



Providing sustainable energy solutions worldwide

Installation and Maintenance Manual
CTC EcoZenith i350
Indoor module with heat pump control

IMPORTANT
READ CAREFULLY BEFORE USE
KEEP FOR FUTURE USE



Important! Information on air bleeding

For the product to work as intended, the system must be fully bled.

It is extremely important that a basic bleeding of the product is carried out systematically and carefully.

Bleeding devices must be fitted to the system's natural high points. A basic bleeding of the hot water tank can be carried out upon installation by releasing the safety valve, which must be fitted to the top of the product.

Water circulation to take place during bleeding of the various subsystems: the radiator systems, heat pump system and hot water charging system (to run the pumps, diverting valve etc. manually, go into the menu Installer/Service/Function test). Also move the diverting valve during the bleeding process. A careful basic bleeding must be carried out before the system is put into operation and the heat pump is started.

Tip:

Once basic bleeding is complete: increase the water pressure in the system temporarily to approx. 2 bar.

- Automatic bleeding valves are included in the package and supplied as standard for this product. They must be fitted to the top of the product as shown in the picture.
- Important! Bleed any air remaining in the radiators (elements) and other parts of the system after it has been in operation for a short time.

Small microbubbles gradually collect in the system's "pockets", and it can take quite a long time before all the air is removed from the system.

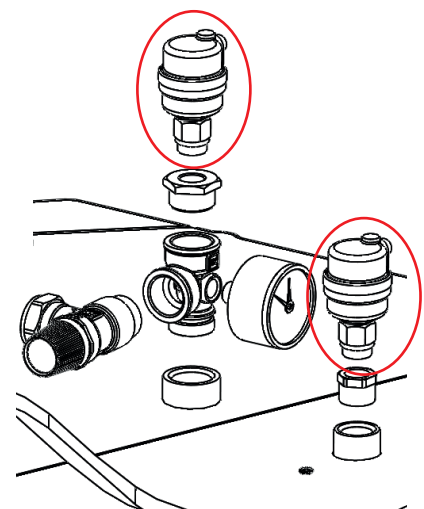
When the pressure is temporarily increased, any remaining air pockets are compressed and carried along more easily with the flow of water, and can be released into the ventilation devices.

Tip:

After the air is bled, there may be a drop in system pressure. Having the system pressure too low increases the risk of noise in the system and of air being "sucked" in on the suction side of the pump. Keep an eye on the system pressure. Bear in mind that the system pressure will vary in the course of the year due to changes in temperature in the heating circuit, which is completely normal.

If "gushing" sounds can be heard from the product, this is a sign of remaining air.

A loss of heating functionality can also be a sign of remaining air.



The automatic bleeding valves are equipped with bleeding valve screws.



Information in this type of box [i] is intended to help ensure that the product functions optimally.



Information in this type of box [!] is particularly important for correctly installing and using the product.

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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.

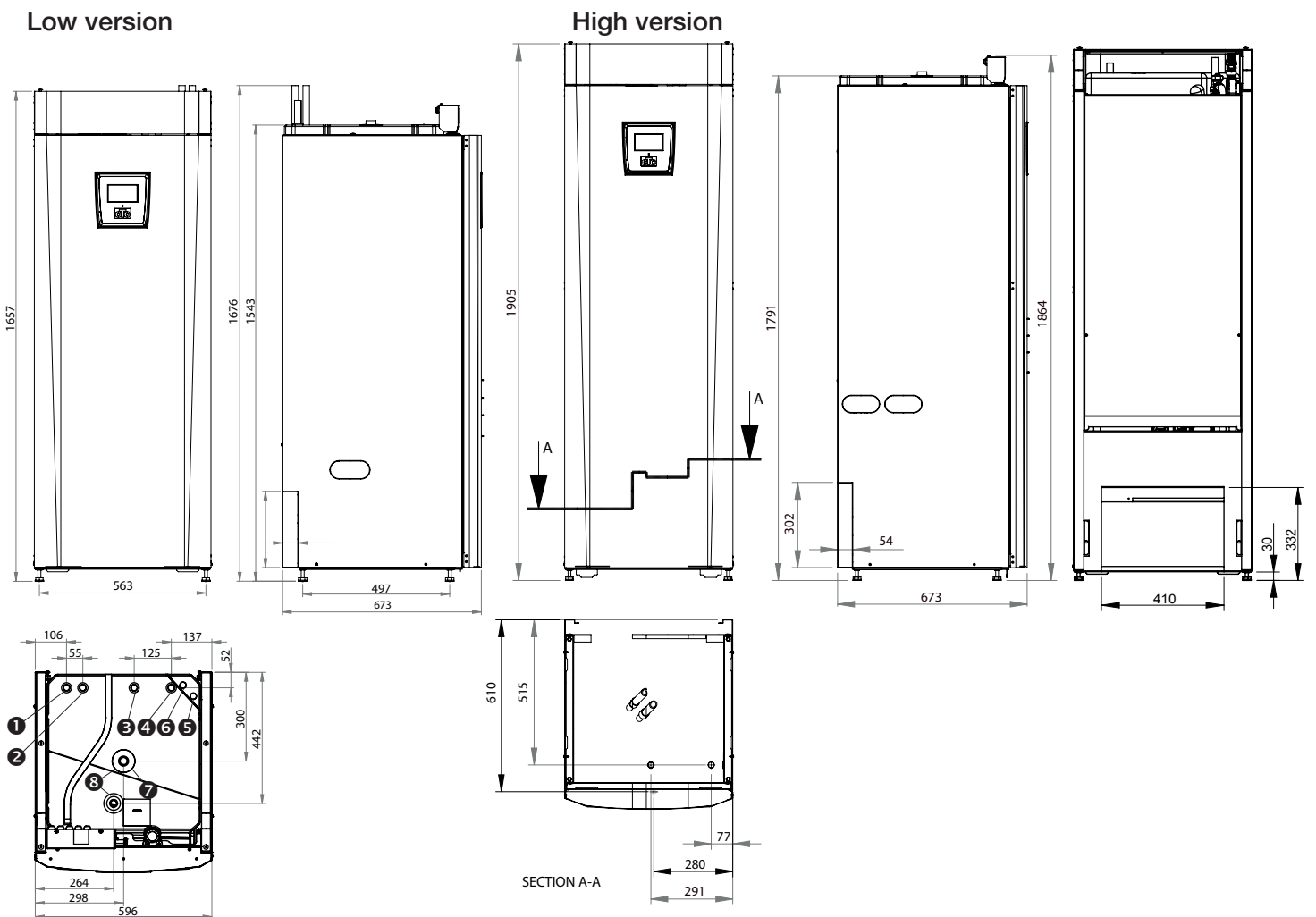
1. Technical data

Designation		CTC EcoZenith i350 L	CTC EcoZenith i350 H	CTC EcoZenith i350 L 1x230V	CTC EcoZenith i350 L 3x230V
General data					
Article number		587800001	587803001	587801001	587802001
EAN		7333077000806	7333077000837	7333077000813	7333077000820
Gross weight	kg	173	185	173	173
Net weight	kg	143	155	143	143
Dimensions DxWxH (with packaging)	mm	768x700x1825	768x700x2090	768x700x1825	768x700x1825
Dimensions DxWxH (without packaging)	mm	673x596x1657	673x596x1905	673x596x1657	673x596x1657
Required ceiling height	mm	1669	1880	1669	1669
Max permitted temperature of external heat source, long-term/ short-term	°C	70 / 95	70 / 95	70 / 95	70 / 95
Electrical data					
Connection	-	400V 3N~ 50Hz	400V 3N~ 50Hz	230V 1N~1 50Hz	230V 3~ 50Hz
Rated power	kW	12.2	12.2	9.3	10.3
Rated power without immersion heater	W	236	236	236	236
Group fuse, 16/20/25/32/50 A matches electrical power	kW	8.9 / 11.9 / 11.9 / - / -	8.9 / 11.9 / 11.9 / - / -	2.9 / 4.6 / 5.8 / 7.5 / 9	5 / 7.5 / - / 10 / - / 9
IP class	IP	IP X1	IP X1	IP X1	IP X1
Number of steps for electrical element	st	31	31	30	4
Power for each step for electrical element	kW	0/0.5/1/1.5/2/2.5/2.8/3/3.3/3.5/3.8/4.3/4.8/5.3/5.6/5.8/6.1/6.3/6.6/7.1/7.6/8.1/8.4/8.6/8.9/9.1/9.4/9.9/10.4/10.9/11.4/11.9	0/0.5/1/1.5/2/2.5/2.8/3/3.3/3.5/3.8/4.3/4.8/5.3/5.6/5.8/6.1/6.3/6.6/7.1/7.6/8.1/8.4/8.6/8.9/9.1/9.4/9.9/10.4/10.9/11.4/11.9	0/0,3/0,6/0,9/1,2/1.5/1.8/2.1/2.3/2.6/2.9/3.2/3.5/3.8/4.1/4.4/4.6/4.9/5.2/5.5/5.8/6.1/6.4/6.7/6.9/7.2/7.5/7.8/8.1/8.4/9	0/2.5/5/7.5/10
Hot tap water system					
Water volume (V) (PED)	l	1.7	1.7	1.7	1.7
Max operating pressure (PED)	Bar	10	10	10	10
Max adjustable hot water temperature	°C	65	65	65	65
Max operating temperature (TS) (PED)	°C	100	100	100	100
		Ekonomi		Normal	Komfort
Quantity of hot water (40°C)	l	210		235	304
Load profile*)		XL	XL	XL	XL

*) according to Regulation (EU) no. 813/2013

Heating medium system					
Water volume (V) (PED)	L	225	225	225	225
Max operating pressure (PS) (PED)	Mpa/ Bar	0.3/3.0	0.3/3.0	0.3/3.0	0.3/3.0
Max operating temperature (TS) (PED)	°C	100	100	100	100
Max adjustable operating temperature	°C	70	70	70	70
Product Kvs value	m³/h	2.6	2.7	2.6	2.6
Pressure differential diagram for product including exchanger and all internal pipes, valves etc.	kPa	See pressure differential diagram in section "System adjustment"	See pressure differential diagram in section "System adjustment"	See pressure differential diagram in section "System adjustment"	See pressure differential diagram in section "System adjustment"
Built-in circulation pump		Yes	Yes	Yes	Yes

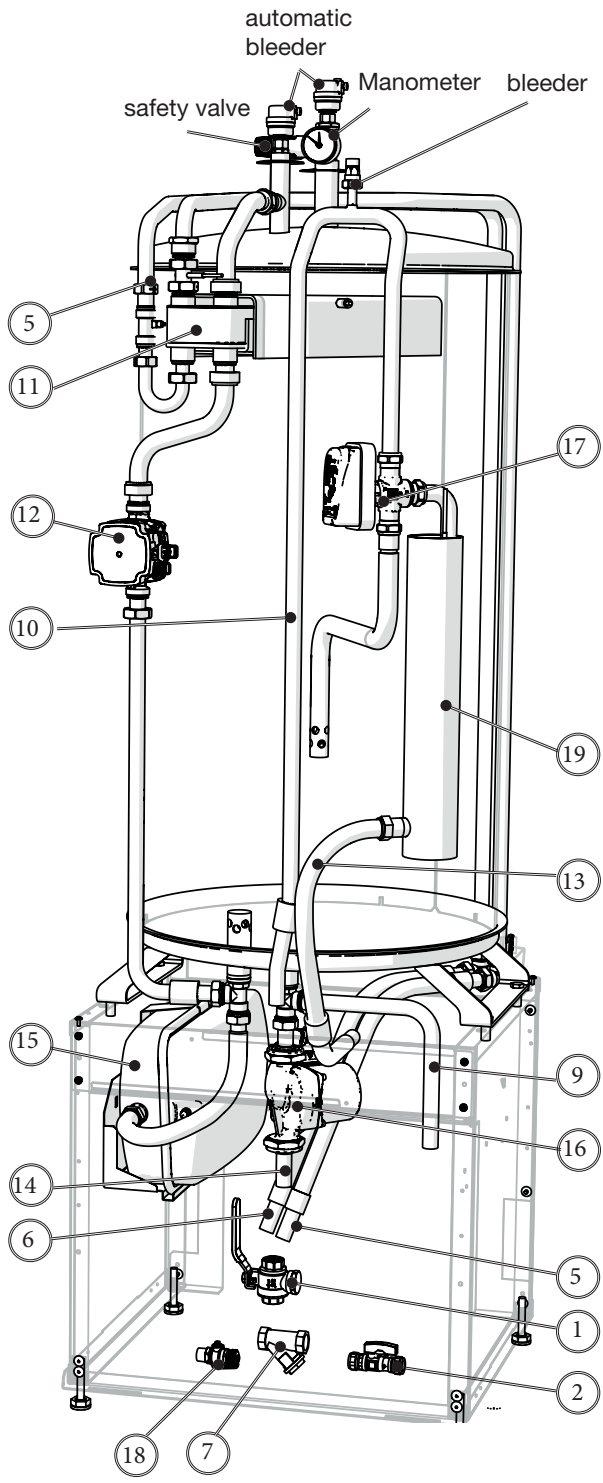
2. Measurements and connections



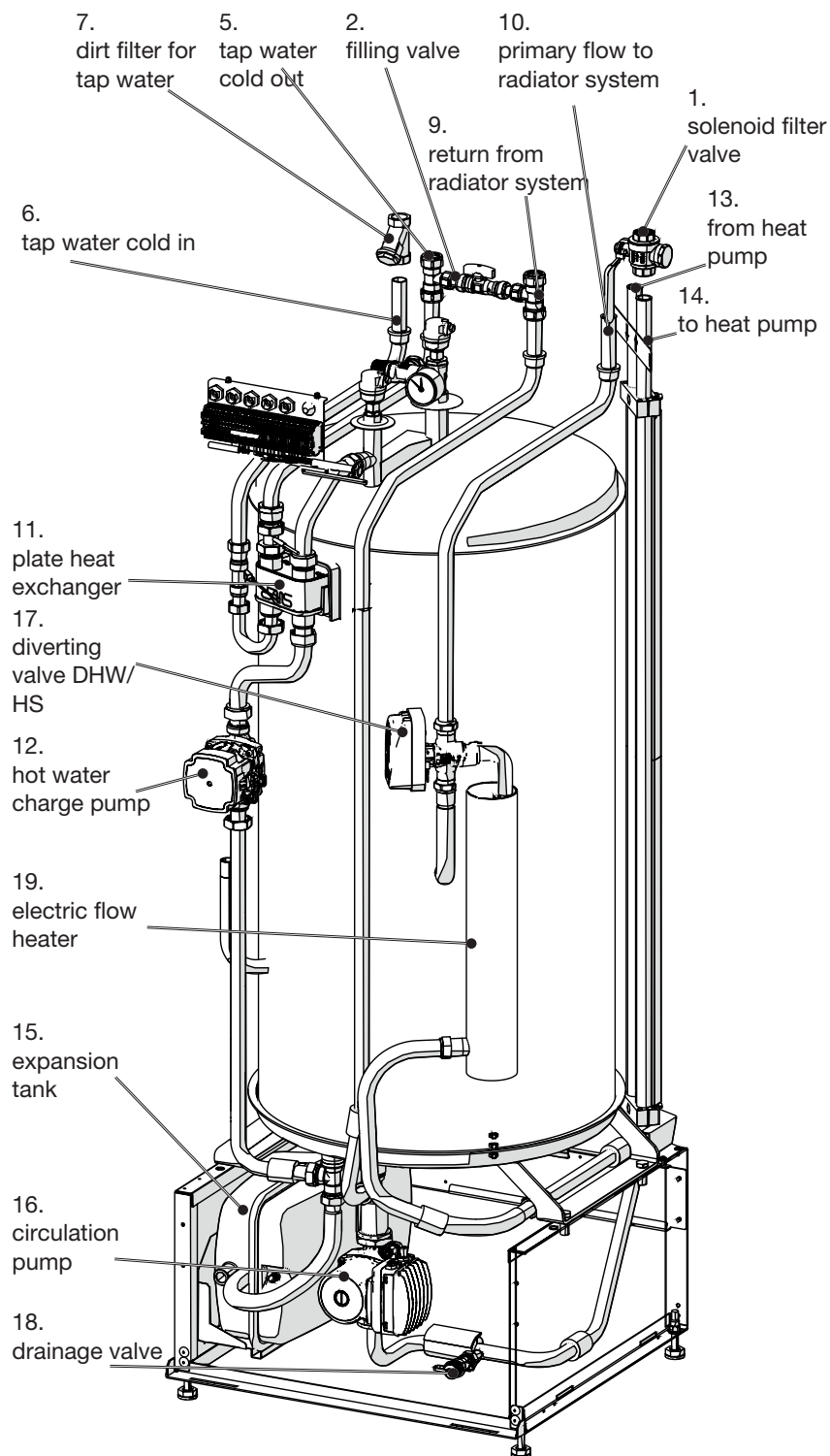
❶ Cold water	22 mm	❺ To HP	22 mm
❷ DHW	22 mm	❻ From HP	22 mm
❸ Return line	22 mm	❼ Expansion/Lifting sleeve	3/4 " inside
❹ Primary flow	22 mm	❽ Automatic bleeding	1/2 " inside

3. Overview of CTC EcoZenith i350

The picture below shows the basic construction of CTC EcoZenith i350. If a heat pump is connected, the energy in the air or bedrock/ground is drawn up by the cooling system. The compressor then increases the temperature to a usable level. Afterwards it releases the energy for the heating system and hot water. The built-in immersion heater helps when additional heat is needed or when a heat pump is not connected.



High version



Low version

3.1 Compatible heat pumps

CTC EcoAir 500M/600M series
speed-controlled air-to-water

- CTC EcoAir 510M
- CTC EcoAir 610M
- CTC EcoAir 614M
- CTC EcoAir 622M

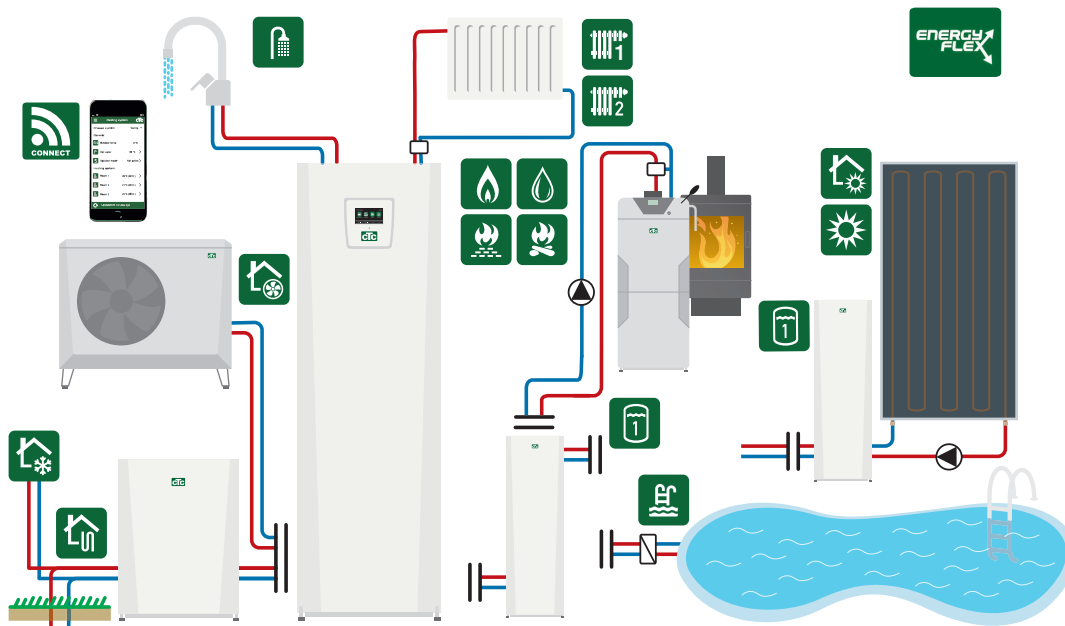
CTC EcoAir 400 series
air-to-water

- CTC EcoAir 406
- CTC EcoAir 408

CTC EcoPart 400 series
fluid-to-water

- CTC EcoPart 406
- CTC EcoPart 408
- CTC EcoPart 410
- CTC EcoPart 412

3.2 Options for CTC EcoZenith i350



* In addition to the basic installation, accessories are required such as: Extra sensor, mixing valve group 2, expansion card etc.

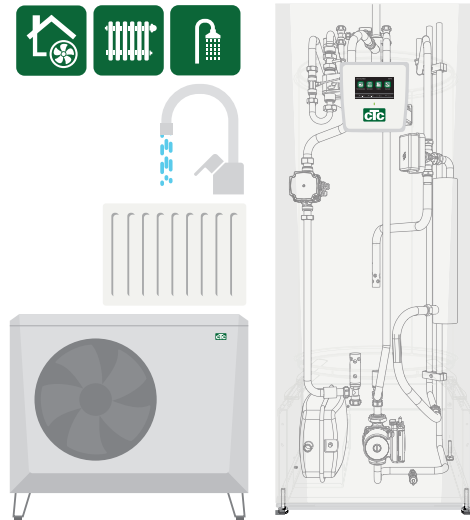
Volume tank CTC VT 80 is recommended for high heating needs or for systems with a high pressure differential.
See section System adjustments.

3.3 Basic installation of CTC EcoZenith i350

CTC EcoZenith i350

1 heating circuit

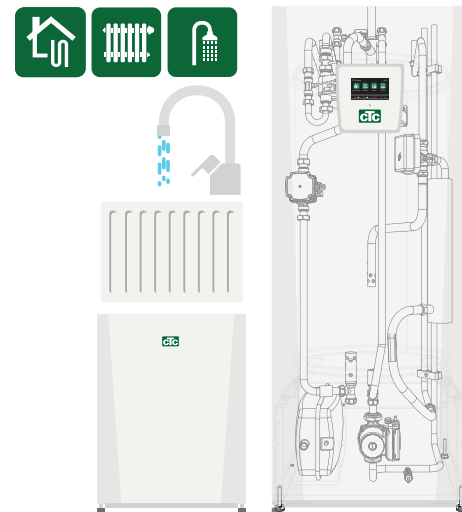
1 compatible CTC EcoAir heat pump



CTC EcoZenith i350

1 heating circuit

1 compatible CTC EcoPart heat pump



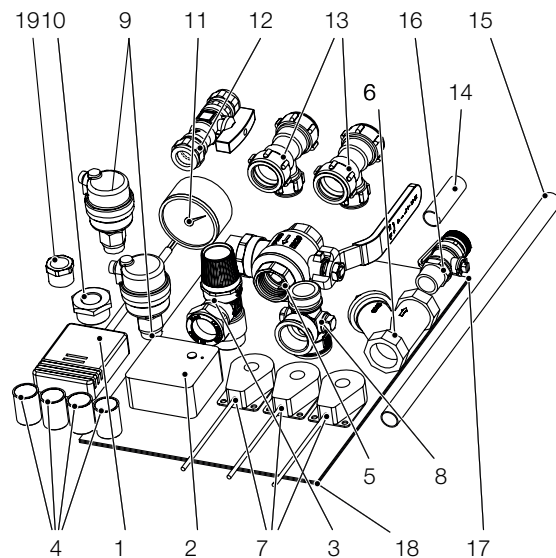
Ecodesign information and energy labelling stickers on the current combination (current package) can be retrieved/downloaded from www.ctc.se/ecodesign

Information and energy labelling stickers must be handed over to the final consumer for the package in question.

3.4 Delivery includes

- CTC EcoZenith i350
- Installation and Maintenance Manual
- Enclosed components (list and image below show additional pack for CTC EcoZenith i350).

No.	Designation	Quantity
1	Outdoor sensor	1/1/1/1
2	Room sensor	1/1/1/1
3	Safety valve 2.5 bar 3/4" ext.	1/1/1/1
4	Support sleeve 22x1	4/5/4/4
5	Filter ball valve with magnet	1/1/1/1
6	Dirt filter 3/4" int. 0.4 mm	1/1/1/1
7	Current sensor	3/3/0/3
8	Manifold	1/1/1/1
9	Automatic vent valve	1/1/1/1
10	Bushing 3/4"x3/8"	1/1/1/1
11	Manometer	1/1/1/1
12	Filling valve	1/1/1/1
13	T-connection 22-15-22	2/2/2/2
14	Filler pipe cu15	2/1/2/2
15	Filler pipe cu15	0/1/0/0
16	Drainage valve 1/2"	0/1/0/0
17	Bleeding instructions	1/1/1/1
18	Installation instructions for bleeding and filling EZi350	1/1/1/1
19	Bushing 1/2" x 3/8"	1/1/1/1



*)CTC EcoZenith i350: L (3x400V) / H (3x400V) / L 1x230V / L 3x230V

4. Important to remember!

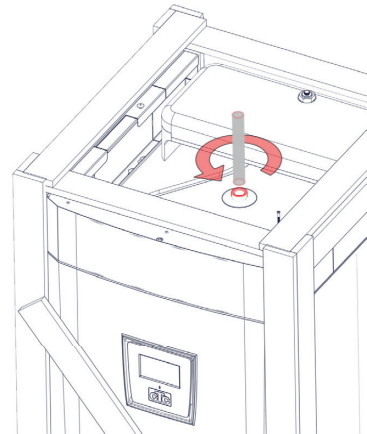
Check the following in particular on delivery and installation:

4.1 Transportation

Transport the unit to the installation site before removing the packaging.
Handle the product in the following manner:

- Forklift
- Lifting eye that has been fitted to the lifting sleeve on top of the product in the expansion connection.
- 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.



4.2 Positioning

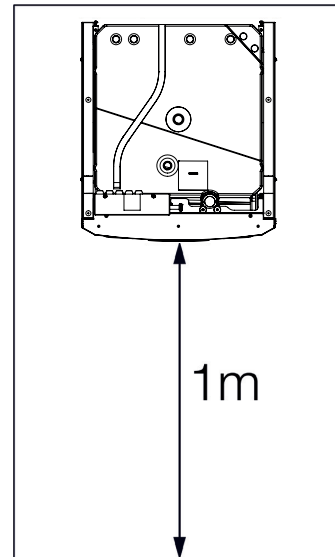
- Remove the packaging and check before installation that the product has not been damaged in transit. Report any transport damage to the carrier.
- Place the product on a solid foundation, preferably made of concrete. **If the product needs to be placed on a soft carpet, base plates must be placed under the adjustable feet.**
- Remember to leave a service area of at least 1 metre in front of the product.
- The product must not be placed below floor level either.

4.3 Recycling

- The packaging must be deposited at a recycling station or with the installation engineer for correct waste management.
- At the end of the product's life cycle, it must be sent correctly to a waste station or reseller offering a service of that type. Disposing of the product as household waste is not permitted.

4.4 After commissioning

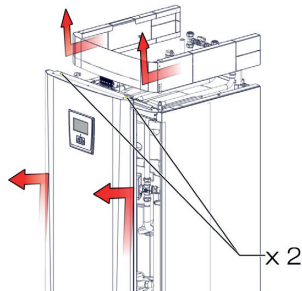
- The installation engineer advises the property owner on the construction and servicing of the system.
- The installation engineer fills in a checklist and contact information – the customer and installation engineer sign the list, which the customer keeps.



5. Pipe installation

The installation must be carried out in accordance with the applicable standards. **Do not forget to flush the heating circuit clean before connecting.** Apply all the installation settings based on the description in the section entitled "First start".

In order to adjust the pre-pressure in the expansion tank and check the pipe connectors before first start, the front must be dismantled by loosening two screws on the top of the front plate and lifting the front plate up and out of the product. Bear in mind that the cable to the display on the front is sensitive to damage.

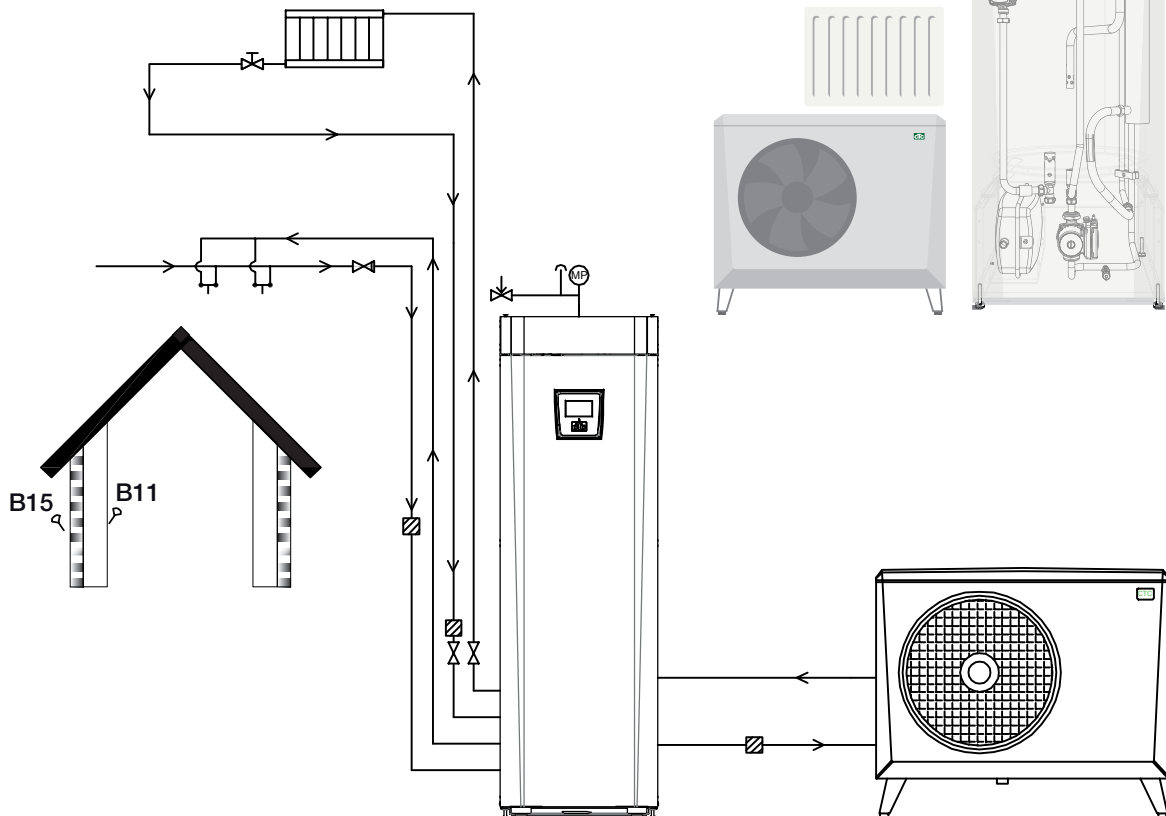


! Minimum water volume in the heating circuit (>25 °C) for reliable defrosting functionality:

EcoAir 610M	80 l
EcoAir 614M	80 l
EcoAir 622M	120 l
EcoAir 406	80 l
EcoAir 408	100 l
EcoAir 410	120 l
EcoAir 415	180 l
EcoAir 420	180 l
EcoAir 510	50 l
1x230 V	

5.1 Schematic diagram, basic installation of CTC EcoZenith i350 for air-to-water heat pump

CTC EcoZenith i350
 1 heating circuit
 1 compatible heat pump
 EcoAir from 400, 500 or 600 series

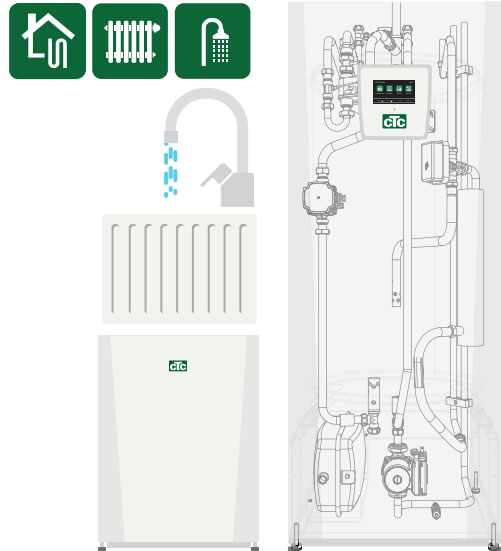
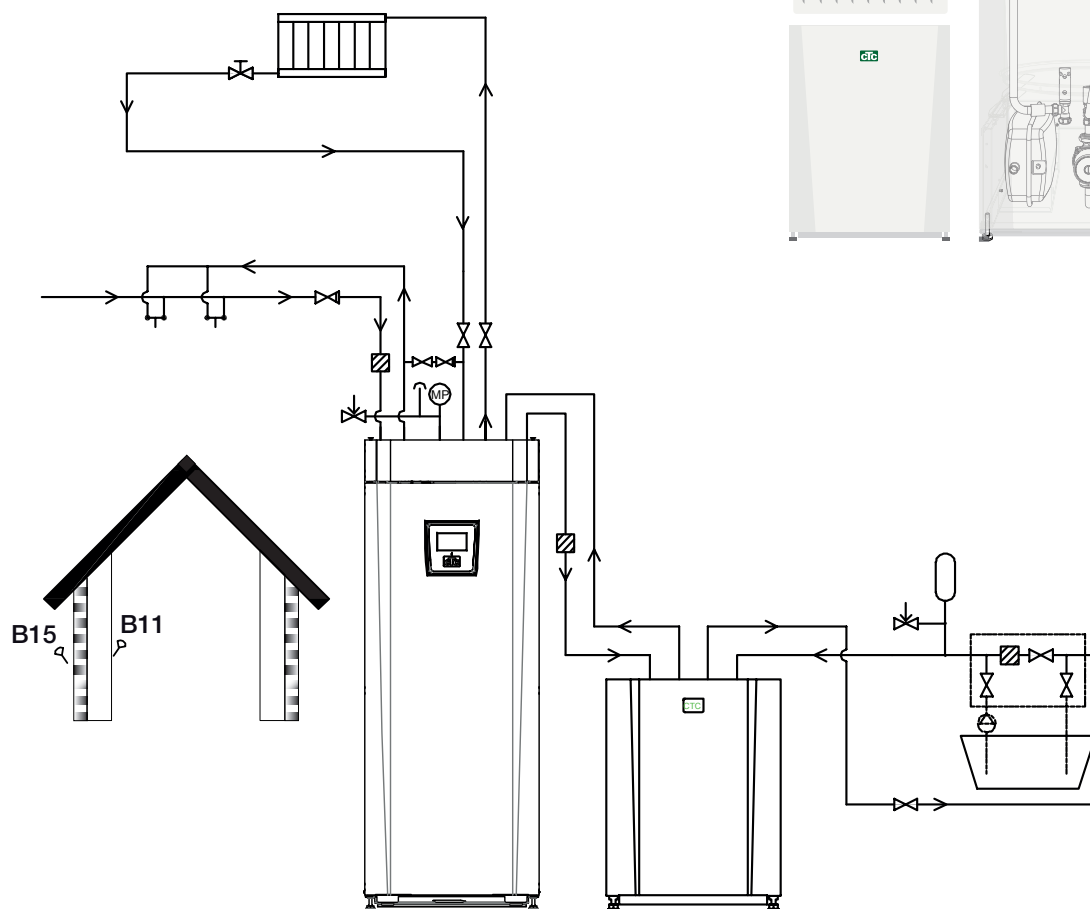


5.2 Schematic diagram, basic installation of CTC EcoZenith i350 for fluid-to-water heat pump

CTC EcoZenith i350

1 heating circuit

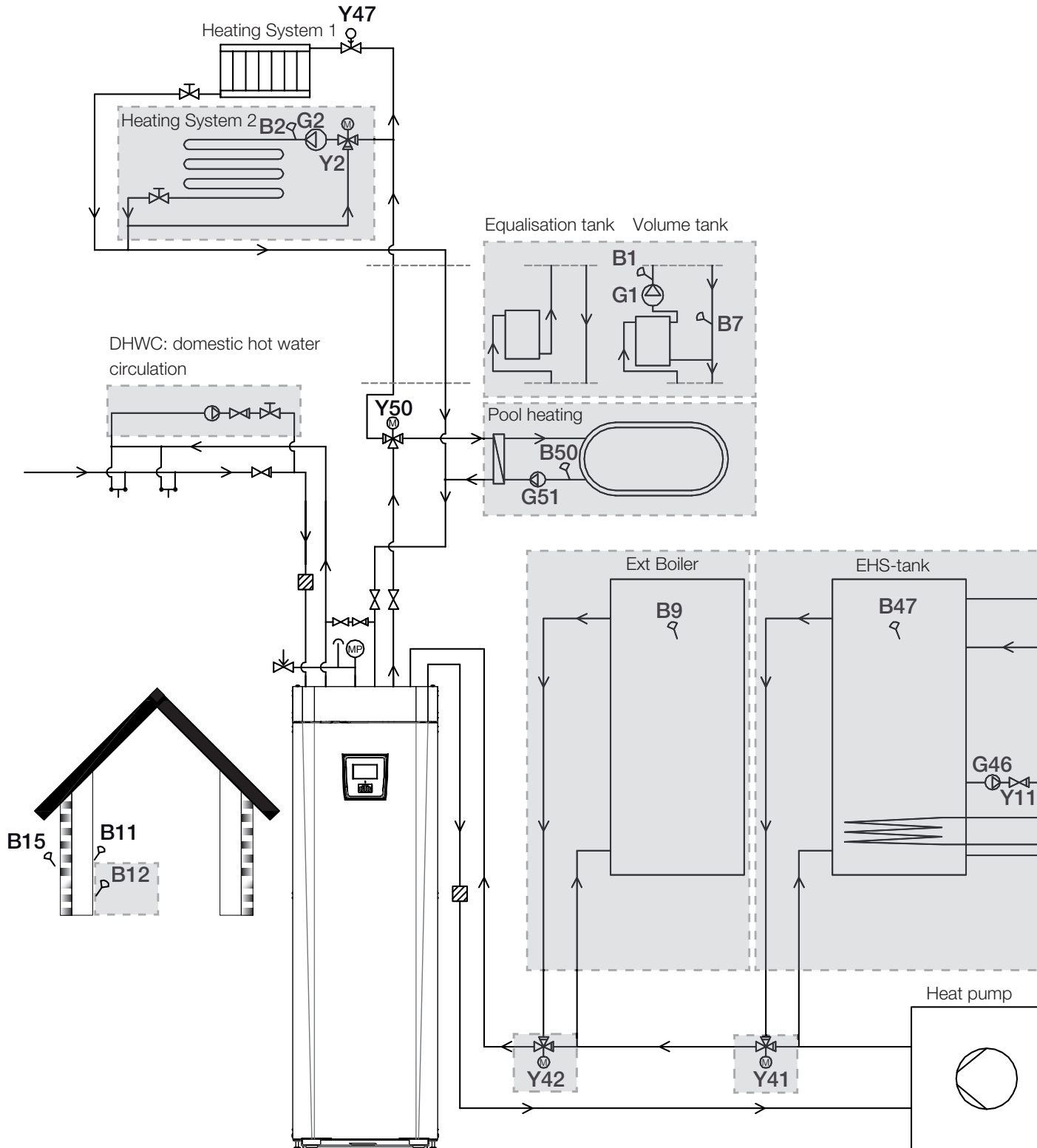
1 compatible heat pump in the EcoPart 400 series



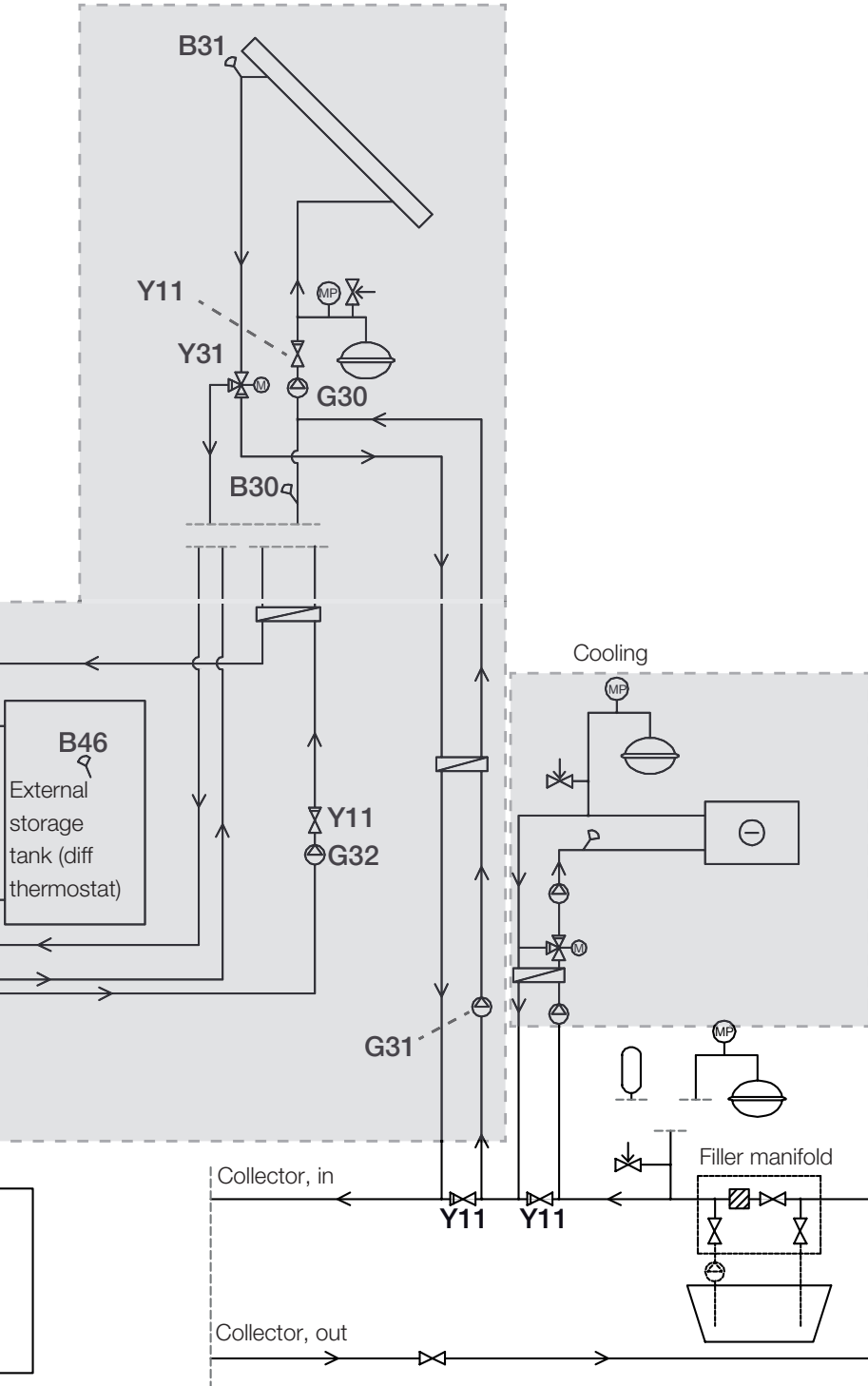
5.3 Full schematic diagram CTC EcoZenith i350

This is a full schematic diagram for CTC EcoZenith i350 connection options. Different installations and systems may look different, e.g. a one or two-pipe system, which means that the finished installation may be different.

In addition to basic installation



Solar Energy



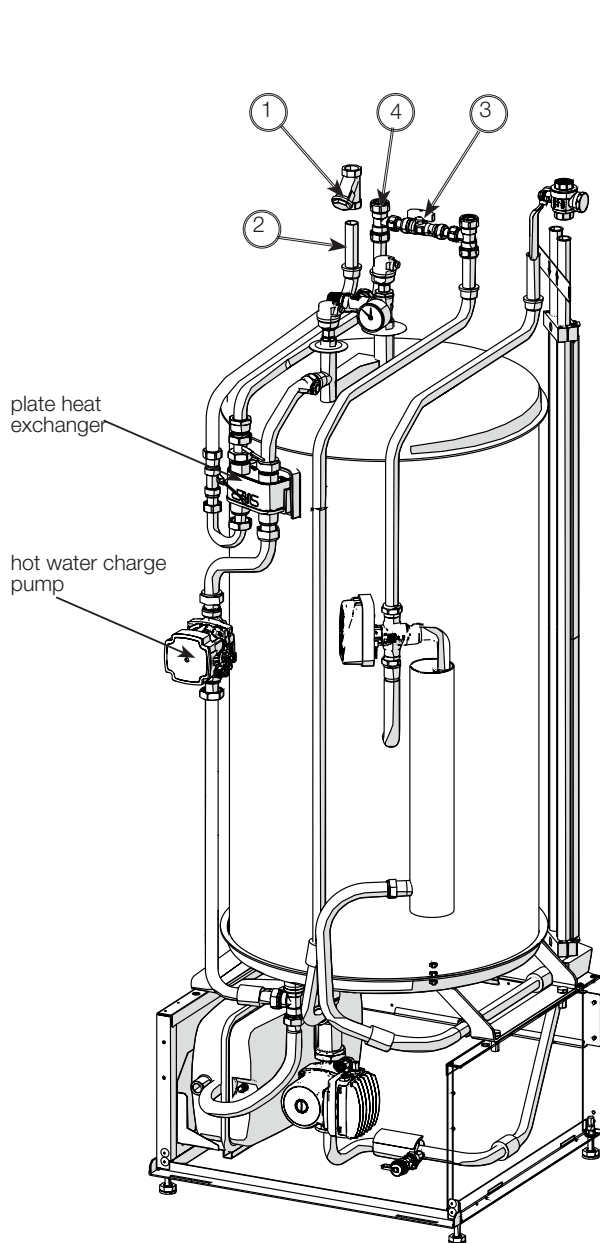
	mixing valve
	diverting valve
	control valve
	solenoid valve
	non-return valve
	shut-off valve
	sensor
	pump
	dirt filter
	pressure sensor
	safety valve
	level vessel
	expansion tank
	heat exchanger

5.4 Install hot water pipe

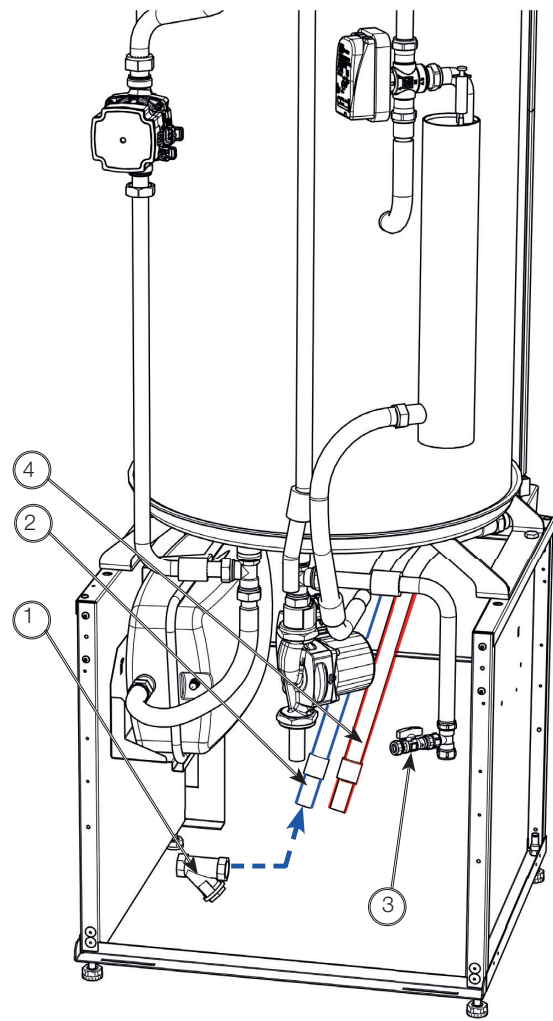
DHW

- Install dirt filter (1)
- Install cold water supply (2) with non-return valve
- Install filling valve (3)
- Install hot water pipe from tank (4)

Check function – flush



Low version



High version

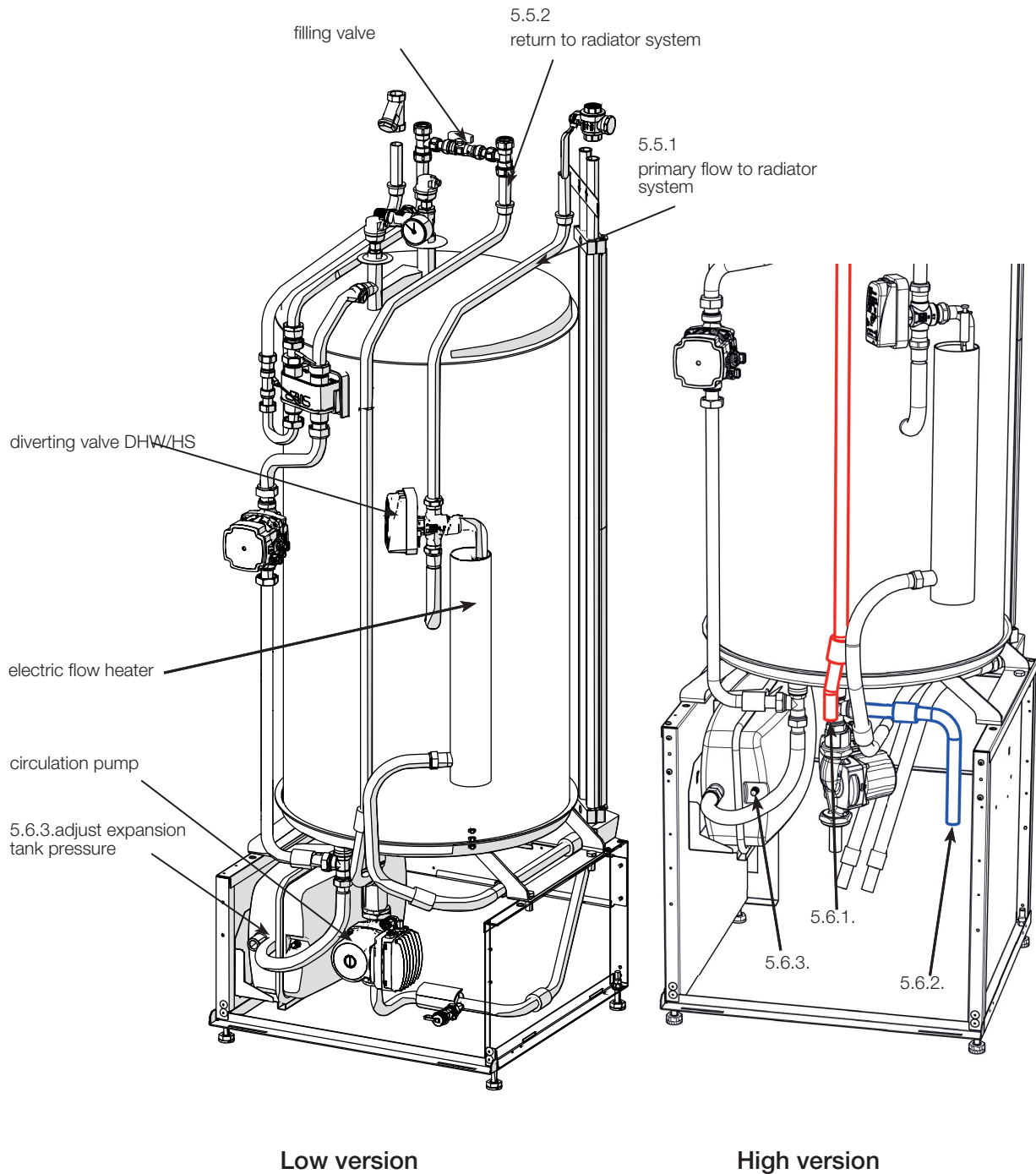
! NB: To facilitate servicing, it is important to fit shut-off valves to both the primary flow and the return line.

5.5 Install pipe for radiator system

Radiator system

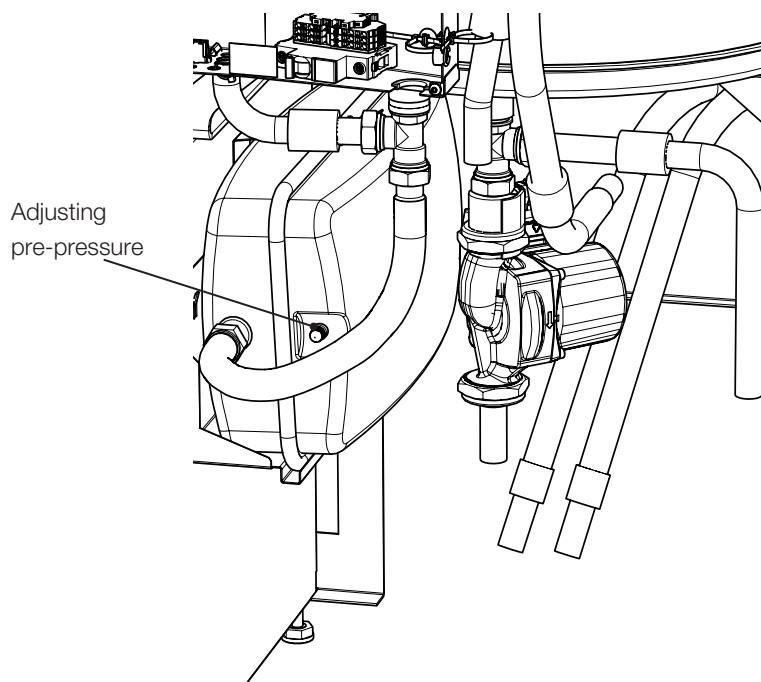
5.5.1 Install primary flow with shut-off valve

5.5.2 Install return line

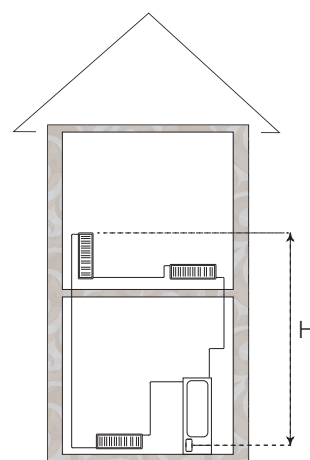


NB: To facilitate servicing, it is important to fit shut-off valves to both the primary flow and the return line.

5.5.3 Adjust the pre-assembled expansion tank to the right pre-pressure by using the valve to raise or lower the pressure.



The pre-pressure in the expansion tank is calculated according to the height (H) between the highest-positioned radiator and the expansion tank. The system pressure must be set 0.3 bar higher than the pre-pressure in the expansion tank. For example, a pre-pressure of 1.0 bar (5 mvp) means a maximum permitted height difference of 10 m.



Maximum height (H) (m)	Pre-pressure (bar)	System pressure (bar)	Maximum volume in the heating circuit (excluding product) (L)
5	0.5	0.8	310
10	1.0	1.3	219
15	1.5	1.8	129

! The expansion tank provided is pre-pressurised to approx. 1 bar, and therefore needs to be adjusted to a suitable pre-pressure for the building. This must be done before the system is filled with water.

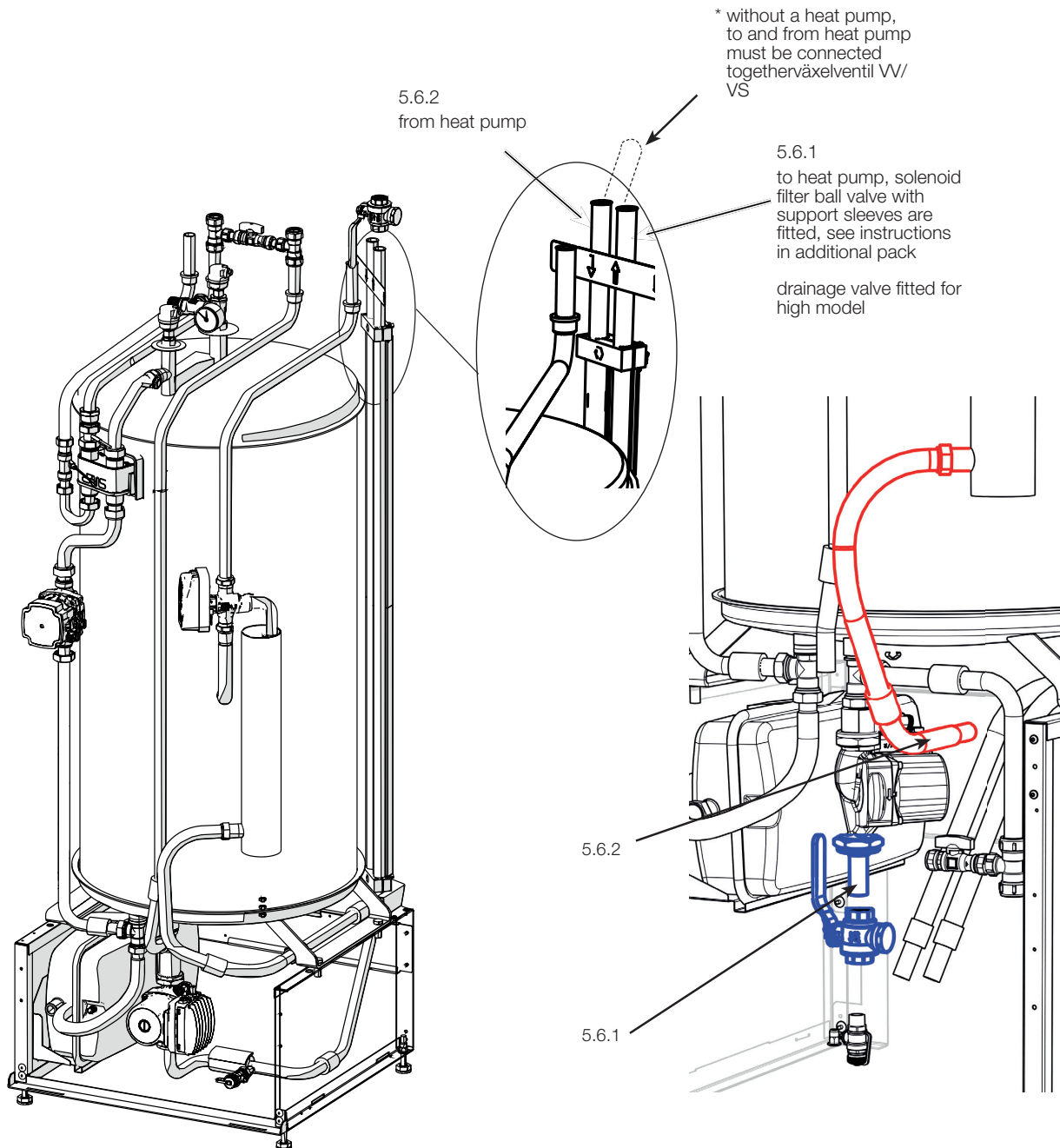
If an open expansion tank is used, the distance between the expansion tank and the highest placed radiator must not be below 2.5 m, in order to avoid introducing oxygen into the system.

If a heat pump is connected together with another heat source, e.g. an existing boiler, the installations must have separate expansion vessels.

5.6 Install pipes to and from the heat pump

Heat pump

- 5.6.1 Install pipe to the heat pump with solenoid filter ball valve
- 5.6.2 Install pipe from the heat pump
Install any adjustable bypass coupling past the heat pump.
(*for electrical operation only without a heat pump, bypass coupling is performed)

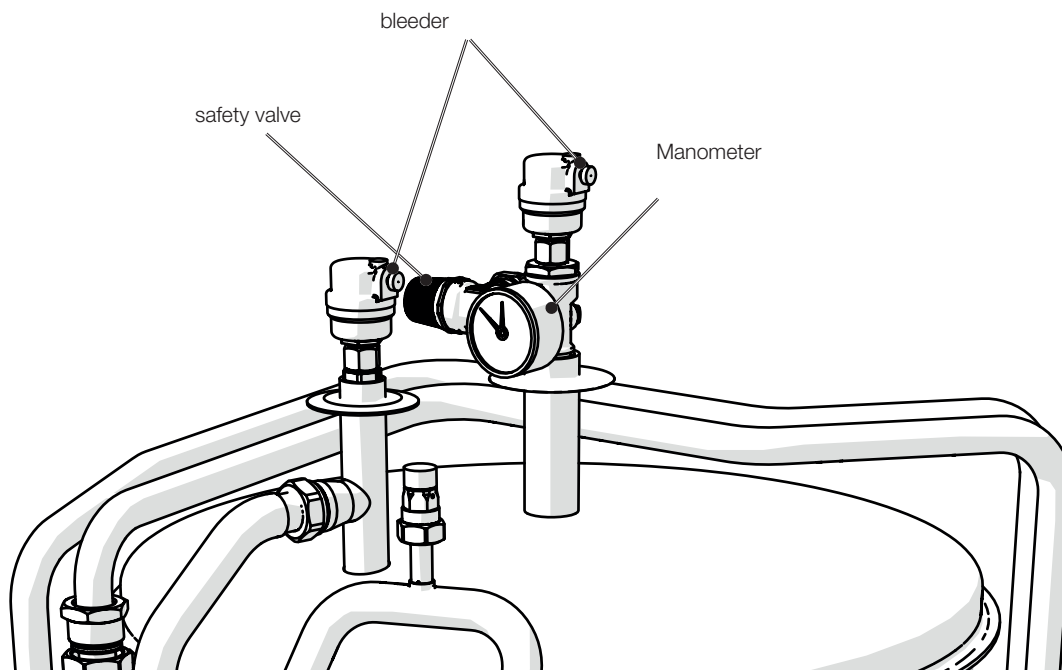


! CTC EcoZenith i350 is only approved for installation together with CTC Heat pumps. See the recommended systems at the start of the installation instructions.

5.7 Install waste water piping

Waste water

- 5.7.1 Fit the safety valve, vent valve and manometer. Components and assembly instructions are included in the additional pack for the product.
- 5.7.2 Install waste water piping
- 5.7.3 The vent valve is activated by loosening the bleeder screw, which should then be closed after a few minutes.



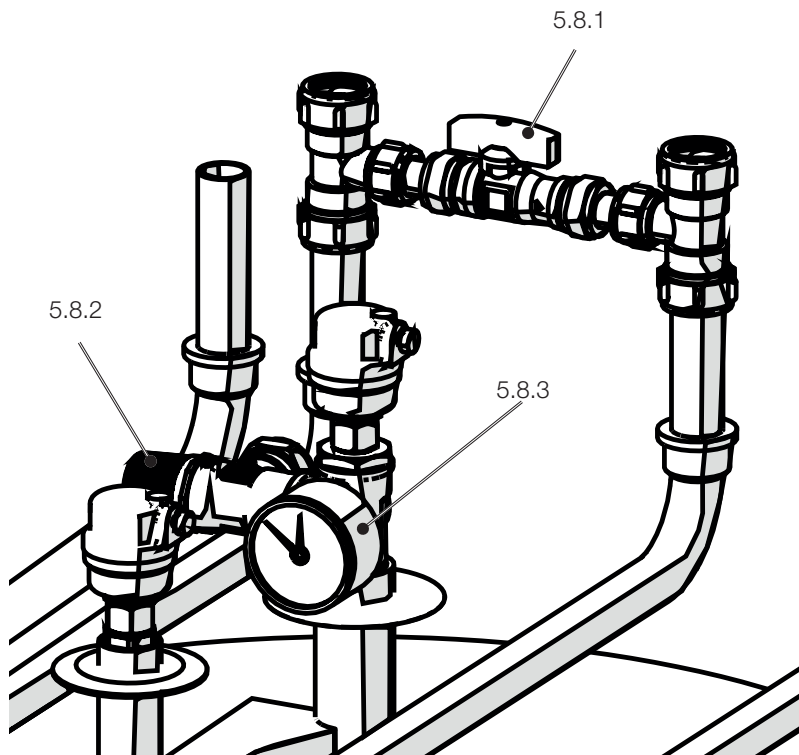
High version

- !** NB: Safety valve
The tank's safety valve (2.5 bar) for the heating circuit must be fitted in accordance with applicable regulations. The waste pipe is connected to the waste system, either directly to the floor drain or via a funnel. The waste pipe must slope towards the waste system, be installed frost-free and left open to the atmosphere/without pressure. The waste pipe must be fitted to the waste system.

5.8 Fill the heating circuit

Fill the heating circuit

- 5.8.1 Open the filling valve and fill the heating circuit
- 5.8.2 Turn the safety valve to release air more quickly when filling; close the filling valve once the system is full.
- 5.8.3 Check the manometer for a filled cold system (approx. 1 bar or 0.2–0.3 bar above the pre-pressure on the expansion tank)

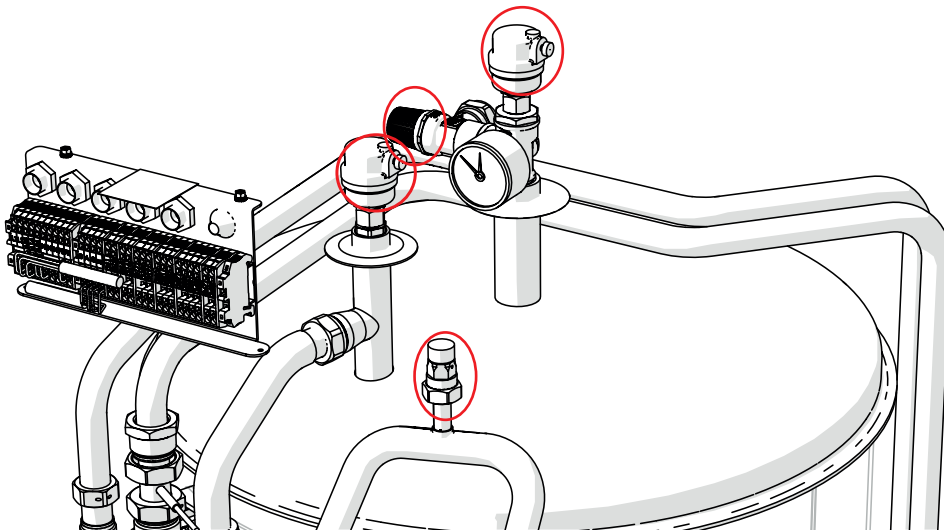


Low version

5.9 Bleed the entire system

Bleed the system

- 5.9.1 Bleed the CTC EcoZenith i350 valve using the safety valve; make sure also that the screw for the automatic vent valve has been activated.
- 5.9.2 Bleed, activate vent valve for heat pump
- 5.9.3 Bleed high points for the radiator system
- 5.9.4 Flush the hot water system



High version

i Bleeding is very important for the product to function. Problems that can be resolved by bleeding are listed in the troubleshooting section.

6. Electrical installation

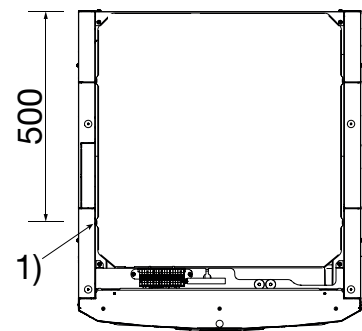
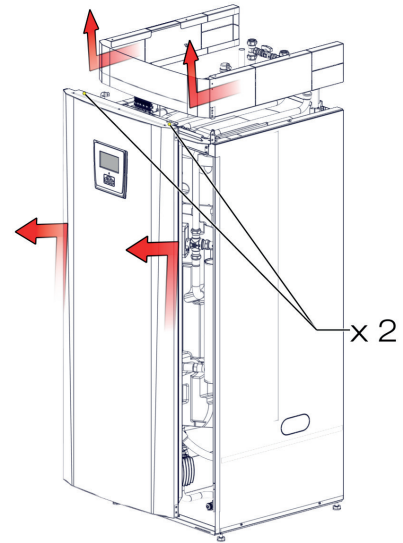
Safety information

The following safety instructions must be observed when handling, installing and using the product:

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

- The product is classified as IPX1. The product must not be rinsed with water.
- Never jeopardise safety by removing bolted covers, hoods or similar.
- Never jeopardise safety by deactivating safety equipment.
- Damaged feed cables must be replaced by the manufacturer or a qualified service engineer in order to avoid any risks.
- Installation and heat pump connection must be performed by an authorised electrician. All wiring must be installed according to applicable provisions. The boiler's internal wiring is installed at the factory.

To open the front panel, loosen the two screws at the top, fold out and set the front aside. Bear in mind that the cable to the display on the front is sensitive to damage.



Positioning of supply cable

Supply

The power supply cable is connected at (1). Length 200 cm.

The group fuse is selected such that all relevant requirements for the electrical installation are met; see technical data. The size of the fuse is set in the installation flow on the touchscreen. The product adjusts the electrical power to this. Once a current sensor has been installed, the built-in load switch is able to regulate the immersion heater's electrical output based on the set main fuse.

Omnipolar switch

The installation should be preceded by an omnipolar switch according to overvoltage category III, which ensures disconnection from all electric power sources.

Residual current device

If there is already a residual current device for the building, the product still needs to be fitted with its own residual current device.

Max. thermostat

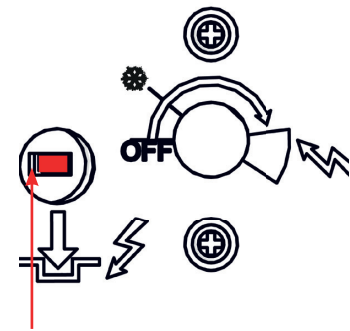
If the product has been stored in an extremely cold place, the max. thermostat may have been triggered. It can be reset by pressing the button on the electrical switchboard behind the front panel. Always check on installation that the max. thermostat has not tripped.

Extra low voltage protection

The following outputs and inputs have extra low voltage protection/potential-free input: current transformer, outdoor sensor, room sensor, primary flow sensor, return sensor, NR/SO, communication to heat pump.

Accessory: expansion card (A3)

For certain system options the product must be supplemented with the expansion card accessory (A3). See the installation instructions provided for how to install the card. Settings carried out after installation can be found in these instructions for CTC EcoZenith i350 under the touchscreen section.



Reset for max thermostat

6.1 Overview of basic electrical installation

Basic installation includes:

CTC EcoZenith i350

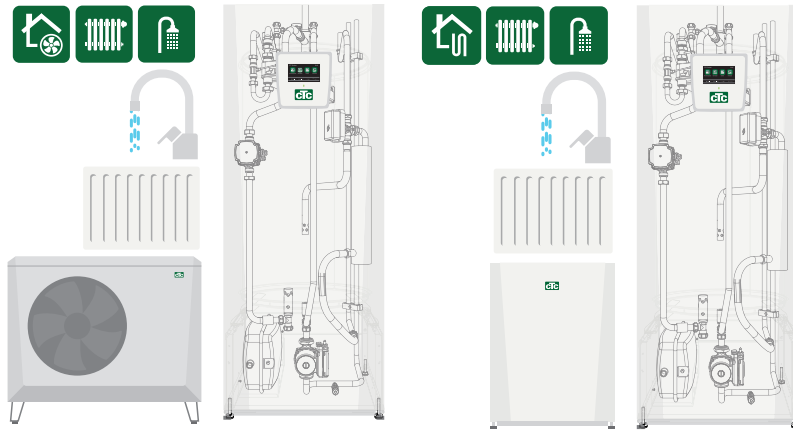
1 heating circuit

1 heat pump in the CTC EcoAir 400 or 500 series

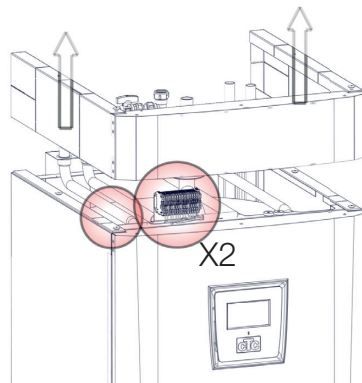
CTC EcoZenith i350

1 heating circuit

1 heat pump in the CTC EcoPart 400 series



In such cases, work flow points 1–6 can be used for electrical installation.



1	2	3	4	5	6
Install fuse panel	Current sensor fitted*	Fit outdoor sensor	Fit room sensor*	Connect heat pump	Finish electrical installation
Omnipolar switch	Fit on fuse panel	Place representatively for outdoor temperature	Place representatively for house temperature	Connect communication cable, terminal block X2	Provide information on house fuse size to pipe installation engineer
Connect factory-fitted feed cable	Connect to terminal block X2	Connect to terminal block X2	Connect to terminal block X2	Connect external power supply to heat pump	Check and sign electrical installation checklist

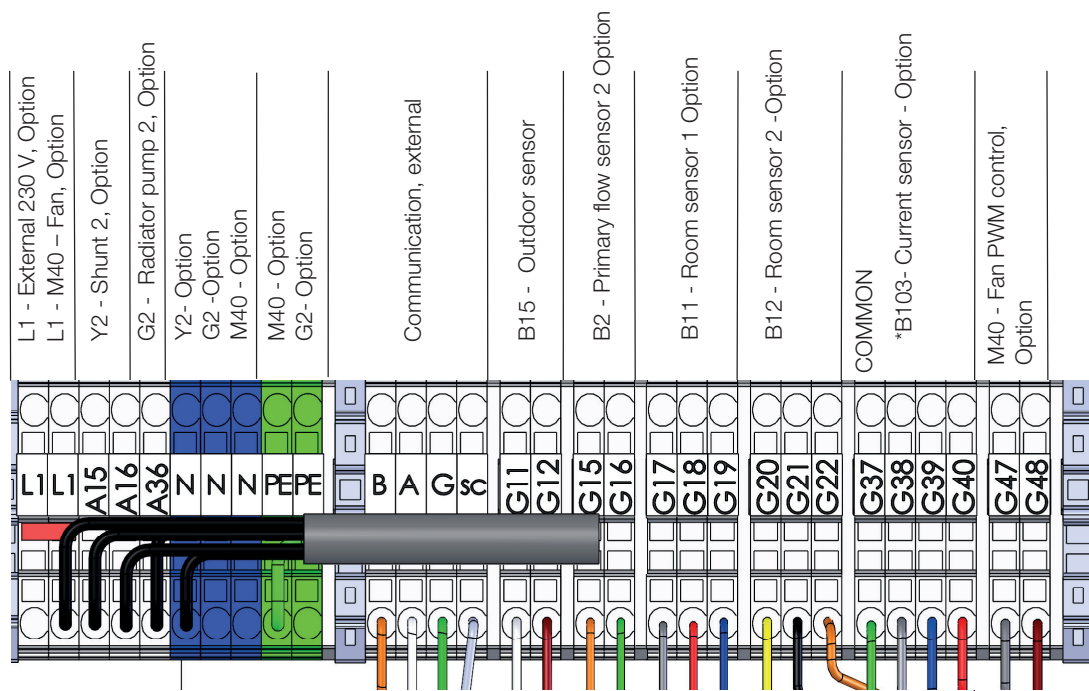
* option – can be selected

6.2 List of functions

Function	Relay card [A]	Sensor [B]	Pump [G]	Valve [Y]	Fan	Other
Basic installation	(A2) (X2)	B11, B15, (B18), B103	(G5), (G11)	Y21		COM HP – HP A1*
Return temp., installation without HP A1	(A2)	B7				
Heating System 2	(A2)	B2, B12	G2	Y2		
Ventilation	(X2)				M40	
Cooling	(A2)	B2	G2			
Volume tank (HS circulation under DHW/Pool)	(A2)	B1	G1			
Electric shut-off valve	(A2)			Y47		
DHW circulation	A3		G40			
External heat source (EHS)	(A2) or A3	B47		Y41		
Ext Boiler	(A2) or A3	B9		Y42		E1
Diff thermostat function	A3	B46	G46			
Pool	A3	B50	G51	Y50		
Solar Energy	A3	B30, B31	G30	Y30		
Solar energy, bore hole charging	A3		G31	Y31		
Solar energy, intermediate heat exchanger	A3		G32	Y30		
Smart Grid	(A2)					K22–K25
Remote control	(A2)					K22–K25

(Factory-fitted)

*powered separately (not from this unit)



**B103 – current sensor not applicable to 1x230V

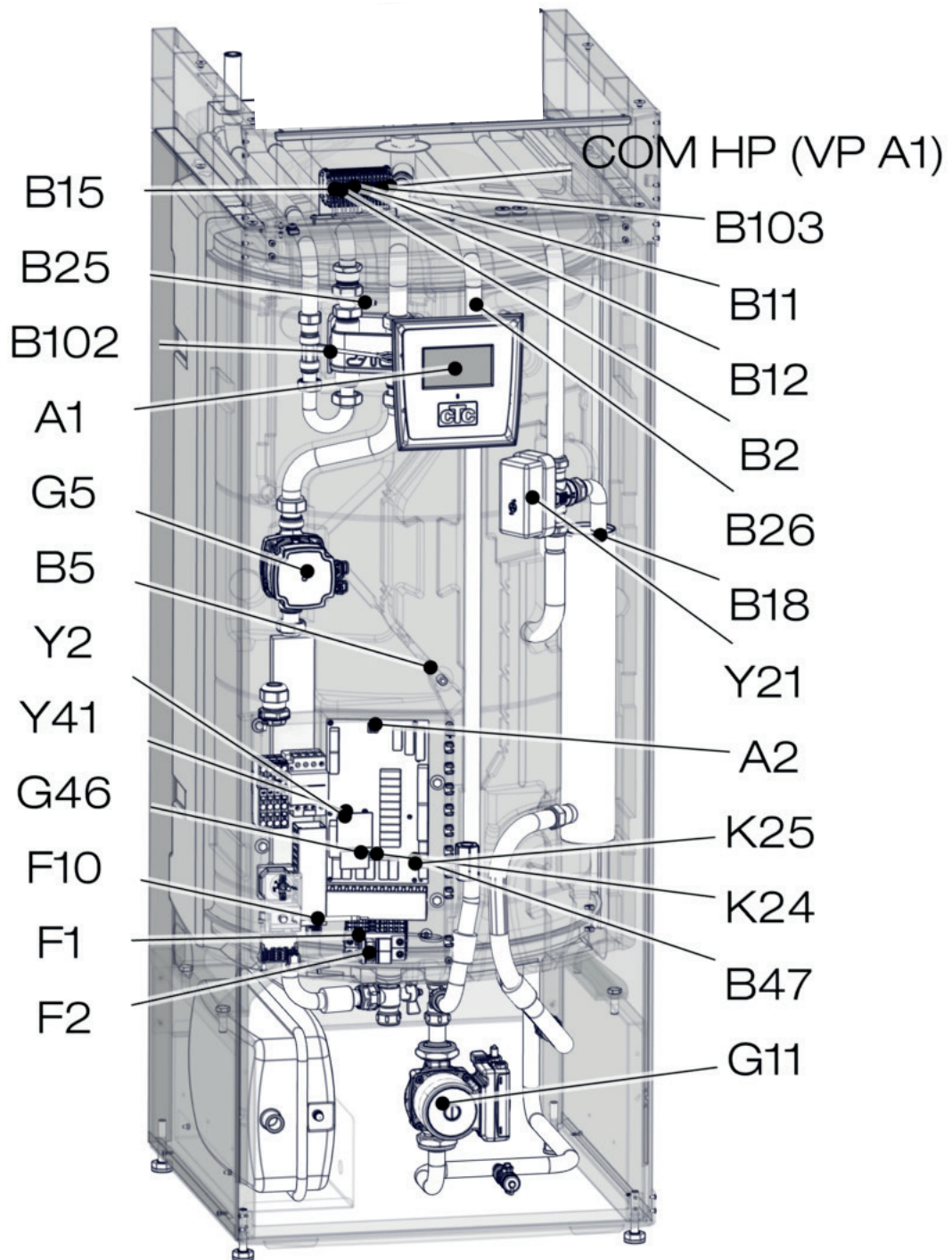
Terminal block X2



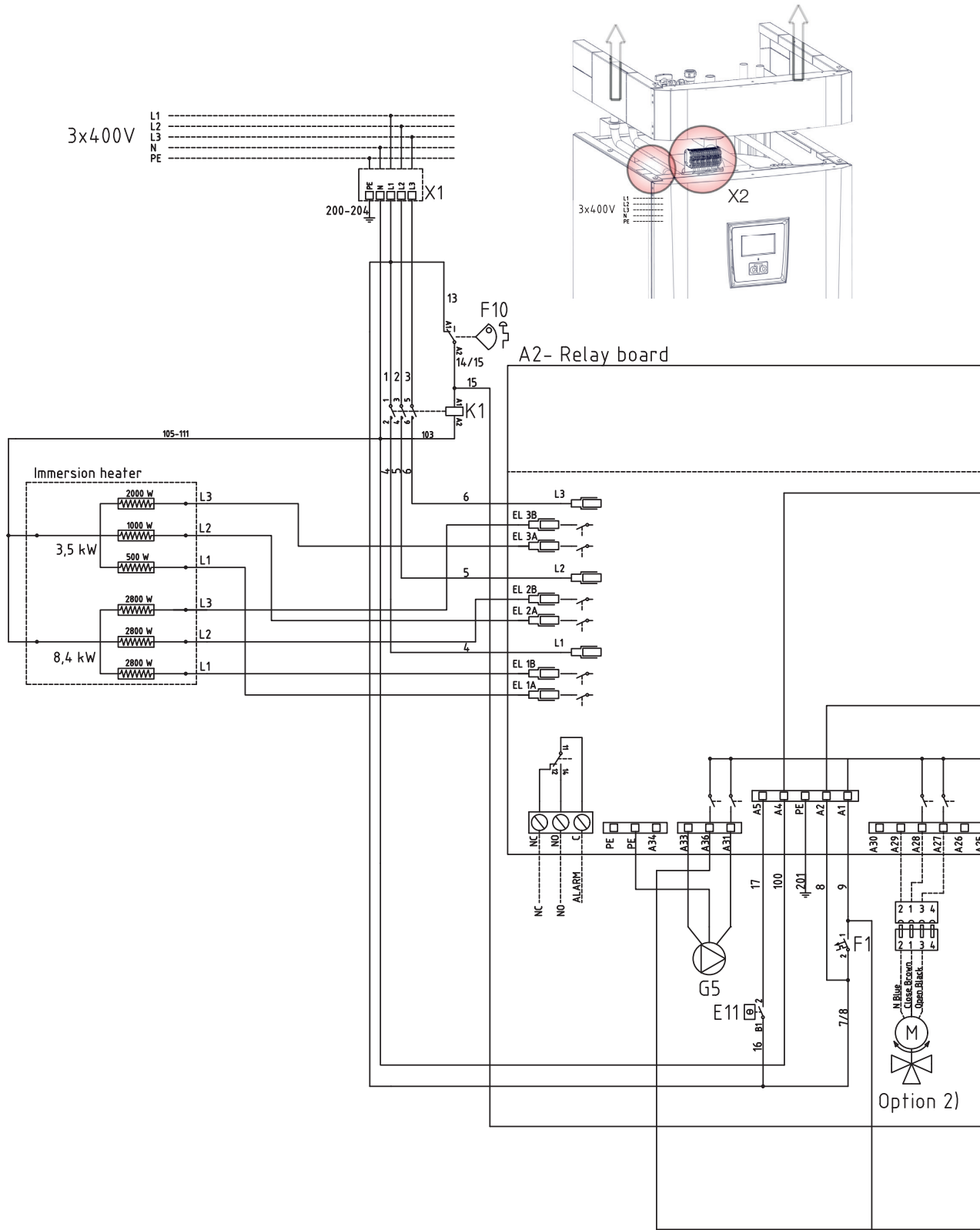
6.3 Electrical parts list

	Designation	Spec
A1	Display	
A2	Relay/main card	
A3	Expansion card	
A6*	Gateway	
B1	Primary flow sensor 1	NTC 22K
B2	Primary flow sensor 2	NTC 22K
B5	Sensor, hot water tank	NTC 22K
B7	Return sensor	NTC 22K
B9	External boiler sensor	NTC 22K
B11	Room sensor 1	NTC 22K
B12	Room sensor 2	NTC 22K
B15	Outdoor sensor	NTC 150
B18	Primary flow sensor	NTC 22K
B25	DHW	NTC 015 WF00
B26	Sensor, upper hot water tank	NTC 22K
B30	Solar panel sensor In	PT 1000
B31	Solar panel sensor out	PT 1000
B41	Sensor, external storage tank upper	NTC 22K
B42	Sensor, external storage tank lower	NTC 22K
B46	Sensor diff thermostat	NTC 22K
B47	External heat source tank	NTC 22K
B50	Sensor pool	NTC 22K
B102	Flow switch	
B103	Current sensor	
E1	Relay, additional heating	
F1	Automatic circuit breaker	
F2	Automatic circuit breaker	
F10	Max thermostat	
G1	Radiator pump 1	
G2	Radiator pump 2	
G5	Circulation pump for hot water heat exchanger	
G11	Charge pump HP1	
G30	Circulation pump, solar collector	
G31	Pump, bore hole recharging	
G32	Pump, plate heat exchanger – solar energy	

	Designation	Spec
G40	Circulation pump for hot water coil	
G46	Charging pump	
G50	Circulation pump, pool heating	
K1	Contactors 1	
K22	Flexible remote control/Smart Grid	
K23	Flexible remote control/Smart Grid	
K24	Flexible remote control/Smart Grid	
K25	Flexible remote control/Smart Grid	
M40	Fan	
HP A1	Heat pump A1	
X1	Terminal board	
X10	Extra terminal board	
Y2	Mixing valve 2	
Y21	Diverting valve DHW 1	
Y30	Diverting valve, solar, external buffer tank	
Y31	Brine diverting valve, solar	
Y41	ExtraHeatTank heat	
Y42	Mixing valve for external boiler	
Y47	Electric shut-off valve	
Y50	Diverting valve, pool	



6.4 Wiring diagram, CTC EcoZenith i350 3x400V



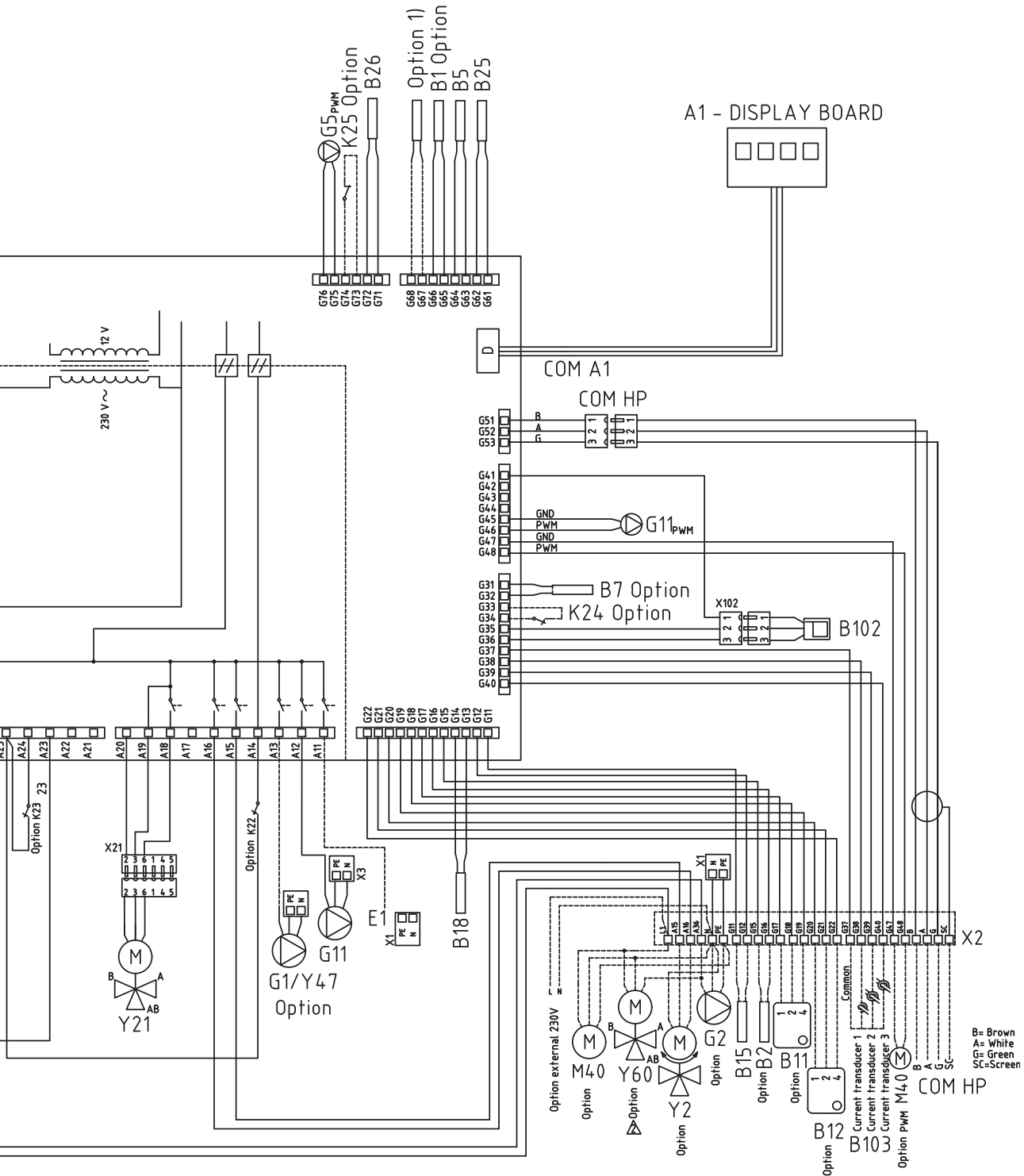
Option

Connections for option

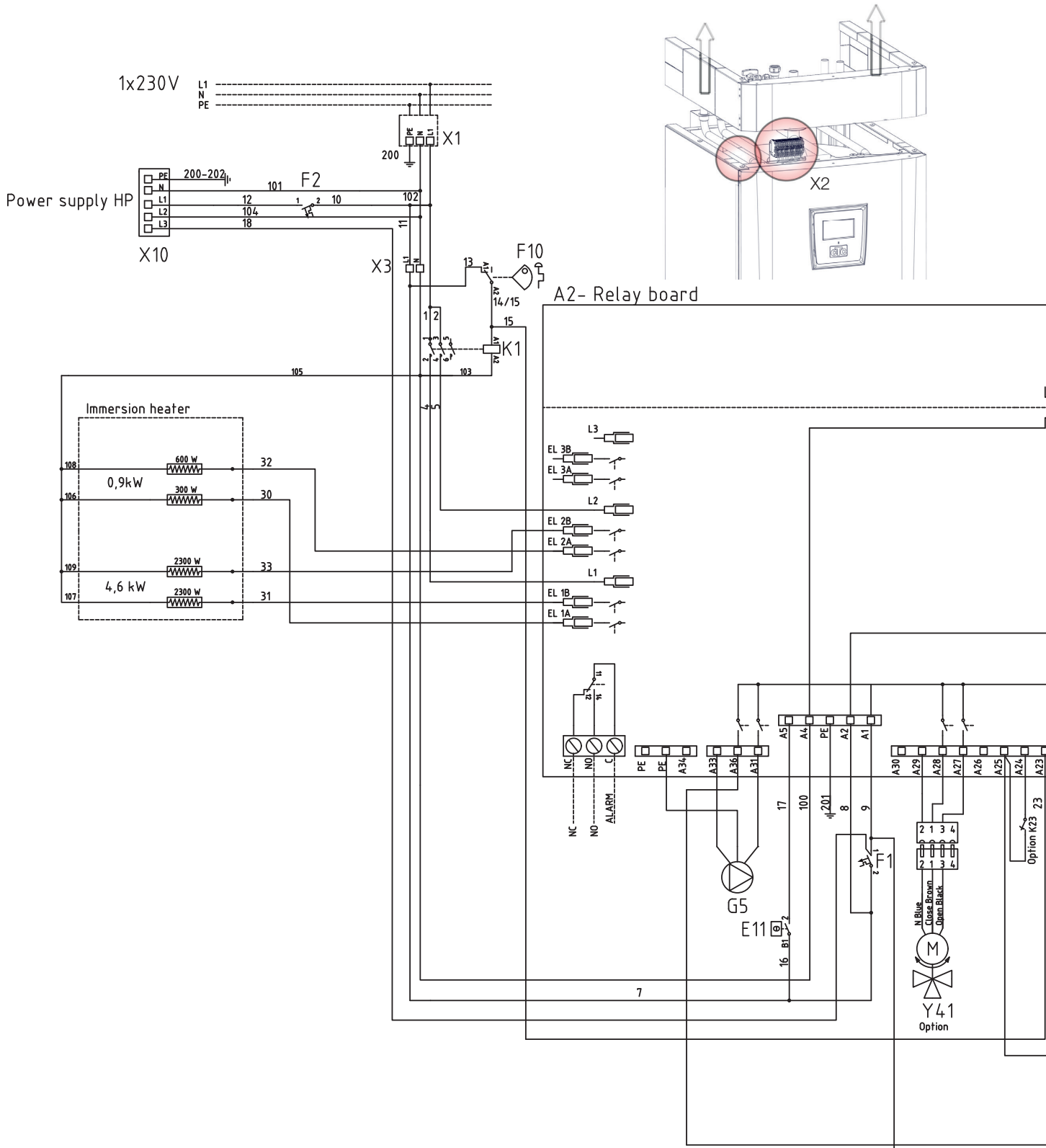
Connect option for extra functions

Accessories

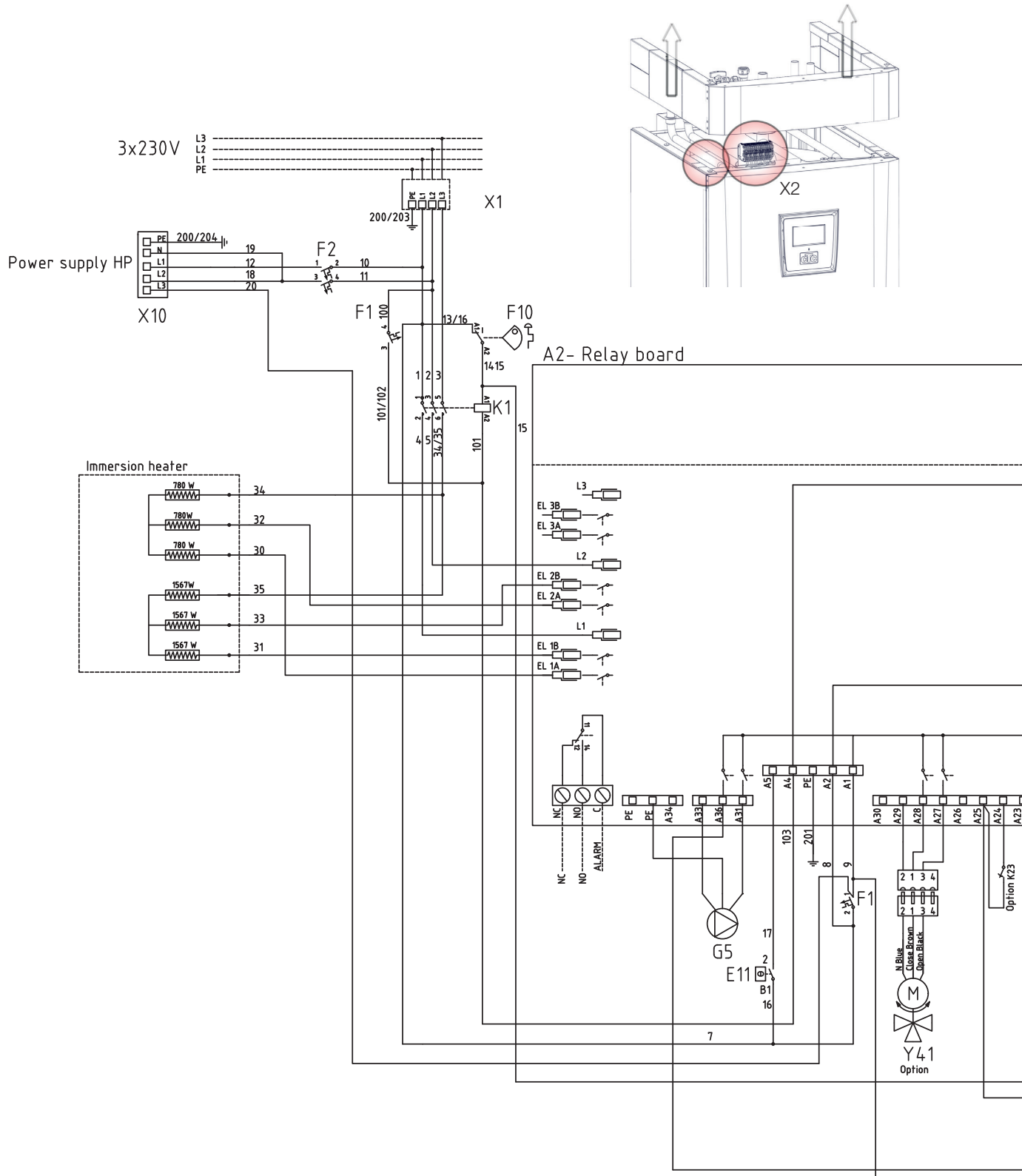
No.	Pos.	EHS	Ext Boiler
1) temp. sensor	G67/G68	B47	B9
2) valve	A27/A28/A29	Y41	Y42



6.5 Wiring diagram, CTC EcoZenith i350 1x230V



6.6 Wiring diagram, CTC EcoZenith i350 3x230V



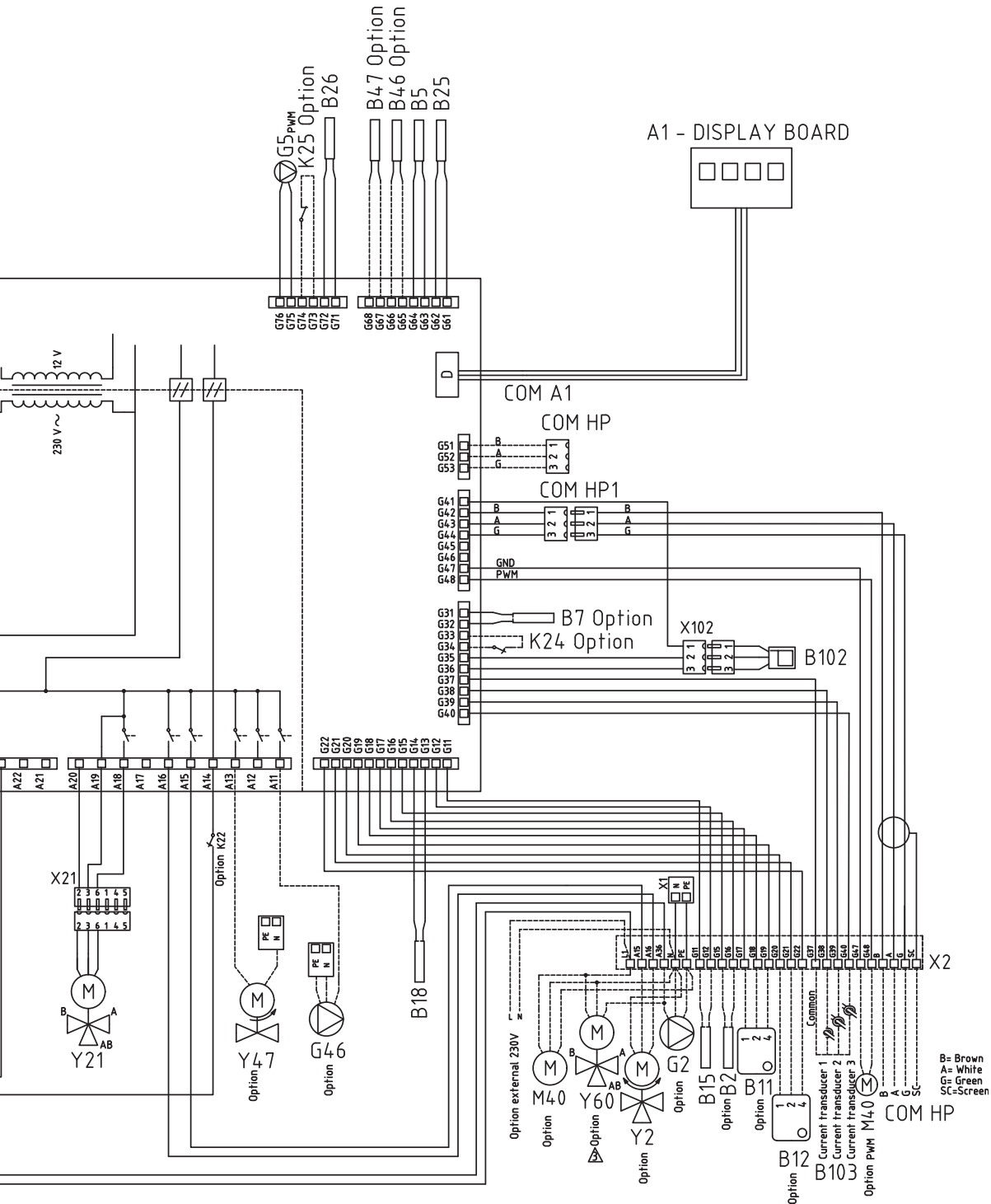
Option

Connections for option

Connect option for extra functions

Accessories

No.	Pos.	EHS	Ext Boiler
1) temp. sensor	G67/G68	B47	B9
2) valve	A27/A28/A29	Y41	Y42



6.7 Connection table for electrical components

This table specifies the connections for components for CTC EcoZenith i350 relay card A2 or terminal board X2. See also the wiring diagram.

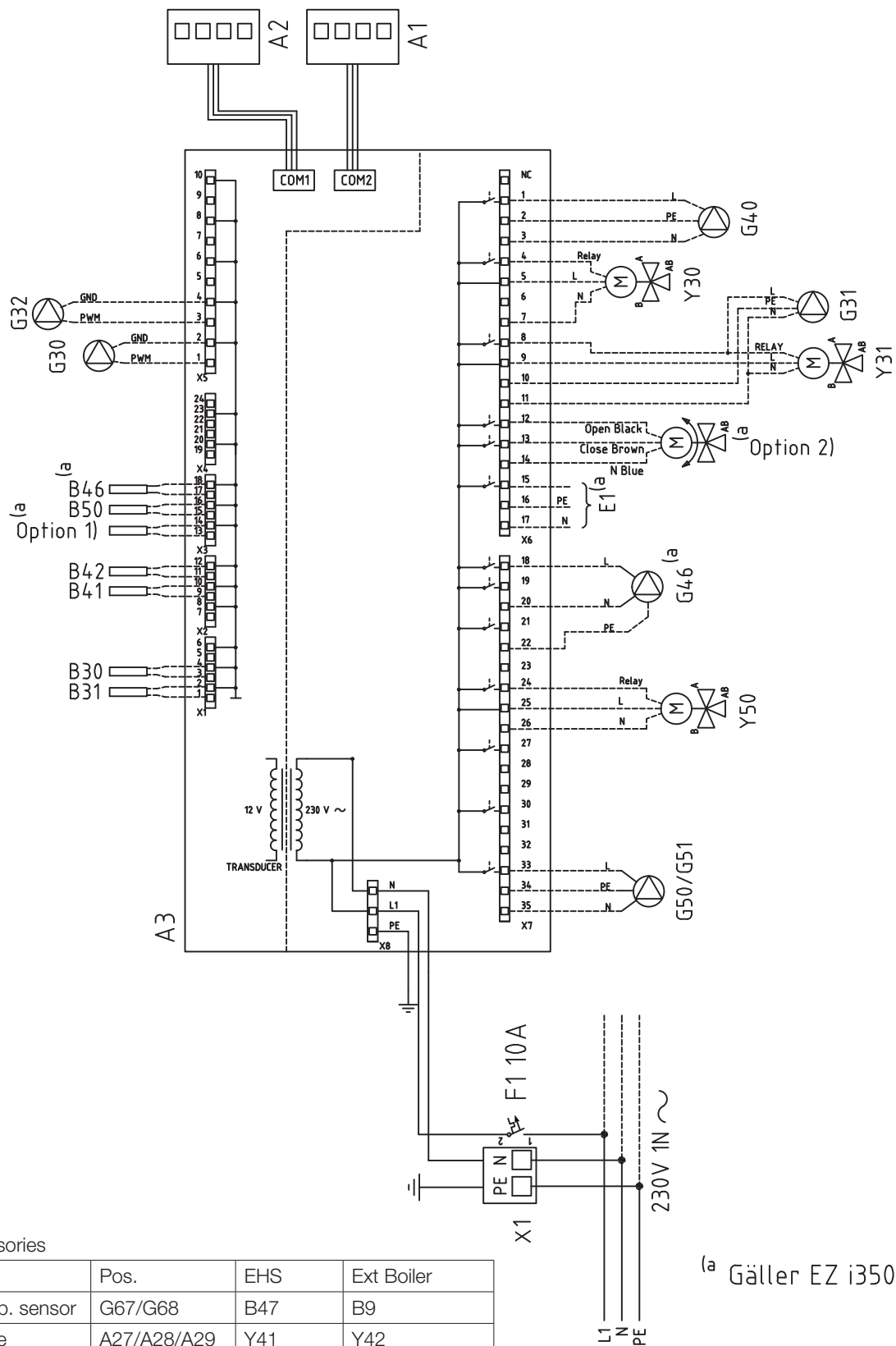
Connection	Designation	Option	Card	Terminal block	Cable
A1 – Display board	Display		A2	COM A1	Patch
A6	Gateway (option CTC SmartControl)	x	X2		
B1	Primary flow sensor 1	x	A2	G65	*
B1	Primary flow sensor 1	x	A2	G66	*
B2	Primary flow sensor 2	x	X2	G15	*
B2	Primary flow sensor 2	x	X2	G16	*
B5	Sensor, hot water tank		A2	G63	*
B5	Sensor, hot water tank		A2	G64	*
B7	Return sensor	x	A2	G31	*
B7	Return sensor	x	A2	G32	*
B9	External boiler sensor	x	A2	G67	*
B9	External boiler sensor	x	A2	G68	*
B11	Room sensor 1	x	X2	G17	1
B11	Room sensor 1	x	X2	G18	2
B11	Room sensor 1	x	X2	G19	4
B12	Room sensor 2	x	X2	G20	1
B12	Room sensor 2	x	X2	G21	2
B12	Room sensor 2	x	X2	G22	4
B15	Outdoor sensor		X2	G11	*
B15	Outdoor sensor		X2	G12	*
B18	Primary flow sensor		A2	G13	*
B18	Primary flow sensor		A2	G14	*
B25	DHW		A2	G61	*
B25	DHW		A2	G62	*
B26	Sensor, upper hot water tank		A2	G71	*
B26	Sensor, upper hot water tank		A2	G72	*
B47	External heat source tank	x	A2	G67	*
B47	External heat source tank	x	A2	G68	*
B102	Flow switch		A2	G35	Green
B102	Flow switch		A2	G36	Brown
B102	Flow switch		A2	G41	White
B103	Current sensor COMMON	x	X2	G37	COMMON
B103	Current sensor L1	x	X2	G38	L1
B103	Current sensor L2	x	X2	G39	L2
B103	Current sensor L3	x	X2	G40	L3
E1	Relay, additional heating		A2	A11	Black/ brown
E1	Relay, additional heating		X1	N	Blue
E1	Relay, additional heating		X1	PE	Green/ yellow
External alarm NC	External alarm		A2	NC	NC
External alarm No	External alarm		A2	No	No

Connection	Designation	Option	Card	Terminal block	Cable
External alarm Alarm	External alarm		A2	C	Alarm
G1	Radiator pump 1		A2	A13	*
G2	Radiator pump 2	x	A2	A36	Brown
G2	Radiator pump 2	x	A2	PE	Yellow/ green
G2	Radiator pump 2	x	A2	A34	Blue
G5	Circulation pump for hot water heat exchanger		A2	A31	Brown
G5	Circulation pump for hot water heat exchanger		A2	A33	Blue
G5	Circulation pump for hot water heat exchanger		A2	PE	Yellow/ green
G5	Circulation pump for hot water heat exchanger		A2	G75	Brown
G5	Circulation pump for hot water heat exchanger		A2	G76	Blue
G11	Charge pump HP1		A2	A12	Brown
G11	Charge pump HP1		A2	G45	Blue
G11	Charge pump HP1		A2	G46	Brown
G11	Charge pump HP1		X3	N	Blue
G11	Charge pump HP1		X3	Pe	Yellow/ green
K22	Flexible remote control/Smart Grid	x	A2	A14	***
K22/K23	Flexible remote control/Smart Grid	x	A2	A25	***
K23	Flexible remote control/Smart Grid	x	A2	A24	***
K24	Flexible remote control/Smart Grid	x	A2	G33	***
K24	Flexible remote control/Smart Grid	x	A2	G34	***
K25	Flexible remote control/Smart Grid	x	A2	G73	***
K25	Flexible remote control/Smart Grid	x	A2	G74	***
M40	Fan	x	X2	G47/G48	Blue/Yellow
COM HP – HP A1	Communication heat pump		X2	B	Brown
COM HP – HP A1	Communication heat pump		X2	A	White
COM HP – HP A1	Communication heat pump		X2	G	Green
COM HP – HP A1	Communication heat pump		X2	Sc	Shielding
Y2	Mixing valve 2	x	A2	A15	Black
Y2	Mixing valve 2	x	A2	A16	Brown
Y2	Mixing valve 2	x	A2	A17	Blue
Y21	Diverting valve DHW		A2	A18	Black
Y21	Diverting valve DHW		A2	A19	Brown
Y21	Diverting valve DHW		A2	A20	Blue
Y41	Mixing valve ExtraHeatTank	x	A2	A27	Black
Y41	Mixing valve ExtraHeatTank	x	A2	A28	Brown
Y41	Mixing valve ExtraHeatTank	x	A2	A29	Blue
Y42	Mixing valve for external boiler	x	A2	A27	Black
Y42	Mixing valve for external boiler	x	A2	A28	Brown
Y42	Mixing valve for external boiler	x	A2	A29	Blue
Y47	Electric shut-off valve	x	A2	A13	*
Y60	Diverting valve cooling	x	A2	A36	Black
Y60	Diverting valve cooling	x	X2	L1	Brown
Y60	Diverting valve cooling	x	X2	N	Blue

* cable can be connected regardless of terminal block for component

*** Connection according to description of remote control functions

6.8 Wiring diagram for expansion card



Accessories

No.	Pos.	EHS	Ext Boiler
1) temp. sensor	G67/G68	B47	B9
2) valve	A27/A28/A29	Y41	Y42

^(a) Galler EZ i350

6.9 Connection table for expansion card A3

This table shows the connections for components for CTC EcoZenith i350 expansion card A3.
See also the wiring diagram for the expansion card.

Designation		Terminal block/ cable	
A1	Display	COM2	*
A2	Relay/main card	COM1	*
B9	Sensor external boiler	X3:13	*
B9	Sensor external boiler	X3:14	*
B31	Solar panel sensor out	X1:1	*
B31	Solar panel sensor out	X1:2	*
B30	Solar panel sensor In	X1:3	*
B30	Solar panel sensor In	X1:4	*
B41	Sensor, external storage tank upper	X2:9	*
B41	Sensor, external storage tank upper	X2:10	*
B42	Sensor, external storage tank lower	X2:11	*
B42	Sensor, external storage tank lower	X2:12	*
B46	Sensor diff thermostat	X3:18	*
B46	Sensor diff thermostat	X3:19	*
B47	Sensor, external heat source, tank	X3:13	*
B47	Sensor, external heat source, tank	X3:14	*
B50	Sensor pool	X3:15	*
B50	Sensor pool	X3:16	*
G30	Circulation pump, solar collector	X5:1	PWM
G30	Circulation pump, solar collector	X5:2	GND
G32	Pump, plate heat exchanger – solar energy	X5:3	PWM
G32	Pump, plate heat exchanger – solar energy	X5:4	GND
G40	Circulation pump for hot water coil	X6:1	L
G40	Circulation pump for hot water coil	X6:2	PE
G40	Circulation pump for hot water coil	X6:3	N
G31	Pump, bore hole recharging	X6:8	L

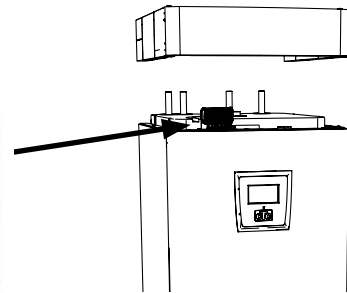
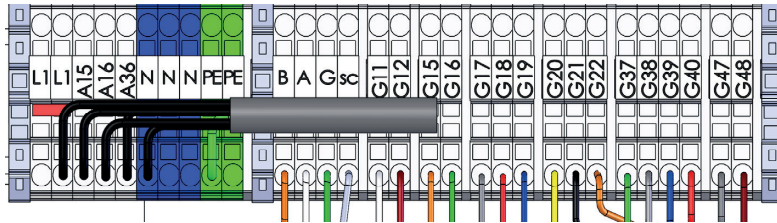
Designation		Terminal block/ cable	
G31	Pump, bore hole recharging	X6:10	PE
G31	Pump, bore hole recharging	X6:11	N
E1	Relay, external boiler	X6:15	L
E1	Relay, external boiler	X6:16	PE
E1	Relay, external boiler	X6:17	N
G46	Charging pump	X7:18	L
G46	Charging pump	X7:20	N
G46	Charging pump	X7:22	PE
G50	Circulation pump, pool heating	X7:33	L
G50	Circulation pump, pool heating	X7:34	PE
G50	Circulation pump, pool heating	X7:35	N
G51	Circulation pump, pool heating	X7:33	L
G51	Circulation pump, pool heating	X7:34	PE
G51	Circulation pump, pool heating	X7:35	N
Y30	Diverting valve, solar, external buffer tank	X6:4	Relay
Y30	Diverting valve, solar, external buffer tank	X6:5	L
Y30	Diverting valve, solar, external buffer tank	X6:7	N
Y31	Brine diverting valve, solar	X6:8	Relay
Y31	Brine diverting valve, solar	X6:9	L
Y31	Brine diverting valve, solar	X6:11	N
Y50	Diverting valve, pool	X7:24	Relay
Y50	Diverting valve, pool	X7:25	L
Y50	Diverting valve, pool	X7:26	N

* cable can be connected regardless of terminal block for component

6.10 Sensor connection

Sensors should be connected on the top cover, behind the product cover.

See the wiring diagram and connection table for correct connection.



Connect the sensors on the top cover of the product, behind the top trim.

Sensor terminal block

6.10.1 Connection of outdoor sensor (B15)

The sensor should be set up on the house's northwest or north side, so that it is not exposed to morning and evening sun. If there is a risk of the sensor being affected by the sun's rays, it must be protected by a screen.

Place the sensor at around 2/3 of the height of the facade near a corner, but not under a roof projection or other form of wind protection. Do not place it either above ventilation ducts, doors or windows where the sensor may be affected by factors other than the actual outdoor temperature.

6.10.2 Connection of room sensors (B11 and B12)

The room sensor is fitted at a central point in the house, in the most open position possible, ideally in a hall between several rooms. This is the best position for the sensor to record an average temperature for the house.

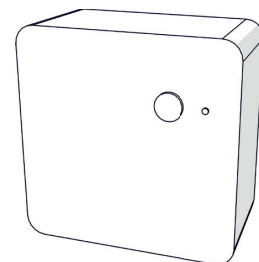
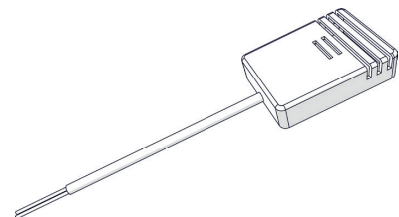
Feed a three-conductor cable (minimum 0.5 mm²) between the product and the room sensor. Then attach the room sensor securely in a position roughly two thirds of the way up the wall. Connect the cable to the room sensor and the product.

When connecting a wireless room sensor (accessory), refer to the wireless room sensor manual.

Check room sensor connection

- Go to the menu: Installer/Service/Function test/Heating system.
- Go down and select the option LED room sensor and press OK.
- Select On using the + button and press OK.
Check that the room sensor LED lights up. If not, check the cables and connection.
- Select Off using the - button and press OK. If the OK LED goes off, the check is complete.
- Return to start menu by pressing the Home button.

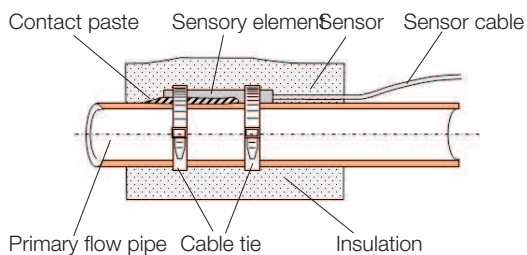
Do not attach the sensor cable permanently until you have tested where the best location is.



6.10.3 Attaching the sensor to the pipe

The sensing part is towards the end of the sensor (see sketch).

- Attach the sensor using the tie strap provided.
- Ensure that the sensor makes good contact with the pipe.
Apply contact paste to the front part of the sensor between the sensor and the pipe if good contact is otherwise difficult to obtain.
- **Important!** Insulate the sensor using pipe insulation.
- Connect the cables to the sensor terminal block



6.10.4 Primary flow sensor connection (B1 & B2)

When connecting primary flow sensors 1 (B1) and 2 (B2), fit the primary flow sensor to the primary flow pipe, ideally after the circulation pump.

- The cooling is adjusted using primary flow sensor 2 (B2), which then means that heating circuit 2 and cooling cannot be used simultaneously

6.10.5 Return sensor connection for installation without a heat pump

When connecting the return sensor (B7), fit the product to the return pipe before connecting to the product.

6.10.6 Checking 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 correct

6.11 Current sensor connection

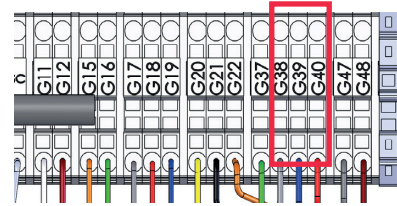
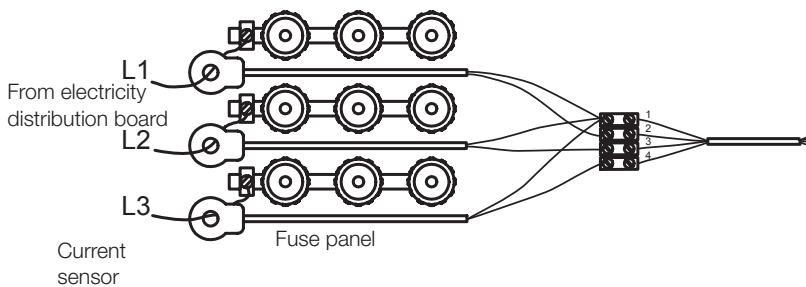
A current sensor with three sensors is used for product models with 400V 3N~ 50Hz (3x400V) and 230V 3N~ 50Hz (3x230V) connections (see technical data).

The three current sensors, one for each phase, are fitted on the fuse panel. Each phase from the electricity distribution board supplying the product is channelled through a current sensor before termination at the relevant terminal. This allows the phase current to be sensed all the time and compared with the value set for the product's load switch. If the current is higher, the control unit drops to a lower heat output on the immersion heater. If this is insufficient, the installed heat pump is also limited. When the power drops back below the set value, the heat pump and immersion heater are reconnected. This means that the current sensors, along with the electronics, prevent more power being supplied than the main fuses can tolerate.

A main fuse of up to 35 A is permitted. If the main fuse is larger, a conversion rate must be used.

The current sensors' cable holes are 11 mm in diameter.

The current sensor connection has no alarm, but the current value can be read in the Operation data menu. Note that the tolerance/accuracy is very low with small current values.



Connect to sensor terminal block (see wiring diagram). Use at least a 0.5 mm² cable.

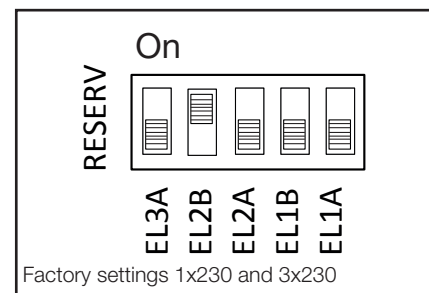
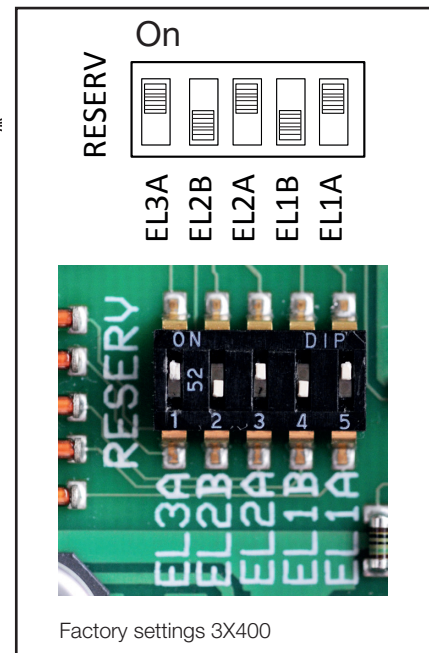
6.12 Installing a backup power supply

The DIP switch on the relay card (A2) 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. The factory-set mode is as shown in the image on the right.

	Power from each step for immersion heater [kW]					
	EL1A	EL1B	EL2A	EL2B	EL3A	EL3B
EcoZenith i350 3x400V	0.5	2.8	1	2.8	2	2.8
EcoZenith i350 1x230V	0.3	2.3	0.6	2.3	1.2	2.3
EcoZenith i350 3x230V	3	3	3	3	-	-

To give the total power for backup heating for 3X400 and 1x230, the power on the active relays is added together; for 3x230V the total power varies depending on the combination (see connection on wiring diagram). The power may need to be adjusted to the building.



6.13 Resistance table for sensor

[°C]	NTC 22K [Ω]	NTC 150 [Ω]	NTC 015 WF00 [Ω]
130	800		
125	906		
120	1027		
115	1167		
110	1330		
105	1522		
100	1746		
95	2010		
90	2320		
85	2690		
80	3130		
75	3650		
70	4280	32	
65	5045	37	
60	5960	43	
55	7080	51	
50	8450	60	
45	10130	72	
40	12200	85	5830
35	14770	102	6940
30	18000	123	8310
25	22000	150	10000
20	27100	182	12090
15	33540	224	14690
10	41800	276	17960
5	52400	342	22050
0	66200	428	27280
-5	84750	538	33900
-10	108000	681	42470
-15	139000	868	53410
-20	181000	1115	67770
-25	238000	1443	86430
-30		1883	
-35		2478	
-40		3289	

7. First start

CTC EcoZenith i350 can be installed and started before the bedrock/ground source or air/water heat pump is put into operation. In order to use the product as electric boiler before a heat pump is installed, the installation engineer must connect the pipes to and from the heat pump (see the pipe installation section). The product can also be started without a room sensor being fitted as the curve which has been set then regulates the heating. The sensor can, however, always be fitted for the alarm LED function.

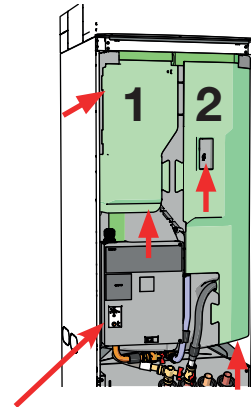
Before first start

1. Check that the product and system are full of water and have been bled. (CTC EcoZenith i350 is bled manually with a safety valve on the top cover of the product; activate the automatic bleeder as well for the first three months.)
2. For installation with a heat pump, follow the instructions in the heat pump manual.
3. Check that all connections are tight.
4. Check that the sensor and radiator pump are connected to the power source. Check that the connections behind the insulation cap remains tight. Remove both insulation caps by pulling carefully on the points marked.
5. The backup heating thermostat is factory-set to OFF (off position when it is turned anticlockwise as far as it will go, at which point the screwdriver slot is vertical). The recommended position is ❄️ = Antifreeze setting, around +7°C. The backup heating thermostat is located on the electrical switchboard behind the front panel. See the image on the right for what the antifreeze setting looks like.

At the end of the installation, check the connections of any current sensors. At this point it is important that you have switched off any major electricity-consuming appliances in the house. Also make sure that the backup heating thermostat is turned off.

- ! The product has an automatic bleeding sequence for the DHW system, which runs in the background.
- The sequence takes approximately 15 minutes and does not affect other functions.

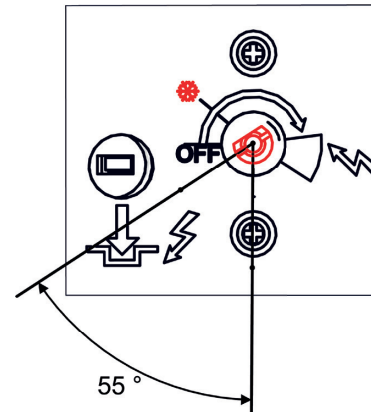
Check connections



First start

Close the omnipolar switch for the product. The display will switch on. The product will now ask the following:

1. Select the language and push OK.
2. Confirm that the system is filled with water and press OK.
3. Size of main fuse Choose between 10 and 90 A.
4. Enter the greatest immersion heater output (for operation as an electric boiler only, this must be set sufficiently high to cover the building's energy needs).
5. Select the option to permit the compressor if a heat pump is installed and the collector system is ready. When the compressor is started for the first time, a check is automatically carried out to ensure that it is running in the correct direction.
6. Specify the max primary flow °C for heating circuit 1.
7. Specify the inclination for heating circuit 1.
8. Specify the adjustment for heating circuit 1.
If the primary flow sensor for heating circuit 2 is installed, repeat steps 7 to 9 for heating circuit 2.
9. A test sequence for the current sensor is carried out.
10. The tank then starts, the hot water pump's bleeding programme is automatically activated for 1 h, and the start menu appears on the touch-screen.
11. When operating as an electric boiler only, the settings must be changed.
 - Settings/DHW tank/Add heat DHW – Yes.
 - DHW – Select mode: Comfort



Position for antifreeze setting

The selected power output must be written on the rating plate with a marker.

Save these settings under: Installer/Settings/Save settings

8. Operation and Maintenance

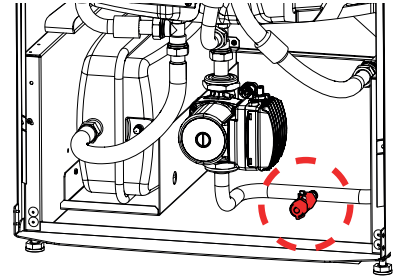
The installation engineer together with the property owner must check that the system is in perfect operating condition. The installation engineer must show the switches, controls and fuses to the property owner so that the owner knows how the system works and how to service it. Bleed the radiators after approximately three days of operation and fill with more water as needed using the filling valve if the manometer shows that the system pressure is too low.

Operation stop

The product is turned off using the omnipolar switch. If there is a risk of the water freezing, all the water should be drained from the heat pump and the heating circuit.

Draining the tank

The product should be disconnected from the power source while it is being drained. The draining valve for the low model is situated in the bottom right as viewed from the front, behind the product's front panel. For the high model, the drainage valve is included in the additional pack and the pipe installation engineer chooses where to connect the valve. Air must be supplied to the closed system.

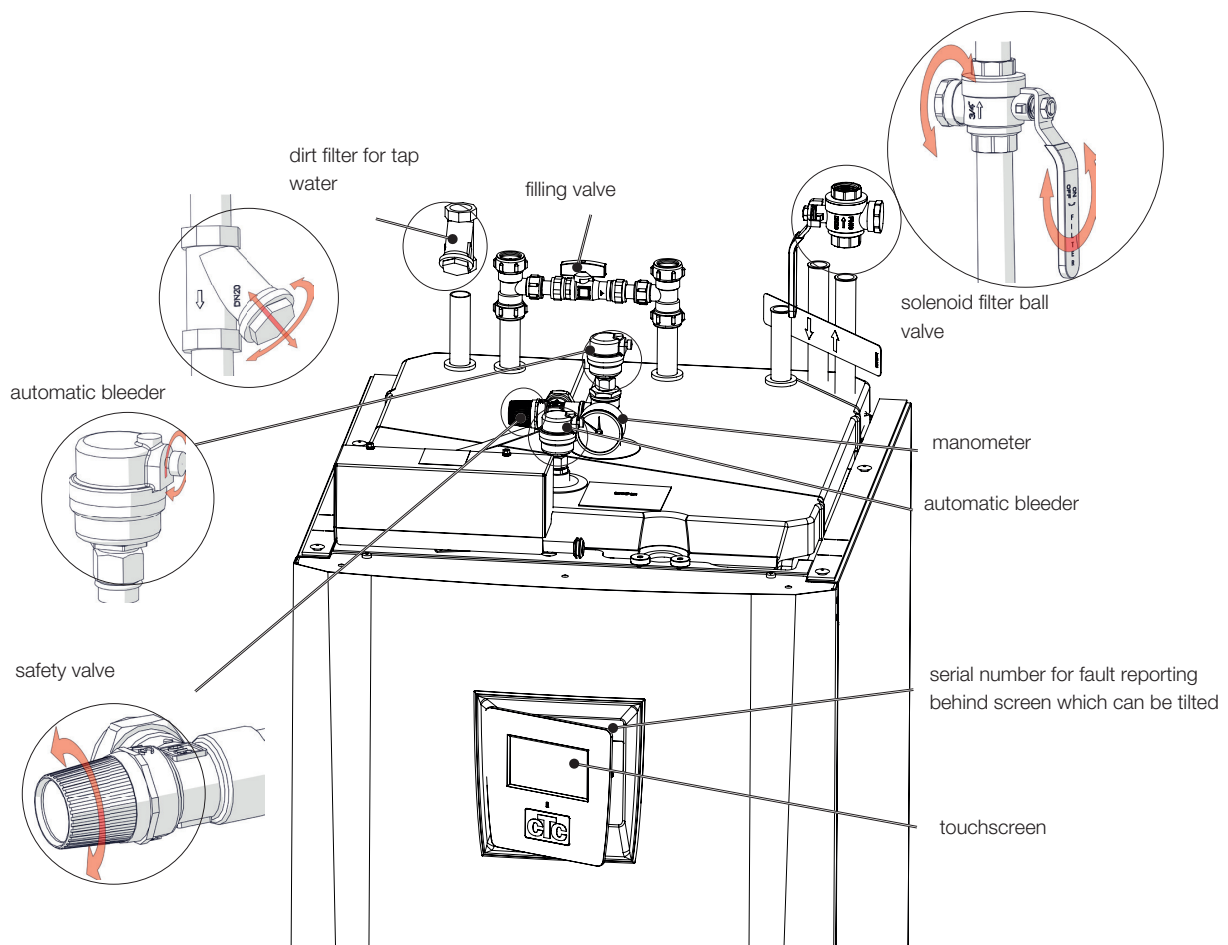


Boiler and heating circuit bleeding/safety valve

Check around four times a year that the valve is working correctly by manually turning the control. Check that there is water and not air coming out of the waste pipe; if air is coming out then the tank will need to be bled. Open the screw on the automatic bleeder for the first few months; the screw should then be closed to avoid damaging the vent valve.

Cleaning the dirt filter and solenoid filter ball valve

Clean the dirt filter regularly (close off incoming tap water; remove and clean the filter)/solenoid filter ball valve (close off the flow to the heat pump; remove and clean the filter).



9. Your home's heating settings

The house heating curve

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

One property requires a radiator temperature of 30°C when the outdoor

■ 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.

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.

Adjustment of default values for the heating curve

You define the heating curve for your property yourself by setting two values in the product control system. You can do this in the menu Installer/Settings/Heating circuit/Inclination or Adjustment. Ask your installation engineer to help you to enter these values.

It is extremely important to set the heating curve, and in some cases this process may take several weeks. The best way of doing this, upon 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. Once the correct heating curve has been set, the room sensor can be activated for even more adapted operation.

During the adjustment period it is important that:

- The night reduction function is not selected.
- All thermostat valves on the radiators are fully opened.
(This is to find the lowest curve for the most economical use of the heat pump.)
- The outside temperature is no higher than +5°C.
- The heating circuit is operational and correctly adjusted between different loops.

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 circuit in the Installer/Settings/Heating circuit menu.

The 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

9.1 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 zero 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 zero 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 zero 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 zero degrees:

Decrease the Adjustment value by a couple of degrees.
Wait 24 hours to see if any further adjustment is required.

 If a value is set too low, this may prevent the desired room temperature from being reached. If this occurs, you should adjust the heating curve as required in accordance with the above.
When the basic values have been set more or less correctly, the curve can be finely adjusted directly from Room temp. on the home menu screen.

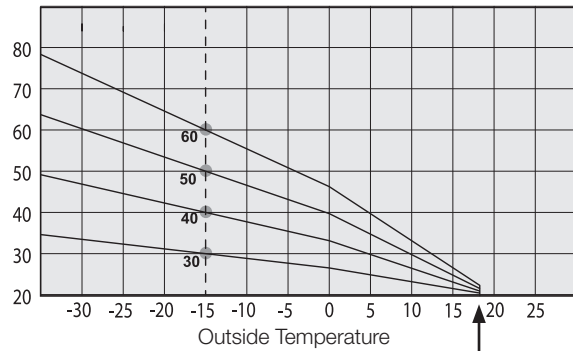
Examples of heating curves

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

Inclination

The inclination value that is set is the primary flow temperature when the outside temperature is -15°C .

Primary Flow Temperature



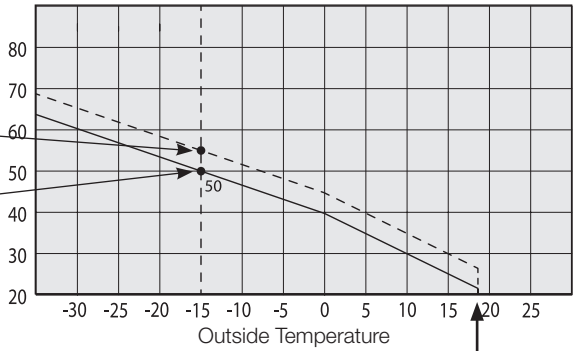
Adjustment

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

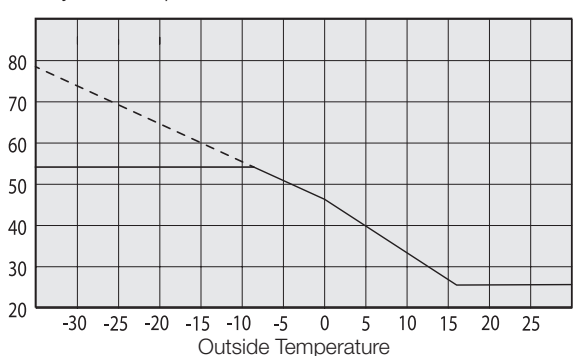
Inclination 50°C
Adjustment $+5^{\circ}\text{C}$

Inclination 50°C
Adjustment 0°C

Primary Flow Temperature



Primary Flow Temperature



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. summertime basement heating or the floor circuits in a bathroom).

Summertime 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 a default value of 18°C. This value, "Heating off, out", can be changed in the Installer/Settings/Heating circuit 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 18°C, 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)**

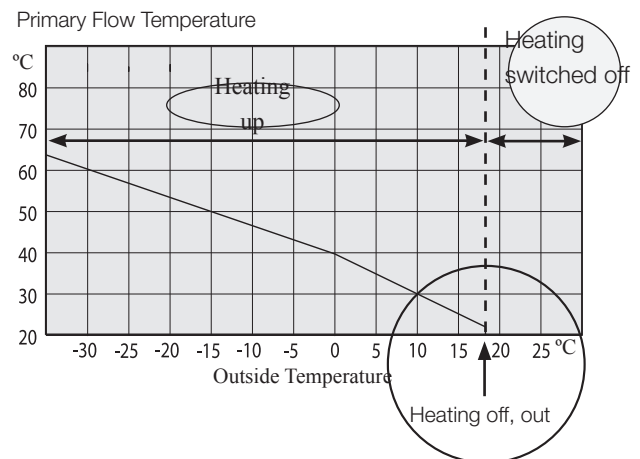
Facility for remote control of whether the heating is to be on or off.

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.



10. System adjustments

10.1 Adjust circulation pump

The charge pump/circulation pump speed for the radiator system is set depending on the system type. Make sure the flow through the heat pump is sufficient.

The circulation pump is factory-set to 90%, and adjustable to [25–100%]. This can be changed in the display under Installer/Settings/Heating circuit/Charge pump %.

- If the products do not work effectively, or if the heat in the radiator system is uneven because the flow is too low, the capacity of the charge pump can be increased. If the flow is too low, the heat in the radiators and floor heating circuits will become uneven. This requires a higher primary flow temperature to compensate, which will make heat pump operation more expensive.
- If there is noise in the radiator system caused by the flow being too high, the capacity of the charge pump can be reduced. As well as noise, unnecessarily high flow means more energy consumption/cost.

For CTC EcoZenith i350, the radiator system's flow must go through the heat pump; the pump needs to be set to produce the minimum flow for the heat pump and the building.

Step 1 Calculate required flow

Read the flow required by the heating circuit from the table below. The following approximations can be used as a simple rule of thumb: 40–45 W/m² for a newer house and 50–60 W/m² for an older house.

Required power [kW]	New house [m ²] 42.5 W/m ²	Older house [m ²] 55 W/m ²	delta 5 degrees. Example: floor heating circuit 40/35 [l/s]	delta 10 degrees. Example: radiator system 55/45 [l/s]
4	94	73	0.19	0.10
5	118	91	0.24	0.12
6	141	109	0.29	0.14
7	165	128	0.33	0.17
8	188	145	0.38	0.19
9	218	164	0.43	0.22
10	235	182	0.48 – VT 80 required	0.24
11	259	200	0.53 – VT 80 required	0.26
12	282	218	0.57 – VT 80 required	0.29
13	306	236	0.62 – VT 80 required	0.31
14	329	255	0.67 – VT 80 required	0.33
15	353	273	0.72 – VT 80 required	0.36
16	376	291	0.77 – VT 80 required	0.38
17	400	309	0.81 – VT 80 required	0.41
18	424	327	0.86 – VT 80 required	0.43
19	447	345	0.91 – VT 80 required	0.45
20	471	364	0.96 – VT 80 required	0.48 – VT 80 required

Power requirement for this building: [kW]

This building requires: [l/s]

Available pressure remaining according to pressure differential diagram in section 9.4 [kPa]

Step 2 Check minimum heat pump flow

To install an air-to-water heat pump, the flows shown below must be used even if step 1 gives a lower flow.

CTC EcoAir 406	0,21 l/s
CTC EcoAir 408	0,27 l/s
CTC EcoAir 610, 614	0,21 l/s
CTC EcoAir 622	0,39 l/s

This building requires: **[l/s]**

Step 3 Check whether a volume tank is needed

If the flow is below 0.45 l/s, the system can manage without a CTC VT 80 volume tank. If the system has a high pressure differential, a volume tank may be required. If the required flow is greater than 0.45 l/s, this accessory should be installed.

A CTC VT 80 volume tank must be installed to increase the flow in the system in the following cases:

- If the flow exceeds 0.45 l/s.
- If a mixing valve for an EHS-tank or external peak needs to be installed and the flow exceeds approx.: 0.35 l/s.
- If the flow in the heating circuit can be closed quickly, e.g. floor heating with no bypass etc.

A CTC VT 80 volume tank should be installed in the following cases:

- The system volume is less than 20 litres per kW heat pump to achieve good operation.

Step 4 Dimension the pipeline to the heat pump

The pipe dimensioning between the heat pump and CTC EcoZenith 350 depending on flow and number of metres between the products (single route).

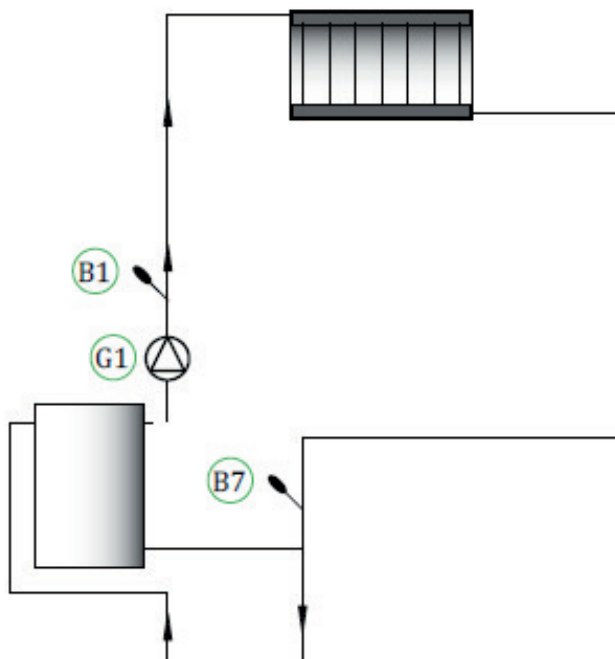
flow [l/s]	copper pipe 22 mm [m]	copper pipe 28 mm [m]	copper pipe 35 mm [m]
0.1	>20	>20	>20
0.12	>20	>20	>20
0.14	>20	>20	>20
0.17	21	>20	>20
0.19	17	>20	>20
0.22	12	>20	>20
0.24	10	>20	>20
0.26	8	>20	>20
0.29		>20	>20
0.31		18	>20
0.33		15	>20
0.36		12	>20
0.38		10	>20
0.41		8	>20
0.43			18
0.45			15

If a CTC VT 80 volume tank is installed to increase flow, the flow between the heat pump and CTC VT 80 is calculated according to the flow below.

CTC EcoAir 406	0,21 l/s
CTC EcoAir 408	0,27 l/s
CTC EcoAir 610, 614	0,21 l/s
CTC EcoAir 622	0,39 l/s
CTC EcoPart 406	0,14 l/s
CTC EcoPart 408	0,20 l/s
CTC EcoPart 410	0,24 l/s
CTC EcoPart 412	0,28 l/s

This building requires: **l/s between heat pump and CTC VT 80.**
This building requires: **l/s to the heating circuit**

Example: House with 11 kW floor heating where an EcoAir 610 is to be installed.



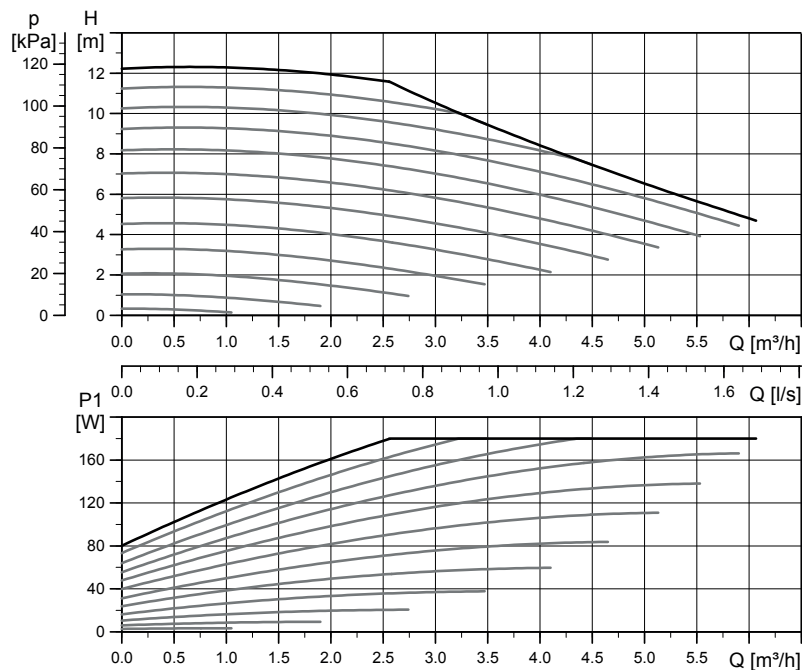
The heating circuit requires a flow of 0.53 l/s. External circulation pump G1 is designed for this flow. The heat pump requires a flow of 0.21 l/s.

Step 5 Set % of PWM signal on the charge pump

Use the pump and pressure differential diagram overleaf to determine the speed [%] according to which the circulation pump/charge pump should be set.

10.2 Pump curve for heating medium system circulation pump

UPMXL GEO 25-125 130 PWM, 1 x 230 V, 50/60 Hz



Electrical data 1 x 230 V, 50 Hz

Speed	Head	P ₁ [W]	I _{1/1} [A]
Min.		3	0.06
Max.		180	1.4

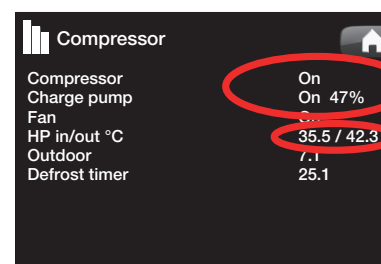
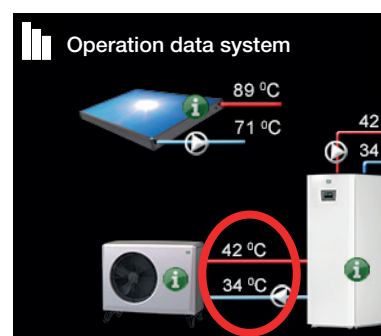
The circulation pumps in CTC's products have energy efficiency class A.

10.3 Flow check

Once the system has been in operation and stabilised and as the outdoor temperature gets colder, the temperature differential between HPout and HPin should be checked so that the set flow speed is sufficient:

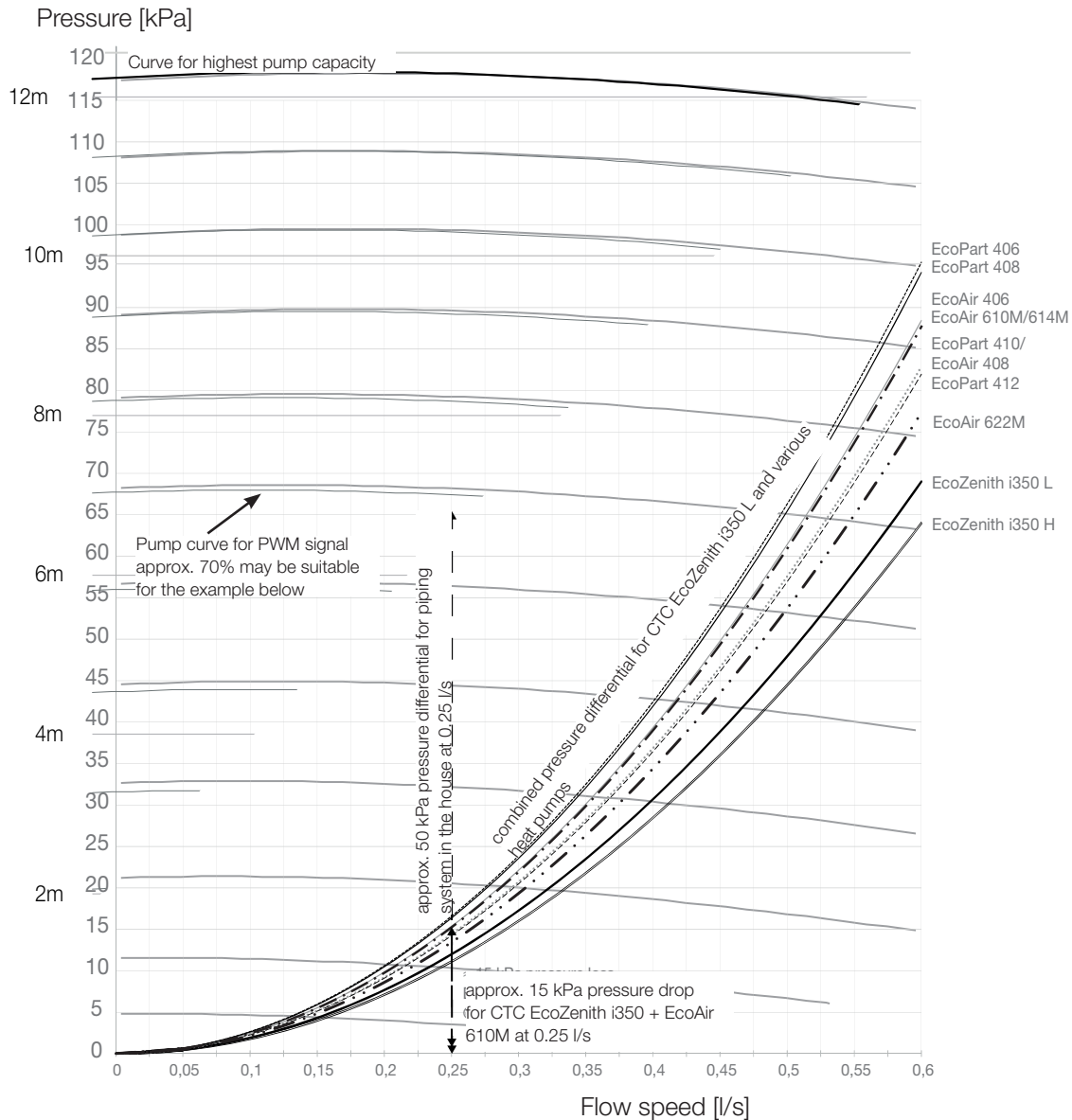
For heat pump in product range:

- EcoAir 400, see table in installation instructions for heat pump.
- EcoAir 600M series:
 - floor heating: HPout–HPin should not exceed 5 degrees, as rps > 20
 - radiators: HPout–HPin should not exceed 10 degrees, as rps > 20
 If HPout–HPin is greater, the circulation pump speed should be increased.
- With an outdoor temperature of -15°C, the temperature differential should be around 5/10 degrees depending on the temperature differential the system is designed for.
- EcoPart 400, see table in installation instructions for heat pump.



10.4 Pressure differential for heating medium side

The diagram below shows the total pressure differential for CTC EcoZenith i350 and the heat pump specified by the curve to the right of the diagram. Curves from the pump diagram on the previous page are added for reference.



Example for calculating speed of pump with required flow of 0.25 l/s
 approx. 15 kPa pressure differential for CTC EcoZenith i350 + CTC EcoAir 610M at 0.25 l/s
 approx. 50 kPa pressure differential for piping system in the house at 0.25 l/s
 The total pressure differential through the heating circuit is approx. 65 kPa at 0.25 l/s
 Compare to reference curves from pump curve included in the diagram.
 Approx. 70% for PWM signal to charge pump may be a suitable setting.

Product	Kvs value	Product	Kvs value	Product	Kvs value
CTC EcoZenith i350 L	2.6	CTC EcoAir 610M	5	CTC EcoPart 406	4.2
CTC EcoZenith i350 H	2.7	CTC EcoAir 622M	7.5	CTC EcoPart 408	4.3
		CTC EcoAir 406	4.9	CTC EcoPart 410	5.8
		CTC EcoAir 408	5.8	CTC EcoPart 412	6.0

10.5 Extra functions

There are many types of possible installation with CTC EcoZenith i350. Several options are described here.

10.5.1 Volume tank/equalisation tank

Connection options with volume tank, circulation pump (G1) and sensor (B1)

The heating circuit is expanded with

- CTC VT 80 volume tank
- radiator pump (G1)
- primary flow sensor (B1).

Aim: to achieve a sufficient flow speed for the building in the event of high energy needs and increased volume to avoid clicks in the radiator system.

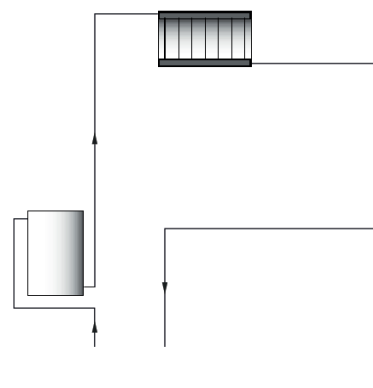
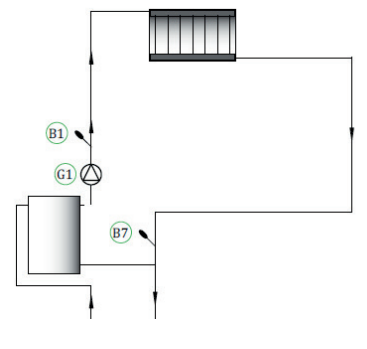
If a volume increaser is needed, this requires an extra circulation pump (G1). For adjustment by degree minutes, install an extra primary flow sensor (B1). The product will then continue to calculate degree minutes in the heating circuit even if the heat pump is producing hot water or heating the pool.

Define radiator pump with the touchscreen:
Installer/Define/Define radiator pump (G1) – Yes.

Connection options with equalisation tank

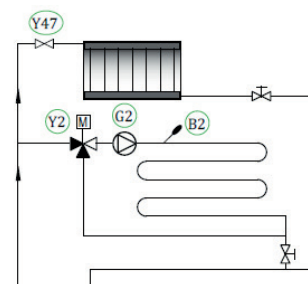
The heating circuit is expanded with an equalisation tank.

Aim: to increase the water volume for defrosting the air-to-water heat pump and to counteract clicks in the radiator system, such as floor heating.



10.5.2 Electric shut-off valve Y47

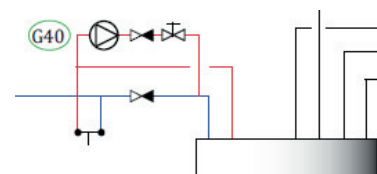
For background heating in heating circuit 2, where the heating is switched off during the summer in heating circuit 1, an electric shut-off valve (Y47) may be installed. Terminal block A13 is powered during the heating season and not powered in the summer.



10.5.3 DHW circulation (accessory)

The settings for hot water circulation require the installation of an expansion card accessory.

DHW circulation is connected as shown in the schematic diagram. Pump G40 is used to circulate the hot water.



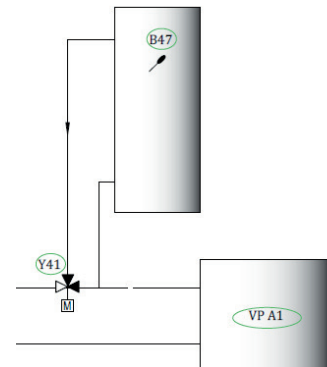
10.5.4 External heat source (EHS)

This function is used to connect additional heat sources to the heating circuit, e.g. water-jacketed stove, solar heat.

The heat from the external heat source is diverted into the system when the set temperature in the external tank is reached, and is at least 5°C higher than the setpoint in the radiator system. Diversion stops when the temperature is 3°C higher. The compressor and immersion heater stay idle for as long as there is sufficient energy in the external heat source. Heat is diverted to both the heating circuit and to hot water.

This comes to an end when one of the following alarms occur: Primary flow sensor 1, HP in-sensor, Comm. error HP or if Primary flow sensor 1 is hotter than 80°C.

Enter settings under Settings/External heat source.

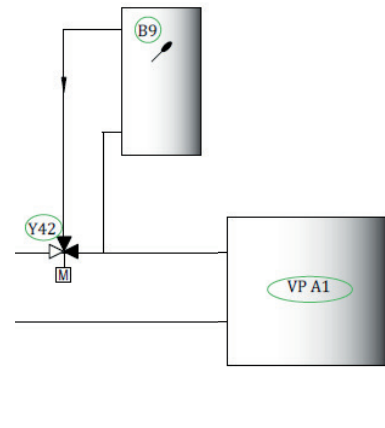


10.5.5 Ext Boiler

Aim: added heat when the need for heating or hot water is at its highest in winter, and for hot water when the need for heating is low if this is permitted. The function allows additional heat sources to be connected to the heating circuit with lower priorities (costlier heat sources), e.g. district heating or oil boilers.

Relay for external boiler (E1) is activated by outdoor temperature (or alarm). When the loss of degree minutes is great enough and the temperature is high enough (B9), the mixing valve (Y42) opens to the external boiler. Both the compressor in the heat pump and the immersion heater can be used at the same time as the external boiler. Heat is diverted to both the heating circuit and to hot water.

See more installation options in the menu description.

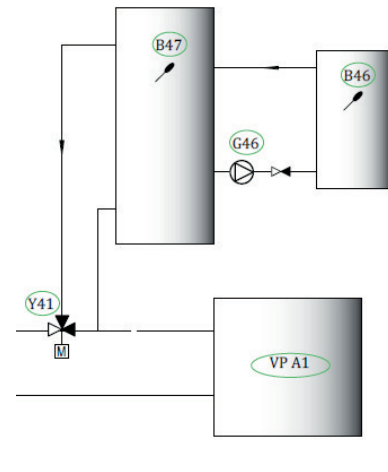


10.5.6 Diff thermostat function

The diff thermostat function is used to transfer heat from a tank with a sensor (B46) to a tank with a sensor (B47). The function compares the temperatures in the tanks and, when it is warmer in the first tank (B46), charging starts to the second tank (B47).

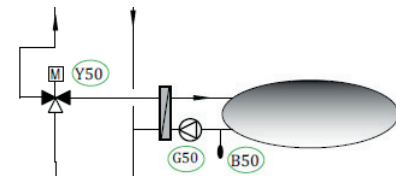
NB: For certain heat sources, e.g. solid fuel boilers, automatic chargers are recommended, among other things to counteract condensation in the fire box. However, this function cannot be combined with solar system 2 with EcoTank. This is because the same circulation pump (G46) is used.

Operation data displays the information “Ext. tank pump/°C”.



10.5.7 Pool (accessory)

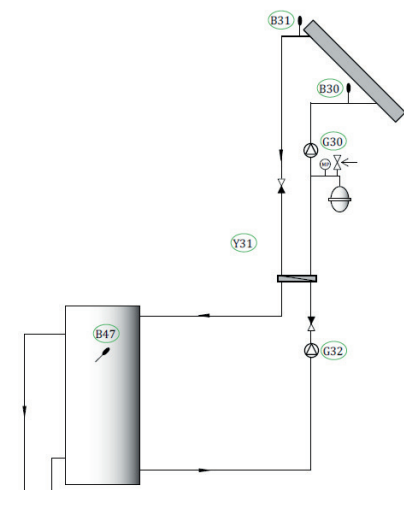
A pool can be connected to the system using a diverting valve (Y50). A heat exchanger should be fitted to separate the liquids. When the pool is heated, the diverting valve (Y50) changes direction and the pool pump (G51) starts. The immersion heater is never used to heat the pool. When a constant flow is desired in the pool water, the pool pump (G51) is connected with a separate supply and constant voltage. The expansion card accessory is required to connect pool heating to your heating circuit.



10.5.8 Solar heat (accessory)

Solar heat is connected to the system through an external heat source tank (EHS-tank).

The number of solar panels which can be connected depends on the volume of water in the product/tanks to which the solar panels are to be connected.



System 1

System 1 is a system structure with solar heat going directly to an external heat source tank (EHS-tank).

Charging conditions (main conditions, factory settings)

Charging starts when B31 is 7°C warmer than B6.

Charging stops when there is a difference of 3°C between B31/B30 or when the charge temperature is reached.

The tank for the external heat source (O1) can also have a solar coil, in which case the heat exchanger (F2), pump (G32) and non-return valve (Y11) are not required.

System 2

System 2 is a system structure with solar heat connected to an external heat source tank (EHS-tank) and an extra buffer tank (CTC EcoTank for example).

The system allows for a larger solar collector surface since it carries a greater volume of water.

Charging conditions

Charging starts when B31 is 7°C warmer than B42.

Buffer tank **without** coil:

Charging stops when there is a difference of 3°C between B31/B30 or when the charge temperature is reached.

Buffer tank **with** coil:

For a tank with a solar coil, the charging stops instead when B31 is 3°C warmer than B42.

Charging of the EHS tank compares sensor B41 to sensor B47.

The buffer tank (O2) may also have a solar coil; this means that the heat exchanger (F2), pump (G32) or non-return valve (Y11) is not required.

System 3

System 3 is a system structure with an extra volume called O3; this can be a large extra tank or a pool. The greater the water volume, the larger the solar collector surface required.

System 3 is solar heat connected to an external heat source tank (EHS-tank) and an extra buffer tank (e.g. CTC EcoTank). The system allows for a larger solar collector surface since it carries a greater volume of water.

Charging conditions

Charging starts when B31 is 7°C warmer than B42 or B47.

Charging stops when there is a difference of 3°C between B31/B30 or when the charge temperature is reached.

10.5.9 CTC EcoVent (accessories)

To connect the CTC EcoVent ventilation product, please refer to the CTC EcoVent manual.

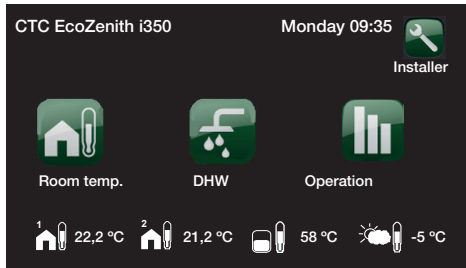
10.5.10 CTC SmartControl (accessories)

To connect CTC SmartControl, please refer to the CTC SmartControl manual.

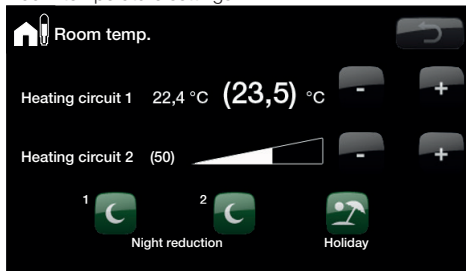
11. Touchscreen

11.1 Menu overview

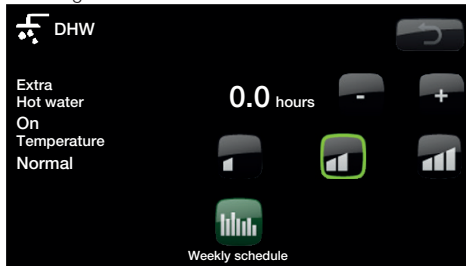
Start menu



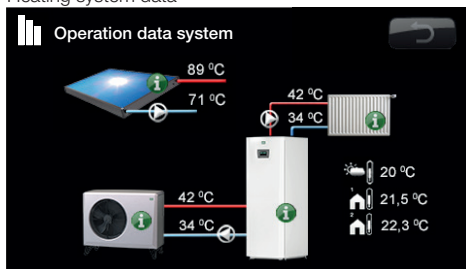
Room temperature settings



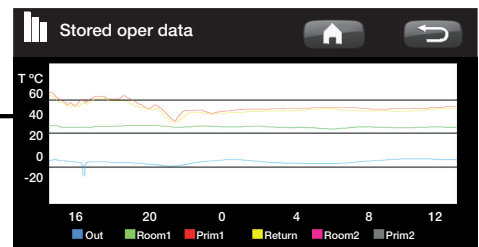
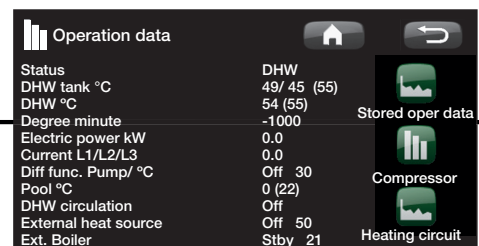
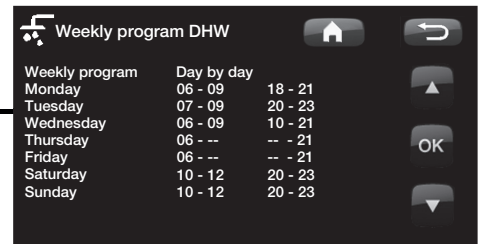
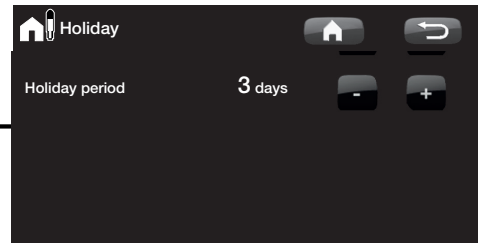
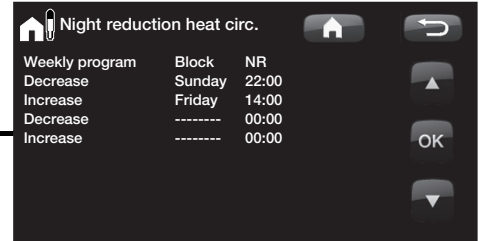
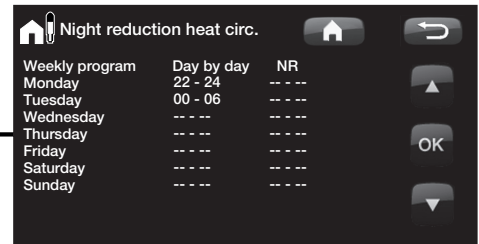
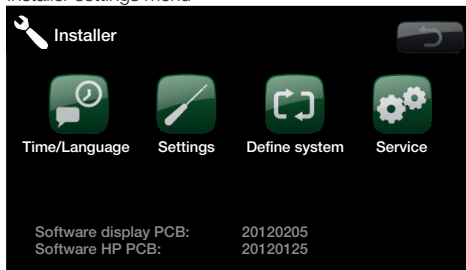
Selecting DHW comfort



Heating system data



Installer settings menu



Stored oper data

Total operation time h: 14196
 Max primary flow °C: 51
 Electric Heating kWh: 20

Compressor:

Total operation time 1540

Compressor

Compressor On
 Charge pump On 47%
 Fan On
 HP in/out °C 35.5 / 42.3
 Outdoor 7.1
 Defrost timer 25.1

Operation data heating

Primary flow 1 °C 37 (38)
 Return flow °C 33
 Radiator pump On

Primary flow 2°C 37 (38)
 Radiator pump 2 On
 Mixing valve 2 Open

Installer

Time Language

OK

Settings

Heating circuit 1
 Heating circuit 2
 Heat pump
 Electric heater
 DHW-tank
 Communication
 Cooling
 Solar panels
 Diff thermostat function
 Pool
 External heat source
 External boiler
 Save settings
 Load settings
 Load factory settings

OK

Define system

Heating circuit 1
 Heating circuit 2
 Heatpump
 CTC SMS
 Cooling No
 Solar panels
 Diff thermostat function No
 Pool No
 DHW circulation No
 Rad circulation (G1)(B1) No
 External heat source No
 External boiler No
 Ventilation No
 SmartControl
 Remote control

OK

Service

Function test
 Alarm log
 Factory settings coded
 Quick start compressor.
 Software update, USB
 Write log to USB
 Control current sensors
 Re-installation

OK

11.2 Component description menus

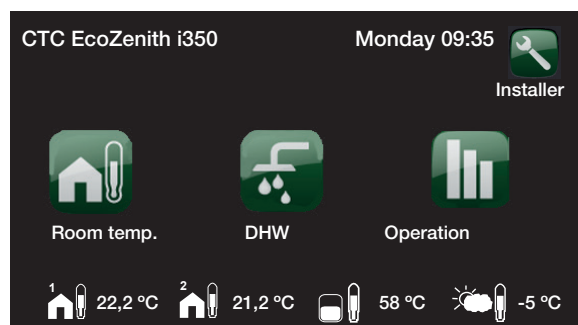
All settings can be configured directly on-screen using the easy-to-read control panel. The large icons function as buttons on the touch display.

Operational and temperature information is also displayed here.

11.3 Home Screen

This menu is the system's home screen. An overview of the current operational data is provided here.

Once an EcoVent ventilation product is connected and defined, the appearance of the home screen will change and a number of submenus will become accessible. Display menus specific to the EcoVent product are described in detail in the EcoVent Installation and Care instructions.



The first figure is the preset factory value, while the values in brackets are the value's range.



Room temperature

Settings for raising or lowering the temperature indoors and also for scheduling temperature changes.



DHW

Settings for DHW production.



Operation

This displays current operational data for both your heating circuit and your heat pump. Historical operational data is also available.



Installer

This option is used by the installer to configure the settings and servicing for your heating system.



Room temperature heating circuit 1

If heating circuit 1 is defined, the current room temperature is displayed here.



Room temperature heating circuit 2

If heating circuit 2 is defined, the current room temperature is displayed here.



Tank temperature

This displays the current temperature in the upper part of the 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 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

You can use this 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.



Stored operation data

This displays historical data.



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 operating the heat pump and system are usually configured by the installer.



Define system

The heating system's structure can be adjusted/modified using this option.



Service

Advanced settings are configured by the appropriate technical person.

11.4 Room temp.



This is used to set the desired room temperature. Use the plus and minus buttons to set the temperature you want. The “setpoint” temperature is given in brackets. You can see the current value next to the brackets.

If two heating circuits are installed, the values for both are displayed here.

If you want to schedule a temperature reduction, you can continue to the Night reduction or Holiday submenus.

Room sensor is defined in the Installer/Define system/Heating circuit menu. Select “Room sensor No” if the room sensor is poorly positioned, if the floor heating system has separate room sensors or if you use 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 heat pump 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.

11.4.1 Setting without a room sensor

If a room sensor has not been installed (selected in the Settings menu), you adjust the room temperature using this option, which displays the setting range as a percentage. If this range is not sufficient, the default setting must be adjusted under the Installer/Settings/Heating circuit menu.

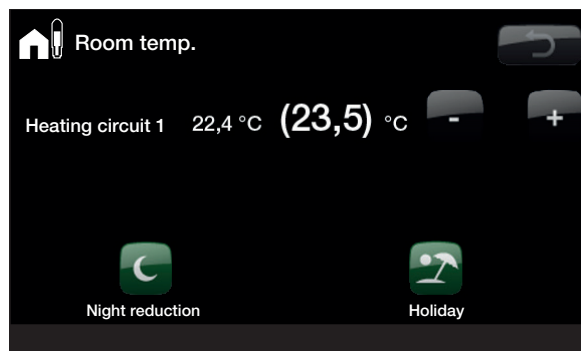
Change the value in small steps each time (approx. 2 to 3 steps) and wait for the result (approx. one day), as there is a delay in the system responding.

Several adjustments may be necessary at different outdoor temperatures, but you will gradually achieve the right setting that will not need to be changed.

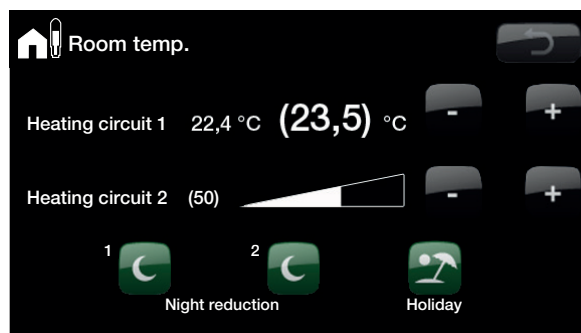
11.4.2 Outdoor sensor/room sensor errors

If a fault occurs with an outdoor sensor, an outdoor temperature of -5 °C is simulated so that the house does not get cold. The product’s alarm is triggered.

If a fault occurs with a room sensor, the heat pump automatically switches to operating according to the set curve. The product’s alarm is triggered.



The example above shows that the room temperature is 22.4 °C, but the desired value (setpoint) is 23.5 °C.



The example above shows operating with two heating circuits. Heating circuit 1 with a room sensor and heating circuit 2 without one.

i The radiator thermostats must always be fully open and operating correctly when the system is tuned.

11.4.3 Night reduction in temperature



You use this menu to activate and set a reduction in the temperature at night. A night reduction means that you reduce the temperature indoors during scheduled periods, for example, at night or when you are working.

The value by which the temperature is reduced, *Room temp reduced °C*, is set under Installer/Settings/Heating circuit.

The value by which the temperature is reduced, Room temp reduced, is set under Installer/Settings/Heating circuit/Factory setting: -2°C.

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

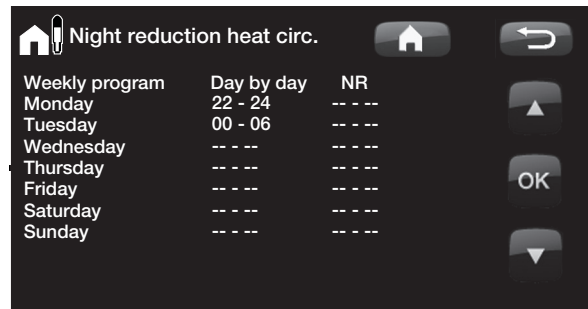
Day by day menu

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

The time set is when you want to have night reduction; the temperature is normal at other times.

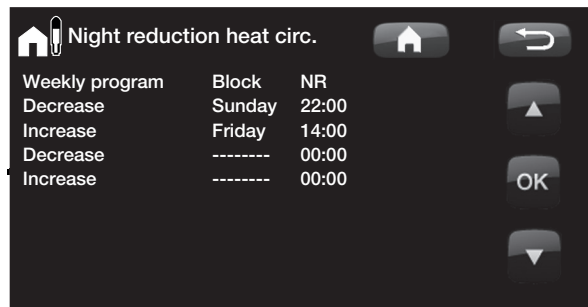
Block

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 are at home at weekends.



Example: On Monday evening at 10 pm the temperature is reduced to the set night reduction temperature. On Tuesday morning at 6 am it is raised to normal temperature.

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 reduced by the value set for Room temp. On Friday at 2 pm the temperature is increased to the set value again.

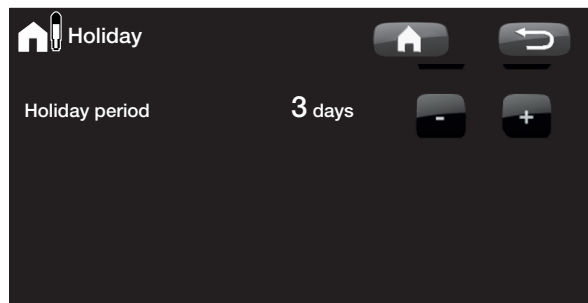
Holiday



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

You can apply this setting for up to 300 days.

The period starts from the time at which you set this parameter



The value by which the temperature is reduced, Room temp reduced °C, is set under Installer/Settings/Heating circuit/Factory setting: -2°C.

11.5 DHW



You can use this to set the hot water comfort level you want and temporary extra hot water.

Temperature

These settings apply to the product's normal operation. There are three modes:



Economic – Small DHW requirement.



Normal – Normal DHW requirement.

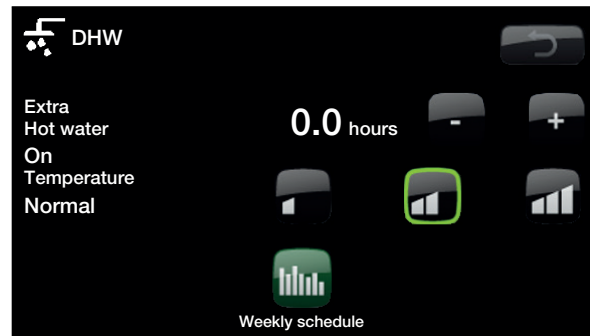


Comfort – Large DHW requirement.

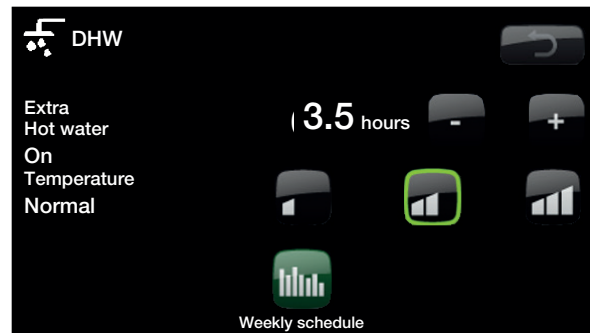
The temperature can also be changed in the menu *Installer/Settings/DHW tank*. If this is done, the green frame around the icon for this menu disappears.

Temporary extra DHW (On/Off)

You select this option if you want to activate the Temporary extra DHW function. When this function is activated, the heat pump starts producing extra hot water immediately. You also have the option to schedule DHW production for certain times using the Weekly program function, which is recommended.



i Tip: Start by setting to Economic 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 set to On for 3.5 hours.

11.5.1 Weekly program DHW

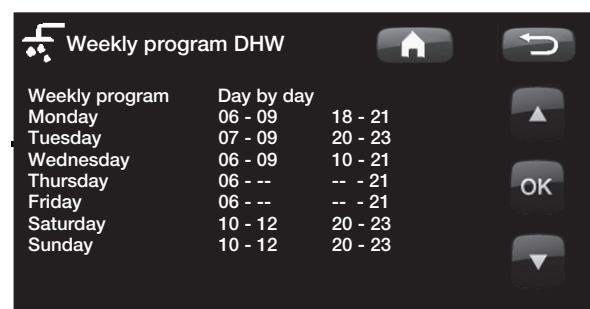


You can use this menu to schedule periods during weekdays when you want extra hot water. This schedule is repeated every week. The image shows the factory settings, which can be changed. If you want an additional period some day, e.g. in the evening, you can program recurring times.

The options are *Off* or *Day by day*.

Off – No scheduled DHW 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, in the morning and in the evening, for instance.



On Monday morning at 6 am the system starts producing more hot water until 9 am when the temperature returns to normal again. There is a further increase between 6 pm and 9 pm.

i Tip: Set the time to approx. 1 hour before you need the hot water, as it takes a while to heat up the water.

11.6 Operation



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

The image shows the input and output temperatures from the heat pump (if this is installed and defined in CTC EcoZenith i350).

Return heating system (accessory)

At the right of the heat pump (42°C) the temperature of the primary flow to the house's radiators is shown. This value will vary during the year according to the parameters set and the current outdoor temperature.

Return to radiators (accessory)

If HS circulation under DHW is installed with a return sensor (B7) in combination with a radiator pump (G1), the temperature return value from the radiators is shown. This value will vary during operation depending on the parameters set, the heating system's capacity and the current outdoor temperature.

HP out

The heat pump's outgoing temperature is displayed to the right of the heat pump (42 °C).

HP in

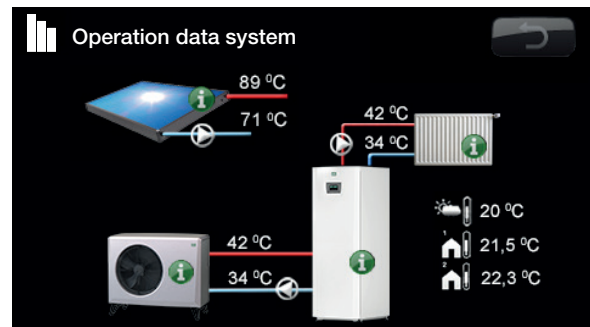
The heat pump's return temperature is displayed to the right of the heat pump (34 °C).

Brine in (CTC EcoPart only)

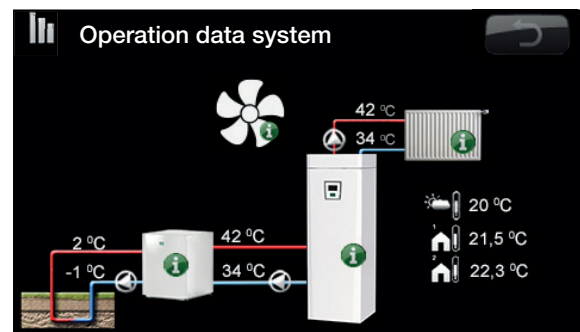
The current temperature of the brine from the collector to CTC EcoPart is displayed at the top left of the EcoPart (2 °C).

Brine return (CTC EcoPart only)

The bottom left value (-1 °C) indicates the return temperature of the brine going back into the collector hose. The values vary during the year depending on the heat source's capacity and the energy consumed.



The screen displays operational information with CTC EcoAir connected. When the pumps are in operation, the pump icons also rotate on screen.



The screen displays operational information with CTC EcoPart connected. When the pumps are in operation, the pump icons also rotate on screen.



Information

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



Current outdoor temperature

Shows the current outdoor temperature. The product uses this value to calculate the various operational parameters.



Current indoor temperature

Shows the current room temperature (if a room sensor is selected during operation). If two heating circuits are installed, the values for both are displayed.

11.6.1 Operation CTC EcoZenith i350



This menu displays current temperatures and operational data. The first figure is the actual operational value, with the value in brackets being the setpoint which the heat pump is trying to achieve.

Status

Shows operating status. The various operating statuses are:

-> DHW

Hot water (DHW) is produced.

-> HC

Heat is produced for the heating circuit (HC).

-> Pool

Heat is produced for the pool.

-> Off

No heating takes place.

DHW tank °C 49/45 (55)

Displays hot water temperatures in the tank: upper part and lower part. The value in brackets is the setpoint (stop temp.).

DHW °C 54 (50)73

Display of current temperature, current set point and current energy amount.

If no hot water is drawn then no temperature is shown, just the set point.

Degree minute -1000

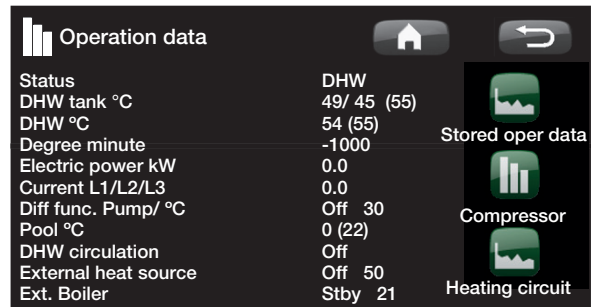
Shows current heat loss in degree minutes.

Electric power kW

Shows the output from the immersion heater (0 to 11.9 kW).

Current L1/L2/L3

Shows the system's total current consumption at the various phases L1/L2/L3, provided that three current sensors (accessories) have been fitted to the unit's incoming cables. If the current sensors are not identified, only the phase with the highest load is displayed. If the current exceeds the main fuse size, the boiler automatically switches down a power step to protect the fuses, for example, when several high-consumption appliances are being used in the house.



“Degree minutes” refers to the product of the cumulative heat loss in degrees (°C) and the time measured for this in minutes.

Diff func. Pump/ °C**Off/On /30**

Differential thermostat function. Shows whether the charge pump from the external tank is turned on. Also displays the temperature in the external tank.

Pool °C 19 (22)

Displays pool temperature and setpoint (in brackets).

DHW circulation**Off/On**

Shows whether the DHW circulation pump is turned on.

External heat source**Off/On /55**

Shows whether the external heat source is supplying heat. Also displays the temperature in the external tank.

Ext. Boiler**Active/Standby/Off**

Shows whether the external boiler is set to Active, Standby (Stby) or Off. Display of the external boiler's temperature (B9).

<i>Active</i>	Boiler powered and carrying a current
<i>Passiv</i>	Boiler not powered providing residual heat.
<i>Stby</i>	Boiler powered
<i>Off</i>	Boiler turned off

11.6.2 Stored operation data



This menu shows the operational values for the heat pump over a long period.

Total operation time h

Shows the total time during which the product has been on.

Max primary flow °C

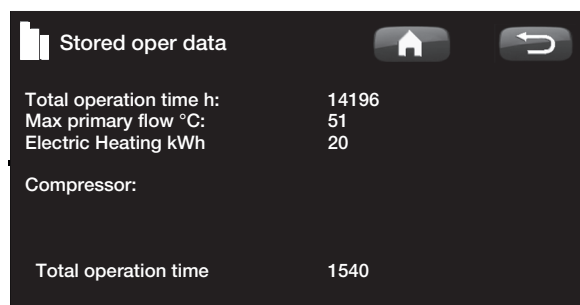
Shows the highest temperature supplied to the radiators. The value may indicate the temperature requirements of the heating system/house.

El. heat 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.

Total operation time

Displays the total operating time of the compressor.



11.6.3 Compressor



This menu is intended for servicing and advanced troubleshooting.

Compressor (On/Off /65 rps)

Shows whether the compressor is operating or not, as well as showing the compressor speed in rps (revolutions per second). Speed is only shown for the inverter-controlled heat pumps.

Charge pump (On/Off/47%)

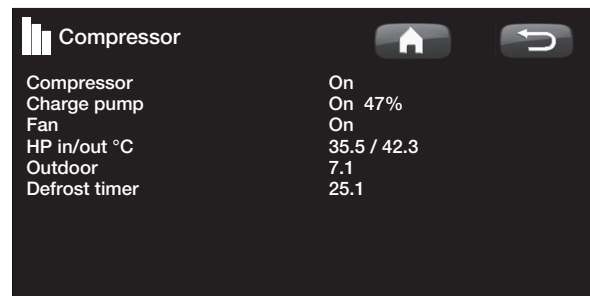
Shows the operating status and flow of the charge pump (G11) as a percentage.

Brine pump (On/Off)

Shows whether the brine pump (G20) is operating or not.

HP in/out °C

Shows the heat pump's return and primary flow temperatures.



11.6.4 Operation data heating



Primary flow °C

Shows the temperature supplied to the system's radiators, along with the temperature which the system is trying to achieve. This value will vary during the year according to the parameters set and the current outdoor temperature.

Return flow °C (accessory)

If sensor B7 and pump G1 are installed and defined, the temperature of the water returning from the heating circuit to the heat pump is shown.

Radiator pump

Shows the operating status of the radiator pump.

Accessories:

Primary flow 2 °C

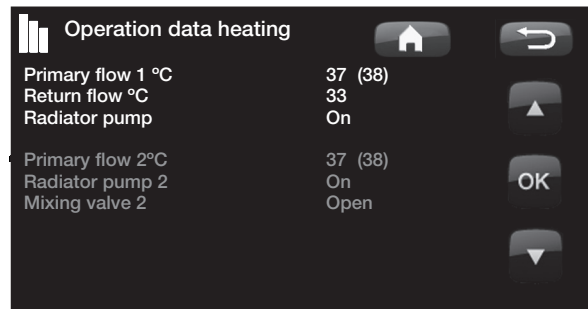
Shows the temperature supplied to heating circuit 2, if it is installed.

Radiator pump 2

Shows the operating status of the radiator pump (G2).

Mixing valve 2

This indicates whether the mixing valve increases (opens) or reduces (closes) the heat supplied to heating circuit 2.



11.6.5 Stored oper data



This displays the heating circuit's operation data 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.

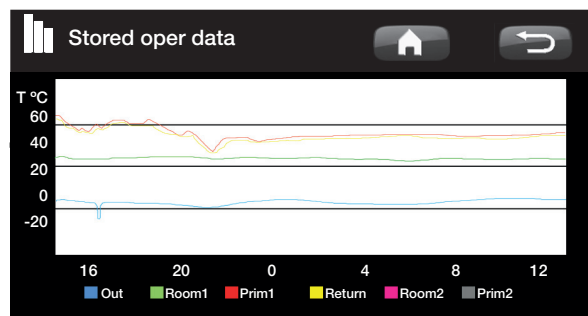
Blue curves show the current outdoor temperature.

The green and pink curves show room temperatures 1 and 2 respectively.

The red curve shows the primary flow temperature.

The grey curve shows the primary flow temperature of heating circuit 2 if it is installed.

The yellow curve shows the return temperature.



11.6.6 Operation data, solar panels

This menu displays current temperatures and operating data for your solar collectors. The menu is only shown if solar collectors are defined.

Status

The operating status of the solar controls is shown here. The different operating modes that can be shown are: heating, not heating, charging EHS-tank, charging X-volume, charging bore hole, (charging bore hole), cooling panel, cooling tank, pre-cooling tank, sensor test and frost protect panel.

Solar panel In/Out °C

Shows the solar panel's incoming and outgoing temperatures.

EHS-tank (B47) °C

Shows the setpoint and current temperature in the external heat source tank.

EcoTank (B41)(B42) °C

Shows EcoTank's top temperature, the setpoint and the tank's bottom temperature.

X-volume (B41)(B42) °C

Shows the X-volume tank's top temperature, the setpoint and the tank's bottom temperature.

Pump solar panel (G30) %

The speed of the solar panel's charge pump is shown here (or Off).

Pump heatexchanger (G32) %

If the intermediate heat exchanger is used, the speed of the charge pump between the intermediate exchanger and tank is shown here (or Off).

Pump charging (G46)

Whether the charge pump is in operation during transfer is shown here.

Pump bore hole charging

Whether the charge pump is in operation during bore hole charging is shown here.

Valve charging (Y31)

Shows whether charging is to tank or bore hole.

Valve tank (Y30)

When two tanks are being charged by solar power, the position of the diverting valve between the tanks is shown here.

Power output (kW)

Shows the panel's output.

Operation solar panels	
Status: Heating	Charging EHS-tank
Solarpanel In/Out °C	65/70
EHS-tank °C (B47)	55
EcoTank (B41)(B42) °C	72 / 50
X-volym (B41)(B42) °C	76 / 52
Pump solarpanel (G30) %	78
Pump heatexchanger (G32) %	88
Pump EHS (G46)	On
Pump bedrock (G31)	Off
Valve charging (Y31)	Tank
Valve tank (Y30)	EHS-tank
Power output kW	1.5
Energy output / 24 kWh	12.3
Energi kWh	712

Energy output/24 h (kWh)

Shows the amount of energy absorbed in the last 24 hours. If heat is taken from the tanks (e.g. if a panel is being protected against frost), negative energy is calculated. During bore hole recharging no useful energy is calculated. The value is updated at the end of the day (00:00).

Energy output kWh

Shows accumulated amount of energy absorbed in kWh.

Negative values are displayed if energy is taken from the tank, e.g. when sensors are being checked and panels are being protected against frost.

The panel output is displayed during bore hole recharging but the energy is not classed as accumulated.

Status:

Heating/Not heating

Status: Shows whether the solar collector is heating or not.

Charging EHS-tank/Charging EcoTank/Charging X-volume/Charging bore hole

Status: Shows whether EHS-tank, EcoTank, X-volume and/or bore hole is being charged.

Sensor test

Status: Displays "sensor test" when circulation pump is running, to check whether solar panel can heat up.

(Charging bore hole)

Status: Shows whether circulation pump is stopped to check whether panel can charge tank.

Cooling panel/Cooling tank/Pre-cooling tank/Frost protect panel

Status: Displayed when any protection function has been activated.

11.6.7 Operational Info Ventilation

Current operational data for the CTC EcoVent ventilation product is displayed here. The menu is only shown if EcoVent is defined.

For operational information, please refer to the CTC EcoVent manual.

11.7 Installer



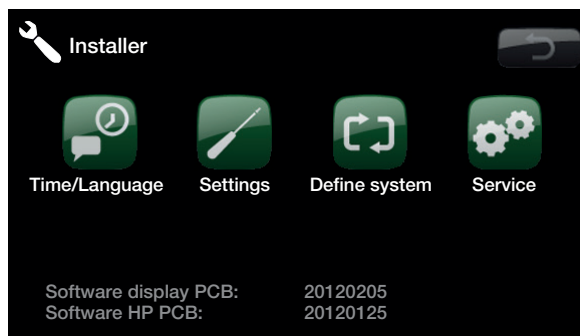
This menu contains four sub-menus. Time/Language, Settings, Define system and Service.

Time/Language includes time and language settings for your product.

Settings are used both by the installer and users to set up the system.

Define system is used by the installer to define your heating system.

Service is used for troubleshooting and diagnosis. You will find the options Function test, Alarm history, Factory settings code, Quick start compressor and Software update here.



Time/Language

You use this to set the date and time. The clock saves the settings in the event of a power cut. Summer/winter time is changed automatically.

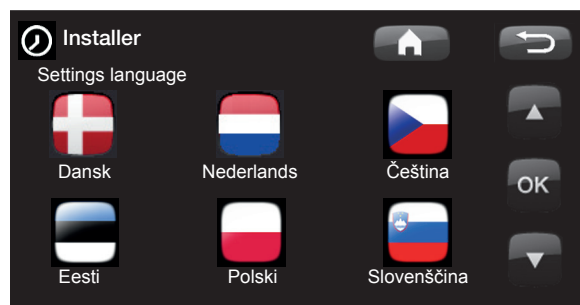
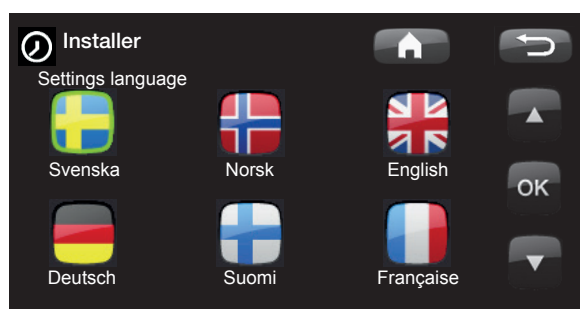
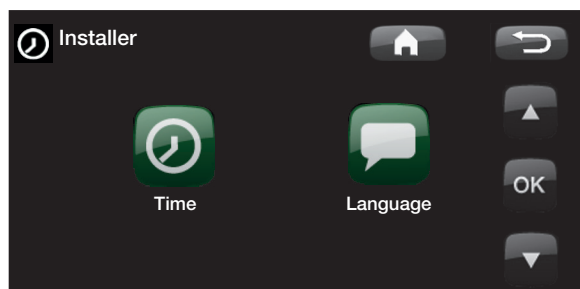
Time settings

Press *Time*. When a green box appears around the time, press OK and the first value is selected. Use the arrows to set the correct value.

When you press OK, the next value is highlighted.

Setting the language

Press *Language*. The current language has a green circle around it.



11.7.1 Settings



This menu 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.

Save settings

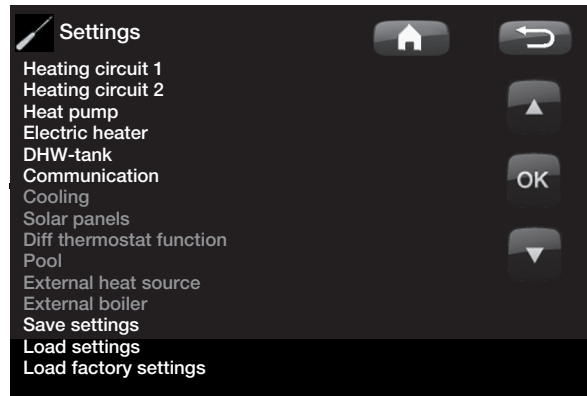
Here your own settings can be stored.

Load settings

The saved settings can be reloaded using this option.

Load factory settings

The product is supplied with the factory values set. They can be restored by activating this function. The language, product and product size are retained.



Heating circuit 1 (or 2)

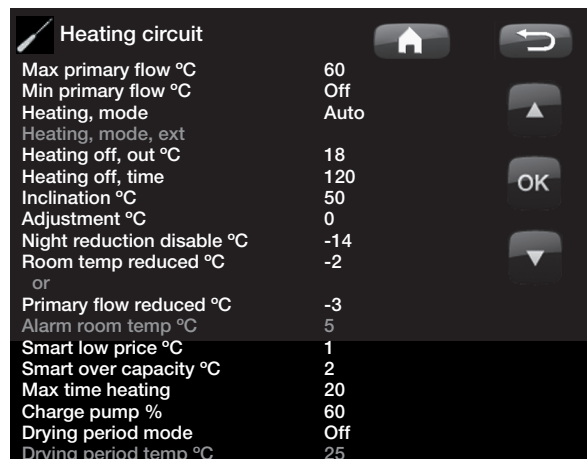
Max primary flow (°C) 60 (30 to 70)

The maximum permitted temperature supplied to the radiators. This functions as an electronic limiter to protect the floor coils in underfloor heating systems. Heating circuit 2 can only give the same temperature as heating circuit 1 or a lower temperature.

Min. primary flow (°C) Off (Off/15 to 65)

You can use this option to set the minimum permitted temperature if you want a specific level of background heating during the summer in the basement or underfloor heating coils, e.g. in the bathroom. The heating in other parts of your property should then be switched off using thermostatic radiator valves or shut-off valves. Note that the radiator pump (G2) will then operate for the whole summer. This means that the temperature supplied to the radiators will not fall below a selected temperature, for example +27°C.

“Off” means that the function is turned off.



i Tip: Read more about these settings in the section entitled “Your home’s heating settings”.

i There is no radiator pump in heating circuit 1. Instead, “Heating, mode” is controlled by the diverting valve.

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 summer mode (Off) takes place automatically

On = (not summer mode) = Continuous heating season, Constant radiator flow.

Off = there is no heating, radiator flow stops.

In the menu that is described below (*Heating off, out °C*), the specific outdoor temperature value for changing between heating season and summer mode, is selected.

Heating mode, ext **--/Auto/On/Off**

Switching between heating and summer mode can be controlled remotely. Find out more in the section entitled "Define/Remote control".

Heating off, out (°C) **18 (10 to 30)**

Outdoor temperature limit at which the house no longer requires heating. The radiator pump stops. The radiator pump (G2) is activated daily for a short period to reduce the risk of jamming. The system restarts automatically when heating is required.

Heating off, time (°C) **120 (30 to 240)**

The delay period before the radiator pump (G2) stops as described above.

Inclination (default setting) **50 (25 to 85)**

Inclination means the temperature your property needs at different outdoor temperatures. See more detailed information about this in the section entitled "Your home's heating settings". The value set corresponds to the temperature of the radiators when the outdoor temperature is -15°C. After this default setting, fine adjustment takes place in the "Room temperature" menu.

Adjustment **0 (-20 to 20)**

The curve adjustment means that the temperature level can generally be raised or lowered at all outdoor temperatures. After this default setting, fine adjustment takes place in the "Room temperature" menu.

Night reduction disable °C **5 (-40 to 40)**

When the outdoor temperature is lower than this, night reduction is deactivated. This menu overrides remote control.

■ There is no radiator pump in heating circuit 1. Instead, "Heating, mode" is controlled by the diverting valve.

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.

Drying period mode

Off (Off/1/2/3)

Floor drying function for newly-built properties.

The function limits the calculation of primary flow temperature (setpoint) for "Your home's heating settings" to the schedule below.

Mode 1

Floor drying function for 8 days.

#1. The (setpoint) for the heating circuit is set to 25°C for 4 days.

#2. On Days 5–8, the value set in "Drying period temp °C" is used.

From Day 9 onwards the value is calculated automatically according to "Your home's heating settings".

Mode 2

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

#1. Stepped increase start. The (setpoint) for the heating circuit is set to 25°C. The (setpoint) is then raised by 5°C each day until it is equal to the "Drying period temp °C".

The final step may be less than 5°C.

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

The final step may be less than 5°C.

Following the stepped decrease and one day at the (setpoint) of 25°C the value is calculated automatically according to "Your home's heating settings".

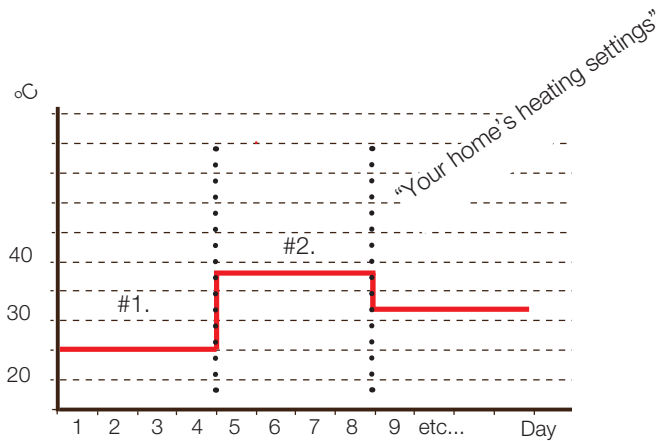
Mode 3

This mode starts with Mode 1, followed by Mode 2 and finally by "Your home's heating settings".

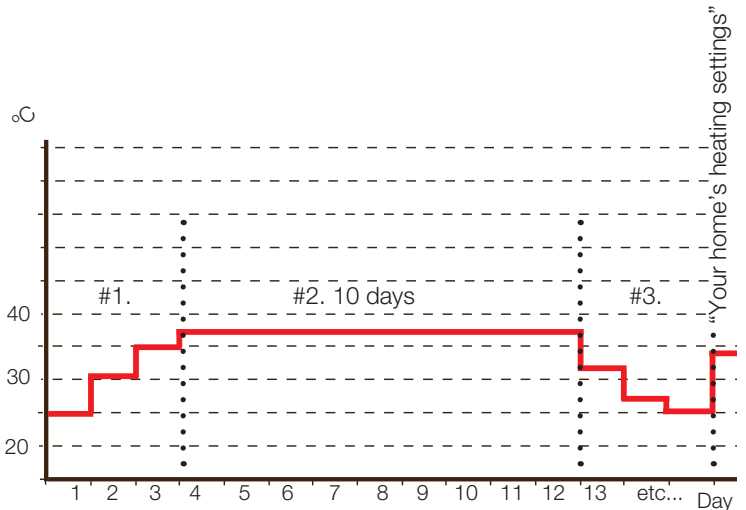
Drying period temp °C

25 (25 to 55)

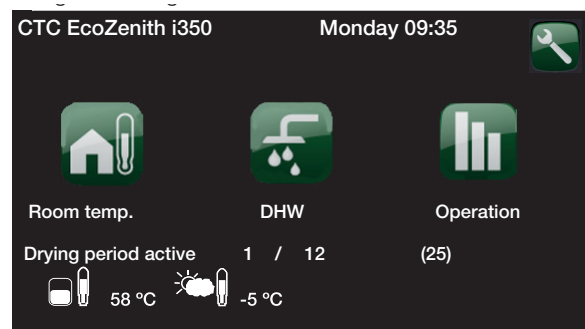
Here you set the temperature for #2 as shown above.



Example of Mode 1 with "Floor function temp °C" of 38°C.



Example of Mode 2 with "Floor function temp °C" of 37°C.

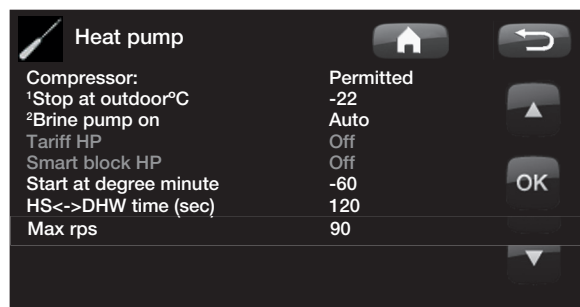


Example of operation data for Mode 2, Day 1 of 12 with current setpoint (25) °C.

11.8 Heat pump

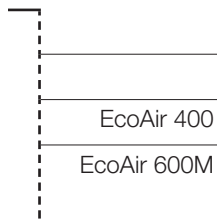
Compressor Permitted/Blocked

The product is supplied with the compressor set to blocked, since the heat pump is connected. Since the compressor in the heat pump is blocked, the product operates like an electric boiler with full functionality. Permitted means that the compressor is allowed to operate.



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

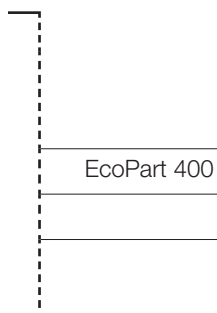
This menu is displayed only if the heat pump is an EcoAir model, and is used to set the outdoor temperature at which the compressor is no longer permitted to operate.



Brine pump on Auto/10d/On

After installation is complete, you can choose:

- to run the brine pump (G20) constantly for *10 days* to remove air from the system. The pump then returns to auto mode.
- *On* means that the brine pump (G20) will operate continuously.
- *Auto* means that the brine pump (G20) will operate at the same time as the compressor.



Tariff HP Off(On/Off)

Find out more in the section entitled "Smart Grid".

Smart blocking HP Off(On/Off)

Find out more in the section entitled "Smart Grid".

Start at degree minute -60 (-900 to -30)

This states the degree minute at which the heat pump will start.

HS<->DHW time (sec) 120 (30 to 240)

Time in seconds for which the compressor maintains a constant speed while switching between HS and DHW.

Max rps (R2 rps) 100 (50 to 120)

Sets the maximum permitted compressor speed.

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 silent mode 50 (50 to 100)

This sets the maximum speed of the compressor when silent mode is active.

NB: The maximum output of the heat pump will fall and the need to add heat may increase.

Timer silent mode

This menu shows scheduled weekday periods when silent mode (noise reduction) should be activated. This schedule is repeated every week.

Silent mode Yes/No

It is possible to start a schedule, e.g. at night time, with limited compressor speed to reduce the sound image when required.

Example:

Monday 00-06 22-24

Max rps silent mode 2 50 (50 to 100)

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

Timer silent mode 2

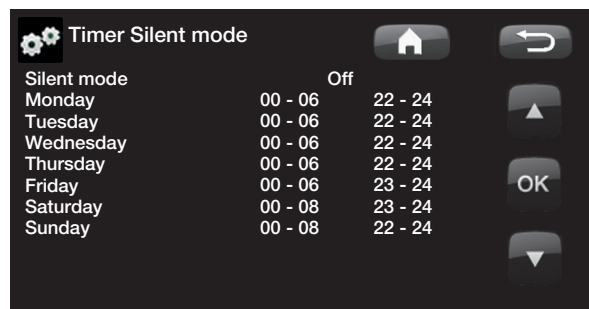
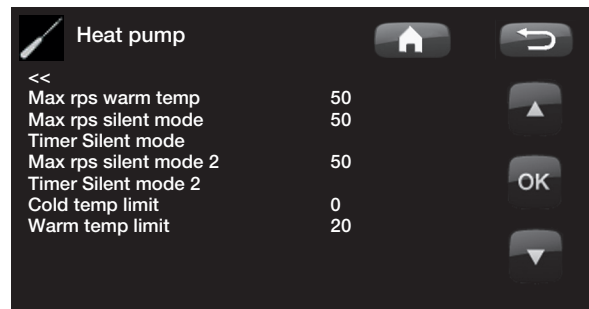
Here you can set an additional scheduled noise reduction scheme. If two noise reduction schemes are active at the same time, the schedule with the lowest set rps value applies.

Cold temp limit (T2°C) 0

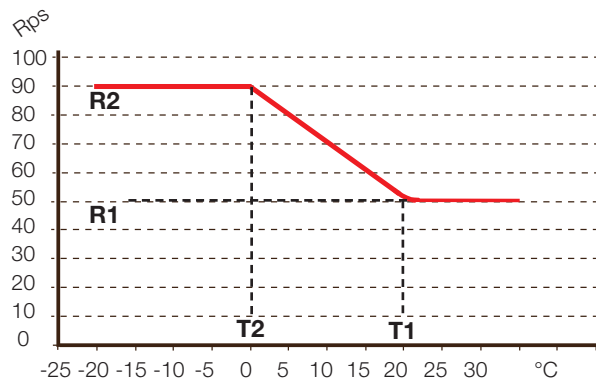
Temperature limit for winter power. When the outdoor temperature is this or lower, the compressor speed is adjusted up to speed R2.

Limit warm temp. (T1°C) 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.



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



11.9 Electric heater

Max el. heater kW 9.0 (0 to 11.9)

Maximum permitted output from electric immersion heater.

Max el. heater DHW kW 0.0 (0 to 11.9)

Maximum permitted output from the immersion heater when charging hot water. Can be set to the available power settings for the model.

Start at degree minute -500 (-900 to -30)

This states at which degree minute the electric immersion heater will start.

Diff step, degree minute -50 (-20 to -300)

This states the difference in degree minutes between the increments of output for the immersion heater. The output of the immersion heater is Max el. heater kW divided into 10 increments.

Main fuse A 20 (10 to 90)

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.

Conv. factor curr. sensors 1 (1 to 10)

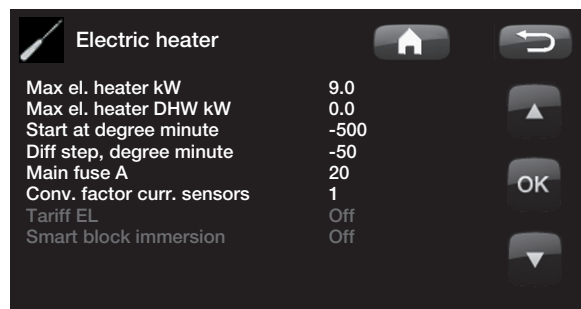
This menu contains the factor the current sensor is to use. This setting is only performed if the connection has been installed for a current sensor for higher currents.

Tariff, el. Off (On/Off)

Find out more in the section entitled "Smart Grid".

Smart block immersion Off (On/Off)

Find out more in the section entitled "Smart Grid".



11.10 DHW tank

DHW program

Settings menus for the Economy, Normal and Comfortprograms. Refer to the DHW Program Settings section.

Start/stop diff. upper °C **5 (3–10)**

The temperature difference between charge start and stop.

Max. time DHW **30 (10–150)**

This is the maximum time (in minutes) that the heat pump charges the hot water tank, if this is needed for the heating circuit.

Charge pump % **50 (25–100)**

Setting for charge pump (G11) speed during hot water charging. Only applies if the heat pump is not the sole heater.

Smart Low price °C **10 (1–30)**

Read more in the “Smartgrid” section.

Smart Overcapacity °C **10 (1–30)**

Read more in the “Smartgrid” section.

Min. rps DHW charging **50 (50–100)**

Lowest compressor speed during hot water charging. When the heat pump switches from heating to hot water, this rps is used for hot water.

Start delay DHW min. **3(0-60)**

Start delay (minutes) for hot water charging after the flow of hot water has stopped.

DHW circulation (accessory)

The settings for hot water circulation require the installation of an expansion card accessory (A3).

Run time DHW circ. **4 (1 to 90)**

The length of time (minutes) that domestic hot water circulation should take place during each period. Applies if DHW circulation has been defined in the Installer/Define system menu.

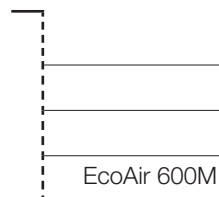
Time DHW circ. **15 (5 to 90)**

The time (minutes) during which domestic hot water circulation takes place. DHW circulation must have been defined in the Installer/Define system menu.

Timer DHW circulation **On/Off/Day by day**

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

Setting	Value	Range
DHW program		
Start/stop diff. upper °C	5	3–10
Max. time DHW	30	10–150
Charge pump %	50	25–100
Smart low price °C	10	1–30
Smart overcapacity	10	1–30
Min. DHW charging	50	50–100
Time DHW-circ.	4	1–90
Timer DHW-circulation	15	5–90
Timer VV-cirk		
Add heat DHW	No	
Time extra DHW Remote cont	0.0	
Start delay DHW min.	3	0–60



Day	Interval 1	Interval 2
Monday	06 - 09	18 - 21
Tuesday	07 - 09	20 - 23
Wednesday	06 - 09	10 - 21
Thursday	06 - --	-- - 21
Friday	06 - --	-- - 21
Saturday	10 - 12	20 - 23
Sunday	10 - 12	20 - 23

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

Additional heating

No (Yes/No)

No means that no immersion heater or external boiler is used to produce hot water.

Auto means that hot water is produced primarily by a heat pump. When the charging time is exceeded and the stop temperature is not reached by the heat pump, additional heating will be allowed during the next hot water heating cycle.

Yes means that an immersion heater or external boiler may be used to produce hot water.

See also Immersion heater/Max. immersion heater DHW kW and External boiler/Prio DHW tank.

Time Extra DHW remote control

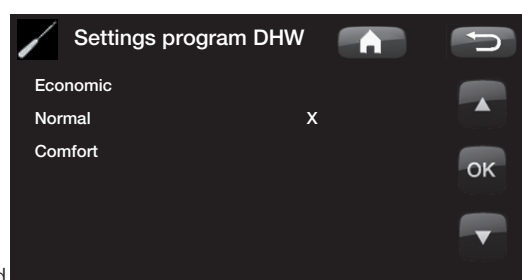
0.0 (0.0 – 10.0)

Time in full or half hour intervals during which the Extra hot water function is enabled when activated in the Remote control menu (Advanced/ Define system/Remote control/Extra DHW) or when activated via a CTC SmartControl accessory. For CTC SmartControl functionality and settings, please refer to the relevant manual.

11.10.1 DHW Program Settings

Economy, Normal and Comfort can be selected.

Press OK to open the settings menu for the selected DHW program.



Charge start %

60 (No, 50 – 90)

Value Charge start: 60% means that hot water charging is allowed to start when the amount of hot water energy is at 60% or below.

No means that a low estimate of the amount of hot water energy does not affect the start of hot water charging.

Charge stop upper/lower °C

55 (20 – 65)

Hot water charging is complete once both sensors reach the set value.

Charge stop lower °C

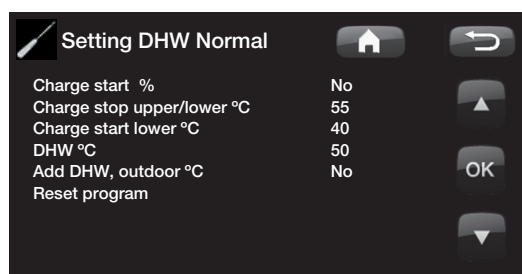
40 (15 – 60)

Hot water charging starts when the temperature falls below the set temperature.

Hot tap water °C

50 (38 – 65)

The temperature of outgoing hot tap water.



Allow additional heating for outdoor temperatures °C

No (-40 – 40)

Additional heating is allowed for hot water charging when the outdoor temperature is equal to or below the set temperature.

No means that additional heating cannot be used regardless of the outdoor temperature.

Reset program

The current DHW program will be restored to factory settings.

11.11 Communication

These settings are activated for the accessory's superior systems and are not used in normal operation. They are not described in these instructions.

11.12 Cooling

Cooling is adjusted using primary flow sensor 2 (B2), which means that heating circuit 2 and cooling cannot be used simultaneously.

Common Heating and Cooling **No (No/Yes)**

For more information, see the instructions for EcoComfort.

Condense Secured? **No (No/Yes)**

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.

(No) means a setting range for room temperature of 18–30°C and (Yes) means a setting range of 10–30°C

In the event of doubt, contact an expert surveyor for an assessment.

Room temp cooling **25.0 (10.0 or 18.0 to 30.0)**

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

Smart low price °C **1 (Off, 1 to 5)**

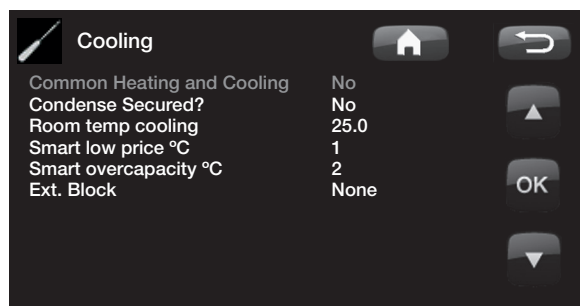
Find out more in section "Smart Grid".

Smart overcapacity °C **2 (Off, 1 to 5)**

Find out more in section "Smart Grid".

Ext. Block **None (NO / NC)**

The function is activated by an external control signal (Normally Open or Normally Closed). The function can be used to turn off cooling with the help of a humidity sensor when there is a risk of condensation.



11.13 Solar panels (accessories)

The settings needed for the solar heating system to function optimally are entered here. It is important that this default setting is adjusted for your heating system. Incorrectly set values may lead to the intended energy saving being lower. The menu names that are shown in grey are not active and do not show in white until they are activated. Activation is carried out in the "Define system" menu.

11.13.1 Solar basic settings

Charge start diff temp °C **7 (3 to 30)**

Here you can set the temperature difference at which charging of solar energy should start. The solar panel must be this many degrees warmer than the tank temperature for charging to start.

Charge stop diff temp °C **3 (2 to 20)**

Here you can set the temperature difference at which charging of solar energy should stop. When the temperature difference between the solar panel and the tank falls below this set value, the charging stops.

Charge pump min % **20 (20 to 100)**

The lowest permitted speed of the charge pump (G30, G32) is indicated here.

Sensor test active **No (No/Yes)**

Whether or not the solar sensor should be activated is indicated here. If the solar panel sensor cannot be installed in such a way that the actual panel temperature can be detected, the charge pump needs to run for a while for the panel's fluid to have an effect on the sensor.

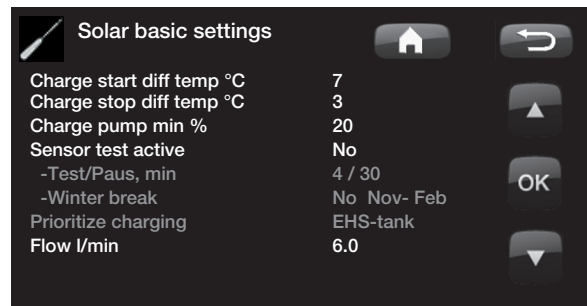
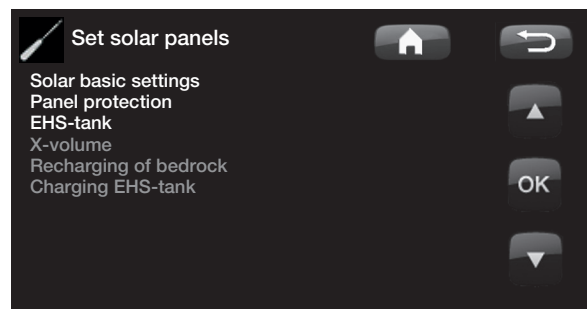
-Test/Pause, min **4 (1 to 20) /30 (10 to 180)**

Test (4): This is where you indicate the duration of the sensor test so that awkwardly positioned sensors have enough time to detect the correct temperature. The length of the sensor test should be as short as possible to prevent heat being taken from the tank unnecessarily in situations when the solar panel cannot charge.

Pause (30): The time between the sensor tests is indicated here. A new sensor test will start after the pause.

-Winter break **No (No/Yes) Nov–Feb**

The months during which there will not be a sensor test are indicated here. During the winter, when the panel (as a rule) cannot heat the tank, there is no need to carry out sensor tests. A sensor test carried out at that time of year can lead to some tank heat being dumped in the solar panel, which should be avoided.



Prioritise charging of: External heat source/X-volume

This is where you indicate whether the tank for the external heat source or the X-volume (acc. tank) should be prioritised when charging (shown only if alternate charging has been defined).

Flow l/min 6.0 (0.1 to 50.0)

The flow circulating through the solar collectors should be indicated here. (This can be read from the flow meter in the system unit.) The flow must be read when the solar panel pump 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 for these parameters. The pump can be set manually to 100% flow in the menu: Installer/Service/Function test to take a reading.

11.13.2 Panel protection functions

This is where you set the functions that protect the solar panels from over temperatures and the risk of freezing.

Over temp protection panel No (Yes/No)

The protection function is activated here to protect the solar panel against over temperatures. This is done by cooling the solar panel.

-max panel temp. °C 120 (100 to 150)

The maximum temperature that the panel may reach is indicated here; the cooling function starts once it has been reached. When cooling is active, heat is dumped 1) in the bore hole if there is bore hole recharging and 2) then in the tanks up to their maximum permitted temperature.

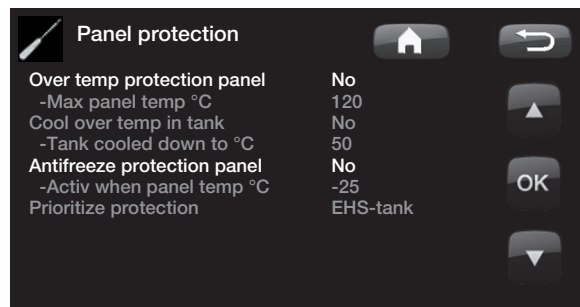
When the temperature in the solar panel goes above 120°C, the circulation pump will start and the text “cooling panel” will be displayed in operation data.

When the temperature in the solar panel drops, but remains high in the tank: The circulation pump will continue to run and the text “cooling tank” will be displayed in operating data. This will continue until the tank has reached 60°C.

(Charge temperature, factory setting.)

Cool over temp in tank No (No/Yes)

If energy has been transferred to the tank in order to cool the panel, the function to cool the tank by conveying energy to the panel is activated here. This is to enable the system to receive panel cooling (e.g. on the next day).



-tank cools down to °C 70 (50 to 80)

This specifies the temperature that the tank is to be cooled to once it has reached over temperature. When this happens, “extra cooling” will be displayed in operating data.

Antifreeze protection panel No (No/Yes)

In the winter, at extremely cold outdoor temperatures there is a risk of the panels freezing (despite antifreeze fluid). The function to take heat from the tank to the panel is activated here.

-Active at panel temp. °C -25 (-30 to -7)

This specifies the temperature in the solar collector at which the frost protection starts. When the panel sensor shows a temperature below the frost protection limit, the charge pump starts until the sensor temperature is 2 degrees warmer than the limit value (temperature difference 2°C).

Prioritise protection EHS-tank / X-volume

This is where the specific tank that the protection functions should protect is indicated.

This is only applicable if system 3/X-volume is activated.

11.13.3 Settings EHS-tank

Settings applicable only when EHS-tank is activated. (Systems 1 and 3 only.)

Charge temperature °C 60 (10 to 95)

Setting for the maximum permitted temperature in the EHS-tank. Charging stops once the set temperature has been reached.

Maximum tank temp °C 70 (60 to 125)

If the solar panel temperature exceeds “max panel temp”, energy is allowed to be transferred to the panel up to this set tank temperature.

Check that the protection function “Over temp protection panel” is activated.

11.13.4 EHS-Tank settings

Settings applicable when EHS-Tank is activated. This is also called system 2.

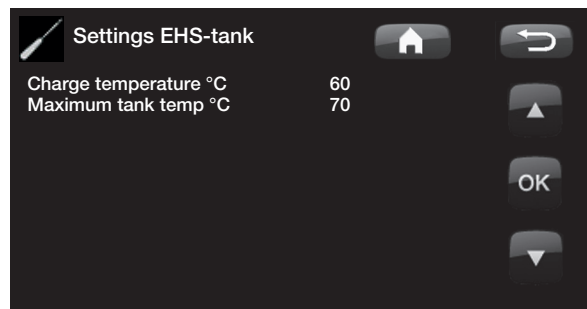
Charge temperature °C 60 (10 to 70)

Setting for the maximum permitted temperature in the EcoTank. Charging stops once the set temperature has been reached.

Maximum tank temp °C 70 (60 to 80)

If the solar panel temperature exceeds its maximum set temperature, energy is permitted to be transferred to the tank up to this set tank temperature.

Check that the protection function “Over temp protection panel” is activated.



11.13.7 Charging EHS-tank

This function concerns charging conditions between EcoTank and EHS-tank in solar system 2.

This function CANNOT be combined with the “Diff thermostat function”.

Charge start diff temp °C 7 (3 to 30)

Here you can set the temperature difference determining when charging to the EHS-tank should start. The EcoTank in system 2 must be this many degrees warmer than the EHS-tank for charging to start.

Charge stop diff temp °C 3 (2 to 20)

Here you can set the temperature difference determining when charging to the EHS-tank should stop. When the temperature difference between the EcoTank and the EHS-tank falls below this set value, charging stops.

Charge tank temp °C 60 (10 to 80)

Setting for the maximum permitted temperature in the EHS-tank. Transfer stops once the set temperature has been reached.

11.14 Diff thermostat function (accessory)

Diff thermostat function is an accessory that requires an expansion card. It is used to transfer heat from a tank with the sensor (B46) to a tank with the sensor (B47).

The function compares the temperatures in the tanks and when it is warmer in the first tank (B46), charging starts to the second tank (B47).

However, this function cannot be combined with the same function in a solar heating system (when e.g. an EcoTank is connected). This is because the same outlets and sensors are used for both functions.

Charge start diff temp °C 7 (3 to 30)

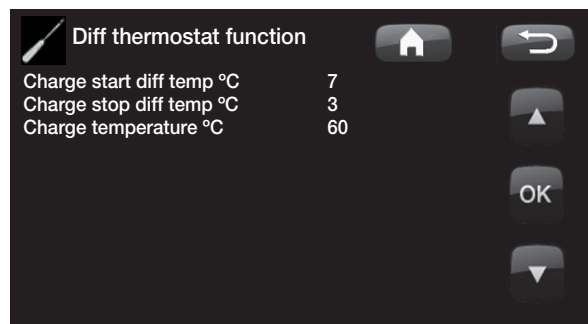
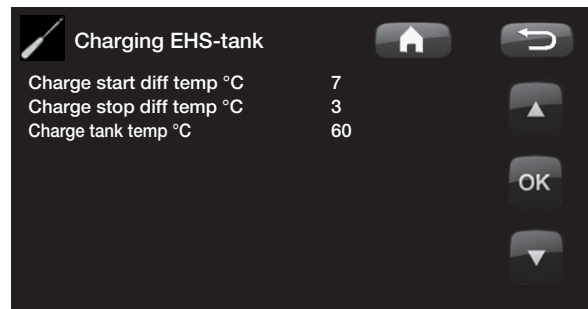
Here you can set the temperature difference determining when charging to the EHS-tank should start; the temperature must be this many degrees warmer than the EHS tank for charging to start.

Charge stop diff temp, °C 3 (2 to 20)

Here you can set the temperature difference determining when charging to the EHS-tank should stop. When the temperature difference falls below this set value, charging stops.

Charge temperature °C 60 (10 to 95)

Setting for the maximum permitted temperature in the EHS-tank. Transfer stops once the set temperature has been reached.



Ensure a high flow on the pump (G46) so that a low temperature difference of approx. 5–10°C is achieved over the EHS tank during charging.

11.15 Pool (accessory)

Pool temp °C **22 (5 to 58)**

The pool temperature is set in this menu.

Pool diff °C **1.0 (0.2 to 5.0)**

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

Max time Pool (min) **20(10 to 150)**

When there is a need for pool heating and heating/hot water, the maximum time for pool heating is shown here.

Charge pump % **50 (0 to 100)**

The charge pump speed is set here.

Smart low price °C **1 (Off, 1 to 5)**

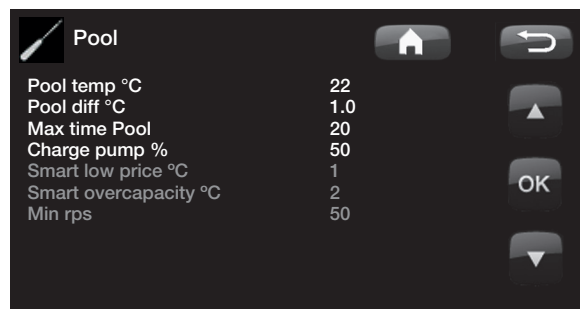
Find out more in section "Smart Grid".

Smart overcapacity °C **2 (Off, 1 to 5)**

Find out more in section "Smart Grid".

Min rps (EcoAir 600M only) **50 (50 to 100)**

Minimum compressor speed during pool heating. When the heat pump switches from heating to pool, this rps is used for pool heating. When the need for energy is low, e.g. during the summer, the power for pool heating can be increased here.



11.16 External heat source (EHS)

Charge start °C **70**

This is the minimum temperature required in the external heat source tank (B47) for the mixing valve to open and emit heat to the system.

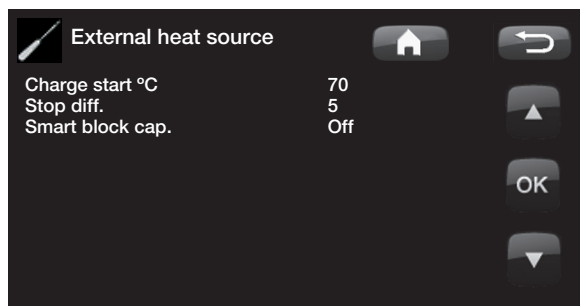
Stop diff (°C) **5**

Temperature difference before charging to the extra heat source stops.

Smart block cap. **Off (On/Off)**

Electric operation prioritised. The shunt on the EHS tank is closed to accumulate heat energy.

Find out more in section "Smart Grid".



11.17 Ext Boiler

Ext. Boiler mode **Auto (Auto/On/Off)**

Mode for adjusting an external boiler.

Auto = adjusted as needed according to selected settings.

On = always active

Off = mode in which the external boiler does not start, e.g. because there is no hot water available.

Boiler start outtemp (°C) **0 (-30/30)**

The maximum outdoor temperature required for the external boiler to activate in Auto mode.

Delay stop ext boiler (min) **0 (0 to 1440)**

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. 10 minutes at a time

Boiler, open mix.valve °C **70 (20 to 90)**

This is the minimum temperature required in the external boiler tank (B9) for the mixing valve to open and emit heat to the system.

Ext boiler diff °C **5 (1 to 15)**

Temperature difference compared to desired tank temperature before the mixing valve is allowed to open

Start boiler, degree minute **-300 (-900 to -30)**

For the shunt to open and emit heat to the system, this requires a loss of degree minutes, which is set here.

Priority DHW tank **Low (Low/High)**

Controls whether or not the external boiler is prioritised before electricity is added when producing hot water.

Low – immersion heater activated before external boiler

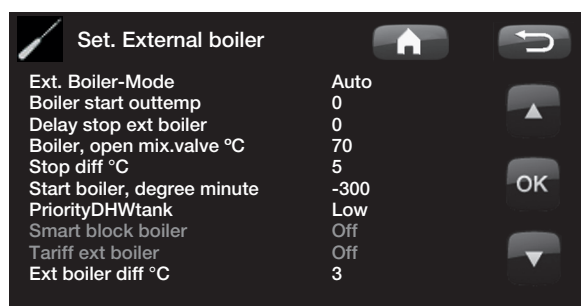
High – external boiler activated before adding electricity

Smart block boiler **Off (Off/On)**

Controls whether the external boiler is blocked by settings in Smart Grid function

Tariff add heat **Off (Off/On)**

Controls whether the external boiler is blocked by tariff settings.



11.18 Define system



You can use this option to define your heating circuit and how it is controlled, with or without a room sensor. The heat pump's flow switch is defined.

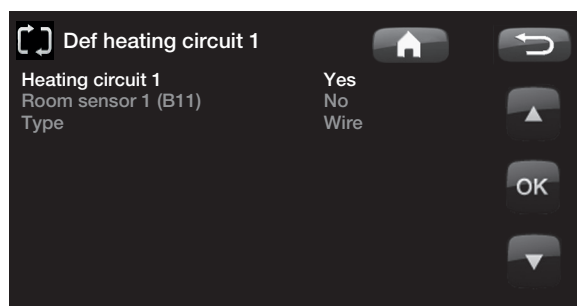
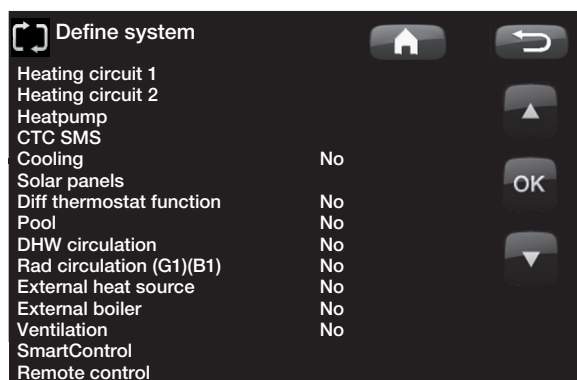
Define heating circuit 1 and/or 2

Specify whether the room sensor should be connected to the system.

Select whether the room sensor for the heating circuit is permanently *connected* or *wireless* (*Wired/Wireless*)

the wireless room sensor, refer to the relevant manual.

Once the CTC SmartControl accessory has been installed/defined, a sensor from the CTC SmartControl series can also be used as a room sensor. In such a case, SmartControl must be selected from the Typemenu. For CTC SmartControl functionality and settings, please refer to the relevant manual.



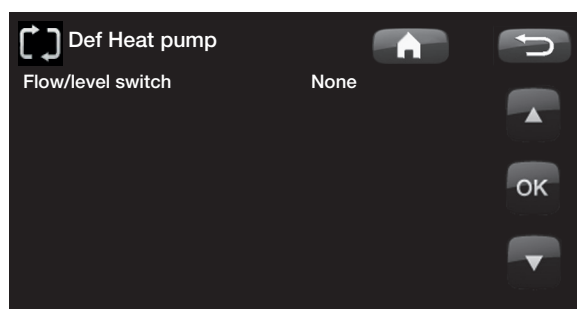
Define heat pump

Flow/level switch **None/NC/NO**
Specify whether or which type of level switch is installed in the system.

Choose between:

- *None*
- *NC* (Normally Closed)
- *NO* (Normally Open).

Flow/level switch must also be set under the section entitled "Remote control procedure".



11.18.1 Define SMS (accessory)

This is for defining whether SMS control is installed (accessory).

Activate **Yes (Yes/No)**

If "Yes", the menus below will be displayed.

Level of signal

The signal strength of the 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.

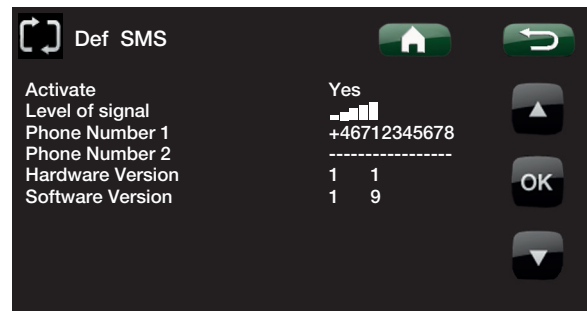
Hardware Version

The hardware version of the SMS accessory is shown here.

Software version

The software version of the SMS accessory is shown here.

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



11.18.2 Define cooling (accessory)

The cooling function is adjusted using primary flow sensor 2 (B2), which means that heating circuit 2 and cooling cannot be used simultaneously.

Cooling **No (No/Yes)**

This is for selecting whether cooling is installed.

See the CTC EcoComfort manual for more information.

11.18.3 Def. Solar panels (accessory)

Solar panels used **No (No/Yes)**

Specify here whether solar panels are used.

Recharge bedrock **No (No/Yes)**

Specify here whether recharging to bedrock (bore hole) or ground coil is installed (only possible for ground source heat pumps).

Alternate charging **No (No/Yes)**

This function activates system 3.

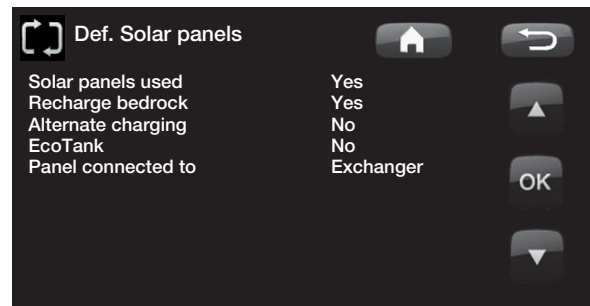
The function lets you choose to prioritise charging of the external heat source (EHS) or X-volume.

EcoTank **No (No/Yes)**

This function activates system 2 with EcoTank buffer tank (or equivalent).

Panel connected to exchanger (coil/exchanger)

Specify here whether there is a solar coil in the EcoTank or an intermediate exchanger is installed.



11.18.4 Define Diff thermostat function (accessory)

Specify here whether the diff thermostat function is to be used in the system.

Diff thermostat function **No (No/Yes)**

11.18.5 Define Pool (accessory)

Specify here whether Pool should be connected to the heating circuit.

The expansion card accessory (A3) needs to be installed for this function.

Pool **No (No/Yes)**

11.18.6 Define DHW circulation (accessory)

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

Set this if hot water circulation with circulation pump G40 is to be used.

The expansion card accessory (A3) needs to be installed for this function.

11.18.7 Define HS circulation in DHW/pool

Rad circulation (G1) **No (Yes/No)**

Set whether radiator pump G1 is installed.

11.18.8 Define External heat source (EHS)

Specify here whether an external heat source is connected to the heating circuit.

External heating source **No (Yes/No)**

11.18.9 Define External boiler

External boiler **No (Yes/No)**

Specify here whether an external boiler is connected to the heating circuit.

Map to relay **A3 (A3/A2)**

The boiler relay (E1), mixing valve (Y42) and sensor (B9) can be connected to the expansion card (A3) or relay card (A2).

The factory-set value is for the external boiler to be connected to the expansion card (A3) and the EHS function to the relay card (A2).

If the external boiler is connected to the relay card (A2), the mapping for the EHS is changed to the expansion card (A3).

11.18.10 Define input voltage

Input voltage **3x400 (1x230/3x230)**

The input voltage can be changed here.

11.18.11 Define CTC EcoVent (accessory)

EcoVent **EcoVent 20**

The CTC EcoVent ventilation product is defined here. For more information, please refer to the CTC EcoVent manual.

11.18.12 Define CTC SmartControl (accessory)

SmartControl

CTC SmartControl components are defined in this menu. For CTC SmartControl functionality and settings, please refer to the relevant manual.

11.19 Define remote control

The remote control function in CTC's products provides a wide range of opportunities to adjust the heating externally. There are four programmable inputs that can activate the following functions:

- Heat pump tariff
- Immersion heater tariff
- Night reduction
- Ripple control
- Extra domestic hot water
- Flow/level switch
- Heating off, HS1
- Heating off, HS2
- Smart A
- Smart B
- Ventilation mode
CTC EcoVent 20:
Vent.Reduced, Vent.Boost,
Vent.Custom and
Vent.Leave active.
- Cooling

Terminal blocks – inputs

On the relay card (A2) there are 2 inputs of 230 V and 2 potential-free inputs (extra low voltage < 12 V) that can be programmed.

Open circuit = no external effect.

Closed circuit = active function externally.

Designation	Terminal block position	Connection type
K22	A14 & A25	230 V
K23	A24 & A25	230 V
K24	G33 & G34	Potential-free input
K25	G73 & G74	Potential-free input

11.20 Remote control procedure

Assign input

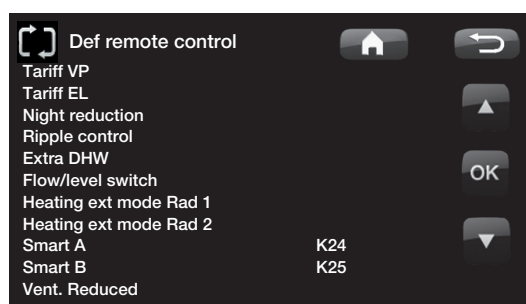
First of all, an input is assigned to the function or functions to be controlled remotely.

This is done in "Define Remote Control".

Example

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

First of all, "Heating off, HS1" is assigned to input K24.



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

NB:

CTC 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). Here, the normal mode has been selected 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".

In this example the heating is always on. (Normal mode)

However, when terminal block K24 is closed, "Off" is activated and the heating is switched off. The heating remains switched off until you choose to start heating up by opening K24.

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.

Tariff el.

When electricity suppliers use a differentiated tariff, you have the opportunity to block the immersion heater 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.

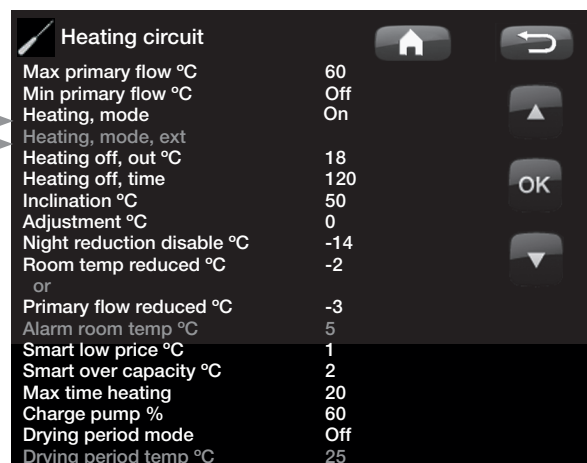
Ripple control

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

You select this option if you want to activate the Extra DHW function.



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)

NB: If both the heat pump and the immersion heater are blocked, the building may be without heating for a long time. It is therefore recommended that you only block the immersion heater with the tariff.

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 Installer/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

With remote controlled "Settings/Heating circuit/Heating mode ext", "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".

Vent. Reduced.

Vent. Boost,

Vent. Custom,

Vent. Unoccupied

Once the CTC EcoVent 20 ventilation product has been installed/defined, these ventilation functions can be activated. For more information, please refer to the CTC EcoVent manual.

Ext. block passive cooling

11.21 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

Example in which Smart A has been assigned low voltage input K24 and Smart B has been assigned low voltage input K25.

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: factory-set low price 1°C increase* in temperature.

Example: factory-set overcapacity 2°C increase* in temperature.

The following can be controlled:

- Room temperature i heating systems 1–2
- Primary flow temperature in heating systems 1–2
- DHW tank
- Pool
- Cooling
- EHS

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

Smart low price °C	1 (Off, 1-5)
Smart overcap. °C	2 (Off, 1-5)

*DHW tank has setting range 1–30

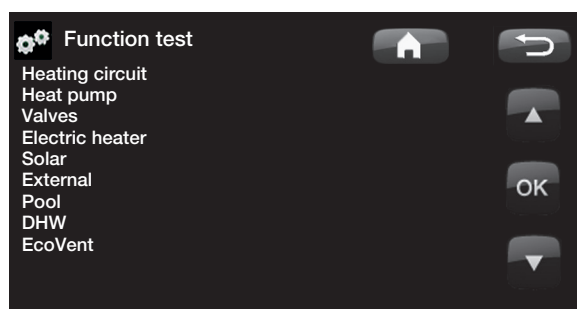
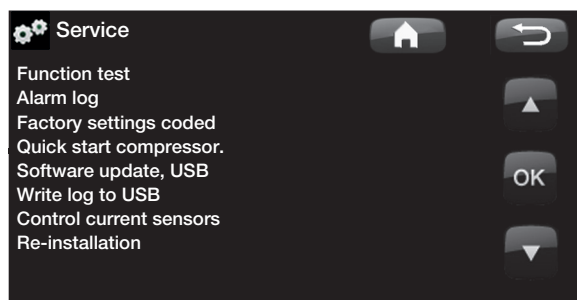
11.22 Service



! NB: This menu is intended for the installer only.

11.22.1 Function test

This menu is intended to test the function of the various components in the product. When the menu is activated, all the product's functions stop. Each component can then be tested separately or together. All control functions are shut off. The only protection against incorrect operation are pressure sensors and the immersion heater's superheat protection. When you exit the menu, the heat pump returns to normal operation. If no button is pressed for 10 minutes, the product automatically returns to normal operation.



Test Heating circuit

Tests for heating circuit 2, if one is installed.

Mixing valve 2

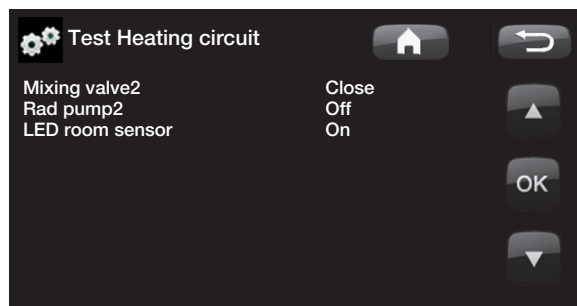
Opens and closes the mixing valve.

Rad pump 2

Starts and stops the radiator pump (G2).

LED room sensor

The room sensor alarm function can be controlled from here. When activated, the room sensor's red LED flashes.



11.22.4 Test Solar (accessory)

This function will only work if an expansion card accessory (A3) is connected to the product.

Solar panel pump (G30) % (0 to 100)

Function test of circulation pump to solar panel 1.

Heat exchanger pump (G32) % 0 (0 to 100)

Function test of circulation pump to intermediate exchanger.

Bedrock (Y31/G31) Tank (Tank/Bedrock)

Function test of diverting valve and circulation pump to bore hole charging. When "Bedrock" is selected, the flow will go to the bore hole, and the circulation pump (G31) will start. When "Tank" is selected, (G31) should be closed.

Valve 2 tanks (Y30) (EHS-tank/X-volume)

Function test of diverting valve between the tanks.

Pump EHS-tank G46 (Off/On)

Function test of circulation pump to tank transfer.

Temperatures

This displays current temperatures.

Solar panels in (B30)

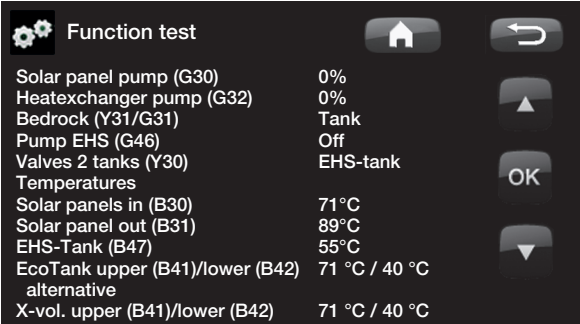
Solar panels out (B31)

EHS-tank (B47)

EcoTank upper (B41) / lower (B42)

or:

X-vol. upper (B41) / lower (B42)



Function test	
Solar panel pump (G30)	0%
Heatexchanger pump (G32)	0%
Bedrock (Y31/G31)	Tank
Pump EHS (G46)	Off
Valves 2 tanks (Y30)	EHS-tank
Temperatures	
Solar panels in (B30)	71 °C
Solar panel out (B31)	89 °C
EHS-Tank (B47)	55 °C
EcoTank upper (B41)/lower (B42) alternative	71 °C / 40 °C
X-vol. upper (B41)/lower (B42)	71 °C / 40 °C

11.22.5 External test (Diffthermostat/ EHS/External boiler)

Pump (G46) (On/Off)

Function test of charge pump for EHS.

Mixing valve (Y41) (- /Open/Close)

Function test of mixing valve for EHS.

Mixing valve (Y42) (- /Open/Close)

Function test of mixing valve for external boiler

Ext boiler Off()

Function test of external boiler

Temperatures

EHS-tank °C (B47)

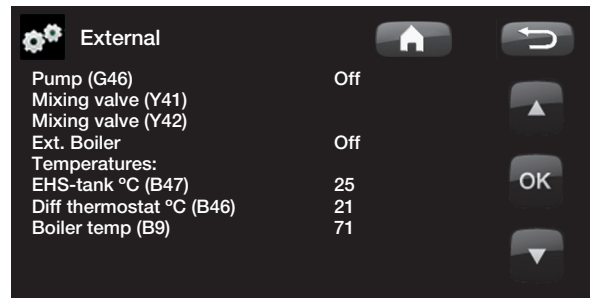
Shows temperature value on sensor in EHS-tank

Diff thermostat °C (B46)

Shows temperature value on sensor for diff thermostat tank

Boiler temp (B9)

Shows temperature value on sensor in external boiler



Test Pool (accessory)

Pool pump/Valve (G51)/(Y50) (On/Off)

Test of pool pump and valve.

Temperatures

This displays current temperatures.

Pool (B50)

Displays current pool temperature.

Test DHW

Tap water pump (G5) 0% (0 to 100)

Function test of the tap water pump for hot water.

DHW circulation pump (G40) (On/Off)

Test of hot water circulation pump.

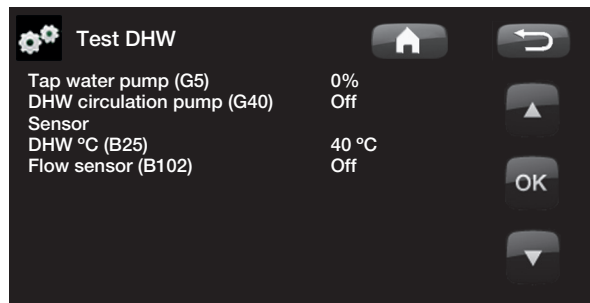
Sensor

DHW °C (B25)

Displays current hot tap water temperature.

Flow sensor (B102) (On/Off)

Shows whether there is a flow in the DHW pipe.



Testing EcoVent (accessory)

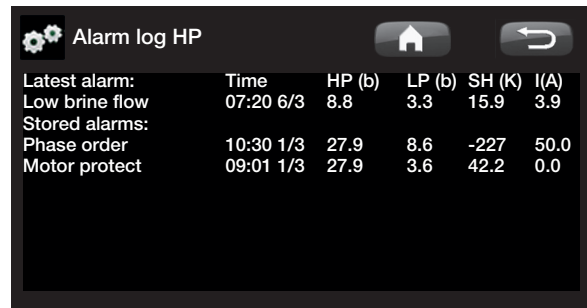
EcoVent

Testing the CTC EcoVent ventilation product. For more information, please refer to the CTC EcoVent manual.

Alarm log HP

You can use this to read information about the latest alarms. 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.

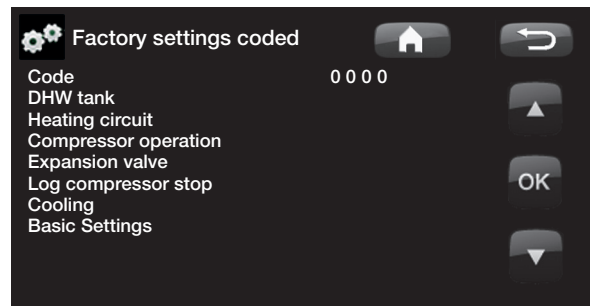


Latest alarm:	Time	HP (b)	LP (b)	SH (K)	I(A)
Low brine flow	07:20 6/3	8.8	3.3	15.9	3.9
Stored alarms:					
Phase order	10:30 1/3	27.9	8.6	-227	50.0
Motor protect	09:01 1/3	27.9	3.6	42.2	0.0

Factory settings coded

! NB: Only an authorised service engineer is allowed to log into 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.

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.



Factory settings coded	
Code	0 0 0 0
DHW tank	
Heating circuit	
Compressor operation	
Expansion valve	
Log compressor stop	
Cooling	
Basic Settings	

11.22.6 Define input voltage

Input voltage **3x400V**

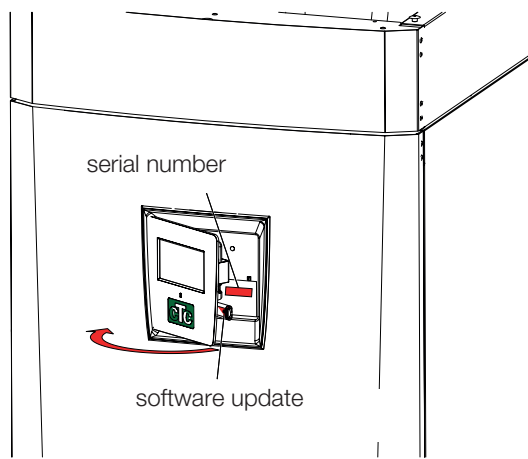
The value is set here to indicate whether the product is connected at 3x400 V, 1x230 V or 3x230 V.

Quick start compressor

When starting up the product with heat pump installed, the compressor start is normally delayed by 10 minutes. When quick start compressor is activated, the compressor will start up more quickly.

Software update, 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.



! 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 software update. Several minutes may pass before the display communicates clearly after restart.

Write log to USB

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

Control current sensors

This is for identifying which current sensor is connected to the relevant phase.

All three currents (L1, L2 and L3) will appear in the current operation data when the heat pump has identified the current transformers' relevant phases.

In this situation it is important that you have switched off any major consumers of electricity in the house. Also make sure that the backup thermostat is turned off.

Re-installation

This command re-launches the installation sequence (see the section entitled "First start").



12. Troubleshooting

12.1 Troubleshooting, heat

Problem	Cause	Action
Temperature too cold	The current monitor limits the heat pump power	The information message "High current, elpower redu (X A)" is shown. An electrician can adjust the load of the three phases or change the fuse size
	Insufficient power permitted	Check that the power is not limited by the current monitor/excessively high current in the house Identify current sensor, otherwise limits the phase with the highest load. Touchscreen: Installer/Service/Control current sensors
	Permitted immersion heater power is too low	Increase the permitted power, touchscreen: Installer/Settings/Electric heater/Max el. heater kW
	Max permitted primary flow temperature set too low	Installer/Settings/Heating circuit. Increase max primary flow °C
Incorrect temperature	Heating curve set incorrectly	Change inclination (when outdoor temperature < 0°C) Installer/Settings/Heating circuit. Change inclination °C Change adjustment (when outdoor temperature > 0°C) Installer/Settings/Heating circuit. Change adjustment °C Install room sensor
	Temperature reduction activated in error	Change on touchscreen: Installer/Settings/Heating circuit or Room temp./Night reduction or Holiday
	Heat source out of order	Make sure the heat pump or other heat source is operational and that no error messages are shown. Contact the installation engineer in the first instance.
Uneven indoor temperature	Air in radiator system	Bleed the radiator system
	Radiator system set up incorrectly	Open the radiator thermostats completely. Evaluate after a few days; if too warm in any room, the thermostat can be turned down Error in radiator, should be evenly hot, replace
	Room sensor incorrectly situated	Change the placement so that the room sensor reflects the indoor temperature of the house. Make sure the room sensor is not in direct sunlight or by a door or staircase with uneven air circulation. The room sensor functions best in an open-plan layout.

12.2 Troubleshooting, hot water

Cause	Action
Incorrect pressure in system	Check pre-pressure in the expansion tank with a pressure gauge. 0.5–0.6 bar. Fill the heating system; pressure should increase to approx. 1–1.5 bar
Air pockets in various parts of the system	Bleed the tank; turn the safety valve
	Bleed the tank; check that the automatic bleeder on the tank works
	Carry out a function test on the diverting valve, touchscreen: Installer/Service/Function test. Valves – 3-valve change between DHW and HS.
	Carry out a function test on the hot tap water pump, touchscreen: Installer/Service/Function test. Hot water – tap hot water pump. Increase and decrease speed.
	Increase the system pressure to 2.5 bar by filling the radiator system; then test the safety valve; water and air pockets are released.
Cold water from the building mixer is leaking back. Causes dilution of hot water	Test the kitchen mixer on full heat, switch off, and then open the tap in the shower/bathroom straight away. If the hot water pipe under the kitchen mixer cools down quickly, it is leaking cold water backwards. Replace the mixer.
Hot water is collecting up too quickly. The DHW heat exchanger is not managing to transfer heat.	Let the water into the bathtub a little more slowly and use a low-flow shower head
Hot water requirements set incorrectly	Increase level, touchscreen: DHW/Economic, normal, comfort
Heat source out of order	Make sure the heat pump or other heat source is operational and that no error messages are shown. Contact the installation engineer in the first instance.

12.3 Information messages

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



[013] Start delay

[I002] Heating off, heating sys. 1

[I005] Heating off, heating sys. 2

Indicates that the product is in Summer mode. No need for heating in the current heating system, only hot water.

[I008] Tariff, HP off.

Indicates that Tariff has switched off the heat pump.

[I009] Compressor locked

The compressor is set to be shut down, e.g. before drilling or digging has been carried out for the collector coils. The product comes with the compressor shut off. This option is selected under the Installer/Settings/Heat pump menu.

[I010] Tariff, El. off.

Indicates that Tariff has switched off the immersion heater.

[I011] Ripple control

Indicates that ripple control is active. Ripple control is a device which can be fitted by an electricity supplier in order to disconnect equipment with a high rate of electricity consumption for a short period of time. Not currently in use in the UK. The compressor and electrical output are blocked when ripple control is active.

[I012] High current, reduced electricity

- The property's main fuses risk being overloaded due to, for example, the simultaneous use of several power-hungry appliances. The product reduces the immersion heaters' electrical output during this period.
- 2h max. 6 kW. Electric heating elements are limited to 6 kW for 2 hours after being switched on. This message appears if more than 6 kW are required during the product's first 2 hours of operation. This is applicable after a power outage or a new installation.

[I013] Start delay

The compressor is not allowed to start too quickly after it has stopped. The delay is usually at least 10 minutes.

[I014] Floor function active, d

Indicates that the floor function is active and displays the time (days) remaining that the function will be active.

Smart: [I019] low price/ [I018] overcapacity/[I017] block

Product functionality is governed by "Smartgrid". Also see *Define system/Remote control/Smartgrid*.

[I021] Heating, ext. mode HC 1

[I022] Heating, ext. mode HC 2

Remote control governs whether the heat in the heating system is to be switched on or off. If the heating is switched off, "Heating off, heating circuit 1/2" is also displayed.

[I028] Holiday period

Displayed when setting the holiday schedule, which entails lowering the room temperature and that no hot water is produced.

[I029] Bleeding DHV in progress

During the bleeding process, hot water will not be delivered at a continuous temperature. Hot water production is allowed to start when the bleeding process has stopped and the information message is no longer displayed .

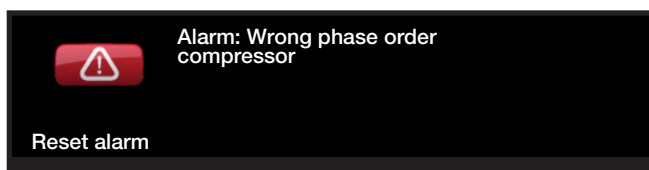
[I030] Driver block under voltage

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.

12.4 Alarm texts



If a fault occurs with e.g. a sensor, 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. A persisting fault must first be rectified before it can be reset. Some alarms are reset automatically if the fault ceases.

Alarm messages	Description
[E010] Compressor type ?	This message appears if no information about the compressor type is available.
[E013] EVO off	This message appears when there is a fault with the expansion valve control.
[E024] Fuse blown	This message appears when the fuse (F1, F2) has been triggered.
[E026] Heat pump	This message appears if the heat pump is in alarm mode.
[E027] Communication error HP	This message appears if the display card (A1) is unable to communicate with the HP control card (A5).
[E063] Comm. err. relay board	This message appears if the display card (A1) is unable to communicate with the relay board (A2).
[E063] Comm. err. motor protection	This message appears if the HP control card (A5) is unable to communicate with the motor protection.
[E086] Comm. err. expansion card	This message appears if the display card (A1) is unable to communicate with the CTC solar controls/expansion card (A3).
[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.
[E040] Low brine flow	Low brine flow is often caused by air in the collector system, especially immediately following installation. Collectors which are too long can also be a cause. Press reset and check whether the alarm recurs. Also check the brine filter that has been installed. If the fault recurs, contact your installer.
[E041] Low brine temp.	Incoming brine temperatures from the bore hole/ground coil are too low. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer to check the positioning of the cold side.
[E044] Stop, high comp. 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.

Alarm messages	Description
[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. valve	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 evap. exp. valve	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 evap. exp. valve	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 overheat. exp. valve	This message appears when the expansion valve's overheat temperature is low. Press reset and check whether the alarm recurs. If the fault recurs, 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.
[E055] Incorrect phase sequence	The product's compressor motor must rotate in the right direction. The product checks that the phases are connected correctly; otherwise, an alarm is triggered. This will require changing two of the phases into the product. The power supply to the system must be shut off when rectifying this fault. This fault generally only occurs during installation.
[Exxx] 'sensor'	An alarm message is displayed if an error occurs with a sensor that is not connected or has short-circuited and if the value is outside the sensor's range. If this sensor is important to the system's operation, the compressor stops. This requires the alarm to be reset manually after the fault has been rectified. The alarm is reset automatically after correction for the following sensors: [E140] EHS tank sensor (B47), [E031] Primary flow sensor 1 (B18), [E032] Primary flow sensor 2 (B2), [E030] Outdoor sensor (B15), [E074] Room sensor 1 (B11), [E075] Room sensor 2 (B12), [E005] Brine out sensor, [E003] Brine in sensor, [E028] HP in sensor, [E029] HP out sensor, [E037] Hot gas sensor, [E080] Suction gas sensor, [E036] High pressure sensor, [E043] Low pressure sensor.
[E057] High current motor protection	High current into the compressor has been detected. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.
[E058] Low current motor protection	Low current into the compressor has been detected. Press reset and check whether the alarm recurs. If the fault recurs, contact your installer.

Alarm messages	Description
[E061] Max. thermostat	<p>This alarm message appears if the product becomes too hot.</p> <p>During installation, make sure the max. thermostat (F10) has not been triggered as there is a chance of this occurring if the boiler has been stored in extremely cold temperatures, Reset it by pressing in the button on the electrical switchboard behind the front panel.</p>
[E135] Risk of freezing	<p>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)</p>
[E152] 4-way valve	<p>This alarm message is displayed if a fault occurs with EcoAir's 4-way valve or if the connection pipes to the EcoAir are incorrectly connected. Press reset and check whether the alarm recurs. If the alarm recurs, check that the charge pump is pumping water to the heat pump's lower connection. If the fault recurs, contact your installer.</p>
[E087] Driver	<p>Press reset and check whether the alarm recurs.</p>
[E088] Driver: 1 -	<p>If the fault recurs, contact your installer and tell them the error code number where applicable.</p>
[E109] Driver: 29	
Driver fault.	<p>Communication error. The electrical connection box and driver of the heat pump are not communicating.</p>
[E117] Driver: Offline	
[E163] Defrost max time duration	<p>The heat pump has not been able to end Defrosting during set time. Ensure that any ice on the evaporator has disappeared.</p>

13. Factory settings

Designation	Factory value	Min value	Max value	Alternative	Set Instal.
Heating circuit					
Max primary flow °C	55	30	70		
Min primary flow °C	Off	15	65	Off	
Heating, mode	Auto			Auto On	Off
Heating mode, ext	-			Auto On	Off
Heat off, outside °C	18	2	30		
Heating off, time	120	30	240		
Inclination °C	50	25	85		
Adjustment °C	0	-20	20		
Night reduction off °C	5	-40	40		
Room temp reduced °C	-2	-40	0		
Primary flow reduced °C	-3	-40	0		
Alarm, low room temp °C	5	-40	40		
Smart low price. °C	1	0	5	Off	
Smart over capacity °C	2	0	5	Off	
Max time heating	40	10	120		
Charge pump %	90	25	100		
Drying period mode	Off	1	3	Off	
Drying period temp °C	25	25	55		
Heat pump					
Compressor	Blocked			Permitted	
Brine pump on (CTC EcoPart)	Auto			10d	On
Stop at outdoor temp °C (EcoAir)	-22	-22	10		
Tariff HP	-			Off	On
Smart blocking HP	-			Off	On
Start at degree minute	-60	-900	-30		
HS<->DHW time (sec)	120	30	240		
Max rps EcoAir 600M (EA610M)	100	50	120 (80)		
Max rps silent mode EcoAir 600M (EA610M)	50	49	120 (80)		
Max rps warm temp EcoAir 600M	50	50	100		
Cold temp limit EcoAir 600M	0	-15	0		
Warm temp limit EcoAir 600M	20	0	20		
Immersion heater					
Max el. heater kW	9.1	0	11.9		
Max el. heater DHW kW	9.1	0	11.9		
Start at degree minute	-500	-900	-30		
Diff step, degree minute	-50	-300	-20		
Main fuse A	20	10	90		
Conv. factor curr. sensors	1	1	10		
Input voltage	3x400 V			1x230	3x230
Tariff el.	-			Off	On

Designation	Factory value	Min value	Max value	Alternative		Set Instal.
Smart block immersion	-			Off	On	
DHW tank						
Hot water mode	Normal	Economic	Comfort			
Stop temp °C	58	40	65			
Start/stop diff upper °C	5	3	10			
Max time DHW	40	10	150			
DHW °C	45	38	65			
Charge pump %	50	25	100			
Add heat DHW	No			No	Yes	
Smart low price. °C	10	0	30	Off		
Smart over capacity °C	10	0	30	Off		
Run time DHW circ.	4	1	90			
Min rps DHW charging	50	50	100			
Cyclic time DHW circ.	15	5	90			
Cooling						
Common Heating and Cooling	No			No	Yes	
Condense Secured?	No			No	Yes	
Room temp cooling	25.0	18.0	30.0			
Smart low price. °C	1	0	5	Off		
Smart over capacity	2	0	5	Off		
Ext. Block	None			NO	NC	
Diff thermostat function						
Charge start diff temp °C	7	3	30			
Charge stop diff temp °C	3	2	30			
Charge temperature °C	60	10	80			
Solar Energy						
Charge start diff temp °C	7	3	30			
Charge stop diff temp °C	3	2	20			
Charge pump min %	20	20	100			
Sensor test active	No			Yes		
Test/Pause, min	4 / 30	1 / 10	20 / 180			
Winterbreak	No Nov / Feb	Dec / Jan	Jan / Dec	Yes		
Prioritise charging	EHS-tank			X-volume		
Flow l/min	6.0	0.1	50.0			
Over temp protection panel	No			Yes		
-Max panel temp °C	120	100	150			
Cool over temp in tank	No			Yes		
-Tank cools down to °C	70	50	80			
Antifreeze protection panel	No			Yes		

Designation	Factory value	Min value	Max value	Alternative	Set Instal.
-Active at panel temp. °C	-25	-30	-7		
Prioritise protection	EHS-tank			X-volume	
Pool					
Pool temp °C	22	5	58		
Pool diff °C	1.0	0.2	5.0		
Max time Pool	20	1	150		
Charge pump %	50	25	100		
Smart low price. °C	1	0	5	Off	
Smart over capacity °C	2	0	5	Off	
Min rps	50	20	100		
External heat source					
Charge start °C	70	20	90		
Start/stop diff	5	1	15		
Smart block cap.	Off			Off	On
Ext Boiler					
Ext. Boiler mode	Auto			On	Off
Boiler start outtemp	0	-30	30		
Delay stop, external boiler (min)	0	0	1440		
Boiler, open mixing valve °C	70	20	90		
Map to relay	A2			A2	A3
Tariff add heat	Off			Off	On
Ext boiler diff °C	5	1	15		
Start boiler, degree minute	-300	-900	-30		
Priority DHW tank	Low			Low	High
Smart block boiler	Off			Off	On
Tariff ext. Boiler	Off			Off	On
EHS-tank					
Charge temperature °C	60	10	95		
Maximum tank temp °C	70	60	125		
EcoTank					
Charge temperature °C	60	10	95		
Maximum tank temp °C	70	60	125		
X-volume					
Charge temperature °C	60	10	95		
Maximum tank temp °C	70	60	125		
Recharge bedrock					
Recharging active	No			Yes	
Charge start diff temp °C	60	3	120		
Charge stop diff temp °C	30	1	118		
Max bring temp °C	18	1	30		
Charging EHS-tank					
Charge start diff temp, °C	7	3	30		
Charge stop diff temp, °C	3	2	20		
Charge temperature °C	60	10	80		

