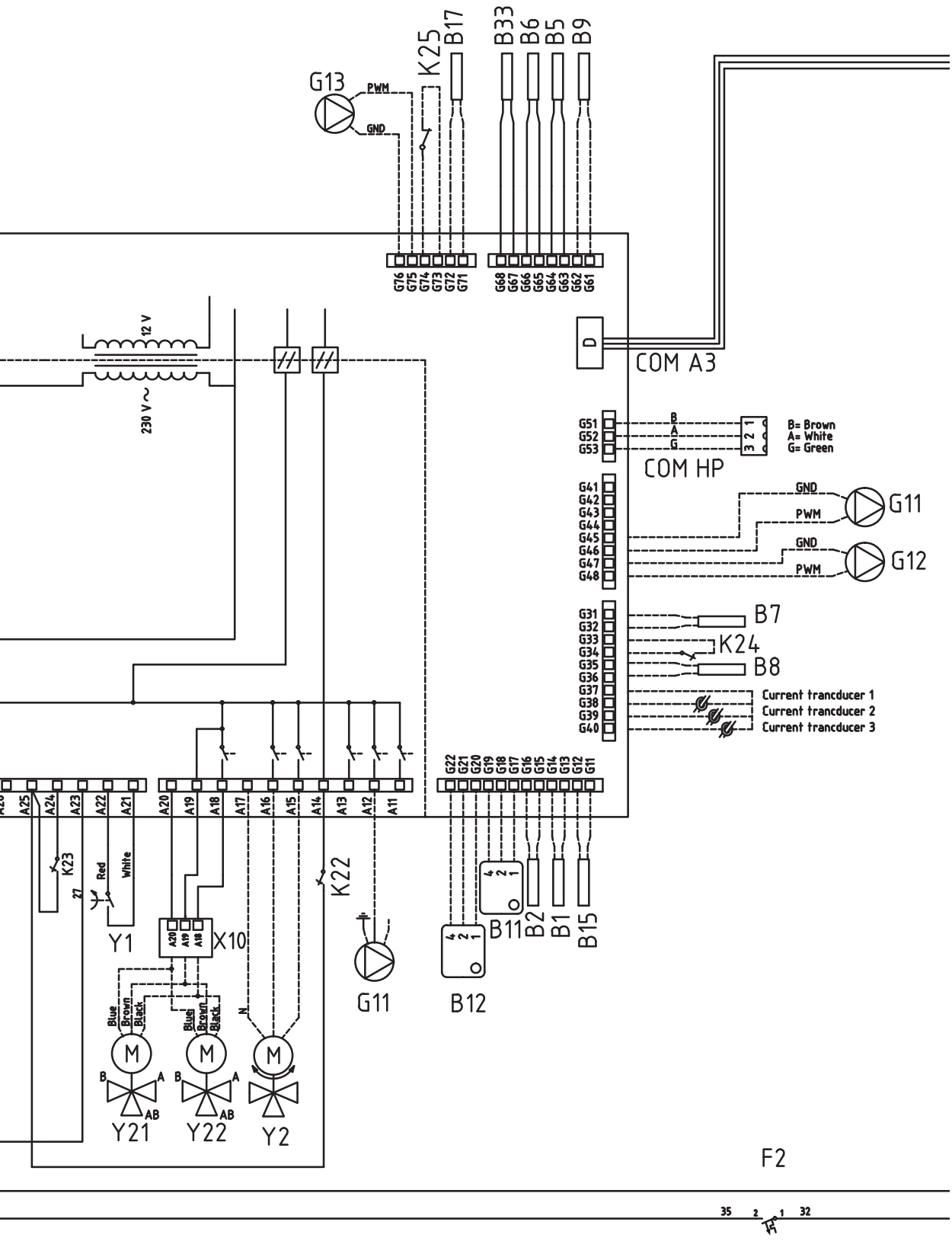
19. Wiring diagram main card 3x400V



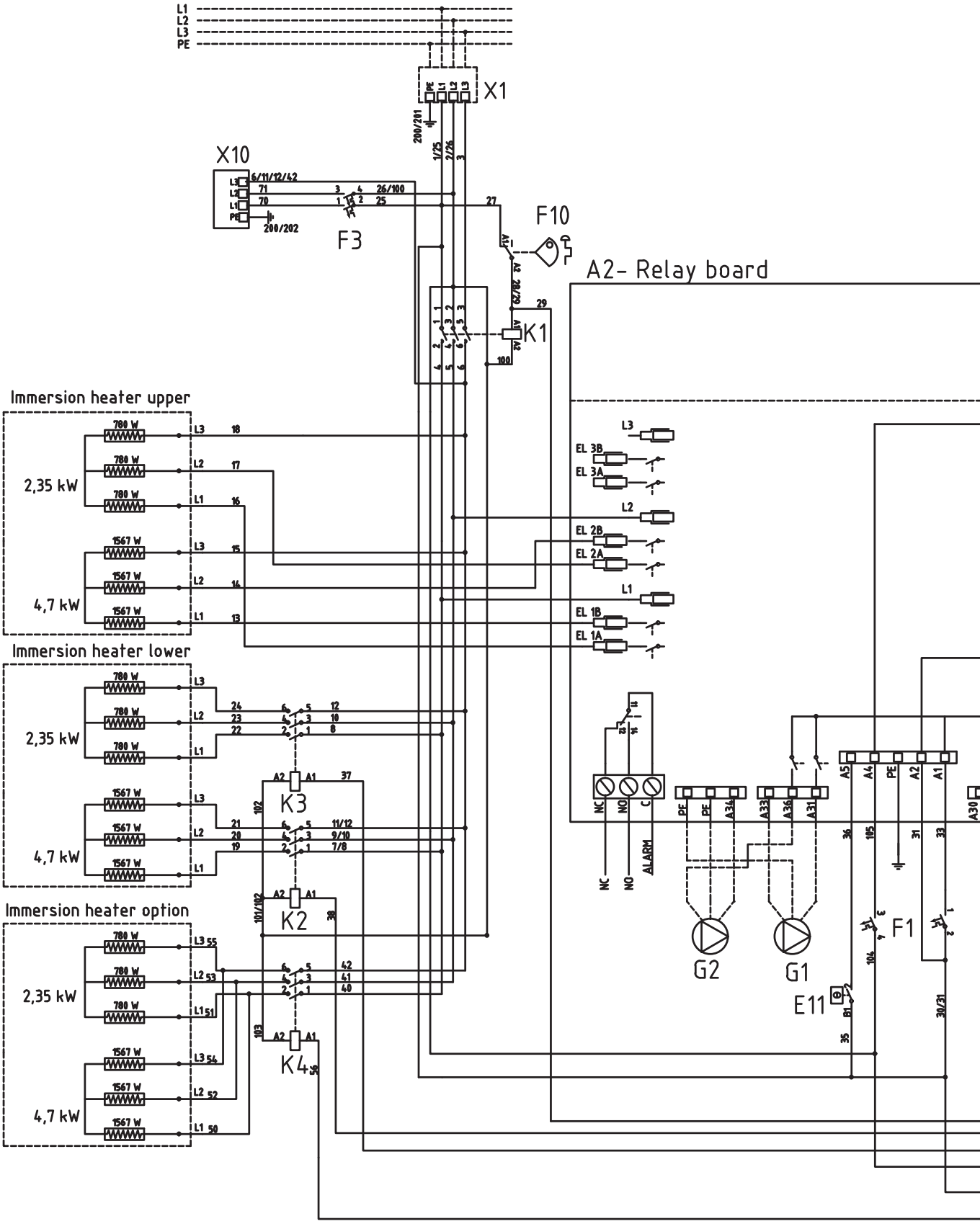

G13
PWM
GND
K25
B17
B33
B6
B5
B9
G76 G75 G74 G73 G72 G71
G68 G67 G66 G65 G64 G63 G62 G61
12 V
230 V ~
D
COM A3
B= Brown
A= White
G= Green
G51 G52 G53
B A G
3 2 1
COM HP
G41 G42 G43 G44 G45 G46 G47 G48
GND
PWM
G11
GND
PWM
G12
G31 G32 G33 G34 G35 G36 G37 G38 G39 G40
B7
K24
B8
Current trancducer 1
Current trancducer 2
Current trancducer 3
G22 G21 G20 G19 G18 G17 G16 G15 G14 G13 G12 G11
A29 A28 A27 A26 A25 A24 A23 A22 A21 A20 A19 A18 A17 A16 A15 A14 A13 A12 A11
N Blue
Close Brown
Open Black
K23
27
Red
White
Y1
X10
A20 A19 A18
N
K22
36
35
N
G11
B12
B11
B2
B1
B15
M
Y1
Blue
Brown
Black
Y2
Y21
Y22
B
A
AB
F2
30 2 1 32

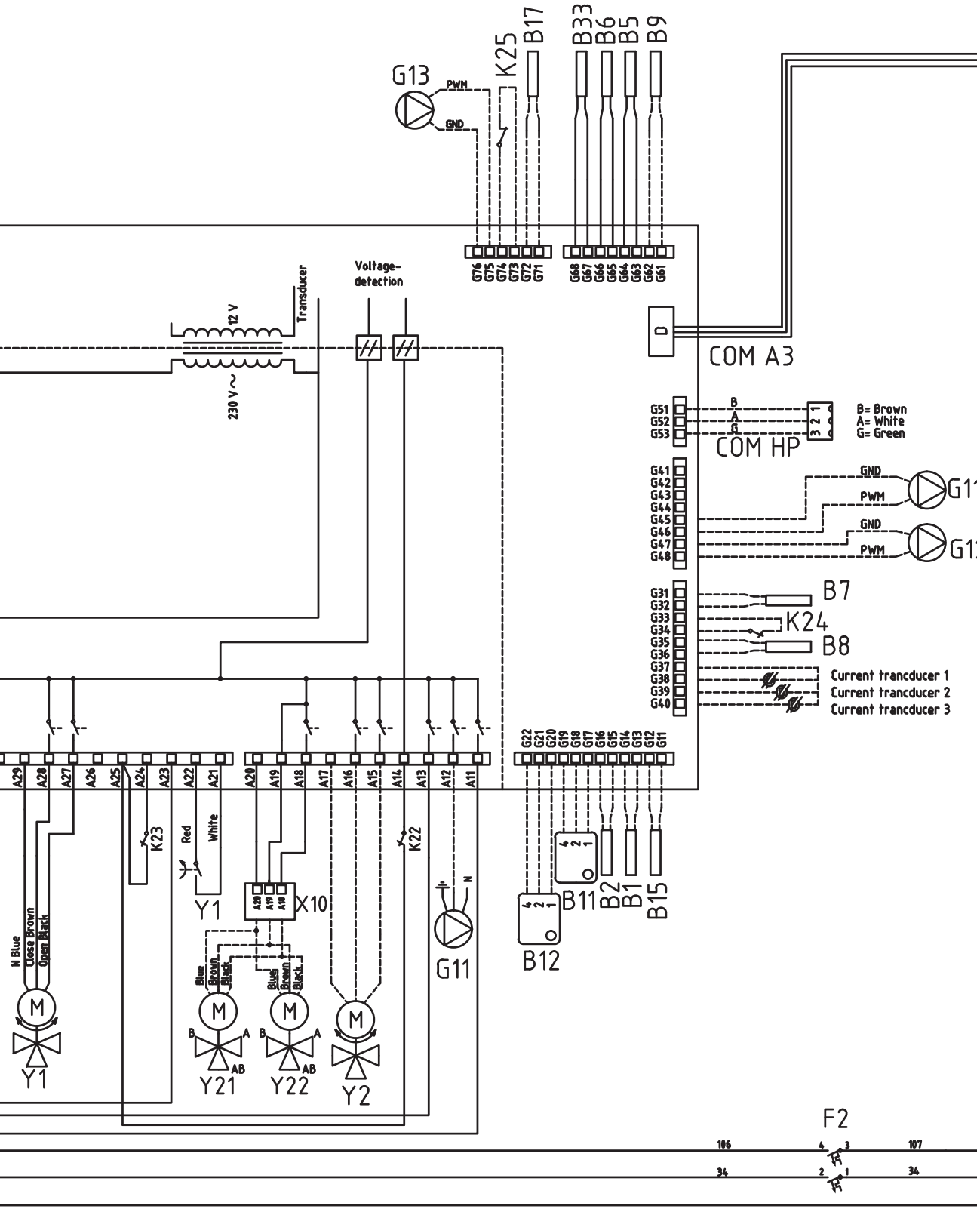
20. Wiring diagram main card 1x230V



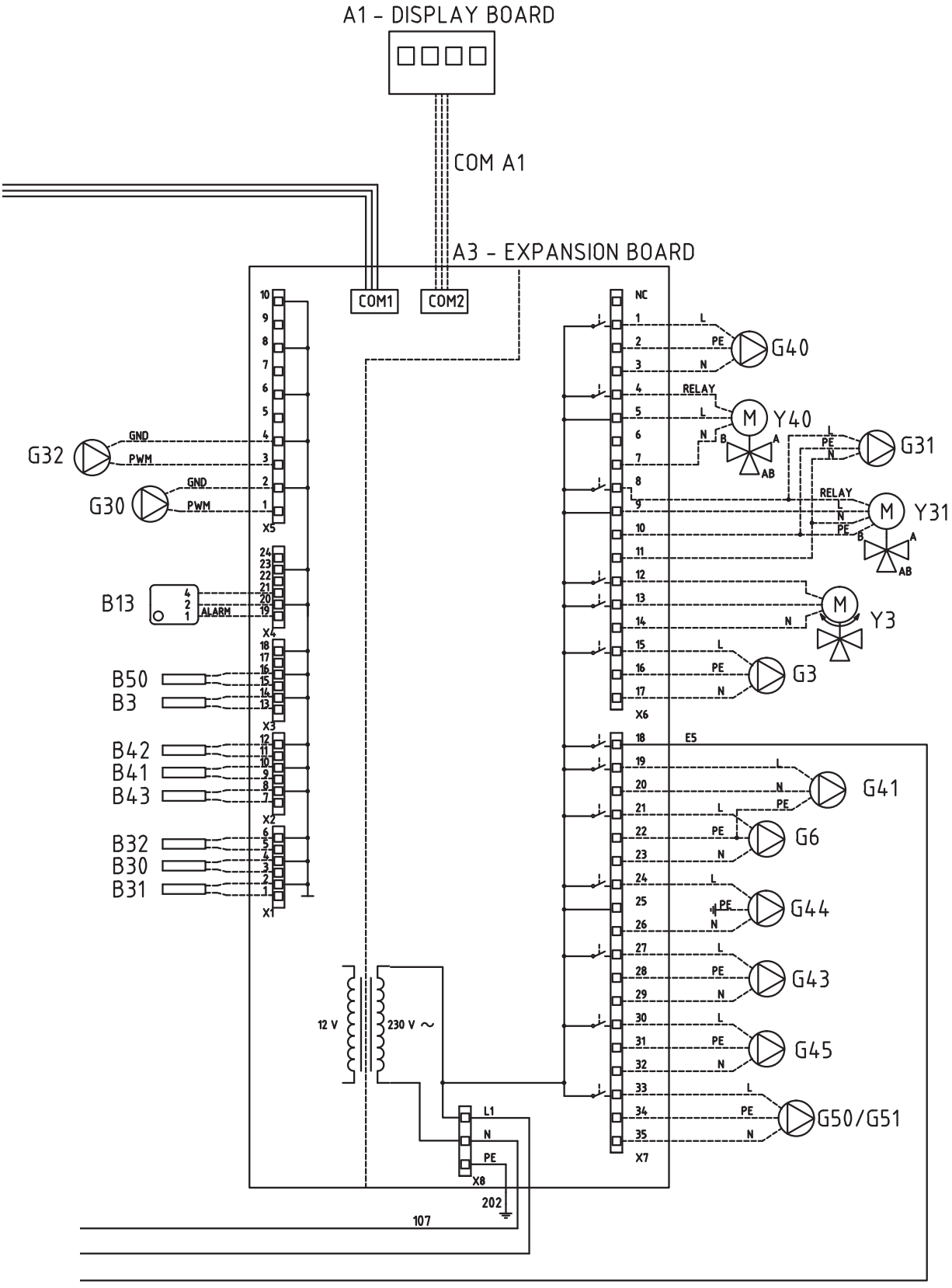

G13
PWM
GND
K25
B17
B33
B6
B5
B9
G76 G75 G74 G73 G72 G71
G68 G67 G66 G65 G64 G63 G62 G61
12 V
230 V ~
D
COM A3
G51
G52
G53
B
A
G
3 2 1
B= Brown
A= White
G= Green
COM HP
G41 G42 G43 G44 G45 G46 G47 G48
GND
PWM
G11
GND
PWM
G12
G31 G32 G33 G34 G35 G36 G37 G38 G39 G40
B7
K24
B8
Current trancducer 1
Current trancducer 2
Current trancducer 3
A25 A24 A23 A22 A21 A20 A19 A18 A17 A16 A15 A14 A13 A12 A11
G22 G21 G20 G19 G18 G17 G16 G15 G14 G13 G12 G11
K23
27
Red
White
Y1
X10
A20
A19
A18
K22
G11
B12
B11
B2
B1
B15
Blue
Brown
Black
N
M
B
A
AB
Y21
Y22
Y2
F2
35 2 1 32

21. Wiring diagram main card 3x230V




G13
PWM
GND
K25
B17
B33
B6
B5
B9
G76 G75 G74 G73 G72 G71
G68 G67 G66 G65 G64 G63 G62 G61
Transducer
12 V
230 V~
Voltage-
detection
D
COM A3
G51 G52 G53
B
A
G
3 2 1
COM HP
B= Brown
A= White
G= Green
G41 G42 G43 G44 G45 G46 G47 G48
GND
PWM
G1
GND
PWM
G1
G31 G32 G33 G34 G35 G36 G37 G38 G39 G40
B7
K24
B8
Current trancducer 1
Current trancducer 2
Current trancducer 3
A29 A28 A27 A26 A25 A24 A23 A22 A21 A20 A19 A18 A17 A16 A15 A14 A13 A12 A11
G22 G21 G20 G19 G18 G17 G16 G15 G14 G13 G12 G11
K23
K22
Red
White
Y1
X10
A20 A19 A18
N
G11
B12
B11
B2
B1
B15
N Blue
Close Brown
Open Black
Blue
Brown
Black
Blue
Brown
Black
M
B
A
AB
Y1
Y21
Y22
Y2
F2
106
107
34
34

22. Wiring diagram for expansion card



23. Parts list Wiring diagram

A1	Display	
A2	Relay/main card	
A3	Expansion card	
B1	Primary flow sensor 1	NTC 22
B2	Primary flow sensor 2	NTC 22
B3	Primary flow sensor 3	NTC 22
B5	Temp Upper tank sensor	NTC 22
B6	Temp Lower tank sensor	NTC 22
B7	Return sensor	NTC 22
B8	Flue gas sensor	NTC 3.3
B9	Sensor wood boiler	NTC 22
B11	Inner sensor 1	NTC 22
B12	Inner sensor 2	NTC 22
B13	Inner sensor 3	NTC 22
B15	Outdoor sensor	NTC 150
B17	Sensor external boiler	NTC 22
B30	Solar panel sensor In	PT 1000
B31	Solar panel sensor Out	PT 1000
B32	Solar panel sensor charging	PT 1000
B33	Temp solar coil tank	NTC 22
B41	Sensor, external storage tank upper	NTC 22
B42	Sensor, external storage tank lower	NTC 22
B43	Sensor external hot water tank	NTC 22
B50	Sensor pool	NTC 22
E13	Backup heating thermostat E13	
F1	Automatic circuit breaker	
F2	Automatic circuit breaker	
F10	Max thermostat	
G1	Radiator pump 1	
G2	Radiator pump 2	
G3	Radiator pump 3	
G6	Circulation pump flue gas controlled	
G11	Charge pump 1	
G12	Charge pump 2	
G13	Charge pump 3	
G30	Circulation pump, solar collector	
G31	Pump, recharging bore hole	
G32	Pump, plate heat exchanger – solar energy	
G40	Circulation pump for hot water coil	
G41	Circulation pump external DHW tank	
G43	Circulation pump, external storage tank charging	
G44	Circulation pump, external boiler	
G45	Circulation pump, external storage tank discharging	
G50/G51	Circulation pump, pool heating	
K1	Contactor 1	
K2	Contactor 2	
K3	Contactor 3	
K4	Contactor 4	
K22	Remote control/ Smart Grid	
K23	Remote control/ Smart Grid	
K24	Remote control/ Smart Grid	
K25	Remote control/ Smart Grid	
NC/NO	Alarm for external unit	
X1	Terminal block	
X10	Terminal block	
Y1	Mixing valve 1	
Y2	Mixing valve 2	
Y3	Mixing valve 3	
Y21	Diverting valve, heat pump in/out	
Y31	Diverting valve solar	
Y40	Diverting valve external buffer tank	

24. Resistances for sensors

NTC 3.3K NTC 22K NTC 150

Temperature °C	Flue gas sensor Resistance Ω	Temperature °C	Brine, HP, El. boiler, Primary flow, Room sensor Resistance Ω	Temperature °C	Outdoor sensor Resistance Ω
300	64	130	800	70	32
290	74	125	906	65	37
280	85	120	1027	60	43
270	98	115	1167	55	51
260	113	110	1330	50	60
250	132	105	1522	45	72
240	168	100	1746	40	85
230	183	95	2010	35	102
220	217	90	2320	30	123
210	259	85	2690	25	150
200	312	80	3130	20	182
190	379	75	3650	15	224
180	463	70	4280	10	276
170	571	65	5045	5	342
160	710	60	5960	0	428
150	892	55	7080	-5	538
140	1132	50	8450	-10	681
130	1452	45	10130	-15	868
120	1885	40	12200	-20	1115
110	2477	35	14770	-25	1443
100	3300	30	18000	-30	1883
90	4459	25	22000	-35	2478
80	6119	20	27100	-40	3289
70	8741	15	33540		
60	12140	10	41800		
50	17598	5	52400		
40	26064				
30	39517				
20	61465				

PT1000

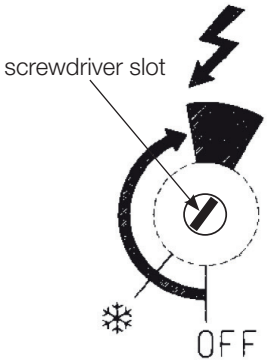
Temperature °C	Resistance Ω	Temperature °C	Resistance Ω
-10	960	60	1232
0	1000	70	1271
10	1039	80	1309
20	1077	90	1347
30	1116	100	1385
40	1155	120	1461
50	1194	140	1535

25. First start

The CTC EcoZenith I 550 can be started without a room sensor being installed; the heating will instead be controlled by the heat curve set for the property. The room sensor can however always be fitted for the alarm LED function. In this case, deselect the room sensor in the menu *Installer/Define system*.

25.1 Before first start

1. Check that the system is filled with water, has been bled and has the correct pressure, and that there are no leaks. Air in the system (poor circulation) can mean that the heat pump is tripped by its high pressure protection, for example.
2. Check that all connections are tight.
3. Check that all the valves in the system are correctly connected and set.
4. Check that all electric cables, sensors and circulation pumps are correctly installed and connected. See the “Electrical installation” chapter.
5. Check that the unit is correctly fused (fuse panel).
6. Check that the backup heating thermostat is in frost protection mode. The backup heating thermostat is located in the lower part of the cabling, behind the front panel. In order to set the backup heating thermostat in frost protection mode, turn anti-clockwise as far as possible so that the screw driver slot is vertical (off position), then turn clockwise until the slot aligns with the frost protection symbol (about 1/8 turn). Frost protection setting, about +7 °C
7. Check that any heat pump circuit breaker installed is in the ON position. Note that when connected in series, the last heat pump must be in terminated position. I.e., on the last heat pump, dipswitch 2 must be in the ON position. On the other heat pumps it should be in the OFF position.
8. See the Installation and Maintenance Manual for the heat pump. If there is already a boiler in place, check that its temperature is set at normal boiler temperature, for example, 70 °C.



25.2 First start

Switch on the power using the safety switch. The display will come on and the operating lamp will start to light up. Factory-set values will apply, so for instance, the connected heat pumps' compressors are blocked. The first time the EcoZenith is started up or if it is restarted within 24 hours after start-up, items 1-3 are displayed.

1. Select desired language and confirm with OK -> Next.
2. Verify that the system is filled with water Confirm with -> Next.
3. Input voltage; select desired input voltage.
   Confirm with -> Next.
4. Main fuse A; select size of main fuse (10–90 A).
   Confirm with -> Next.
5. Conversion factor for current sensor; select desired factor (1–10). This menu contains the factor the current sensor is to use. This setting is only performed if the connection has been installed for a current sensor for higher currents. Example: User (set) value 2 => 16 A will be 32 A.
   Confirm with -> Next.
6. Max. power immersion heaters kW. Select between 0 and 27.0 kW.
   – Confirm with -> Next.
7. Compressor A1, confirm whether compressor A1 is to be blocked or permitted. This can also be changed in the menu **Installer/Settings/Heat pump A1–A3.** Confirm with -> Next.
8. Set the Max. primary flow °C, Inclination and Adjustment for each heating circuit. See also the menu: Installer/Settings/Heating circuit 1–3.
   Confirm with -> Next.
9. The EcoZenith is now up and running and the product is working using its factory settings. See the chapter "Detail Description Menus" for other settings.

Save these settings in the menu: *Installer/Settings/Save settings*

25.2.1 Getting started

Define system

- The EcoZenith senses whether primary flow sensors 1 and 2 and room sensors 1 and 2 are connected and if so automatically defines radiator systems 1 and 2 “Yes” with the associated room sensor “Yes”.
- Scroll further down in the menu and select the connected systems with “Yes”. The immersion heaters are factory set to “Yes”.
- For heat pump operation, the pumps in question are defined 1–3 by selecting “Yes”. For the relevant heat pump, the type of heat pump must then be selected, EcoPart or EcoAir, followed finally by selection of relay-controlled or speed-controlled (PWM) charge pump.

Operation

- Check whether heat is needed in the upper and lower tank Heat is needed when the temperature in the upper or lower tank is 5°C below the setpoint in brackets. When this occurs, start-up of the compressor should be delayed 10 minutes. Information on this is available in the main menu. Return to the main menu to check.

Notes

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