AIR SOURCE HEAT PUMP WATER HEATER SERVICE MANUAL

T1/R134A/50Hz
(GC201510 - III)

GREE ELECTRIC APPLIANCES, INC.OF ZHUHAI

Contents

PRODUCT

PRODUCT

1 MODELS LIST

Product type	-	Model	Product code	Heating capacity(W)	Outline diagram
Split type	Water tank	SXD200LCJW/C1-K	ER20000320	2800+1500 (electric heating)	
	Outdoor unit	GRS-S3.0G/NbA-K	ER02000130		

Product type	Model	Product code	Heating capacity(W)	Outline diagram
Integral type	GRS-2.4/D270ANbA-K	ER02100050	2400+1500 (electric heating)	

Notes:

① The above table lists specifications of the air source water heater series product for static heat up. The product standard is EN16147-2011, (EU) No 814/2013, EN 12102-2008.

② Conditions for testing heating capacity of the unit: outdoor ambient temperature: 20°C DB/15°C WB; Initial/ending water temperature in the water tank: 15°C/55°C.

③ For units with a water tank equipped with an electrical heater, that is, the water tank model of which includes “ D ”, both the heat pump and electrical heater are started for heat up under low ambient temperature or rapid mode.

④ If the product specification changes with product improvement, refer to the parameter specified on the nameplate.

2 NOMENCLATURE

2.1 Nomenclature of split type unit

G	RS	-	S	3.0	G	/	Nb	A	-	K
1	2		3	4	5		6	7		8

NO.	Description	Options
1	GREE	G
2	Heat Pump Water Heater	RS
3	Heating style	S = Static, C = Circulating
4	Heating Capacity	2.8kW
5	Water Tank Capacity	E=100L,F=150L,G=200L,H=250L
6	Refrigerant	Nb = R134a, Default = R22
7	Design Serial Number	A
8	Power style	220-240V-1Ph ～ 50Hz

2.2 Nomenclature of integral type unit

G	RS	-	2.4	/	D	270	A	Nb	A	-	K
1	2		3		4	5	6	7	8		9

NO.	Description	Options
1	GREE	G
2	Heat Pump Water Heater	RS
3	Heating Capacity	2.4kW
4	Function code	Null for no electric heating function; D—with electric heating function
5	Water Tank Capacity	270L
6	Design code	A—LCJW: floor standing type; outer coil pipe static heating type; B—BCJW: wall-mounted type; outer coil pipe static heating type; C—LCJ: floor standing type; built-in coil pipe static heating type; D—BCJ: wall-mounted type; built-in coil pipe static heating type;
7	Refrigerant	Nb = R134a, Default = R22
8	Design Serial Number	A
9	Power style	220-240V-1Ph ～ 50Hz

3 FUNCTION

No.	Name	Function
1	Compressor	Increases pressure for the refrigerant and provides driving force for circular flow of the refrigerant as a main driving component.
2	Four-way valve	Reverses flow direction of the refrigerant when the system switches between the normal heat up mode and defrosting mode.
3	Water tank	Provides heat exchange channel for refrigerant and water and stores hot water for daily use.
4	Electronic expansion valve	Speeds up high-pressure and high-temperature refrigerant and reduces pressure and adjusts the circulation amount of coolant.

5	Finned tube exchanger	Provides heat exchange channel for refrigerant and air.
6	Fan motor	Enhances heat exchange on the air side of the finned tube exchange and provides a low-temperature heat source continuously.
7	Filter	Filters impurities in refrigerant to protect components with small diameter.

4 PRODUCT PARAMETERS

4.1 Product Parameters of Split type unit

4.1.1 Product Parameters of Outdoor Unit

Model			GRS-S3.0G/NbA-K
Product code		-	ER02000130
Rated Heating Capacity(*)		W	2800
Rated Input Power(*)		W	700
COP(*)		W/W	4.00
Load Profile		-	L
COP_{DHW}(**)		W/W	2.90
Energy Efficiency Class(**)		-	A
Water Heating Energy Efficiency(**)		-	110%
Annual electricity consumption (average climate conditions)		kWh	878
Maximum Input Power		W	1180+1500W (Electric Heater)
Outlet Water Temperature		°C	Default: 55°C, 35°C~70°C
Power Supply		-	220V-240V ~50Hz
Insulation Level		-	Ⅰ
Protection of Ingression		-	ⅠPX4
Refrigerant	Name		R134a
	Charge	kg	1.20
Outline Dimensions	W x D x H	mm	848×320×540
Package Dimensions	W x D x H	mm	881×363×595
Net Weight		kg	35.5
Sound Power Level(***)		dB(A)	61
Operating Range		°C	-7~45°C

Notes:

① (*) Value obtained with the following conditions: Outdoor temperature: 20°C DB/15°C WB; Water tank temperature (start/end): 15°C /55°C.

② (**) Value obtained with an air temperature of 7°C and a water inlet at 10°C, as per EN16147, (EU) No 814/2013.

③ (***) Value obtained as per EN 12102-2008.

④ Under fast water heating mode, electric heater helps to heating water.

⑤ Please always see the nameplate for the exact data as this table is subject to change.

4.1.2 Parameters of the Water Tank

Coil water tank

Model	Product code	Capacity	Power Supply to E-heater	Heating Power of E-heater	Dimensions	Net Weight	Size of Pipe Between the Main Unit and Water Tank Coolant	Size of Pipe at the Water Acquisition Position
	-	L	-	W	mm	kg	mm	mm
SXD200LCJW/C1-K	ER20000320	185	220V-240V ~50Hz	1500	545 x 545 x 1919	52	Φ6, Φ9.52	DN15

Notes:

① Type selection of water tank shall also be made based on local climatic conditions and opinions from professionals.

② For units with a water tank equipped with an electrical heater, that is, the water tank model of which starts with SXD, both the heat pump and electrical heater are started for heat up under low ambient temperature or rapid mode.

③ If the specification parameters change with product improvement, refer to the parameter specified on the nameplate.

4.2 Product Parameters of Integral type unit

Model			GRS-2.4/D270ANbA-K
Product code		-	ER02100050
Rated Heating Capacity(*)		W	2400
Rated Input Power(*)		W	685
COP(*)		W/W	3.50
Capacity		L	270
Load Profile		-	XL
COP_{DHW}(**)		W/W	2.58
Energy Efficiency Class(**)		-	A
Water Heating Energy Efficiency(**)		-	105%
Annual electricity consumption (average climate conditions)		kWh	1594
Maximum Input Power		W	1300+1500W (Electric Heater)
Outlet Water Temperature		°C	Default: 55°C, 35°C~70°C
Power Supply		-	220V-240V ~50Hz
Insulation Level		-	Ⅰ
Protection of Ingression		-	ⅠPX4
Refrigerant	Name		R134a
	Charge	kg	1.10
Outline Dimensions	W x D x H	mm	660×667×1958
Package Dimensions	W x D x H	mm	813×813×2100
Net Weight		kg	114

Sound Power Level(***)	dB(A)	58
Operating Range	°C	-7~45

Notes:

(1) (*) Value obtained with the following conditions: Outdoor temperature: 20°C DB/15°C WB; Water tank temperature (start/end): 15°C /55°C.

(2) (**)Value obtained with an air temperature of 7°C and a water inlet at 10℃, as per EN16147-2011, (EU) No 814-2013.

(3) (***) Value obtained indoor placement, with 2m long inlet and outlet wind duct, as per EN 12102-2008, (EU) No 814-2013.

(4) The installation of suction and backflow conduits on the heat pump lessens its performance.

Under RAPID function, electric heater helps to heating water.

Please always see the nameplate for the exact data as this table is subject to change.

4.3 Work Temperature Range

	Models	
	GRS-S3.0G/NbA-K	GRS-2.4/D270ANbA-K
Heating	-7~45°C	-7~45°C
Note: The above value range indicates the outdoor ambient temperate range for normal operation of the unit. For details on the configurable range of water temperature, see the nameplate of the water tank.		

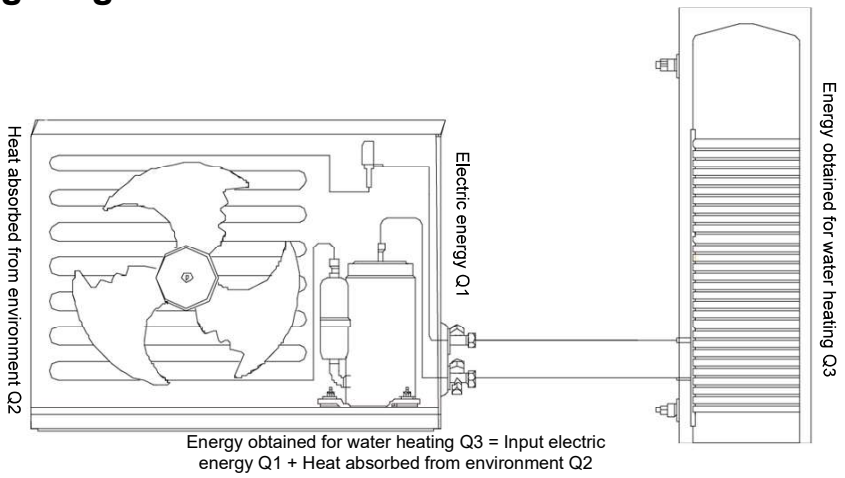
5 Working Principle

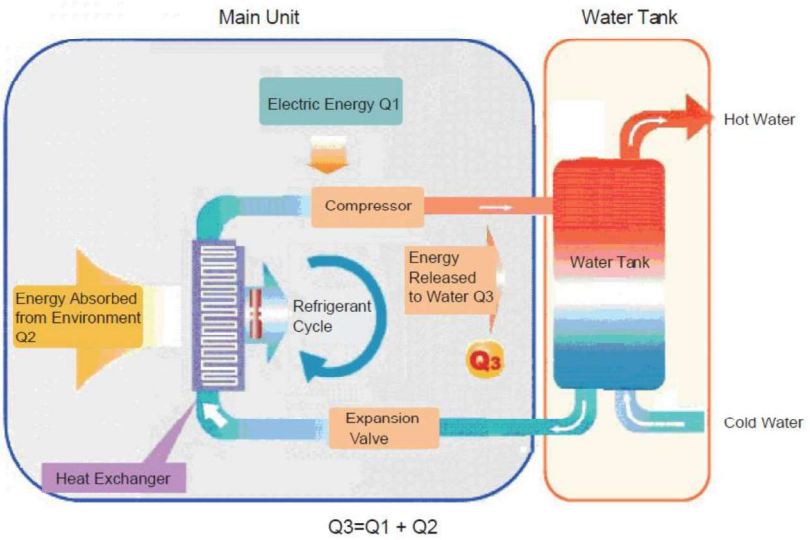
5.1 Brief Introduction to Working Principle

As the refrigerant has different phase-transition temperature under varied pressure, it enables the heat pump to transfer heat of low-temperature heat source to the high-temperature heat source. The air source water heater unit utilizes the heat pump to obtain heat from the ambient low-grade energy (air source) via thermodynamic cycle by consuming partial electrical energy, and then delivers heat to the water tank for heating up water.

5.2 Working Diagram

5.2.1 Working Diagram





The compressor consumes partial electrical energy to compress the refrigerant into high-temperature and high-pressure gas. After entering the condenser (the water tank coil of a water heater in static heat up mode), the gaseous refrigerant transfers its heat to water as its saturation temperature is higher than the water temperature and leaves the condenser after condensing into liquid. The liquid refrigerant enters the throttling device (generally the electronic expansion valve) for speedup and pressure reduction. As partial liquid vaporizes, the liquid refrigerant has two states (gas and liquid) when leaving the throttling device. The low-pressure refrigerant enters the vaporizer (the finned tube exchanger of a water heater in static heat up mode) and is vaporized into liquid after absorbing heat from air as its saturation temperature is lower than the air temperature. The low-pressure gas is inhaled by the compressor for the next cycle.

6 Optional Accessories

The Gree air source water heater unit supports the following accessories:

Item	Model	Remark
Intelligent preheat water return device (transient heat up module)	HS-01	
Self-regulation heating belt	76612816	
Pressure stabilizing valve	07382812	

Note:

(1) If any of the preceding accessories is required, contact with the local sales company.

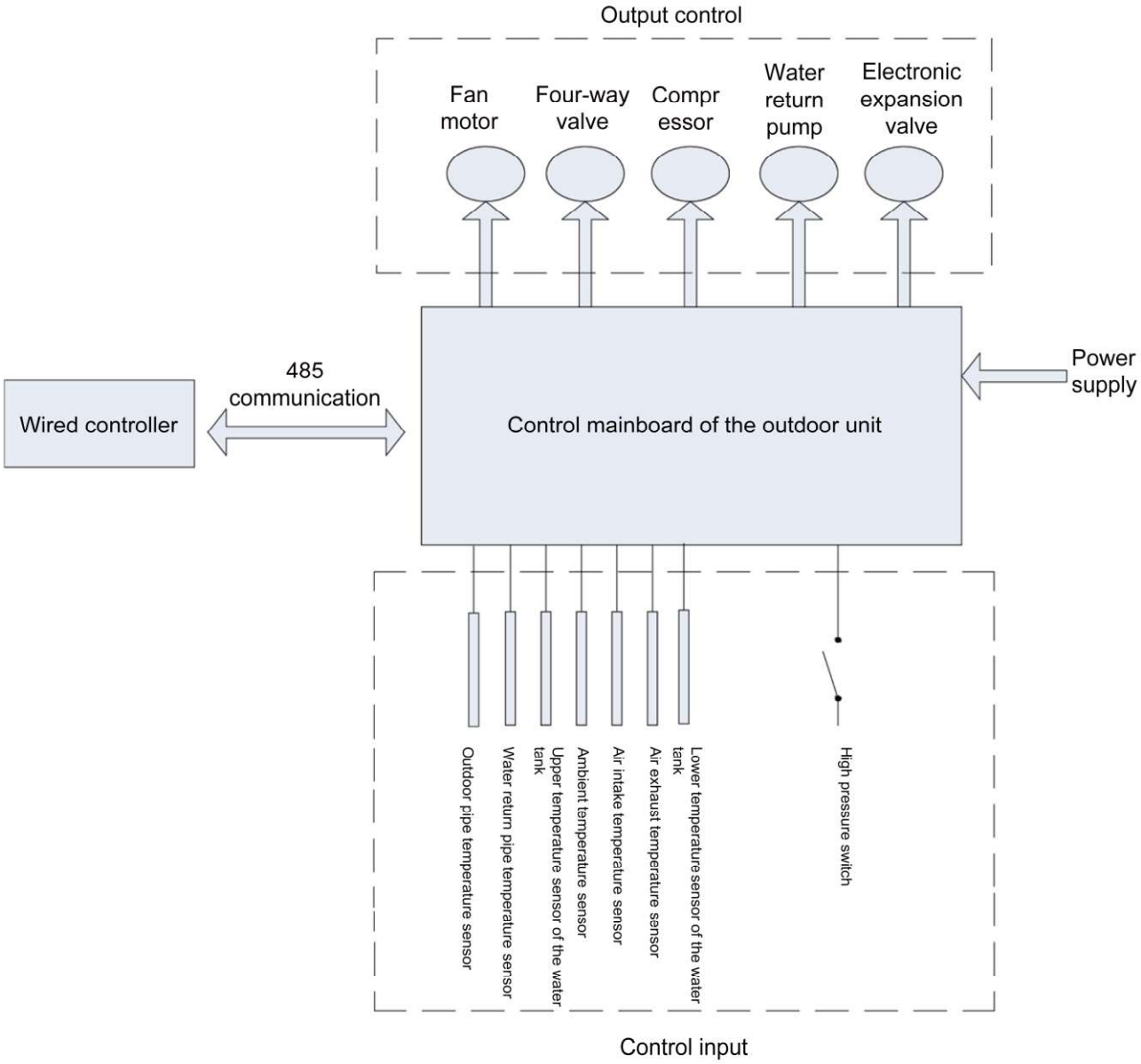
(2) GRS-2.4/D270ANbA-K unit can not connect Intelligent preheat water return device.

CONTROL

CONTROL

1 Unit Control

1.1 Overall Control Logic



1) High pressure switch

When the detected voltage exceeds the preset value, a fault will be displayed and the unit will stop or not start.

2) Temperature sensor fault detection and handling

Once the temperature sensor for the ambient temperature, air discharge, air inhaling, pipe temperature, or water tank is open-circuited or short-circuited, the corresponding fault code will be displayed and all loads will be cut off. After the fault is rectified, the unit automatically runs again.

1.2 Key Control Logics

1) Control on compressor

After power is connected, start the system by the manual operator and detect the outdoor ambient

temperature sensor. If the outdoor ambient temperature is not lower than -7°C and when no fault is detected and start up conditions of the compressor are met, the system starts by following the hot water sequence.

2) Control on fan motor

When start up conditions of the compressor are met, the system starts by following the hot water sequence. The electronic expansion valve resets and is initialized, and the external fan motor starts. After 10s, the compressor starts. The fan motor will determine whether to still run at high level or to run at low level based on the ambient temperature after it runs at high level. If the system enters overload control, the fan motor will switch to discontinuous start up and shutdown status at low level.

3) Control on defrosting

When the compressor is initially powered on and started, it determines the defrosting condition after running for the preset duration. If the defrosting condition is met, the system defrosts before running in hot water mode (including freeze-proofing operation of compressor). After defrosting is over, the compressor starts for heat up. When the cumulative operation time exceeds or equals to the preset time for defrosting, defrosting will be performed if the relation between the outdoor exchanger pipe temperature sensor Th and the outdoor ambient temperature sensor Te meets the defrosting condition.

4) Control on water return pump

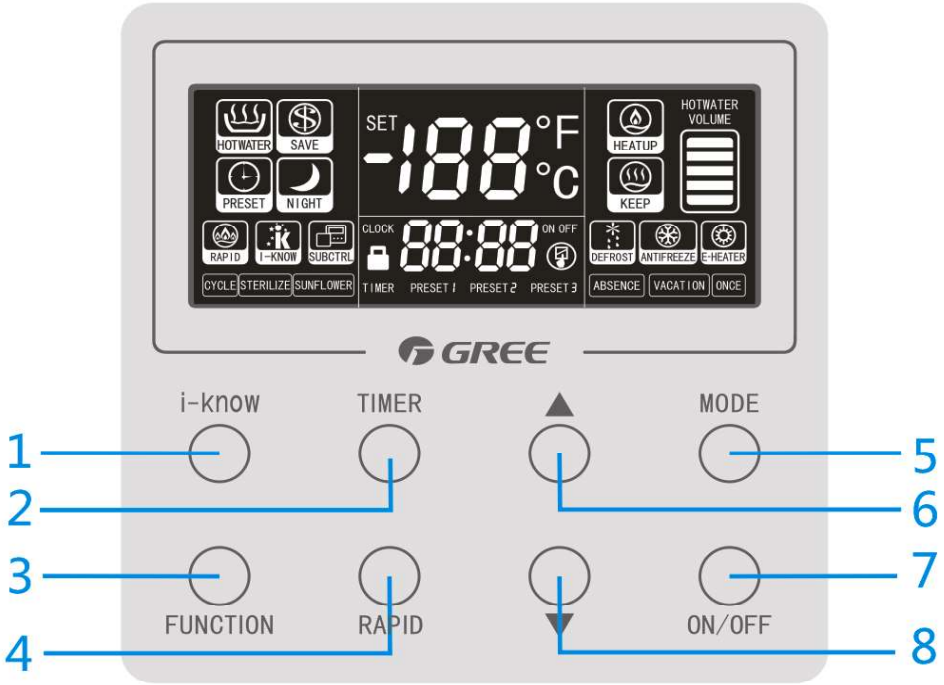
The water return pumps runs in automatic or manual control mode as set by users. In automatic control mode, the water return pump is control based on temperature of the return pipe thermo-bulb. In manual control mode, the return pump is stopped after water return is complete.

Notes: GRS-2.4/D270ANbA-K unit have not the function.

5) Control on freeze-proofing function

In the Off state, if water temperature in the water tank detected by the system based on the ambient temperature is too low, the unit starts the freeze-proofing function immediately.

2 Wired Controller



1	i-know button	2	Timer button	3	Function button	4	Rapid button
5	Mode button	6	Increase button	7	On/Off button	8	Decrease button

1	Display of Common Operation Modes: HOTWATER, SAVE, PRESET and NIGHT mode.	6	Display of defrost, antifreeze running, and e-heater running (or display of the Special E-HEATER Mode).
2	Display of RAPID and i-KNOW function.	7	Display of hot water volume (this function is unavailable to models with single temperature sensor).
3	Display of CYCLE, STERILIZE, SUNFLOWER, ABSENCE, VACATION, and ONCE function (the STERILIZE function may not work for models without an electrical heater).	8	Display of operating/standby.
4	Display of Keypad Lock function.	9	Display of actual water temperature, temperature setpoint, error codes, and running parameters.

5	Display of system time, preset time, timer setting and running parameters.	10	Display of the sub-controller. (This function is reserved.)

3 Query Parameters

This function is provided for the debugging personnel to query running status of the unit. After pressing and holding **MODE+▲** button for 5s, the parameter display area blinks. 00 is displayed by default. The ▲ and ▼ buttons can be pressed to switch the query item.

Query codes are described in the following table.

Query Code	Query Parameter
00	00 by default
01	Communication protocol version
02	Temperature of the temperature sensor for water outlet pipe
03	Temperature of the upper temperature sensor of the water tank (detected by the mainboard)
04	Temperature of the outdoor ambient temperature sensor
05	Reserved
06	Temperature of the air intake temperature sensor
08	Temperature of the air exhaust temperature sensor
13	Temperature of the temperature sensor for outdoor pipe
16	Temperature of the water temperature sensor
17	Display of single or dual temperature sensor (01 indicates single temperature sensor and 02 indicates dual temperature sensor)
18	Temperature of the middle temperature sensor of the water tank (part of units have the temperature sensor)
19	Temperature of the upper temperature sensor of the water tank

4 Operation Instructions

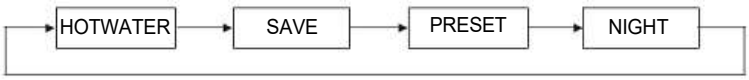
4.1 On/Off Setting

The unit will be started or stopped by pressing the “On/Off ” button.

Note: After energization and under normal communication, the LCD will display the water temperature, time, and hot water volume (for models with dual temperature sensor) under both On and Off states of the unit. It means the Off state if the LCD does not display the running mode, as shown in the following figure.

4.2 Common Modes Setting

In the On state of the unit, press the **MODE** button to switch the operation modes in the following sequence:



The HOTWATER mode is shown in the following figure.

4.3 Special Modes Setting

If the heat pump of a water heater equipped with an electrical heater is faulty, users can press and hold **MODE+RAPID** for 5s in any mode under the state to enter the **E-HEATER** mode.

Note: The E-HEATER mode can be used only when the heat pump is faulty. In this case, contact the aftersales service immediately.

The E-HEATER mode is shown in the following figure.

In the E-HEATER mode, users can press the **MODE** button to switch to the HOTWATER mode. Note that the E-HEATER mode will be cancelled automatically and the HOTWATER mode will be started upon restart of the water heater in the case of blackout.

4.4 Water Temperature Setting

In the On state, press ▲ to increase or press ▼ to decrease the temperature setpoint. The water temperature will increase or decrease continuously by 1°C when the button is pressed and held.

The minimum temperature setpoint for all models is 35°C. The maximum temperature setpoint can be set to 55°C, 58°C, or 70°C. For details, see the Integrated Unit User Manual.

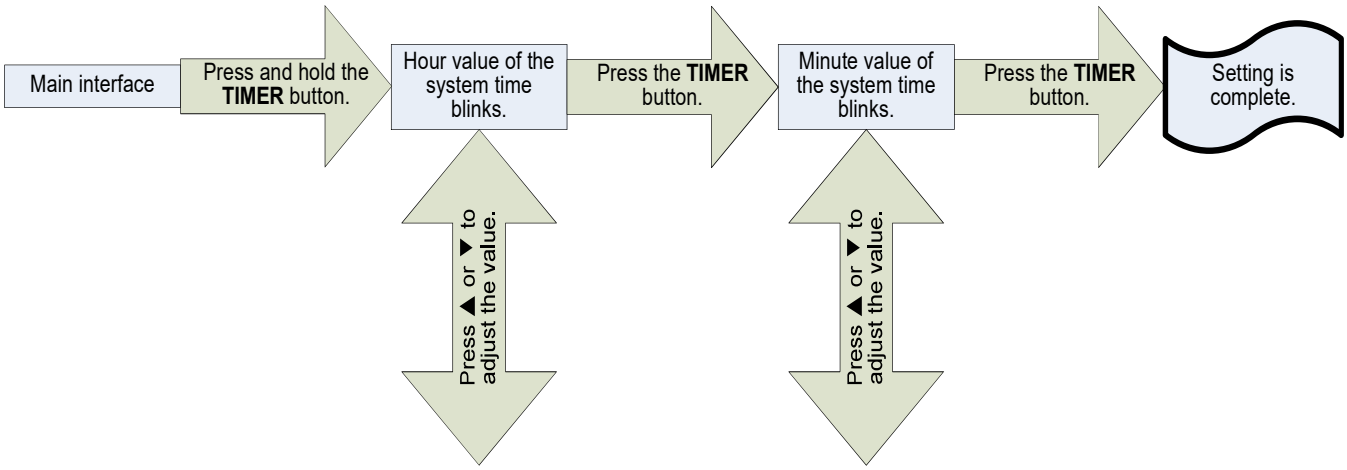
4.5 Time Setting

4.5.1 System Time Setting

In the main interface, press and hold the **TIMER** button for 5s. The system time setting interface is displayed. The clock icon is on and the hour value blinks. Press ▲ **or** ▼ to adjust the hour value and press the **TIMER** button to confirm setting. Then the minute value flickers. Press ▲ **or** ▼ to adjust the minute value and press the **TIMER** button to confirm setting. After system time setting is saved, the main interface is displayed. In the setting process, if no button is pressed within 15s, the main interface will be displayed and setting will not be saved.

The system time ranges from 00:00 to 23:59. Each time you press ▲ or ▼, the time increases or decreases by 1 hour or 1 minute. When the button is pressed and held, the time increases or decreases continuously by 1°C or 1 minute.

The setting process is shown in the following figure.

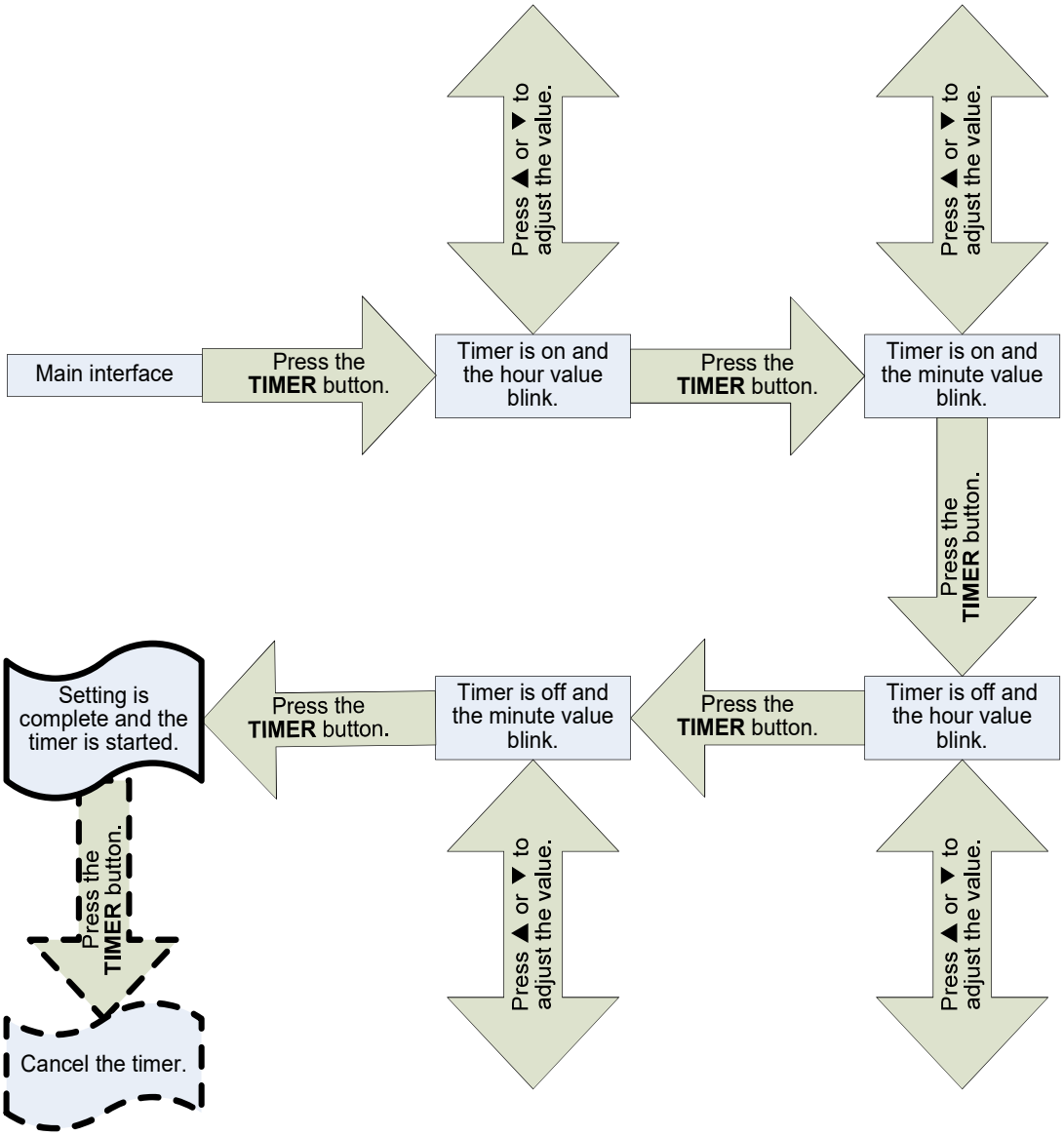


4.5.2 Timer Setting

Timer setting: Under the HOTWATER or SAVE mode or under the Off state, press the **TIMER** button to enter the timer setting interface. The TIMER and ON icons are on and the hour value blinks. Press ▲ **or** ▼ to adjust the hour value and press the **TIMER** button to confirm setting. Then the minute value flickers. Press ▲ **or** ▼ to adjust the minute value and press the **TIMER** button to confirm setting. Then the OFF icon is on and ON icon is off. The hour value blinks. Press ▲ **or** ▼ to adjust the hour value and press the **TIMER** button to confirm setting. Then the minute value flickers. Press ▲ **or** ▼ to adjust the minute value and press the **TIMER** button to confirm setting. After the scheduled on/off time setting is saved, the main interface is displayed. In the setting process, if no button is pressed within 15s, the main interface will be displayed and setting will not be saved.

Timer cancelling: After the scheduled on/off time is set, press the **TIMER** button to cancel it.

Note: The scheduled on time and off time cannot be the same; otherwise, the LCD switches to the interface for resetting the timer.



4.5.3 Preset Time Setting

In the PRESET mode, hot water is prepared in advance by the preset time.

In the main interface of the PRESET mode, press the **TIMER** button to enter the selection interface. PRESET 1 blinks while PRESET 2 and PRESET 3 are not displayed. Press ▲ **or** ▼ and the LCD blinks circularly in the flowing sequence: PRESET 1 – PRESET 2 – PRESET 3 – PRESET 1.

Preset time setting: Press the **TIMER** button to select PRESET 1. Then the PRESET 1 icon is on and the hour value blinks. Press ▲ **or** ▼ to adjust the hour value and press the **TIMER** button to confirm setting. Then the minute value flickers. Press ▲ **or** ▼ to adjust the minute value and press the **TIMER** button to confirm setting. After time setting for PRESET 1 is saved, the main interface is displayed.

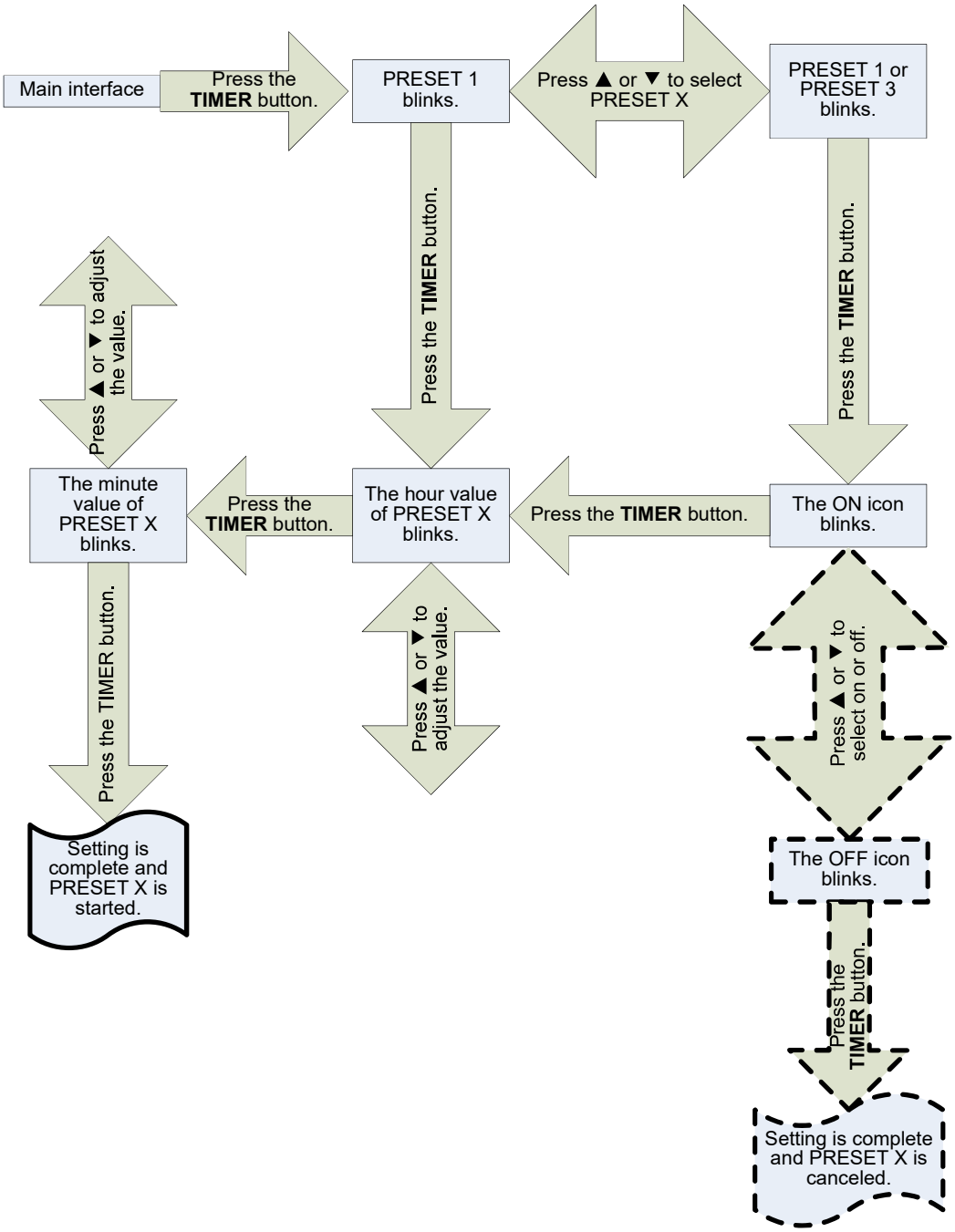
PRESET 2 or PRESET 3 setting: Press the **TIMER** button to select PRESET 2 and then the ON icon blinks. Press ▲ **or** ▼ to switch the ON and OFF icons. When the ON icon blinks, press the **TIMER** button. Then the PRESET 2 icon is on and the ON icon is off. The hour value blinks. Press ▲ **or** ▼ to adjust the hour value and press the **TIMER** button to confirm setting. Then the minute value flickers. Press ▲ **or** ▼ to adjust the minute value and press the **TIMER** button to confirm setting. After time setting for PRESET 2 is saved, the main interface is displayed. The method for setting PRESET 3 is the same as that for PRESET 2. (After setting is saved, the ON and OFF icons are not displayed in the main interface as these icons are available in the setting process.)

In the time presetting process, if no button is pressed within 15s, the preset interface will switch to the main interface automatically and setting will not be saved.

If the time preset for PRESET 1, PRESET 2, and PRESET 3 is the same, it is regarded as one timer.

The preset time can be memorized. If the preset time does not need to be reset, users only need to select on or off.

Preset time cancelling: After time is preset for PRESET 2 or PRESET 3, users can press the **TIMER** button to display the selection interface. The icon of PRESET 2 blinks. Press ▲ **or** ▼ and the LCD blinks circularly in the flowing sequence: PRESET 2 – PRESET 3 – PRESET 1 – PRESET 2. Select PRESET 2 and press the **TIMER** button. Select to cancel PRESET 2. Then the PRESET 2 icon is on and the ON icon blinks. Press ▲ **or** ▼ to select OFF. Press the **TIMER** button to confirm cancelling and return to the main interface. The method for cancelling preset time for PRESET 3 is the same as that for PRESET 2. Preset time for PRESET 1 cannot be cancelled. If users select PRESET 1, the time setting interface will be displayed.



The PRESET mode runs circularly. The water heater starts to heat up water based on the preset time and ambient temperature and stops one hour after the preset time.

4.6 Function Setting

4.6.1 i-KNOW

In the On state, press the **i-KNOW** button to select the i-KNOW function. To cancel this function, press the **i-KNOW** button again.

4.6.2 RAPID

In the On state, press the **RAPID** button to select the RAPID function. The electrical heater is started for heat up. To cancel this function, press the **RAPID** button again. Then electrical heater is stopped.

Under the E-HEATER mode, users can press the RAPID button to switch to the HOTWATER mode. To return to the E-HEATER mode, press the RAPID button again.

4.6.3 CYCLE, SUNFLOWER, ABSENCE, and ONCE

In the On state, press the **FUNCTION** button to enter the interface for selecting among the CYCLE, SUNFLOWER, ABSENCE, and ONCE functions. When a function is selected, the corresponding icon blinks. Then users can press ▲ **or** ▼ to start or cancel this function. If no operation is performed within 5s, it will be regarded that this function is not required. If this function is started, the function icon is displayed without blinking. If this function is cancelled, the function icon will not be displayed. If no function is selected in setting interface for 5s, the interface switches back to the original status.

4.6.4 STERILIZE

The STERILIZE function is available under four common modes. However, after this function is set, the unit runs as under the HOTWATER mode. The water heater controls startup and shutdown of the unit based on the difference between the actual water temperature and that required for sterilization.

In the On state and in a common mode, press the **FUNCTION** button to enter the function selection interface. When the STERILIZE function is selected, the corresponding icon blinks. At the same time, the preset circular sterilization duration is displayed as d:XX, as shown in the following figure.

During this period, the following operations can be performed:

1) Press ▲ **or** ▼ to start or cancel the STERILIZE function. If this function is started, the STERILIZE icon is displayed without blinking. Sterilization will be performed circularly by the preset d and h value; If this function is canceled, the STERILIZE icon is not displayed. If no operation is performed within 5s, it will be regarded that this function is not required. After this function is started and when sterilization is being performed, the function icon blinks.

2) Press the **TIMER** button to enter the sterilization parameter setting interface. Press ▲ **or** ▼ to select the d value and then press the **TIMER** button to confirm the value. When the confirmed d value is not 0, the h value setting interface is displayed. Press ▲ **or** ▼ to select the h value and then press the **TIMER** button to confirm the value. When the STERILIZE icon is displayed, the STERILIZE function is started. If the STERILIZE icon blinks, the preset h value (time point for sterilization) is achieved and sterilization is being performed.

Sterilization Parameter	Meaning	Range
d value	Day interval for circular sterilization	0-10 days; 0 indicates sterilization for once only and the sterilization function will be canceled after being performed.
h value	Time point for circular sterilization	00:00-23:00

Circular sterilization:

Sterilization is performed circularly by the d value. Once the circular sterilization conditions are met, sterilization is performed regardless of on/off status of the controller and beyond limit of common modes and functions except VACATION. However, users can stop sterilization under process by pressing the **ON/OFF** button to shut it down. (But it can only stop sterilization for this time without affecting circular sterilization, the preset circular sterilization function still works.)

OFF reminder for sterilization failure:

If the OFF icon is displayed at the clock position after the STERILIZATION function is started, sterilization fails and the water temperature required for sterilization cannot be reached. The OFF reminder can be canceled when any button is pressed.

The OFF reminder only indicates that sterilization fails for this time without affecting circular sterilization.

The OFF reminder is shown in the following figure.

Notes:

① When time goes from 23:59 to 00:00, the system enters a new day, which is the basis for increasing the number of days.

② Every time after the STERILIZE function is started or sterilization parameters are adjusted in the sterilize function setting interface, sterilization will be performed for once immediately and the day interval for sterilization will be recalculated accumulatively. Even when sterilization is being performed, operations such as sterilize function resetting and day interval adjusting for sterilization will also cause recalculation of the day interval.

③ After the circular sterilization function is set, the water heater can still precisely calculate the day interval for sterilization accumulatively and the circular sterilization function can still work in the case of short-term power failure. If the time point for sterilization is within the power failure duration, sterilization will be made up once power is provided again. In addition, the day interval for sterilization will be recalculated accumulatively based on this sterilization and next sterilization will be calculated accordingly.

④ Ensure that there is no long-term power failure; otherwise, the clock of the water heater will malfunction and the STERILIZE function will not work properly.

⑤ Under the E-HEATER mode, the STERILIZE function is unavailable.

4.6.5 VACATION

In the On state, press the **FUNCTION** button to enter the function selection interface. When the VACATION function is selected, the corresponding icon blinks. At the same time, the preset number of vacation days is displayed at the clock position, as shown in the following figure.

During this period, the following operations can be performed:

1) Press ▲ **or** ▼ to start or cancel the VACATION function. After this function is started, the VACATION icon will be displayed without blinking and the water heater runs based on the preset number of vacation days; If this function is canceled, the VACATION icon will not be displayed. If no operation is performed within 5s, it will be regarded that this function is not required.

2) Press the **TIMER** button to set the number of vacation days. Press ▲ **or** ▼ to select the number of vacation days from 3 to 120 days and press the **TIMER** button to confirm setting. Then press ▲ **or** ▼ to start or cancel the VACATION function.

When the VACATION function is started under the On state, the water heater calculates the number of vacation days accumulatively. And the STERILIZE function will be started to sterilize the water tank one day before the vacation is over. In addition, hot water is prepared by advance in the HOTWATER before the vacation is over.

Notes:

① When time goes from 23:59 to 00:00, the system enters a new day, which is the basis for increasing the number of days.

② Every time after the VACATION function is started or the number of vacation days is adjusted in the vacation function setting interface, the number of vacation days will be recalculated accumulatively. Even when the VACATION function is being performed, operations such as vacation function resetting and vacation day adjusting will also cause recalculation of the number of vacation days.

③ After the VACATION function is set, the water heater can still precisely calculate the number of vacation days accumulatively in the case of short-term power failure. But ensure that there is no long-term power failure; otherwise, the clock of the water heater will malfunction and the VACATION function will not work properly.

4.6.6 CYCLE

The water pipe between the water tank and the water acquisition position is preheated duly when hot water is available in the water tank. This enables immediate provision of hot water without requiring exhausting of cold water in the water pipe, which is different from conventional water heaters. This function requires installation of the water return system during unit installation. The water returning system consists of the water return pump, water return pipe, check valve for the water return pipe, and cycle temperature sensor for the water return pipe.

The CYCLE function enables both automatic and manual control. The later one is adopted by default. For details on the setting method, see description on manual and automatic switchover of the water return pump in section 6.8.3.

Manual control: After the water return system is installed and manual control is set on the wired controller, press the **FUNCTION** button on the wired controlled before hot water is needed by the user. The CYCLE icon blinks. Press and hold ▲ **or** ▼ to keep the CYCLE icon on for 5s and then start the

manual return function. The unit preheats the water pipe with hot water in the water tank. This method requires manual operation but minimizes energy consumption.

Automatic control: Within the scheduled duration for automatic water return, the unit preheats the water pipe based on the pipe temperature. This method does not require manual operation but consumes more energy.

Steps of setting scheduled time for automatic water return are as follows: (The automatic control mode needs to be set. For details on the setting method, see description on manual and automatic switchover of the water return pump in section 6.8.3.)

Step 1: Press the **FUNCTION** mode to select the CYCLE function. The CYCLE icon blinks.

Step 2: Press the **TIMER** button to enter the scheduled time setting interface for water return. The TIMER character, time value, and ON character are displayed at the time position, which together indicate the scheduled start-up time. When the hour value for scheduled start-up blinks, it can be set by pressing **▲ or ▼.**

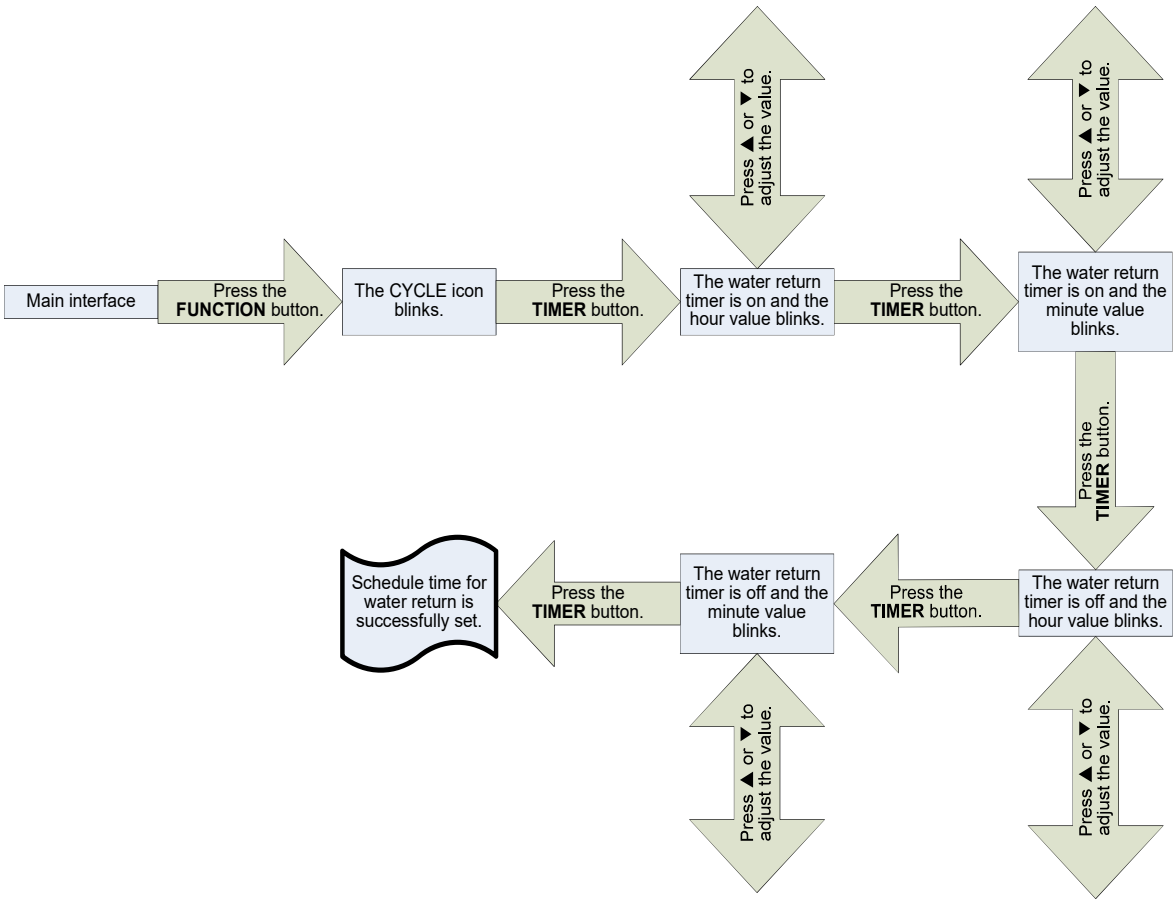
Step 3: After the hour value is set, press the **TIMER** button to switch to the minute value for scheduled start-up. When the minute value blinks, it can be set by pressing **▲ or ▼**.

Step 4: After the minute value is set, press the **TIMER** button. The ON character disappears and the OFF character is displayed. Meanwhile, the hour value blinks, indicating that the scheduled shutdown time can be set by pressing ▲ or ▼.

Step 5: After the hour value is set, press the **TIMER** button to switch to the minute value for scheduled shutdown. When the minute value blinks, it can be set by pressing **▲ or ▼**.

Step 6: Press the **TIMER** button to switch back to the CYCLE function selection interface. If the CYCLE character blinks, the scheduled time for water return is successfully set to a new value.

Step 7: When users press any button except the **TIMER**, **FUNCTION**, **ON/OFF**, and ▲/▼ buttons shortly or stay in the selection interface for 5s, the current interface exits automatically and whether the CYCLE character is displayed is determined based on the scheduled time for water return.



Notes: GRS-2.4/D270ANbA-K unit have no CYCLE function.

4.7 Special Function

4.7.1 Keypad Lock

In normal status of the unit, press and hold ▲+▼ for 5s. The LOCK icon is displayed on the controller and all buttons become unavailable. The LOCK icon blinks when any button is pressed. To cancel the Keypad lock function, press and hold ▲+▼ for 5s again. Then the LOCK icon disappears.

If the unit is faulty, the lock function becomes invalid and all buttons are available again. The Keypad lock function will resume after the error is rectified. In addition, the lock status before power failure is memorized.

4.7.2 Cleaning (available to circular models only)

In the Off state of a normal unit, press and hold **MODE+▼** for 5s. The unit starts the cleaning function and HOTWATER, SAVE, PRESET, and NIGHT icons are displayed on the LCD. To cancel the cleaning function, press and hold **MODE+▼** for 5s again.

The cleaning process lasts for 30 minutes at the most and it will stop automatically 30 minutes after the cleaning function is started. When the cleaning function is started, the ON and OFF buttons become unavailable.

If the unit is faulty, the cleaning function is canceled automatically.

This function is used for cleaning circular air source water heaters and for exhausting air in the water system during debugging.

4.7.3 Manual/Automatic switchover for the water return pump

In the Off state of the wired controller, press and hold **MODE+▲** on the main interface for 5s to enter the query interface. Then the query code 00 is displayed, press and hold **MODE+▲** for 5s to display the configurable parameter codes and values. Press ▲ **or** ▼ to select P0 and press the **MODE** button. Then item value 00 blinks under the parameter code P0. Press ▲ **or** ▼ to select the item value and press the **MODE** button to confirm setting (00 indicates manual control and 01 indicates automatic control). After that, press the **FUNCTION** button to return to the main interface. If no operation is performed with 15s, it will switch back to the main interface automatically.

Note: Other parameters cannot be modified; otherwise, operation exception will be caused.

4.7.4 Temperature unit setting (℃/℉)

In the Off state of the wired controller, press and hold **MODE+▲** on the main interface for 5s to enter the query interface. Then the query code 00 is displayed, press and hold **MODE+▲** for 5s to display the configurable parameter codes and values. Press ▲ **or** ▼ to select P5 and press the **MODE** button. Then item value 00 or 01 blinks under the parameter code P5. Press ▲ **or** ▼ to select the item value and press the **MODE** button to confirm setting (00: ℃ and 01: ℉). After that, press the **FUNCTION** button to return to the main interface. If no operation is performed with 15s, it will switch back to the main interface automatically.

Note: Other parameters cannot be modified; otherwise, operation exception will be caused.

4.8 Errors Display

When some errors occur during operation, the error codes will be displayed on the controller.

Meanwhile, the unit is in the Off state and the controller supports only the on/off and query functions.

If multiple errors occur to the water heater simultaneously, the corresponding error codes will be displayed circularly.

If the controller displays a error, shut down the water heater and contact qualified personnel for maintenance. The following figure shows a communication error.

For details on error codes, see the table attached at the end of this manual.


E6°C
CLOCK
20:00
HOTWATER
VOLUME
GREE
i-know
TIMER
MODE
FUNCTION
RAPID
ON/OFF