

Instruction Manual

Integrated Heat Pump Water Heater

V Series R134a

The water heater must shall be installed, maintained and repaired strictly in accordance with the appropriate and relevant requirements of SANS 10254.

- Please read the manual carefully before installation and maintenance.
- Please keep this manual well for future use.

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Part I: General Information

1.1 Function description

Air source heat pump water heater is used to heat water for domestic hot water or commercial hot water, etc.

1.2 Important Information

For your own security, and to ensure proper operation of the unit, this heat pump unit must be installed and repaired by qualified technician.

A leakage protection switch must be installed near the heat pump in an accessible place.

Do not use any damaged wires and switches, If found (to be damaged), replace it immediately.

Do not open the electrical box without shutting off all power sources to the heat pump.

When transporting the heat pump, ensure that it keeps upwards and not tilted more than 45° in any direction.

Before performing any maintenance on the unit you must turn it off first and shut off the power to the unit.

Do not install the unit in places where there are any inflammable or explosive materials.

Do not restrict or block the air intake or outlet of the unit.

When the unit is not used for a long time, please switch it off and disconnect the power supply. Drain the unit when ambient temperature is lower than 0°C

When power failure occurs and lasts for more than 5 hours with the ambient temperature lower than 2°C, please drain the unit to prevent the formulation of ice in it.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Respect safety distance between the unit and other equipment or structures. Guarantee adequate space for access to the unit for maintenance and/or service operations.

Power supply: the cross section of the electrical cables must be adequate for the power of the unit, the power supply voltage must correspond with the value indicated on the respective units. All units must be

earthed in conformity with legislation in force in the country concerned.

1.3 About heat pump

Heat Pump unit is a new technology and is regarded as the latest generation among the various water heating/cooling methods. It surpasses coal, electrical, gas and solar water heating, offering a better solution for energy saving and environmental protection.

With the advantage of high energy efficiency ratio and pollution-free, heat pump is widely used all over the world. Compared to electrical heating, consuming the same quantity of electricity, heat pump water heater makes as 3~5 times of hot water as the former does.

1.4 Features of integrated heat pump water heater

1) More Safety

Water and electricity are completely isolated, No electric shock problem, more secure than traditional electrical water heaters.

No fuel tubes and storage, no potential danger from oil leakage, fire, explosion, etc.

A full range of protection including compressor delay protection, water-pressure check switch, high & low pressure protection, super heating protection, Anti-phase and open-phase protection, high temperature protection, etc.

2) Energy-saving

Provide the same amount of hot water at 1/4 cost of electrical water heaters, heat pump water heater can save your bill every day.

3) Super-Sized evaporator coil

Hydrophilic aluminum fin and rifled copper coil, it has higher performance in cold weather.

4) World famous Compressor

Adopt the world famous brand compressor, unmatched reliability, quiet operation, energy-saving and environmental-friendly.

5) Monoblock design, convenient installation, nice appearance.

6) All-weather running

It provides hot water no matter in a rainy day, snowy day or at night.

7) Running automatically

Microcomputer controlled, with timer function, it can automatically start up and stop according to the water temperature and other running conditions you set, no need for a supervisor.

8) Environmental friendly

Environment-friendly, free of pollution, it reduces the global green house effect.

Part II Installation & Application

2.1 Transportation

When transporting the heat pump, ensure that it keeps upwards and not tilted more than 45° in any direction.

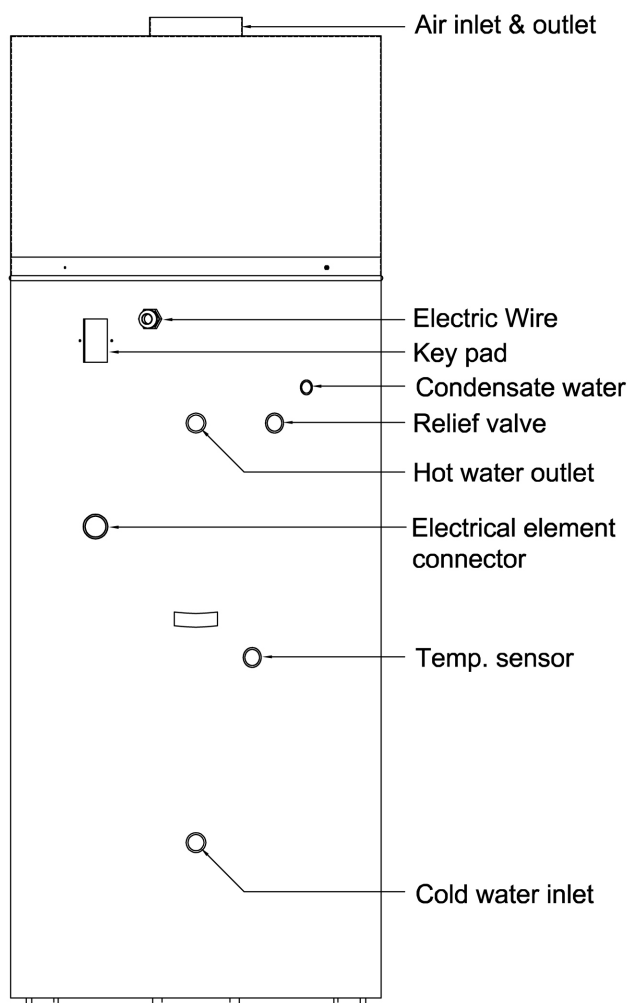
2.2 Installation Location Selection

It is very important to select a proper position for the unit, you should consider the followings:

- The ventilation of the heat pump should be in good condition.
- The installation position should be close to drainage channel to facilitate condensate water discharge.
- Choose a smooth, horizontal position where it can stand the weight of the unit, and it won't increase noise and vibration as well,
- Do not install the unit in place where there is pollution, accumulation of dirt or fallen leaves.
- There should not be inflammable or explosive materials close to the unit.



Note:

1. Make sure to install **a wye strainer** before water inlet of the unit to avoid clogging of the system. It's an essential requirement to install **a relief valve** onto the water tank.
2. Install mixing valve in user's hot water system to increase the utilization rate of hot water.



Remark: The heat pump must be fixed to avoid topple.

2.3 Trial Operation

- To ensure that start-up is performed correctly, it should only be operated by qualified technician.
- The heat pump water heater is designed according to the conditions as follows: the range of ambient temperature is 0°C ~ 43°C and the range of water pressure is 0.15 ~ 0.8Mpa. The range of water outlet temp. is 28 to 75°C, default hot water temp. is 60°C
- Make sure the piping system and water tank is filled up before commissioning, Do not press  before filling up the water tank. When there is water flowing out of the hot water outlet, that means the tank is full of water.
- After the tank is full of water, connect the power of the unit, then press  to turn it on. Observe if it works normally.

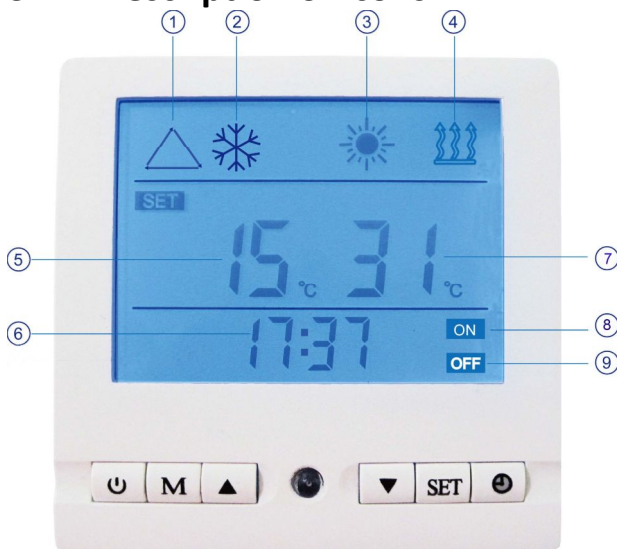
2.4 Caution

If something occurs as follows, please stop it immediately and cut the power off. You should contact with our authorized agent or maintenance personnel, don't repair it by yourselves. Without professional technology, it may cause fire and you may get hurt.

- Fuse blown or protection activated frequently
- The wire and switches are heated abnormally
- Abnormal sounds coming from the unit
- Abnormal smell comes out of the unit.
- Electricity leakage

Part III Control System

3.1 Description of Icons



- | | |
|---|--|
| ① | Flashing when compressor starts running |
| ② | Defrosting indication |
| ③ | Showing when the unit starts running |
| ④ | Auxiliary electrical heating indication (unused) |
| ⑤ | The desired temperature |
| ⑥ | Clock |
| ⑦ | Measured water tank temperature |
| ⑧ | Timer of turning-on the unit |
| ⑨ | Timer of turning-off the unit |

3.2 Operation Instruction



OFF

ON

Compressor starts running

A. Lock/Unlock the buttons

- Lock the buttons: Under ON or OFF status, extended press button simultaneously for 5 seconds, buttons are locked, and icon is shown on the screen.
- Unlock the buttons: Repeat the above step to unlock the buttons.

B. On/Off the unit

- Connect power to the unit, press button to turn on the unit, When compressor starts working, icon flashes on screen.
- When the unit is on, press button, you can turn it off.

C. Set the clock (Note: it will exit the interface when no operation for 10 seconds)

Under ON or OFF status, extended press button for 5 seconds, then press button to set the hour, press button, then press button to set the minute, press button to exit.

D. Set water temperature

When the unit is on, press button to set desired water tank temperature. The setting will be saved automatically when no further operation on it for 10 seconds. The range is 28°C-75°C.

Note:

- Heat pump unit will stop running automatically when water temperature in water tank reaches desired water temperature you set.
- The unit will start running automatically when water temperature drops to a certain temperature. (according to temperature difference you set, refer to item 05 in table 3.1)

E. Set/Cancel the timer of On/Off (Note: it will exit the interface when no operation for 10 seconds)

Note:

You can set totally three period of time for the unit to start/stop automatically. Under ON or OFF status, Press button once, “ 1 ” flashing; Press button twice, “ 2 ” flashing; Press button thrice, “ 3 ” flashing.

- Set timer: (Take “ 1 ” for example)
when “ 1 ” is flashing, Press button, flashing on the screen, then press button to set hour, Press button then press button to set minute; press button,

OFF flashing on the screen, then press button to set hour, Press button then press button to set minute, press button to finish setting.

- Cancel timer: To cancel timer, just set the unit to turning-on & turning-off at the similar time, then **ON** **OFF** icon disappeared.

F. Set/Review the parameters (for technician only)

When the unit is on, extended press button to enter the interface. press button, select item (01-08), press button, then press button to set, press button to confirm.

Table 3.1

Item	Description	Range	Default Value	Remark
01	Coil temp. to start defrosting	-1~-9°C	-3°C	flashing
02	Coil temp. to stop defrosting	5~25°C	20°C	flashing
03	Time interval for defrosting	10~90 Min	45 Min	flashing
04	Running time of defrosting	5-18 Min	10 Min	flashing
05	Temperature difference set	2-10°C	5°C	Refer to note 1,2,3 as below
06	(unused)			
07	(unused)			
08	(unused)			

Note:

- Set the temperature difference between measured water temperature and purpose water temperature
- By setting the temperature difference to control the unit to start up/stop automatically.
- For example, the default value is 5°C, when the measured temperature is lower than target water temperature by 5°C, the unit will run automatically. The unit will not stop until the measured temperature reaches the target water temperature you set.

G. Review Data

When the unit is on, shortly press button, then press button, review the actual measured data as below:

Table 3.2

Name	Item	Remarks
Code	01	It shows "28" when it works normally, otherwise refer to table of trouble shooting
"Mode Selection" Code Name	02	"0" circulation heating mode
Unit type	03	"0" single compressor, without phase detection
Unused	04	Spare
Coil temperature	05	Monitoring point of Defrosting temp. for compressor
Ambient temperature	06	Opening measurement of the electric expansion valve, and the anti-freeze temperature
Unused	07	Spare
Unused	08	Spare
Water temperature in tank	09	The unit stops working automatically when temp. reaches desired value.
Unused	10 & 11	Spare

3.3 Protection

- ◆ Compressor delay protection: the delay for the compressor to start/stop is three minute. The first time when it is power on, it starts up in one minute.
- ◆ High pressure protection: After compressor starts running and the high pressure switch interrupts for 10 seconds, the unit stops, “03E” flashing on the screen, and alarm sounds.
- ◆ Low pressure protection: After compressor starts running for 3 minutes and the low pressure switch interrupts for 10 seconds, the unit stops, “04E” flashing on the screen, and alarm sounds.
- ◆ Sensor fault: if the sensors fail, all parts stop working.

Part IV Trouble Shooting

Table 4.1

Fault Code	Fault	Possible Causes	Treatment
03E	High pressure switch fault (protect when interrupts)	<ul style="list-style-type: none"> ◇ High pressure switch destroyed ◇ water tank lacks of water ◇ The system is jammed, the probe of sensor falls down ◇ Excessive refrigerant ◇ Some un-condensable gas in the refrigerant system 	<ul style="list-style-type: none"> ◇ Replace high pressure switch ◇ Refill water ◇ Check and clean the system, retighten the probe ◇ Drain out the superfluous refrigerant ◇ Drain out the un-condensable gas
04E	Low pressure switch fault (protect when interrupts)	<ul style="list-style-type: none"> ◇ Low pressure switch destroyed ◇ Inadequate refrigerant ◇ The fins of the evaporator are dirty 	<ul style="list-style-type: none"> ◇ Replace low pressure switch ◇ Leak hunting and fill in standard quantity of refrigerant ◇ Clean the fins
05E	Overheating of the outlet water	<ul style="list-style-type: none"> ◇ Clogged water line ◇ water outlet temperature sensor fault 	<ul style="list-style-type: none"> ◇ Check the water system and the pump ◇ Check the electric resistance of the sensor
09E	Communication error (the control panel can't receive information from the PCB)	<ul style="list-style-type: none"> ◇ Open circuit or short circuit between the operation panel and PCB 	<ul style="list-style-type: none"> ◇ Renovate or Replace the wire between control panel and PCB
11E	Coil sensor fault (open circuit or short circuit)	<ul style="list-style-type: none"> ◇ The sensor open circuit ◇ The probe of the sensor falls down ◇ the sensor short circuit 	<ul style="list-style-type: none"> ◇ Reconnect the wirings of the sensor ◇ Retighten the probe ◇ Renovate wirings and remove faults
12E	Environment sensor fault (open circuit or short circuit)	<ul style="list-style-type: none"> ◇ The sensor open circuit ◇ The probe of the sensor falls down ◇ the sensor short circuit 	<ul style="list-style-type: none"> ◇ Reconnect the wirings of the sensor ◇ Retighten the probe ◇ Renovate wirings and remove faults
15E	Water-tank sensor fault (open circuit or short circuit)	<ul style="list-style-type: none"> ◇ The sensor open circuit ◇ The probe of the sensor falls down ◇ the sensor short circuit 	<ul style="list-style-type: none"> ◇ Reconnect the wirings of the sensor ◇ Retighten the probe ◇ Renovate wirings and remove faults

Note: when the fault arises, the correspondent fault code will be flashing on the screen and alarm sounds.

Table 4.2

Fault Condition	Possible Causes	Treatment
The unit doesn't work	<ul style="list-style-type: none"> ◇ Power failure ◇ Bad connection to the power ◇ Fuse blow 	<ul style="list-style-type: none"> ◇ Turn off the switch, check the Power source ◇ Find the causes and renovate them ◇ Replace the fuse
Low heating capacity	<ul style="list-style-type: none"> ◇ Inadequate refrigerant ◇ Drying filter stoppage ◇ Air side heat exchanger is un-efficient 	<ul style="list-style-type: none"> ◇ Leak hunting and fill in standard quantity of refrigerant ◇ Replace the drying filter ◇ Clean the heat exchanger
The compressor doesn't work	<ul style="list-style-type: none"> ◇ Power failure ◇ Compressor relay destroyed ◇ Poor connection ◇ Overheating protection 	<ul style="list-style-type: none"> ◇ Check it and solve the problems ◇ Replace the PCB ◇ Check and renovate it ◇ Check and solve the problems
The compressor works but too noisy	<ul style="list-style-type: none"> ◇ Liquid refrigerant goes into the compressor ◇ interior components destroyed ◇ Inadequate refrigeration oil 	<ul style="list-style-type: none"> ◇ Check the expansion valve ◇ Replace the compressor ◇ Add in adequate refrigeration oil
The fan doesn't work	<ul style="list-style-type: none"> ◇ Capacitor damaged ◇ The fans are not fixed well ◇ The electromotor burned out ◇ Contactor destroyed 	<ul style="list-style-type: none"> ◇ Replace it ◇ Fix it well again ◇ Replace the electromotor ◇ Replace the Contactor
Compressor works but not heating	<ul style="list-style-type: none"> ◇ Refrigerant leakage ◇ Compressor fault 	<ul style="list-style-type: none"> ◇ Leak hunting and fill in standard quantity of refrigerant ◇ Replace the compressor
Excessive discharge pressure	<ul style="list-style-type: none"> ◇ Too much refrigerant ◇ Non-condensable gas in the Refrigeration cycle 	<ul style="list-style-type: none"> ◇ Draw off the superfluous refrigerant ◇ Drive the gas out
Low suction pressure	<ul style="list-style-type: none"> ◇ Drying filter stoppage ◇ Lack of refrigerant ◇ Excessive pressure drop in the heat exchanger 	<ul style="list-style-type: none"> ◇ Replace the filter ◇ Leak hunting and fill in standard quantity of refrigerant ◇ Check the opening of electronic expansion valve

Part V Wiring Diagram

Wiring Diagram

