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Versati II+
MONOBLOC TYPE

Air-to-water Heat Pump Monobloc Versati

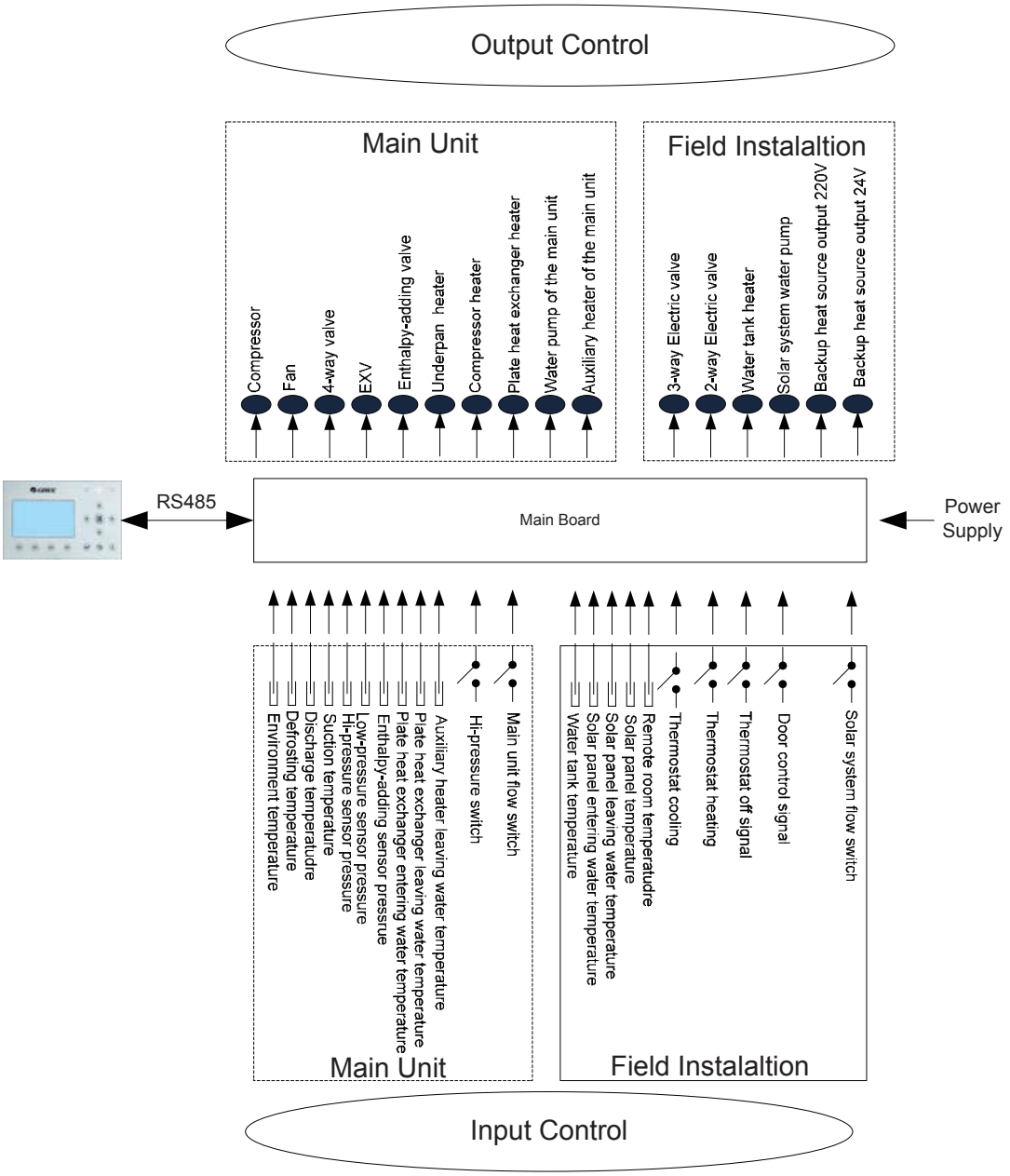
Unit Control

GREE ELECTRIC APPLIANCES, INC.OF ZHUHAI

CONTENTS

1 Integral Control Concept

1.1 Control Principle Diagram



1. The environment 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 defrosting 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 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.

6. The entering 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.

7. The leaving 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 continues to operate.

8. The auxiliary heater leaving water temperature is detected by the sensor installed at the outlet pipe of the auxiliary heater, which is mainly used to control the leaving water temperature of the main unit. 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 (the 2-way electric and 3-way electric valve will be closed).

9. 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.

10. 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 disconnect, 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 1~10 listed above are control parameters input by the main unit.

11. 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.

12 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. Theses 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.

13. 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.

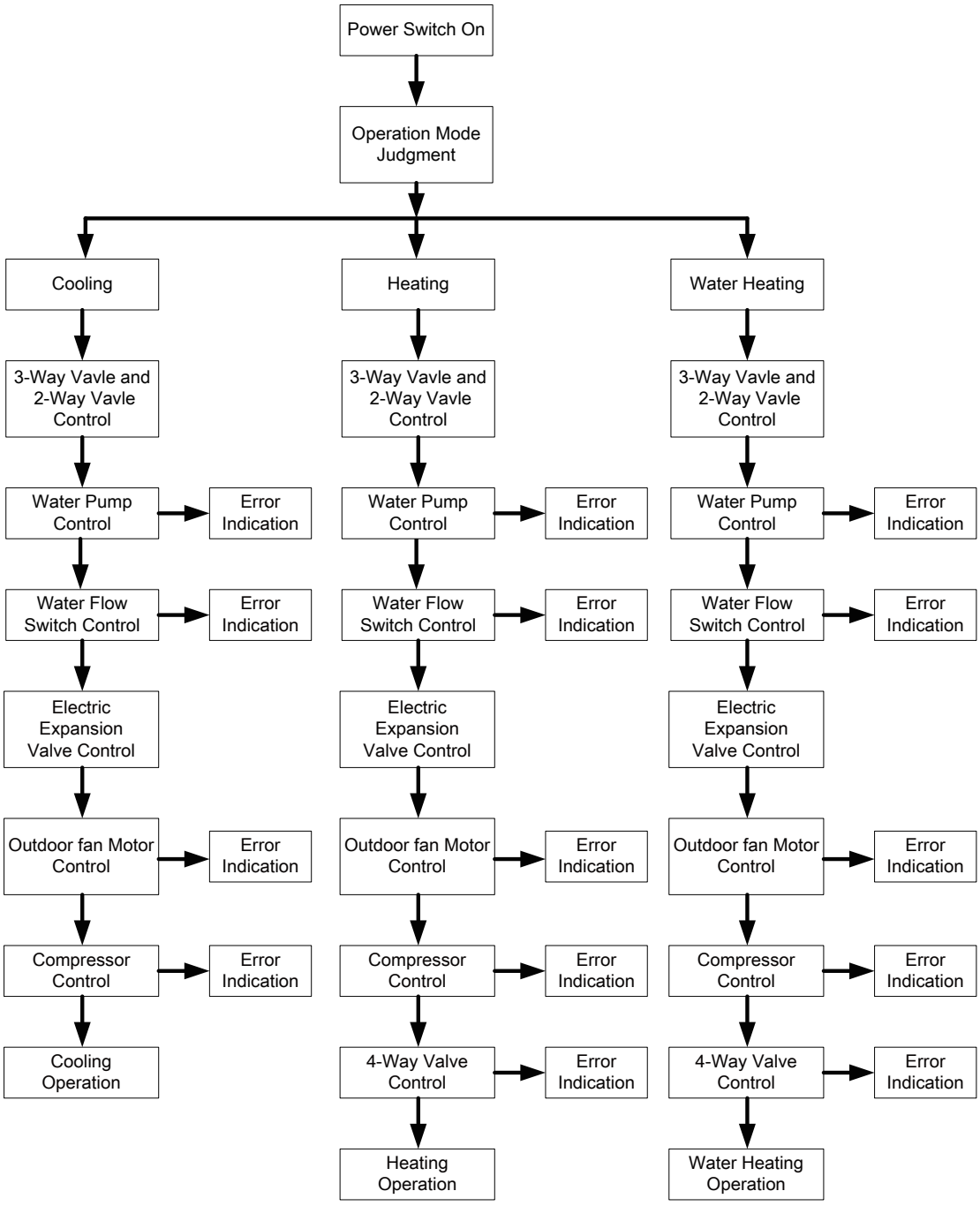
14. Only when the control function of the thermostat has been activated through the wired controller, then the thermostat can switch run modes among cooling, heating and shutdown, otherwise, the unit will run as per the run mode set by the wired controller.

15. 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.

16. 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 11~16 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 Auxiliary Electric Heater

When the auxiliary 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.

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 Auxiliary 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.

2.3.1.1 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

Three 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 minmum 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) Refrigerant Loss Protection

When the unit receives the “On” demand (through On/Off key operation or automatic freeze protection), it will immediately detect the temperature of the high-pressure sensor and the environment temperature. If the temperature of the high-pressure sensor is lower than the set point, this error will be displayed with the error indicating LED flashing. In this case, the unit is not allowed to start up unless this error does not exit. Once the compressor starts up, the system will no longer detect refrigerant loss protection.

(4) Water Pump Protection

When it is detected continuously for three seconds that the unit comes into water pump overload protection, then all loads except the water pump of the solar system and the auxiliary electric heater of the water tank will stop. Three minutes later, all loads resume normal operation. When it is detected three times within 60 minutes that the unit comes into water pump overload protection, this error will be displayed and is unrecoverable. The unit is allowed to restart only after the unit is shut down manually and this error is cleared.

(5) 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.

(6) Flow Switch Protection

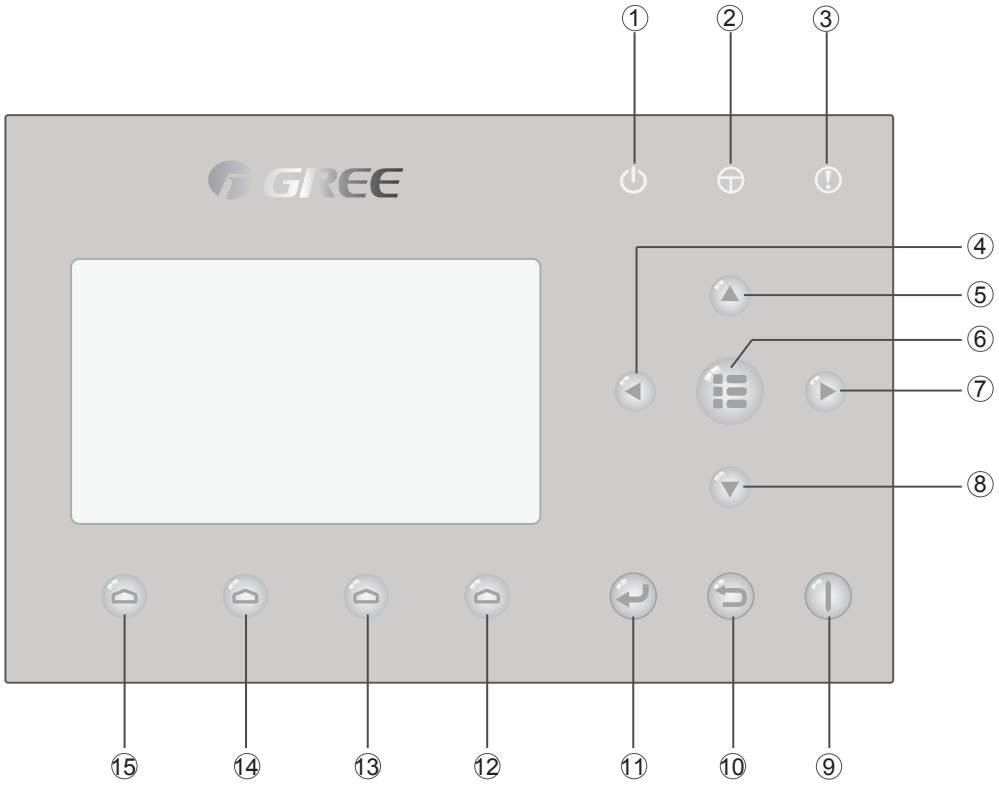
In any case, when it is detected that the flow switch of the main unit disconnects, then all loads except the water pump of the solar system and the auxiliary electric heater of the water tank will stop. This protection is unrecoverable. The unit is allowed to be restart only after this error is cleared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

(7) 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 and vice versa.

3 Controller

3.1 External View



(This effect drawing is just for reference)

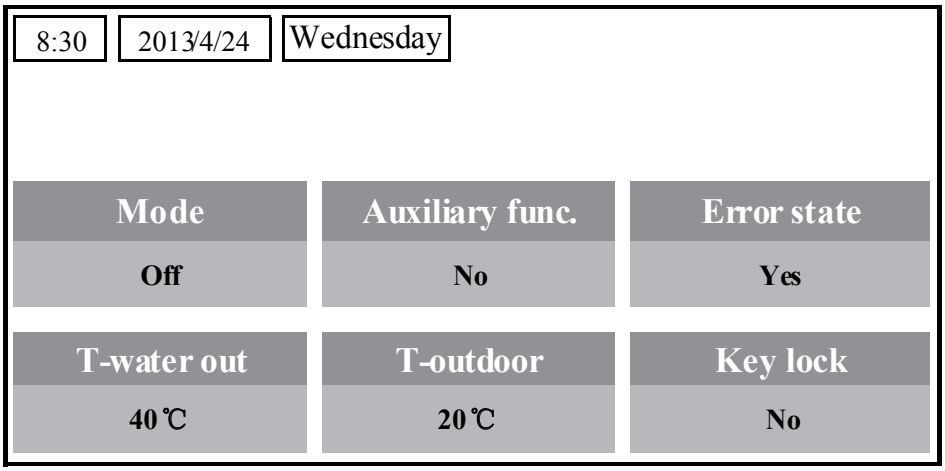
3.1.1 Keys & Indicating LEDs

No.	Symbol	Name	Functional Description
①		Running indicating LED (green)	It will light on/off when the unit is turned on/off.
②		Power indicating LED (yellow)	It will light on/off when the unit is powered on/off.
③		Error indicating LED (red)	It will light on when some fault occurs.
④		Left key	It is intended to move the cursor left.
⑤		Up key	It is intended to modify the setting state or value of the selected parameter.
⑥		Menu key	It is intended to call out the main menu or back to the homepage.
⑦		Right key	It is intended to move the cursor right.
⑧		Down key	It is intended to modify the setting state or value of the selected parameter.
⑨		ON/OFF key	It is intended to turn on or off the unit.
⑩		Cancel/Return key	It is intended to go to the higher level menu.
⑪		OK key	It is intended to save the setting or go to the submenu.

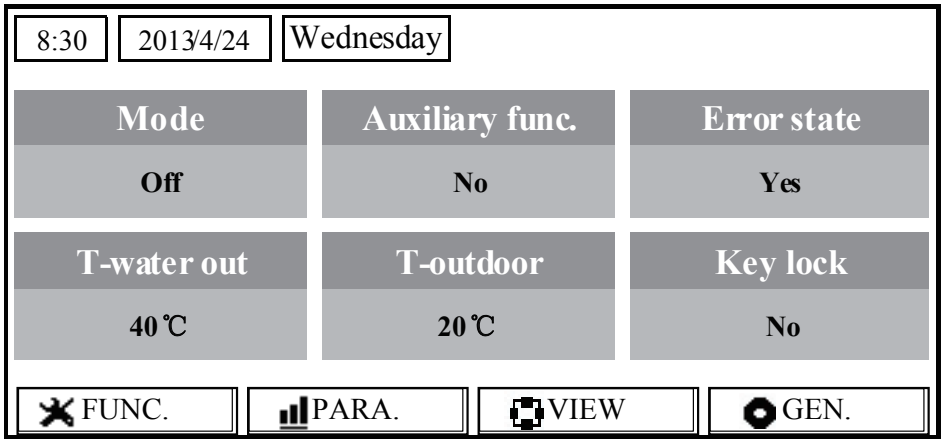
⑫		Function key no. 4	It is intended to perform different functions at difference pages.
⑬		Function key no. 3	
⑭		Function key no. 2	
⑮		Function key no. 1	

3.1.2 Standby Page and Homepage

Standby Page



Home Page



No.	Item	Functional Description
1	Mode	It is intended to access to the actual running mode.
2	Auxiliary Func.	It indicates the auxiliary function.
3	Error state	It indicates if there is any error.
4	T-water out	It indicates the actual leaving water temperature.
5	T-outdoor	It indicates the actual outdoor environment temperature.
6	Key lock	It indicates if the key lock is activated or deactivated.
7	FUNC.	It is intended to access to the function setting page.
8	PARA.	It is intended to access to the parameter setting page.
9	VIEW	It is intended to access to the view page.
10	GEN.	It is intended to access to the general setting page.

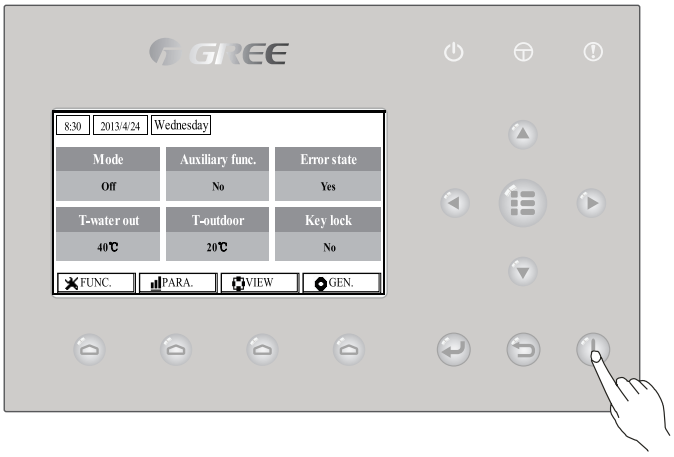
Note:

it includes the "**Sanitize mode**", "**Quiet**" mode, "**Auto**" mode, "**Floor debug**" mode, "**Emergen.mode**", "**Holiday mode**", "**Forced Cooling**" mode, "**Forced Heating**" mode, and "**Debug**" mode.

3.2 Operation Instructions

3. 2.1 On/Off

It is intended to turn on/off the unit.



[Operation Instructions]

At the homepage, by pressing the ON/OFF key , the unit will be turned on/off.

When the unit is ON, the green indicating LED located at the upper right of the control will light on. When the unit is OFF, the green indicating LED will light off.

[Notes]

① The unit is defaulted to be OFF when energized for the first time.

② The ON/OFF key operation works only at the home page and the standby page.

③ When the "**Holiday mode**" or the "**Emergen.mode**" is activated, the ON/OFF key operation will become ineffective.

④ When the "**Forced Heating**" or "**Forced Cooling**" is activated, it will be deactivated by pressing the "ON/OFF" key , and then press the ON/OFF key again to start the unit.

⑤ ON/OFF operation will be memorized by setting "**Memory**" to be "**On**" at the "**GEN**." 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.

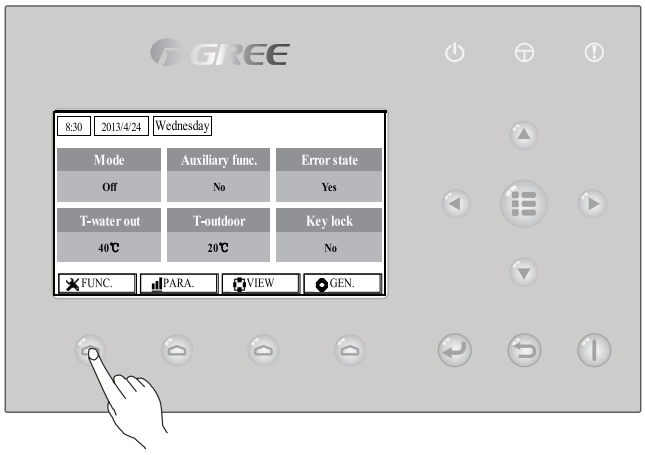
⑥ At the home page, the ON/OFF key is intended to turn on/off the unit if applicable. The Function keys no.1 to no.4 are corresponding to "**FUNC.**", "**PAPA**", "**VIEW**" and "**GEN.**" setting pages respectively.

⑦ At the standby page, the Menu key is used to back to the homepage, the ON/OFF key is used to turn on/off the unit if applicable, and all other key operations are ineffective.

⑧ The control will return automatically to the homepage where there is no any key operation in 10 consecutive minutes.

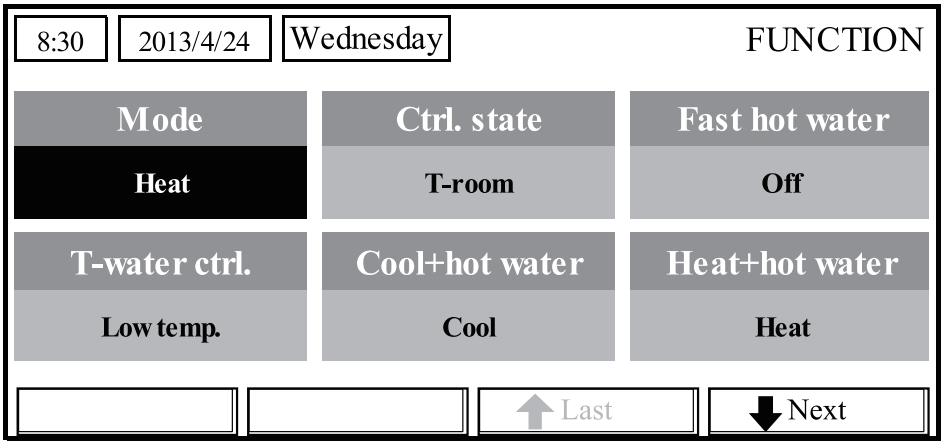
3.2.2 Function Setting

It enables the user to set each function.



[Operation Instructions]

1. At the homepage, by pressing the Function key no. 1  , the control will access to the **FUNCTION** page 1, as shown in the figure below.



FUNCTION page 1

2. At the **FUNCTION** page, by the Right/Left key  , the desired function option can be selected, and by the Up/Down key  , the setting of the current function option can be modified. The function key no. 3  or no. 4  can be used for switch pages. After the setting is finished, by pressing the Menu key  , the control will back to the homepage, or by pressing the Return key  the control will back to the higher level menu.

[Notes]

① Move the cursor to the desired option and “Enter” will be displayed at the lower left side of the LCD, reminding you that you are allowed to access to the submenu by pressing the OK key  .

② At the **FUNCTION** page, when the setting of some function option is changed and needs to be memorized, then in case of power failure it will be saved automatically and resume upon power recovery.

Function Settings

No.	Full Name	Displayed Name	Range	Default	Remarks
1	Running mode setting	Mode	Cool Heat Hot water Cool+Hot water Heat+Hot water	Heat	When the water tank is unavailable, then only “Cool” and “Heat” are included in the range.

2	Control state	Ctrl. state	T-water out / T-room	T-water out	“T-Room” is available only when “Remote Sensor” is set to “WITH”.
3	Fast hot water	Fast hot water	On/Off	Off	When the water tank is unavailable, this function will be reserved, and the LCD will display ‘Reserved’.
4	Water out temperature control	T-water ctrl.	High temp. /Normal temp.	Normal temp.	This function cannot be set but changed with floor configuration. While floor is available, it is defaulted to“Normal temp.”, while floor is unavailable, it is defaulted to“High temp.”
5	Cool+hot water	Cool+hot water	Cool/Hot water	Cool	When the water tank is unavailable, this function will be reserved, and the LCD will display ‘Reserved’.
6	Heat+hot water	Heat+hot water	Heat/Hot water	Heat	When the water tank is unavailable, this function will be reserved, and the LCD will display ‘Reserved’.
7	Quiet mode	Quiet mode	On/Off	Off	/
8	Quiet timer	Quiet timer	On/Off	Off	/
9	Weather-dependent mode	Weatherdepend	On/Off	Off	/
10	Holiday release	Holiday release	On/Off	Off	/
11	Disinfection	Disinfection	On/Off	Off	When the water tank is unavailable, this function will be reserved, and the LCD will display ‘Reserved’.
12	Weekly timer	Weekly timer	On/Off	Off	/
13	Clock timer	Clock timer	On/Off	Off	/
14	Temperature timer	Temp. timer	On/Off	Off	/
15	Solar kit	Solar kit	On/Off/Timer	Off	When the water tank is unavailable, this function will be reserved, and the LCD will display ‘Reserved’.
16	Floor debug	Floor debug	On/Off	Off	/
17	Emergency mode	Emergen. mode	On/Off	Off	/
18	Holiday mode	Holiday mode	On/Off	Off	/
19	Thermostat	Thermostat	Air/Without/ Air+hotwater	Without	/
20	Assistant heater	Assistant heater	1/2/Off	1	/
21	Other heater	Other heater	With/Without	Without	/
22	Chassis heater	Chassis heater	On/Off	On	/
23	Tank heater	Tank heater	With/ Reserved	Reserved	When the water tank is available,the tank heater is defaulted "with" and cannot be changed.
24	Plate heat exchanger heater	Plate heater	On/Off	On	
25	Solar kit-antifreeze	Solar antifre	On/Off	On	
26	Water tank	Water tank	With/Without	Without	/
27	Tank sensor	Tank sensor	1/2	2	When the water tank is unavailable, this function will be reserved. and the LCD will display ‘Reserved’.
28	Solar heater	Solar heater	With/Without	Without	/
29	Floor config	Floor config	With/Without	With	

30	Radiator config	Radia config	With/Without	Without	
31	FCU	FCU	With/Without	Without	
32	Remote sensor	Remote sensor	With/Without	Without	When it is set to “Without”, the “Control state” will be automatically changed to “T-water out”.
33	Air removal	Air removal	On/Off	Off	/
34	Address	Address	[1~125] [127~253]	1	/
35	Gate-Controller	Gate-Controller	On/Off	Off	/

3.2.2.1 Mode

It enables the user to select the run mode of the unit. When the water tank is not prepared, then only **Cool** and **Heat** modes are available. When the water tank has been prepared and **Water Tank** is set to “**With**” through the wired controller (see Section 2.2.26 for more details), then **Cool**, **Heat**, **Hot water**, **Heat + hot water**, and **Cool + hot water** modes are available. In this case, **Heat + hot water** or Cool + hot water can be given priority. (see Section 2.2.5 and 2.2.6 for more details), which is the default setting before delivery.

[Operation Instructions]

At the equipment OFF state, access to the **FUNCTION** page and then move through the Left/Right key  the cursor to the “**Mode**” whose characters will be reversed, then press the Up/Down key  to modify its setting.

[Notes]

① The “**Heat**” mode is defaulted when the unit is energized for the first time.

② The running mode is allowed to be changed only when the unit is not in operation. If it is done with the unit being on, a window will pop up, warning “**Please turn off the system first**”.

③ When the water tank is disabled, only the ‘**Heat**” or the “**Cool**” mode is allowed.

④ When the water tank is enabled, “**Cool**”, “**Heat**”, “**Hot water**”, “**Cool+hot waterr**”, “**Heat+hot water**” is allowed.

⑤ For the heat pump, the “**Cool**” mode is allowed; for the heating only unit, “**Cool+ Hot water**” and “**Cool**” are unallowable.

⑥ This setting can be memorized upon power failure.

3.2.2.2 Control State (Ctrl. state)

It enables the user to configure the control state to leaving water temperature or room temperature.

[Operation Instructions]

Go to the **FUNCTION** page and locate **Ctrl. state**, then, configure it through the Up/Down key  .

[Notes]

① If “**Remote sensor**” is set to “**With**”, “**T-out water**” and “**T-room**” are available. While if “**Remote Sensor**” is set to “**Without**”, only “**T-out water**” is selectable.

② This setting will be memorized upon power failure.

3. 2.2.3 Fast Hot Water

When hot water is needed urgently, this function can be configured to be “On”, In this case, the heat pump and the water tank heater will work together to generate sanitary hot water in a quickest way.

[Operation Instructions]

Go to the **FUNCTION** page and locate “**Fast hot water**”, then, configure it through the Up/Down key   , “**On**” or “**Off**”.

[Notes]

① It works only when “**Water tank**” is set to “**With**”.

② This setting will be memorized upon power failure.

3. 2.2.4 T-water Ctrl (Water Temperature Control for Heating)

There are two options for the leaving water temperature control, high-temperature water circulation (**High**

temp) and normal-temperature water circulation (**Normal temp**). When "**Floor config**" is set to "**With**" (see 2.2.29), then the leaving water temperature control is defaulted to be "**Normal temp**" and cannot be changed. When "**Floor config**" is set to "**Without**" (see 2.2.29), no matter either "**FCU config**"(see 2.2.31) or "**Radia config**"(see 2.2.30) is set to"**With**", the leaving water temperature is defaulted to be "**Hihg temp**"and cannot be changed.

"**Floor config"**, "**FCU config**", and "**Radia config**" all can be configured to be "**With**". However, as long as "**Floor config**" is configure to be "**With**", only "**Normal temp**" is available.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**T-water ctrl.**", then,check the water control is "**Normal temp**" or "**Hihg temp**".

[Notes]

① When this setting is changed, the following parameters will return to the default values.

Full Name	Displayed Name	Default
Water out temperature for heating	WOT-Heat	45°C/113°F[High] 35°C/95°F[Normal]
Upper limit water-out temperature at the weather-dependent mode for heating	Upper WT-Heat	60°C/140°F[High] 35°C/95°F[Normal]
Lower limit water-out temperature at the weather-dependent mode for heating	Lower WT-Heat	55°C/131°F[High] 29°C/84°F[Normal]

② This setting will be memorized upon power failure.

3. 2.2.5 Cool + Hot water

This compound mode enables the user to give priority to the "**Cool**" or "**Hot water**" mode depending on the actual demand.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Cool+hot water**", then, configure it through the Up/Down key  , "**Cool**" or "**Hot water**".

[Notes]

① "**Hot water**" will take precedence only when "**Water tank**" is available, other it will tell "**Reserved**".

② This setting will be memorized upon power failure.

3. 2.2.6 Heat + Hot water

This compound mode enables the user to give priority to the "**Heat**" or "**Hot water**" mode depending on the actual demand.

[Operation Instructions]

Go to the **FUNCTION** page and locate **Heat+hot water**, then, configure it through the Up/Down key  , "**Heat**" or "**Hot water**".

[Notes]

① "**Hot water**" will take precedence only when "**Water tank**" is available, other it will tell "**Reserved**".

② This setting will be memorized upon power failure.

3. 2.2.7 Quiet

This function can be activated when the running noise is too high.

[Note]

when this function is activated, frequency of both the compressor and the fan will go down and also the capacity of the unit will correspondingly decrease.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Quiet**", then, configure it through the Up/Down key  , "**On**" or "**Off**".

[Notes]

① It can be set to "**On**" or "**Off**" no matter if the unit is in operation or not.

② Once it is activated, it should be deactivated manually or by **Quiet Timer**.

③ It will not memorized and defaulted to be off upon power failure.

④ It will be deactivated when the unit is turned off.

3. 2.2.8 Quiet Timer

When running noise is too high at some specific timer period, this function enables the unit run quietly at this time period.

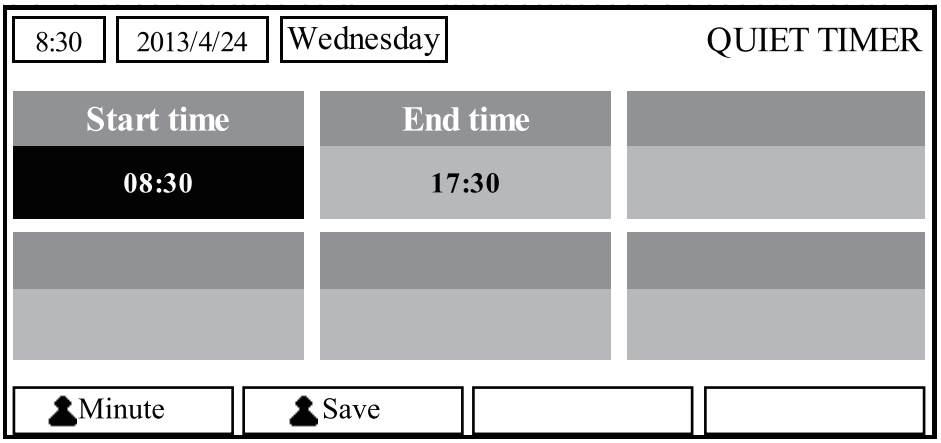
[Operation Instructions]

1. Go to the **FUNCTION** page and locate **Quiet timer**, then, access to the **QUIET TIMER** setting page.

2. At the **QUIET TIMER** setting page, select "**Start time**" or "**End time**" through the Left/Right keys and then configure the desired time through the Up/Down keys .

3. When the mode setting is finished, then by pressing "Save", a pop-up window will pop up to remind if you are determined to save this setting. If so, press the "OK" key . If not, press the "Cancel" key to not save this setting.

4. When the setting is saved, the control then will back to the **FUNCTION** page and the cursor will be where the "**Quiet timer**" option is, then by the Up/Down key , it can be set to be "**On**" or "**Off**".



[Notes]

① Once it is activated, it should be deactivated manually.

② It will not be memorized and be defaulted to be off upon power failure.

③ The saved "**Start time**" and "**End time**" will be memorized upon power failure.

④ It is configurable no matter if the unit is in operation or not.

3. 2.2.9 Weather-dependent Mode

For areas with large change of diurnal temperature, in order to avoid the user to set the leaving water temperature or room temperature too often, this function will adjust automatically depending on the environmental temperature.

[Operation Instructions]

Go to the **FUNCTION** page and locate **Weatherdepend**, then, configure it through the Up/Down key , "**On**" or "**Off**".

[Notes]

① Once it is activated, it should be deactivated manually.

② It will be defaulted to be off upon power failure.

③ At the "**Parameter View**" page, it is able to check the set point at the Weather-dependent Mode.

④ When it is activated, it is allowed to set the room temperature but the set point does not take effective. However, when it is deactivated, the unit will run according to this set point.

⑤ It can be set to "**On**" or "**Off**" no matter if the unit is in operation or not, but be activated only when the

unit is in operation.

⑥ This mode works only for the air conditioning function.

3. 2.2.10 Holiday Release

In summer or high-temperature season, this function will make the unit pause to run in some specific periods when the user is out.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Holiday release**", then, configure it through the Up/Down key , "**On**" or "**Off**".

[Notes]

① When it is activated, at the **WEEKLY TIMER** page, it is able to set some week day to "**Holiday release**". In this case, the "**Weekly timer**" in this day is ineffective unless it is set to "**Effective**" manually.

② This setting will be memorized upon power failure.

3. 2.2.11 Disinfection

This function is intended to sanitize the water tank by raising the water temperature to 70°C under which the legionella will die immediately. When this function is activated, the sanitation data and start time is configurable.

[Operation Instructions]

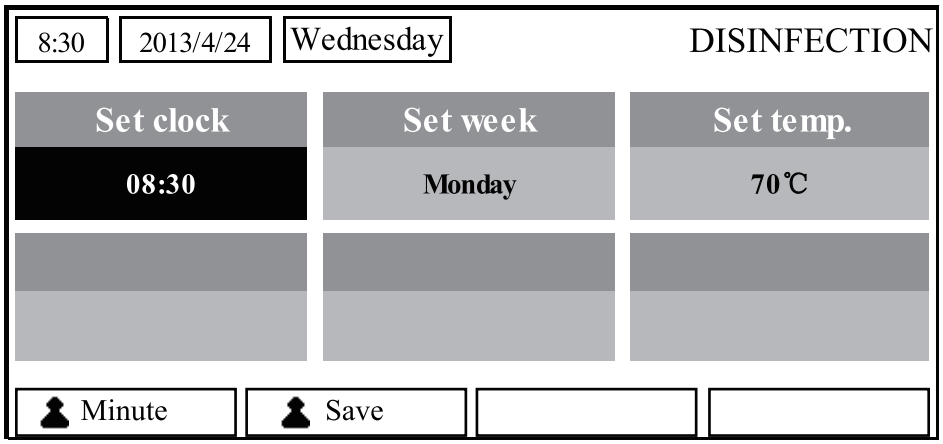
1. At the **FUNCTION** page, locate "**Disinfection**", and then access to the **DISINFECTION** setting page by pressing the OK key .

2. At the **DISINFECTION** setting page, select "**Set clock**", "**Set week**" or "**Set temp**" through the Left/Right key and then modify the corresponding setting through the Up/Down key .

3. When the mode setting is finished, then by pressing "**Save**", a pop-up window will pop up to remind if you are determined to save this setting. If so, press the OK key . If not, press the Cancel key to not save this setting.

4. When the setting is saved, the control then will back to the **FUNCTION** page and the cursor will be where the "**Disinfection**" is, then by the Up/Down key , it can be set to "**On**" or "**Off**".

Name	Name	Default	Range
Disinfection temperature	Set temp.	70°C	45°C~70°C



[Notes]

① It can be activated only when the "**Water tank**" is set to "**With**".

② It can be set to "**On**" or "**Off**" no matter if the unit is in operation or not

③ When "**Disinfection**" is set to "On", if you intend to set the "**Emergen. mode**", "**Holiday mode**", "**Floor Debug**", then a window will pop up, warning "**Please disable the Disinfection Mode!**".

④ It can be set to "**On**" or "**Off**" no matter if the unit is in operation or not, and "**Hot water**" mode always

takes precedence.

⑤ When Sanitize is activated, "**Disinfection**" will show on the home page of the control until this operation is finished. If this operation fails, "**Disinfect fail**" will show. In this case, by pressing any key, "**Disinfect fail**" will be cleared or it will be always there.

⑥ When Sanitize is activated, it will quit upon "**Communication error with the indoor unit**" or "**Water tank heater error**".

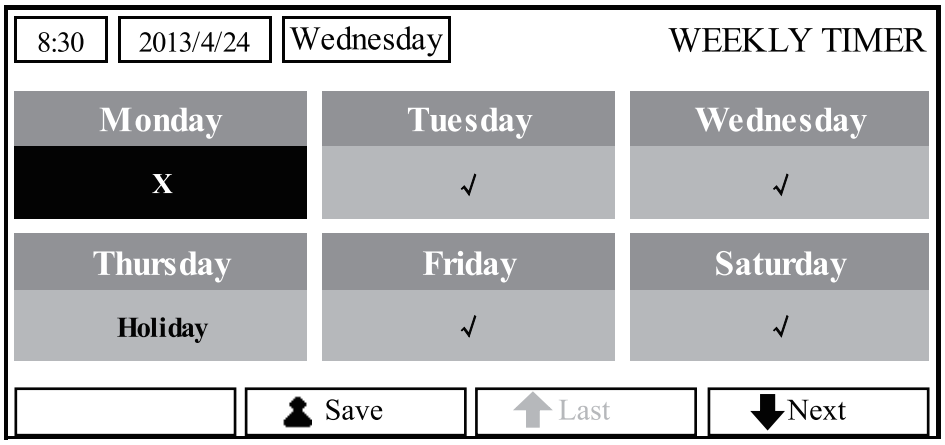
3. 2.2.12 Weekly Timer

This function will make the unit run with certain modes in certain periods within a week based on the user's actual demand.

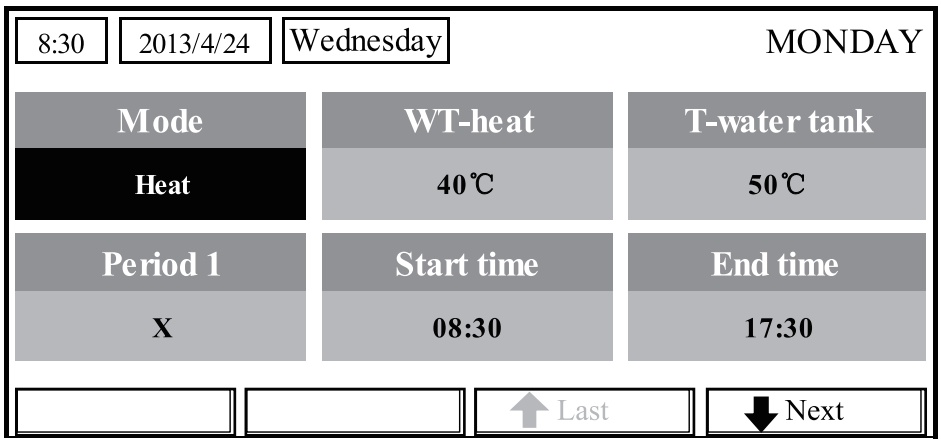
[Operation Instructions]

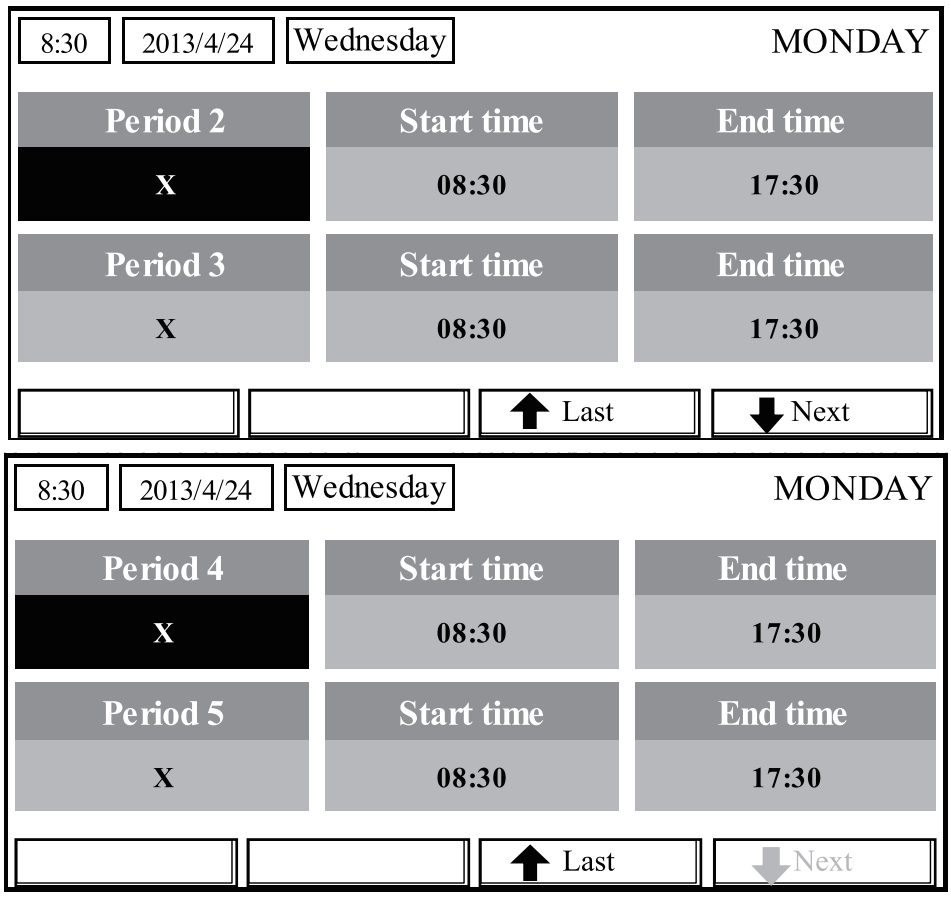
1. At the homepage, by pressing the Function key access to the **FUNCTION** page, and then locate where "**Weekly timer**" is by switching pages, after that, press OK key to go to the **WEEKLY TIMER** setting page.

2. At the **WEEKLY TIMER** setting page, by the Right/Left key it is able to select the desired week day and then by the Up/Down key to set this day, "√", "×" or "Holiday", as shown in the figure below. When this setting is finished, press OK key to go to this day's setting page.



3. At the week day's setting page, it is allowed to set the running mode (Mode), temperature set point (WT-HEAT), and water tank temperature (T-Water Tank). The running mode includes "**Heat**", "**Cool**", "**Hot water**", "**Heat+ hot water**", "**Cool+ hot water**" (the last three ones are available only when "Water tank" is set to "With". There are totally five periods for each day, and each period can be set to "√"or "×". Besides, it is able to set the "**Start time**" and "**End time**" for each period, as shown in the figure below.





4. When above settings are finished, pressing the Return key and then pressing "**Save**", a pop-up window will pop up to remind if you are determined to save these settings. If so, press the OK key . If not, press the Return key to not save these settings.

5. In this case, finally by pressing the Up key , "**Weekly timer**" will be activated.

[Notes]

① Totally five periods are allowed to be set for each time. For each period, "**Start time**" must be earlier than "**End time**". Similarly, the preceding period must be earlier than its following period.

② When "**Weekly timer**" has been set successfully, by changing "**FCU**", "**Water tank**", "**Ctrl state**", or "**T-water ctrl**", then the temperature set point for "**Weekly timer**" will be automatically changed to the set point of last setting. For instance, if "**Heat**" is set for Monday of "**Weekly timer**", "**FCU**" is set to "**With**" and the "**T-water out**" is 20℃, by resetting "**FCU**" to "**Without**", then "**T-water out**" will be the value of last setting. In this case, if FCU is disabled for last setting, then "**T-water out**" will be the default value (18℃).

③ At the "**WEEKLY TIMER**" setting page there are totally three setting types for each day

"√": it indicates once the Week Timer is activated, the timer on this day is effective and will not be affected by the "**Holiday**" mode.

"×": it indicates even if the Week Timer is activated, the timer on this day is ineffective.

"**Holiday**": it indicates when the Week Timer is activated but "**Holiday**" is not activated, then the timer on this day is effective; when "Holiday" is also activated, the timer on this day is ineffective.

④ When "**Weekly timer**" has already been set and the concerned modes include "**Hot water**", if resetting "**Water tank**" from "**With**" to "**Without**", then "**Hot water**" mode will be automatically changed to "**Heat**", "**Cool+hot water**"/ "**Heat+hot water**" changed to "**Cool**"/ "**Heat**".

⑤ Temperature Setpoint

The control is able to decide the temperature type and temperature range based on the current "**Clock Timer**", "**FCU**", "**T-water Ctrl.**", and "**Ctrl. state**" settings. See the followings for more details.

If the set mode is "**Hot water**", the temperature set point shows nothing, indicating there is no need to set

"**T-water out**" and "**T-room**" but only "**T- tank**". If the set mode "**Cool**" or "**Heat**", then water tank temperature box will show nothing, indicating there is no need to set "**T-tank**".

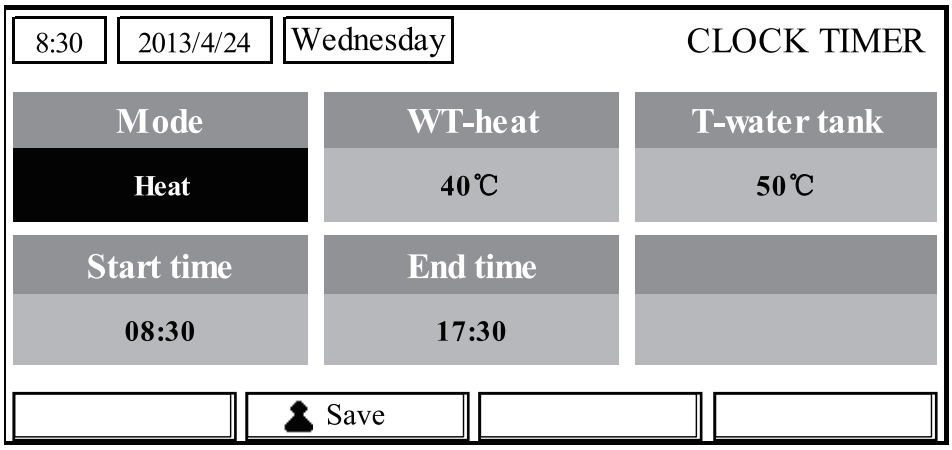
Ctrl. state	Set Mode	Object	Range		Default	Accuracy
T-water out	Cool	Water out temperature for cooling(WT-cool)	7-25°C (With FCU)	18-25°C (Without FCU)	7°C(With FCU) 18°C(Without FCU)	1°C
	Heat	Water out temperature for heating(WT-heat)	High temp.	25-60°C	45°C	1°C
			Low temp.	25-55°C	35°C	1°C
T-room	Cool	Room temperature for cooling(RT-cool)	18-30°C		24°C	1°C
	Heat	Room temperature for heating(RT-heat)	18-30°C		20°C	1°C

3. 2.2.13 Clock Timer

This function will make the unit run with certain modes in certain periods within a day based on the user's actual demand.

[Operation Instructions]

1. At the homepage, by pressing the Function key access to the **FUNCTION** page, and then locate where "**Clock timer**" is, after that, press OK key to go to the **COLCK TIMER** setting page.



2. At the **CLOCK TIMER** setting page, by the Left/Right key select the desired parameter and then by the Up/Down key configure it.

3. When this setting is concerned about time value, by pressing the Function key no. 1 alternately set the hour or minute values, and by pressing the Up/Down key increase or decrease the corresponding value which will be continuously changed by pressing and holding the key. (Unless otherwise specified, all timer settings follow the similar way.)

4. When the setting is finished, save it by pressing the Function key no. 2, or this setting without being saved is ineffective.

5. When the setting has been saved, activate the "**Clock Timer**" at the **FUNCTION** page.

[Notes]

① When "**Weekly timer**" and "**Clock timer**" settings are performed at the same time, the latter takes precedence.

② When the water tank is available, the allowed running modes include "**Heat**", "**Cool**", "**Heat+ hot water**", "**Cool+hot water**", and "**Hot water**".

③ When the water tank is unavailable, the allowed running modes only include "**Heat**" and "**Cool**".

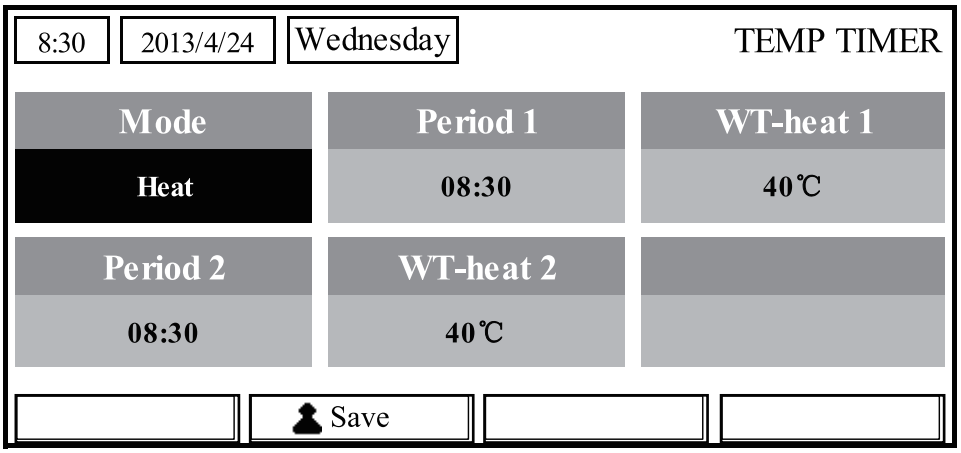
④ When "**Clock timer**" has already been set and the concerned modes include "**Hot water**", if resetting "**Water tank**" from "**With**" to "**Without**", then "**Hot water**" mode will be automatically changed to "**Heat**", "**Cool+hot water**"/ "**Heat+hot water**" changed to "**Cool**"/ "**Heat**".

3. 2.2.14 Temp. Timer

This function will make the unit run with certain temperature in a certain period within a day based on the user's actual demand.

[Operation Instructions]

1. At the homepage, by pressing the Function key access to the **FUNCTION** page, and then locate where "**Temp timer**" is, after that, press OK key to go to the **TEMP TIMER** setting page.



2 At the **TEMP TIMER** setting page, by the Left/Right key select the desired parameter and then by the Up/Down key configure it. The configurable parameters include "**Mode**", "**Period 1**", "**WT-HEAT 1**", "**Period 2**" and "**WT-HEAT 2**".

3. When the setting is finished, save it by pressing the Function key no. 2, or this setting without being saved is ineffective.

4. When the setting has been saved, activate the "**Temp. timer**" at the **FUNCTION** page.

[Notes]

① When "**Weekly timer**", "**Clock timer**", and "**Temp. timer**" settings are performed at the same time, the last one takes precedence.

② This function works only when the unit is in operation.

③ The allowed running modes include "**Heat**" and "**Cool**"

④ When the start time of "**Period 2**" is equal to that of "**Period 1**", then the set point of "**Period 2**" takes precedence.

⑤ **TEMP. TIMER** is judged by the timer value.

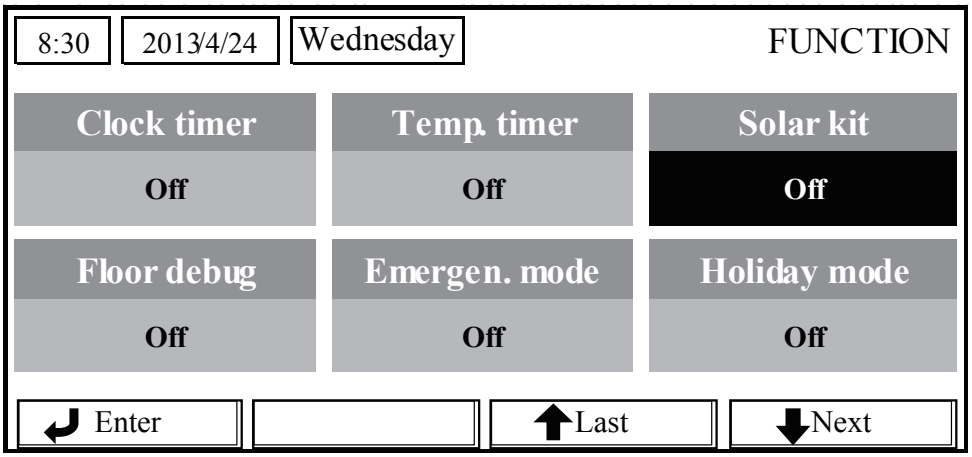
⑥ During the setting, the temperature set point which is set manually always takes precedence.

3. 2.2.15 Solar kit

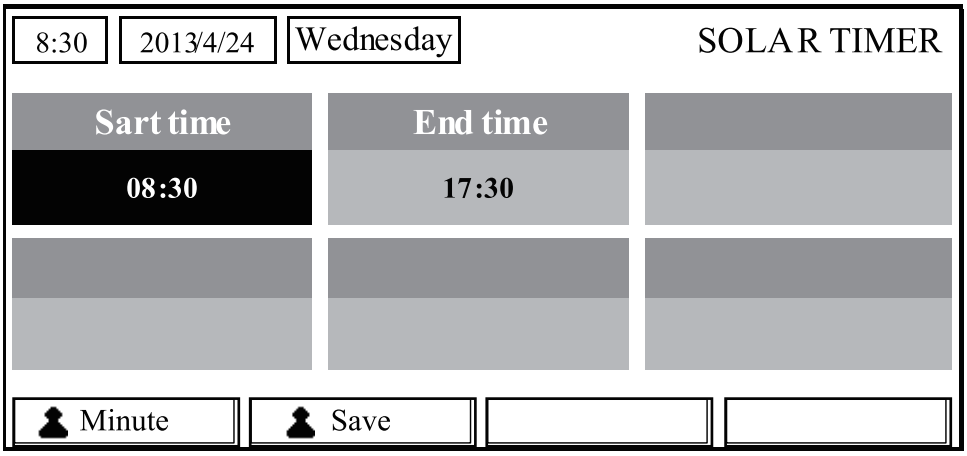
This mode can be set to **On/Off/Timer**.If **On Mode** is chosen,the solar system will be actived while the temperature required is satisfied;if **Off Mode** is choesen, the solar system will not be actived;if **Timer Mode** is chosen,the solar system will be actived in the setting time while the temperature required is satisfied.

[Operation Instructions]

1. Go to the **FUNCTION** page and locate "**Solar kit**", tthen press UP/DOWM keys to chose **On/Off/Timer mode**.



2.When Timer mode is chosen,press on leftdown or enter key to enter the Timer setting page as shown below.



No.	Full Name	Displayed Name	Range	Default
1	Solar kit start time	Start time	0:00~24:00	8:00
2	Solar kit stop time	Stop time	0:00~24:00	18:00

3. At the "**Solar Timer**" page, locate "**Start time**" or "**End time**" through the up and down keys and then adjust the start or stop time also through the up and down keys .

4. After configuration, press "Save" and then a dialog box will pop up. In the dialog box, press "OK" to confirm the configuration, or press "Cancel" to cancel this configuration.

5. After saving the configuration, this page will automatically back to the **FUNCTION** page with the cursor stayed at "**Solar timer**", and then through the up and down keys to set it to be "ON" to activate "**Solar timer**".

[Notes]

① Once "**Solar timer**" is activated,it cannot be deactivated through ON/OFF operation but be done manually.

② "**Start time**" and "**End time**" will be memorized upon power failure

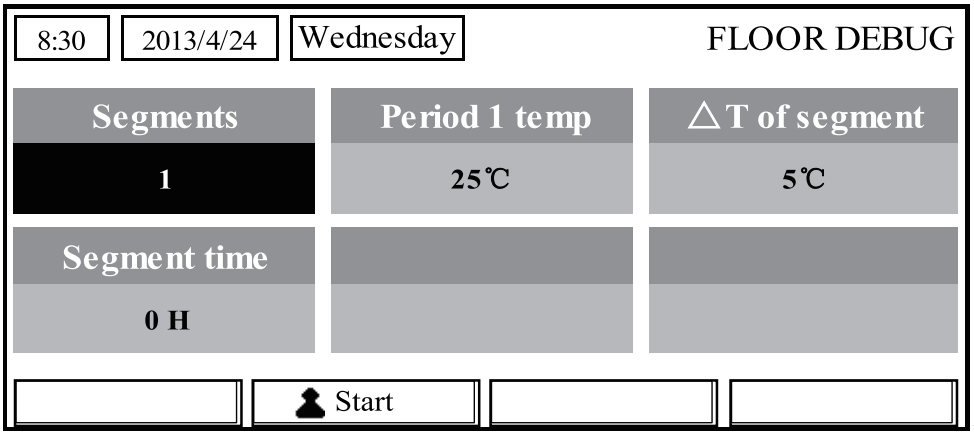
③ It can be set under both ON and OFF states

3. 2.2.16 Floor Debug

This function will make the unit to perform periodic preheating to the floor for the initial run once floor coils have been installed.

[Operation Instructions]

1. At the homepage, by pressing the Function key access to the **FUNCTION** page, and then locate where "**Floor debug**" is, after that, press OK key to go to the **FLOOR DEBUG** setting page.



2. At the **FLOOR DEBUG** setting page, by the Left/Right key select the desired parameter and then by the Up/Down key configure it. The configurable parameters include "**Segments**", "**Period 1 temp**", "**ΔT of segment**", and "**Segment time**", as listed in the following table.

No.	Full Name	Displayed Name	Range	Default	Accuracy
1	Segments for floor debug	Segments	1~10	1	1
2	First temperature for floor debug	Period 1 temp	25~35°C/77~95°F	25°C/77°F	1°C/1°F
3	Segment temperature difference for floor debug	ΔT of segment	0~72H	0	12H
4	Segments duration for floor debug	Segment time	2~10°C/36~50°F	5°C/41°F	1°C/1°F

3. After the above setting is finished, by pressing the function key no.2 activate this function and a dialog box will pop up, reminding "**Start the Floor Debug Mode now?**". If so, press the "OK" key . Once "**Floor debug**" has been activated, by pressing the function key no.2 , a dialog box also will pop up, reminding "**Stop the Floor Debug Mode now?**" If so, press the OK key ; if not, press "**Cancel**" to go on.

[Notes]

① This function can be activated only when the unit is OFF. When it is intended to activate this function with the unit being ON, a dialog box will pop up, warning "**Please turn off the system first!**".

② When this function has been activated, it is unable to turn on or off the unit. In this case, when pressing the ON/OFF key , a dialog will pop up, warning "**Please disable the Floor Debug Mode!**".

③ When this function has been set successfully, "**Timer week**", "**Clock timer**" and "**Temp timer**" will be deactivated.

④ "When "**Floor debug**" mode has been activated, "**Emergen.mode**", "**Sanitize**", "**Holiday mode**" is not allowed to be activated, or a dialog box will pop up, warning "**Please disable the Floor Debug Mode!**".

⑤ Upon power failure, this function will be OFF and runtime will be cleared.

⑥ At the **FIOOR DEBUG** setting page, the control will remain at this page and never back to the homepage unless pressing the Return key or Menu key .

⑦ When this function is activated, it is allowed to check the target temperature and runtime of "Floor Debug" at the Parameter View page.

⑧ Before activating "**Floor debug**", please make sure each period for "**Floor debug**" is not zero, or a dialog box will pop up, warning "**Wrong Floor Debug time!**". It will resume only by pressing "OK" and then

correcting the time.

3. 2.2.17 Emergency Mode (Emergen. Mode)

When the compressor fails to run owing to some urgent condition, this function will allow the unit to run in the "Heat" or "Hot water" mode through the assistant heater and the water tank heater.

[Operation Instructions]

1. Set "**Mode**" to "**Heat**" or "**Hot water**" at the Parameter Set page

2. Then, switch pages to go the page where "**Emergen. mode**", locate it by the Left/Right key  , and configure it to "**On**" or "**Off**" by the Up/Down key  .

3. When it is set to "**On**", "**Auxiliary func.**" at the homepage will be replaced by "**Emergen. Mode**".

4. When it is set to "**On**" but the running mode is not "**Heat**" or "**Hot water**", a dialog will pop up, warning "**Wrong running mode!**". In this case, by pressing the OK key  , the control will go to the Mode setting page, or by pressing the Cancel key  , the control will return to the "**Emergen. Mode**" page.

[Notes]

① When the unit is performing "**Heat**" at the Emergency mode, if there is water flow switch protection, IDU assistant heater welding protection, or leaving water temperature sensor error, the Emergency mode will quit and will not be allowed to be activated.

② When the unit is performing "**Hot water**" at the Emergency mode, if there is water tank heater welding protection, or water tank temperature sensor error, the Emergency mode will quit and will not be allowed to be activated.

③ At the Emergency mode, the ON/OFF key  operation will be disabled; the running mode will not be allowed to be changed; the Quiet Mode and Weather-dependent Mode cannot be deactivated; "**Weekly timer**", "**Clock timer**" and "**Temp timer**" also cannot be activated, or will be deactivated if being activated.

④ At the Emergency mode, commands from the Thermostat is ineffective.

⑤ At the Emergency mode, only one running mode between "**Heat**" and "**Hot water**" is allowed.

⑥ This function can be activated only when the unit is OFF, or a dialog box will pop up, warning "**Please turn off the system first!**"

⑦ Under the Emergency mode, "**Floor debug**", "**Sanitize**", "**Holiday mode**", cannot be activated, or a dialog box will pop up, warning " **Please disable the Emergency Mode!**".

⑧ Upon power failure, the "**Emergen. mode**" will be defaulted to be "**Off**".

3. 2.2.18 Holiday Mode

In winter or low-temperature season, this function will control the leaving water temperature or room temperature within a certain range to avoid the water system from being frozen when the user is out on holiday for a long time.

[Operation Instructions]

1. Locate where "**Holiday mode**" at the **Parameter Set** page

2. Set Holiday to "**On**" or "**Off**" by the Up/Down key  .

[Notes]

① At the holiday mode, "**Mode**" setting of the control and On/Off key operation both are disabled.

② When it is activated, "**Weekly timer**", "**Clock timer**" or "**Temp timer**" will be deactivated.

③ At the holiday mode, when "**T-Room**" is adopted, the temperature set point should be 15℃; when "**T-Out water**" is adopted, then the temperature set point should be 30℃.

④ It will quit when the thermostat effectively works ("**Cool**" or "**OFF**" operation).

⑤ When this setting is saved successfully, it will be memorized upon power failure.

⑥ This function can be activated only at the "**Heat**" mode and with the unit turned off. When it is done with the unit turned on, a prompt dialog box will pop up, warning "**Please turn off the system first!**"; or when it is done at other modes except the "**Heat**" Mode with the unit turned off, also a prompt dialog box will pop up,

warning "**Wrong running mode!**".

⑦ When it is activated, the ON/OFF key  operation is disabled, or a dialog box will pop up, warning "**Please disable the Holiday Mode !**".

⑧ Under the Holiday mode, "**Floor debug**", "**Sanitize**", "**Emergen. mode**" cannot be activated, or a dialog box will pop up, warning "**Please disable the Holiday Mode !**".

3. 2.2.19 Thermostat

When the thermostat has been installed, it can be used to control the run mode of the unit ("**Air**", "**Off**" or "**Air+hotwater**"mode)

[Operation Instructions]

1. Locate where "**Thermostat**" is at the **FUNCTION** page

2. By pressing the Up/Down keys  , It can be set to "**Air**" "**Off**" "**Air+hotwater**". When it is "**Air**",the control follows the running mode of the thermostat and is not allowed to set the running mode; when it is "**Off**", the control follows the running mode set by itself. When it is "**Air+hotwater**", the unit will run "**Heat+heating water**"or"**Cool+heating water**" mode according to the thermostat

[Notes]

① When "**Floor debug**" or "**Emergen. Mode**" is activated, then the control will not receive signals from the thermostat.

② If "**Thermostat**" is set to "**Air**" or "**Air+hotwater**", the control will automatically disable some functions concerning.

③ When this setting is saved successfully, it will be memorized upon power failure.

④ The state of the Thermostat can be changed when the unit is turned off.

3. 2.2.20 Assistant Heater(Assis. Heater)

There are three options for the assistant heater, " 1 group", "2 groups" or "Without".

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Assistant heater**", then, configure it through the Up/Down key 

 , "**With**" or "**Without**".

[Notes]

●It will be memorized upon power failure.

3. 2.2.21 Other Heater

It can be configured to "With" or "Without" through the wired controller.

[Operation Instructions]

Go to the **FUNCTION** page and locate **Other heater**, then, configure it through the Up/Down key 

 , "**With**" or "**Without**".

[Notes]

●It will be memorized upon power failure.

3. 2.2.22 Chassis Heater

The user will decide if to activate or deactivate the chassis heater. Generally it is suggested to activate it under low environment temperature, "**Heat**" mode or "**Hot water**" mode to prevent the chassis from being frozen.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Chassis Heater**" then, configure it through the Up/Down key 

 , "**On**" or "**Off**".

[Notes]

●It will be memorized upon power failure.

3. 2.2.23 Tank heater

When the water tank is installed, it will be activated automatically and cannot be changed.

3. 2.2.24 Plate heater

The plate heater can be activated or deactivated by the user. Generally it is suggested to activate it when the water pump has stopped and the environment temperature is lower than 2°C so as to prevent the heat exchanger from being frozen.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Plate heater**" then, configure it through the Up/Down key  , "**On**" or "**Off**".

[Notes]

●It will be memorized upon power failure.

3. 2.2.25 Solar antifre

When the solar system has been installed, it is highly suggested to activate this function.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Solar antifre**" then, configure it through the Up/Down key  , "**On**" or "**Off**".

[Notes]

●It will be memorized upon power failure.

3. 2.2.26 Water Tank

It can be configured to be "**With**" or "**Without**" based on the actual condition.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Water tank**" then, configure it through the Up/Down key  , "**With**" or "**Without**".

[Notes]

① It will be memorized upon power failure.

② This setting is allowed only when the unit is turned off.

3. 2.2.27 Tank Sensor

When the water tank has been installed, one group or two groups of tank sensors can be selected to detect and control the water tank temperature.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Water tank**", then, configure it through the Up/Down key  , "**1**" or "**2**". When the water tank is unavailable, this option will be reserved.

[Notes]

●It will be memorized upon power failure.

3. 2.2.28 Solar Heater

It can be configured to be "**With**" or "**Without**" based on the actual condition.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Solar heater**", then, configure it through the Up/Down key  , "**With**" or "**Without**".

[Notes]

●It will be memorized upon power failure.

3. 2.2.29 Floor config

It can be configured to be "**With**" or "**Without**" based on the actual condition.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Floor config**", then, configure it through the Up/Down key  , "**With**" or "**Without**".

[Notes]

① It will be memorized upon power failure.

② When it is set to be "**With**", the water temperature will be set to "**Normal temp.**" automaticy.

③ When it is set to be "**Without**", the water temperature will be set to "**High temp.**" automaticy.

3. 2.2.30 Radia config

It can be configured to be "**With**" or "**Without**" based on the actual condition.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Radia config**", then, configure it through the Up/Down key  , "**With**" or "**Without**".

[Notes]

① It will be memorized upon power failure.

② When it is set to "with", the water temperature is defaulted to be "High temp."

3. 2.2.31 FCU

It can be configured to be "**With**" or "**Without**" based on the actual condition.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**FCU**", then, configure it through the Up/Down key  , "**With**" or "**Without**".

[Notes]

●It will be memorized upon power failure.

3.2.2.32 Remote Sensor

It can be configured to be "**With**" or "**Without**" based on the actual condition.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Remote sensor**", then, configure it through the Up/Down key  , "**With**" or "**Without**".

[Notes]

① It will be memorized upon power failure.

② "**T-room ctrl**" can be selected only when the **Remote Sensor** is set to "**With**".

3.2.2.33 Air removal

This function is intended to expel air inside the water system with only the water pump in operation when installation of the unit is finished.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Air removal**", then, configure it through the Up/Down key  , "**On**" or "**Off**".

[Notes]

① It will not be memorized upon power failure.

② It can be set only when the unit is turned off.

3.2.2.34 Address

It is used to identify the unit in use in the central control system.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Address**", then, configure it through the Up/Down key  to set the address.

[Notes]

① It indicates the address of the control and is intended for the group control.

② It will not be memorized upon power failure.

③ The address range is [1,125] and [127,253]

④ The default address is 1 for the initial use.

3.2.2.35 Gate-Controller

It can be configured to be "**On**" or "**Off**" based on the actual condition.

[Operation Instructions]

Go to the **FUNCTION** page and locate "**Gate-Controller**", then, configure it through the Up/Down key , "**On**" or "**Off**".

[Notes]

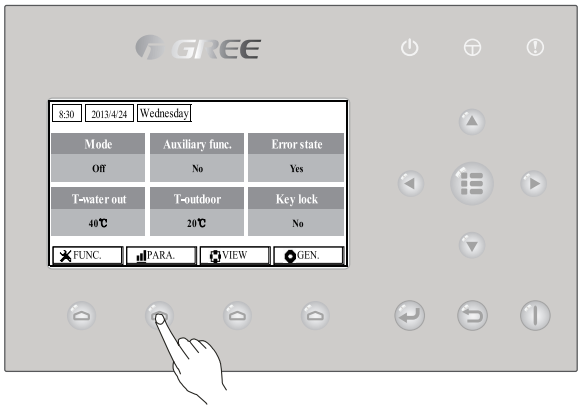
① When it is activated, the control will check the card is inserted or not. If inserted, the control will run normally; if not, the control will turn off the unit and back to the homepage. In this case, any key operation is ineffective (except for the combined key operation), or a dialogue box will pop up, warning"**Keycard uninserted!**".

② It will not be memorized upon power failure.

3.2.3 Parameter Setting (Parameter Set)

3.2.3.1 User Parameter Setting

At the parameter setting pages, each parameter is configurable, like: water out temperature for cooling, water out temperature for heating, and water tank temperature etc.



[Operation Instructions]

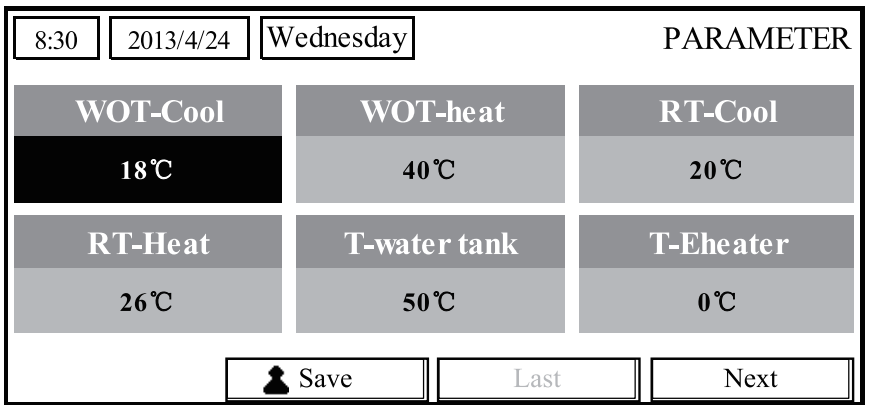
1. At the homepage, it is able to go to the **PARAMETER** page by pressing the Function key no.2 .

2. At the **Parameter Set** page, by the Left/Right key select the desired option and then by the Up/Down key increase or decrease the setting value which will be continuously changed when pressing and holding the key.

3. When the setting is finished, press "**Save**" and a dialog box will pop up, reminding "**Save settings?**". If so, press the OK key ; if not press the Cancel key to not save this setting.

[Notes]

① For those parameter which default value vary by different condition, the value will set to default when the condition changes.

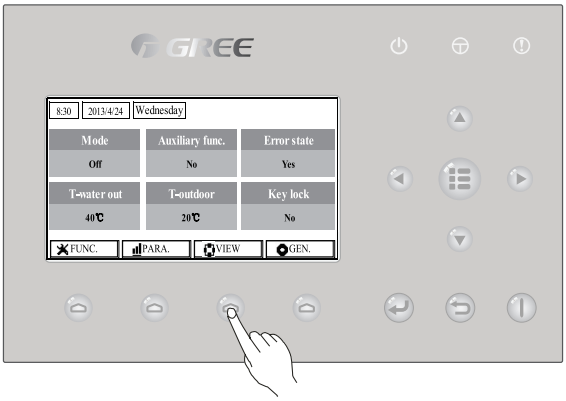


User Setting

No.	Full Name	Displayed Name	Range		Default
1	Water out temperature for cooling	WOT-Cool	7~25°C [With FCU] 18~25°C [Without FCU]	45~77°F [With FCU] 64~77°F [Without FCU]	7°C/45°F[With FCU] 18°C/64°F[Without FCU]
2	Water out temperature for heating	WOT-Heat	25~60°C[High temp.] 25~55°C[Normal temp.]	77~140°F[High temp.] 77~131°F[Normal temp.]	45°C/113°F[High temp.] 35°C/95°F[Normal.]
3	Room temperature for cooling	RT-Cool	18~30°C	64~86°F	24°C/75°F
4	Room temperature for heating	RT-Heat	18~30°C	64~86°F	20°C/68°F
5	Tank temperature	T-water tank	40~80°C	104~176°F	50°C/122°F
6	Eheater-on ambient temperature	T-Eheater	-22~18°C	-8~64°F	-7°C/19°F
7	Extra-heater-on ambient temperature	T-Extraheater	-22~18°C	-8~64°F	-15°C/5°F
8	Max heat pump waterout temperature (no eheater)	T-HP Max	40~50°C	104~122°F	50°C/122°F
9	Solar kit-max water temp	Solarwater Max	50~80°C	122~176°F	80°C/176°F
10	Lower limit ambient temperature at the Weather-dependent Mode for heating	Lower AT-Heat	-22~5°C	-8~41°F	-20°C/-4°F
11	Upper limit temperature at the Weather-dependent Mode for heating	Upper AT-Heat	10~37°C	50~99°F	25°C/77°F
12	Upper limit room temperature at the Weather-dependent Mode for heating	Upper RT-Heat	22~30°C	72~86°F	24°C/75°F Set to default value when the Weather-dependent Mode setting changes.
13	Lower limit room temperature at the Weather-dependent Mode for heating	Lower RT-Heat	18~21°C	64~70°F	18°C/68°F Set to default value when the Weather-dependent Mode setting changes.
14	Upper limit water-out temperature at the Weather-dependent Mode for heating	Upper WT-Heat	56~60°C[High temp.] 30~55°C[Normal temp.]	133~140°F[High temp.] 86~95°F [Normal temp.]	60°C/140°F[High temp.] 35°C/95°F[Low temp.] Set to default value when the Weather-dependent Mode setting changes.
15	Lower limit water-out temperature at the Weather-dependent Mode for heating	Lower WT-Heat	55~58°C[High temp.] 25~29°C[Normal temp.]	131~136°F[High temp.] 77~84°F [Normal temp.]	50°C/131°F[High temp.] 29°C/84°F[Low temp.] Set to default value when the Weather-dependent Mode setting changes.
16	Lower limit ambient temperature at the Weather-dependent Mode for cooling	Lower AT-Cool	8~25°C	46~77°F	25°C/77°F

17	Upper limit temperature at the Weather-dependent Mode for cooling	Upper AT-Cool	26~50°C	79~122°F	40°C/104°F
18	Upper limit room temperature at the Weather-dependent Mode for cooling	Upper RT-Cool	24~30°C	75~86°F	27°C/81°F
19	Lower limit room temperature at the Weather-dependent Mode for cooling	Lower RT-Cool	18~23°C	64~73°F	22°C/72°F
20	Upper limit water-out temperature at the Weather-dependent Mode for cooling	Upper WT-Cool	15~25°C[With FCU] 22~25°C[Without FCU]	59~77°F [With FCU] 72~77°F [Without FCU]	15°C/59°F[With FCU] 23°C/73°F[Without FCU]
21	Lower limit water-out temperature at the weather-dependent mode for cooling	Lower WT-Cool	7~14°C[With FCU] 18~21°C[Without FCU]	45~57°F[With FCU] 64~70°F[Without FCU]	7°C/45°F[With FCU] 18°C/64°F[Without FCU]
22	Temperature deviation for cooling	ΔT-Cool	2~10°C	36~50°F	5°C/41°F
23	Temperature deviation for heating	ΔT-Heat	2~10°C	36~50°F	10°C/50°F
24	Temperature deviation for heating water	ΔT-hot water	2~8°C	36~46°F	5°C/41°F
25	Room temp variation	ΔT-Room temp	1~5°C	36~41°F	2°C/36°F
26	Run time	Run time	1~10min		3min[with FCU or Radiator] 5min[witnout FCU and Radiator]
27	Solar kit-start temp variation	T-Solar start	10~30°C	50~86°F	15°C/59°F
28	Solar pannel-max. temp	SL- pannel Max	90~130°C	194~266°F	110°C/230°F

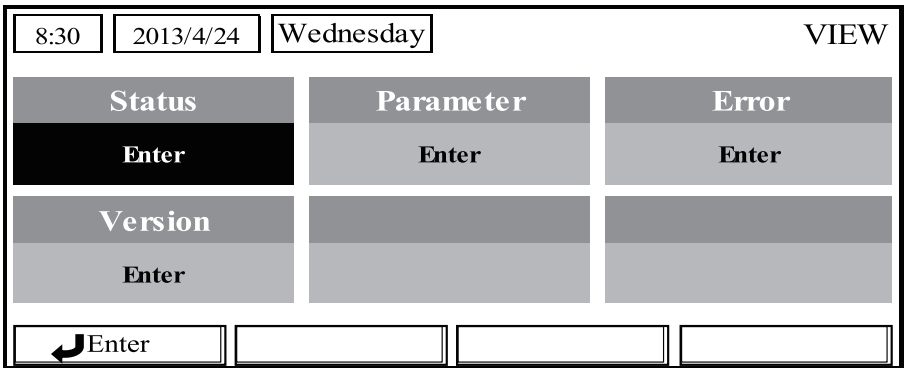
3. 2.4 View



At the view pages, the user is enabled to view the unit's running state, running parameters, errors, version of the wired controller etc.

[Operation Instructions]

At the homepage, by pressing the Function key no.3  , it is able to go to the **VIEW** page as shown in the figure below.

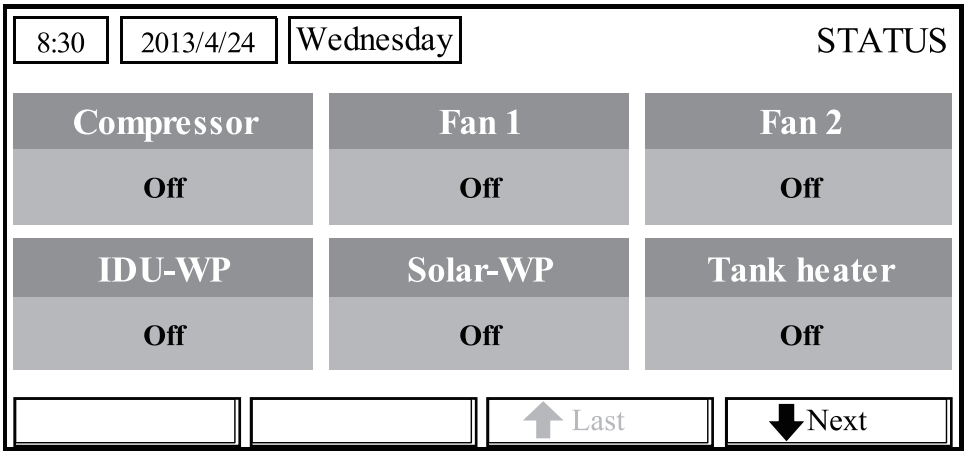


3. 2.4.1 Status View

At the status view pages, the user is enabled to view the unit's running status, like compressor On/Off, fan 1 On/Off, water pump On/Off, antifreeze On/Off, defrost On/Off etc.

[Operation Instructions]

1. At the **VIEW** page, select "**Status**" and then press the OK key to go to the **STATUS** page.
2. At the **STATUS** page, it is able to check the status of each component.



Viewable Components

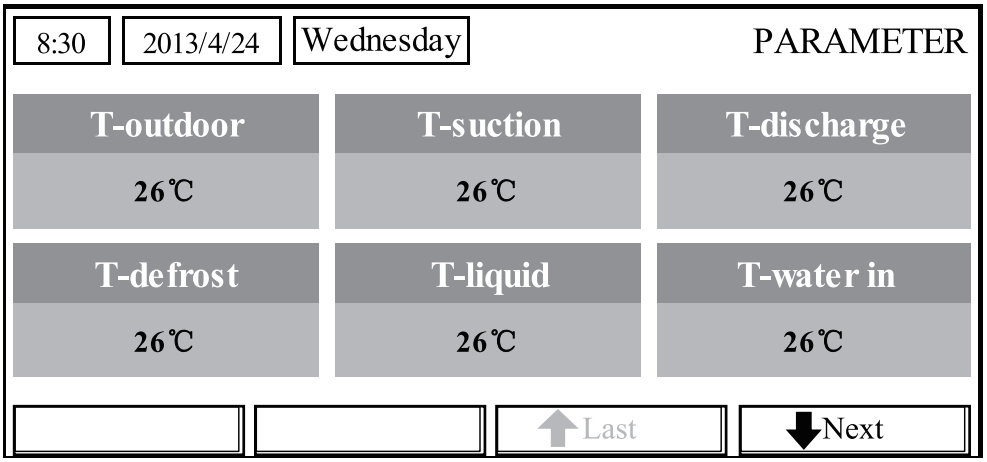
Full Name	Displayed Name	Status
Compressor running state	Compressor	On/Off
Fan 1 running state	Fan 1	On/Off
Fan 2 running state	Fan 2	On/Off
Heat pump-water pump	HP-pump	On/Off
Solar water pump running state	SL-pump	On/Off
Swimming pool-water pump	Swimming-pump	On/Off
Tank heater running state	Tank heater	On/Off
3-Way valve 1 running state	3-way valve 1	On/Off
3-Way valve 2 running state	3-way valve 2	On/Off
Crankcase heater running state	Crankc.heater	On/Off
Chassis heater running state	Chassis heater	On/Off
Plate heat exchanger heater	Plate heater	On/Off
Defrost	Defrost	On/Off
Oil return	Oil return	On/Off
Thermostat	Thermostat	Off/Cool/Heat
Assistant heater running state	Assist. Heater	On/Off
Circulating two-way valve 1 running state	2-way valve 1	On/Off
Circulating two-way valve 2 running state	2-way valve 2	On/Off
Doorguard	Doorguard	Card in/Card out
Opration LED	Opration LED	On/Off
Error LED	Error LED	On/Off
4-way valve running state	4-way valve	On/Off
Enthalpy-enhancing solenoid valve	En.valve	On/Off
Heat pump-auxiliary heater 1	HP-heater 1	On/Off
Heat pump-auxiliary heater 2	HP-heater 2	On/Off
Solar kit- freeze protection	SL-Antifree	Enabled/Disabled
Heat pump-freeze protection	HP-Antifree	Enabled/Disabled

3. 2.4.2 Parameter View (Para View)

At the parameter view pages, the unit is enabled to view the units' running parameters, like outdoor temperature, suction temperature, discharge temperature, water in temperature, water out temperature etc.

[Operation Instructions]

1. At the **VIEW** page, select **Parameter** and then press the OK key to go to the **Para View** page.
2. At the **Para View** page, it is able to view each parameter.



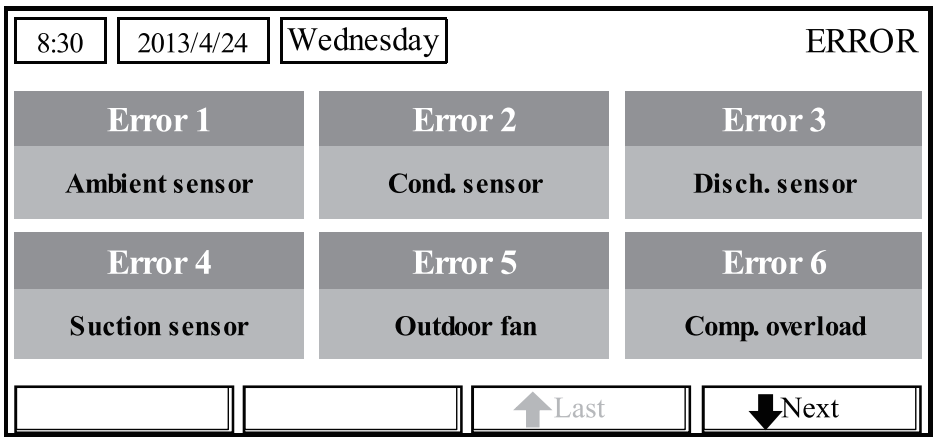
No.	Full Name	Displayed Name
1	Outdoor temperature	T-outdoor
2	Suction temperature	T-suction
3	Discharge temperature	T-discharge
4	Defrost temperature	T-defrost
5	Plate heat exchanger Water in temperature	T-water in PE
6	Plate heat exchanger water-out temperature	T-waterout PE
7	E-heater water-out temperature	T-waterout EH
8	Water tank temperature set point	T-tank ctrl.
9	Water tank temperature reading	T-tank display
10	Remote room temperature	T-remote room
11	Solor kit-entering water temp	T-SL water I
12	Solor kit-leaving water temp	T-SL water O
13	Solar battery temp	T-SL battery
14	Swimming pool-water temp	T-Swimming
15	Swimming pool-entering water temp	T-Swimming in
16	Swimming pool-leaving water temp	T-Swimming out
17	Discharge pressure	Dis.pressure
18	Enthalpy-enhancing pressure	En.pressure
19	Suction pressure	Su.pressure
20	Target temperature for Weather-dependent Mode	T-auto mode
21	Target temperature for floor debug	T-floor debug
22	Time period for floor debug	Debug time

3. 2.4.3 Error View

At the error view pages, the user is enabled to see which error the unit suffers.

[Operation Instructions]

1. At the **VIEW** page, select **Error** and then press the OK key to go to the **ERROR** page.
2. At the **Error View** page, it is able to view each error.



[Notes]

① The real-time error will show on the control. Taking Error 2 in the above figure for example, when it is recovered, it will disappear and be replaced by Error 3, and other errors follow the same way.

② If the total no. of errors exceed six, other errors should be viewed by switching pages through "**Last**" and "**Next**".

③ Any one among "**IDU auxiliary heater 1 error**", "**IDU auxiliary heater 2 error**", "**Water tank heater error**" occurs, the control will beep until this error has been cleared.

See the following table for error description.

No.	Full Name	Displayed Name	Error Code
1	Ambient temperature sensor error	Ambient sensor	F4
2	Defrost temperature sensor error	Defro. sensor	d6
3	Discharge temperature sensor error	Disch. sensor	F7
4	Suction temperature sensor error	Suction sensor	F5
5	Outdoor fan error	Outdoor fan	EF
6	Compressor internal overload protection	Comp. overload	H3
7	High pressure protection	High pressure	E1
8	Low pressure protection	Low pressure	E3
9	High discharge protection	Hi-discharge	E4
10	Refrigerant loss protection	Refri-loss	P2
11	Heat pump-water pump protection	HP-pump	E0
12	Solar kit-water pump protection	SL-pump	EL
13	Swimming pool-water pump protection	Swimming-pump	
14	Incorrect capacity DIP switch setting	Capacity DIP	c5
15	Communication error between indoor and outdoor unit	ODU-IDU Com.	E6
16	Drive communication error	Drive com.	
17	High pressure sensor error	HI-pre. sens.	Fc
18	Enthalpy-enhancing sensor error	En. senser	F8
19	Low pressure sensor error	LOW-pre. Sens.	dL
20	Heat exchanger-leaving water temperature sensor error	Temp-HELW	F9
21	Auxiliary heater-leaving water temperature sensor error	Temp-AHLW	dH
22	Heat exchanger-entering water temperature sensor error	Temp-HEEW	
23	Water tank water temperature sensor 1 error	Tank sens. 1	FE
24	Water tank water temperature sensor 2 error	Tank sens. 2	
25	Solar kit-entering water temp sensor	T-SL water out	
26	Solar kit-leaving water temp sensor	T-SL water in	FH
27	Solar kit- temp sensor	T-Solar pannel	FF

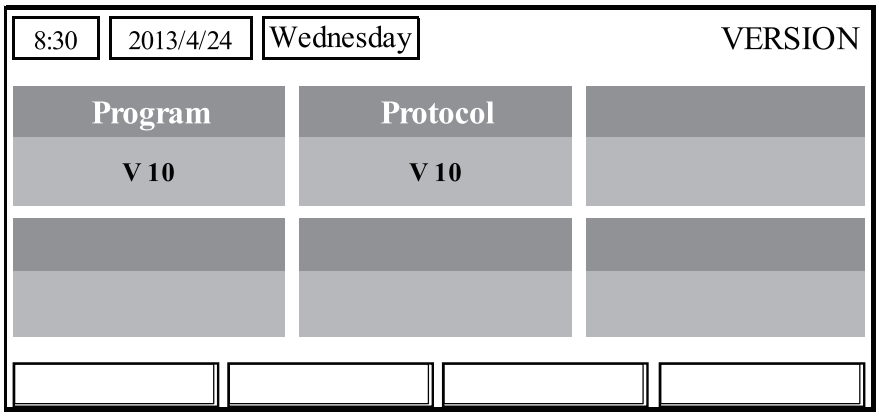
28	Swimming pool-entering water temp sensor	T-Swimming in	
29	Swimming pool-leaving water temp sensor	T-Swimming out	
30	Swimming pool-water temp sensor	T-Swimming	
31	Remote room sensor 1	T-Remote Air1	F3
32	Remote room sensor 2	T-Remote Air2	
33	Heat pump-water flow switch	HP-Water SW	Ec
34	Solar kit-water flow switch	SL-Water SW	F2
35	Swimming pool-water flow switch	SW-Water SW	F1
36	Welding protection of the auxiliary heater 1	Auxi. heater 1	EH
37	Welding protection of the auxiliary heater 2	Auxi. heater 2	EH
38	Welding protection of the water tank heater	Auxi. -WTH	EH
39	Under-voltage DC bus or voltage drop error	DC under-vol.	PL
40	Over-voltage DC bus	DC over-vol.	PH
41	AC current protection (input side)	AC curr. pro.	PA
42	IPM defective	IPM defective	H5
43	PFC defective	FPC defective	Hc
44	Start failure	Start failure	Lc
45	Phase loss	Phase loss	LD
46	Drive module resetting	Driver reset	P6
47	Compressor over-current	Com. over-cur.	P0
48	Overspeed	Overspeed	P5
49	Sensing circuit error or current sensor error	Current sen.	LF
50	Desynchronizing	Desynchronize	Pc
51	Compressor stalling	Comp. stalling	H7
52	Communication error	drive-main com.	LE
53	Radiator or IPM or PFC module overtemperature	Overtemp.-mod.	P8
54	Radiator or IPM or PFC module temperature sensor error	T-mod. sensor	P7
55	Charging circuit error	Charge circuit	Pu
56	Incorrect AC voltage input	AC voltage	PP
57	Drive board temperature sensor error	Temp-driver	PF
58	AC contactor protection or input zero crossing error	AC contactor	P9
59	Temperature drift protection	Temp. drift	PE
60	Current sensor connection protection (current sensor not connected to phase U/V)	Sensor con.	PD
61	Communication error to the outdoor unit	ODU Com.	E6
62	Communication error to the indoor unit	IDU Com.	E6
63	Communication error to the drive	Driver Com.	E6
64	Solar kit-superheating	Solarsuperheat	F6

3. 2.4.4 Version View (VERSION)

At the version view page, the user is enabled to see the version of the program and the protocol.

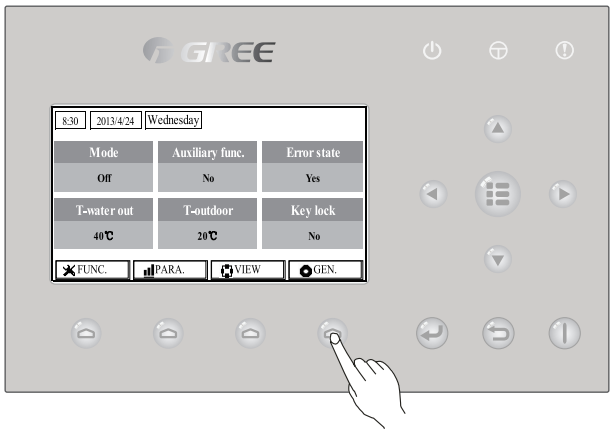
[Operation Instructions]

1. At the **VIEW** page, select **Version** and then press the OK key  to go to the **VERSION** page.
2. At the **VERSION** page, the program and protocol versions are listed.



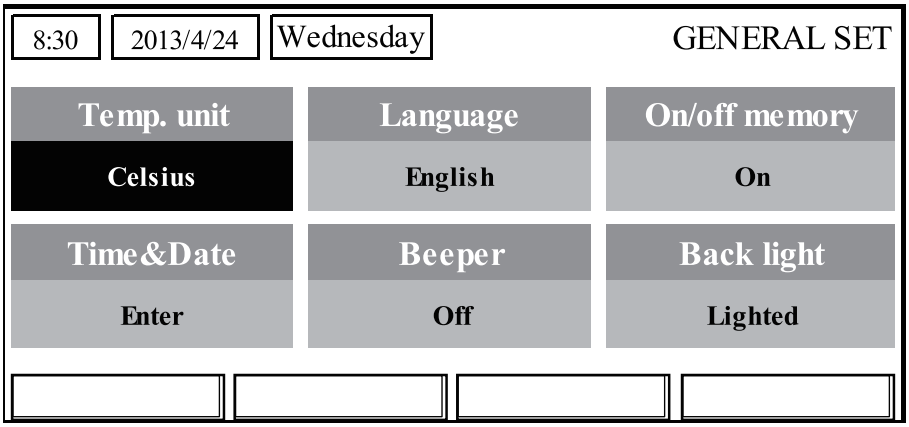
3. 2.5 General Setting

At the general setting pages, the user is enabled to configure general parameters, like temperature unit, language, On/off memory, time & date etc.



[Operation Instructions]

At the homepage, by pressing "**GEN**." access to the GENERAL SET page. At this page, it is able to set "**Temp. unit**", "**Language**", "**On/off memory**", "**Time & Date**", "**Beeper**" and "**Back light**", as shown in the figure below.



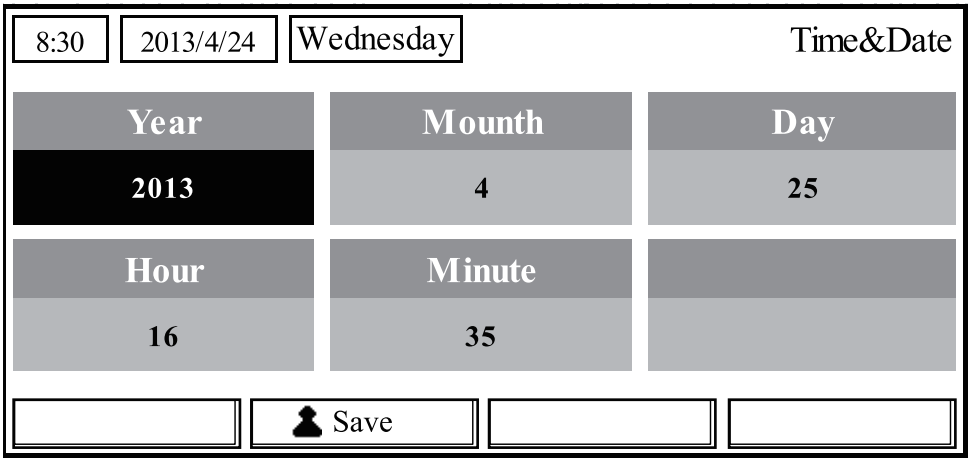
No.	Full Name	Displayed Name	Range	Default	Remarks
1	Temperature unit	Temp. unit	Celsius/Fahrenheit	Celsius	/
2	Language	Language	中文 /English	English	/
3	On/off memory	On/off memory	On/Off	On	/
4	Time&Date	Time&Date	/	/	/
5	Beeper	Beeper	On/Off	On	/
6	Back light	Back light	Lighted/Energy save	Energy save	"On": it always lights on. "Eco": it lights off when there is no key operation for 1 minute, and will lights on where there is any key operation.

3. 2.5.1 Time&Date

[Operation Instructions]

At the homepage, by pressing "**GEN.**" access to the **GENERAL SET** page. Then, select "**Time & Date**" at this page. After that, go to the "**Time & Date**" setting page by pressing the OK key .

Change the set value by pressing the Up/Down key . Then by pressing "**Save**", a pop-up window will pop up to remind if you are determined to save this setting. If so, press the OK key . If not, press the Cancel key to not save this setting. The saving setting will update at the upper left corner of the control.

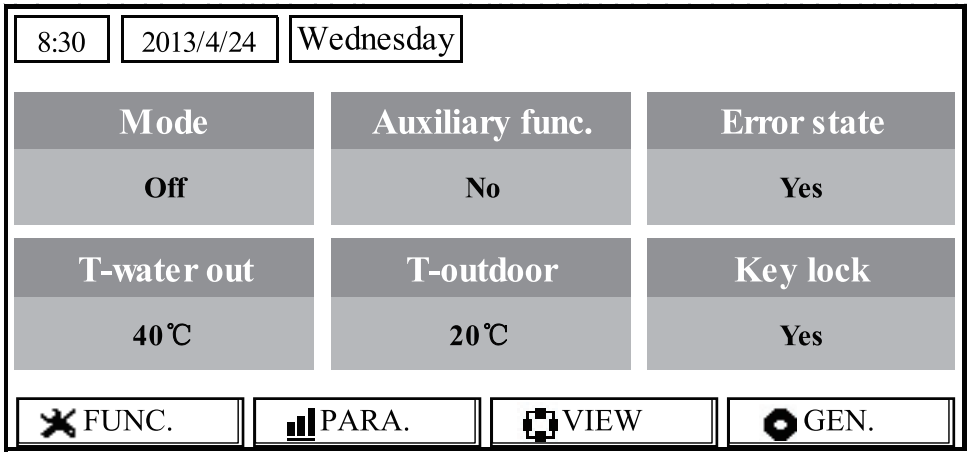


3. 2.6 Key Lock

This function can be activated or deactivated through the wired controller. Once it is activated, any key operation will become ineffective.

[Operation Instructions]

At the homepage, by pressing the up and down keys simultaneously for 5 seconds, it is able to activate or deactivate this function. When it is activated, any key operation is ineffective and the key lock icon in main page and standby page will display Yes.



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