

# SWIMMING POOL DEHUMIDIFIER

## Installation & Operation Manual





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# 1. Preface

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Thank you for choosing Swimming Pool Dehumidifier for controlling the climate in you pool area. This product strictly complies with design and production standards to provide perfect performance, high reliability and good adaptability for you.

Read the entire manual before the initial start-up of the unit. It is important to know the correct operating procedures for the unit and all safety precautions to prevent the possibility of property damage and/or personal injury. Do not modify or intervene on the unit by yourself only as this could create dangerous situations and the manufacturer will not be responsible for any damage caused.

This instruction must be kept carefully and must always accompany the appliance. If it is lost or damaged, please contact the local technical service center.

## 1.1 Fail to comply with these recommendations will invalidate the warranty.

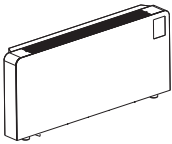
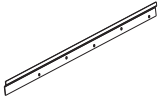

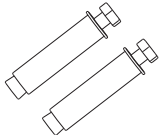
- This unit must be installed by an authorized installer.
- All repair or maintenance interventions must be performed by the technical service department or by professionally qualified personnel.
- All repair or maintenance interventions must be performed in the specified period and times.
- Use the spare parts ONLY provided by the manufacturer.

1.2 In case of system leakage, disconnect the power to the unit and call the technical service department or other professionally qualified personnel as soon as possible, and do not intervene personally on the appliance.

If the unit is not used for a long time, you should disconnect the power to the unit.



## 1.3 Packing List (Fig.1)

Fig.1




Main unit	Wall suspension bar	Manual	Expansion bolts
			

## 2. Installation Precautions



### 2.1 Marks



Mark	Meaning
 WARNING	A wrong operation may lead to death or heavy injury on people.
 ATTENTION	A wrong operation may lead to harm to people or loss of property.




### 2.2 Icons

Icon	Meaning
	Prohibition. What is prohibited will be nearby this icon.
	Compulsory implement. The listed actions need to be taken.
	Attention(include warnings) Please pay attention to what is indicated.

### 2.3 Warnings



INSTALLATION	 PROFESSIONAL INSTALLER IS REQUIRED	Entrust a specialized personnel for installation. Wrong installation may cause leakage, personnel electric shock or fires.
	 EARTHING IS REQUIRED	Confirm whether wether the unit is with correct earthing. Wrong connection may cause personnel shock.




OPERATION	 PROHIBITION	Do not put fingers or others into the fan or evaporator of the unit, otherwise harm may be occurred.
	 SHUT OFF THE POWER	When there is something wrong or strange smell from the unit, please cut off the power to the unit immediately.

MOVE AND REPAIR	 ENTRUST	When the unit needs to be moved or installed again, please entrust dealer or qualified person to carry it out. Improper installation may lead to water leakage, electrical shock, injury or fire.
	 PROHIBIT	It is prohibited to repair the unit by the user himself, otherwise electrical shock or fire may occur.
	 ENTRUST	When the unit needs to be repaired, please entrust dealer or qualified person to carry it out. Improper movement or repair on the unit may lead to water leakage, electrical shock, injury or fire.

## 2. Installation Precautions

### 2.4 Attention

INSTALLATION	Meaning
 Fix the unit	Make sure that the basement of the unit is strong enough to avoid any decline or fall down.
 Need circuit breaker	Make sure that there is circuit breaker for the unit. Lack of circuit breaker can lead to electrical shock or fire.

OPERATION	Meaning
 Check the installation basement	Please check the installation basement regularly to avoid any decline or damage which may hurt people or damage the unit.
 Disconnect the power	Please disconnect the power to the unit for clean or maintenance.
 Prohibit	Please use the suitable fuse. If copper or iron is used to replace the fuse, it will cause failure, even fire.



### Warning:

Remember that some fundamental safety rules should be followed when using this product:

1. 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. Children should be supervised to ensure that they do not play with the appliance.
2. It is forbidden to touch the appliance with wet hands or body when barefoot.
3. It is forbidden to carry out any cleaning before having disconnected the appliances from the electricity mains supply by turning the system master switch to OFF.
4. It is forbidden to modify the safety or adjustment devices or adjust without authorization and indication of the manufacturer.
5. It is forbidden to pull, cut or knot the electrical cables coming out of the appliance, even if it is disconnected from the mains supply.
6. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
7. It is forbidden to poke objects or anything else through the inlet or outlet grills.
8. It is forbidden to dispose of or leave in the reach of children the packaging materials which could become a source of danger.
9. It is forbidden to climb onto the appliance or rest any object on it.
10. It is forbidden to touch the unit with hands directly as the external parts of the appliance can reach temperatures of more than 70°C.
11. The appliance shall be installed in accordance with national wiring regulations.



## 2. Installation Precautions

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12. The unit can only be repaired by qualified installer centre personnel or an authorised dealer. (for Europe market)
13. 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.
14. Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.
15. 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.
16. 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.
17. 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.
18. The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas, fire can occur.
19. Make sure that there is circuit breaker for the unit, lack of circuit breaker can lead to electrical shock or fire.
20. 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.
21. The unit can only be repaired by the qualified personnel of an installer center or an authorized dealer. (for North America market)
22. Installation must be performed in accordance with the NEC/CEC by authorized person only. (for North America market)
23. USE SUPPLY WIRES SUITABLE FOR 75°C.
24. Caution: Single wall heat exchanger, not suitable for potable water connection.

# 3. Specifications

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## 3.1 Parameters

### ● Swimming Pool Dehumidifier

Model	Unit	PCF-2.2BD-C4W	PCF-3.5BD-C4W	PCF-4.5BD-C4W
Rated Capacity	L/h	2.2	3.5	4.5
Dehumidification capacity per day	L	53.0	84.0	108.0
Max pool area	m <sup>2</sup>	10	15	20
Noise Level	dB(A)	44	44	46
Rated Voltage/Freq	/	220-240V~/50Hz		
Rated Power Input	kW	0.9	1.1	1.95
Rated Running Current	A	4.0	5.0	8.8
Max.Power Input	kW	1	1.3	2.3
Max.Running Current	A	4.3	5.85	10
Relative Humidity	%RH	40~90	40~90	40~90
Temperature	℃	10~32		
Dimensions(L/W/H)	mm	See 3.3		
Net Weight	kg	See nameplate/ package label		
Refrigerant	/	R32		
Condensation Pipe Diameter	mm	16	16	16

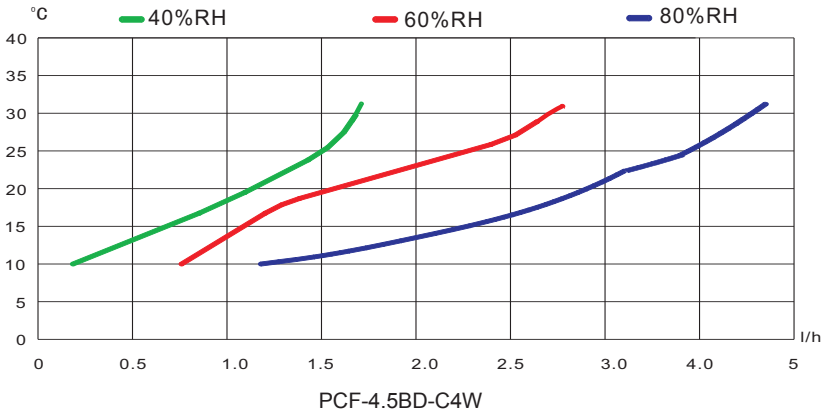
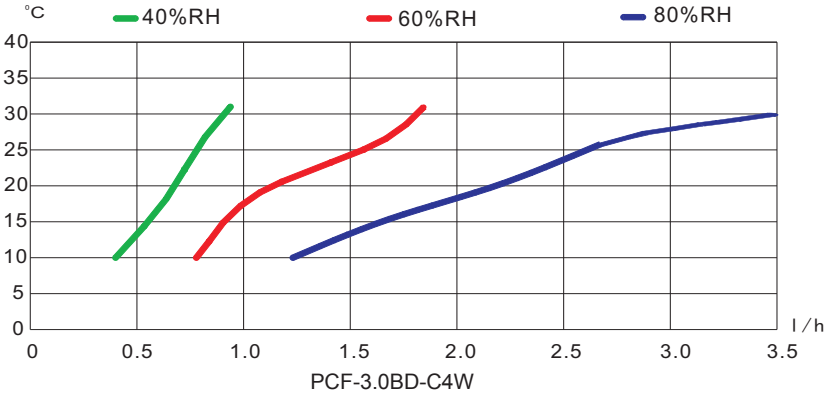
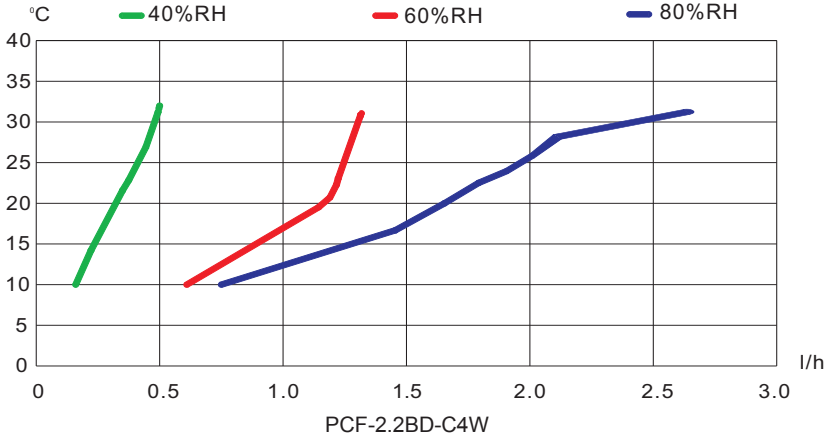
Test condition: Ambient temperature: 30℃, Relative humidity: 80%.

Operating limits: temperature 10℃~32℃  
relative humidity 40%~90%



# 3. Specifications

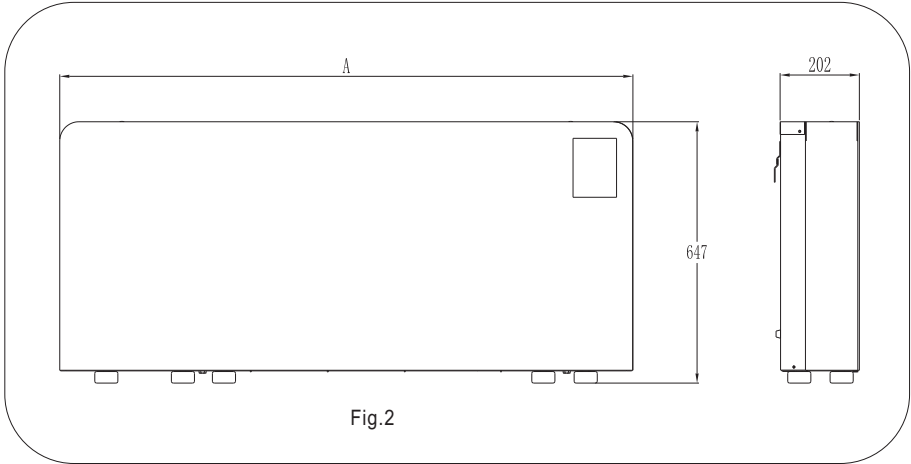
## 3.2 Performance Curve



# 3. Specifications

## 3.3 Dimensions

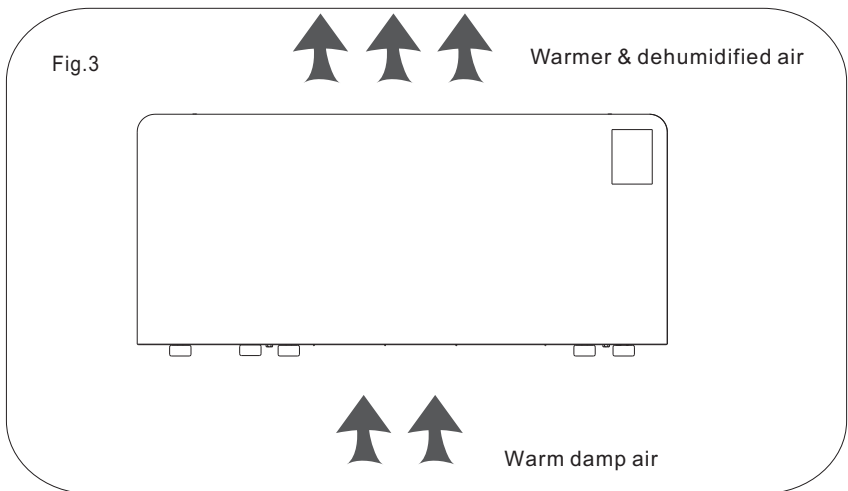
3.3.1 Applicable product model: AP-22W/AP-22B/AP-35W/AP-35B/PCF-4.5BD-C4W/PCF-4.5BD-C4B



Model	PCF-2.2BD-C4W	PCF-3.0BD-C4W	PCF-4.5BD-C4W
Length: A	1295	1495	1695

## 3.4 Working Principle:

The unit works by drawing moist air over a refrigerated coil with a small fan. The cold coil of the refrigeration device condenses the water, which is removed, then the air is reheated by the hot coil. This process works most effectively with higher ambient temperatures with a high dew point temperature(Fig.3).



# 3. Specifications

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## 3.5 Product Features

### 3.5.1 Ultra-low noise

With the advanced air ducting technology and the super quiet cross-flow fan, the unit can operate with ultra-low noise.

### 3.5.2 Ultra-thin casing

With the ultra-thin casing of 200mm, which is the result of compact design, the unit can save more space for you when it is compared with the common dehumidifiers with the thickness of 400mm.

### 3.5.3 Fashionable appearance

With noble & fashion arc frame and elegant & graceful snow white color, the unit will be perfectly combined with your pool house.

### 3.5.4 Newly design controller.

With simple operating display, the newly developed controller makes the unit operation easier and more user-friendly.

## 3.6 Hygrostat Control

3.6.1 The dehumidifier is controlled by a built-in hygrostat set on one side of the unit and the target RH value can be set ranges from 30% to 90%.

3.6.2 The unit will not start to dehumidify until the actual RH is beyond the setting value.

3.6.3 We recommend that an external hygrostat should be installed to ensure a constant measure of the humidity in the pool area.

3.6.4 The location of hygrostat is as the following (Fig.4):

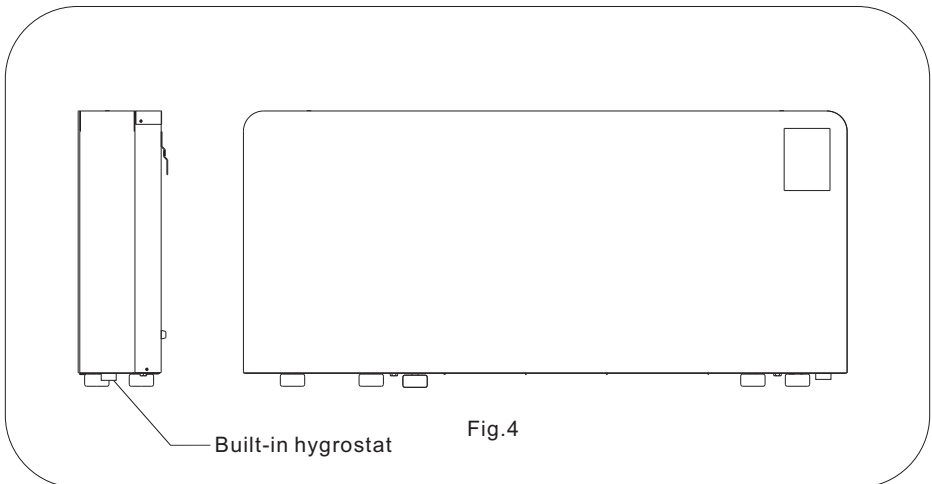


Fig.4

## 4. Installation

### 4.1 Installation Precautions

4.1.1 To ensure that the installation is performed correctly and that the appliance will perform perfectly, please carefully follow the instructions indicated in this manual. Fail to respect the rules indicated not only can cause malfunctions of the appliance but also invalidate the warranty, hence our company shall not respond for any damage to persons, animals or property.

4.1.2 It is important that the electrical installation is made according to the laws in force, respects the data indicated in the technical sheet and the unit is correctly earthed.

4.1.3 The appliance must be installed in a position that allows the routine maintenance, such as filter cleaning.

### 4.2 Positioning

4.2.1 Avoid installing the unit in proximity to:

- positions subject to exposure to direct sunlight;
- sources of heat;
- in places with oil fumes
- places subject to high frequencies.

4.2.2 Make sure that:

- the wall on which the unit is to be installed is strong enough to support the weight;
- the part of the installation wall does not have pipes or electric wires passing through;
- the installation wall is perfectly flat;
- there is an area free of obstacles which could interfere with the inlet and outlet air flow;
- it is preferably that there is an outside perimeter-wall to allow the discharge of condensation outside;

### 4.3 Minimum Installation Distances

4.3.1 Removing the four rubber feet of the unit are suggested if hanging it on the wall.

4.3.2 Fig. 5 indicates the minimum mounting distances between the wall-mounted swimming pool dehumidifier and furniture in the room.

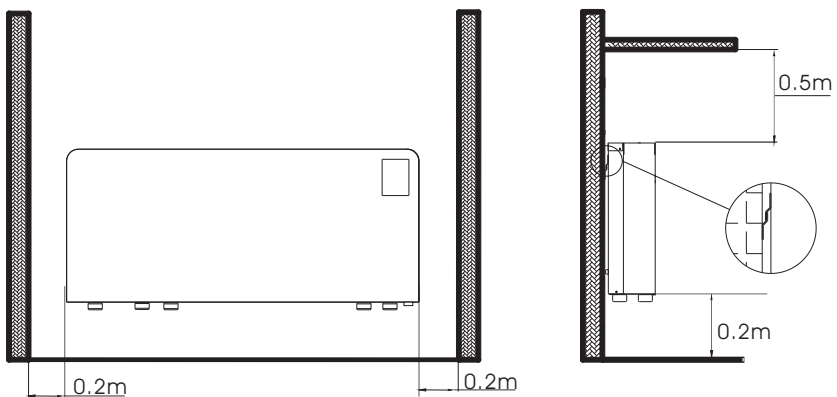
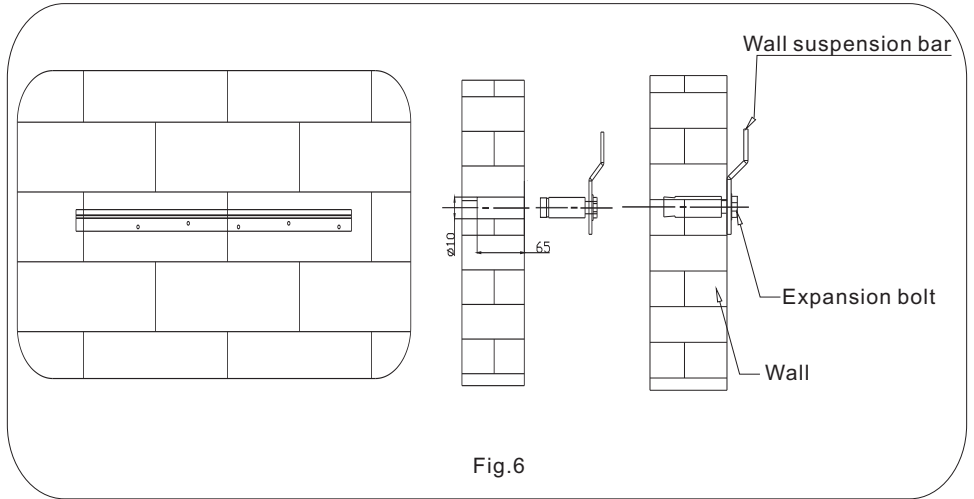


Fig.5

# 4. Installation

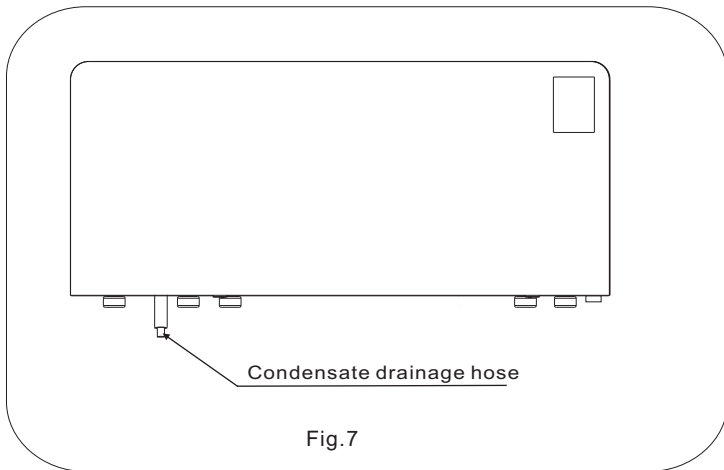
## 4.3.3 Wall mounted installation

Insert 5 expansion bolts into holes which are bored by  $\phi 10$  drill and fix the wall suspension bar horizontally(Fig.6).



## 4.4 Drainage

Select a suitable size hose to connect to the built-in hose if it is needed(Fig.7).



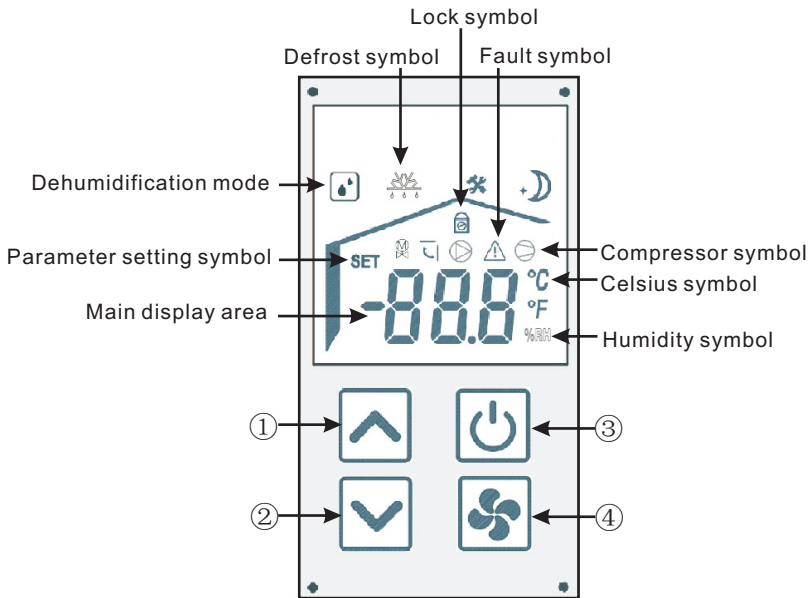
 Attention :

- If the condensation water discharges directly into a container, the condensate outlet should be above the container to avoid immersing in the container.

# 5. Usage

## 5.1. The wire controller operation interface

### 5.1.1 Full display interface



### 5.1.2 Key description

Key number	Key name	Key function
①	Up	Press this key to select the upward option or increase the parameter value.
②	Down	Press this key to select the downward option or decrease the parameter value.
③	ON/OFF	Press this button to turn on/off and cancel the current operation and return to the previous menu
④	Wind speed button	Press to set the wind speed and confirm/save Parameters

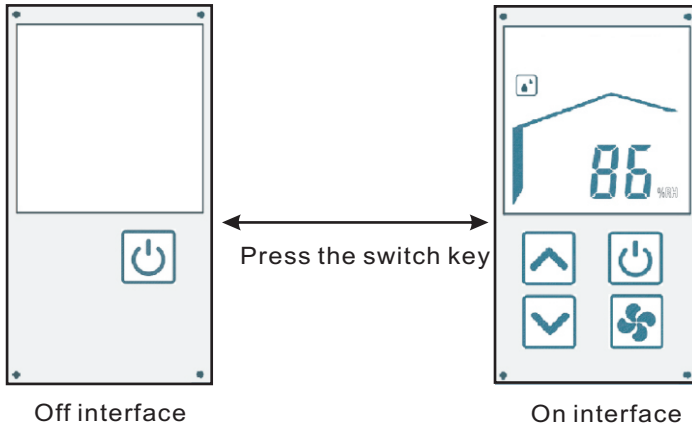
# 5. Usage

## 5.2. Function of wire controller

### 5.2.1 ON and OFF

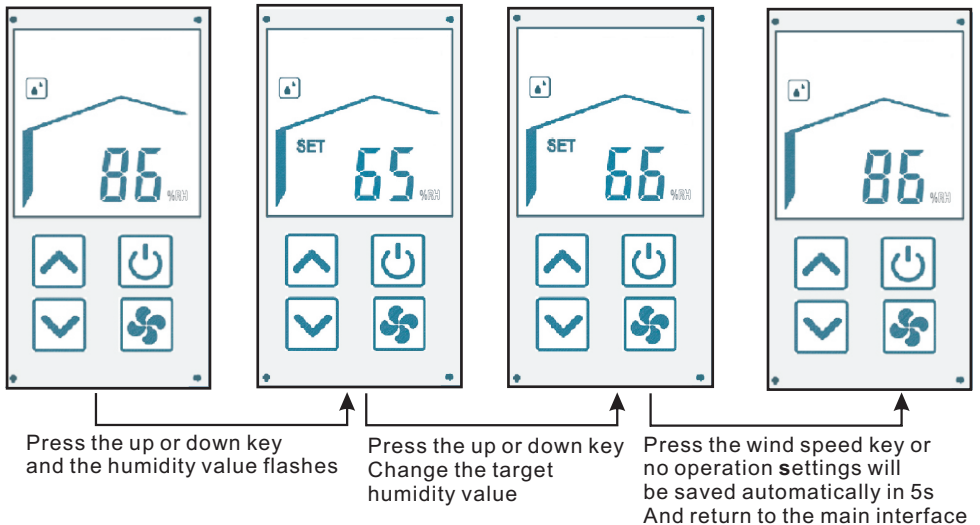
Off state: press the On/Off key, the unit enters the On state; key lights and display lights are up.

On state: press the On/Off key, the unit enters the Off state; key lights and display lights are off .



### 5.2.2 Target humidity setting

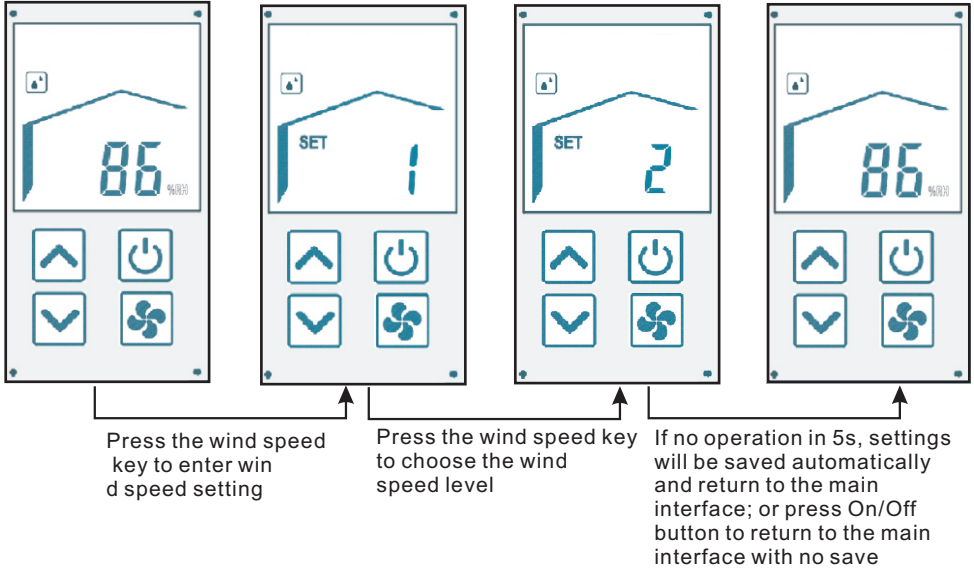
In the ON interface, short press the up or down key after the target humidity flashing, Press the up or down key to change the target humidity value.



# 5. Usage

## 5.2.3 wind speed setting

In the main interface short press the wind speed button to enter the wind speed setting, wind speed level value flashing, Short press the wind speed key, wind speed cycles between 1-3, if no operation in 5s, settings will be saved automatically and return to the main interface.



### Fan Mode:

ON: The fan keeps running when the target humidity is reached;

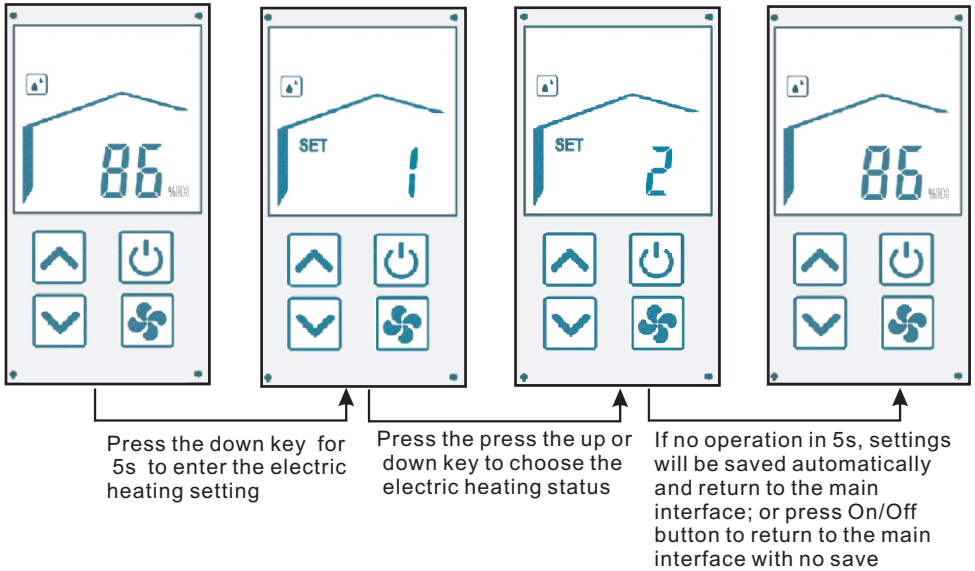
OFF: The fan stops when the target humidity is reached.

## 5.2.4 Electric heating setting

In the main interface press the down key for 5s to enter the electric heating setting, electric heating status value flashing. Short press the up or down key, electric heating status value between 0-1-2, if no operation in 5s, settings will be saved automatically and return to the main interface.



## 5. Usage

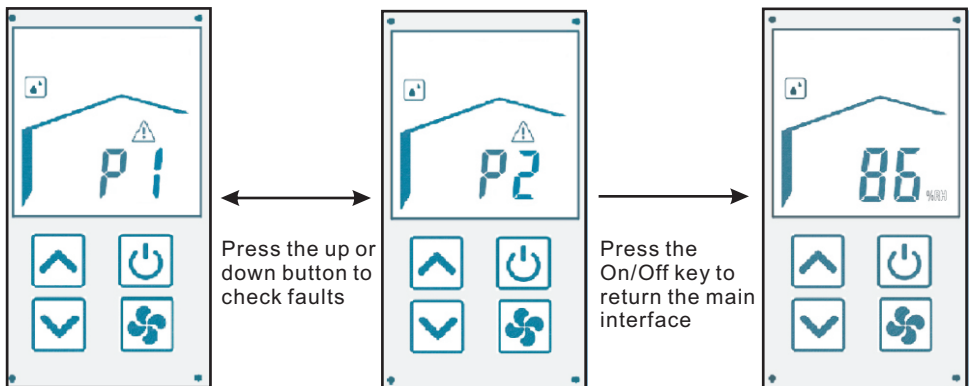


### 5.2.5 keyboard lock function

To avoid any faulty operations by others, please lock the keyboard after finishing settings. In the main interface, long press On/Off button for 5 seconds, you can lock the keyboard; in the keyboard lock state, long press On/Off button for 5 seconds, you can unlock the keyboard. In the lock keyboard interface you can only unlock, other operations are invalid.

### 5.2.6 fault interface

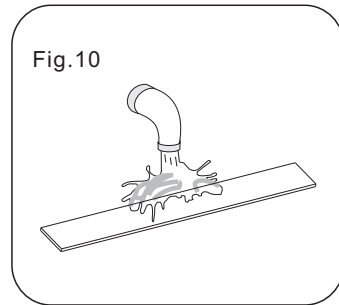
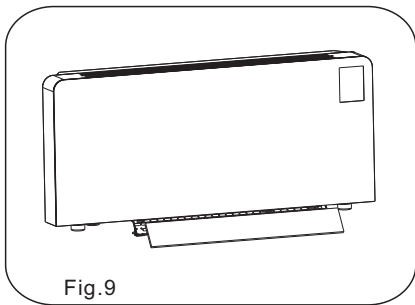
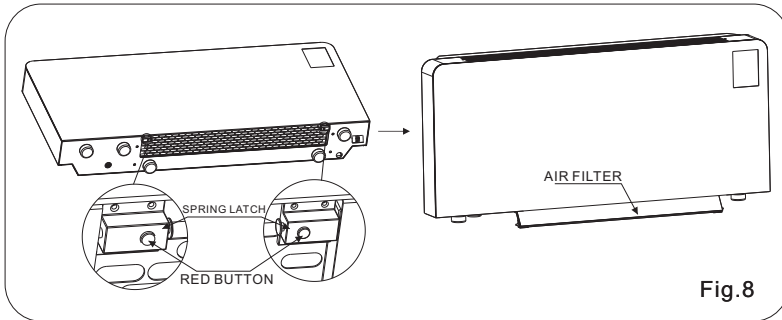
When the unit fails, the fault code displays in the main display area, press the up or down button, faults will display in cycle. Press the On button to return to the main interface.



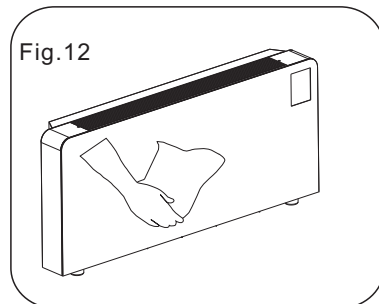
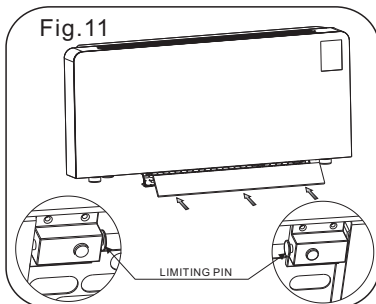
# 6. Maintenance

## 6.1 Maintenance

- To guarantee the unit reliable and security operation for a long time, it is suggested to maintain and clean up the unit every six months.
- Please take the following steps to clean up the strainer regularly:
  - 1) Press the two red buttons and drag it down slowly (Fig.8) ;
  - 2) Seperate the return air filter screen from the units as the image shown below (Fig.9) ;
  - 3) Take away the return air filter screen and flush it with water (Fig.10) .



- 4) Set the filter net and the air return grille to the original place and press the limiting pin. (Fig.11).
- 5) Clean up the unit outer with soft and damp rag (Fig.12) . To protect the paint-coat of the unit, please don' t use rough sponge or corrosive detergent to do these.



Warning: Cut off power supply before cleaning or maintaining the unit.

# 6. Maintenance

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## 6.2 Trouble shootings

Press the key of "UP" or "Down" to check that if there are more failure codes. You can find solutions to the problems according to the codes.

Malfunction	Code	Reason	Solution
High pressure protection has appeared 3 times in 30mins.	P1	High pressure protection is too frequently.	Check the below solutions to failure P1/P2/P3
High pressure protection	P2	Discharge pressure is too high	
Condenser outlet temp. overhigh	P3	Condenser coil temp. is too high	
Evaporator outlet temp. sensor failure	P5	This temp. sensor is broken or in open/short circuit	Check or replace this temp. sensor
Evaporator inlet temp. sensor failure	P6	This temp. sensor is broken or in open/short circuit	Check or replace this temp. sensor
Condenser outlet temp. sensor failure	P7	This temp. Sensor is broken or in open/short circuit	Check or replace this temp. sensor
Humidity sensor failure	P8	Humidity sensor is broken or in open/short circuit	Check or replace this humidity sensor
Motor feedback signal failure	E0	The feedback wiring is in bad connection. Or fan motor is damaged.	1. Check the feedback wiring of fan motor. 2. Or replace the fan motor.
Return air temp. sensor failure	P9	This temp. sensor is broken or in open/short circuit	Check or replace this temp. Sensor

Solution to failure P1/P2/P3:

1. If P1/P2/P3 appears together with other failures, please solve the others first.
2. If there is no other failures of P3~E0, and P1 & P2 still exist, please disconnect the power to the unit and connect again after 1 hour.
3. If only P3 exists, please keep the fan running for 30min. If P3 still exist after the running, please disconnect the power to the unit and connect again after 1 hour.

Note: Please contact with Technical Service Assistance when failures can not be solved.

## 6. Maintenance

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- 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 the 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.
- Checks to the area  
Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.
- Work procedure  
Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.
- General work area  
All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.
- Checking for presence of refrigerant  
The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.
- Presence of fire extinguisher  
If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

## 6. Maintenance

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### ● No ignition sources

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

### ● Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

### ● Checks to the refrigeration equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using flammable refrigerants:

The charge size is in accordance with the room size within which the refrigerant containing parts are installed;

The ventilation machinery and outlets are operating adequately and are not obstructed;

If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;

Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

### ● Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

. That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;

. That there no live electrical components and wiring are exposed while charging, recovering or purging the system;

. That there is continuity of earth bonding.

## 6. Maintenance

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### ● Repairs to sealed components

1) During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

2) Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

### ● Ensure that apparatus is mounted securely.

Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE: The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

### ● Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

### ● Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

### ● Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

### ● Leak detection methods

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/ extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

## 6. Maintenance

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### ● Removal and evacuation

When breaking into the refrigerant circuit to make repairs or for any other purpose conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- . Remove refrigerant;
- . Purge the circuit with inert gas;
- . Evacuate;
- . Purge again with inert gas;
- . Open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be "flushed" with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available. working on them.

### ● Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

### ● Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

## 6. Maintenance

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### ● Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically.
- c) Before attempting the procedure ensure that:
  - . Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
  - . All personal protective equipment is available and being used correctly;
  - . The recovery process is supervised at all times by a competent person;
  - . Recovery equipment and cylinders conform to the appropriate standards.
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with manufacturer's instructions.
- h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

### ● Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.

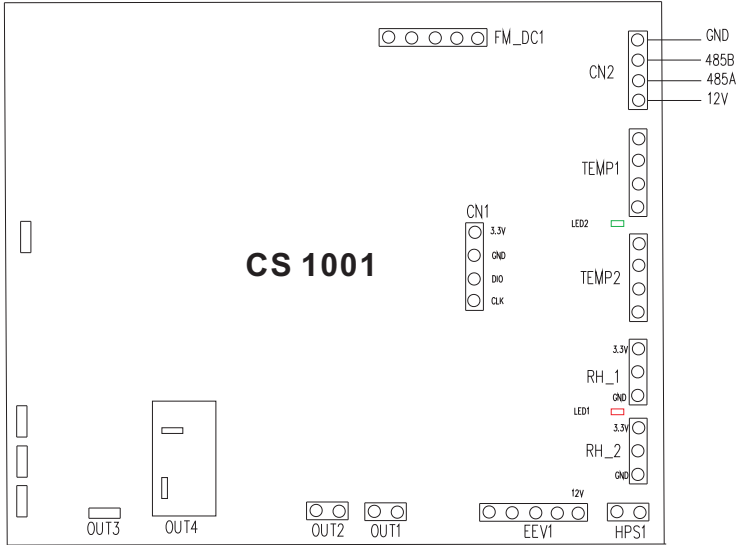
Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

- The safety wire model is 5\*20\_5A/250VAC, And must meet the explosion-proof requirements



# 7. Appendix

## 7.1 PCB I/O Port



Explanation :

NO	Ports	Meaning
1	OUT4	Compressor
2	FM_DC1	Dc motor output
3	OUT3	Electric heating
4	EEV1	Electronic expansion valve
5	RH_1	Return air humidity (interior)
6	RH_2	Return air humidity (external)
7	TEMP2	Evaporation outlet temperature
8	TEMP2	Evaporation inlet temperature
9	TEMP1	Condensation outlet temperature
10	TEMP1	Return air temperature
11	HPS1	High pressure protection
12	CN2	485 communication

# 7. Appendix

## 7.2 Cable specification

### (1) Single phase unit

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	2×1.5mm <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.

## 7. Appendix

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### 7.3 Comparison table of refrigerant saturation temperature

Pressure (MPa)	0	0.3	0.5	0.8	1	1.3	1.5	1.8	2	2.3
Temperature (R410A)(°C)	-51.3	-20	-9	4	11	19	24	31	35	39
Temperature (R32)(°C)	-52.5	-20	-9	3.5	10	18	23	29.5	33.3	38.7
Pressure (MPa)	2.5	2.8	3	3.3	3.5	3.8	4	4.5	5	5.5
Temperature (R410A)(°C)	43	47	51	55	57	61	64	70	74	80
Temperature (R32)(°C)	42	46.5	49.5	53.5	56	60	62	67.5	72.5	77.4

