GREE
Change for life

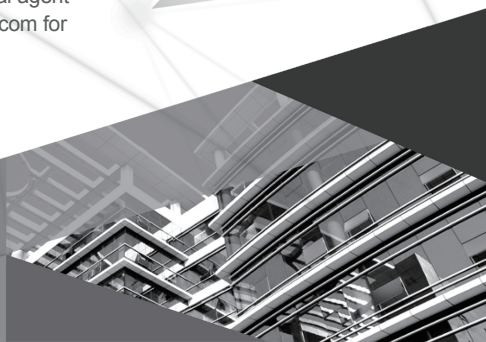
Owner's Manual

Original Instructions

Split Air Conditioner

INVERTER

Thank you for choosing our product.
Please read this Owner's Manual carefully before operation and retain it for future reference.
If you have lost the Owner's Manual, please contact the local agent or visit www.gree.com or send an email to global@cn.gree.com for the electronic version.



GWH09AECXB-K6DNA1A/I
GWH12AECXD-K6DNA1A/I

Content

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.

Frequency band(s) in which the radio equipment operates : 2400MHz-2483.5MHz
Maximum radio-frequency power transmitted in the frequency band(s) in which the radio equipment operates : 20dBm

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

R32: 675

Explanation of Symbols

⚠ DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates important but not hazard-related information, used to indicate risk of property damage.
	Indicates a hazard that would be assigned a signal word WARNING or CAUTION.

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.

If it needs to install, move or maintain the air conditioner, please contact dealer or local service center to conduct it at first. Air conditioner must be installed, moved or maintained by appointed unit. Otherwise, it may cause serious damage or personal injury or death.
When refrigerant leaks or requires discharge during installation, maintenance, or disassembly, it should be handled by certified professionals or otherwise in compliance with local laws and regulations.

Appliance filled with flammable gas R32.

Before use the appliance, read the owner's manual first.

Before install the appliance, read the installation manual first.

Before repair the appliance, read the service manual first.

The Refrigerant

- To realize the function of the air conditioner unit, a special refrigerant circulates in the system. The used refrigerant is the fluoride R32, which is specially cleaned. The refrigerant is flammable and inodorous. Furthermore, it can lead to explosion under certain conditions. But the flammability of the refrigerant is very low. It can be ignited only by fire.
- Compared to common refrigerants, R32 is a nonpolluting refrigerant with no harm to the ozonosphere. The influence upon the greenhouse effect is also lower. R32 has got very good thermodynamic features which lead to a really high energy efficiency. The units therefore need a less filling.

WARNING:

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacture. Should repair be necessary, contact your nearest authorized Service Centre. Any repairs carried out by unqualified personnel may be dangerous. The appliance shall be stored in a room without continuously operating ignition sources. (for example: open flames, an operating gas appliance or an operating electric heater.) Do not pierce or burn.

Appliance shall be installed, operated and stored in a room with a floor area larger than X m^2. (Please refer to table "a" in section of " Safety operation of flammable refrigerant " for Space X.)

Appliance filled with flammable gas R32. For repairs, strictly follow manufacturer's instructions only. Be aware that refrigerants may not contain an odour. Read specialist's manual.

Precautions

WARNING

Operation and Maintenance

- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance.
- Cleaning and user maintenance shall not be made by children without supervision.
- Do not connect air conditioner to multi-purpose socket. Otherwise, it may cause fire hazard.
- Do disconnect power supply when cleaning air conditioner. Otherwise, it may cause electric shock.
- 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.
- Do not wash the air conditioner with water to avoid electric shock.
- Do not spray water on indoor unit. It may cause electric shock or malfunction.
- After removing the filter, do not touch fins to avoid injury.
- Do not use fire or hair dryer to dry the filter to avoid deformation or fire hazard.

Precautions

WARNING

- Maintenance must be performed by qualified professionals. Otherwise, it may cause personal injury or damage.
- Do not repair air conditioner by yourself. It may cause electric shock or damage. Please contact dealer when you need to repair air conditioner.
- Do not extend fingers or objects into air inlet or air outlet. It may cause personal injury or damage.
- Do not block air outlet or air inlet. It may cause malfunction.
- Do not spill water on the remote controller, otherwise the remote controller may be broken.
- When below phenomenon occurs, please turn off air conditioner and disconnect power immediately, and then contact the dealer or qualified professionals for service.
  - Power cord is overheating or damaged.
  - There's abnormal sound during operation.
  - Circuit break trips off frequently.
  - Air conditioner gives off burning smell.
  - Indoor unit is leaking.
- If the air conditioner operates under abnormal conditions, it may cause malfunction, electric shock or fire hazard.
- When turning on or turning off the unit by emergency operation switch, please press this switch with an insulating object other than metal.
- Do not step on top panel of outdoor unit, or put heavy objects. It may cause damage or personal injury.

Precautions

WARNING

Attachment

- Installation must be performed by qualified professionals. Otherwise, it may cause personal injury or damage.
- Must follow the electric safety regulations when installing the unit.
- According to the local safety regulations, use qualified power supply circuit and circuit break.
- Do install the circuit break. If not, it may cause malfunction.
- An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.
- Including an circuit break with suitable capacity, please note the following table.Air switch should be included magnet buckle and heating buckle function, it can protect the circuit-short and overload.
- Air Conditioner should be properly grounded. Incorrect grounding may cause electric shock.
- Don't use unqualified power cord.
- Make sure the power supply matches with the requirement of air conditioner.Unstable power supply or incorrect wiring may result in electric shock, fire hazard or malfunction. Please install proper power supply cables before using the air conditioner.
- Properly connect the live wire, neutral wire and grounding wire of power socket.
- Be sure to cut off the power supply before proceeding any work related to electricity and safety.

Precautions

WARNING

- Do not put through the power before finishing installation.
- 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.
- The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.
- The appliance shall be installed in accordance with national wiring regulations.
- Installation must be performed in accordance with the requirement of NEC and CEC by authorized personnel only.
- The air conditioner is the first class electric appliance. It must be properly grounding with specialized grounding device by a professional. Please make sure it is always grounded effectively, otherwise it may cause electric shock.
- The yellow-green wire in air conditioner is grounding wire, which can't be used for other purposes.
- The grounding resistance should comply with national electric safety regulations.
- The appliance must be positioned so that the plug is accessible.
- All wires of indoor unit and outdoor unit should be connected by a professional.
- If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.

Precautions

WARNING

- For the air conditioner with plug, the plug should be reachable after finishing installation.
- For the air conditioner without plug, an circuit break must be installed in the line.
- If you need to relocate the air conditioner to another place, only the qualified person can perform the work. Otherwise, it may cause personal injury or damage.
- Select a location which is out of reach for children and far away from animals or plants.If it is unavoidable, please add the fence for safety purpose.
- The indoor unit should be installed close to the wall.
- Instructions for installation and use of this product are provided by the manufacturer.

Working temperature range

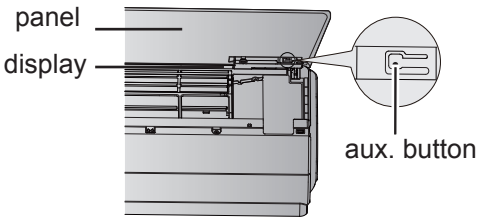
	Indoor side DB/WB(°C)	Outdoor side DB/WB(°C)
Maximum cooling	32/23	43/26
Maximum heating	27/-	24/18

NOTICE:

- The operating temperature range (outdoor temperature) for Low-temperature cooling only unit is -15°C~ 43°C; for Low-temperature heat pump unit is -22°C~ 43°C.

Emergency operation

If remote controller is lost or damaged, please use aux. button to turn on or turn off the air conditioner. The operation in details is as below:
As shown in the fig. Open panel, press aux. button to turn on or turn off the air conditioner. When the air conditioner is turned on, it will operate under auto mode.

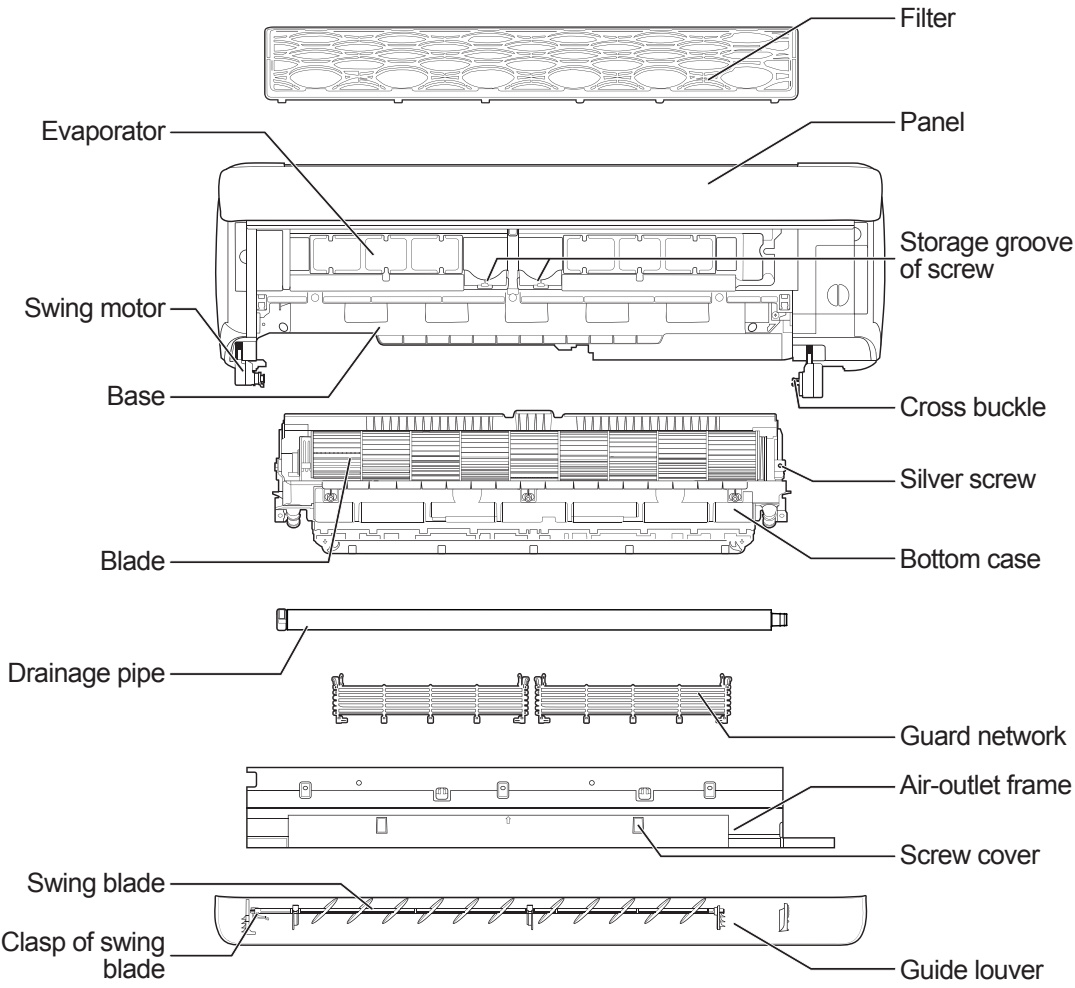


⚠WARNING:

Use insulated object to press the auto button

Clean and maintenance

Schematic diagram of parts



Clean and maintenance

Notices for clean

- When the unit has operated for a period of time and the display flashes to display " 88 " continuously, it indicates you should clean the air conditioner. When hold " " button on the remote controller for 3s to enter into deep cleaning (power must be cut off for cleaning) under off status, the reminding status will disappear after turning on the unit. If you don't want to clean the air conditioner at the moment, press the combination buttons of "MODE+TEMP" to cancel this remind.
- Please select the clean procedure according to the actual operation environment or the degree of dirt of parts.

Warning

Please pull out the power plug

Before maintenance, please do cut off the power. Otherwise, it may cause electric shock.

Prohibition During the process of maintenance, please make sure the stand position is stable and reliable. Otherwise, it may cause injury.

Prohibition Do not touch the aluminum fins with hand directly. Otherwise, it may cause injury.

Prohibition During disassembly process, do not stand underneath the air conditioner.

Prohibition Do not wash the electrical components with water.

Indoor unit clean

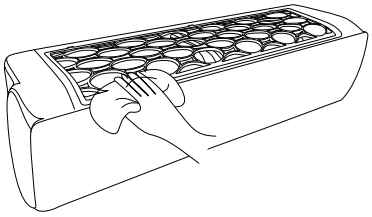
Caution

- Do not use volatile liquid (such as thinner, gasolin, etc.) to clean the air conditioner. Otherwise, the appearance of the air conditioner may be damaged.
- Please use clean and soft cloth to wipe the appearance of the air conditioner.
- Do not use liquid or corrosive detergent clean the appliance and do not splash water or other liquid onto it, otherwise, it may damage the plastic components, even cause electric shock.

Daily clean (appearance/filter clean)

Wipe the appearance

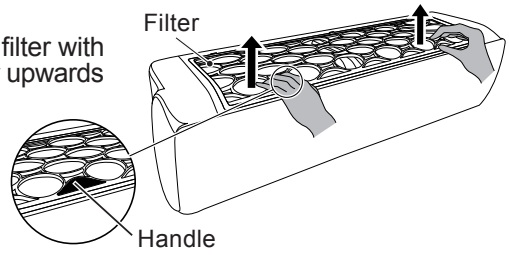
When there's dust on the appearance of the unit, please wipe it with soft cloth; When the surface is dirty (such as grease), please use immerse the cloth into warm water (45℃(113°F)), wrist up it and then wipe the surface. You can also dip a little neutral detergent when it's nessary.



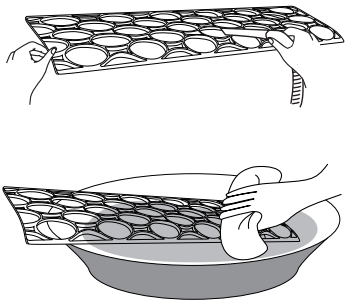
Clean and maintenance

Filter clean

①Hold the handles at both sides of filter with both hands, and then pull the filter upwards to remove it.



②Use clear water to wash it or dust catcher to clean it. If the filter is very dirty (such as grease), use warm water (45℃(113℉)) dissolved with neutral detergent to clean it, and then put it at the shady place to dry it.



Caution

Do not use hot water (more than 45℃(113℉)) to clean the filter to prevent color losing or deformation.
Do not dry the filter on the fire or use hair drier to dry the filter. Otherwise, it may cause fire or deformation.

Reminder

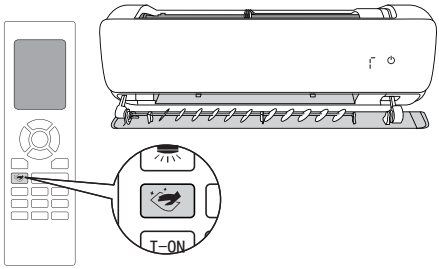
- User can select the clean period according to the actual circumstances and operation environment.

Clean and maintenance

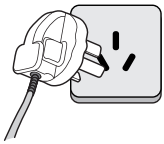
Deep clean (parts clean)

Guide louver clean

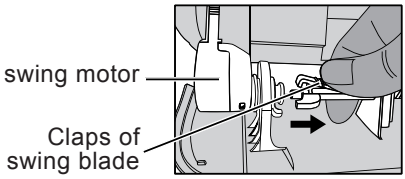
①Under standby status, press button for 3s, and the display flashes to display . Meanwhile, the guide louver will open automatically.



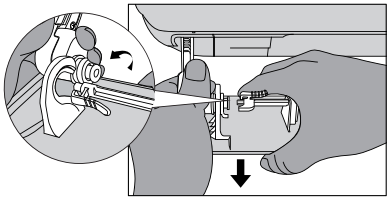
②When the guide louver automatically rotates to the maximum position, will disappear. Cut off the power.



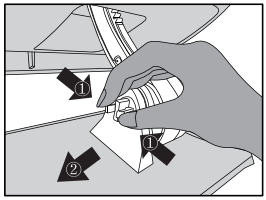
③Press the clasp at the left side of the swing blade and pull it to the right side, and then it can separate with the swing motor.



④Press the left side connection rod with left hand, hold the guide louver with the right hand, and then pull the guide louver outwards.



⑤Press the cross clasp at the right side of guide louver with right hand, hold the guide louver with left hand and then draw out the guide louver to the left side.



⑥Immerse the cloth into the warm water (45℃(113℉)), wring it out and then wipe the dirty part slightly. After that, dry it.

⑦When the installation is finished, energize the air conditioner again until the guide louver is reset automatically and then the unit can be operated.

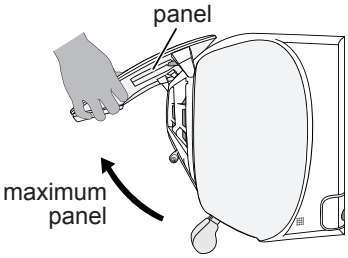
Clean and maintenance

Air-outlet frame clean

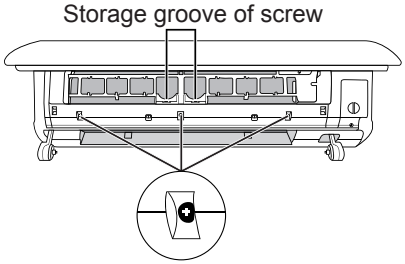
Caution

- The black screw is the removable screw. Prohibit disassembling the silver screw at your will (except the silver screw of blade).
- Prevent the air-outlet frame dropping to avoid injury.

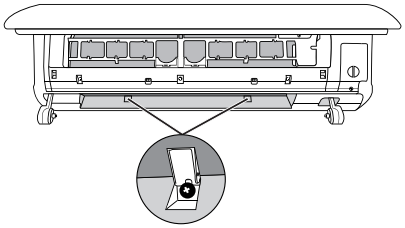
①Open the panel with both hands. When the panel is opened to the maximum angle (when a sound has been heard), the panel can be fixed.



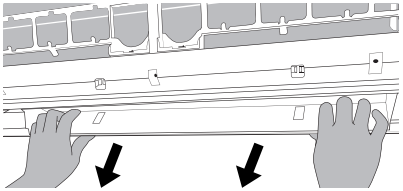
②Use screwdriver to remove 3 black screws on the upper side of the air-outlet frame. After that, put the screws into the storage box of screw.



③Open the screw cover at the lower side of the air-outlet frame and then use screwdriver to remove 2 black screws.



④Pull the air-outlet frame outwards according to the diagram as below and then remove it.



⑤Immerse the cloth into the warm water (less than 45℃(113℉)), wring it out and then use it to wipe the dirty part, and then dry it.

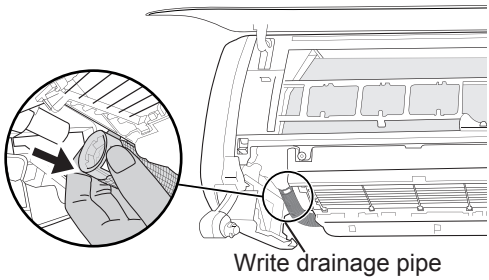
Clean and maintenance

Bottom case and parts clean

1.Pull out the drainage pipe

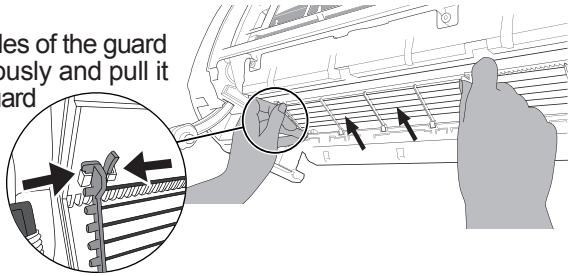
Press the beige locking spring at both ends of white drainage pipe simultaneously, and then pull the drainage pipe backwards.

Caution: There may be residual water drop in the drainage pipe. Please make the outlet of drainage pipe face upwards when then drainage pipe is removed.



2.Remove the guard net

Press spring fastener at both sides of the guard net with both hands simultaneously and pull it upwards,and then remove the guard net.



3.Remove blade

①Rotate the blade slightly and the find the silver screw at the right side of the blade. Use the screwdriver to loose the silver screw for 2-3 circles slowly in an anticlockwise direction. (as shown in fig.1)

②Until the blade can slide to the left side to unlock status (as shown in fig.2).

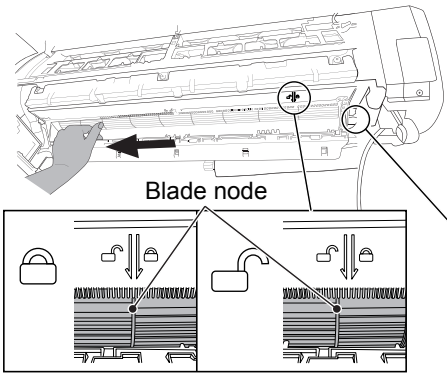


Fig.2

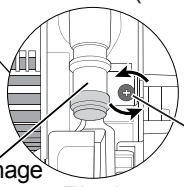
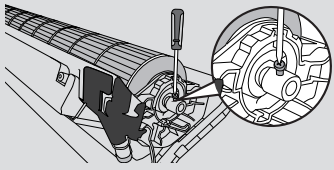


Fig.1

Note: Do not twist off the silver screws.

Caution

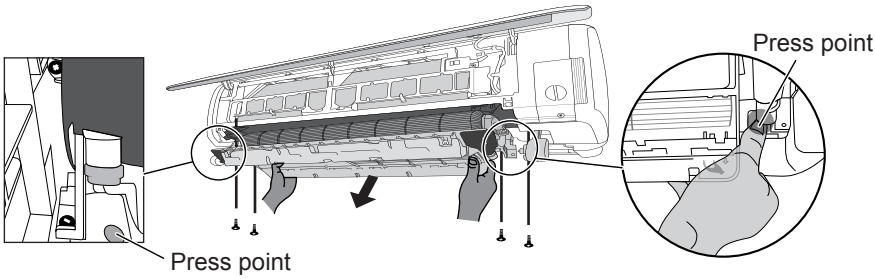
If the screw is removed carelessly when disassembling the blade, put the blade sub-assy on the ground flatly, rotate the screw into the axle sleeve of blade (2-3 circles clockwise), fix the blade sub-assy at the indoor unit and then fix the screw at the motor shaft. Tighten the screws as shown in the right figure (2-3 circles clockwise).



Clean and maintenance

③Remove 4 black screws at both sides used for fixing the bottom case.

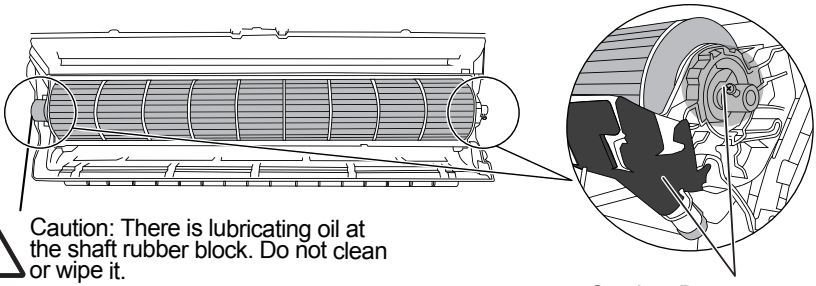
④Press the appointed positions at both sides with both thumbs (as shown in below figure), hold the bottom case with other four fingers and then lift it upwards, and then remove the bottom case of the air conditioner.



Caution

When user has remove the bottom case, do not touch the evaporator to prevent scratching the fingers.

⑤Immerse the cloth into water (below 45℃(113℉)), wring it out and then wipe the dirty position of the unit. After that, dry the cloth.



Caution: There is lubricating oil at the shaft rubber block. Do not clean or wipe it.

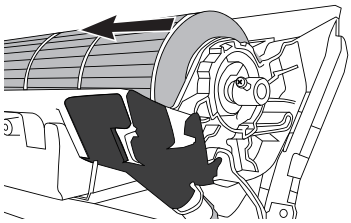
Caution: Do not wash or wipe the aluminium shaft of blade and the black sponge.

Clean and maintenance

Indoor unit installation

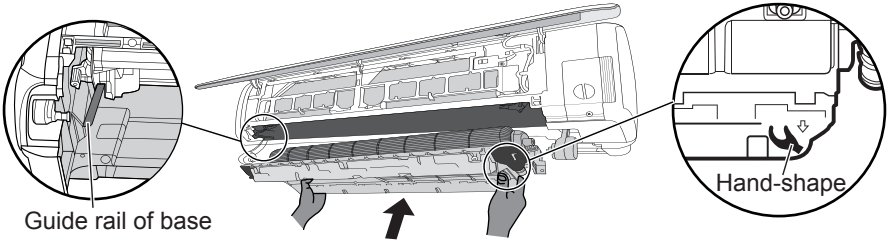
⚠Caution

Before reinstall the bottom case when it has been cleaned, please check whether the blade has been pushed to the left side.



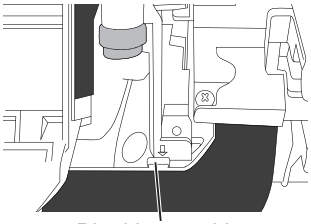
1 Install bottom case

Hold the position with " " under the bottom case, push it upwards parallel along the guide rail of base and then check whether the both ends of bottom case is set into the tail of the guide rail of base for ensuring the installation.

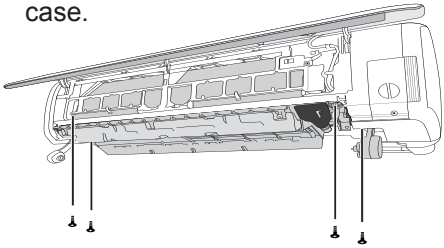


2 Fix the bottom case

①Check whether the guide rail of bottom case is installed at the blocking position of base.

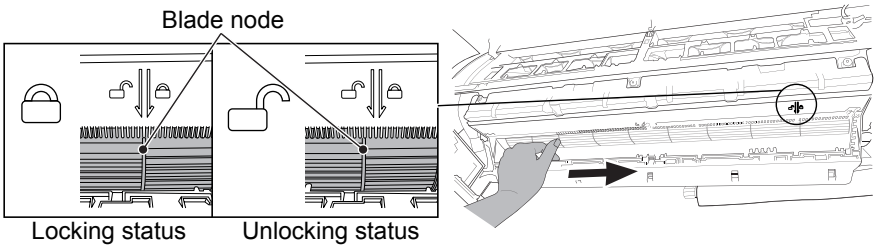


②When the bottom case is assembled, take 4 screws from the storage box of screw at the middle of the front case and then use the screwdriver to fix these 4 screws at the bottom case.



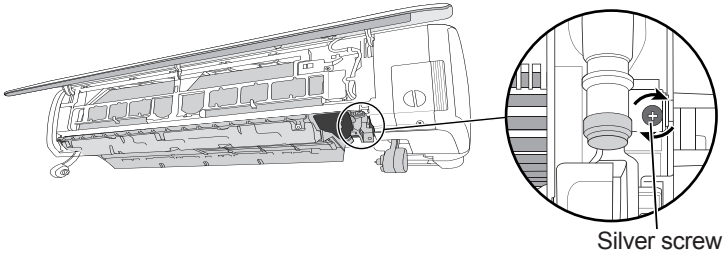
3 Pull blade

Hold the blade node to pull it to the right side until to the locking status.



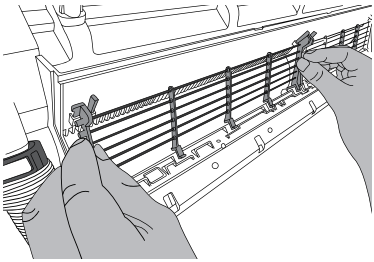
4 Tighten silver screw

Please make sure the blade is locked and then the silver screws of blade can be tightened clockwise.



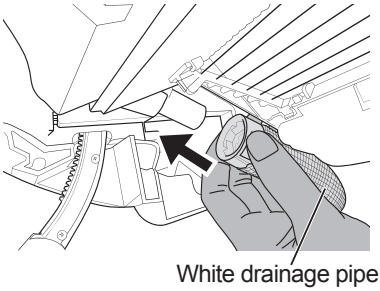
5 Install guard net

Hold the guard net with both hands and then assemble the guard net according to the following figure.



6 Install drainage pipe

Hold the joint of white drainage pipe with hand, install the drainage pipe to the direction of drainage mouth until you have head a sound.



7 Install air-outlet frame

Insert the clasp at the back side of the air-outlet frame into the groove of the base (as shown in fig.3) until you have heard a sound.

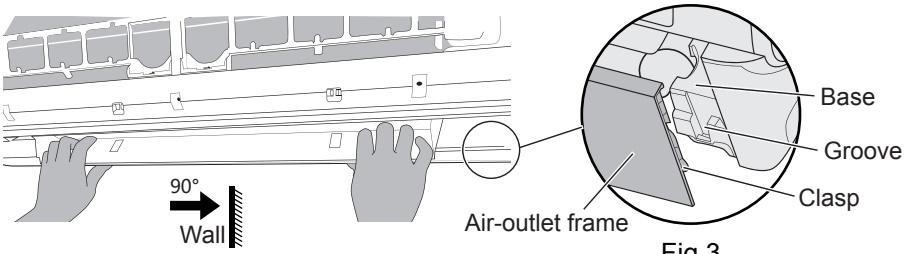
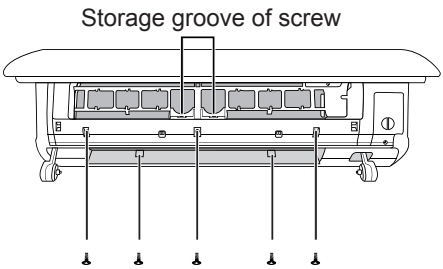


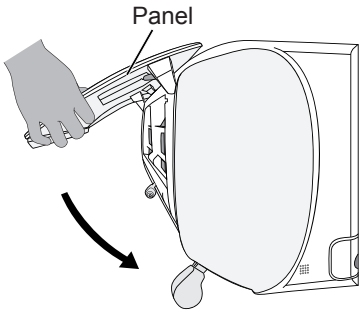
Fig.3

8 Tighten screws of air-outlet frame

①Take out 5 screws from the storage groove of screw and then fix the air-outlet frame with the screwdriver.

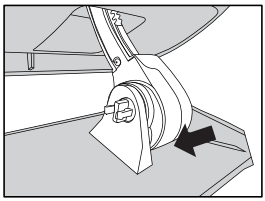


②Close the panel.

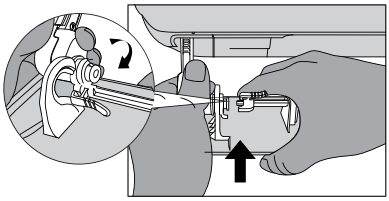


9 Install guide louver

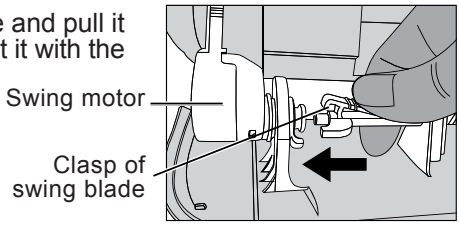
①Hold the guide louver with the left hand, hold the connection rod with the right hand and then install the "cross groove" at the right side of the guide louver at the “cross clasp" of the connecting rod.



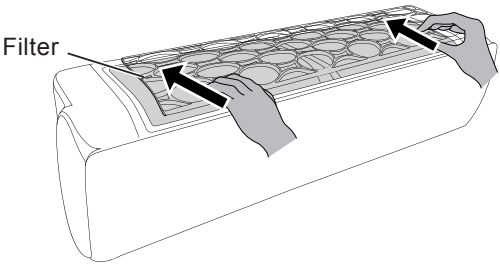
②Hold the left side connection rod with left hand, hold the air louver with the right hand and then assemble the guide louver according to the direction as shown by the figure.



③Press the clasps of swing blade and pull it to the left side and then connect it with the swing motor.



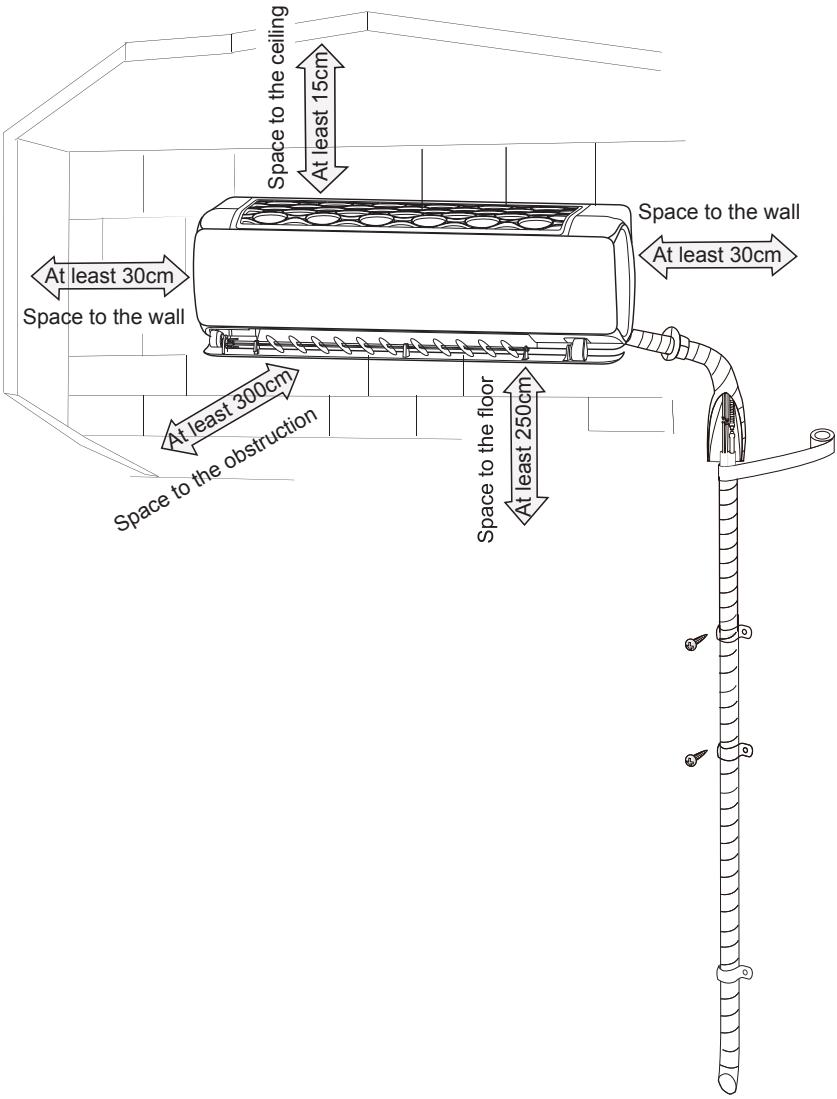
10 Install filter



Caution

- Maintenance should be conducted by the professional person.
- Because there will be water on the guide louver and other parts during clean operation, the unit will conduct the dry function when it’s turned on for the first time. For the first startup, the guide louver will open to the first position and then display board will display → → ..... → . When the display is finished, the indoor unit will be turned on to blow wind. Meanwhile, the display board will countdown for a period of time. When the countdown is over, the unit will switch to operation at the mode set by the remote controller.
- Please make sure all disassembled screws are fixed well.
- After being energized, if the indoor unit cannot work normally, please check the unit: ①Whether the guide louver is assembled well; ②whether the air-outlet frame is assembled well; ③whether the blade is tightened according to the requirement; ④Whether the air inlet is blocked by foreign objects.

Installation dimension diagram



Safety precautions for installing and relocating the unit

To ensure safety, please be mindful of the following precautions.

⚠ Warning

- **When installing or relocating the unit, be sure to keep the refrigerant circuit free from air or substances other than the specified refrigerant.**
  Any presence of air or other foreign substance in the refrigerant circuit will cause system pressure rise or compressor rupture, resulting in injury.
- **When installing or moving this unit, do not charge the refrigerant which is not comply with that on the nameplate or unqualified refrigerant.**
  Otherwise, it may cause abnormal operation, wrong action, mechanical malfunction or even series safety accident.
- **When refrigerant needs to be recovered during relocating or repairing the unit, be sure that the unit is running in cooling mode.Then, fully close the valve at high pressure side (liquid valve).About 30-40 seconds later, fully close the valve at low pressure side (gas valve), immediately stop the unit and disconnect power. Please note that the time for refrigerant recovery should not exceed 1 minute.**
  If refrigerant recovery takes too much time, air may be sucked in and cause pressure rise or compressor rupture, resulting in injury.
- **During refrigerant recovery, make sure that liquid valve and gas valve are fully closed and power is disconnected before detaching the connection pipe.**
  If compressor starts running when stop valve is open and connection pipe is not yet connected, air will be sucked in and cause pressure rise or compressor rupture, resulting in injury.
- **When installing the unit, make sure that connection pipe is securely connected before the compressor starts running.**
  If compressor starts running when stop valve is open and connection pipe is not yet connected, air will be sucked in and cause pressure rise or compressor rupture, resulting in injury.
- **Prohibit installing the unit at the place where there may be leaked corrosive gas or flammable gas.**
  If there leaked gas around the unit, it may cause explosion and other accidents.
- **Do not use extension cords for electrical connections. If the electric wire is not long enough, please contact a local service center authorized and ask for a proper electric wire.**
  Poor connections may lead to electric shock or fire.
- **Use the specified types of wires for electrical connections between the indoor and outdoor units. Firmly clamp the wires so that their terminals receive no external stresses.**
  Electric wires with insufficient capacity, wrong wire connections and insecure wire terminals may cause electric shock or fire.

Tools for installation

1 Level meter	2 Screw driver	3 Impact drill
4 Drill head	5 Pipe expander	6 Torque wrench
7 Open-end wrench	8 Pipe cutter	9 Leakage detector
10 Vacuum pump	11 Pressure meter	12 Universal meter
13 Inner hexagon spanner		14 Measuring tape

Note:

- Please contact the local agent for installation.
- Don't use unqualified power cord.

Selection of installation location

Basic requirement

Installing the unit in the following places may cause malfunction. If it is unavoidable, please consult the local dealer:

1. The place with strong heat sources, vapors, flammable or explosive gas, or volatile objects spread in the air.
2. The place with high-frequency devices (such as welding machine, medical equipment).
3. The place near coast area.
4. The place with oil or fumes in the air.
5. The place with sulfureted gas.
6. Other places with special circumstances.
7. The appliance shall not be installed in the laundry.
8. It’s not allowed to be installed on the unstable or motive base structure (such as truck) or in the corrosive environment (such as chemical factory).

Indoor unit

1. There should be no obstruction near air inlet .
2. Select a location where the condensation water can be dispersed easily and won't affect other people.
3. Select a location which is convenient to connect the outdoor unit and near the power socket.
4. Select a location which is out of reach for children.
5. The location should be able to withstand the weight of indoor unit and won't increase noise and vibration.
6. The appliance must be installed 2.5m above floor.
7. Don't install the indoor unit right above the electric appliance.
8. Please try your best to keep way from fluorescent lamp.

Requirements for electric connection

Safety precaution

1. Must follow the electric safety regulations when installing the unit.
2. According to the local safety regulations, use qualified power supply circuit and air switch.
3. Make sure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring or malfunction. Please install proper power supply cables before using the air conditioner.
4. Properly connect the live wire, neutral wire and grounding wire of power socket.
5. Be sure to cut off the power supply before proceeding any work related to electricity and safety. For models with a power plug, make sure the plug is within reach after installation.
6. Do not put through the power before finishing installation.
7. 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.
8. The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.
9. The appliance shall be installed in accordance with national wiring regulations.
10. Appliance shall be installed, operated and stored in a room with a floor area larger than Xm^2. (Please refer to table "a" in section of " Safety operation of flammable refrigerant " for Space X.)

Please notice that the unit is filled with flammable gas R32. Inappropriate treatment of the unit involves the risk of severe damages of people and material. Details to this refrigerant are found in chapter “refrigerant”.

Grounding requirement

1. The air conditioner is the first class electric appliance. It must be properly grounding with specialized grounding device by a professional. Please make sure it is always grounded effectively, otherwise it may cause electric shock.
2. The yellow-green wire in air conditioner is grounding wire, which can't be used for other purposes.
3. The grounding resistance should comply with national electric safety regulations.
4. The appliance must be positioned so that the plug is accessible.
5. An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.

Installation of indoor unit

Step one: choosing installation location

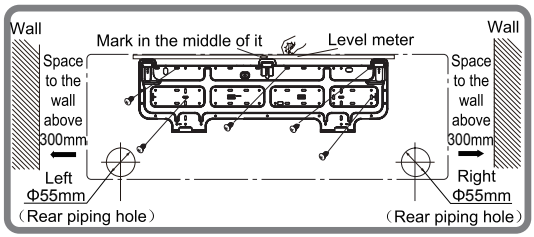
Recommend the installation location to the client and then confirm it with the client.

Step two: install wall-mounting frame

1. Hang the wall-mounting frame on the wall; adjust it in horizontal position with the level meter and then point out the screw fixing holes on the wall.
2. Drill the screw fixing holes on the wall with impact drill (the specification of drill head should be the same as the plastic expansion particle) and then fill the plastic expansion particles in the holes.
3. Fix the wall-mounting frame on the wall with tapping screws and then check if the frame is firmly installed by pulling the frame. If the plastic expansion particle is loose, please drill another fixing hole nearby.

Step three: open piping hole

1. Choose the position of piping hole according to the direction of outlet pipe. The position of piping hole should be a little lower than the wall-mounted frame, shown as below.

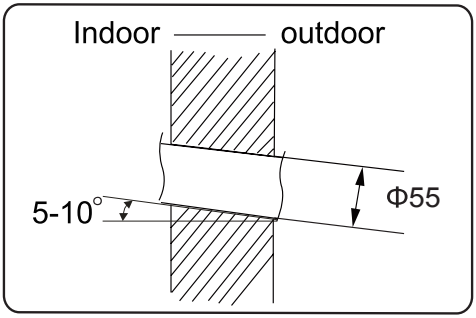


2. Open a piping hole with the diameter of Φ55 on the selected outlet pipe position. In order to drain smoothly, slant the piping hole on the wall slightly downward to the outdoor side with the gradient of 5-10°.

Installation of indoor unit

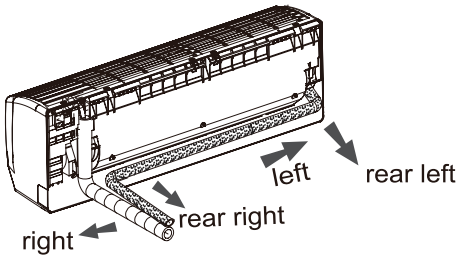
Note:

- Pay attention to dust prevention and take relevant safety measures when opening the hole.

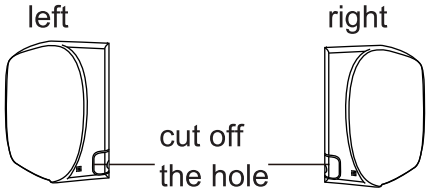


Step four: outlet pipe

1. The pipe can be led out in the direction of right, rear right, left or rear left.



2. When select leading out the pipe from left or right, please cut off the corresponding hole on the bottom case.

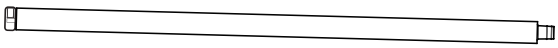


3.Selection of drainage outlet and drainage installation and disassembly guide

(1)Please determine the position of drainage outlet before installation the drainage pipe.

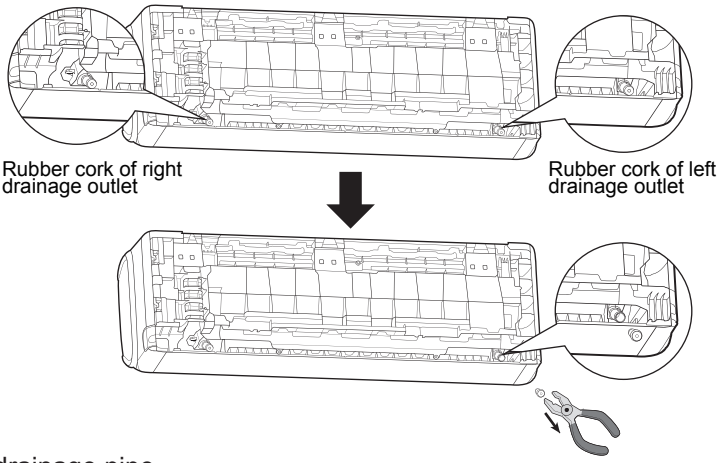
(2)Suggestion for selection of drainage outlet: there are no mandatory requirements for the direction of the drainage pipe. However, it's suggested to be same with the direction of liquid pipe and gas pipe. Therefore, you are suggested to select the drainage outlet which is close to the exit tube:

①Take out the drainage pipe from the carton box.



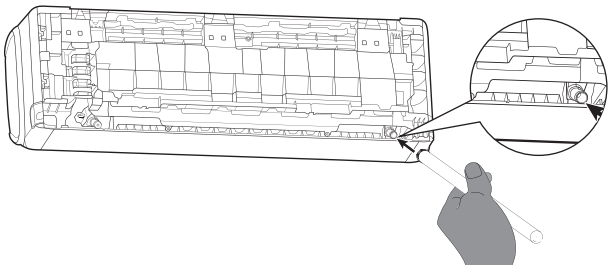
Installation of indoor unit

②Pull out the rubber stopper of drainage outlet with pliers or other tools.



(3)Install drainage pipe.

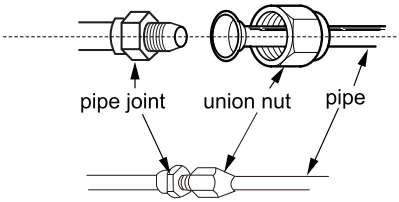
Hold the head of drainage pipe (20cm away from the drainage pipe outlet) with hand and install it along the direction of drainage outlet until you have head a sound.



Step five: connect the pipe of indoor unit

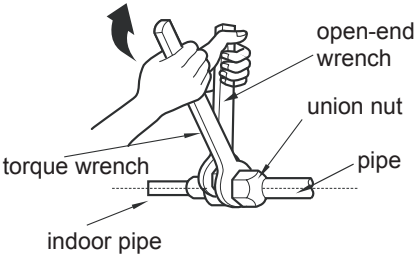
1. Aim the pipe joint at the corresponding bellmouth.

2. Pretighten the union nut with hand.



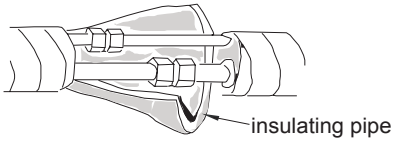
3. Adjust the torque force by referring to the following sheet. Place the open-end wrench on the pipe joint and place the torque wrench on the union nut. Tighten the union nut with torque wrench.

Installation of indoor unit



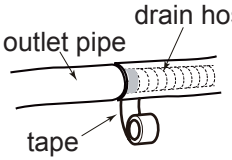
Hex nut diameter	Tightening torque (N·m)
1/4"	15~20
3/8"	30~40
1/2"	45~55
5/8"	60~65
3/4"	70~75

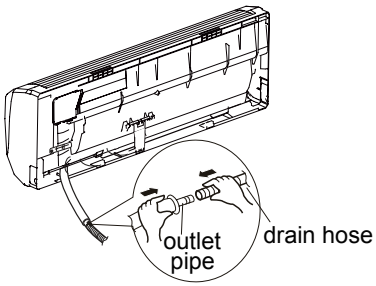
4. Wrap the indoor pipe and joint of connection pipe with insulating pipe, and then wrap it with tape.



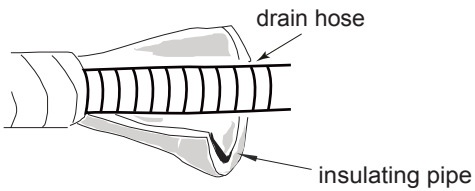
Step six: install drain hose

1. Connect the drain hose to the outlet pipe of indoor unit.
2. Bind the joint with tape.



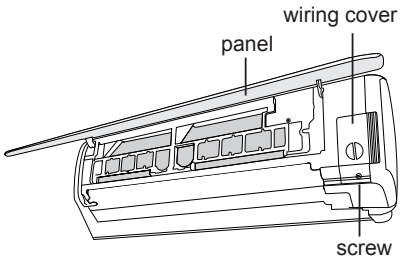


Note:
- Add insulating pipe in the indoor drain hose in order to prevent condensation.
- The plastic expansion particles are not provided.



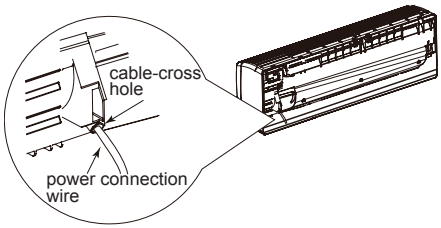
Step seven: connect wire of indoor unit

1. Open the panel, remove the screw on the wiring cover and then take down the cover.

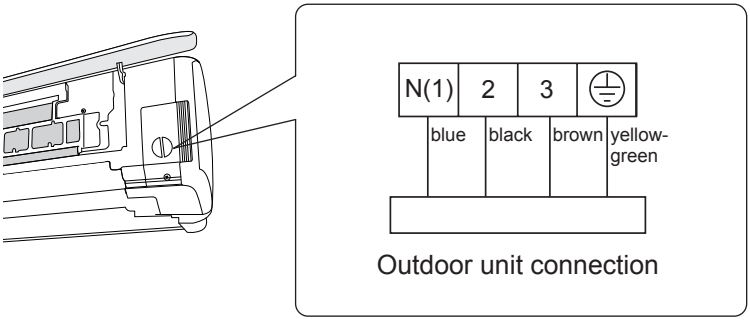


Installation of indoor unit

2. Make the power connection wire go through the cable-cross hole at the back of indoor unit and then pull it out from the front side.



3. Remove the wire clip; connect the power connection wire to the wiring terminal according to the color; tighten the screw and then fix the power connection wire with wire clip.



4. Put wiring cover back and then tighten the screw.
5. Close the panel.

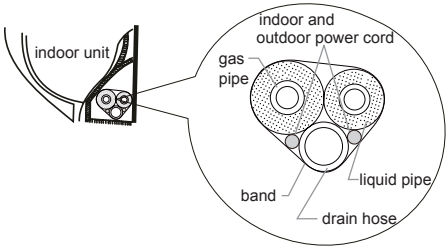
Note:

- All wires of indoor unit and outdoor unit should be connected by a professional.
- If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.
- For the air conditioner with plug, the plug should be reachable after finishing installation.
- For the air conditioner without plug, an circuit break must be installed in the line. The circuit break should be all-pole parting and the contact parting distance should be more than 3mm.
- When installing the unit for after-sales service, please remove the cable cross plate at first, fix the pipeline at the cable cross plate, and then fix the cable cross plate.

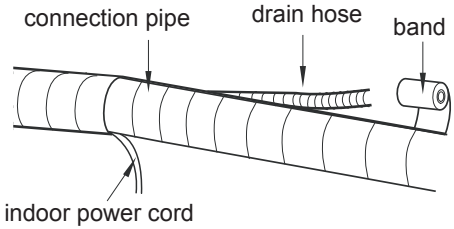
Installation of indoor unit

Step eight: bind up pipe

1. Bind up the connection pipe, power cord and drain hose with the band.



2. Reserve a certain length of drain hose and power cord for installation when binding them. When binding to a certain degree, separate the indoor power and then separate the drain hose.



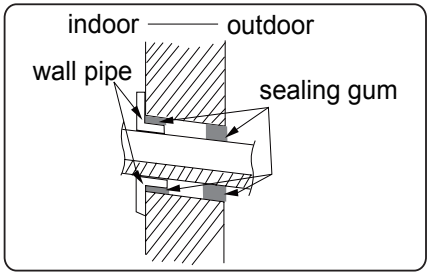
3. Bind them evenly.
4. The liquid pipe and gas pipe should be bound separately at the end.

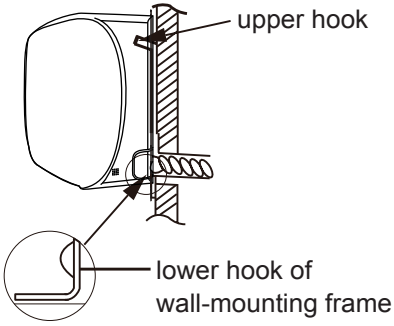
Note:

- The power cord and control wire can't be crossed or winding.
- The drain hose should be bound at the bottom.

Step nine: hang the indoor unit

1. Put the bound pipes in the wall pipe and then make them pass through the wall hole.
2. Hang the indoor unit on the wall-mounting frame.
3. Stuff the gap between pipes and wall hole with sealing gum.
4. Fix the wall pipe.
5. Check if the indoor unit is installed firmly and closed to the wall.





Note:

- Do not bend the drain hose too excessively in order to prevent blocking.

Check after installation

● Check according to the following requirement after finishing installation.

Items to be checked	Possible malfunction
Has the unit been installed firmly?	The unit may drop, shake or emit noise.
Have you done the refrigerant leakage test?	It may cause insufficient cooling (heating) capacity.
Is heat insulation of pipeline sufficient?	It may cause condensation and water dripping.
Is water drained well?	It may cause condensation and water dripping.
Is the voltage of power supply according to the voltage marked on the nameplate?	It may cause malfunction or damaging the parts.
Is electric wiring and pipeline installed correctly?	It may cause malfunction or damaging the parts.
Is the unit grounded securely?	It may cause electric leakage.
Does the power cord follow the specification?	It may cause malfunction or damaging the parts.
Is there any obstruction in the air inlet and outlet?	It may cause insufficient cooling (heating) capacity.
The dust and sundries caused during installation are removed?	It may cause malfunction or damaging the parts.
The gas valve and liquid valve of connection pipe are open completely?	It may cause insufficient cooling (heating) capacity.
Is the inlet and outlet of piping hole been covered?	It may cause insufficient cooling (heating) capacity or waste electricity.

Test operation

1. Preparation of test operation

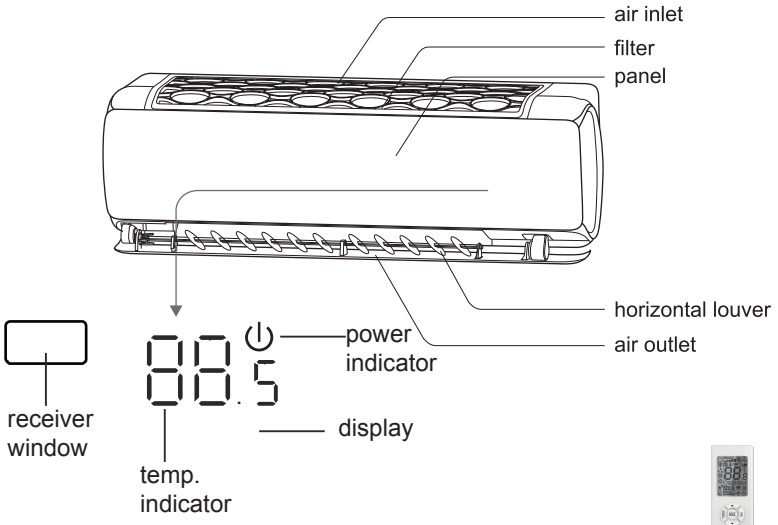
- The client approves the air conditioner.
- Specify the important notes for air conditioner to the client.

2. Method of test operation

- Put through the power, press ON/OFF button on the remote controller to start operation.
- Press MODE button to select AUTO, COOL, DRY, FAN and HEAT to check whether the operation is normal or not.
- If the ambient temperature is lower than 16℃(61°F), the air conditioner can't start cooling.

Parts name

Indoor Unit



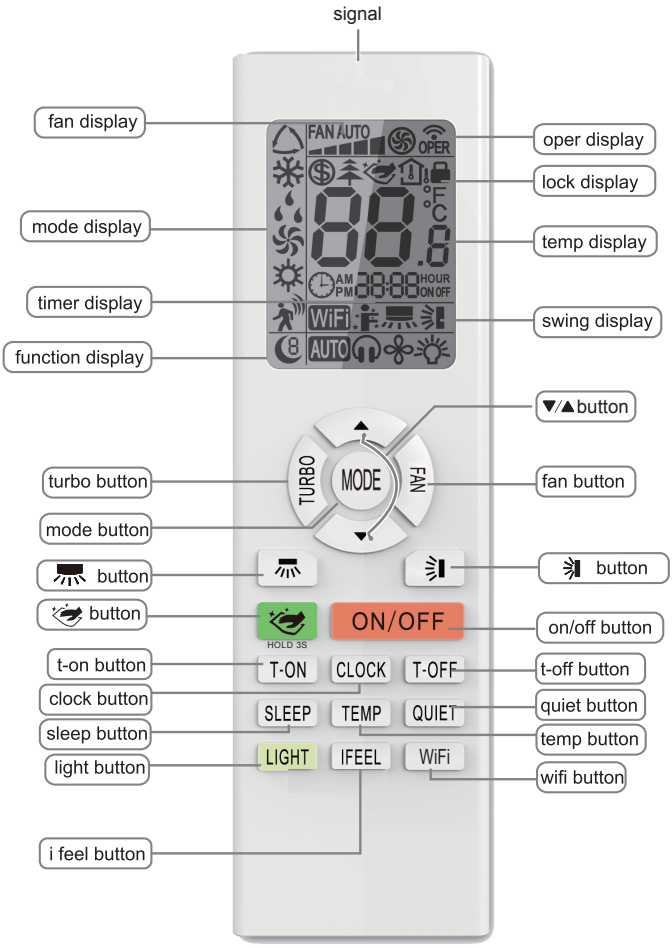
(Display content or position may be different from above graphics, please refer to actual products)

remote controller

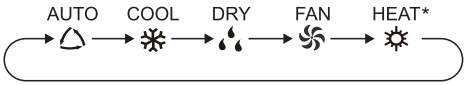
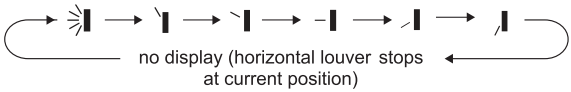
Buttons on remote controller

Note:

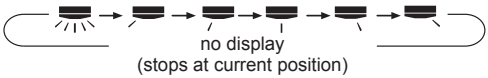
- This is a general use remote controller, it could be used for the air conditioners with multifunction; For some function, which the model doesn't have, if press the corresponding button on the remote controller that the unit will keep the original running status.
- After putting through the power, the air conditioner will give out a sound. Operation indicator "⏻" is ON (red indicator, the colour is different for different models). After that, you can operate the air conditioner by using remote controller.
- Under on status, pressing the button on the remote controller, the signal icon "((•))" on the display of remote controller will blink once and the air conditioner will give out a “di” sound, which means the signal has been sent to the air conditioner.



Introduction for buttons on remote controller

ON/OFF	Press this button to turn on the unit. Press this button again to turn off the unit.
FAN	Press this button can select fan speed,it can be selected circularly as below:  Under dry mode, fan speed can't be adjusted.
▼/▲BUTTON	• Press "▲" or "▼" button once increase or decrease set temperature 0.5℃(°F). • Holding "▲" or "▼" button, 2s later, set temperature on remote controller will change quickly. On releasing button after setting is finished, temperature indicator on indoor unit will change accordingly.
MODE	Press this button to select your required operation mode.  *Note: Only for models with heating function.
BUTTON	Press this button can select up & down swing angle. Fan blow angle can be selected circularly as below:  • When selecting " ", air conditioner is blowing fan automatically. Horizontal louver will automatically swing up & down at maximum angle. • When selecting " ", air conditioner is blowing fan at fixed position. Horizontal louver will stop at the fixed position. • Hold " " button above 2s to set your required swing angle. When reaching your required angle, release the button.
LIGHT	Press this button to turn off display light on indoor unit. " " icon on remote controller disappears. Press this button again to turn on display light. " " icon is displayed.

Introduction for buttons on remote controller

BUTTON	Press this button can select left & right swing angle. Fan blow angle can be selected circularly as below:  • Press this button continuously more than 2s, the main unit will swing back an forth from left to right, and then loosen the button, the unit will stop swinging and present position of guide louver will be kept immediately. • Under swing left and right mode, when the status is switched from off to , if press this button again 2s later, status will switch to off status directly; if press this button again within 2s, the change of swing status will also depend on the circulation sequence stated above. • This function is only available for some model.
TURBO	• Under COOL or HEAT mode, press this button to turn to quick COOL or quick HEAT mode. "" icon is displayed on remote controller. Press this button again to exit turbo function and "" icon will disappear. • If start this function, the unit will run at super-high fan speed to cool or heat quickly so that the ambient temp. approaches the preset temp. as soon as possible.
QUIET	Press this button, the Quiet status is under the Auto Quiet mode (display " Auto ") and Quiet mode (display " ") and Quiet OFF (there is no signal displayed), after powered on, the Quiet OFF is defaulted.
SLEEP	• Press this button, can select Sleep 1 (1), Sleep 2 (2), Sleep 3 (3) and cancelthe Sleep, circulate between these, after electrified, Sleep Cancel is defaulted. • Sleep 1 is Sleep mode 1, in Cool modes; sleep status after run for one hour, the main unit setting temperature will increase 1℃ , two hours, setting temperature increased 2℃, then the unit will run at this setting temperature; In Heat mode: sleep status after run for one hour, the setting temperature will decrease 1℃ , two hours, setting temperature will decrease 2℃ , then the unit will run at this setting temperature. • Sleep 2 is sleep mode 2, that is air conditioner will run according to the presetting a group of sleep temperature curve. • Sleep 3-the sleep curve setting under Sleep mode by DIY;

Introduction for buttons on remote controller

SLEEP	(1)Under Sleep 3 mode, press "Turbo" button for a long time, remote controller enters into user individuation sleep setting status, at this time, the time of remote controller will display "1hour", the setting temperature "88" will display the corresponding temperature of last setting sleep curve and blink (The first entering will display according to the initial curve setting value of original factory); (2)Adjust "▲" and "▼" button, could change the corresponding setting temperature, after adjusted, press "Turbo" button for confirmation; (3)At this time, 1hour will be automatically increased at the timer position on the remote controller, (that are "2hours" or "3hours" or "8hours"), the place of setting temperature "88" will display the corresponding temperature of last setting sleep curve and blink; (4) Repeat the above step (2)~(3) operation, until 8 hours temperature setting finished, sleep,curve setting finished, at this time, the remote controller will resume the original timer display; temperature display will resume to original setting temperature. • Sleep3- the sleep curve setting under Sleep mode by DIY could be inquired: The user could accord to sleep curve setting method to inquire the presetting sleep curve, enter into user individuation sleep setting status, but do not change the temperature, press "Turbo" button directly for confirmation. Note: In the above presetting or enquiry procedure, if continuously within 10s, there is no button pressed, the sleep curve setting within 10s, there is no button pressed, the sleep curve setting status will be automatically quit and resume to display the original displaying. In the presetting or enquiry procedure, press "ON/OFF" button, "Mode" button, "Sleep" button, the sleep curve setting or enquiry status will quit similarly.
TEMP	Press this button, could select displaying the indoor setting temperature or indoor ambient temperature. When the indoor unit firstly power on it will display the setting temperature, if the temperature's displaying status is changed from other status to " " , displays the ambient temperature, 3s later or within 3s, it receives other remote controller signal that will return to display the setting temperature.
I FEEL	Press this button to turn on I FEEL function. " " icon is displayed on remote controller. The unit automatically adjust temperature according to the sensed temperature. Press this button again to cancel I FEEL function. " " icon will disappear. Please put the remote controller near user when this function is set. Do not put the remote controller near the object of high temperature or low temperature in order to avoid detecting inaccurate ambient temperature.When I FEEL function is turned on, the remote controller should be put within the area where indoor unit can receive the signal sent by the remote controller.

Introduction for buttons on remote controller

T-ON/T-OFF	• T-ON button "T-ON" button can set the time for timer on. After pressing this button, " ◷ " icon disappears and the word "ON" on remote controller blinks. Press "▲" or " ▼ " button to adjust TIMER ON setting. After each pressing "▲" or "▼" button, TIMER ON setting will increase or decrease 1min. Hold "▲" or " ▼ " button, 2s later, the time will change quickly until reaching your required time. Press "T-ON" to confirm it. The word "ON" will stop blinking. " ◷ " icon resumes displaying. Cancel TIMER ON: Under the condition that TIMER ON is started up, press "T-ON" button to cancel it. • T-OFF button "T-OFF" button can set the time for timer off. After pressing this button," ◷ " icon disappears and the word "OFF" on remote controller blinks. Press "▲" or " ▼ " button to adjust TIMER OFF setting. After each pressing "▲" or "▼" button, TIMER OFF setting will increase or decrease 1min. Hold "▲" or " ▼ " button, 2s later, the time will change quickly until reaching your required time. Press "T-OFF" word "OFF" will stop blinking. " ◷ " icon resumes displaying. Cancel TIMER OFF. Under the condition that TIMER OFF is started up, press "T-OFF" button to cancel it. Note: Under on and off status, you can set TIMER OFF or TIMER ON simultaneously. Before setting TIMER ON or TIMER OFF, please adjust the clock time. After starting up TIMER ON or TIMER OFF, set the constant circulating valid. After that, air conditioner will be turned on or turned off according to setting time. ON/OFF button has no effect on setting. If you don't need this function, please use remote controller to cancel it.
WiFi	Press " WiFi " button to turn on WiFi function, " WiFi " icon will be displayed on the remote controller. Hold " WiFi " button for 5s to turn off WiFi function and " WiFi " icon will disappear. Under off status, press "MODE" and " WiFi " buttons simultaneously for 1s, WiFi module will restore factory settings. (This function is only available for some models.)
	• Under unit off, press this button and hold for 3s to open the air guide louver, icon is displayed in indoor unit. When air guide louver is open to the maximum, and icon was disappear, you could clean the unit. Cancel this function: Press and hold for 3s to reset the air guide louver. If you press the power button directly, the unit will be turned on.
CLOCK	Press CLOCK, ◷ blinking. Within 5 seconds, pressing ▲ or ▼ button adjusts the present time. Holding down either button above 2 seconds increases or decreases the time by 1 minute every 0.5 second and then by 10 minutes every 0.5 second. During blinking after setting, press CLOCK again to confirm the setting and then ◷ will be constantly displayed.

Function introduction for combination buttons

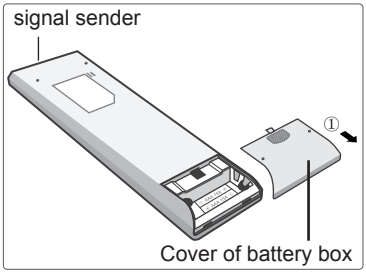
Energy-saving function	Under cooling mode, press "TEMP" and "CLOCK" buttons simultaneously to start up or turn off energy-saving function. When energy-saving function is started up, "SE" will be shown on remote controller, and air conditioner will adjust the set temperature automatically according to ex-factory setting to reach to the best energy-saving effect. Press "TEMP" and "CLOCK" buttons simultaneously again to exit energy-saving function. Note: • Under energy-saving function, fan speed is defaulted at auto speed and it can't be adjusted. • Under energy-saving function, set temperature can't be adjusted. Press "TURBO" button and the remote controller won't send signal. • Sleep function and energy-saving function can't operate at the same time. If energy-saving function has been set under cooling mode, press sleep button will cancel energy-saving function. If sleep function has been set under cooling mode, start up the energy-saving function will cancel sleep function.
Child lock function	Press "+" and "-" buttons simultaneously can turn on or turn off child lock function. When child lock function is started up, " 🔒 " icon will be displayed on remote controller. If operate remote controller, " 🔒 " icon will flash three times, while remote controller won't send signal.
Switchover function for temperature display	After turning off the unit by remote controller, press "▼" button and "MODE" button simultaneously to switch between ℃ and °F .
Cancel filter-clean reminding	If the dual-8 nixie tube is flashing to display, it reminds the user to clean the filter. Press MODE and TEMP buttons simultaneously to cancel this reminding.
Auto clean function	• Under unit off status, hold "MODE" and "FAN" buttons simultaneously for 5s to turn on or turn off the auto clean function. When the auto clean function is turned on, indoor unit displays "CL" . During the auto clean process of evaporator, the unit will perform fast cooling or fast heating. There may be some noise, which is the sound of flowing liquid or thermal expansion or cold shrinkage. The air conditioner may blow cool or warm air, which is a normal phenomenon. During cleaning process, please make sure the room is well ventilated to avoid affecting the comfort. • The auto clean function can only work under normal ambient temperature. If the room is dusty, clean it once a month; if not, clean it once every three months. After the auto clean function is turned on, you can leave the room. When auto clean is finished, the air conditioner will enter standby status. (This function is only available for some models.)

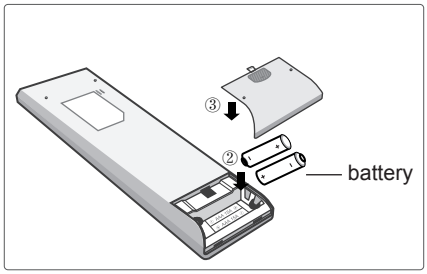
Replacement of batteries in remote controller

NOTICE

- During operation, point the remote control signal sender at the receiving window on indoor unit.
- The distance between signal sender and receiving window should be no more than 8m, and there should be no obstacles between them.
- Signal may be interfered easily in the room where there is fluorescent lamp or wireless telephone; remote controller should be close to indoor unit during operation.
- Replace new batteries of the same model when replacement is required.
- When you don't use remote controller for a long time, please take out the batteries.
- If the display on remote controller is fuzzy or there's no display, please replace batteries.

1. Press the back side of remote controller marked with "OPEN", as shown in the fig, and then push out the cover of battery box along the arrow direction.
2. Replace two 7# (AAA 1.5V) dry batteries, and make sure the position of "+" polar and "-" polar are correct.
3. Reinstall the cover of battery box.





Malfunction analysis

General phenomenon analysis

Please check below items before asking for maintenance. If the malfunction still can't be eliminated, please contact local dealer or qualified professionals.

Phenomenon	Check items	Solution
Indoor unit can't receive remote controller's signal or remote controller has no action.	• Whether it's interfered severely (such as static electricity, stable voltage)?	• Pull out the plug. Reinsert the plug after about 3min, and then turn on the unit again.
	• Whether remote controller is within the signal receiving range?	• Signal receiving range is 8m.
	• Whether there are obstacles?	• Remove obstacles.
	• Whether remote controller is pointing at the receiving window?	• Select proper angle and point the remote controller at the receiving window on indoor unit.
	• Is sensitivity of remote controller low; fuzzy display and no display?	• Check the batteries. If the power of batteries is too low, please replace them.
	• No display when operating remote controller?	• Check whether remote controller appears to be damaged. If yes, replace it.
	• Fluorescent lamp in room?	• Take the remote controller close to indoor unit. • Turn off the fluorescent lamp and then try it again.
No air emitted from indoor unit	• Air inlet or air outlet of indoor unit is blocked?	• Eliminate obstacles.
	• Under heating mode, indoor temperature is reached to set temperature?	• After reaching to set temperature, indoor unit will stop blowing out air.
	• Heating mode is turned on just now?	• In order to prevent blowing out cold air, indoor unit will be started after delaying for several minutes, which is a normal phenomenon.

Malfunction analysis

Phenomenon	Check items	Solution
Air conditioner can't operate	• Power failure?	• Wait until power recovery.
	• Is plug loose?	• Reinsert the plug.
	• Air switch trips off or fuse is burnt out?	• Ask professional to replace air switch or fuse.
	• Wiring has malfunction?	• Ask professional to replace it.
	• Unit has restarted immediately after stopping operation?	• Wait for 3min, and then turn on the unit again.
	• Whether the function setting for remote controller is correct?	• Reset the function.
Mist is emitted from indoor unit's air outlet	• Indoor temperature and humidity is high?	• Because indoor air is cooled rapidly. After a while, indoor temperature and humidity will be decrease and mist will disappear.
Set temperature can't be adjusted	• Your required temperature exceeds the set temperature range?	• Set temperature range: 16~30℃(61~86℉). • Set temperature range in HEAT mode: 8~30℃(46~86℉).
Cooling (heating) effect is not good.	• Voltage is too low?	• Wait until the voltage resumes normal.
	• Filter is dirty?	• Clean the filter.
	• Set temperature is in proper range?	• Adjust temperature to proper range.
	• Door and window are open?	• Close door and window.
Odours are emitted	• Whether there's odour source, such as furniture and cigarette, etc.	• Eliminate the odour source. • Clean the filter.

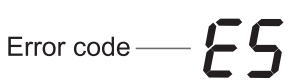
Malfunction analysis

Phenomenon	Check items	Solution
Air conditioner operates normally suddenly	● Whether there's interference, such as thunder, wireless devices, etc.	● Disconnect power, put back power, and then turn on the unit again.
"Water flowing" noise	● Air conditioner is turned on or turned off just now?	● The noise is the sound of refrigerant flowing inside the unit, which is a normal phenomenon.
Cracking noise	● Air conditioner is turned on or turned off just now?	● This is the sound of friction caused by expansion and/or contraction of panel or other parts due to the change of temperature.

Malfunction analysis

Error Code

- When air conditioner status is abnormal, temperature indicator on indoor unit will blink to display corresponding error code. Please refer to below list for identification of error code.



Above indicator diagram is only for reference. Please refer to actual product for the actual indicator and position.

Error code	Troubleshooting
E1,E5,E8	It can be eliminated after restarting the unit. If not, please contact qualified professionals for service.
H3,H6	
C5,E6	Please contact qualified professionals for service.
F3,F4	
F0,F1,F2	

Note: If there're other error codes, please contact qualified professionals for service.

⚠ WARNING

- When below phenomenon occurs, please turn off air conditioner and disconnect power immediately, and then contact the dealer or qualified professionals for service.
  - Power cord is overheating or damaged.
  - There's abnormal sound during operation.
  - Air switch trips off frequently.
  - Air conditioner gives off burning smell.
  - Indoor unit is leaking.
- Do not repair or refit the air conditioner by yourself.
- If the air conditioner operates under abnormal conditions, it may cause malfunction, electric shock or fire hazard.

Configuration of connection pipe

1. Standard length of connection pipe
   - 5m、7.5m、8m
2. Min. length of connection pipe
   For the unit with standard connection pipe of 5m, there is no limitation for the min. length of connection pipe. For the unit with standard connection pipe of 7.5m and 8m, the min. length of connection pipe is 3m.
3. Max. length of connection pipe

Sheet 1 Max. length of connection pipe Unit: m

capacity	Max. length of connection pipe	capacity	Max. length of connection pipe
5000Btu/h (1465W)	15	24000Btu/h (7032W)	25
7000Btu/h (2051W)	15	28000Btu/h (8204W)	30
9000Btu/h (2637W)	15	36000Btu/h (10548W)	30
12000Btu/h (3516W)	20	42000Btu/h (12306W)	30
18000Btu/h (5274W)	25	48000Btu/h (14064W)	30

4. The calculation method of additional refrigerant oil and refrigerant charging amount after prolonging connection pipe
   After the length of connection pipe is prolonged for 10m at the basis of standard length, you should add 5ml of refrigerant oil for each additional 5m of connection pipe.
   The calculation method of additional refrigerant charging amount (on the basis of liquid pipe):
   (1) Additional refrigerant charging amount= prolonged length of liquid pipe × additional refrigerant charging amount per meter
   (2) Basing on the length of standard pipe, add refrigerant according to the requirement as shown in the table. The additional refrigerant charging amount per meter is different according to the diameter of liquid pipe. See Sheet 2.

Configuration of connection pipe

Sheet 2. Additional refrigerant charging amount for R32

Piping size		Indoor unit throttle	Outdoor unit throttle	
Liquid pipe	Gas pipe	Cooling only, cooling and heating (g / m)	Cooling only (g / m)	cooling and heating (g / m)
1/4"	3/8" or 1/2"	16	12	16
1/4" or 3/8"	5/8" or 3/4"	40	12	40
1/2"	3/4" or 7/8"	80	24	96
5/8"	1" or 1 1/4"	136	48	96
3/4"	–	200	200	200
7/8"	–	280	280	280

Note: The additional refrigerant charging amount in Sheet 2 is recommended value, not compulsory.

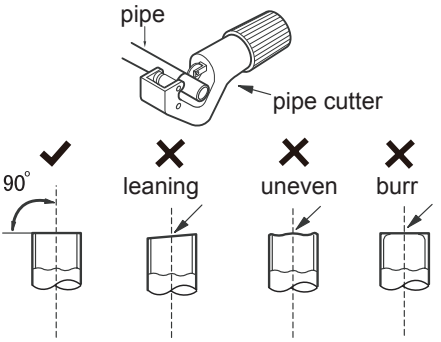
Pipe expanding method

Note:

Improper pipe expanding is the main cause of refrigerant leakage. Please expand the pipe according to the following steps:

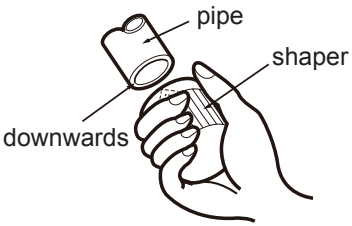
A: Cut the pipe

- Confirm the pipe length according to the distance of indoor unit and outdoor unit.
- Cut the required pipe with pipe cutter.



B: Remove the burrs

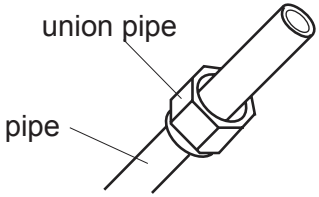
- Remove the burrs with shaper and prevent the burrs from getting into the pipe.



C: Put on suitable insulating pipe

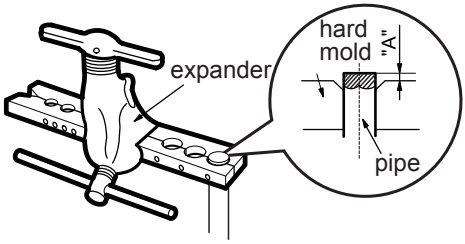
D: Put on the union nut

- Remove the union nut on the indoor connection pipe and outdoor valve; install the union nut on the pipe.



E: Expand the port

- Expand the port with expander.



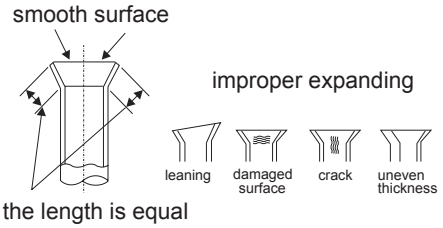
Note:

- "A" is different according to the diameter, please refer to the sheet below:

Outer diameter (mm)	A(mm)	
	Max	Min
Φ6 - 6.35(1/4")	1.3	0.7
Φ9 - 9.52(3/8")	1.6	1.0
Φ12-12.7(1/2")	1.8	1.0
Φ15.8-16(5/8")	2.4	2.2

F: Inspection

- Check the quality of expanding port. If there is any blemish, expand the port again according to the steps above.



- **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.

- **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 no live electrical components and wiring are exposed while charging, recovering or purging the system;
  – that there is continuity of earth bonding.

- **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 toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable 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 CO_2 fire extinguisher adjacent to the charging area.

- **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.

- **Leak detection methods**
  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.

- **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.

- **Checks to electrical devices**
  – that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
  – that no live electrical components and wiring are exposed while charging, recovering or purging the system.

- **Repairs to sealed components**
  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.
  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 the apparatus is mounted securely.
  – Ensure that seals or sealing materials have not degraded to the point 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 can 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.

- **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.

- **Labelling**

Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

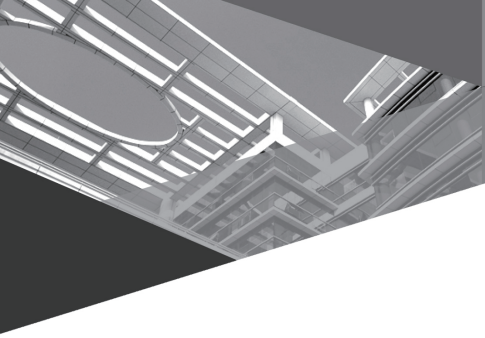
- **Recovery**

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 are 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 all appropriate refrigerants including, when applicable, 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 re- turning 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.



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