OPERATION MANUAL

Air Source Heat Pump Water Heater Wire Controller

Thank you for purchasing our product.
Please read this manual carefully before running the unit and keep it for future reference.

CONTENTS

- This manual gives detailed description of the precautions that should be brought to your attention during operation.
- In order to ensure correct service of the wired controller please read this manual carefully before using the unit.
- For convenience of future reference, keep this manual after reading it.

1. Safety precautions

WARNING

- Please assign the distributor or professionals to install the device.
- Imporper installation may lead to electric shock or fire.
- Do not install the unit in a place vulnerable to leakage of flammable gases. Once flammable gases are leaked and left around the wire controller, fire may occur.
- Do not operate with wet hands or let water enter the wire controller. Otherwise, the device lifespan will be shortened.

2. Technical data and characteristic

2.1 Technical data

1) Input voltage: 10VAC.
2) Operating environment temperature of wired controller: -10°C~+43°C.
3) Operating RH of wired controller: RH 40%~RH90%.

2.2 Characteristic

1) Touch key operation;
2) LCD displays operation parameters;
3) Multiple timer;
4) Real-time clock (battery life:5~8 years).

3. Overview

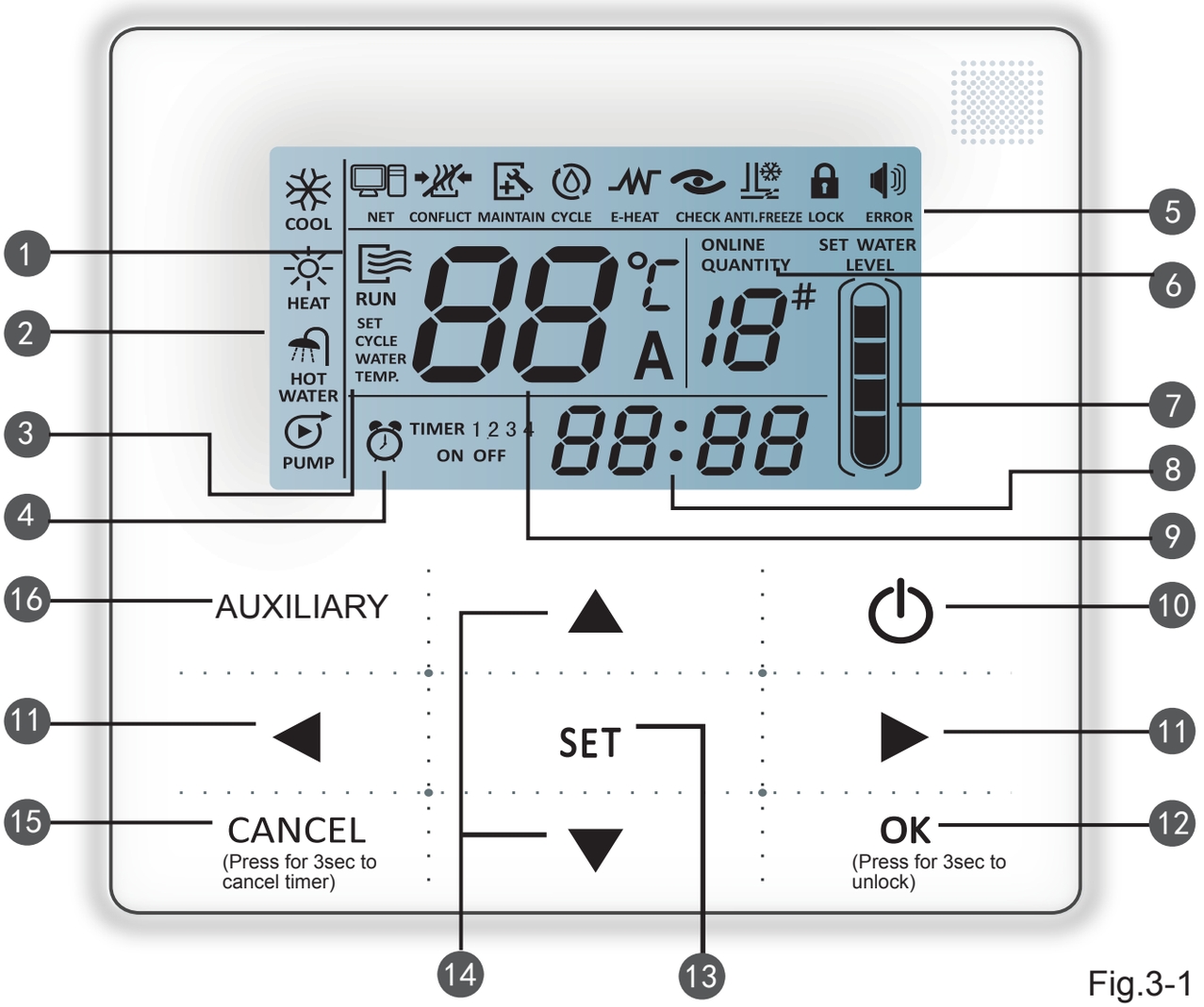


Fig.3-1

1. Operation icon
2. Mode area
3. Setting temperature
4. Timing On/Off
5. Function Icon
6. On-line Unit Qty. Indication
7. Water Level Indication
8. Clock
9. Water temp.
10. ON/OFF Key
11. Left Right Key
12. Confirm Key

1. **Operation icon** **:** Indicate unit ON and OFF status; the icon displays when the unit is on and does not display when the unit is off;
2. **Mode area:** Indicate the main unit operating mode; details refer to Page 15;
3. **Setting temperature: 3 status can be** displayed: WATER TEMP. | SET WATER TEMP. | SET CYCLE WATER TEMP. ;
4. **Timing ON/OFF indication** TIMER 1 2 3: Indicate the timing information; details refer to Page 10;
5. **Function icon**

1) NET : Displays when water heater system connects to Modbus network;

2) CONFLICT : Displays when other heat source is provided to the system.

3) MAINTAIN : Displays when water heater maintenance is needed. Press and hold "AUXILIARY" key for 3 seconds to cancel the icon and timing will restart until next maintenance;

4) CYCLE : Displays when cycle heating function is on; details refer to Page 14;

5) E-HEAT : Displays when electric auxiliary heating function is on. Details refer to Page 20;

6) CHECK : Displays when check function is on; details refer to Page 22;

7) ANTI.FREEZE : Displays when ambient temperature is below 2℃ which means the main unit need anti-freezing action;

8) LOCK : Displays when no key operation for 2 minutes and all keys are locked.

Press and hold “OK” key for 3 seconds to unlock;

9) ERROR : Displays when error or protection occurs and means the unit need maintainence by professionals.

6 **On-line unit qty. indication:** Under normal status display the quantity of units connected to the wire controller; under check status display the device serial number;

7 **Water level indication:** Under normal status displays water level; Under water level setting status displays setting value, details refer to Page 18;

8 **Clock:** Under normal status displays clock; Under timing setting displays the setting timing, details refer to Page 10;

9 **Water temperature:** Under normal status display water temperature; Under water temperature setting status displays the setting value; Under cycle heating water temperature setting status displays the setting value; under check status displays check parameter, details refer to Page 9, 14, 19;

10 **ON/OFF key: Turn** on and turn off functions; details refer to page 8.

11 **Right and Left key:** Press these keys to check setting water temperature, setting cycle heating water temperature and setting water level under main page; Press right key to shift to the next step setting under timing setting status; Press these keys to turn over the unit parameter information under check status;

12 **OK key:** Press this key to confirm settings. Press and hold this key for 3 seconds to unlock under locking status;

13 **Setting key:** Setting water temperature, timing and mode etc, details refer to Page 9-19; Press and hold this key for 3 seconds to enter check status, details refer to Page 22;

14 **Add and Reduce key:** Move up or move down values of temperature, timing, water level etc; Turn over #0～#15 units under check status;

15 **Cancel key:** Press this key to cancel parameter setting under setting status; Press and hold this key for 3 seconds to cancel timing when timing is valid;

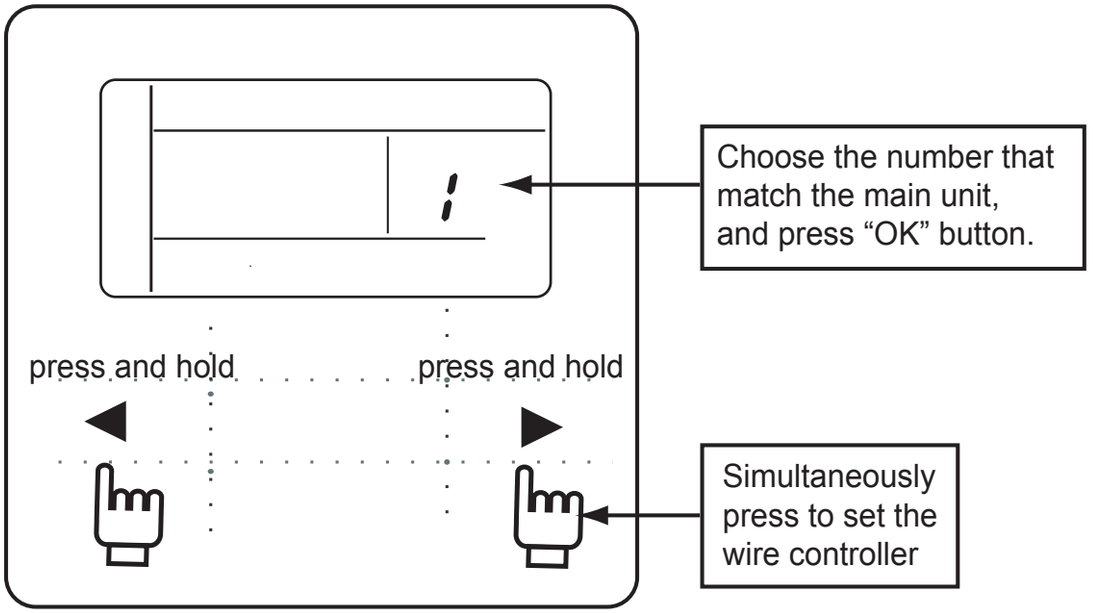
16 **Auxiliary key:** Power on the cycle heating function, electric auxiliary heating function or water pump function, details refer to Page 20.

4. Operation instruction

4.1 Setting wire controller

This controller need setting before applying to certain HPWH models. The user's manual of the main unit will tell you which number you should set or you can use the controller directly.

Setting method: When the controller is "OFF" , press and hold "◀ " " ▶" two buttons, wait for one number (1 to 5) displayed on the screen, press "▲ "or "▼ " button and select the number which match with the main unit, then press "OK" button to confirm.



NOTE

- If matched with wrong models, maufunction may occur.
- Some models can match this controller without setting, please refer to the user's manual of the main unit.

4.2 Turn On and Turn Off the main unit

1) Press the On/Off key to control On and Off status of the main unit.
2) Under Off status, press the On/Off key " ⏻ " to run the main unit, at that time the LCD of wire controller will display the operation icon " RUN ". The main unit will running as the current setting of the wire controller.
3) Under On status, press the On/Off key " ⏻ " to turn off the main unit and the operation icon " RUN " on the LCD will disappear.

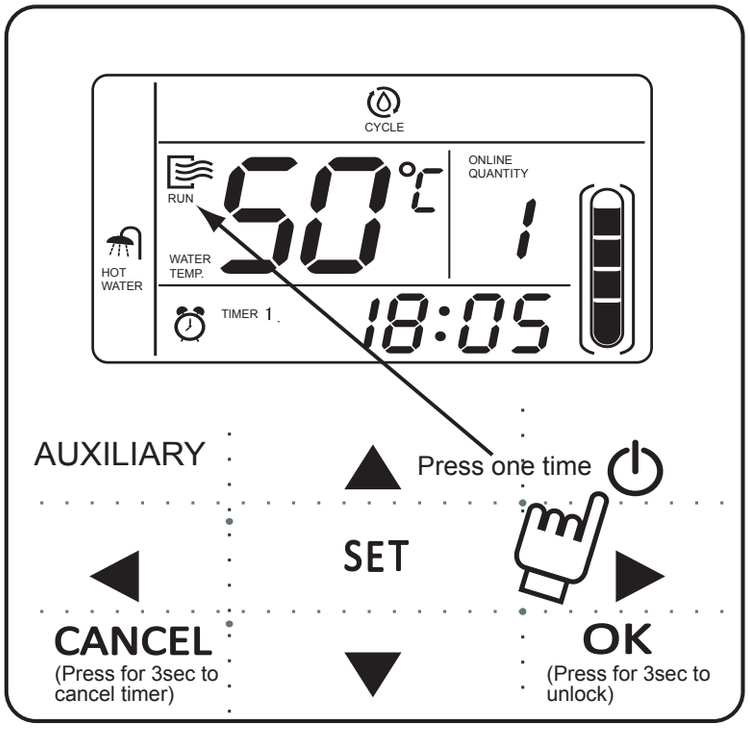
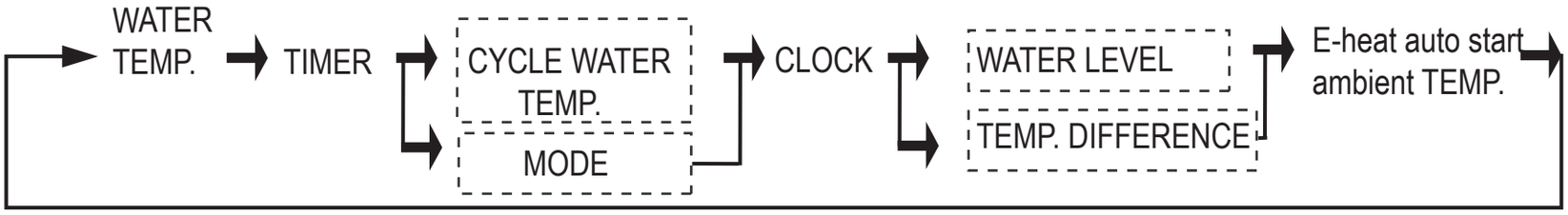


Fig.4-2

4.3 Setting operating modes and parameters

Press “SET” key to enter the operation mode and parameters setting. The setting contents will change as the following order each time the key is pressed:



NOTE

The setting options in the dotted line frame are not general setting. The wire controller automaticly judge the needed setting according to the main unit model.

1) Setting water temperature: Press the “▲” or “▼” to adjust the water temperature after the controller is powered on. Or press “SET” key once when “SET WATER TEMP” is displayed on the LCD and then press “▲” or “▼” to adjust water temprature.
Water temperature setting check: To check the water temprature setting vaule, press the “◀” or “▶” key under the main page(the page displayed after the controller is powered on).

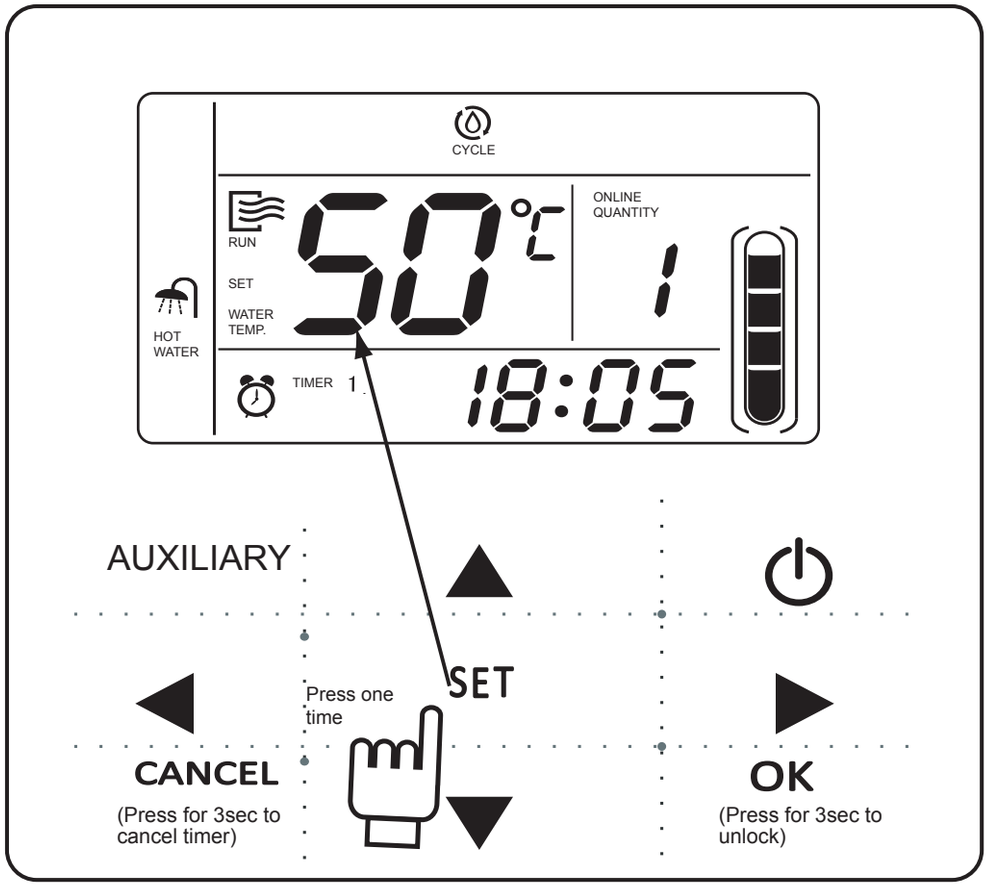


Fig.4-3

2) Timing setting: 3 timing periods can be set on the wire controller to control the unit to be turned ON during specific time: Timer 1, Timer 2, Timer 3. During each period, water temp. ,water level or operation mode can be set independently.(decide by the main unit)

Setting method: press “SET” key under main page twice to enter timing setting. Then the LCD will display as the following:

Fig.4-4

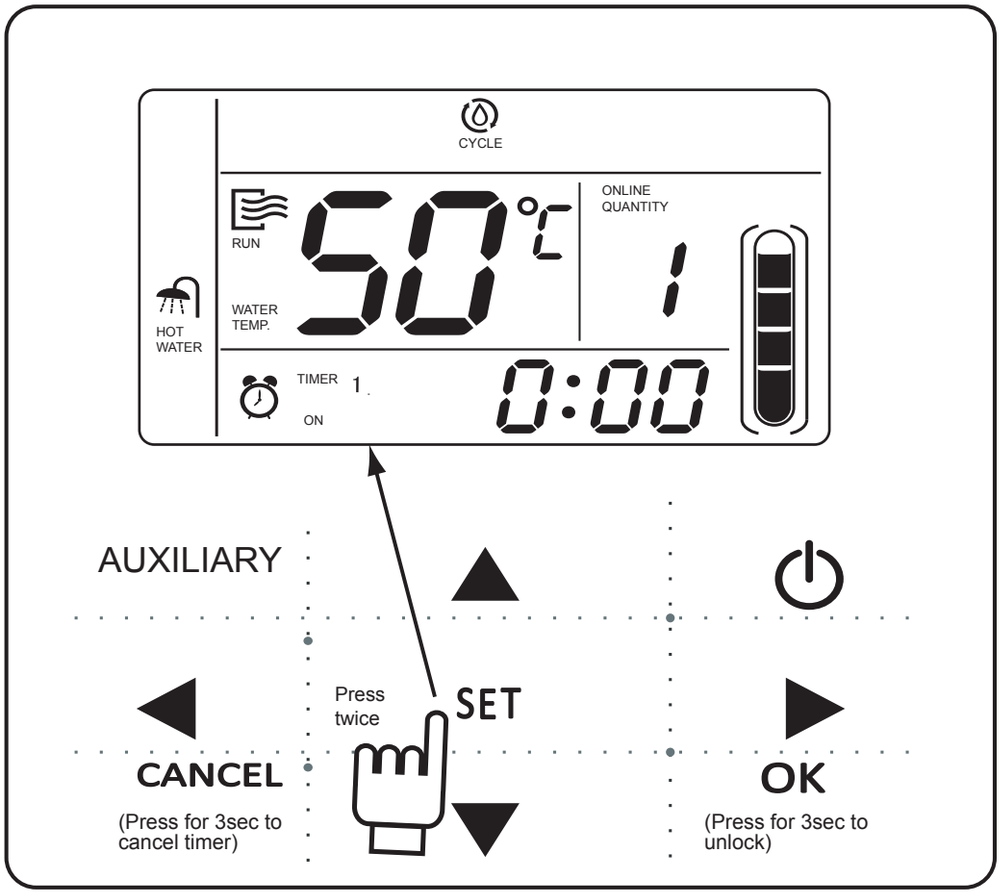


Fig.4-5

At this time the hour of the clock will flash, which means the current setting is the hour of Timer 1 “On”, press the “▲” or “▼” to adjust, press “ ▶ ” key when finished, and then the minute of the clock will flash, which means the current setting is the minute of Timer 1 “On”, press the “▲” or “ ▼ ” to adjust, press “ ▶” key when finished, the LCD will display as the following:

Fig.4-6

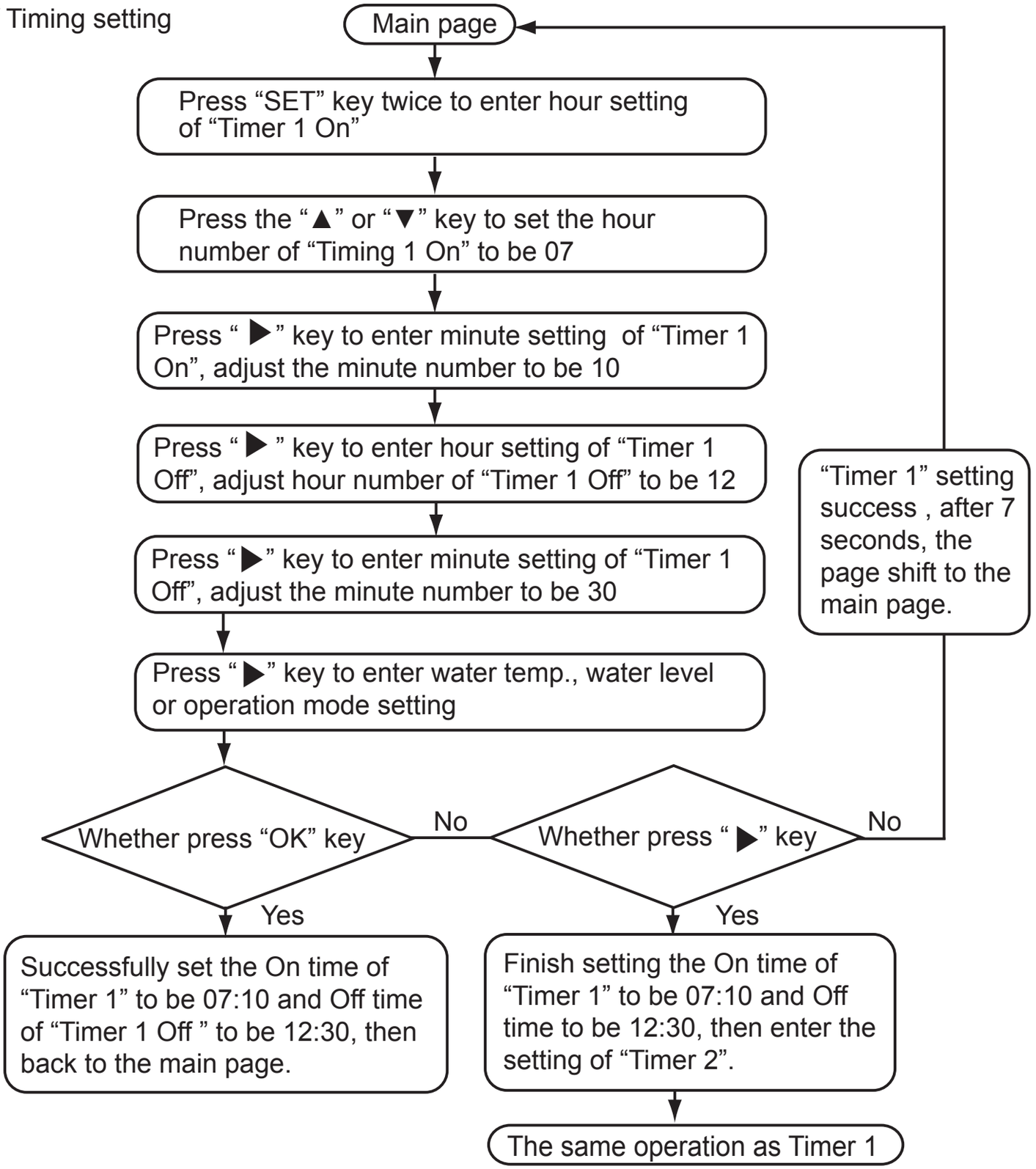
At this time the hour of the clock will flash, which means the current setting is the hour of Timer 1 “Off”, press the “▲” or “▼” to adjust, press “ ▶ ” key when finished, and then the minute of the clock will flash, which means the current setting is the minute of Timing 1 “Off”, press the “▲” or “▼” to adjust, press “ ▶ ” key when finished; then water temp. setting page of timer1 is shown(refer to Fig 4-3),press the “▲” or “▼” to adjust, press “▶ ” key when finished; then water level or operation mode page is shown according to the function of the main unit(refer to Fig 4-10 and Fig 4-12),press the “▲” or “▼” to adjust, press “ ▶ ” key when finished; then the LCD will display as the following:

Fig.4-7

At this time the hour of the clock will flash, it means the current setting is the hour of the Timer 2 “On”. And the follow setting method will be the same as the Timer 1. Similarly, the setting of Timing 3 is the same as this method. After setting is finished, press “OK” key or wait for 7 seconds to confirm the setting, and the LCD will display the effective timing information, as the following display:

Fig.4-8

Example of Timing setting



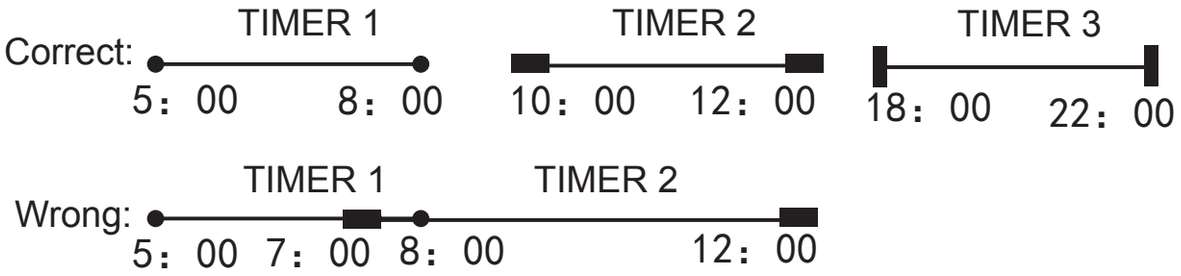
During any period of timing setting to press “OK” key , the timing periods which have been set will be effective (only if the “On” and “Off” of one timing period have been set, the setting is effective).

Check timing information: to check the timing which has been set, press “◀ ” or “ ▶” key under main page, the “ On ”and “ Off ” time of Timer1, Timer 2 and Timer3 will be displayed in turns.

Cancel timing: press and hold “CANCEL” key for 3 seconds, then all the effective timing periods will be cancelled.

NOTE

To avoid timing error, each period of timing should not be crossed. E.g.:



3) Set the cycle heating water temperature (valid when wire controller set to 1)

Continuous press “SET” key 3 times to enter cycle heating water temperature setting. The LCD will display”SET CYCLE WATER TEMP.” and temperature value will flash. Press the “▲” or “▼” key to adjust the temperature value, press “OK” key or wait for 7 seconds to confirm. During setting process pressing “CANCEL” key to exit without saving.

Check cycle water temperature value setting: Press “◀ ” or “ ▶ ” key under main page to Check the value.

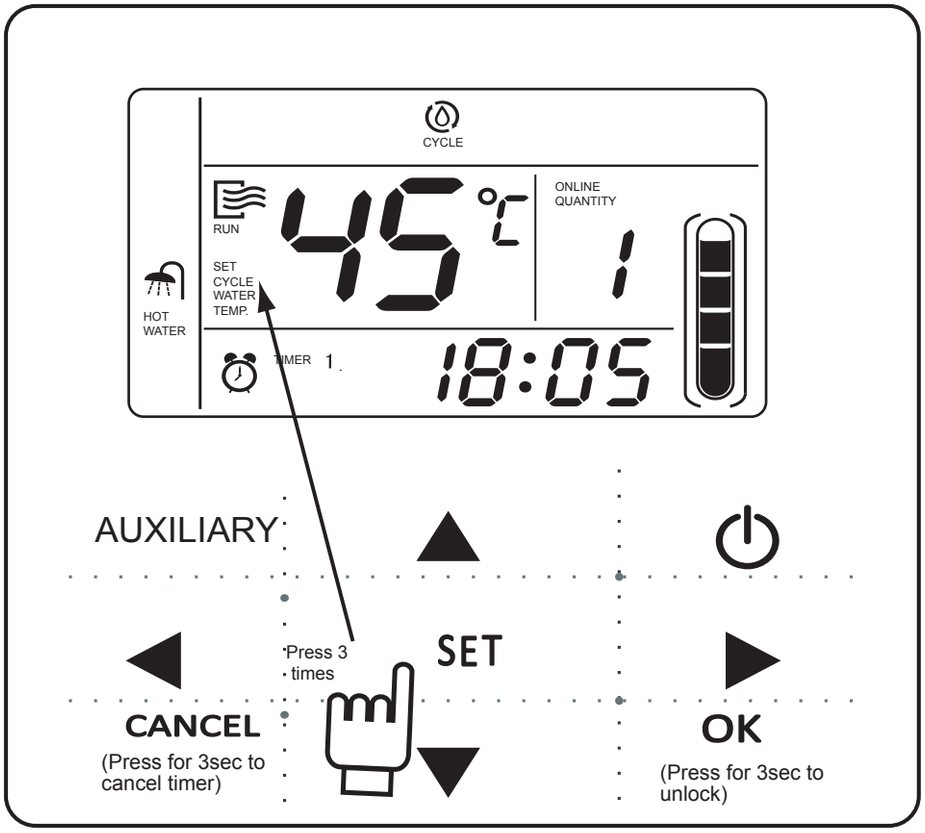


Fig.4-9

4) Set working mode(valid when wire controller set to 2,3,4)

Press “SET” key 3 times to enter the working mode setting when the main unit is off power. Press the “▲” or “▼” key to adjust , press “OK” key or wait for 7 seconds to confirm and back to the main page; During setting process pressing “CANCEL” key to exit without saving. The controller will show different working mode when it is applied to different main unit and set to 2,3,4 respectively. See fig.4-10.

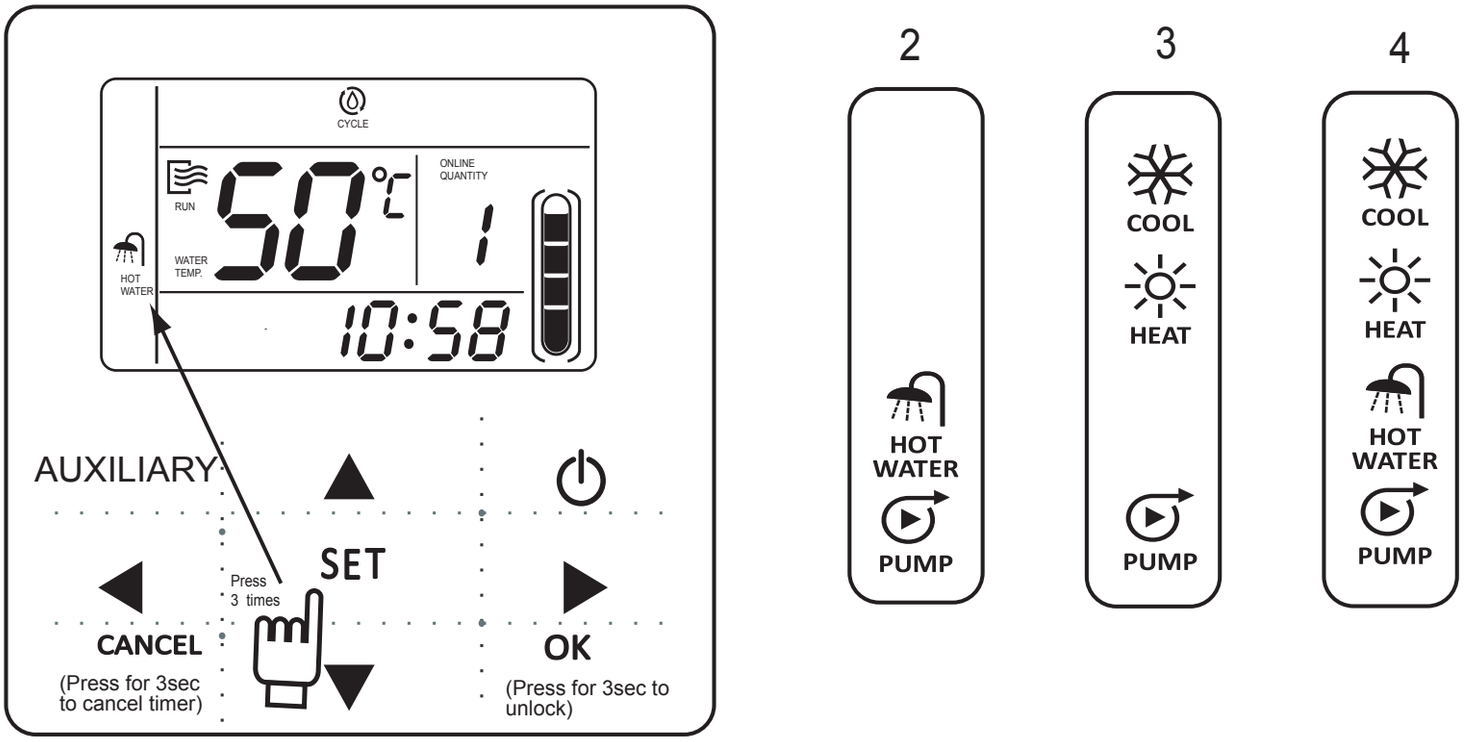


Fig.4-10

NOTE

Working mode setting is valid only when the unit is power off.

5) Set clock

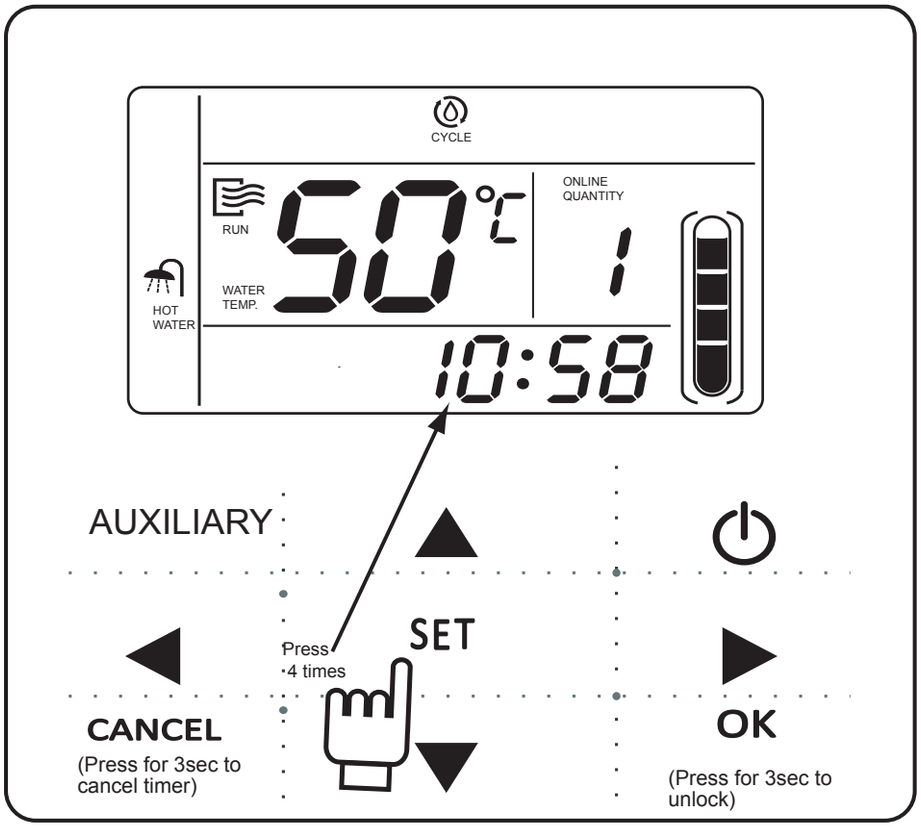


Fig.4-11

Press the “SET” key 4 times to enter clock setting. The hour of the clock will flash, which means the current setting is the hour of the clock, press the “▲” or “▼” to adjust, press “ ▶ ” key when finished, and then the minute of the clock will flash, it means the current setting is the minute of the clock, press the “▲” or “▼” to adjust, press “ OK ” key when finished or wait for 7 seconds to confirm.During the setting process pressing the “CANCEL” key to exit without saving.

NOTE

To get the correct timing On and timing Off time, please correctly set the clock!

6) Set water level(Valid when the wire controller is set to 1)

Press the “SET” key 5 times to enter the water level setting. Press “▲” or “▼” to adjust the water level. press “ OK ”key when finished or wait for 7 seconds to confirm. During the setting process pressing the “CANCEL” key to exit without saving. The setting value is 50%,75% or100%.Press “ ◀ ” or “ ▶ ” key under main page to check the water level which has been set.

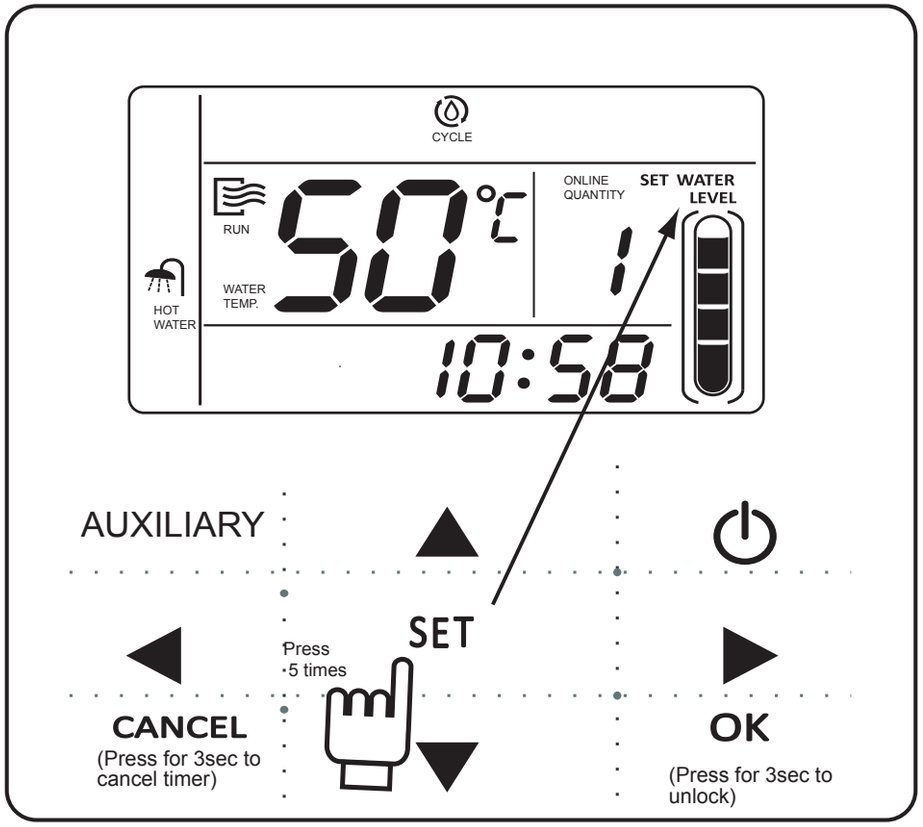


Fig.4-12

7) Set the stop and restart temperature difference (Valid when the wire controller is set to 5)

Continuous press “SET” key for 4 times to enter temperature difference setting, the LCD will display “diFF”. Press the “▲” or “▼” key to adjust the temperature difference, press “OK” key or wait for 7 seconds to confirm and back to the main page. During setting process pressing “CANCEL” key to exit without saving. The range of temperature difference is 2-10 degree.

Check the stop and restart temperature difference setting: Press “◀ ” or “ ▶ ” key under main page to check the difference value which has been set.

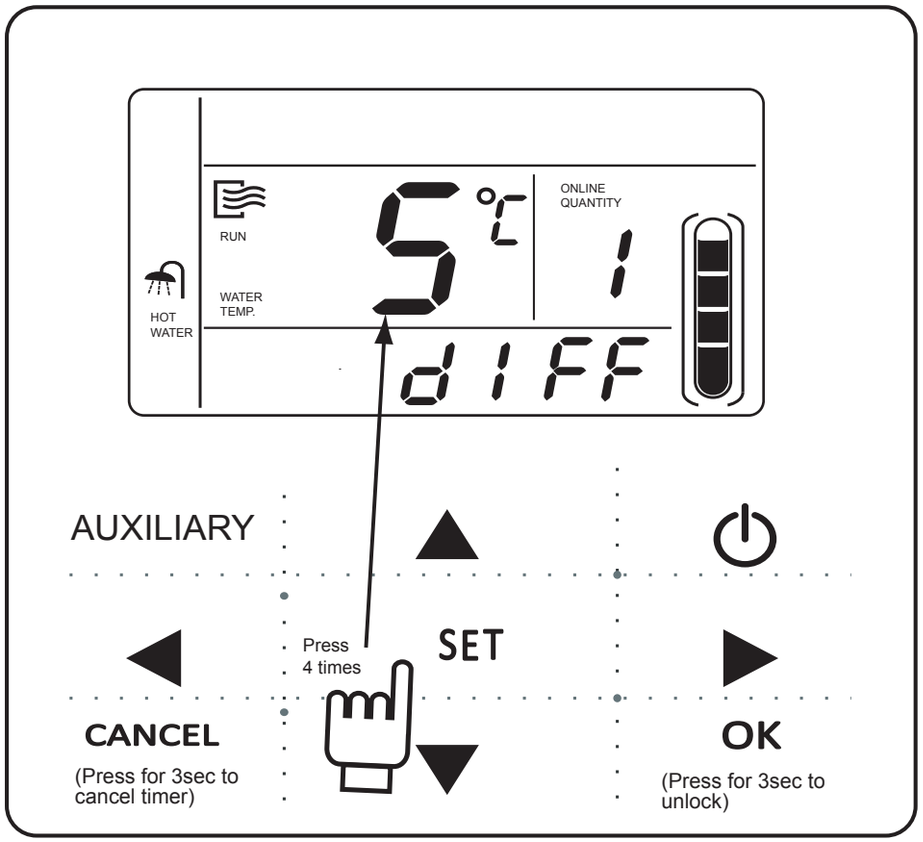


Fig.4-13

8) Set e-heat auto start ambient temp.

when ambient temprature is below this temprature, the e-heat will start automatically.Press “SET”key 6 times to enter the setting, LCD shown as below figure. Press “▲”or“▼” to adjust temprature value, Press “OK”key or wait for 7 seconds to effect the setting; Press “CANCEL”key to quit setting. The setting range is -5 -- 15 celsius.

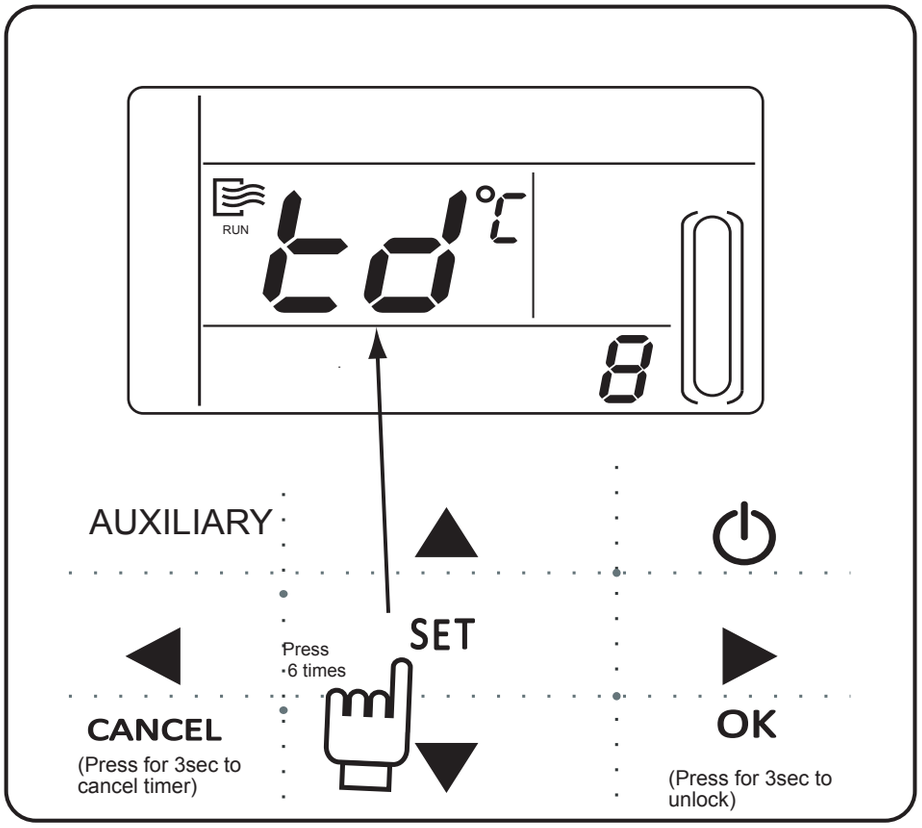


Fig.4-14

4.4 Auxiliary operation

1) Electric auxiliary heating

This function allows to run the electric auxiliary heating of main unit manually. Operation method: press “AUXILIARY” key once to enter this function.“ E-HEAT ” icon will flash, and then press “OK” key to confirm. The “E-HEAT” icon will be on if the electric auxiliary heating running requirement is fulfilled and will be off if not fulfilled.

NOTE

Direct heating water heaters do not have this function.

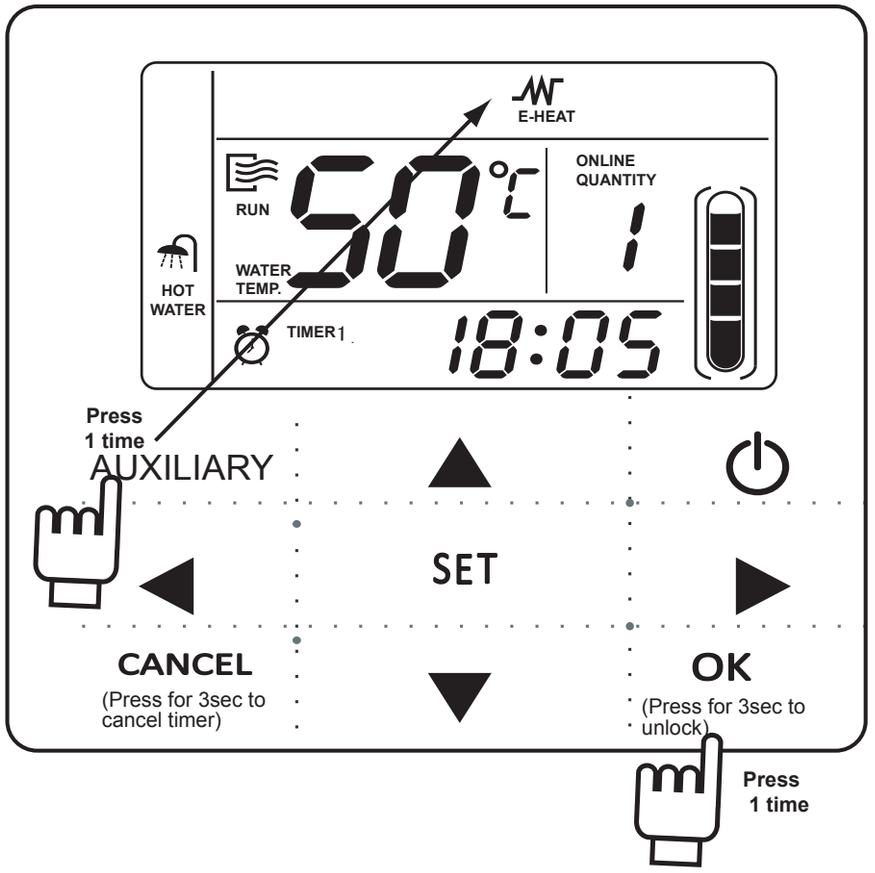


Fig.4-15

2) Cycle heating(Direct heating water heater has this function).

Cycle heating function makes the direct heating water heater to run the cycle heating function.

Operation method: Press “AUXILIARY” key twice to enter this function.“ CYCLE ” icon will flash, press “OK” key to confirm.The “CYCLE” icon will be on if the cycle heating running requirement is fulfilled and will be off if not fulfilled.

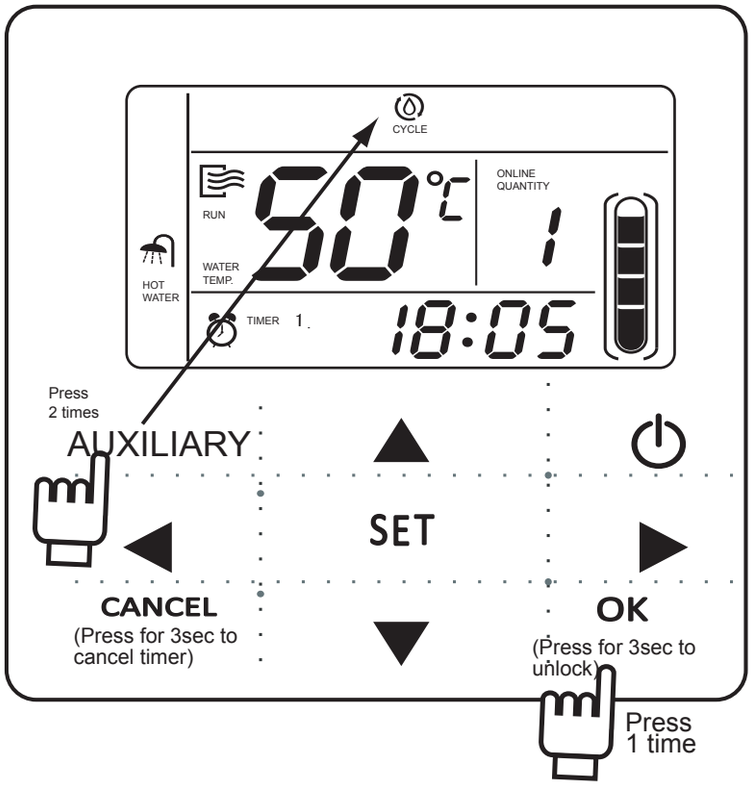


Fig.4-16

3) Water pump (reserved for future use.)

This function is used to run the main water pump in the device installing and debugging.

Operation method: when the wire controller is set to be 1, press “AUXILIARY” key 3 times to enter this function. “ PUMP ” icon will flash and then press “OK” key to confirm. The “PUMP” icon will be on if the pump running requirement is fulfilled and will be off if not fulfilled.

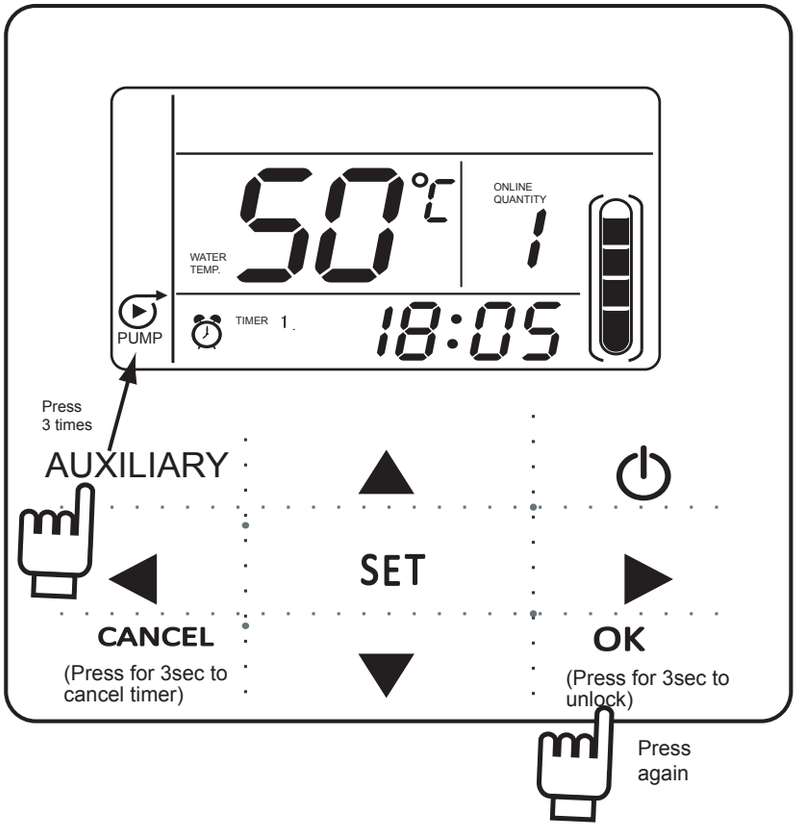


Fig.4-17

4) Cancel auxiliary: To stop the auxiliary function, press the “AUXILIARY” key again, and then press “CANCEL” key when the corresponding icon is flashing. Then the auxiliary function will be cancelled.

4.5 check

1) Check function allows the user to check all the operating parameters, error and protection information of the main unit.
2) Enter method: press and hold “SET” key for 3 seconds to enter check interface, as the figure display:

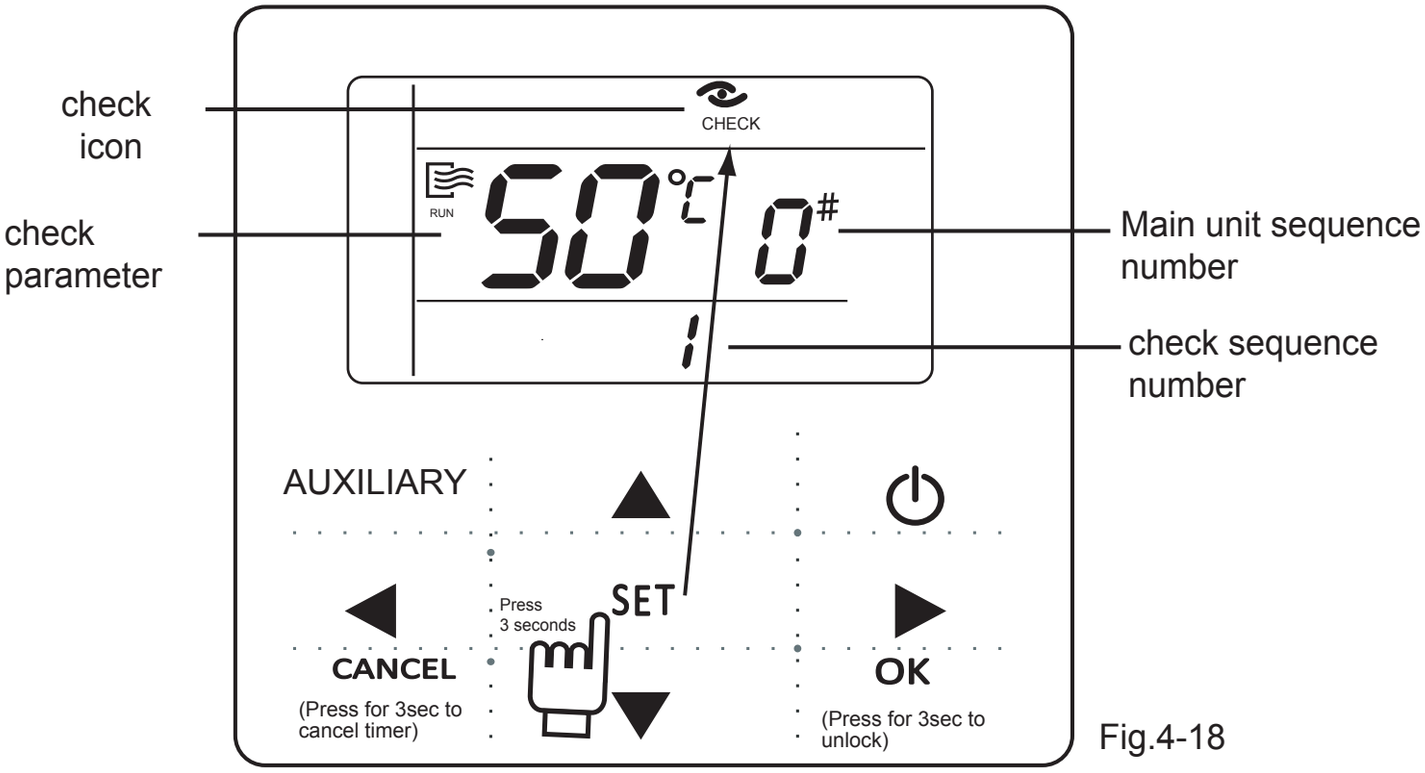


Fig.4-18

3) Press the "▲" or " ▼ " key to adjust the main unit serial number and check 16 units' status information from #0～#15. Press " ◀ " or " ▶ " to adjust the check sequence number of one unit and check all the status information of this unit.

Check content when wire controller setting is 1:

Table 4-1

1	Water outlet temp. T1->2, outdoor pipe temp. T3->3, outdoor ambient temp. T4->4, air exhausting temp. ->
5	Compressor A current ->6, compressor B current ->7, EXV opening ->8, EXV opening
9	Last one error or protection ->10, last second error or protection ->
11	Last third error or protection ->12, outdoor unit model->13, wire controller setting value ->1, water outlet temp. T1 ……

Check content when wire controller setting is 2,3,4:

Table 4-2

1	condenser pipe temp. T3a ->2, condenser pipe temp.T3b ->
3	Outdoor ambient temp. T4->4, compressor A current ->5, compressor B current
6	Last one error or protection ->7, last second error or protection ->
8	Last third error or protection ->9, outdoor unit model->
10	wire controller setting value>1, condenser pipe temp. T3a

Check content when wire controller setting is 5:

Table 4-3

1	pipe temp. ->2, condenser pipe temp. ->
3	Outdoor ambient temp. T4->4, compressor current ->
5	Last one error or protection ->6, last second error or protection ->
7	Last third error or protection ->8, outdoor unit model->
9	wire controller setting value>1, condenser pipe temp. T3a of system A ·····

5. Error handling

When the unit has error or protection, " ERROR " icon will flash. Press and hold "SET" key for 3 seconds to enter check status and then press the "▲" or "▼" key to check the unit of 0-15#. If the "error" icon is on, it means the corresponding unit has error or protection at that time. The last 3 error or protection codes of the unit can be checked. The error icon will disappear if the error or protection is cleared.

Error code list (when the wire controller set to 1).

Table 5-1

E0	Water pressure detection error (main unit display)	E8	Cycle water flow detection error
E1	Power phase sequence error	EE	Communication error between function locking module and main panel
E2	Communication error	EF	EEPROM error
E3	Sensor error of water outlet temp.	P0	Protection for system low pressure
E4	Sensor error of water temp.in tank	P1	Protection for system high pressure
E5	Sensor error of condenser pipe temp	P2\3	Protection for system current
E6	Sensor error of outdoor ambient temp.	P8	Protectin for the over-high water outlet temp.
E7	Sensor error of E-heater pipe temp.	PF	Function loking module is under locking status

Error code list (when the wire controller set to 2,3,4)

Table 5-2

E0	water flow error
E1	Power phase sequence error
E2	Communication erro
E3	Sensor error of water outlet temp
E4	Sensor error of heat exchanger water outlet temp
E5	Sensor error of condenser A pipe temp
E6	Sensor error of condenser B pipe temp
E7	Sensor error of outdoor ambient temp.
E8	Water tank temp. sensor error or exhaust temp.sensor error（3）
E9	Water flow error(first 3 times)
EA	Sub-unit offline
EB	Heat exchanger A temp.sensor error or water oulet B （3）
Ed	3 times PE protection
EF	Heat exchanger B templ sensor error or T5 error（3）

Table 5-3

P0	Systme A high pressure or exhaust overheat protection
P1	System A low prossure protection
P2	Systme A high pressure or exhaust overheat protection
P3	System B low prossure protection
P4	System A current flow protection
P5	System B current flow protection
P6	Systme A condensor overheat protection
P7	Systme B condensor overheat protection
P8	Exhaust overheat protection
P9	Outlet water temp. over heat protection
F1	EEprom error
Pb	System anti-freeze protection
PE	Heat exchanger low temp. protection、oulet water overheat（2)

Error code list (when the wire controller set to 5)

Table 5-4

E2	Communication error
E3	Sensor error of T1 temperature
E4	Sensor error of water tank temperature
E5	Sensor error of condenser pipe temperature
E6	Sensor error of outdoor ambient temperature
E7	T6 sensor error
E9	Tp sensor error
P1	Protection for system high-pressure
P2	Protection for system low-pressure
P8	Protection for over-high outlet temp. of sleeve pipe
P9	Protection for over-high air exhausting temperature
Note: Parts of error code are not listed here, please query the main unit error code table.	

Error code list (Corresponded new circulation series model during the wire controller is auto matching).

Table 5-5

E1	Power phase sequence error	Ed	Error of water inlet temp. sensor (T7)
E2	Communication error of main unit and wire controller, main unit and slaveunit	P0	System low pressure protection
E3	Error of water outlet temp. sensor (T1)	P1	System high pressure protection
E4	Error of water temp. sensor in the water tank (only the main unit display) (T5)	P2	Curretn protection of system 1
E5	Error of condenser pipe temp. sensor (T3)	P4	Protection for air exhausting over-temperature
E6	Error of outdoor ambient temp. sensor (T4)	P5	Big temperature difference between water inlet and outlet
E8	Error of circulating waterflow detection	P9	Water outlet over-temperature protection
EA	Error of air exhausting temp. sensor (Tp)	db	Anti-freezing protection
E9	Error of air returning temp. sensor (Th)	d8	Dry contact signal is ON close status

Version:MD12U-020JW

202055100934

更改记录表（仅做说明用，不做菲林）

尺寸：130mm*130mm　　材质：100g双胶纸　　颜色：黑白印刷

版本升级	更改人	更改日期	更改主要内容	更改页码 印刷页（或默认页码）
B-C	罗静	13.4.10	更改表6-1，增加表6-2，更新图片long press更改为press and hold更改图片cancel和ok下语句错误	P29\30\目录、封底整本
C-D	罗静\苏展	13.5.6	更新语法错误	整本
D-E	罗静\苏展	13.7.2	更改接线方式， 删除适配器， 增加单壁套管机型	整本
E-F	罗静\苏展	13.7.19	更新描述 cancel locking 与unclock	整本
H-I	罗静\苏展	14.10.23	增加电辅热开启温度描述，定时描述更新	整本
I-J	黄耀良	15.3.18	增加19页码	增加19页码