



Owner's Manual

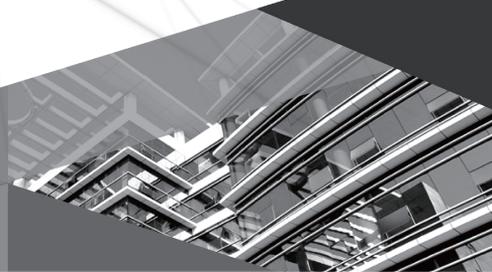
Original Instructions

DC Inverter Rooftop Packaged Air Conditioner

Models:

ÔÚÍ €€ÖËFG€ÖÍ PFP
ÔÚÍ €€ÖËFÌ €ÖÍ PFP
ÔÚÍ €€ÖËG €ÖÍ PFP

Thank you for choosing this product. Please read this Owner's Manual carefully before operation and retain it for future reference.



To Users

Thank you for selecting CIAC product. Please read this instruction manual carefully before installing and using the product, so as to master and correctly use the product. In order to guide you to correctly install and use our product and achieve expected operating effect, we hereby instruct as below:

- (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) In order to ensure reliability of product, the product may consume some power under stand-by status for maintaining normal communication of system and preheating refrigerant and lubricant. If the product is not to be used for long, cut off the power supply; please energize and preheat the unit in advance before reusing it.
- (3) Please properly select the model according to actual using environment, otherwise it may impact the using convenience.
- (4) This product can't be installed at corrosive, inflammable or explosive environment or the place with special requirements, such as kitchen. Otherwise, it will affect the normal operation or shorten the service life of the unit, or even cause fire hazard or serious injury. As for above special places, please adopt special air conditioner with anti-corrosive or anti-explosion function.
- (5) If the product needs to be installed, moved or maintained, please contact our designated dealer or local service center for professional support. Users should not disassemble or maintain the unit by themselves, otherwise it may cause relative damage, and our company will bear no responsibilities.
- (6) All the illustrations and information in the instruction manual are only for reference. In order to make the product better, we will continuously conduct improvement and innovation. If there is adjustment in the product, please subject to actual product.

Exception Clauses

Manufacturer will bear no responsibilities when personal injury or property loss is caused by the following reasons:

- (1) Damage the product due to improper use or misuse of the product.
- (2) Alter, change, maintain or use the product with other equipment without abiding by the instruction manual of manufacturer.
- (3) After verification, the defect of product is directly caused by corrosive gas.
- (4) After verification, defects are due to improper operation during transportation of product.
- (5) Operate, repair, maintain the unit without abiding by instruction manual or related regulations.
- (6) After verification, the problem or dispute is caused by the quality specification or performance of parts and components that produced by other manufacturers.
- (7) The damage is caused by natural calamities, bad using environment or force majeure.

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1 Safety Notices (Please be sure to abide)

SPECIAL WARNING:

- (1) Be sure to comply with national gas regulations.
- (2) Do not pierce or burn.
- (3) Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- (4) Be aware that refrigerants may not contain an odor.



PROHIBITED: This sign indicates that the operation must be prohibited.

Improper operation may cause severe damage or death to people.



WARNING: If not abide strictly, it may cause severe damage to the unit or the people.



NOTICE: If not abide strictly, it may cause slight or medium damage to the unit or the people.



OBSERVED: This sign indicates that the items must be observed.

Improper operation may cause damage to people or property.

Please read this operating manual carefully before operating the unit.



Before using the air conditioner, please read the instruction manual.



Before installing the air conditioner, please read the instruction manual.



Before repairing the air conditioner, please read the instruction manual.

The figures in this manual may be different with the material objects, please refer to the material objects for reference.



PROHIBITED

- (1) The air conditioner should be grounded to avoid electric shock. Do not connect the ground wire to gas pipe, water pipe, lightning arrester or telephone wire.
- (2) According to federal/state/local laws and regulations, all packages and transportation materials, including nails, metal or wooden parts, and plastic packing material, must be treated in a safe way.



WARNING

- (1) Do not use or store flammable, explosive, poisonous or other dangerous substances beside the air conditioner.
- (2) Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- (3) Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- (4) The appliance shall be installed in accordance with national wiring regulations.
- (5) An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.
- (6) Air conditioner should be stored with protective measures against mechanical damage caused by accident.
- (7) During installation, use the specialized accessories and components, otherwise water leakage, electric shock or fire hazard may occur.
- (8) Please install the air conditioner in a secure place that can withstand the weight of air conditioner. Insecure installation may cause the air conditioner falling down and lead to injury.
- (9) Be sure to adopt independent power circuit. If the power cord is damaged, it must be repaired by the manufacturer, service agent or other professional agents.
- (10) In case of trouble (e.g. burnt smell), please immediately cut off the main power of air conditioner unit.
- (11) The air conditioner can be cleaned only after it is turned off and power-disconnected, otherwise electric shock may occur.
- (12) The air conditioner is not intended to be cleaned or maintained by children without supervision.
- (13) Do not alter the setting of pressure sensor or other protective devices. If the protective devices are short-circuited or changed against rules, fire hazard or even explosion may occur.
- (14) Do not operate the air conditioner with wet hands. Do not wash or sprinkle water on the air conditioner, otherwise malfunction or electric shock will occur.
- (15) Do not dry the filter with naked flame or an air blower; otherwise the filter will be out of shape.
- (16) When installing or re-installing the air conditioner, please keep the refrigerant circuit away from substances other than the specified refrigerant, such as air. Any presence of foreign substances will cause abnormal pressure change or even explosion, resulting in injury.

**NOTICE**

- (1) Do not put a finger or other objects into the air inlet or air return grill.
- (2) Please do not foot on or place any goods on air conditioner unit.
- (3) Before installation, please check the power supply for compliance with the ratings on nameplate. Check the power safety as well.
- (4) Please adopt safety protection measures before touching the refrigerant pipe, otherwise your hands may be hurt.
- (5) Please arrange the drain pipe according to the instruction manual.
- (6) Never stop the air conditioner by directly cutting off the power.
- (7) Never install the air conditioner in the following places:
 - a) Places with oil smoke or volatile liquid: plastic parts may deteriorate and fall off or even cause water leakage.
 - b) Places with corrosive gas: copper pipe or the welding parts may be corroded and cause refrigerant leakage. Places with oil smoke or volatile liquid: plastic parts may deteriorate and fall off or even cause water leakage.
- (8) Adopt proper measures to protect the unit from small animals because they may damage the electric components and cause malfunction of the air conditioner.
- (9) The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.

**OBSERVED**

- (1) If wired control is to be used, it should be connected first before powering up the unit, otherwise the wired control may not be able to use.
- (2) Before operating the unit under low temperature, connect it to power for 8 hours. If it is stopped for a short time, for example, one night, do not cut off the power (This is to protect the compressor).
- (3) Once started, the air conditioner shall not be stopped at least after 5 minutes or longer; otherwise the oil return to compressor may be affected.
- (4) Please disconnect the main power if to put the air conditioner unit out of use for a long period.

2 Product Introduction

CIAC rooftop packaged units are completely assembled, piped and wired at the factory to provide one-piece shipment and rigging. Each unit is pressurized with a holding charge of R410A for storage and shipping.

The compact design, attractive appearance, outstanding anti-rust cabinet and quiet operation make these units suitable for almost any manufactured or modular homes, offices, restaurants, residences or similar places.

2.1 Nominal Operating Condition

Item	Outdoor condition		Indoor condition	
	DB temperatrue(°C)	WB temperatrue(°C)	DB temperatrue(°C)	WB temperatrue(°C)
Cooling	35	24	27	19
Heating	7	6	20	15

2.2 Operating Range

Item	Outdoor condition (DB °C)
Cooling	18~48
Heating	-10~24

3 Pre-installation Instruction

3.1 Checking Product Received

Upon receiving the product, check any damage from transportation. Shipping damage is the responsibility of the carrier. Verify the model number, specifications and accessories are correct prior to installation. The distributor or manufacturer will not accept claims from dealers for transportation damage or installation of incorrectly shipped units.

3.2 Standard Accessory Parts

The standard accessory parts listed below are furnished and should be used as required.

No.	Name	Appearance	Q'ty	Usage
1	Wired controller		1	To control the unit

3.3 Before Beginning Installation

Carefully read all instructions for the installation prior to installing product. Make sure each step or procedure is understood and any special considerations are taken into account before starting installation. Assemble all tools, hardware and supplies needed to complete the installation. Some items may need to be purchased locally. Make sure everything needed to install the product is on hand before starting.

3.4 Codes & Regulations

This product is designed and manufactured to comply with national codes. It is installer's responsibilities to install the product in accordance with such codes and/or any prevailing local codes/regulations. The manufacturer assumes no responsibilities for equipment installed in violation of any codes or regulations.

3.5 Replacement Parts

When reporting shortages or damages, or ordering repair parts, give the complete product model and serial numbers as stamped on the product. Replacement parts for this product are available through your contractor or local distributor.

4 Installation Instructions

4.1 Physical Dimension

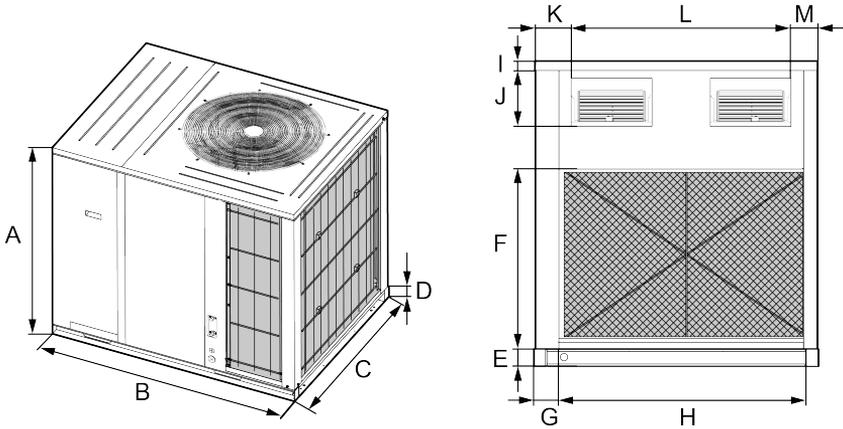


Fig.1

Dimension(mm)	A	B	C	D	E	F	G	H	I	J	K	L	M
ÔÚÌ €€ÖÏ FGEÓÍ PFP	1215	1450	1120	70	98	686	94	916	70	190	144	866	105
ÔÚÌ €€ÖÏ FÌ €OPÍ PFP	1245	2260	1140	80	111	595	50	914	58	406	298	487	349
ÔÚÌ €€ÖÏ G €OPÍ PFP	1250	1880	2240	85	115	590	158	2021	45	412	311	1336	588

NOTE: Above diagrams may be different from actual mode.

4.2 General Information

Model name	Model		
	Refrigerant	Function	Climate type
ÔÚÍ €€ÖËFG€ÖÍ PFP	R410A	Heat pump	T1
ÔÚÍ €€ÖËFÌ €ÖÍ PFP	R410A	Heat pump	T1
ÔÚÍ €€ÖËG €ÖÍ PFP	R410A	Heat pump	T1

4.3 Location

To ensure the unit in proper function, selection of installation location must be in accordance with following principles.

- (1) Unit shall be installed so that the air discharged by outdoor fan will not return and that sufficient space for repair shall be provided around the unit.
- (2) The installation site must have good ventilation, so that the unit can take in and exhaust enough air.
- (3) Place of installation shall be strong enough to support the weight of unit, and it shall be able to insulate noise and prevent vibration. Ensure that the wind and noise from the unit will not affect your neighbors.
- (4) Avoid direct sunshine over the unit. It is better to set up a sun shield as the protection.
- (5) Place of installation must be able to drain the rainwater and defrosting water.
- (6) Place of installation must ensure the unit will not subject to the influence of rubbish or oil fog.
- (7) The installation site must be at a place where the air exhaust outlet does not face strong wind.
- (8) Unit must be fixed on stable and solid surface of floor.

4.4 Crane Way

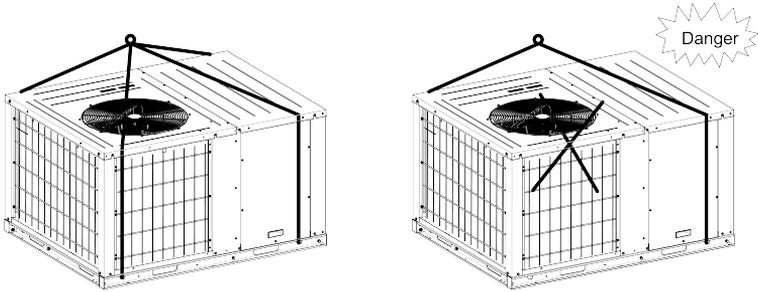


Fig.2

- (1) When removing the unit, two ropes are needed to hang the unit along the four ways.
- (2) In order to avoid the extrusion, between the ropes should be add something to protect the unit (e.g. batten).
- (3) Please use M12 to tight the support fundus.

4.5 Installation Positions and Clearances

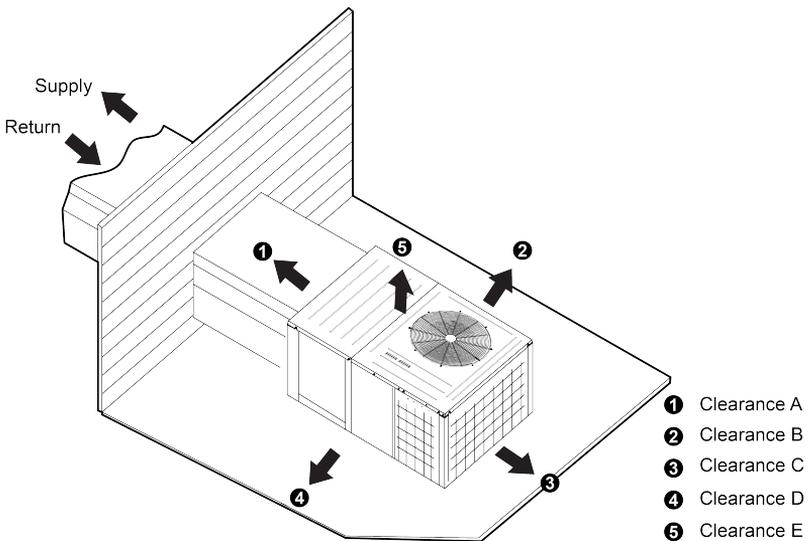


Fig.3

NOTE: Above diagrams may be different from actual model.

Installation clearances		
Dimension (minimum)	mm	inch
A	1000	39
B	1500	59
C	1100	43
D	1100	43
E	3000	118

4.6 Installation of Condensate Pipe

- (1) After the unit is installed, it is required to check the level of the whole unit. The unit must be placed horizontally to ensure the unit in proper function.
- (2) When shipped out from factory, both the condensate outlets are blocked by rubber plug. So before installation, please take the rubber plug out.
- (3) Condensate removal is performed by attaching a PVC pipe to the drain pan and terminated in accordance with local or state Plumbing/HVAC codes.
- (4) The condensate pipe shall be installed with an inclining angel of 5~10°, so as to facilitate the drainage of condensate.
- (5) As the inside of the unit is in the negative pressure status, it is required to set up a backwater elbow. The requirements is: $A=B \geq P/10+20(\text{mm})$. P is the absolute pressure inside the unit. The unit of the pressure is Pa.
- (6) After the electrical installation is completed, carry out the testing of the drainage system.
- (7) It is not allowed to connect the condensate drain pipe into waste pipe or other pipelines which are likely to produce corrosive or peculiar smell to prevent the smell from entering indoors or corrupt the unit.
- (8) It is not allowed to connect the condensate drain pipe into rain pipe to prevent rain water from pouring in and cause property loss or personal injury.
- (9) Condensate drainpipe should be connected into special drain system for air conditioner.

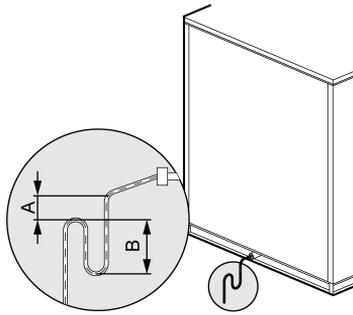


Fig.4

Drain connection size (inch)	3/4"(NPT)
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4.7 Adjust the Tightness of the Belt (Only above 10 Ton)

- (1) The rotation of the fan is achieved by the transmission of the belt. The velocity and stability of the fan is associated with the tightness of the belt and the tightness should be adjusted after a period of time.
- (2) For a new belt, the tightness should be adjusted for at least twice within 24 hours. After one week running, the tightness of the belt should be adjusted again, we should routinely check it every 1-2 months; also ensure the test results complying with the following table.
- (3) The adjustment of the tightness of the belt is shown in the following figure. Loosen screws fixing motor on the base, move motor along the direction of arrow as shown in the picture, and then fix the screw again.
- (4) The tension of the belt can be measured by a measuring tool, which can measure the tension based on the center-to-center distance and sectional areas of the belt pullies.

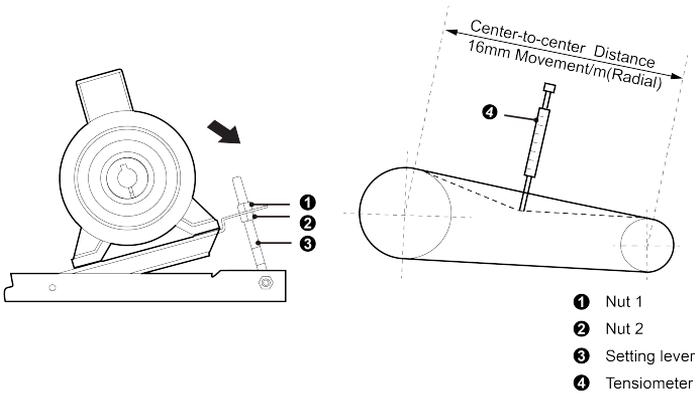


Fig.5

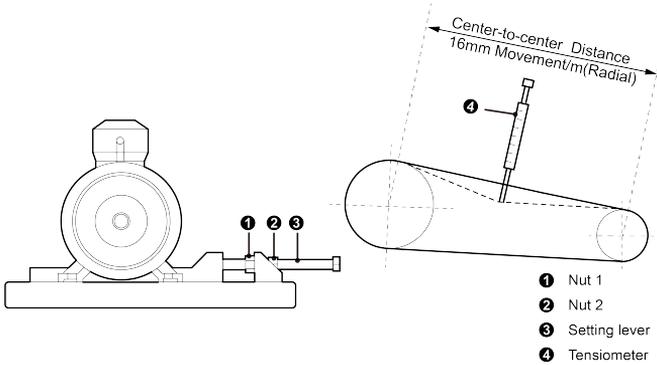


Fig.6

Tension range of the belt			
Belt section	Force required for the belt moving 16 mm downward or 1m radial distance		
	Small pulley diameter(mm)	N	kgf
SPA	80-132	23-35	2.5-3.6
	140-200	35-45	3.6-4.6

NOTE: Above diagrams may be different from actual model.

5 Electrical Installation

5.1 Electrical Data and Wire Sizing

Model name	Power supply	Capability of circuit breaker(A)	Min. sectional area of earth wire(mm ²)	Min. sectional area of power cord(mm ²)
ÔÚÌ €€€ŸFG€ÓÍ PFP	220-240V 3~, 60Hz	50	10.0	10.0
ÔÚÌ €€€ŸFÌ €€ÓÍ PFP	220-240V 3~, 60Hz	80	25.0	25.0
ÔÚÌ €€€ŸG €€ÓÍ PFP	220-240V 3~, 60Hz	100	25.0	25.0



NOTICE!

- (1) An all-pole disconnection switch having a contact separation of at least 3 mm in all poles should be connected in fixed wiring.
- (2) The circuit breaker and power cord specification in above sheet is based on max power (max current) of the unit.
- (3) The power cord specification in above sheet is based on ambient temperature of 40°C.
- (4) If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.
- (5) The circuit breaker specification in above sheet is based on ambient temperature of 40°C. If the working condition is different, please adjust it according to the specification sheet of circuit breaker.

5.2 Connect Wiring to the Terminals



NOTICE!

Please note the following items before installing the electric appliance.

- (1) Check if the power supply accords with its value on the nameplate.
- (2) The capacity of the power supply must be large enough.
- (3) The circuit should be installed by the professional technician.
- (4) In fixed circuit, there must be electricity leakage protection switch of enough power capacity and circuit breaker with space between its electrode contacts $\geq 3\text{mm}$.
- (5) Single wire connection.
 - a) Peel off the insulation for 25mm with pliers.
 - b) Remove the screw from the terminal board.
 - c) Bend the peeled wire into circle with pliers.
 - d) Screw cross the circle and fix it on the terminal board.
- (6) Strand wires connection.
 - a) Peel off the insulation for 10mm with pliers.
 - b) Remove the screw from the terminal board.
 - c) Clamp a round terminal of the peeled wires.
 - d) Screw cross the circle and fix it on the terminal board.

Unit: mm

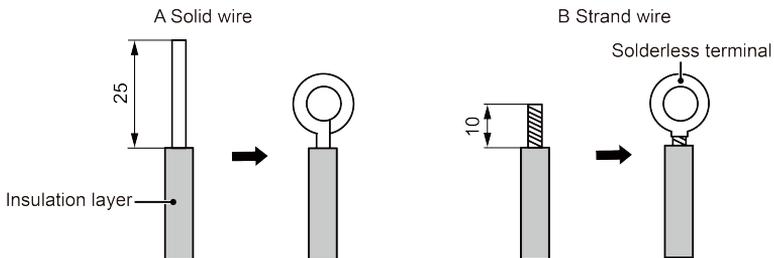


Fig.7



WARNING!

If the power line or the signal line is defective, use the special coil to replace it.

- (1) Before connecting lines, read the voltages of the relevant parts on the nameplate. Then carry out line connection according to the schematic diagram.
- (2) The air-conditioning unit shall have special power supply line which shall be equipped with electricity leakage switch and circuit breaker, so as to deal with overload conditions.
- (3) The air-conditioning unit must have grounding to avoid hazard owing to insulation failure.
- (4) All fitting lines must use crimp terminals or single wire. If multiple twisted wires are connected to terminal board, arc may arise.
- (5) All line connections must conform to the schematic diagram of lines. Wrong connection may cause abnormal operation or damage of the air-conditioning unit.
- (6) Do not let any cable contact the refrigerant pipe, the compressor and moving parts such as fan.
- (7) Do not change the internal line connections inside the air-conditioning unit. The manufacturer shall not be liable for any loss or abnormal operation arising from wrong line connections.
- (8) If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.
- (9) All of the supplied components, material, and electric operation should be accorded with the local principles.
- (10) The null line of power input must be connected to the "N" section of the terminal board! A wrong connection will cause the damage of unit!

5.3 Electrical Connections-Supply Voltage

- (1) Air-conditioning unit with single-phase power supply.
 - a) Remove the electric box cover of the unit.
 - b) Pass the cable though rubber ring.
 - c) Connect the power supply cable to the terminals and the grounding screw.
 - d) Use cable fastener to bundle and fix the cable.
- (2) Air-conditioning unit with 3-phase power supply.
 - a) Remove the electric box cover of the unit.

- b) Pass the cable through rubber ring.
 - c) Connect the power supply cable to terminals and the grounding screw according to wiring diagram.
 - d) Use cable fastener to bundle and fix the cable.
- (3) Low voltage connections.
- Low voltage wiring is to be copper conductors. The wire size of the communication line should be no less than 0.75mm².
- a) Remove the electric box cover of the unit.
 - b) Pass the signal cable of the wire controller through rubber ring.
 - c) Connect the signal cable to terminals according to wiring diagram.
 - d) Use cable fastener to bundle and fix the cable.



NOTICE!

Take great care when carrying out the following connections, so as to avoid malfunction of the air-conditioning unit because of electromagnetic interference.

- (1) The signal line of the wire controller must be separated from the power line.
- (2) In case the unit is installed in a place vulnerable by electromagnetic interference, it is better to use shielded cable or double-twisted cable as the signal line of the wire controller.

5.4 Wiring Diagram

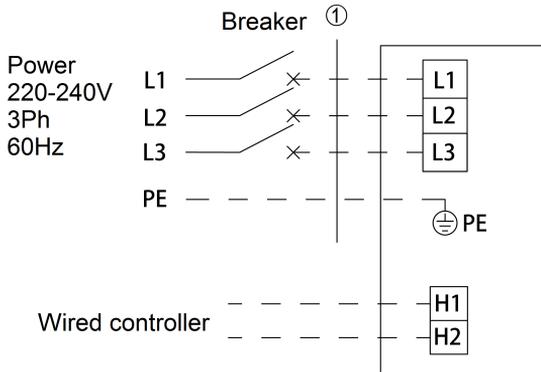


Fig.9

ΌÚΙ €€ÖÏ F€ÖÍ PFP, ΌÚΙ €€ÖÏ FÍ €ÖÍ PFP, ΌÚΙ €€ÖÏ G €ÖÍ PFP

6 Maintenance

To protract the life of the air-conditioning unit, check and maintain the unit regularly with a qualified service person.

- (1) Cleaning the air filter
 - a) Do not disassemble the air filter when cleaning it. Otherwise failure may be caused.
 - b) If the air-conditioning unit is used in an environment with much dust, you should clean the air filter frequently (once every two weeks).
- (2) Cleaning the outdoor heat exchanger

Outdoor heat exchanger must be cleaned regularly, at least once every two months. You can clean the surface with vacuum cleaner or nylon brush, please do not wash it with water.
- (3) Maintenance at the beginning of operating season
 - a) Check the air inlet and outlet of the units to confirm there is no blockage.
 - b) Check to see if the grounding wire is in good condition.
 - c) Check to see if the line connection is in good condition.
 - d) Check the drainage pipe so as to confirm the fluency flow of condensate.
- (4) Maintenance at the end of the operational season

- a) When the weather is clear, operate the unit for half a day, so as to dry the inside of the unit.
- b) If not to use the air-conditioning unit for a long time, please disconnect the power supply.

**NOTICE!**

You shall pay attention to the following matters when cleaning the air-conditioning unit.

- (1) Cut off all power supply before contacting the line connecting equipment.
- (2) Only clean the air-conditioning unit after the unit is shut off and the power supply is disconnected. Otherwise electrical shock or injury may be caused.
- (3) Do not use water to clean the air-conditioning unit. Otherwise there may be electrical shock.
- (4) Pay more attention to the place that the air conditioner should be installed firm.

7 Trial Run

- (1) The power supply should be turned on only after finishing all the installation.
- (2) All the control wires and cables are connected correctly and safely.
- (3) All the objects like screws and wires etc that remained in the unit should be cleared after installation.
- (4) Witch on power supply and press the ON/OFF button to start operation.

8 Troubleshooting

If your air-conditioning unit suffers from abnormal operation or failure, please first check the following points before repair.

Failure	Possible cause	Solution
The unit can not be started.	The power supply does not connect or improper phase sequence.	Connect the power supply or change two random phase.
	Electrical leakage of air-conditioning unit causes tripping of leakage switch.	Contact the nearest service center.
	The voltage is too low.	Contact the dealer.
	The control loop has failure.	Contact the nearest service center.

Failure	Possible cause	Solution
The unit operates for a while and then stops.	Air outlet port or intake port of the unit is blocked.	Remove the obstacles.
	There is obstacle in front of the condenser.	Remove the obstacles.
	The control loop is abnormal.	Contact the nearest service center.
Poor cooling effect.	Air filter is dirty.	Clean air filter.
	Air outlet port or intake port of indoor side or outdoor side is blocked.	Remove the obstacles.
	Too many persons or a heat source in the room.	If possible, clear heat sources.
	Doors or windows are open.	Close windows and doors.
	Refrigerant leakage.	Contact the nearest service center.

NOTE: After carrying out the check of the above items and taking relevant measures to solve the problems found but the air-conditioning unit still does not function well, please stop the operation of the unit immediately and contact the nearest service center. Only ask professional serviceman to check and repair the unit.

9 Unit Function

9.1 Setting of Double Indoor Room Sensors

This series of rooftop packaged unit has two indoor room sensors. One is located at the air intake of the unit and the other one is located inside the wire controller.

Users can select one from the two indoor room sensors on the basis of the engineering requirement.

(Refer to the section of wire controller instructions for detailed operation.)

9.2 Checking of Outdoor Ambient Temperature

The outdoor ambient temperature can be checked on the wire controller for the convenience of users before going out.

(Refer to the section of wire controller instructions for detailed operation.)

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