OWNER'S MANUAL

PENTAIR

For the Installation, Operation and Service of the

PWT-HP-135i

INVERTER HEAT PUMP

Should the installer or owner be unfamiliar with the correct installation or operation of this type of equipment, you should contact the distributor/manufacturer for the correct advice before proceeding with the installation or operation of this product.
The equipment operator or owner must be provided with this owner's manual.

CONTENTS

1. PREFACE

- In order to provide our customers with quality, reliability and versatility, this product has been made to strict production standards. This manual includes all the necessary information about installation, debugging, discharging and maintenance. Please read this manual carefully before you open or maintain the unit. The manufacture of this product will not be held responsible if someone is injured or the unit is damaged, as a result of improper installation, debugging, or unnecessary maintenance. It is vital that the instructions within this manual are adhered to at all times. The unit must be installed by qualified personnel.
- The unit can only be repaired by qualified installer centre , personnel or an authorised dealer.
- Maintenance and operation must be carried out according to the recomended time and frequency, as stated in this manual.
- Use genuine standard spare parts only.
  Failure to comply with these recommendations will invalidate the warranty.
- Swimming Pool Heat Pump Unit heats the swimming pool water and keeps the temperature constant. For split type unit, The indoor unit can be Discretely hidden or semi-hidden to suit a luxury house.

  Our heat pump has following characteristics:

  1 Durable
  The heat exchanger is made of PVC & Titanium tube which can withstand prolonged exposure to swimming pool water.
  2 Installation flexibility
  The unit can be installed outdoors.
  3 Quiet operation
  The unit comprises an efficient rotary/ scroll compressor and a low-noise fan motor, which guarantees its quiet operation.
  4 Advanced controlling
  The unit includes micro-computer controlling, allowing all operation parameters to be set. Operation status can be displayed on the LCD wire controller. Remote controller can be chosen as future option.

- WARNING

Do not use means to accelerate the defrosting process or to clean, Other than those recimmended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example:open flames, an Operating gas appliance or an operating electric heater.)

Do not pierce or burn.

Be aware that refrigerants may not contain an odour,

Appliance shall be installed,operated and stored in a room with a floor area larger than Xm^2.

NOTE The manufacturer may provide other suitable examples or may provide additional information about the refrigerant odour.

1. PREFACE

- 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.

- 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.

- The appliance shall be installed in accordance with national wiring regulations.

- Do not operate your air conditioner in a wet room such as a bathroom or laundry room.

- Before obtaining access to terminals, all supply circuits must be disconnected.

- An all-pole disconnection device which has at least 3mm clearances in all poles , and have a leakage current that may exceed 10mA, the residual current device (RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer

- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.)

- Do not pierce or burn

- Appliance shall be installed, operated and stored in a room with a floor area larger than X m2
  Be aware that refrigerants may not contain an odour.
  The installation of pipe-work shall be kept to a minimum X m2
  Spaces where refrigerant pipes shall be compliance with national gas regulations.
  Servicing shall be performed only as recommended by the manufacturer.
  The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
  All working procedure that affets safety means shall only be carried by competent persons.

- Transport of equipment containing flammable refrigerants
  Compliance with the transport regulations
  Marking of equipment using signs
  Compliance with local regulations
  Disposal of equipment using flammable refrigerants
  Compliance with national regulations
  Storage of equipment/appliances
  The storage of equipment should be in accordance with the manufacturer's instructions.
  Storage of packed (unsold) equipment
  Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.
  The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

1. PREFACE

Caution & Warning

1. The unit can only be repaired by qualified installer centre personnel or an authorised dealer.（for Europe market）
2. This appliance is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.（for Europe market）
   Children should be supervised to ensure that they do not play with the appliance.
3. Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.
4. If the supply cord is damaged, it must be replaced by the manufacturer or our service agent or similarly qualified person in order to avoid a hazard.
5. Directive 2002/96/EC (WEEE):
   The symbol depicting a crossed-out waste bin that is underneath the appliance indicates that this product, at the end of its useful life, must be handled separately from domestic waste, must be taken to a recycling centre for electric and electronic devices or handed back to the dealer when purchasing an equivalent appliance.
6. Directive 2002/95/EC (RoHs): This product is compliant with directive 2002/95/EC (RoHs) concerning restrictions for the use of harmful substances in electric and electronic devices.
7. The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas , fire can be occur.
8. Make sure that there is circuit breaker for the unit, lack of circuit breaker can lead to electrical shock or fire.
9. The heat pump located inside the unit is equipped with an over-load protection system. It does not allow for the unit to start for at least 3 minutes from a previous stoppage.
10. The unit can only be repaired by the qualified personnel of an installer center or an authorized dealer.（for North America market）
11. Installation must be performed in accordance with the NEC/CEC by authorized person only.（for North America market）
12. USE SUPPLY WIRES SUITABLE FOR 75℃.
13. Caution: Single wall heat exchanger, not suitable for potable water connection.

2.SPECIFICATION

2.1 Performance data of Swimming Pool Heat Pump Unit

*** REFRIGERANT : R32

Model		PASRW300S-P-BPII
Heating capacity (27/24.3℃)	kW	34.4~135.8
	Btu/h	117372~463349
Heating Power Input	kW	2.76~24.4
COP		12.4~5.56
Heating capacity (15/12℃)	kW	23.2~99.9
	Btu/h	79158~340858
Heating Power Input	kW	2.44~23.75
COP		9.5~4.20
Heating capacity (10/6.8℃)	kW	18.6~88.4
	Btu/h	63500~301620
Heating Power Input	kW	2.1~20.6
COP		8.6~4.1
Power Supply		380-415V/3N~/50Hz
Compressor Quantity		2
Compressor		Rotor
Fan Number		2
Noise(10m)	dB(A)	58~61
Water Connection	mm	110
Water Flow Volume	m^3/h	42
Water Pressure Drop(max)	kPa	37
Unit Net Dimensions(L/W/H)	mm	See the drawing of the units
Unit Ship Dimensions(L/W/H)	mm	See package lable
Net Weight	kg	see nameplate
Shipping Weight	kg	see package label

Heating: Outdoor air temp: 27℃/24.3℃, Inlet water temp:26℃

Outdoor air temp: 15℃/12℃, Inlet water temp:26℃

Outdoor air temp: 10℃/6.8℃, Inlet water temp:26℃

Operating range:

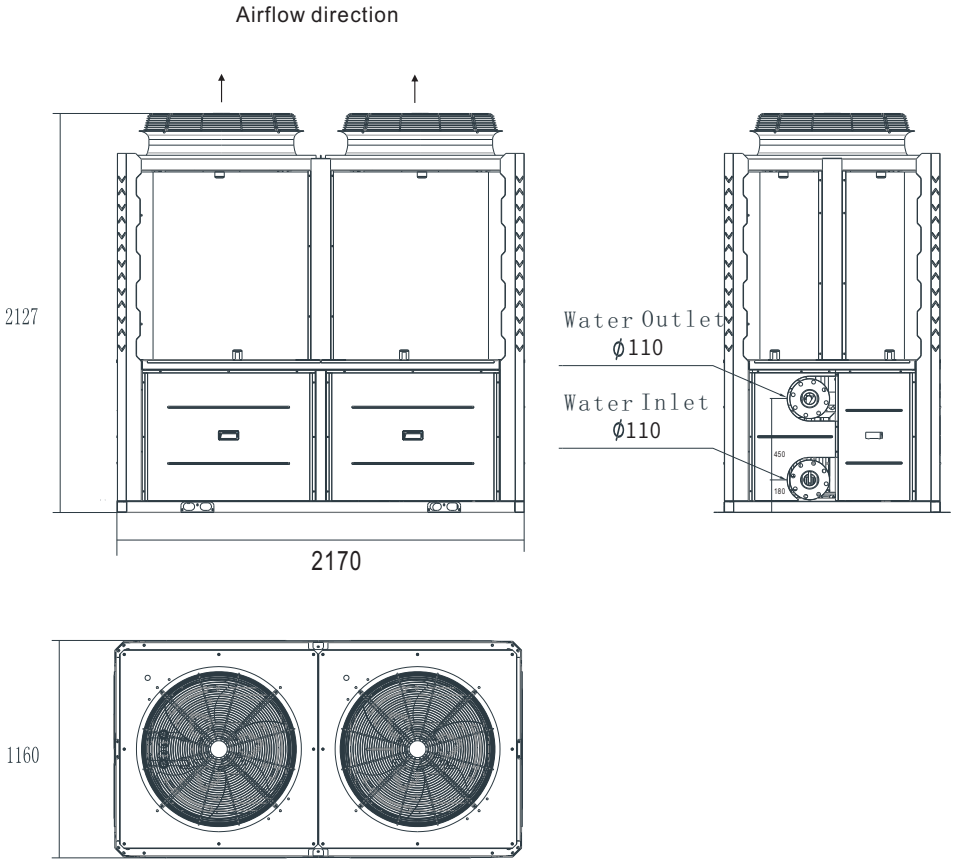
Ambient temperature:-15—43℃

Water temperature:9-40℃

2.2 The dimensions for Swimming Pool Heat Pump Unit

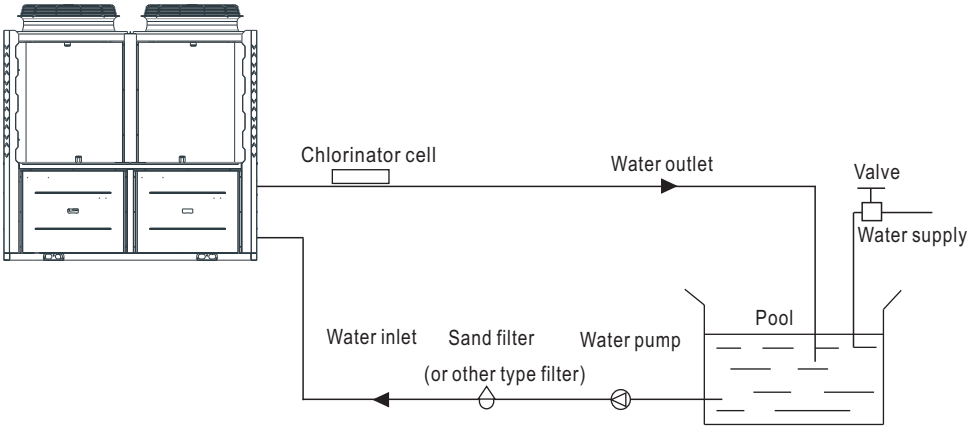
Model: PASRW300S-P-BPII

unit：mm



3.INSTALLATION AND CONNECTION

3.1 Installation illustration



Installation items:

The factory only provides the main unit and the water unit; the other items in the illustration are necessary spare parts for the water system ,that provided by users or the installer.

Attention:

Please follow these steps when using for the first time
1.Open valve and charge water.
2.Make sure that the pump and the water-in pipe have been filled with water.
3.Close the valve and start the unit.
ATTN: It is necessary that the water-in pipe is higher than the pool surface.

The schematic diagram is for reference only. Please check the water inlet/outlet label on the heat pump while plumbing installation.

3.INSTALLATION AND CONNECTION

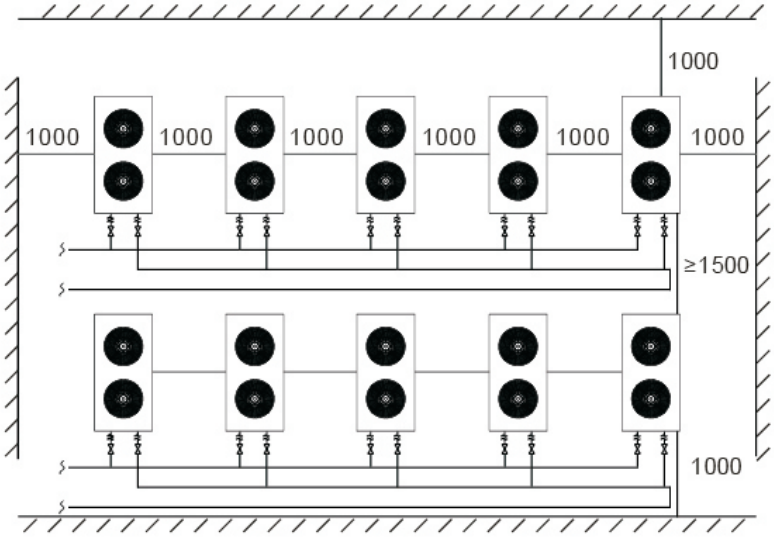
3.2 Swimming Pool Heat Pumps Location

The unit will perform well in any outdoor location provided that the following three factors are presented:

1. Fresh Air - 2. Electricity - 3. Pool filter piping

The unit may be installed virtually anywhere outdoors. For indoor pools please consult the supplier. Unlike a gas heater, it has no draft or pilot light problem in a windy area.

DO NOT place the unit in an enclosed area with a limited air volume, where the units discharge air will be re-circulated.
DO NOT place the unit to shrubs which can block air inlet. These locations deny the unit of a continuous source of fresh air which reduces it efficiency and may prevent adequate heat delivery.



3.3 How Close To Your Pool?

Normally, the pool heat pump is installed within 7.5 metres of the pool. The longer the distance from the pool, the greater the heat loss from the piping. For the most part ,the piping is buried. Therefore, the heat loss is minimal for runs of up to15 meters(15 meters to and from the pump = 30 meters total), unless the ground is wet or the water table is high. A very rough estimate of heat loss per 30 meters is 0.6 kW-hour,(2000BTU) for every 5 ℃ difference in temperature between the pool water and the ground surrounding the pipe, which translates to about 3% to 5% increase in run time.

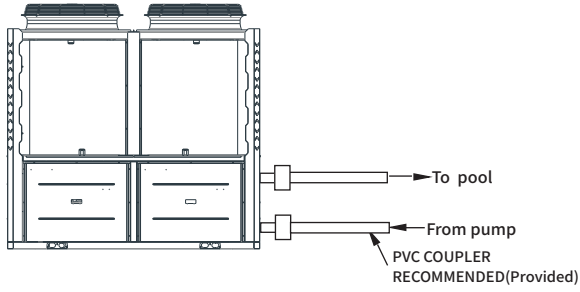
3.4 Swimming Pool Heat Pumps Plumbing

The Swimming Pool Heat Pumps exclusive rated flow titanium heat exchanger requires no special plumbing arrangements except bypass(please set the flow rate according to the nameplate). The water pressure drop is less than 10kPa at max. Flow rate. Since there is no residual heat or flame Temperatures, The unit does not need copper heat sink piping. PVC pipe can be run straight into the unit.

Location: Connect the unit in the pool pump discharge (return) line downstream of all filter and pool pumps, and upstream of any chlorinators, ozonators or chemical pumps.

Standard model have slip glue fittings which accept 40mm NB PVC pipe for connection to the pool or spa filtration piping. By using a 50 NB to 40NB you can plumb 50NB PVC piping

Give serious consideration to adding a quick coupler fitting at the unit inlet and outlet to allow easy draining of unit for winterizing and to provide easier access should servicing be required.



Condensation: Since the Heat pump cools down the air about 4 -5℃, water may condense on the fins of the horseshoe shaped evaporator. If the relative humidity is very high, this could be as much as several litres an hour. The water will run down the fins into the basepan and drain out through the barbed plastic condensation drain fitting on the side of the basepan. This fitting is designed to accept 20mm clear vinyl tubing which can be pushed on by hand and run to a suitable drain. It is easy to mistake the condensation for a water leak inside the unit.

NB: A quick way to verify that the water is condensation is to shut off the unit and keep the pool pump running. If the water stops running out of the basepan, it is condensation. AN EVEN QUICKER WAY IS to TEST THE DRAIN WATER FOR CHLORINE - if the is no chlorine present, then it's condensation.

3.INSTALLATION AND CONNECTION

3.5 Swimming Pool Heat Pumps Electrical Wiring

NOTE: Although the unit heat exchanger is electrically isolated from the rest of the unit, it simply prevents the flow of electricity to or from the pool water. Grounding the unit is still required to protect you against short circuits inside the unit. Bonding is also required.

The unit has a separate molded-in junction box with a standard electrical conduit nipple already in place. Just remove the screws and the front panel, feed your supply lines in through the conduit nipple and wire-nut the electric supply wires to the three connections already in the junction box (four connections if three phase). To complete electrical hookup, connect Heat Pump by electrical conduit, UF cable or other suitable means as specified (as permitted by local electrical authorities) to a dedicated AC power supply branch circuit equipped with the proper circuit breaker, disconnect or time delay fuse protection.

Disconnect - A disconnect means (circuit breaker , fused or un-fused switch) should be located within sight of and readily accessible from the unit, This is common practice on commercial and residential air conditioners and heat pumps. It prevents remotely-energizing unattended equipment and permits turning off power at the unit while the unit is being serviced.

3.6 Initial startup of the Unit

NOTE- In order for the unit to heat the pool or spa, the filter pump must be running to circulate water through the heat exchanger.

Start up Procedure - After installation is completed, you should follow these steps:
1. Turn on your filter pump. Check for water leaks and verify flow to and from the pool.
2. Turn on the electrical power supply to the unit, then press the key ON/OFF of wire controller, It should start in several seconds.
3. After running a few minutes make sure the air leaving the top(side) of the unit is cooler(Between 5-10 ℃)
4. With the unit operating turn the filter pump off. The unit should also turn off automatically,
5. Allow the unit and pool pump to run 24 hours per day until desired pool water emperature is reached. When the water-in temperature reach setting, The unit just shuts off. The unit will now automatically restart (as long as your pool pump is running)when the pool temperature drops more than 2℃below set temperature.

Time Delay- The unit is equipped with a 3 minute built-in solid state restart delay included to protect control circuit components and to eliminate restart cycling and contactor chatter. This time delay will automatically restart the unit approximately 3 minutes after each control circuit interruption. Even a brief power interruption will activate the solid state 3 minute restart delay and prevent the unit from starting until the 5 minute countdown is completed. Power interruptions during the delay period will have no effect on the 3 minute countdown.

4. Color screen wire controller interface introduction

4.1 Main interface

1.2 Button Description

NO.	Name	The button function
①	ON/OFF	Press to start /shut off the unit.
②	Parameter	Click this button to view the unit state and the parameter.
③	CLOCK	Press to set the clock, the timer on or timer off. When the timer was starting,the button is green.
④	Fault display	Click to view fault history.
⑤	Silent setting	Click to turn on/off silent function and to set timing low speed function.
⑥	MODE	Click to enter mode setting and the target temp. setting interface.
⑦	Curve	Click to view the temp. and comp. frequency curve.
⑧	Water Inlet Temp.	Click to enter mode setting and the target temp. setting interface.
⑨	LOCK	Click to lock the screen, input "22" to unlock the screen by press the "lock button".
⑩	Boost	Displayed at startup, not at shutdown, click to turn boost mode on and off.

2. Color screen wire controller function introduction

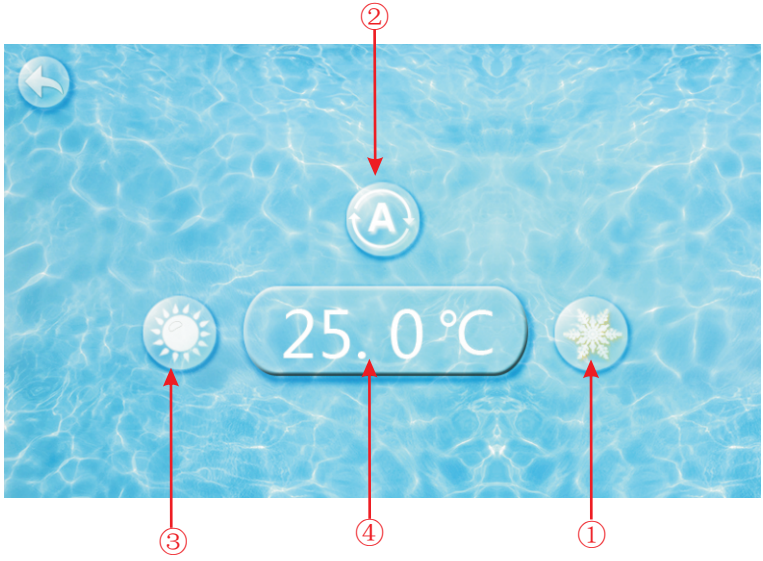
2.1 Booting and shutdown

As shown in figure 1.1:
In shutdown status, press ① then the unit will be booted.
In booting status, press ① then the unit will be shut down.

2.2 Mode switch and target temperature Setting

2.2.1 Mode switch

In the main interface, click mode button or inlet water temperature setting button, interface displays as follows:



Click the refrigeration mode button ①, automatic mode button ② or heating mode button ③ then you can select the corresponding mode.

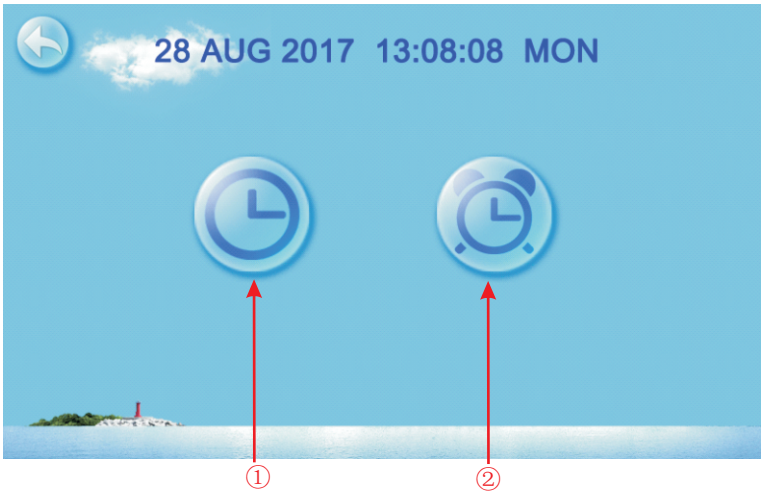
Note: when the unit is designed for single automatic mode or single thermal mode, the mode can not be switched.

2.2.2 Target temp setting

Click the temperature set button ④, you can set the target temperature.

2.3 Clock setting

In the main interface, click on the clock settings button, interface displays as follows:



2.3.1 The operation of time setting

Click on the time settings button ① , interface displays as follows:

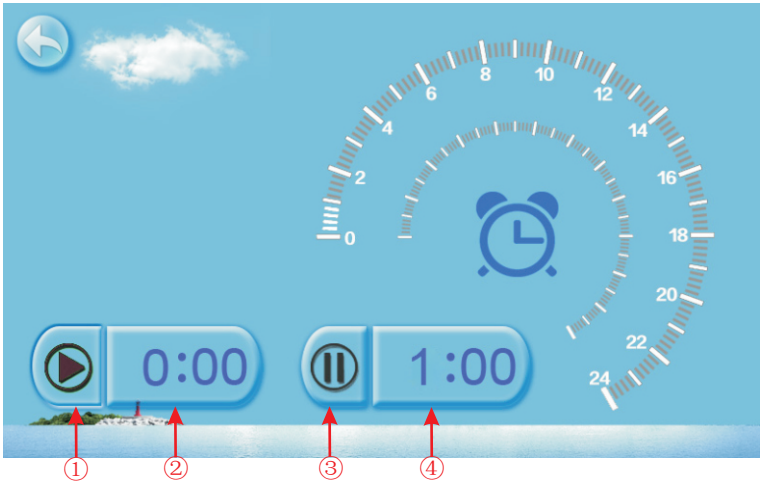
Click the value to set time directly, the click confirm button to save the settings.

For example: setup time: the 30-11-2016 16:00:00, input 30 11 16 16 00 00 ,the time change then click confirm button.

Note: if the input format is not correct, the wrong time will be saved by clicking confirm button.

2.3.2 The operation of timing setting

Click the timing set button ② to enter timing setting interface.

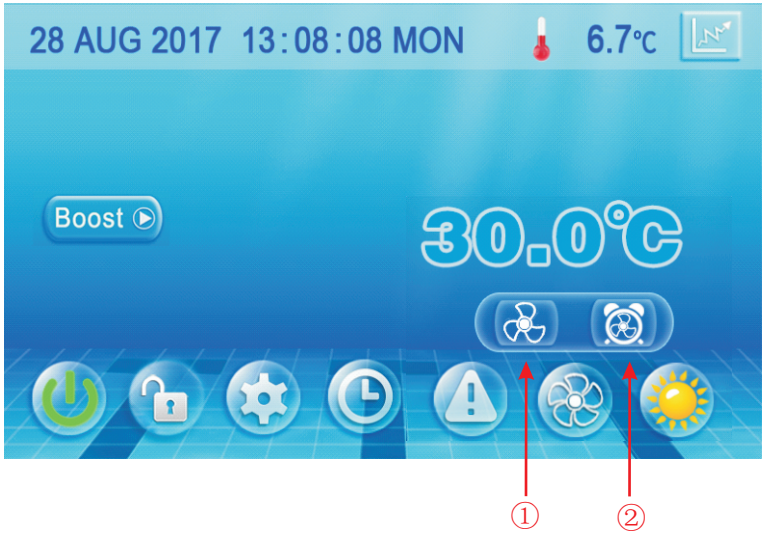


NO.	Name	Button color	Button function
①	Timing start button	Enable: green Disable: gray	Click this button to enable or disable the timing start setting function
②	Timing on setting		Click to set start time of the timing
③	Timing end button	Enable: red Disable: gray	Click this button to enable or disable the timing end setting function
④	Timing off setting		Click to set end time of the timing

When the timer was starting,the clock button is green in the main interface

2.4 Silent setting and silent timing setting

Click the silent setting button ,and the interface displays as follows:



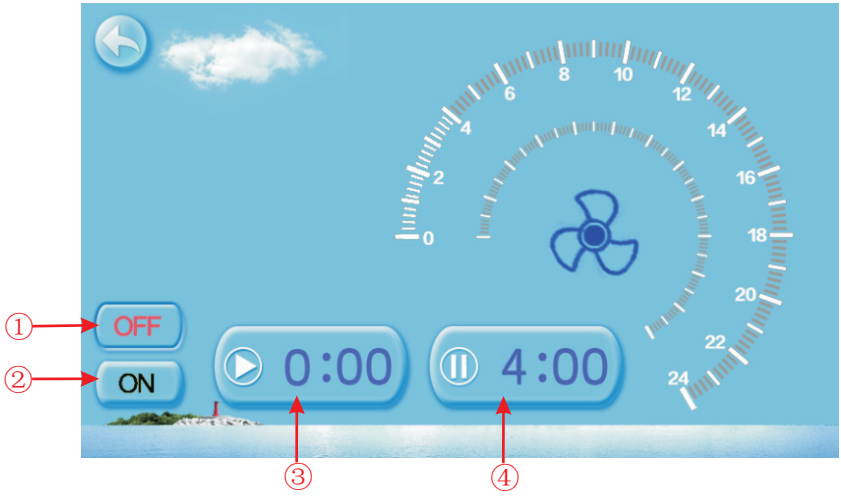
2.4.1 The silent button

Click the silent button ①, the unit will enter the silent mode, and interface displays as follows:

Click the silent button ① again and exit the silent mode.

2.4.2 Timing silent function setting

Click timing silent button ②, and interface displays as follows:



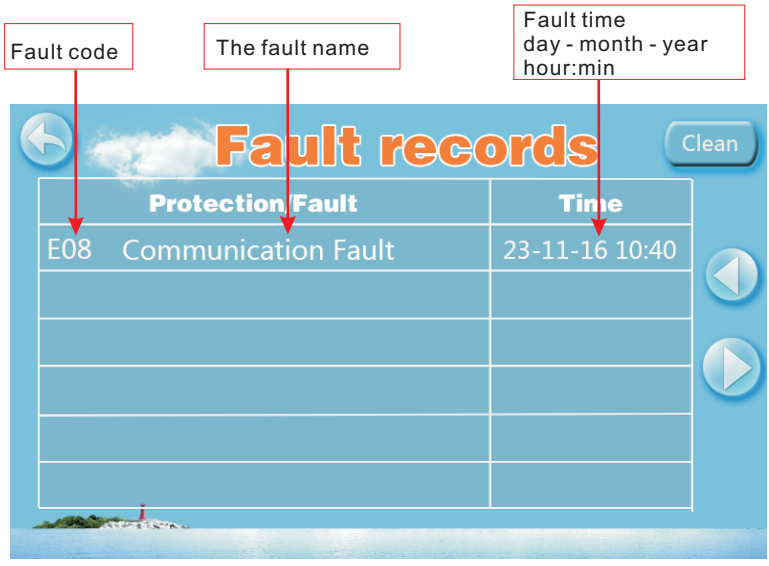
NO.	Name	Color	Function
①	Timing silent off	Enable: red Disable:gray	Click to enable or disable timing off function
②	Timing silent on	Enable:green Disable:gray	Click to enable or disable timing on function
③	Timing silent start time		Click this button to set the timing silent start time
④	Timing silent end time		Click this button to set the timing silent end time

Start time and end time setting value must be among the range of 0:00-23:00,and setting value can be precise to hour digit.

For example above, click "ON"to use timing silent, the unit will start the silent at 0:00 points and end at 4:00;click "OFF" to disable the timing silent, but if the unit is in timing silent mode, it will exit silent timing immediately.

2.5 History of the fault

In the main screen click fault display key, interface displays as follows:



If no failure, main interface displays static " ".

When fault occurs, the fault icon will flash between the " " " ",the failure interface will record time, code, name of the fault.

After troubleshooting, if you do not check the failure record, the main interface will display static " "; if you check the failure record, the main interface will displays static " ".

Failure record is in reverse order, according to the happening time.

Press the "Clean" key, you can delete the fault record.

2.6 Color Display Calibration

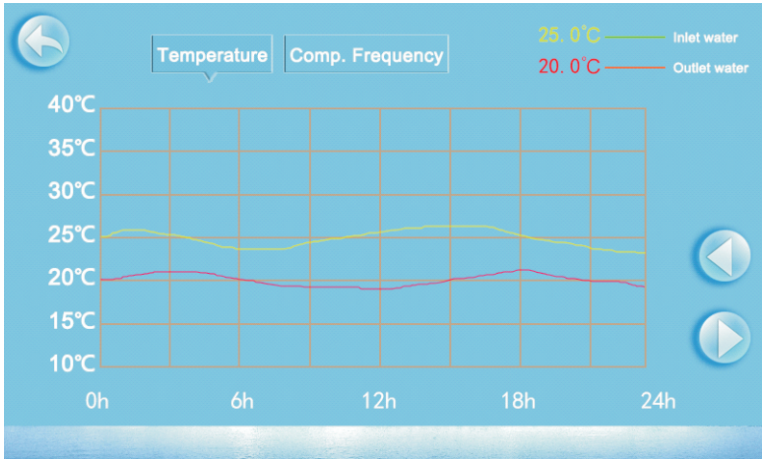
Keep click quickly at the blank area on any interface till you hear a long beep.
Then you will enter the calibration interface. Click "+" to start calibration.
When you hear the beep again, you will finish calibration and exit.

Remark: the wire controller can display the temperature unit as "℉" or "℃" according to the unit model you bought.

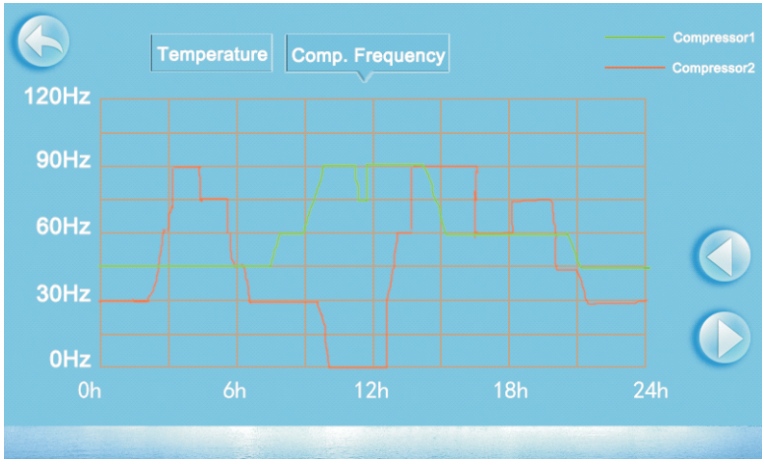
2.7 Curve

In the main interface, click the curve display button, interface displays as follows:

2.7.1 Temperature recording curve is as follows:



2.7.2 Compressor frequency curve



Temperature curve automatically updates one time per hour and the curve record can be stored for 60 days. Start from the latest curve saved time ,if power is off and curve data collecting time is less than one hour ,the data in this period will be saved.

3. Parameter list and breakdown table

3.1 Electronic control fault table

Can be judged according to the remote controller failure code and troubleshooting

Protect/fault	Fault display	Reason	Elimination methods
Inlet Temp. Sensor Fault	P01	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Outlet Temp. Sensor Fault	P02	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Amibent Temp. Sensor Fault	P04	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Syst1: Coil 1 Temp. Sensor Fault	P151	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Syst2: Coil 1 Temp. Sensor Fault	P251	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Syst1：Suction Temp. Sensor Fault	P17	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Syst2：Suction Temp. Sensor Fault	P27	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Syst1：Exhaust Temp. Sensor Fault	P181	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Syst2：Exhaust Temp. Sensor Fault	P281	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Syst1：Exhaust Air over Temp. Prot.	P182	The compressor is overload	Check whether the system of the compressor running normally
Syst1：Exhaust Air over Temp. Prot.3+	P182	The compressor is overload	Check whether the system of the compressor running normally
Syst2：Exhaust Air over Temp. Prot.	P282	The compressor is overload	Check whether the system of the compressor running normally
Syst2：Exhaust Air over Temp. Prot.3+	P282	The compressor is overload	Check whether the system of the compressor running normally
Syst1：High Pressure Prot.	E11	The high-preesure switch is broken	Check the pressure switch and cold circuit
Syst1：High Pressure Prot. 3+	E11	The high-preesure switch is broken	Check the pressure switch and cold circuit
Syst2：High Pressure Prot.	E21	The high-preesure switch is broken	Check the pressure switch and cold circuit
Syst2：High Pressure Prot. 3+	E21	The high-preesure switch is broken	Check the pressure switch and cold circuit
Syst1：Low Pressure Prot.	E12	The low-preesure switch is broken	Check the pressure switch and cold circuit
Syst1：Low Pressure Prot. 3+	E12	The low-preesure switch is broken	Check the pressure switch and cold circuit
Syst2：Low Pressure Prot.	E22	The low-preesure switch is broken	Check the pressure switch and cold circuit
Syst2：Low Pressure Prot. 3+	E22	The low-preesure switch is broken	Check the pressure switch and cold circuit
Flow Switch Prot.	E03	No water/little water in water system	Check the pipe water flow and water pump
Flow Switch Prot.3+	E03	No water/little water in water system	Check the pipe water flow and water pump
Waterway Anti-freezing Prot.	E05	Water temp.or ambient temp. is too low	Check the ambient temp value
Excess Water Temp.Diff Prot.	E06	Water flow is not enough and low differential pressure	Check the pipe water flow and whether water system is jammed or not

Protect/fault	Fault display	Reason	Elimination methods
Excess Water Temp. Diff Prot. 3+	E06	Water flow is not enough and low differential pressure	Check the pipe water flow and whether water system is jammed or not
Anti-freezing Prot.	E07	Water flow is not enough	Check the pipe water flow and whether water system is jammed or not
Anti-freezing Prot. 3+	E07	Water flow is not enough	Check the pipe water flow and whether water system is jammed or not
Syst1： Low Pressure Sensor Fault	PP11	The pressure Sensor is broken	Check or change the pressure Sensor or pressure
Syst2： Low Pressure Sensor Fault	PP21	The pressure Sensor is broken	Check or change the pressure Sensor or pressure
Syst1： High Pressure Sensor Fault	PP12	The pressure Sensor is broken	Check or change the pressure Sensor or pressure
Syst2： High Pressure Sensor Fault	PP22	The pressure Sensor is broken	Check or change the pressure Sensor or pressure
Syst1: Comp. Overcurrent Prot.	E151	The compressor is overload	Check whether the system of the compressor running normally
Syst1: Comp. Overcurrent Prot. 3+	E151	The compressor is overload	Check whether the system of the compressor running normally
Syst2: Comp. Overcurrent Prot.	E251	The compressor is overload	Check whether the system of the compressor running normally
Syst2: Comp. Overcurrent Prot. 3+	E251	The compressor is overload	Check whether the system of the compressor running normally
Abnormal Power Down Record	EE1	Loss of power when power on	Automatic recovery after 3 minutes of power on
Syst1: Coil 2 Temp. Sensor Fault	P152	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Syst2: Coil 2 Temp. Sensor Fault	P252	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Primary Anti-freezing Prot.	E19	The ambient temp. Is low	Check the ambient temp value
Secondary Anti-freezing Prot.	E29	The ambient temp. Is low	Check the ambient temp value
Communication Fault	E08	Communicat ion failure between wire controller and mainboard	Check the wire connection between remote wire controller and main board
Communication Fault (Fan Motor 1)	E081	Speed control module and main board communication fail	Check the communication connection
Communication Fault (Fan Motor 2)	E082	Speed control module and main board communication fail	Check the communication connection
Low AT Protection	TP	Ambient temp is too low	Check the ambient temp value
EC fan feedback Fault	F051	There is something wrong with fan motor and fan motor stops running	Check whether fan motor is broken or locked or not
Water(Out) High Temp Protection	E065	The outlet temperature is too high.	Check the pipe water flow and water pump
Water(Out) High Temp Protection 3+	E065	The outlet temperature is too high.	Check the pipe water flow and water pump
Water(Out) Low Temp Protection	E071	The outlet temperature is too low.	Check the pipe water flow and water pump
Water(Out) Low Temp Protection 3+	E071	The outlet temperature is too low.	Check the pipe water flow and water pump
The Wire Controller does not match Main Controller	E084	The Wire Controller program does not match Main Controller program	Re-burn the new program
Fan Motor 1 Overheat Protection	E103	Fan Motor 1 overload	Check whether the fan motor 1 is in normal operation
Fan Motor 2 Overheat Protection	E203	Fan Motor 2 overload	Check whether the fan motor 2 is in normal operation

Protect/fault	Fault display	Reason	Elimination methods
Syst1: Refrigerant Leakage Protection	E131	System1 Refrigerant Leakage	Check whether the System 1 refrigerant has been leaking
Syst2: Refrigerant Leakage Protection	E231	System2 Refrigerant Leakage	Check whether the System 2 refrigerant has been leaking
Syst1: Suction High Temp Protection	E077	Suction overtemperature	Check whether the sunction temperature over the protection value
Syst2: Suction High Temp Protection	E078	Suction overtemperature	Check whether the sunction temperature over the protection value
Syst1: 4-way Valve Abnormal Switch	E121	4-way Valve Abnormal Switch	Check whether 4-way Valve state is the required state
Syst2: 4-way Valve Abnormal Switch	E221	4-way Valve Abnormal Switch	Check whether 4-way Valve state is the required state
Syst1: Refrigerant Leakage Protection 3+	E131	System1 Refrigerant Leakage	Check whether the System 1 refrigerant has been leaking
Syst2: Refrigerant Leakage Protection 3+	E231	System2 Refrigerant Leakage	Check whether the System 2 refrigerant has been leaking
Fan Motor 1 Overheat Protection 3+	E103	Fan Motor 1 overload	Check whether the fan motor 1 is in normal operation
Fan Motor 2 Overheat Protection 3+	E203	Fan Motor 2 overload	Check whether the fan motor 2 is in normal operation
Anti-condensation Prot.	E174	The condition of current air temp and inlet water temp is cruel	Check the air temp and inlet water temp
Fan Motor 1 Output Out Phase	F101	Fan motor 1 does not start	Check the wiring of fan motor 1
Fan Motor 1 Output Zero Speed	F102	Fan motor 1 does not start	Check if the fan motor 1 is blocked or not
Fan Motor 1 Start IPM Protection	F103	The start current of fan motor 1 is overloaded	Check if the fan motor 1 is blocked or not
Fan Motor 1 Running IPM Protection	F104	The running current of fan motor 1 is overloaded	Check if the fan motor 1 is blocked or not
Fan Motor 1 Overcurrent Protection	F105	The running current of fan motor 1 is overloaded	Check if the fan motor 1 is blocked or not
Fan Motor 1 Over-temperature Protection	F106	The heat reduction of fan motor 1 is not enough	Check the condition of heat reduction
Fan Motor 1 Bus Over Voltage	F107	The voltage is overloaded	Check if the power supply is higher than 480V or not
Fan Motor 1 Bus Under Voltage	F108	The voltage is too low	Check if the power supply is lower than 250V or not
Fan Motor 2 Output Out Phase	F201	Fan motor 2 does not start	Check the wiring of fan motor 2
Fan Motor 2 Output Zero Speed	F202	Fan motor 2 does not start	Check if the fan motor 2 is blocked or not
Fan Motor 2 Start IPM Protection	F203	The start current of fan motor 2 is overloaded	Check if the fan motor 2 is blocked or not
Fan Motor 2 Running IPM Protection	F204	The running current of fan motor 2 is overloaded	Check if the fan motor 2 is blocked or not
Fan Motor 2 Overcurrent Protection	F205	The running current of fan motor 2 is overloaded	Check if the fan motor 2 is blocked or not
Fan Motor 2 Over-temperature Protection	F206	The heat reduction of fan motor 2 is not enough	Check the condition of heat reduction
Fan Motor 2 Bus Over Voltage	F207	The voltage is overloaded	Check if the power supply is higher than 480V or not
Fan Motor 2 Bus Under Voltage	F208	The voltage is too low	Check if the power supply is lower than 250V or not

Frequency conversion board fault table:

Protect/fault	Fault display	Reason	Elimination methods
Syst1: Inverter Board Communication Failure	F151	Communication failure with system 1Inverter board	1.Check whether the communication line is normal. 2.Check whether the system 1 Inverter board power on is normal
Syst1: Compressor Start Failure	F152	System1 compressor start failure	1.Check whether the compressor line is normal 2.Check whether theSystem1 compressor is blocked
Syst1: Start IPM Protection	F153	Excessive system1 compressor startup current	1.Check whether the starting high pressure is too high 2.Check whether the System1 compressor is blocked
Syst1: Running IPM Protection	F154	Excessive system1 compressor running current	Check whether the pressure ratio is too high
Syst1: Comp. IPM Over-temperature Protection	F155	Poor heat dissipation of system1 Inverter Board	Check whether there are any gaps in the installation of refrigerant cooling fins
Syst1: Compressor Overcurrent Protection	F156	Excessive System1..Compressor Running..Current	Check whether the pressure ratio is too high
Syst1: Compressor Bus Over Voltage	F157	Over Voltage	Check whether the input voltage is higher than 480v
Syst1: Compressor Bus Under Voltage	F158	Under Voltage	Check whether the input voltage is lower than 250v
Syst2: Inverter Board Communication Failure	F251	Communication failure with system 1Inverter board	1.Check whether the communication line is normal. 2.Check whether the system 1 Inverter board power on is normal.
Syst2: Compressor Start Failure	F252	System2 compressor start failure	1.Check whether the compressor line is normal. 2.Check whether theSystem1 compressor is blocked.
Syst2: Start IPM Protection	F253	Excessive system1 compressor startup current	1.Check whether the starting high pressure is too high 2.Check whether theSystem1 compressor is blocked
Syst2: Running IPM Protection	F254	Excessive system1 compressor running current	Check whether the pressure ratio is too high
Syst2: Comp. IPM Over-temperature Protection	F255	Poor heat dissipation of system1 Inverter Board	Check whether there are any gaps in the installation of refrigerant cooling fins
Syst2: Compressor Overcurrent Protection	F256	Excessive System1 Compressor Running Current	Check whether the pressure ratio is too high
Syst2: Compressor Bus Over Voltage	F257	Over Voltage	Check whether the input voltage is higher than 480v
Syst2: Compressor Bus Under Voltage	F258	Under Voltage	Check whether the input voltage is lower than 250v

3.2 Parameter list

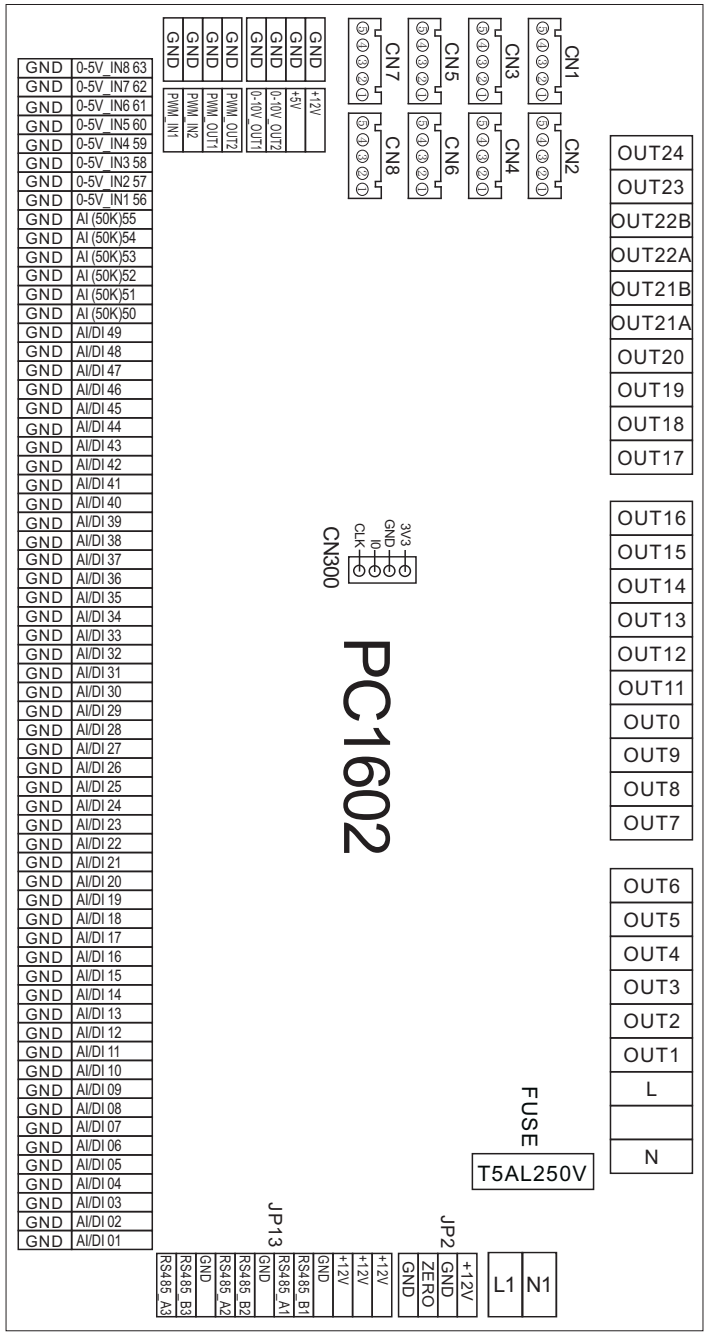
Meaning	Default	Remarks
Refrigeration target temperature set point	27℃	Adjustable
Heating the target temperature set point	27℃	Adjustable
Automatic target temperature set point	27℃	Adjustable

4. Interface drawing

4.1 Wire control interface diagram and definition

Sign	Meaning
V	12V（power +）
R	No use
T	No use
A	485A
B	485B
G	GND (power -)

4.2 Controller interface diagram and definition



Main board of the input and output interface instructions below

Number	Sign	Meaning
01	OUT1	System1compressor (output 250VAC）
02	OUT2	System2compressor2(output 250VAC）
03	OUT3	Low speed of fan 1 (output 250VAC）
04	OUT4	High speed 1 of fan 1 (output 250VAC）
05	OUT5	High speed 2 of fan 1 (output 250VAC）
06	OUT6	Low speed of fan 2 (output 250VAC）
07	OUT7	High speed 1 of fan 2 (output 250VAC）
08	OUT8	High speed 2 of fan 2 (output 250VAC）
09	OUT9	Four-way valve 1 (output 250VAC）
10	OUT10	Four-way valve 2 (output 250VAC）
11	OUT11	Crankshaft heating belt 1
12	OUT12	Crankshaft heating belt 2
13	OUT13	Water pump (output 250VAC）
14	OUT14	Chassis heating belt
15	OUT15	Electrical heating 1
16	OUT16	Electrical heating 2
17	OUT17	Reserved
18	OUT18	Reserved
19	OUT19	Reserved
20	OUT20	Reserved
21	OUT21	Reserved
22	OUT22	Reserved
23	OUT23	Reserved
24	OUT24	Reserved
25	AI/DI01	Water input temperature （input）
26	AI/DI02	Water output temperature (input)
27	AI/DI03	Ambient temperature（input）
28	AI/DI04	System 1 suction temperature （input）
29	AI/DI05	System 2 suction temperature （input）
30	AI/DI06	System 1 fan coil temperature 1（input）
31	AI/DI07	System 2 fan coil temperature 1（input）
32	AI/DI08	System 1 fan coil temperature 2（input）
33	AI/DI09	System 2 fan coil temperature 2（input）
34	AI/DI10	Reserved
35	AI/DI11	Reserved
36	AI/DI12	Reserved
37	AI/DI13	Reserved
38	AI/DI14	Reserved
39	AI/DI15	Reserved
40	AI/DI16	Reserved
41	AI/DI17	Reserved

Number	Sign	Meaning
42	AI/DI18	Reserved
43	AI/DI19	Reserved
44	AI/DI20	Reserved
43	AI/DI21	System1 high pressure （input）
44	AI/DI22	System2 high pressure （input）
45	AI/DI23	System1 low pressure （input）
46	AI/DI24	System2 low pressure （input）
47	AI/DI25	Water flow switch （input）
48	AI/DI26	Emergency switch （input）
49	AI/DI27	Mode switch （input）
50	AI/DI28	Master-slave machine switch（input）
51	AI/DI29	Fan 1 heater overload protection （input）
52	AI/DI30	Fan 2 heater overload protection （input）
53	AI/DI31	Reserved
54	AI/DI32	Reserved
55	AI/DI33	Reserved
56	AI/DI34	Reserved
57	AI/DI35	Reserved
58	AI/DI36	Reserved
59	AI/DI37	Reserved
60	AI/DI38	Reserved
61	AI/DI39	Reserved
62	AI/DI40	Reserved
63	AI/DI41	Reserved
64	AI/DI42	Reserved
65	AI/DI43	Reserved
66	AI/DI44	Reserved
67	AI/DI45	Reserved
68	AI/DI46	Reserved
69	AI/DI47	Reserved
70	AI/DI48	Reserved
71	AI/DI49	Reserved
72	AI（50K）50	System1 exhaust temperature （input）
73	AI（50K）51	System2 exhaust temperature （input）
74	AI（50K）52	Reserved
75	AI（50K）53	Reserved
76	AI（50K）54	Reserved
77	AI（50K）55	Reserved
78	0-5V_IN1	System1 high pressure transducer (input)
79	0-5V_IN2	System2 high pressure transducer (input)
80	0-5V_IN3	System1 low pressure transducer (input)
81	0-5V_IN4	System2 low pressure transducer (input)

Number	Sign	Meaning
82	0-5V_IN5	Reserved
83	0-5V_IN6	Reserved
84	0-5V_IN7	Reserved
85	0-5V_IN8	Reserved
86	CN1	System1electronic expansion valve（output 12VDC）
87	CN2	System2 electronic expansion valve（output 12VDC）
88	CN3	Reserved
90	CN4	Reserved
91	CN5	Reserved
92	CN6	Reserved
93	CN7	Reserved
94	CN8	Reserved
95	+12V	12V output
96	+5V	5V output
97	0-10V_OUT2	Reserved
98	0-10V_OUT1	Reserved
99	PWM_OUT2	Reserved
100	PWM_OUT1	Reserved
101	PWM_IN2	Reserved
102	PWM_IN1	Reserved
103	CN300	Program port
104	L N	220V input
105	L1 N1	220V output
106	JP2	12V input
107	JP13_1	Inverter board/DC fan speed regulation module
108	JP13_2	Centralized control communication port
109	JP13_3	Color line controller communication/DTU module/WIFI

Note:
JP5_1 represents +12V, 485_A1, 485_B1, GND on the JP5 terminal;
JP5_2 represents +12V, 485_A2, 485_B2, GND on the JP5 terminal;
JP5_3 represents +12V, 485_A3, 485_B3, GND on the JP5 terminal.

5. MAINTENANCE AND INSPECTION

- Check the water supply device and the release often. You should avoid the condition of no water or air entering into system, as this will influence unit's performance and reliability. You should clear the pool/spa filter regularly to avoid damage to the unit as a result of the dirty of clogged filter.
- The area around the unit should be dry, clean and well ventilated. Clean the side heating exchanger regularly to maintain good heat exchange as conserve energy .
- The operation pressure of the refrigerant system should only be serviced by a certified technician .
- Check the power supply and cable connection often,.Should the unit begin to operate abnormally, switch it off and contact the qualified technician.
- Discharge all water in the water pump and water system ,so that freezing of the water in the pump or water system does not occur. You should discharge the water at the bottom of water pump if the unit will not be used for an extended period of time. You should check the unit thoroughly and fill the system with water fully before using it for the first time after a prolonged period of no usage.

6.APPENDIX

6.1 Caution & Warning

1. The unit can only be repaired by qualified installer centre personnel or an authorised dealer(for Europe market).
2. This appliance can used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved(for Europe market).
   Children shall not play with the appliance .Cleaning and user maintenance shall not be made by children without supervision.
3. Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.
4. If the supply cord is damaged, it must be replaced by the manufacturer or our service agent or similarly qualified person in order to avoid a hazard.
5. Directive 2002/96/EC (WEEE):
   The symbol depicting a crossed-out waste bin that is underneath the appliance indicates that this product, at the end of its useful life, must be handled separately from domestic waste, must be taken to a recycling centre for electric and electronic devices or handed back to the dealer when purchasing an equivalent appliance.
6. Directive 2002/95/EC (RoHs): This product is compliant with directive 2002/95/EC (RoHs) concerning restrictions for the use of harmful substances in electric and electronic devices.
7. The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas , fire can be occur.
8. Make sure that there is circuit breaker for the unit, lack of circuit breaker can lead to electrical shock or fire.
9. The heat pump located inside the unit is equipped with an over-load protection system. It does not allow for the unit to start for at least 3 minutes from a previous stoppage.
10. The unit can only be repaired by the qualified personnel of an installer center or an authorized dealer(for North America market).
11. Installation must be performed in accordance with the NEC/CEC by authorized person only (for North America market).
12. Use supply wires suitable for 75℃.
13. Caution: Single wall heat exchanger is not suitable for potable water connection.
14. The appliance shall be installed in accordance with national wiring regulations.
15. The appliance must be fitted with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III conditions, and these means must be incorporated in the fixed wiring in accordance with the wiring rules.
16. An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.

6.2 Cable specification

(1) Single phase unit

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	2×1.5mm^2	1.5mm^2	20A	30mA less than 0.1 sec	n×0.5mm^2
10~16A	2×2.5mm^2	2.5mm^2	32A	30mA less than 0.1 sec	
16~25A	2×4mm^2	4mm^2	40A	30mA less than 0.1 sec	
25~32A	2×6mm^2	6mm^2	40A	30mA less than 0.1 sec	
32~40A	2×10mm^2	10mm^2	63A	30mA less than 0.1 sec	
40~63A	2×16mm^2	16mm^2	80A	30mA less than 0.1 sec	
63~75A	2×25mm^2	25mm^2	100A	30mA less than 0.1 sec	
75~101A	2×25mm^2	25mm^2	125A	30mA less than 0.1 sec	
101~123A	2×35mm^2	35mm^2	160A	30mA less than 0.1 sec	
123~148A	2×50mm^2	50mm^2	225A	30mA less than 0.1 sec	
148~186A	2×70mm^2	70mm^2	250A	30mA less than 0.1 sec	
186~224A	2×95mm^2	95mm^2	280A	30mA less than 0.1 sec	

(2) Three phase unit

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	3×1.5mm^2	1.5mm^2	20A	30mA less than 0.1 sec	n×0.5mm^2
10~16A	3×2.5mm^2	2.5mm^2	32A	30mA less than 0.1 sec	
16~25A	3×4mm^2	4mm^2	40A	30mA less than 0.1 sec	
25~32A	3×6mm^2	6mm^2	40A	30mA less than 0.1 sec	
32~40A	3×10mm^2	10mm^2	63A	30mA less than 0.1 sec	
40~63A	3×16mm^2	16mm^2	80A	30mA less than 0.1 sec	
63~75A	3×25mm^2	25mm^2	100A	30mA less than 0.1 sec	
75~101A	3×25mm^2	25mm^2	125A	30mA less than 0.1 sec	
101~123A	3×35mm^2	35mm^2	160A	30mA less than 0.1 sec	
123~148A	3×50mm^2	50mm^2	225A	30mA less than 0.1 sec	
148~186A	3×70mm^2	70mm^2	250A	30mA less than 0.1 sec	
186~224A	3×95mm^2	95mm^2	280A	30mA less than 0.1 sec	

When the unit will be installed at outdoor, please use the cable which can against UV.

Note:

PWT-HP-135i

Inverter Heat Pump

IMPORTANT
Please attach your sales invoice/docket here as proof of purchase should warranty service be required.

Purchased from:.....

Purchase date: ..... Serial No.: ..... Model No.: .....

Head Office
Pentair AU/NZ: 1-21 Monash Drive
Dandenong South,
VIC 3175

Australia

National customer service:	Phone:	1300 137 344
National dealer locator:	Phone:	1800 664 266
Email:	au.sales@pentair.com	
Web:	www.pentairpool.com.au	

International

Phone: +61 3 9709 5800
au.exports@pentair.com