

# **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  |
| 3. Installation and Connection .....                       | 4  |
| 3.1 Installation of System .....                           | 4  |
| 3.2 Swimming Pool Heat Pumps Location .....                | 5  |
| 3.3 How Close to Your Pool? .....                          | 5  |
| 3.4 Swimming Pool Heat Pumps Plumbing .....                | 6  |
| 3.5 Swimming Pool Heat Pumps Electrical Wiring .....       | 7  |
| 3.6 Initial Start-up of the Unit .....                     | 7  |
| 4. Usage and Operation .....                               | 8  |
| 4.1 Function of the controller .....                       | 8  |
| 4.2 Usage of the controller .....                          | 9  |
| 4.3 Parameter table .....                                  | 13 |
| 5. Maintenance and Inspection .....                        | 14 |
| 5.1 Maintenance .....                                      | 14 |
| 5.2 Malfunction table .....                                | 15 |
| 6. Appendix .....  | 16 |
| Appendix 1: Connection of PCB illustration .....           | 16 |
| Appendix 2: Explosive view of the unit .....               | 18 |
| Appendix 3: Circuit diagram of the unit .....              | 22 |
| Appendix 4: Caution & Warning .....                        | 26 |
| Appendix 5: Cable specification .....                      | 27 |

## 1. PREFACE

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- 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 & Copper Nickle 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 LED wire controller. Remote controller can be chosen as future option.

## 2.SPECIFICATION

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### 2.1 Performance data of Swimming Pool Heat Pump Unit

\*\*\* REFRIGERANT : R410A

| Model                       |       | PASRW070-P-C                    | PASRW130-P-C |
|-----------------------------|-------|---------------------------------|--------------|
| Heating capacity            | KW    | 35.1                            | 58.6         |
|                             | BTU/h | 120000                          | 200000       |
| Heating Power Input         | KW    | 5.8                             | 10.4         |
| Running Current             | A     | 30.1                            | 51.8         |
| Power Supply                |       | 208-230V~/60Hz                  |              |
| Compressor Quantity         |       | 2                               | 2            |
| Compressor                  |       | rotary                          | scroll       |
| Fan Number                  |       | 1                               | 2            |
| Fan Power Input             | W     | 390                             | 2×200        |
| Fan Rotate Speed            | RPM   | 900                             | 830          |
| Fan Direction               |       | vertical                        | vertical     |
| Noise                       | dB(A) | 58                              | 61           |
| Water Connection            | inch  | 1.5                             | 2.0          |
| Water Flow Volume           | gal/m | 46.2                            | 85.8         |
| Water Pressure Drop(max)    | kPa   | 12                              | 14           |
| 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/Shipping Weight  | lb    | see nameplate/see package label |              |

Heating: Ambient temp.(DB/WB):80.6°F/71.2°F, Inlet watertemp:80°F  
 Operating envelope: heating 20°F-95°F, cooling 86°F-109°F

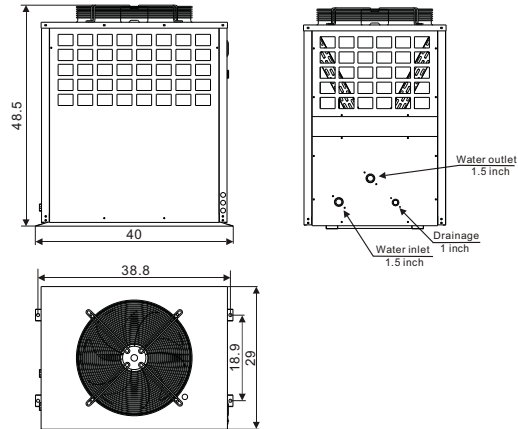
## 2.SPECIFICATION

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### 2.2 The dimensions for Swimming Pool Heat Pump Unit

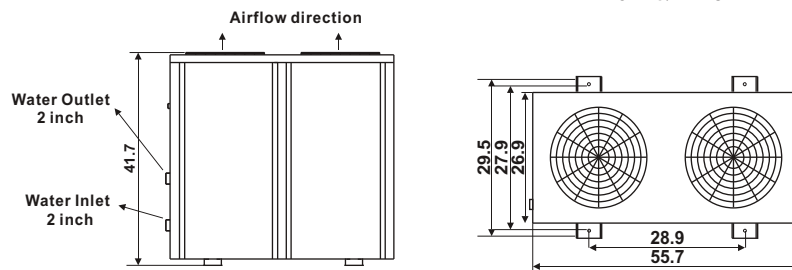
Models :PASRW070-P-C

unit: inch



Models :PASRW130-P-C

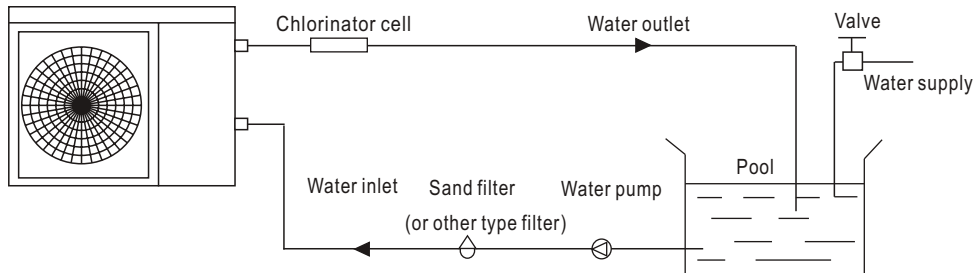
unit: inch



## 3. INSTALLATION AND CONNECTION

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### 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.

### 3. INSTALLATION AND CONNECTION

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#### 3.2 Swimming Pool Heat Pumps Location

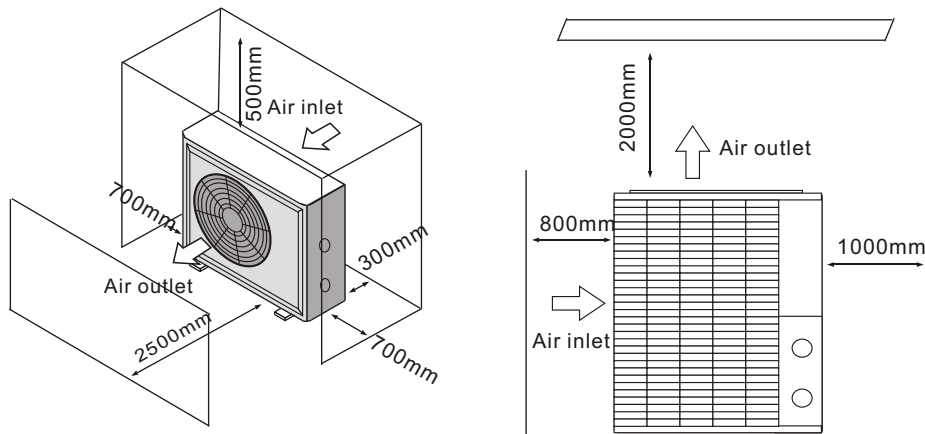
The unit will perform well in any outdoor location provided that the following three factors are presented:

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 its 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

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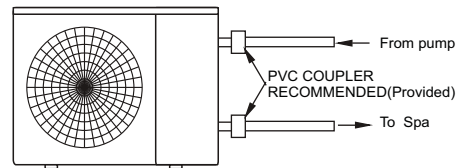
#### 3.4 Swimming Pool Heat Pumps Plumbing

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 straight into the unit.

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.



Horizontal vision

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 3/4" 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

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### 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:

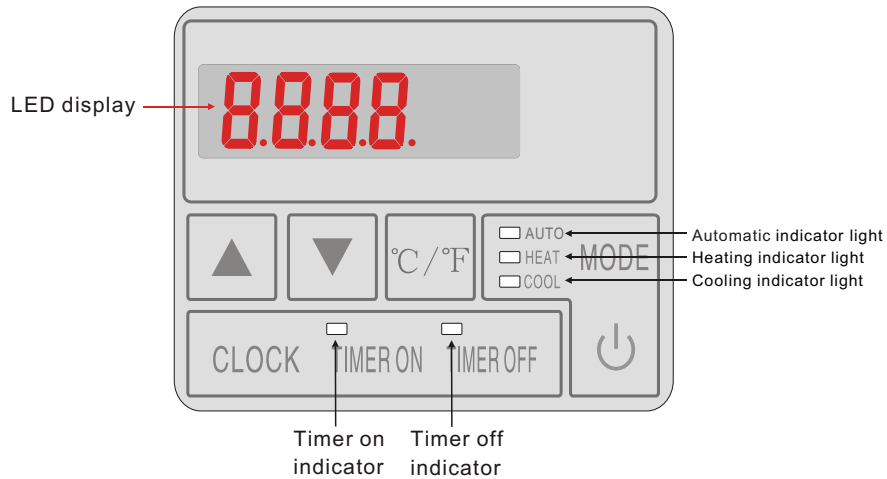
1. Turn on your filter pump. Check for water leaks and verify flow to and from the pool.
2. Turn on the electrical power supply to the unit, then press the key ON/OFF of wire controller, It should start in several seconds.
3. After running a few minutes make sure the air leaving the top(side) of the 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 temperature 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°C 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. USAGE

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### 4.1 Function of the wire controller





| Key       | Key name  | Key function  |
|-----------|-----------|---|
|           | ON/OFF    | Press this key to turn on/off the unit  |
| MODE      | Mode      | Press this key to change the working mode                                     |
| CLOCK     | Timer     | Press this key to set system time   |
| °C/°F     | Type      | Press this key to change celsius degree or fahrenheit degree                  |
| TIMER ON  | TIMER ON  | Press this key to set timer-on  |
| TIMER OFF | TIMER OFF | Press this key to set timer-off   |
|           | 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

### 4.2 Usage of wire controller

#### 4.2.1 Turn ON/OFF the unit

When the unit is off, press the key “

When the unit is on, press the key “

Standby interface

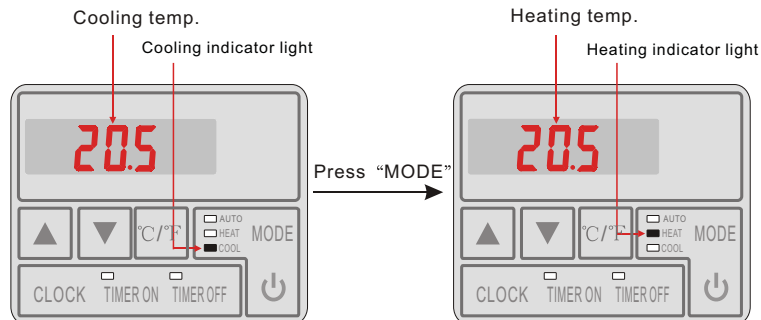
Running interface

#### 4.2.2 Mode switch

You can choose unit mode.

In the unit on or off state , you can choose cooling 、 heating or automatic mode by pressing "MODE" Button.

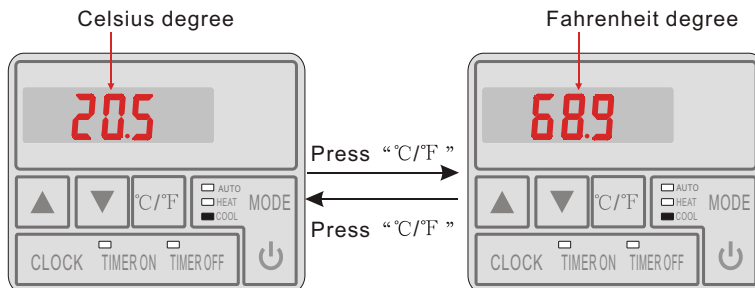
Attention: if the unit is only for heating/cooling, the mode switching operation is invalid.



#### 4.2.3 The temperature types

You can choose the temperature types.

In the unit on state , you can choose celsius degree or fahrenheit degree by pressing “°C/°F” Button.

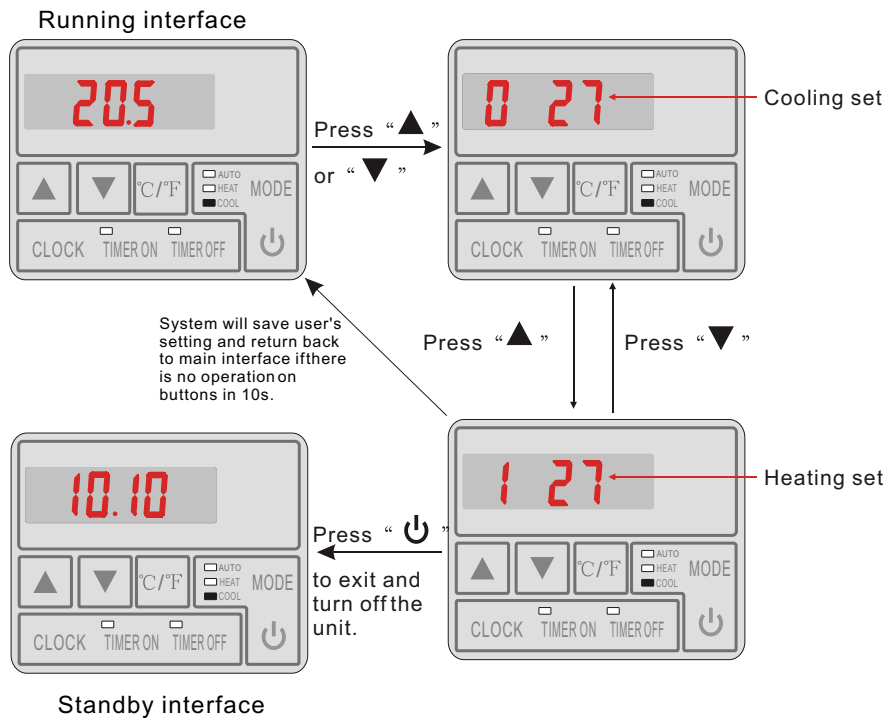


## 4.USAGE

### 4.2.4 Parameter setting

You can check parameter value.

In the uniton state, Press "▲" or "▼" can check orset heating temperatureand cooling temperature(The meaning ofspecific parameters refer to parameter table). If there is no operation in 10seconds, system will exitthe parameter interface automatically. (Or press "⏻" just to quit parameterinterface and unitoff ).



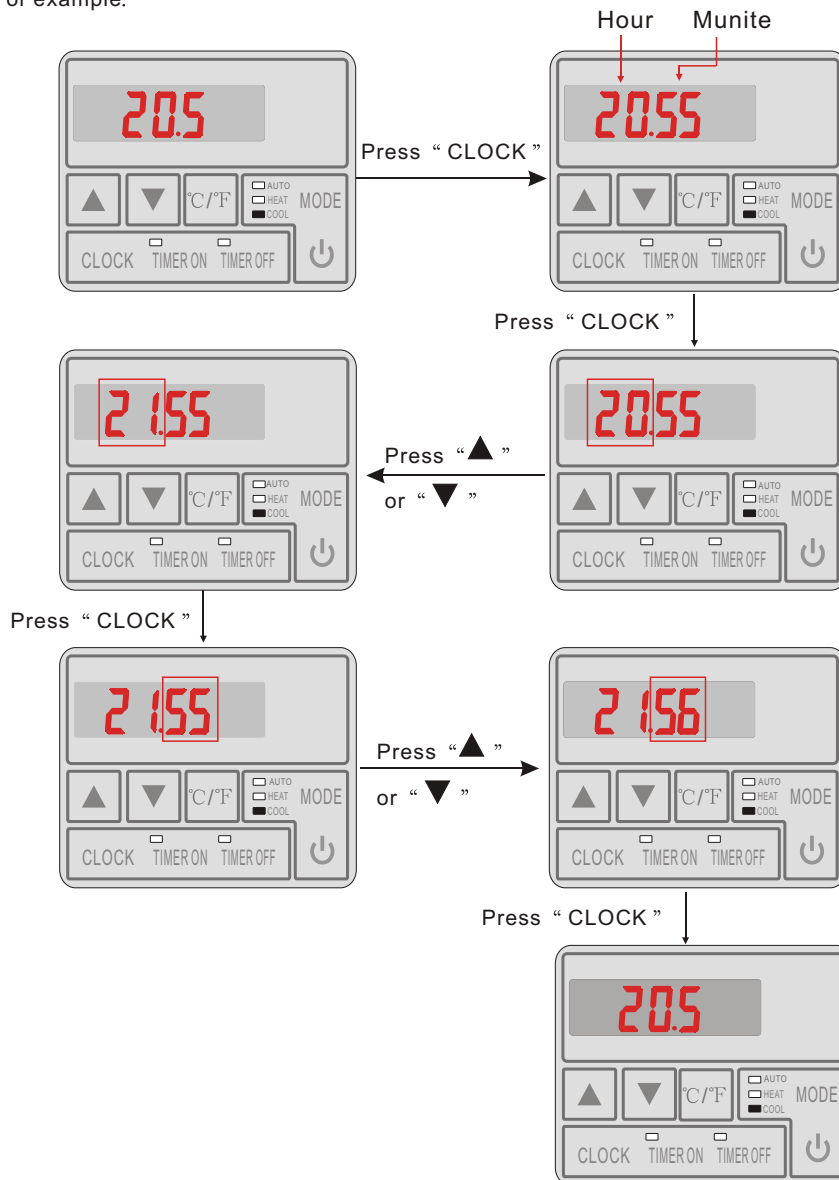
## 4.USAGE

### 4.2.5 Timesetting

You can set the system time.

In the on or off state, Press "CLOCK" to enter the timesetting interface. Press "CLOCK" and hour-bit flashing. Press "▲" or "▼" to change hours value. Press "CLOCK" to save hours. At the same time, minutes-bit flashing. Press "▲" or "▼" to change minutes value. Press "CLOCK" and heard "Didi" twice is to save time and exit.

For example:



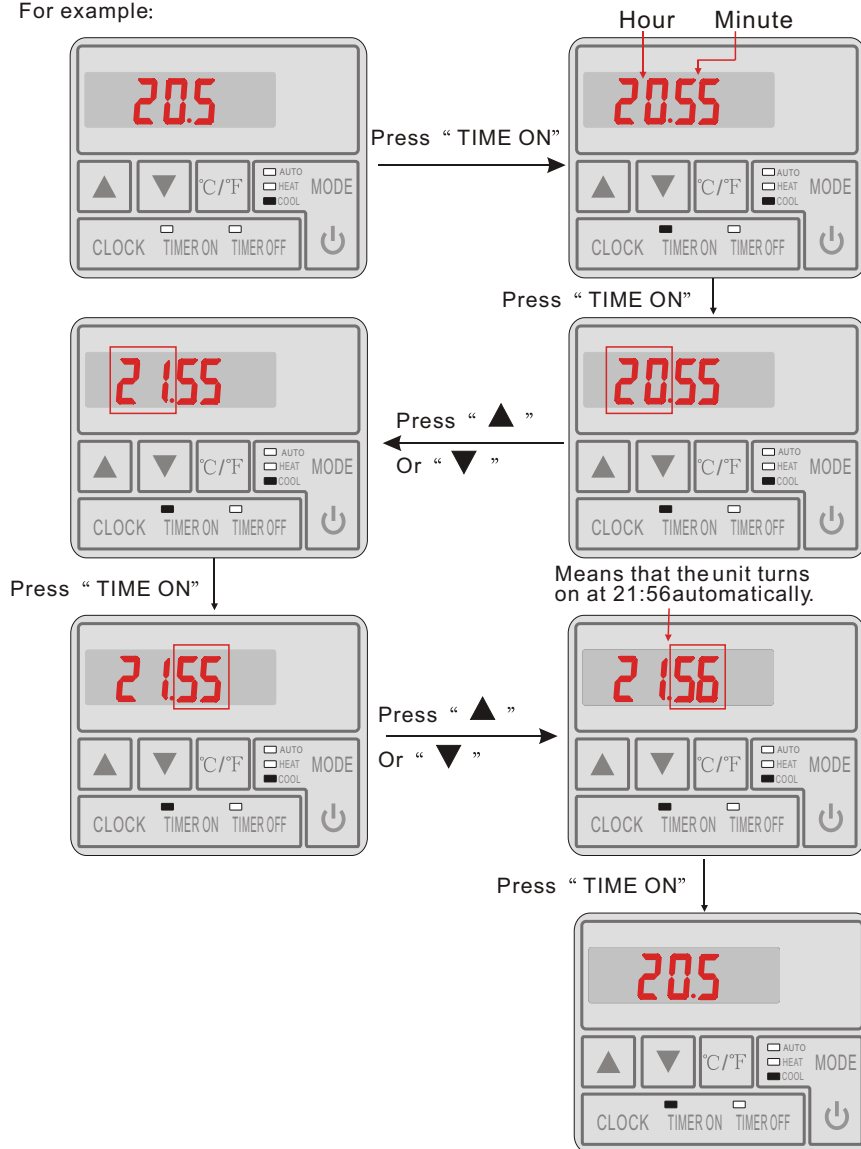
## 4. USAGE

### 4.2.6 Timer setting

(1) You can set the timer of unit on

In the on or off state, Press "TIME ON" to enter timer-on interface, Press "TIME ON" and time-hour-bit flashing, Press "▲" or "▼" to change the hours value, Press "TIME ON" to save hours. At the same time, minutes-bit flashing, Press "▲" or "▼" to change the minute value, Press "TIME ON" to save and exit. At this time, "TIME ON" LED light is on. (The time-off setting is to press "TIME OFF", the other operation is the same as timer-on)

For example:



## 4. USAGE

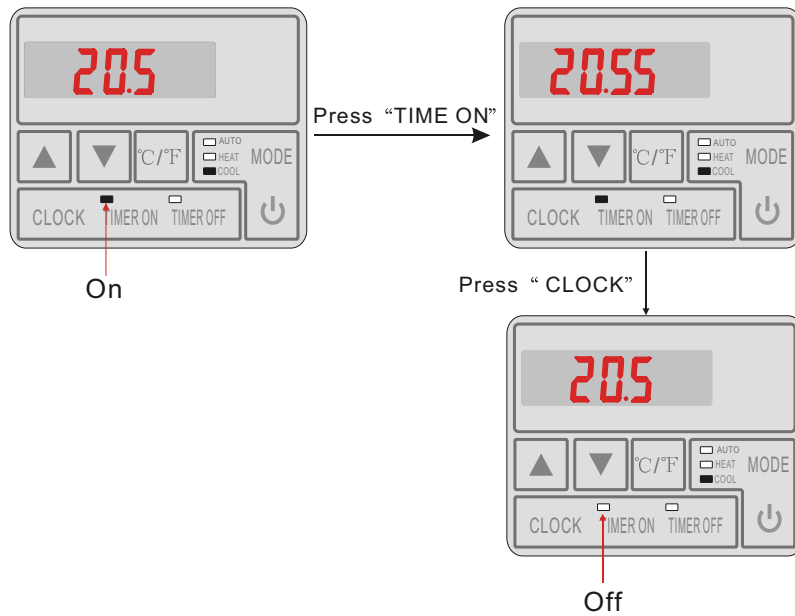
### (2) The setting of cancelling the timer

If there is no need to set timer on or timer off, the timer setting can be cancelled.

At unit on or off state, press "TIME On" to enter timer-on setting interface, then press "CLOCK" to cancel the timer-on, at this timer, the timer-on light turn off.

(press "TIME Off" to enter timer-off setting interface, then press

"CLOCK" to cancel the timer-off, at this timer, the timer-off light turn off.



### 3. Parameter table

Please set the parameters according to the table below.

| Parameter | Meaning                 | Default | Remarks  |
|-----------|-------------------------|---------|----------|
| 0         | Set value for cooling   | 80°F    | Adjusted |
| 1         | Set value for heating   | 80°F    | Adjusted |
| 2         | Set value for automatic | 80°F    | Adjusted |



## 5. MAINTENANCE AND INSPECTION

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### 5.1 Maintenance

- 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 your certified 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.

## 5. MAINTENANCE AND INSPECTION

### 5.2 Malfunction table

You could determine or remove failures according to the following malfunction table:

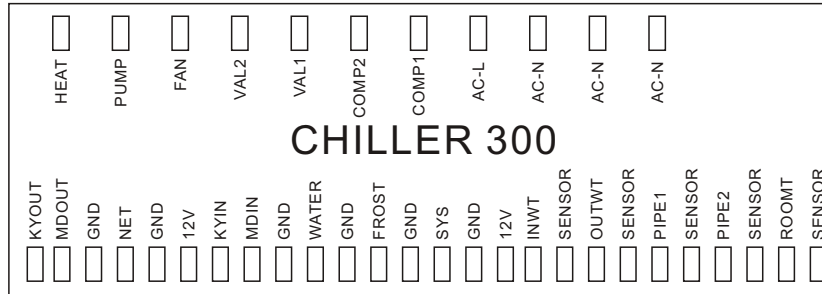
| Malfunction                      | LED Display | Reason  | Solution   |
|----------------------------------|-------------|---|--|
| Water In Temp Failure            | PP1         | Temp. Sensor is open or Short circuit.                              | Check or replace the water inlet temp. Sensor.                           |
| Water Out Temp Failure           | PP2         | Temp. Sensor is open or Short circuit.                              | Check or replace the water outlet temp. Sensor.                          |
| Pipe Temp 2 Failure              | PP3         | Temp. Sensor is open or Short circuit.                              | Check or replace the Coil 1temp. Sensor.                                 |
| Pipe Temp 2 Failure              | PP4         | Temp. Sensor is open or Short circuit.                              | Check or replace the Coil 2temp. Sensor.                                 |
| Ambient Temp Failure             | PP5         | Temp. Sensor is open or Short circuit.                              | Check or replace the ambient temp. Sensor.                               |
| Temp Difference Protect          | PP6         | Outlet water temperature is too low.                                | Check the flow volume to see whether it meets the requirements.          |
| Anti freezing under cooling mode | PP7         | Outlet water temperature is too low.                                | Check the flow volume to see whether it meets the requirements.          |
| Frostbite 1 Protect              | PP7         | Ambient temperature is too low.                                     |  |
| Frostbite 2 Protect              | PP7         | Ambient temperature is too low.                                     |  |
| Systems 1 Failure                | EE1         | System protection failure of system 1                               | Check all the protection devices of system 1.                            |
| Systems 2 Failure                | EE2         | System protection failure of system 2                               | Check all the protection devices of system 2.                            |
| Water Flow Failure               | EE3         | 1. Water flow volume is not enough.<br>2.No water in water loop.    | Check the flow volume to see the water system is block or not.           |
| Power Phase                      | EE4         | Power supply connection failure                                     | Check the power supply connection.                                       |
| Temp Difference Error            | EE5         | Outlet water temperature is too low.                                | Check the flow volume to see whether it meets the requirements.          |
| Defrosting                       | Flashing    |   |  |
| Communication Failure            | EE8         | Communication failure between remote wire controller and main board | Check the wire connection between remote wire controller and main board. |

### 5.3 You can judge and remove the malfunctions according to the malfunction code display on the PROTECT300

| Display | Name                              | Reason                                      | Action               | Recover (yes or no) | Revolution   |
|---------|-----------------------------------|---|----------------------|---------------------|--|
| 1       | Refrigerant freezing              | Refrigerant temp. too low from tube outlet  | Unit stops and alarm | Yes                 | Reduce refrigerant   |
| 2       | Refrigerant leakage               | Refrigerant temp. before tube inlet too low | Unit stops and alarm | Yes                 | Increase refrigerant   |
| 3       | Low pressure                      | Low pressure switch action                  | Unit stops and alarm | Yes                 | Check through the pressure switch and return system            |
| 4       | Compressor exhaust temp. too high | Compressor exhaust temp. too high           | Unit stops and alarm | Yes                 | Check through the refrigerant system                           |
| 5       | Over-current on compressor        | Current through compressor too heavy        | Unit stops and alarm | Yes                 | Check through the power supply for compressor or short circuit |
| 6       | High pressure                     | High pressure switch action                 | Unit stops and alarm | Yes                 | Check through the pressure switch and return system            |
| 7       | Temp. sensor before tube failure  | Temp. Sensor open or short circuit          | Unit stops and alarm | Yes                 | Check and renew the sensor                                     |
| 8       | Tube outlet temp. sensor failure  | Temp. Sensor open or short circuit          | Unit stops and alarm | Yes                 | Check and renew the sensor                                     |
| 9       | Exhaust temp. sensor failure      | Temp. Sensor open or short circuit          | Unit stops and alarm | Yes                 | Check and renew the sensor                                     |
| E       | Power supply wrong connection     | Wrong connection or lack of connection      | Unit stops and alarm | Yes                 | Check the connections  |

## 6.APPENDIX

### Appendix 1: Connection of PCB illustration

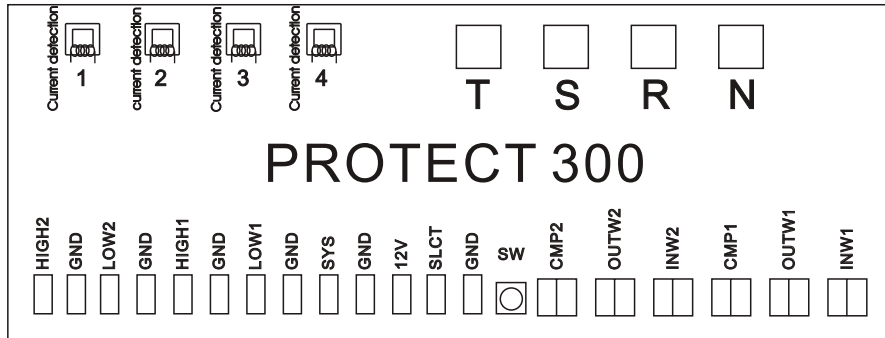


#### Connections explanation

| No. | symbol      | meaning                             |
|-----|-------------|-------------------------------------|
| 1   | HEAT        | Auxiliary electrical heating 220VAC |
| 2   | PUMP        | Water pump 220VAC                   |
| 3   | FAN         | Fan motor 220VAC                    |
| 4   | VAL2        | Solenoid valve 220VAC               |
| 5   | VAL1        | 4way valve of system1 220VAC        |
| 6   | COMP2       | Compressor of system2 220VAC        |
| 7   | COMP1       | Compressor of system1 220VAC        |
| 8   | AC-L        | Fire wire                           |
| 9   | AC-N        | Neutral Wire                        |
| 10  | KYOUT GND   | On/Off switch                       |
| 11  | MDOUT GND   | Mode                                |
| 12  | NET GND 12V | Wire controller                     |
| 13  | KYIN        | On/Off Switch(input)                |
| 14  | MDIN        | Model(input)                        |
| 15  | WATER GND   | Flow switch (input)(normal close)   |
| 16  | FROST GND   | Defrost signal                      |
| 17  | SYS GND 12V | System protection(normal close)     |
| 18  | ROOMT       | Ambient temp.(input)                |
| 19  | PIPE2       | Temp.Of fan coil2(input)            |
| 20  | PIPE1       | Temp.Of fan coil11(input)           |
| 21  | OUTWT       | Water out temp.(output)             |
| 22  | INTWT       | Water in temp.(output)              |

## 6.APPENDIX

### Appendix 1:Connection of PCB illustration

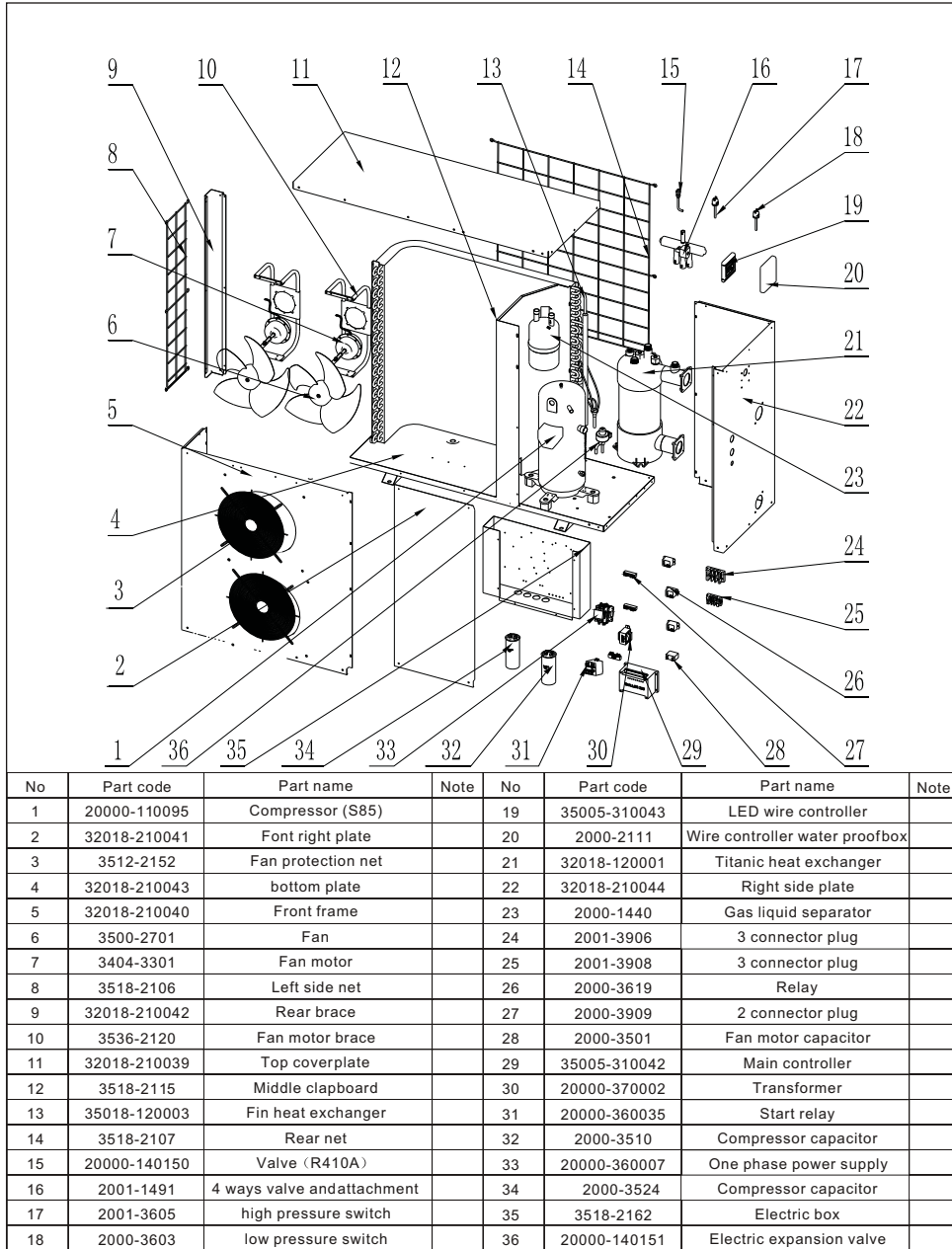


Connections explanation:

| NO. | SYMBOL      | MEANING   |
|-----|-------------|---|
| 1   | HINGH2 GND  | High pressure protection for system2 (normal close) |
| 2   | LOW2 GND    | Low pressure protection for system2 (normal close)  |
| 3   | HINGH1 GND  | High pressure protection for system1 (normal close) |
| 4   | LOW1 GND    | Low pressure protection for system1 (normal close)  |
| 5   | SYS GND 12V | Protection signal                                   |
| 6   | SW          | Current setting(handest)                            |
| 7   | CMP2        | Exhausting temp. Of compressor2                     |
| 8   | OUTW2       | Tube temp. Of system 2                              |
| 9   | INW2        | Tube temp. Of system 2                              |
| 10  | CMP1        | Exhausting temp. Of compressor1                     |
| 11  | OUTW1       | Tube temp. Of system 1                              |
| 12  | INW1        | Tube temp. Of system 1                              |

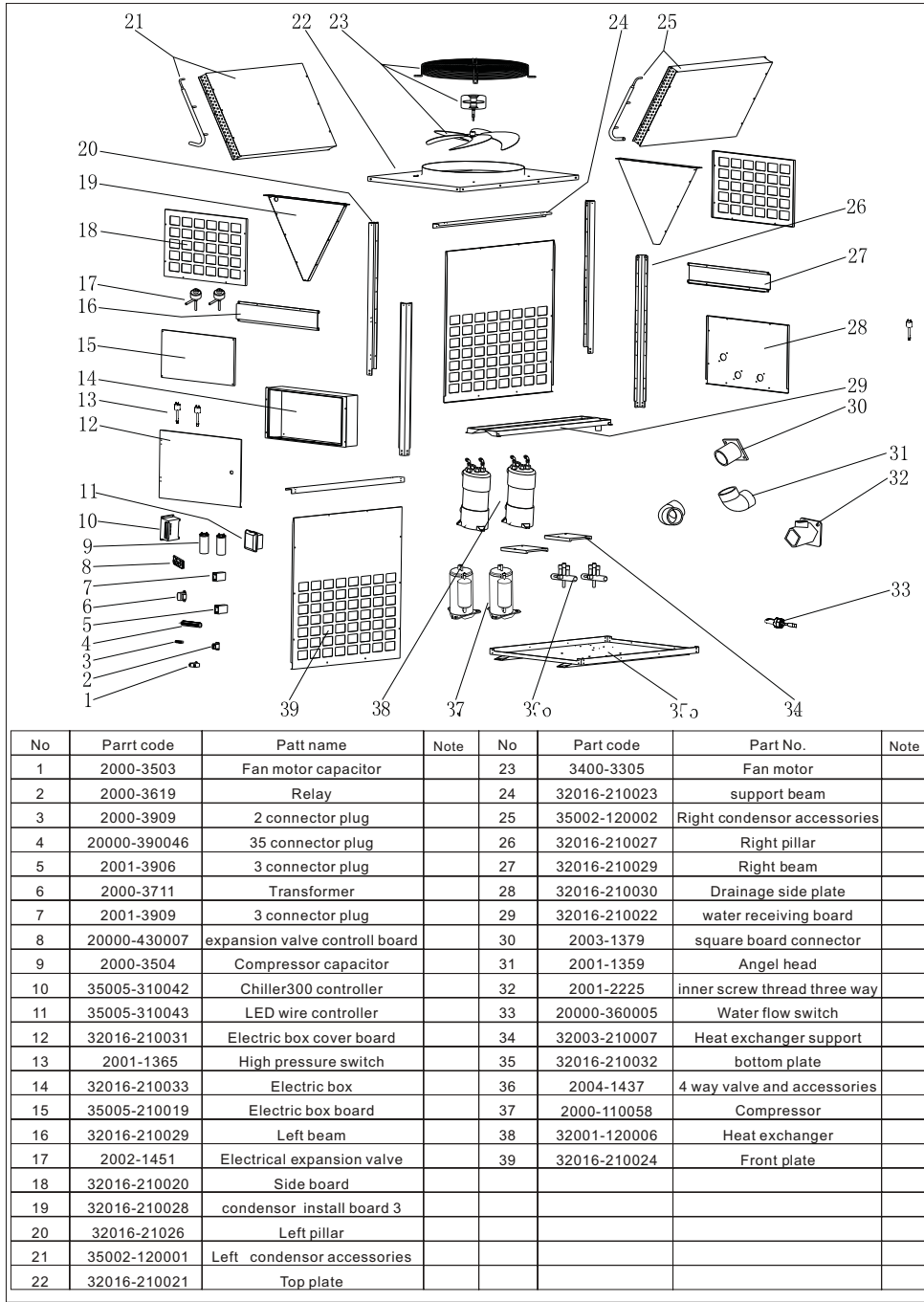
## 6.APPENDIX

Appendix2 : Explosive view of the unit PASRW050-P-V



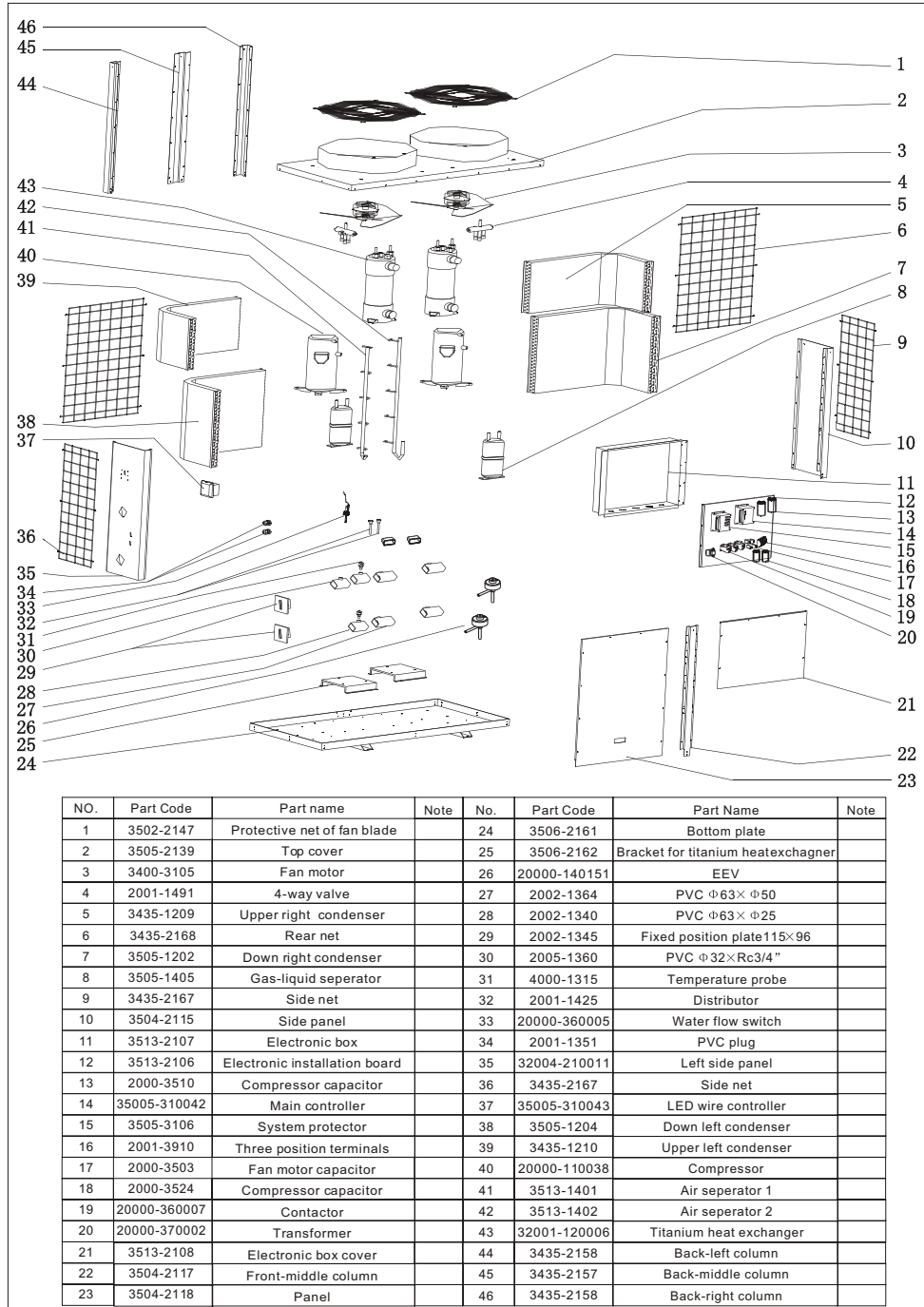
## 6.APPENDIX

Appendix 2 : Explosive view of the unit PASRW070-P-V



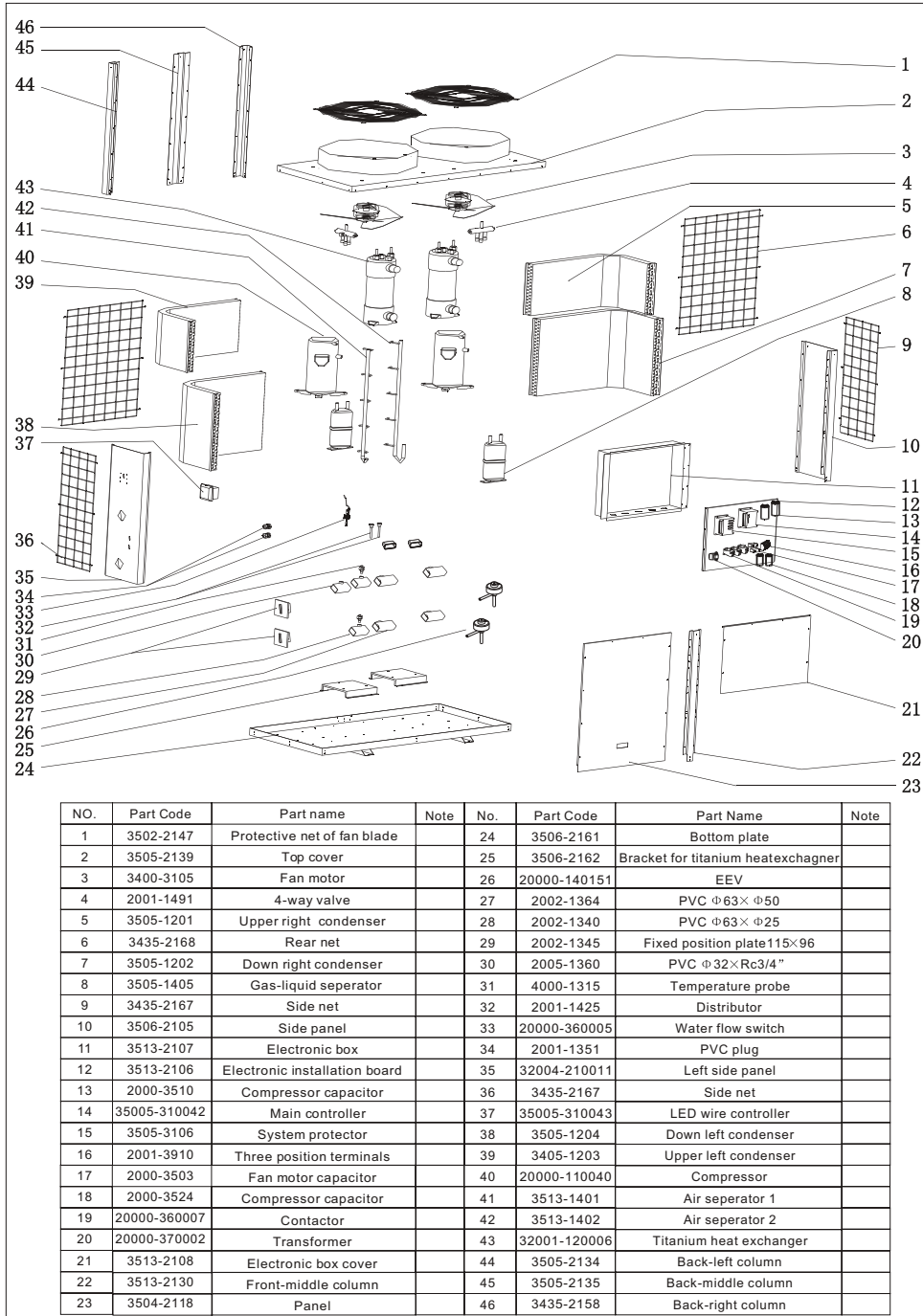
## 6.APPENDIX

Appendix 2: Explosive view of the unit PASRW080-P-V



## 6.APPENDIX

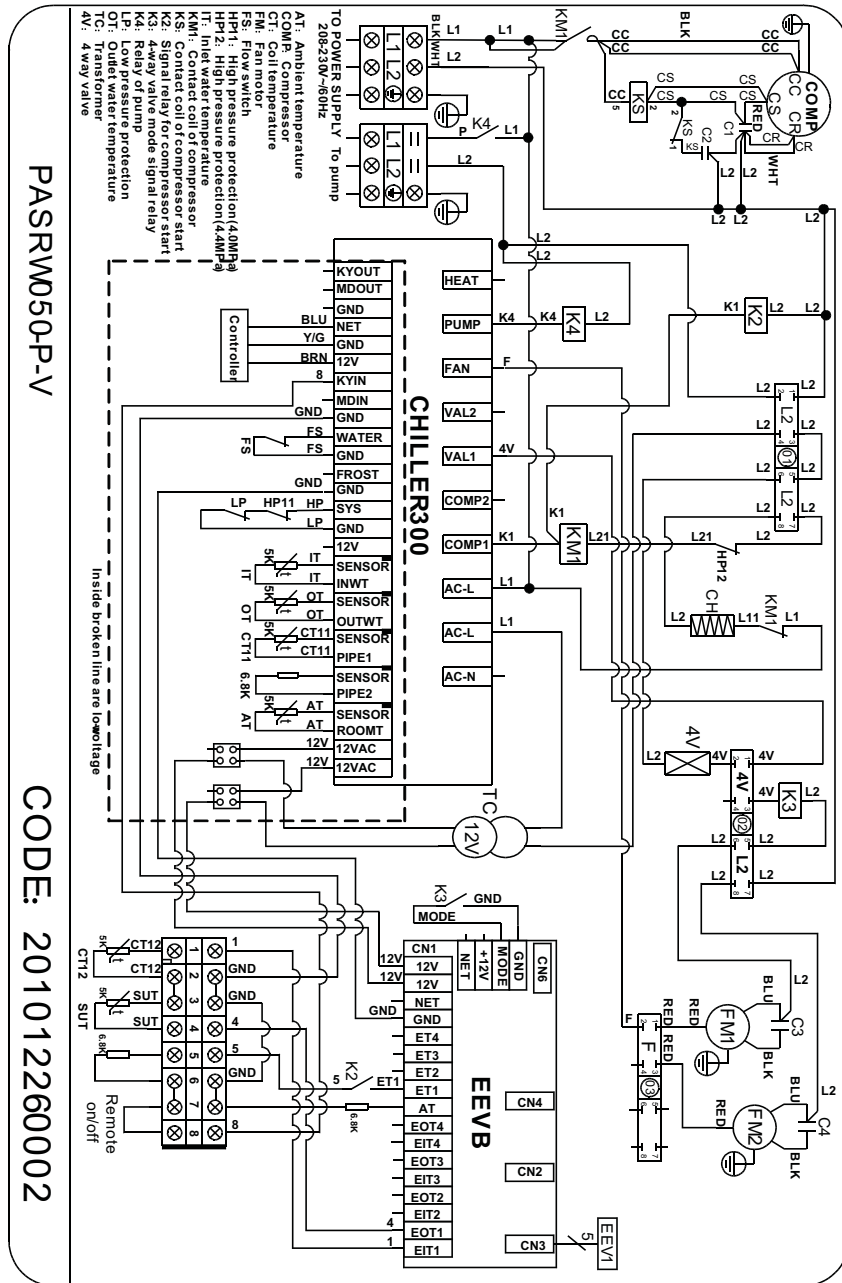
Appendix 2 : Explosive view of the unit PASRW130-P-V





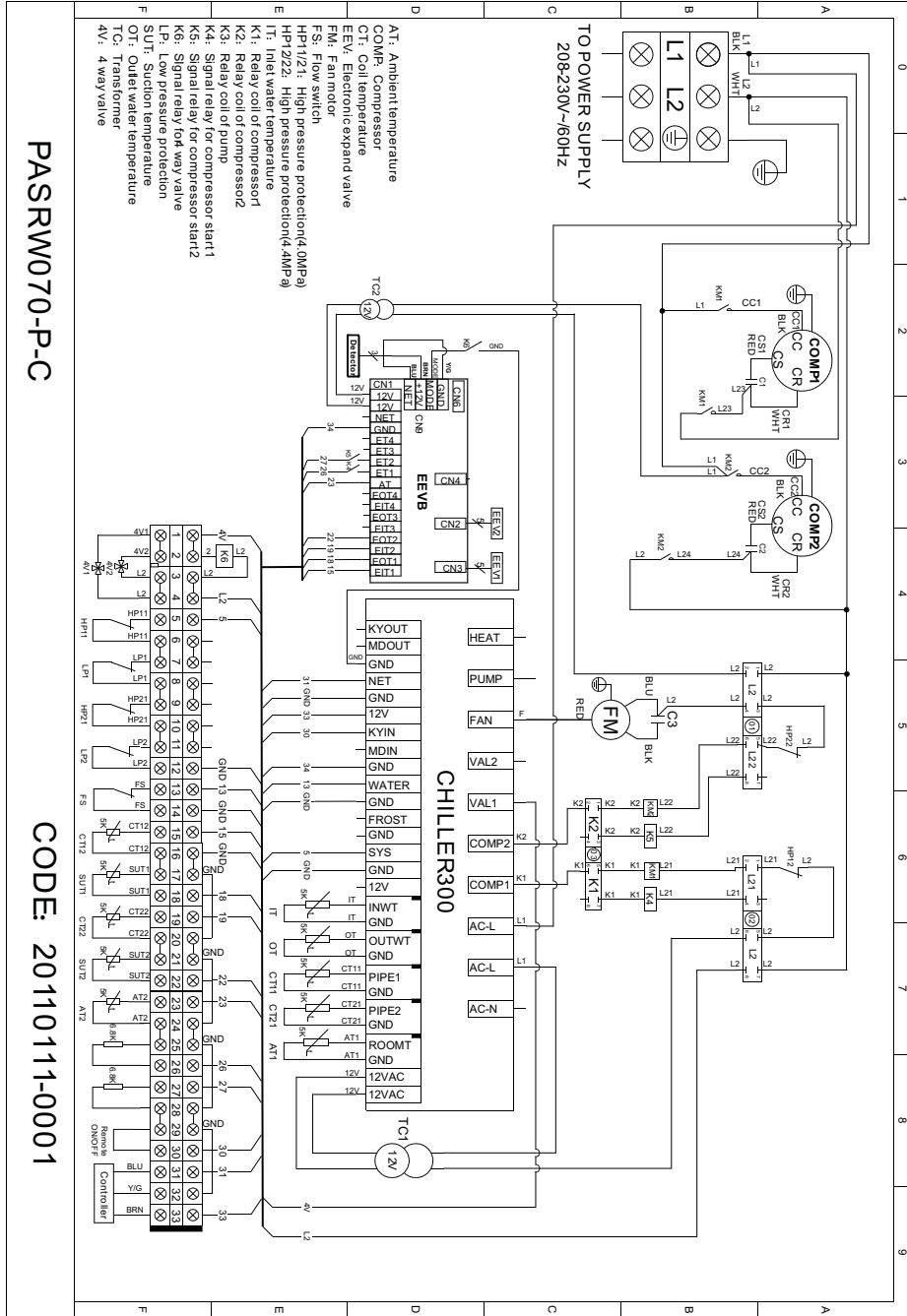
## 6.APPENDIX

### Appendix 3: Circuit diagram of the unit



# 6.APPENDIX

## Appendix 3: Circuit diagram of the unit

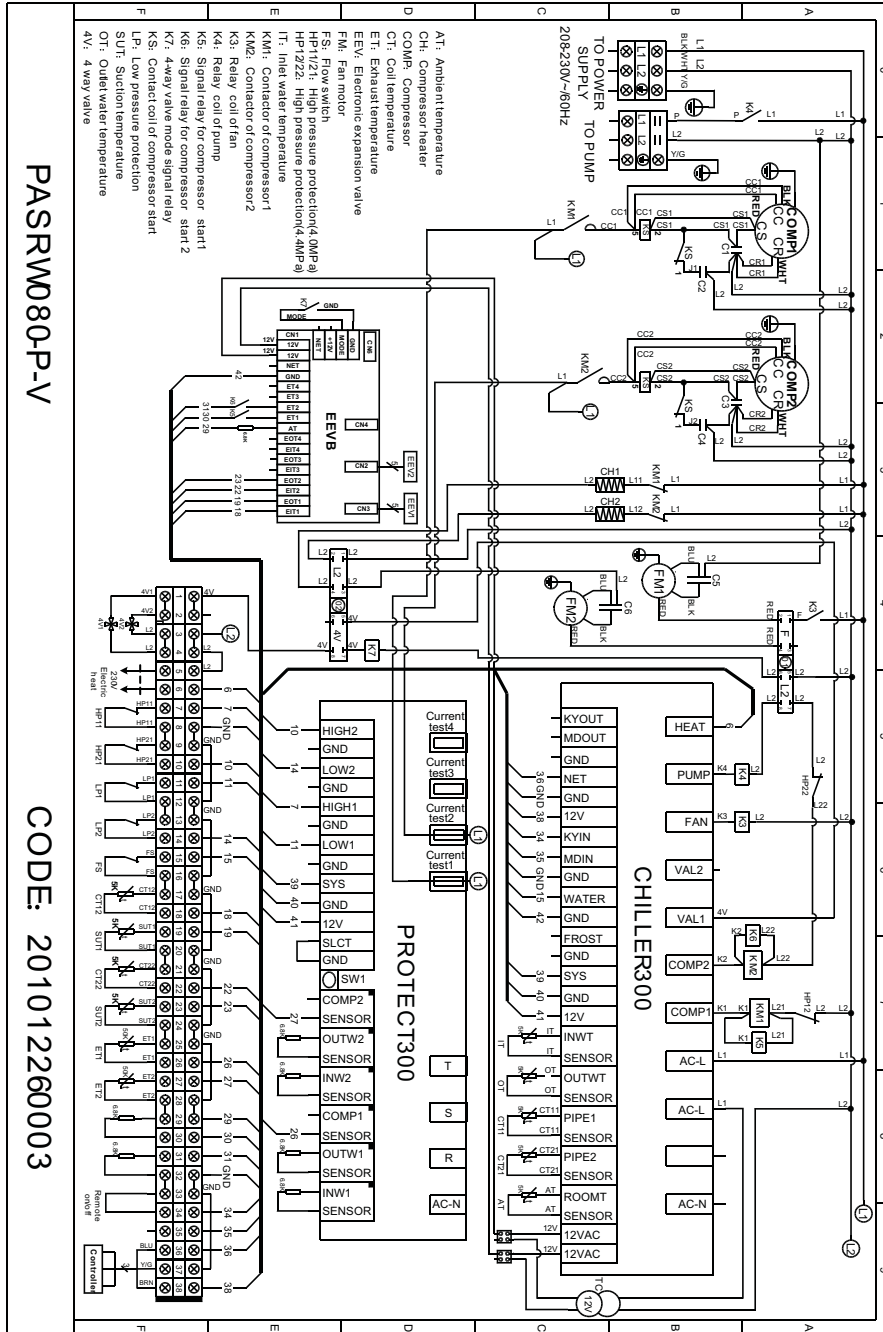


PASRW070-P-C

CODE: 20110111-0001

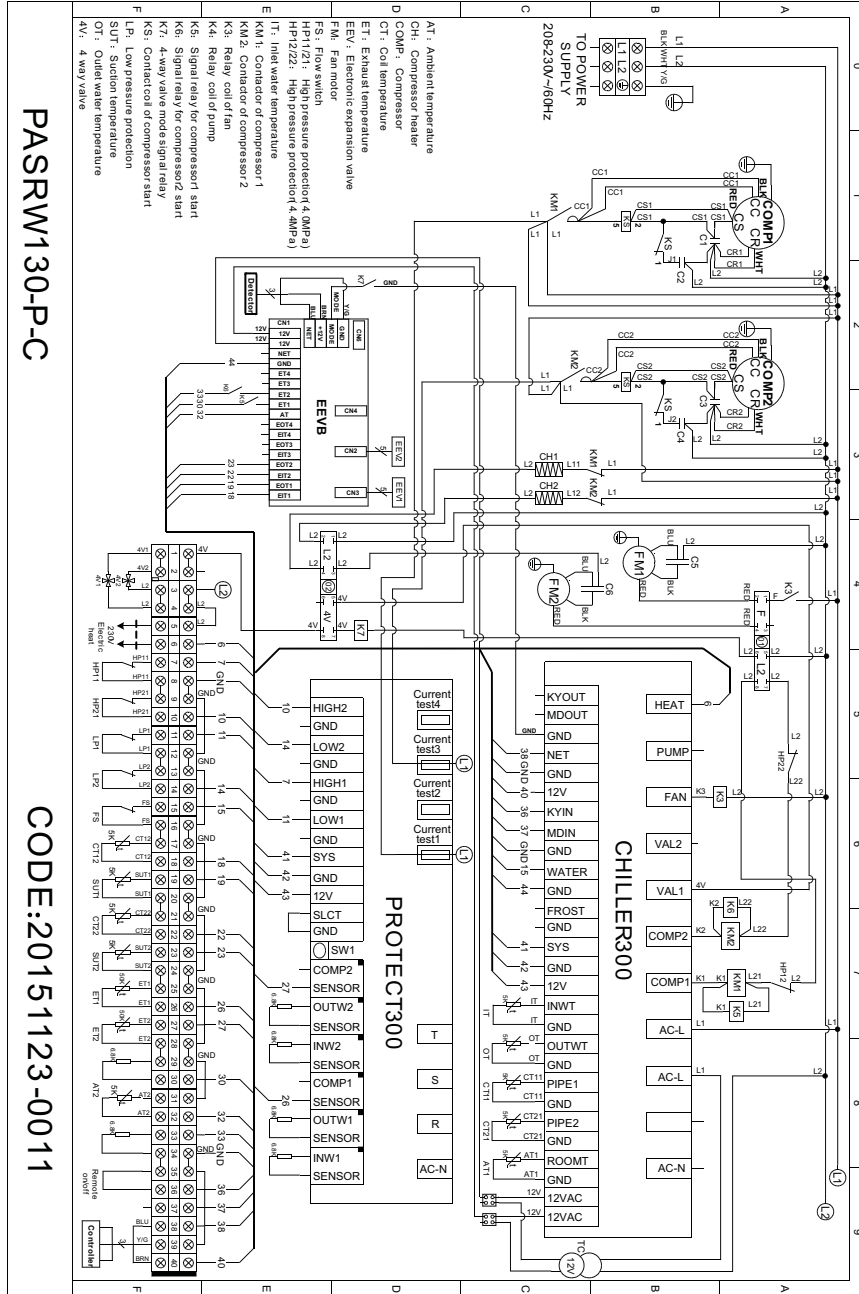
# 6.APPENDIX

## Appendix 3: Circuit diagram of the unit



# 6.APPENDIX

## Appendix 3: Circuit diagram of the unit



## 6. APPENDIX

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### Appendix 4: 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 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, not suitable for potable water connection.

## 6.APPENDIX

### Appendix 5: 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 <sup>2</sup> | 1.5mm <sup>2</sup> | 20A  | 30mA less than 0.1 sec | n×0.5mm <sup>2</sup> |
| 10~16A                    | 2×2.5mm <sup>2</sup> | 2.5mm <sup>2</sup> | 32A  | 30mA less than 0.1 sec |                      |
| 16~25A                    | 2×4mm <sup>2</sup>   | 4mm <sup>2</sup>   | 40A  | 30mA less than 0.1 sec |                      |
| 25~32A                    | 2×6mm <sup>2</sup>   | 6mm <sup>2</sup>   | 40A  | 30mA less than 0.1 sec |                      |
| 32~40A                    | 2×10mm <sup>2</sup>  | 10mm <sup>2</sup>  | 63A  | 30mA less than 0.1 sec |                      |
| 40~63A                    | 2×16mm <sup>2</sup>  | 16mm <sup>2</sup>  | 80A  | 30mA less than 0.1 sec |                      |
| 63~75A                    | 2×25mm <sup>2</sup>  | 25mm <sup>2</sup>  | 100A | 30mA less than 0.1 sec |                      |
| 75~101A                   | 2×25mm <sup>2</sup>  | 25mm <sup>2</sup>  | 125A | 30mA less than 0.1 sec |                      |
| 101~123A                  | 2×35mm <sup>2</sup>  | 35mm <sup>2</sup>  | 160A | 30mA less than 0.1 sec |                      |
| 123~148A                  | 2×50mm <sup>2</sup>  | 50mm <sup>2</sup>  | 225A | 30mA less than 0.1 sec |                      |
| 148~186A                  | 2×70mm <sup>2</sup>  | 70mm <sup>2</sup>  | 250A | 30mA less than 0.1 sec |                      |
| 186~224A                  | 2×95mm <sup>2</sup>  | 95mm <sup>2</sup>  | 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 <sup>2</sup> | 1.5mm <sup>2</sup> | 20A  | 30mA less than 0.1 sec | n×0.5mm <sup>2</sup> |
| 10~16A                    | 3×2.5mm <sup>2</sup> | 2.5mm <sup>2</sup> | 32A  | 30mA less than 0.1 sec |                      |
| 16~25A                    | 3×4mm <sup>2</sup>   | 4mm <sup>2</sup>   | 40A  | 30mA less than 0.1 sec |                      |
| 25~32A                    | 3×6mm <sup>2</sup>   | 6mm <sup>2</sup>   | 40A  | 30mA less than 0.1 sec |                      |
| 32~40A                    | 3×10mm <sup>2</sup>  | 10mm <sup>2</sup>  | 63A  | 30mA less than 0.1 sec |                      |
| 40~63A                    | 3×16mm <sup>2</sup>  | 16mm <sup>2</sup>  | 80A  | 30mA less than 0.1 sec |                      |
| 63~75A                    | 3×25mm <sup>2</sup>  | 25mm <sup>2</sup>  | 100A | 30mA less than 0.1 sec |                      |
| 75~101A                   | 3×25mm <sup>2</sup>  | 25mm <sup>2</sup>  | 125A | 30mA less than 0.1 sec |                      |
| 101~123A                  | 3×35mm <sup>2</sup>  | 35mm <sup>2</sup>  | 160A | 30mA less than 0.1 sec |                      |
| 123~148A                  | 3×50mm <sup>2</sup>  | 50mm <sup>2</sup>  | 225A | 30mA less than 0.1 sec |                      |
| 148~186A                  | 3×70mm <sup>2</sup>  | 70mm <sup>2</sup>  | 250A | 30mA less than 0.1 sec |                      |
| 186~224A                  | 3×95mm <sup>2</sup>  | 95mm <sup>2</sup>  | 280A | 30mA less than 0.1 sec |                      |

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



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