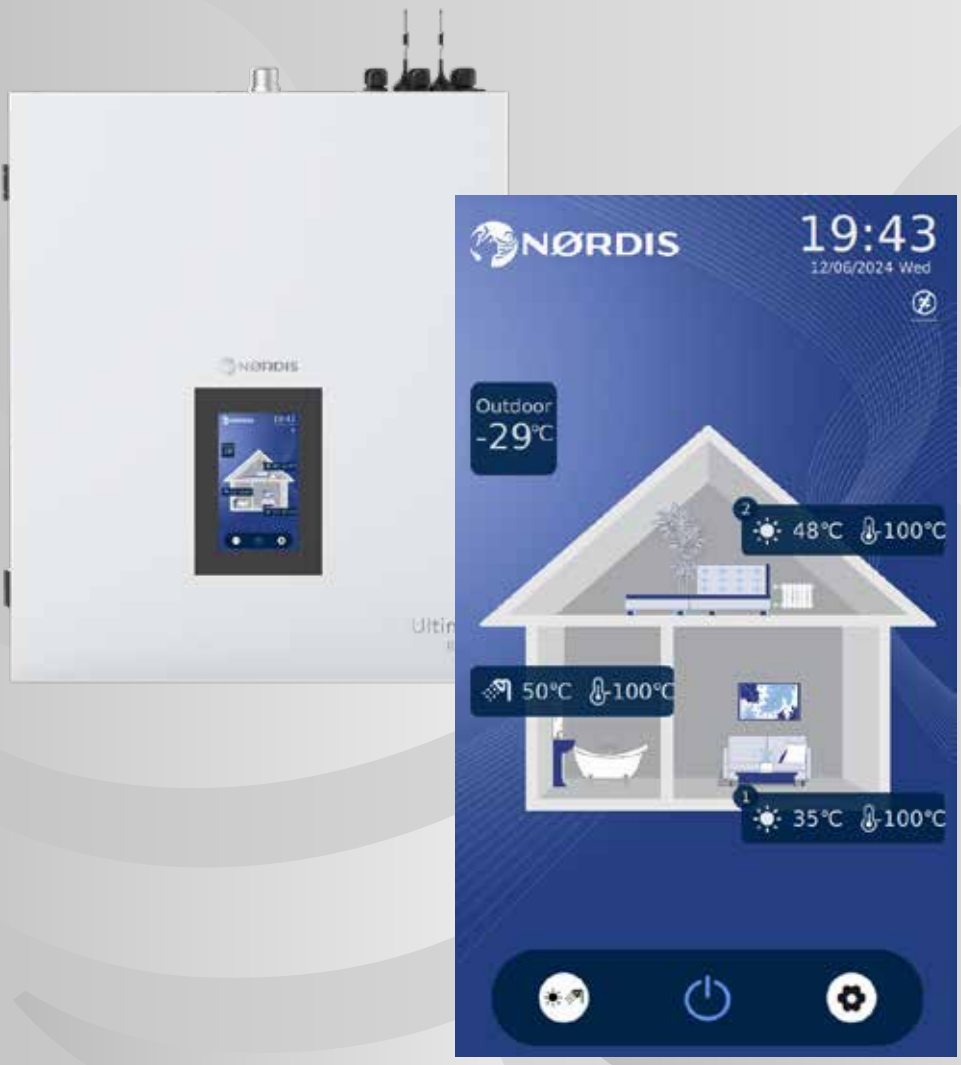
DC Inverter Air to Water Heat Pump

ULTIMA (R290)



End user manual

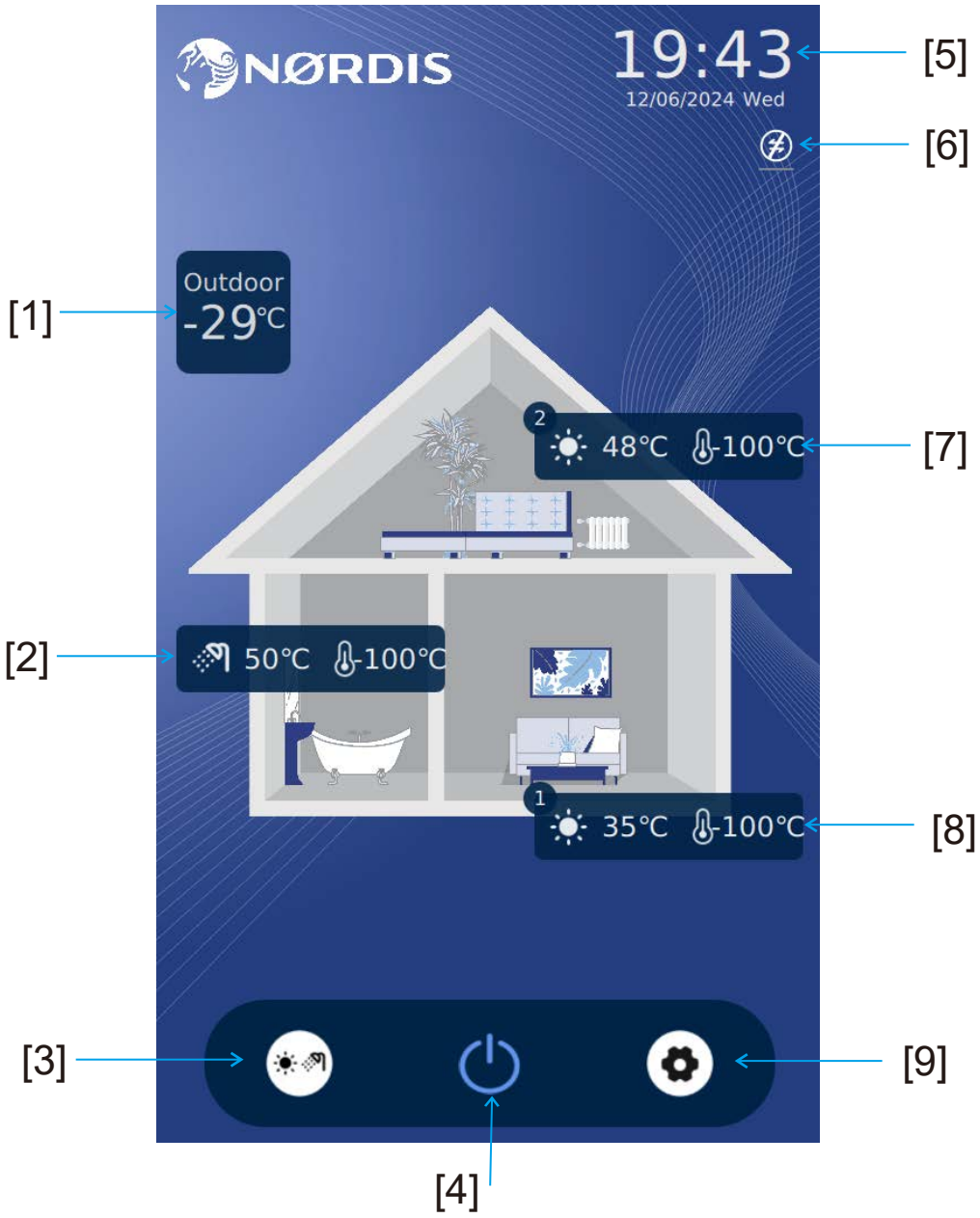
202412-V2

Before operating this product, please read the instructions carefullyand keep this manual for future use.

Contents

NORDIS ULTIMA end user manual

Home page

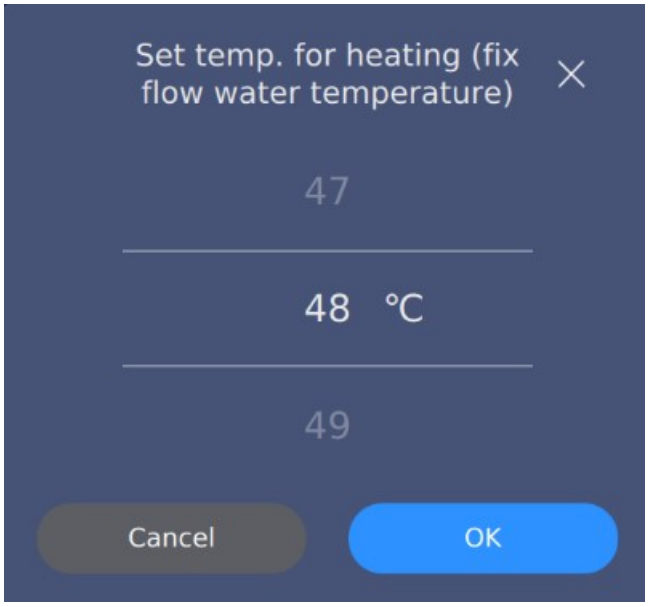


1 - Outdoor ambient temperature
2 - DHW (Set temperature / Current temperature in the boiler)
3 - Working modes
4 - Turn ON/OFF the unit
5 - Date and time
6 - Working states
7 - Heating / Cooling Circuit 2 (Set water temperature / Current water temperature)
8 - Heating / Cooling Circuit 1 (Set water temperature / Current water temperature)
9 - Settings page

Control from the home page

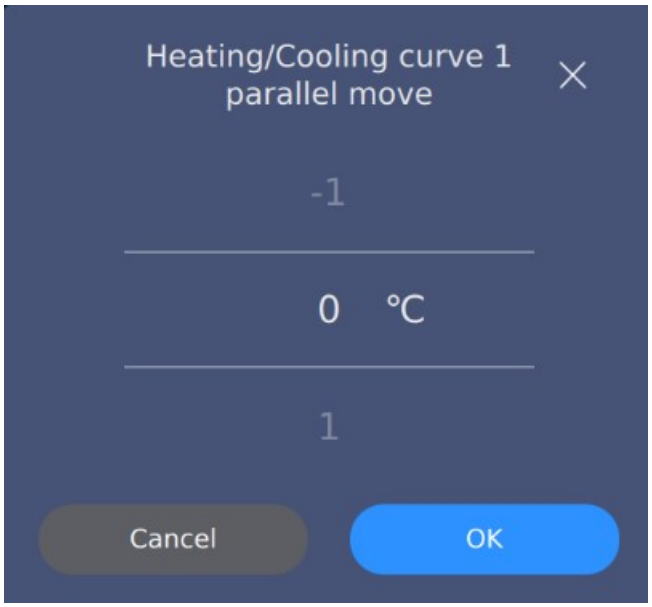
1. Setting the heating / cooling temperature

1.1 Manual control



To set the heating / cooling temperature, click on the heating / cooling parameter box [7] or [8] and after selecting the desired value, press OK.

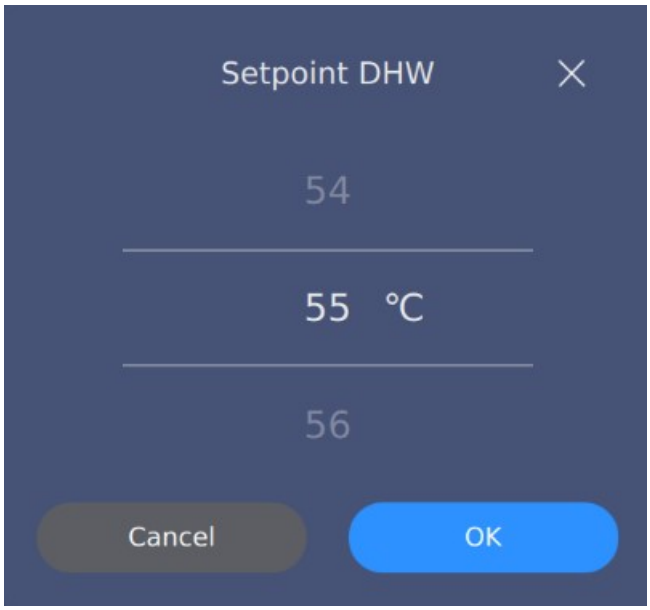
1.2 Temperature curve control



If the system (or one circuit in a system with two circuits) is set to operate according to the temperature curve, click on the heating / cooling parameter box [7] or [8] and after selecting parallel curve move, press OK.

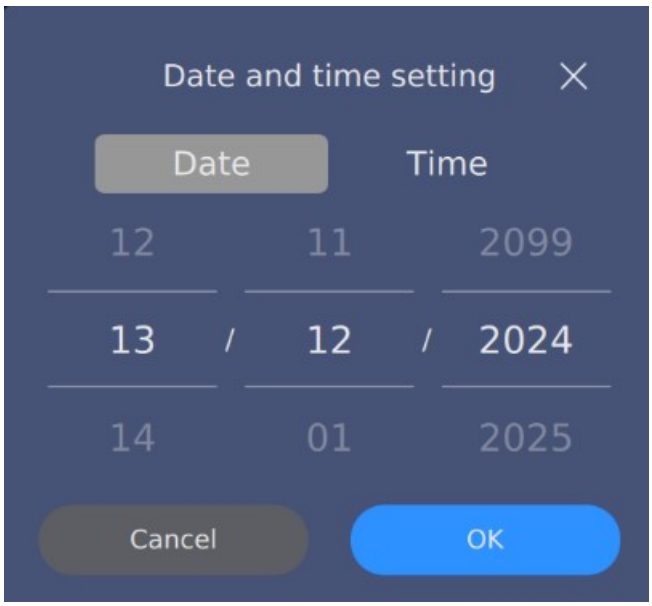
Control from the home page

2. Setting the DHW temperature



To set DHW temperature, click on the DHW parameter box [2] and after selecting the desired value, press OK.

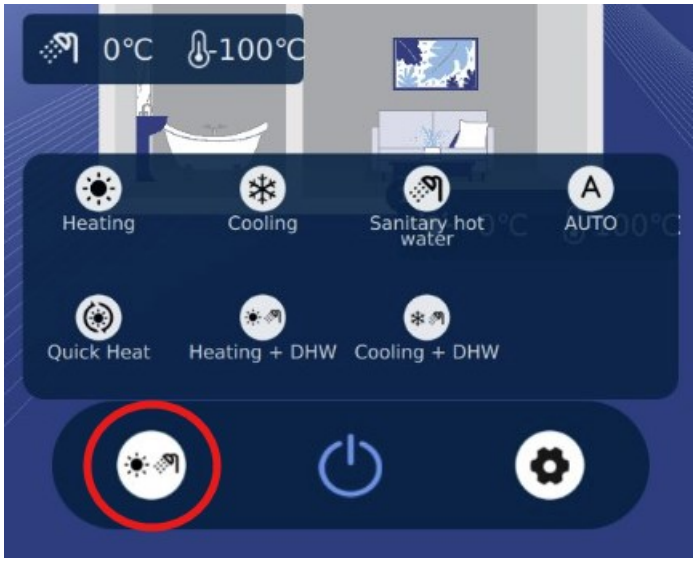
3. Setting the date and time



To set date and time, click on the date / time parameter box [5] and after setting, press OK.

Control from the home page

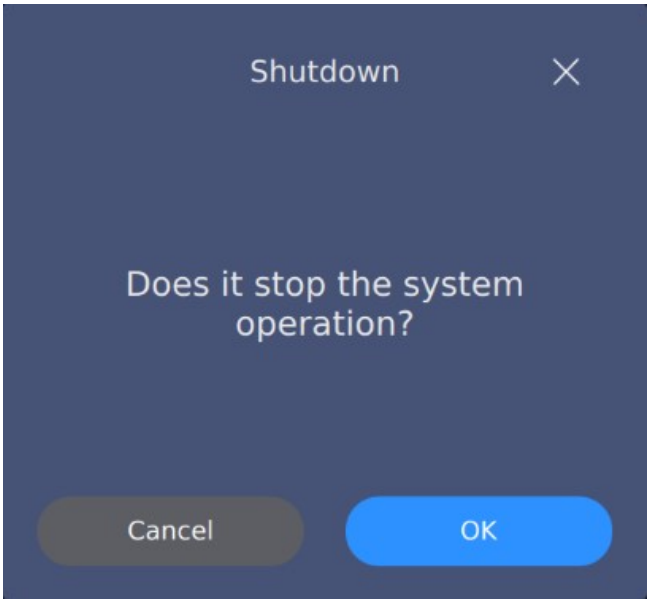
4. Setting the working mode



To set working mode, click on the "Working mode" icon [3] and select the working mode.

Heating - is only for heating;
Cooling - is only for cooling;
Sanitary hot water - is only for DHW preparation;
AUTO - is for automatic switching between heating and cooling. The unit will work according to parameters 4.12 and 4.13;
Quick heat - for quick DHW preparation. Heat pump and electric heater work at the same time. When DHW Tset is reached, the device returns to the previous operating mode;
Heating+DHW - is for heating and DHW preparation;
Cooling+DHW - is for cooling and DHW preparation.

5. To turn the unit ON / OFF



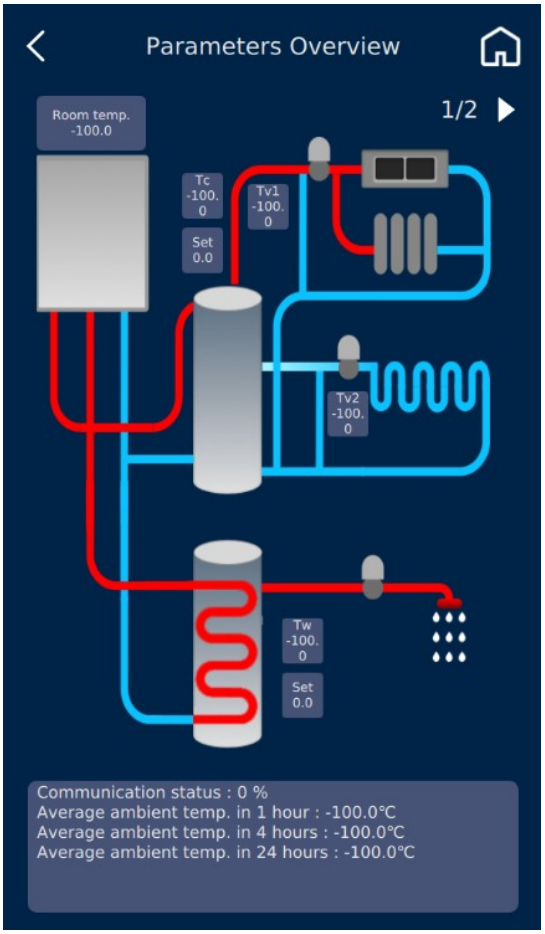
To turn the unit OFF click on the blue icon [4] and press OK to confirm. The icon turns red.
To turn the unit ON click on the red icon [4]. The icon turns blue.

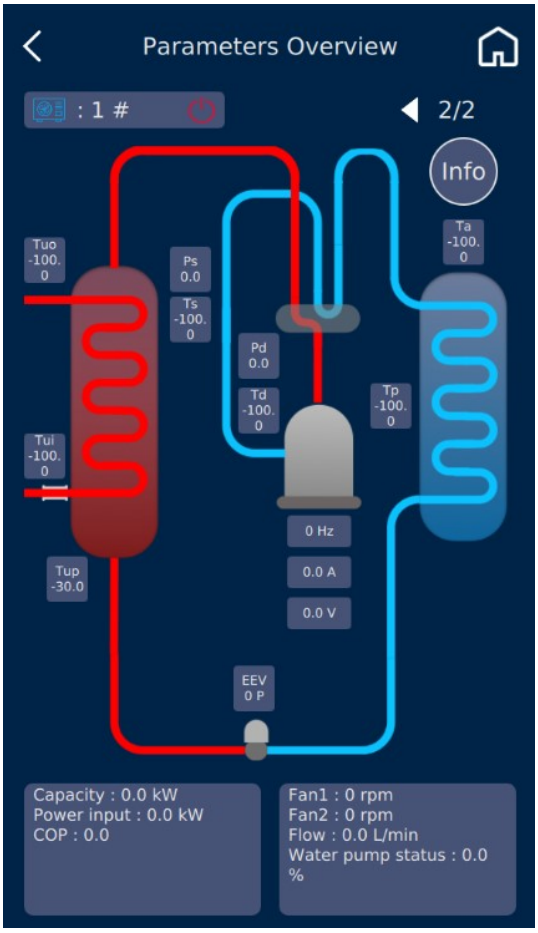
NOTE. Powering off the unit via the home page does not interrupt the unit's power supply. To completely cut off the power, turn off the automatic switch from the electrical panel.

Control from the home page

6. Quick view of parameters

Click on the outdoor temperature box [1] to quickly view the parameters





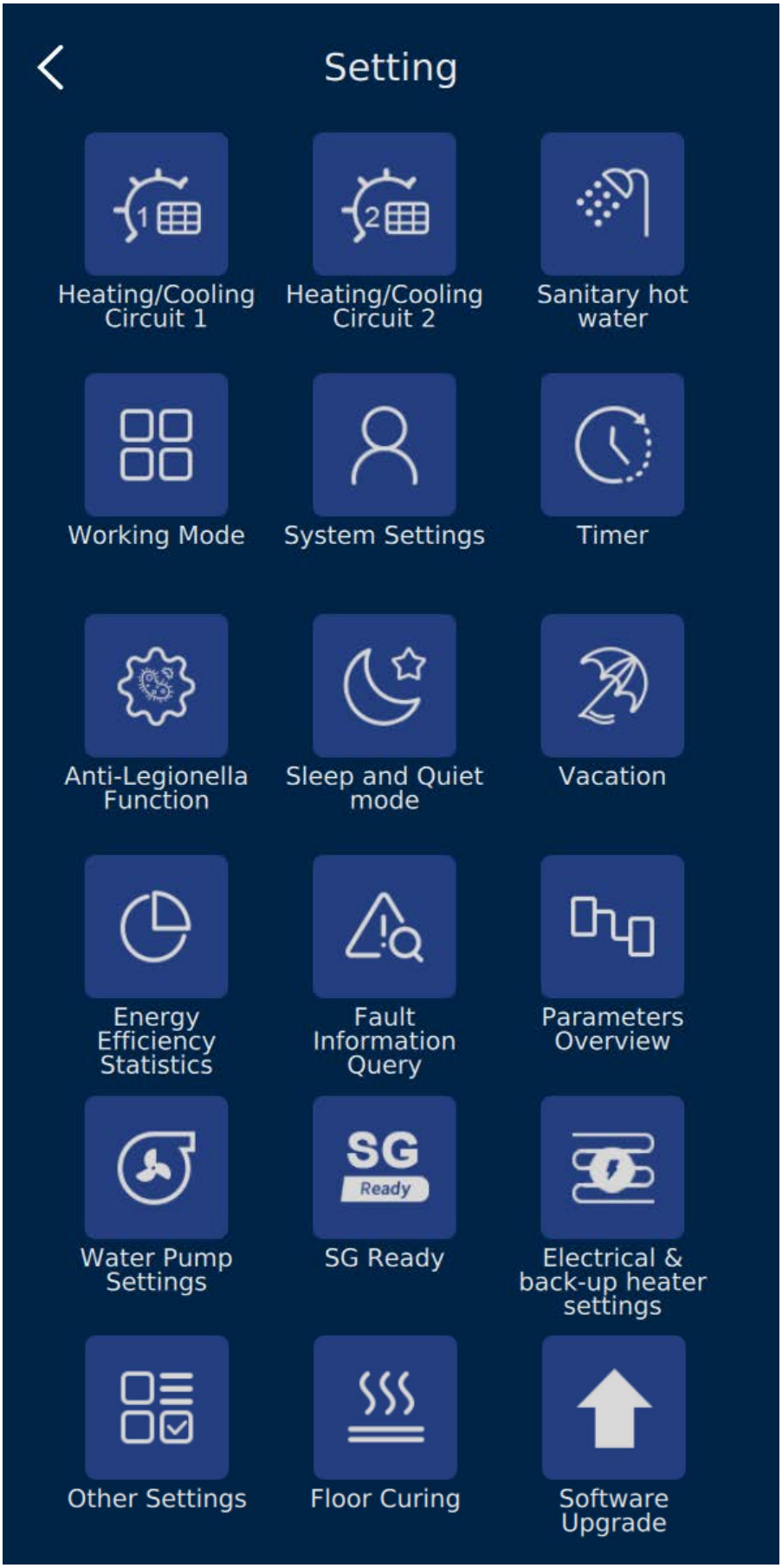
NORDIS ULTIMA end user manual

System Icons Overview

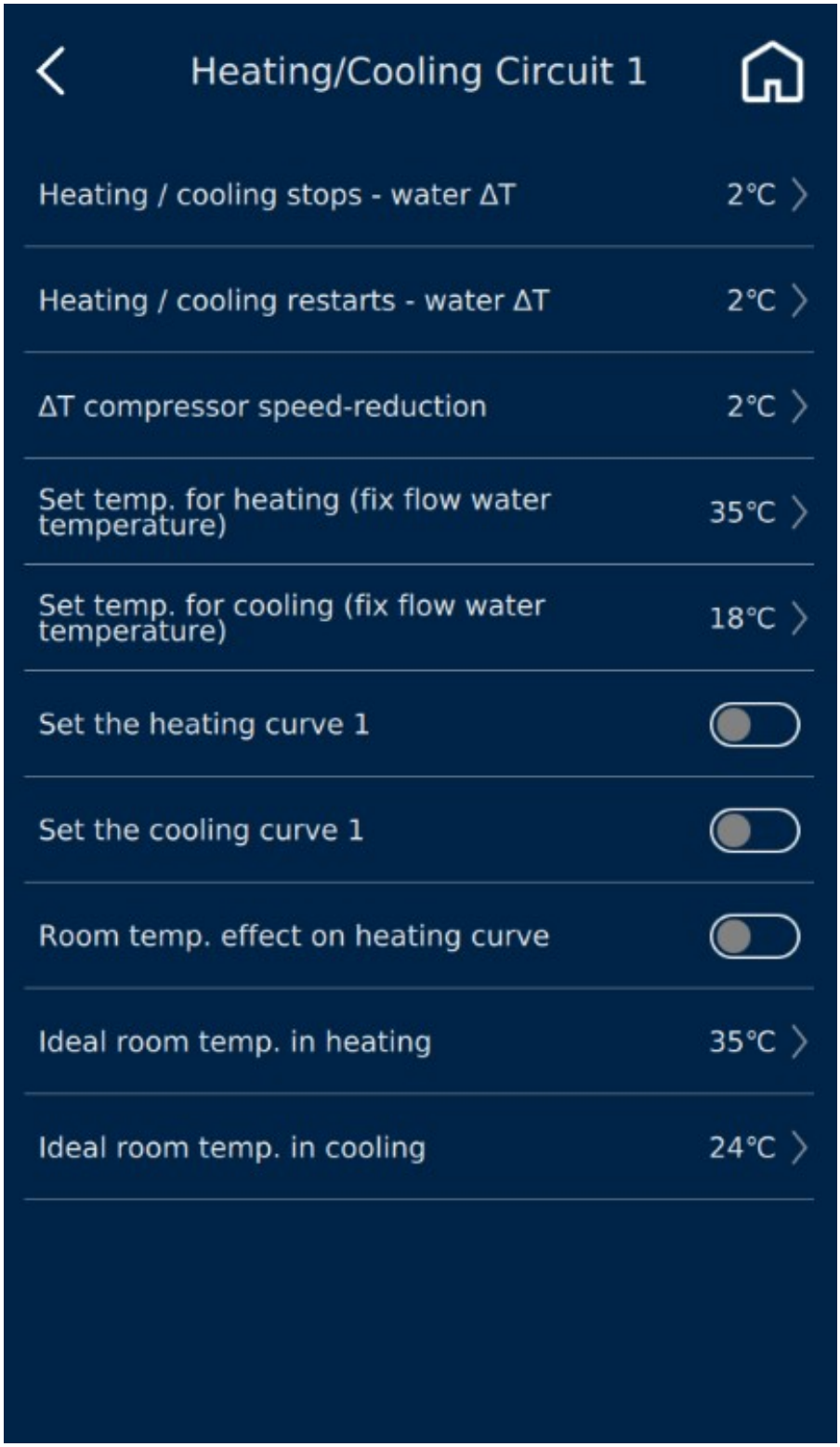
Icon	Description
	Heating mode
	Cooling mode
	Sanitary hot water mode
	Anti-legionella mode is working
	Anti-legionella failed
	Sleep mode
	Low noise mode
	Vacation mode
	DHW ECO
ECO	Heating ECO
	SG-Ready 1
	SG-Ready 2
	SG-Ready 3
	SG-Ready 4

Icon	Description
	Electrical utility lock
	P0 circulation pump (integrated)
	P1 circulation pump (circuit 1)
	P2 circulation pump (circuit 2)
	P3 circulation pump (DHW)
	AH (Auxiliary Heater)
	HBH (Heating Back-up Heater)
	HWTBH (DHW Tank Backup Heater)
	Floor curing
	Error for system 1
	Error for system 2
	Communication normal
	Communication failed

Setting Menu Overview



1. Heating / Cooling Circuit 1



1. Heating / Cooling Circuit 1

1.01) Heating / Cooling Stops based - Water ΔT

1.02) Heating / Cooling Restarts based - Water ΔT

ΔT is a temperature deviation value. Set ΔT to stop (1.01) or restart (1.02) the unit. Unit stops running when [Tset+ΔT] in heating operation, or when [Tset-ΔT] in cooling operation.

For example, in heating mode, if Tset = 48°C, while ΔT (1.01) = 2°C, and ΔT (1.02) = 1°C, when the water temperature is higher than 50°C (48+2°C), unit stops. When unit stops and the water temperature drops lower than 47°C (48-1°C), unit restarts.

1.03) ΔT Compressor Speed-Reduction

This parameter is used to set a temperature that compressor starts to slow down its speed. Normally if actual water temperature is lower than [Tset-ΔT] (in heating mode) or higher than [Tset-ΔT] (in cooling mode), compressor always works with its maximum allowable speed.

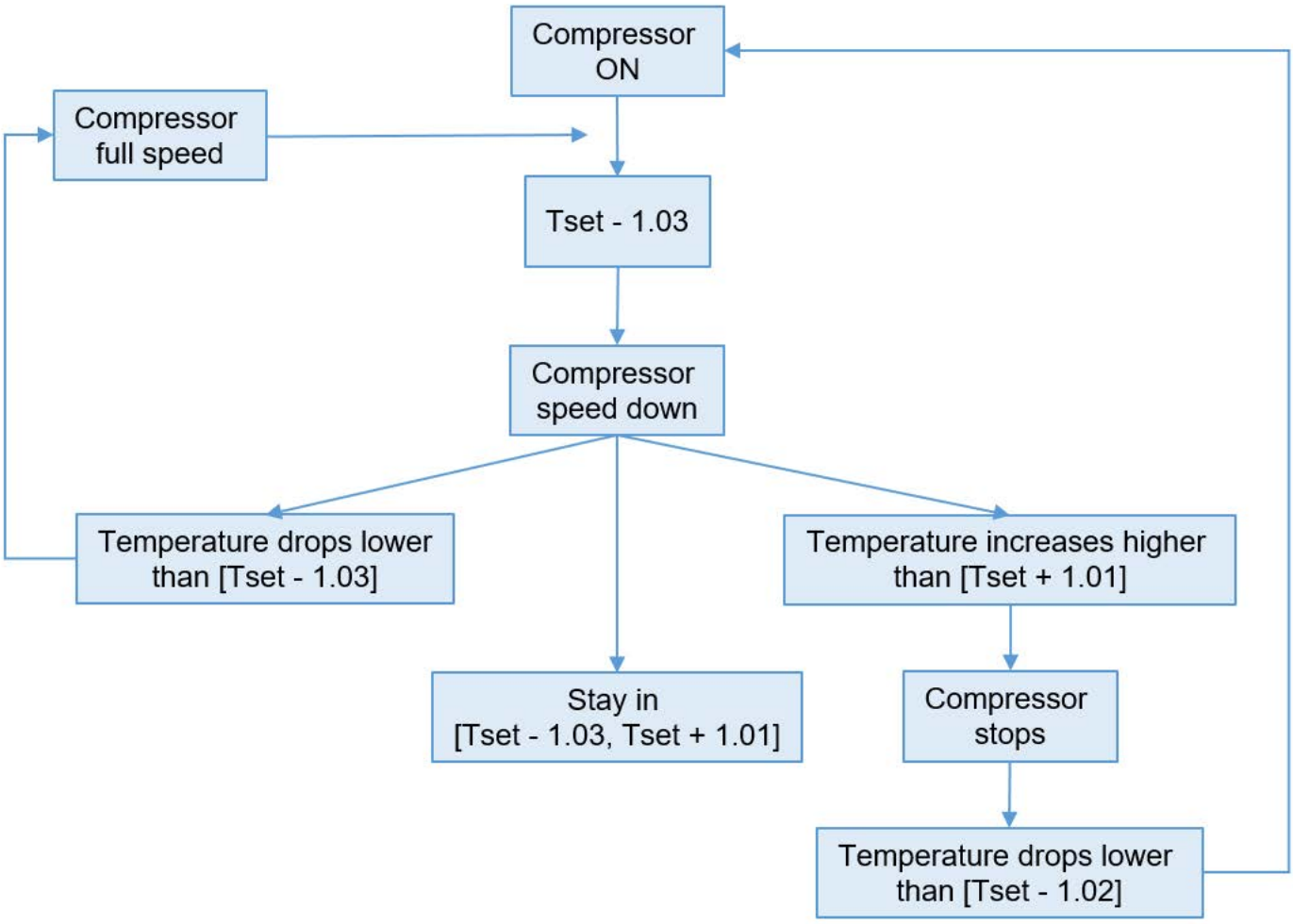
If real temperature is between [Tset-ΔT, Tset] in heating mode or [Tset, Tset+ΔT] in cooling mode, compressor will adjust frequency, to balance the total heating output and system heating load.

This setting is to balance the comfort and energy-saving demand. If this value is set too big, even if the room is not warm (or cool) enough, compressor will slow down its speed quite soon to save energy. If this value is set too small, even if the room is warm (or cool) enough, compressor will slow down its speed quite late, which consumes more power.

For example, in heating mode, if Tset=48°C and ΔT =2°C, compressor will work at maximum speed to get 46°C as soon as possible, then it will lower the speed. But if even the compressor works in its lowest allowable speed, the water temperature still goes over [Tset+ΔT], unit stops.

1. Heating / Cooling Circuit 1

Working in Heating



1.04) Set temp. for heating (fix flow water temperature)

1.05) Set temp. for cooling (fix flow water temperature)

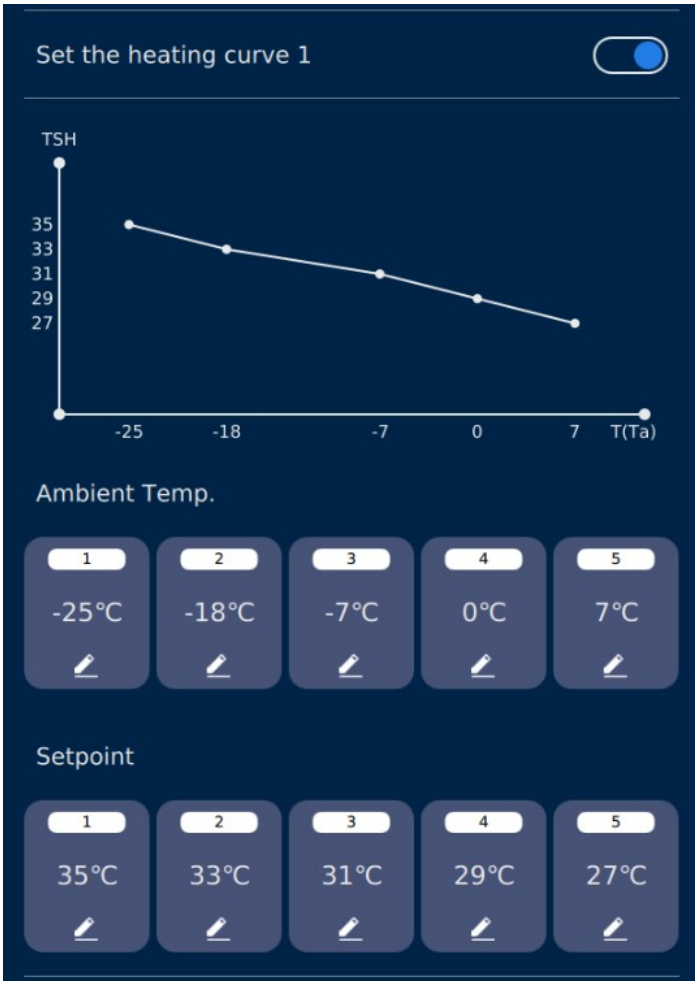
If heating curve function is off, a fixed water temperature for heating can be set via "Set Temp. For Heating" (1.04);

If cooling curve function is off, a fixed water temperature for cooling can be set via "Set Temp. For Cooling"(1.05).

1. Heating / Cooling Circuit 1

1.06) Set the heating curve 1

Set whether heating curve 1 function is needed or not. If heating curve function is off (so this parameter is set to off), then you can set a fixed water set temperature under heating mode via parameter "Set temp. for heating (fix flow water temperature) " (1.04).



If Heating Curve 1 is on, user can set this parameter to create a suitable curve which fits his house. The horizontal coordinate is the ambient temperature and the vertical coordinate is the water temperature.

When the curve function is turned on, the system will use the water temperature corresponding to the current ambient temperature in the curve as the set temperature for heating in circuit 1.You can modify the data to get ideal curve.

1.07) Set the Cooling curve 1

Same as setting in 1.06, just modify heating to cooling mode.

1.08) Room temp. effect on heating curve

Turn ON/OFF this function, to decide if room temperature need to have an influence on heating curve or not.

1. Heating / Cooling Circuit 1

1.09) Ideal room temp. in heating
1.10) Ideal room temp. in cooling

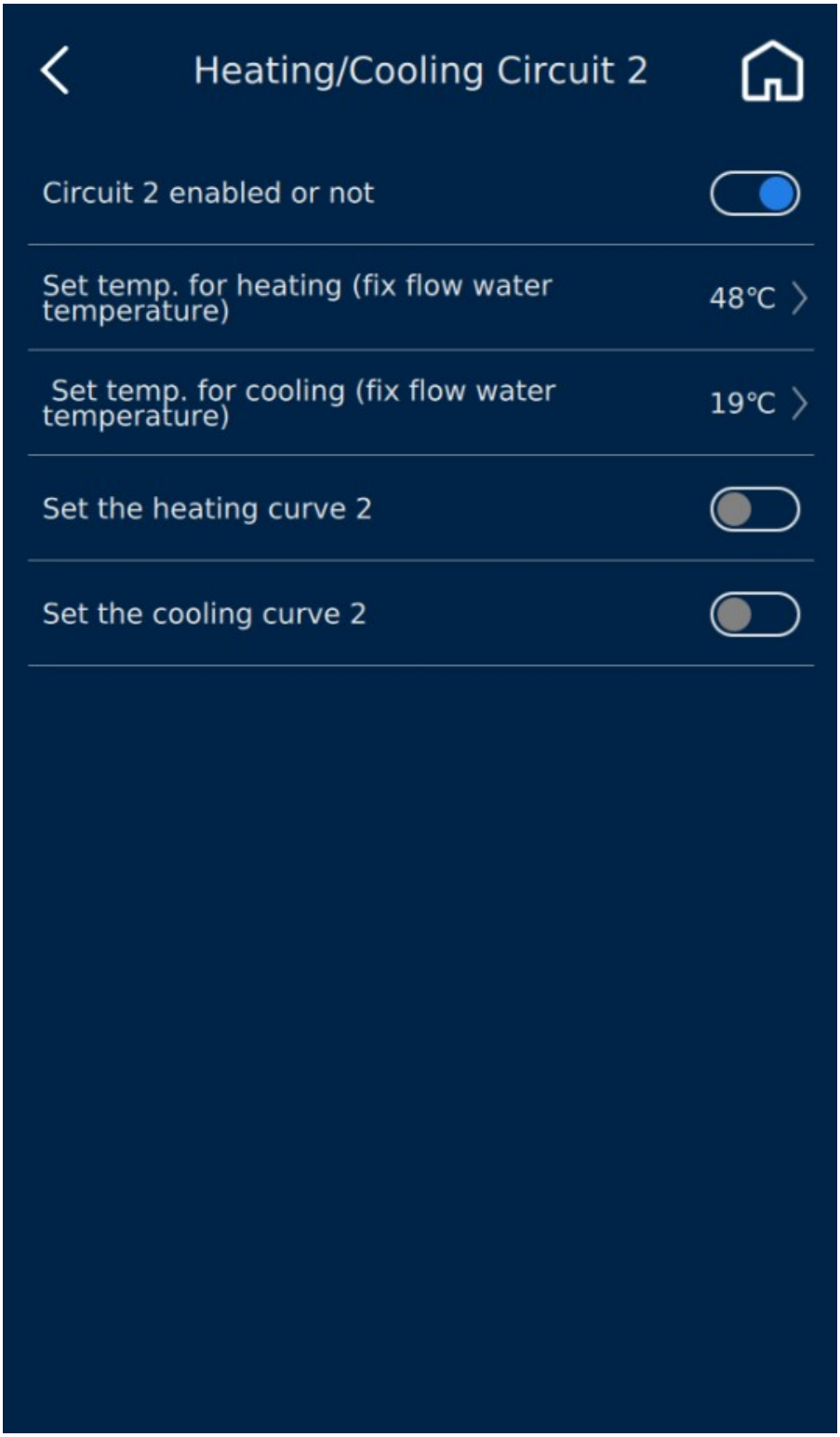
Set an ideal room temperature in heating (1.09) or in cooling (1.10).

When in Room Temperature Control mode, this parameter will also be the Room Set Temperature for heating (1.09) or cooling (1.10).

For example:

If 1.08 (Room temp. effect on heating curve) is on, the unit works in heating mode, water set temperature in the heating curve is 35°C, and the real room temperature is 27°C, while 1.09 (Ideal room temp. in heating) is set to 22°C, then the unit will deduct 5°C (27°C-22°C) from water set temperature, which means unit will take 30°C (35°C-5°C) as the final set water temperature.

2. Heating / Cooling Circuit 2



2.01

2.02

2.03

2.04

2.05

2. Heating / Cooling Circuit 2

2.01) Circuit 2 enabled or not

Set whether the system has the second circuit or not. "Heating/Cooling Circuit 2" is allowed to operate when the house has two temperature zones i.e. low (e.g. underfloor heating) and high temperature (e.g. radiators) zones.

2.02) Set temp. for heating (fix flow water temperature)

2.03) Set temp. for cooling (fix flow water temperature)

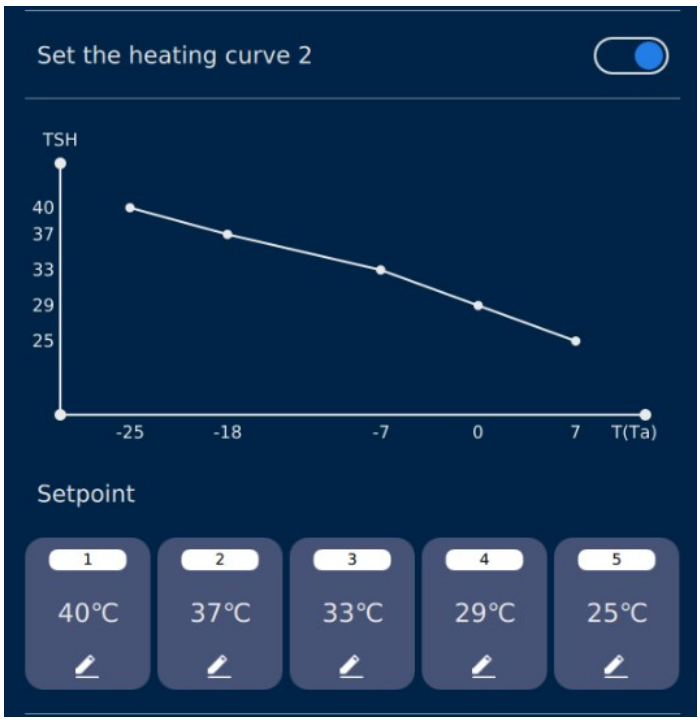
If heating curve function is disabled for circuit 2, a fixed value of set water temperature in heating mode (2.02) or cooling mode (2.03) can be set here.

2.04) Set the heating curve 2

Set whether heating curve 2 function is needed or not.

If heating curve function is off, set this parameter to off, then you can set a fixed water set temperature under heating mode via parameter "Set Temp For Heating".

If Heating Curve 2 is on, user can set this parameter to create a suitable curve which fits his house.

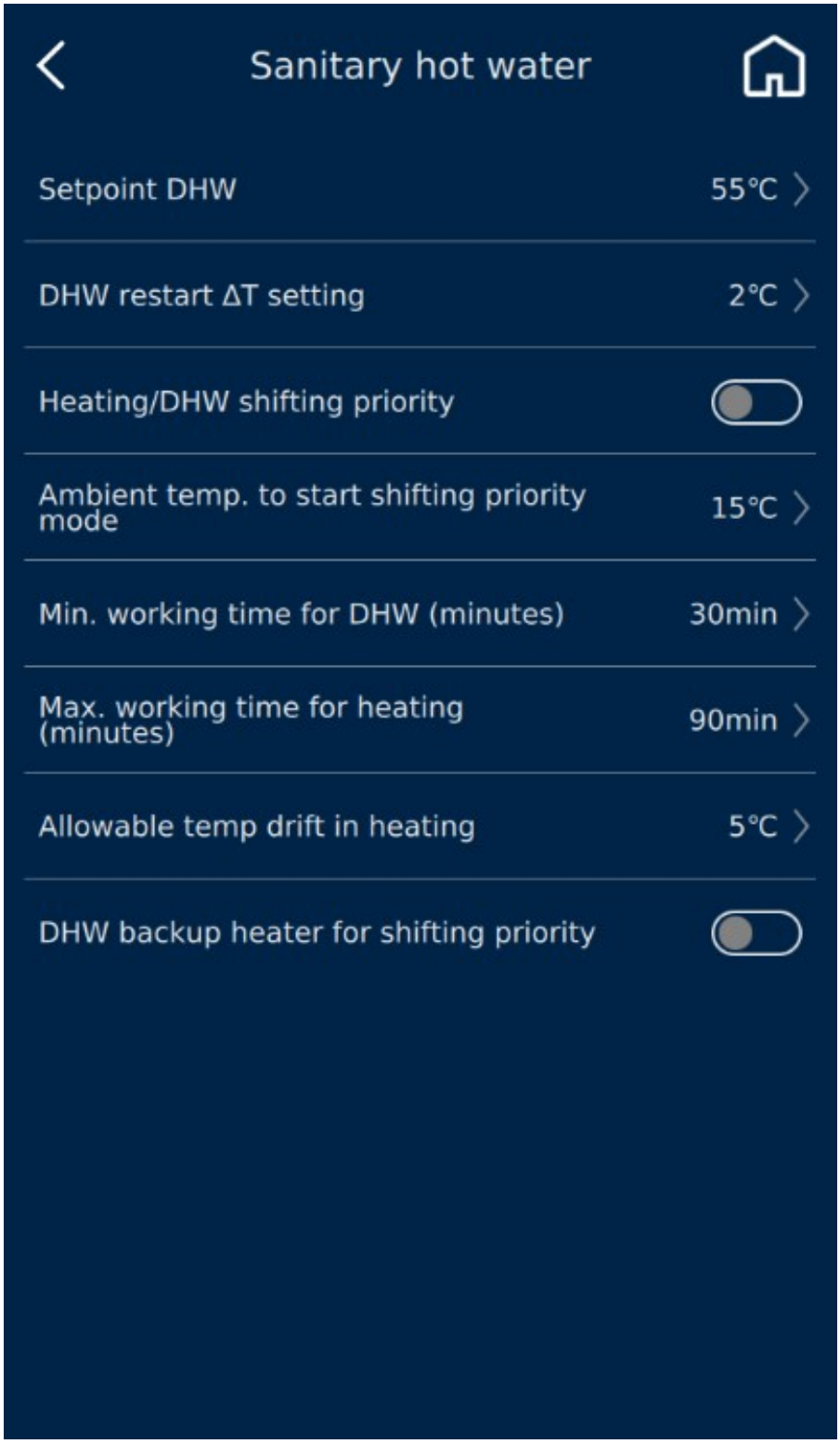


The horizontal coordinate is the ambient temperature and the vertical coordinate is the water temperature. When the curve function is turned on, the system will use the water temperature corresponding to the current ambient temperature in the curve as the set temperature for heating
in circuit 1.
You can modify the values to get an ideal curve.

2.05) Set the Cooling curve 2

Same as setting in 2.04, just modify heating to cooling mode.

3. Sanitary hot water



3. Sanitary hot water

3.01) Setpoint DHW

Set temperature for sanitary hot water.

3.02) DHW restart ΔT setting

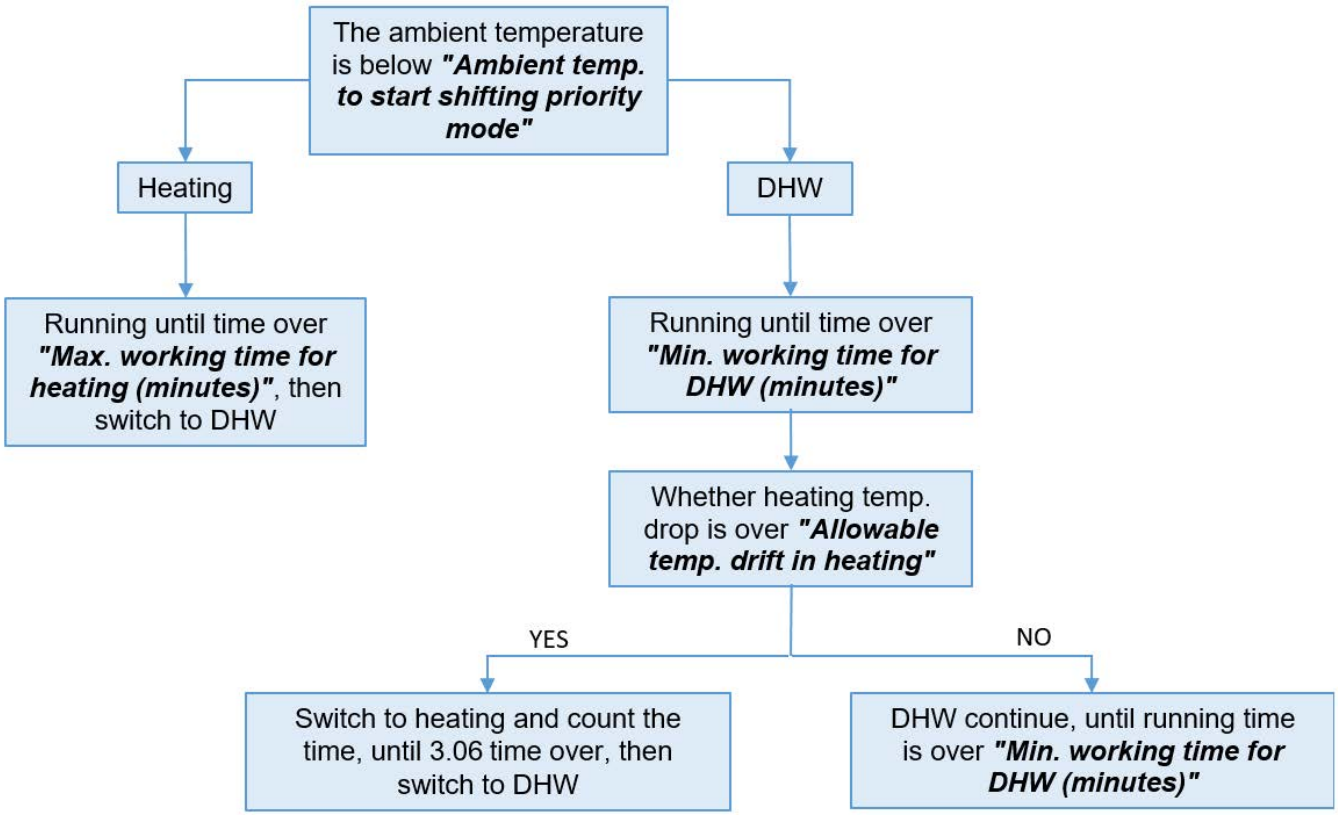
Heat pump will restart to work for sanitary hot water after temperature drops below Tset-ΔT here.

3.03) Heating/DHW shifting priority

Turn ON/OFF this function.

Air to water heat pump is an equipment that absorbs heat from surrounding air, and transfers it to water. The lower the ambient temperature is, the less heat the unit absorbs. Performance of heat pump will reduce if ambient temperature drops and it takes longer time to heat up the sanitary hot water. At the same time, the lower ambient temperature it is, the more heating demand for the house.

Shifting priority logic:



3. Sanitary hot water

If the unit does not provide enough heat while it is working for hot water, the temperature inside the house may drop too much. So parameters 3.03~3.06 try to balance the demand for sanitary hot water and heating.

When this function is ON, AH (Auxiliary Heater) or HWTBH (Hot Water Tank Back-up Heater) or both, depending on their priority, will work individually or together to enhance heat pump's capacity in hot water mode to heat up the water as soon as possible.

3.04) Ambient temp. to start shifting priority mode

Set the ambient temperature below which this function starts to work.

3.05) Min. working time for DHW (minutes)

Under shifting priority mode, set the minimum working period for sanitary hot water mode.

3.06) Max. working time for heating (minutes)

Under shifting priority mode, set the maximum working period for heating mode.

3.07) Allowable temp. drift in heating

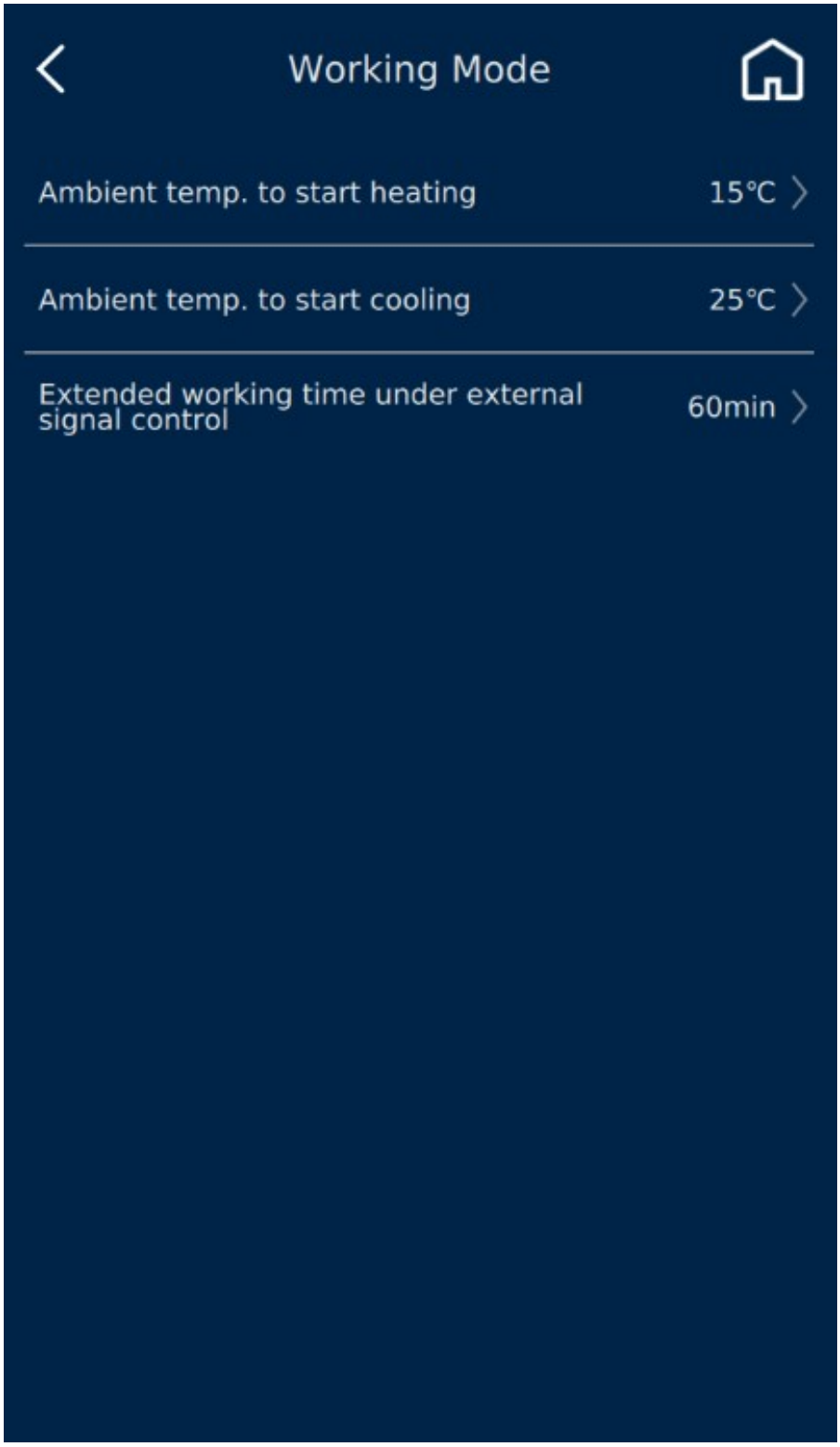
Set allowable temperature drift in heating mode.

3.08) DHW backup heater for shifting priority

Working mode of HWTBH (Hot Water Tank Back-up Heater) in this function. If it is set ON, even if heat pump switch to house heating, HWTBH will keep on working to help the unit heat up hot water as soon as possible.

NOTE. 3.08 function does not work with indoor unit with integrated DHW tank!

4. Working mode



4.12

4.13

4.14

4. Working mode

4.12) Ambient temp. to start heating

For example, set value as 18°C, the system will start heating operation automatically when ambient temperature is lower than 18°C.

4.13) Ambient temp. to start cooling

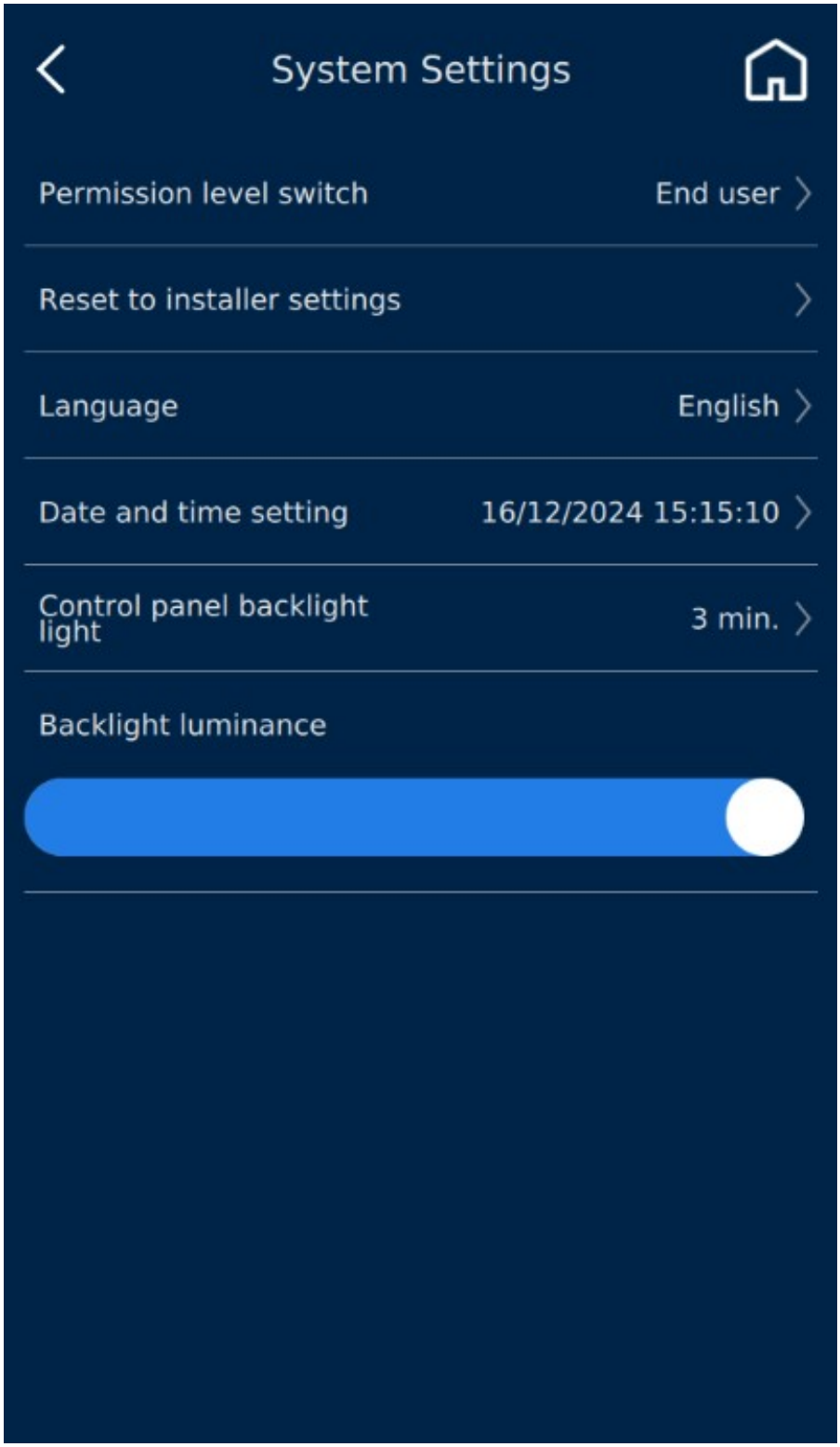
For example, set value as 28°C, the system will start cooling operation automatically when ambient temperature is higher than 28°C.

4.14) Extended working time under external signal control

When the external signal (e.g. external room thermostat) controls heating and cooling operations of the unit, this setting is the heat pump OFF delay time after OFF signal from the external control.

The unit keep running for some time to ensure overall room temperature instead of only the thermostat detecting temperature reaches the set value.

5. System settings



5. System settings

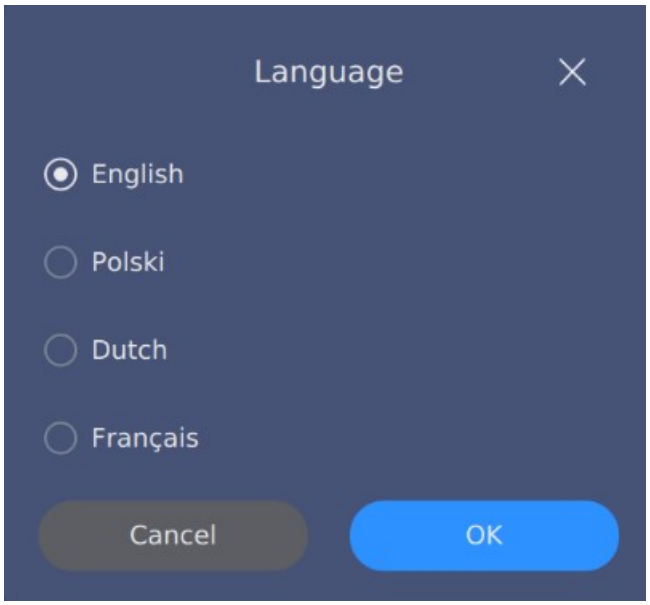
5.01) Permission level (End user / Installer)

For safety purposes, some parameters can only be adjusted under installer level. The permission level can be changed in this menu. A password for installer level is needed.

5.03) Reset to installer settings

Loads saved "Installer Settings". If the device works unstable or does not work at all after the settings made by the user, this function can be used to restore the settings saved by the installer.

5.05) Language



Set system language.
Choose desired language and press OK.

5.06) Date and time setting

Set system date and time.

NOTE. The date and time can also be changed from the home page (see "Control from the home page" → "3. Setting the date and time").

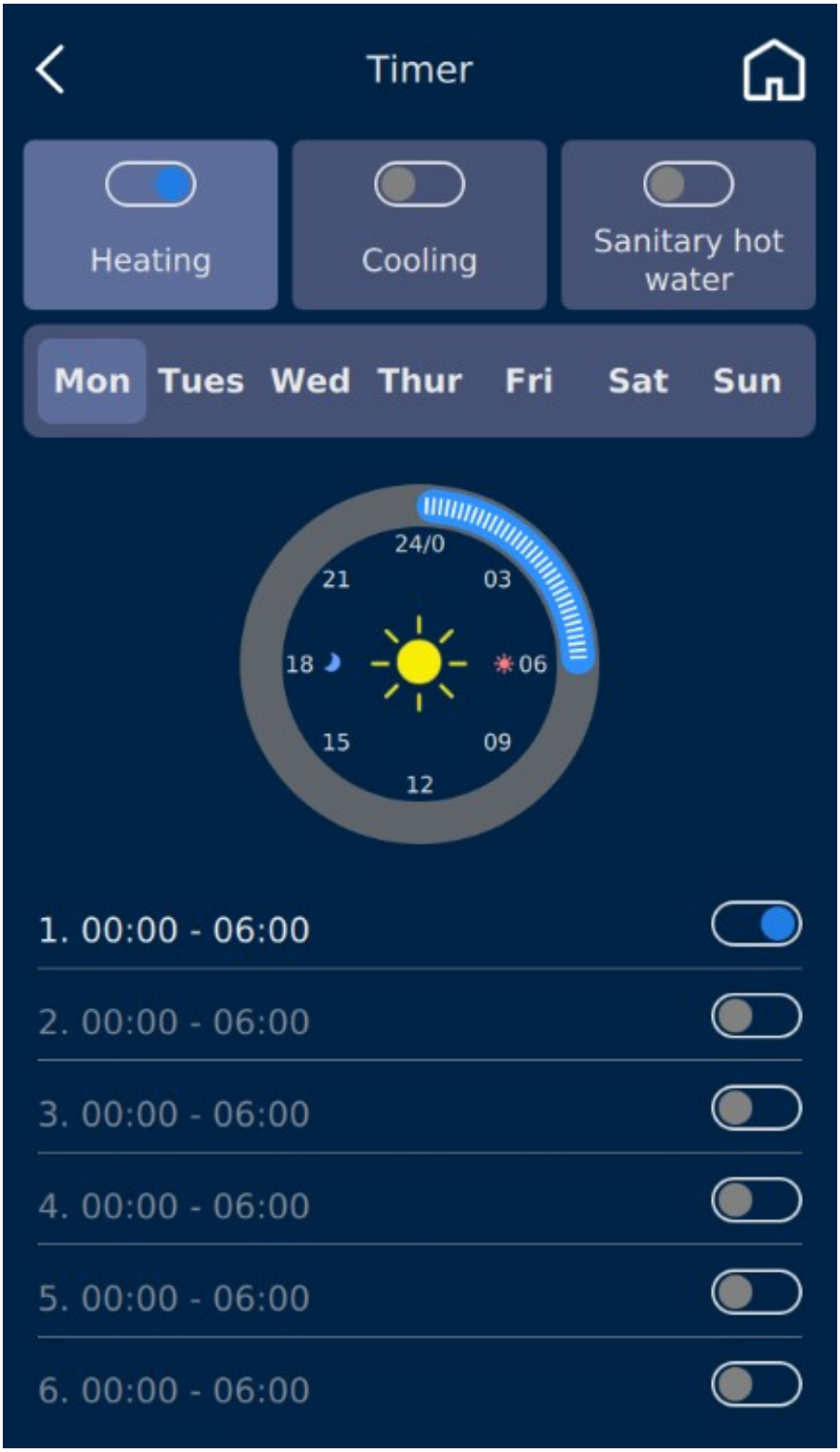
5.07) Controller panel backlight setting

Set the screen backlight time.

5.08) Backlight luminance

Set the screen brightness.

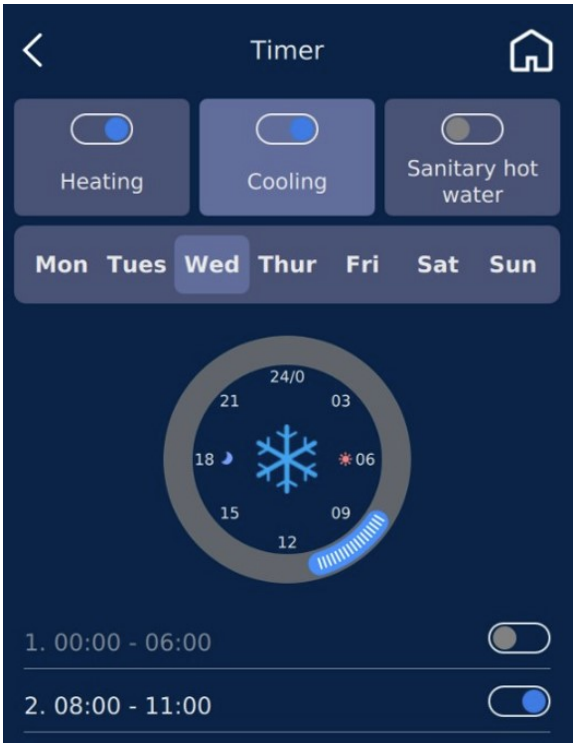
6. Timer

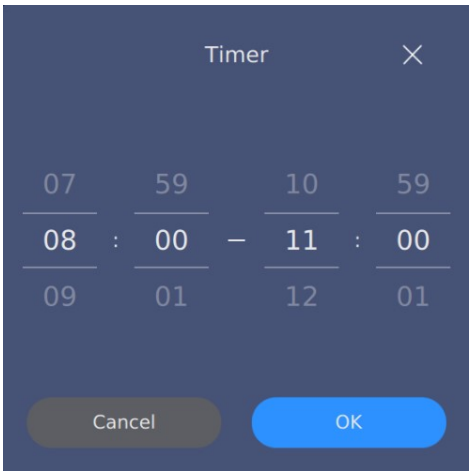

Timer
Heating
Cooling
Sanitary hot water
Mon
Tues
Wed
Thur
Fri
Sat
Sun
24/0
03
06
09
12
15
18
21
1. 00:00 - 06:00
2. 00:00 - 06:00
3. 00:00 - 06:00
4. 00:00 - 06:00
5. 00:00 - 06:00
6. 00:00 - 06:00

6. Timer

Heating / Cooling timer settings

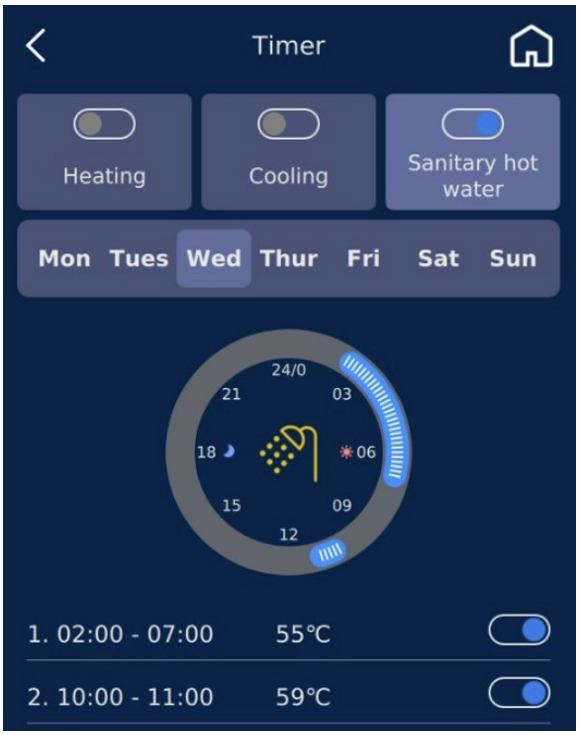
You can set a 6 timers for each day of the week in heating / cooling mode.

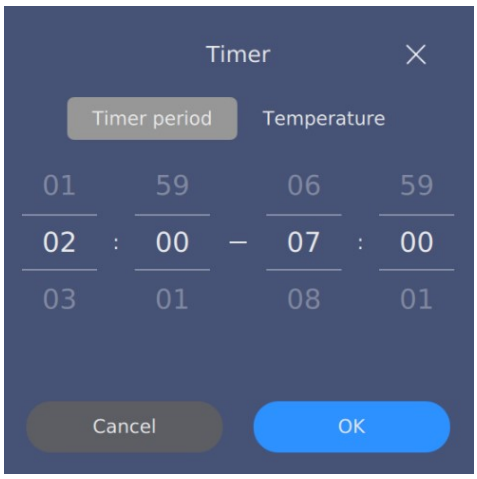


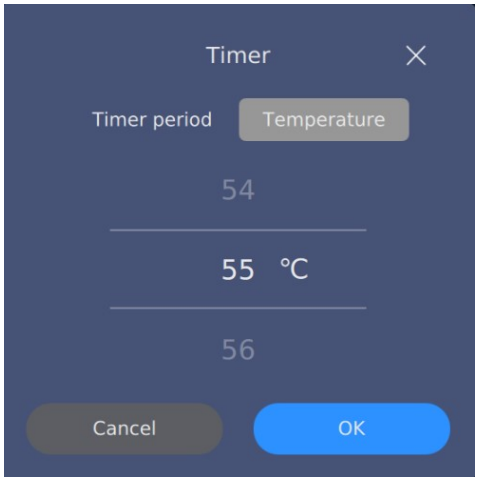


DHW timer settings

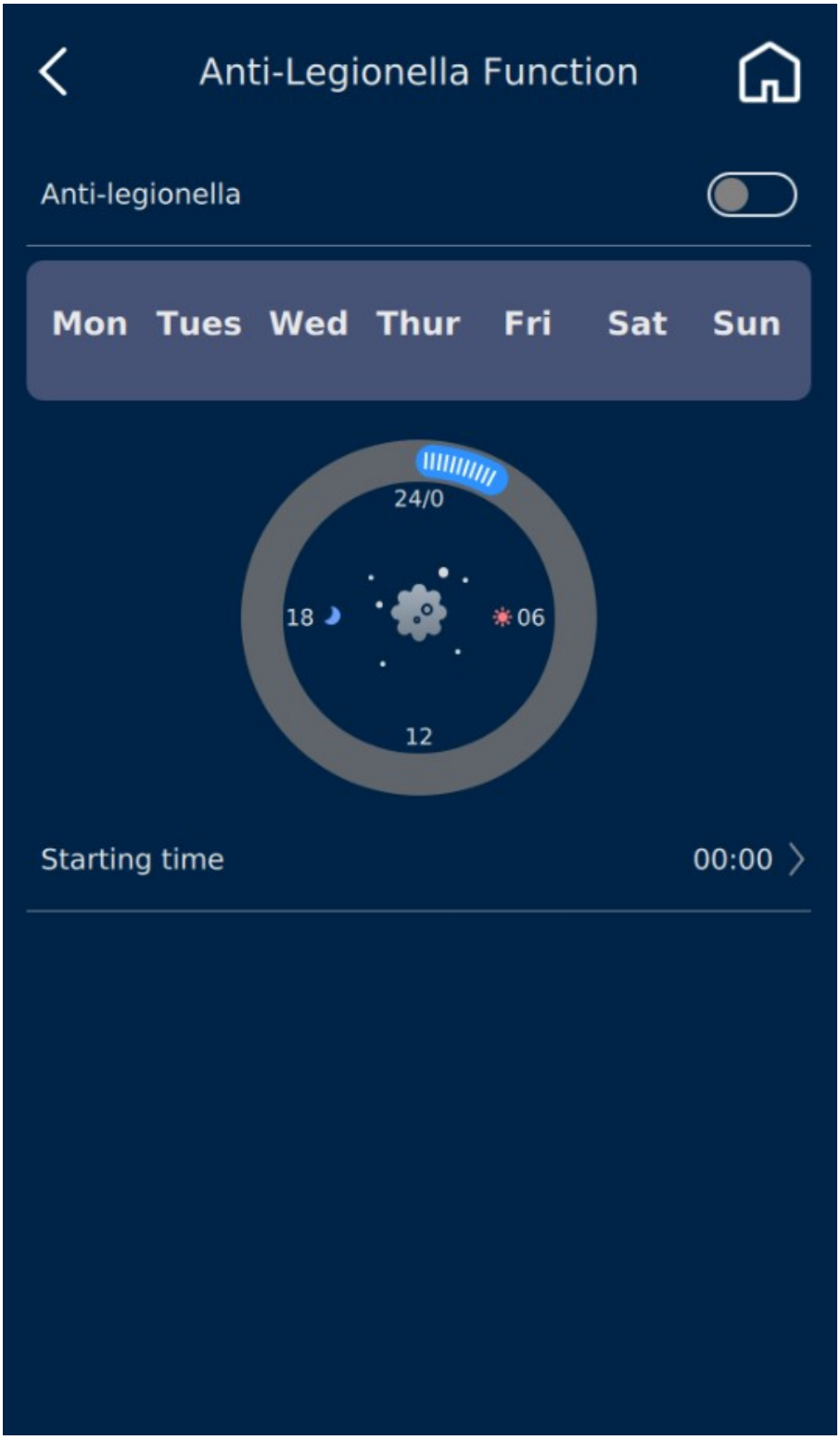
You can set a 6 timers for each day of the week in DHW mode and a separate DHW temperature for each timer.







7. Anti-Legionella Function



7.01

7.02

7. Anti-Legionella Function

When the Anti-Legionella function starts and is in the setting a timer of parameter 7.02, the unit will heat up DHW tank to the 7.03* temperature setpoint. When the water outlet temperature (TUO) reaches the unit's max. water outlet temperature (TUOmax), the compressor will stop, then the auxiliary heater (AH) and the DHW backup heater (HWTBH)** will start to heat the DHW tank until the DHW temperature reaches the sterilization temperature.

The system will count the time for sterilization 7.05*, if it is over "duration" that is set, then exits sterilization;

When the sterilization function running time is greater than the maximum running time of 120 minutes, also exits sterilization, waiting for the next opening.

NOTE: Please always refer to local regulations for the correct usage of this function.

7.01) Anti-legionella program

Turn ON/OFF Anti-Legionella function.

7.02) Starting time

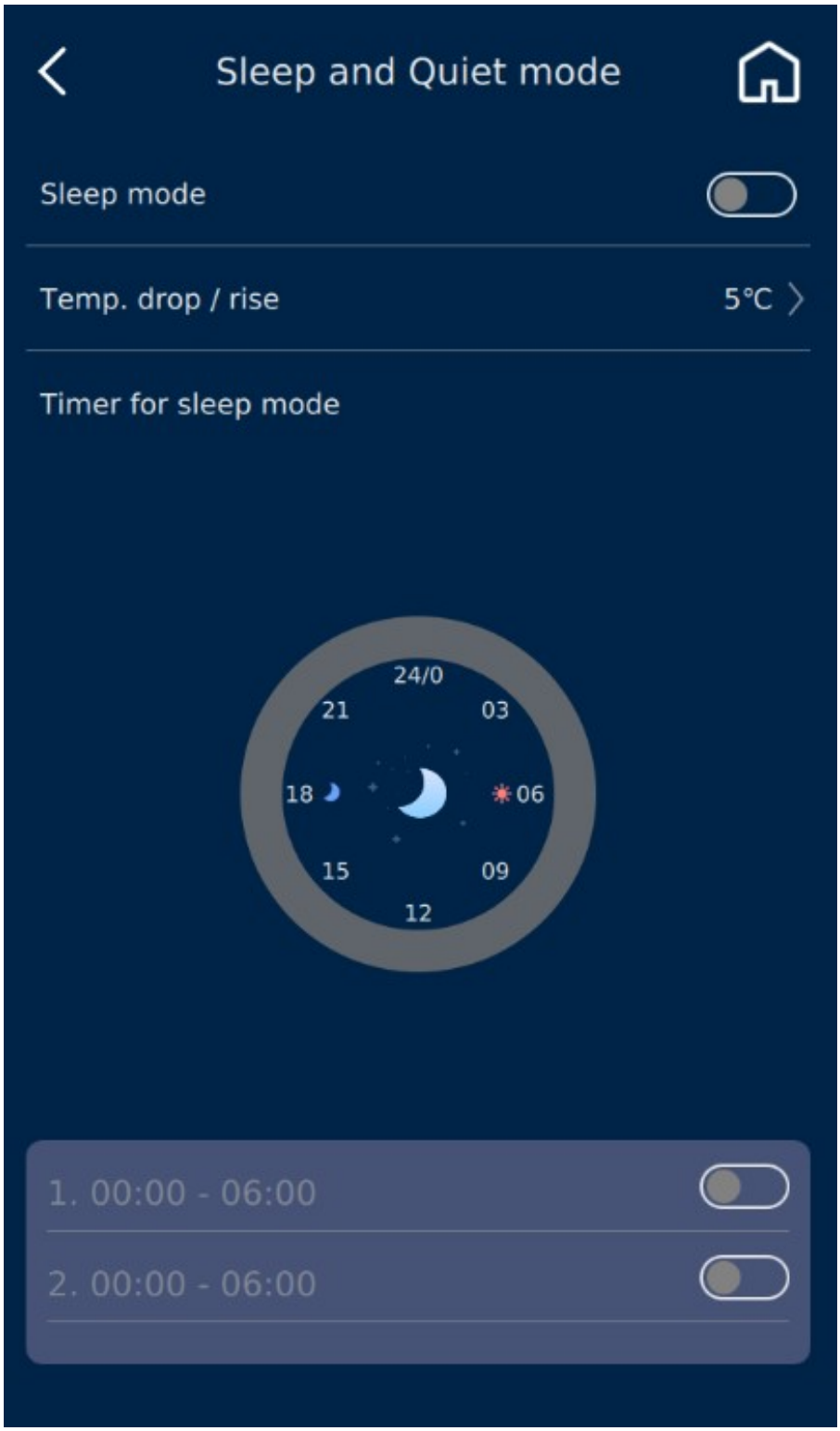
Set the start time for the Anti-Legionella function to run, which can only be set when 7.01 is turned on. Select weekday(s) for the start of Anti-Legionella operation.

NOTE. If the set disinfection temperature has not been reached, the device will display a message and ask whether to repeat the disinfection.

* can only be set in the "Installer menu"

** if it is installed

8. Sleep and Quiet mode

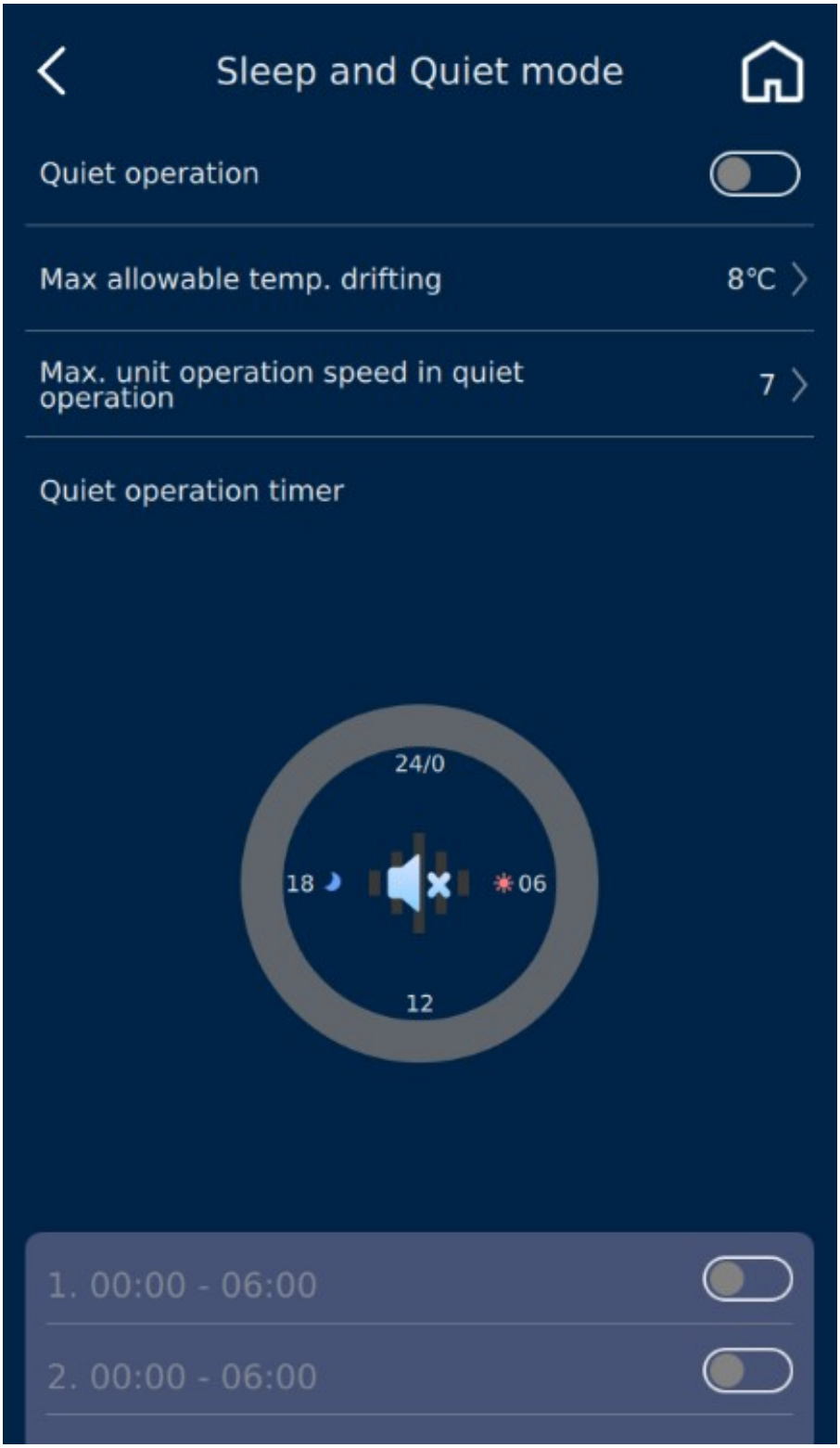


8.01

8.02

8.03

8. Sleep and Quiet mode



8.04

8.05

8.06

8.07

8. Sleep and Quiet mode

8.01) Sleep mode

Turn ON/OFF Sleep operation mode.

When the house heating demand can be lower, like sleep period or working time, a lower set temperature can be set here for better system consumption.

8.02) Temp. drop / rise

Set allowable temperature drop (in heating) or increase (in cooling) based on standard set temperature during sleep mode.

8.03) Timer for sleep mode

Set a timer for Sleep mode.

Two different time periods for every day in a week can be set.

8.04) Quiet operation

Turn ON/OFF Quiet operation mode.

After activating this function and setting the time period for quiet operation, unit will reduce its noise level.

NOTE. Unit efficiency in Quiet Operation mode will be lower than standard working mode.

8.05) Max allowable temp. drifting

When the unit works in quiet mode, the output may drop because both the fan and the compressor may need to work at a lower speed. So, temperature in the system may drop (in heating) or increase (in cooling) due to the lower output.

The data set here is a temperature difference between set temperature and bearable temperature. If the current temperature is lower than Tset - 8.05, the unit will exit this Quiet Operation, to ensure a comfortable house temperature.

8. Sleep and Quiet mode

8.06) Max. unit operation speed in quiet operation

Set the max. compressor frequency limitation under quiet mode.

8.07) Quiet operation timer

Set a timer for Quiet Operation.

Two different time periods for every day in a week can be set.

9. Vacation

9.01
9.02
9.03
9.04
9.05

9. Vacation

If you need to be away from home for some days, use Vacation Mode function to save energy.

9.01) Vacation mode

Turn ON/OFF Vacation mode.

9.02) Sanitary hot water temp. drop

Set an allowable temperature drop for sanitary hot water based on standard DHW Tset value during the set time for vacation mode. When the temperature drops below the set drop temperature (9.02), the device restarts to reach the set DHW temperature Tset.

9.03) Heating water temp. drop

Set an allowable temperature drop for heating based on standard heating Tset value during the set time for vacation mode. When the temperature drops below the set drop temperature (9.03), the device restarts to reach the set heating temperature Tset.

9.04) Vacation start time

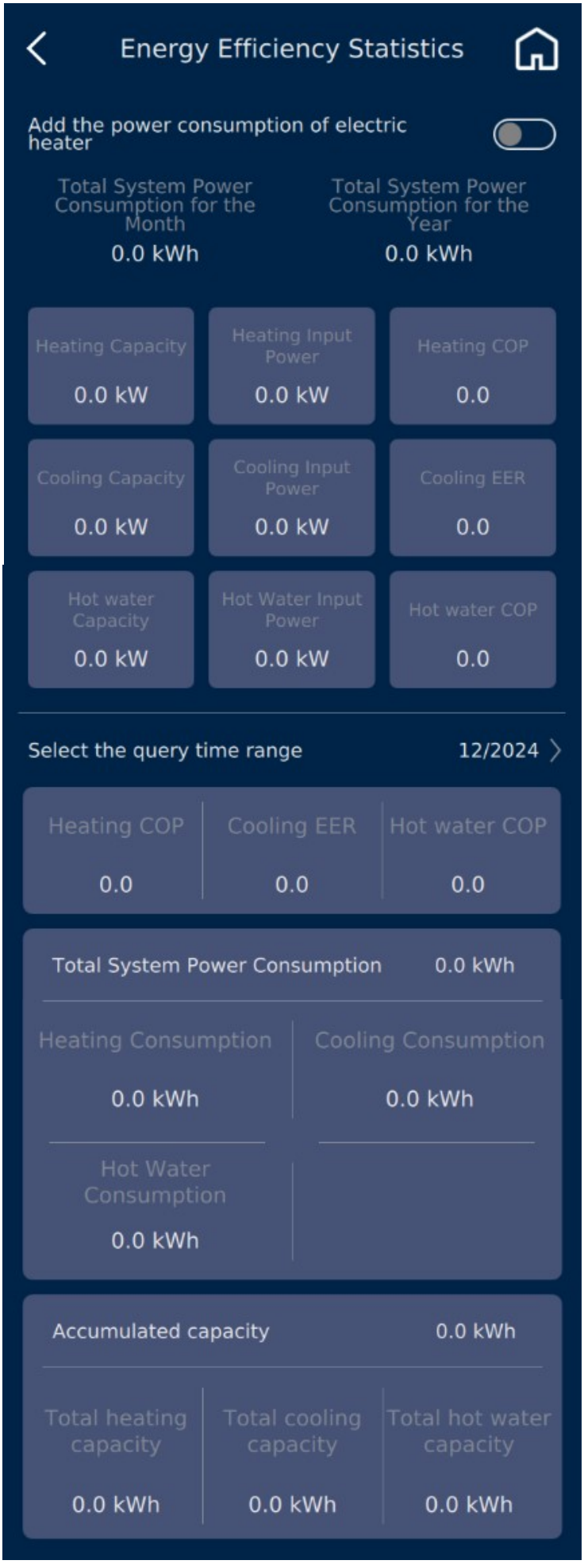
Set the time and date when vacation starts.

9.05) Vacation finish time

Set the time and date when vacation finishes.

After this time, the setting temperature of sanitary hot water and heating will restore.

10. Energy Efficiency Statistics



10. Energy Efficiency Statistics

Energy Efficiency Statistics

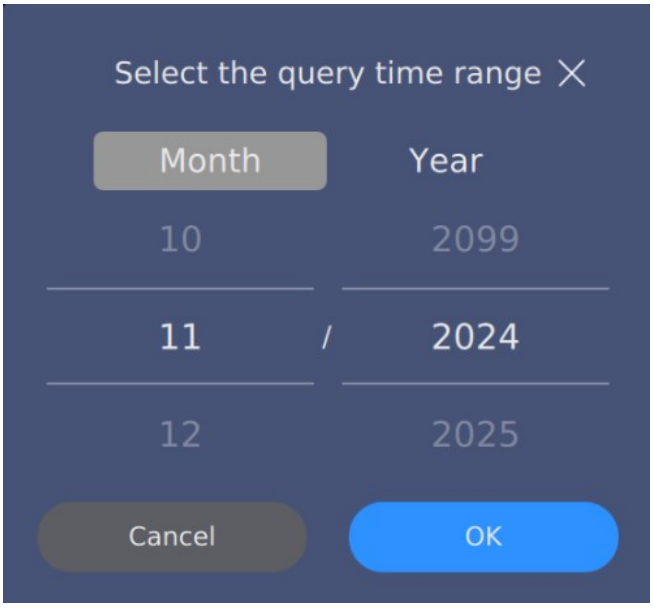
The following is the system's energy efficiency information. You can view the current energy efficiency information as well as the historical energy efficiency information.

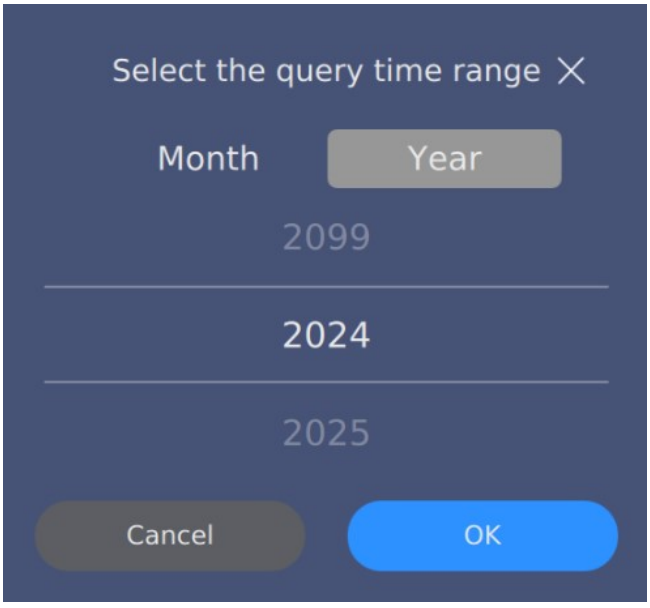
This menu is designed for viewing the power consumption and COP of the heat pump and system.

Select the query time range

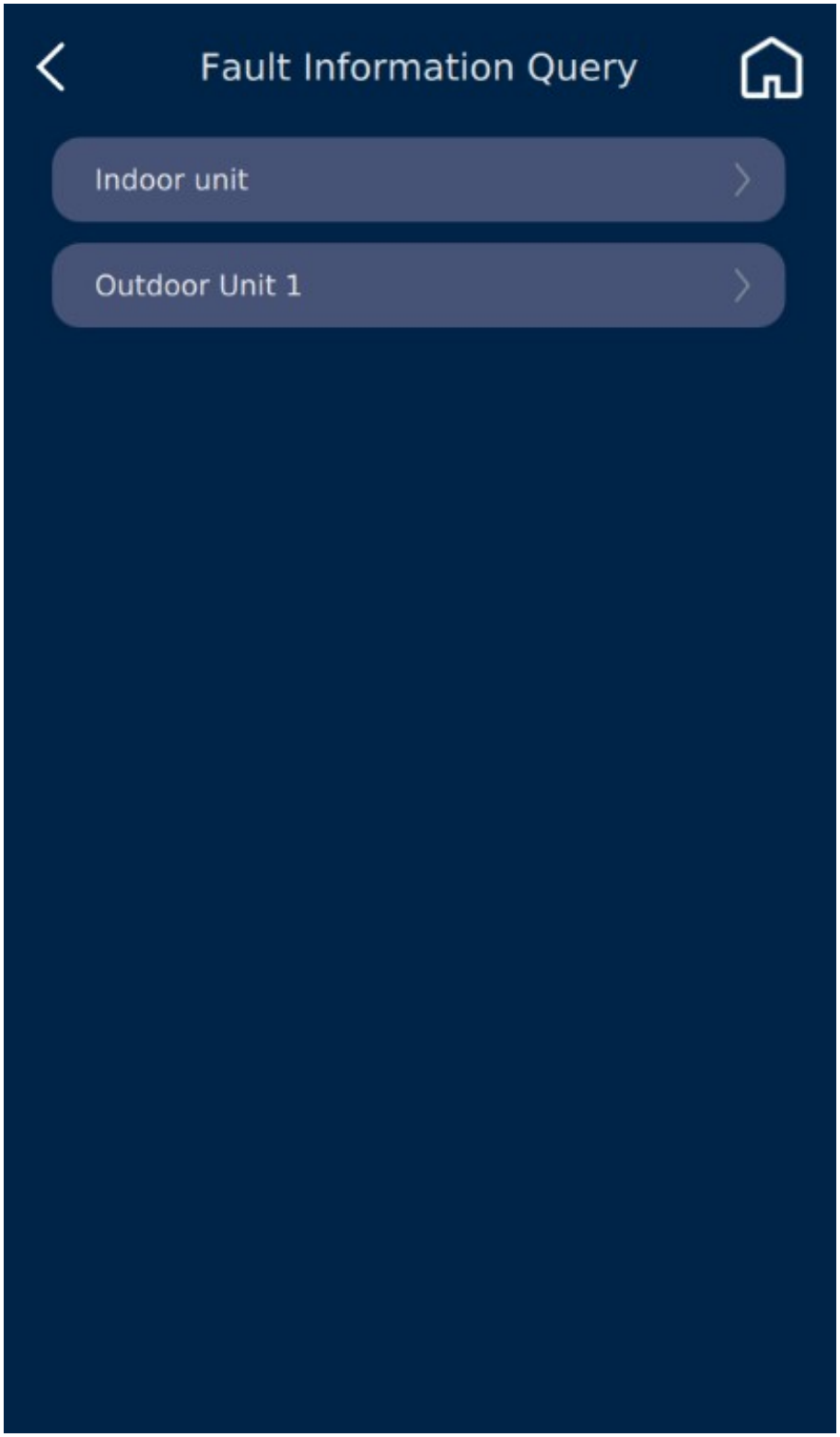
Click through for historical energy efficiency information.

Click the "Month" button to choose to query energy efficiency data for a particular month; click the "Year" button to choose to query energy efficiency data for a particular year.





11. Fault Information Query



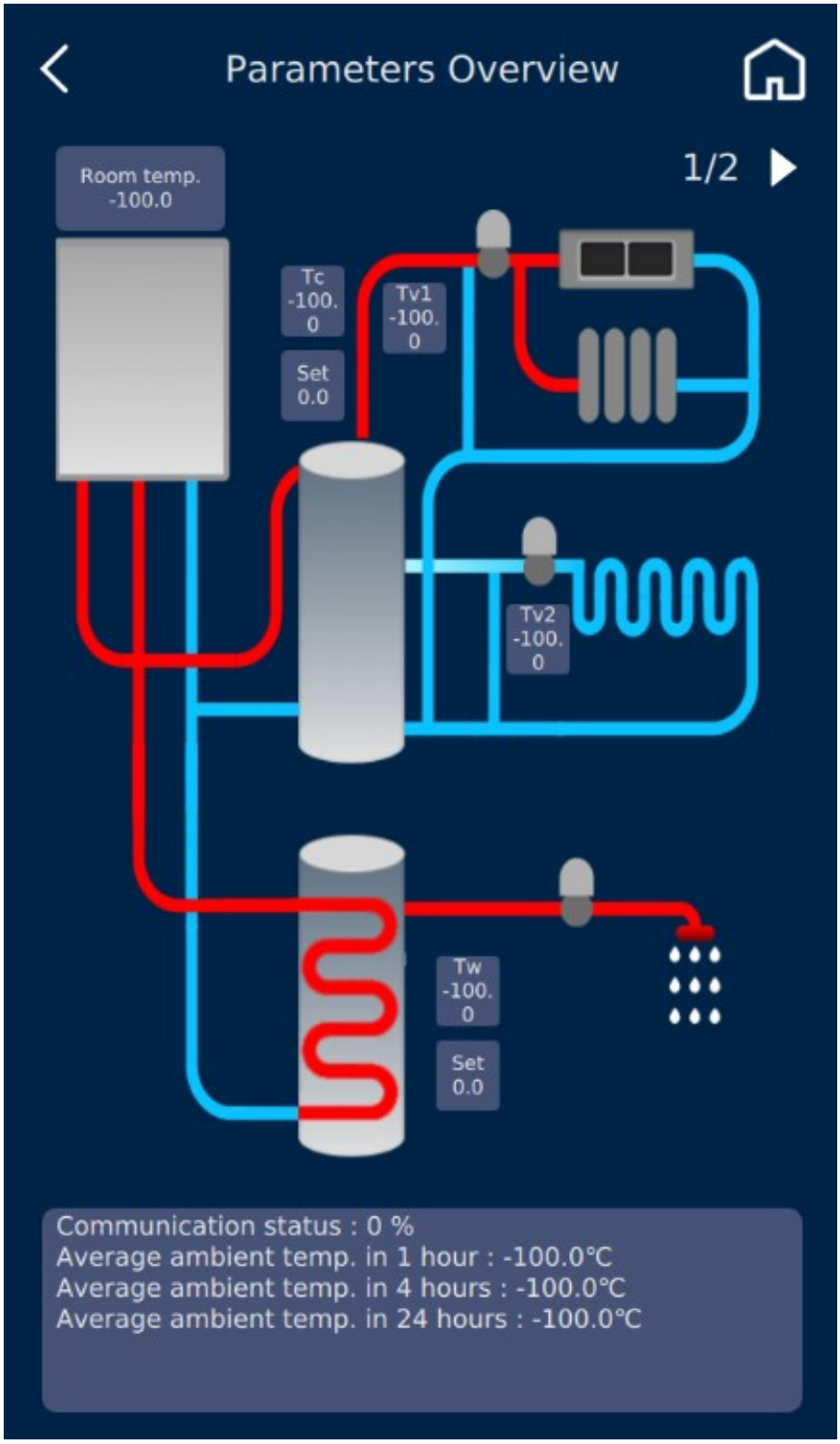
11.01

11.02

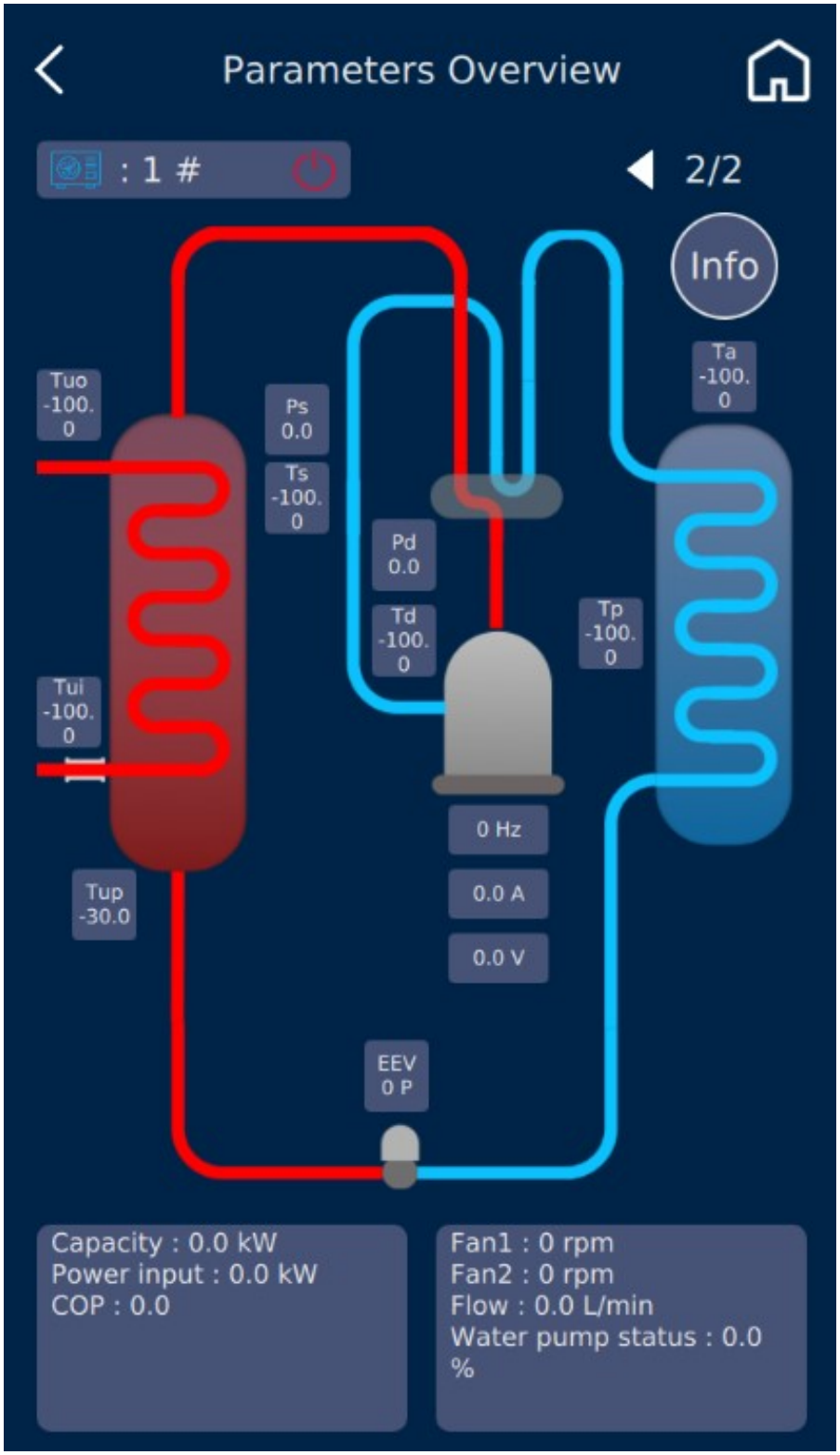
11. Fault Information Query

Here you can see both indoor (11.01) and outdoor (11.02) units' errors. In the second page, you can check a specific error (description, reasons, solutions).

12. Parameters Overview



12. Parameters Overview

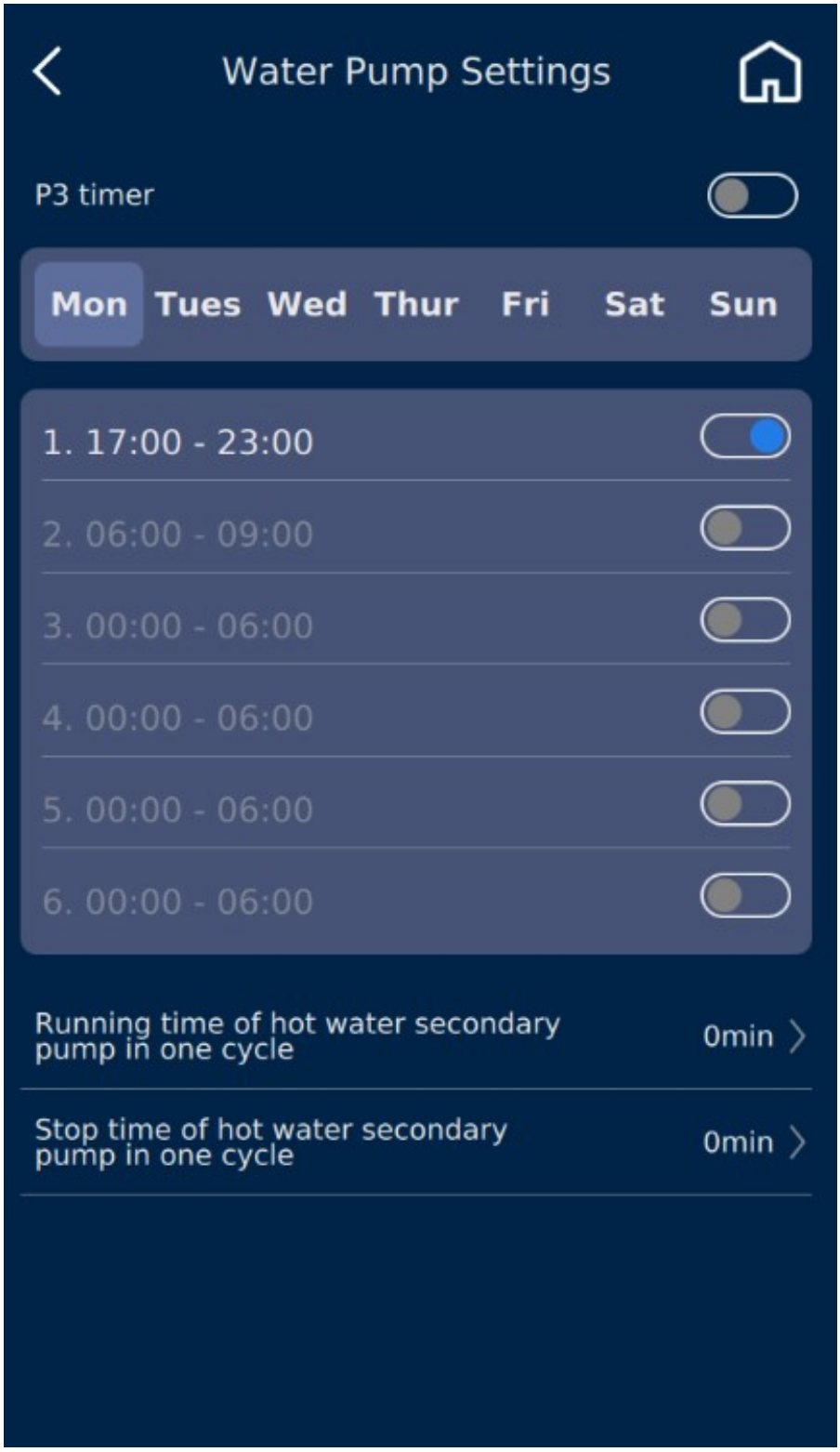


12. Parameters Overview

Parameters overview for indoor and outdoor units.
Tw: Sanitary hot water temperature
Tc: Heating/Cooling water temperature
Tv1: Mixing temperature 1
Tv2: Mixing temperature 2
Room temp. (Tr): Room temperature
Communication status

Tuo: Heat exchanger water outlet temperature
Tui: Heat exchanger water return temperature
Tup: Water coil temperature
Ta: Ambient temperature
Tp: Refrigerant coil temperature
Pd: High pressure
Ps: Low pressure
Td: Compressor discharge temperature
Ts: Compressor suction temperature
EEV: Electronic Expansion Valve opening value
Fans' speed
Pump speed
Water flow value
Capacity, power input and COP values

13. Water Pump Settings



13.10

13.11

13.12

13.13

13. Water Pump Settings

13.10) P3 timer

P3 (DHW recirculation) pump timer is activated or not

13.11) You can set up to six timers for each day of the week

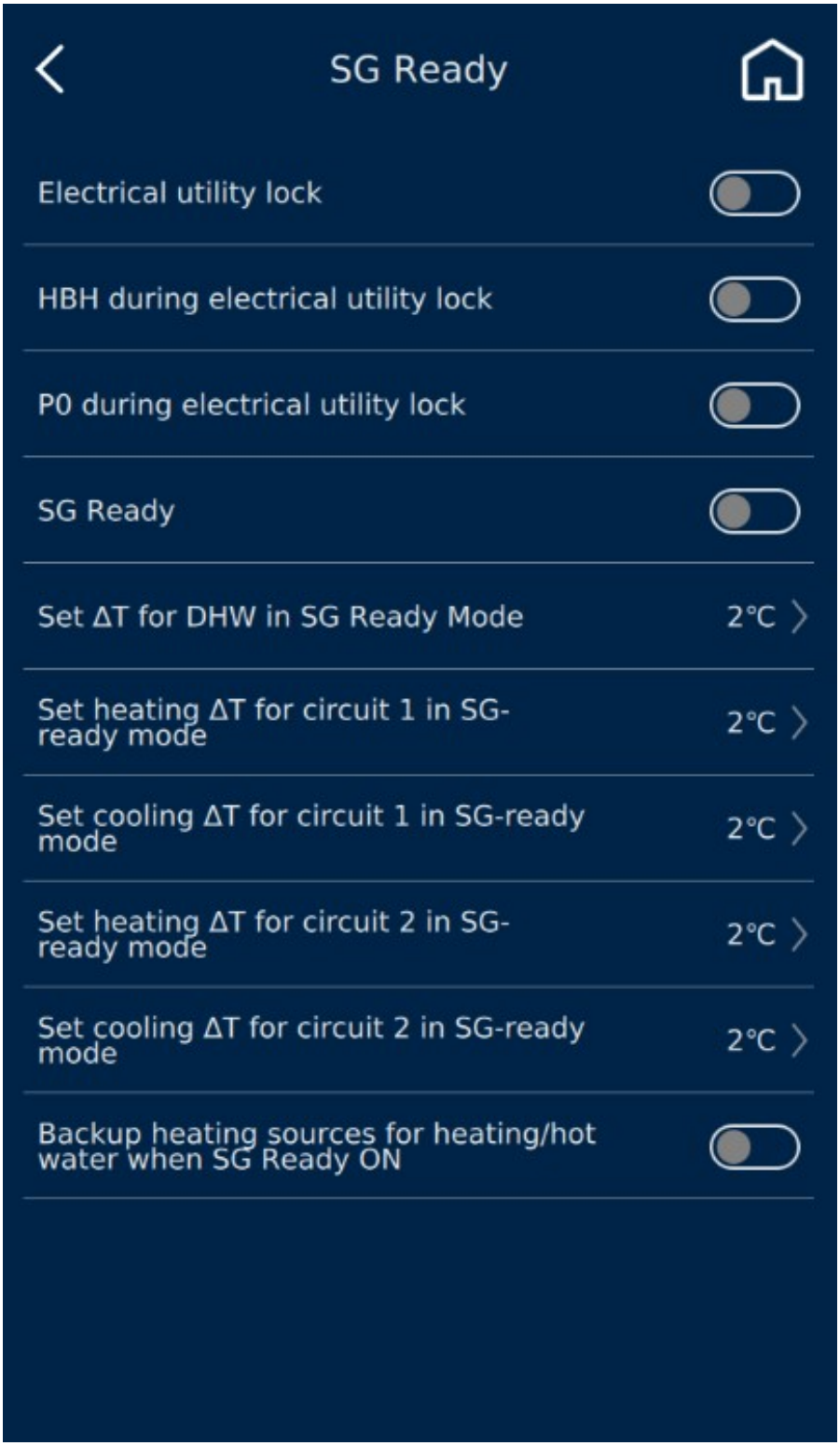
13.12) Running time of hot water secondary pump in one cycle

Set the working time for the recirculation pump during one cycle

13.13) Stop time of hot water secondary pump in one cycle

Set the stand time for the recirculation pump during one cycle

14. SG-Ready


SG Ready
Electrical utility lock
14.01
HBH during electrical utility lock
14.03
P0 during electrical utility lock
14.04
SG Ready
14.05
Set ΔT for DHW in SG Ready Mode
2°C
14.06
Set heating ΔT for circuit 1 in SG-ready mode
2°C
14.07
Set cooling ΔT for circuit 1 in SG-ready mode
2°C
14.08
Set heating ΔT for circuit 2 in SG-ready mode
2°C
14.09
Set cooling ΔT for circuit 2 in SG-ready mode
2°C
14.10
Backup heating sources for heating/hot water when SG Ready ON
14.11

14. SG-Ready

14.01) Electrical utility lock

Set ON/OFF electrical utility lock function.

14.03) HBH during electrical utility lock

Set whether turn on HBH (Heating Back-up Heater), when unit is blocked by Electrical Utility Lock. e.g. gas boiler.

14.04) P0 during electrical utility lock

Set the working of circulation pump when unit is blocked by Electrical Utility Lock. If it's activated, the circulation pump will keep on working when compressor stops. If it's not activated, the circulation pump will stop working when compressor stops.

14.05) SG-Ready

The smart grid will send two external signals to adjust heat pump's operation to match the state of the grid and shaving peaks/ filling valleys.

If the unit is supposed to adjust working during this period or need to turn on "SG-Ready" function, one can connect the signal from smart grid to this “SG-Ready” port and use the parameter setting to activate this function.

14.06) Set ΔT for DHW in SG-Ready mode

Set this parameter to raise the setpoint in DHW mode when the SG Ready mode is activated and receive smart grid signal input 0:1 (SGA: open, SGB: closed) or 1:1 (SGA: closed, SGB: closed).

14.07) Set heating ΔT for circuit 1 in SG-Ready mode

Set this parameter to raise the setpoint of circuit 1 in heating mode when the SG Ready mode is activated and receive smart grid signal input 0:1 (SGA: open, SGB: closed) or 1:1 (SGA: closed, SGB: closed).

14.08) Set cooling ΔT for circuit 1 in SG-Ready mode

Set this parameter to reduce the setpoint of circuit 1 in cooling mode when the SG Ready mode is activated and receive smart grid signal input 0:1 (SGA: open, SGB: closed) or 1:1 (SGA: closed, SGB: closed).

14. SG-Ready

14.09) Set heating ΔT for circuit 2 in SG-Ready mode

Set this parameter to raise the setpoint of circuit 2 in heating mode when the SG Ready mode is activated and receive smart grid signal input 0:1 (SGA: open, SGB: closed) or 1:1 (SGA: closed, SGB: closed).

14.10) Set cooling ΔT for circuit 2 in SG-Ready mode

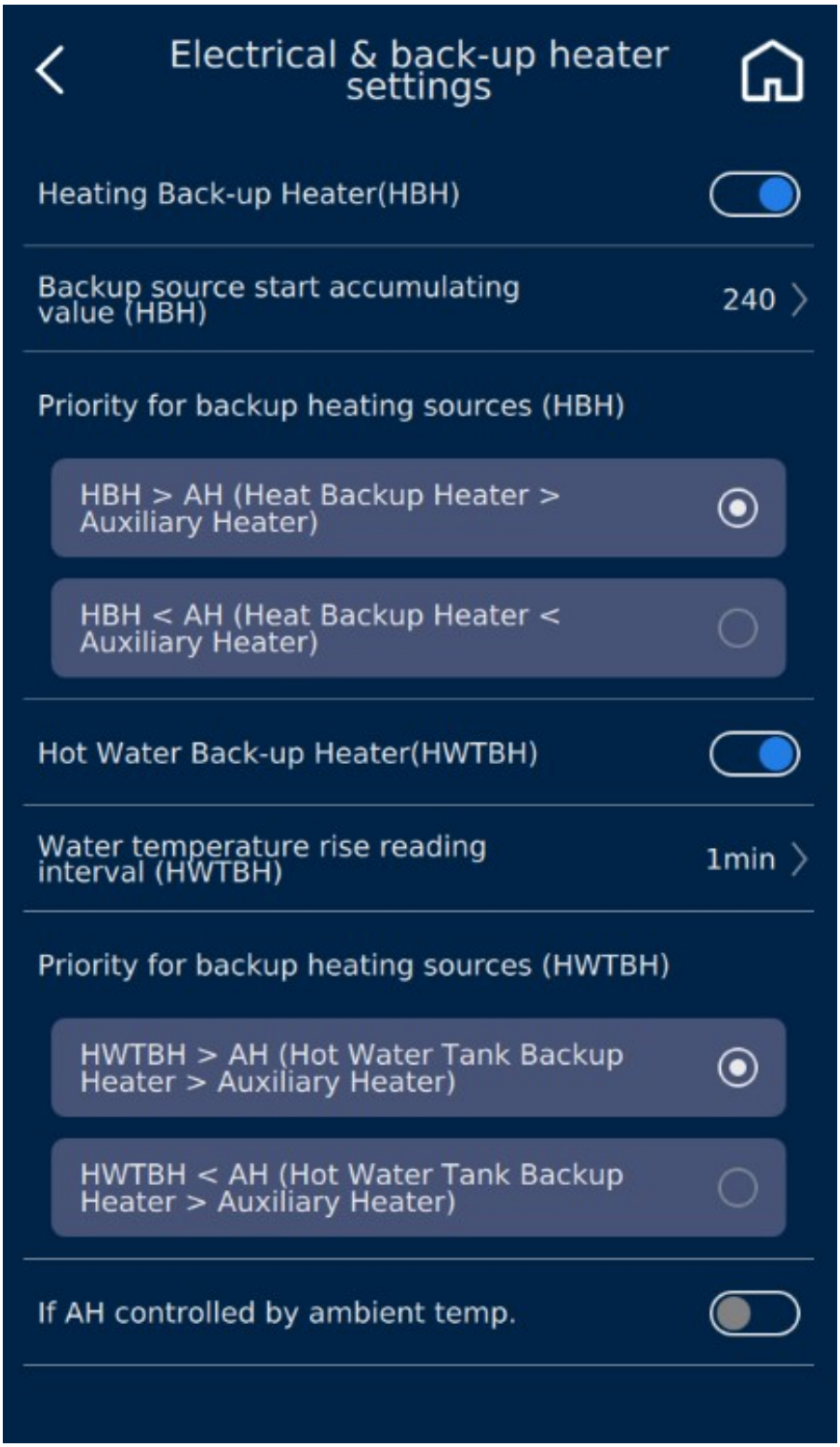
Set this parameter to reduce the setpoint of circuit 2 in cooling mode when the SG Ready mode is activated and receive smart grid signal input 0:1 (SGA: open, SGB: closed) or 1:1 (SGA: closed, SGB: closed).

14.11) Backup heating sources for heating / hot water when SG-Ready ON

The heating backup heater (HBH) and DHW backup heater (HWTBH) will startup immediately when unit receive smart grid signal input 1:1 (SGA: closed, SGB: closed).

SGA	SGB	Status Icon	SG Ready operation requirement
0	0		The heat pump is operating normally
1	0		Insufficient energy from the grid necessitates a forced shutdown of the heat pump. After shutdown, the backup heater can be turned on.
0	1		Grid recommmends to consume more power by heat pump. The heat pump will automatically add a set temperature difference on the original set water temperature to get a new set point.
1	1		Grid produces too much power and has to be consumed by heat pump. At this time, heat pump will automatically adjust the set temperature to the maximum set temperature allowed by the system, and the electric heating can be turned on in order to consume more power from Grid.

15. Electrical & back-up heater settings



15. Electrical & back-up heater settings

AH - Auxiliary Heater
HBH - Heating Back-up Heater
HWTBH - Hot Water Back-up Heater

15.01) Heating Back-up Heater (HBH)

Set whether the system has HBH (Heating Back-up Heater)

15.02) Backup source start accumulating value (HBH)

Accumulated value calculated between operation time and set temperature to start the HBH.

This is for adjusting how fast Backup Heating Sources for heating operation will be turned ON if heat pump unit can't provide enough power.The bigger the value is set, longer time it takes to start the HBH.

15.03) Priority for backup heating sources (HBH)

Set the priority of HBH (integrated) compared with unit AH (integrated). When unit works in heating, if heat pump unit can't provide enough power, it will turn on AH or HBH(which set to have the higher priority) automatically. If after AH or HBH is activated, the total output power is still insufficient, the unit will also turn on the lower priority backup heating source.

15.04) Hot Water Back-up Heater (HWTBH)

Set whether the system has installed external HWTBH (Hot Water Tank Back-up Heater). Can be installed only with indoor unit without integrated DHW tank.

15.05) Water temperature rise reading interval (HWTBH)

Time interval for checking the temperature increase when unit works in DHW mode. If within this interval, DHW temperature can not increase for 1°C, unit will activate HWTBH.

15.06) Priority for backup heating sources (HWTBH)

Set the priority of HWTBH (integrated) compared with unit AH (integrated). When unit works in hot water, if heat pump unit can't provide enough power, it will turn on AH or HWTBH (which set to have the higher priority) automatically. If after AH or HWTBH is activated, the total output power is still insufficient, the unit will also turn on the lower priority backup heating source.

15. Electrical & back-up heater settings

15.09) If AH controlled by ambient temp.

This function sets whether the auxiliary heater (AH) is controlled by ambient temperature.

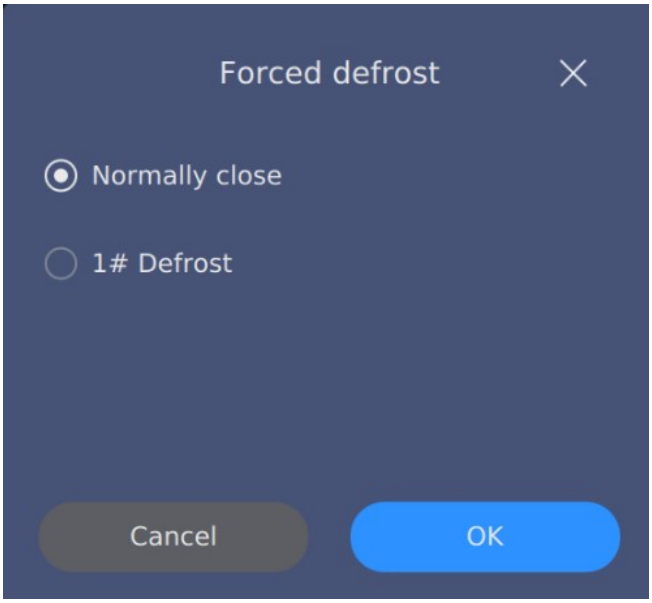
16. Other Settings

16.07

16. Other Settings

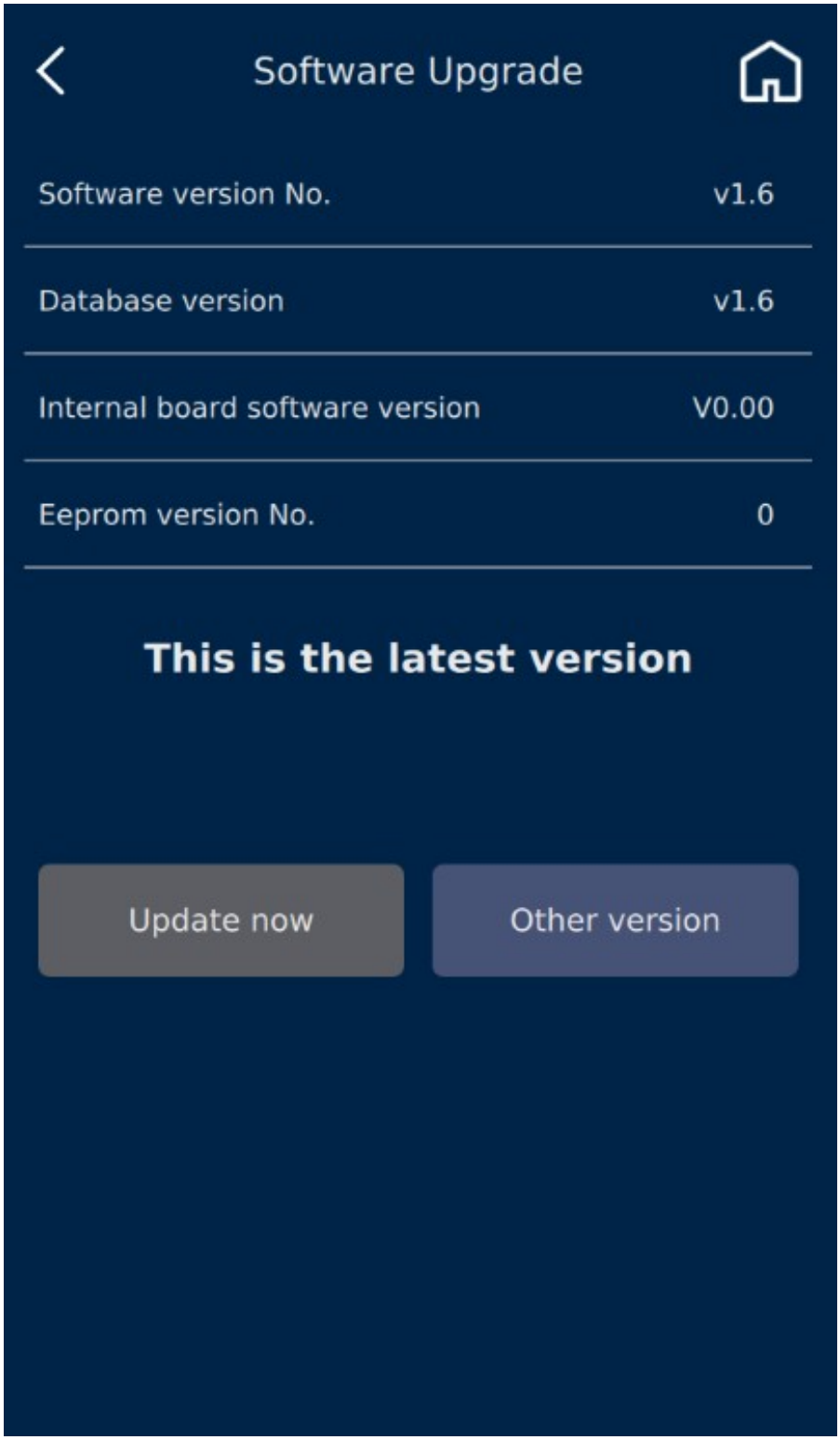
16.07) Forced defrost

With this function, the defrost cycle can be forced to start.



Choose "1# Defrost" and then OK, to start this function.

17. Software upgrade



17. Software upgrade

The software upgrade can be easily done by a USB flash drive.

Copy the new program to a USB flash drive on computer, then insert the USB flash drive into the PCB of the operation panel.

Click "Update now", a window will pop up, select the program and choose OK.

Thank you for purchasing our quality product. Please read this manual thoroughly before use, and follow the instructions carefully when operating the unit to prevent damage to either the device or persons.

Product specifications are subject to change with improvements, without prior notice. Please refer to the specification sticker on the unit for the most recent specifications.