

## USER'S MANUAL

## SINCLAIR WATER HEATER

SWH-200IRA+SWH-35ERA



“Original instructions”

## **User Notice**

Thanks for purchasing the SINCLAIR air source heat pump water heater. In order to make the best use of this unit, prior to installation and operation, please read this manual carefully, pay attention to the operation and maintenance instructions provided in this manual, and keep it properly for future reference.

The air source heat pump water heater shall be installed and maintained by skilled personnel, as it is an appliance that may be damaged or cause hazards when improperly installed and maintained. Please contact the appointed local service center for installation and maintenance, and strictly observe instructions in this manual. SINCLAIR reserves the rights to interpret this manual which will be subject to any change without prior notice.

The air source heat pump water heater is thermal storage water heater. When using water, please open the cold water valve first, and then adjust the cold and hot water volumes to a proper temperature to prevent scald. When you do not use the heater for a short period in cold seasons, ensure that this unit is energized all day long. When you do not use it for a long period, ensure that its water system is drained to prevent cracking caused by cold weather. For any problem, please contact the sales representative or the service center that can provide professional services, including inspection, water drainage, water charging, and cleaning.

This air source water heater adopts DC inverter compressor, which is with Standard, Save, Rapid and other kinds of operation modes. In order to save the energy as much as possible, you are suggested to use the “Save” mode during daily operation.




This manual serves as installation and use guides for vertical coil type air source water heaters. For details about how to use the wired controller, refer to the wired controller guide delivered with the unit.


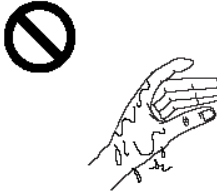



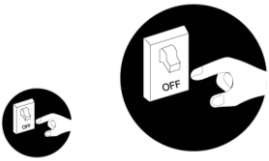





# Contents




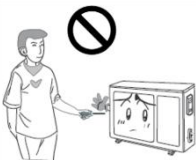




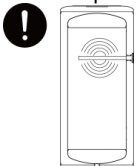
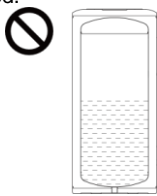
<b>1 Precautions for Use .....</b>	<b>1</b>
<b>2 Models and Technical Specifications .....</b>	<b>4</b>
<b>3 Working Principles and Advantages .....</b>	<b>7</b>
3.1 Schematic Diagram of the Air Source Water Heater .....	7
3.2 Brief Introduction to Principles .....	7
3.3 Advantages .....	8
<b>4 Installation Precautions.....</b>	<b>10</b>
4.1 Importance Notes.....	10
4.2 Basic Requirements for Installation Sites .....	10
<b>5 Main Unit Installation .....</b>	<b>11</b>
5.1 Location for Installing the Main Unit.....	11
5.2 Space Requirement for Main Unit Installation and Installation Diagram .....	11
<b>6 Installation of the Water Tank .....</b>	<b>13</b>
<b>7 Pipeline Connection.....</b>	<b>14</b>
7.1 Refrigerant Pipe Connection .....	14
7.2 Exhaust Methods .....	15
7.3 Water Pipe Connection .....	17
<b>8 Installation Diagram of the Unit.....</b>	<b>20</b>
<b>9 Wiring .....</b>	<b>21</b>
9.1 Wire Layout.....	21
9.2 Wire Connections.....	22
<b>10 Wired Controller Installation .....</b>	<b>24</b>
10.1 Requirements for Wired Controller Installation Locations .....	24
10.2 Wired Controller Installation .....	24
10.3 Rainproof Box Installation .....	26
<b>11 Commissioning .....</b>	<b>28</b>
<b>12 Methods for Replenishing or Discharging Refrigerants.....</b>	<b>30</b>
12.1 Refrigerant Replenishment.....	30
12.2 Refrigerant Discharging.....	30
<b>13 Method for Refrigerant Reclamation.....</b>	<b>31</b>
<b>14 Performance of the Unit .....</b>	<b>32</b>

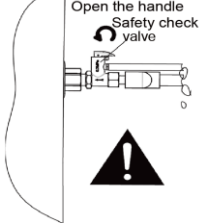
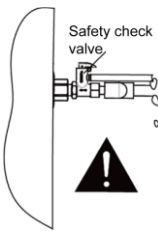
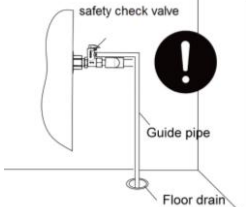
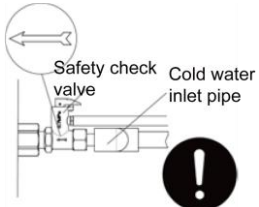
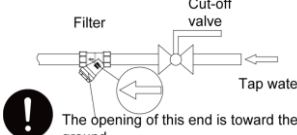
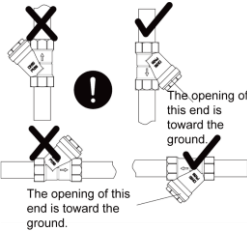



14.1 Heating Capacity.....	32
14.2 Operating Performance.....	33
<b>15 Notes on Winter Use .....</b>	<b>34</b>
<b>16 Servicing and Maintenance.....</b>	<b>35</b>
16.1 Water Replenishment for the Water Tank.....	35
16.2 Regular Cleaning for the Water Tank .....	35
16.3 Mg-Stick Replacement .....	36
16.4 Safety Check Valve Maintenance.....	37
16.5 Maintenance of the Unit .....	37
<b>17 Precautions for Safety Use .....</b>	<b>38</b>
<b>18 Troubleshooting.....</b>	<b>39</b>

# 1 Precautions for Use

 indicates the prohibited operations.  indicates instructions that must be followed.  indicates instructions to which special attentions must be paid.

Before you use this product, please read the following instructions carefully:		
Caution		
<p>★ For any exceptions such as burning smells, please cut off the power supply and then contact SINCLAIR authorized maintenance center.</p>  <p>If an exception persists, the air source water heater may be damaged, which may even cause an electric shock hazard or cause a fire.</p>	<p>★ Do not operate the water heater with wet hand.</p>  <p>Otherwise, an electric shock hazard may be caused.</p>	<p>Before installation, check whether the voltage of the local power grid accords with the voltage on nameplate of the unit, and capacity of the power supply, power cord or socket is suitable for input power of this unit.</p> 
<p>★ Dedicated lines must be used for the power supply to prevent a fire.</p>   <p>Do not use multipurpose sockets or mobile wiring boards to connect wires. Otherwise, overheating or even a fire may be caused.</p>	<p>★ Pull out the power plug and drain the main unit and water tank when water heater is not in use for a long time to prevent cracking caused by cold weather.</p> 	<p>★ Do not damage wires or use undesignated wires.</p>   <p>Otherwise, overheating or a fire may be caused.</p>
<p>★ Before cleaning, please cut off the power supply.</p>  <p>Otherwise, an electric shock hazard may be caused.</p>	<p>★ Use dedicated circuits with a leakage circuit breaker protection for the power supply and ensure sufficient capacity.</p>  <p>Otherwise, overheating, a fire, or an electric shock hazard may be caused.</p>	<p>★ Do not change the power cord or socket without any consent. Wiring tasks must be completed by qualified electricians. Ensure proper grounding for the metal part of the unit, and do not change the grounding mode.</p> 

<p>★ The unit must be securely grounded! The grounding wire must be connected to a dedicated apparatus of the building.</p>   <p>If the unit is not grounded, contact qualified personnel for installation. Do not connect the ground cable to the gas pipe, water pipe, drainage pipe, or any other places considered improper by professional personnel.</p>	<p>★ Do not put any foreign matter into the unit. Otherwise, the unit may be damaged or cause hazards. Do not put your hands into the air outlet of the main unit. Otherwise, hazards may be caused.</p> 	<p>★ Do not repair the unit by yourself.</p>  <p>Improper repair may cause an electric shock hazard or a fire. For repair services, contact the SINCLAIR appointed service center.</p>
<p>★ Do not stand on the main unit or water tank, or place any object on it.</p>  <p>Otherwise, the main unit or water tank may be deformed or damaged, or even hazards may be posed when a person or object falls off.</p>	<p>★ To save energy more efficiently, install the main unit at a well-ventilated place. Do not block the air inlet or outlet of the main unit.</p>  <p>Otherwise, energy efficiency may be reduced, and shutdown or even a fire may be caused.</p>	<p>★ Keep chemical sprays, gas tanks at least 1 meter away from the main unit.</p>  <p>Otherwise, fire hazards or explosions may be caused.</p>
<p>★ Check whether the base of the main unit is damaged.</p>  <p>If the base is damaged and not fixed, the unit may fall off, causing hazards.</p>	<p>★ To improve durability of the water tank, a Mg-Stick is installed inside the water tank. The Mg-Stick has a lifespan of two to three years, and must be replaced by professional maintenance personnel if a replacement is required.</p> 	<p>★ When the water tank has no water or not full filled, do not power on the unit. Otherwise, the unit may be damaged or a fire may be caused.</p> 

<p>★ Open the safety check valve handle on a regular (about one month) basis to check whether it is blocked. Perform sewage disposal by following the guide on a regular (about once a year) basis.</p> 	<p>★ It is normal that the safety check valve drips.</p> 	<p>★ The pressure relief opening of the safety check valve must be connected to one end of a securely fixed guide hose, and the other end is connected to the floor drain. Ensure that the guide hose is not twisted or folded.</p> 
<p>★ The installation direction of the safety check valve must be correct; that is, the direction indicated by the arrow on the safety check valve must be the same as the flow direction of cold water.</p> 	<p>★ You are advised to install the filter horizontally after the main shutoff valve of the user's water pipe. Ensure that the direction indicated by the arrow on the filter must be the same as the water flow. If impurities inside the waterway need to be cleared, open the end cap of the filter.</p> 	<p>★ When the filter is installed vertically, the direction indicated by the arrow must not be upward and the end cap must be placed slantwise downwards.</p> 
<p>★ This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it possibly to promote the sustainable reuse of material resources. To return you used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.</p> 	<p>★ This unit contains fluorinated gas with greenhouse effect covered by the Kyoto Protocol. Maintenance and disposal must be carried out by qualified persons only. Refrigerant gas R410A, GWP=2100.</p> 	<p>★ The fuse model and rated value are in accordance with the corresponding controller or the silk screen attached on the protective tube.</p> 



# 2 Models and Technical Specifications

The air source water heater consists of an outdoor unit, a water tank, wired controller, refrigerant pipes, and water pipes. It provides hot water to users for household use.

The appearance of the main parts is shown in Figure 2-1. Actually, the appearance of the product may not be exactly the same as that shown in the figure. For the actual appearance, refer to the product delivered.

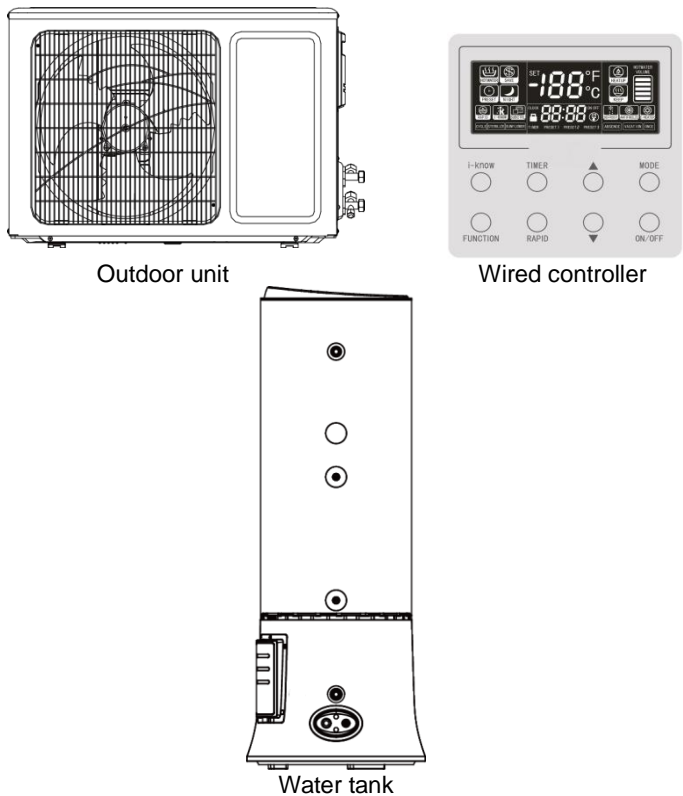


Figure 2-1 Appearance of the main parts

This installation guide provides guidance on installation of the following model.

Table 2-1 Mapping between the main unit and the water tank

Outdoor unit model	Water tank model
SWH-35ERA	SWH-200IRA

During the installation, please comply with the model mapping in the preceding table. Otherwise, a fault may occur because the main unit mismatches the exchanger capacity of the water tank.

Table 2-2 Unit Model and Specification

Model			SWH-35ERA
Rated Heating Capacity <sup>(*)</sup>		W	3500(1800~4000)
Rated Input Power <sup>(*)</sup>		W	850(360~1333)
COP <sup>(*)</sup>		W/W	4.10
Load Profile		-	L
COP <sub>DHW</sub> <sup>(**)</sup>		W/W	3.20
Energy Efficiency Class <sup>(2)</sup>		-	A <sup>+</sup>
Water Heating Energy Efficiency <sup>(2)</sup>		-	132%
Annual electricity consumption (average climate conditions)		kWh	776
Maximum Input Power		W	1500+1500W (Electric Heater)
Outlet Water Temperature		°C	Default: 55°C, 35°C~55°C
Power Supply		-	220V-240V ~50Hz
Insulation Level		-	I
Protection of Ingression		-	I PX4
Refrigerant	Name		R410A
	Charge	kg	1.40
Outline Dimensions	W x D x H	mm	842×320×591
Package Dimensions	W x D x H	mm	941×371×660
Gross/Net Weight		kg	44.5/38.5
Sound Power Level <sup>(***)</sup>		dB(A)	61
Operating Range		°C	-25~45°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 Rapid function, electric heater helps to heating water.

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

Table 2-3 Water Tank Model and Specification

Model		SWH-200IRA
Capacity	L	185
Power Supply for Electric Heater	-	220V-240V~50Hz
Input Power for Electric Heater	W	1500
Outline Dimensions(W x D x H)	mm	545 x 545 x 1919
Package Dimensions(W x D x H)	mm	2009 x 656 x 625
Water Tank Gross/Net Weight	kg	60/52
Outer Size of Connection Pipe	mm	Φ6, Φ9.52

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

Table 2-3 Performance Data of Hot water Mode

Te (℃)	Mode	inlet water T1 (℃)	outlet water T2 (℃)	capability (kW)	COP (W/W)
45	Hot water	29	55	2.90	7.80
20		15	55	3.50	4.10
7		10	55	1.80	3.80
0		10	55	1.90	2.30
-7		10	55	2.40	2.20
-15		10	55	1.90	1.80
-20		10	55	1.40	1.50

## 3 Working Principles and Advantages

### 3.1 Schematic Diagram of the Air Source Water Heater

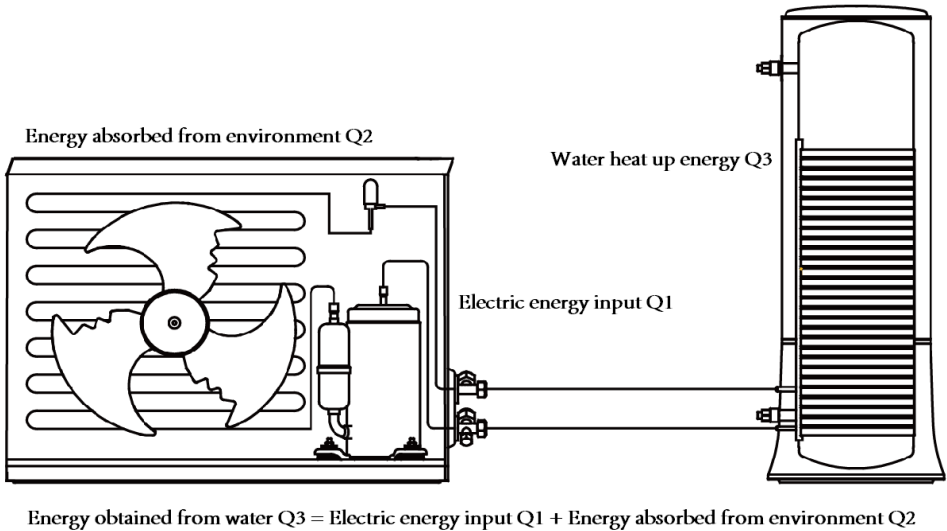


Figure 3-1 Schematic diagram of the air source water heater

### 3.2 Brief Introduction to Principles

The air source water heater unit is designed based on the heat pump principles. It consumes a part of electric energy as a supplement, and by using the thermodynamic cycle, absorbs heat from the low-grade energy (air source) environment, and transfers the heat to a condenser through a compressor, and releases it to the water inside the water tank. In this way, the water is heated up.

The working principles of an air source water heater are the same as those of a heat pump air conditioner. A heat pump air conditioner absorbs heat from the natural environment and transfers it to the indoor air; however, the air source water heater uses the absorbed heat to heat up domestic water. The air source water heater is a novel, efficient, energy-saving, and environment-friendly heater product.

## 3.3 Advantages

### ● Efficient and Energy-Saving

The outdoor unit of this product adopts an electronic expansion valve for adaptive control. It automatically adjusts its opening size based on the unit operating conditions, and uses the heat in the air to heat up domestic water, so that the unit always runs at optimal performance as well as ensuring reliability.

This unit adopts inverter 2-stage compressor and the capacity can realize stepless adjustment. EER is much higher and noise is lower under low-frequency operation; rapid heating can be realized under high-frequency operation. Heating capacity is improved by 40% above compared with common heat pump water heater.

The water tank adopts an externally wrapped microchannel heat exchanger, and is in planar contact with the inner container, which features higher efficiency in heat exchange and a high pressure-bearing capability. Effective thermally-conductive materials are used between the microchannel heat exchanger and the inner container of the water tank to enhance heat transfer.

In testing conditions of the unit, the coefficient of performance (COP) reaches up to 3.0, and the operating costs are more economical than conventional heaters.

### ● Reliability and Durability

The unit adopts heat pump water heater specialized inverter 2-stage compressor, which provides a powerful heat for the air source water heater. The unit can produce 55°C hot water reliably under -25°C ultra-low ambient temperature.

The insulated water tank adopts the advanced stainless steel inner port, equipping with the anticorrosive design for the super-long magnesium. The complete unit is with multiple kinds of protection.

### ● Simple and Convenient Installation

The installation is not subject to any environmental limitation. The unit can be installed in the kitchen, balcony, garage, storage room, or basement according to actual living conditions, and requires no special care. It applies to places such as household use and villa suites. It is a no-loop waterway system, and can be easily and conveniently installed.

### ● Luxury Configurations:

The unit is equipped with a high-end ultra-thin touch-wired controller, which provides five heating modes: Hot water, Save, Preset, Night and E-heater modes.

The unit provides a proper water temperature range from 35°C to 55°C. It provides functions such as timer switch, "Rapid" and "i-know".

- Intelligent Defrosting

The unit provides the antifreeze and automatic defrosting functions, which effectively solve the problems such as heat exchanger freezing, frosting, and sewage caused by defrosting.

- All-Weather Applicable

Supplies hot water all year round regardless of nights or rainy weather.

## 4 Installation Precautions

### 4.1 Importance Notes

(1) The air source water heater must be installed by professional personnel by abiding by the national wiring code and following the instructions in this guide.

(2) For installation or migration of the air source water heater, please contact your local service centers authorized by SINCLAIR. In the case of an air source water heater installed by any party not authorized or designated by SINCLAIR, SINCLAIR shall not undertake any responsibility for any fault or problems caused the air source water heater.

(3) If the user installs the air source water heater using self-prepared installation materials, SINCLAIR shall not undertake any responsibility for any loss caused by improper running and use of the air source water heater due to pipe leakage, fall-off, or insecure installation.

(4) The quality of water heated by the air source water heater meets the local drinking water health standards. If well water, groundwater, and seawater are used, the depletion of the Mg-Stick in the water tank may be accelerated, thereby shortening the lifespan of the unit.

(5) The water processed by the ion exchange water softener accelerates the depletion of the Mg-Stick in the water tank. Therefore, you are advised not to connect the water inlet of the air source water heater to a water softener.

### 4.2 Basic Requirements for Installation Sites

The following sites for installing the air source water heater may be prone to become faulty. If the following sites cannot be avoided, please consult your local service centers authorized by SINCLAIR to customize special models.

(1) Environments that are exposed to strong heat sources, steam, flammable gases, or volatile substances.

(2) Places where there are high-frequency facilities, such as welding machines or medical equipment.

(3) Seaside saline areas.

(4) Places where the air contains oil (such as machine oil).

(5) Places where the air contains sulfide gases (such as sulfide hot springs).

(6) Other special environments.

## 5 Main Unit Installation

### 5.1 Location for Installing the Main Unit

The main unit must be installed at a location where:

- (1) The noise and air flow generated by the air outlet do not affect neighbors, animals, and plants.
- (2) Good ventilation of the main unit can be ensured, and there are no obstructions nearby that hinders the air intake or output of the unit
- (3) The installation position is able to withstand the weight and vibration of the main unit, and the installation can be safely performed.
- (4) The place is dry and not exposed to direct sunlight or strong winds.
- (5) The installation dimension diagram of the main unit can be complied with, and it is convenient to maintain and check the unit.
- (6) The main unit is out of the reach of children.
- (7) It does not hinder public aisle or affect city appearance.

### 5.2 Space Requirement for Main Unit Installation and Installation Diagram

(1) The installation requirements of the water heater's main unit are the same as those of the outdoor unit of an air conditioner. The main unit can be installed in the exterior walls, roof, balcony, or ground. The air outlet should avoid the wind direction. The dimension diagram of the main unit structure is shown in Figure 5-1 (unit: mm).

(2) The distance between the main unit and the walls or other obstructions must not be too small, and the space for installing the main units must meet the requirements provided in Figure 5-2.

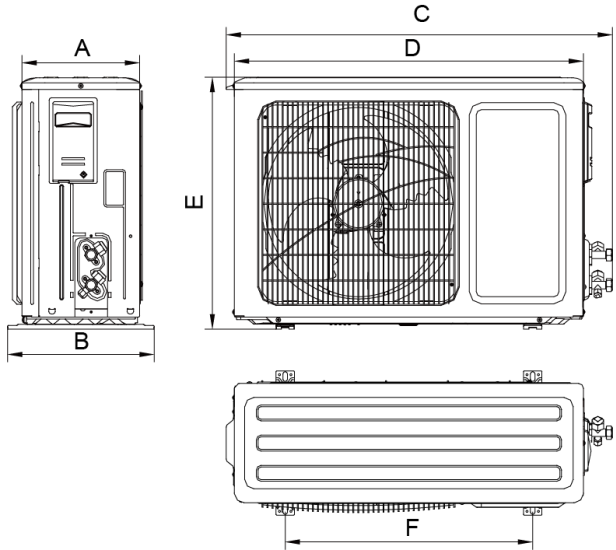
(3) If a canopy is to be installed for the water heater main unit, note that the heat dissipation and absorption should not be affected.

(4) The main unit must be installed in the host places a solid foundation, and ensure that the main unit is installed upright, and fastened with foundation bolts. If the vibration is strong, add rubber gaskets to prevent vibration.

(5) Condensate drain of the outdoor unit: buckle snap the drainage joint of



the outdoor unit into the drainage hole located in the middle of the chassis, as shown in Figure 5-3, and ensure reliable and tight fitting. Then, connect the drainage pipe to the drainage mouth, and guide the drainage pipe to a proper place for drain.



Unit: mm

Model	A	B	C	D	E	F
SWH-35ERA	260	320	842	784	591	540

Figure 5-1 Dimension diagram of the main unit structure

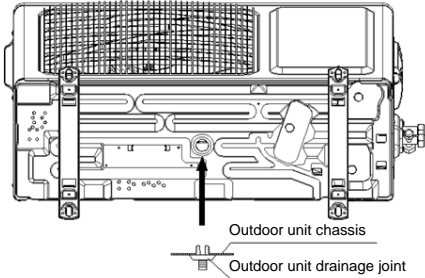
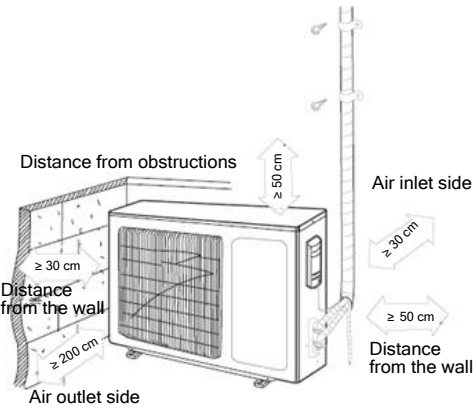


Figure 5-2 Space requirements for installation

Figure 5-3 Drainage pipe connection

## 6 Installation of the Water Tank

(1) The water tank can be installed outdoors with the main unit, for example, installed in the balcony, roof, or ground. It can also be installed inside the room. Try to install it in an environment where the temperature is higher than 0°C. The hot water outlet should not be too far away from the locations for use. Lay out the pipes in a centralized manner, and take thermal insulation measures on hot water piping to reduce heat loss.

(2) The water tank must be placed upright with all feet touching the ground. It must be installed on a solid foundation. During water tank installation, consider the weight bearing capability of the foundation. Figure 6-1 shows the installation diagram.

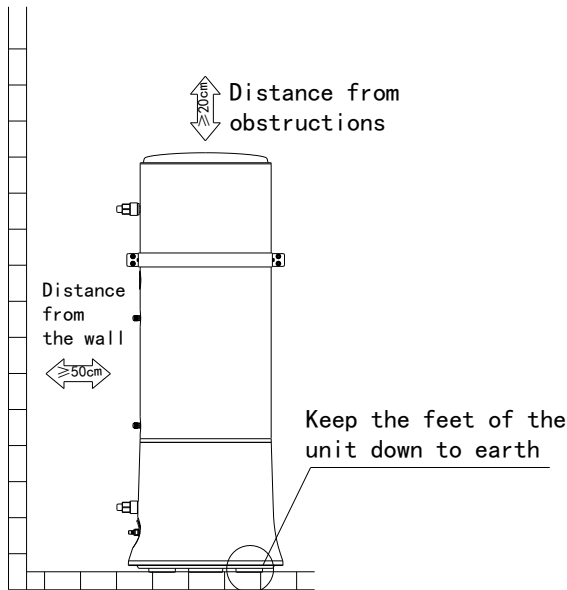


Figure 6-1 Fastening of the water tank

Note: The water tank must also be fastened to the wall using a tank mounting hoop or plate to prevent fall-off the water tank due to exceptions.

(3) There should be water pipes, hot water interfaces, and floor drains to facilitate water replenishment for the water tank, hot water supply, and drainage. And the pressure of the tap water shouldn't higher than 0.7MPa, else, a decompressor should be installed in the water inlet pipe.

# 7 Pipeline Connection

## 7.1 Refrigerant Pipe Connection

(1) If the water tank and the main unit need to be connected by punching through a wall, a hole of  $\Phi 55$  mm must be drilled in the wall and the hole should be inclined toward the exterior wall, as shown in Figure 7-1. Protective sleeves need to be put on both sides of the hole.

(2) Bind up the connecting pipes, power cable, water temperature sensing package, and communication lines (if necessary) of the wired controller with thermal insulation bands, and then lead them through the hole.

(3) Remove the refrigerant pipe joint from the water tank and the sealing nuts from the small and large valves of the outdoor unit, and add refrigerant oil on the joint and valve cones.

(4) Remove the sealing caps of the connecting pipe. Align the center of the bell mouth with the pipe joint and valve cone, and screw up the conical nut with your hand and then with a wrench, as shown in Figure 7-2.

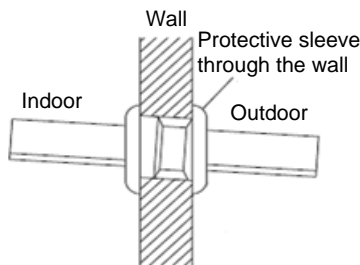


Figure 7-1 Refrigerant connecting pipe through the wall

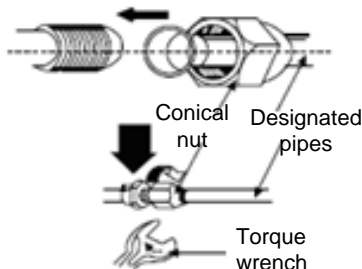


Figure 7-2 Fastening the connecting pipe



Caution: Perform pipe layout and bending carefully. Do not damage connecting pipes. Do not screw up the nut too tight to damage to the nut, its corners, or the bell mouth, or too loose to cause leakage. Table 7-1 shows the tightening torque.

Table 7-1 Recommended tightening torque

Hex nut	Φ 6	Φ 9.52
Tightening torque (N•m)	15-20	31-35

## 7.2 Exhaust Methods

Table 7-2 Exhaust methods

Length of Connection Pipe	Air Exhaust Method	Refrigerant Charge Volume
Not greater than 10 m	Use a refrigerant in the outdoor unit	/
10 to 20 m	Use a vacuum pump	+22g/m

Note: The unit capability and energy efficiency decreases when length of the connecting pipe increases. Therefore, take thermal insulation measures on the connecting pipe when it needs to be extended.

(1) Use a refrigerant in the outdoor unit:

① Remove the valve cap and the fluoride injection mouth nut from the fluid valve and the air valve.

② Use a hex key to slightly unscrew the valve plug of the fluid valve, and use a screwdriver to jack up the valve core of the air valve. Then, the air is discharging.

③ Discharge the air for about 15 seconds. When there is refrigerant gas discharged, close the valve core and tighten the fluoride injection mouth nut.

④ Fully open the valve cores of the fluid valve, and the air valve, as shown in Figure 7-3.

⑤ Tighten the valve cap, and then use a leak detector or soapy water to check whether the pipes for connecting the outdoor unit and the water tank leak.

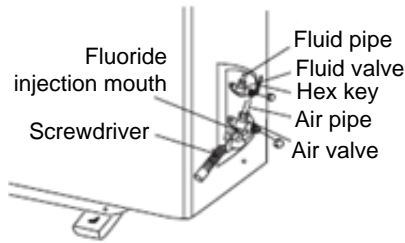


Figure 7-3 Opening the fluid valve and air valve

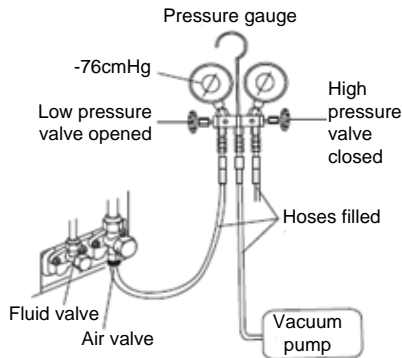


Figure 7-4 Vacuum pump connection diagram

(2) Vacuum pump:

- ① Connect the filling hose to the fluoride injection mouth of the air valve. Ensure that the valve cores of the air valve and fluid valve are tightly closed.
- ② Connect the joint of the filling hose to the vacuum pump, as shown in Figure 7-4.
- ③ Fully open the low pressure valve of the pressure gauge.
- ④ Start the vacuum pump to vacuumize the air for 20 minutes or more, and ensure that the pressure gauge pointer points to  $-1.0 \times 10^5 \text{ Pa}$  ( $-76\text{cmHg}$ ). Close the low pressure valve, and stop running the vacuum pump. Wait 2 minutes. If the number indicated by the pressure gauge pointer does not rise, the vacuumization and piping are successful. If the number indicated by the pressure gauge pointer rises, it indicates that air is entering the system. In this case, check the piping for leaks, and vacuumize the air again.

- ⑤ Remove the filling pose from the air valve.
- ⑥ Fully open valve cores of the gas valve and fluid valve.
- ⑦ Tighten the valve caps of the air valve and fluid valve, and the fluoride injection mouth nut.
- ⑧ Tighten the valve caps, and then use a leak detector or soapy water to check whether the pipes for connecting the outdoor unit and the water tank leak.

## 7.3 Water Pipe Connection

### (1) Preparing of water pipes

Hot water tank hot water pipes must be selected out of the tube, it is recommended to use a nominal outside diameter of dn20, S2.5 series PPR pipe. Such as the use of other similar insulated pipe, can refer to more than the outside diameter and wall thickness to choose, do not recommend the use of plastic pipe and other fast heat pipe.

The water tank should be permanently connected to water mains and not connected by a hose-set.

### (2) Installing water outlet and inlet pipes for the water tank

The safety check valve, filter, and cut-off valve must be installed for the water inlet pipe, and the installation order must be consistent with that shown in the unit installation diagram. At least a cut-off valve must be installed for the water outlet pipe.

In order to facilitate water tank emptying or cleaning, you are advised to add a tee joint and a cut-off valve at the water outlet of the water tank. They must be installed if the water tank is far away (the hot water pipe is longer than 20 m) from the location for water use or all locations for water use are lower than the hot water tap of the water tank.

### (3) Installing the safety check valve

Use a PPR pip to connect the safety check valve delivered with the unit to the water inlet of the water tank (note: the direction indicated by "→" should point to the water tank) by following Figure 7-5. The other end of the safety check valve is connected to the tap water for water replenishment. To ensure safe use, please strictly follow the installation order shown in Figure 7-5. A guide pipe must be installed for the safety check valve, and the connection must be securely fastened to prevent it from loosening. The guide pipe must be installed at the non-frost

environment and connected to the floor drain adown and must not be folded to prevent blocking.

If the safety check valve is damaged, you should maintain or replace the same type or the same parameter. The safety check valve's parameter should meet the following table requirement.

Table 7-3 safety check valve parameter

Name	Value of relief pressure
Safety check valve	0.7MPa

(4) Installing the outfall pipe

As shown in Figure 7-5, remove the outfall plug. Then, use an outfall pipe to connect the outfall to the floor drain, and ensure that the outfall pipe and the joint of the floor drain are lower than the bottom of the water tank. Otherwise, the water cannot be drained. In addition, the cut-off valve must be installed in the position at which the user can conveniently operate it.

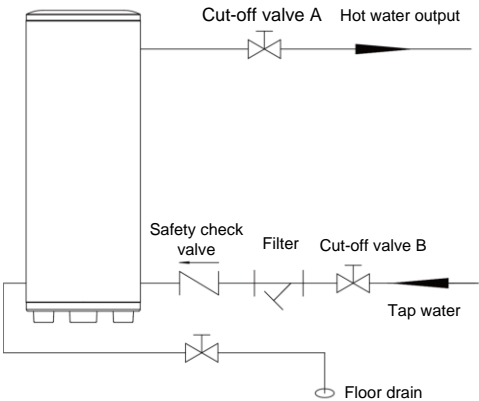


Figure 7-5 Safety check valve and outfall pipe installation



Caution:

In order to ensure water safety, both the water inlet and outlet must be connected to a PPR pipe for each to insulate electricity. The length L of the PPR pipe is calculated by the following formula:  $L \geq 70 \times R^2$ , of which L is the length of the PPR pipe (unit: cm), and R is the inner radius (unit: cm) of the PPR pipe. In addition, take thermal insulation measures, and do not directly use metal pipes.

To ensure safety and reliability, use dedicated accessories (PPR pipe joints, safety check valves, and filters) delivered with the unit, and do not use accessories from third-party vendors or replace any parts by the user. SINCLAIR shall not undertake any responsibility for personal injuries, or any loss caused by improper running and use of the air source water heater.



# 8 Installation Diagram of the Unit

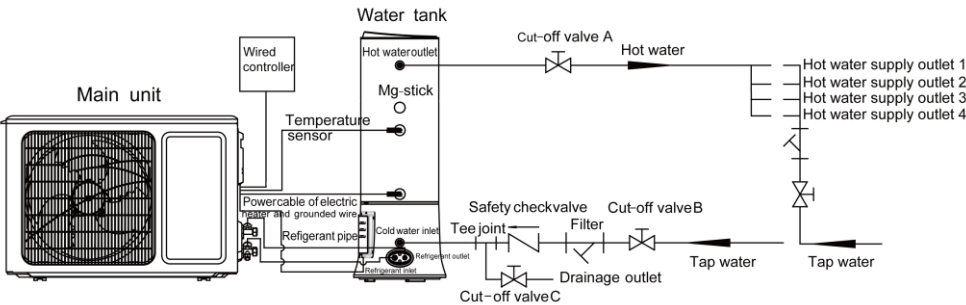


Figure 8-1 Installation diagram of the unit

Table 8-1 Dimensions and specifications

Name	Interfacing Pipe Screw Thread
Hot water outlet of the water tank	G1/2
Cold water inlet of the water tank	G1/2

## Caution

- (1) Prepare materials according to the preceding dimensions and specifications. If the cut-off valve is installed outdoors, PPR pipes are recommended to prevent freezing caused by low temperature.
- (2) Install the piping system only after the unit is fastened. Prevent dust and other foreign matters from entering the piping system during pipe connection or installation.
- (3) After all pipes required are installed, check leakage first, and then take thermal insulation measures on the waterway system. Particularly, note the following:  
  
Take thermal insulation measures on the valves and pip joints. A thickness of not less than 15 mm is recommended for the thermal insulation cotton.
- (4) The thermal insulation and pressure-bearing water tank can supply hot water only when the tap water is available.
- (5) When using hot water, ensure that cut-off valve of the cold water inlet of the water tank is open.

# 9 Wiring

## 9.1 Wire Layout

(1) This air source water heater is class I appliance. Ensure that wire layout is performed by professional personnel according to national wiring rules.

(2) Ensure that a switch for all-pole disconnection is available for the fixed lines and is directly connected to wiring terminals of the power supply. Ensure that contactor opening distance on all poles meets the disconnection requirements under overvoltage category III conditions.

(3) Ensure that reliable grounding measures are taken. A dedicated grounding apparatus should be used.

(4) Use the power supply with specifications provided in the nameplate, and use circuits dedicated for air conditioners.

(5) Copper-conductor cables must be adopted for power cables, and the operating temperature should not greater than the stipulated value. The diameter of the cables should be large enough. For details, refer to Table 9-1. If the length of the power cable is greater than 15 meters, choose a power cable with a larger cross-sectional area to prevent problems caused overloading. Do not pull the power cable during the installation.

(6) If the installation conditions on site change, consider using cables whose reduced capacity can still meet site requirements, based on the specifications of the power cables and air circuit breakers provided by the vendor.

(7) If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Table 9-1 Power configuration table

Model	Power Supply	Minimum Sectional Area (mm <sup>2</sup> ) of Power Cables			Air Circuit Breaker Capacity (A)
		Firing Line	Zero Line	Ground Line	
SWH-35ERA	220V-240V ~50Hz	1.5	1.5	1.5	16

## 9.2 Wire Connections

(1) Unscrew the screw on the connection box cover on the right side panel of the main unit to open the connection box cover. Figure 9-1 shows the external wiring.

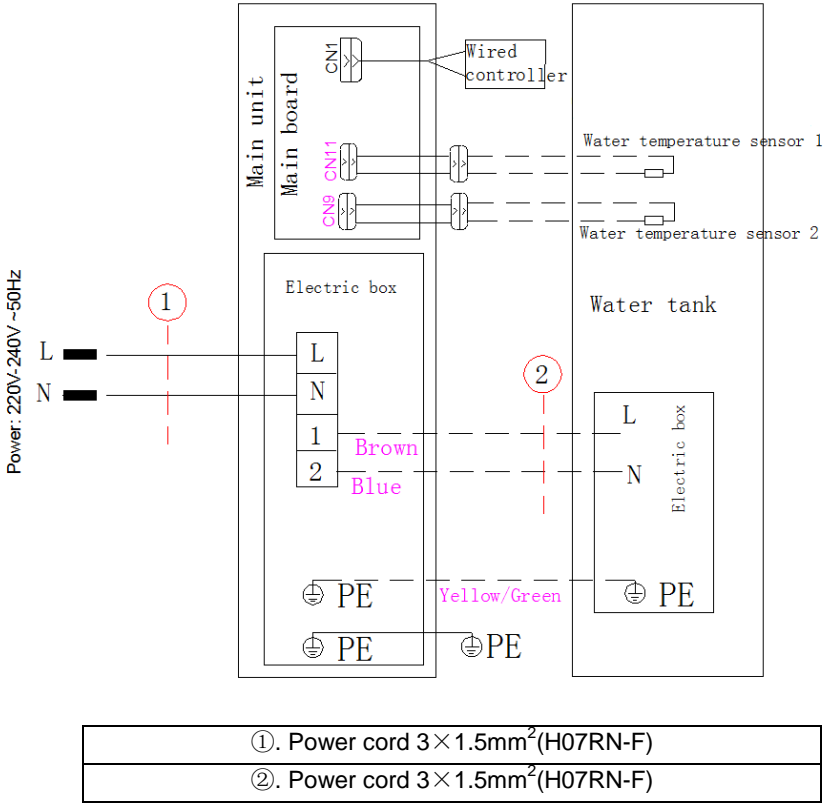


Figure 9-1 External wiring for SWH-35ERA mapping SWH-200IRA

(2) If the unit is equipped with a grounding cable, connect one end of the ground cable to the grounding screw of the water tank, and the other end to the grounding screw in the connection box on the right panel of the main unit.

(3) Select an appropriate power cable (with a leakage circuit breaker) according to the power configuration table, and connect it to the main power supply.

(4) Connect the interface of the temperature sensor delivered with the water tank to the interface coming from the connection box of the main unit

according to the identifiers ("TOP" for "TOP" and "BOTTOM" for "BOTTOM") on the line of the temperature sensor. Put the temperature sensor inside the connection box. The line of the temperature sensor must be clamped tightly. Check whether the temperature sensor is securely fastened.

(5) Use wire clips to clamp the strong wires, and install the connection box to the original place.

(6) Fasten the wired controller, and connect it to with the communications line coming from the main unit.

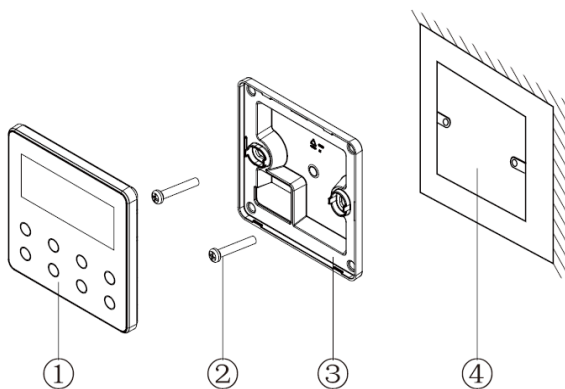
(7) The communications line of the wired controller and the line of the temperature sensor should be separated from the power cable, and the distance between them should be greater than 20 cm. Otherwise, the unit may not be able to communicate properly. Strong wires and weak wires need to be separately sheathed.

# 10 Wired Controller Installation

## 10.1 Requirements for Wired Controller Installation Locations

- (1) Do not install the wired controller in a wet place or a place exposed to direct sunlight.
- (2) Do not install the unit or wired controller of the air source water heater in a place susceptible to electromagnetic interference.
- (3) Ensure that the communication line is connected to the correct interface. Otherwise, communication will be failure.

## 10.2 Wired Controller Installation



No.	1	2	3	4
Name	Front panel of wired controller	Screw	Soleplate of controller	Socket's base box installed in the wall

Figure 8-1 Accessories of Wired Controller

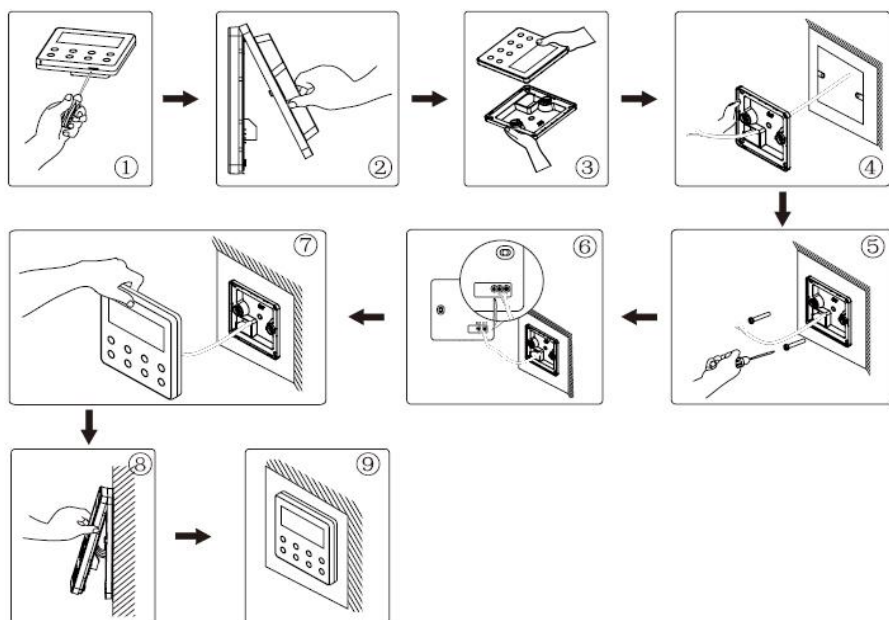


Figure 8-2 Installation Diagram of Wired Controller

Figure 8-1 is the installation diagram of wired controller. Cut off power supply of heavy-current wire embedded in mounting hole in the wall before installation. The installation method is as below:

Pry the removal port with straight screwdriver to separate the front panel and soleplate of wired controller;

Pull out the communication cable(4-core twisted pair wire) in the base box and then make the communication cable go through the hole of soleplate of wired controller;

Joint the controller's soleplate and base box with screws M4×25;

Insert the communication cable(4-core twisted pair wire) into controller's slot;

Buckle the front panel and soleplate of controller together.



Caution

During the following connections, pay special attentions to prevent malfunction due to electromagnetic interference:

(1) The communications line of the wired controller and the line of the temperature sensor should be separated from the power cable, and the distance

between them should be greater than 20 cm. Otherwise, the unit may not be able to communicate properly.

(2) If the unit is installed in a place susceptible to electromagnetic interference, the communications line of the wired controller and the line of the temperature sensor must be used. Shielded twisted pair.

## 10.3 Rainproof Box Installation

If the wired controller is to be installed in outdoors or dank places, please install a rainproof box for wired controller. Pay attention to cut off the power supply of heavy current wire embedded in the installation hole of wall. The whole installation procedure shall be done without electricity. The installation method is as follows:

Separate the panel of wired control and bottom plate with a flat screwdriver;

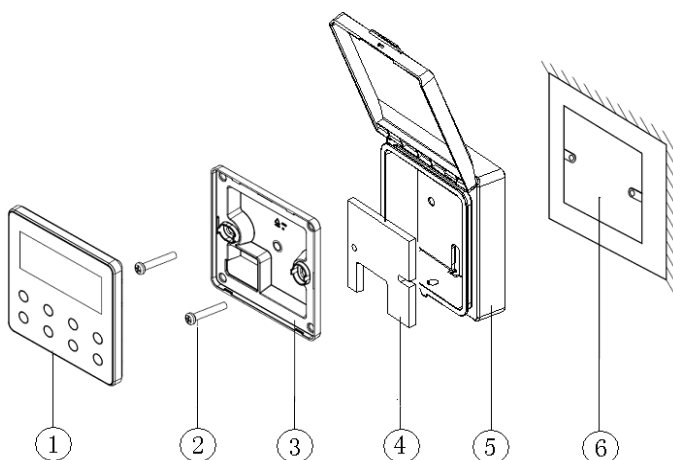
Pull out the communication wire(4-core twisted pair wire) inside the installation box and make this wire go through the wire-crossing hole of rainproof box and wired controller bottom plate.

Secure the bottom plate of wired controller, rubber cushion, rainproof box at the installation box with screws; if there is no installation box in the wall, please drill hole on the wall and install plastic expansion pipe. Secure the bottom plate of wired controller, rubber cushion and rainproof box at the plastic expansion pipe with tapping screws(plastic expansion pipe and tapping screw are provided by our company);

Insert the communication cable(4-core twisted pair wire) into the groove of wired controller;

Align the panel of wired controller with the bottom plate and then fasten them together.

Note: When disassembling the wired controller, please use the flat screwdriver carefully(As shown in Figure 8-4).



No.	Name	No.	Name
1	Panel of wired controller	4	Rubber cushion(rainproof box)
2	Screw	5	Rainproof box
3	Bottom plate of wired controller	6	Installation box inside the wall

Figure 8-3 Rainproof Box Accessories of Wired Controller

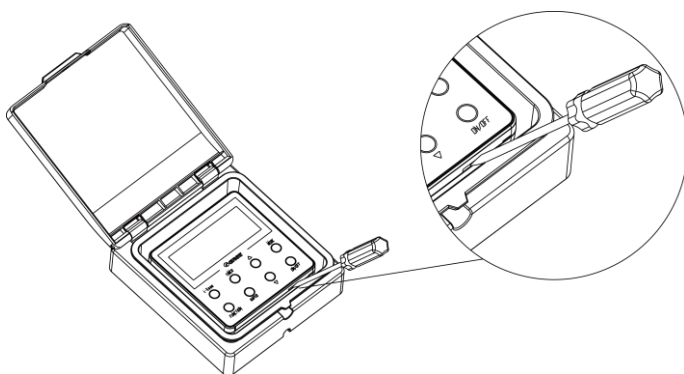


Figure 8-4 Disassembly Diagram of Rainproof Box of Wired Controller



# 11 Commissioning

After the main unit, water tank, wired controller, waterway system, fluorine circulation system, and electrical wiring are installed, check the unit based on the following checklist.

Table 11-1 Checklist for the installation

Check Item	Possible Symptoms Caused by Improper Installation
Are the main unit and water tank securely fastened?	The main unit and the water tank may fall, or vibration or noise may be caused.
Are there any obstructions to the air outlet and inlet of the main unit?	The unit does not work properly.
Is the connection pipe of the water tank properly insulated?	Potential hazards may exist.
Are thermal insulation measures taken on the waterway pipes?	The performance of the unit may be affected or the pipes may be frozen and damaged.
Is the power voltage consistent with the voltage indicated in the nameplate?	The unit may become faulty or the parts may be burnt.
Does the wire model comply with specifications?	The unit may become faulty or the parts may be burnt.
Is a safety check valve installed for the water inlet pipe?	If the water tank bears high pressure, safety hazards exist. The water may be returned if water supply stops.
Is the tap water replenishment pressure too high?	If the water tank bears high pressure, the safety check valve discharges water and abnormal noise is caused.
Is a pressure reduction valve installed for the water inlet pipe when the water replenishment pressure is too high?	If the water tank bears high pressure, the safety check valve discharges water and abnormal noise is caused.
Is the ground wire of the water tank reliable?	Potential hazards may exist.

Is the temperature sensor securely connected?	Performance of the water tank is affected.
Is the temperature sensor inserted to the bottom of the water tank?	The water temperature displayed in the wired controller is different from the actual temperature. The unit is protected from high pressure.

Perform the following commissioning steps only after all the preceding check items are passed:

(1) **Water replenishment:** Follow the instructions in section 16.1 or the installation notes on the water tank to replenish water for the tank water tank, and check whether the pipes or joints for leaks. For initial installation, this step must be performed by installation and commissioning personnel. If a drain operation is performed before use of the unit, replenish water before starting the unit.

(2) **Power-on of the unit:** After the unit is powered on, "beep" can be heard from the wired controller buzzer. Observe whether the wired controller is displayed properly. If there is no fault code, the unit is normal. The wired controller has a power memory function. However, if the wired controller is power on for the first time, it may indicate power-on, power-off, or standby. **Note that the unit can be powered on only after the water tank full filled with water, and do not power on the unit before the water replenishment.**

(3) **Wired controller parameter settings:** provide settings such as enabling the water return function and correcting the system time.

(4) **System operating:** After the water tank is full filled with water, check the waterway system to ensure that the tap or sprayer is closed and cut-off valves of the inlet and outlet pipes of the water tank are open before starting the unit. When the heating icon is displayed on the wired controller, check whether the unit runs properly. The unit runs properly if the following criteria are met: The fan runs properly; the unit runs smoothly without shaking or abnormal sound. Hand over the unit to the user after the unit runs properly at least for 20 minutes.

# 12 Methods for Replenishing or Discharging Refrigerants

## 12.1 Refrigerant Replenishment

Refrigerants can be replenished for the source water heater only in specific mode.

First, connect the hose in the middle of the pressure gauge to the refrigerant bottle, and connect (but do not tighten) one end of the blue hose of the low pressure gauge to the fluoride injection mouth of the air valve on the unit. Then, open the valve of the refrigerant bottle. Open the valve next to the low pressure gauge for 5 seconds and close it, and immediately tighten the hose interface on the fluoride injection mouth.

In normal hot water mode, press and hold MODE+▲ for 5 seconds to enter the query status. When the temperature display area displays 00, press and hold MODE+▲ for 5 seconds. Then, 00 changes to P0. Press the ▲ or ▼ button to switch to the P3. Then, press the MODE button for settings. Press the ▲ or ▼ button again to change 00 in the time display area to 01. Press MODE to confirm and complete the settings. After the settings are complete, when the low pressure gauge pointer declines, you can loosen the valve next to the low pressure gauge for refrigerant replenishment (Figure 12-1 shows the diagram for refrigerant replenishment).

## 12.2 Refrigerant Discharging

Open the air valve using a hex key to discharge the refrigerant (Figure 12-2 shows the refrigerant discharging diagram).



Caution

This operation can be performed only by professional personnel to avoid hazards. Inject refrigerants based on the nominal amount indicated on the nameplate when charging refrigerants.

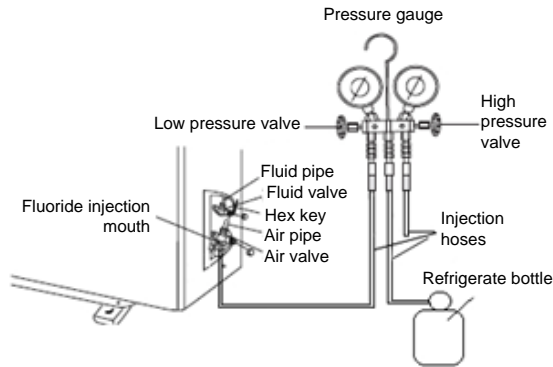


Figure 12-1 Refrigerant replenishment diagram

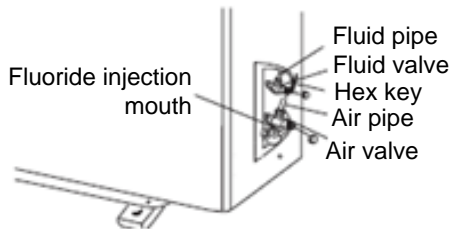


Figure 12-2 Refrigerant discharging diagram

## 13 Method for Refrigerant Reclamation

Refrigerants can be reclaimed for the source water heater only in specific mode.

In normal hot water mode, press and hold **MODE+▲** for 5 seconds to enter the query status. When the temperature display area displays 00, press and hold **MODE+▲** for 5 seconds. Then, 00 changes to P0. Press the **▲** or **▼** button to switch to the P3. Then, press the **MODE** button for settings. Press the **▲** or **▼** button again to change 00 in the time display area to 01. Press **MODE** to enter the defrosting mode, and complete the settings for refrigerant reclamation settings. After the settings are complete, first close the fluid valve (smaller valve), and when there is cold air blowing out from the outlet, immediately close the air valve (larger valve). After it is closed, immediately shut down the unit



Caution

Refrigerant reclamation must be promptly completed, so as not to cause any

damage to the unit. If refrigerant reclamation is required, please contact the professional personnel to perform refrigerant reclamation.

## 14 Performance of the Unit

### 14.1 Heating Capacity

During heating, the unit will absorb the heat from outdoor air constantly and then release the heat to water for heating the water inside the water tank. Once the outdoor temperature is decreased, the heating capacity will also be decreased. Figure 14-1 and Figure 14-2 are the correction diagram of water generation capacity under different mode and the COP curve diagram with the change of ambient temperature (only for reference).

The unit's water generation capacity will increase with the increased of ambient temperature. Under the same ambient temperature, the maximum water generation capacity is under Rapid mode, and then the Hot water mode. The heating time under SE mode is longer. Under the normal circumstances, the required time for heating 200L water is 1-3 hours in summer, 2-5 hours in spring. The required time in winter is longer. Under Save mode, the time for heating 200L water will not longer than 7.5h (under -25 ambient temperature).

After pressing “Rapid” button on the wired controller, the heating speed will be increased, and then power consumption will also be increased. If selecting Save mode, the heating speed will be decreased, and the power consumption will also be decreased. The defaulted mode after ex-factory is Hot water mode.

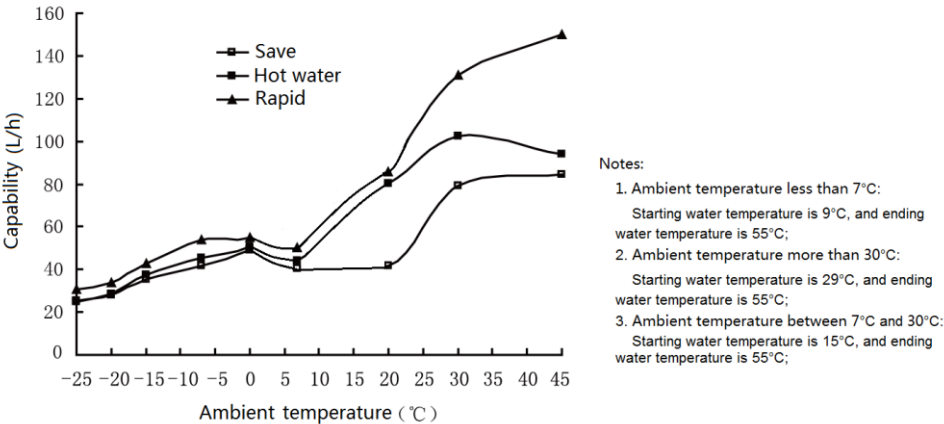


Figure 14-1 Correction diagram of capacity

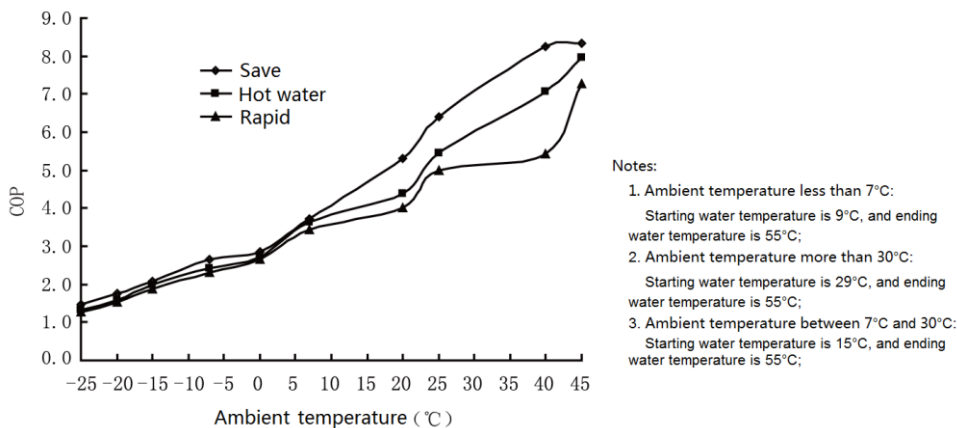


Figure 14-2 Correction diagram of COP

## 14.2 Operating Performance

### (1) Defrosting

- ① If frosting appears during water heating, the unit automatically enables the defrosting function to improve the heating effect.
- ② When defrosting runs, the unit stops running the fan;
- ③ If defrosting runs in high ambient temperatures (>10°C), the unit is running improperly. In this case, please report for repairing.

### (2) Starting the unit after long-time shutdown

If the unit is not used for a long time, turbid fluid may come out from the tap when the unit is started again (or started for the first time). This is a normal phenomenon. Wait a moment, the turbid fluid will disappear.

### (3) Power outage

- ① If an outage occurs when the unit is running, all tasks are stopped.
- ② The wired controller has a power memory function.
- ③ If a malfunction occurs due to lightning or car radio, manually cut off the power switch, and then power on the unit again.

### (4) Power memory function

Every time before the power of the water heater or wired controller is cut off, the wired controller automatically memorize the power switch status of the unit. After

the power is restored, the wired controller sends power-on/power-off signals to the water heater according to the status memorized before the power is cut off. This ensures that the unit can run according to the original status after the power is restored.

## 15 Notes on Winter Use

(1) Temperatures in winter are low. If the unit is not used for a long time, before starting the unit, connect it with electricity for at least 8 hours.

(2) Outdoor temperatures in Winter are relatively low, do not disconnect the unit from electricity if it needs to be shut down for a short time. Otherwise, the automatic freeze-proof protection function will fail. At low ambient temperatures, the automatic freeze-proof protection function enables the unit to heat the water before water temperature approaches the freezing point. When the water temperature rises to a safe temperature, the function is disabled. However, this function does not apply to the water inlet and outlet pipes of the water tank. If the water tank is inevitably installed outdoors, reduce the outdoor part of pipes including the refrigerant connecting pip and water inlet and outlet pips of the water tank. Otherwise, the heat loss is large, power consumption increases, and the water system is vulnerable to freezing. In addition, pay attention to thermal insulation of special positions such as valve joints and pipe bends. Otherwise, these positions are vulnerable to freezing.

(3) If the unit is not used for a long time, drain the water in the water tank and the pipes by following drain operations. Otherwise, the water system may be frozen and damaged. Use the unit after the water is drained and then the water tank is full filled with water.

**Tips:** If it is inconvenient or dangerous to perform the preceding operations, directly contact your local dealer or authorized service center of SINCLAIR, and SINCLAIR will dispatch professional personnel to provide inspection, drainage, water replenishment, commissioning, cleaning, and maintenance services.

# 16 Servicing and Maintenance

## 16.1 Water Replenishment for the Water Tank

### (1) Water replenishment procedure

- ① Cut off the power supply of the unit, and open the cut-off valve of the hot water outlet pipe and the valve at the location for water use.
- ② Open the cut-off valve of the tap water inlet pipe.
- ③ When the water comes out from the location for water use, close the valve at the location for water use.
- ④ Complete water replenishment, and switch on the power supply.

### (2) Water tank drainage procedure

- ① Cut off the power supply of the unit, and close the cut-off valve of the tap water inlet pipe;
- ② Open the cut-off valve of the hot water outlet pipe and the valve at the location for water use.
- ③ Open the cut-off valve of the outfall;
- ④ After the water tank is drained, close the cut-off valve of the outfall. The drainage operations are complete.

## 16.2 Regular Cleaning for the Water Tank

To ensure the quality of hot water you use, follow the following steps to regularly clean the water tank:

- (1) Cut off the power supply of the unit.
- (2) Close the cut-off valve on the water inlet pipe of the water tank.
- (3) Open the cut-off valve of the hot water outlet pipe and the valve at the location for water use.
- (4) Open the cut-off valve of the outfall until the water tank is drained.
- (5) Open the cut-off valve on the water inlet pipe of the water tank to clean the water tank. Close the cut-off valve of the outfall until the water discharged from the outfall becomes clean.
- (6) Replenishment water for the water tank by following the water replenishment operations.



〈7〉 After the water tank is cleaned, switch on the power supply.

Note: Under normal conditions, the water tank can be cleaned once a year. If the water quality is poor, you need to shorten cleaning frequency.

## 16.3 Mg-Stick Replacement

To improve durability of the water tank, a Mg-Stick is installed inside the water tank. Generally, the Mg-Stick has a lifespan of two to three years. However, if the quality of water used by the water heater is poor, the Mg-Stick lifespan will be shortened. For Mg-Stick replacement, perform the following steps:

(1) Before removing the Mg-Stick, drain the water tank by following drainage operations.

(2) Open the cap on the mounting mouth for the Mg-Stick in the water tank.

(3) Use a hex key to unscrew the Mg-Stick component, and then steadily removed the magnesium to prevent it from falling into the inner container of the water tank;

(4) Install a new Mg-Stick component into the mounting mouth of the Mg-Stick, and then tighten it using a hex key.

(5) Close the cap, and replenish water by following water replenishment operations.

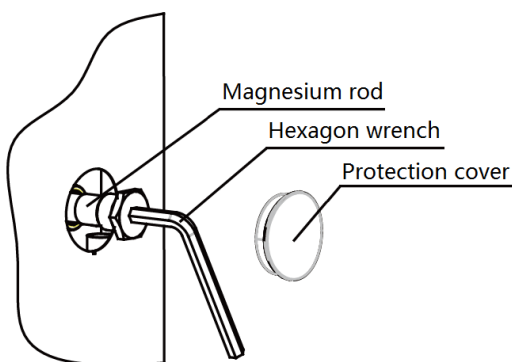


Figure 16-1 Mg-Stick replacement



Caution

The Mg-Stick must be replaced by professional maintenance personnel. Directly contact your local dealer or authorized service center of SINCLAIR, and SINCLAIR will dispatch professional personnel to provide services.

## 16.4 Safety Check Valve Maintenance

In the heating process, when the inner container of water tank is in overpressure, a small amount of water may be discharged through the safety check valve, which is a normal phenomenon. However, if a large amount of water is discharged through the safety check valve or even pipe vibration occurs and abnormal noise is caused, contact SINCLAIR authorized maintenance centers. The possible causes of this problem are as follows: The safety check valve is damaged; the water replenishment pressure is higher than the maximum working pressure (0.7MPa) of the water tank, which occurs generally when pressure reduction is not performed on the tap water. In normal conditions, the tap water pressure is around 0.3 MPa. If a booster pump is used to replenish water, the water replenishment pressure may exceed 0.7 MPa. In this case, a pressure reduction valve needs to be added to the tap water replenishment pipe to reduce water replenishment pressure.

Open the safety check valve's handle to check whether it is blocked on a regular (about once a month) basis. If it is blocked, contact the authorized maintenance center for check or replacement. Perform sewage disposal by following the guide on a regular (about once a year) basis.

## 16.5 Maintenance of the Unit

(1) Regularly check whether the air inlet and outlet of the main unit are blocked. If blocked, immediately clean them.

(2) Regularly check whether piping between the main unit and the water tank, piping on the water use side, pipe fittings, and valves are damaged or blocked. Check whether any joint leaks, and whether the filter is blocked.

# 17 Precautions for Safety Use

(1) For comfort usage, it's suggested to use shower head with flow rate of 6 ~7L / min.

(2) User should have regular check and maintenance for heat pump water heater, if there is abnormal condition, please immediately contact SINCLAIR after-sales service for help so as to guarantee normal, safe and reliable unit operation.

(3) Regular check and replace the magnesium bar is necessary. Customer can contact SINCLAIR serviceman for replacement. Recommended replace period is 2~ 3 years.

(4) Cut off the power supply prior to any maintenance or services. A non-professional personnel is not allowed to adjust or service the heat pump water heater.

(5) Improper operation might cause scald due to hot water. Water heating without enough water might produce high-temperature steam or hot water, which might cause serious scald. Hence, guarantee the water tank is filled with water.

(6) The water heater is equipped with safe relief valve for reliable operation, please do not change its location and never block its outlet. The pipe should be directly connected to floor drain.

(7) Never drink the water inside the water tank.

(8) Children bath should be supervised by adults.

(9) This appliance can be 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.

(10) In order to prevent danger caused by water tank electric heater failure, a thermostat is equipped in the electric heater circuit; once the water temperature reaches 75 °C, the thermostat will cut off the power supply for the electric heater. In spite of this protection, when there is electric heater anomaly, please contact SINCLAIR professional service people for maintenance or replace.

(11) The inlet water pressure range for water tank is 0.02MPa~0.7MPa, it is necessary to confirm the pressure range before installation.



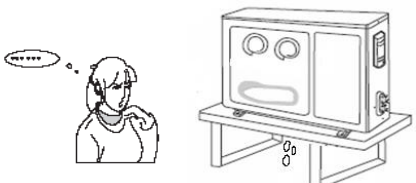
# 18 Troubleshooting



## Warning

Do not personally repair the air source water heater. Non-professional maintenance may cause electric shock hazards or a fire. If maintenance is required, please contact SINCLAIR authorized service center to dispatch professional personnel. Before contact SINCLAIR authorized service center, check the following items, which may save your time and expenses.

Table 18-1

Symptom	Fault Diagnosis
<p>The unit does not run when it is started immediately after shutdown.</p> 	<p>To protect the unit, the microcomputer controls it to run 5 minutes after it is shut down and then immediately started.</p>
<p>The bicker sound can be heard during operating.</p> 	<p>When the unit is running, the "wow" or "hiss" sound can be heard sometimes, which is the sound of flowing refrigerants. It does not indicate a fault.</p>
<p>The main unit discharges condensate water.</p> 	<p>This is a result of normal operating of the unit and does not indicate a fault. You can use the drainage pipe to guide the water to a proper place, as shown in Figure 5-3.</p>
<p>The safety check valve is discharging water.</p>	<p>In the water heating process, when the inner container of the water tank bears overpressure, it may discharge a small amount of water through the safety check valve, which is a normal</p>

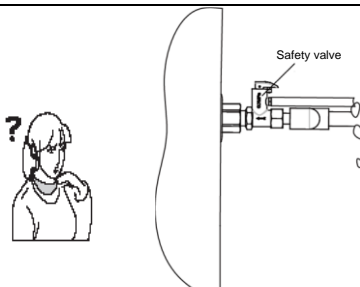
	<p>phenomenon. However, if a large amount of water is discharged through the safety check valve or even pipe vibration occurs and abnormal noise is caused, contact SINCLAIR authorized maintenance centers.</p>
--	--

Table 18-2

Symptom	Fault Diagnosis
Freeze-proof is displayed on the wired controller.	The unit can automatically enable freeze-proof protection in winter, which is a normal phenomenon.
The sprayer sprays hot water for a short time.	If the sprayer sprays water too fast due to the model, this symptom is a normal phenomenon. You are advised to use a sprayer with a speed of 6 to 7 L/min.
The wired controller alternately displays L6 and the water temperature.	The ambient temperature is too low, it is beyond the running range of the main unit, or the temperature is set too high and exceeds the maximum temperature of the heat pump.
In the water heating process, the unit is slightly frosted.	If the unit runs too long for hot water, it may be frosted, which is a normal phenomenon. To improve heating effects, the unit will automatically defrost.
When defrosting runs, the electric motor of the fan in the unit stops.	The fan does not work during defrosting, which is a normal phenomenon.
If the unit is not used for a long time, turbid fluid may come out from the tap when the unit is started again (or started for the first time).	This is a normal phenomenon. Wait a moment, the turbid fluid will disappear.

Table 18-3



**Please contact the SINCLAIR appointed service center in case of any of following conditions.**

Malfunction phenomenon	Malfunction analysis
The water heater can't turn on and the wired controller displays EC	The unit hasn't been deciphered. Please change to use the wired controller with password input function to decipher the unit.
The water heater stops operation and the wired controller displays E1	High pressure protection
The water heater stops operation and the wired controller displays E3	Refrigerant-lacking protection
The water heater stops operation and the wired controller displays C5	Malfunction of jumper cap
The water heater stops operation and the wired controller displays E4	Discharge protection
The water heater stops operation and the wired controller displays E5	Overload protection of compressor
The water heater stops operation and the wired controller displays E6	Communication malfunction
The water heater stops operation and the wired controller displays F3	Malfunction of outdoor ambient temperature sensor
The water heater stops operation and the wired controller displays F4	Malfunction of discharge temperature sensor
The water heater stops operation and the wired controller displays F6	Malfunction of tube temperature sensor for outdoor heat exchanger
The water heater stops operation and the wired controller displays Fd	Malfunction of suction temperature sensor
The water heater stops operation and the wired controller displays FE	Malfunction of upper temperature sensor of water tank
The water heater stops operation and the wired controller displays FL	Malfunction of lower temperature sensor of water tank
The water heater stops operation and the wired controller displays L6	Unit's capacity is insufficient
The water heater stops operation and the wired controller displays PL	Low voltage protection for drive DC bus bar of inverter compressor or voltage dropping malfunction
The water heater stops operation and the wired controller displays PH	High voltage protection for drive DC bus bar of inverter compressor
The water heater stops operation and the wired controller displays PA	Drive DC current protection of inverter compressor (input side)
The water heater stops operation and the wired controller displays H5	Drive IPM module protection of inverter compressor
The water heater stops operation and the wired controller displays HC	Drive PFC protection of inverter compressor
The water heater stops operation and the wired controller displays Lc	Failure startup of inverter compressor

The water heater stops operation and the wired controller displays Ld	Phase-lacking protection of inverter compressor
The water heater stops operation and the wired controller displays P0	Drive module reset of inverter compressor
The water heater stops operation and the wired controller displays P5	Overcurrent protection of inverter compressor
The water heater stops operation and the wired controller displays LF	Power protection of inverter compressor
The water heater stops operation and the wired controller displays Pc	Detection circuit malfunction of driven circuit of inverter compressor
The water heater stops operation and the wired controller displays H7	Desynchronizing protection of inverter compressor
The water heater stops operation and the wired controller displays P6	Drive communication malfunction between main control and inverter compressor
The water heater stops operation and the wired controller displays P8	High temperature protection of drive module of inverter compressor
The water heater stops operation and the wired controller displays P7	Malfunction of temperature sensor of drive module of inverter compressor
The water heater stops operation and the wired controller displays ee	Malfunction of drive storage chip of inverter compressor
The water heater stops operation and the wired controller displays PU	Malfunction of drive charging loop of inverter compressor
The water heater stops operation and the wired controller displays PP	Abnormal protection of drive DC input voltage of inverter compressor
The water heater stops operation and the wired controller displays PF	Malfunction of temperature sensor of drive electric box of inverter compressor
The water heater stops operation and the wired controller displays P9	Zero-crossing protection of drive AC input of inverter compressor
The water heater stops operation and the wired controller displays AL	Low voltage protection of drive DC bus bar of inverter outdoor unit or voltage dropping malfunction
The water heater stops operation and the wired controller displays AH	High voltage protection of drive DC bus bar of inverter outdoor unit
The water heater stops operation and the wired controller displays AA	AC current protection of inverter outdoor fan (input side)
The water heater stops operation and the wired controller displays A1	Drive IPM module protection of inverter outdoor fan
The water heater stops operation and the wired controller displays AF	Drive PFC protection of inverter outdoor fan
The water heater stops operation and the wired controller displays AC	Failure startup of inverter outdoor fan
The water heater stops operation and the wired controller displays Ad	Phase-lacking protection of inverter outdoor fan
The water heater stops operation and the wired controller displays A0	Drive module reset of inverter outdoor fan
The water heater stops operation and the wired controller displays A0	Overcurrent protection of inverter outdoor fan

The water heater stops operation and the wired controller displays UP	Power protection of inverter fan
The water heater stops operation and the wired controller displays AE	Detection circuit malfunction of driven current of inverter outdoor fan
The water heater stops operation and the wired controller displays AJ	Desynchronizing protection of inverter outdoor fan
The water heater stops operation and the wired controller displays A6	Driven communication malfunction between main control and inverter outdoor fan
The water heater stops operation and the wired controller displays A8	High temperature protection of driven module of inverter outdoor fan
The water heater stops operation and the wired controller displays A9	Malfunction of temperature sensor of driven module of inverter outdoor fan
The water heater stops operation and the wired controller displays An	Malfunction of drive storage chip of inverter outdoor fan
The water heater stops operation and the wired controller displays AU	Drive charting loop malfunction of inverter outdoor fan
The water heater stops operation and the wired controller displays AP	Abnormal protection of driven AC input of inverter outdoor fan
The water heater stops operation and the wired controller displays Ar	Malfunction of temperature sensor of drive electric box of inverter fan
The water heater stops operation and the wired controller displays U9	Zero-crossing protection of drive AC input of inverter fan
The water heater stops operation and the wired controller displays EE	Malfunction of storage chip of main control
There's harsh sound during operation; There's off-flavor during operation; Air switch or leakage protection switch breaks off frequently.	There may be risk for the safety. Please stop operation immediately and cut off the power.
<b>After-sales service</b>	
If there's quality or other problems for the SINCLAIR products, please contact with SINCLAIR local appointed maintenance center.	





# NOTE CONCERNING PROTECTION OF ENVIRONMENT

---



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

## INFORMATION CONCERNING USED REFRIGERANT MEDIUM

---

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

Type of refrigerant: R410A

The composition of the cooling medium R410A: (50% HFC-32, 50% HFC-125)

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

The value GWP: 2088 (1 kg R410A = 2,088 t CO<sub>2</sub> eq)

GWP = Global Warming Potential

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

**Emergency number: 112**

## PRODUCER

---

SINCLAIR CORPORATION Ltd.

1-4 Argyll St.

London W1F 7LD

Great Britain

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

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

## REPRESENTATIVE

---

SINCLAIR EUROPE spol. s r.o.

Purkynova 45

612 00 Brno

Czech Republic

## TECHNICAL SUPPORT

---

NEPA spol. s r.o.

Purkynova 45

612 00 Brno

Czech Republic

Tel.: +420 541 590 140

Fax: +420 541 590 124

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

[info@sinclair-solutions.com](mailto:info@sinclair-solutions.com)

