



Providing sustainable energy solutions worldwide

Installation and Maintenance Manual

CTC EcoComfort

for the property owner

IMPORTANT

READ CAREFULLY BEFORE USE
KEEP FOR FUTURE REFERENCE



Enertech Group

Installation and Maintenance Manual

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For your own reference

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

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

Enertech AB provides the information with reservation for any printing errors and subject to modification.

Congratulations on buying your new product



You have just bought a CTC EcoComfort passive cooling unit, an accessory to the CTC EcoHeat ground source heat pump.

EcoComfort is an accessory that utilises the cold in the bore hole to cool your house during the summer. By connecting EcoComfort to the house's underfloor heating system (or separate fan coil units), its water is cooled by the bedrock's cooler collector water. The heat in the house is taken out into the bore hole in the bedrock.

The unit is completely pre-wired at the factory and easy to connect to the system.

EcoComfort's built-in circulation pump is a low-energy model and tailored for the tough new eco-design requirements taking effect in 2015.

The cooling function is controlled entirely from your EcoHeat ground source heat pump on which you can set your preferences for when and how you would like cooling.

This type of cooling is energy efficient – only circulation pumps circulate the cool water. The capacity is, however, slightly lower compared to so-called active

cooling where the more energy-intensive compressor works to create coldness.

The system can be connected to underfloor heating or separate fan coil units.

Connection to an underfloor heating system (underfloor cooling) limits the temperature of the water circulating in the heating system. A temperature that is too cold can lead to condensation forming and result in serious damage. The current room temperature should also be considered.

Connection to separate fan coil units where the system is insulated against condensation and condensation collects in the fan coil unit can permit very low temperatures.

The unit's cooling capacity is dependent on several factors such as the flows and the temperature of the bore hole and house. The unit's capacity is at its greatest in the first part of summer, when the bore hole is still cold after the winter's heat extraction.

Check list

The check list must be completed by the installer.

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

The points below shall be checked off.

Pipe installation

- ☐ The system has been filled, positioned and adjusted in the correct manner according to the instructions.
- ☐ The products are positioned so that they can be serviced.
- ☐ Pumps, valves, etc. are dimensioned for the required flows.
- ☐ The unit has been tested for leaks and tightness.
- ☐ Bleeding performed (re-bleeding may be necessary).

Electrical installation

- ☐ Proper wiring, performed according to current regulations.
- ☐ Correct connection to CTC EcoHeat.

Customer information (adapted to the relevant installation)

- ☐ Start-up with customer/installer.
- ☐ Review of the cooling unit's function.
- ☐ Installation and maintenance manual supplied to the customer.
- ☐ Check and filling, system.
- ☐ Information on fine adjustments, settings, etc.
- ☐ Information on potential operational malfunction and remedial action.
- ☐ Guarantees and any insurance.
- ☐ Installation certificate/insurance form completed and posted.
- ☐ Information and procedure for fault registration.

1. Installation

1.1 Scope of delivery

The following items are included in the delivery of a CTC EcoComfort passive cooling unit:

- Packaging box with impact protection
- Cooling unit fitted in enclosed box containing:
 - Heat exchanger
 - Circulation pump (circulates brine in the collectors)
 - Mixing valve with mounted steering motor, including 2 m connection cable
 - Non-return valve
 - Bleeding valve for the cold side (brine)
 - Support sleeves in copper pipe connections
- Non-return valve for main brine system
- Installation and Maintenance Manual

1.2 Important to remember!

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

- Check before installation that the product has not been damaged in transit. Report any transportation damage to the carrier.
- Make sure the heating system is suitable for cooling, and the type of system (underfloor heating, fan coil units).
- Make sure the product is mounted horizontally.
- Make sure the wall is suitable for installation, and no hidden electrical cables/pipes can be damaged during installation.
- Remember to leave a service area around the product.
- The radiator system's water flow passes through the heat exchanger in EcoComfort. This is why the radiator system must be flushed thoroughly before installation.

1.3 Safety instructions!

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

- When working on the product: turn off the safety switch to the product. Electrical work must only be carried out by qualified personnel. Keep in mind that the product is powered by EcoHeat.
- Correct flushing of the system shall be carried out before the system is filled with a recommended brine/heating fluid.
- Never risk your safety by removing voltage guards/caps.
- Never use the product for anything other than its intended use.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.

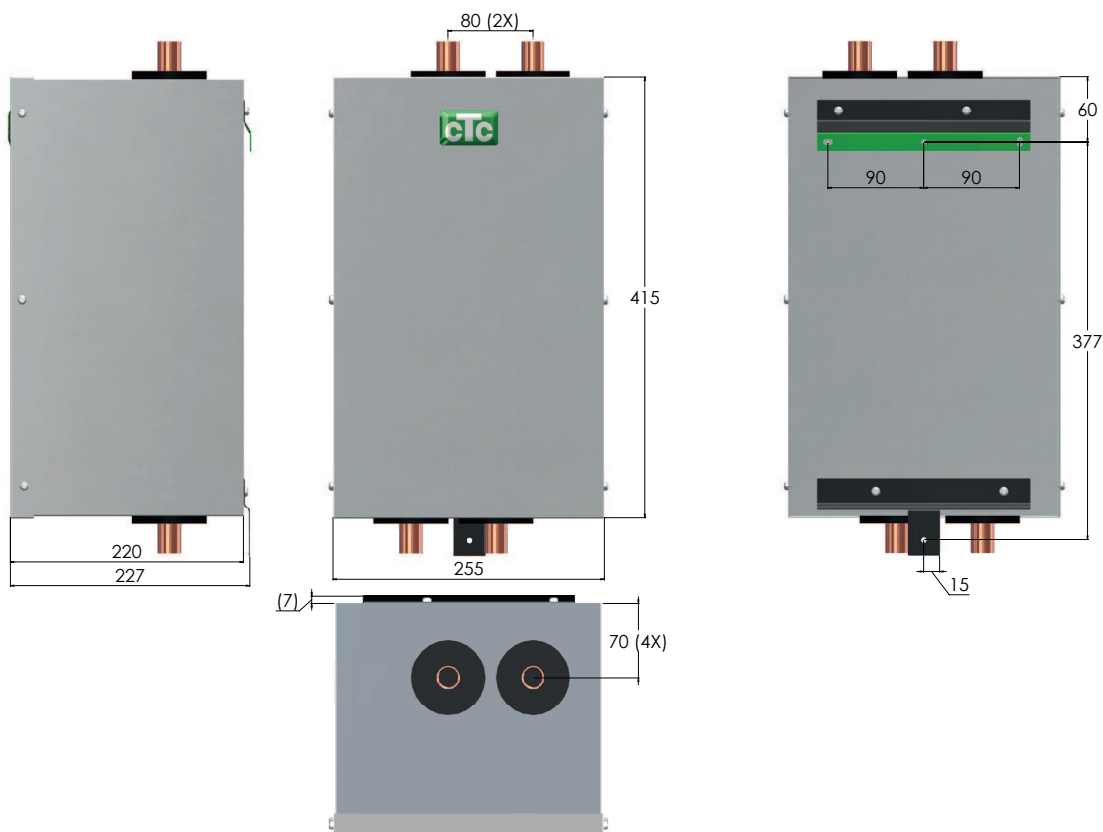


If these instructions are not followed when installing, operating and maintaining the system, Enertech's commitment under the applicable warranty terms is not binding

1.4 Technical data

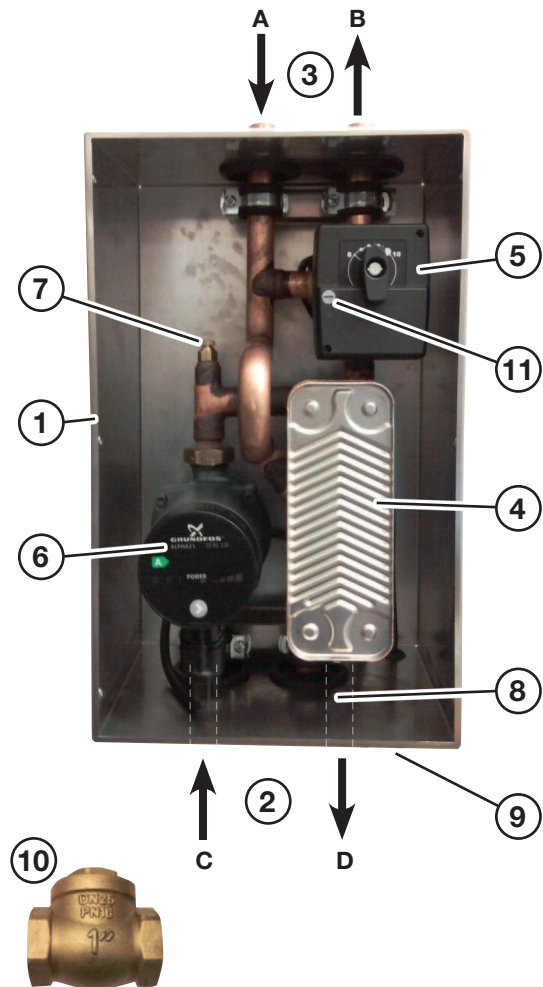
CTC EcoComfort passive cooling unit		
Electrical data (components powered by CTC EcoHeat)	230V 1N~ 50Hz	Approx. 2x2.5 m cable from cooling unit included for connection to EcoHeat
IP class	IPX1	
Nominal power output	kW	0.03
Volume (V) cold/hot side	l	0.46/0.54
Max. operating pressure (PS)	kPa/Bar	1/10
Min./max. operating temperature (TS)	°C	+2/80
Weight excl. packaging (net)	kg	11
Weight incl. packaging	kg	12.5
Dimensions incl. packaging (WxDxH)	mm	280x310x580
Basic dimensions excl. packaging (WxDxH)	mm	255x220x410
Height incl. connections	mm	470
Pipe connections (4 pcs)	mm	Ø22
Capacity	See separate section	
Non-return/throttle valve, main brine system	Rp	1" Internal thread

1.5 Dimensional drawing



1.6 Component location

- A. Incoming connection from EcoHeat (or from fan coil unit). Hot water.
 - B. Connection to heating system (or to fan coil unit). Cooled water.
 - C. Incoming connection from bedrock collector
 - D. Outgoing connection to bedrock collector
1. Box with lid, tight design
 2. Cold side, brine system
 3. Hot side, heating system
 4. Heat exchanger
 5. Mixing valve with motor for cooling control
 6. Circulation pump, bore hole circulation
 7. Bleeder, cold side (brine)
 8. Non-return valve, cooling unit (in the pipe)
 9. Cables for connection to CTC EcoHeat (2.5 m)
 10. Non-return/throttle valve, main system (brine), provided
 11. Block for manual control



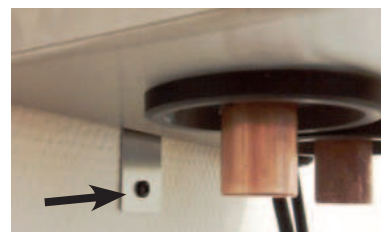
2. Pipe installation

General

This chapter is intended for anyone responsible for the installation. Take your time going through functions and settings with the property owner and answer any questions. Installation must be performed by a qualified professional.

Mounting

EcoComfort must be mounted on the wall with the wall bracket provided. Fasten the bracket with suitable screws (not included) for the type of wall material. Make sure the bracket is screwed securely in a horizontal position. Then hang the box on the bracket and secure with a screw in the mounting ear underneath the box. For offset dimensions, see the dimensional drawing and technical data.



Water quality, cold side

Approved antifreeze liquids are propylene/ethylene glycol and ethyl alcohol with max. 30% concentration by volume. The suitability of other antifreeze liquids can be considered after checking the materials used in constituent components. Note that the unit capacity is specified for ethyl alcohol which is 30% by volume.

Water quality, hot side

The radiator system's water flow passes through the heat exchanger in EcoComfort. This is why the radiator system must be flushed thoroughly before installation. If dirt is to be expected, the installation of a dirt filter before EcoComfort is recommended.

Delivery inspection

Check that the product has not been damaged in transit. Report any transportation damage to the carrier. Check that the delivery is complete.

General comment on pipe installation

The installation must be carried out in accordance with current standards and regulations. Refer to the Swedish Building Regulations and the Warm and Hot Water Instructions 1993.

Non-return valve, cooling circuit

A non-return valve is pre-installed in the unit at the factory to prevent a short-circuiting flow when the cooling pump is stationary.

Non-return valves, main circuit's brine system

The delivery includes a non-return/throttle valve (int. 1" thread) which must be mounted in the brine system's main flow between the heat pump and cooling unit; see schematic diagram for connection. Make sure the valve is installed with the correct flow direction; see the marking on the valve. The valve prevents a short-circuiting flow when the heat pump's brine pump is stationary.



Bleeding the cooling unit

A manual bleeding valve is mounted in the cooling unit on the cold side's highest point. The valve is not designed to bleed the entire cold side system, but only to bleed the parts of the exchanger system. Ensure that liquid drawn out is collected and disposed of. Re-bleeding/checks may be needed after a few days.

Connection to the heating system

The hot water going out to the underfloor heating/fan coil unit must pass the cooling unit, i.e. EcoHeat's supply line is connected to the cooling unit's incoming connection (hot water) and the outgoing water (cooled water) to the heating system's supply line or fan coil unit. In cases where one or more fan coil units are connected, it is the return water from the fan coil system that is connected to the cooling unit's incoming pipe. Note that the cooling unit does not contain a circulation pump for the hot side; this must be dimensioned and connected separately.

Connection to the brine system

The cooling unit is connected to the incoming and outgoing collector pipes for the bore hole. The cooling unit's incoming fluid connection is connected to the brine pipe coming from the bore hole while its outgoing fluid connection is connected to the brine pipe that goes to the bore hole. Do not forget to install the non-return valve in the main brine circuit.

Insulating the pipes

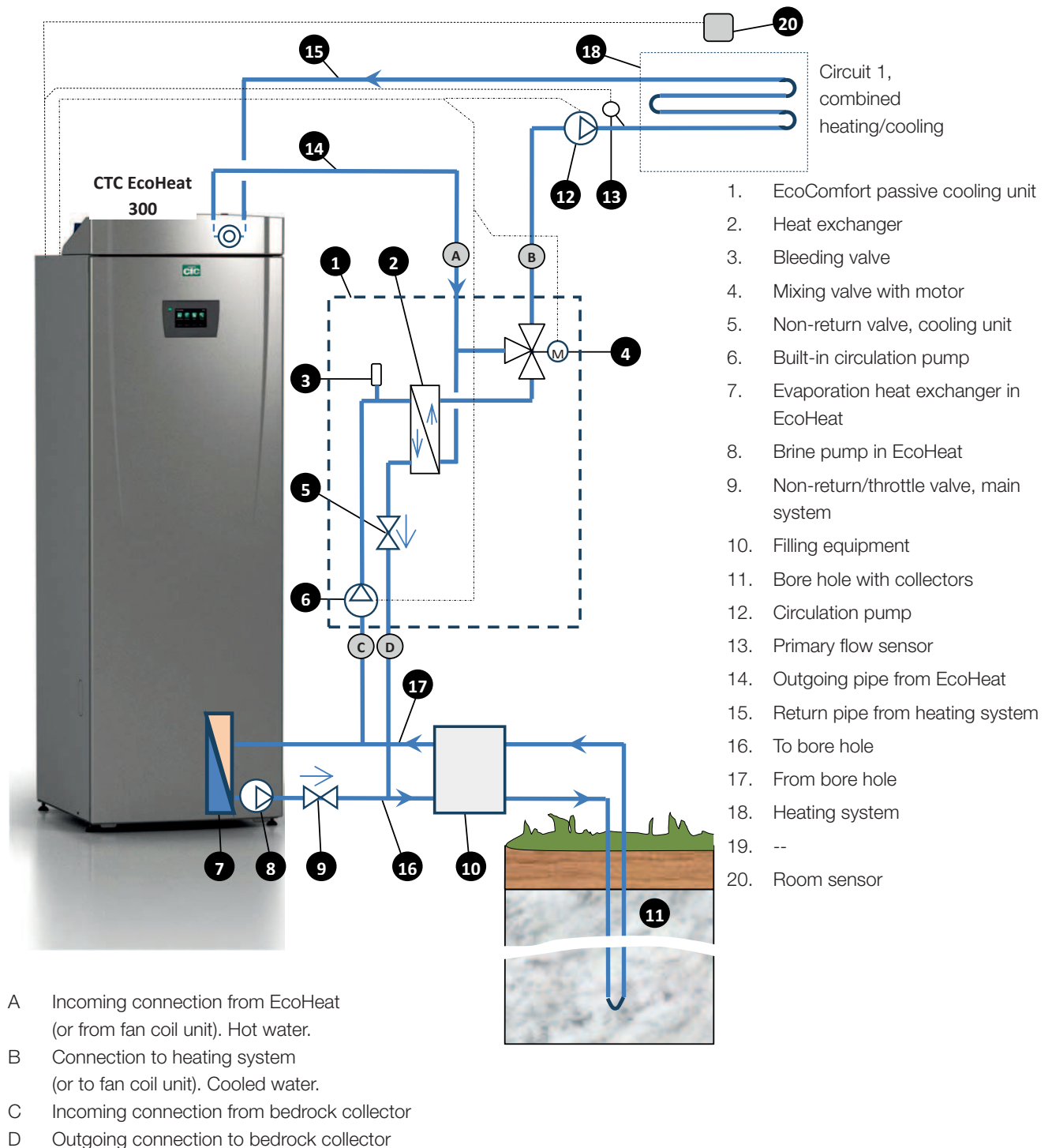
The brine pipes must be insulated against condensation right up to and tightly against the cooling unit's box. Use insulation that is intended for protection against condensation.

The pipes of the heating system must be insulated with thermal insulation.

3. Schematic diagrams

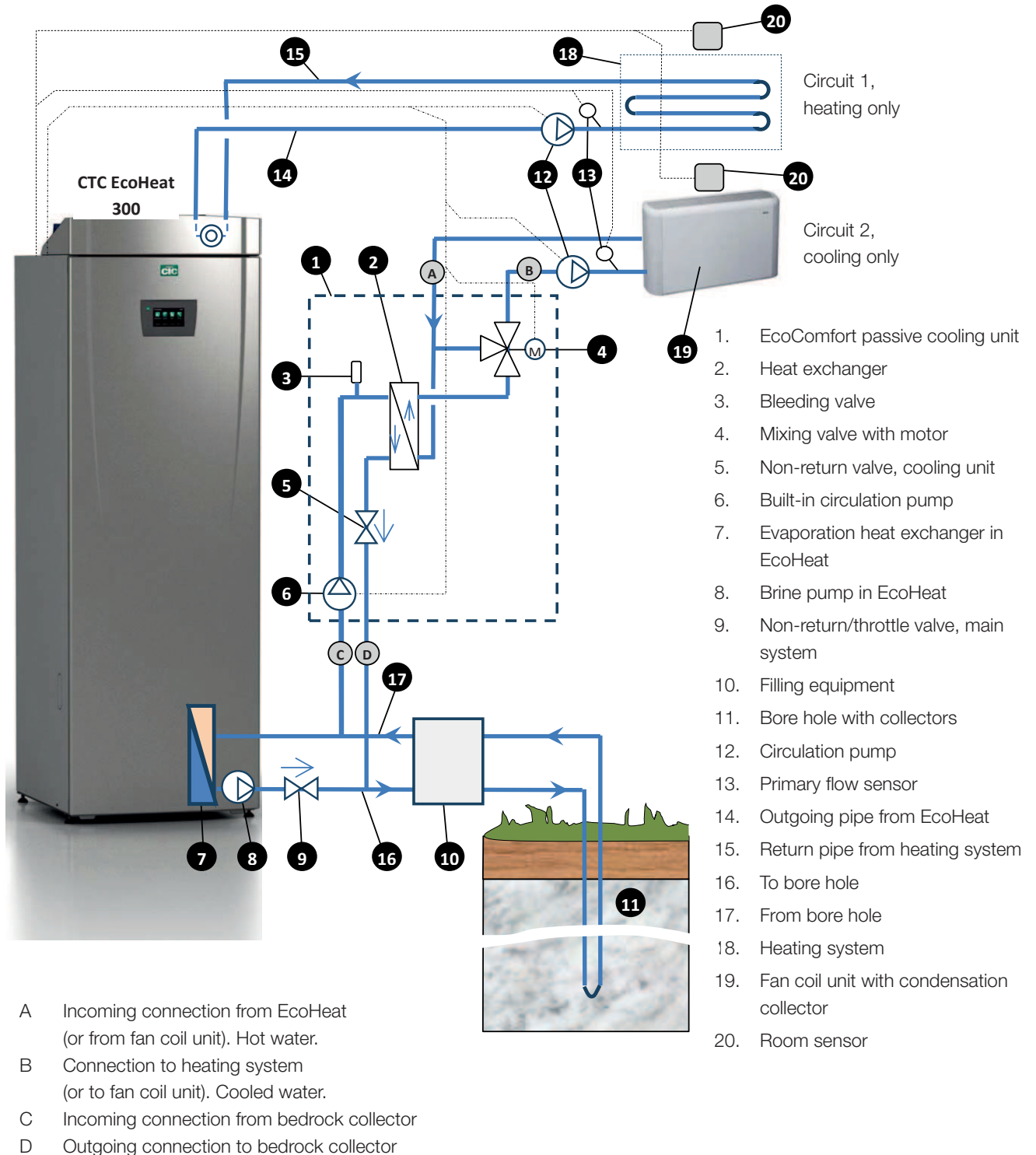
Connection to CTC EcoHeat, common underfloor heating/cooling

The diagram shows schematically how EcoComfort is connected to the systems; additional equipment, such as expansion vessels, shut-off valves, safety valves, etc., is not shown here.



Connection to CTC EcoHeat, underfloor/radiator heating and separate cooling coil units

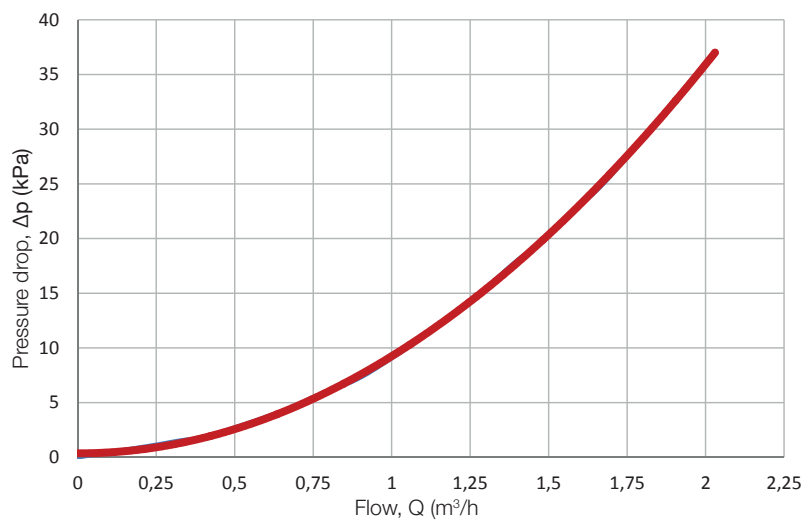
Note: The diagram shows schematically how EcoComfort is connected to the systems; additional equipment, such as expansion vessels, shut-off valves, safety valves, etc., is not shown here.



3.1 Pressure drop curves for CTC EcoComfort

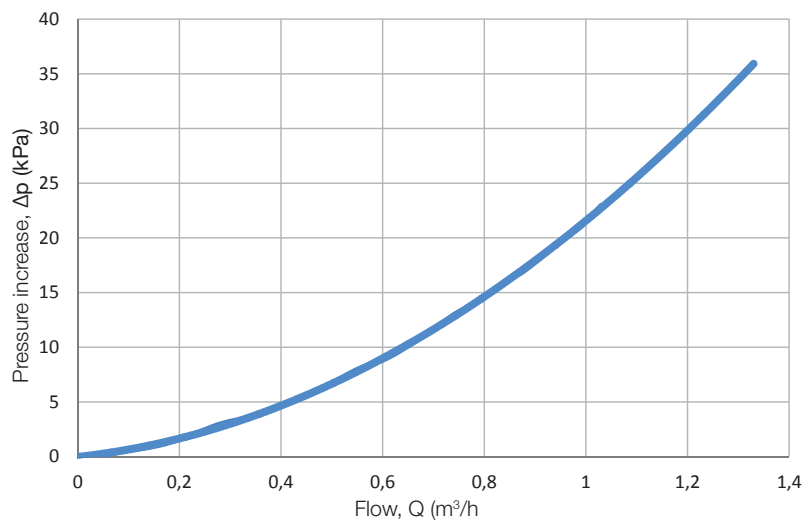
Pressure drop, radiator side (hot side)

Including pipe and mixing valve.

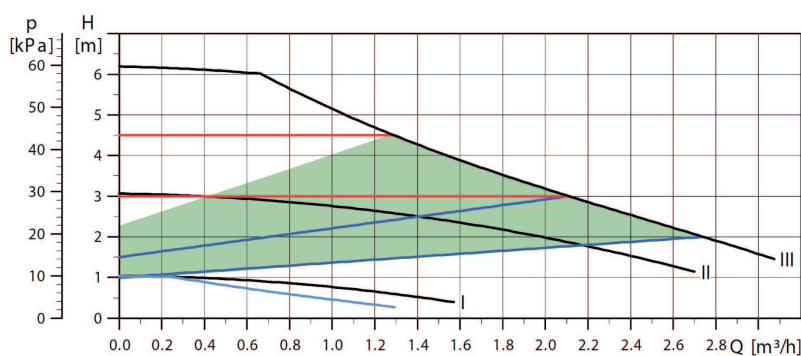


Pressure increase, brine side (cold side)

Including pipe and non-return valve.



Pump capacity Grundfos Alpha 2 15-60



4. Electrical connection

Installation, switching and any servicing of the product's electrical attachments must be performed by a qualified electrician. All wiring must be done according to current regulations.

All cooling control takes place from the control system in CTC EcoHeat 300.

The circulation pump, mixing valve motor and sensors in CTC EcoComfort must be connected to blocks in EcoHeat according to the following two options:

Option 1: Schematic 1, common underfloor heating/cooling

Component	Block in Eco-Heat	Cable	Note
Radiator pump 1, used for both heating and cooling	A31 A33 PE	L1 Neutral Earth	230V 1N~ (Not mounted in EcoComfort)
Radiator pump 2, cooling pump in EcoComfort	A36 A34 PE	L1 Neutral Earth	230V 1N~
Mixing valve 2 in EcoComfort	A15 A16 A17	Open signal (white 3) Close signal (brown 1) Neutral (blue 2)	230V 1N~ Fully open = 10 (cooling) Fully closed = 0 (no cooling)
Primary flow sensor 1	G13 G14	Pole-independent Pole-independent	Extra low voltage protection
Room sensor 1	G17 G18 G19	RG-1 (block in the room sensor) RG-2 (block in the room sensor) RG-4 (block in the room sensor)	Extra low voltage protection

Option 2: Schematic 2, underfloor/radiator heating and a separate cooling circuit (fan coil unit)

Component	Block in Eco-Heat	Cable	Note
Radiator pump 1, for the heating system	A31 A33 PE	L1 Neutral Earth	230V 1N~ (Not mounted in EcoComfort)
Radiator pump 2, cooling pump in EcoComfort	A36 A34 PE	L1 Neutral Earth	230V 1N~
Mixing valve 2 in EcoComfort	A15 A16 A17	Open signal (white 3) Close signal (brown 1) Neutral (blue 2)	230V 1N~ Fully open = 10 (cooling) Fully closed = 0 (no cooling)
Primary flow sensor 1, for the heating circuit	G13 G14	Pole-independent Pole-independent	Extra low voltage protection
Primary flow sensor 2, for the cooling circuit	G15 G16	Pole-independent Pole-independent	Extra low voltage protection
Room sensor 1, for the heating circuit	G17 G18 G19	RG-1 (block in the room sensor) RG-2 (block in the room sensor) RG-4 (block in the room sensor)	Extra low voltage protection
Room sensor 2, for the cooling circuit	G20 G21 G22	RG-1 (block in the room sensor) RG-2 (block in the room sensor) RG-4 (block in the room sensor)	Extra low voltage protection

5. First start

After installation

Check that:

1. All sensors have been mounted in the designated spaces
2. All connections are properly installed, the systems are filled with liquid and have been pressure tested and checked for tightness.
3. The system is pressurised and bled. Make extra sure that the heat exchanger in EcoComfort is bled; use the air valve in the unit. Additional bleeding may be needed after start-up.

Start-up

Switch on the main switch for CTC EcoHeat 300.

Selecting cooling function

The cooling function can now be selected in EcoHeat's menu system. Go to the "Advanced/Define system/Cooling" menu and set "Cooling" to "YES".

Selecting system type

The control features in EcoHeat handle different types of cooling systems; see the schematic diagrams.

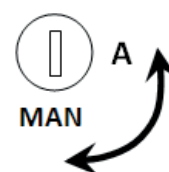
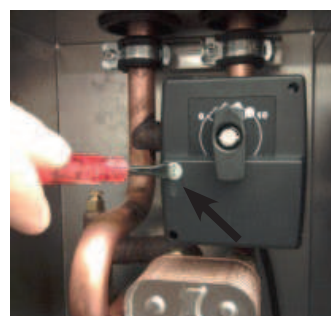
- Select "YES" or "NO" when asked whether the heating or cooling system is used for both heating and cooling. If the answer is "NO", heating is run on circuit 1 and cooling on circuit 2. If the answer is "YES" (common), circuit 1 is used for both heating and cooling.
- Select "YES" or "NO" when asked whether the system for cooling is condensation-proof. If the system is condensation-proof, a significantly lower temperature is permitted in the system. WARNING! Condensation forming in the house structure can cause damp and mould damage. If in doubt, contact an expert for their opinion!
- Then set the desired room temperature for cooling.

Note: Room sensors should always be used in the part of the property to be cooled since the room sensor determines/controls the cooling capacity.

Additional bleeding can now be performed by manually activating the pump and mixing valve in EcoHeat (the mixing valve in EcoComfort also has a "manual mode"). Push in and twist as shown in the picture to release the mixing valve knob.

After activating the cooling function in EcoHeat, check the following by going to the "Advanced/Service/Function test" menu on EcoHeat:

- The pump in EcoComfort receives power when activated
- The mixing valve closes (moves towards zero) when the "reduce" signal is activated
- The mixing valve opens (moves towards 10) when the "increase signal" is activated



Disengaging the mixing valve for manual mode.

6. Operation and maintenance

6.1 After installation

Once the system has been installed, the user and installer must together check that the system is in perfect working order. Let the installer show you where the power switches, controls, valves, safety valves, etc. are so that you know how the system works and how it should be maintained.

The system may need to be re-bled after a few days of operation. Also check for any leakage after a few days of operation; re-tighten if necessary.

6.2 Periodic maintenance

CTC EcoComfort does not normally require any special maintenance, although it should be checked for leakage and residual air:

- Immediately after installation and pressurisation of the systems.
- After a week of operation.
- After about a month of operation, then each year (leakage).

6.3 Breaks in operation

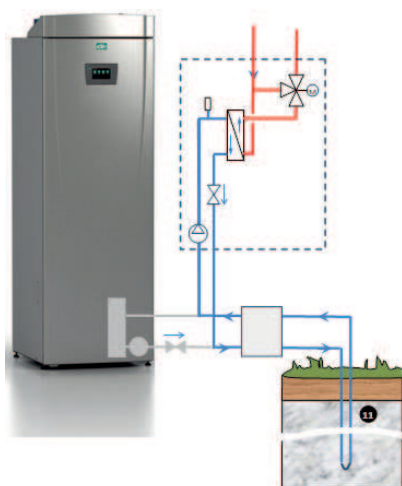
If the unit is to be turned off for a period of time, ensure the following:

- The taps, valves, etc. are closed/set to a position that means the system cannot be damaged during this period.
- The whole system is drained of water (the cold side does not need to be drained since it is protected against frost). Make sure that electrical power is cut off to pumps etc.
- Safety valves and other functions are checked when the system is restarted.
- When draining, make sure all water is drained from the heat exchanger; remove one of the lower connections.

6.4 Function description

Passive cooling

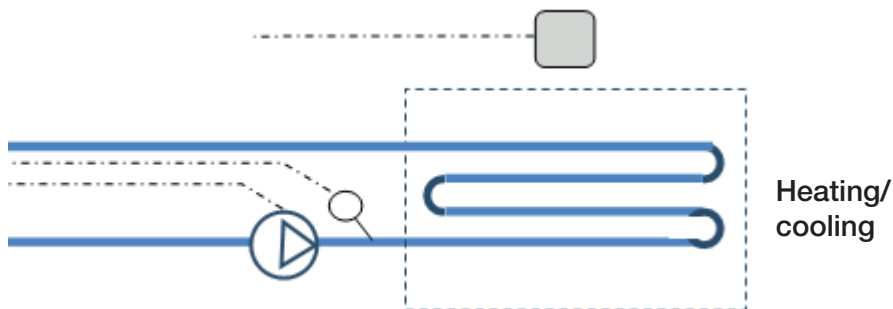
Passive cooling means that the free cooling available is made use of. In this case, the bore hole's cool temperature cools the radiator water. The compressor in the heat pump is not used; only pump energy is required to circulate the water. EcoComfort's circulation pump is a low-energy model and tailored for the tough eco-design requirements in force from 2015.



6.5 Function options

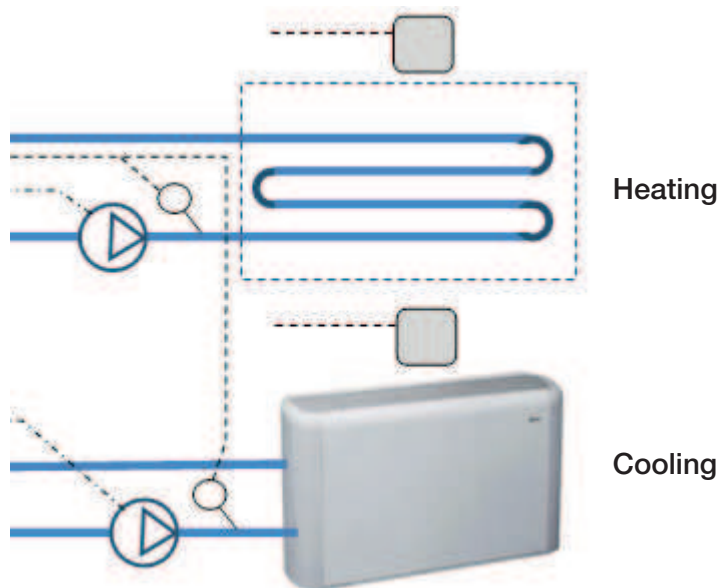
Combination underfloor heating/cooling

To take advantage of passive cooling, you need to have an underfloor heating system to which cooling can be connected. If the underfloor heating system can be used to cool the property, it will be used for heating in the winter and cooling in the summer.



Separate heating/radiator system and cooling system (fan coil unit)

EcoHeat can handle a radiator system for heating and a separate system for cooling simultaneously. This may be appropriate if you want to cool a certain part of a property with e.g. a fan coil unit while another part requires heating.



Standard radiators (elements)

A standard radiator system with elements is not suitable for cooling. In such cases, the system must be supplemented with fan coil units (air/water heat exchanger with built-in fan, only for cooling).

Cooling capacity

Passive cooling is a cost-effective way to take advantage of the cooler temperature in the bedrock in the summer. How much you can cool a property is dependent on several factors, such as the bedrock temperature currently available, house size, capacity of the underfloor heating/fan coil units, lay-out (fan coils), etc.

Yet a drop of a few degrees in a warm house often feels much more comfortable. Often the capacity (cooling) is reduced during the latter part of the summer as the bore hole heats up.

Desired room temperature

The desired room temperature is set on the EcoHeat display. The automated control system “mixes” to the right temperature in relation to the need for cooling (room sensor difference). The greater the difference, the colder the water that goes to the system. Depending on the system, excessively cold temperatures (which can result in damp damage) are not permitted.

NOTE! The recommended room temperature setting when cooling is a few degrees higher than the temperature set in heating mode. Since the room temperature tends to rise when the outdoor temperature is increasing, the cooling function takes effect.

Also note that the cooling capacity depends on factors such as the bore hole temperature, bore hole length, flows and the underfloor heating/fan coil unit capacity, and will vary during the warm season.

Automatic heating-cooling function

Once the settings have been made, operation is fully automatic. The control system automatically ensures that the property is heated when there is a need for heating and cooled when there is a need for cooling without the systems “fighting” each other.

Automatic running of pump and mixing valve

The pump and mixing valve built into EcoComfort are run regularly to prevent them seizing up.

7. Menu settings and their functions

In menu	Menu option	Function description
Advanced/Define system/ Cooling	Cooling (YES/NO)	Specified on installation. Select YES if the cooling function is installed and should be activated.
	Common heating and cooling (YES/NO)	Specified on installation. Select YES if underfloor heating system is to be used for both heating and cooling. If the cooling system is separate, select NO.
	Is the system condensation-proof? (YES/NO)	Specified on installation. If the system where cooling is to be used is fully insulated against condensation and condensate in e.g. a fan coil unit is taken care of, select YES.
	Room temp cooling 25(18...30) for a non-condensation-proof system. 18(10...30) for a condensation-proof system.	Specified on installation. The desired room temperature is set here. Depending on the difference from the actual room temperature, the temperature to the underfloor heating/fan coil unit is automatically adjusted. If the underfloor heating system is used or a non-condensation-proof system is selected, the cold temperature from EcoComfort is limited to prevent condensation forming.
Room temperature	25(18...30)	The customer's setting. In this menu accessible from the main menu, the desired room temperature can be set/changed. The menu looks slightly different depending on the type of system chosen. Recommendation: should be set a few degrees higher than the desired room temperature for heating.
Coded environment (only for advanced settings by trained personnel)		
Advanced/Service/Factory set. coded/Cooling	Min flow temp cooling 18(10...30). For a non-condensation-proof system.	Only for specialists. This setting specifies the lowest possible adjustable temperature out to the system for a non-condensation-proof system. Used where e.g. an extremely humid climate may pose an extra risk of condensation forming.
	Min flow temp cooling 15(10...30). For a condensation-proof system.	Only for specialists. This setting specifies the lowest possible adjustable temperature out to the system for a condensation-proof system. Used where e.g. extra cold temperatures in the room may be permitted.
	(Max diff room temp cooling) 5(0...20)	Only for specialists. Normally, with a non-condensation-proof system, the primary flow temperature is permitted to be up to 5 degrees lower than the current room temperature to prevent condensation forming. This setting makes it possible to reduce the difference e.g. when excessive moisture occurs.

Error codes

If EcoComfort experiences an error, this is shown in plain text on the EcoHeat display. See also the EcoHeat manual.

Troubleshooting EcoComfort's components

The circulation pump and mixing valve motor in EcoComfort can be activated separately from the menu system in EcoHeat. See the EcoHeat manual for service functions.

8. Troubleshooting and remedial action

Symptom														Action/comment	
X = probable cause O = possible cause		Normal, nothing wrong													
		Inadequate insulation/no condensate drain													
		Mixing valve incorrectly connected in EcoHeat	X	X			X		X	X	X	X	O	X	
		Mixing valve set to manual mode													
		Sluggish underfloor heating system													
		Restricted cooling due to non-cond-proof system													
		Setting error													
		Cooling effect from bedrock insufficient													
		Room sensor misplaced													
		Inadequate bleeding (cold side)													
		Inadequate bleeding (hot side)													
		Underfloor heating group stops (closed)													
		Mixing valve in EcoComfort not working													
		Pump in EcoComfort stationary													
	No cooling (after installation)				X	X			X	X	X	X	X	X	
No cooling (but has worked for a long time prev.)					O		O	O				O	X	X	Has it been extremely hot compared to before? Check function of components.
Insufficient cooling					O	O	X	X	X	O	O	O	O		Installation of fan coil unit?
Too cold indoors				X	O			X		X			X		Risk of condensation? Check installation immediately!
Uneven cooling					O	O		O	O	X	X	X	O		
Condensation forms on pipe			X												Insulate! Risk of damage to the property.
Condensation from the fan coil			X												Insulate! Risk of damage to the property.
Floors too cold	X				O			X							Check installation immediately, risk of condensation? Could be one person's feeling. Install fan coil unit?
Gurgling noise										X	X				
No cooling when heat pump produces hot water	X														When brine pump in EcoHeat is on, it obstructs brine flow through EcoComfort, which can lower cooling capacity temporarily.

8.1 Capacity data

2°C brine			Result	
Flow brine l/s	Hot T °C	Flow radiator l/s	Capacity kW	Hot T lowered K
0,1	15	0,1	2,8	6,7
		0,4	3,7	2,2
		0,7	4,5	1,5
		1	4,8	1,1
20	0,1	0,1	3,9	9,3
		0,4	5,1	3
		0,7	6,3	2,2
		1	6,7	1,6
25	0,1	0,1	5	12
		0,4	6,5	3,9
		0,7	8	2,7
		1	8,6	2,1
30	0,1	0,1	6,2	15
		0,4	8,1	4,8
		0,7	10	3,4
		1	10,7	2,6
0,4	15	0,1	3,7	8,8
		0,4	7,9	4,7
		0,7	8,8	3
		1	9,3	2,2
20	0,1	0,1	5,1	12
		0,4	11	6,6
		0,7	12,2	4,2
		1	13	3,1
25	0,1	0,1	6,5	16
		0,4	14	8,4
		0,7	15,6	5,3
		1	16,5	3,9
30	0,1	0,1	8,1	19
		0,4	17,5	11
		0,7	19,4	6,6
		1	20,6	4,9
0,7	15	0,1	4,5	11
		0,4	8,8	5,3
		0,7	10,5	3,6
		1	11	2,6
20	0,1	0,1	6,3	15
		0,4	12,2	7,3
		0,7	14,6	5
		1	15,4	3,7
25	0,1	0,1	8	19
		0,4	15,6	9,3
		0,7	18,6	6,3
		1	19,6	4,7
30	0,1	0,1	10	24
		0,4	19,4	12
		0,7	23,3	8
		1	24,5	5,9
1	15	0,1	4,8	12
		0,4	9,3	5,6
		0,7	11	3,8
		1	12,1	2,9
20	0,1	0,1	6,7	16
		0,4	13	7,8
		0,7	15,4	5,3
		1	16,9	4
25	0,1	0,1	8,6	21
		0,4	16,5	9,9
		0,7	19,6	6,7
		1	21,5	5,1
30	0,1	0,1	10,7	26
		0,4	20,6	12
		0,7	24,5	8,4
		1	26,9	6,4

5°C brine			Result	
Flow brine l/s	Hot T °C	Flow radiator l/s	Capacity kW	Hot T lowered K
0,1	15	0,1	2,1	5
		0,4	2,9	1,7
		0,7	3,5	1,2
		1,0	3,8	1,3
20	0,1	0,1	3,3	7,9
		0,4	4,5	2,7
		0,7	5,4	1,8
		1	5,8	1,4
25	0,1	0,1	4,4	10,5
		0,4	6,1	3,6
		0,7	7,4	2,5
		1	7,8	1,9
30	0,1	0,1	5,5	13,1
		0,4	7,6	4,5
		0,7	9,1	3,1
		1	9,7	2,3
0,4	15	0,1	2,9	6,9
		0,4	6	3,6
		0,7	6,7	2,3
		1	7,2	1,7
20	0,1	0,1	4,5	10,8
		0,4	9,2	5,5
		0,7	10,3	3,5
		1	11	2,6
25	0,1	0,1	6,1	14,6
		0,4	12,5	7,5
		0,7	14	4,8
		1	14,9	3,6
30	0,1	0,1	7,6	18,2
		0,4	15,4	9,2
		0,7	17,3	5,9
		1	18,4	4,4
0,7	15	0,1	3,5	8,4
		0,4	6,7	4
		0,7	8,1	2,8
		1	8,6	2,1
20	0,1	0,1	5,4	12,9
		0,4	10,3	6,2
		0,7	12,5	4,3
		1	13,1	3,1
25	0,1	0,1	7,4	17,7
		0,4	14	8,4
		0,7	16,9	5,8
		1	17,8	4,3
30	0,1	0,1	9,1	21,7
		0,4	17,3	10,3
		0,7	20,9	7,1
		1	22	5,3
1	15	0,1	3,8	9,1
		0,4	7,2	4,3
		0,7	8,6	2,9
		1	9,4	2,2
20	0,1	0,1	5,8	13,9
		0,4	11	6,6
		0,7	13,1	4,5
		1	14,5	3,5
25	0,1	0,1	7,8	18,6
		0,4	14,9	8,9
		0,7	17,8	6,1
		1	19,6	4,7
30	0,1	0,1	9,7	23,2
		0,4	18,4	11
		0,7	22	7,5
		1	24,3	5,8

10°C brine			Result	
Flow brine l/s	Hot T °C	Flow radiator l/s	Capacity kW	Hot T lowered K
0,1	15	0,1	1,1	2,6
		0,4	1,3	0,8
		0,7	1,6	0,5
		1	1,7	0,4
20	0,1	0,1	2,3	5,5
		0,4	2,8	1,7
		0,7	3,3	1,1
		1	3,6	0,9
25	0,1	0,1	3,3	7,9
		0,4	4,1	2,4
		0,7	4,8	1,6
		1	5,3	1,3
30	0,1	0,1	4,4	11
		0,4	5,4	3,2
		0,7	6,4	2,2
		1	7	1,7
0,4	15	0,1	1,3	3,1
		0,4	3,1	1,9
		0,7	3,5	1,2
		1	3,7	0,9
20	0,1	0,1	2,8	6,7
		0,4	6,5	3,9
		0,7	7,3	2,5
		1	7,8	1,9
25	0,1	0,1	4,1	9,8
		0,4	9,4	5,6
		0,7	10,7	3,7
		1	11,4	2,7
30	0,1	0,1	5,4	13
		0,4	12,4	7,4
		0,7	14,1	4,8
		1	15	3,6
0,7	15	0,1	1,6	3,8
		0,4	3,5	2,1
		0,7	4,2	1,4
		1	4,5	1,1
20	0,1	0,1	3,3	7,9
		0,4	7,3	4,4
		0,7	8,9	3
		1	9,4	2,2
25	0,1	0,1	4,8	12
		0,4	10,7	6,4
		0,7	13	4,4
		1	13,8	3,3
30	0,1	0,1	6,4	15
		0,4	14,1	8,4
		0,7	17,2	5,9
		1	18,2	4,3
1	15	0,1	1,7	4,1
		0,4	3,7	2,2
		0,7	4,5	1,5
		1	4,9	1,2
20	0,1	0,1	3,6	8,6
		0,4	7,8	4,7
		0,7	9,4	3,2
		1	10,5	2,5
25	0,1	0,1	5,3	13
		0,4	11,4	6,8
		0,7	13,8	4,7
		1	15,3	3,7
30	0,1	0,1	7	17
		0,4	15	9
		0,7	18,2	6,2
		1	20,1	4,8

1. Select brine temperature (closest value)
2. Select brine value (l/s)
3. Select radiator system temperature (hot T) coming into the heat exchanger.
4. Select radiator system flow (l/s)
5. Read off the capacity/cooling effect in kW, and how much the temperature of the radiator water is lowered.

The capacity values in the tables are for 100% flow through the heat exchanger, i.e. the mixing valve in EcoComfort is fully open.

! The temperature of the cold water permitted to go out in the system is limited by EcoHeat's control system, depending on system type and room temperature. If the cold temperature to the heating system is limited, the cooling effect is also reduced due to the reduced flow through the heat exchanger.

