Domestic hot water cylinder with built in heat pump.
Installation & Operation Manual

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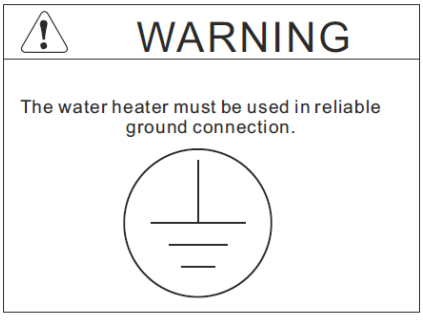
1. Safety Precaution

For safety this product must be installed by suitably qualified personnel in accordance with the local regulations.



The heat pump must be installed by qualified personnel to avoid improper installation which could lead to water leakage, electrical shock or fire.
The installation must be completed in accordance with the local regulations.

The heat pump should be maintained by qualified personnel to avoid improper maintenance which will lead to water leakage, electrical shock or fire.

If the unit is damaged in any way do not operate the unit until effective repairs have been carried out by suitably qualified personnel.

2. Installation Location

The water heater must be installed indoors.
Choose the place that there are no direct sunlight and other heat radiating. If you can not avoid it, please install coverings to prevent the direct sunlight.

When the air inlet and outlet are not connected to the duct, please make sure no barriers near it. Air outlet could be connected to the air duct to bring fresh cool air into the rooms. If this measure is carried out, a reversing valve should be installed in the air duct to make the cool air blows to outdoors in winter. The air inlet could be connected the rooms with the air duct to draft the air from and keep fresh air in the rooms.

It is important that the air intake of the appliance only takes in clean air free of any pollutants or corrosive materials of materials that will block the filter rendering the product ineffective. the air must not contain,

Air which is filled with mineral oil;
air high in salt, (not recommended within 1000metres of the coastline.
Air filled with corrosive gas, air from a kitchen which will contain cooking fats, air which will contain excessive fibres from laundry, air which may contain flammable gas or exhaust fumes., air which is excessively acidic or alkaline.

In addition the electrical supply must not suffer from serious voltage fluctuation or electromagnetic disturbances,
The heat pump requires a continuous supply of fresh air from which to extract heat. It must be installed in a well ventilated area.

The location must have access for associated pipework and electrical wiring.
The unit must be placed on a flat surface capable of supporting the tank and the water when filled.

3. Warnings

The unit CANNOT be installed near flammable gas. If there is were leakage of the gas, fire may occur.
Make sure that the base is adequate to support of the heat pump and the water within.
Make sure that the unit is installed by a qualified electrician with a dedicated circuit breaker for the unit.
Do not put fingers or others into the fans. Children should be supervised to ensure that they do not play with the appliance.
If there is something wrong or strange smell, disconnect the power supply and call an approved service technician.
Should it is be required to move the heat pump again it must be completed by suitably qualified personnel.
Repair of the product should only be completed by suitably qualified personnel.

The unit must be installed indoors, and the ambient temperature must be over 0℃,if you do not operate the unit for a long time and the ambient temperature is below 0℃, please drain the water in the tank to prevent freezing of the water in the tank or associated pipework.

Disconnect the power supply prior to cleaning.
Do not spray flammable aerosols on or near the appliance there is a risk that it may cause a fire..

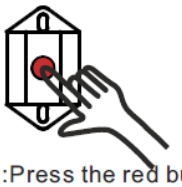
This appliance can used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

4. Overheat protection

Overheat thermostat reset

Overheat thermostat will disconnect the power supply automatically should the temperature of the water in the tank get too high which may be caused by the malfunction of the unit. It has to be reset manually after the unit returns to normal temperature. Follow the steps below to reset the overheating.

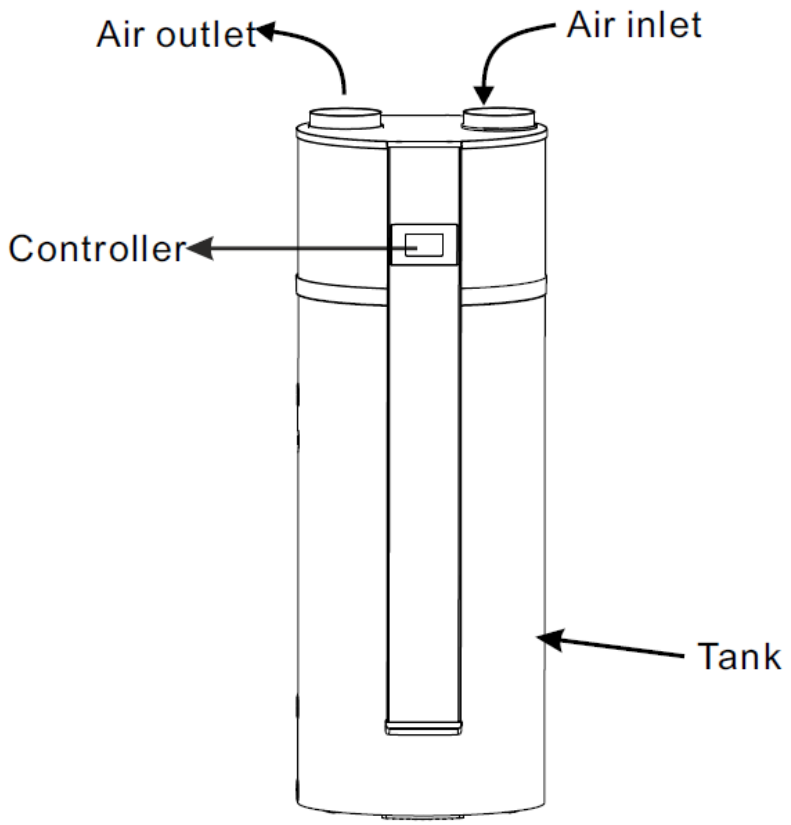
Step1:Loosen the screws and remove the cover.



Step2:Press the red button to reset the overheating protector.

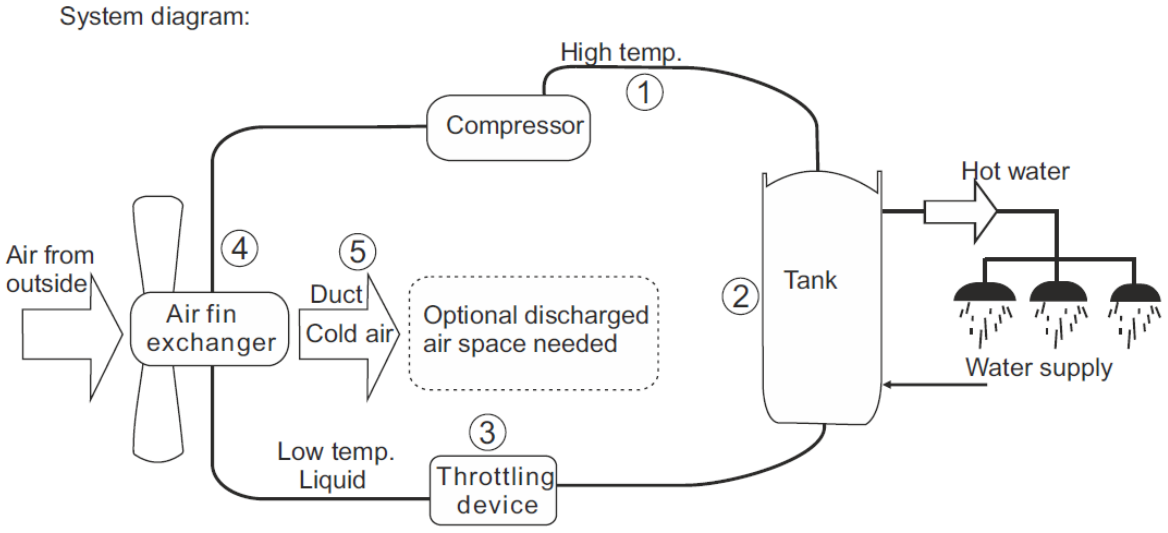
5. Technical Data

Appearance



High efficiency water heater with streamlined design
The unit will operate with an energy consumption of approximately 25% of your traditional immersion heater.
The unit contains an electrically driven compressor, it heats the sanitary water through the use of a refrigerant gas with creating waste gas or waste water.
The unit is simple to operate and can also be used to recycle indoor waste heat.

Working principle



1 Refrigerant is compressed into vapour with high temperature and high pressure when

it goes through the compressor.

2 On the discharge side of the compressor, the now hot and highly pressurized vapour

is cooled down through the heat exchange with the water in the tank until it condenses into a high pressure, moderate temperature liquid.

3 Then the pressure of the liquid refrigerant drops as it passes throttling device.

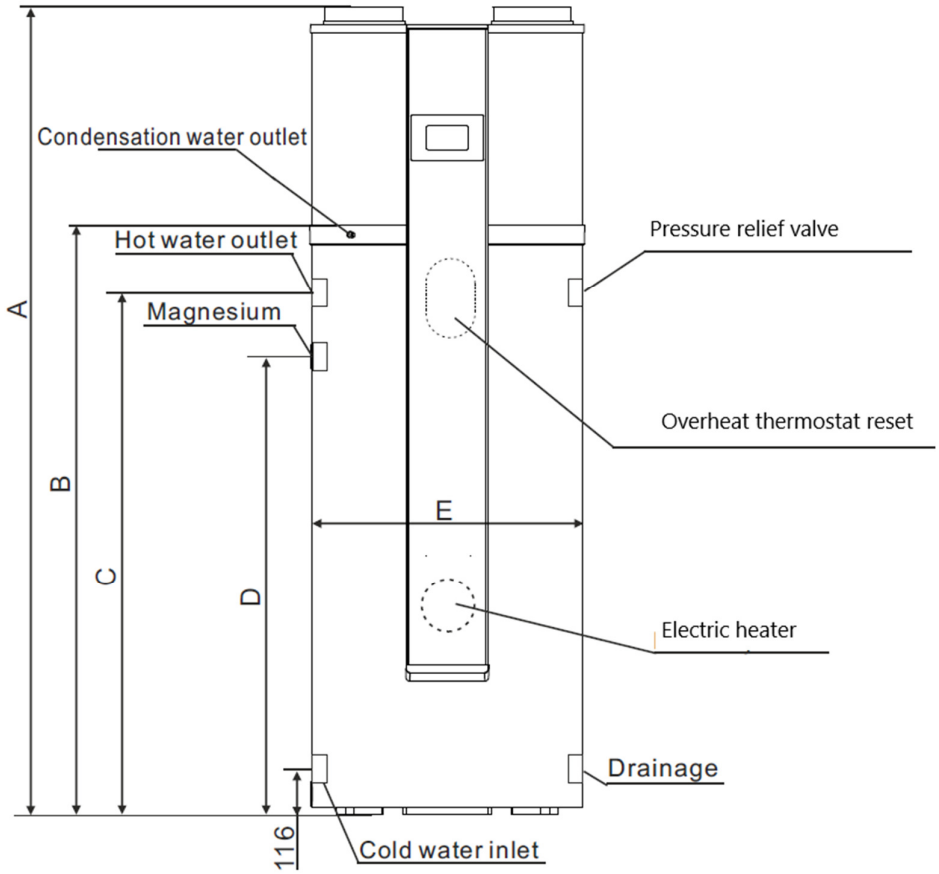
4 Finally, refrigerant absorbs heat from the surrounding air and evaporates into vapour with low temperature and low pressure and then it goes into compressor again.

5 The cooled surrounding air can be blown to the rooms which needs fresh cooled air.

Dimensions

Model / Dimension	200Litre	300Litre
A	1765	1875
B	1362	1467
C	1113	1212
D	1013	1112
E	Dia. 560	Dia. 640

All dimensions in mm.



Performance Parameters

Model		200 Litre	200 Litre
Heating capacity	kW	2.5	
Water tank capacity	L	200	300
Power input	kW	0.68	
Running current	A	2.96	
Power supply		230V / 50Hz	
Compressor Number		1	
Compressor		Rotary	
Rated outlet water Temp.	℃	55	
Air volume	m3/h	350	
Air pressure	Pa	40	
Duct diameter	mm	Φ150	
Nosie	dB(A)	45	
Water inlet/outlet size	inch	3/4 "	
*Auxiliary E-heater	kW	1.5	
Net weight	kg	130	

Working range：
(1).Ambient temperature is -5℃~43℃(Heat Pump)
(2).The max temperature of water tank is 60℃
Measurement conditions:
Instant heating: Ambient temperature20℃/15℃,Water inlet 15℃ Water outlet 55℃
Operating parameters
The range of the operating water temperatures: 9~60℃
The range of the operating water pressures: 0.15~0.7MPa

6. Functionality

Air Conditioning

Air outlet could be connected to the air duct to bring fresh cool air into the rooms. If this measure is carried out, a valve should be installed in the air duct to make the cool air blow to outdoors in winter.

Ventilation

The unit can extract the indoor air during its running to achieve the ventilation, which can purify the indoor air. In the low ambient temperature, it can also improve the efficiency of unit performance.

Heating Capacity

Because the supplied hot water absorbs heat from the surrounding air and releases the heat at heat exchanger side. Once ambient temperature goes down, the heating capacity may decrease accordingly.

3 minutes protection

When the unit stops after running ,if the user immediately starts the unit or turns on manual switch, the unit will not run within 3 minutes. This is designed into the controller to protect the compressor.

Defrosting function in heating mode

In heating mode, if the unit freezes, the machine will automatically defrost to promote heating capacity.(2 to 10 minutes) Under defrosting process, the fan motor of the unit will stop running and compressor continue running.

Water source

The unit should only use tap water . Do not use underground water which is not filtered or treated.

Power supply interruption

If power is cut during machine running, the unit will stop immediately.
If the unit is mis-works because of thunder, wireless of motor car, power net fluctuation, please turn off the power switch by hand. After the unit restarts, the user can re-press the running/stop button.

Water pressure protection

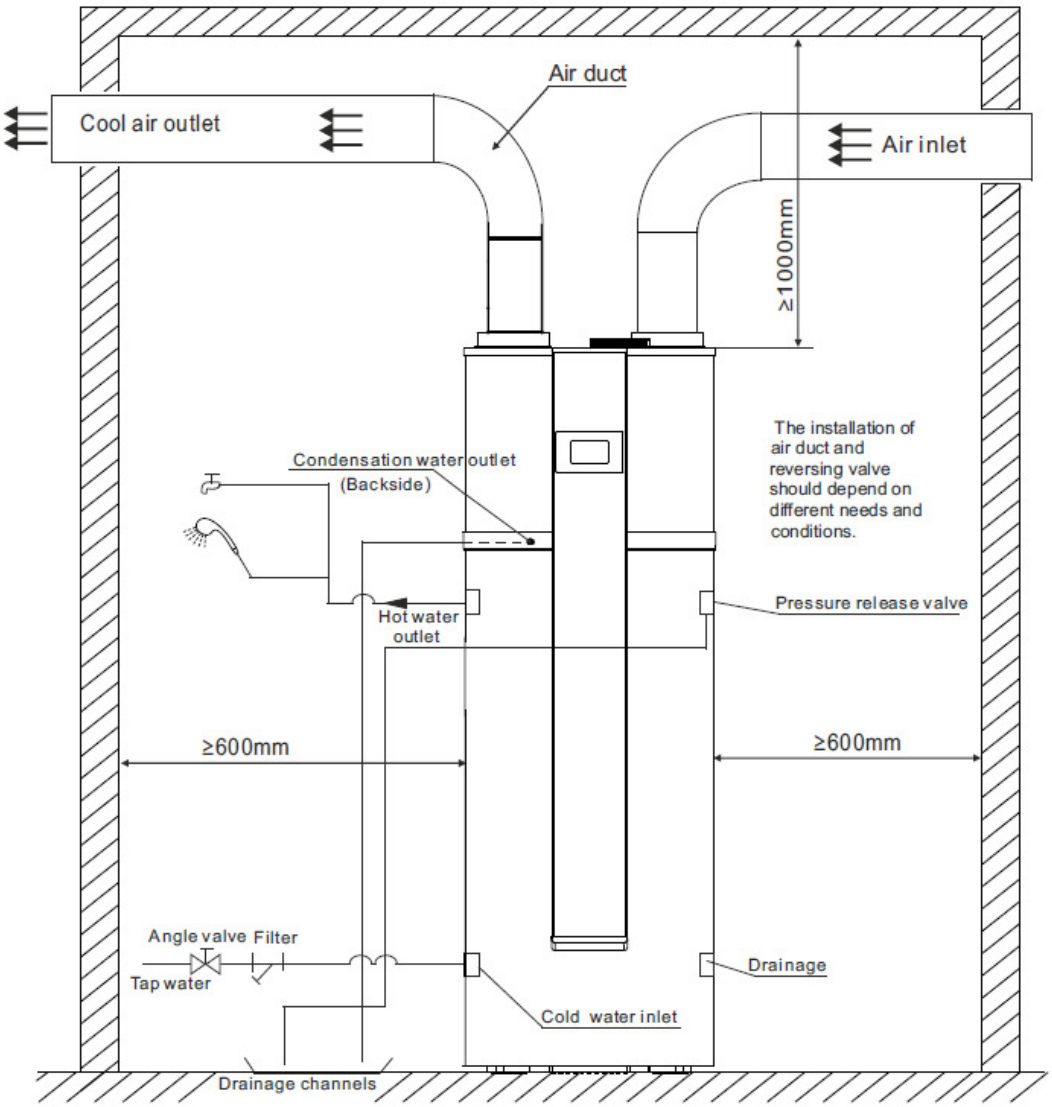
In the water system a Pressure release valve will be installed. When the tank pressure reaches 0.7MPa, the Pressure release valve will open allowing excess water flow to drain.

7. Installation

Where the mains supply is not connected to a storage tank that would allow for expansion the unit must have a inlet group fitted with built in pressure reducing valve and must have an expansion vessel of appropriate volume adjusted to appropriate pressure fitted between the pressure reducing valve and the storage tank.

1. Installation sketch map

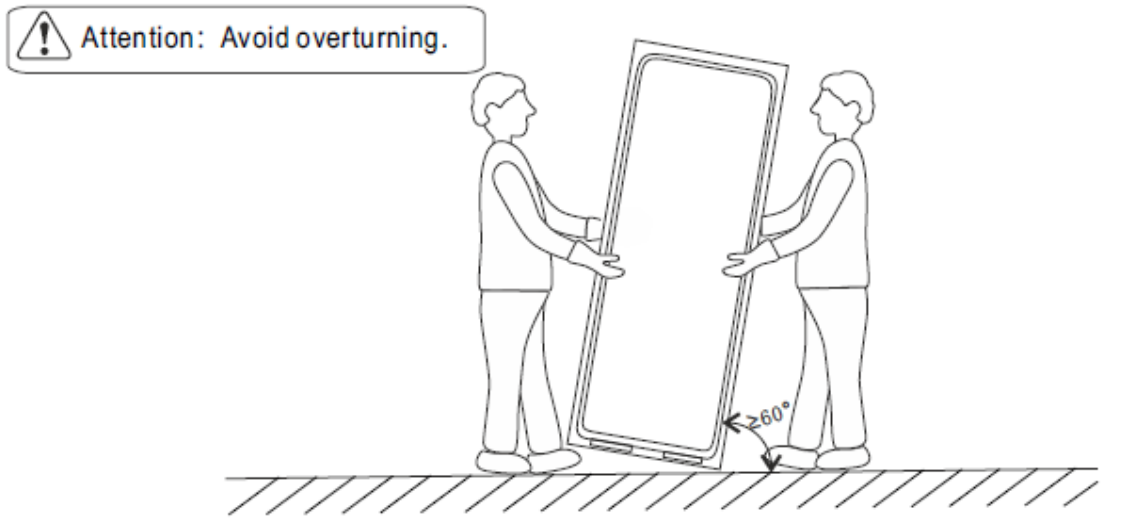
Unit: mm



Pressure release valve is a necessary component of the unit.
Do not hold the handle of the Pressure release valve; Do not block the drain outlet;
Please obey the above instructions to avoid any possible injury or unexpected accident.
Do not use stainless steel fittings to connect directly with other metals to prevent galvanic corrosion. The drain pipe must be piped to drain correctly.

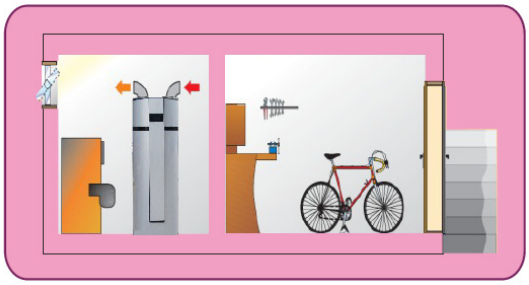
8. Storage and Transportation

Ideally the Unit should be maintained upright at all times.
When transporting, please be careful that the maximum inclination is
no more than 60°.If the inclination unavoidably exceeds 60°,the unit must be kept at vertical status for at least 2 hours and then can be started for testing or running. During transportation and storage, the ambient temp is best from 0℃~40℃



9. Installation Position

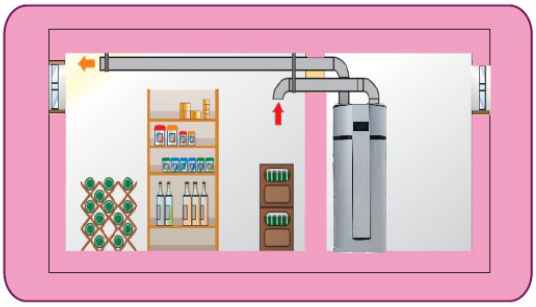
Waste heat is useful heat （see picture below）
The standard heat exchanger of the hot-water heat pump enables direct connection to a second heat generator, e.g. a solar heating system or a boiler.



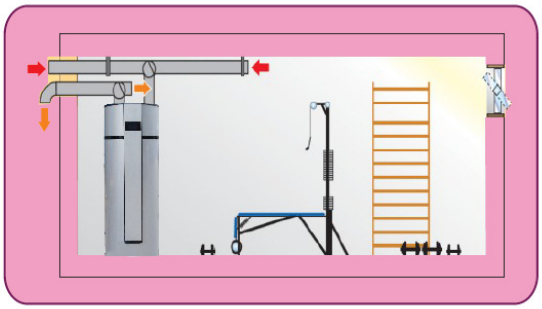
Dehumidification in the recirculating air mode（see picture below）
Dehumidified air in the laundry room supports laundry drying and prevents moisture induced damage.

Cooling in the recirculating air mode（see picture below）

The room air is extracted from the storage room or a wine cellar, subsequently cooled and dehumidified in the heat pump and finally re-introduced into the room. Recreation rooms, boiler rooms or utility rooms are ideal installation sites. The air ducts leading through warm sections must be insulated to prevent the formation of condensation.



variable change over of intake air（see picture below）
A duct system with integrated bypass flaps allows for variable utilization of the heat contained in the outside air or room air for the production of hot water.



10. Electrical connection

The unit requires a 230 V 50 Hz supply

Power input Heat pump 0.68kW

Power Input Auxiliary Heater 1.5kW

Total Power 2.18 KW

Max Rated Current 9.5A

Wire connection
Appliances should be installed in accordance with national wiring rules.
The unit must be connected to a dedicated circuit breaker.
If the power wire has been destroyed, the new wire must get the same certification with the old one, or provided by the factory.

11. Plumbing connection

Hydraulic connection
Please note the following points when connecting the water pipes:
Minimise the resistance in water pipes.
Inner surface of whole pipe system should be clean, no rusty spots and dirt to avoid any Blockage of the filter or pipes. After connecting pipes, please leak check the whole system to assure there are no leaks firstly and then make the insulation.
Add a Pressure release valve and other safety valve in water way. The specification of Pressure release valve is G3/4" male thread. Pressure relief must be connected to drain via copper pipe with a tundish to allow observation of flow
The installation of water pipes must be in accordance with the requirements of the local

standard(To avoid excess water pressure, please install a discharge valve).
Every 6 months pull the handle of the pressure relief valve in order
to remove the sediment of Calcium Carbonate. Please confirm
the device is not jammed. The drainage outlet water temp is high,
please pay attention to it.
Please insulate the drainage pipe to prevent pipe
freezing in winter, which may lead to accidents.
The discharge temperature may be higher than expected and please take care to avoid burns.

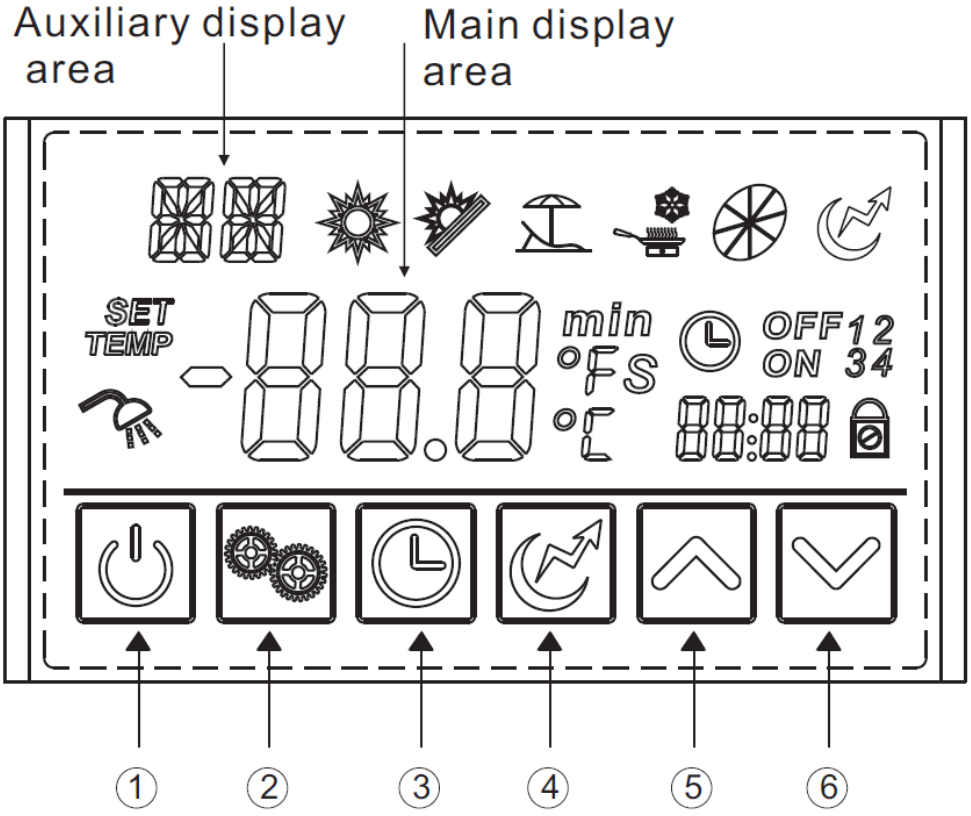
12. Trial running

Inspect before trial running
Check the heat pump unit: When the unit is powered on, check the indicator and
temperature display on the controller to see if there is any malfunction.
Check whether the water tank is filled with water and water pipe installation is all right;
Check the electrical wiring. Make sure that the voltage is normal, the wiring and
the earthing is connected well;

Use the wire controller to start the unit；

When compressor is running, listen whether there is strange sound or not. If abnormal
sound occurs please stop the unit and check the compressor.
Measure the water temp. to check the undulation of the water Temp.;
Usually the first trail running takes about 4-10 hours to reach the set
temperature. This is according to the temperature of water and environment.

13. Operation and use



Controller

NO.	Button	Name	Function
①		ON/OFF	Turn on/off the unit.
②		Mode	Switch unit running modes or save setting parameters.
③		Clock	Set the clock or the timer.
④		Electric Heater	Turn on/off the electric heater or switch fan modes.
⑤		Up	Move up or increase parameter values.
⑥		Down	Move down or decrease parameter values.

14. Functions of the controller

Status icon	Name	What it means
	Heating	Shows that the unit is in heating mode.
	Eco.heating	Shows that the unit is in eco.heating mode.
	Vacation	Shows that the unit is in vacation mode.
	Cooling	Shows that the unit is in cooling mode.
	Fan	Shows that the fan is on and the speed of the fan.
	Electric heater	Shows that the electric heater is on.
	Set temperature achieved	Shows that the water temperature has reached the target point and the unit shut off automatically.
SET	Parameter setting	Shows that the parameter is adjustable.
TEMP	Temperature	Shows that the temperature is non-adjustable (measured value).
ON	Timer & ON	Shows that the unit will be turned on by the timer automatically.
OFF	Timer & OFF	Shows that the unit will be turned off by the timer automatically.
min	Minute	Shows that the main display area displays the minute.
S	Second	Shows that the main display area displays the second.
℃	Centigrade	Shows that the temperature in Main display area or Auxiliary display area is in ℃.
℉	Fahrenheit	Shows that the temperature in Main display area or Auxiliary display area is in ℉.
	Lock	Shows that the keyboard is locked.

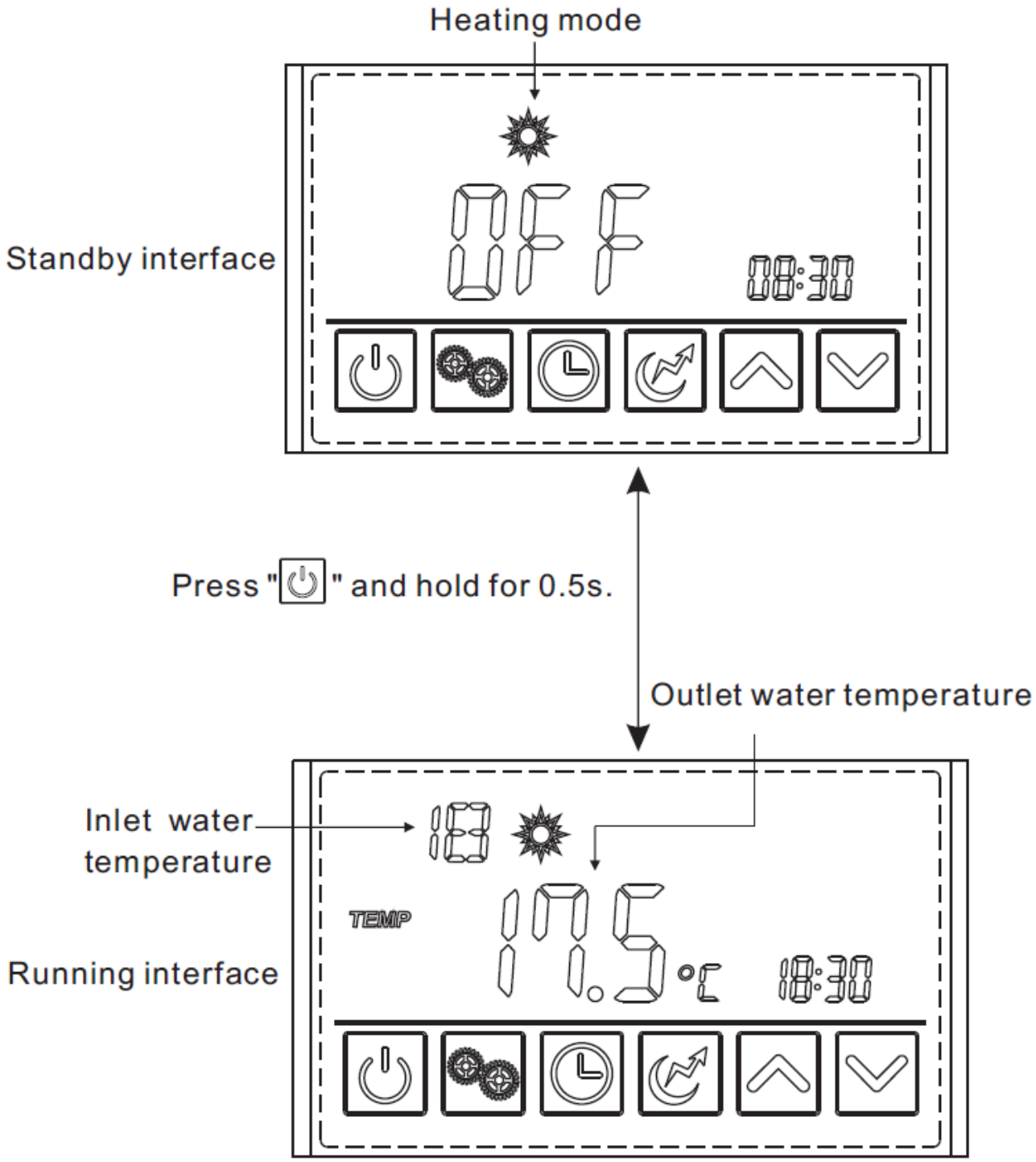
15. Operation of the controller

To Turn ON/OFF the unit

Press " Power button (1) " and hold for 0.5s in the standby interface of the controller to turn on the unit and at this time the main display area shows the water outlet temperature.

Press " Power button (1) " and hold for 0.5s in the running interface of the controller to turn off the unit and at this time the main display area shows OFF.

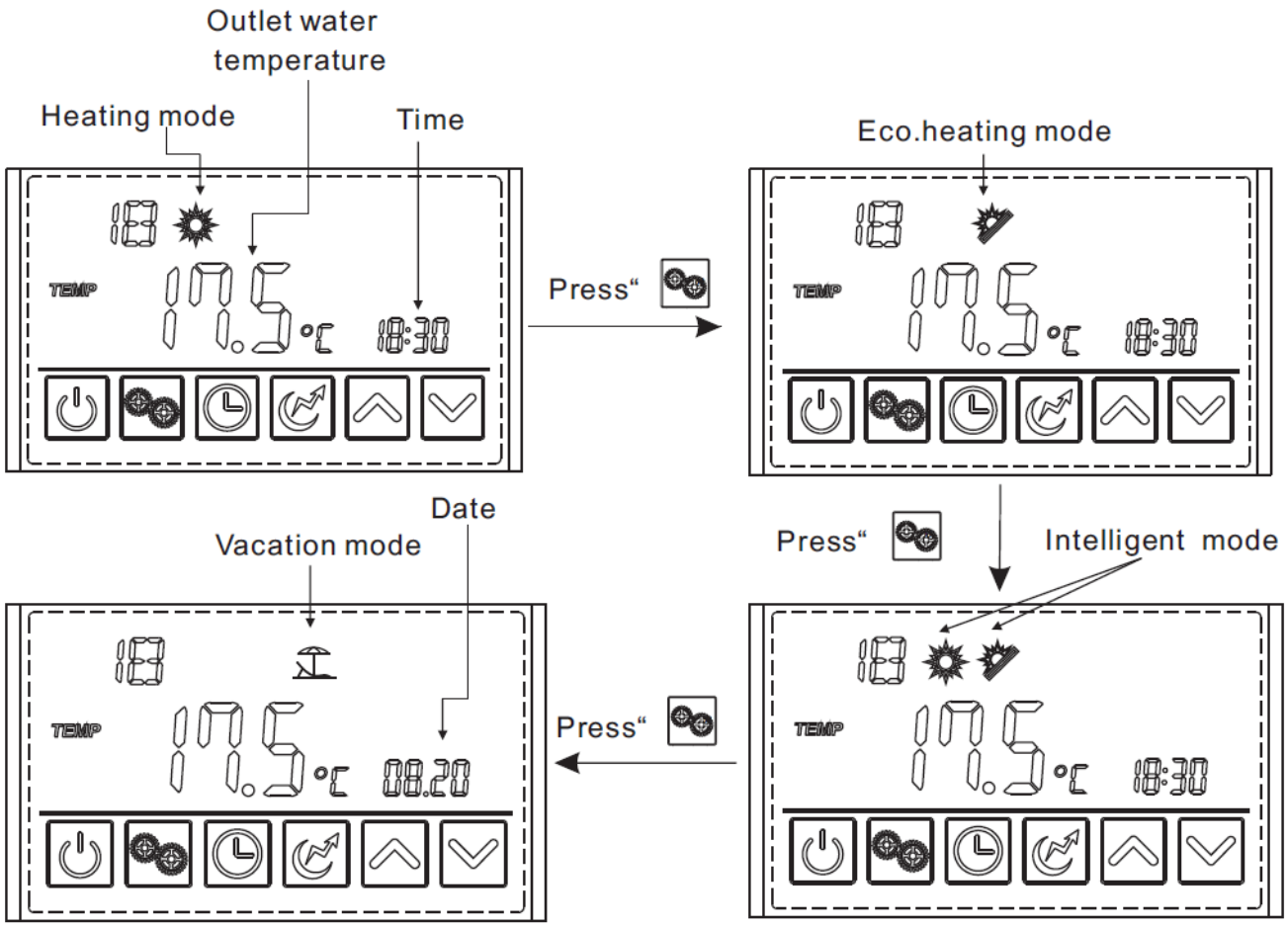
Note: The ON/OFF button can only be used to turn on/off the unit in standby or running interface of the wire controller.



Mode selection

Press " gear wheel icon (2) " to select the mode from Heating ,Eco.heating , , Vacation in the standby or running interface.

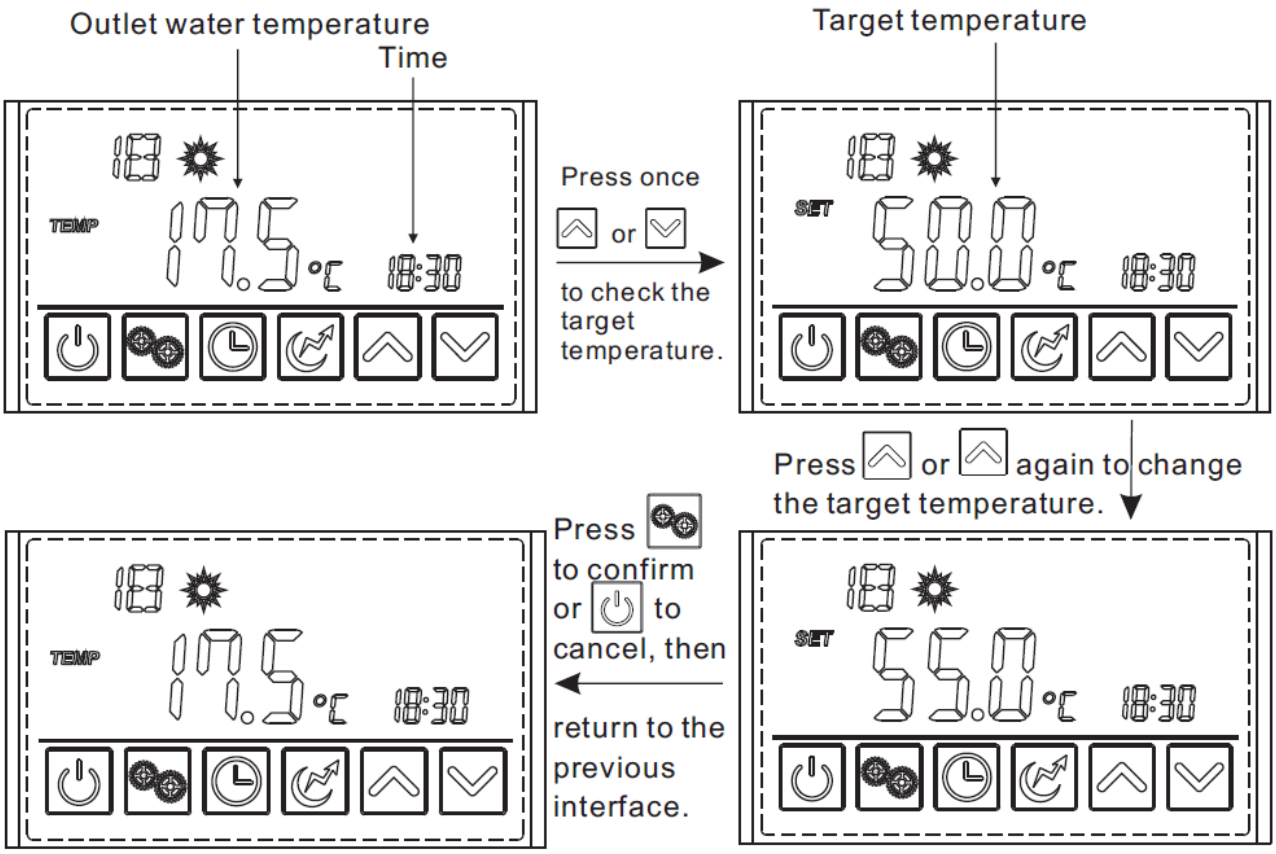
For example:



Target temperature checking and setting

In the standby or running interface, press " UP ARROW " or " Down ARROW " once to check the target temperature of the outlet water. Press " UP ARROW " or " Down ARROW " again to change the target temperature. After making the changes to the parameter, press " Gear wheel Icon " to confirm or " Power Button " to cancel the changes, then return to the previous interface. If no operations are performed on the keypad for 5s, the controller exits the parameter modification menu by timeout and the changes are confirmed.

Example: Change the target temperature from 50 to 55.5 when the actual outlet water temperature is 18℃.



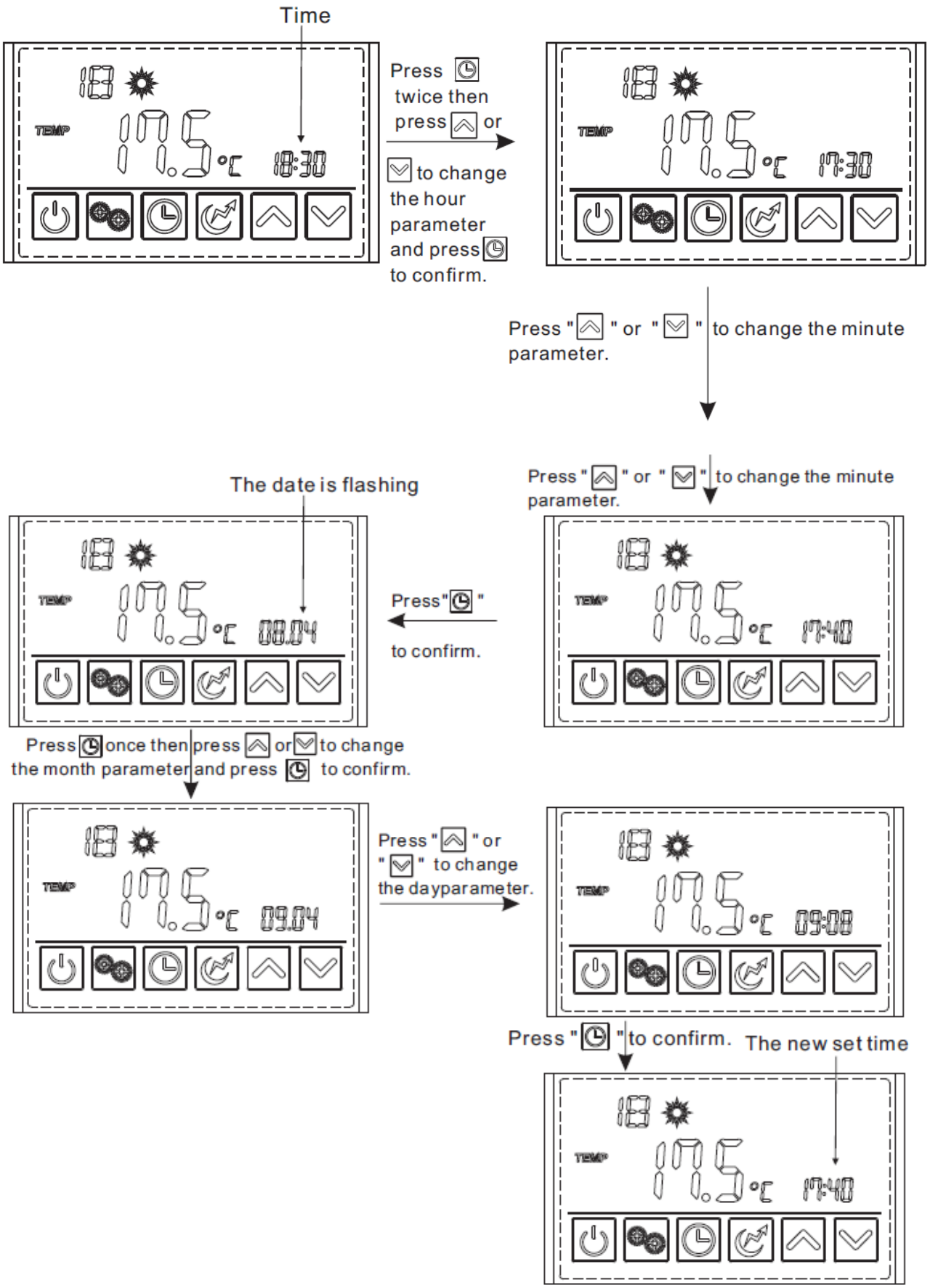
Setting the time

In the standby or running interface, do as follows to set the time when in heating mode. When press " Clock symbol (3) " once, the time will flash. When press " Clock symbol (3) " again, the hour will flash then press " UP ARROW " or " Down ARROW " to change it. After making the changes to the parameter, press" Clock symbol (3) " to confirm, then change the minute parameter as well as the date parameter in the same way.

If no operations are performed on the keypad for 10s, the controller exits the parameter modification menu by timeout and the changes are confirmed.

Note: Set the date in the same way when in vacation mode.

Example: Change the time and date from 18:30 on August 4th to 17:40 on September 8th.



Timer setting
In the heating mode, two running periods can be set.
Press " Clock Symbol " and hold for 2s to enter into the timer setting interface.
Running period 1: The symbol "ON 1" on the right side of the interface and the time parameter flash at this time. Press " Clock symbol" again and the hour parameter flashes. Set the time as before and confirm. Then "OFF 1" and the time parameter flash. Set the time following the previous steps.
Running period 2: After **Running period 1** is set, the controller will enter into the **Running period 2** setting interface. Set the start-up and shut-down time in the same way as **Running period 1**.
Press "Power Button " to cancel any modifications during the setting.
Press "Clock Symbol " and hold for 2s twice to set the "OFF 1" time directly or press " UP ARROW " " Down ARROW " when
the unit is already running.
Press "Clock symbol " cancel the setting when the hour parameter is flashing.

16. Maintenance and repair

It should keep dry, clean and well-ventilated around the unit to maintain efficiency of heat transfer and energy saving.
Check the parts of the unit and the pressure of the system regularly (once 1 year). If there is any unusual phenomena, repair and replace it immediately.
Check if the electrical wiring is not firm enough and the electrical element has any unusual action and or smell. If so, repair and replace it immediately.
Do not make power off the unit for a long period of time. We will not be responsible for any lost caused by the frost crack of parts due to the unit being power off power off.
Check if the power socket and plug make good contact, perfect earthing and thermal protections.

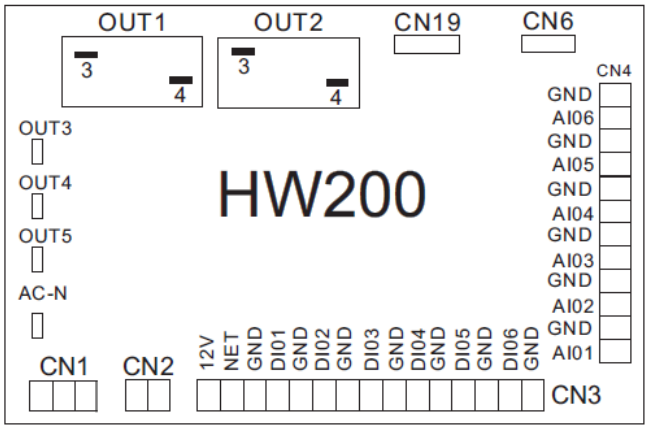
In the cold area (below 0 ℃), if you do not use the unit for a long time, please drain the

It is recommended that the set temperature can be set lower when there is enough hot water for daily life to saves energy and extend the service life of water heater.

Specification of the fuse in the controller is 5AL250V; meaning: 250V, 5A.

Note: The heat pump must be installed by qualified personnel to avoid improper installation which will lead to water leakage, electrical shock or fire.

17. PCB I/O ports



NO.	Symbol	The definition of the ports
1	OUT1	Compressor(output)(220-230VAC)
2	OUT2	Heater (output) (220-230VAC)
3	OUT3	Two way valve (output)(220-230VAC)
4	OUT4	High speed fan/Source pump (output) (220-230VAC)
5	OUT5	Low speed fan /Circulate pump/Solar pump/ Recovery pump/Cooling(output)(220-230VAC)
6	AC-N	Ground
7	NET GND 12V	Remote controller
8	DI01 GND	Remote ON/OFF
9	DI02 GND	Over heat protection
10	DI03 GND	Low pressure protection
11	DI04 GND	High pressure protection
12	DI05 GND	(SPARE)
13	DI06 DND	Flow swtich protection
14	AI01 GND	Ambient temp. sensor(input)
15	AI02 GND	Tank of bottom temp.Sensor(input)
16	AI03 GND	Tank of top temp. Sensor(input)
17	AI04 GND	Coil temp. Sensor/Anti-freeze Sensor(input)
18	AI05 GND	Suction temp. sensor(input)
19	AI06 GND	Solar temp.sensor(input)
20	CN6	Running indication/Circulate pump/Solar pump

18. Fault Finding

For any malfunctions, please refer to the table below :

Malfunction	Display	Canse	Solution
Bottom water temp. Failure	P01	The water bottom temp. Sensor is open or short circuit	Check or change the water bottom temp. Sensor
Top tank water temp. Failure	P02	The water top tank temp. sensor is open or short circuit	Check or change the water top tank temp. Sensor
Ambient temp. Failure	P04	The ambient temp. sensor is open or short circuit	Check or change the ambient temp. Sensor
Coil temp. Failure	P05	The pipe temp. sensor is open or short circuit	Check or change the pipe temp. Sensor
Refrigerant absorb temp. Failure	P07	The evaporator temp. Sensor is open or short circuit	Check or change the evaporator temp. Sensor
Anti-freeze temp. Failure	P09	The anti-freeze temp. Sensor is open or short circuit	Check or change the anti-freeze temp. Sensor
Solar temp. Failure	P034	The solar temp. Sensor is open or short circuit	Check or change the solar temp. Sensor
High pressure protection	E01	The exhaust pressure is high , high pressure switch action	Check high pressure switch and cooling return circuit
Low pressure protection	E02	The suction pressure is low, Low pressure switch action	Check low pressure switch and cooling return circuit
Water flow failure	E03	No water or litter water in water system	Check the flow volume ,water pump is failure or not
Electric-heater overheat protection	E04	Water flow volume not enough,Water system pressure difference is small	Check the flow volume,water system is jammed or not
Anti-freeze protection	E07	Water flow volume not enough,Water system pressure difference is small	Check the flow volume,water system is jammed or not
Communication failure	E08	Wired remote control with master signal failure	Check the connection line between the wired remote control and motherboard
Winter frost protection	E09	Ambient temperature is too low	

19. FAQ

1）Why does the compressor not run when I start up the unit?

Answer：When the unit is powered on after the last shut-down, the compressor will not run until 3 minutes later. This is the self-protection of the unit.

2）Why does the outlet water temperature on the display sometimes increases slowly?

Answer：Because the water temperature is different between the upper layer and bottom layer in the tank at the beginning. When the water temperature in all parts of the tank is basically the same, it will rise faster.

3）Why the outlet water temperature on the display decreases when the unit is in heating mode?

Answer：If the upper water temperature is much higher than that of the bottom water, the water temperature will decrease a little because of the convection current arising between hot water and cold water in the tank during the heating process.

4）Why does the unit not start up to heat when the outlet water temperature decreases?

Answer: The water temperature will decrease because of the heat loss if the hot water in the tank is not used for a long time. In order to avoid the continual ON/OFF, the unit does not start up until the water temperature decrease for more than 5℃ .

5）Why does the outlet water temperature sometimes decrease abruptly?

Answer: The temperatures of hot water and cold water in the tank are different. The cold water may go to the upper sensor when the hot water have been used up.

6）Why the hot water is still available when the water out temperature on the display decreases a lot?

Answer: Because the upper sensor is positioned near the top of the tank, there is still 1/5 of hot water available when the outlet water temperature on the display decreases a lot.

7）Why the compressor stops but the fan keeps running when the unit is in the heating mode?

Answer: The unit needs to defrost when the evaporator freezes because of the low ambient temperature. The compressor will stop and the fan keeps running when the unit defrosts.

8）Why is the heating time so long ?

Answer: Energy saving, low power consumption is achieved through a longer heating time. Normally, the heating time is 2~5 hours depending on the various factors such as ambient temperature , water inlet temperature and set point.

20. Caution/ Warnings.

1. The unit can only be repaired by qualified installer centre personnel or an authorised dealer.（for Europe market）
2. This appliance is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.（for Europe market）
Children should be supervised to ensure that they do not play with the appliance.
3. Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.
4. If the supply cord is damaged, it must be replaced by the manufacturer or our service agent or similarly qualified person in order to avoid a hazard.
5. Directive 2002/96/EC (WEEE):
The symbol depicting a crossed-out waste bin that is underneath the appliance indicates that this product, at the end of its useful life, must be handled separately from domestic waste, must be taken to a recycling centre for electric and electronic devices or handed back to the dealer when purchasing an equivalent appliance.
6. Directive 2002/95/EC (RoHs): This product is compliant with directive 2002/95/EC (RoHs) concerning restrictions for the use of harmful substances in electric and electronic devices.
7. The unit CANNOT be installed near flammable gas. If there is any leakage of the gas , fire can be occur.

8. Make sure that the electrical installation is complete with a circuit breaker for the unit, lack of circuit breaker can lead to electrical shock or fire.
9. The heat pump located inside the unit is equipped with an over-load protection system. It does not allow for the unit to start for at least 3 minutes from a previous stoppage.
12. USE SUPPLY WIRES SUITABLE FOR 75℃.
13. Caution: Single wall heat exchanger, not suitable for potable water connection.
14. The pressure-relief device must be connected to drain via a tundish so that any issue can be observed and rectified.

Waterford Stanley Ltd.
Unit 401-403,
IDA Industrial Estate,
Cork road,
Waterford,
Tel 051 302300
www.waterfordstanley.com