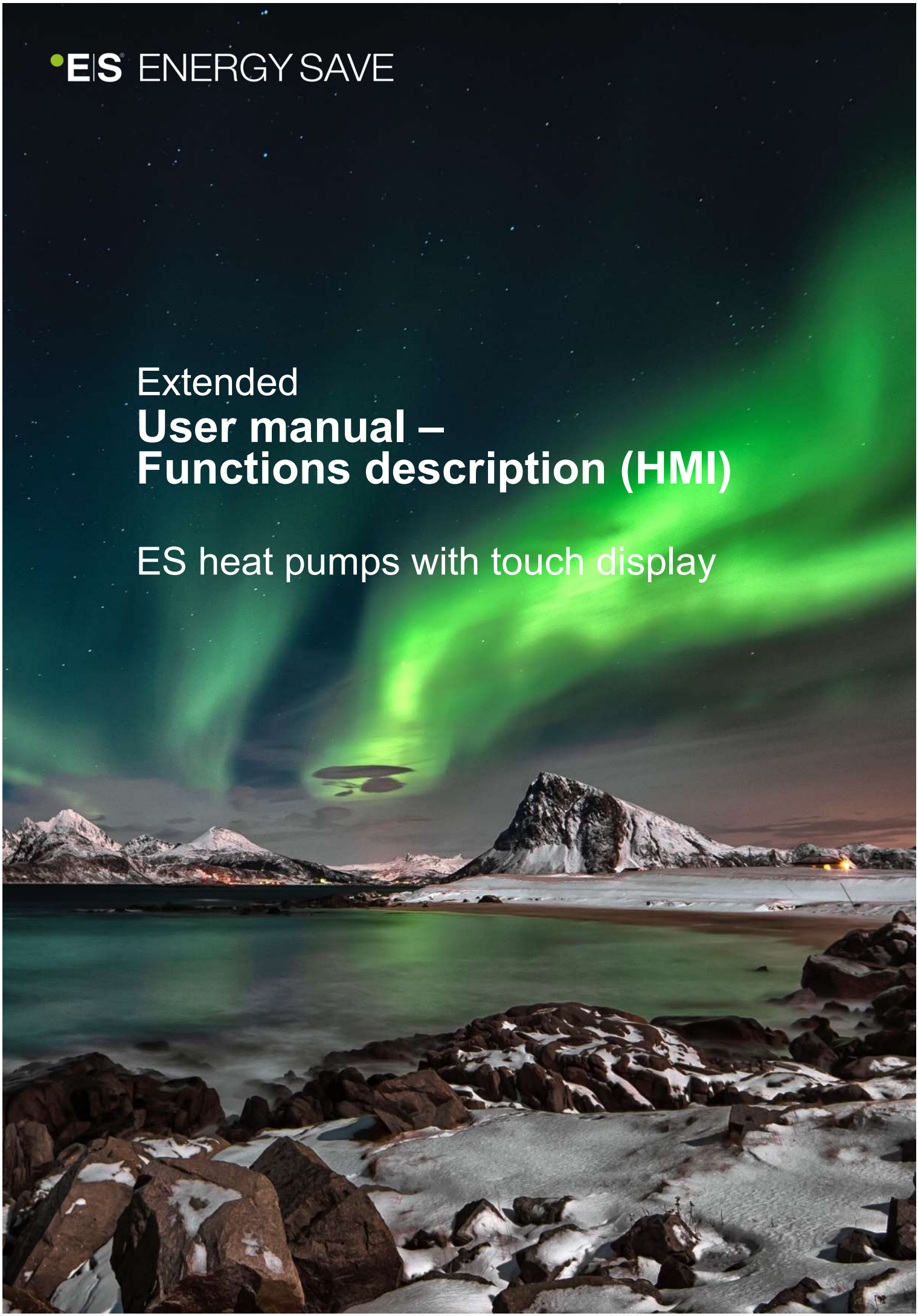
ES ENERGY SAVE

Extended

User manual – Functions description (HMI)

ES heat pumps with touch display



Introduction

This extended user manual is a complement to the user manual and describes all the settings that are possible for the user to change on Energy Saves air/water heat pumps with touch display. The naming of the functions may differ depending on the version of the software. But the order and function are the same in the menus.

Some functions are set by the installer during commissioning and may, in case of improper use, damage the device or other parts/components of the property and are therefore protected with an installer password. The password-protected settings are grayed out in the menus and cannot be changed. These settings are not described in detail in this manual.

Table of contents

1 Main menu

1	**Outdoor temperature**
2	**Room temperature**– press the temperature to: • Parallel move the heating curve of the zones1 & 2 (if the room temperature is set not to affect the heating curve, factory setting) • Change the set room temperature (if the room temperature is set to affect the heating curve, not factory setting)
3	**Domestic hot water**– press the temperature to change the desired temperature of the hot water in the tank
4	**Zone 1 – current temperature in the heating system**– press on the temperature to change the temperature of the water for the current outdoor temperature. (Nearest point of the heating curve, outdoor temperature)
5	**Zone 2 – current temperature in the heating system**– see point 4
6	**Mode selection** – Auto mode / manual mode  Auto – automatically alternates between heating, cooling and domestic hot water  Heating –only heating is activated  Domestic hot water – only domestic hot water is activated  Cooling - only cooling is activated  Quick heat – fast heating of domestic hot water to set temperature (when done it switches back to **Auto**)
7	**Menu** – access to submenus
8	**ON/OFF** – Blue color= the heat pump is on; Grey color= heat pump is switched off (stand by)

1.1 Additional symbols

The symbols below are shown in cases where a special function is active.

	Night mode is active
	Outdoor unit defrosting – normal operation
	Timer for heating domestic hot water is active
	Heating- and cooling timer is active
	Legionella function is active
	Vacation mode is active
	Floor curing function is active
	Electrical utility lock is active
	ECO heating function is active
	Warning (yellow); The heat pump operates normally but authorized service personnel must be informed! Alarm (red); To ensure the safety of the system and heat pump, the heat pump is switched off. If the "Emergency Operation" function is activated, the heat pump continues to operate, but only with backup heating sources (e.g. electric heater). Contact an authorized service personnel immediately!

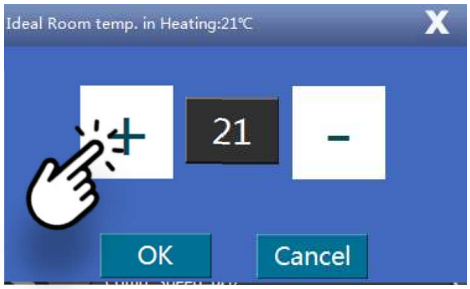
2 Main menu settings

2.1 Setting room temperature

Room temperature control <u>with</u> room temperature sensor (TR)

Note: Room temperature control can only be used if the room temperature sensor is located in an appropriate room (e.g. living room) and the **Room temp. effect on heating curve** is activated (see Chapter 4.1).
If the function is not activated, the heat pump operates according to the heating curve. Room temperature affects both zones.

Follow the instructions below to adjust the room temperature:



Press + or – to raise or lower the temperature. Press **OK** to confirm.

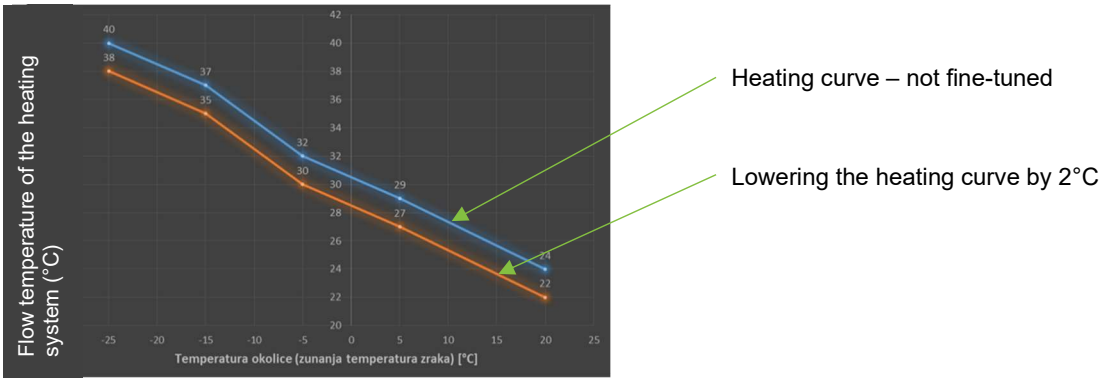
Room temperature control <u>without</u> room temperature sensor (TR)

When commissioning, the heating curve must be adjusted based on the type of heating system of the house and the desired indoor temperature.

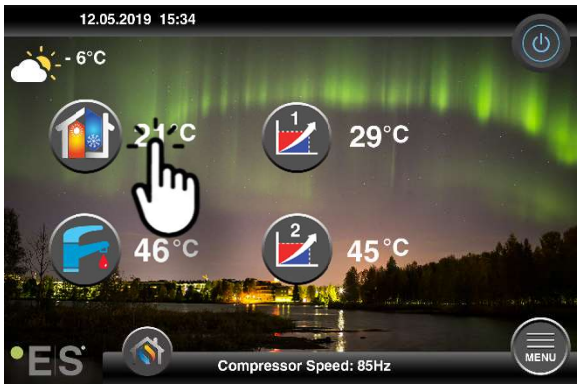
On the main menu, the heating curve can be fine-tuned by moving parallel (raised or lowered). The heat curve can be raised or lowered by 3°C (-3 to +3).

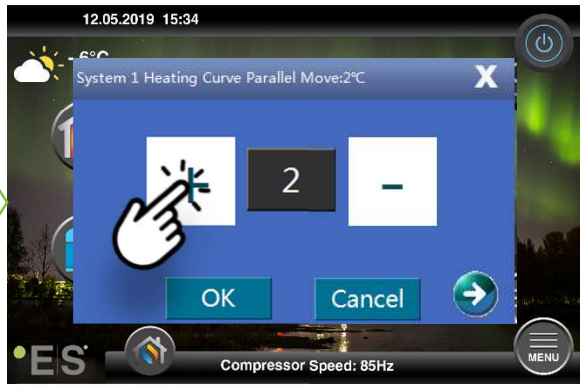
Normally, raising the heating curve by 2-3°C means an increase in room temperature of about 1°C. If major adjustments are required, see Chapter 1. 4.1.

The graph below shows a reduction (parallel move) of the heating curve by 2°C



Parallel move the heating curve - ZONE 1

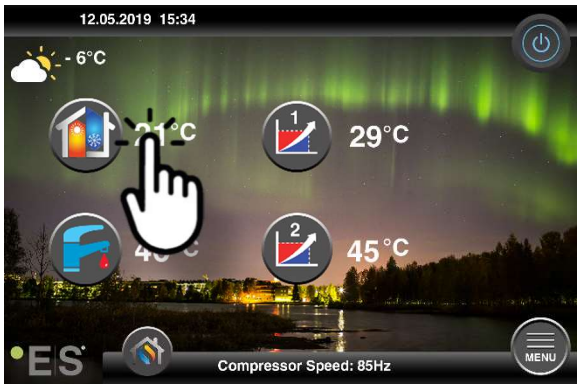


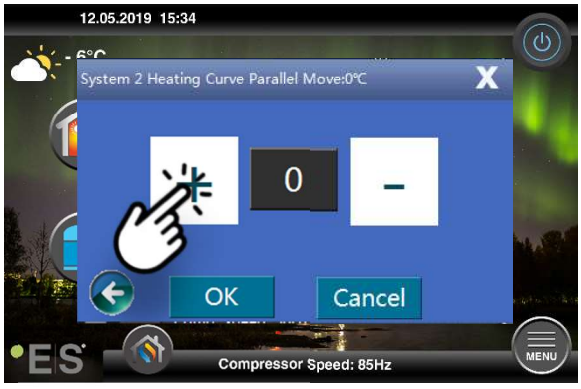


Press + or – to raise or lower the temperature. Press **OK** to confirm.

Parallel move the heating curve - ZONE 2

If the house has two heating systems with separate heating curves, these can be fine-tuned individually. First comes the window to parallel move the heating curve for zone 1. To fine-tune the heating curve for zone 2, press .

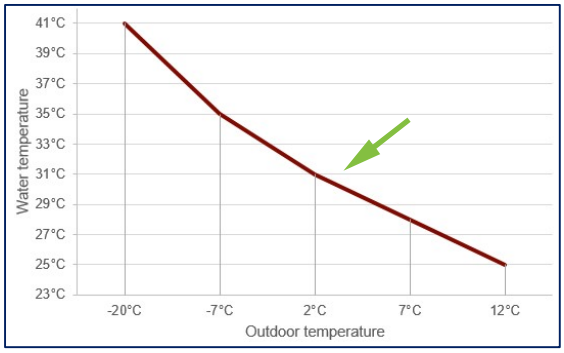


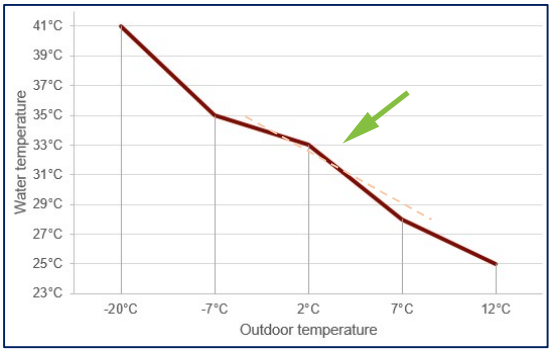


Press + or – to raise or lower the temperature. Press **OK** to confirm.

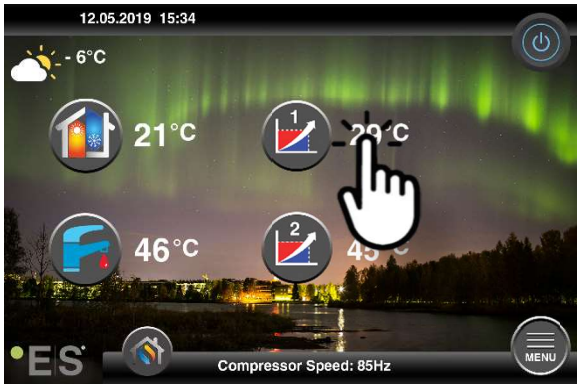
Adaptation of (break) heating curve

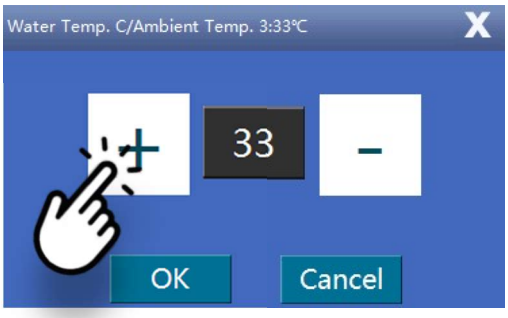
If the heating curve needs to be adjusted at a certain outdoor temperature, it can be adjusted (break). This is done directly from the main menu, see pictures below.
Example: changing the temperature setting for +2°C outdoor temperature produces a heating curve as shown below



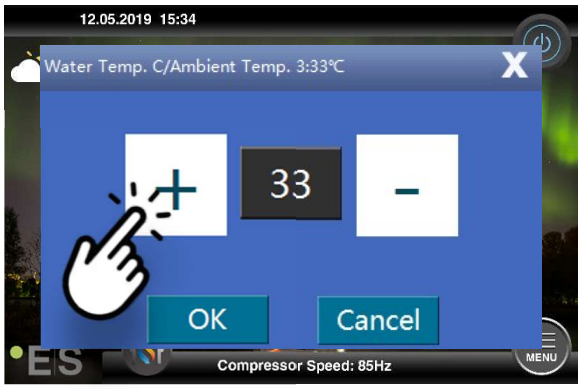


Zone 1 (e.g.: first floor/underfloor heating):





Zone 2 (e.g.: second floor/radiators):



Note: if  is gray  ,
means that the zone is not activated.

2.2 Temperature setting domestic hot water

Press the temperature next to the domestic hot water symbol to adjust the setting.

The temperature that is suitable to set depends on the user's needs and habits.

The recommended setting is between 47°C and 50°C. If higher temperatures of domestic hot water are needed, see Chapter 4.3.

3 Submenus

Submenu 1:

Most settings concern the end user.

Submenu 2:

Most settings concern the installer(commissioning).

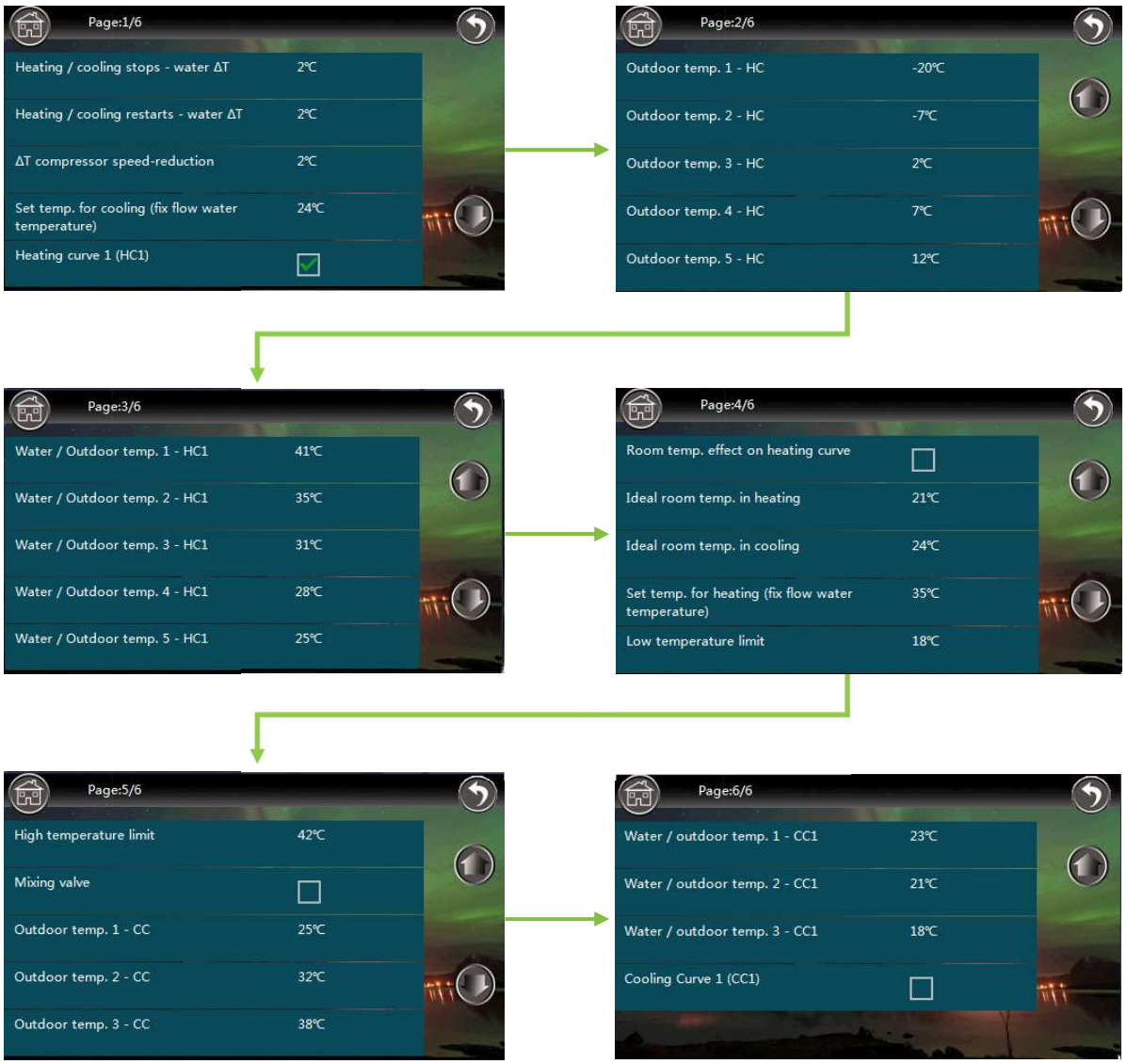
Settings that affect the installer during deployment are protected with a password. The end user can see all the changes but can only change those that are not related to commissioning.

Note:

The naming of the functions in the menus may differ depending on the version of the software. But the order and function are the same in the menus.

4 Settings

4.1 Zone 1



Heating/cooling stops – water ΔT

Temperature setting that allows overheating of the heating system for the set value. The recommended setting is 2°C for the heat pump to operate as efficiently as possible and minimize wear.
Please note, that we allow the heat pump to overheat the system, to maintain a low working speed and to avoid a frequent stopping and starting of the compressor.
Example:
If the current set point is 30°C, the heat pump stops at 32°C

Heating/cooling restarts – water ΔT

The compressor restarts based on the set values of heating/cooling circuits. The recommended value is 2°C. This enables efficient operation of the Inverter technology and brings the highest savings.
Example:
If the current set point is 30°C, the heat pump starts at 28°C.

ΔT compressor speed-reduction

This setting determines the temperature from which the heat pump starts to reduce the compressor speed. The recommended setting is 2°C to ensure that the heat pump operates as efficiently as possible.
Example:
If the current set point is 30°C and **ΔT compressor speed-reduction** is set to 2°C, the compressor will operate at maximum speed up to 28°C and then reduce the speed.

Set temp. for cooling (fix flow water temperature)

If **Cooling Curve 1 (CC1)** is not activated, the heat pump operates against this fixed temperature in the operating mode cooling, regardless of the outdoor temperature. This setting applies to **Zone 1**.

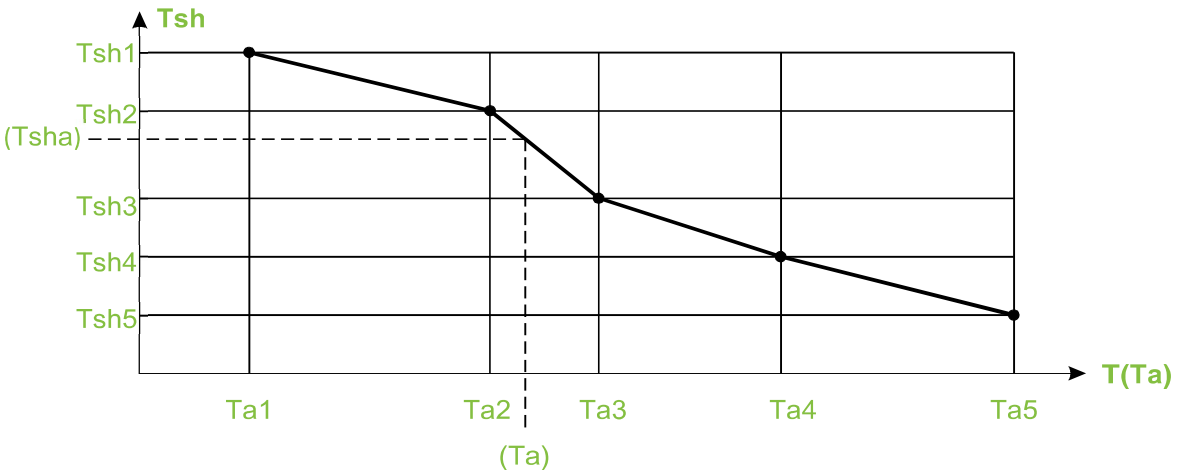
Heating curve 1 (HC1)

Activated	The heat pump works according the heating curve
Not activated	The heat pump works towards a fixed temperature **Set temp. for heating (fix flow water temperature)**

Outdoor temp. 1 - HC
Outdoor temp. 2 - HC
Outdoor temp. 3 - HC
Outdoor temp. 4 - HC
Outdoor temp. 5 - HC
} Heating curve – outdoor temperatures

Water / Outdoor temp. 1–HC1
Water / Outdoor temp. 2–HC1
Water / Outdoor temp. 3–HC1
Water / Outdoor temp. 4–HC1
Water / Outdoor temp. 5–HC1
} Heating curve – water temperatures Zone 1

Tsh – Water temp. T(Ta) – Outdoor temp.



Note:

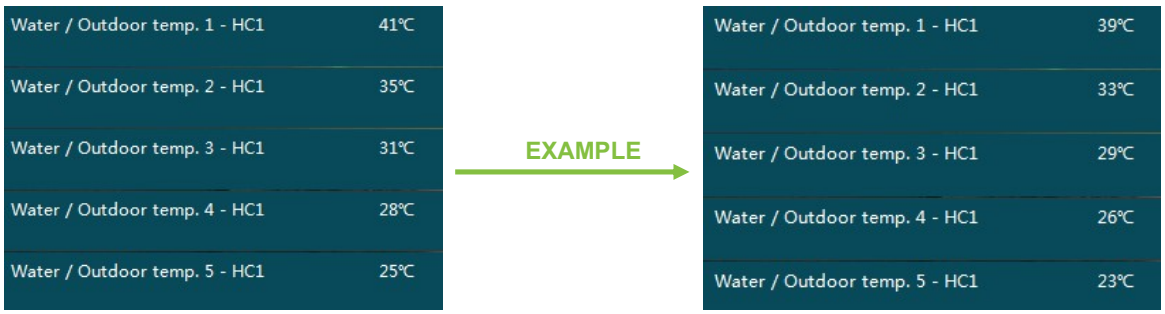
The recommendation is to only change the water temperature (page 3/6) to match the heating system and house needs. Changing outdoor temperatures (page 2/6) affects both zones.

Set heating curve 1 (ZONE 1)

The water temperatures are set on page 3/6.

Example:

The requirement is an indoor temperature of 21°C but the current heating curve heats the house to 22°C. Normally, lowering the water temperatures by 2-3°C will reduce the indoor temperature by app 1°C. (See example below)



Room temp. effect on heating curve

Activated	The heat pump makes small adjustments to the heating curve to adjust the indoor temperature according to **Ideal room temp. in heating**
Not activated	The heat pump works only by the heating curve

Note:
It is a must that the **TR** sensor is mounted in an appropriate room (e.g. living room).
This function is not a room temperature control but only makes small corrections to the heat curve. If the temperature is still too high or low in the room, the heat curve needs to be adjusted.

Ideal room temp. in heating

Set the desired room temperature. This setting is active if the **Room temp. effect on heating curve** is activated.

Ideal room temp. in cooling

Set the desired room temperature. This setting is active if the **Room temp. effect on heating curve** is activated.

Set temperature for heating (fix flow water temperature)

If **Heating curve 1 (HC1)** is not activated, the heat pump operates against this set temperature in the operating mode heat, regardless of the outdoor temperature. This setting applies to **Zone 1**.

Low temperature limit

Installer setting.

High temperature limit

Installer setting.

Mixing valve

Installer setting.

Outdoor temp. 1 – CC
Outdoor temp. 2 – CC
Outdoor temp. 3 – CC
} Cooling curve – outdoor temperatures

Water / outdoor temp. 1 – CC1
Water / outdoor temp. 2 – CC1
Water / outdoor temp. 3 – CC1
} Cooling curve – water temperatures Zone 1.

Cooling Curve (CC1)

Activated	The heat pump works according the set cooling curve
Not activated	The heat pump works towards a fixed temperature **Set temp. for cooling (fix flow water temperature)**

4.2 Zone 2

Zone 2

Activation of **Zone 2**.

Set temp. for cooling (fix flow water temperature)

If **Cooling Curve 1 (CC2)** is not activated, the heat pump operates against this fixed temperature in the operating mode cooling, regardless of the outdoor temperature. This setting applies to **Zone 2**.

Set temperature for heating (fix flow water temperature)

If **Heating curve 2 (HC2)** is not activated, the heat pump operates against this set temperature in the operating mode heat, regardless of the outdoor temperature. This setting applies to **Zone 2**.

Mixing valve

Installer setting.

Heating curve (HC2)

Activated	The heat pump works according to the heating curve
Not activated	The heat pump works towards a fixed temperature **Set temperature for heating (fix flow water temperature)**

Water / Outdoor temp. 1–HC2
Water / Outdoor temp. 2–HC2
Water / Outdoor temp. 3–HC2
Water / Outdoor temp. 4–HC2
Water / Outdoor temp. 5–HC2

Heating curve – water temperatures Zone 2

Note: it refers to the outdoor temperature settings for Zone 1

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High temperature limit

Installer setting.

Low temperature limit

Installer setting.

Water / outdoor temp. 1 – CC2
Water / outdoor temp. 2 – CC2
Water / outdoor temp. 3 – CC2

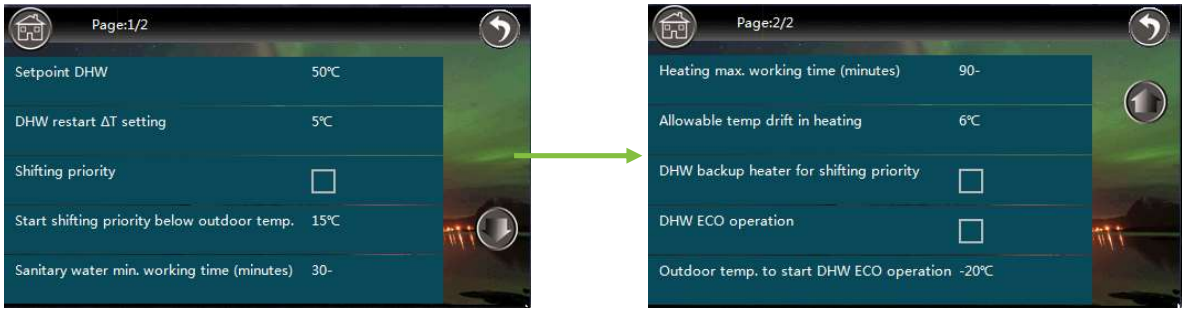
Cooling curve – water temperatures Zone 2

Note: it refers to the outdoor temperature settings for Zone 1

Cooling Curve (CC2)

Activated	The heat pump works according the set cooling curve
Not activated	The heat pump works towards a fixed temperature **Set temp. for cooling (fix flow water temperature)**

4.3 DHW



Setpoint DHW

Set the desired temperature in the hot water tank. The recommended setting is between 47°C and 50°C.

Note:
At a higher set point than the compressor can handle (max 58°C), backup is required. Ensure that the **HWTBH** (see chapter 4.10) heat source is placed in the hot water tank.

DHW restart ΔT setting

Domestic hot water restart setting. Recommended setting is 5°C.

Example:
Setpoint DHW is set to 47°C and **DHW restart ΔT setting** is set to 5°C. The heat pump will then start production of domestic hot water when the temperature in the tank drops to 42°C (47-5=42).

Shifting priority

This function is used only in exceptional cases. For example, during a reconstruction when parts of/whole house lack insulation and require an abnormal amount of heating. In normal operation, priority is given to sanitary hot water production. With this function, the priority is adjusted to heat losses when the outdoor temperature reaches a certain point.

Activated	The heat pump will determine based on the temperature of the heating system whether to switch to heat even if the set sanitary hot water temperature has not yet been reached
Not activated (normal operation)	The heat pump prioritizes the production of sanitary hot water and produces heat after the set temperature for sanitary hot water is reached

Example:
The set point for sanitary hot water is 47°C and the heat pump is currently operating in sanitary hot water mode. At the moment the temperature is 44°C, i.e. it should normally (function not activated) heat another 3°C before switching over to heat mode. If the temperature in the heating system drops more than **Allowable temp drift in heating** and that **Sanitary water min. working time (minutes)** has passed, the heat pump shift operation mode to heating for a period (maximum **Heating max. working time (minutes)**) and then switch back to the production of sanitary hot water.

Start shifting priority below outdoor temp

Possible only if **Shifting priority** is enabled.
Setting the outdoor temperature that enables **Shifting priority**. The function is active when the outdoor temperature is below the set temperature.

Sanitary water min. working time (minutes)

Possible only if **Shifting priority** is enabled.
The heat pump will attempt to heat the sanitary hot water for a minimum period of time before switching to heating, even if all other conditions for **Shifting priority** are met.

Heating max. working time (minutes)

Possible only if **Shifting priority** is enabled.
When the heat pump switches to heat mode, it allows the unit to stay in heat mode for a maximum of this time, before switching back to heat up the sanitary hot water.

Allowable temp drift in heating

Possible only if **Shifting priority** is enabled.
Setting the maximum permissible temperature deviation in the heating system when the heat pump produces sanitary hot water. When this value is exceeded, the heat pump switches the working mode to heat.

DHW backup heater for shifting priority

Possible only if **Shifting priority** is enabled.
This setting applies only to **HBH**. See Chapter 4.10 for more information on **HBH**.

Activated	Backup heater **HBH** is switched on for faster heating of sanitary hot water
Not activated	Backup heater **HBH** will operate according to normal setting (see Chapter 4.10)

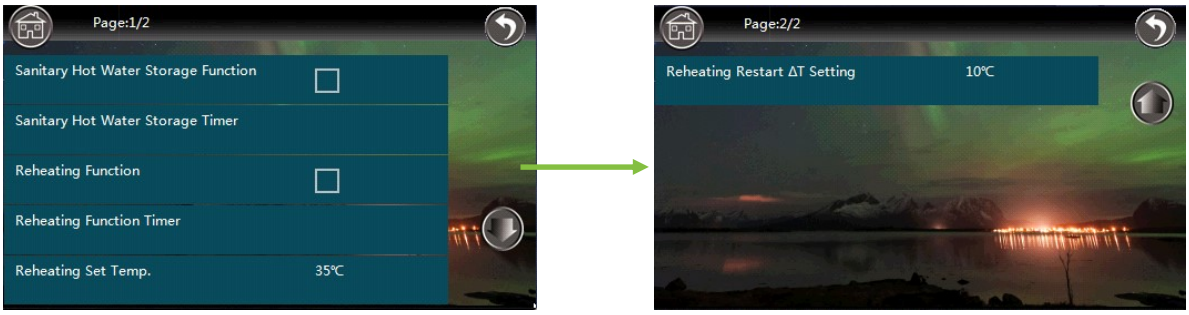
DHW ECO operation

Installer setting.

Outdoor temp. to start DHW ECO operation

Installer setting.

4.4 DHW storage



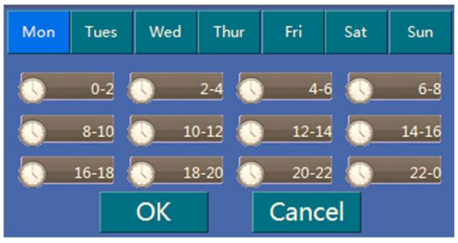
Sanitary hot water storage function

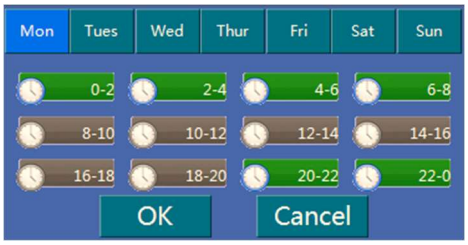
This function allows to control the periods during which the heat pump is to produce sanitary hot water.

Activated	The function is active during the periods selected in **Sanitary hot water storage timer**
Not activated	Function is not active, normal operation

Sanitary hot water storage timer 

Select periods when the function should be active.





The heat pump will produce sanitary hot water during the marked/green period. Grey periods, the heat pump will not produce sanitary hot water.

Reheating function

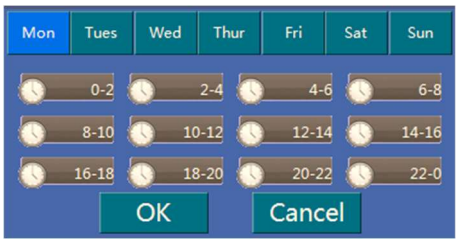
This function is used in combination with **Sanitary hot water storage function** and provides the possibility to set a second temperature for the sanitary hot water. This temperature is active during the periods set in the **Reheating function timer**.

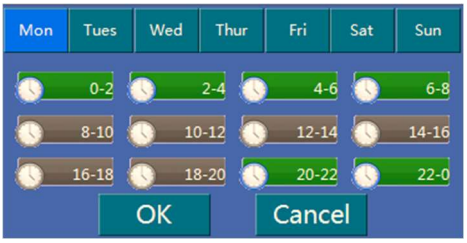
Note:

If the selected periods for these functions overlap, the heat pump will work towards the highest set temperature.

Reheating function timer

Select periods when the function should be active.





The function is active during marked/green periods.

Reheating set temp.

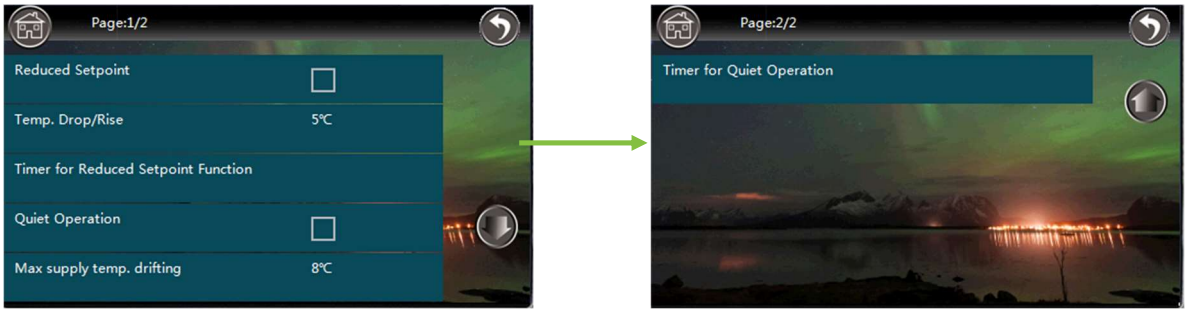
Setting the desired sanitary hot water temperature when the function is active.

Reheating restart ΔT setting

Setting how many degrees the temperature is allowed to drop in the tank for sanitary hot water, before the heat pump starts production of sanitary hot water.
Recommended setting for **Reheating restart ΔT setting** is 5°C.

Example:
Reheating set temp. is set to 45°C and **Reheating restart ΔT setting** is set to 5°C. The heat pump will then start production of sanitary hot water when the temperature in the tank drops to 40°C (45–5=40).

4.5 Night



Reduced setpoint

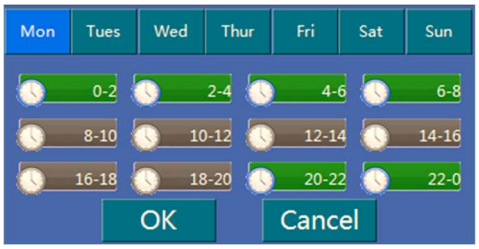
Activated	The current set point for the heating curve is lowered by the set value for **Temp- drop/rise**. If Zone 2 is activated, the adjustment also applies to the that heating curve. The function also affects the cooling curve for both zones. In cooling operation, the set point is increased by the set value for **Temp- drop/rise**
Not activated	Function is not active, normal operation

Temp. drop / rise

Please see above, **Reduced setpoint**.

Reduced setpoint timer

Select periods when the function should be active.



The function is active during marked/green periods.

Quite operation

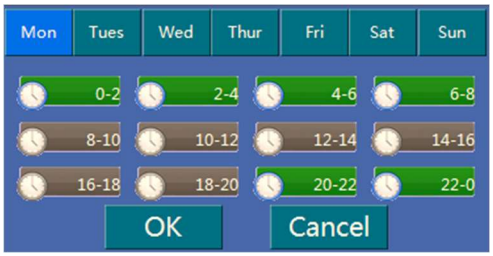
Activated	The heat pump operates at the lowest possible speed on the fan and compressor for the lowest possible sound level. The function is active during the periods marked in the **Quite operation timer** and if the conditions in **Max allowable temp. drifting** are met
Not activated	Function not activated, normal operation

Max allowable temp. drifting

Setting the maximum permissible temperature deviation, applies to both zones.

Quite operation timer

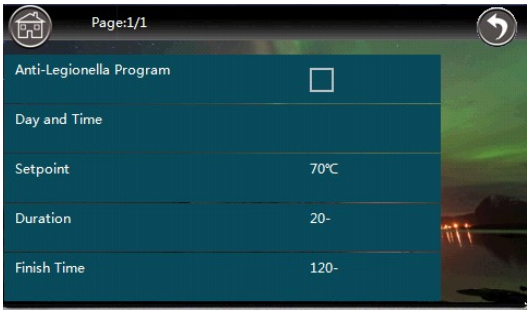
Select periods for the function to be active.



The function is active during marked/green periods.

Note:
If the selected periods for **Reduced setpoint** and **Quite operation** overlap, the heat pump will operate according to **Quite operation** and with a reduced set point according to the setting **Temp. drop/rise**.

4.6 Legionella



Anti-legionella program

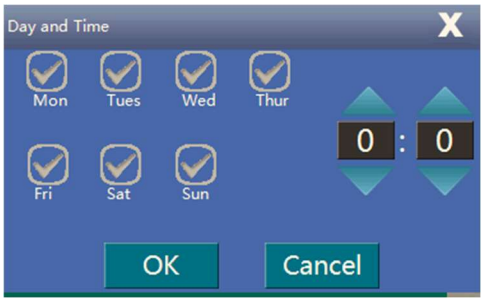
If the sanitary hot water is produced in coil, the function does not need to be activated because the sanitary hot water is not stored in the tank but is heated when there is a need.

Note:
To heat the water to 65-70°C, backup heater is required. Ensure that the **HWTBH** is placed in the sanitary hot water tank. (See chapter 4.10)

Activated	The temperature is temporarily raised 1 time/week during the period marked in the **Day and time**
Not activated	Function is not active, normal operation

Day and time

Select the period when the function should be active.



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Setpoint

Installer setting.

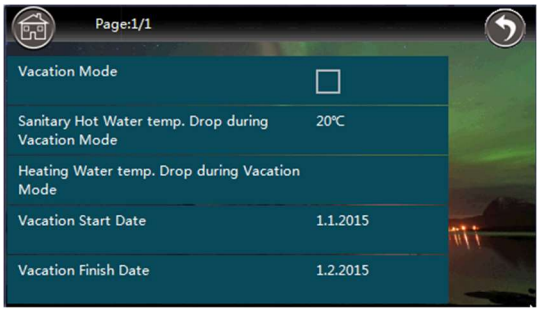
Duration

Installer setting.

Finish time

Installer setting.

4.7 Vacation



Vacation mode

With this function you have the possibility to lower the set points both for sanitary hot water and the heat in the house for a period, e.g. during vacation.

Activated	The function is active during the period selected in **Vacation start date** and **Vacation finish date**
Not activated	Function is not active, normal operation

Sanitary hot water temp. drop during vacation

Setting the number of degrees to be lowered during the period.

Heating water temp. drop during vacation

Setting the number of degrees that the set temperature for heat (the heating curve) should be lowered during the period.

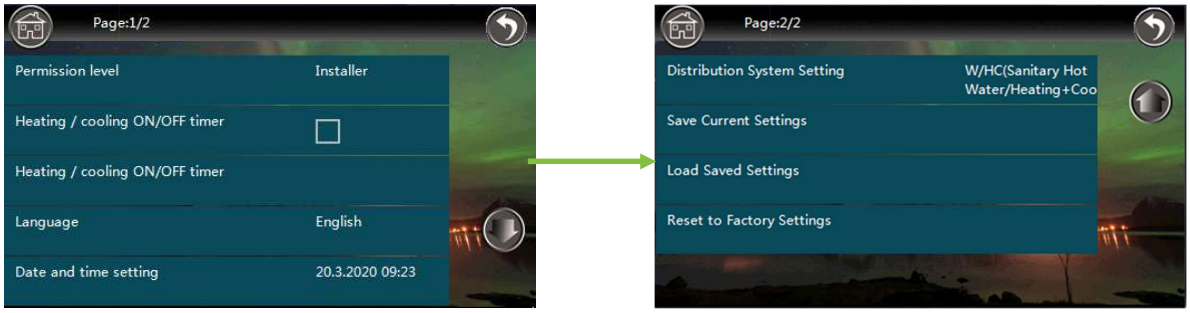
Vacation start date

Set the date from which the **Vacation mode** should be activated.

Vacation finish date

Set the date when the **Vacation mode** should end, and the heat pump should return to the normal settings.

4.8 User



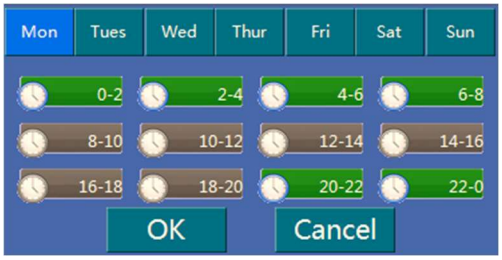
Permission level

There are two permission levels, **End user** and **Installer** (password protected).

Heating / cooling ON/OFF timer

Activated	The heat pump will heat/cool, only in the marked periods in the **Heating/cooling ON/OFF timer**. Other times, antifreeze only. This setting does not affect sanitary hot water
Not activated	Normal operation

Heating/cooling ON/OFF timer:



The function is active during marked/green periods.

Language

Menu language setting.

Date and time setting

Set the current time and date.

Distribution system setting

Installer setting.

Save settings

Installer setting.

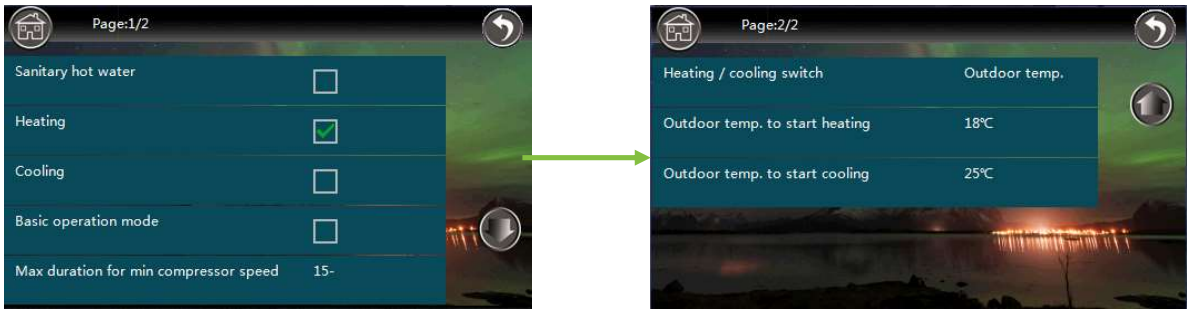
Load saved setting

Reset to the saved settings.

Reset to factory settings

Installer setting.

4.9 Working mode



Sanitary hot water

Installer setting.

Heating

Installer setting.

Cooling

Installer setting.

Basic operation mode

Installer setting.

Max duration for min compressor speed

Installer setting.

Heating / cooling switch

Installer setting.

Outdoor temp. to start heating

Setting, from which outdoor temperature the heat pump should produce heat.

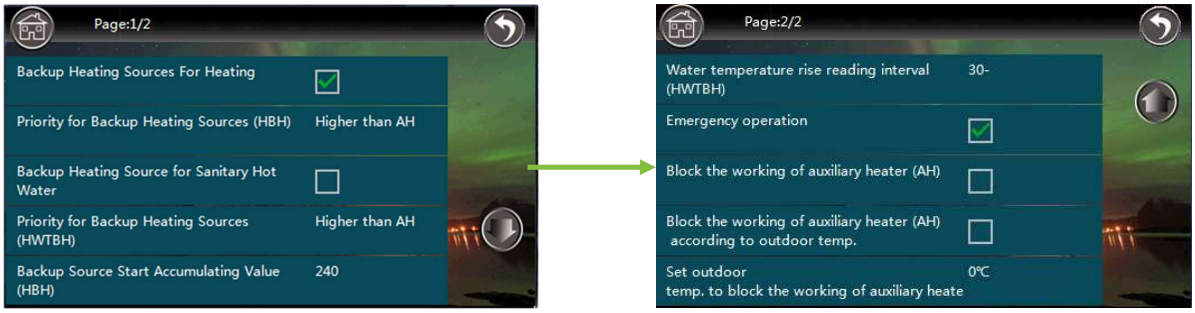
Example:
Outdoor temp. to start heating is set to 18°C. When the outdoor temperature drops below 18°C, the heat pump will start producing heat. When the outdoor temperature rises above 18°C, the heat pump stops producing heat.

Outdoor temp. to start cooling

Setting, from which outdoor temperature the heat pump should produce cooling.

Example:
Outdoor temp. to start cooling is set to 25°C. When the outdoor temperature rises above 25°C, the heat pump will start produce cooling. When the outdoor temperature drops below 25°C, the heat pump stops producing cooling.

4.10 **Back-up**



This menu sets the control of back-up heaters. Back-up heaters may be of different types e.g. electrical heaters, pellets-, wood- or oil boilers. They are switched on if necessary, in one or two steps, depending on the settings below.

AH (Auxiliary Heater)	Common for both heating and sanitary hot water
HBH (Heating Backup Heater)	Used only for heating
HWTBH (Hot Water Backup Heater)	Used only for sanitary hot water

Note:
In some models, **AH** and **HBH** are integrated into the unit (electric heaters), see technical specification.
Installations with separate tanks for heating and sanitary hot water, keep in mind that **AH** is common to both heating and sanitary hot water and therefore cannot be placed in one of the tanks, but before the switching valve.

Backup heating sources for heating

Activated	The heat pump switch on two back-up heaters in two steps (**AH**+**HBH**)
Not activated	The heat pump only switches on **AH**

Priority for backup heating sources (HBH)

Setting which of **AH** and **HBH** that should be switched on as first step.

Lower than AH	First step **AH** and second step **HBH**
Higher than AH	First step **HBH** and second step **AH**

Backup heating source for sanitary hot water

Activated	The heat pump switch on two back-up heaters in two steps (**AH**+**HWTBH**)
Ej aktiverad	The heat pump only switches on **AH**

Priority for backup heating sources (HWTBH)

Setting which of **AH** and **HWTBH** that should be switched on as first step.

Lower than AH	First step **AH** and second step **HWTBH**
Higher than AH	First step **HWTBH** and second step **AH**

Backup source start accumulating value (HBH)

Default setting: 200 (degree minutes).
Degree minutes are the product by the accumulated heat deficit in degrees (°C) and measured time (in minutes).

Example:
The set point (Tset) at a given time is 35°C and the actual temperature (Tactual) is 33°C. This results in a heat deficit, difference of 2°C (35-33=2). After 100 minutes, 200 degree minutes have passed (2x100=200). When the set accumulating value is exceeded, the first backup heater is switched on. Then a new countdown starts for the second step.
I.e. if the set **Backup source start accumulation value (HBH)** is low, backup heaters will be switched on early. It is possible to set values between 0 and 600.

Water temperature rise reading interval (HWTBH)

Factory setting: 30 (minutes).

Example:
The heat pump starts production of sanitary hot water when the temperature in the tank has dropped to 45°C. If the heat pump has not been able to raise the temperature to 46°C (starting temperature + 1°C) within the set time, the first step is switched on. If the temperature has not been reached after another period, the second step is switched on.

Emergency operation

Installer setting.

Block the working of auxiliary heater (AH)

Installer setting.

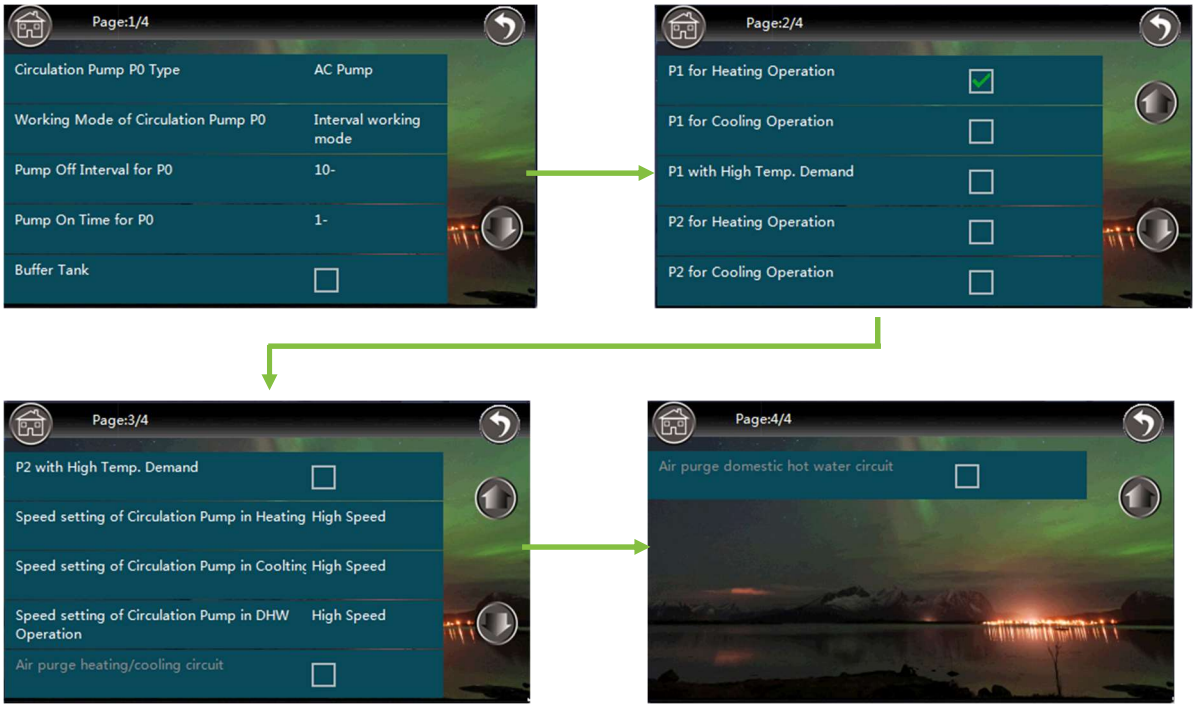
Block the working of auxiliary heater (AH) according to outdoor temp.

Installer setting.

Set outdoor temp. to block the working of auxiliary heater

Installer setting.

4.11 **Water pumps**

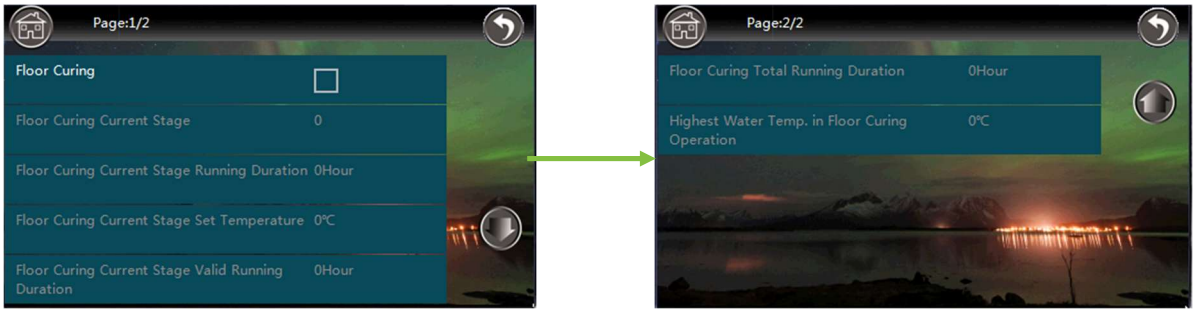


The heat pump can control 3 circulation pumps.

P0	Main circulation pump. Common for heating, cooling and sanitary hot water. Placed before the switching valve
P1	For heating and cooling
P2	For heating and cooling

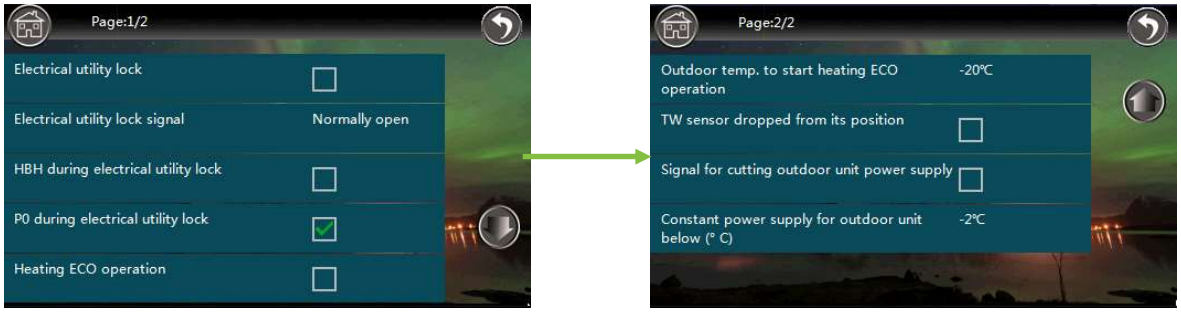
All settings in this menu are installer settings.

4.12 **Floor curing**



All settings in this menu are Installer settings.

4.13 **Electric lock**



Electrical utility lock

This function allows externally, to block the compressor from producing heating, cooling and sanitary hot water.
In some countries/areas, a function that network owners is used to limit the power outlet on the network called Electrical Utility Lock (EUL). The network owner sends a signal to the property that turns off the affected units, including heat pumps. It is recommended to install a buffer tank to have access to stored heat while the compressor is blocked. The function is controlled by a potential-free contact, ES-COM..

Activated	The compressor is blocked if the conditions of the **Electrical utility lock signal** is met
Not activated	Normal operation

Electrical utility lock signal

Installer setting.

HBH during electrical utility lock

Backup heater **HBH** is possible to activate during blocking of compressor.

Activated	When blocked, **HBH** is activated
Not activated	No backup is activated when blocked

P0 during electrical utility lock

Activated	**P0** will work during blocking
Not activated	**P0** will not work during blocking

Heating ECO operation

Installer setting.

Outdoor temp. to start heating ECO operation

Installer setting.

TW sensor dropped from its position

When enabled, the heat pump will always compare the value from temp. sensor Tuo with TW (TW is the sensor for sanitary hot water). If the temperature difference is outside a certain range, the unit will consider that the TW sensor is out of it´s position. A notification will be visible on the controller and it will disable sanitary hot water mode.

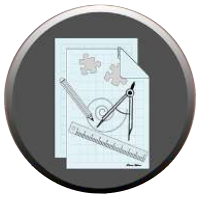
Signal for cutting outdoor unit power supply

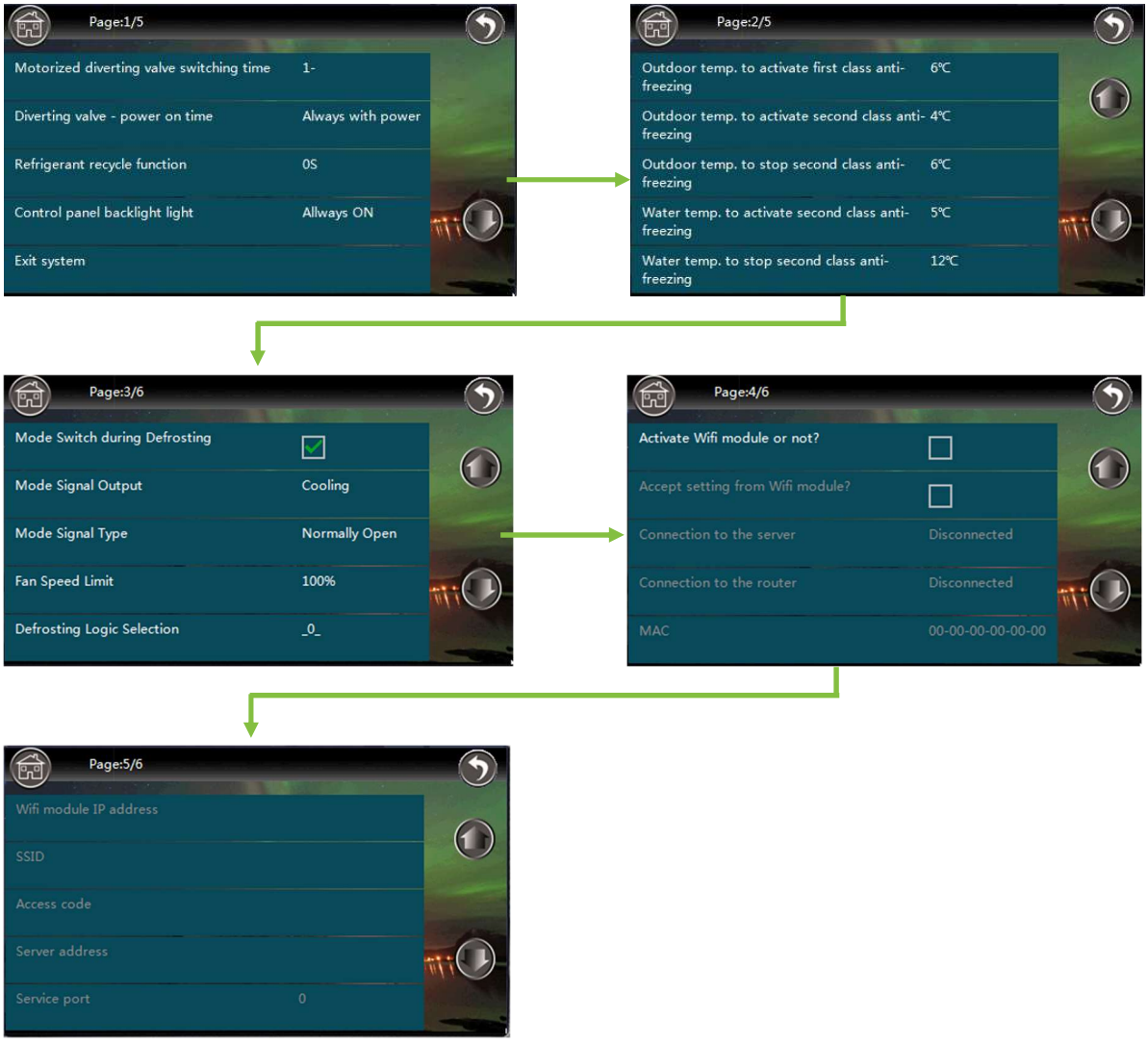
This function is normally not used and demands external equipment. Consult Energy Save for further information.

Constant power supply for outdoor unit below (°C)

Installer setting.

4.14 **Other options**





Motorized diverting valve switching time

Installer setting.

Diverting valve – power on time

Installer setting.

Refrigerant recycle function

Installer setting.

Control panel backlight light

Always ON	Factory setting, recommended setting
3 min	After 3 minutes of inactivity, the display turns off
5 min	After 5 minutes of inactivity, the display turns off
10 min	After 10 minutes of inactivity, the display turns off

Exit system

Installer setting.

Table for anti-freeze protection

Installer setting.

Mode switch during defrosting

Installer setting.

Mode signal output

Installer setting.

Mode signal type

Installer setting.

Fan speed limit

Installer setting.

Defrosting logic selection

Installer setting.

Activate WiFi module or not?

Installer setting.

Accept setting from WiFi module?

Activated	Possibility to change settings via WiFi, recommended
Not activated	Only possible to monitor via WiFi, not change settings

Connection to server

Installer setting.

Connection to the router

Installer setting.

MAC

Installer setting.

Wifi module IP address

Installer setting.

SSID

Installer setting.

Access code

Installer setting.

Server address

Installer setting.

Service port

Installer setting.

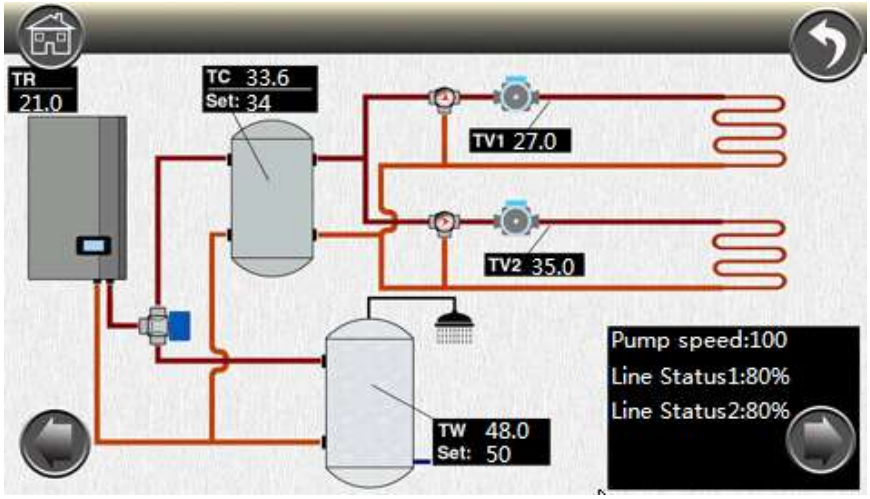
4.15 Real time data

This menu shows the current data for the heat pump. They can be used to diagnose the operation of the heat pump.

5 Information pages

By pressing in one of the submenus, you will enter the information pages. The first is a hydraulic overview.

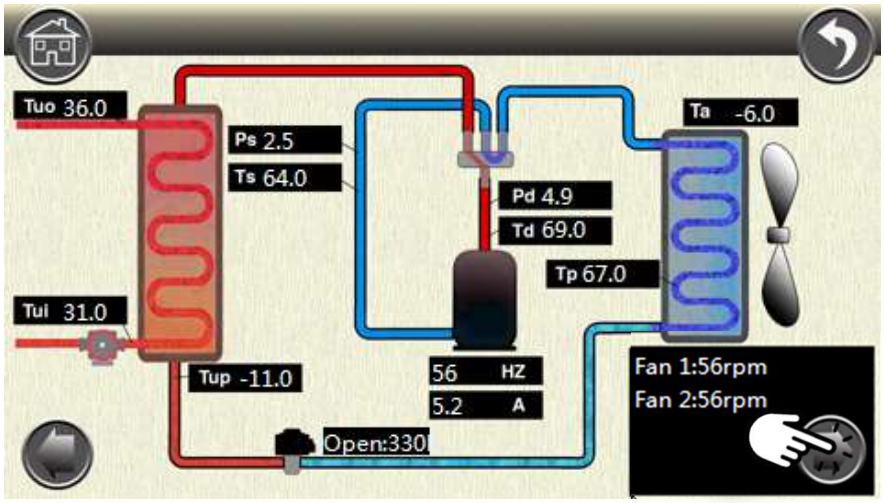
Hydraulic overview



TC	Water temperature for heating or cooling
TW	Hot water temperature
TV1	Water temperature for Zone 1
TV2	Water temperature for Zone 2
TR	Room temperature
Line Status1	Displays the communication between the touch display and the indoor unit. 90% to 100% is normal
Line Status2	Displays the communication between the touch display and the outdoor unit. 90% to 100% is normal
Pump speed	100 = **P0** is on; 0 = **P0** is off

Overview refrigerant circuit

By pressing the arrow in the lower right corner, you will enter an overview of the refrigerant circuit.



Ta	Outdoor temperature
Tui	Inlet temperature - evaporator
Tuo	Outlet temperature - evaporator
Tup	Temperature of refrigerants - liquid phase
Ts	Temperature, suction side of compressor
Td	Temperature, pressure side of compressor
Tp	Evaporation temperature
Ps	Low pressure sensor, suction side of compressor
Pd	High pressure sensor, compressor pressure side
Fan 1, 2	Fan speed - fan 1 and fan 2

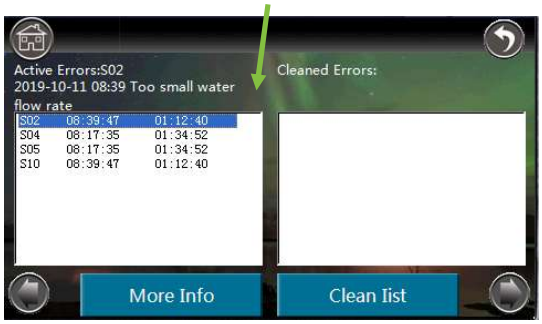
6 Error codes

If an error occurs, it appears as an error code. Errors can also occur in the event of faults that are not directly due to the heat pump but in the heating/cooling system. There may be too low pressure, air in the system, clogged filters, etc..

Error codes appear in the main menu and in the error code list.

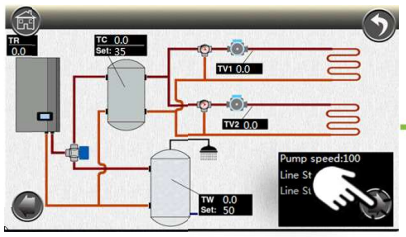
Main menu

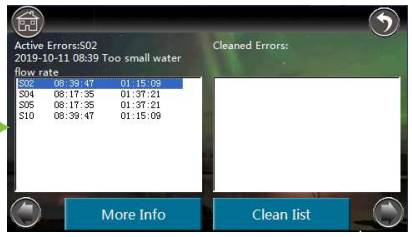
Error code list



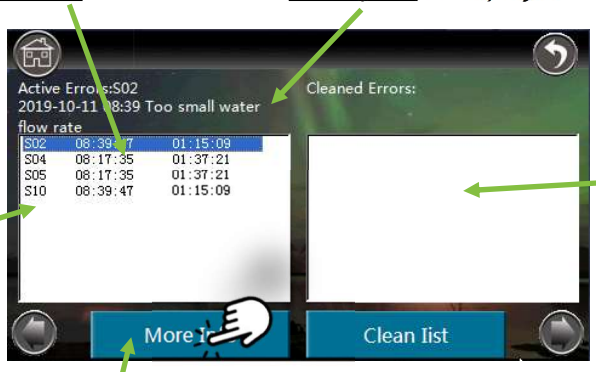
Detailed information about error codes on display

By pressing  in one of the submenus, you will enter the information pages. To enter the error code list, press the right arrow in the lower right corner twice.





By pressing the error code, a more detailed description is displayed.



Active errors

Alarm log

By pressing **More information,** information about the status of the heat pump when the error occurred is displayed.

6.1 Error code list

Code	Name	Consequence	Possible cause and action
P01	Main line current protection	Compressor stops	Input current is too high or too low or the system works in over-load condition. Unit recovers automatically after 5 minutes when it happened the first time. If same failure happens 3 times in a certain period of time, unit stops until repowered. Check unit input current. Check if the fan motor and circulation pump is working OK; Check if condenser is blocked; Check if the water temperature is too high and if the water temperature difference between inlet & outlet is too big (should not be bigger than 8℃)
P02	Compressor phase current protection	Compressor stops	Compressor input current is too high or too low or the system works in over-load condition. Check compressor input current. Check if the fan motor and circulation pump are working OK; Check if the condenser is blocked; Check if the water temperature is too high and if the water temperature difference between inlet & outlet is too big (should not be bigger than 8℃)
P03	IPM module protection	Compressor stops	Compressor drive failure. Check whether cable is broken or loosen. Check whether compressor driver PCB or compressor is broken.
P04	Compressor oil return protection	Compressor speed up	If unit has been continuously working in low speed for certain period of time, unit starts this protection to suck compressor oil back into compressor. This is a normal protection and does not need any treatment.
P05	Compressor shut down due to high/low pressure switch open caused by abnormal high/low pressure	Compressor stops	If system pressure is too high or too low, it activates this protection. Unit recovers automatically after 5 minutes when it happened the first time. If same failure happens 3 times in a certain period of time, unit stops until repowered. Check if the fan motor and circulation pump are working OK; Check if the condenser is blocked; Check if the water temperature is too high and if the water temperature difference between inlet & outlet is too big (should not be bigger than 8℃).

P06	Compressor speed down due to abnormal high pressure detected by condensing pressure sensor	Compressor speed down	This protection happens when system pressure is higher than the set compressor speed-down pressure point. If the pressure is still higher than the protection point after slowing down the compressor speed, compressor stops. Check if the water temperature set value is too high; Check if the system water flow rate is too small; Check if EEV works normally; Check if air circulates fluently in cooling mode; Check if temperature difference between water inlet & outlet is too big (should not be bigger than 8℃).
P07	Compressor preheating	Standard function, does not need any treatment.	This is a normal protection and does not need any treatment. When compressor did not work for long time and outdoor temperature is low, compressor crankcase heater work for certain period of time before compressor start to warm up the compressor.
P08	Compressor discharge temp. too high protection	Compressor stops	Check if the water temperature set value is too high, especially when outdoor temperature is low; Check if the water flow rate too small; Check if the system is lacking enough refrigerant.
P09	Outdoor evaporator coil temp. sensor protection	Compressor stops	Check if air circulates fluently in outdoor unit.
P10	AC over high/low voltage protection	Compressor stops	Unit input voltage too high or too low. Check the voltage of unit power supply.
P11	Compressor shut down due to too high/low outdoor temperature	Compressor stops	Outdoor temperature is too high or too low for unit to work.
P12	Compressor speed limited due to too high/low ambient temperature	Compressor speed down	Normal operation - no error
P14	Compressor speed limited due to low condensing pressure	Compressor speed down	Not enough refrigerant in the system, low inlet water temperature, Air flow on the evaporator restricted, EEV not working properly, broken cable to the EEV…
F01	Outdoor ambient temp. sensor failure - Ta	Compressor stops	Check if outdoor temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F02	Outdoor evaporator coil temp. sensor failure - Tp	Compressor stops	Check if outdoor coil temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F03	Compressor discharge temp. sensor failure - Td	Compressor stops	Check if compressor discharge temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.

F04	Outdoor Suction temp. sensor failure - Ts	Compressor stops	Check if outdoor suction temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F05	Evaporating pressure sensor failure - Ps	Compressor stops	Check if evaporating temperature sensor is open, short-circuited or broken. Replace it if necessary.
F06	Condensing pressure sensor failure - Pd	Compressor stops	Check if condensing temperature sensor is open, short-circuited or broken. Replace it if necessary.
F07	High/low pressure switch failure	Compressor stops	If pressure switch is in open position when unit is in standby state or 2 minutes after compressor stops, unit gives this failure. Check if high or low-pressure switch is broken or not well connected.
F09	DC fan failure (A)	Compressor speed down	Speed of DC fan (or one of the DC fans for dual fan system) cannot reach the required value or no feedback signal. Please check whether the PCB or fan motor is broken.
F10	DC fan failure (B)	Compressor stops	Speed of both DC fans (for dual fan system) cannot reach the required value or no feedback signal. Please check if the PCB or fan motor is broken.
F11	System evaporating pressure too low	Compressor stops	If system too low-pressure protection detected by evaporating pressure sensor happened 3 times in a certain period, it gives this failure code and unit can't be restarted until repowered. Check if the system has enough refrigerant or if there is a leakage inside (more likely it is not enough refrigerant that caused this abnormal evaporating pressure); Check if the fan motor and circulation pump are working OK; Check if condenser is blocked; Check if EEV works normally; Check if the water temperature is too low and if the water temperature difference between inlet & outlet is too big in cooling (should not be bigger than 8℃).
F12	System condensing pressure too high	Compressor stops	If system too high-pressure protection detected by condensing pressure sensor happened 3 times in a certain period of time, it gives this failure code and unit can't be restarted until repowered. Check if the water flow rate is not enough (more likely it is not enough water flow rate that caused system build up too high pressure); Check if the fan motor and circulation pump is working OK;

			Check if the condenser is blocked; Check if EEV works normally; Check if the water temperature is too high and if the water temperature difference is too big between inlet & outlet (should not be bigger than 8℃).
E01	Communication between operation panel and indoor PCB or outdoor PCB failure	Compressor stops	Communication failure between operation panel and the indoor or outdoor PCB. Check the cable connection in between. Check if the last three switches on outdoor power PCB are set to 001; Check the last three switches on indoor PCB are set to 001. Unit recovers when communication recovers.
E02	Outdoor power PCB and driver PCB communication failure	Compressor stops	Check the communication cable between outdoor power PCB and driver PCB. Check if the outdoor power PCB and driver PCB is broken.
E03	Compressor phase current failure	Compressor stops	Check if the power cable to the compressor is broken or short-circuited.
E04	Compressor phase current overload (over current)	Compressor stops	Check if the power cable to compressor is broken or short-circuited.
E05	Compressor driver failure	Compressor stops	Check if the compressor drive PCB is broken, or the cable to compressor is connected wrong.
E06	Module VDC over high/low voltage failure	Compressor stops	Input voltage too high or too low.
E07	AC current failure	Compressor stops	Check the current to outdoor unit and compare it with the unit current shown on the operation panel. If the difference is not big, check if the system has enough refrigerant (more likely it is not enough refrigerant that caused this abnormal low current). If the difference is big, outdoor power PCB is broken. Please replace it with a new one;
E08	EEPROM failure	Compressor stops	Cut the unit power and short-circuit JP404 port on outdoor power PCB, repower the unit, cut power again and cancel the short-circuit on JP404 port. If still not OK, replace the outdoor power PCB.
E10	Communication error	Unit stops	Check if the communication wires are loosened or not connected.
E11	Clock error	Unit stops	Change with new controller
E12	Ext. Memmory error	Unit stops	Change with new controller
E13	High pressure protection	Unit stops	1. Too much refrigerant. Reclaim and vacuum and inject the correct amount.

			2. There is air inside the refrigerant system. Vacuum again and inject refrigerant again. 3. Too low water flow. Check the water system and circulating pumps, increase water flow. 4. Condenser is dirty and is blocked inside. Wash it. 5. EEV does not work. Check its wiring and if its coil is ok or not.
E14	Low pressure protection	Unit stops	1. Filter in the refrigerant system is blocked, change a new one to clean the inside refrigerant system. 2. EEV does not work. Check its wiring and if its coil is OK or not. 3. EEV inside is blocking. Change the EEV and clean the refrigerant system. 4. Refrigerant leakage. Check and find the leakage point and fix it. Vacuum and inject new refrigerant.
E15	Power plus offline	Unit stops	Communication between CPP controller and driver is OFF. Check if the wiring is loosened or not.
E16	Power plus generic AL	Unit stops	Check if the 3-phase power for outdoor unit is OK or not. If it is OK, the Power plus driver is defective, replace the Power plus driver.
E17	EVO sensor error	Unit stops	Sensor wires are off or defective. Check if the wires are losen or if the sensor body resistance is OK or not. If the resistance is not OK, replace the sensor.
E18	Low superheat EVO	Unit stops	1. Too much refrigerant. Reclaim and vacuum and inject the correct amount. 2. Refrigerant system leakage, not enough refrigerant. Check and fix the leakage, vacuum and inject again. 3. Bad ventilation condition for outdoor unit fans. Check if there is an obstacle at the fan system. 4. Not enough evaporating area after the eavaporator is frosted. Check if the defrost coil sensor is positioned correctly and if it can measure the temperature correctly.
E19	Lov evap. Temp. EVO	Unit stops	1. Not enough evaporating area after the eavaporator is frosted. Check if the defrost coil sensor is positioned correctly and if it can measure the temperature correctly. 2. Refrigerant system leakage, not enough refrigerant. Check and fix the leakage, vacuum and inject again. 3. Filter of the refrigerant system is dirty and blocking, change a new one and clean the refrigerant system.

E20	High evap. Temp. EVO	Unit stops	1. Bad ventilation condition for outdoor unit fans. Check if there is an obstacle at the fan system. 2. Not enough water flow leads to low heat exchange in condenser. Check the water system and Discharge inside air, make sure pumps 1 and 2 are powerful enough to run the water system. 3. Sensor is defective or bad connection. If it is connected correctly, check its wiring, if the wiring is OK, replace the sensor. 4. The suction temp. sensor is loosened. Plug it back to its position and make sure the heat preservation is good. 5. Refrigerant leakage. Find and fix the leakage, vacuum and inject refrigerant again. 6. Sensors of main EEV and EVI EEV mix each other. Check the both sensors according to wiring scheme.
E21	Low suction temp. EVO	Unit stops	1. Too much refrigerant. Reclaim and vacuum and inject the correct amount. 2. Filter if the refrigerant system is dirty and blocking, change a new one and clean the refrigerant system. 3. Bad ventilation condition for outdoor unit fans. Check if there is an obstacle at the fan system. 4. Not enough evaporating area after the eavaporator is frosted. Check if the defrost coil sensor is positioned correctly and if it can measure the temperature correctly.
E22	Comp. Start failure	Unit stops	Hardware failure, compressor or driver has a problem. Change the compressor or change the driver.
E23	Envelop error	Unit stops	Compressor envelope out of range.
E24	Low press. Differential error	Unit stops	Pressure difference to low during start.
E25	High discharge temp.	Unit stops	1. There is air inside the refrigerant system. Vacuum again and inject new refrigerant. 2. Not enough water flow leads to low heat exchange in condenser. Check the water system and Discharge inside air, make sure pump 1 and 2 are powerful enough to run the water system. 3. Plate heat exchanger condenser is dirty and blocking at water side. Wash it. 4. Filter if the refrigerant system is dirty and blocking, change a new one and clean the refrigerant system. 5. Refrigerant leakage. Find and fix the leakage, vacuum and inject refrigerant again.

E26	Amb. temp. probe fault(B1)	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is ok, check the sensors resistance. If resistance is not OK, replace the sensor.
E27	Outdoor unit alarm：Evap. coil temp. probe fault (B2)	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is ok, check the sensors resistance. If resistance is not OK, replace the sensor.
E28	Outdoor unit alarm Suction temp. probe fault	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is ok, check the sensors resistance. If resistance is not OK, replace the sensor.
E29	Outdoor unit alarm Comp. discharge probe	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is ok, check the sensors resistance. If resistance is not OK, replace the sensor.
E30	B5 temp. prob faul	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is ok, check the sensors resistance. If resistance is not OK, replace the sensor.
E31	Outdoor unit alarm Suction pressure sensor	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is ok, check the sensors resistance. If resistance is not OK, replace the sensor.
E32	Outdoor unit alarm：Discharge pressure sensor fault (B7)	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is ok, check the sensors resistance. If resistance is not OK, replace the sensor.
E33	Outdoor unit alarm：Defrost time too long	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is ok, check the sensors resistance. If resistance is not OK, replace the sensor.
E34	Outdoor unit alarm： Gas Pressure differ. too high at Comp. Start	Unit stops	Only displayed on outdoor software interface. This alarm normally would happen after the unit stops and before re-start.
E35	Outdoor unit alarm： EVI Sunction temp probe fault (B8)	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is ok, check the sensors resistance. If resistance is not OK, replace the sensor.
E36	Outdoor unit alarm： EVI sunction pressure probe fault (B11)	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is ok, check the sensors resistance. If resistance is not OK, replace the sensor.
E37	High press. swtich defect	Unit stops	1. Too much refrigerant. Reclaim and vacuum and inject the correct amount. 2. There is air inside the refrigerant system. Vacuum again and inject new refrigerant. 3. Not enough water flow leads to low heat exchange in condenser. Check the water

			system and discharge inside air, make sure pumps 1 and 2 are powerful enough to run the water system. 4. Plate heat exchanger condenser is dirty and blocking at waterside. Wash it. 5. EEV does not work. Check its wiring or if its coil is OK or not. 6. The check valves at the outdoor unit are not opened.
E38	Low press. swtich defect	Unit stops	1. Too much refrigerant. Reclaim and vacuum and inject the correct amount. 2. Filter if the refrigerant system is dirty and blocking, change a new one and clean the refrigerant system. 3. Bad ventilation condition for outdoor unit fans. Check whether there is obstacle at the fan system. 4. Not enough evaporating area after the eavaporator is frosted. Check if the defrost coil sensor is positioned correctly and if it can measure the temperature correctly.
E39	EVI Low superheat	Unit stops	
E40	EVI low evap. Temp.	Unit stops	
E41	EVI high evap. Tem.	Unit stops	
E42	Outdoor unit alarm： Amb. Temp. out of HP working range	Unit stops	Too high/low outdoor outdoor temperature. Check whether the outdoor sensor is installed correctly or not.
E43	Outdoor unit alarm：Outlet water temp. Too low	Unit stops	Avoid too low water outlet temperature in cooling mode, protect the plate heat exchanger. This Alarm can be cleared only after power is cut off.
F13	Room temp. sensor failure	Unit stops	Check if room temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F14	Sanitary hot water temp. sensor failure	Unit stops	Check if sanitary hot water temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F15	Cooling/heating water temp. sensor failure	Unit keeps on working, use "unit water inlet temperature" as reference.	Check if cooling/heating water temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F16	Unit water outlet temp. sensor failure	Unit keeps on working, use "unit water inlet temperature" as reference.	Check if unit water outlet temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.

F17	Unit water inlet temp. sensor failure	Unit keeps on working, use "unit water outlet temperature" as reference.	Check if unit water inlet temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F18	Indoor coil temp. sensor failure	Unit keeps on working, except cooling mode.	Check if indoor temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F21	Mixture valve 1 temperature sensor failure	Unit keep on working, mixture valve 1 output fixed to 0.	Check if TV1 temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F22	Mixture valve 2 temperature sensor failure	Unit keep on working, mixture valve 2 output fixed to 0.	Check if TV2 temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F25	Communication between operation panel and indoor PCB or outdoor PCB failure	Unit stops	Communication failure between operation panel and the indoor or outdoor PCB. Check the cable connection in between. Check if the last three switches on outdoor power PCB are set to 001; Check if the last three switches on indoor PCB are set to 001. Unit recovers when communication recovers.
F27	Indoor EEPROM failure	Unit keeps on working	Cut the unit power, connect CN213-5 and CN213-6 together, repower the unit and then cut the power and cancel the connection. If still not OK, replace the indoor PCB.
F28	Circulation pump PWM signal feedback failure	Unit keeps on working	Check the cicrulating pump cable connection; Check the power supply to the circulating pump; Check if the circulating pump is broken.
F29	Mixture valve 1 failure	Unit keep on working, mixture valve 1 output fixed to 0.	Check MV1 cable connection; Check the PCB output voltage signal; Check if the MV1 is broken.
F30	Mixture valve 2 failure	Unit keep on working, mixture valve 2 output fixed to 0.	Check MV2 cable connection; Check the PCB output voltage signal; Check if the MV2 is broken.
S01	Indoor anti-freezing protection in cooling	Compressor speed down or stop	Compressor speed down if coil temp. lower than 2°C; Compressor stops if coil Temp. lower than -1°C; Compressor restarts if coil Temp. higher than 6°C. Check if the set temperature for cooling is too low; Check if the system has too small water flow rate; Check the water system especially the filter.

			Check if the system has not enough refrigerant inside by measuring the evaporating pressure. Check if the outdoor temperature is lower than 15°C.
S02	Too small water flow rate	Compressor stops	System water flow rate is less than minimum allowable flow rate. Check the water system, especially the filter; Check the working statue of water pump.
S03	Water flow switch failure	Warning but unit keeps on working	Water flow switch failed to work. Check if the flow switch is broken or not well connected.
S04	Communication failure	Unit stops	Communication data lost too much. Check if the communication cable is longer than 30M; Check if there is a source of disturbance nearby the unit. Unit recovers when communication recovers.
S05	Serial port connect error	Unit stops	Communication failure between operation panel and the indoor or outdoor PCB. Check the cable connection in between. Check if the last three switches on outdoor power PCB are set to 001; Check if last three switches on indoor PCB are set to 001. Unit recovers when communication recovers.
S06	Water outlet Temp. too low protection in cooling	Compressor stops	Compressor stops if water outlet is lower than 5°C in cooling mode. Check if the temperature sensor Tc is OK and well connected; Check if the set water temperature too low Check if the system flow rate too small.
S07	Water outlet Temp. too high protection in heating/hot water	Compressor stops	Compressor stops if water outlet is higher than 57°C in heating or hot water mode. Check if the temperature sensors Tc and Tw is OK and well connected; Check if the set water temperature is too high; Check if the system flow rate is too small.
S08	Unit defrosting failure	Unit Stops and can only be restarted by repowering the unit	System water temperature is too low for defrosting. Please either set the temperature higher, have the back-up heating source connected or close some heating circuit to let the system enough high-water temperature for a safe defrosting.
S09	Water outlet Temp. too low protection in defrosting	Quit current defrosting operation	If water outlet temperature is lower than 15°C during defrosting, water may freeze up in the plate heat exchanger and cause damage, so

			unit will quit current defrosting mode. It will try again in next defrosting cycle but if it continuously failed to make the defrosting for 3 times, it shows S08 failure code and can only be restarted by repower the unit. Please either set the temperature higher, have the back-up heating source connected or close some heating circuit so to let the system has enough high-water temperature for a safe defrosting.
S10	Too small water flow rate failure	Compressor stops	If "too small water flow rate protection" happens over 3 times in certain period, it gives this failure code and unit stops until repower. This failure means the system water flow rate is less than minimum allowable flow rate. Check the water system, especially the filter; Check the working statue of water pump.
S11	Indoor anti-freezing failure in cooling	Compressor stops	If "indoor coil anti-freezing protection in cooling mode" happens over 3 times in certain period of time, it gives this failure code and unit stops until repower. Check whether set temperature for cooling is too low; whether system has too small water flow rate; check water system especially the filter. Check whether system has not enough refrigerant inside by measuring the evaporating pressure. Check whether outdoor temperature is lower than 15°C.
S12	Floor curing function failed to finish	Unit switch back to standard working mode with failure information shown on the screen	If floor curing function can't be finished in the maximum allowable time, it shows this information. Unit will go back to normal working mode, with failure information shown on the display. Failure information can only be erased until repower or start the floor curing function again.

Dear Customer!

We would like to thank you for reading this manual.
For more information, feel free to contact us.
Your ES team.

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