

**CONTROL AND OPERATION  
MANUAL**

**USER**



**SPLIT INVERTER  
AIR TO WATER HEAT PUMPS**

GSH-80IRB + GSH-80ERB  
GSH-100IRB + GSH-100ERB



“Original instructions”

## To Users

Thank you for selecting Sinclair's product. Please read this instruction manual carefully before installing and using the product, so as to master and correctly use the product. In order to guide you to correctly install and use our product and achieve expected operating effect, we hereby instruct as below:

- (1) This instruction manual is a universal manual, some functions are only applicable to particular product. All the illustrations and information in the instruction manual are only for reference.
- (2) In order to make the product better, we will continuously conduct improvement and innovation. We have the right to make necessary revision to the product from time to time due to the reason of sales or production, and reserve the right to revise the contents without further notice.
- (3) For personal injury or property loss and damage caused by improper operation such as improper installation and debugging, unnecessary maintenance, violation of related national laws and rules and industrial standard, and violation of this instruction manual, etc., we will bear no liability.
- (4) The final right to interpret for this instruction manual belongs to Sinclair

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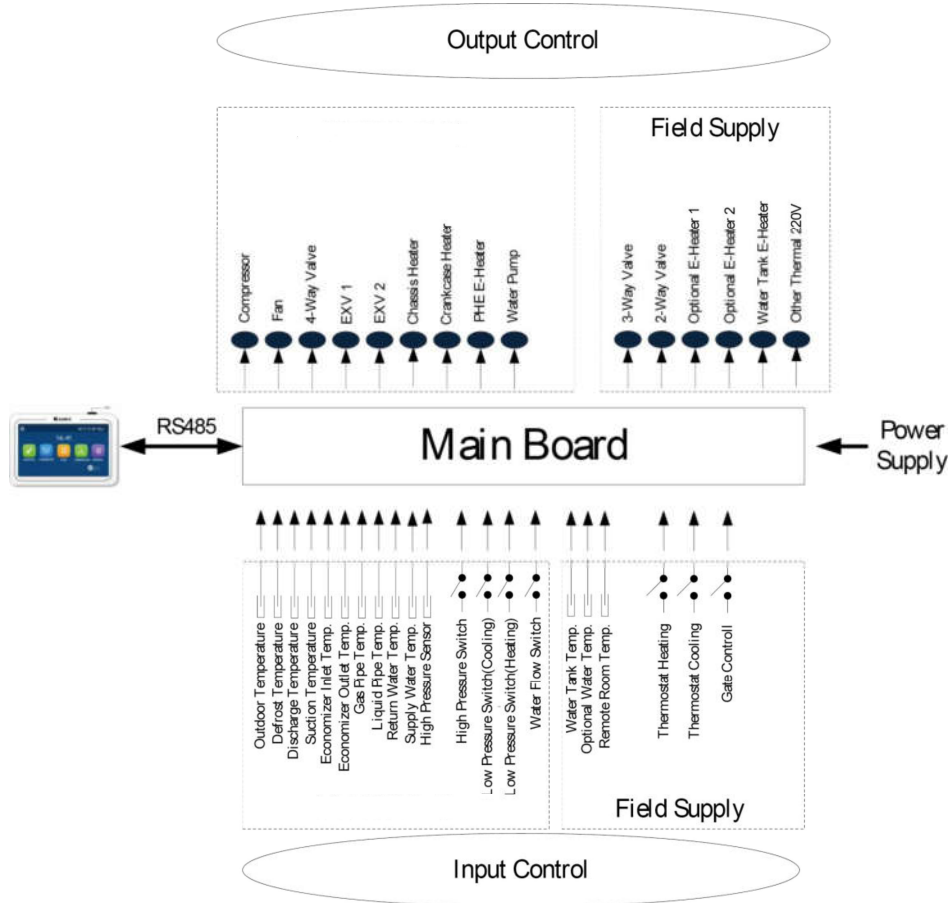
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# **UNIT CONTROL**

# 1 Integral Control Concept

## 1.1 Control Principle Diagram

### ◆ Control Diagram



1. The outdoor temperature is detected by the sensor installed at fins of the finned heat exchanger, which is mainly used to control the initialization steps of the fan and the electrostatic expansion valve and also limit the maximum running frequency of the compressor. When this sensor fails, the main board will detect it and deliver this error message to the controller and then the unit will fail to start up or shut down.

2. The defrost temperature is detected by the sensor installed at the defrosting pipes of the finned heat exchanger, which is mainly used to control defrosting. When this sensor fails at the heating or water heating mode, the compressor will stop and this error will be displayed at the controller. When it fails at the cooling mode, the compressor continues to run but this error will be displayed at the controller.

3. The discharge temperature is detected by the sensor installed at the discharge pipe of the compressor, which is mainly used for high discharge temperature protection. When this sensor fails, this error will be displayed at the controller, all loads except the water pump of the solar system and the electric heater of the water tank will stop. Then, the main unit will resume normal running when this error is eliminated.

4. The suction temperature is detected by the sensor installed at the suction pipe of the compressor, which is mainly used to control superheating degree. When this sensor fails, this error will be displayed at the controller, all loads except the water pump of the solar system and the electric heater of the water tank will stop. Then, the main unit will resume normal running when this error is eliminated.

5. The temperature sensor at the economizer is used to detect the temperature of the economizer after throttling via the electrostatic expansion 2. Under the Heating or Hot Water mode, this sensor and that at the economizer outlet both are used to control the opening angle of the electrostatic expansion valve 2. Under the Cooling mode, the electrostatic expansion valve 2 is fully closed.

6. The temperature sensor at the economizer outlet is used to detect the temperature of the outlet of the economizer. Under the Heating or Hot Water mode, this sensor and that at the economizer inlet both are used to control the opening angle of the electrostatic expansion valve 2. Under the Cooling mode, the electrostatic expansion valve 2 is fully closed.

7. The high pressure is detected by the sensor installed at the discharge pipe of the compressor, the low pressure is detected by the sensor installed at the suction pipe of the compressor, and the enthalpy-adding pressure is detected by the sensor installed at the enthalpy-adding pipe. The first one is mainly used for high pressure protection, the second one is mainly used to control defrosting, freeze protection and superheating degree, and all of three are used to together to control the intermediate pressure ratio of the compressor. When any of these sensors fails, it will be displayed at the controller, all loads except the water pump of the solar system and the electric heater of the water tank will stop. Among them, the water pump will stop 120 seconds later than the compressor. Then, the main unit will resume normal running when this error is eliminated.

Component	Range
High pressure sensor	4.5/3.8MPa (absolute)
Low pressure switch (cooling)	0.45/0.55MPa (absolute)
Low pressure switch (heating)	0.1/0.2 MPa (absolute)

8. The return water temperature of the plate heat exchanger is detected by the sensor installed at the inlet pipe of the plate heat exchanger, which is mainly used for freeze protection. When this sensor fails, this error will be displayed at the controller but the unit will resume normal operation.

9. The supply water temperature of the plate heat exchanger is detected by the sensor installed at the outlet pipe of the plate heat exchanger, which is mainly used for freeze protection at the water side.

When this sensor fails, this error will be displayed at the controller and the unit will continue to operate.

10. The optional water temperature is detected by the sensor installed at the outlet pipe of the optional E-heater, which is mainly used to control the supply water temperature. When this sensor fails, this error will be displayed at the controller, all loads except the electric heater of the water tank will stop (the 2-way electric and 3-way electric valve will be closed).

11. The temperature sensor for the vapor line is used to detect the temperature of the vapor refrigerant line. Under the Cooling mode, it and that for the liquid line together are used to control the opening angle of the electrostatic expansion valve 1.

12. The temperature sensor for the liquid line is used to detect the temperature of the liquid refrigerant line. Under the Cooling mode, it and that for the vapor line together are used to control the opening angle of the electrostatic expansion valve 1.

13. The hi-pressure switch is used to judge the system pressure. When the pressure is too high, this switch will disconnect and the unit will shut down.

14. The flow switch of the main unit is mainly used to judge the water flow. When the flow rate is too low, this switch will be disconnected; all loads except the water tank heater and the water pump of the solar system will stop. This error will be displayed at the controller and will be unrecoverable. The unit can restart only when it is repowered on and this error does not be displayed again.

**Items from 1~14 listed above are control parameters input by the main unit.**

15. The water tank temperature is detected by sensors immersed inside the water tank. These sensors can be divided into two groups. Group 1 is used to control the water tank temperature and group 2 is used to display the water tank temperature. When group 1 fails at the heating mode, this error will be displayed at the controller, and all loads except the water pump of the main unit will stop. When group 2 fails, this error also will be displayed at the controller but the unit continues normal operation.

16. The leaving and entering water temperature of the solar panel and also the solar panel temperature are detected by sensors installed at the inlet pipe, outlet pipe and solar panel of the solar system respectively. These sensors are mainly used to control the water pump of the hot water of the solar system. When the entering water temperature sensor fails, this error will be displayed at the controller and the unit continues normal operation. When other two sensors fail, this error also will be displayed at the controller and the water pump of the solar system will stop.

17. The remote room temperature is detected by the sensor installed at the room, which is mainly used to control the input capacity of the compressor through room temperature setting. When the main unit is controlled through the room temperature and this sensor fails, all loads except the water pump of the solar system and the electric heater of the water tank will stop. However, when the main unit is controlled through the leaving water temperature, if this sensor fails, this error will be displayed but the main unit will resume normal operation.

18. Only when the control function of the thermostat has been activated through the wired controller, then the thermostat can switch run modes among cooling, heating and shutdown, otherwise, the unit will run as per the run mode set by the wired controller.

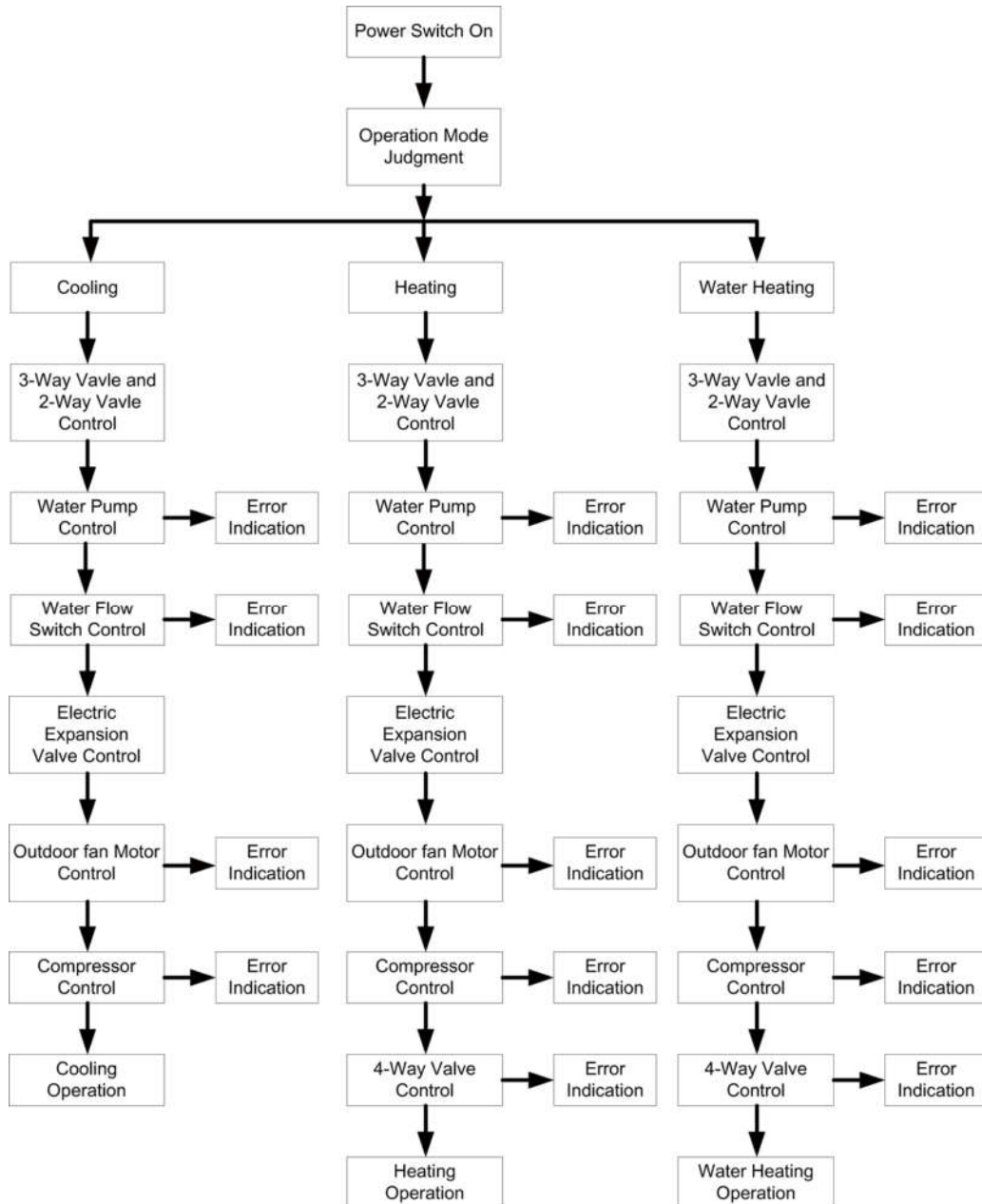
19. The gate control function can be set to be "On" or "Off" at the function setting page of the wired controller. When this function has been activated and it is detected that the gate control card has been drawn out, the unit will shut down and will tell any key operation of the controller is invalid. Then, if it is detected that the gate control card has been inserted in, the unit will resume normal operation.

20. The flow switch of the solar system is mainly used to judge the water flow. When the flow rate is too low, the flow switch will disconnect and immediately the water pump of the solar system will stop. This error will be displayed at the controller and is unrecoverable. When this error is cleared, upon power on again, the unit will restart.



Items 15~ 20 are control parameters input by the filed installed equipment.

## 1.2 Control Flowchart



## 2 Main Control Logics

### 2.1 Cooling

#### 2.1.1 Control to the Compressor

When the unit is controlled by the leaving water temperature, the operating frequency of the compressor will be adjusted by the temperature difference in the way that it increases as the temperature difference goes up and it decreases as the temperature difference goes down. (Temperature difference= actual leaving water temperature-leaving water temperature set point).

#### 2.1.2 Freeze Protection

When it is detected that the leaving water temperature of the plate heat exchanger is lower than the

freeze protection temperature, the compressor will drop its operating frequency until it reaches the minimum operating frequency. Then if it is still detected that the leaving water temperature is lower than the freeze protection temperature, the main unit will stop as per the shutdown frequency but the water pump keeps normal operation.

When it is detected that the leaving water temperature of the plate heat exchanger is equal to or larger than the freeze protection withdrawing temperature, freeze protection will exit. At this point, once the compressor has stopped for three minutes and conditions for startup have been satisfied, the compressor will run for cooling.

## **2.2 Heating**

### **2.2.1 Control to the Compressor**

When the unit is controlled by the leaving water temperature, the operating frequency of the compressor will be adjusted by the temperature difference in the way that it increases as the temperature difference goes up and it decreases as the temperature difference goes down. When the compressor reaches the minimum frequency but the temperature frequency is still quite large, the unit will shut down (temperature difference= actual leaving water temperature-leaving water temperature set point).

### **2.2.2 Over-temperature Protection**

When the compressor is running and it is detected that the leaving water temperature of the auxiliary electric heater is higher than the over-temperature protection temperature, the compressor will lower its frequency to the minimal. Then if it is still detected that the leaving water temperature of the auxiliary electric heater is higher than the over-temperature protection temperature, all loads except the water pump of the main unit and the 4-way valve will stop. Over-temperature protection will exit until the leaving water temperature of the auxiliary electric heater is lower than the over-temperature withdrawing temperature. After that, the unit will resume normal operation.

### **2.2.3 Control to the Optional Electric Heater**

When the Optional electric heater is deactivated through the wired controller, it will never come into operation. When it is activated, it will run based on the outdoor temperature.

Note: If electric heating is directly connected to the unit control, the maximum power should not exceed 500W

## **2.3 Water Heating**

Water heating can be achieved by either the solar system or the main unit (heat pump).

### **2.3.1 Water Heating by the Main Unit**

1) When the outdoor temperature is out of the operation range, the compressor will not start, and water heating will be done by the water tank heater.

2) When the outdoor temperature is within the operation range, water heating will be done by the main unit. The output frequency of the compressor will be adjusted by the difference between the water tank temperature set point and the actual water tank temperature.

3) Control to the Water Tank Electric Heater

a. when the water tank temperature set point is lower than the maximum value of the water heating range of the main unit, the auxiliary electric heater of the main unit will run depending on the temperature difference, and the water tank keeps shut-down.

b. when the water tank temperature set point is higher than the maximum value of the water heating

range of the main unit but the actual water tank temperature is lower than the maximum value of the water heating range of the main unit, the auxiliary electric heater of the main unit will run depending on the temperature difference. If the actual water tank temperature is higher than the maximum value of the water heating range of the main unit, the water tank heater will start. At any time, only one between the auxiliary electric heater and the water tank heater is allowed to run.

### **Over-temperature Protection for Water Heating**

When the compressor is running, if it is detected that the leaving water temperature of the auxiliary electric heater of the main unit is higher than the over-temperature protection temperature, the compressor will lower its operating frequency until it reaches the minimal operating frequency. At this point, if it is still detected that leaving water temperature is still lower than the over-temperature protection, all loads except the water pump of the main unit and the 4-way valve will stop. Over-temperature protection will exit when the leaving water temperature is lower than the over-temperature protection temperature. Then, the main unit will resume normal operation.

### **2.3.2 Water Heating by the Solar System**

When the solar water heating system is equipped but temperature difference ( it is the difference of solar panel temperature and the actual water tank temperature) for startup is not satisfied, the water pump of the solar system will not start. When the temperature difference is satisfied, the water pump will start. However, when it is detected that the water tank temperature reaches the set point, or the entering/leaving water temperature difference of the solar panel is too small, then this water pump will stop running.

## **2.4 Shutdown**

There are three kinds of shutdown conditions: normal shutdown, shutdown with some error, shutdown for protection

Shutdown sequence: for normal shutdown, the compressor lowers its frequency firstly to the minimum value, while for shutdown with some error or for protection, the compressor will stop directly. Then, the electrostatic expansion valve turns to the maximum opening angle; the fan stops after the compressor has stopped; the water pump of the main unit stops after the compressor has stopped; the electrostatic expansion valve turns the maximum opening angle to the fixed opening angle.

During shutdown under the heating and water heating modes, the 4-way valve will be powered off after the compressor has stopped.

For shutdown owing to some error (except the communication error) or protection, the 4-way valve will keep the power-on status.

For shutdown owing to communication between the unit and the wired controller, the 4-way valve will be powered off some timer later.

For shutdown with some error or for protection, the electrostatic expansion valve will keep the maximum opening angle.

## **2.5 Control to the Compressor**

When the unit is controlled by the leaving water temperature, the output frequency of the compressor is adjusted by the difference between the actual water temperature and the leaving water temperature set point. When the unit is controlled by the room temperature, the output frequency of the compressor is adjusted by the difference between the actual room temperature and the room temperature set point.

## 2.6 Control to the Fan

Under the cooling mode, the operating frequency of the fan is adjusted according to pressure at the high pressure side. Under the heating or water heating mode, the operating frequency of the fan is adjusted according to the pressure at the low pressure side. During defrosting, the fan stops and resumes operation when defrosting ends up.

## 2.7 Control to the 4-way Valve

The 4-way valve always keeps on under the cooling mode and will off after the compressor starts up under the heating or water heating mode. When the unit comes into defrosting, the 4-way valve will be on and resume the off status when defrosting ends up. For shutdown under the heating mode, the 4-way valve will be closed after the compressor stops.

## 2.8 Control to the Water Pump

The water pump firstly will run at the initialized speed and then adjust the speed according to the entering/leaving water temperature difference. When the temperature difference is large, the fan runs at the high speed. When the temperature difference is small, the fan runs at the low speed.

## 2.9 Control the Electrostatic Expansion Valve

There are two electrostatic expansion valves for two-stage throttling control. The opening angle of the first-stage electrostatic expansion valve is adjusted based on the ratio of readings of the high-pressure sensor, low-pressure sensor and enthalpy-adding sensor. The opening angle of the second-stage is adjusted based on the suction superheating degree.

## 2.10 Protection Control

### (1) Compressor Low-pressure Protection

When it is detected continuously that pressure at the low side is too low, then low-pressure protection will occur and this error will be displayed at the controller, all loads act as per the shutdown sequence. This error is unrecoverable and can be cleared unless repowered on.

### (2) High Discharge Temperature Protection

When it is detected continuously that the discharge temperature is higher than the recoverable temperature, the electrostatic expansion valve will turn to the maximum opening angle with large step until the discharge temperature is lower than the recoverable temperature. However, if this condition remains, the compressor will restrict the frequency output or lower its frequency three times. At any time, if it is detected that the discharge temperature is higher than the set point for protection for three seconds, the compressor will stop and the unit comes into high discharge temperature protection.

### (3) Compressor Hi-pressure Protection

In any case, when it is detected that the high-pressure switch acts, the unit will come into high-pressure protection three seconds later. This protection is unrecoverable.

### (4) Flow Switch Protection

In any case, when it is detected that the flow switch of the main unit disconnects, then all loads except the water pump of the solar system and the auxiliary electric heater of the water tank will stop. This protection is unrecoverable. The unit is allowed to be restart only after this error is cleared and the unit is repowered on.

(5) Communication Error

When the indoor unit main board or drive board does not receive correctly any data from the unit main board, all loads will stop.

### 3 Controller

#### 3.1 General



(This picture is just for reference)

This display panel uses the capacitor touch screen for input operation. The valid touching area indicates the black rectangle when the display panel lights off.

This control panel is of high sensitivity and will response to unexpected click by the foreign matters on the display panel. Therefore, please keep it clean during operation.

This is a generous-purpose controller, whose control functions might not be completely the same as those of the actually purchased. As the control program will update, the actual always prevails.

### 3.1.1 Homepage

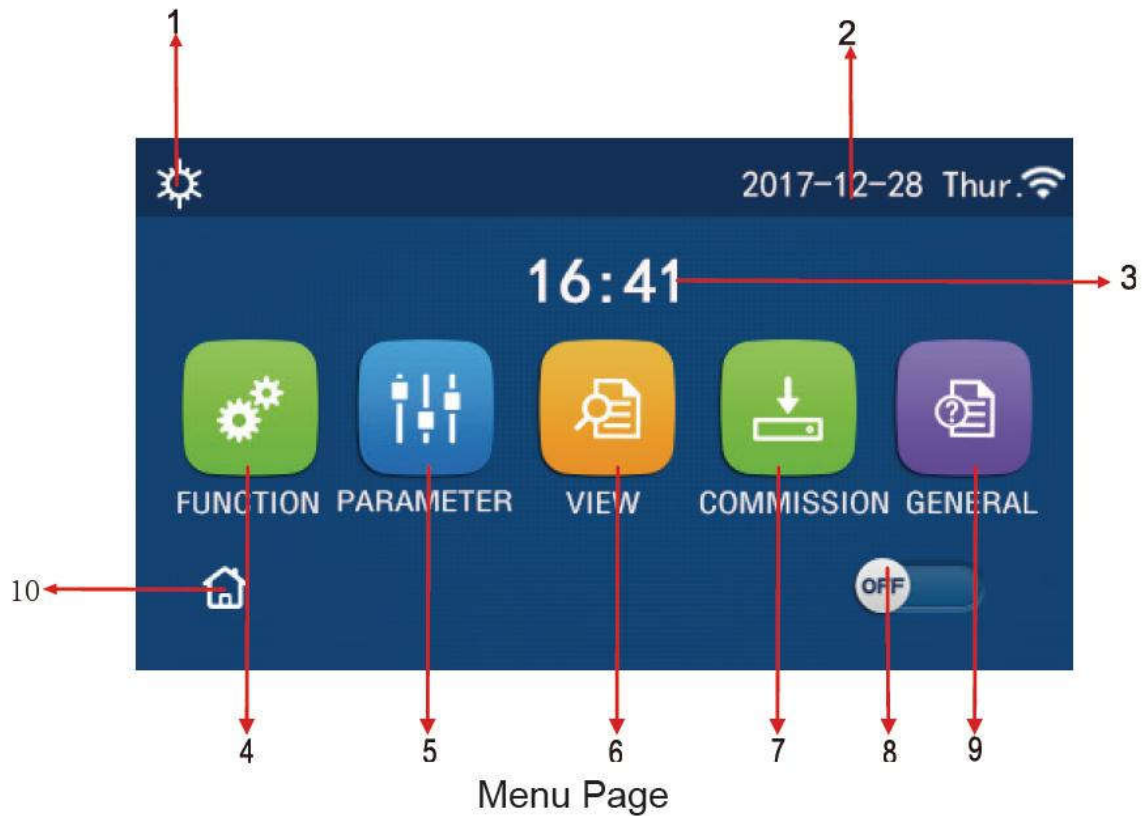


Icon	Description	Icon	Description
	Space heating		Outdoor temperature
	Space cooling		Leaving water temperature of the main unit, leaving water temperature of the auxiliary electric heater, remote room temperature
	Water heating		Error
	Menu		Card out/Failed disinfection
	Switchover between cooling and heating		ON/OFF

#### [Notes]

- The “ON/OFF” icon will turn to green when the control is turned on.
- When the control mode is “Room temperature”, the temperature displayed at the upper right corner indicates the remote room temperature; when the control mode is “leaving water temperature”, it indicates the leaving water temperature of the auxiliary electric heater under the water heating mode, or the leaving water temperature of the main unit under the cooling/heating mode or combined modes.
- Under the combined modes, the temperature set point is for space heating or cooling. Only under the water heating mode, it is for water heating.
- It will go back automatically to the homepage when there is no any operation in ten minutes.

### 3.1.2 Menu Page























Above the menu, the corresponding icon will be displayed based on the mode and status of the controller.

Menu Page

No	Item	Description
1	Current mode	Current mode
2	Data	Current data
3	Time	Current time
4	Function setting	Go to the user setting page.
5	Parameter setting	Go to the parameter setting page.
6	Parameter viewing	Go to the parameter viewing page.
7	Commissioning parameters	Go to the commissioning parameter setting page.
8	ON/OFF	It is used to turn on or off the unit. "OFF" indicates the unit has turned off and "ON" indicates the unit has turned on. When there is failure-level error, this button will turn to OFF once the unit is automatically turned off.
9	General setting	Go to the general parameter setting page.
10	Homepage	Back to the home page.

## Control

Icon	Description	Icon	Description
	Heating		Floor commissioning
	Cooling		Floor commissioning error
	Hot water		Card out
	Heating + Hot water		Defrosting
	Hot water + Heating		Holiday
	Cooling + Hot water		WiFi
	Hot water + Cooling		Back
	Quiet		Menu page
	Sanitation		Save
	Emergency		Error

### [Notes]

- The “Cooling” mode is unavailable to the heating only unit.
- The “Hot water” mode is unavailable to the heating only unit.
- The “Heating + Hot water” ( “Hot water” takes the priority) is unavailable to the mini chiller.
- The “Hot water + Heating” ( “Heating” takes the priority) is unavailable to the mini chiller.
- The “Cooling + Hot water” ( “Hot water” takes the priority) is unavailable to the mini chiller.
- The “Hot water + Cooling” ( “Cooling” takes the priority) is unavailable to the mini chiller.
- The “Sanitation” function is unavailable to the mini chiller.



- As shown in the figure below, the error icon will appear at the upper left corner when any error exists.



Error Icon

[Notes]

- At any other page, where there is no operation in 10 minutes, the display panel will back to the menu page.

### 3.1.3 Backlight

Among the general setting page, when “Back light” is set to “Energy save”, the display panel will light off when there is no operation in 5 minutes. However, it will light on again by touching any valid area.

When “Back light” is set to “Lighted”, the display panel will be kept lighting on.

It is suggested to set it to “Energy save” so as to extend its service life,

## 3.2 Operation Instructions

### 3.2.1 ON/OFF

[Operation Instructions]

- ★At the menu page, by touching ON/OFF, the unit will be turned on/off.

[Notes]

- It is defaulted to be OFF upon first power-on.
- ON/OFF operation will be memorized by setting “On/Off Memory” to be “On” at the “GENERAL.” setting page. That is, in case of power failure the unit will resume running upon power recovery. Once “On/off Memory” is set to be “Off”, in case of power failure the unit will keep “Off” upon power recovery.

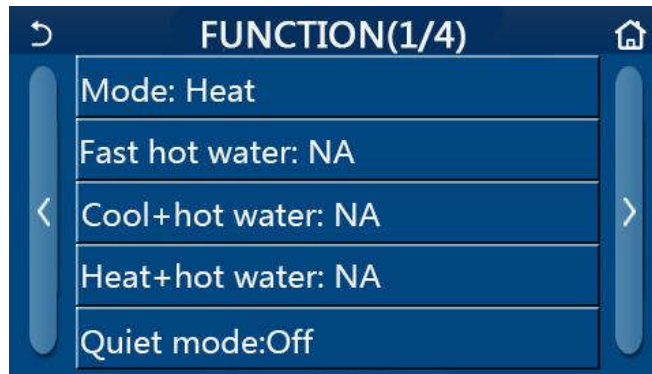


ON Page

### 3.2.2 Function Setting

[Operation Instructions]

★1. At the menu page, by touching “**FUNCTION**”, it will go to the function setting page as shown in the figure below.



FUNCTION Setting Page

★2. At the function setting page, by touching the page turning key, it will access to the last or next page. When setting is finished, by touching the homepage icon, it will directly back to the homepage; by touching the back icon, it will back to the upper menu.

★3. At the function setting page, by pressing the desired function, it will access to the corresponding setting page of this option.

★4. At the function setting page of some function option, by touching “OK”, this setting will be saved; by touching the “CANCEL” key, this setting will be canceled.

[Notes]

●At the function setting page with setting of any function changed, if the function is set to be memorized upon power failure, this setting will be saved automatically and memorized upon next power-on.

●When there is submenu for the selected function option, by pressing it the control will go directly the setting page of the submenu.

Function Setting

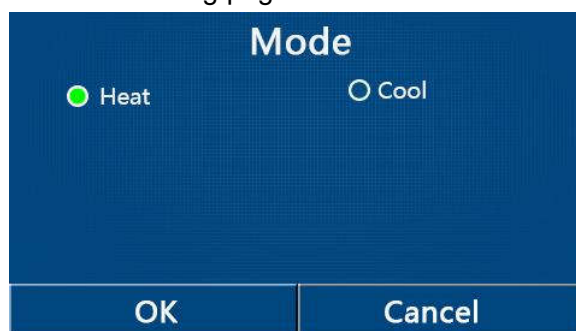
No	Item	Range	Default	Remarks
1	Mode	Cool	Heat	1. When the water tank is unavailable, then only “Cool” and “Heat” are available. 2. For the heating only unit, only “Heat” mode, “Hot water”, and “Heat + hot water” are available.
		Heat		
		Hot water		
		Cool + Hot water		
		Heat + Hot water		
2	Fast hot water	On/Off	Off	1. When the water tank is unavailable, it will be reserved.
3	Cool + hot water	Cool/Hot water	Cool	1. When the water tank is available, it will be defaulted to be “Hot water”; when unavailable, it will be reserved.
4	Heat + hot water	Heat/Hot water	Heat	1. When the water tank is available, it will be defaulted to be “Hot water”; when unavailable it will be reserved.
5	Quiet mode	On/Off	Off	
6	Quiet timer	On/Off	Off	

No	Item	Range	Default	Remarks
7	Weather depend	On/Off	Off	
8	Weekly timer	On/Off	Off	
9	Holiday release	On/Off	Off	
10	Disinfection	On/Off	Off	When the water tank is unavailable, it will be reserved 1. The disinfection date ranges from Monday to Sunday. Saturday is defaulted. 23: 00. 2. The disinfection time ranges from 00:00~23:00. 23:00 is defaulted.
11	Clock timer	On/Off	Off	
12	Temp. timer	On/Off	Off	
13	Emergen. mode	On/Off	Off	
14	Holiday mode	On/Off	Off	
15	Preset mode	On/Off	Off	
16	Error reset	/	/	Some error can be cleared only when it has been reset manually.
17	WiFi reset			It is used to reset the WiFi.
18	Reset	/	/	It is used to reset all user parameter setting.

### 3.2.2.1 Mode

[Operation Instructions]

★At the function setting page with the unit turned off, by touching “**Mode**”, it will go to the mode setting page, where desired mode can be selected. Then by touching “OK” this setting will be saved and the display panel will back to the function setting page.



[Notes]

- The default mode is “**Heat**” upon first power-on.
- Mode setting is allowed only when the unit is turned off, otherwise a dialog box will pop up, saying “**Please turn off the system first!**”
- When the water tank is unavailable, only ‘**Heat**’ and “**Cool**” mode are allowed.
- When the water tank is available, “**Cool**”, “**Heat**”, “**Hot water**”, “**Cool+ Hot water**”, and “**Heat+ Hot water**” are allowed.

- For the heat pump, the “**Cool**” mode is allowed; for the heating only unit, “**Cool+ Hot water**” and “**Cool**” are unallowable.
- This setting can be memorized upon power failure.

### 3.2.2.2 Fast Hot Water

[Operation Instructions]

★ At the function setting page with the unit turned off, by touching “**Fast hot water**”, the display panel will go to the corresponding setting page, where desired option can be selected. Then by pressing “**OK**” this setting will be saved and the display panel will back to the function setting page.

[Notes]:

- This function can be set to “**On**” only when the water tank is available. When the water tank is unavailable, this function will be reserved.
- It will be memorized upon power failure.

### 3.2.2.3 Cool + hot water

[Operation Instructions]

★ At the function setting page with the unit turned off, by touching “**Cool + hot water**”, the display panel will go to the corresponding setting page, where desired option can be selected. Then by pressing “**OK**” this setting will be saved and the display panel will back to the function setting page.

[Notes]

- When the water tank is unavailable, it will be reserved; when it is unavailable, the default priority will be given to “**How water**”.
- It will be memorized upon power failure.

### 3.2.2.4 Heat + hot water

[Operation Instructions]

★ At the function setting page with the unit turned off, by touching “**Heat + hot water**”, the display panel will go to the corresponding setting page, where desired option can be selected. Then by pressing “**OK**” this setting will be saved and the display panel will back to the function setting page.

[Notes]

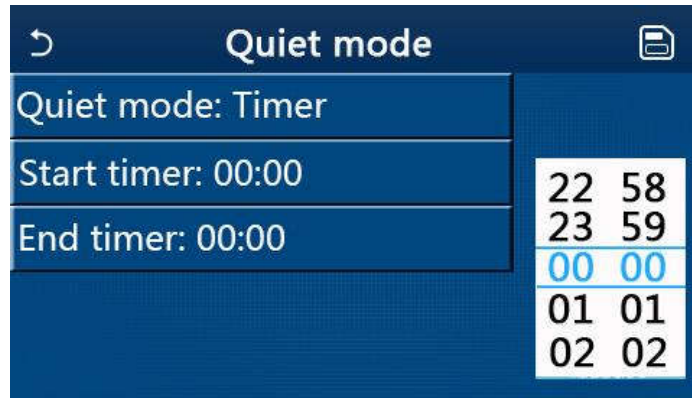
- When the water tank is unavailable, it will be reserved; when it is unavailable, the default priority will be given to “**How water**”.
- It will be memorized upon power failure.

### 3.2.2.5 Quiet Mode

[Operation Instructions]

★ At the function setting page with the unit turned off, by touching “**Quiet mode**”, there will be a choice box, where “**Quiet mode**” can be set to “**On**”, “**Off**”, or “**Timer**”.

★ When it is set to “**Timer**”, it is also required to set the “**Start timer**” and “**End timer**”. Unless otherwise stated, otherwise time setting is all the same.



Timer for Quite Mode

★ 3. This setting will be saved by touching the corner at the upper right corner.

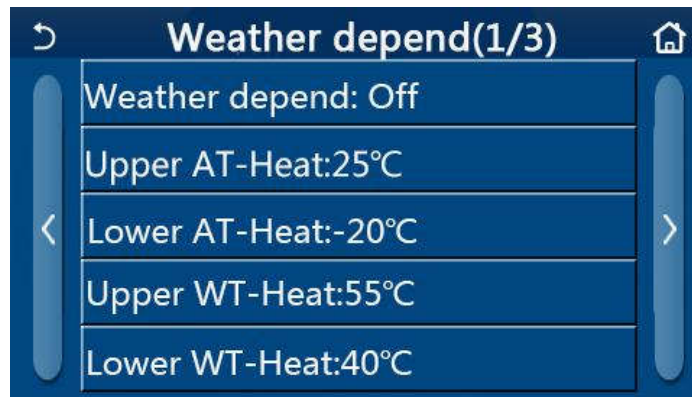
[Notes]

- It can be set under both ON and OFF statuses, but will work only when the main unit is turned on.
- When it is set to “On”, it will automatically back to “Off” when the main unit is turned off; while it is set to “Timer”, this setting will remain when the main unit is turned off and can only be canceled manually.
- It will be memorized upon power failure.

### 3.2.2.6 Weather Depend

[Operation Instructions]

★ At the function setting page, by touching “**Weather depend**”, there will be a choice box, where it is able to set it to “On” or “Off”, and also it is able to set the weather-dependent temperature.



Page of the Weather Depend

[Notes]

- When “**Weather depend**” has been activated; it cannot be deactivated by ON/OFF operation but done manually.
- It is available to find the weather-dependent target temperature at that parameter viewing pages.
- When this function has been activated, it is still allowed to set the room temperature, however, this setting becomes valid only when “**Weather depend**” has been deactivated.
- This function can be set to “On” no matter the unit is turned on or off, but works only when the unit is turned on.
- This function only works for air conditioning. Under the “**Hot water**” mode, it cannot be activated.
- It will be memorized upon power failure.

### 3.2.2.7 Weekly Timer

[Operation Instructions]

★1. At the function setting page, by touching “**Weekly timer**”, it will go to the setting page as shown below.

Weekly timer	
Weekly timer: Off	
Mon. : Invalid	Tue. : Invalid
Wed. : Invalid	Thur. : Invalid
Fri. : Invalid	Sat. : Invalid
Sun. : Invalid	

★2. At the “**Weekly timer**” setting page, as shown in the figure below, the weekly timer can be set to “**On**” or “**Off**”.

★3. At the “**Weekly timer**” setting page, by touching the desired day (Monday ~ Sunday) it will access to the setting page of this option.

★4. At the weekday setting page, it is able to set the timer to “**Valid**” or “**Invalid**”. Also, it is able to set three timing periods, each of which can be set to “**Valid**” or “**Invalid**”.

★5. Then, by touching the “**Save**” icon, this setting will be saved.

[Notes]

- Three periods can be set for each day. The start time should be earlier than the end time for each period, otherwise this setting will be invalid. In the same way, the latter should be earlier than the former.

- When the weekly timer has been activated, the display panel will act based on the current mode and temperature setting.

- Timer setting for the weekday

“**Valid**” it indicates this setting works only when “**Weekly timer**” has been activated, unaffected by the holiday mode.

“**Invalid**” indicates this setting does not work even though the “**Weekly timer**” has been activated.

- It will be memorized upon power failure.

### 3.2.2.8 Holiday Release

[Operation Instructions]

★At the function setting page, by touching “**Holiday release**”, it will go to the corresponding setting page, where it can be set to “**On**” or “**Off**”.

[Notes]

- When this function has been activated, at the “**Weekly timer**” setting page, some week day can be set to “Holiday release”. In this case, the setting of the “Weekly timer” at this day is invalid unless it has been manually set to “**Valid**”.

- It will be memorized upon power failure.

### 3.2.2.9 Disinfection

[Operation Instructions]

★ At the function setting page, access to “**Disinfection**” setting page.

★ At the “**Disinfection**” setting page, it can select the disinfection clock, disinfection temperature and disinfection week and the corresponding setting page will pop up at the right side.

★ Then, this setting will be saved by touching the “**Save**” icon.



[Notes]

- This setting can be activated only when “**Water tank**” is set to “**With**”. When “**Water tank**” is set to “**Without**”, this function will be deactivated.
- This setting can be done no matter if the unit is turned on or off.
- When “**Emergen.mode**”, “**Holiday mode**”, “**Floor debug**”, “**Manual defrost**”, or “**Refri. recovery**” has been activated, this function cannot be activated at the same time. When “**Disinfection**” has been activated, “**Emergen.mode**”, “**Holiday mode**”, “**Floor debug**”, “**Manual defrost**”, or “**Refri. recovery**” setting will fail and a window will pop up, saying “**Please disable the disinfect mode!**”
- “**Disinfection**” can be activated no matter if the unit is turned on or off. This mode will take priority over the “**Hot water**” mode.
- When disinfection operation fails, the display panel will tell “**Disinfection fail!**”. Then, by pressing OK it will be cleared.
- When “**Disinfection**” has been activated, if communication error with the indoor unit or malfunction of the water tank heater occurs, it will automatically quit.
- It will be memorized upon power failure.

### 3.2.2.10 Clock Timer

[Operation Instructions]

★ At the function setting page, access to the “**Clock timer**” setting page.

★ At the “**Clock timer**” setting page, it can be set to “**On**” or “**Off**”.



★ The option “**Mode**” is used to time the desired mode; “**WOT-Heat**” and “**T-water tank**” is used to set



the corresponding water temperature; “**Period**” is used to for time setting. After that, by touching the “**Save**” icon, all settings will be saved.



[Notes]

- When “**Clock timer**” has been set and “**Hot water**” mode is involved, in this case, if “**Water tank**” is changed to “**Without**”, “**Hot water**” will be automatically switched to “**Heat**”, and “**Cool/Heat + Hot water**” will be switched to “**Cool/Heat**”.
- When “**Weekly timer**” and “**Clock timer**” have been set at the same time, the priority will be given to the former.
- When the water tank is available, “**Heat**”, “**Cool**”, “**Hot**”, “**Heat + Hot water**”, and “**Cool + Hot water**” are allowed; however, when the water tank is unavailable, only “**Heat**” and “**Cool**” are allowed.
- When the end time is earlier than the start time, this setting is invalid.
- Water tank temperature can be set only when “**Hot water**” is involved in the operation mode.
- The setting of “**Clock timer**” only works once. If this setting is needed again, it should be set again.
- It will be deactivated when the unit is turned on manually.
- This function will be memorized upon power failure.

### 3.2.2.11 Temp. Timer

- ★ At the function setting page, access to the “**Temp.timer**” setting page.
- ★ At the “**Temp.timer**” setting page, it can be set to “**On**” or “**Off**”.



- ★ Select “**Period 1**”/”**Period 2**” and a window will pop up, where time period can be set. Then select “**WT-Heat1/WT-Cool 1/2**” and also a window will pop up where temperature can be set”.





[Notes]

- When “**Weekly timer**”, “**Preset mode**”, “**Clock timer**” “**Temp. timer**” have been set at the same time, then the latter takes the priority.
- This setting is valid only when the unit is turned on.
- Under the “**Cool**” or “**Cool+Hot water**” mode, the setting targets at “**WT-Cool**”; while under the “**Heat**” or “**Heat+Hot water**” mode, the setting targets at “**WT-Heat**”.
- When start time of period 2 is the same as that of period 1, then the former takes prevalence.
- ”Temp.timer” is judged based on timer.
- During this setting, when temperature is set manually, then this setting will take prevalence.
- Under the “**Hot water**” mode, this function will be reserved.
- This function will be memorized upon power failure.

### 3.2.2.12 Emergen. Mode

[Operation Instructions]

- ★At the function setting page, set the mode to “**Heat**” or “**Hot water**”.
- ★At the function setting page, select “**Emergen.mode**” and set it to “**On**” or “**Off**”.
- ★When “**Emergen.mode**” has activated, the corresponding icon will appear at the upper side of the menu page.
- ★When the mode is not set to “**Heat**” or “**Hot water**”, the display panel will tell “**Wrong running mode!**”

[Notes]

- The emergency mode is allowed on conditions that there is some error or protection and the compressor has stopped at least for three minutes. If the error or protection has not been recovered, the unit can access to the emergency mode through the wired controller (when the unit is off).
- Under the emergency mode, “**Hot water**” or “**Heat**” cannot be performed at the same time.
- When the running mode is set to “**Heat**”, if “**Other thermal**” or “**Optional E-Heater**” is set to “**Without**”, the unit will fail to access to the “**Emergen. mode**”.
- When the unit performs “**Heat**” under “**Emergen. mode**” and the controller detects “**HP-Water Switch**”, “**Auxi. heater 1**”, “**Auxi. heater 1**”, and “**Temp-AHLW**”, this mode will quit at once. In the same way, when errors mentioned above occur, “**Emergen. mode**” cannot be activated.
- When the unit performs “**Hot water**” under “**Emergen. mode**” and the controller detects “**Auxi.-WTH**”, this mode will quit at once. In the same way, when errors mentioned above occur, “**Emergen. mode**” cannot be activated.
- When this function has been activated, “**Weekly timer**”, “**Preset mode**”, “**Clock timer**”,and “**Temp timer**” will be deactivated. Beside “**On/Off**”, “**Mode**”, “**Quiet mode**”, “**Weekly timer**”, “**Preset mode**”, “**Clock timer**”,and “**Temp timer**” operation are unavailable.
- Under “**Emergen. mode**”, the thermostat does not work.
- This function can be activated only when the unit is turned off. If dosing so with the unit keeping “**On**”,

a window will pop up, saying “**Please turn off the system first!**”.

- “**Floor debug**”, “**Disinfection**”, and “**Holiday mode**” cannot be activated at the same with this function. When doing so, a window will pop up, saying “**Please disable the emergen. mode!**”.
- Upon power failure, “**Emergen. mode**” will back to “**Off**”.

### 3.2.2.13 Holiday Mode

[Operation Instructions]

★At the function setting page, select “**Holiday mode**” and set it to “On” or “Off”.

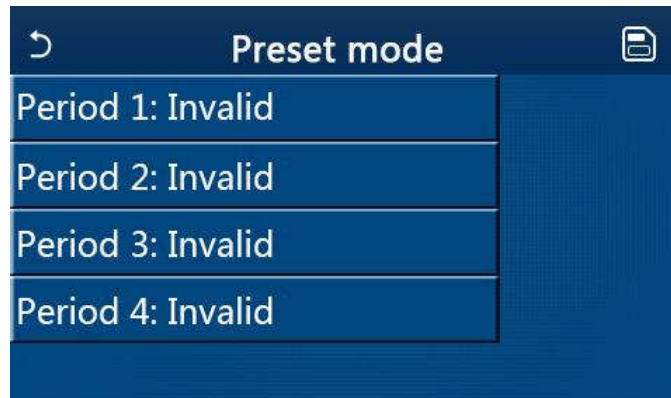
[Notes]

- This function can be activated only when the unit has been turned off, otherwise a prompt dialog box will pop up, saying “**Please turn off the system frist!**”.
- When “**Holiday mode**” has been activated, the operation mode will automatically switch to “**Heat**”. Mode setting and “**On/Off**” operation through the controller will be unavailable.
- When “**Holiday mode**” has been activated, the controller will automatically deactivate the “**Weekly timer**” and “**Preset mode**”and “**Clock timer**” and “**Temp.timer**”.
- Under the “**Holiday mode**”, when the unit is under the control of room temperature, the set point (room temperature for heating) should be set to 10°C; when it is under the control of leaving water temperature, the set point (leaving water temperature for heating) should be 30°C.
- When this function has been activated, “**Floor debug**”, “**Emergen.mode**”, “**Disinfection**”, “**Manual defrost**”, “**Preset mode**”, “**Weekly timer**”, “**Clock timer**”, and “**Temp.timer**” cannot be activated at the same time, meanwhile a window will pop up, saying “**Please disable the holiday mode!**”.
- This function will be memorized upon power failure.

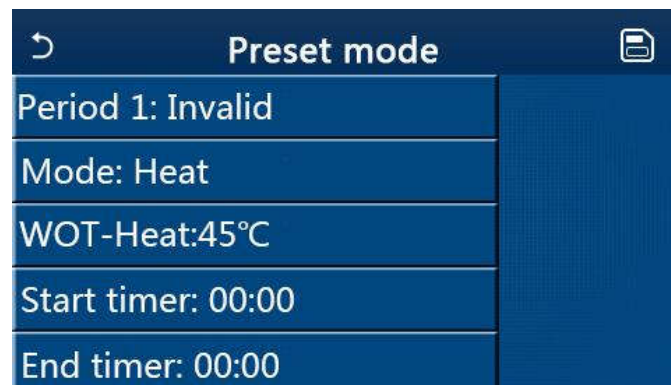
### 3.2.2.14 Preset Mode

[Operation Instructions]

- ★ At the function setting page, select “**Preset mode**” and go to the corresponding setting page.



- ★ At the time period setting page, each time period can be set to “**Valid**” or “**Invalid**”.



- ★ The option “**Mode**” is used to preset the mode; “**WOT-Heat**” is used to set the leaving cold/hot water temperature; “**Start timer**” / “**End timer**” is used to for time setting. After that, by touching the “**Save**” icon, all settings will be saved.

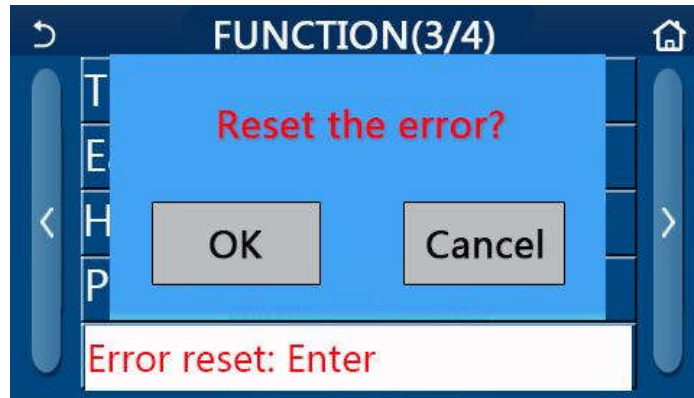
[Notes]:

- When “**Preset mode**” has been set to “**Hot water**” and “**Water tank**” is to set to “**Without**”, the preset “**Hot water**” mode will be automatically switched to “**Heat**”.
- When “**Weekly timer**” and “**Preset mode**” both have been set, priority will be given to the latter.
- When the water tank is available, the preset mode can be “**Heat**”, “**Cool**”, or “**Hot water**”; however, when the water tank is unavailable, the preset mode can only be “**Heat**” or “**Cool**”.
- “**Start timer**” should be earlier than “**End timer**”, otherwise a dialog will pop up, saying “time setting wrong”.
- The setting for “**Preset mode**” will works until it has been canceled manually.
- When “**Start timer**” is reached, the unit will perform the preset mode. In this case, mode and temperature setting are still allowed but will not be saved to the preset mode. When “**End timer**” is reached, the unit will perform OFF operation.
- This function will be memorized upon power failure.

### 3.2.2.15 Error Reset

[Operation Instructions]

- ★ At the function setting page, by touching “**Error reset**”, a choice box will pop up, where by touching “**OK**” the error will be reset and by touching “**Cancel**” the error will not be reset.



[Notes]:

- It can be performed only when the unit is turned off.

### 3.2.2.16 WiFi Reset

[Operation Instructions]

★At the function setting page, by touching “WiFi”, a choice box will pop up, where by touching “OK” , the WiFi setting will be reset, and by touching “Cancel” the choice box will quit and WiFi will not be reset.

### 3.2.2.17 Reset

[Operation Instructions]

★At the function setting page, by touching “Reset”, a choice box will pop up, where by touching “OK” all user parameter settings will be reset and by touching “Cancel” it will back to the function setting page.

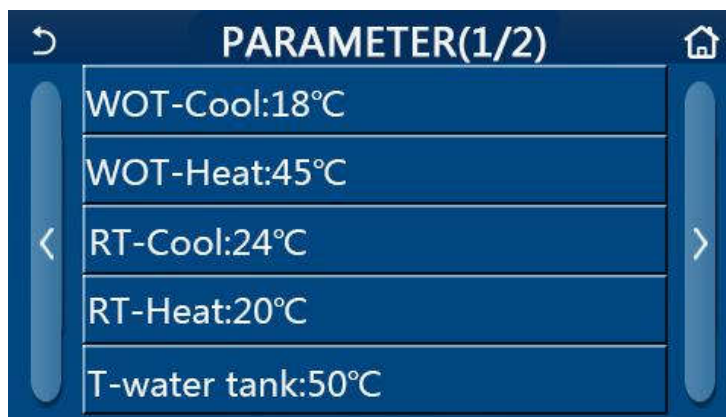
[Notes]:

- This function is allowed only when the unit has turned off.
- This function is valid for “Temp. timer”, “Clock timer”, “Preset mode”, “Weekly timer”, and “Weather depend”.

## 3.2.3 User Parameter Setting

[Operation Instructions]

★1. At the menu page, by touching “PARAMETER”, it will back to the parameter setting page, as shown in the figure below.



Parameter Setting Page

★2. At the menu setting page, by touching the page turning keys, it is able to switch to the page where the desired parameter is.

★3. After that, this setting will be saved by touching “OK” and then the unit will run based on this setting. While this setting will give up by touching “Cancel”.

[Notes]:

- For parameters with different defaults under different conditions, when conditions changes, the

default value also will change as the corresponding condition changes.

- All parameters will be memorized upon power failure.

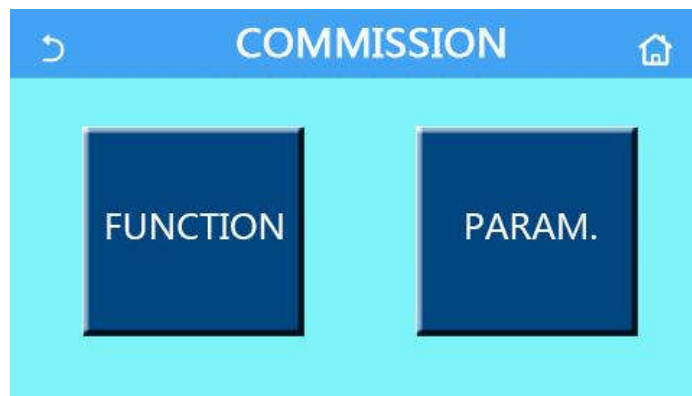
#### Parameter Setting

No	Full Name	Displayed Name	Range	Range	Default	Remarks
			(°C)	(°F)		
1	Leaving water temperature for cooling(T1)	WOT-Cool	7~25°C	45~77°F	18°C/64°F	
2	Leaving water temperature for heating (T2)	WOT-Heat	20~60°C	68~140°F	45°C/113°F	High-temp series units
3	Room temperature for cooling (T3)	RT-Cool	18~30°C	64~86°F	24°C/75°F	
4	Room temperature for heating (T4)	RT-Heat	18~30°C	64~86°F	20°C/68°F	
5	Water tank temperature(T5)	T-water tank	40~80°C	104~176°F	50°C/122°F	
6	Leaving water temperature difference for cooling ( $\Delta t_1$ )	$\Delta T$ -Cool	2~10°C	36~50°F	5°C/41°F	
7	Leaving water temperature difference for heating ( $\Delta t_2$ )	$\Delta T$ -Heat	2~10°C	36~50°F	10°C/50°F	
8	Leaving water temperature difference for water heating ( $\Delta t_3$ )	$\Delta T$ -hot water	2~8°C	36~46°F	5°C/41°F	
9	Room temperature control difference ( $\Delta t_4$ )	$\Delta T$ -Room temp	1~5°C	34~41°F	2°C/36°F	

### 3.2.4 Commissioning Parameter Setting

[Operation Instructions]

★1. At the menu page, by touching “**Commission**”, it will access to the commissioning parameter page, where the left side is for the function setting and the right side is for the parameter setting, as shown in the figure below.



[Notes]

- At the commissioning parameter setting page, when the state of any function changes, the system

will automatically save this change and this change will remain upon power failure.

- Do not modify any commissioning parameter except the approved qualified servicemen, as it would give birth to adverse effects to the unit.

#### Commissioning Function Setting

No	Item	Range	Default	Description
1	Ctrl. state	T-water out/T-room	T-water out	When “ <b>Remote sensor</b> ” is set to “ <b>With</b> ”, it can be set to “ <b>T-room</b> ”.
2	2-Way valve	Cool 2-Way valve, On/Off	Off	It will decide the status of the 2-way valve under the “ <b>Cool</b> ” and “ <b>Cool + Hot water</b> ” modes.
		Heat 2-Way valve, On/Off	On	It will decide the status of the 2-way valve under the “ <b>Heat</b> ” and “ <b>Heat + Hot water</b> ” modes
5	Solar setting	With/Without	Without	<ol style="list-style-type: none"> <li>1. When the water tank is unavailable, this setting will be reserved.</li> <li>2. When it is set to “<b>With</b>”, the solar kitting will work on its own.</li> <li>3. When it is set to “<b>Without</b>”, hot water by the solar kitting is unavailable.</li> </ol>
6	Water tank	With/Without	Without	
7	Thermostat	Without/Air/Air+ hot water	Without	<ol style="list-style-type: none"> <li>1. This setting cannot be interchanged between “<b>Air</b>” and “<b>Air+ hot water</b>” directly but via “<b>Without</b>” this option</li> <li>2. Each time when “<b>Air</b>” or “<b>Air + hot water</b>” is switched to “<b>Without</b>”, the unit will go to the OFF status. Meanwhile, the control will send out “<b>OFF</b>” command for consecutive 40 seconds (it is longer than the communication error, and the “<b>ON</b>” command can be performed only when 40 seconds have been expired.</li> </ol>
8	Other thermal	With/Without	Without	
9	Optional E-Heater	Off/1/2	Off	
10	Remote sensor	With/Without	Without	When it set to “ <b>Without</b> ”, and the “ <b>Ctrl. state</b> ” will be defaulted to be “ <b>T-water out</b> ”.
11	Air removal	On/Off	Off	
12	Floor debug	On/Off	Off	
13	Manual defrost	On/Off	Off	
14	Force mode	Off/Force-cool/Force-heat	Off	
15	Tank heater	Logic 1/Logic 2	Logic 1	This setting is allowed when the water tank is

## Control

No	Item	Range	Default	Description
				available and the unit is OFF.
16	Gate-Ctrl.	On/Off	Off	
17	C/P limit	Off/Current limit/Power limit	Off	Current limit: it ranges from 0 to 50A and the default is 16A. Power limit: it ranges from 0.0 to 10.0kW and the default is 3.0kW.
18	Address	[1-125] [127-253]	1	
19	Refri. recovery	On/Off	Off	
20	Gate-Ctrl memory	On/Off	Off	

### Commissioning Parameters Setting

No	Full Name	Display Name	Range		Default	Remark
1	T-HP max	T-HP max	40~55℃	104~131℉	50℃/122℉	
2	Cool run time	Cool run time	1~10min		3min [2-way valve Off] 5min [2-way valve On]	
3	Heat run time	Heat run time	1~10min		3min [2-way valve Off] 5min [2-way valve On]	

#### 3.2.4.1 Ctrl. state

[Operation Instructions]

- ★ At the commissioning parameter setting page, by touching “**Ctrl. state**”, it can be set to “**T-water out**” or “**T-room**”



[Notes]

- When “**Remote sensor**” is set to “**With**”, this setting can be set to “**T-water out**” or “**T-room**”. When “**Remote sensor**” is set to “**Without**”, this setting can only be set to “**T-water out**”.
- This setting will be memorized upon power failure.

### 3.2.4.2 2-Way valve

[Operation Instructions]

★ At the commissioning parameter setting page, by touching “**Cool 2-Way valve**” or “**Heat 2-Way valve**”, the control panel will access to the corresponding setting page.

[Notes]

- Under “**Cool**”, or “**Cool + Hot water**” mode, “**Cool 2-Way valve**” will decide the status of the 2-way valve; while under “**Heat**” or “**Heat + Hot water**”, “**Heat 2-Way valve**” will decide the status of the 2-way valve.
- It will be memorized upon power failure.

### 3.2.4.3 Solar Setting

[Operation Instructions]

- ★ 1. At the commissioning parameter setting page, by touching “**Solar setting**”, the control panel will access to its submenu page.
- ★ 2. At the submenu page, “**Solar setting**” can be set to “**With**” or “**Without**”.
- ★ 3. At the submenu page, the “**Solar heater**” can be set to “**On**” or “**Off**”.



Solar Setting

[Notes]

- This setting can be done no matter if the unit is turned on or off.
- This setting is allowed only when the water tank is available. When the water tank is unavailable, this setting will be reserved.
- It will be memorized upon power failure.

### 3.2.4.4 Water Tank

[Operation Instructions]

★ At the commissioning parameter setting page, by touching “**Water tank**”, the control panel will access to the corresponding setting page, where “**Water tank**” can be set to “**With**” or “**Without**”.

[Notes]

- This setting will be memorized upon power failure.
- This setting will become valid only when the unit is turned off.

### 3.2.4.5 Thermostat

[Operation Instructions]

- ★ 1. At the commissioning parameter setting page, by touching “**Thermostat**”, the control panel will access to the corresponding setting page.
- ★ 2. At the “**Thermostat**” setting page, it can be set to “**Air**”, “**Without**” or “**Air + hot water**”. When it is set to “**Air**” or “**Air + hot water**”, the unit will run based on the mode set by the thermostat; when it is set to “**Without**”, the unit will run based on the mode set by the control panel.



[Notes]

- When “**Water tank**” is set to “**Without**”, the “**Air + hot water**” mode is unavailable.
- When “**Floor debug**” and “**Emergen.mode**” have activated, function of the thermostat will be invalid.
- When “**Thermostat**” is set to “**Air**” or “**Air + hot water**”, timer function will be disabled and the unit will run based on the mode set by the thermostat. Meanwhile, mode setting and On/Off operation will be ineffective.
- When “**Thermostat**” is set to “**Air**”, the unit will run based on the setting of the thermostat.
- When “**Thermostat**” is set to “**Air + hot water**”, when the thermostat is turned off, the unit can still perform the “**Hot water**” mode. In this case, the ON/OFF icon at the homepage does not indicate the running status of the unit. Running parameters are available at the parameter viewing pages.
- When “**Thermostat**” is set to “**Air + hot water**”, operation priority can be set by the control panel (see Section 2.2.3 and 2.2.4 for more details.)
- The status of the thermostat can be changed only when the unit is turned off.
- When it has been activated, “**Weekly timer**”, “**Clock timer**”, “**Temp.timer**”, and “**Preset mode**” cannot be activated at the same time.
- This setting will be memorized upon power failure.

### 3.2.4.6 Other Thermal

[Operation Instructions]

- ★1. At the commissioning parameter setting page, by touching “**Other thermal**”, the control panel will access to the corresponding setting page.
- ★2. At the “**Other thermal**” setting page, “Other thermal” can be set to “**With**” or “**Without**”, “**T-Other switch on**” can be set to the desired value. When “**Other thermal**” is set to “**With**”, it is allowed to set the operating mode for the backup thermal source.



[Notes]

- This setting will be memorized upon power failure.
- There are three working logics for it.

#### Logic 1

1. The set point of the other thermal should be equal to that of “**WOT-Heat**” in “**Heat**” mode and “**Heat +hot water**” mode; The set point should be the smaller one between “**T-Water tank**” +5°C and 60°C in “**Hot water**” mode.
2. The water pump for other thermal must be always active under the “**Heat**” mode.
3. Under the “**Heat**” mode, the 2-way valve will be controlled based on the setting of the control panel. During heating operation, the water pump of the heat pump unit will be stopped; however, during standby status, the water pump will start but the other thermal will stop.

Under the “**Hot water**” mode, the 3-way valve will switch to the water tank, the water pump of the heat pump will always stop but the other thermal will start.

Under the “**Heat + Hot water**” mode, the other thermal only works for space heating, and the electric heater of the water tank works for water heating. In this case, the 2-way valve is controlled based on the setting of the control panel, and the 3-way valve will always turn to space heating system. During heating operation, the water pump of the heat pump unit will be stopped; however, during standby status, the water pump of the heat pump unit will start.

### Logic 2

1. The set point of the other thermal should be equal to that of “**WOT-Heat**” and both are or lower than 60°C in “**Heat**” or “**Heat + hot water**” mode ;The set point should be the smaller one between “T-water tank” +5°C and 60°C in “**Hot water**” mode.
2. The water pump for other thermal must be always active under the “**Heat**” mode.
3. Under the “**Heat**” mode, the 2-way valve will be controlled based on the setting of the control panel. During heating operation, the water pump of the heat pump unit will be stopped; however, during standby status, the water pump will start but the other thermal will stop.

Under the “**Hot water**” mode, the 3-way valve will switch to the water tank, the water pump of the heat pump will always stop but the other thermal will start.

Under the “**Heat + Hot water**” mode (“**Heat**” takes the priority), the other thermal only works for space heating, and the electric heater of the water tank works for water heating. In this case, the 2-way valve is controlled based on the setting of the control panel, and the 3-way valve will always stop. During heating operation, the water pump of the heat pump unit will be stopped; however, during standby status, the water pump will start.

Under the “**Heat + Hot water**” mode (“**Hot water**” takes the priority), the other thermal works for space heating and water heating. The other thermal will work for water heating firstly, after reached “**T-water tank**”, other thermal turn to space heating.

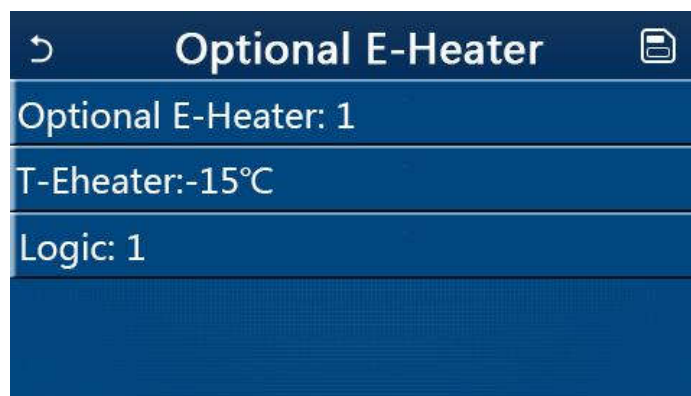
### Logic 3

The heat pump will only send a signal to other thermal, but all the logic of control must be “stand alone”.

#### 3.2.4.7 Optional E-Heater

[Operation Instructions]

- ★1. At the commissioning parameter setting page, by touching “**Optional E-Heater**”, the control panel will access to the corresponding setting page.
- ★2. At the “**Optional E-Heater**” setting page, it can be set to “**1**”, “**2**” or “**Off**”.



[Notes]

- This setting will be memorized upon power failure.
- Either “**Other thermal**” or “**Optional E-Heater**” can be activated at the same time.
- There are two working logics for “**Optional E-heater**”.
- Logic 1: either the heat pump or the optional electric heater can be started at the same time.
- Logic 2: both the heat pump and the optional electric heater can be started at the same time after the

compressor has run for four minutes and  $T_{\text{Optional Water Temp}}$  is equal to or lower than  $WOT_{\text{-heat}} - \Delta t_2$ .

### 3.2.4.8 Remote Sensor

[Operation Instructions]

★At the commissioning parameter setting page, by touching “**Remote sensor**”, the control panel will access to the corresponding setting page, where it can be set to “**With**” or “**Without**”.

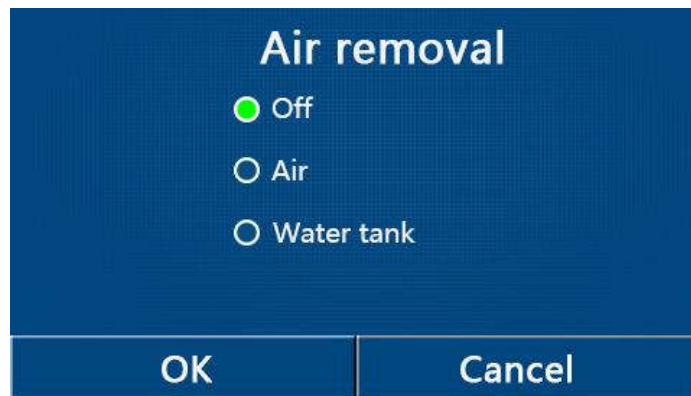
[Notes]

- This setting will be memorized upon power failure.
- Only when “**Remote sensor**” is set to “**With**”, the “**Ctrl. State**” can be set to “**T-room**”.

### 3.2.4.9 Air Removal

[Operation Instructions]

★At the commissioning parameter setting page, by touching “**Air removal**”, the control panel will access to the corresponding setting page, where it can be set to “**On**” or “**Off**”.



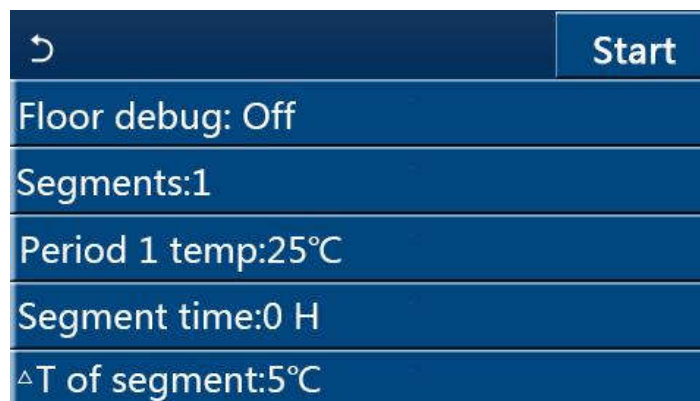
[Notes]

- This setting will be memorized upon power failure.
- This setting can be done only when the unit is turned off. And when it is set to “**On**”, the unit is not allowed to be turned on.

### 3.2.4.10 Floor Debug

[Operation Instructions]

★1. At the commissioning parameter setting page, by touching “**Floor debug**”, the control panel will access to the corresponding setting page.



★2. At the setting page, “**Floor debug**”, “**Segments**”, “**Period 1 temp**”, “**Segment time**”, and “**ΔT of**

**segment**” can be set.

No.	Full Name	Displayed Name	Range	Default	Accuracy
1	Floor debug switch	Floor debug	On/Off	Off	/
2	Quantity of segments	Segments	1~10	1	1
3	Temperature of the first segment	Period 1 temp	25~35℃/ 77~95℉	25℃/ 77℉	1℃
4	Duration of each segment	Segment time	12~72 hours	0	12 hours
5	Temperature difference of each segment	ΔT of segment	2~10℃/ 36~50℉	5℃/ 41℉	1℃

★3. When this setting is finished, by pressing “**Start**” this setting will be saved and start working, and by pressing “**Stop**” the function will halt.

[Notes]

- This function can be activated only when the unit is turned off. When it is done with the unit keeping “**On**”, a window will pop up, saying “**Please turn off the system first!**”.
- When this function has been activated, “**On/Off**” operation will be deactivated. By pressing On/Off , a window will pop up, saying “**Please disable the floor debug!**”.
- When “**Floor debug**” has been activated; “**Weekly timer**”, “**Clock Timer**”, “**Temp timer**” and “**Preset mode**” will be deactivated.
- “**Emergen. mode**”, “**Disinfection**”, “**Holiday mode**”, “**Manual defrost**”, “**Forced mode**” and “**Refri. recovery**” cannot be activated at the same time with “**Floor debug**”. If doing so, a window will pop up, saying “**Please disable the floor debug!**”.
- Upon power failure, “**Floor debug**” will back to “**Off**” and the runtime will be zeroed.
- When “**Floor debug**” has been activated, “**T-floor debug**” and “**Debug time**” can be viewed.
- When “**Floor debug**” has been activated and works normally; the corresponding icon will be displayed at the upper side of the menu page.
- Before activating “Floor debug”, make sure “**Segment time**” of each segment is not zero. If so, a window will pop up, saying “**Segment time wrong!**” In this case, “**Floor debug**” is allowed to be activated only when “**Segment time**” has changed.

#### 3.2.4.11 Manual Defrost

[Operation Instructions]

★At the commissioning parameter setting page, by touching “**Manual defrost**”, the control panel will access to the corresponding setting page.

[Notes]

- This setting will not be memorized upon power failure.
- This setting can be set only when the unit has turned off. When this function has been activated, ON operation is un-allowed.
- Defrosting will quit when the defrosting temperature goes to 20℃ or the defrosting duration is equal to 10 minutes.

#### 3.2.4.12 Force Mode

[Operation Instructions]

★1. At the commissioning parameter setting page, by touching “**Force mode**”, the control panel will access to the corresponding setting page.

★2. At the “**Force mode**” setting page, it can be set to “**Force-cool**”, “**Force-heat**”, and “**Off**”. When it is set to “**Force-cool**” or “**Force-heat**”, the control panel will directly go back to the homepage and

response to any touching operation except the ON/OFF operation, with a window popping up, saying “**The force-mode is running!**”. In this case, by touching ON/OFF, “**Force mode**” will quit.

[Notes]

- This function is allowed only when the unit has just repowered and not turned on. For the unit which once has been put into operation, this function is unavailable, alerting “**Wrong operation!**”.
- It will not be memorized upon power failure.

#### 3.2.4.13 Gate-Ctrl.

[Operation Instructions]

★ At the commissioning parameter setting page, by touching “**Gate-Ctrl.**”, the control panel will access to the corresponding setting page.

[Notes]

• When “**Gate-Ctrl.**” has been activated; the display panel will detect the card state. When the card has inserted, the unit will run normally. When the card is drawn out, the controller will turn off the unit at once and back to the homepage. In this case, all touching operation become ineffective, and a prompt dialog box will pop up. The unit will resume normal operation until the card has inserted back and the ON/OFF status of the control panel will resume to that before the card is drawn out.

- This setting will be memorized upon power failure.

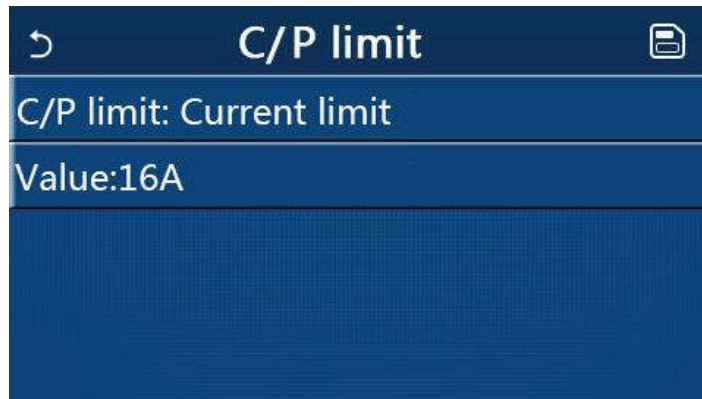
#### 3.2.4.14 Current Limit/Power Limit

[Operation Instructions]

★1. At the commissioning parameter setting page, by touching “Current limit”, it can be set to “On” or “Off”.

★2. When it is set it “Off”, current limit and power limit both cannot be set. When it is set to “Current limit” or “Power limit”, they can be set.

★3. After that, this setting will be saved by touching the “Save” icon.



[Notes]

- This setting will be memorized upon power failure.

#### 3.2.4.15 Address

[Operation Instructions]

★At the commissioning parameter setting page, by touching “**Current limit**”, it can be set the address.

[Notes]:

- It is used to set the address of the control panel for being integrated to the centralized control system.
- This setting will be memorized upon power failure.
- The setting range is 1~125 and 127~253.
- The defaulted address is 1 upon first power-on.

#### 3.2.4.16 Refrigerant Recovery

[Operation Instructions]

★At the commissioning parameter setting page, by touching “**Refri. recovery**”, it will access to the refrigerant recovery page.

★ When “**Refri. recovery**” is set to “**On**”, the control panel will go back to the home page. At this time, any touch operation except ON/OFF will get no response, with a prompt dialog box popping up, saying “**The refrigerant recovery is running!**” By touching ON/OFF, refrigerant recovery will quit.

[Notes]

- This function is allowed only when the unit has just repowered and not turned on. For the unit which once has been put into operation, this function is unavailable, alerting “**Wrong operation**”.
- This function will not be memorized upon power failure.

#### 3.2.4.17 Control Logic of the Water Tank Heater

[Operation Instructions]

At the commissioning parameter setting page, by touching “Tank heater”, it will access to the setting page of control logic for the water tank heater.

[Notes]

- “Reserved” will be displayed when the water tank is unavailable.
- This setting can be done only when the unit is off.
- This function can be memorized upon power failure.
- Logic 1: **NEVER** allowed the Unit’s Compressor and the Water Tank Electric Heater or the Optional Electric Heater to work at the same time.
- Logic 2: While **Heating/Cooling + Hot water** mode (**Hot Water** priority)  $T_{set} \geq THP_{max} + \Delta T_{hot\ water} + 2$ , when water tank temperature reach  $THP_{max}$ , the water tank EH will be ON and start to do hot water, at the same time, the compressor will turn to heating/cooling mode, water tank EH and Compressor will be ON together.

#### 3.2.4.18 Gate Control Memory

[Operation Instructions]

At the commissioning parameter setting page, by touching “Gate-Ctrl Memory”, it will access to the setting page.

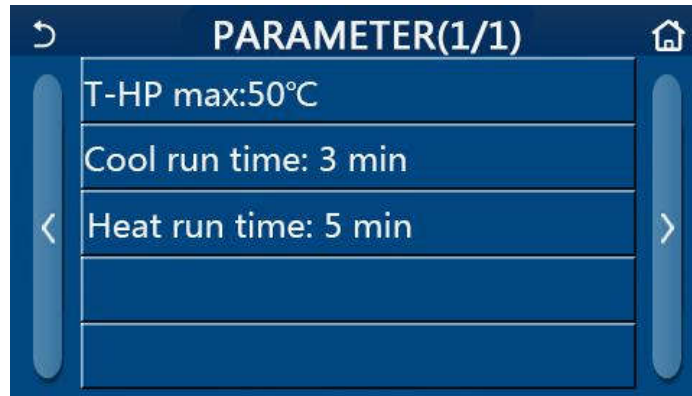
[Notes]

- When it is enabled, “Gate-Ctrl” will be memorized upon power failure.
- When it is disabled, “Gate-Ctrl” will not be memorized upon power failure.

#### 3.2.4.18 Parameter Setting

[Operation Instructions]

★At the commissioning parameter setting page, by touching “PARAM.”, it will access to the pages as shown below.



Page of Commissioning Parameters

★At this page, select the desired option and then go to the corresponding page.

★After that, by pressing “OK”, this setting will be saved and then the unit will run based on this setting; or by pressing “Cancel”, this setting will not be saved and quit.

No	Full Name	Display Name	Range		Default	Remark
1	T-HP max	T-HP max	40~55°C	104~131°F	50°C/122°F	
2	Cool run time	Cool run time	1~10min		3min [2-way valve Off]	When “Cool run time” has expired and temperature difference keeps at the standby zone, the unit will stop.
					5min [2-way valve On]	
3	Heat run time	Heat run time	1~10min		3min [2-way valve Off]	When “Heat run time” has expired and temperature difference keeps at the standby zone, the unit will stop.
					5min [2-way valve On]	

[Notes]

- For parameters with different defaults at different conditions, once the current condition changes, the corresponding default also will change.
- All parameters at this page will be memorized upon power failure.

### 3.2.5 Viewing

[Operation Instructions]

★1. At the menu page, by touching “VIEW”, the control panel will go to the sub-menu page as shown in

the figure below.

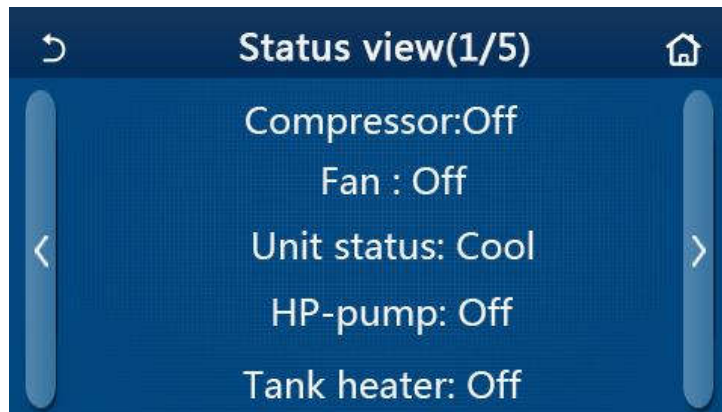


VIEW Page

### 3.2.5.1 Status Viewing

[Operation Instructions]

★1. At the “VIEW” page, by touching “**Status**”, it is able to view status of the unit, as shown in the figure below.



Status View Page



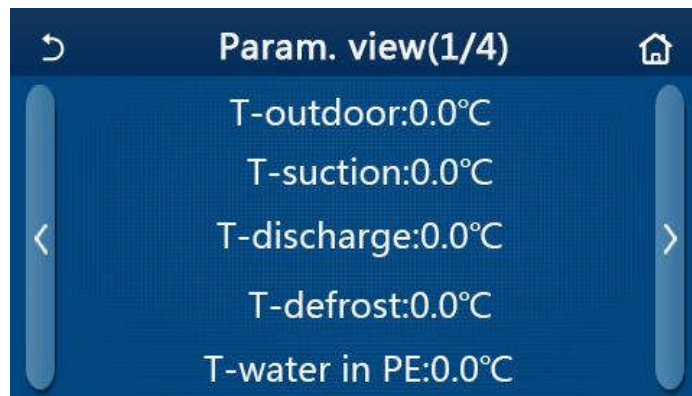
## Viewable Status

No	Full Name	Displayed Name	Status
1	Status of the compressor	Compressor	On/Off
2	Status of the fan	Fan	On/Off
3	Status of the unit	Unit status	Cool/Heat/Hot water/Off
4	Status of the water pump	HP-pump	On/Off
5	Status of the water tank heater	Tank heater	On/Off
6	Status of the 3-way valve 1	3-way valve 1	NA
7	Status of the 3-way valve 2	3-way valve 2	On/Off
8	Status of the compressor crankcase heater	Crankc. heater	On/Off
9	Status of the heater 1 for the main unit	HP-heater 1	On/Off
10	Status of the heater 2 for the main unit	HP-heater 2	On/Off
11	Status of the Chassis heater	Chassis heater	On/Off
12	Status of the heat exchanger heater	Plate heater	On/Off
13	Status for the system defrosting	Defrost	On/Off
14	Status of the system oil return	Oil return	On/Off
15	Status of the thermostat	Thermostat	Off/Cool/Heat
16	Status of other thermal source	Other thermal	On/Off
17	Status of the 2-way valve	2-way valve	On/Off
18	Status of antifreeze	HP-Antifree	On/Off
19	Status of the door guard	Gate-Ctrl.	Card in/Card out
20	Status of the 4-way valve	4-way valve	On/Off
21	Status of disinfection	Disinfection	Off/Running/Done/Fail
22	Status of the flow switch	Flow switch	On/Off

## 3.2.5.2 Parameter Viewing

[Operation Instructions]

★1. At the “VIEW” page, by touching “Parameter”, it is able to view each parameter of the unit, as shown in the figure below.



Parameter View Page

Viewable Parameters

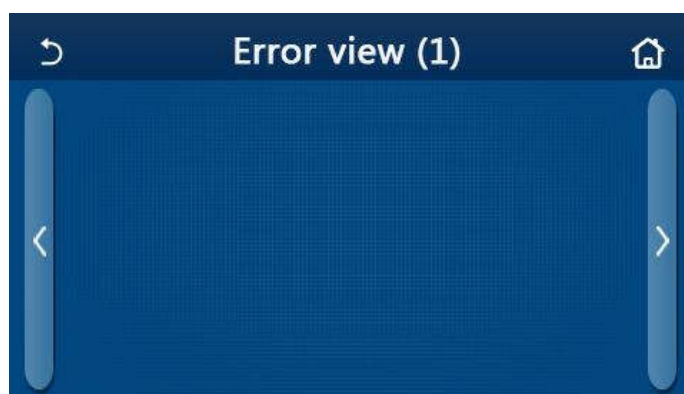
No.	Full Name	Displayed Name
1	Environmental temperature	T-outdoor
2	Suction temperature	T-suction
3	Discharge temperature	T-discharge

4	Defrosting temperature	T-defrost
5	Entering water temperature of the plate type heat exchanger	T-water in PE
6	Leaving water temperature of the plate type heat exchanger	T-water out PE
7	Leaving water temperature of the auxiliary heater	T-optional water Sen.
8	Water tank temperature	T-tank ctrl.
9	Floor debug target temperature	T-floor debug
10	Floor debug runtime	Debug time
11	Liquid line temperature	T-liquid pipe
12	Vapor line temperature	T-gas pipe
13	Economizer inlet temperature	T-economizer in
14	Economizer outlet temperature	T-economizer out
15	Remote room temperature	T-remote room
16	Discharge pressure	Dis. pressure
17	Weather-dependent target temperature	T-weather depend

### 3.2.5.3 Error Viewing

[Operation Instructions]

★At the “VIEW” page, by touching “Error”, it is able to view errors of the unit, as shown in the figure below.



Error View Page

[Notes]

- The control panel can display real-time errors. And at these pages, all errors will be listed here.
- Each page displays at most 5 pieces of errors. Others can be viewed by touching the page turning keys.

Error List

No	Full Name	Displayed Name	Code
1	Ambient temperature sensor error	Ambient sensor	F4
2	Defrosting temperature sensor error	Defrost sensor	d6
3	Discharge temperature sensor error	Discharge sensor	F7
4	Suction temperature sensor error	Suction sensor	F5
5	Economizer inlet temperature sensor	Econ. in sens.	F2
6	Economizer outlet temperature sensor	Econ. out sens.	F6

## Control

No	Full Name	Displayed Name	Code
7	Fan error	Outdoor fan	EF
8	High pressure protection	High pressure	E1
9	Low pressure protection	Low pressure	E3
10	High discharge protection	Hi-discharge	E4
11	Capacity DIP switch error	Capacity DIP	c5
12	Communication error between the outdoor and indoor main boards	ODU-IDU Com.	E6
13	Communication error between the outdoor main board and the drive board	Drive-main com.	P6
14	Communication error between the display panel and indoor main board	IDU Com.	E6
15	High pressure sensor error	HI-pre. sens.	Fc
16	Leaving water temperature sensor error for the plate type heat exchanger of the heat pump	Temp-HELW	F9
17	Leaving water temperature sensor error for the auxiliary electric heat of the heat pump	Temp-AHLW	dH
18	Entering water temperature sensor error of the plate type heat exchanger of the heat pump	Temp-HEEW	No error code but displayed at the error view pages.
19	Water tank temperature sensor error	HI-pre. sens.	FE
20	Remote room temperature sensor error	T-Remote Air	F3
21	Protection for the flow switch of the heat pump	HP-Water Switch	Ec
22	Welding protection to the auxiliary electric heater 1 of the heat pump	Auxi. heater 1	EH
23	Welding protection to the auxiliary electric heater 2 of the heat pump	Auxi. heater 2	EH
24	Welding protection to the water tank electric heater	Auxi. -WTH	EH
25	DC bus under-voltage or voltage drop error	DC under-vol.	PL
26	DC bus over-voltage	DC over-vol.	PH
27	AC current protection (input side)	AC curr. pro.	PA
28	IPM defective	IPM defective	H5
29	PFC defective	PFC defective	Hc
30	Start failure	Start failure	Lc
31	Phase loss	Phase loss	Ld

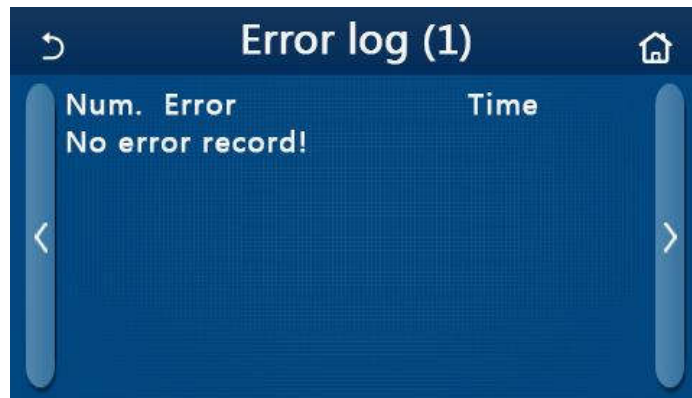
## Control

No	Full Name	Displayed Name	Code
32	Communication error with the drive board	Driver Com.	P6
33	Driver resetting	Driver reset	P0
34	Compressor overcurrent	Com. over-cur.	P5
35	Overspeed	Overspeed	LF
36	Current sensing circuit error or current sensor error	Current sen.	Pc
37	Desynchronization	Desynchronize	H7
38	Compressor stalling	Comp. stalling	LE
39	Radiator or IPM or PFC over-temperature	Overtemp.-mod.	P8
40	Radiator or IPM or PFC temperature sensor error	T-mod. sensor	P7
41	Charging circuit error	Charge circuit	Pu
42	AC input voltage error	AC voltage	PP
43	Ambient temperature sensor error at the drive board	Temp-driver	PF
44	AC contactor protection or input over-zero error	AC contactor	P9
45	Temperature drift protection	Temp. drift	PE
46	Sensor connection protection ( the current sensor fails to be connected with the corresponding phase U and or phase V)	Sensor con.	Pd
47	Communication error between the display panel and the outdoor unit	ODU Com.	E6
48	Refrigerant vapor line temperature sensor error	Temp RGL	F0
49	Refrigerant liquid line temperature sensor error	Temp RLL	F1
50	4-way valve error	4-way valve	U7

### 3.2.5.4 Error Log

[Operation Instructions]

★ At the “**VIEW**” page, by touching “**Error log**”, the control panel will go to the error log page, where it is able to view error records.



[Notes]:

- The error log can accommodate up to 20 pieces of error. Name and occurrence time are available for each error.
- When error log exceeds 20, the latest will supersede the earliest.

### 3.2.5.5 Version Viewing

[Operation Instructions]

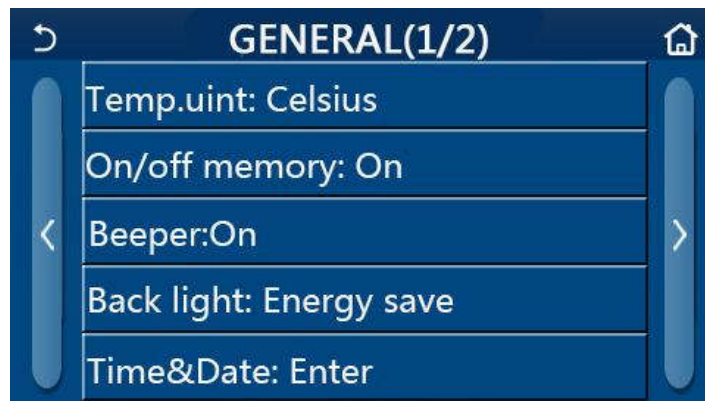
- ★ At the “**VIEW**” page, by touching “**Version**”, the control panel will go to the version view page, where it is able to view both the program version and protocol version.



### 3.2.6 General Setting

[Operation Instructions]

- ★ 1. At the menu page, by touching “**GENERAL**”, the control panel will go to the setting page, as shown in the figure below, where it is able to set “**Temp.unit**”, “**On/off memory**”, “**Beeper**”, “**Back light**”, “**Time & Date**” and “**Language**”.



General Setting Page

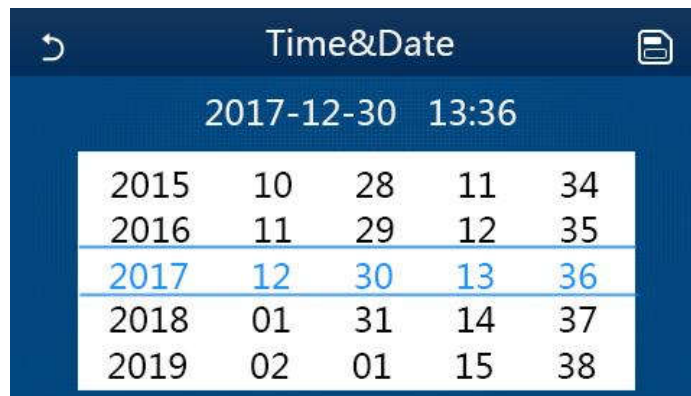
## General Settings

No	Item	Range	Default	Remarks
1	Temp. unit	°C/°F	°C	/
2	On/Off memory	On/Off	On	/
3	Beeper	Enter	On	/
4	Back light	Lighted/Energy save	Energy save	<p><b>“Lighted”</b>: the control panel will always light on.</p> <p><b>“Energy save”</b>: When there is no touching operation in 5 minutes, the control panel will be lighted off automatically, but will light on again once there is any touching operation.</p>
5	Time&Data	Enter	/	/
6	Language	Italian/English/Spanish	English	/
7	WiFi	On/Off	On	/

## 3.2.6.1 Clock Setting

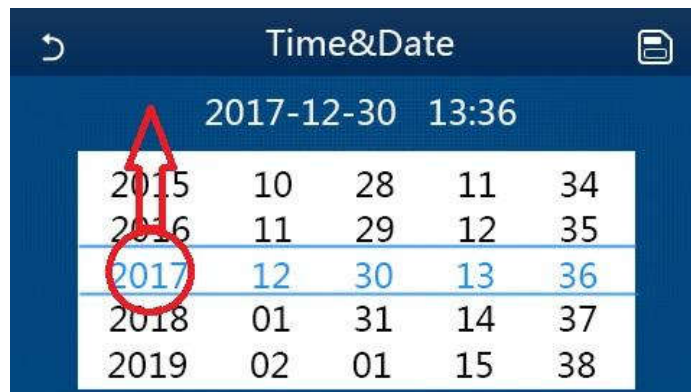
[Operation Instructions]

- ★ 1. At the **“GENERAL”** setting page, by touching **“Time&Data”**, it will go to the setting page as shown in the figure below.



Time&amp;Data Page

- ★ 2. The mouse roller can change the date and time value. After it, by touching the **“Save”** icon, this setting will be saved and directly displayed; while by touching the **“Back”** icon, this setting will give up and the control panel will directly go back to the **“GENERAL”** setting page.



Time&amp;Data Page

### 3.3 Intelligent Control

[Notes]:

- Make sure the smart phone or tablet computer adopts standard Android or ios operation system. For detailed version, please refer to the APP.
- The Wi-Fi function doesn't support Chinese Wi-Fi network name.
- The devices can be connected and controlled only in Wi-Fi and 4G hotspot modes.
- Router with WEP encryption is not supported.
- Software operation interface is universal and its control functions may not be completely corresponding to the unit. Software operation interface may vary along with APP upgrading or different operation system. Please refer to the actual program.

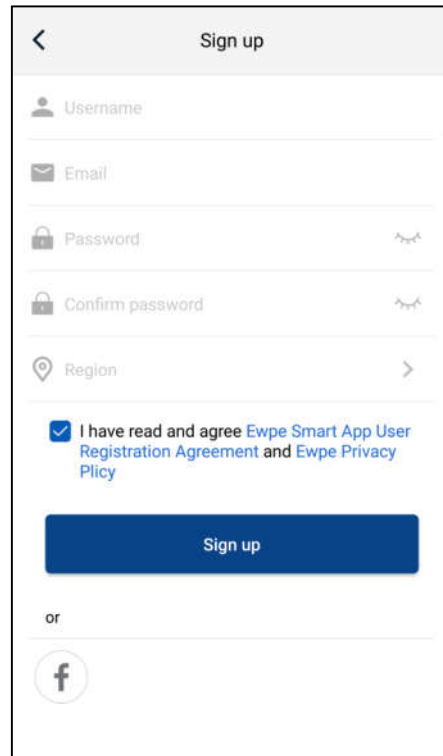
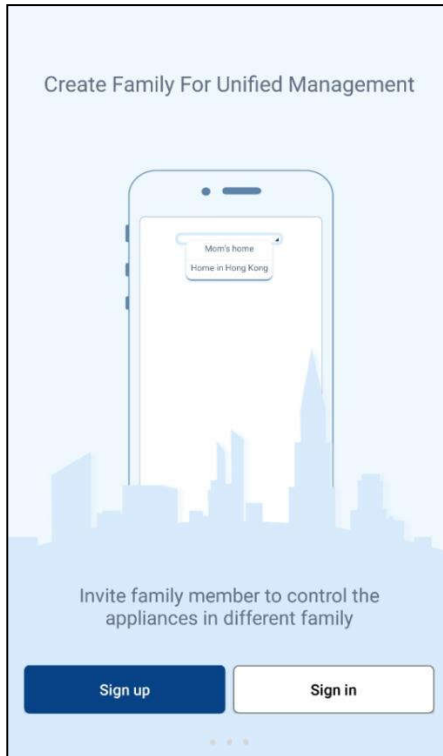
#### 3.3.1 Installation of the Ewpe Smart APP

[Operation Instructions]

- ★ 1. Scan the following QR code with your smart phone to download and install Ewpe Smart APP directly.

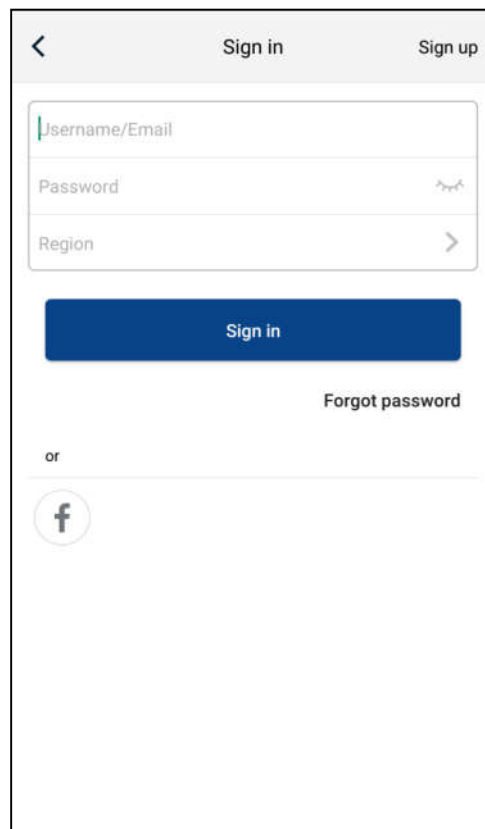
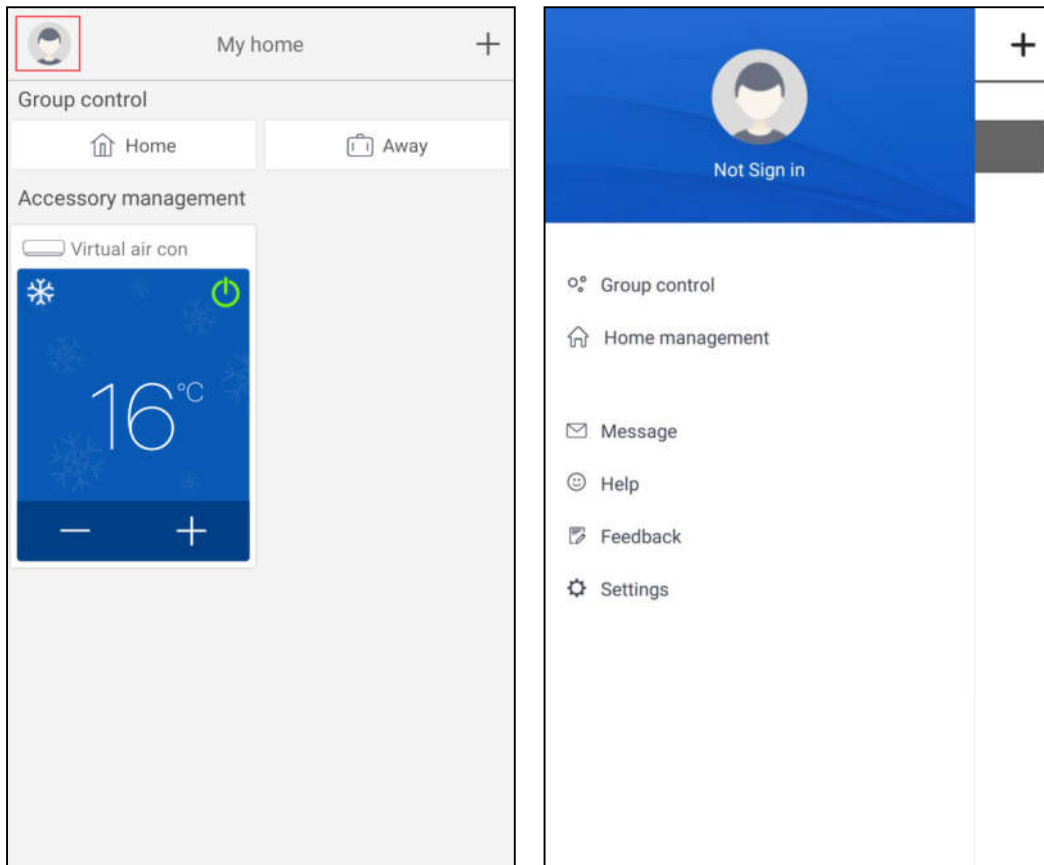


- ★ 2. Open Ewpe Smart APP and click “Sign up” for registration.



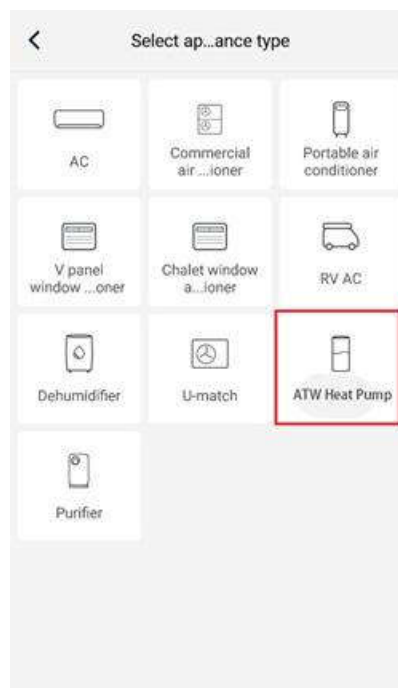
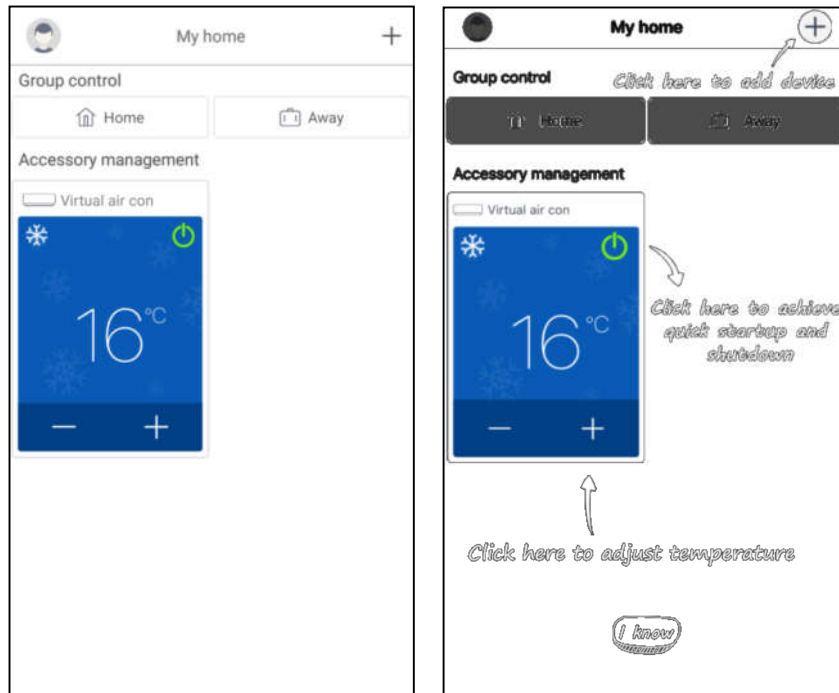


- ★ 3. Except sign in in the prompt interface, you can also enter the homepage and click the profile picture at the left upper corner to sign in.

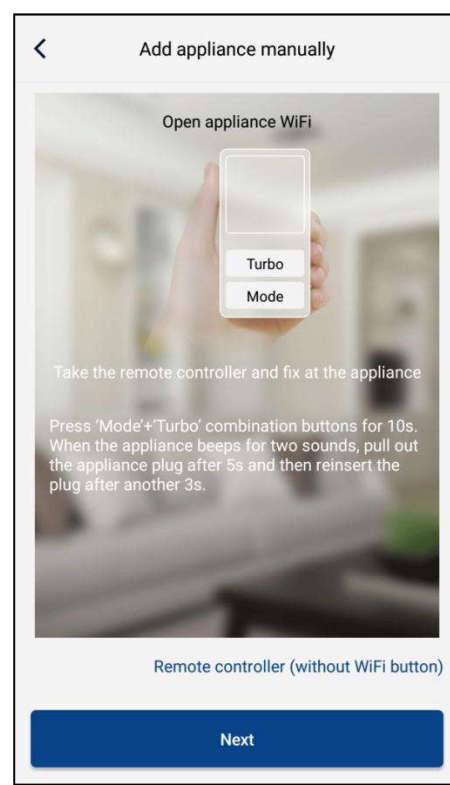
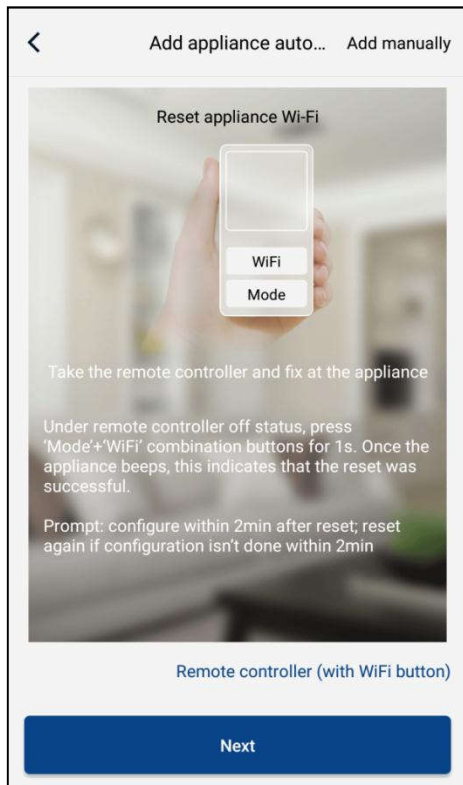
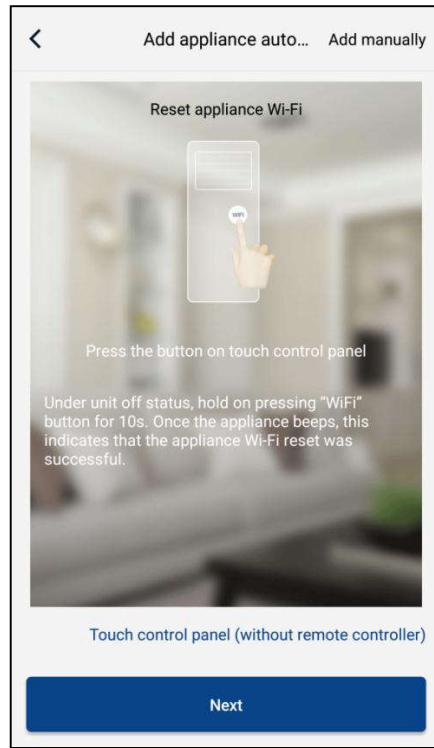
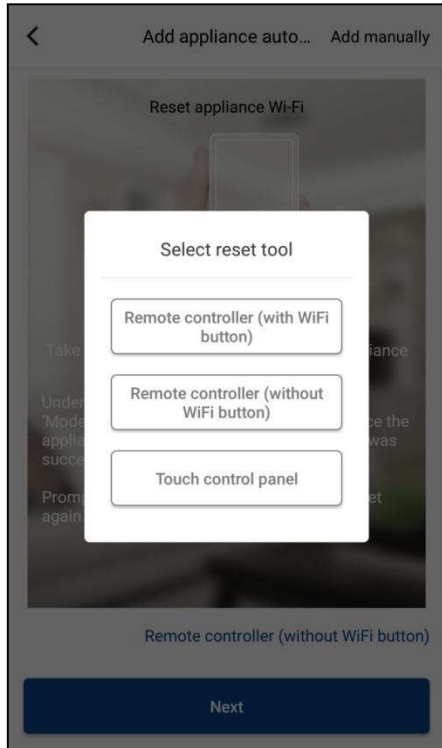


## Control

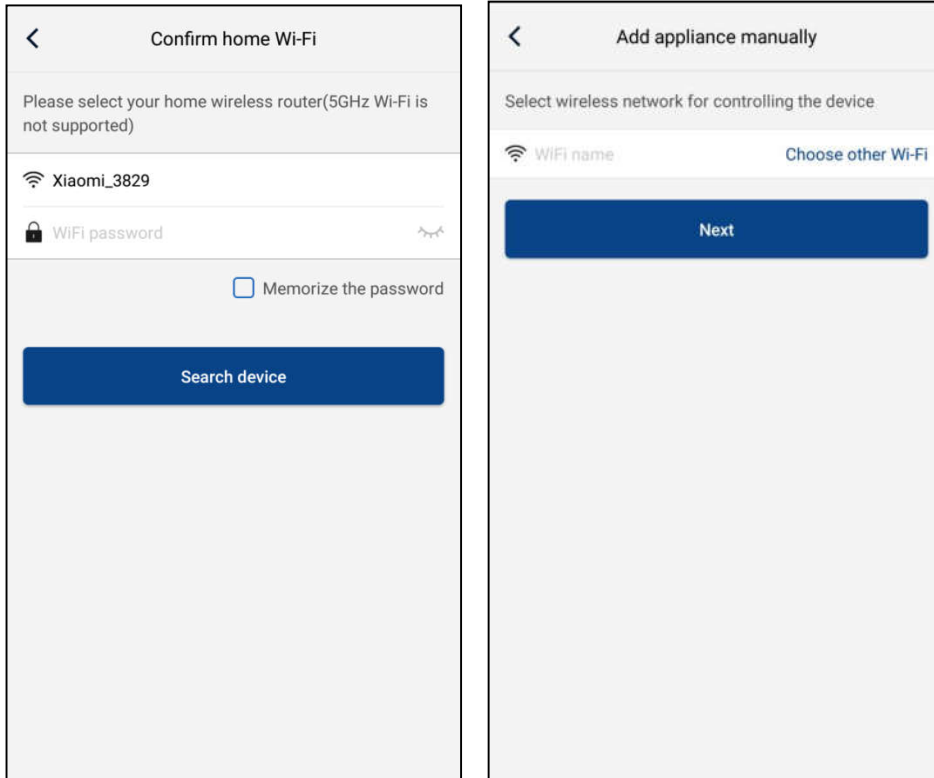
- ★ 4. Click "+" at the right upper corner of homepage to add device.



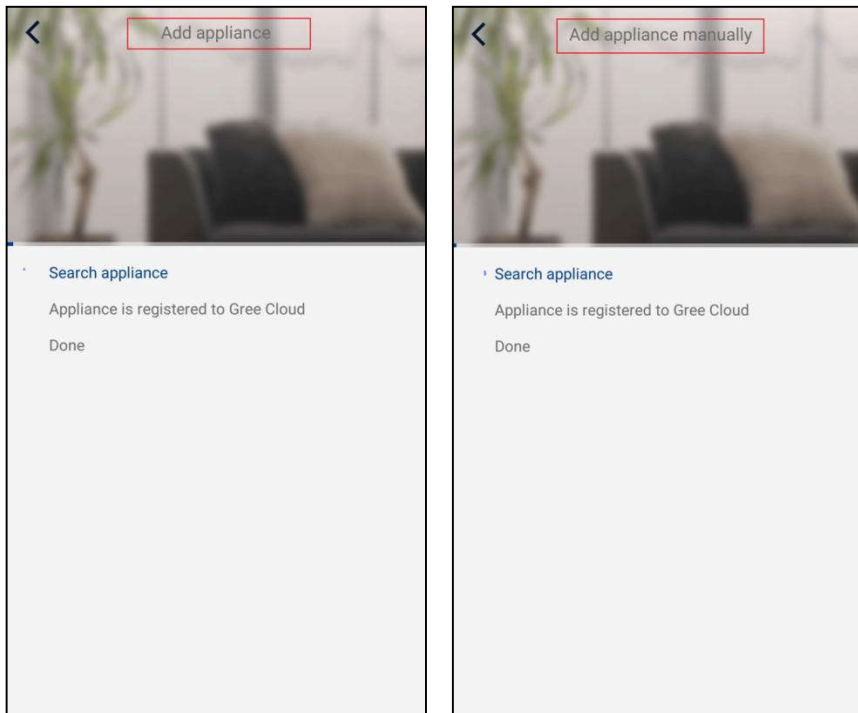
After selecting “ATW Heat Pump”, the APP interface will provide relevant operation instructions.

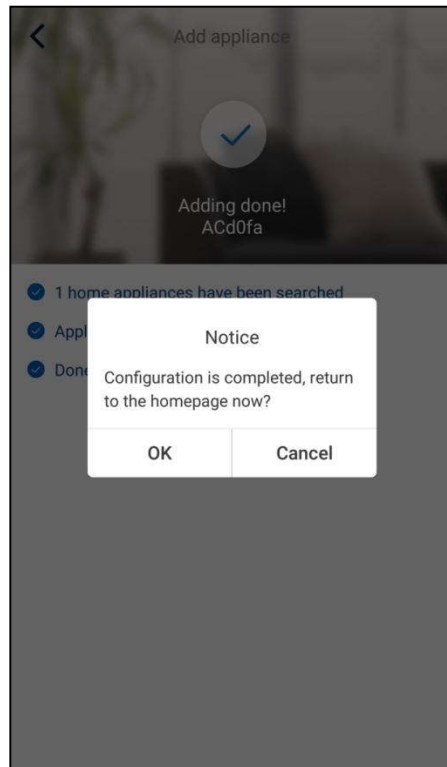


Reset the air conditioner (refer to the operation instructions in APP interface) and click “Next” to add home appliance automatically (Wi-Fi password shall be input). Or after setting and energizing the air conditioner, click “Add appliance manually” at the right upper corner to select the wireless network for controlling the device. Then confirm family Wi-Fi and arrange configuration.



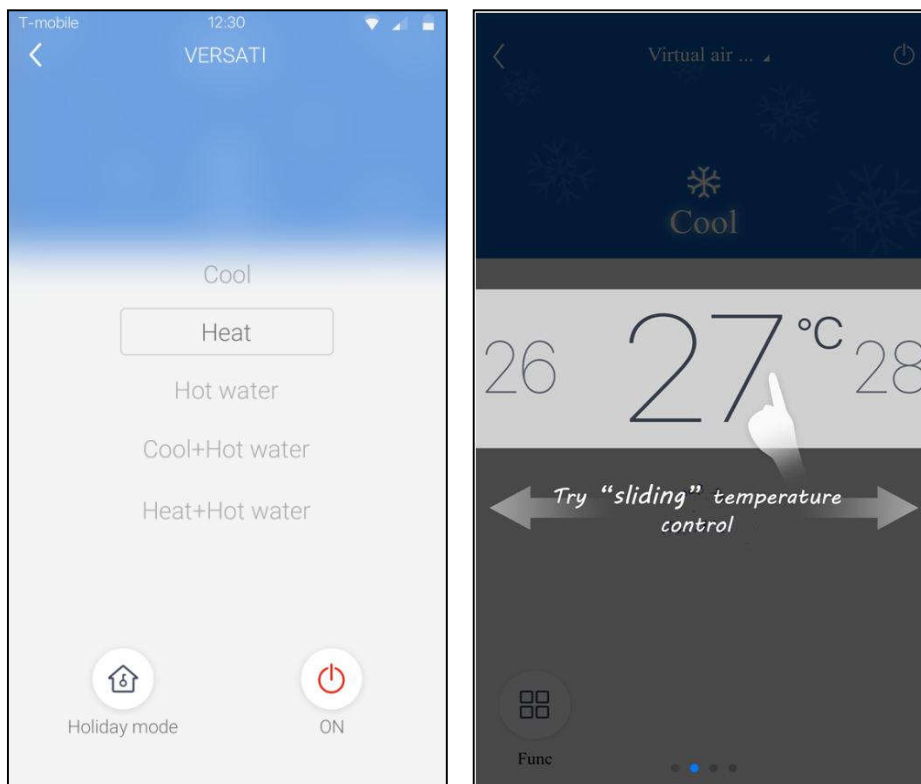
After accomplishing device reset and filling correct information, search device and arrange configuration.

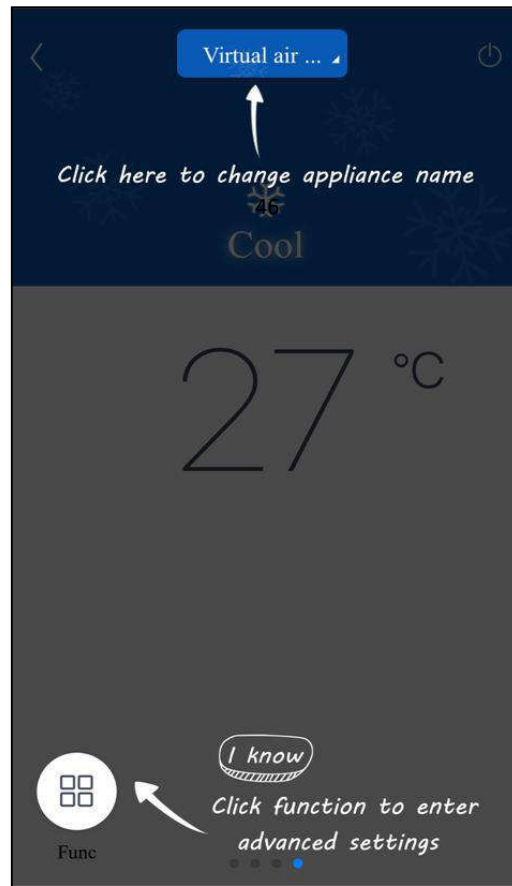




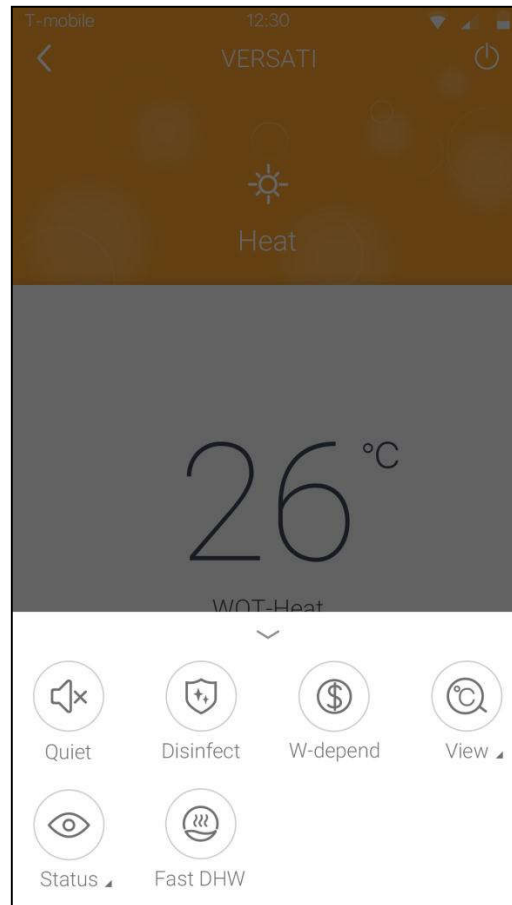
### 3.3.2 Setting of Main Functions

- ★ 1. Set mode and temperature.



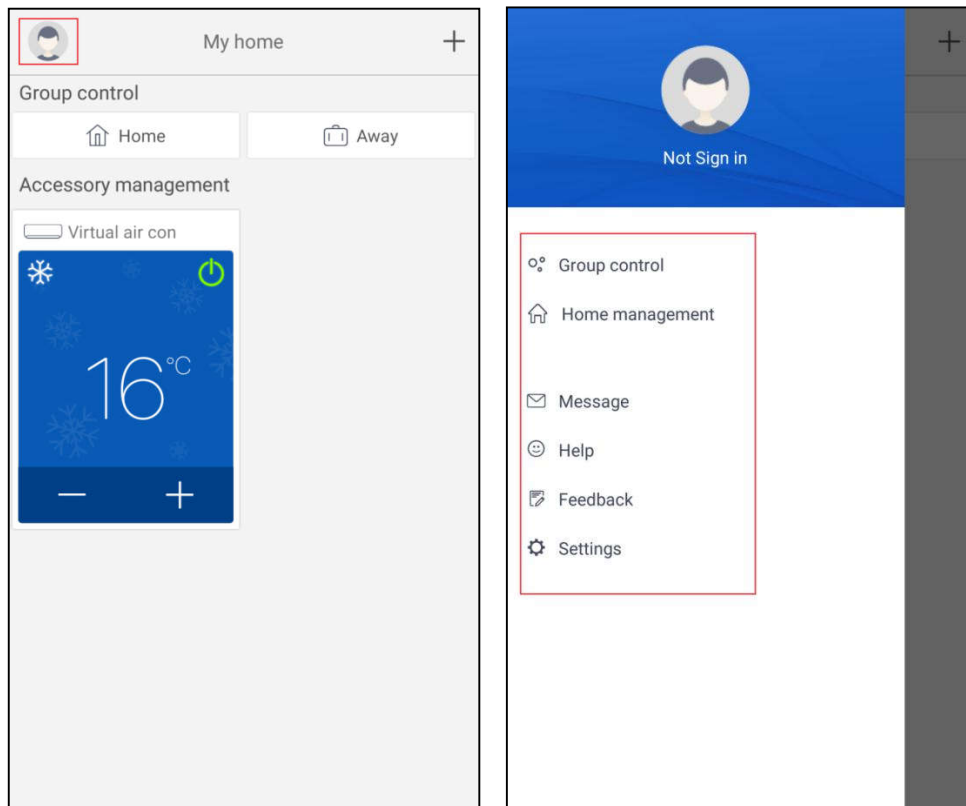


★2. Click Func at the left lower corner in device operation interface to enter advanced settings



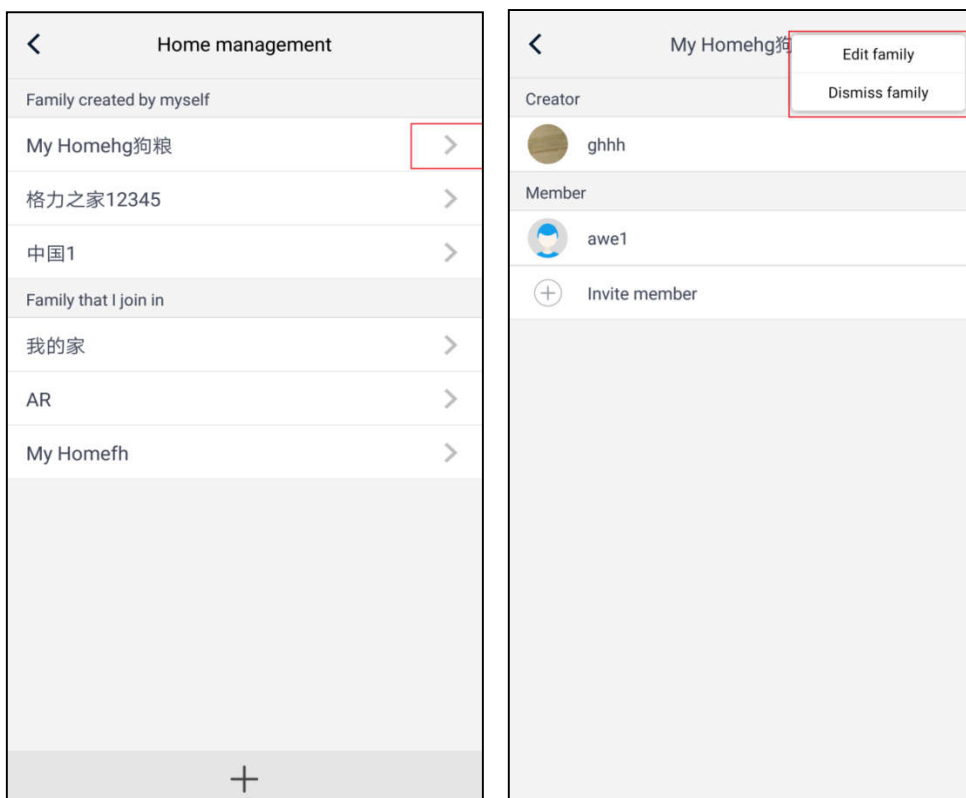
### 3.3.3 Setting of Other Functions

Click the profile picture at the left upper corner of homepage and set each function in the following menu.

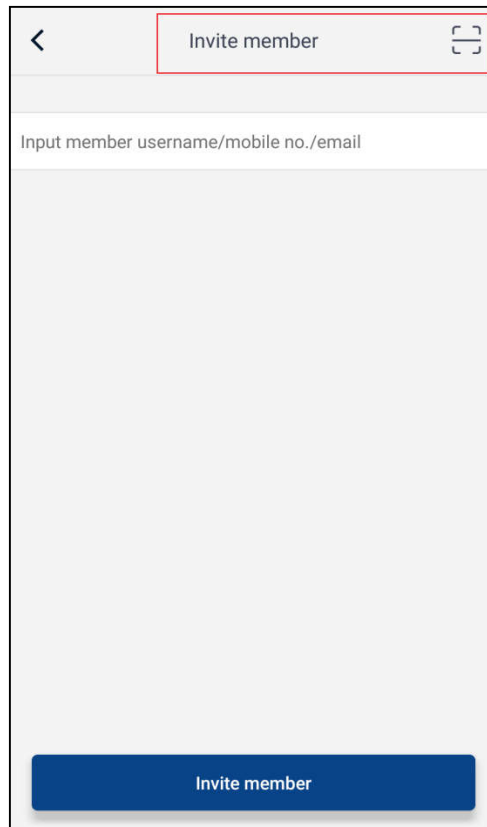
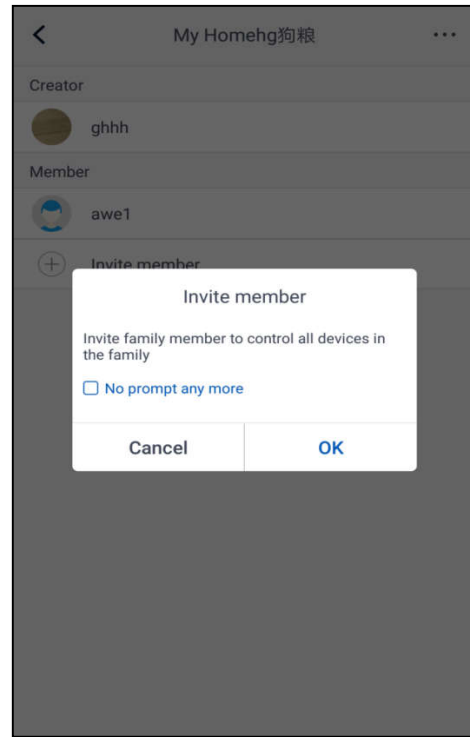
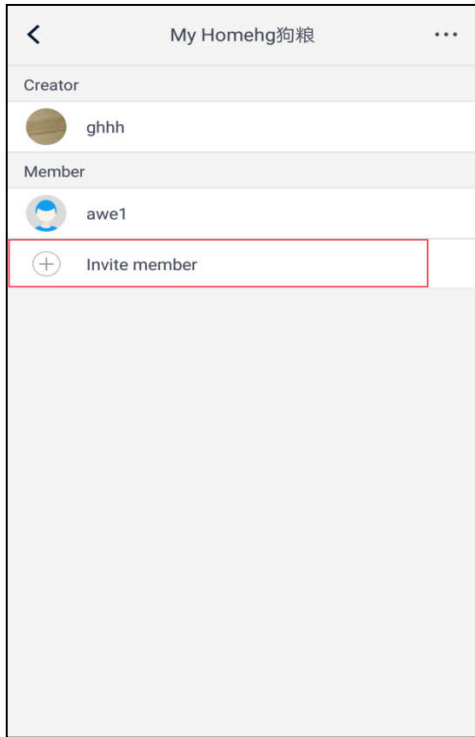


#### 3.3.3.1 Home management

Click “Home management” to create or manage family. You can also add family members according to the registered account.



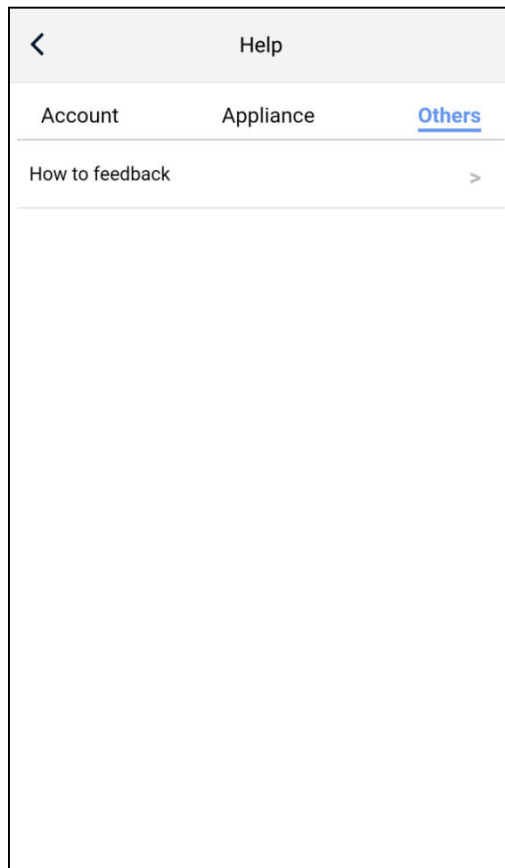
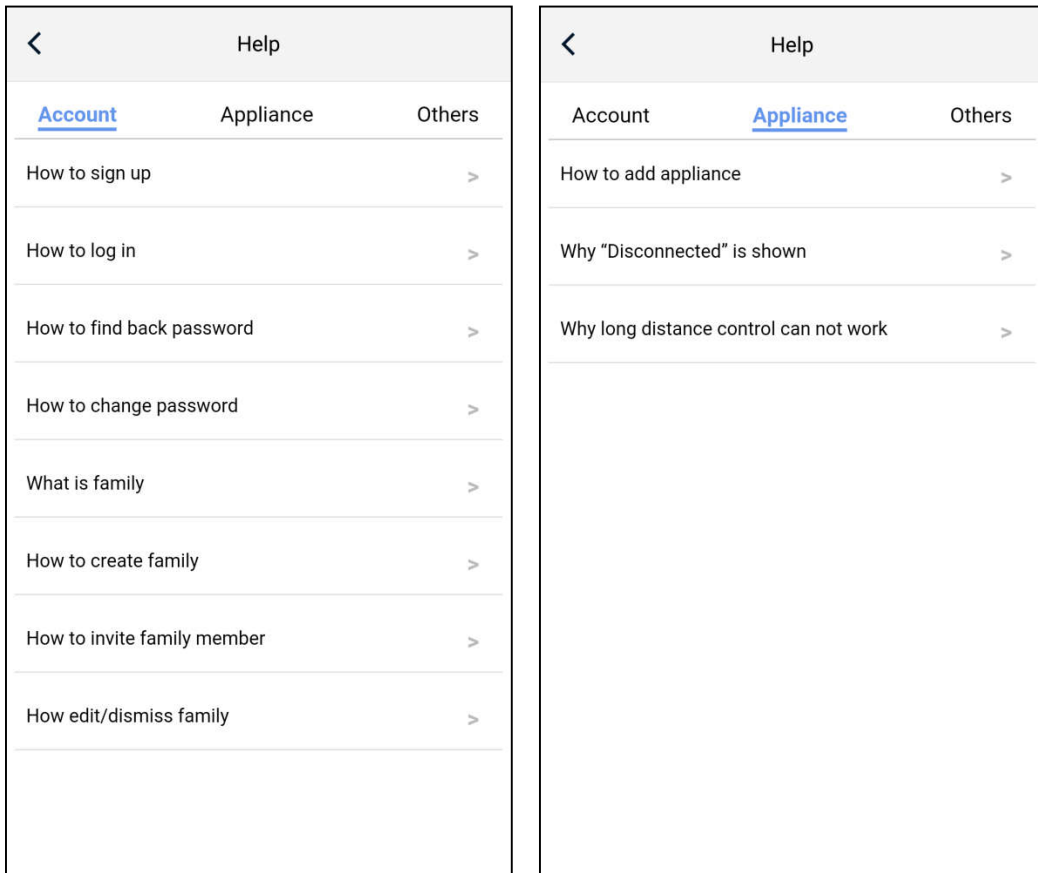
# Control





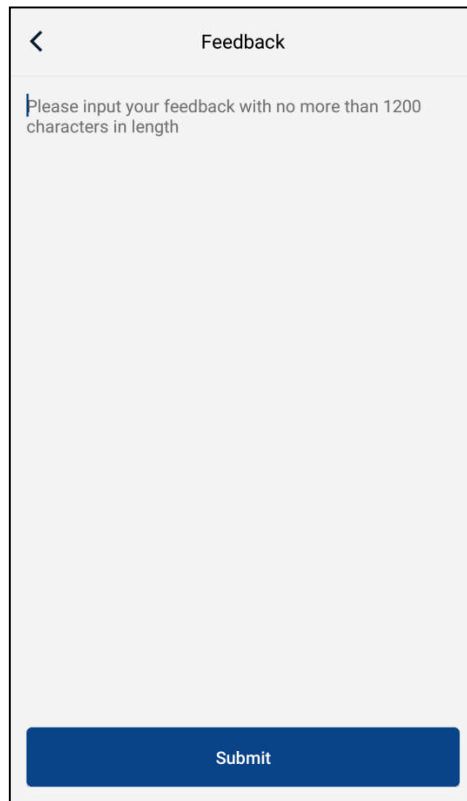
### 3.3.3.2 Help

Click "Help" and view the operation instructions of the APP.



### 3.3.3.3 Feedback

Click "Feedback" to submit feedback.



A screenshot of a mobile application's feedback form. The form has a light gray background and a dark blue header bar with a back arrow on the left and the word "Feedback" in the center. Below the header, there is a text input field with a light blue border and a placeholder text that reads "Please input your feedback with no more than 1200 characters in length". At the bottom of the form, there is a dark blue button with the word "Submit" in white text.

# NOTE CONCERNING PROTECTION OF ENVIRONMENT

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This product must not be disposed of via normal household waste after its service life, but must be taken to a collection station for the recycling of electrical and electronic devices. The symbol on the product, the operating instructions or the packaging indicate such disposal procedures. The materials are recyclable in accordance with their respective symbols. By means of re-use, material recycling or any other form of recycling old appliances you are making an important contribution to the protection of our environment. Please ask your local council where your nearest disposal station is located.

## INFORMATION CONCERNING USED REFRIGERANT MEDIUM

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This unit is containing fluorinated gases included in the Kyoto protocol. The maintenance and the liquidation must be carried out by qualified personnel.

Type of refrigerant: R32

The quantity of the refrigerant: please see the unit label.

The value GWP: 675 (1 kg R32 = 0,675 t CO<sub>2</sub> eq)

GWP = Global Warming Potential



Appliance filled with flammable gas R32.

In case of quality problem or other please contact your local supplier or authorized service center.

**Emergency number: 112**

## PRODUCER

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SINCLAIR CORPORATION Ltd.

1-4 Argyll St.

London W1F 7LD

Great Britain

[www.sinclair-world.com](http://www.sinclair-world.com)

This product was manufactured in China (Made in China).

## REPRESENTATIVE

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SINCLAIR Global Group s.r.o.

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## TECHNICAL SUPPORT

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