



SWIMMING POOL HEAT PUMP UNIT

Installation & Owner`s manual

Swimming pool heat pump

Models:

CH-HP050LTIRK
CH-HP050LTIRM
CH-HP060LTIRK
CH-HP060LTIRM
CH-HP070LTIRM



Thank you for choosing Cooper&Hunter **swimming pool heat pump** , please read this installation & owner`s manual carefully before operation and retain it for future reference.

CONTENTS

| | |
|---|----|
| 1. Preface | 1 |
| 2. Specifications | 2 |
| 2.1 Performance Data of Swimming Pool Heat Pump Unit | 2 |
| 2.2 Dimensions for Swimming Pool Heat Pump Unit | 5 |
| 2.3 How to disassemble the units | 7 |
| 2.4 How the power cord go | 7 |
| 2.5 How to replace the wire controller | 8 |
| 3. Installation and Connection | 9 |
| 3.1 Installation illustration | 9 |
| 3.2 Swimming Pool Heat Pumps Location | 10 |
| 3.3 How Close to Your Pool? | 10 |
| 3.4 Swimming Pool Heat Pumps Plumbing | 11 |
| 3.5 Swimming Pool Heat Pumps Electrical Wiring | 12 |
| 3.6 Initial Start-up of the Unit | 12 |
| 4. Usage and Operation | 13 |
| 4.1 Color screen wire controller interface introduction | 13 |
| 4.2 Color screen wire controller function introduction | 14 |
| 4.3 Parameter list and breakdown table | 21 |
| 4.4 Interface drawin | 23 |
| 5. Maintenance and Inspection | 25 |
| 6. Appendix | 26 |
| 6.1 Caution & Warning | 26 |
| 6.2 Cable specification | 27 |

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 recommended 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 or indoors.

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 color screen wire controller. Remote controller can be chosen as future option.

2.SPECIFICATION

2.1 Performance data of Swimming Pool Heat Pump Unit

*** REFRIGERANT : R32

| UNIT | | CH-HP050LTIRK | CH-HP050LTIRM |
|--------------------------------|-------------------|------------------------------|---------------|
| Heating capacity (27/24.3℃) | kW | 6.249-21.29 | 6.338-21.13 |
| | Btu/h | 21246-72386 | 21549-71842 |
| Heating Power Input | kW | 0.400-2.925 | 0.429-2.795 |
| COP | | 15.61-7.280 | 14.77-7.560 |
| Heating capacity (15/12℃) | kW | 4.471-16.32 | 4.468-16.31 |
| | Btu/h | 15201-55488 | 15191-55454 |
| Heating Power Input | kW | 0.6770-3.029 | 0.627-2.939 |
| COP | | 7.000-5.390 | 7.410-5.550 |
| Power Supply | | 220-240V~/50Hz | 380V/3N~/50Hz |
| Compressor Quantity | | 1 | 1 |
| Compressor | | rotary | rotary |
| Fan Number | | 1 | 1 |
| Noise | dB(A) | 48-57 | 50-57 |
| Water Connection | mm | 50 | 50 |
| Water Flow Volume | m ³ /h | 9.0 | 9.0 |
| Water Pressure Drop(max) | kPa | 16 | 16 |
| 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℃

Operating range:

Ambient temperature:-15—43℃

Water temperature:9-40℃

2.SPECIFICATION

2.1 Performance data of Swimming Pool Heat Pump Unit

*** REFRIGERANT : R32

| UNIT | | CH-HP060LTIRK | CH-HP060LTIRM |
|--------------------------------|-------------------|------------------------------|---------------|
| Heating capacity (27/24.3℃) | kW | 5.601~24.88 | 5.486~24.26 |
| | Btu/h | 19043-84592 | 18652-82484 |
| Heating Power Input | kW | 0.368~3.891 | 0.387~3.697 |
| COP | | 15.20~6.390 | 14.19~6.560 |
| Heating capacity (15/12℃) | kW | 4.384~18.66 | 4.049~18.79 |
| | Btu/h | 14905-63444 | 13766-63886 |
| Heating Power Input | kW | 0.559~3.852 | 0.570~3.716 |
| COP | | 7.840~4.840 | 7.100~5.060 |
| Power Supply | | 220-240V~/50Hz | 380V/3N~/50Hz |
| Compressor Quantity | | 1 | 1 |
| Compressor | | rotary | rotary |
| Fan Number | | 1 | 1 |
| Noise | dB(A) | 50-57 | 50-58 |
| Water Connection | mm | 50 | 50 |
| Water Flow Volume | m ³ /h | 9.0 | 9.0 |
| Water Pressure Drop(max) | kPa | 16 | 16 |
| 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℃

Operating range:

Ambient temperature:-15—43℃

Water temperature:9-40℃

2.SPECIFICATION

2.1 Performance data of Swimming Pool Heat Pump Unit

*** REFRIGERANT : R32

| | | |
|--------------------------------|-------------------|------------------------------|
| UNIT | | CH-HP070LTIRM |
| Heating capacity (27/24.3℃) | kW | 8.873~31.21 |
| | Btu/h | 30168-106114 |
| Heating Power Input | kW | 0.567~5.081 |
| COP | | 15.65~6.14 |
| Heating capacity (15/12℃) | kW | 6.550~23.60 |
| | Btu/h | 22270-80240 |
| Heating Power Input | kW | 0.796~4.732 |
| COP | | 8.230~4.990 |
| Power Supply | | 380V/3N~/50Hz |
| Compressor Quantity | | 1 |
| Compressor | | rotary |
| Fan Number | | 1 |
| Noise | dB(A) | 50-59 |
| Water Connection | mm | 50 |
| Water Flow Volume | m ³ /h | 12.0 |
| Water Pressure Drop(max) | kPa | 23 |
| 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℃

Operating range:

Ambient temperature:-15—43℃

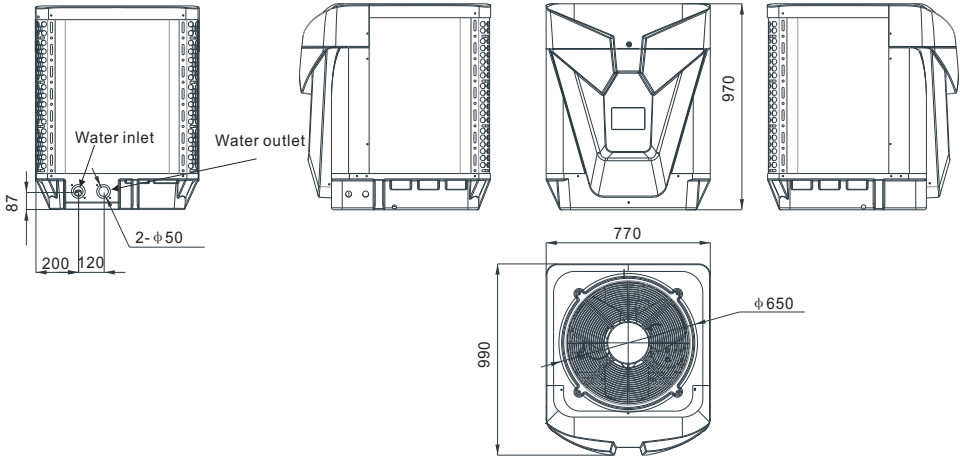
Water temperature:9-40℃

2.SPECIFICATION

2.2 The dimensions for Swimming Pool Heat Pump Unit

CH-HP050LTIRK / CH-HP050LTIRM
CH-HP060LTIRK / CH-HP060LTIRM

unit: mm

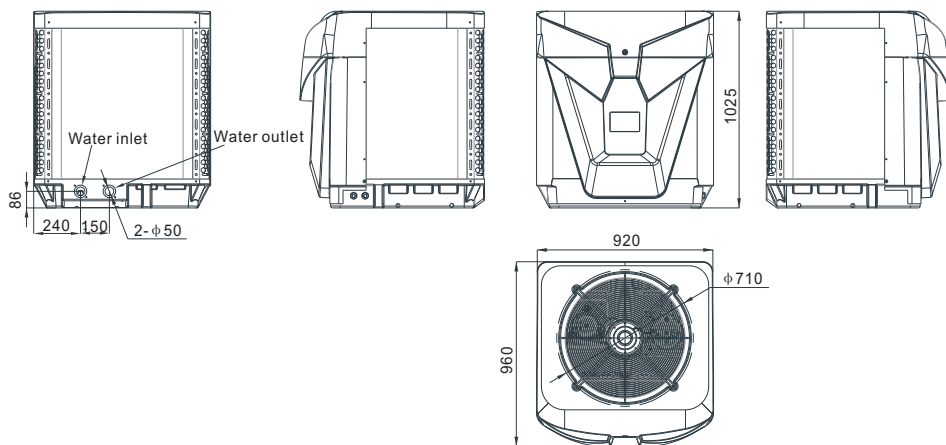


2.SPECIFICATION

2.2 The dimensions for Swimming Pool Heat Pump Unit

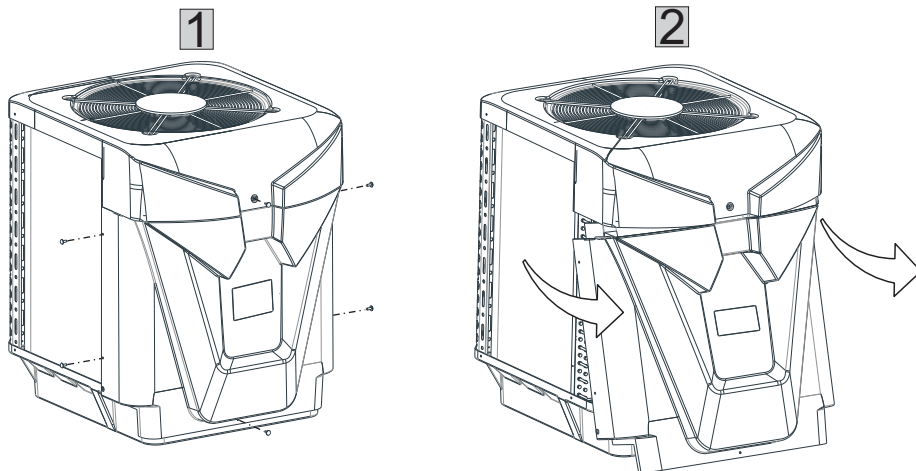
CH-HP070LTIRM

unit: mm

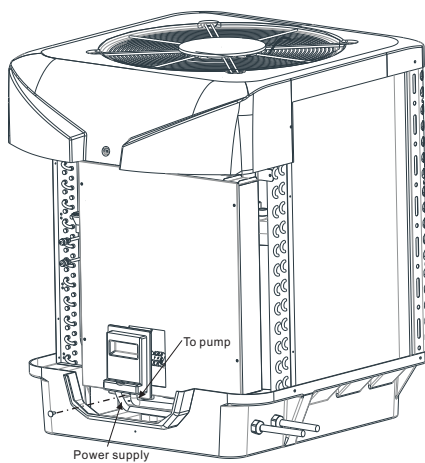


2.SPECIFICATION

2.3How to disassemble the units.

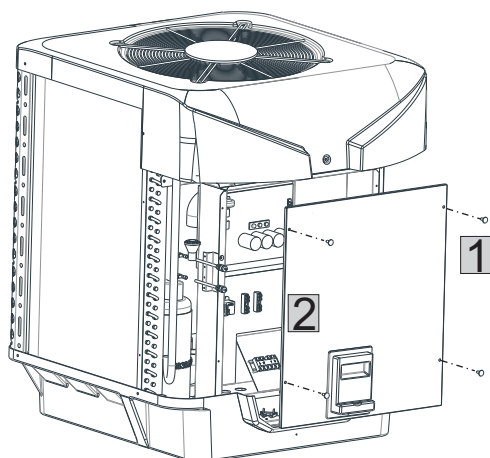


2.4 How the power cord go



2.SPECIFICATION

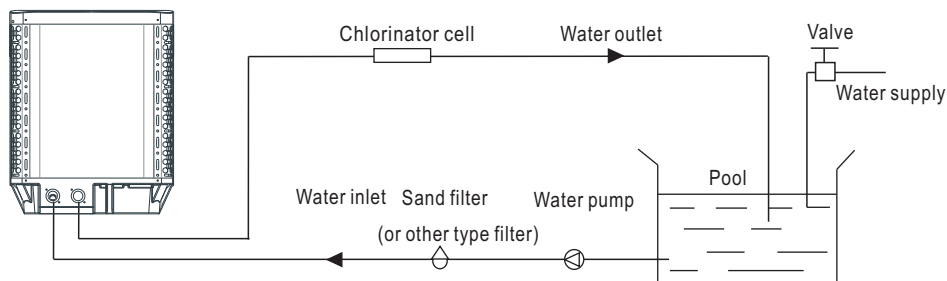
2.5 How to replace the wire controller



Notes: Touch display installation for magnetic adsorption, can be directly removed

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

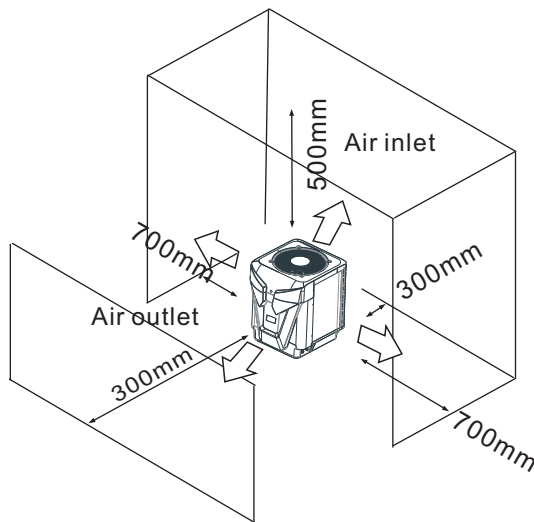
The unit will perform well in any outdoor location provided that the following three factors are presented:

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 to 15 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, (2000 BTU) for every 5 °C 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.INSTALLATION AND CONNECTION

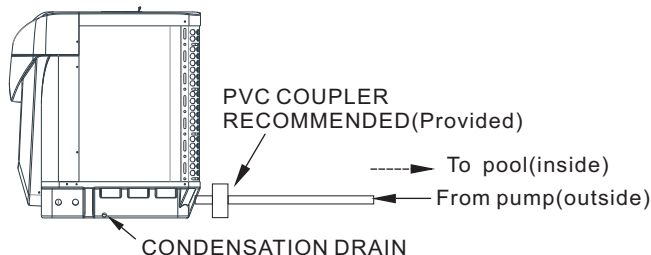
3.4 Swimming Pool Heat Pumps Plumbing

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 32mm or 50 mm PVC pipe for connection to the pool or spa filtration piping. By using a 50 NB to 40NB you can plumb 40NB

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°C, 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 there 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 °C)
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°Cbelow 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.USAGE AND OPERATION

4.1 Color screen wire controller interface introduction

(1) Main interface



(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 |
| ④ | Fault display | Click to view fault history |
| ⑤ | Silent setting | Click to turn on/off silent function and to set timingLow speed function. |
| ⑥ | MODE | Click to enter the mode switch interface |
| ⑦ | Temp. 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" |

4.USAGE AND OPERATION

4.2 Color screen wire controller function introduction

(1) Booting and shutdown

As shown in figure 1.1:

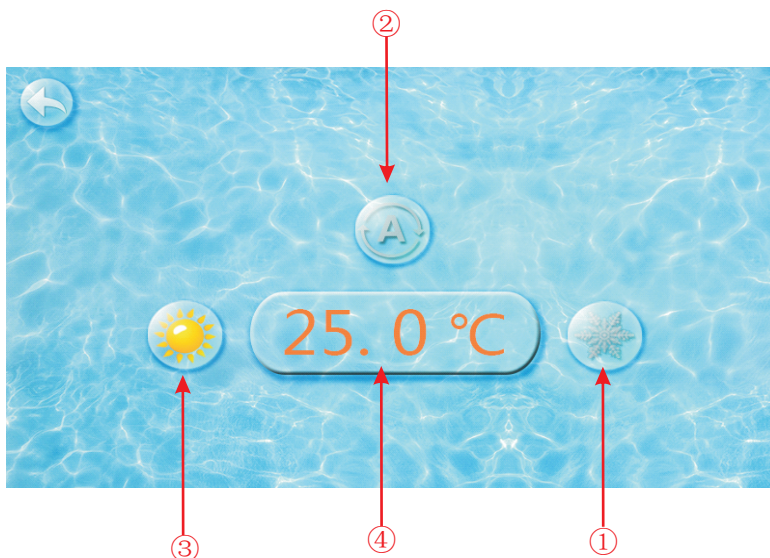
In shutdown status, press ① then the unit will be booted

In booting status, press ① then the unit will be shut down.

(2) Mode switch and target temperature Setting

2-1 Mode switch

In the main screen, 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.

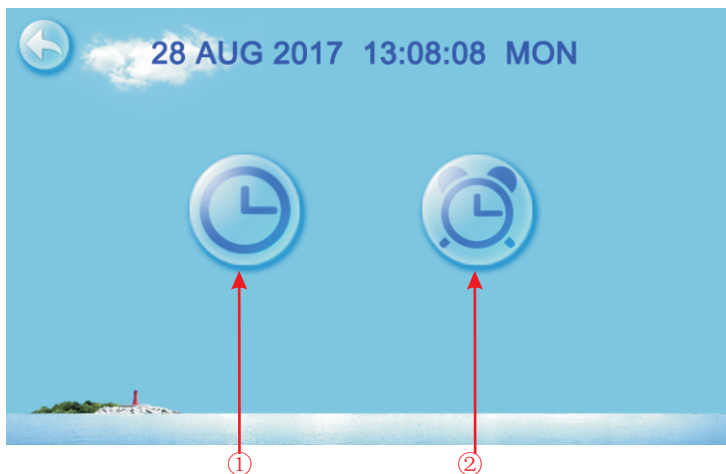
2-2Target temp setting

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

4.USAGE AND OPERATION

(3) Clock setting

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



3-1The 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.

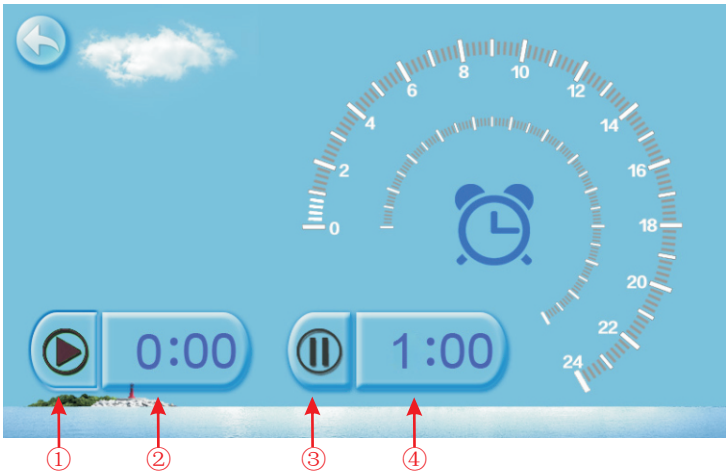
For example: setup time: the 30-11-2016 16:00:00, input 30 11 16 16 00 00 , the time change then click confirm button.

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

4.USAGE AND OPERATION

3-2 The operation of timing setting

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



| NO. | Name | Button color | Button function |
|-----|---------------------|---------------------------|---|
| ① | Timing start button | Start: green End: gray | Click this button to start or end timing start setting function |
| ② | Timing on setting | | Click to set start time of the timing |
| ③ | Timing end button | Open: red End: gray | Click this button to start or end 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

4.USAGE AND OPERATION

(4) Silent setting and silent timing setting

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



4-1The silent button

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

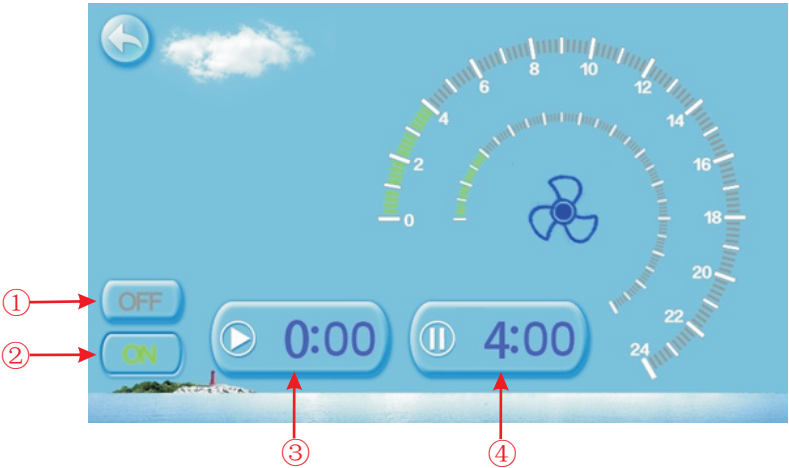


Click the silent button ① again, to exit the silent mode.

4.USAGE AND OPERATION

4-2Timing silent function setting

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



| NO. | Name | Colur | Function |
|-----|--------------------------|--------------------------|---|
| ① | Timing silent off | Used: red Unused:gray | Click to use or unuse timing off function |
| ② | Timing silent on | Use:green Unused:gray | Click to use or unuse 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 |

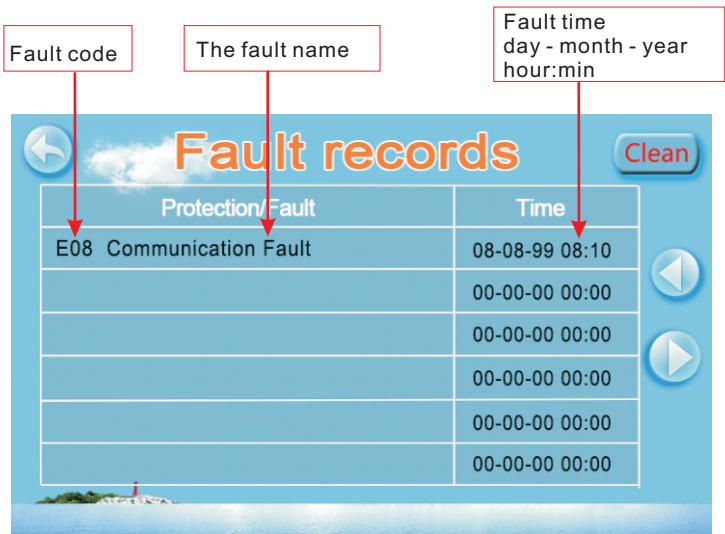
Start time and end time setting value must be among the range of 0:00-23:00,and setting value can be precise to hour digit.

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 unuse the timing silent, but if the unit is in timing silent mode, it will exit silent timing immediately.

4.USAGE AND OPERATION

(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

failurerecord, 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.

(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.

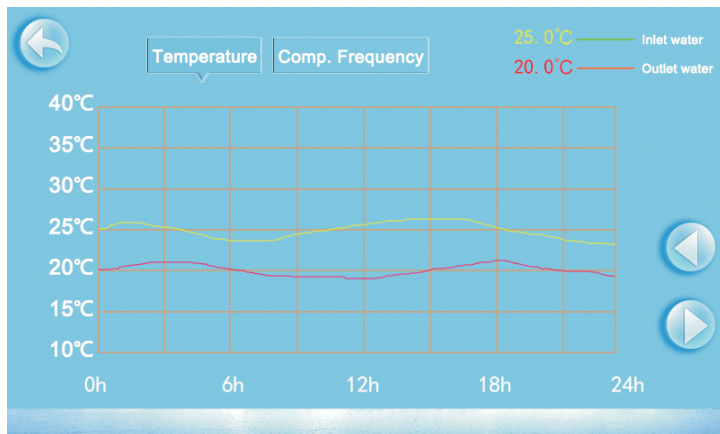
Remark: the wire controller can display the temperature unit as "°F" or "°C" according to the unit model you bought.

4.USAGE AND OPERATION

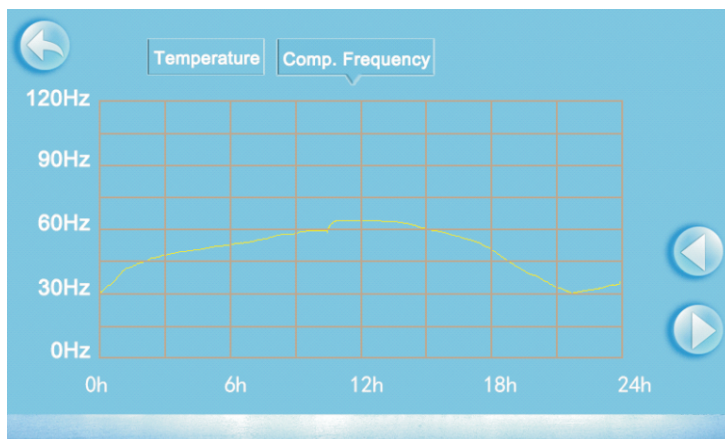
(7) Temperature curve

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

6-1 Temperature recording curve is as follows:



7-2 Comp.Frequency curve



Temperature curve automatically updates every one 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 not be saved;

4.USAGE AND OPERATION

4.3 Parameter list and breakdown table

(1) Electronic control fault table

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

| Protect/fault | Fault display | Reason | Elimination methods |
|--------------------------------|---------------|--|--|
| Standby | Non | | |
| Normal boot | Non | | |
| 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 |
| Coil Temp. Sensor Fault | P05 | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| Suction Temp. Sensor Fault | P07 | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| Discharge Temp. Sensor Fault | P081 | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| High Pressure Prot. | E01 | The high-pressure switch is broken | Check the pressure switch and cold circuit |
| Low Pressure Prot. | E02 | Low pressure1 protection | 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 |
| Anti-freezing Prot | E07 | Water flow is not enough | Check the pipe water flow and whether water system is jammed or not |
| Primary Anti-freezing Prot. | E19 | The ambient temp. Is low | |
| Secondary Anti-freezing Prot. | E29 | The ambient temp. Is low | |
| Inlet and outlet temp. too big | E06 | Water flow is not enough and low differential pressure | Check the pipe water flow and whether water system is jammed or not |
| Low temperature protection | Non | The environment temp. is low | |
| Comp. Overcurrent Prot. | E051 | The compressor is overload | Check whether the system of the compressor running normally |
| Exhaust Air over Temp Prot. | P082 | The compressor is overload | Check whether the system of the compressor running normally |
| Communication Fault | E08 | Communication failure between wire controller and mainboard | Check the wire connection between remote wire controller and main board |
| Antifreeze Temp. Sensor Fault | P09 | Antifreeze temp sensor is broken or short circuited | check and replace this temp sensor |
| Waterway Anti-freezing Prot. | E05 | Water temp.or ambient temp. is too low | |
| 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 |
| Pressure sensor Fault | PP | The pressure Sensor is broken | Check or change the pressure Sensor or pressure |
| Fan Motor1 Fault | F031 | 1. Motor is in locked-rotor state 2.The wire connection between DC-fan motor module and fan motor is in bad contact | 1.Change a new fan motor 2.Check the wire connection and make sure they are in good contact |
| Low AT Protection | TP | Ambient temp is too low | |

4.USAGE AND OPERATION

| | | | |
|--|------|--|--|
| Fan Motor2 Fault | F032 | 1. Motor is in locked-rotor state 2.The wire connection between DC-fan motor module and fan motor is in bad contact | 1.Change a new fan motor 2.Check the wire connection and make sure they are in good contact |
| Communication Fault (speed control module) | E081 | Speed control module and main board communication fail | Check the communication connection |

Frequency conversion board fault table:

| Protection/fault | Fault display | Reason | Elimination methods |
|------------------------------|---------------|--|--|
| Drv1 MOP alarm | F01 | MOP drive alarm | Recovery after the 150s |
| Inverter offline | F02 | Frequency conversion board and main board communication failure | Check the communication connection |
| IPM protection | F03 | IPM modular protection | Recovery after the 150s |
| Comp. Driver Failure | F04 | Lack of phase, step or drive hardware damag | Check the measuring voltage check requency conversion board hardware |
| DC Fan Fault | F05 | Motor current feedback open circuit or short circuit | Check whether current return wires connected motor |
| IPM Overcurrent | F06 | IPM Input current is large | Check and adjust the current measurement |
| Inv. DC Overvoltage | F07 | DC bus voltage>Dc bus over-voltage protection value | Check the input voltage measurement |
| Inv. DC Lessvoltage | F08 | DC bus voltage<Dc bus over-voltage protection value | Check the input voltage measurement |
| Inv. Input Lessvolt. | F09 | The input voltage is low, causing the input current is high | Check the input voltage measurement |
| Inv. Input Overvolt. | F10 | The input voltage is too high, more than outage protection current RMS | Check the input voltage measurement |
| Inv. Sampling Volt. | F11 | The input voltage sampling fault | Check and adjust the current measurement |
| Comm. Err DSP-PFC | F12 | DSP and PFC connect fault | Check the communication connection |
| Input Over Cur. | F26 | The equipment load is too large | |
| PFC fault | F27 | The PFC circuit protection | Check the PFC switch tube short circuit or not |
| IPM Over heating | F15 | The IPM module is overheat | Check and adjust the current measurement |
| Weak Magnetic Warn | F16 | Compressor magnetic force is not enough | |
| Inv. Input Out Phase | F17 | The input voltage lost phase | Check and measure the voltage adjustment |
| IPM Sampling Cur. | F18 | IPM sampling electricity is fault | Check and adjust the current measurement |
| Inv. Temp. Probe Fail | F19 | Sensor is short circuit or open circuit | Inspect and replace the sensor |
| Inverter Overheating | F20 | The transducer is overheat | Check and adjust the current measurement |
| Inv. Overheating Warn | F22 | Transducer temperature is too high | Check and adjust the current measurement |
| Comp. OverCur. Warn | F23 | Compressor electricity is large | The compressor over-current protection |
| Input Over Cur. Warn | F24 | Input current is too large | Check and adjust the current measurement |
| EEPROM Error Warn | F25 | MCU error | Check whether the chip is damaged Replace the chip |
| V15V over/undervoltage fault | F28 | The V15V is overload or undervoltage | Check the V15V input voltage in range 13.5v~16.5v or not |

4.USAGE AND OPERATION

(2) Parameter list

| Meaning | Default | Remarks |
|--|---------|------------|
| Refrigeration target temperature set point | 27°C | Adjustable |
| Heating the target temperature set point | 27°C | Adjustable |
| Automatic target temperature set point | 27°C | Adjustable |

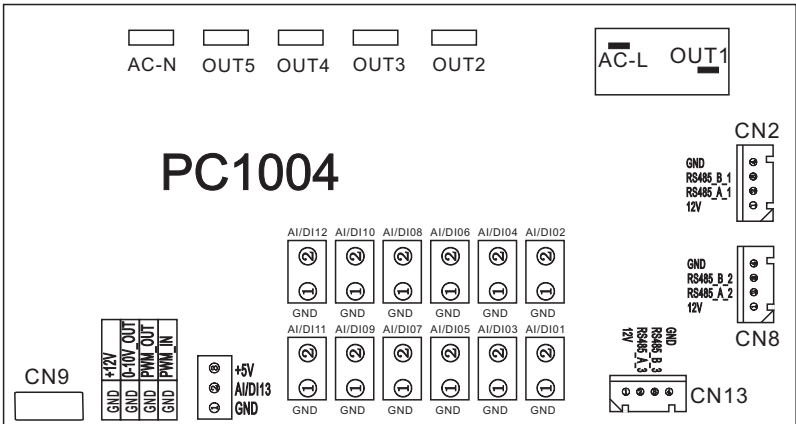
4.4 Interface drawin

(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 -) |

| |
|---|
| V |
| R |
| T |
| A |
| B |
| G |

(2) Controller interface diagram and definition



4.USAGE AND OPERATION

Main board of the input and output interface instructions below

| Number | Sign | Meaning |
|--------|-----------|---|
| 01 | OUT1 | Compressor (output 220-230VAC) |
| 02 | OUT2 | Water pump (output 220-230VAC) |
| 03 | OUT3 | 4-way valve (output 220-230VAC) |
| 04 | OUT4 | High speed of fan (output 220-230VAC) |
| 05 | OUT5 | Low speed of fan (output 220-230VAC) |
| 06 | AC-L | Live wire (input 220-230VAC) |
| 07 | AC-N | Neutral wire (input 220-230VAC) |
| 08 | AI/DI01 | Emergency switch (input) |
| 09 | AI/DI02 | Water flow switch (input) |
| 10 | AI/DI03 | System low pressure (input) |
| 11 | AI/DI04 | System high pressure (input) |
| 12 | AI/DI05 | System suction temperature (input) |
| 13 | AI/DI06 | Water input temperature (input) |
| 14 | AI/DI07 | Water output temperature (input) |
| 15 | AI/DI08 | System fan coil temperature (input) |
| 16 | AI/DI09 | Ambient temperature (input) |
| 17 | AI/DI10 | Mode switch (input) |
| 18 | AI/DI11 | Master-slave machine switch / Antifreeze temperature (input) |
| 19 | AI12(50K) | System Exhaust temperature (input) |
| 20 | 0_5V_IN | Compressor current detection/Pressure sensor(input) |
| 21 | PWM_IN | Master-slave machine switch / Feedback signal of EC fan (input) |
| 22 | PWM_OUT | AC fan control (output) |
| 23 | 0_10V_OUT | EC fan control (output) |
| 24 | +5V | +5V (output) |
| 25 | +12V | +12V (output) |
| 26 | GND | Frequency conversion board communications |
| 27 | 485_B1 | |
| 28 | 485_A1 | |
| 29 | 12V | |
| 30 | GND | Color line controller communication |
| 31 | 485_B2 | |
| 32 | 485_A2 | |
| 33 | 12V | |
| 34 | CN9 | Electronic expansion valve |
| 35 | GND | The port for centralized control system |
| 36 | 485_B3 | |
| 37 | 485_A3 | |
| 38 | 12V | |
| 39 | FUSE | T5AL250V |

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 or 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 and 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°C.
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.APPENDIX

6.2 Cable specification

(1) Single phase unit

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

