

SWIMMING POOL HEAT PUMP UNIT

Installation & Instruction Manual

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	3
2.3 How to disassemble the units	5
2.4 How the power cord go	5
3. Installation and Connection	6
3.1 Installation illustration	6
3.2 Swimming Pool Heat Pumps Location	7
3.3 How Close to Your Pool	7
3.4 Swimming Pool Heat Pumps Plumbing	8
3.5 Swimming Pool Heat Pumps Electrical Wiring	9
3.6 Initial Start-up of the Unit	9
4. Usage and Operation	10
4.1 Function of the controller	10
4.2 Usage of the controller	11
4.3 Clock setting	14
4.4 Malfunction Table	16
4.5 Parameter table	18
4.6 Interface drawing	18
5. Maintenance and Inspection	21
6. Appendix	22

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 : R410A

UNIT		PRO110
*Rated Heating Capacity	kW	11.80~32.24
	Btu/h	40,260~110,000
*Rated Heating Power Input	kW	1.14~6.74
	Btu/h	3890~23000
*COP		5.0~10.4
**Rated Heating Capacity	kW	10.75~31.00
	Btu/h	36680~105800
**Rated Heating Power Input	kW	1.12~6.60
	Btu/h	3820~22520
**COP		4.7~9.6
***Rated Heating Capacity	kW	6.40~16.50
	Btu/h	21830~56300
***Rated Heating Power Input	kW	1.24~4.12
	Btu/h	4230~14060
***COP		4.0~5.2
Power Supply		208-230V/1N~/60Hz
Compressor Quantity		1
Compressor		rotary
Fan Quantity		1
Fan Power Input	W	250
Fan Rotate Speed	rpm	600~700
Fan Direction		vertical
Noise(1m)	dB(A)	53~59
Water Connection	inch	1.9
Water Flow Volume	gal/m	47.6(24.2~70.4)
Heating Operating Water Temperature	°F	48.2~104
Cooling Operating Water Temperature	°F	48.2~86
Operating Water Pressure	PSIG	14.5~145
Water Pressure Drop	PSIG	2.36
Unit Net Dimensions(L/W/H)	inch	See the drawing of the units
Unit Ship Dimensions(L/W/H)	inch	See package lable
Net Weight	lb.	See nameplate
Shipping Weight	lb.	See package label

Rated Heating: *Outdoor air temp:80°F Ambient Air, 80°F Water,80% Relative Humidity

**Outdoor air temp:80°F Ambient Air, 80°F Water,63% Relative Humidity

***Outdoor air temp:50°F Ambient Air, 80°F Water,63% Relative Humidity

During heating: Running ambient temperature 19°F~109°F

Running water temperature 48.2°F~104°F

2.SPECIFICATION

2.1 Performance data of Swimming Pool Heat Pump Unit

*** REFRIGERANT : R410A

UNIT		PRO140
*Rated Heating Capacity	kW	16.85~41.00
	Btu/h	57,490~140,000
*Rated Heating Power Input	kW	1.74~8.20
	Btu/h	5940~27980
*COP		5.0~9.7
**Rated Heating Capacity	kW	15.30~38.40
	Btu/h	52200~131000
**Rated Heating Power Input	kW	1.59~8.00
	Btu/h	5430~27300
**COP		4.8~9.6
***Rated Heating Capacity	kW	10.40~18.50
	Btu/h	35500~63000
***Rated Heating Power Input	kW	1.86~4.50
	Btu/h	6350~15350
***COP		4.1~5.6
Power Supply		208-230V/1N~/60Hz
Compressor Quantity		1
Compressor		rotary
Fan Quantity		1
Fan Power Input	W	250
Fan Rotate Speed	rpm	700~800
Fan Direction		vertical
Noise(1m)	dB(A)	50~61
Water Connection	inch	1.9
Water Flow Volume	gal/m	59.0(30.8~88.0)
Heating Operating Water Temperature	°F	48.2~104
Cooling Operating Water Temperature	°F	48.2~86
Operating Water Pressure	PSIG	14.5~145
Water Pressure Drop	PSIG	3.41
Unit Net Dimensions(L/W/H)	inch	See the drawing of the units
Unit Ship Dimensions(L/W/H)	inch	See package lable
Net Weight	lb.	See nameplate
Shipping Weight	lb.	See package label

Rated Heating: *Outdoor air temp:80°F Ambient Air, 80°F Water,80% Relative Humidity

**Outdoor air temp:80°F Ambient Air, 80°F Water,63% Relative Humidity

***Outdoor air temp:50°F Ambient Air, 80°F Water,63% Relative Humidity

During heating: Running ambient temperature 19°F~109°F

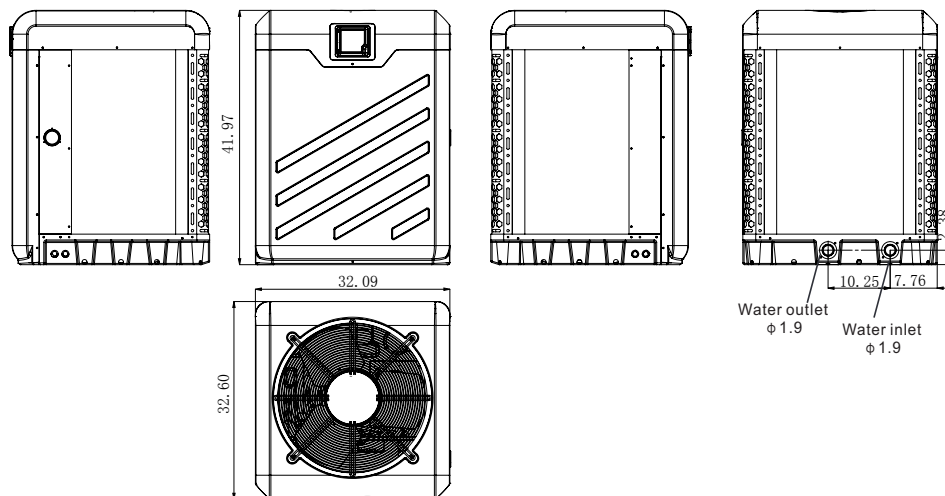
Running water temperature 48.2°F~104°F

2.SPECIFICATION

2.2 The dimensions for Swimming Pool Heat Pump Unit

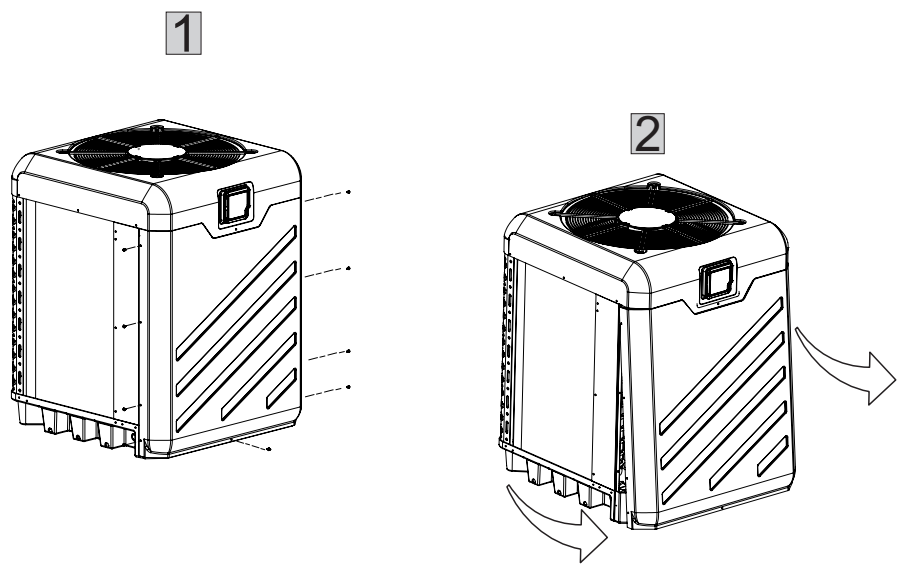
Model: PR0110/PR0140

Unit: inch

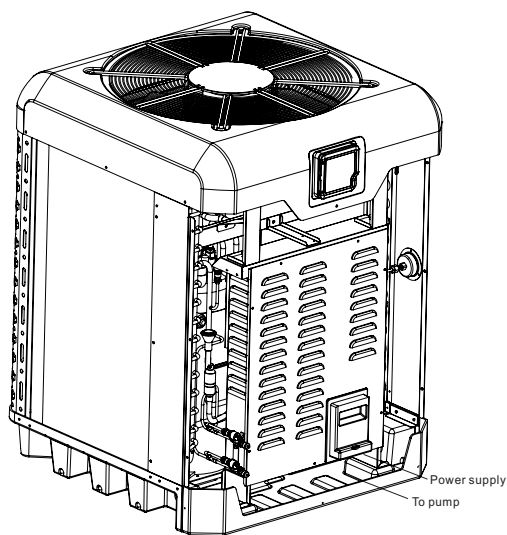


2.SPECIFICATION

2.3How to disassemble the units.

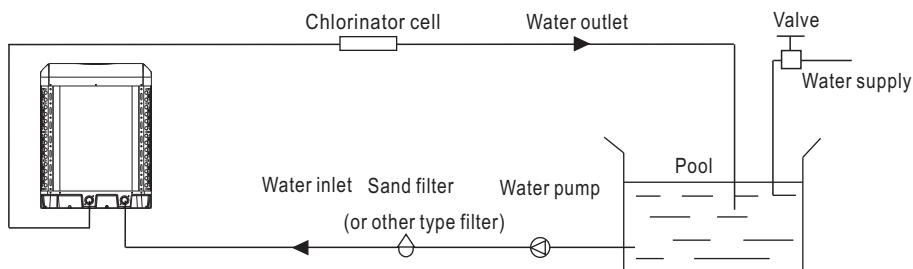


2.4 How the power cord go



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

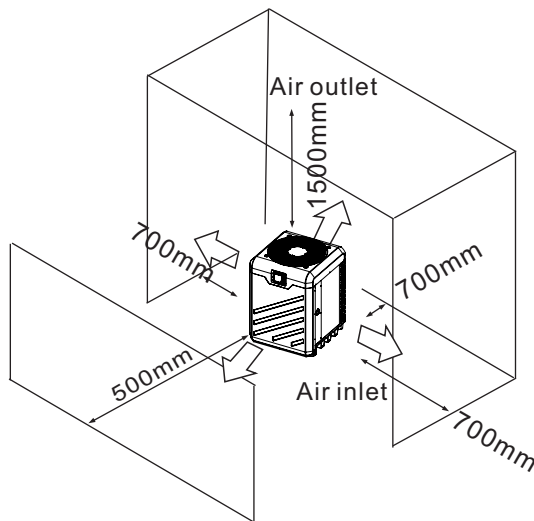
The unit will perform well in any outdoor location provided that the following three factors are presented:

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

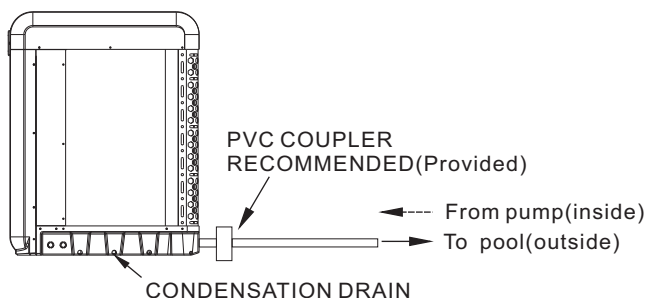
3.4 Swimming Pool Heat Pumps Plumbing

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.

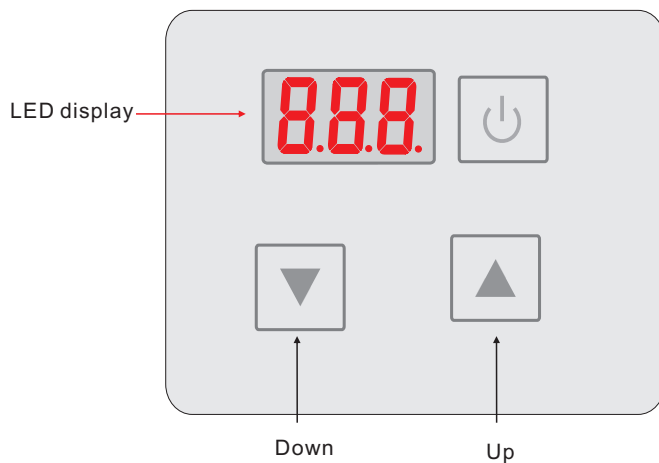
Start up Procedure - After installation is completed, you should follow these steps:




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

1. Function of the controller

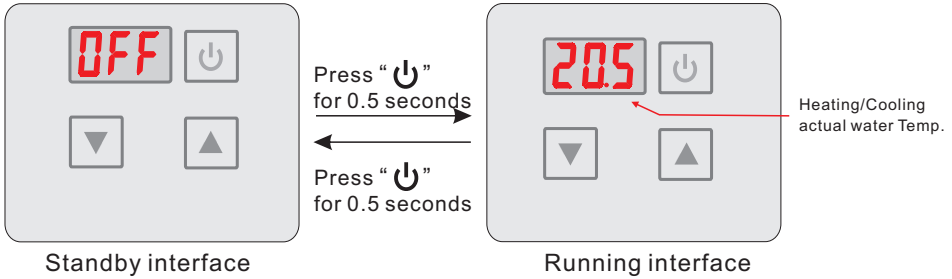




Key	Key name	Key function
	ON/OFF	Press this key to turn on/off the unit.
	Up	Press this key to select the upward option or increase the parameter value.
	Down	Press this key to select the downward option or decrease the parameter value.

4.Usage and Operation

2.Usage of the controller

2.1 Turn ON/OFF the unit

When the unit is off, press the key “

The diagram illustrates the process of turning the unit on. On the left, the 'Standby interface' shows a red LED display with 'OFF' and a power button icon. An arrow labeled 'Press “

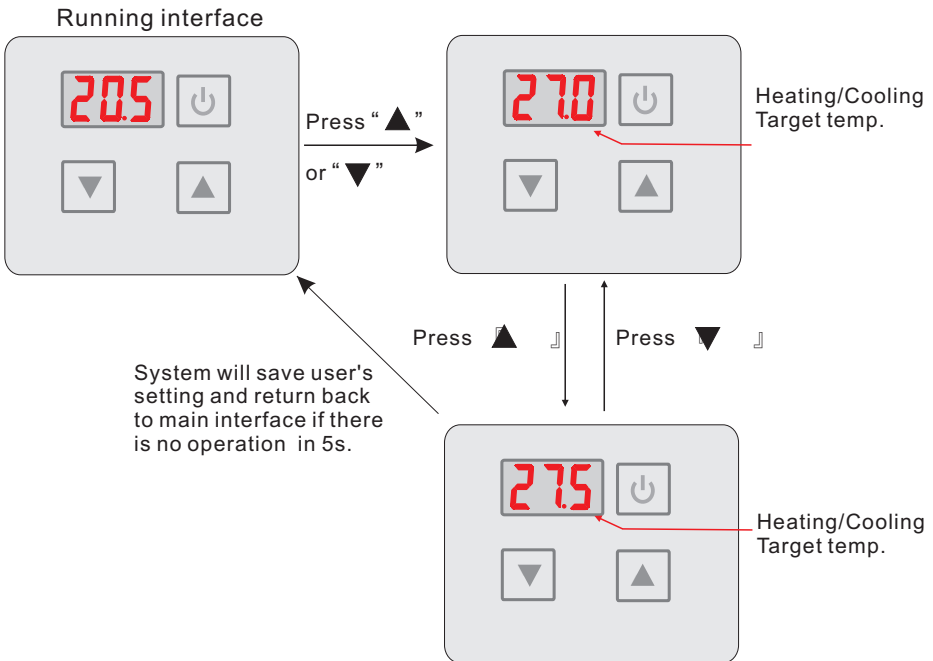
2.2 Setting temperature

In the running interface, press “

Press “

Attention : If there is no operation for 5 seconds, system will memorize parameter setting and back to the main interface.

For example :



4.Usage and Operation

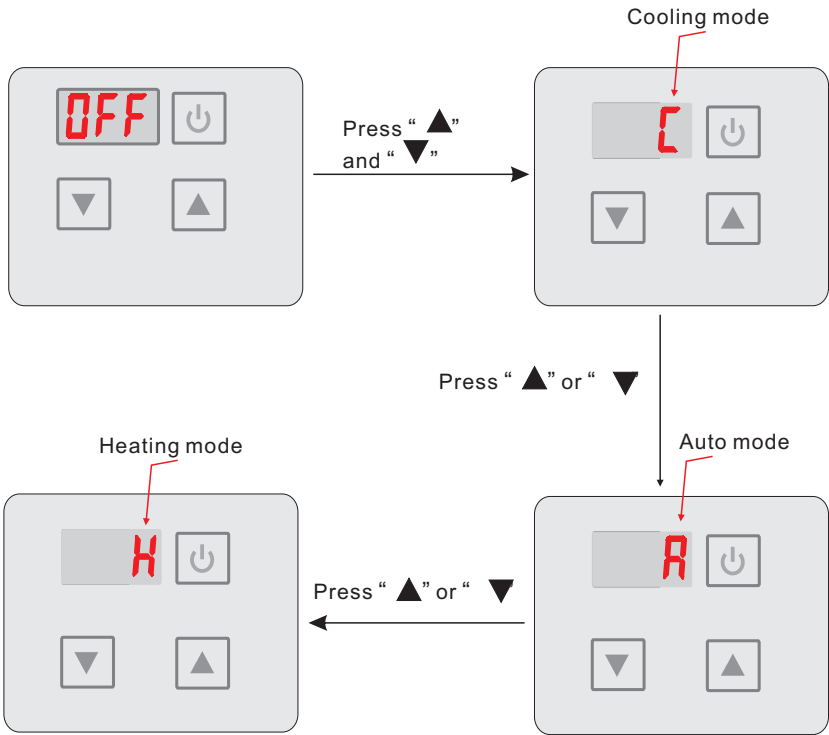
Remark:

Operation	Short press, long press “▲” or “▼” to change each time within 2s	Long press “▲” or “▼” for more than 2s to change each time
Range of temp. Variation	0. 1℃/°F	1℃/°F

2.3 Mode switch

In the main interface, press “▲” and “▼” for 0.5 seconds can set the mode, press “▲” or “▼” to change the current mode, you can switch different modes of cooling, heating and auto mode.

If there is no operation for 5 seconds system will memorize the current mode and back to the main interface, if press “⏻” the change will not be saved and return to the main interface. The modes switching is useless of the unit you buy is single-cold / single-heat unit.



2.4 Keyboard lock

To avoid mis-operations, please lock the controller after completing the setting.

At the main interface, pressing “⏻” for 5 seconds, and at the same time the wire controller will buzz for 1s, the screen is locked.

When the keyboard is locked, pressing “⏻” for 5 seconds, and at the same time the wire controller will buzz for 1s, the screen is unlocked.

NOTES: When the unit is in alarming state, the screen will be unlocked automatically.

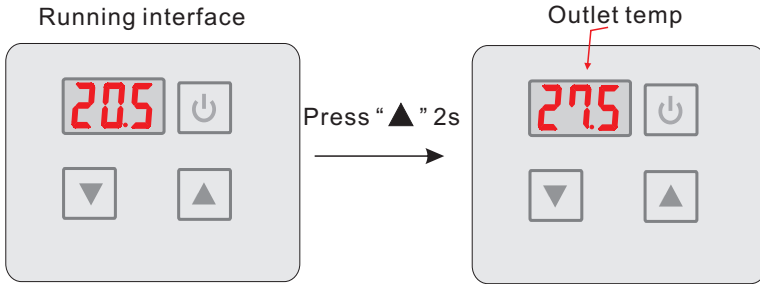
4.Usage and Operation

2.5 Outlet water temperature

In the main interface, press “▲” for 2 seconds can check the outlet water temperature, and at the same time the wire controller will buzz for 1s and the outlet water temperature will flickering display .

If there is no operation for 10s or press “⏻” system will back to the main interface.

For example :

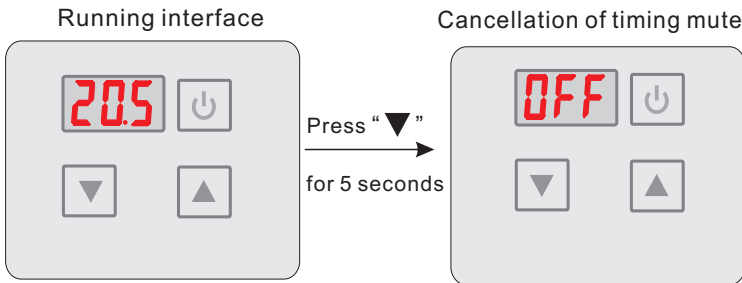


2.6 One-click Mute

In the main interface, press “▼” for 5 seconds can change the current mode, if the digital display “ON” , it means the One-click mute has been set, if the digital display “OFF” ,it means cancellation of One-click mute.

If there is no operation for 5 seconds system will save the current mode and back to the main interface.

For example :



2.7 Malfunction display

There will be malfunction code showing on the controller screen when relative malfunction occurs.

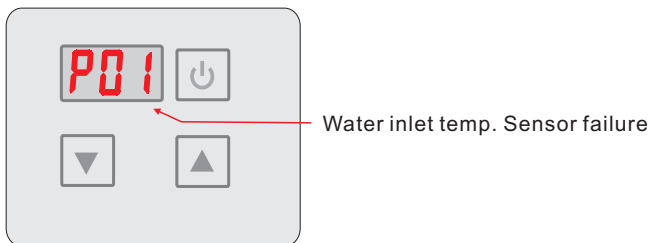
If there are more than one malfunction occurs at the same time, you can check the current error codes list by pressing “▲” or “▼” key.

In the main interface, if there is no operation for 10seconds, it will return to the malfunction display.

You can refer to the malfunction table to find out the failure cause and solution.

4.Usage and Operation

For example :



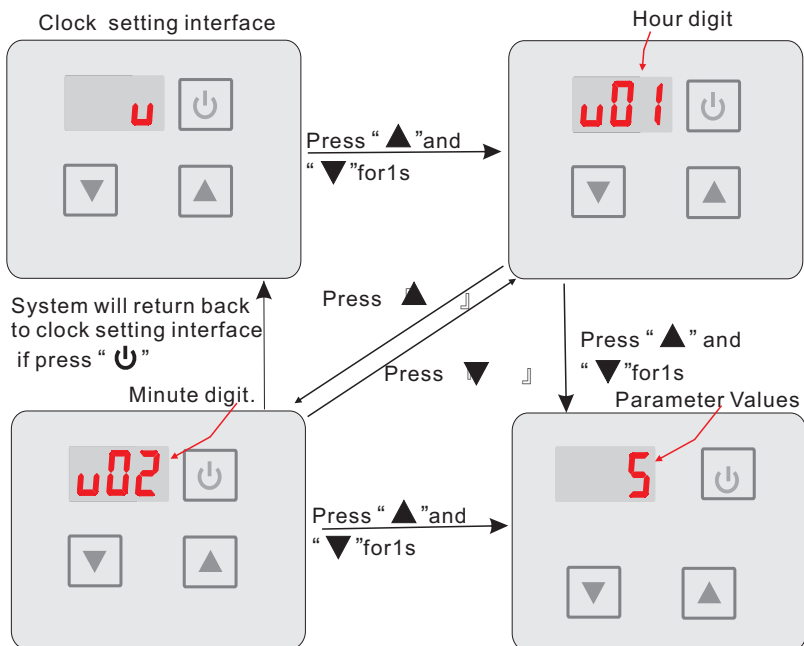
3. Clock setting

In the main interface, keep long press of “▲” and “▼” for 10s for entering password setting interface, press “▲” or “▼” to change the password, choice password “022” and waiting for 2 seconds, it will enter user setting interface. (Password:022,unchangeable)

In the user setting interface, short press “▲” or “▼” can select Parameter Groups “v”, keep long press of “▲” and “▼” for 1 second entering clock setting interface.

3.1 System time setting

In the clock setting interface,press “▲” or “▼” can choose the time parameter.

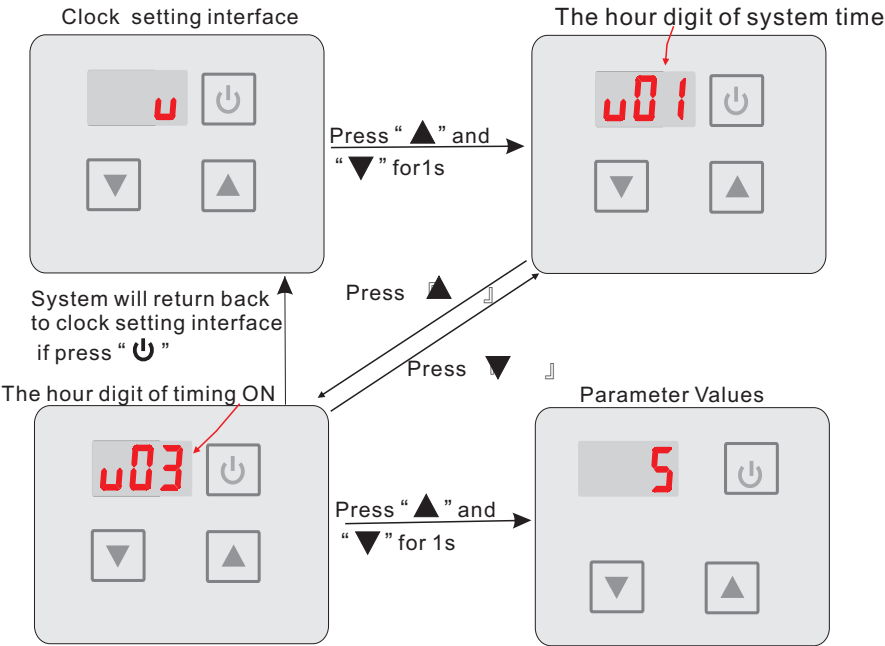


In the parameter value interface, press “▲” or “▼” for changing hour digit and minute digit, if there is no operation for 5s, the system will memorize parameter setting, and return to parameter value setting interface.

4.Usage and Operation

3.2 Setting and cancellation of timing ON and OFF

In the clock setting interface,press “▲” or “▼” can choose the timing parameter.



In the hour digit of timing ON interface,short press “▲” or “▼” to circularly display among timing v03,v04,v05,v06,v07 and v08,and press “▲” and “▼” enter the parameter value interface, press “▲” or “▼” for changing the number, if there is no operation for 5s, the system will memorize parameter setting, and return to parameter value setting interface.

3.3 Time parameter table

Display	Time Parameter	Meaning
V01	The hour digit of system time	
V02	The minute digit of system time	
V03	The hour digit of timing ON	
V04	The minute digit of timing ON	
V05	The hour digit of timing OFF	
V06	The minute digit of timing OFF	
V07	Timing ON setting	1 represent saving timing ON setting, 0 represent cancelling timing ON setting.
V08	Timing OFF setting	1 represent saving timing OFF setting, 0 represent cancelling timing OFF setting.

4.Usage and Operation

4. Malfunction Table

The common failure cause and solution.

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
Ambient Temp. Sensor Fault	P04	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Coil 1 Temp. Sensor Fault	P05	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Coil 2 Temp. Sensor Fault	P15	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
Exhaust Temp. Sensor Fault	P81	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Exhaust Air Over-Temp Prot.	P82	The compressor is overload	Check whether the compressor running normally
Antifreeze Temp. Sensor Fault	P09	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Pressure Sensor Fault	PP	The pressure sensor is broken	Check or change the pressure sensor or pressure
High Pressure Prot.	E01	The high-pressure switch is broken	Check the pressure switch and cold circuit
Low Pressure Prot.	E02	The low-pressure switch is broken	Check the pressure switch and cold circuit
Flow Switch Prot.	E03	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Waterway Anti-freezing Prot.	E05	No water/little water in water system	Check the pipe water flow and water pump
Excess Water In/Out 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
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	Check whether the ambient temp. is low or not
Secondary Anti-freezing Prot.	E29	The ambient temp. is low	Check whether the ambient temp. is low or not
Comp. Overcurrent Prot.	E51	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
Comm. Fault(Mainboard-DC Fan)	E81	Speed control module and main board communication fail	Check the communication connection
Low AT Prot.	TP	The ambient temp. is low	Check whether the ambient temp. is low or not
EC fan feedback Fault	F51	There is something wrong with fan motor and fan motor stops running	Check whether fan motor is broken or locked or not
Fan Motor1 Fault	F31	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
Fan Motor2 Fault	F32	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

4.Usage and Operation

Frequency conversion board fault table:

Protect/fault	Fault display	Reason	Elimination methods
Driver MOP Alarm	F01	MOP drive alarm	Recovery after the 150s
Inverter Board 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 damage	Check the measuring voltage check frequency conversion board hardware
DC Fan Fault	F05	Motor current feedback open circuit or short circuit	Check the input voltage measurement
IPM Input Overcurrent Prot.	F06	IPM input current is too large	Check and adjust the current measurement
Inv. DC Over-volt.	F07	DC bus voltage>Dc bus Overload-voltage protection value	Check the input voltage measurement
Inv. DC Under-volt.	F08	DC bus voltage<Dc bus Underload-voltage protection value	Check the input voltage measurement
Inv. Input Under-volt.	F09	The input voltage is low, causing the input current is low	Check the input voltage measurement
Inv. Input Over-volt.	F10	The input voltage is too high, more than outage protection current RMS	Check the input voltage measurement
Inv. Sampling Volt. Fault	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	Check the input current of the unit whether is bigger than the rate current
PFC fault	F27	The PFC circuit protection	Check the PFC switch tube short circuit or not
IPM Superheat Prot.	F15	The IPM module is overheat	Check and adjust the current measurement
Weak Magnetic Warn	F16	Compressor magnetic force is not enough	Restart the unit after multiple power failures, if the fault still exists, replace the compressor
Inv. Input Out of Phase	F17	The input voltage lost phase	Check and measure the voltage adjustment
IPM Sampling Current Fault	F18	IPM sampling electricity is fault	Check and adjust the current measurement
Inv. Temp. Probe Fault	F19	Sensor is short circuit or open circuit	Inspect and replace the sensor
Inverter Superheat Prot.	F20	The transducer is overheat	Check and adjust the current measurement
Inverter Superheat Warn	F22	Transducer temperature is too high	Check and adjust the current measurement
Comp. Over Cur. Warn	F23	Compressor is too large	Check and adjust the current measurement
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/Under-Volt. Prot.	F28	The V15V is overload or undervoltage	Check the V15V input voltage in range 13.5v~16.5v or not

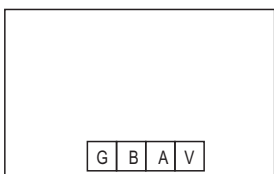
4.Usage and Operation

5. Parameter table

Meaning	Default	Remarks
Set-point of cooling mode target temp.	27℃	Adjustable
Set-point of heating mode target temp.	27℃	Adjustable
Set-point of auto mode target temp.	27℃	Adjustable

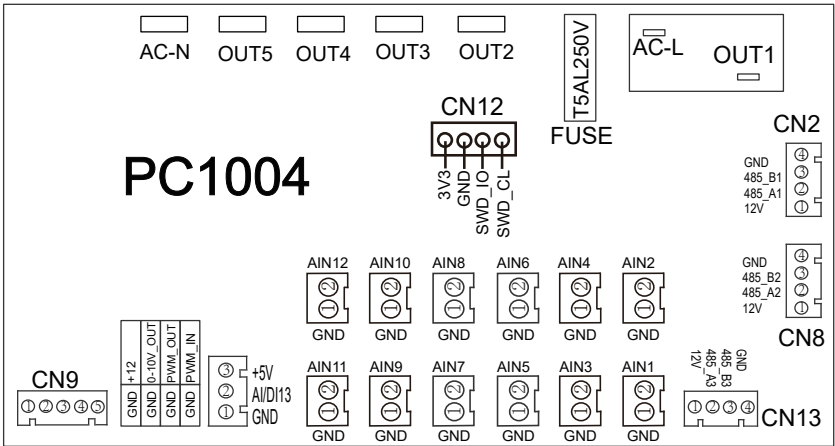
6. Interface drawing

6.1 Wire control interface diagram and definition



Sign	Meaning
V	12V(power+)
A	485A
B	485B
G	GND(power-)

6.2 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
02	OUT2	Water pump
03	OUT3	4-way valve
04	OUT4	High speed of fan
05	OUT5	Low speed of fan
06	AC-L	Live wire
07	AC-N	Neutral wire
08	AIN1	Emergency switch/SW1
09	AIN2	Water flow switch
10	AIN3	System low pressure
11	AIN4	System high pressure
12	AIN5	System suction temperature
13	AIN6	Water input temperature
14	AIN7	Water output temperature
15	AIN8	System fan coil 1 temperature
16	AIN9	Ambient temperature
17	AIN10	Mode switch / System fan coil 2 temperature/SW2
18	AIN11	Master-slave machine switch / Antifreeze temperature
19	AIN12	System exhaust temperature
20	AIN13	Compressor current detection/Pressure sensor
21	PWM_IN	Master-slave machine switch / Feedback signal of EC fan
22	PWM_OUT	AC fan control
23	0_10V_OUT	EC fan control
24	+5V	+5V
25	+12V	+12V
26	CN2	Frequency conversation board communications
27	CN8	WIFI / /3.5 inch color display communication port / DC fan speed control module
28	CN9	Electronic expansion valve
29	CN12	Program port
30	CN13	OMNI centralized control communication port

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.
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.
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 :
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.

