



SM_YA400_R410A_3D INV_EU_NA_2007

FLOOR STANDING

R410A 3D INVERTER CONTROL

SERVICE MANUAL

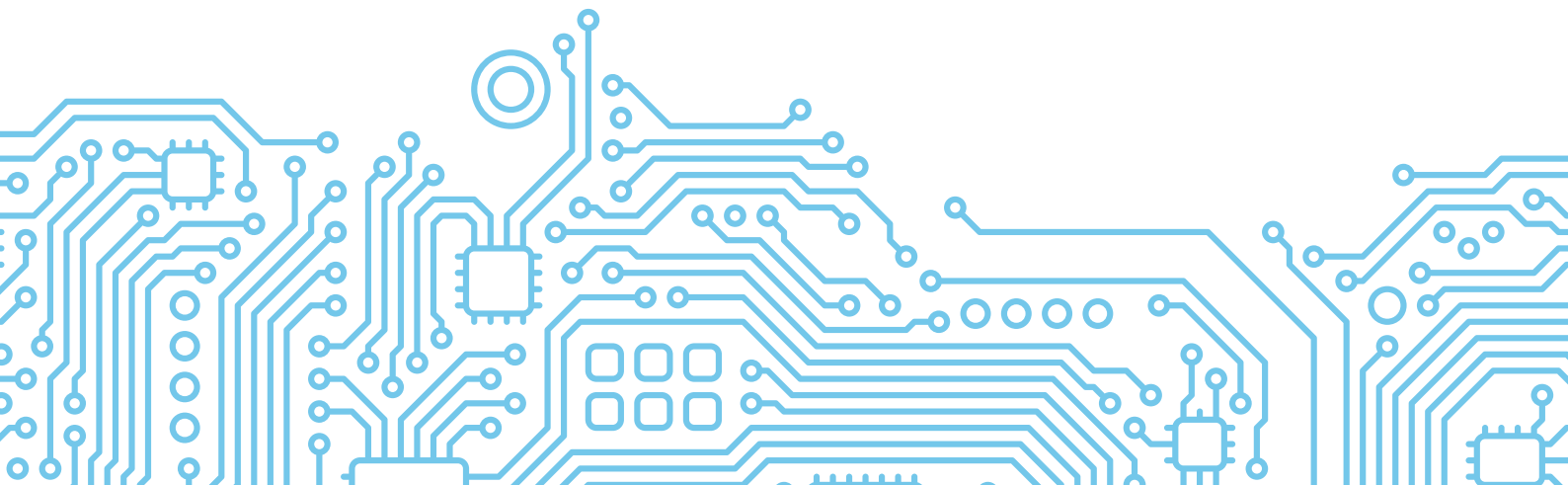


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Safety Precautions


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1. Precautions

To prevent personal injury, or property or unit damage, adhere to all precautionary measures and instructions outlined in this manual. Before servicing a unit, refer to this service manual and its relevant sections.

Failure to adhere to all precautionary measures listed in this section may result in personal injury, damage to the unit or to property, or in extreme cases, death.

 **WARNING** indicates a potentially hazardous situation which if not avoided could result in serious personal injury, or death.

 **CAUTION** indicates a potentially hazardous situation which if not avoided could result in minor or moderate personal injury, or unit damage.

1.1 In case of Accidents or Emergency

WARNING

- If a gas leak is suspected, immediately turn off the gas and ventilate the area if a gas leak is suspected before turning the unit on.
- If strange sounds or smoke is detected from the unit, turn the breaker off and disconnect the power supply cable.
- If the unit comes into contact with liquid, contact an authorized service center.
- If liquid from the batteries makes contact with skin or clothing, immediately rinse or wash the area well with clean water.
- Do not insert hands or other objects into the air inlet or outlet while the unit is plugged in.
- Do not operate the unit with wet hands.
- Do not use a remote controller that has previously been exposed to battery damage or battery leakage.

CAUTION

- Clean and ventilate the unit at regular intervals when operating it near a stove or near similar devices.
- Do not use the unit during severe weather conditions. If possible, remove the product from the window before such occurrences.

1.2 Pre-Installation and Installation

WARNING

- Use this unit only on a dedicated circuit.
- Damage to the installation area could cause the unit to fall, potentially resulting in personal injury, property damage, or product failure.
- Only qualified personnel should disassemble, install, remove, or repair the unit.
- Only a qualified electrician should perform electrical work. For more information, contact your dealer, seller, or an authorized service center.

CAUTION

- While unpacking be careful of sharp edges around the unit as well as the edges of the fins on the condenser and evaporator.

1.3 Operation and Maintenance

WARNING

- Do not use defective or under-rated circuit breakers.
- Ensure the unit is properly grounded and that a dedicated circuit and breaker are installed.
- Do not modify or extend the power cable. Ensure the power cable is secure and not damaged during operation.
- Do not unplug the power supply plug during operation.
- Do not store or use flammable materials near the unit.
- Do not open the inlet grill of the unit during operation.
- Do not touch the electrostatic filter if the unit is equipped with one.
- Do not block the inlet or outlet of air flow to the unit.
- Do not use harsh detergents, solvents, or similar items to clean the unit. Use a soft cloth for cleaning.
- Do not touch the metal parts of the unit when removing the air filter as they are very sharp.
- Do not step on or place anything on the unit or outdoor units.
- Do not drink water drained from the unit
- Avoid direct skin contact with water drained from the unit.
- Use a firm stool or step ladder according to manufacturer procedures when cleaning or maintaining the unit.

CAUTION

- Do not install or operate the unit for an extended period of time in areas of high humidity or in an environment directly exposing it to sea wind or salt spray.
- Do not install the unit on a defective or damaged installation stand, or in an unsecure location.
- Ensure the unit is installed at a level position
- Do not install the unit where noise or air discharge created by the outdoor unit will negatively impact the environment or nearby residences.
- Do not expose skin directly to the air discharged by the unit for prolonged periods of time.
- Ensure the unit operates in areas water or other liquids.
- Ensure the drain hose is installed correctly to ensure proper water drainage.
- When lifting or transporting the unit, it is recommended that two or more people are used for this task.
- When the unit is not to be used for an extended time, disconnect the power supply or turn off the breaker.

2. Information servicing

2.1 Checks to the area

- Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized.
- For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

2.2 Work procedure

- Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapor being present while the work is being performed.

2.3 Work procedure

- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out.
- Work in confined spaces shall be avoided.
- The area around the work space shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

2.4 Checking for presence of refrigerant

- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. no sparking, adequately sealed or intrinsically safe.

2.5 Presence of fire extinguisher

- If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand.
- Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.

2.6 No ignition sources

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

hazards or ignition risks.

- NO SMOKING signs shall be displayed.

2.7 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.

2.8 Checks to the refrigeration equipment

- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance. The following checks shall be applied to installations using flammable refrigerants:
 - the charge size is in accordance with the room size within which the refrigerant containing parts are installed;
 - the ventilation machinery and outlets are operating adequately and are not obstructed;
 - if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant; marking to the equipment continues to be visible and legible.
 - markings and signs that are illegible shall be corrected;
 - refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

2.9 Checks to electrical devices

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

a safe manner to avoid possibility of sparking;

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

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

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

2.11 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.

2.12 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.

2.13 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.

2.14 Leak detection methods

- The following leak detection methods are deemed acceptable for systems containing flammable refrigerants. Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
 - If a leak is suspected, all naked flames shall be removed or extinguished.
 - If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

2.15 Removal and evacuation

- When breaking into the refrigerant circuit to make repairs or for any other purpose, conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration.
- The following procedure shall be adhered to:
 - remove refrigerant;
 - purge the circuit with inert gas;
 - evacuate;
 - purge again with inert gas;
 - open the circuit by cutting or brazing.
- The refrigerant charge shall be recovered into the

correct recovery cylinders. The system shall be flushed with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task. Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.

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

2.16 Charging procedures

- In addition to conventional charging procedures, the following requirements shall be followed:
 - Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
 - Cylinders shall be kept upright.
 - Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
 - Label the system when charging is complete (if not already).
 - Extreme care shall be taken not to overfill the refrigeration system.
 - Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

2.17 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.

- Become familiar with the equipment and its operation.
- Isolate system electrically.
- 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.
- Pump down refrigerant system, if possible.
- If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- Make sure that cylinder is situated on the scales before recovery takes place.
- Start the recovery machine and operate in accordance with manufacturer's instructions.
- Do not overfill cylinders. (No more than 80 % volume liquid charge).
- Do not exceed the maximum working pressure of the cylinder, even temporarily.
- 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.
- Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

2.18 Labelling

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

2.19 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 numbers 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 flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order.
- Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Specifications

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1. Model Reference

Refer to the following table to determine the specific indoor and outdoor unit model number of your purchased equipment.

Indoor Unit Model	Outdoor Unit Model	Capacity (Btu/h)	Power Supply
MFYA400-24ARFN1-QRD0W	MOX401UL-24AFN1-QRD0W	24k	1 ϕ , 220~240V, 50Hz

2. Pipe Length and Drop Height

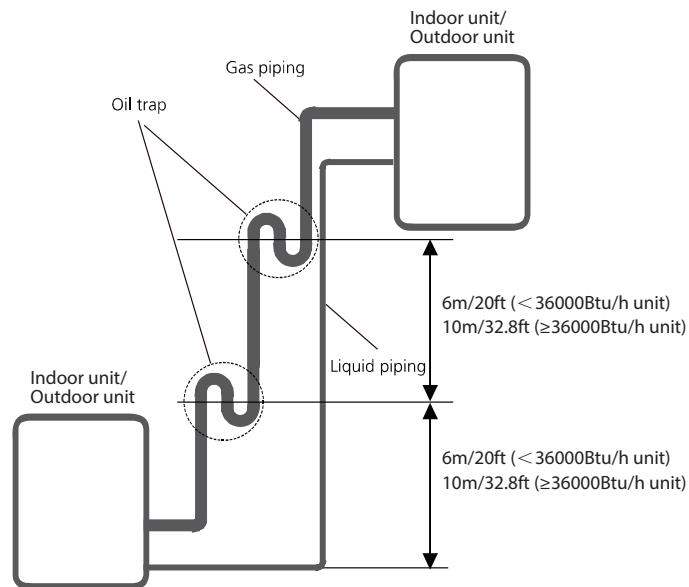
The length and elevation of connection pipe are shown in the table below. If the pipe length exceeds max pipe length, additional refrigerant should be charged to ensure nominal cooling/heating capacity.

Capacity(Btu/h)	Standard Length	Max Pipe Length	Max Elevation	Additional Refrigerant
24k	5m (16.4ft)	25m(82.0ft)	15m(49.2ft)	15g/m (0.16oz/ft)

If oil flows back into the outdoor unit's compressor, this might cause liquid compression or deterioration of oil return. Oil traps in the rising gas pipe can prevent this.

-An oil trap should be installed every 6m(20ft) of vertical suction line riser (<36000Btu/h unit).

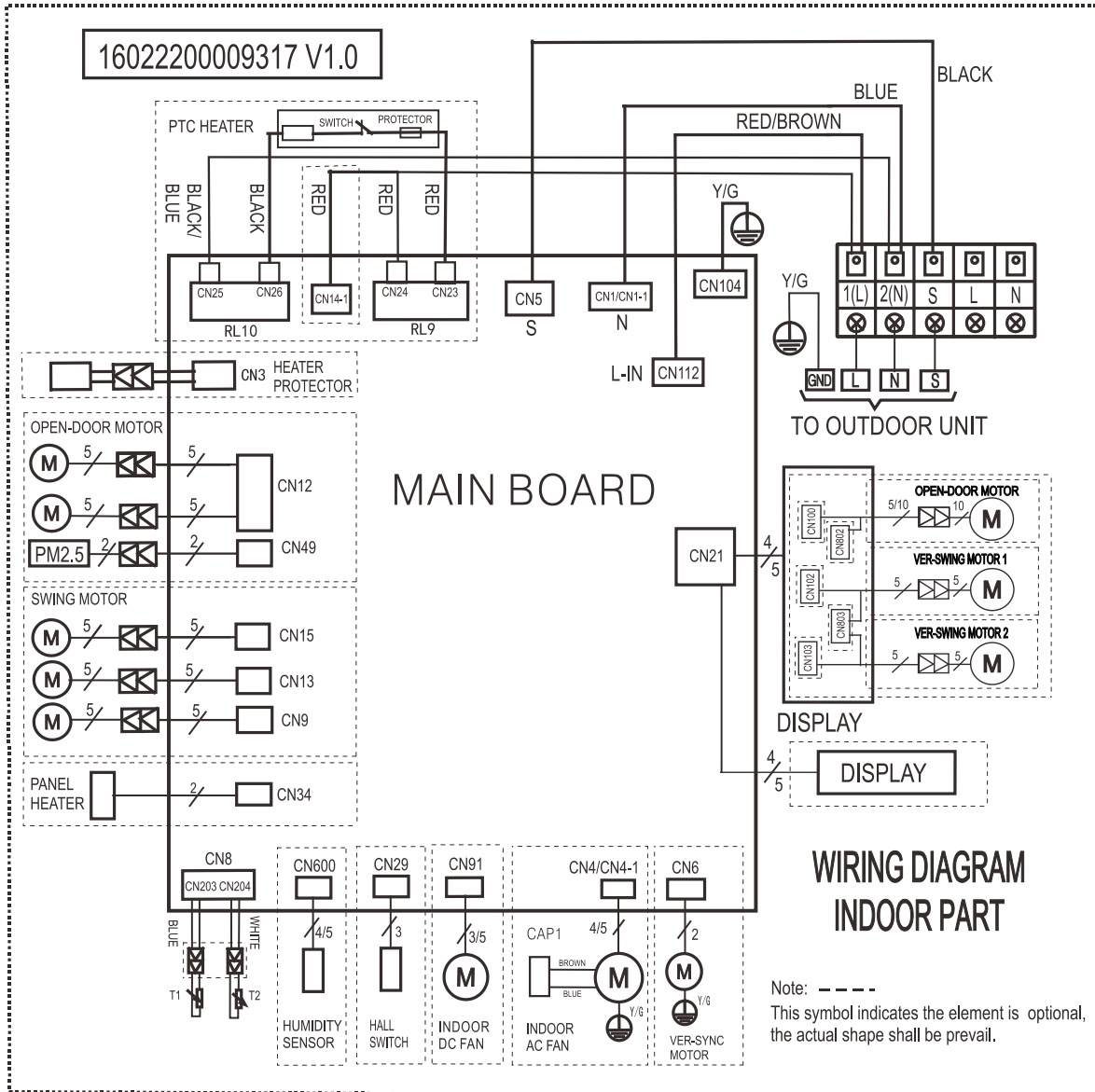
-An oil trap should be installed every 10m(32.8ft) of vertical suction line riser (≥36000Btu/h unit).



3. Electrical Wiring Diagrams

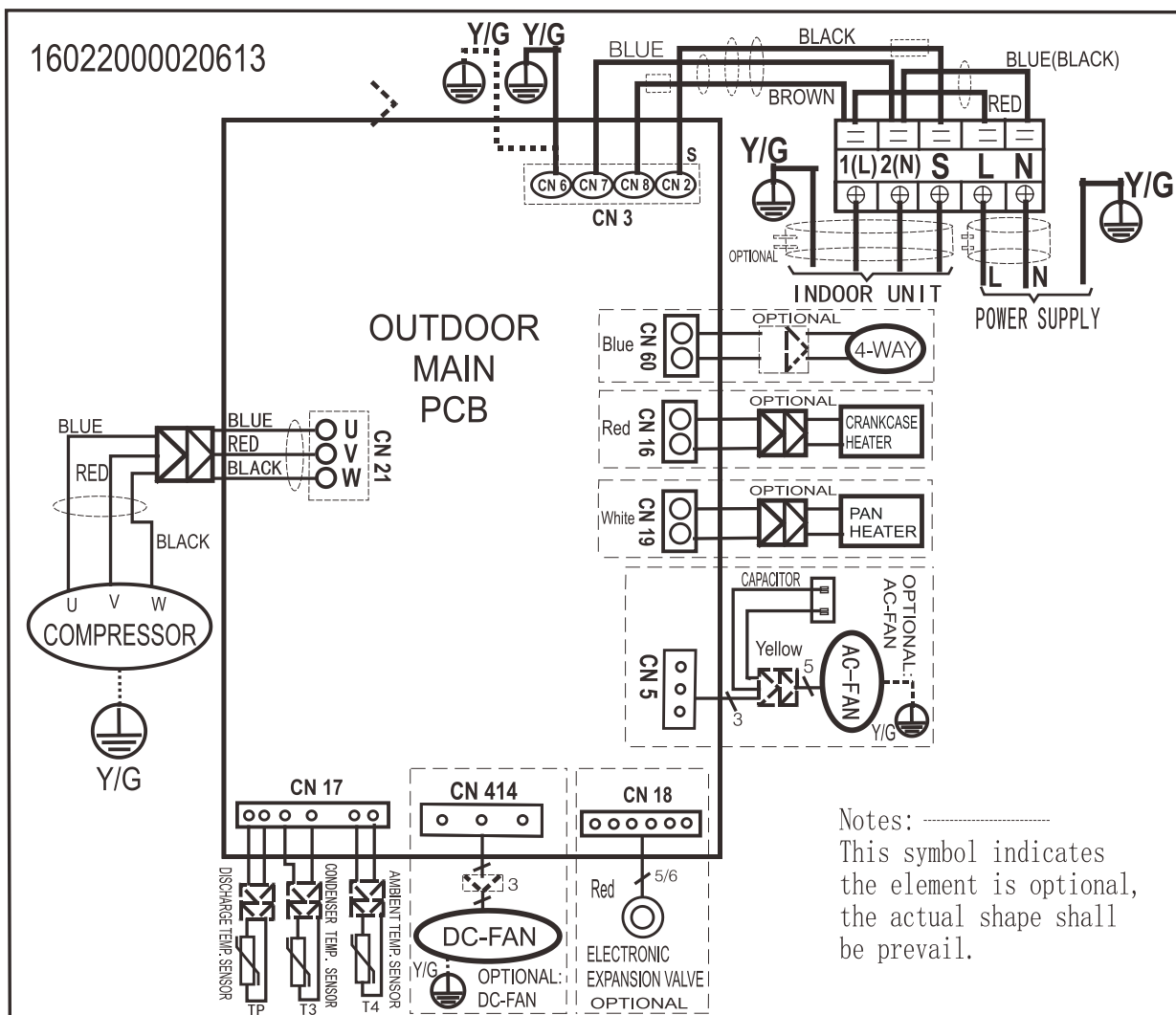
3.1 Indoor unit

Abbreviation	Paraphrase
Y/G	Yellow-Green Conductor
VER-SWING	Vertical Fan
L	LIVE
N	NEUTRAL
T1	Indoor Room Temperature
T2	Coil Temperature of Indoor Heat Exchanger



3.2 Outdoor Unit

Abbreviation	Paraphrase
COMP	Compressor
CAP1,CAP2	Fan Motor Capacitor
DC FAN	Outdoor Direct Current Fan
AC FAN	Outdoor Alternating Current Fan
H-PRO	High Pressure Switch
L-PRO	Low Pressure Switch
TP	Exhaust Temperature Sensor
T3	Condenser Temperature Sensor
T4	Outdoor Ambient Temperature Sensor
TH	Heatsink Temperature Sensor



Product Features

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1. Operation Modes and Functions

1.1 Abbreviation

Unit element abbreviations

Abbreviation	Element
T1	Indoor room temperature
T2	Coil temperature of evaporator
T3	Coil temperature of condenser
T4	Outdoor ambient temperature
TS	Set temperature
Td	Control target temperature
TP	Compressor discharge temperature

In this manual, such as CDIFTEMP, HDIFTEMP2, TCE1, TCE2...etc., they are well-setting parameter of EEPROM.

1.2 Safety Features

Compressor three-minute delay at restart

Compressor functions are delayed for up to one minute upon the first startup of the unit, and are delayed for up to three minutes upon subsequent unit restarts.

Automatic shutoff based on discharge temperature

If the compressor discharge temperature exceeds a certain level for a period of time, the compressor ceases operation.

Inverter module protection

The inverter module has an automatic shutoff mechanism based on the unit's current, voltage, and temperature. If automatic shutoff is initiated, the corresponding error code is displayed on the indoor unit and the unit ceases operation.

Indoor fan delayed operation

- When the unit starts, the vertical louver is automatically activated and the indoor fan will operate after vertical louver is opened to the target angle.
- If the unit is in heating mode, the indoor fan is regulated by the anti-cold wind function.

Sensor redundancy and automatic shutoff

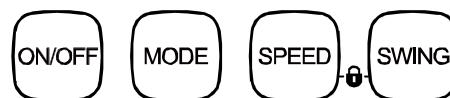
- If one temperature sensor malfunctions, the air conditioner continues operation and displays the corresponding error code, allowing for emergency use.
- When more than one temperature sensor is malfunctioning, the air conditioner ceases operation.

Automatic shutoff based on fan speed

When indoor fan speed registers 300RPM or 1500 RPM for 50s, the unit ceases operation and the corresponding error code is displayed on the indoor unit.

1.3 Display Function

Unit display functions



- Auto operation
- Cooling operation
- Dry operation
- Heating operation
- Fan operation
- Horizontal airflow
- Indoor room temperature
- Electric heating function (some models)
- Change of air (depending on models)
- Lock operation
- Defrost operation
- When wireless control feature is activated (some models)

1.4 Fan Mode

When fan mode is activated:

- The outdoor fan and compressor are stopped.
- Temperature control is disabled and no temperature setting is displayed.
- The indoor fan speed can be set to 1%-100% or auto.
- The louver operations are identical to those in cooling mode.
- Auto fan: In fan-only mode, AC operates the same as auto fan in cooling mode with the temperature set at 24°C.

1.5 Cooling Mode

1.5.1 Compressor Control

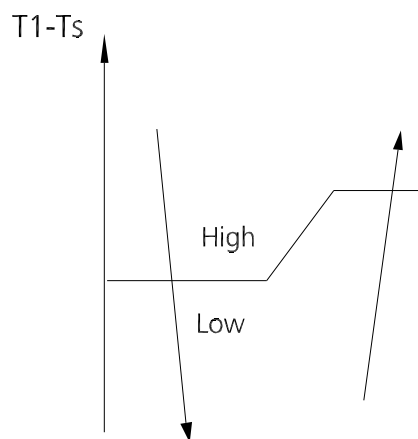
Reach the configured temperature:

- 1) When the compressor runs continuously for less than 120 minutes.
 - If the following conditions are satisfied, the compressor ceases operation.
 - While calculated frequency(fb) is less than minimum limit frequency(FminC).
 - While protective time is more than or equal to ten minutes.
 - While T1 is lower than or equal to (Tsc-CDIFTEMP-0.5°C)
- Note: CDIFTEMP is EEPROM setting parameter. It is 2°C usually.
- 2) When the compressor runs continuously for more than 120 minutes.
 - If the following conditions are satisfied, the compressor ceases operation.
 - When calculated frequency(fb) is less than minimum limit frequency(FminC).
 - When protective time is more than or equal to ten minutes.
 - When T1 is lower than or equal to (Tsc-CDIFTEMP).
- Note: CDIFTEMP is EEPROM setting parameter. It is 2°C usually.
- 3) If one of the following conditions is satisfied, not judge protective time.
 - Compressor running frequency is more than test frequency.
 - When compressor running frequency is equal to test frequency, T4 is higher than 15°C or T4 sensor fault

- Change setting temperature.
- Turbo function on/off
- Various frequency limit shutdown occurs.

1.5.2 Indoor Fan Control

- In cooling mode, the indoor fan operates continuously. The fan speed can be set to high, low, or auto.
- Auto fan in cooling mode:



1.5.3 Outdoor Fan Control

- The outdoor unit will be run at different fan speed according to T4 and compressor frequency.
- For different outdoor units, the fan speeds are different.

1.5.4 Condenser Temperature Protection

When condenser temperature is more than setting value, the compressor ceases operation..

1.5.5 Evaporator Temperature Protection

When evaporator temperature drops below a configured value, the compressor and outdoor fan cease operation.

1.6 Heating Mode(Heat pump units)

1.6.1 Compressor Control

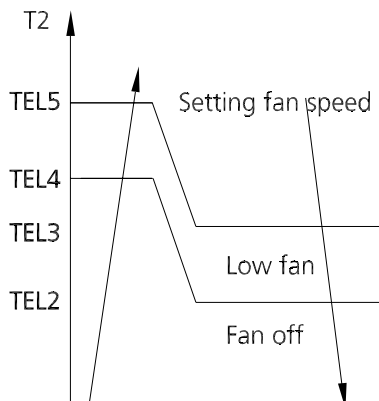
- 1) Reach the configured temperature
 - If the following conditions are satisfied, the compressor ceases operation.
 - While calculated frequency(fb) is less than minimum limit frequency(FminH).
 - When protective time is more than or equal to ten minutes.
 - When T1 is higher than or equal to Tsc+HDIFTEMP2.

Note: HDIFTEMP2 is EEPROM setting parameter. It is 3°C usually.

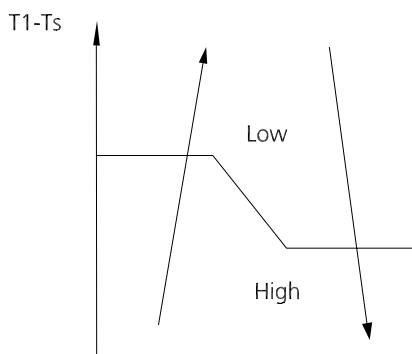
- If one of the following conditions is satisfied, not judge protective time.
 - Compressor running frequency is more than test frequency.
 - When compressor running frequency is equal to test frequency, T4 is higher than 15°C or T4 sensor fault.
 - Change setting temperature.
 - Turbo/sleep function on/off.
- 2) When the current is higher than the predefined safe value, surge protection is activated, causing the compressor to cease operation.

1.6.2 Indoor Fan Control:

- When the compressor is on, the indoor fan speed can be set to high, low, or auto. And the anti-cold wind function has the priority.
- Anti-cold air function
 - The indoor fan is controlled by the indoor unit coil temperature T2.



- Auto fan action in heating mode:



1.6.3 Outdoor Fan Control:

- The outdoor unit will be run at different fan speed according to T4 and compressor frequency.
- For different outdoor units, the fan speeds are different.

1.6.4 Defrosting mode

- The unit enters defrosting mode according to the temperature value of T3 and T4 as well as the compressor running time.
- In defrosting mode, the compressor continues to run, the indoor and outdoor motor will cease operation, the defrost light of the indoor unit will turn on, and the "df" symbol is displayed.
- If any one of the following conditions is satisfied, defrosting ends and the machine switches to normal heating mode:
 - T3 rises above TCDE1.
 - T3 maintained above TCDE2 for 80 seconds.
 - Unit runs for 15 minutes consecutively in defrosting mode.
- If T4 is lower than or equal to -22°C and compressor running time is more than TIMING_DEFROST_TIME, if any one of the following conditions is satisfied, defrosting ends and the machine switches to normal heating mode:
 - Unit runs for 10 minutes consecutively in defrosting mode.
 - T3 rises above 10°C.

For some models:

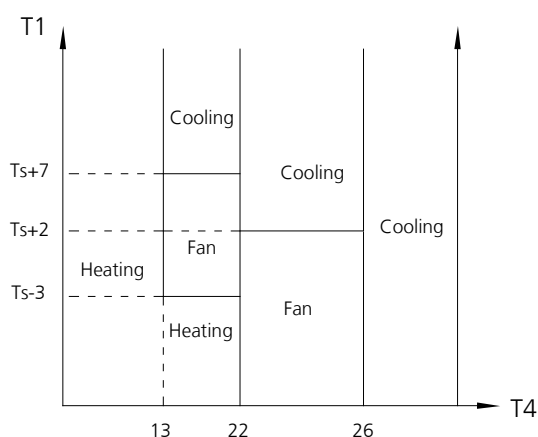
- T3 is lower than 3°C and compressor running time is more than 120 minutes, at this time, if T3 is lower than TCDI1+4°C(39.2°F) for 3 minutes. If any one of the following conditions is satisfied, defrosting ends and the machine switches to normal heating mode:
 - T3 rises above TCDE1+4°C.
 - T3 maintained above TCDE2+4°C for 80 seconds.
 - Unit runs for 15 minutes consecutively in defrosting mode.

1.6.5 Evaporator Temperature Protection

When the evaporator temperature exceeds a preset protection value, the compressor ceases operation.

1.7 Auto-mode

- This mode can be selected with the remote controller and the setting temperature can be changed between 16°C~30°C.
- In auto mode, the machine selects cooling, heating, or fan-only mode on the basis of T1, Ts and T4.



- If the setting temperature is modified, the machine selects a new running function.

1.8 Drying Mode

- AC operates the same as auto fan in cooling mode.
- When $T1 < 17^{\circ}\text{C}$, the fan speed is lower than 30%, the unit will operate at 30%.
- Low Room Temperature Protection
 - If the room temperature is lower than 10°C , the compressor ceases operations and does not resume until room temperature exceeds 12°C .
- All protections are active and the same as that in cooling mode.

1.9 Sleep Function

- The sleep function is available in cooling, heating, or auto mode.
- The operational process for sleep mode is as follows:
 - When cooling, the temperature rises $1^{\circ}\text{C}(2^{\circ}\text{F})$ (to not higher than $30^{\circ}\text{C}(86^{\circ}\text{F})$) every hour. After 2 hours, the temperature stops rising and the indoor fan is fixed at low speed.
 - When heating, the temperature decreases $1^{\circ}\text{C}(2^{\circ}\text{F})$ (to not lower than $16^{\circ}\text{C}(60.8^{\circ}\text{F})$) every hour. After 2 hours, the temperature stops decreasing and the indoor fan is fixed at low speed. Anti-cold wind function takes priority.
- The unit exits sleep operation when it receives the following signals:
 - Switch off
 - Turbo
 - Silence
 - Self-clean
 - Changes in:

- mode
- fan speed

1.10 Follow Me Function

- If you press "Follow Me" on the remote, the indoor unit will beep. This indicates the follow me function is active.
- Once active, the remote control will send a signal every 3 minutes, with no beeps. The unit automatically sets the temperature according to the measurements from the remote control.
- The unit will only change modes if the information from the remote control makes it necessary, not from the unit's temperature setting.
- If the unit does not receive a signal for 7 minutes or you press "Follow Me," the function turns off. The unit regulates temperature based on its own sensor and settings.

1.11 Silence Function

- Press "Silence" on the remote control to enable the SILENCE function. While this function is active, the compressor frequency is maintained at a lower level. The indoor unit will operate at 1%, which reduces noise to the lowest possible level.

1.12 Self Clean Function

- If you press "Self Clean" when the unit is in cooling or drying mode:
 - The indoor unit will run in low fan mode for a certain time, then ceases operation.
- Self Clean keeps the indoor unit dry and prevents mold growth.
- When match with multi outdoor unit, this function is disabled.

1.13 8°C Heating Function

In heating mode, the temperature can be set to as low as 8°C , preventing the indoor area from freezing if unoccupied during severe cold weather.

1.14 Auto-Restart Function

- The indoor unit has an auto-restart module that allows the unit to restart automatically. The module automatically stores the current settings and in the case of a sudden power failure, will restore those settings automatically within 3 minutes after power returns.

-
- If there is a power failure while the unit is running, the compressor starts 3 minutes after the unit restarts. If the unit was already off before the power failure, the compressor starts 1 minute after the unit restarts.

Maintenance and Disassembly

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1. Maintenance

1.1 First Time Installation Check

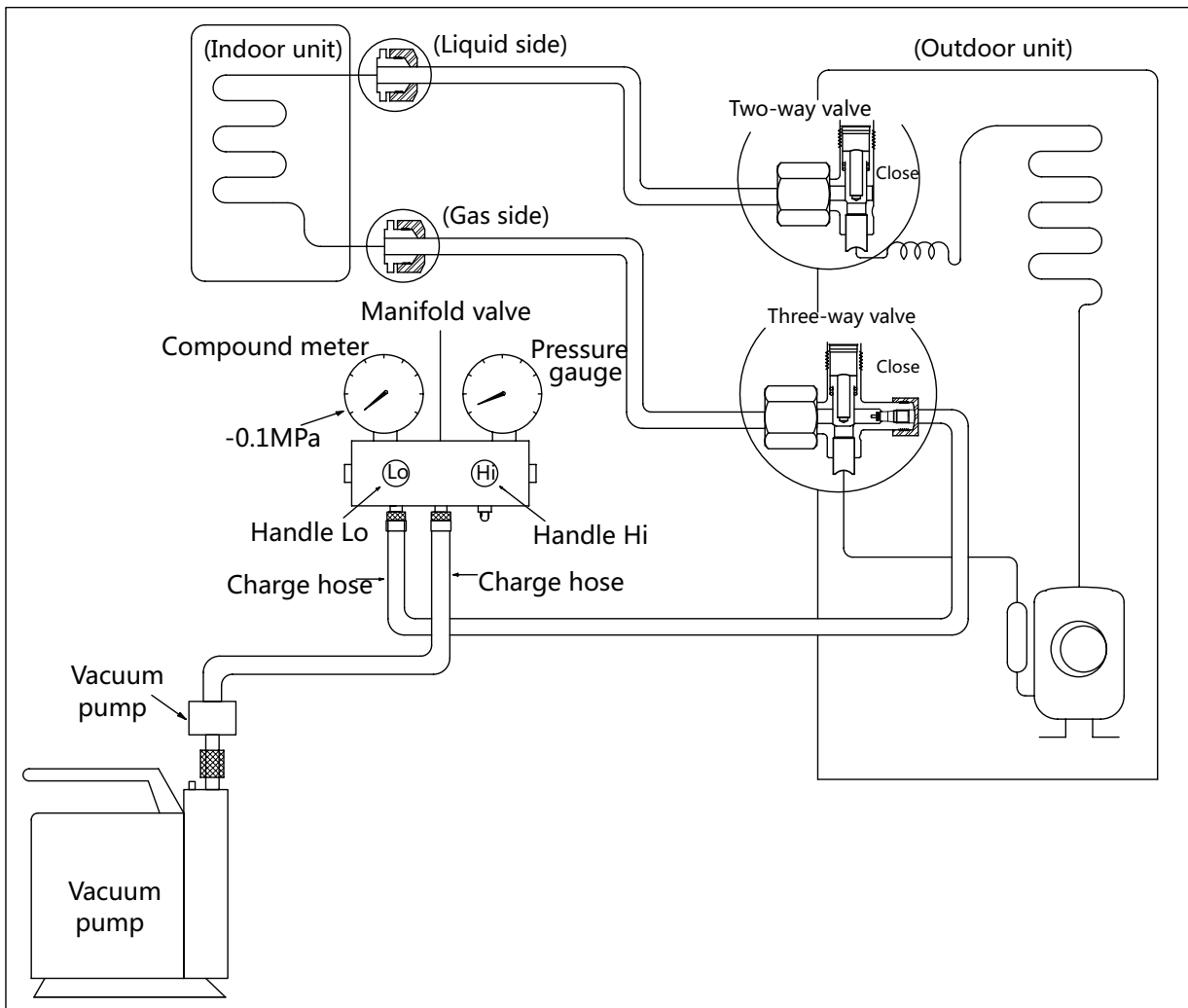
Air and moisture trapped in the refrigerant system affects the performance of the air conditioner by:

- Increasing pressure in the system.
- Increasing the operating current.
- Decreasing the cooling or heating efficiency.
- Congesting the capillary tubing due to ice build-up in the refrigerant circuit.
- Corroding the refrigerant system.

To prevent air and moisture from affecting the air conditioner's performance, the indoor unit, as well as the pipes between the indoor and outdoor unit, must be leak tested and evacuated.

Leak test (soap water method)

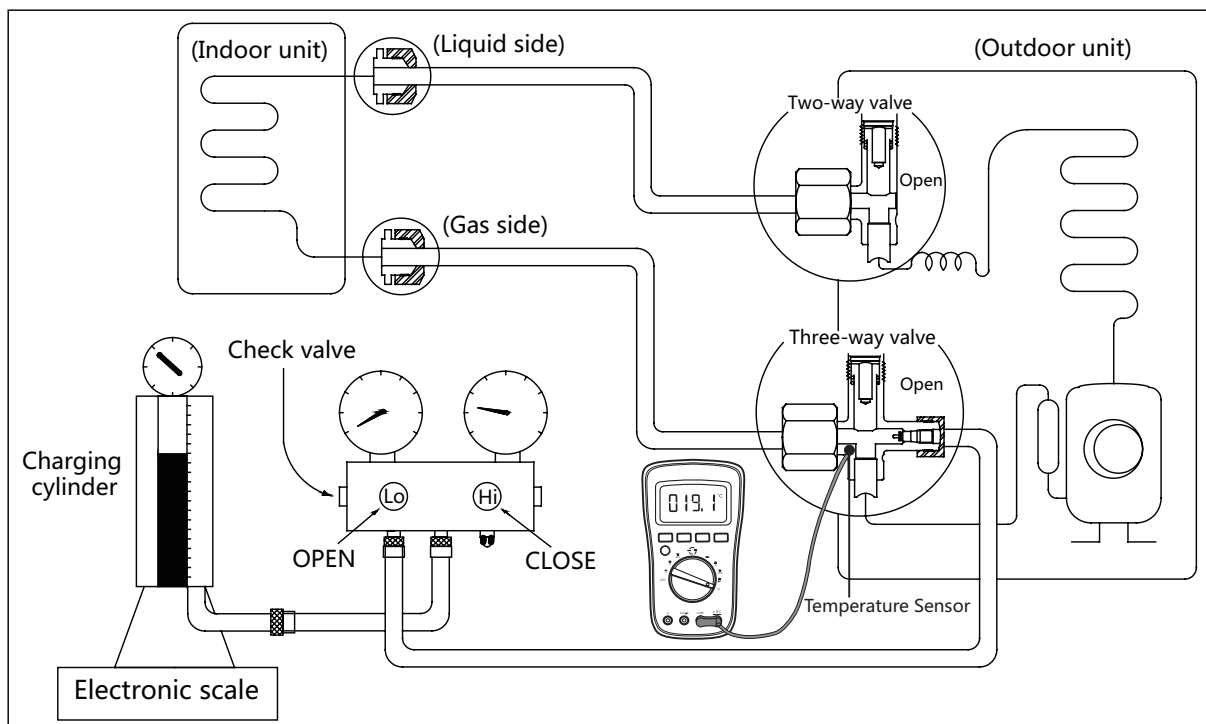
Use a soft brush to apply soapy water or a neutral liquid detergent onto the indoor unit connections and outdoor unit connections. If there is gas leakage, bubbles will form on the connection.



Procedure:

1. Tighten the flare nuts of the indoor and outdoor units, and confirm that both the 2- and 3-way valves are closed.
2. Connect the charge hose with the push pin of Handle Lo to the gas service port of the 3-way valve.
3. Connect another charge hose to the vacuum pump.
4. Fully open the Handle Lo manifold valve.
5. Using the vacuum pump, evacuate the system for 30 minutes.
 - a. Check whether the compound meter indicates -0.1 MPa (14.5 Psi).
 - If the meter does not indicate -0.1 MPa (14.5 Psi) after 30 minutes, continue evacuating for an additional 20 minutes.
 - If the pressure does not achieve -0.1 MPa (14.5 Psi) after 50 minutes, check for leakage.
 - b. If the pressure successfully reaches -0.1 MPa (14.5 Psi), fully close the Handle Lo valve, then cease vacuum pump operations.
6. Wait for 5 minutes then check whether the gauge needle moves after turning off the vacuum pump. If the gauge needle moves backward, check whether there is gas leakage.
6. Loosen the flare nut of the 3-way valve for 6 or 7 seconds and then tighten the flare nut again.
 - a. Confirm the pressure display in the pressure indicator is slightly higher than the atmospheric pressure.
 - b. Remove the charge hose from the 3-way valve.
7. Fully open the 2- and 3-way valves and tighten the cap of the 2- and 3-way valves.

1.2 Refrigerant Recharge



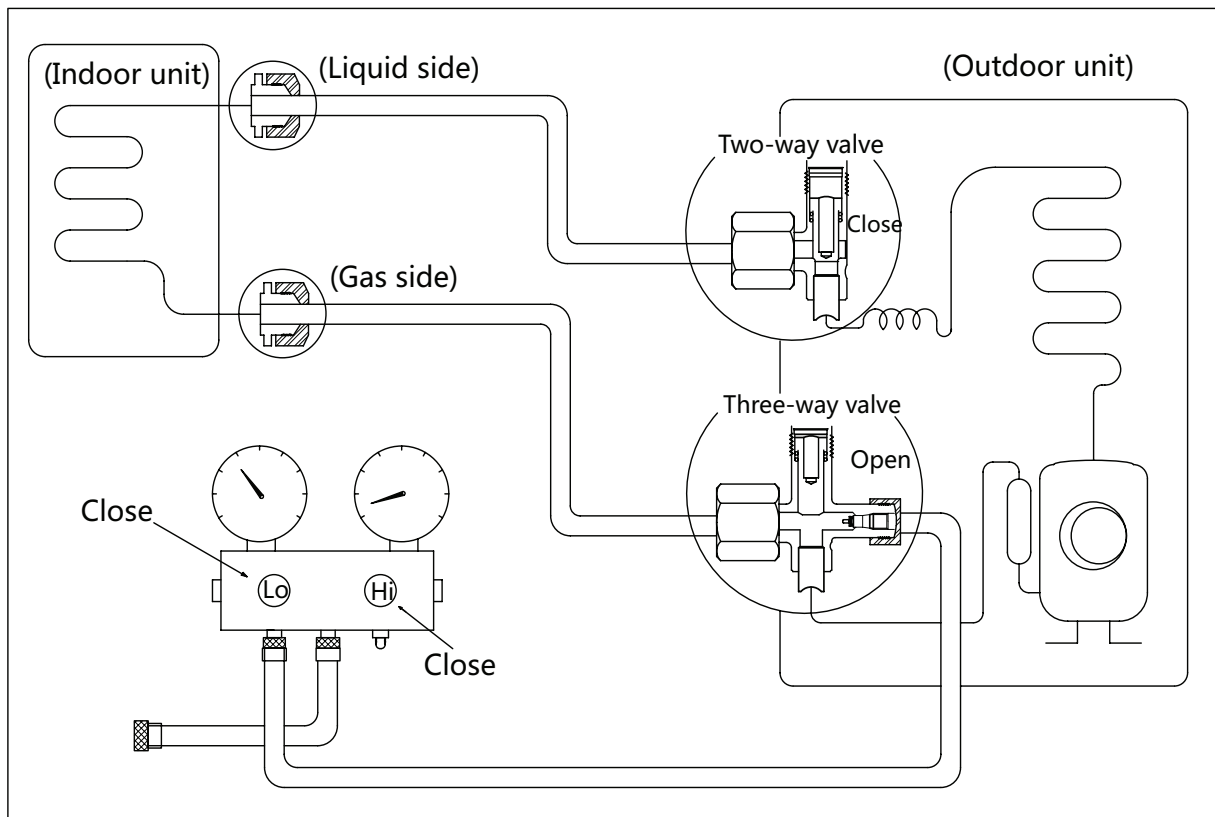
Procedure:

1. Close both 2- and 3-way valves.
2. Slightly connect the Handle Lo charge hose to the 3-way service port.
3. Connect the charge hose to the valve at the bottom of the cylinder.
4. If the refrigerant is R410A/R32, invert the cylinder to ensure a complete liquid charge.
5. Open the valve at the bottom of the cylinder for 5 seconds to purge the air in the charge hose, then fully tighten the charge hose with push pin Handle Lo to the service port of 3-way valve..
6. Place the charging cylinder onto an electronic scale and record the starting weight.
7. Fully open the Handle Lo manifold valve, 2- and 3-way valves.
8. Operate the air conditioner in cooling mode to charge the system with liquid refrigerant.
9. When the electronic scale displays the correct weight (refer to the gauge and the pressure of the low side to confirm, the value of pressure refers to chapter Appendix), turn off the air conditioner, then disconnect the charge hose from the 3-way service port immediately..
10. Mount the caps of service port and 2- and 3-way valves.
11. Use a torque wrench to tighten the caps to a torque of 18 N.m.
12. Check for gas leakage.

1.3 Re-Installation

1.3.1 Indoor Unit

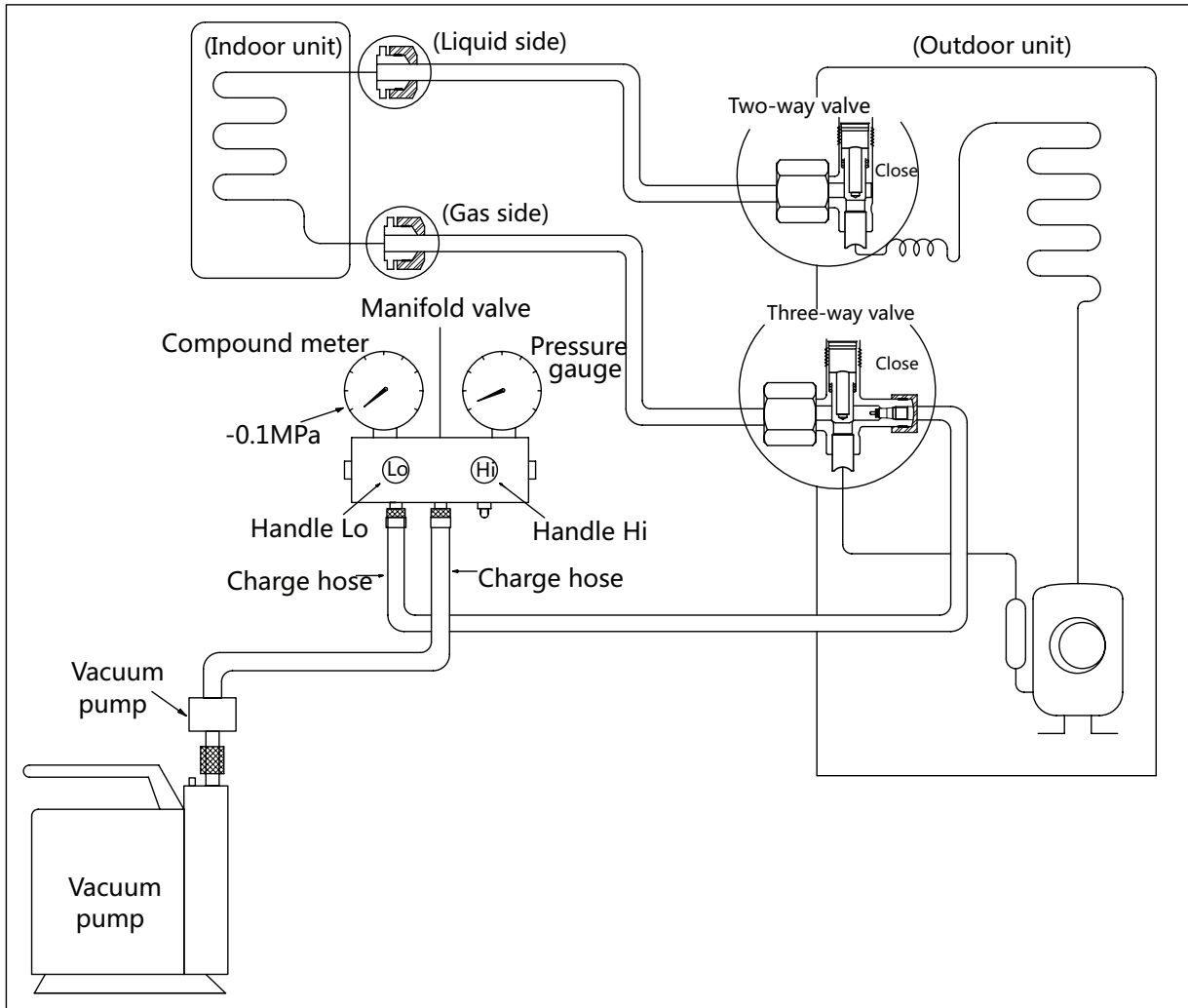
Collecting the refrigerant into the outdoor unit



Procedure:

1. Confirm that the 2- and 3-way valves are opened.
2. Connect the charge hose with the push pin of Handle Lo to the 3-way valve's gas service port.
3. Open the Handle Lo manifold valve to purge air from the charge hose for 5 seconds and then close it quickly.
4. Close the 2-way valve.
5. Operate the air conditioner in cooling mode. Cease operations when the gauge reaches 0.1 MPa (14.5 Psi).
6. Close the 3-way valve so that the gauge rests between 0.3 MPa (43.5 Psi) and 0.5 MPa (72.5 Psi).
7. Disconnect the charge set and mount the caps of service port and 2- and 3-way valves.
8. Use a torque wrench to tighten the caps to a torque of 18 N.m.
9. Check for gas leakage.

Air purging with vacuum pump

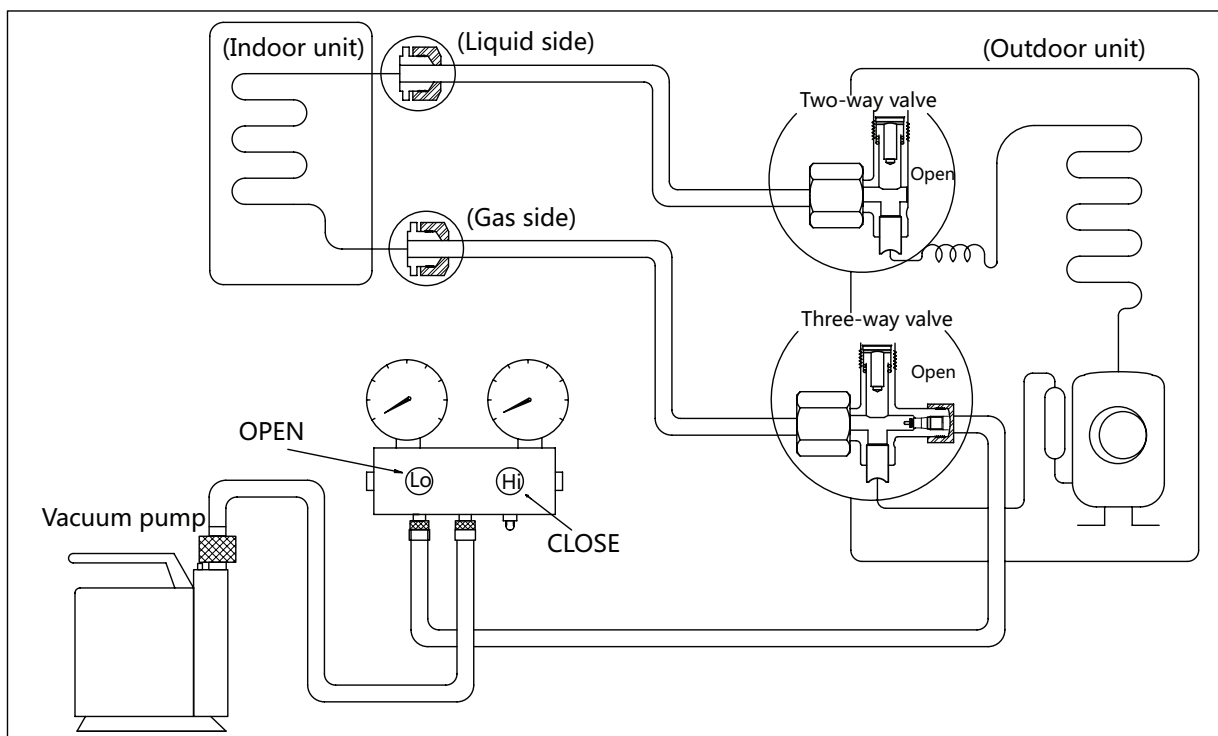


Procedure:

1. Tighten the flare nuts of the indoor and outdoor units, and confirm that both the 2- and 3-way valves are closed.
2. Connect the charge hose with the push pin of Handle Lo to the gas service port of the 3-way valve.
3. Connect another charge hose to the vacuum pump.
4. Fully open the Handle Lo manifold valve.
5. Using the vacuum pump, evacuate the system for 30 minutes.
 - a. Check whether the compound meter indicates -0.1 MPa (14.5 Psi).
 - If the meter does not indicate -0.1 MPa (14.5 Psi) after 30 minutes, continue evacuating for an additional 20 minutes.
 - If the pressure does not achieve -0.1 MPa (14.5 Psi) after 50 minutes, check for leakage.
 - b. If the pressure successfully reaches -0.1 MPa (14.5 Psi), fully close the Handle Lo valve, then cease vacuum pump operations.
6. Loosen the flare nut of the 3-way valve for 6 or 7 seconds and then tighten the flare nut again.
 - a. Confirm the pressure display in the pressure indicator is slightly higher than the atmospheric pressure.
 - b. Remove the charge hose from the 3-way valve.
7. Fully open the 2- and 3-way valves and tighten the cap of the 2- and 3-way valves.

1.3.2 Outdoor Unit

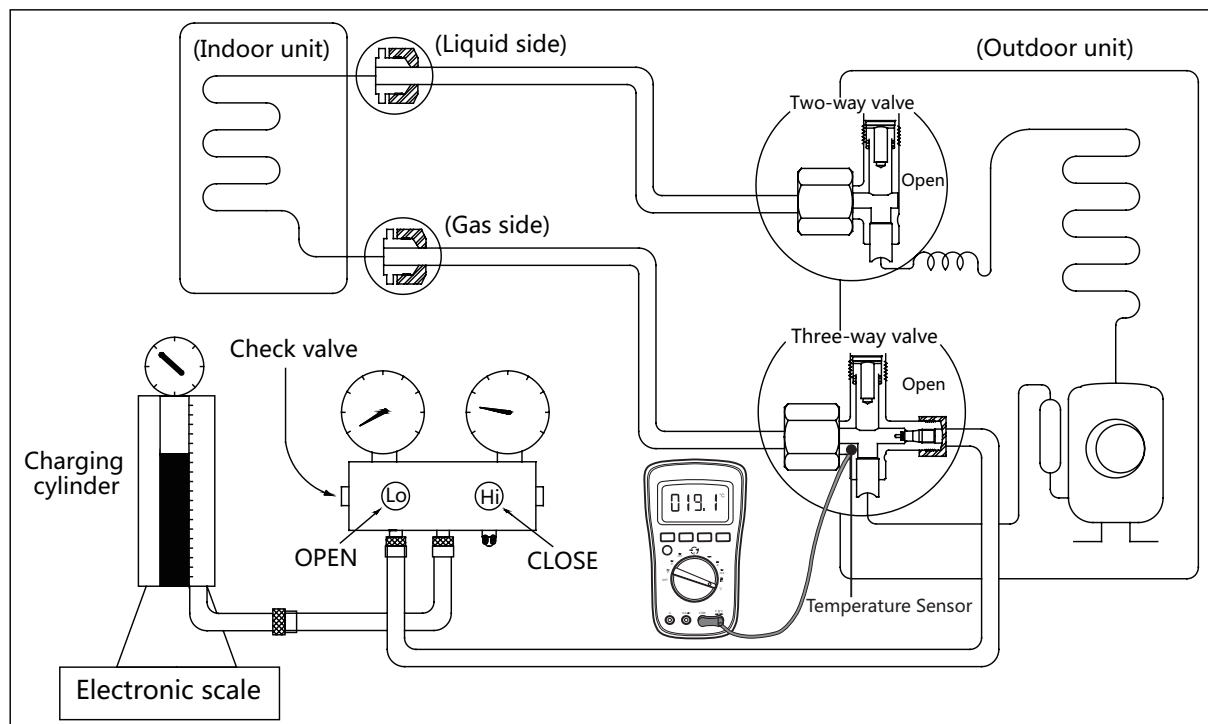
Evacuation for the whole system



Procedure:

1. Confirm that the 2- and 3-way valves are opened.
2. Connect the vacuum pump to the 3-way valve's service port.
3. Evacuate the system for approximately one hour. Confirm that the compound meter indicates -0.1 MPa (14.5Psi).
4. Close the valve (Low side) on the charge set and turn off the vacuum pump.
5. Wait for 5 minutes then check whether the gauge needle moves after turning off the vacuum pump. If the gauge needle moves backward, check whether there is gas leakage.
6. Disconnect the charge hose from the vacuum pump.
7. Mount the caps of service port and 2- and 3-way valves.
8. Use a torque wrench to tighten the caps to a torque of 18 N.m.

Refrigerant charging



Procedure:

1. Close both 2- and 3-way valves.
2. Slightly connect the Handle Lo charge hose to the 3-way service port.
3. Connect the charge hose to the valve at the bottom of the cylinder.
4. If the refrigerant is R410A/R32, invert the cylinder to ensure a complete liquid charge.
5. Open the valve at the bottom of the cylinder for 5 seconds to purge the air in the charge hose, then fully tighten the charge hose with push pin Handle Lo to the service port of 3-way valve..
6. Place the charging cylinder onto an electronic scale and record the starting weight.
7. Fully open the Handle Lo manifold valve, 2- and 3-way valves.
8. Operate the air conditioner in cooling mode to charge the system with liquid refrigerant.
9. When the electronic scale displays the correct weight (refer to the gauge and the pressure of the low side to confirm, the value of pressure refers to chapter Appendix), turn off the air conditioner, then disconnect the charge hose from the 3-way service port immediately..
10. Mount the caps of service port and 2- and 3-way valves.
11. Use a torque wrench to tighten the caps to a torque of 18 N.m.
12. Check for gas leakage.

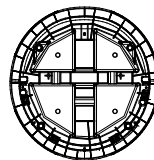
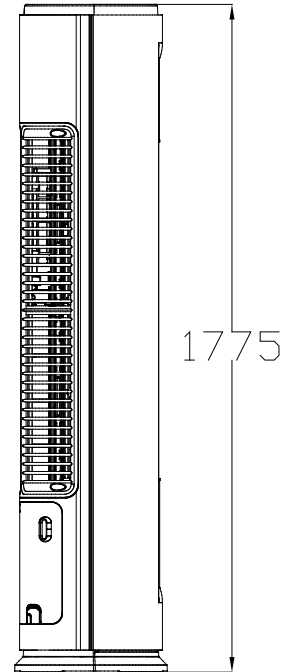
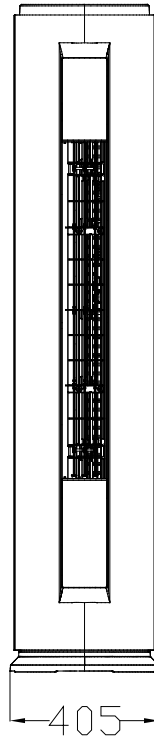
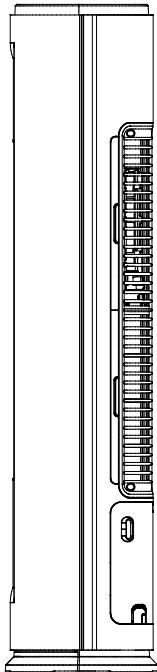
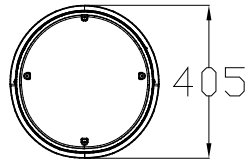
Note: 1. Mechanical connectors used indoors shall comply with local regulations.

2. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be re-fabricated.

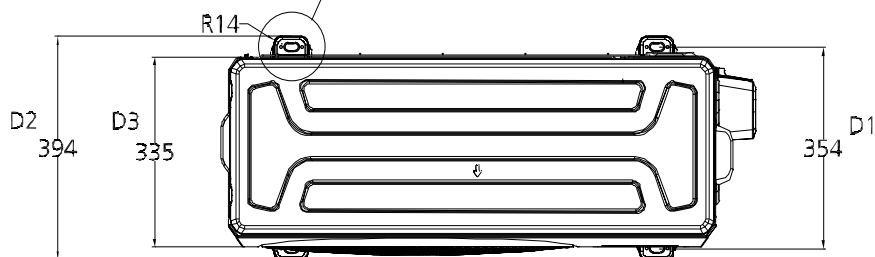
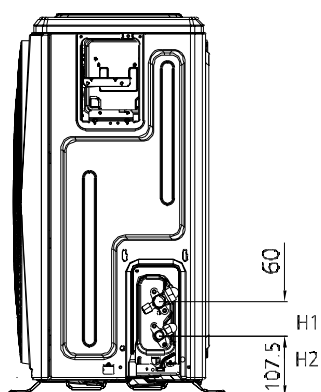
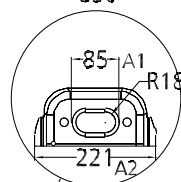
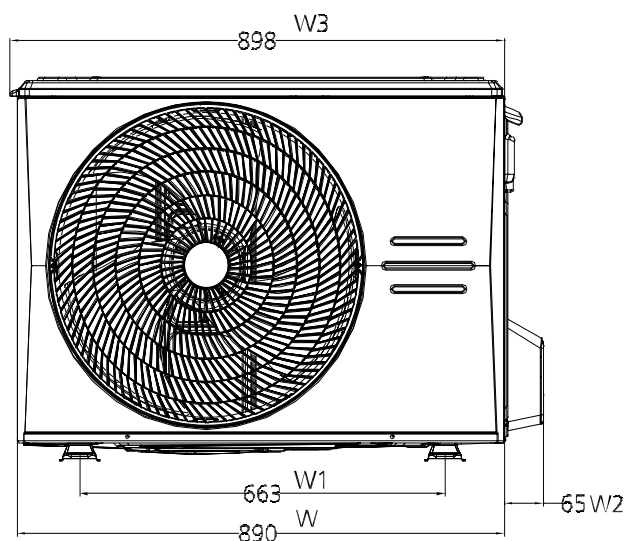
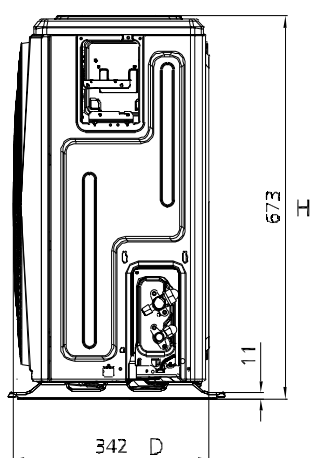
2. Disassembly

2.1 Dimension

Indoor unit

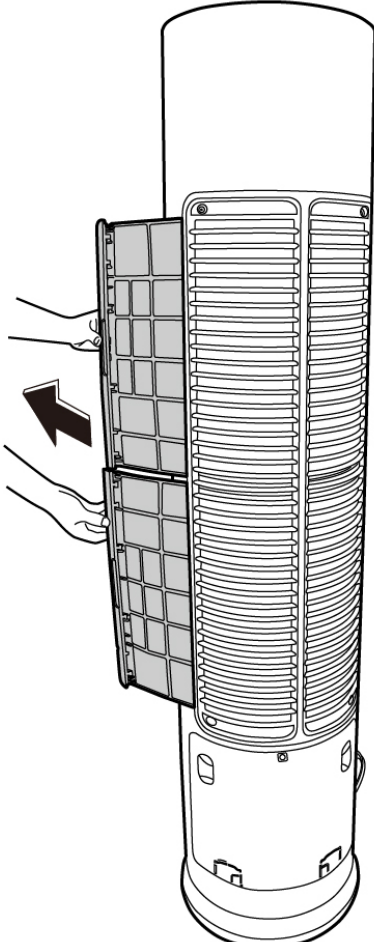


Outdoor unit



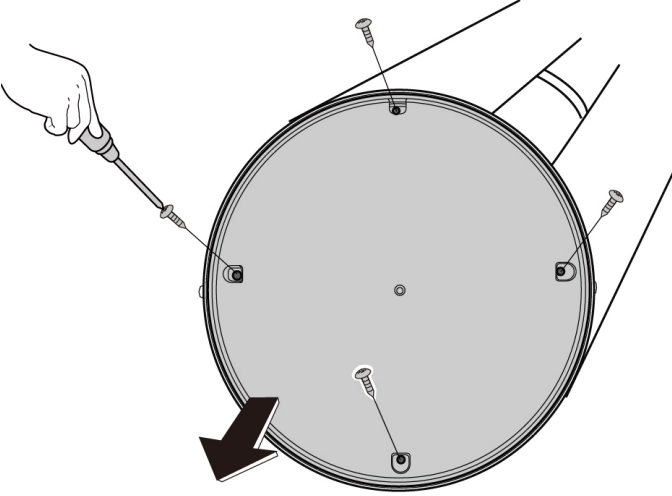
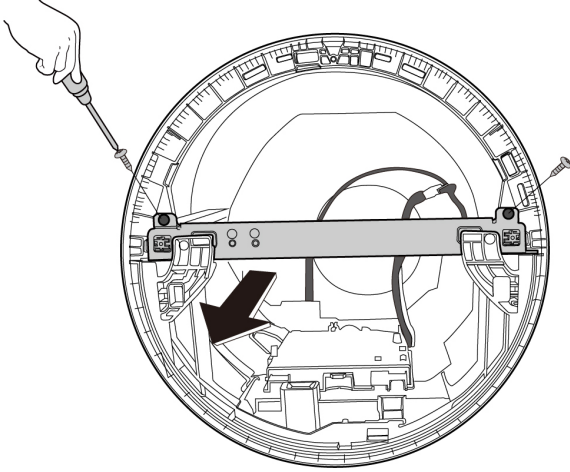
2.2 Indoor Unit Disassembly

1.Filter

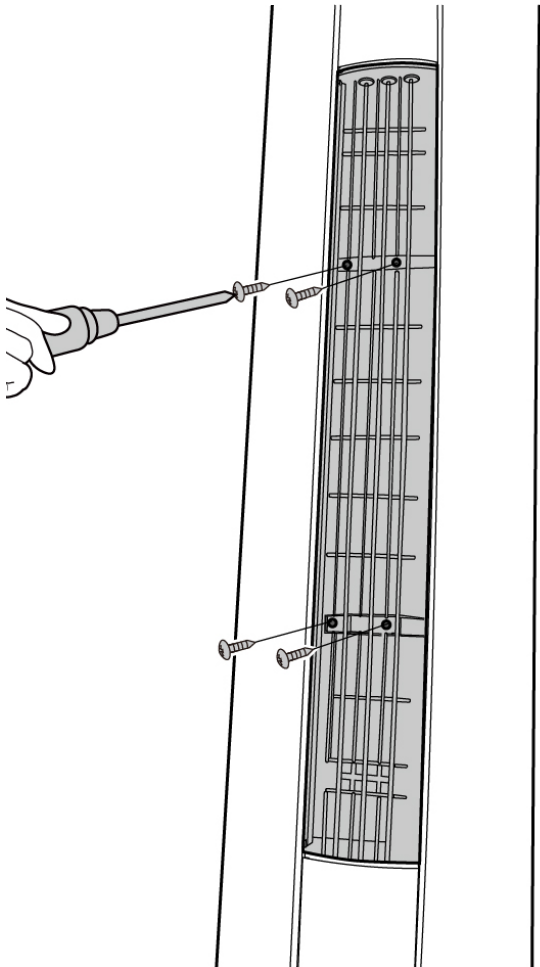
Procedure	Illustration
<p>1) Hold the handlers of the filters and then pull them out sideways. (Filters are back of the unit) (see CJ_YA_001)</p>	 <p>The illustration shows a vertical indoor unit with a front grille. Two hands are shown pulling out two rectangular filter panels from the back of the unit. A large black arrow points to the left, indicating the direction of removal. The unit has a cylindrical top and a base with mounting feet.</p> <p data-bbox="981 1489 1125 1534">CJ_YA_001</p>

Note: This section is for reference only. Actual unit appearance may vary.

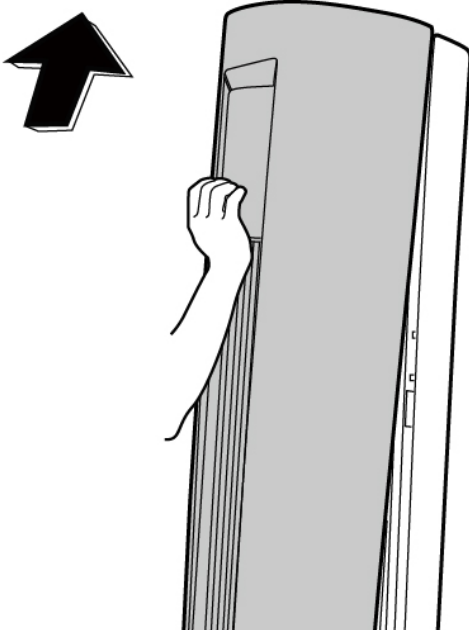
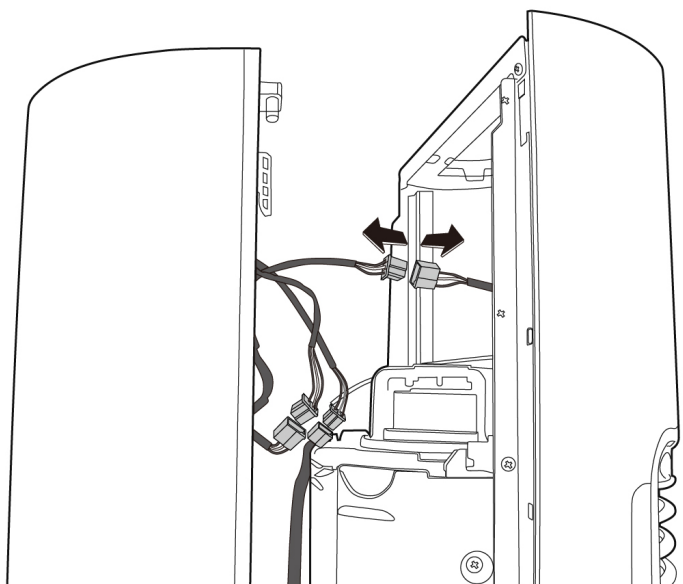
2 Panel Assembly

Procedure	Illustration
<p>2) Remove 4 screws and then remove the top cover. (see CJ_YA_002)</p>	 <p>CJ_YA_002</p>
<p>3) Remove 2 screws and then remove the upper connecting plate (see CJ_YA_003)</p>	 <p>CJ_YA_003</p>

Note: This section is for reference only. Actual unit appearance may vary.

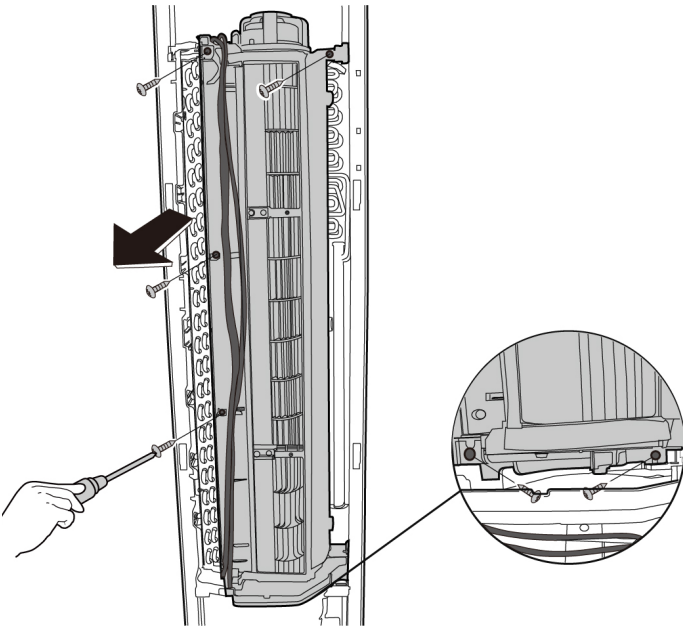
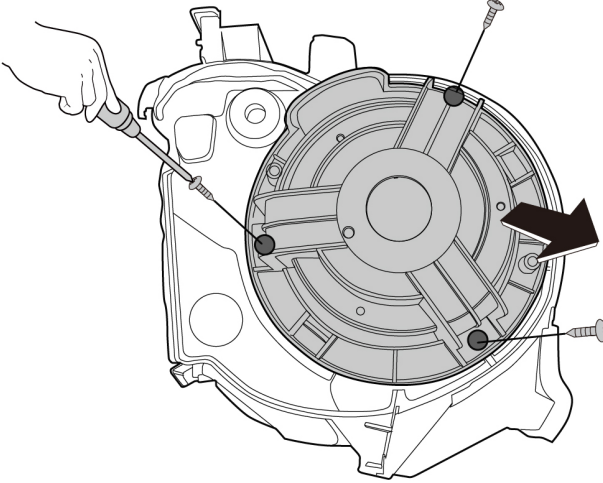
Procedure	Illustration
<p>4) Remove 4 screws fixing panel assembly and duct parts.(see CJ_YA_004)</p>	 <p>The illustration shows a hand holding a screwdriver, positioned to remove a screw from a vertical, cylindrical panel assembly. The panel has a grid-like structure and is mounted on a wall. Four screws are shown being removed from the panel. The screws are located at the top and bottom of the panel, with two screws on each side. The hand is shown from the left, holding the screwdriver and applying force to the screw. The panel is shown in a perspective view, with the top and bottom edges visible. The background is a plain white wall.</p> <p>CJ_YA_004</p>

Note: This section is for reference only. Actual unit appearance may vary.

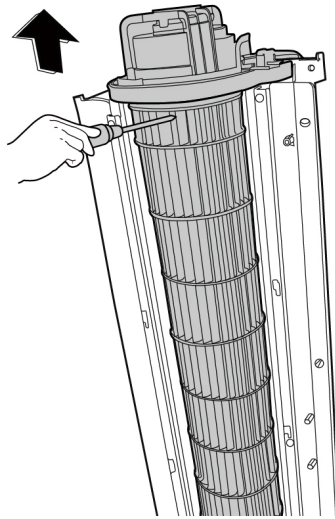
Procedure	Illustration
<p>5) Lift up the panel assembly.(see CJ_YA_005)</p> <p>6) Disconnect the connector for fan motor and then remove the panel assembly (see CJ_YA_006)</p>	 <p style="text-align: center;">CJ_YA_005</p>  <p style="text-align: center;">CJ_YA_006</p>

Note: This section is for reference only. Actual unit appearance may vary.

3 Fan Motor

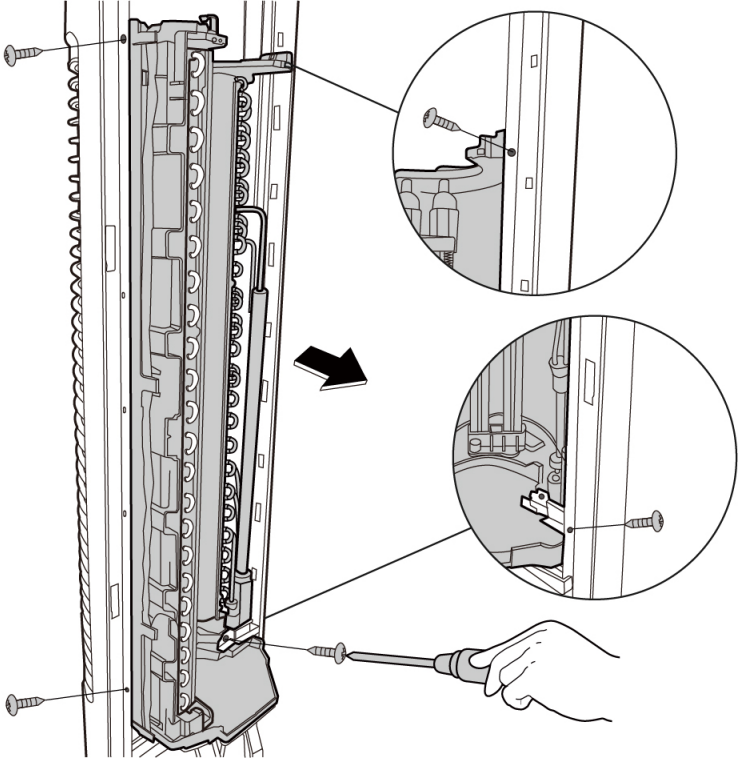
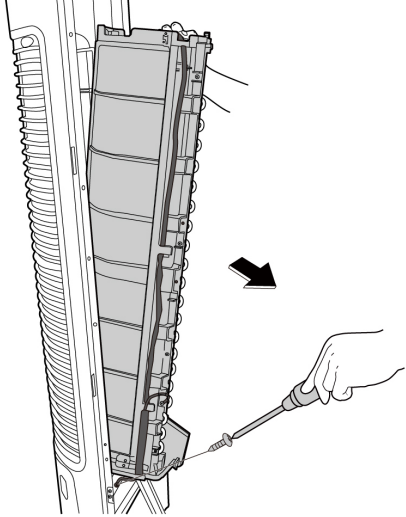
Procedure	Illustration
<p>1) Remove 6 screws and then remove volute shell assembly.(see CJ_YA_007)</p>	 <p>CJ_YA_007</p>
<p>2) Remove 3 screws and then remove the motor base. (see CJ_YA_008)</p>	 <p>CJ_YA_008</p>

Note: This section is for reference only. Actual unit appearance may vary.

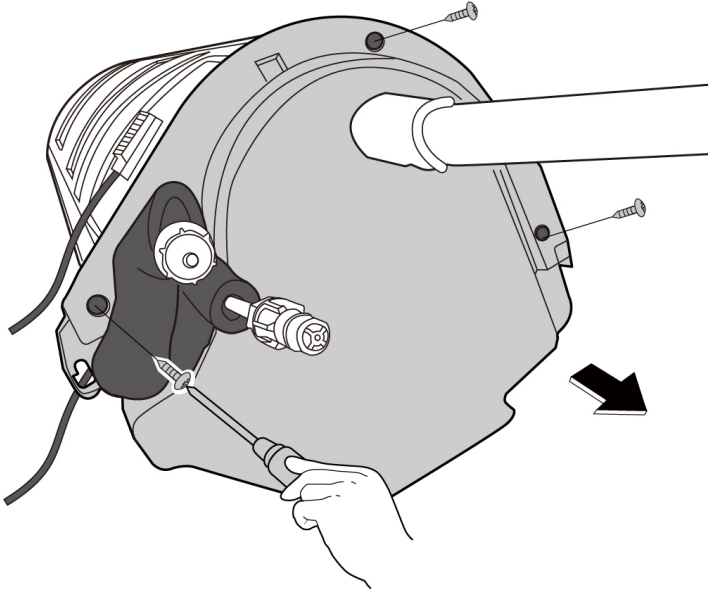
Procedure	Illustration
<p>3) Release the fixing screw. (see CJ_YA_009)</p> <p>4) Pull out the fan motor and fan assembly</p>	 <p>CJ_YA_009</p>

Note: This section is for reference only. Actual unit appearance may vary.

4 Evaporator

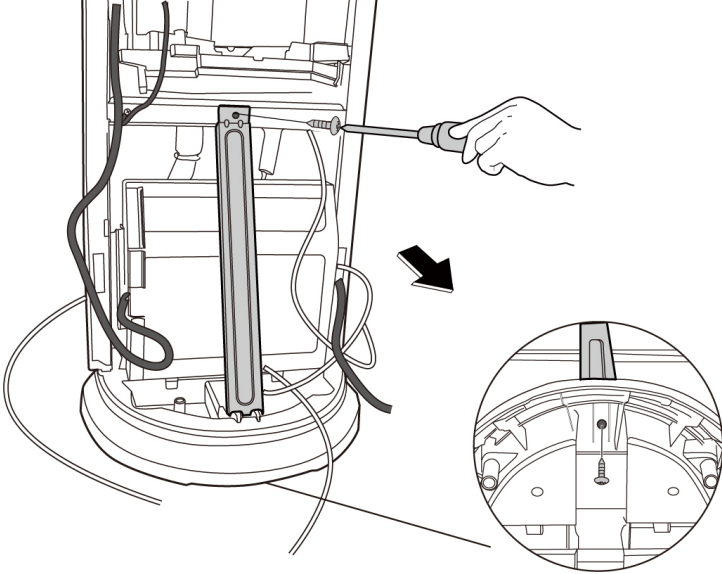
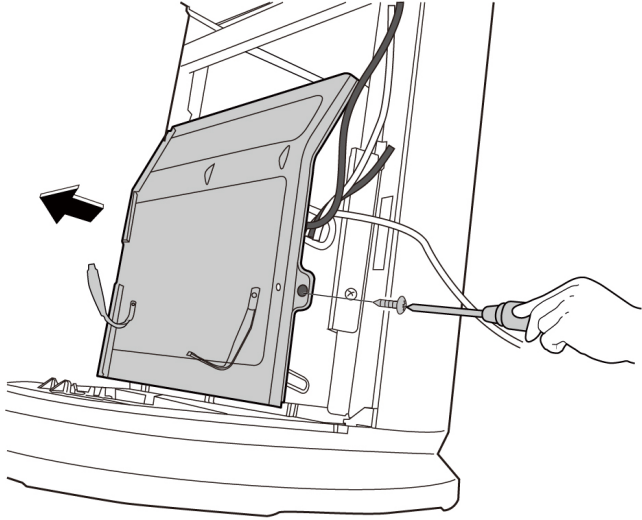
Procedure	Illustration
<p>1) Remove 5 screws fixing the evaporator.(Two on the left, three on the right)(see CJ_YA_010)</p>	 <p>CJ_YA_010</p>
<p>2) Remove 1 grounding screw. (see CJ_YA_011)</p> <p>3) Take off the evaporator.</p>	 <p>CJ_YA_011</p>

Note: This section is for reference only. Actual unit appearance may vary.

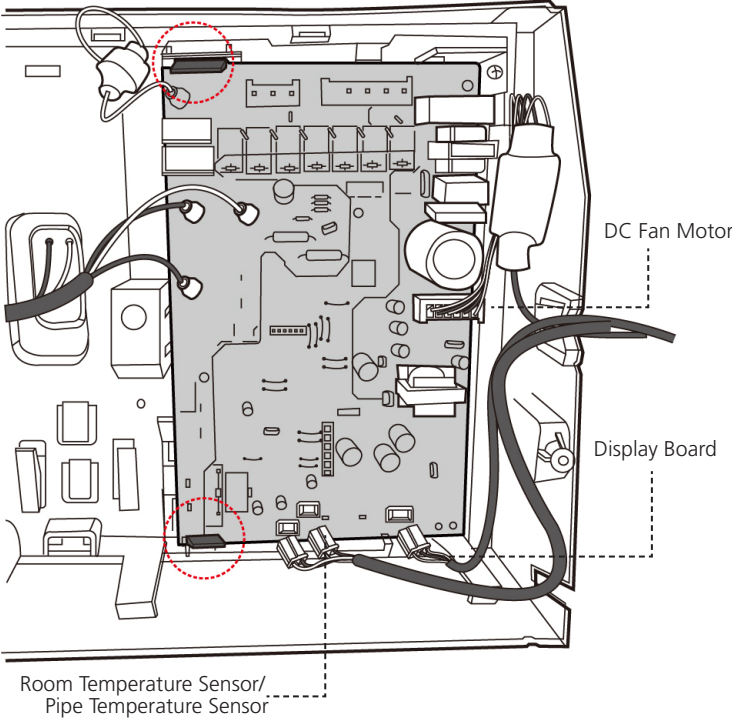
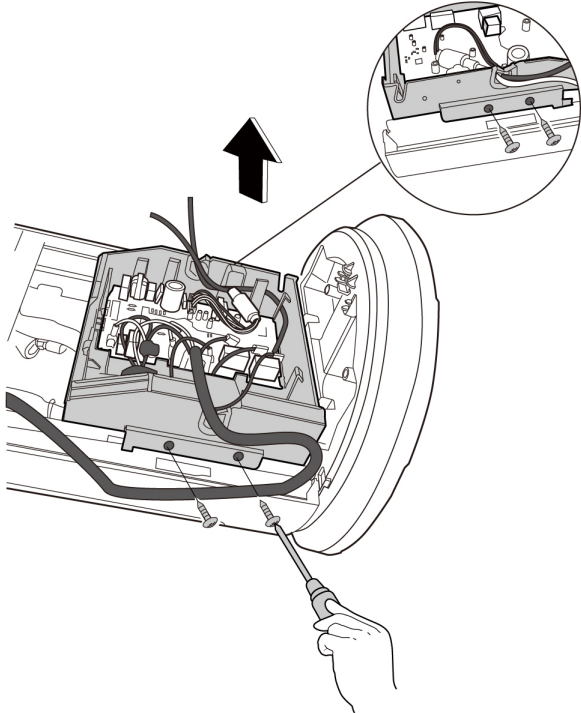
Procedure	Illustration
<p>4) Remove 3 screws fixing the water collector subassembly.(see CJ_YA_012)</p>	 <p>CJ_YA_012</p>

Note: This section is for reference only. Actual unit appearance may vary.

5 Electrical parts (Antistatic gloves must be worn.)

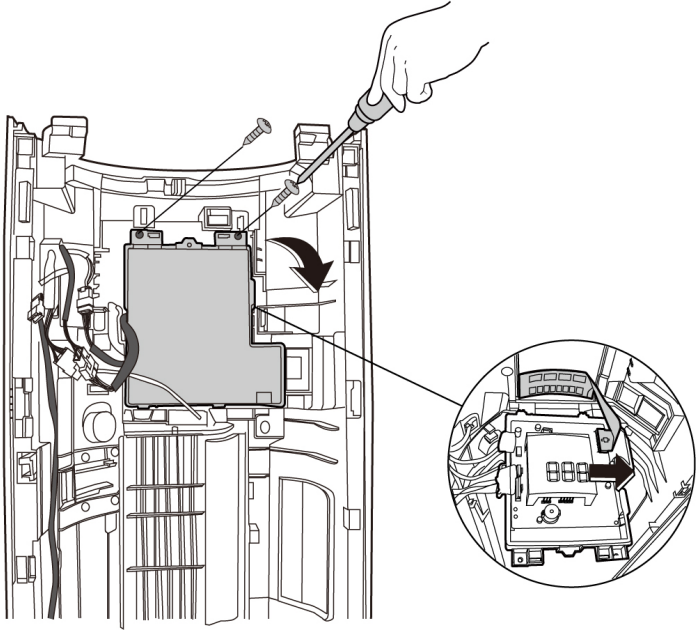
Procedure	Illustration
<p>1) Remove 2 screws fixing supporting plate.(One of them is on the chassis) (see CJ_YA_013)</p>	 <p>CJ_YA_013</p>
<p>2) Remove 1 screw of the cover of the electronic control box (see CJ_YA_014)</p> <p>3) Then remove the cover.</p>	 <p>CJ_YA_014</p>

Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
<p>4) Unplug all the connections on the main PCB. (see CJ_YA_015)</p> <p>5) Release 2 hooks and take out the main PCB (see CJ_YA_015)</p>	 <p>DC Fan Motor</p> <p>Display Board</p> <p>Room Temperature Sensor/ Pipe Temperature Sensor</p> <p>CJ_YA_015</p>
<p>6) Release 4 screws fixing the electrical control box and remove it.(2 screws per side.)(see CJ_YA_016)</p>	 <p>CJ_YA_016</p>

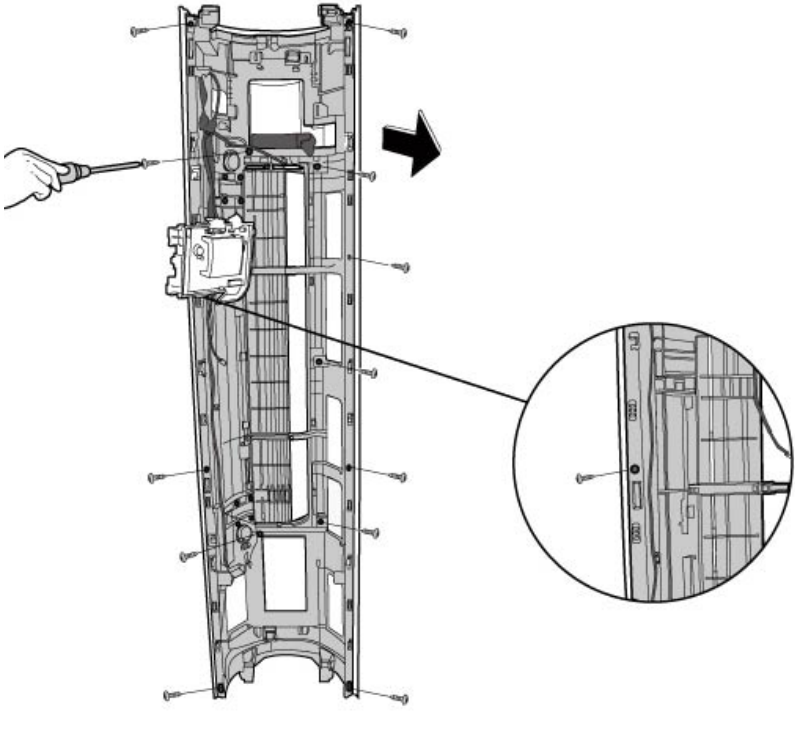
Note: This section is for reference only. Actual unit appearance may vary.

6 Display Board

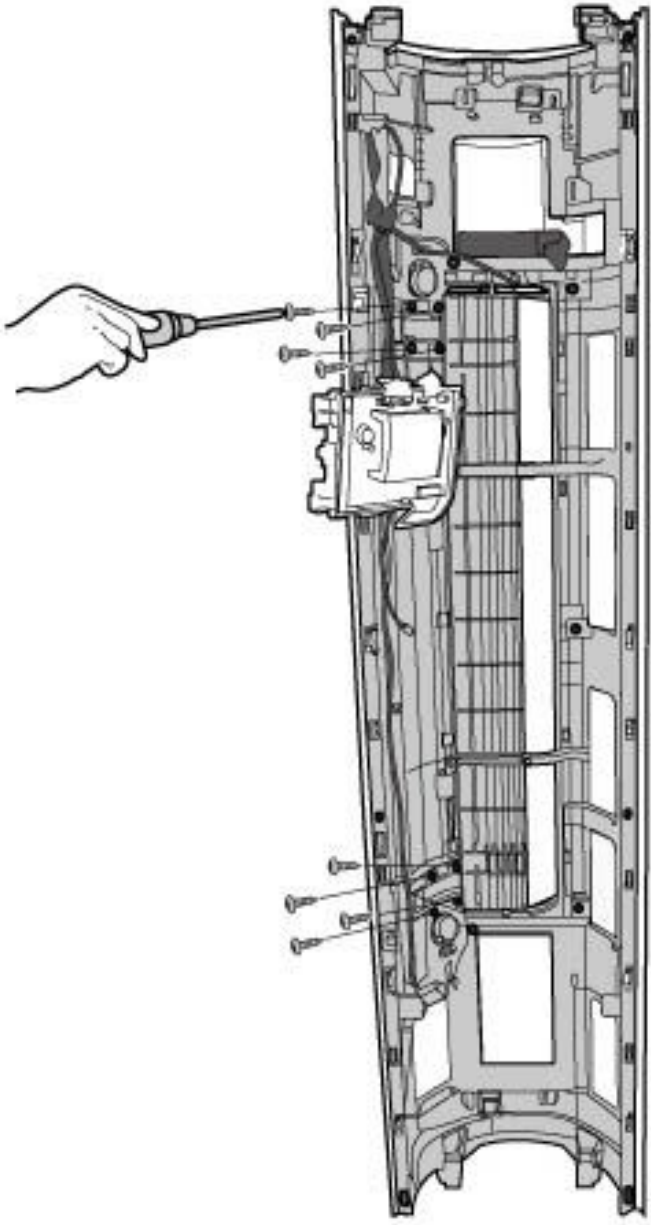
Procedure	Illustration
<ol style="list-style-type: none">1) Remove 2 screws and turn over display board subassembly. (see CJ_YA_017)2) Disconnect the connector for touch screen. (see CJ_YA_017)	 <p data-bbox="943 1115 1086 1149">CJ_YA_017</p>

Note: This section is for reference only. Actual unit appearance may vary.

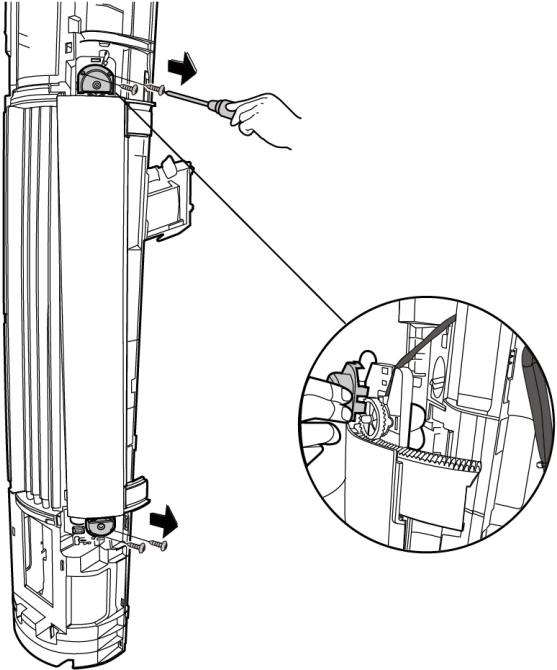
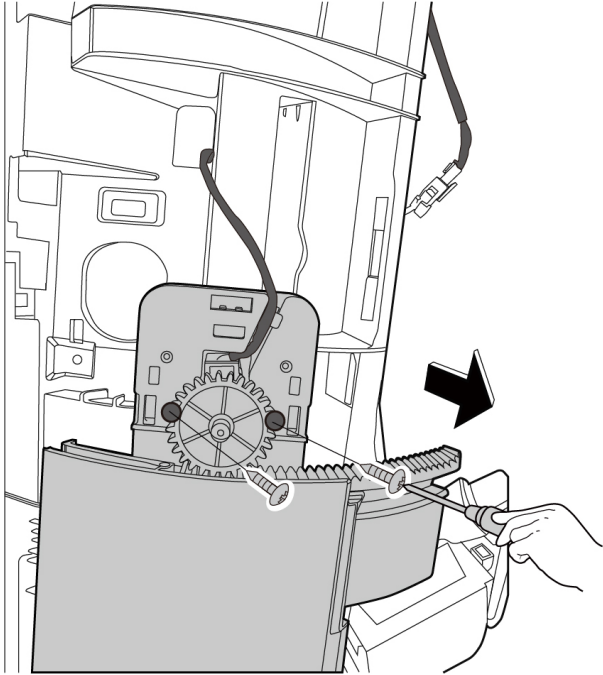
7 Step Motor

Procedure	Illustration
<ol style="list-style-type: none">1) Remove 13 screws fixing panel support. (see CJ_YA_018)2) Release 16 hooks and then remove the panel support.(see CJ_YA_018)	 <p data-bbox="941 1142 1085 1176">CJ_YA_018</p>

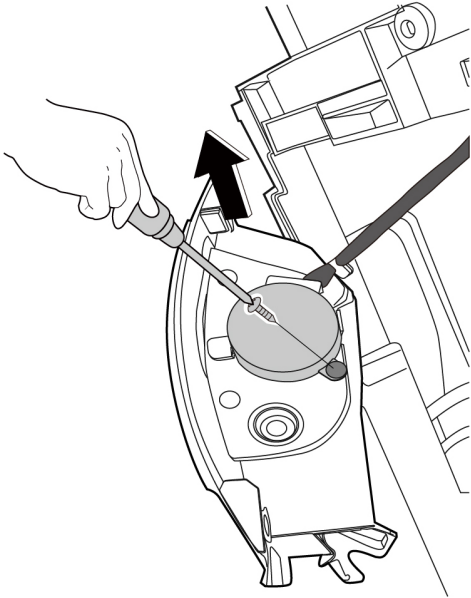
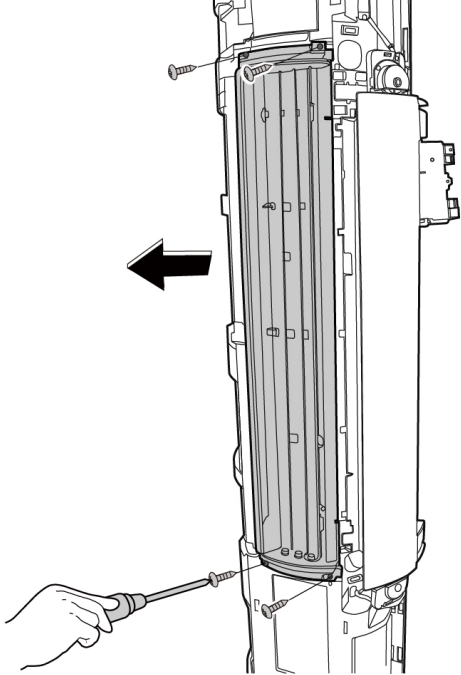
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
<p>3) Remove 8 screws fixing switch door subassembly. (Four up and four down)(see CJ_YA_019)</p>	 <p style="text-align: center;">CJ_YA_019</p>

Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
<p>4) Remove 2 screws to remove the gear housing.(There are two housings, one up and one down)(see CJ_YA_020)</p>	 <p style="text-align: center;">CJ_YA_020</p>
<p>5) Remove 2 screws fixing the installation board.(There are two installation boards, one up and one down)(see CJ_YA_021)</p>	 <p style="text-align: center;">CJ_YA_021</p>

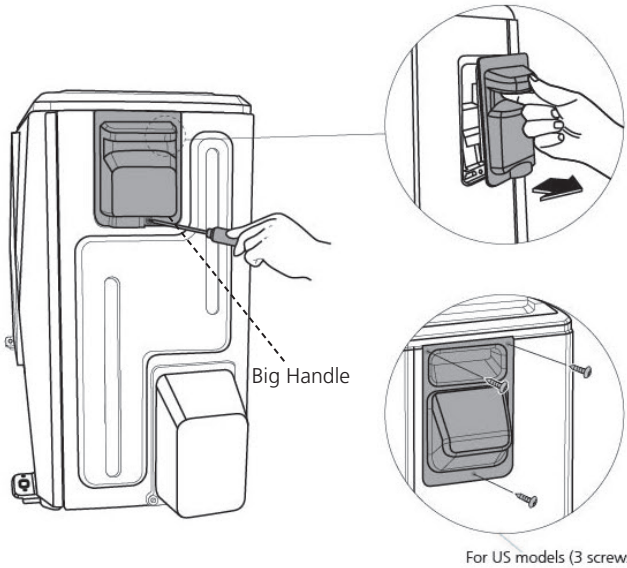
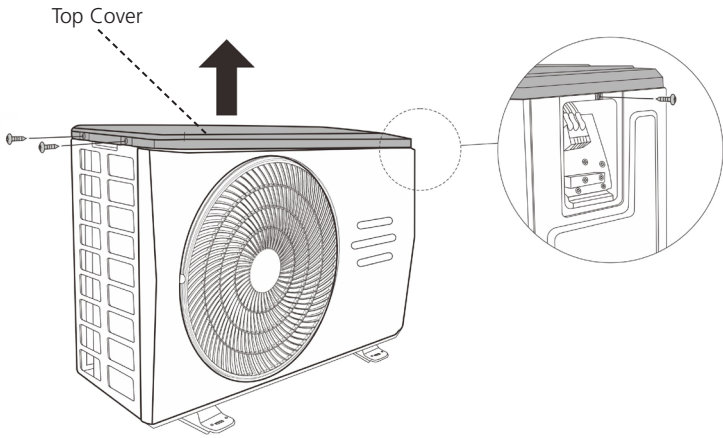
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
<p>6) Remove 1 screw to remove the step motor.(There are two motors, one up and one down) (see CJ_YA_022)</p>	 <p style="text-align: center;">CJ_YA_022</p>
<p>7) Remove 4 screws to remove the air outlet subassembly. (see CJ_YA_023)</p>	 <p style="text-align: center;">CJ_YA_022</p>

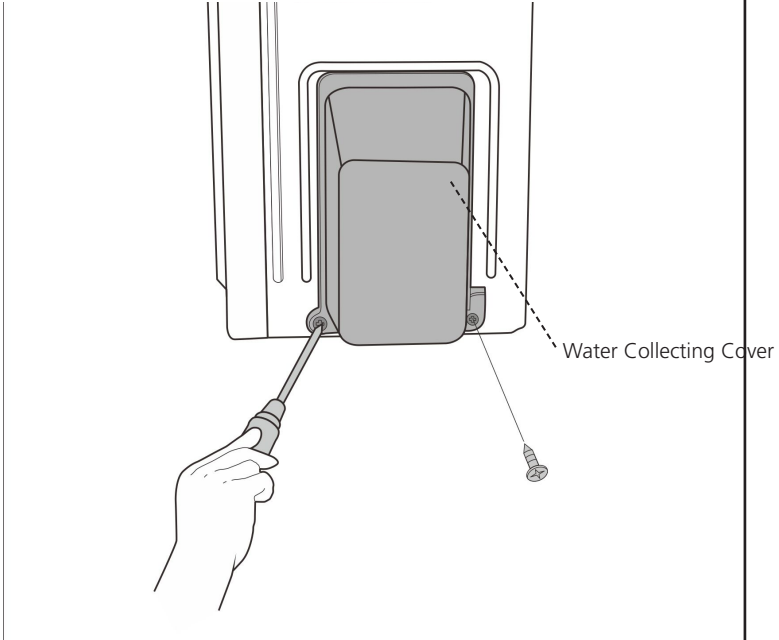
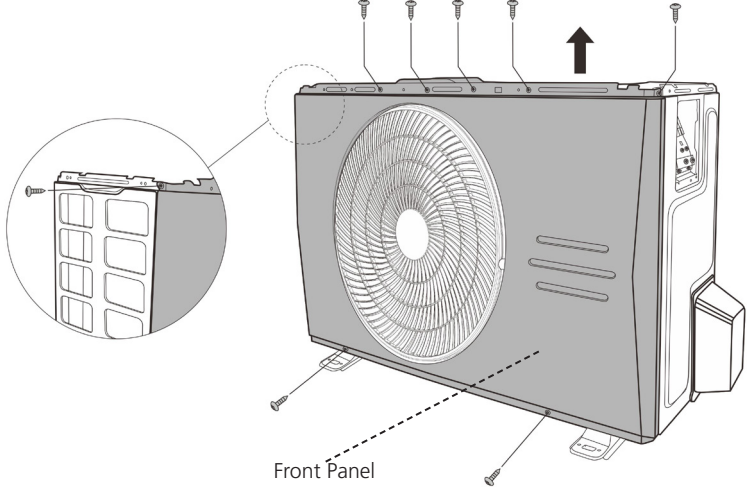
Note: This section is for reference only. Actual unit appearance may vary.

2.3 Outdoor unit Disassembly

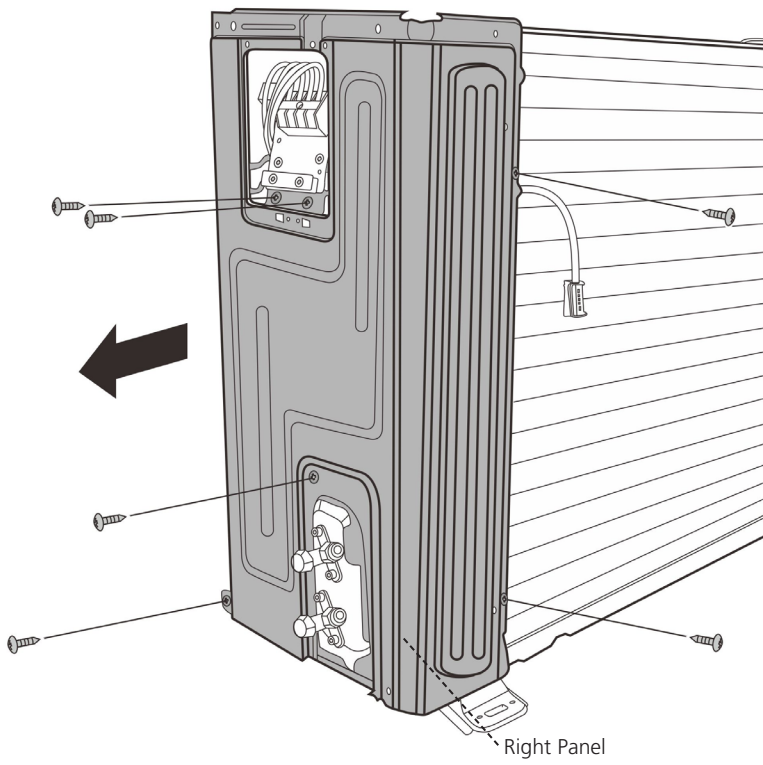
1. Panel Plate

Procedure	Illustration
<p>1) Turn off the air conditioner and the power breaker.</p> <p>2) Remove the screw of the big handle and then remove the big handle (1 screw) (see CJ_X401_001).</p>	 <p data-bbox="949 795 1053 828">Big Handle</p> <p data-bbox="1165 985 1348 1008">For US models (3 screws)</p> <p data-bbox="925 1041 1101 1086">CJ_X401_001</p>
<p>3) Remove the screws of the top cover and then remove the top cover (3 screws). One of the screws is located underneath the big handle (see CJ_X401_002).</p>	 <p data-bbox="702 1288 798 1321">Top Cover</p> <p data-bbox="925 1803 1101 1848">CJ_X401_002</p>

Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
<p>4) Remove the screws of water collecting cover and then remove the water collecting cover (2 screw) (see CJ_X401_003).</p>	 <p style="text-align: center;">CJ_X401_003</p>
<p>5) Remove the screws of the front panel and then remove the front panel (6 screws(onoff models) or 8 screws(inverter models) (see CJ_X401_004).</p>	 <p style="text-align: center;">CJ_X401_004</p>

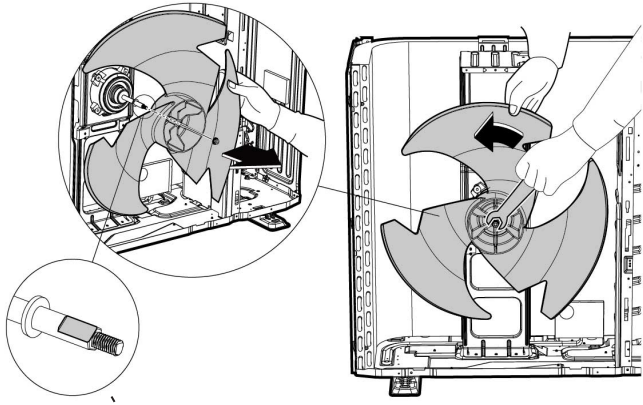
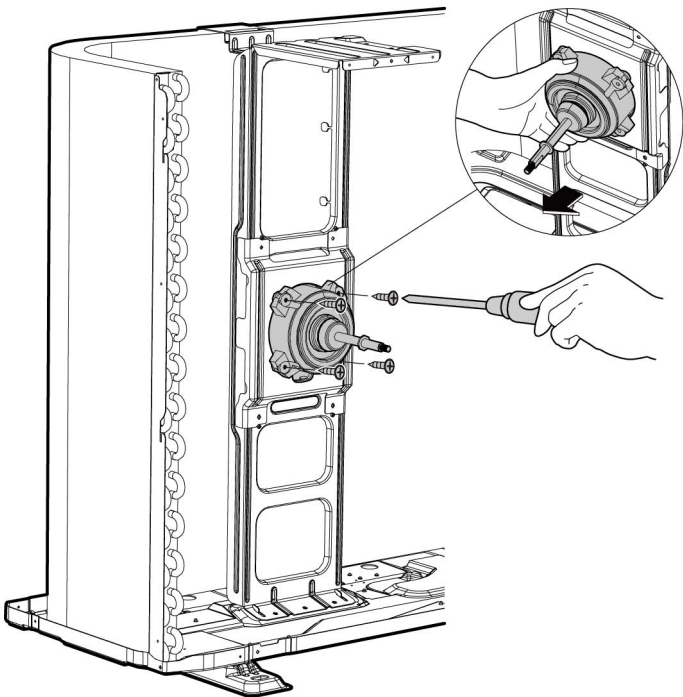
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
<p>6) Remove the screws of the right panel and then remove the right panel (6 screws) (see CJ_X401_005).</p>	 <p style="text-align: center;">CJ_X401_005</p>

Note: This section is for reference only. Actual unit appearance may vary.

2. Fan disassembly

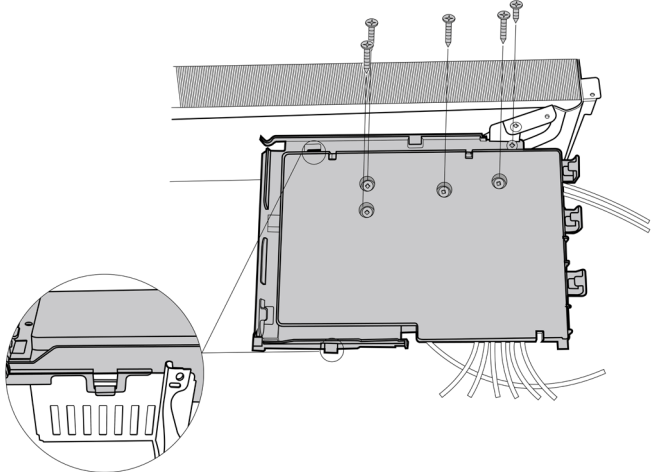
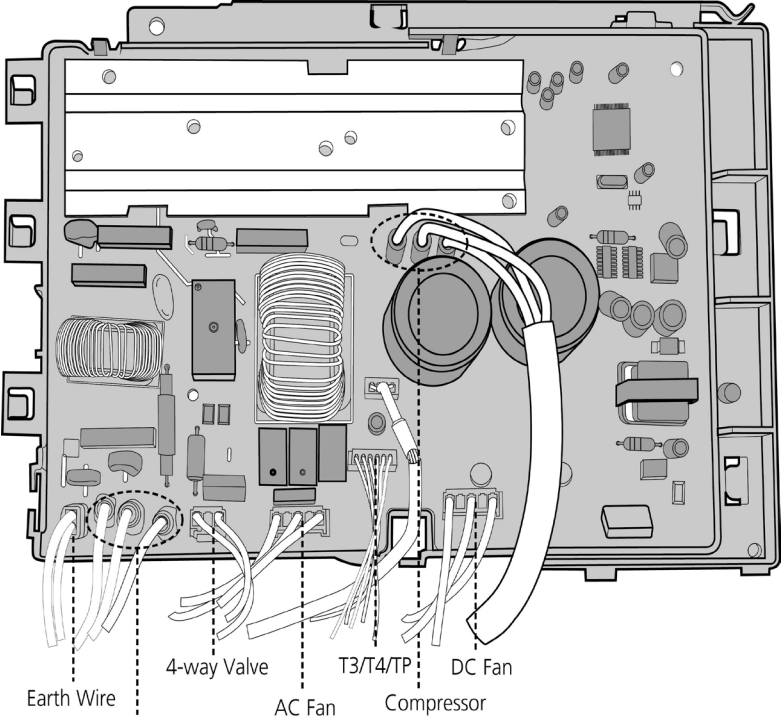
Note: Remove the panel plate and (refer to 1. Panel plate) before disassembling fan.

Procedure	Illustration
<p>1) Remove the nut securing the fan with a spanner (see CJ_ODU_007).</p> <p>2) Remove the fan.</p> <p>3) Disconnect the connectors for fan motor from the terminal. (see CJ_ODU_007)</p>	 <p style="text-align: center;">CJ_ODU_007</p> <p style="text-align: center;">D-cut</p>
<p>4) Remove the fixing screws of the fan motor (4 screws) (see CJ_ODU_008).</p> <p>5) Remove the fan motor.</p>	 <p style="text-align: center;">CJ_ODU_008</p>

Note: This section is for reference only. Actual unit appearance may vary.

3. Electrical parts

Note: Remove the panel plate and fan assembly (refer to 1. Panel plate and 2. Fan assembly) before disassembling electrical parts.

Procedure	Illustration
<p>1) Remove the screws and unfix the hooks, then open the electronic control box cover (5 screws and 2 hooks) (see CJ_ODU_PCB_006-1).</p>	 <p style="text-align: center;">CJ_ODU_PCB_006-1</p>
<p>2) Disconnect the connector for fan motor from the electronic control board (see CJ_ODU_PCB_006-2).</p> <p>3) Remove the connector for the compressor (see CJ_ODU_PCB_006-2).</p> <p>4) Pull out the two blue wires connected with the four way valve (see CJ_ODU_PCB_006-2).</p> <p>5) Pull out connectors of the condenser coil temp. sensor(T3), outdoor ambient temp. sensor(T4) and discharge temp. sensor(TP) (see CJ_ODU_PCB_006-2).</p> <p>6) Disconnect the electronic expansion valve wire (see Fig CJ_ODU_PCB_006-2).</p> <p>7) Remove the connector for the DR and reactor (see Fig CJ_ODU_PCB_006-2).</p> <p>8) Then remove the electronic control board.</p>	 <p style="text-align: center;">CJ_ODU_PCB_006-2</p>

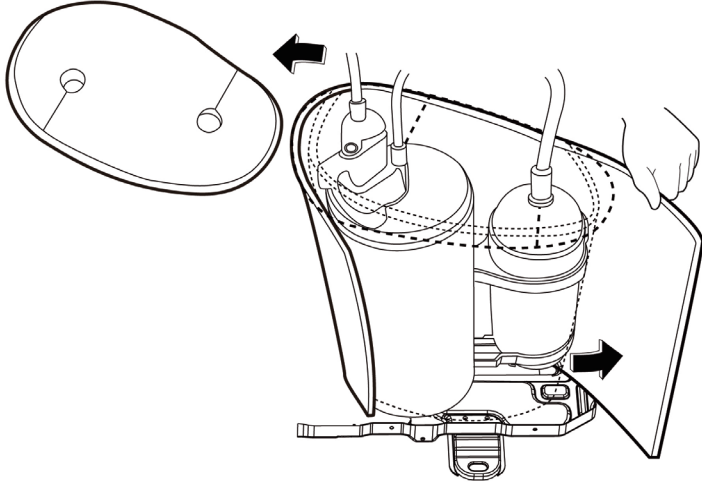
Note: This section is for reference only. Actual unit appearance may vary.

C

4. Sound blanket

⚠ WARNING: Recover refrigerant from the refrigerant circuit before remove the compressor.

Note: Remove the panel plate, electrical parts, and fan assembly (refer to 1. Panel plate, 2. Electrical parts, and 3. Fan assembly) before disassembling sound blanket.

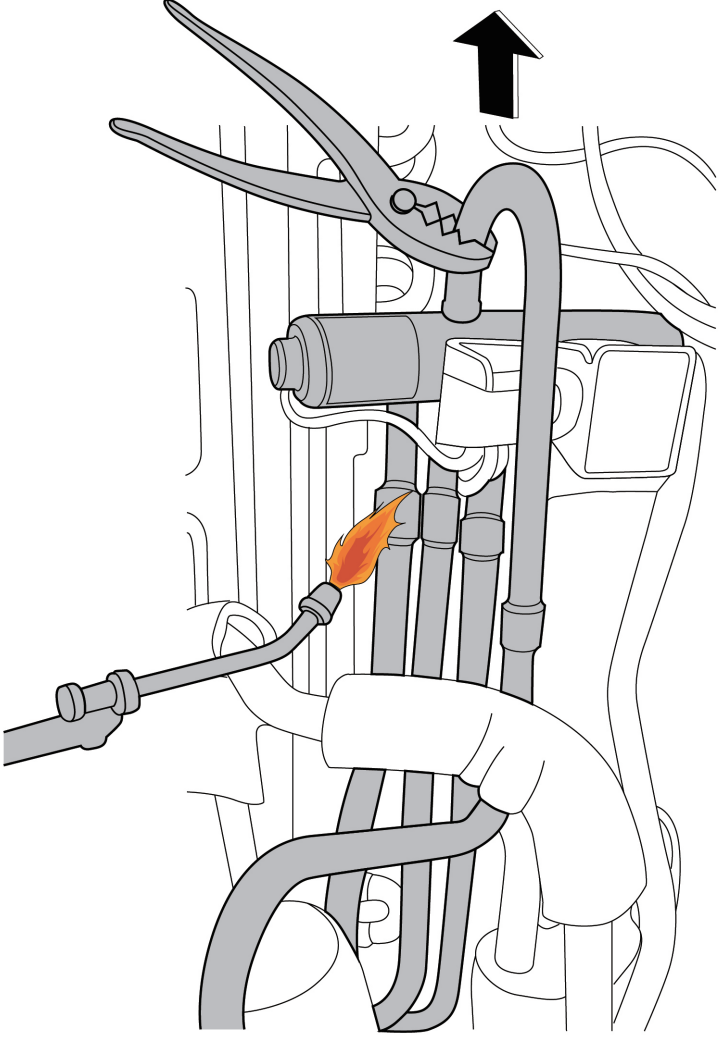
Procedure	Illustration
1) Remove the sound blanket (side and top) (see CJ_ODU_015).	 <p>CJ_ODU_015</p>

Note: This section is for reference only. Actual unit appearance may vary.

5. Four-way valve (For heat pump models)

!WARNING: Recover refrigerant from the refrigerant circuit before remove the four-way valve.

Note: Remove the panel plate, electrical parts, and fan assembly (refer to 1. Panel plate, 2. Electrical parts, and 3. Fan assembly) before disassembling four-way valve.

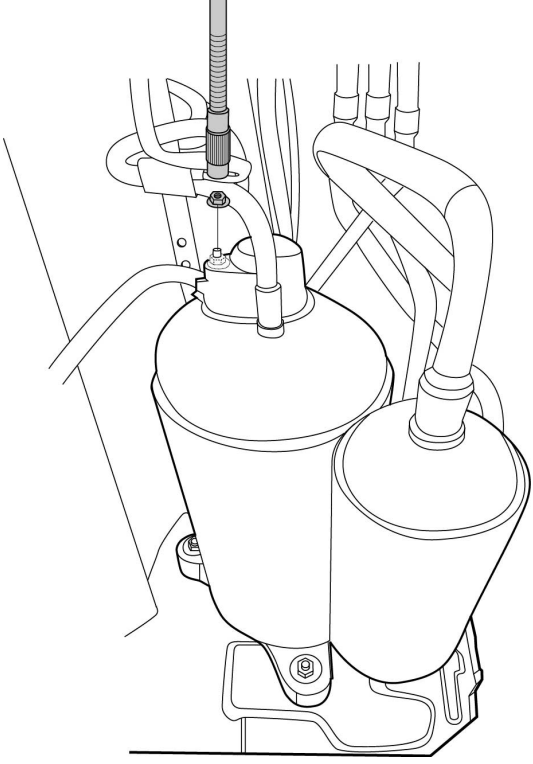
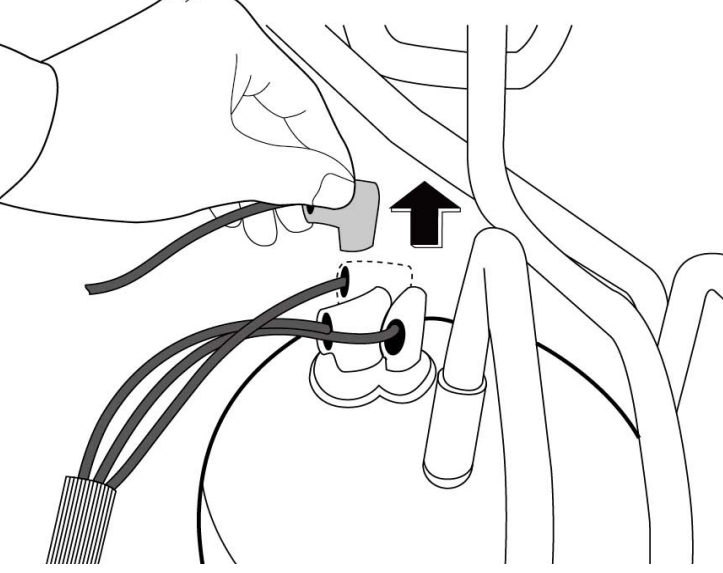
Procedure	Illustration
<ol style="list-style-type: none">1) Heat up the brazed parts and then detach the the four-way valve and the pipe (see CJ_ODU_016).2) Remove the four-way valve assembly with pliers.	 <p data-bbox="957 1653 1125 1686">CJ_ODU_016</p>

Note: This section is for reference only. Actual unit appearance may vary.

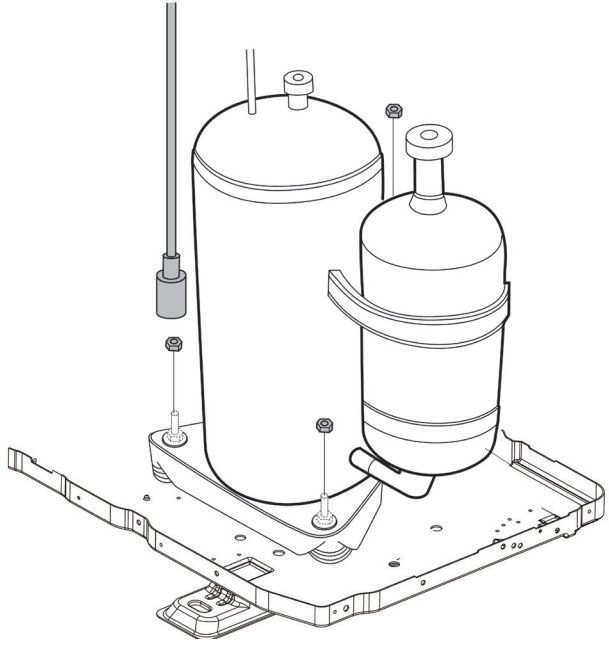
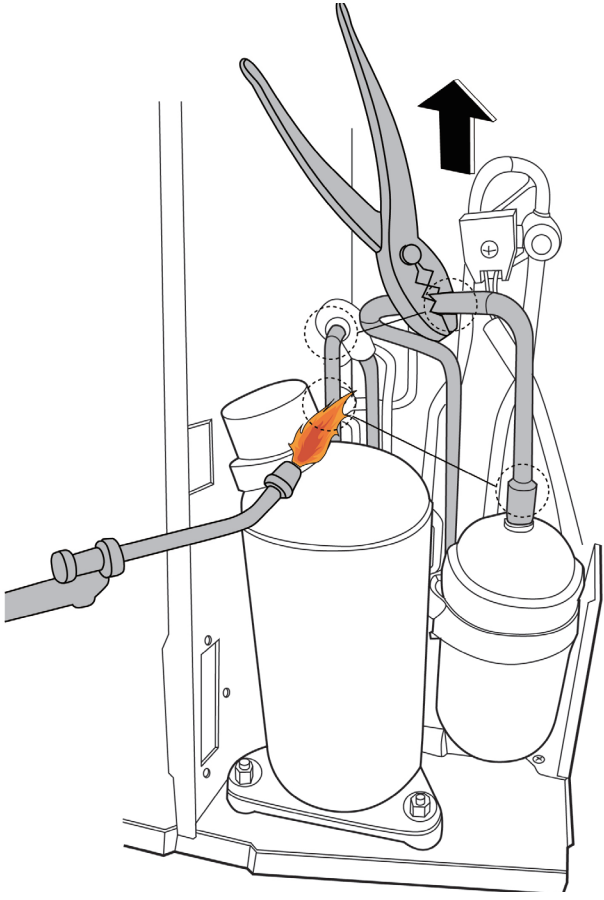
6. Compressor

⚠ WARNING: Recover refrigerant from the refrigerant circuit before remove the compressor.

Note: Remove the panel plate, electrical parts, and fan assembly (refer to 1. Panel plate, 2. Electrical parts, and 3. Fan assembly) before disassembling compressor.

Procedure	Illustration
<p>1) Remove the flange nut of terminal cover and remove the terminal cover (see CJ_ODU_017).</p>	 <p>CJ_ODU_017</p>
<p>2) Disconnect the connectors (see CJ_ODU_018).</p>	 <p>CJ_ODU_018</p>

Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
<p>3) Remove the hex nuts and washers securing the compressor, located on the bottom plate (see CJ_ODU_019).</p>	 <p style="text-align: center;">CJ_ODU_019</p>
<p>4) Heat up the brazed parts and then remove the the discharge pipe and the suction pipe (see CJ_ODU_020).</p> <p>5) Lift the compressor from the base pan assembly with pliers.</p>	 <p style="text-align: center;">CJ_ODU_020</p>

Note: This section is for reference only. Actual unit appearance may vary.

Troubleshooting

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Troubleshooting

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1. Safety Caution

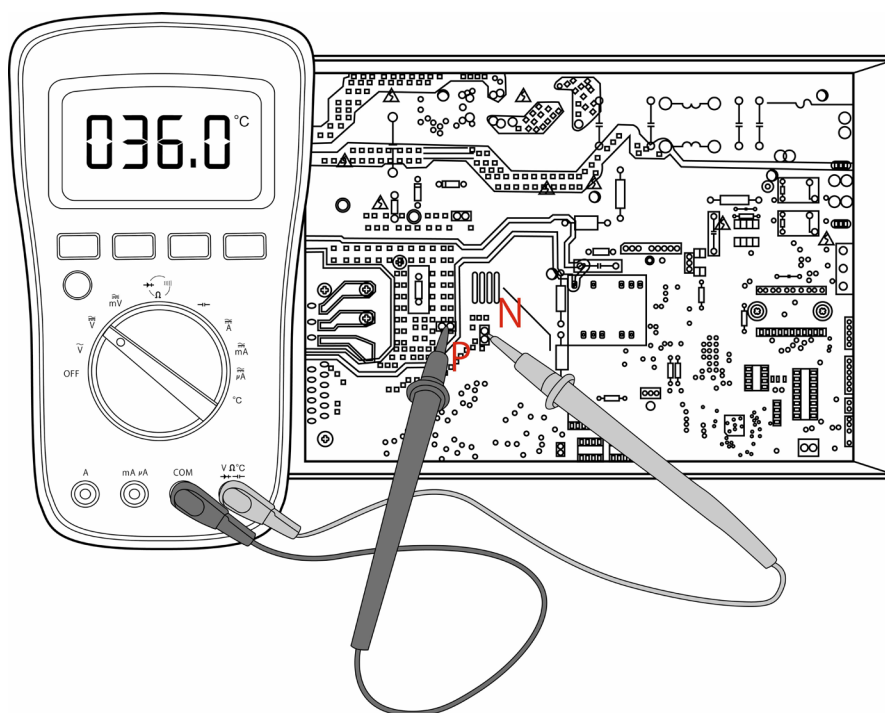
⚠ WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. While checking indoor/outdoor PCB, please equip oneself with antistatic gloves or wrist strap to avoid damage to the board.

⚠ WARNING

Electricity remains in capacitors even when the power supply is off. Ensure the capacitors are fully discharged before troubleshooting.

Test the voltage between P and N on back of the main PCB with multimeter. If the voltage is lower than 36V, the capacitors are fully discharged.



Note: This picture is for reference only. Actual appearance may vary.

2. General Troubleshooting

2.1 Error Display (Indoor Unit)

These error codes are described in the following table:

Display	Error Information	Solution
dF	Defrost	--
SC	Self clean	--
FP	Heating in room temperature under 8°C	--
EH00/EH0A	Indoor unit EEPROM parameter error	Page 66
EL01	Indoor/outdoor unit communication error	Page 68
EH03	The indoor fan speed is operating outside of the normal range	Page 70
EC50	Outdoor temperature sensor is in open circuit or has short circuited	Page 75
EC51	Outdoor unit EEPROM parameter error	Page 67
EC52	Condenser coil temperature sensor T3 is in open circuit or has short circuited	Page 75
EC53	Outdoor room temperature sensor T4 is in open circuit or has short circuited	Page 75
EC54	Compressor discharge temperature sensor TP is in open circuit or has short circuited	Page 75
EC56	Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for free-match outdoor units)	Page 75
EC05	Open circuit or short circuit of outdoor temperature sensor or outdoor unit EEPROM parameter error	Page 75
EH60	Indoor room temperature sensor T1 is in open circuit or has short circuited	Page 74
EH61	Evaporator coil middle temperature sensor T2 is in open circuit or has short circuited	Page 74
EC07	The outdoor fan speed is operating outside of the normal range	Page 72
EH0b	Indoor PCB/Display board communication error	Page 77
EL0C	Refrigerant leakage detection	Page 76
PC00	IPM malfunction or IGBT over-strong current protection	Page 78
PC01	Over voltage or over low voltage protection	Page 80
PC02	Top temperature protection of compressor	Page 82
PC04	Inverter compressor drive error	Page 78

PC40	Communication error between outdoor main chip and compressor driven chip	Page 86
PC03	Low pressure protection	Page 83
EC0d	Outdoor unit malfunction	Page 85
FL09	Indoor and outdoor mismatch malfunction	Page 86

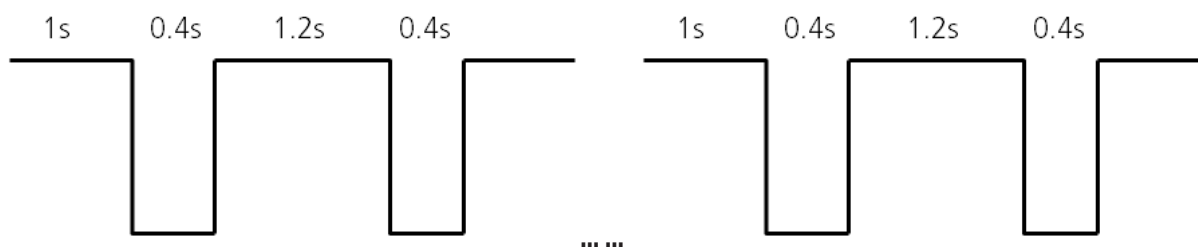
For other errors:

The display board may show a garbled code or a code undefined by the service manual. Ensure that this code is not a temperature reading.

Troubleshooting:

Test the unit using the remote control. If the unit does not respond to the remote, the indoor PCB requires replacement. If the unit responds, the display board requires replacement.

88 flash frequency:



3. Complain Record Form

Complain Record Form

Request No.:

Date:

Installation Date:

Service Date:

Customer Information			
Name		Telephone No.	
Home Address			
Email			
Product Information			
Indoor Unit Model		Outdoor Unit Model	
Serial No. of indoor unit			
Serial No. of outdoor unit			
Working Mode	<input type="checkbox"/> Cooling <input type="checkbox"/> Heating <input type="checkbox"/> Fan only <input type="checkbox"/> Dry		
Setting temperature	_____°C / °F	Fan speed	<input type="checkbox"/> Turbo <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low <input type="checkbox"/> Auto
Temperature of air inlet	_____°C / °F	Temperature of air outlet	_____°C / °F
Installation / Condition Information			
Indoor temperature	_____°C / °F	Indoor humidity	_____ %RH
Outdoor temperature	_____°C / °F	Outdoor humidity	_____ %RH
Length of Connecting pipe		Pipe diameter	Gas pipe: Liquid pipe:
Length of Wiring		wire diameter	
System Running Pressure	_____MPa or _____Bar or _____PSI		
Room size (L*W*H)			
Photo of Installation of Indoor unit (Photo #1)		Photo of Installation of Outdoor unit (Photo #2)	
Failure Description			
Error Code of Indoor unit		Code of Outdoor PCB	
Unit does not start			
Remote control does not work			
Indoor display shows nothing			
No cooling or heating at all			
Less cooling or heating			
Unit starts but stops shortly			
High noise			
High vibration			

Parameter Checking information by Remote controller			
Displaying code	Displaying code meaning	Display value	Display value meaning
T1	Room temperature		
T2	Indoor coil temperature		
T3	Outdoor coil temperature		
T4	Ambient temperature		
TP	Discharge temperature		
FT	Targeted Frequency		
Fr	Actual Frequency		
dl	Compressor current		
Uo	Outdoor AC voltage		
Sn	Indoor capacity test		
--	Reserve		
Pr	Outdoor fan speed		
Lr	EXV opening steps		
ir	Indoor fan speed		
HU	Indoor humidity		
TT	Adjusted setting temperature		
/	/		
	Wifi signal strength		
/	/		
oT	Setting maximum frequency in heating mode		
--	Reserve		

Approval from Manufacturer	
<input type="checkbox"/> Approved	
<input type="checkbox"/> More Proof needed	
<input type="checkbox"/> Rejected	

4. Error Diagnosis and Troubleshooting Without Error Code



WARNING

Be sure to turn off unit before any maintenance to prevent damage or injury.

4.1 Remote maintenance

SUGGESTION: When troubles occur, please check the following points with customers before field maintenance.

	Problem	Solution
1	Unit will not start	Page 61-62
2	The power switch is on but fans will not start	Page 61-62
3	The temperature on the display board cannot be set	Page 61-62
4	Unit is on but the wind is not cold(hot)	Page 61-62
5	Unit runs, but shortly stops	Page 61-62
6	The unit starts up and stops frequently	Page 61-62
7	Unit runs continuously but insufficient cooling(heating)	Page 61-62
8	Cool can not change to heat	Page 61-62
9	Unit is noisy	Page 61-62

4.2 Field maintenance

	Problem	Solution
1	Unit will not start	Page 63-64
2	Compressor will not start but fans run	Page 63-64
3	Compressor and condenser (outdoor) fan will not start	Page 63-64
4	Evaporator (indoor) fan will not start	Page 63-64
5	Condenser (Outdoor) fan will not start	Page 63-64
6	Unit runs, but shortly stops	Page 63-64
7	Compressor short-cycles due to overload	Page 63-64
8	High discharge pressure	Page 63-64
9	Low discharge pressure	Page 63-64
10	High suction pressure	Page 63-64
11	Low suction pressure	Page 63-64
12	Unit runs continuously but insufficient cooling	Page 63-64
13	Too cool	Page 63-64
14	Compressor is noisy	Page 63-64
15	Horizontal louver can not revolve	Page 63-64

1.Remote Maintenance	Electrical Circuit					Refrigerant Circuit								
Possible causes of trouble	Power failure	The main power tripped	Loose connections	Faulty transformer	The voltage is too high or too low	The remote control is powered off	Broken remote control	Dirty air filter	Dirty condenser fins	The setting temperature is higher/lower than the room's (cooling/heating)	The ambient temperature is too high/low when the mode is cooling/heating	Fan mode	SILENCE function is activated (optional function)	Frosting and defrosting frequently
Unit will not start	☆	☆	☆	☆										
The power switch is on but fans will not start			☆	☆	☆									
The temperature on the display board cannot be set						☆	☆							
Unit is on but the wind is not cold(hot)										☆	☆	☆		
Unit runs, but shortly stops					☆					☆	☆			
The unit starts up and stops frequently					☆						☆			☆
Unit runs continuously but insufficient cooling(heating)								☆	☆	☆	☆		☆	
Cool can not change to heat														
Unit is noisy														
Test method / remedy	Test voltage	Close the power switch	Inspect connections - tighten	Change the transformer	Test voltage	Replace the battery of the remote control	Replace the remote control	Clean or replace	Clean	Adjust the setting temperature	Turn the AC later	Adjust to cool mode	Turn off SILENCE function.	Turn the AC later

Others	
Check heat load	Heavy load condition
Tighten bolts or screws	Loosen hold down bolts and / or screws
Close all the windows and doors	Bad airproof
Remove the obstacles	The air inlet or outlet of either unit is blocked
Reconnect the power or press ON/OFF button on remote control to restart	Interference from cell phone towers and remote boosters
Remove them	Shipping plates remain attached

2.Field Maintenance	Electrical Circuit														
Possible causes of trouble	Power failure	Blown fuse or varistor	Loose connections	Shorted or broken wires	Safety device opens	Faulty thermostat / room temperature sensor	Wrong setting place of temperature sensor	Faulty transformer	Shorted or open capacitor	Faulty magnetic contactor for compressor	Faulty magnetic contactor for fan	Low voltage	Faulty stepping motor	Shorted or grounded compressor	Shorted or grounded fan motor
Unit will not start	☆	☆	☆	☆	☆			☆							
Compressor will not start but fans run				☆		☆			☆	☆				☆	
Compressor and condenser (outdoor) fan will not start				☆		☆				☆					
Evaporator (indoor) fan will not start				☆					☆		☆				☆
Condenser (Outdoor) fan will not start				☆		☆			☆		☆				☆
Unit runs, but shortly stops										☆	☆				
Compressor short-cycles due to overload										☆	☆				
High discharge pressure															
Low discharge pressure															
High suction pressure															
Low suction pressure															
Unit runs continuously but insufficient cooling															
Too cool					☆	☆									
Compressor is noisy															
Horizontal louver can not revolve			☆	☆								☆			
Test method / remedy	Test voltage	Inspect fuse type & size	Inspect connections - tighten	Test circuits with tester	Test continuity of safety device	Test continuity of thermostat / sensor & wiring	Place the temperature sensor at the central of the air inlet grille	Check control circuit with tester	Check capacitor with tester	Test continuity of coil & contacts	Test continuity of coil & contacts	Test voltage	Replace the stepping motor	Check resistance with multimeter	Check resistance with multimeter

Refrigerant Circuit												Others
Replace the compressor												Compressor stuck
Leak test												Shortage of refrigerant
Replace restricted part												Restricted liquid line
Clean or replace												Dirty air filter
Clean coil												Dirty evaporator coil
Check fan												Insufficient air through evaporator coil
Change charged refrigerant volume												Overcharge of refrigerant
Clean condenser or remove obstacle												Dirty or partially blocked condenser
Purge, evacuate and recharge												Air or incompressible gas in refrigerant cycle
Remove obstruction to air flow												Short cycling of condensing air
Remove obstruction in air or water flow												High temperature condensing medium
Remove obstruction in air or water flow												Insufficient condensing medium
Replace compressor												Broken compressor internal parts
Test compressor efficiency												Inefficient compressor
Replace valve												Expansion valve obstructed
Replace valve												Expansion valve or capillary tube closed completely
Replace valve												Leaking power element on expansion valve
Fix feeler bulb												Poor installation of feeler bulb
Check heat load												Heavy load condition
Tighten bolts or screws												Loosen hold down bolts and / or screws
Remove them												Shipping plates remain attached
Choose AC of larger capacity or add the number of AC												Poor choices of capacity
Rectify piping so as not to contact each other or with external plate												Contact of piping with other piping or external plate

5. Quick Maintenance by Error Code

If you do not have the time to test whether specific parts are faulty, you can directly change the required parts according to the error code. You can find the parts to replace by error code in the following table.

Part requiring replacement	Error Code						
	EH00/EH0A	EH03	EH60	EH61	EH0b	EU0C	EC56
Indoor PCB	✓	✓	✓	✓	✓	✓	x
Outdoor PCB	x	x	x	x	x	x	✓
Display board	x	x	x	x	✓	x	x
Indoor fan motor	x	✓	x	x	x	x	x
T1 sensor	x	x	✓	x	x	x	x
T2 Sensor	x	x	x	✓	x	✓	x
T2B Sensor	x	x	x	x	x	x	✓
Additional refrigerant	x	x	x	x	x	✓	x

Part requiring replacement	Error Code						
	PC0F	EU01	PC03	PC01	PC02	PC04	PC40
Indoor PCB	x	✓	x	x	x	x	x
Outdoor PCB	✓	✓	✓	✓	✓	✓	✓
Indoor fan motor	x	x	x	x	✓	x	x
Outdoor fan motor	x	x	x	x	x	x	x
Reactor or inductance	✓	✓	x	✓	x	x	x
Compressor	x	x	x	x	x	x	x
Additional refrigerant	x	x	x	x	x	x	x
PFC module	✓	x	x	x	x	x	x
Low pressure protector	x	x	✓	x	x	x	x
High pressure protector	x	x	x	x	✓	x	x
IPM module board	x	x	x	✓	✓	✓	x
Electric control box	x	x	x	x	x	x	✓

6. Troubleshooting by Error Code

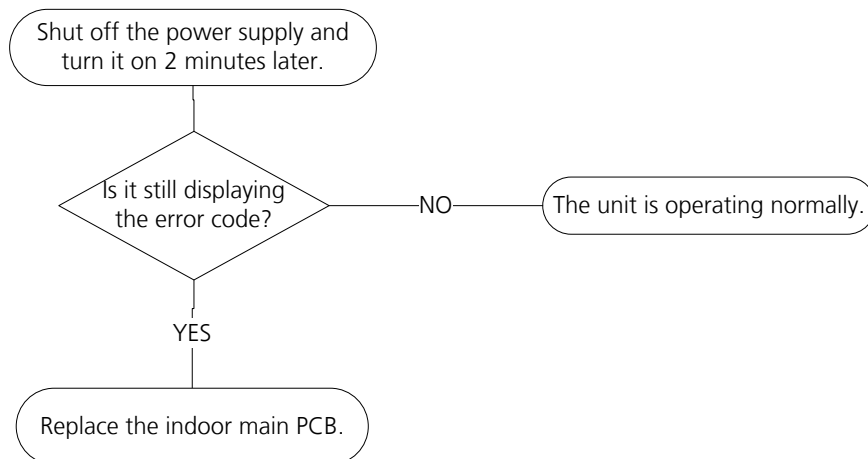
6.1 EH 00/EH 0A (Indoor EEPROM parameter error diagnosis and solution)

Description: Indoor PCB main chip does not receive feedback from EEPROM chip.

Recommended parts to prepare:

- Indoor PCB

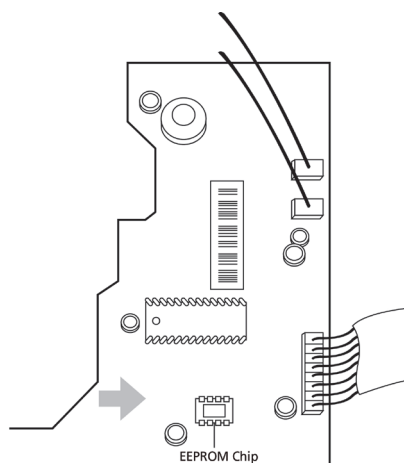
Troubleshooting and repair:



Remarks:

EEPROM: A read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

The location of the EEPROM chip on the indoor PCB is shown in the following image:



Note: This pictures are only for reference, actual appearance may vary.

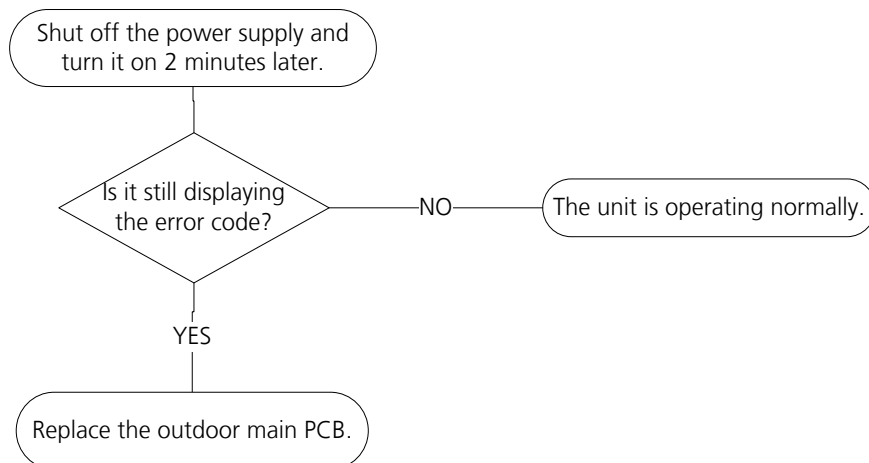
6.2 EC 51(Outdoor EEPROM parameter error diagnosis and solution)

Description: Outdoor PCB main chip does not receive feedback from EEPROM chip or compressor driven chip.

Recommended parts to prepare:

- Outdoor PCB

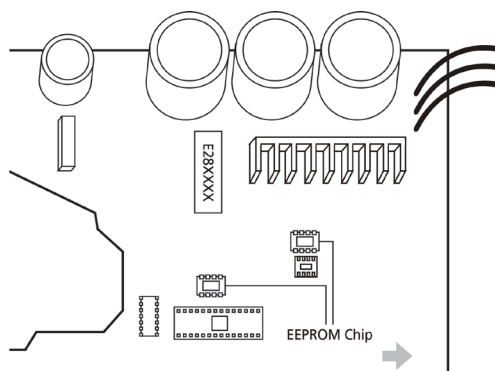
Troubleshooting and repair:



Remarks:

EEPROM: A read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

The location of the EEPROM chip on the outdoor PCB is shown in the following image:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole. This pictures are only for reference, actual appearance may vary.

6.3 EL 01 (Indoor and outdoor unit communication error diagnosis and solution)

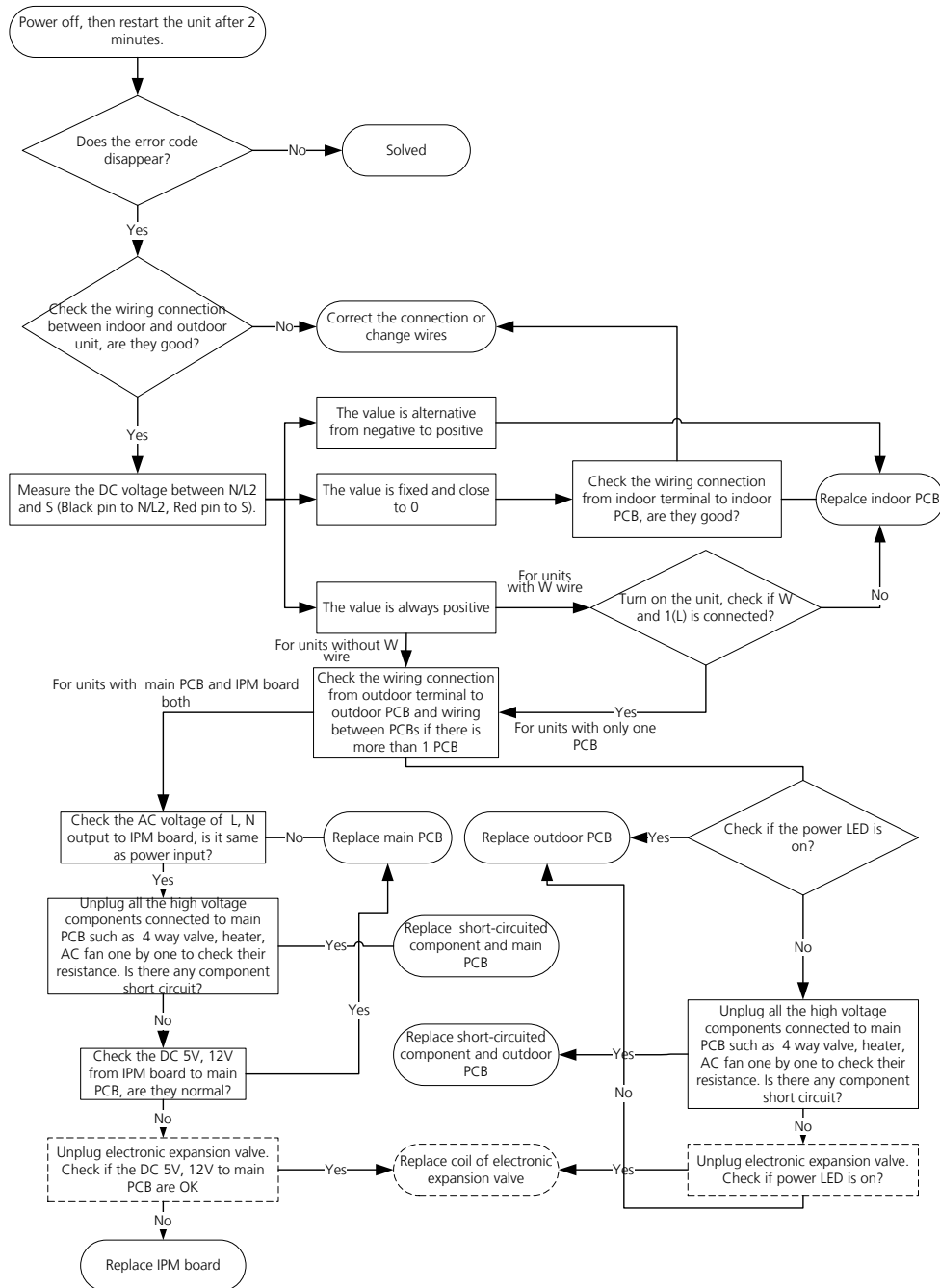
Description: Indoor unit can not communicate with outdoor unit

Recommended parts to prepare:

- Indoor PCB
- Outdoor PCB
- Short-circuited component

Troubleshooting and repair:

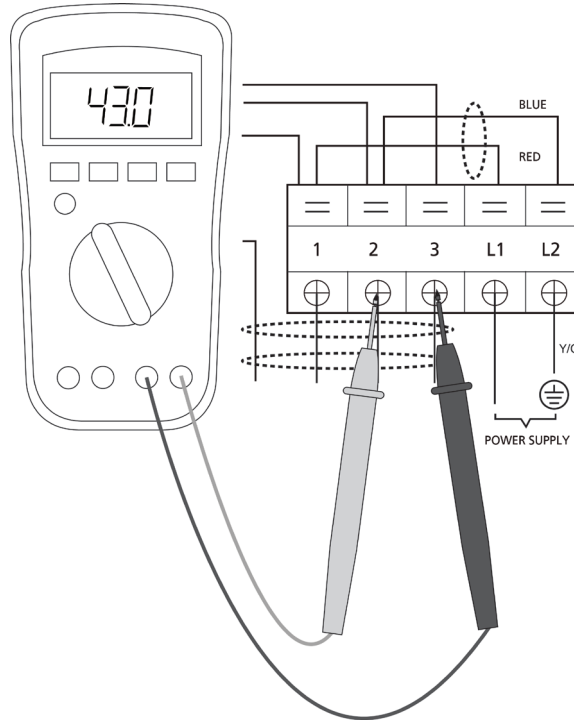
S Communication:



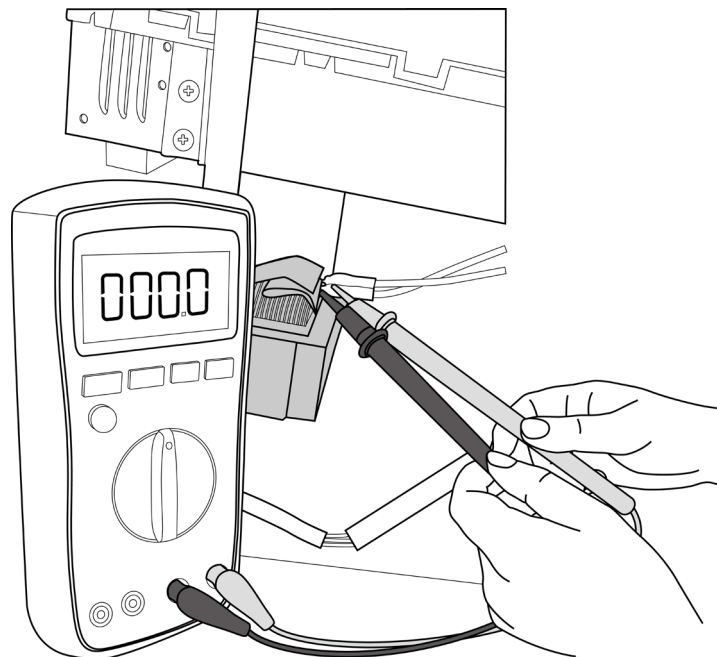
Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

Remarks:

- Use a multimeter to test the DC voltage between 2 port(or S or L2 port) and 3 port(or N or S port) of outdoor unit. The red pin of multimeter connects with 2 port(or S or L2 port) while the black pin is for 3 port(or N or S port) .
- When AC is normal running, the voltage is moving alternately as positive values and negative values
- If the outdoor unit has malfunction, the voltage has always been the positive value.
- While if the indoor unit has malfunction, the voltage has always been a certain value.



- Use a multimeter to test the resistance of the reactor which does not connect with capacitor.
- The normal value should be around zero ohm. Otherwise, the reactor must have malfunction.



Note: The picture and the value are only for reference, actual condition and specific value may vary.

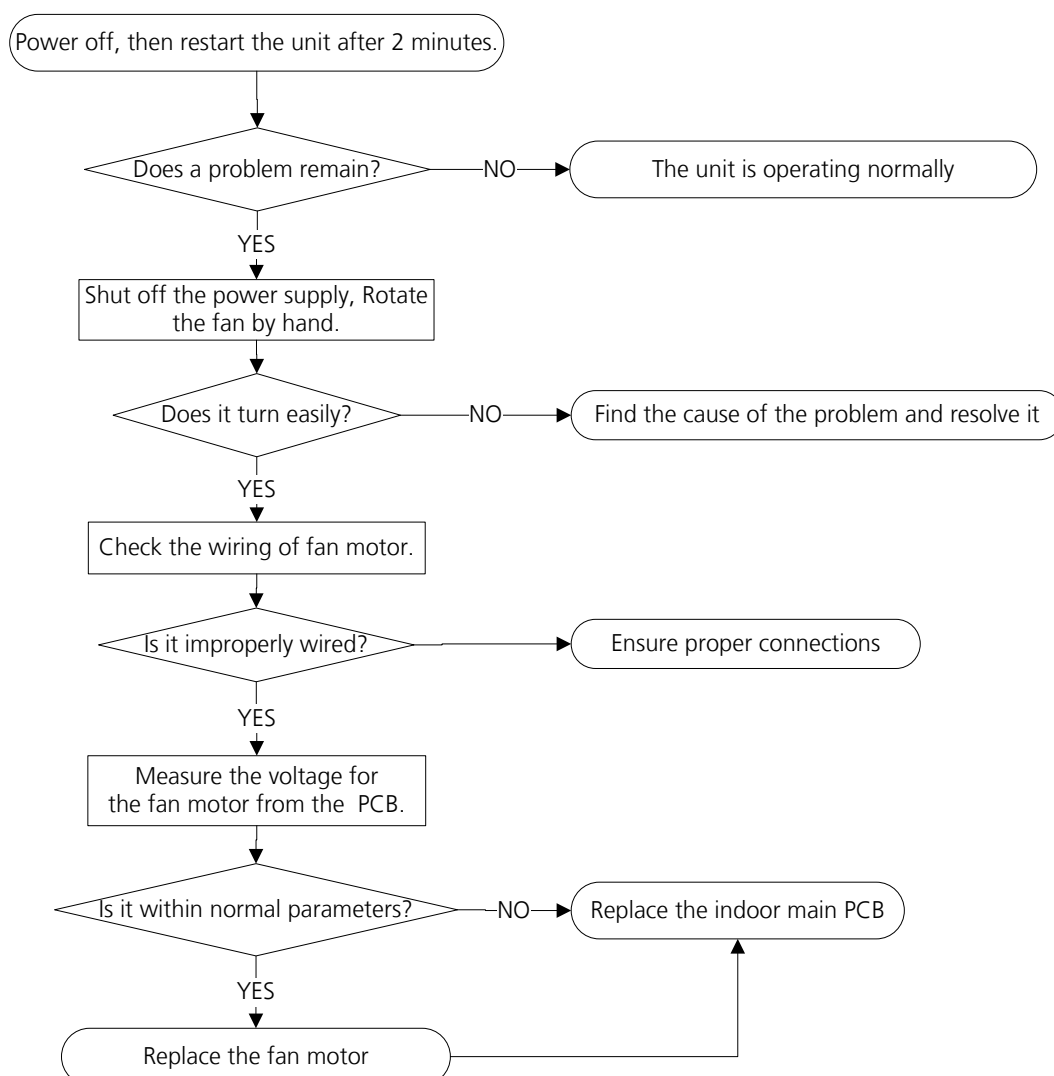
6.4 EH 03 (The Indoor fan speed is operating outside of normal range diagnosis and solution)

Description: When indoor fan speed keeps too low or too high for a certain time, the LED displays the failure code and the AC turns off.

Recommended parts to prepare:

- Connection wires
- Fan assembly
- Fan motor
- Indoor main PCB

Troubleshooting and repair:

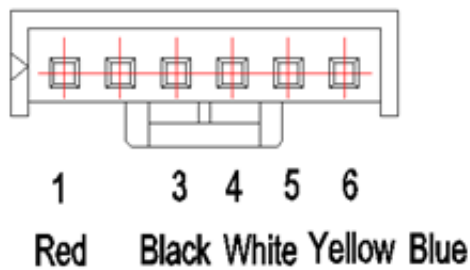


Index:**1. DC Fan Motor(control chip is in fan motor)**

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must has problems and need to be replaced.

- DC motor voltage input and output:

No.	Color	Signal	Voltage
1	Red	Vs/Vm	200V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5-16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5-16.5V



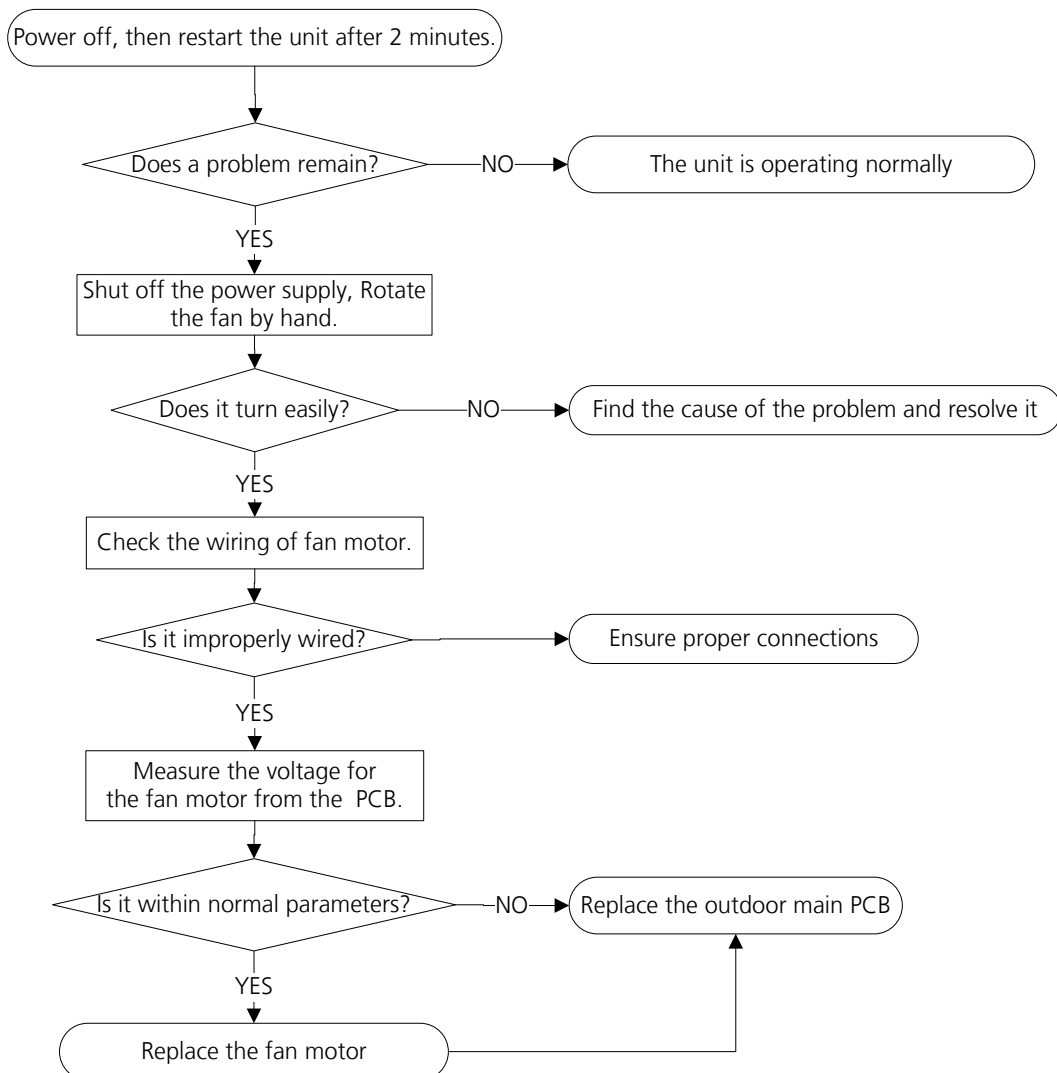
6.5 EC 07 (The outdoor fan speed is operating outside of normal range diagnosis and solution)

Description: When outdoor fan speed keeps too low or too high for a certain time, the LED displays the failure code and the AC turns off.

Recommended parts to prepare:

- Connection wires
- Fan assembly
- Fan motor
- Outdoor main PCB

Troubleshooting and repair:

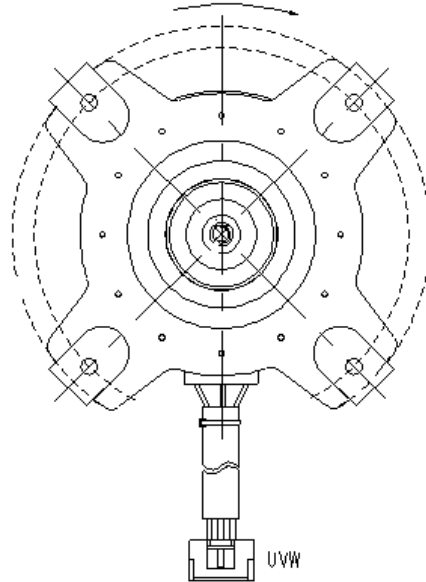


Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

Index:

1. Outdoor DC Fan Motor (control chip is in outdoor PCB)

Release the UVW connector. Measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other, the fan motor must have problems and need to be replaced. Otherwise the PCB must have problems and need to be replaced.

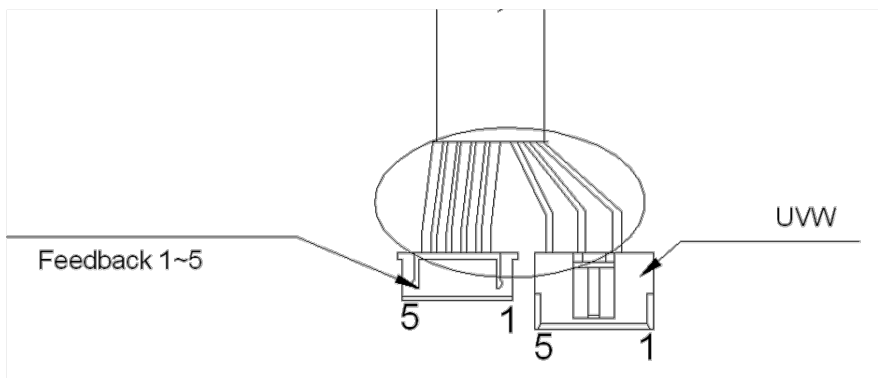


2. Outdoor DC Fan Motor (DC motor that control chip on the PCB)

1)Release the UVW connector. Measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other, the fan motor must have problems and need to be replaced. Otherwise, go to step 2).

2)Power on and when the unit is in standby, measure the voltage of pin4-5 in feedback signal connector. If the value is not 5V, change the PCB. Otherwise, go to step 3).

3)Rotate the fan by hand, measure the voltage of pin1-5, pin 2-5 and pin 3-5 in feedback signal connector. If any voltage is not positive voltage fluctuation, the fan motor must have problems and need to be replaced.



NO.	1	2	3	4	5
Color	Orange	Grey	White	Pink	Black
Signal	Hu	Hv	Hw	Vcc	GND

Color	Red	Blue	Yellow
Signal	W	V	U

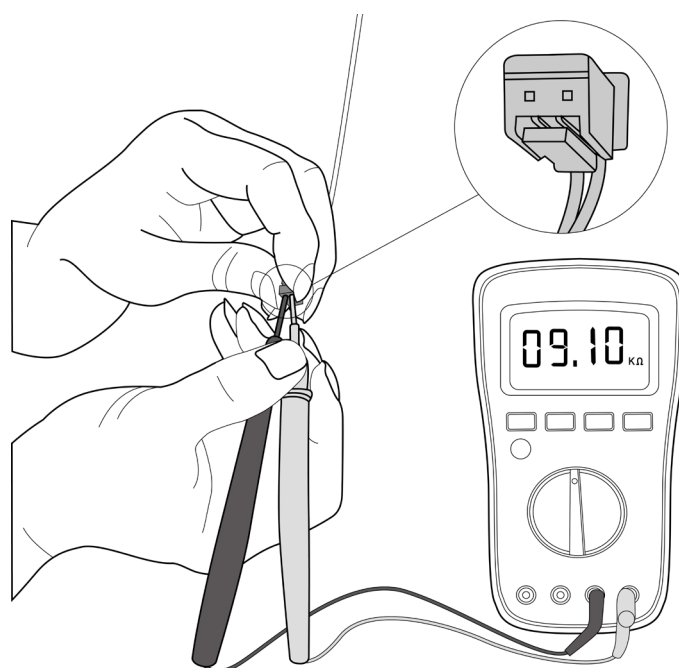
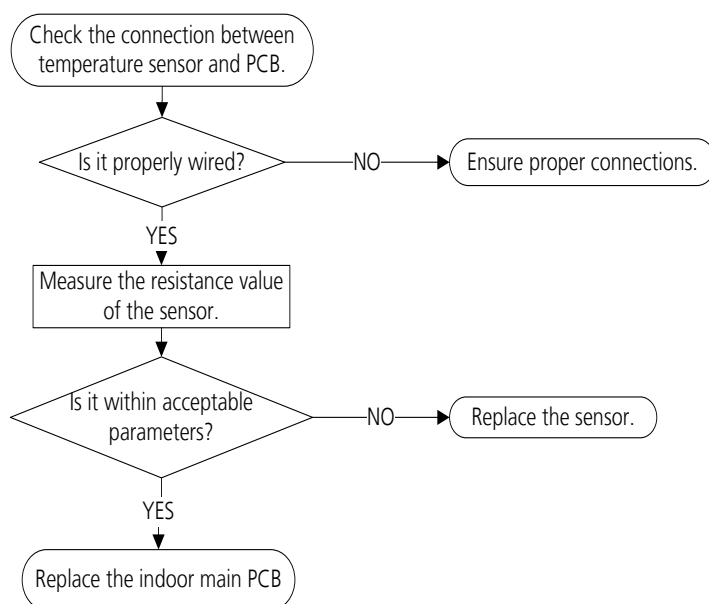
6.6 EH 60/EH 61 (Open circuit or short circuit of indoor temperature sensor(T1, T2) diagnosis and solution)

Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays the failure code.

Recommended parts to prepare:

- Connection wires
- Sensors
- Indoor main PCB

Troubleshooting and repair:



Note: This picture and the value are only for reference, actual appearance and value may vary.

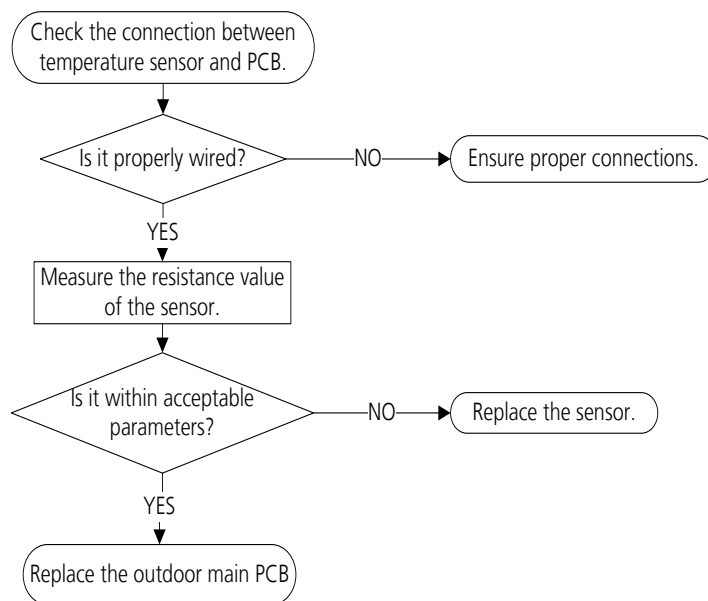
6.7 EC 52/EC 53/EC 54/EC 56/EC 05 (Open circuit or short circuit of outdoor temperature sensor(T3, T4, TP, T2B) or outdoor unit EEPROM parameter error diagnosis and solution)

Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays the failure code or Outdoor PCB main chip does not receive feedback from EEPROM chip or compressor driven chip.

Recommended parts to prepare:

- Connection wires
- Sensors
- Outdoor main PCB

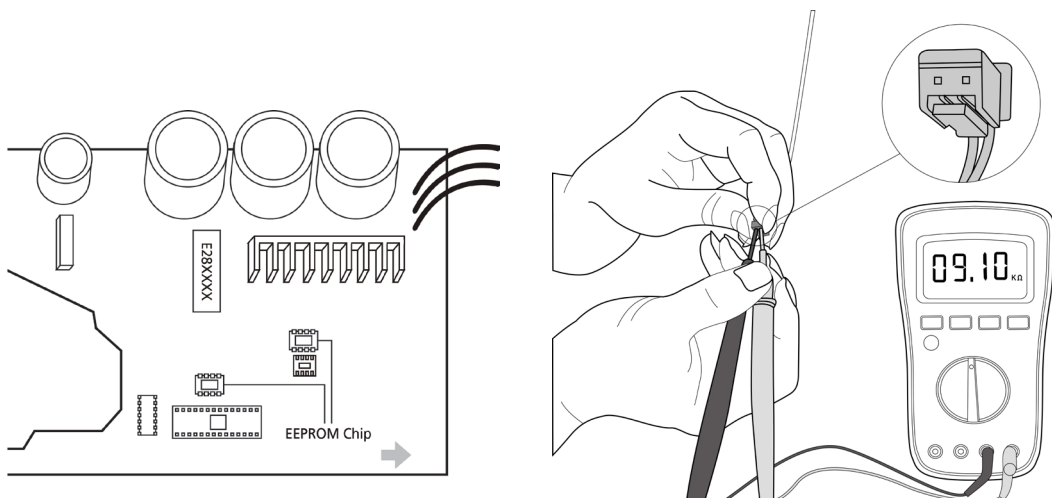
Troubleshooting and repair:



Remarks:

EEPROM: A read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

The location of the EEPROM chip on the outdoor PCB is shown in the following image:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole. For certain models, outdoor unit uses combination sensor, T3,T4 and TP are

the same of sensor. This picture and the value are only for reference, actual appearance and value may vary.

6.8 EL 0C (Refrigerant Leakage Detection diagnosis and solution)

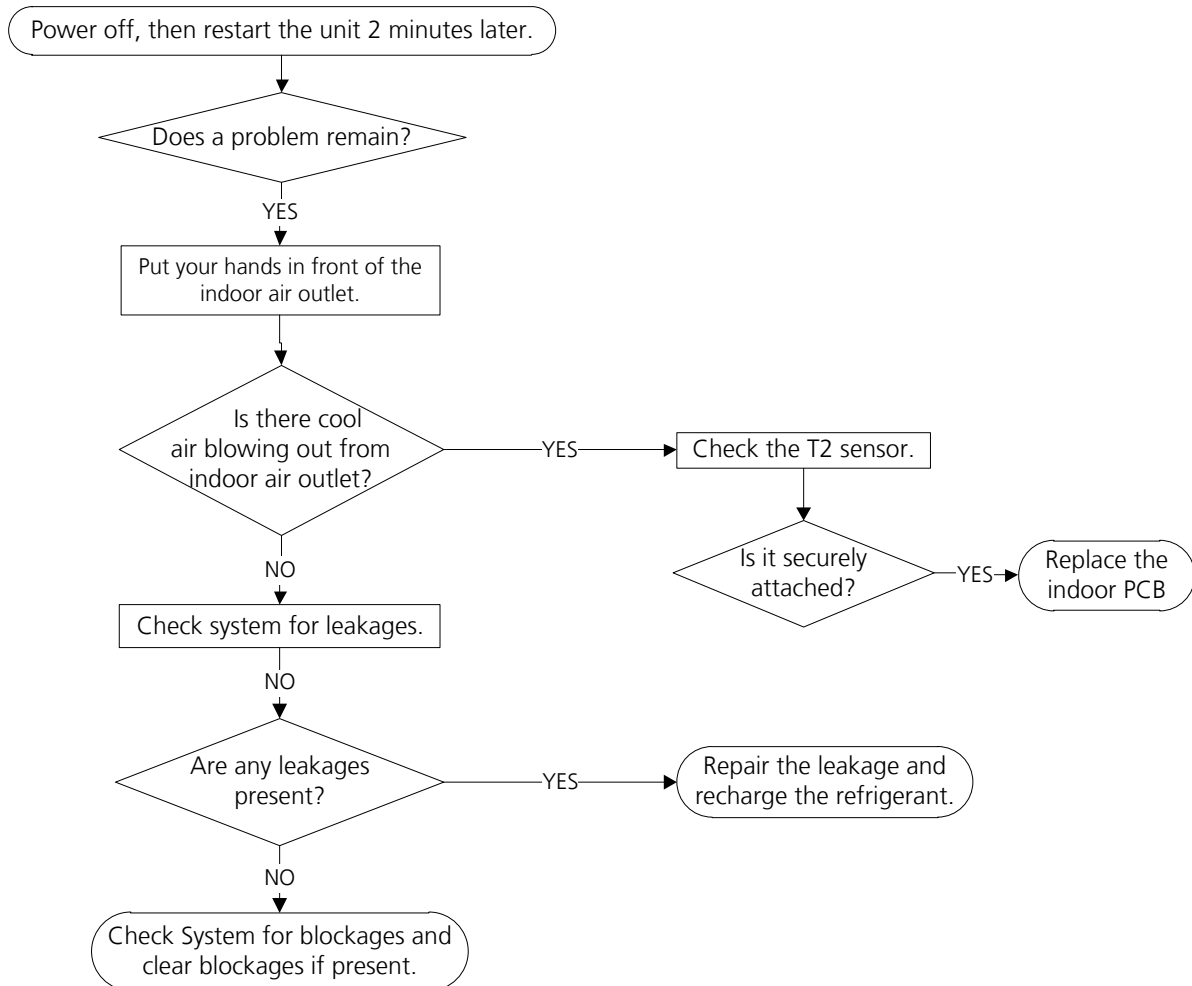
Description: Define the evaporator coil temperature T2 of the compressor just starts running as Tcool.

In the beginning 5 minutes after the compressor starts up, if $T2 < T_{cool} - 1^{\circ}\text{C}$ (1.8°F) does not keep continuous 4 seconds and compressor running frequency higher than 50Hz does not keep for 3 minutes, and this situation happens 3 times, the LED displays the failure code and the AC turns off.

Recommended parts to prepare:

- T2 sensor
- Indoor PCB
- Additional refrigerant

Troubleshooting and repair:



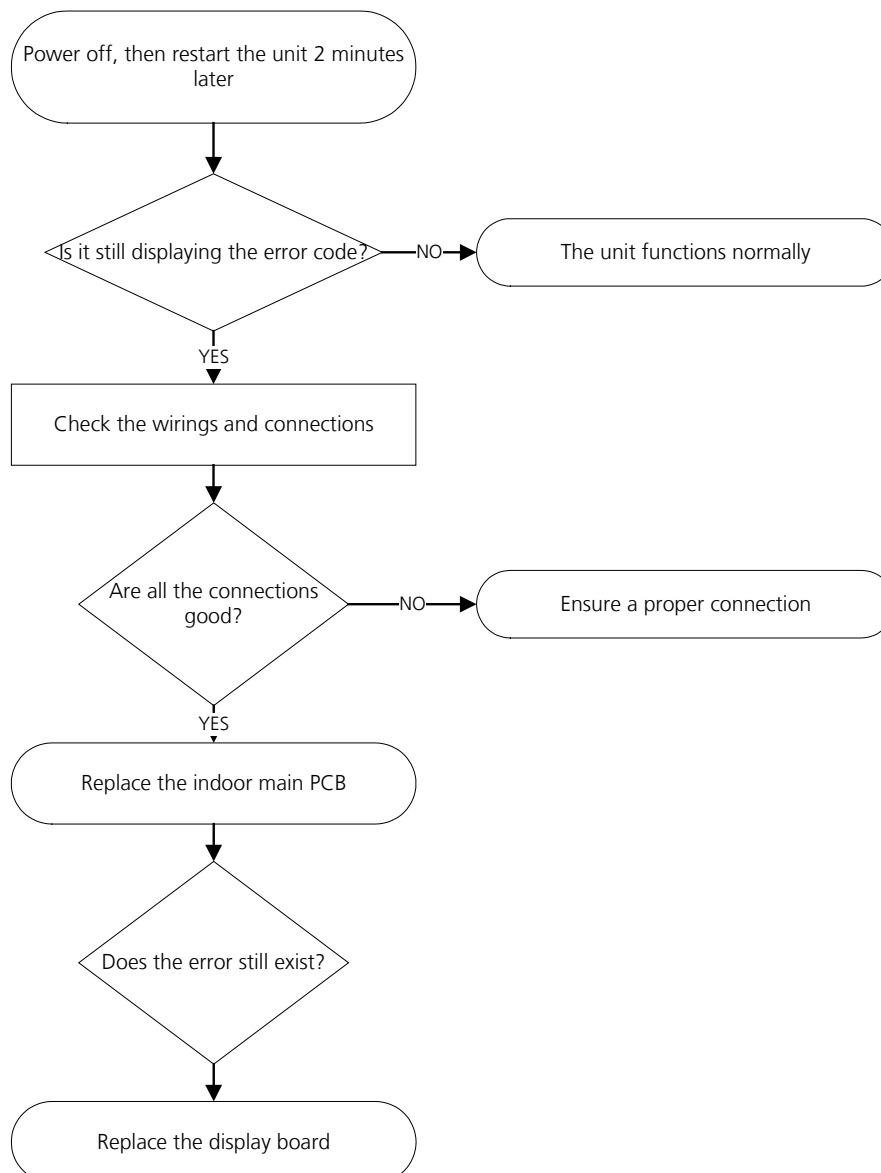
6.9 EH 0b (Indoor PCB / Display board communication error diagnosis and solution)

Description: Indoor PCB does not receive feedback from the display board.

Recommended parts to prepare:

- Communication wire
- Indoor PCB
- Display board

Troubleshooting and repair:



6.10 PC 00 (IPM malfunction or IGBT over-strong current protection or Inverter compressor drive error diagnosis and solution)

Description: When the voltage signal the IPM sends to the compressor drive chip is abnormal, the LED displays the failure code and the AC turns off.

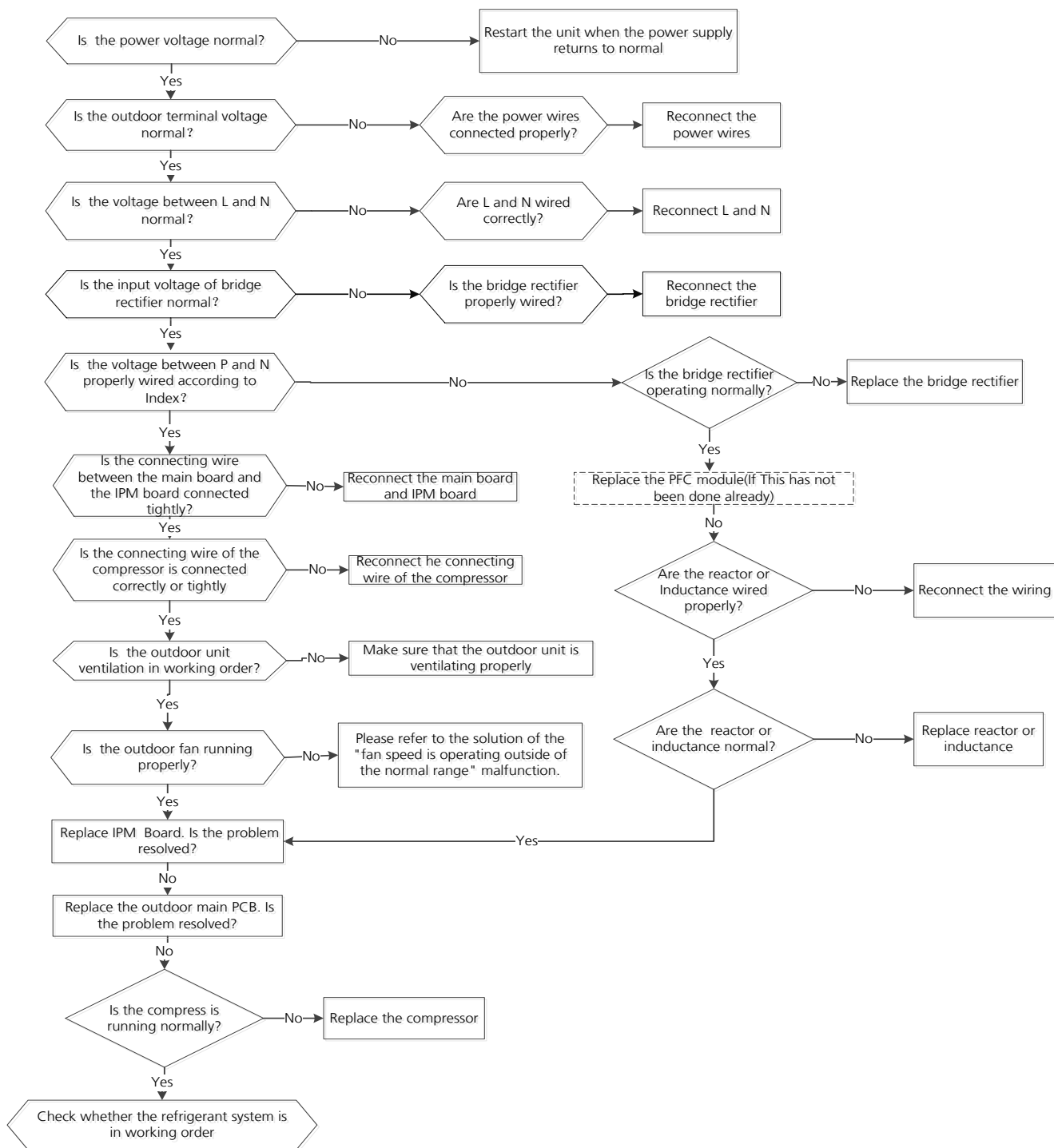
Or an abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on.

Recommended parts to prepare:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB
- High-voltage components
- PFC circuit or reactor

Troubleshooting and repair:

First, test the resistance between every two ports of U, V, the W of the IPM and P, N. If any of the results is 0 or close to 0, the IPM is defective. If not, follow the following procedure:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

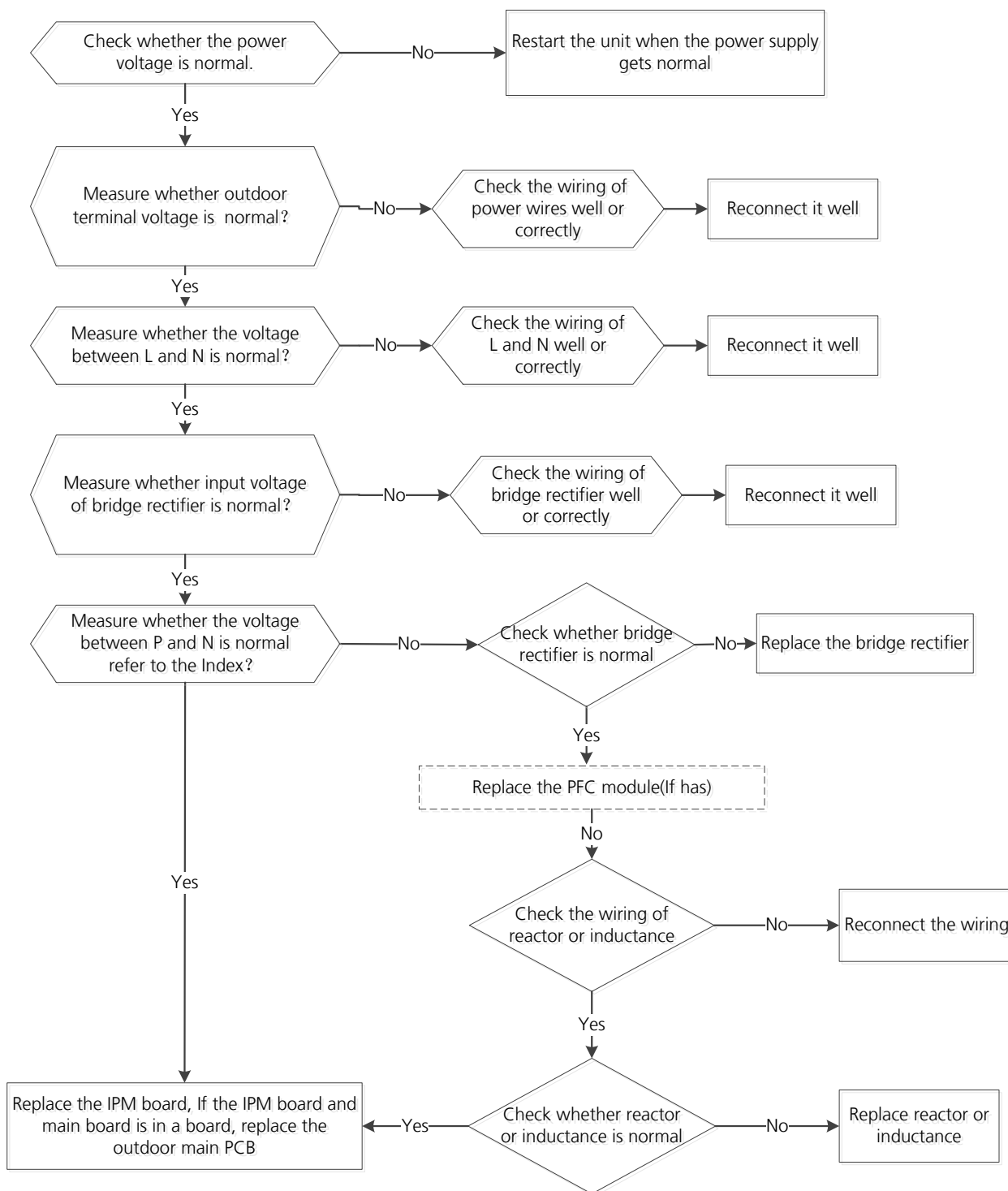
6.11 PC 01 (Over voltage or too low voltage protection diagnosis and solution)

Description: Abnormal increases or decreases in voltage are detected by checking the specified voltage detection circuit.

Recommended parts to prepare:

- Power supply wires
- IPM module board
- PCB
- Reactor

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

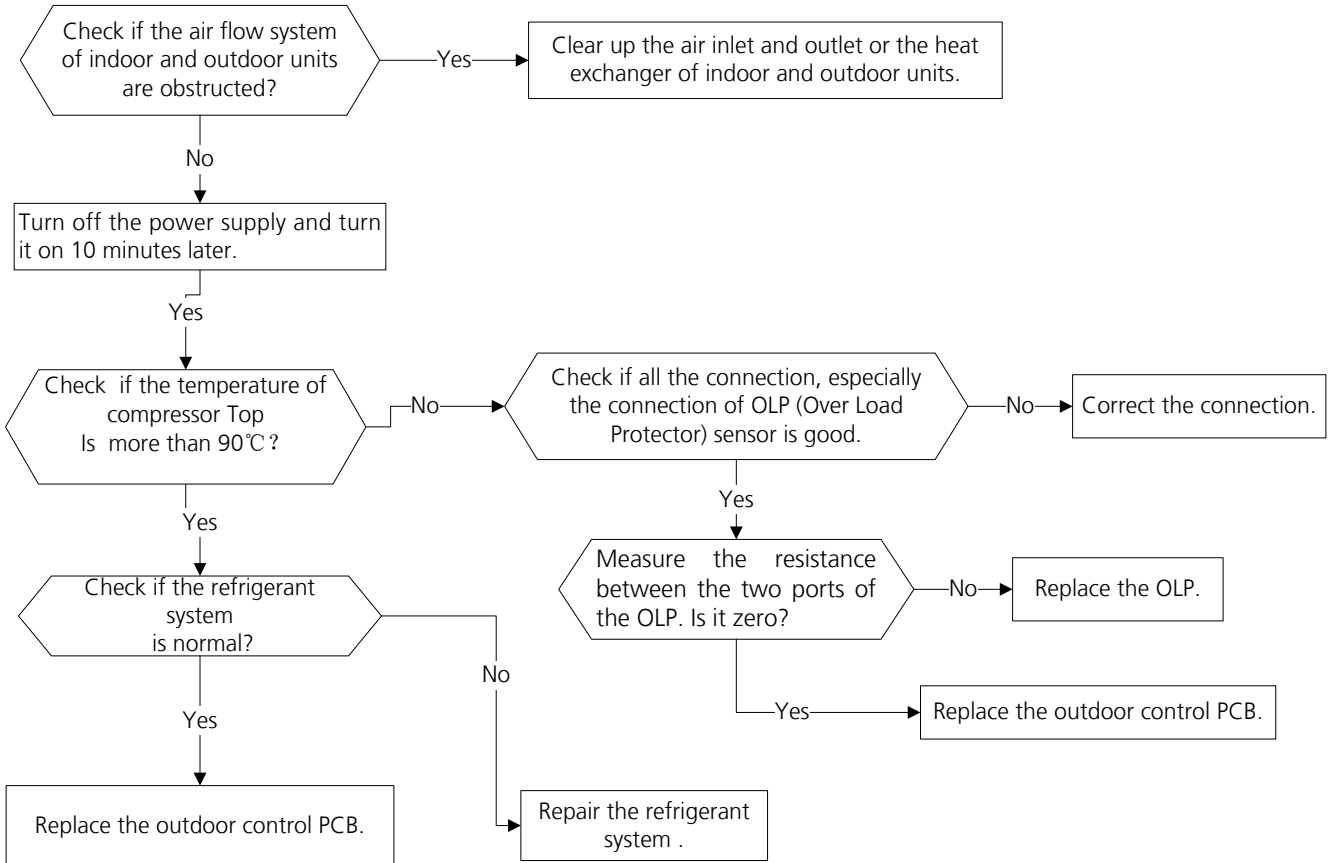
6.12 PC 02 (Top temperature protection of compressor diagnosis and solution)

Description: If the sampling voltage is not 5V, the LED will display the failure.

Recommended parts to prepare:

- Connection wires
- Overload protector
- Outdoor PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

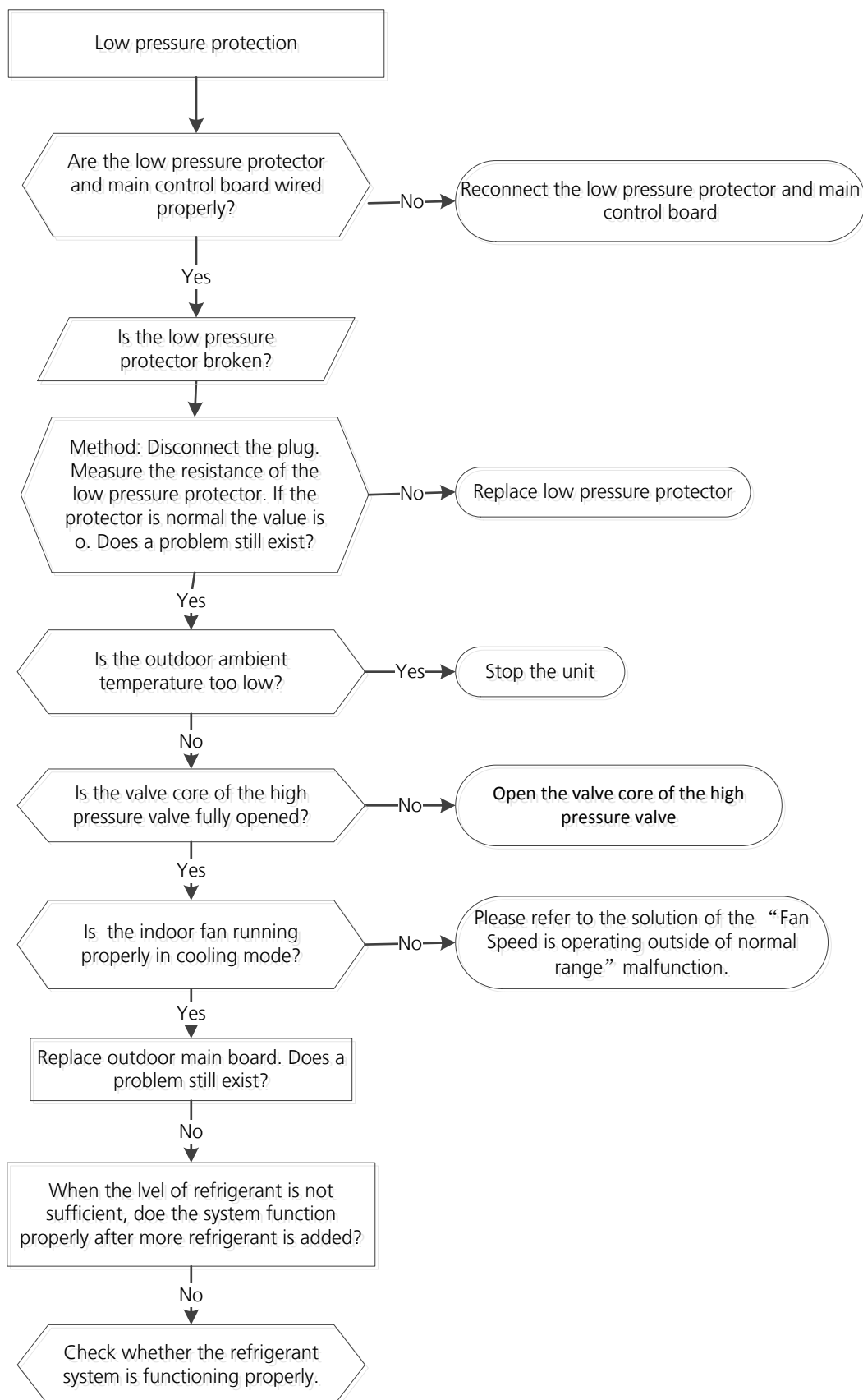
6.13 PC 03 (Low pressure protection diagnosis and solution)

Description: Outdoor pressure switch cut off the system because low pressure is lower than 0.13 MPa, the LED displays the failure code.

Recommended parts to prepare:

- Connection wires
- Outdoor PCB
- Low pressure protector
- Refrigerant

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

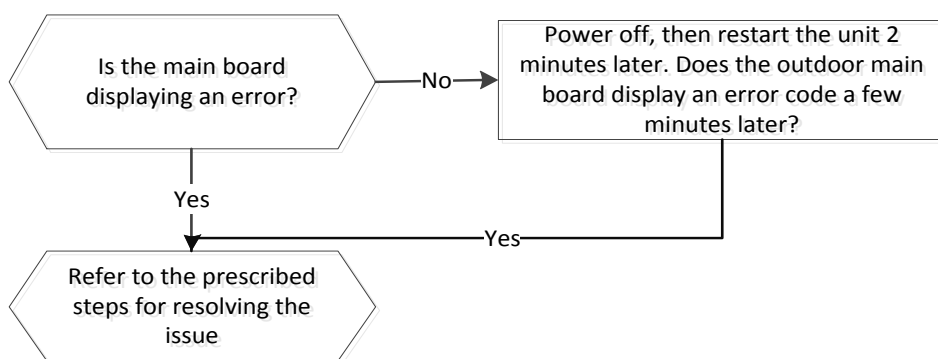
6.14 EC 0d (Outdoor unit malfunction Diagnosis and Solution)

Description: The indoor unit detect the outdoor unit is error.

Recommended parts to prepare:

- Outdoor unit

Troubleshooting and repair:



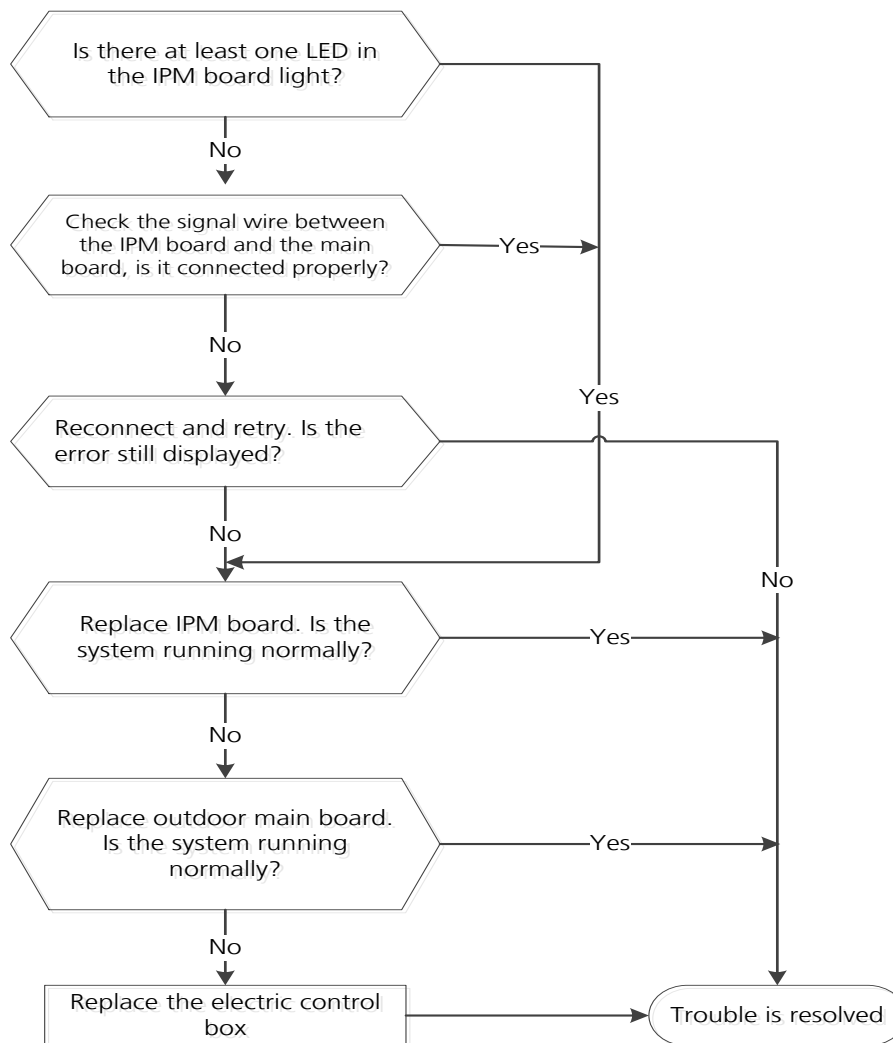
6.15 PC 40 (Communication error between outdoor main PCB and IPM board diagnosis and solution)

Description: The main PCB cannot detect the IPM board.

Recommended parts to prepare:

- Connection wires
- IPM board
- Outdoor main PCB
- Electric control box

Troubleshooting and repair:



6.16 FL 09 (Indoor and outdoor mismatch malfunction diagnosis and solution)

Description: Indoor and outdoor units are mismatched, the LED displays this code. Please replace the matching indoor or outdoor unit.

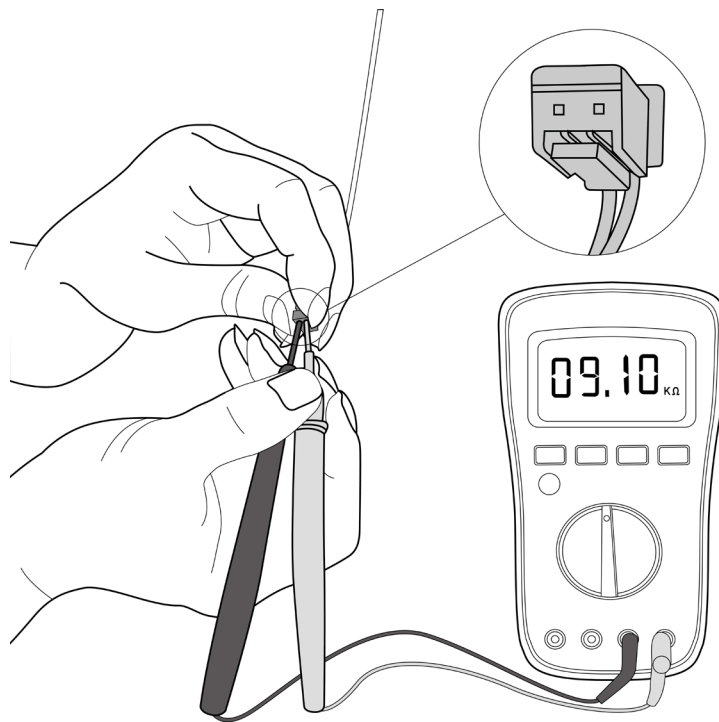
7. Check Procedures

7.1 Temperature Sensor Check

! WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. Operate after compressor and coil have returned to normal temperature in case of injury.

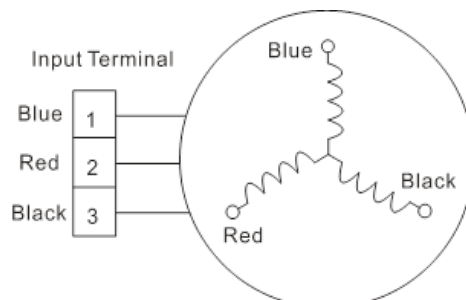
1. Disconnect the temperature sensor from PCB (Refer to Chapter 5&6. Indoor&Outdoor Unit Disassembly).
2. Measure the resistance value of the sensor using a multi-meter.
3. Check corresponding temperature sensor resistance value table (Refer to Chapter 8. Appendix).



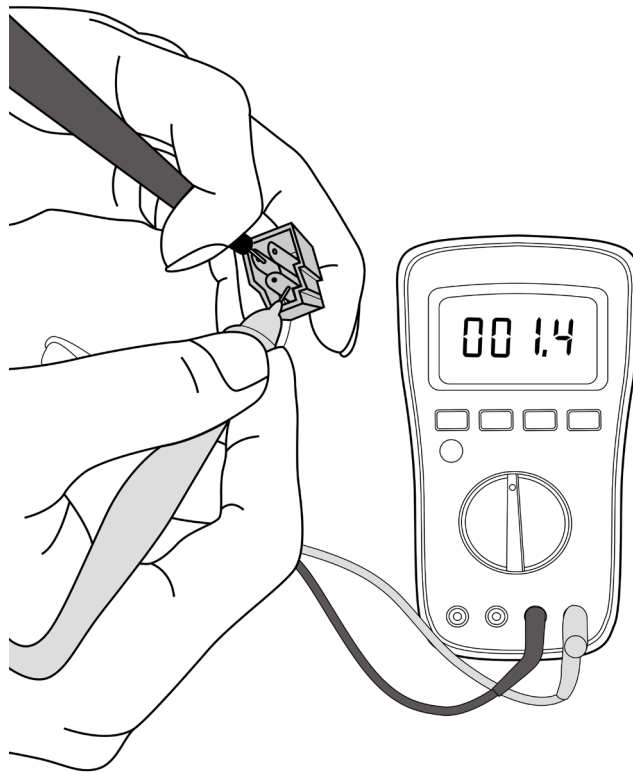
Note: The picture and the value are only for reference, actual condition and specific value may vary.

7.2 Compressor Check

1. Disconnect the compressor power cord from outdoor PCB (Refer to Chapter 6. Outdoor Unit Disassembly).
2. Measure the resistance value of each winding using a multi-meter.
3. Check the resistance value of each winding in the following table.



Resistance Value	KTM240D43UKT
Blue-Red	1.03Ω
Blue-Black	
Red-Black	



Note: The picture and the value are only for reference, actual condition and specific value may vary.

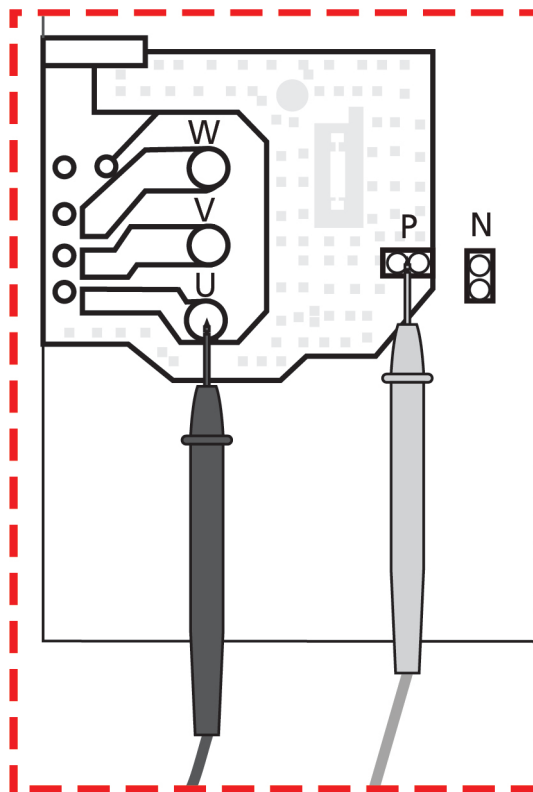
7.3 IPM Continuity Check

⚠ WARNING

Electricity remains in capacitors even when the power supply is off. Ensure the capacitors are fully discharged before troubleshooting.

1. Turn off outdoor unit and disconnect power supply.
2. Discharge electrolytic capacitors and ensure all energy-storage unit has been discharged.
3. Disassemble outdoor PCB or disassemble IPM board.
4. Measure the resistance value between P and U(V, W, N); U(V, W) and N.

Digital tester		Resistance value	Digital tester		Resistance value
(+)Red	(-)Black		(+)Red	(-)Black	
P	N	∞ (Several MΩ)	U	N	∞ (Several MΩ)
	U		V		
	V		W		
	W		-		



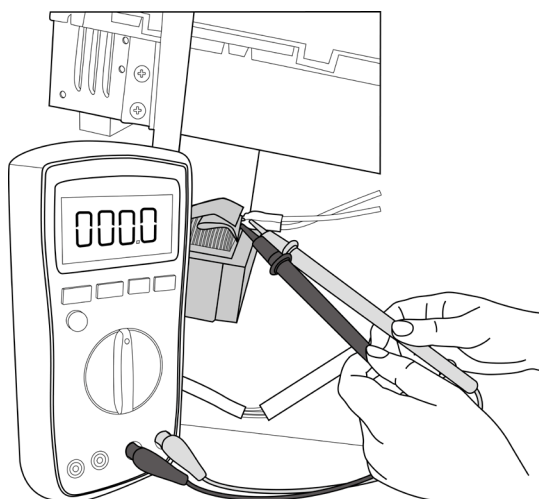
Note: The picture and the value are only for reference, actual condition and specific value may vary.

7.4 Normal voltage of P and N

208-240V(1-phase,3-phase)		380-415V(3-phase)	
In standby			
around 310VDC		around 530VDC	
In operation			
With passive PFC module	With partial active PFC module	With fully active PFC module	/
>200VDC	>310VDC	>370VDC	>450VDC

7.5 Reactor Check

Measure the resistance and voltage (to ground) of the reactor. The normal resistance should be around 0.1 ohm. Otherwise, the reactor must have malfunction.



i) Temperature Sensor Resistance Value Table for T1,T2,T3 and T4 (°C – K)

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	115.266	20	68	12.6431	60	140	2.35774	100	212	0.62973
-19	-2	108.146	21	70	12.0561	61	142	2.27249	101	214	0.61148
-18	0	101.517	22	72	11.5	62	144	2.19073	102	216	0.59386
-17	1	96.3423	23	73	10.9731	63	145	2.11241	103	217	0.57683
-16	3	89.5865	24	75	10.4736	64	147	2.03732	104	219	0.56038
-15	5	84.219	25	77	10	65	149	1.96532	105	221	0.54448
-14	7	79.311	26	79	9.55074	66	151	1.89627	106	223	0.52912
-13	9	74.536	27	81	9.12445	67	153	1.83003	107	225	0.51426
-12	10	70.1698	28	82	8.71983	68	154	1.76647	108	226	0.49989
-11	12	66.0898	29	84	8.33566	69	156	1.70547	109	228	0.486
-10	14	62.2756	30	86	7.97078	70	158	1.64691	110	230	0.47256
-9	16	58.7079	31	88	7.62411	71	160	1.59068	111	232	0.45957
-8	18	56.3694	32	90	7.29464	72	162	1.53668	112	234	0.44699
-7	19	52.2438	33	91	6.98142	73	163	1.48481	113	235	0.43482
-6	21	49.3161	34	93	6.68355	74	165	1.43498	114	237	0.42304
-5	23	46.5725	35	95	6.40021	75	167	1.38703	115	239	0.41164
-4	25	44	36	97	6.13059	76	169	1.34105	116	241	0.4006
-3	27	41.5878	37	99	5.87359	77	171	1.29078	117	243	0.38991
-2	28	39.8239	38	100	5.62961	78	172	1.25423	118	244	0.37956
-1	30	37.1988	39	102	5.39689	79	174	1.2133	119	246	0.36954
0	32	35.2024	40	104	5.17519	80	176	1.17393	120	248	0.35982
1	34	33.3269	41	106	4.96392	81	178	1.13604	121	250	0.35042
2	36	31.5635	42	108	4.76253	82	180	1.09958	122	252	0.3413
3	37	29.9058	43	109	4.5705	83	181	1.06448	123	253	0.33246
4	39	28.3459	44	111	4.38736	84	183	1.03069	124	255	0.3239
5	41	26.8778	45	113	4.21263	85	185	0.99815	125	257	0.31559
6	43	25.4954	46	115	4.04589	86	187	0.96681	126	259	0.30754
7	45	24.1932	47	117	3.88673	87	189	0.93662	127	261	0.29974
8	46	22.5662	48	118	3.73476	88	190	0.90753	128	262	0.29216
9	48	21.8094	49	120	3.58962	89	192	0.8795	129	264	0.28482
10	50	20.7184	50	122	3.45097	90	194	0.85248	130	266	0.2777
11	52	19.6891	51	124	3.31847	91	196	0.82643	131	268	0.27078
12	54	18.7177	52	126	3.19183	92	198	0.80132	132	270	0.26408
13	55	17.8005	53	127	3.07075	93	199	0.77709	133	271	0.25757
14	57	16.9341	54	129	2.95896	94	201	0.75373	134	273	0.25125
15	59	16.1156	55	131	2.84421	95	203	0.73119	135	275	0.24512
16	61	15.3418	56	133	2.73823	96	205	0.70944	136	277	0.23916
17	63	14.6181	57	135	2.63682	97	207	0.68844	137	279	0.23338
18	64	13.918	58	136	2.53973	98	208	0.66818	138	280	0.22776
19	66	13.2631	59	138	2.44677	99	210	0.64862	139	282	0.22231

ii) Temperature Sensor Resistance Value Table for TP (°C – K)

Appendix

Contents

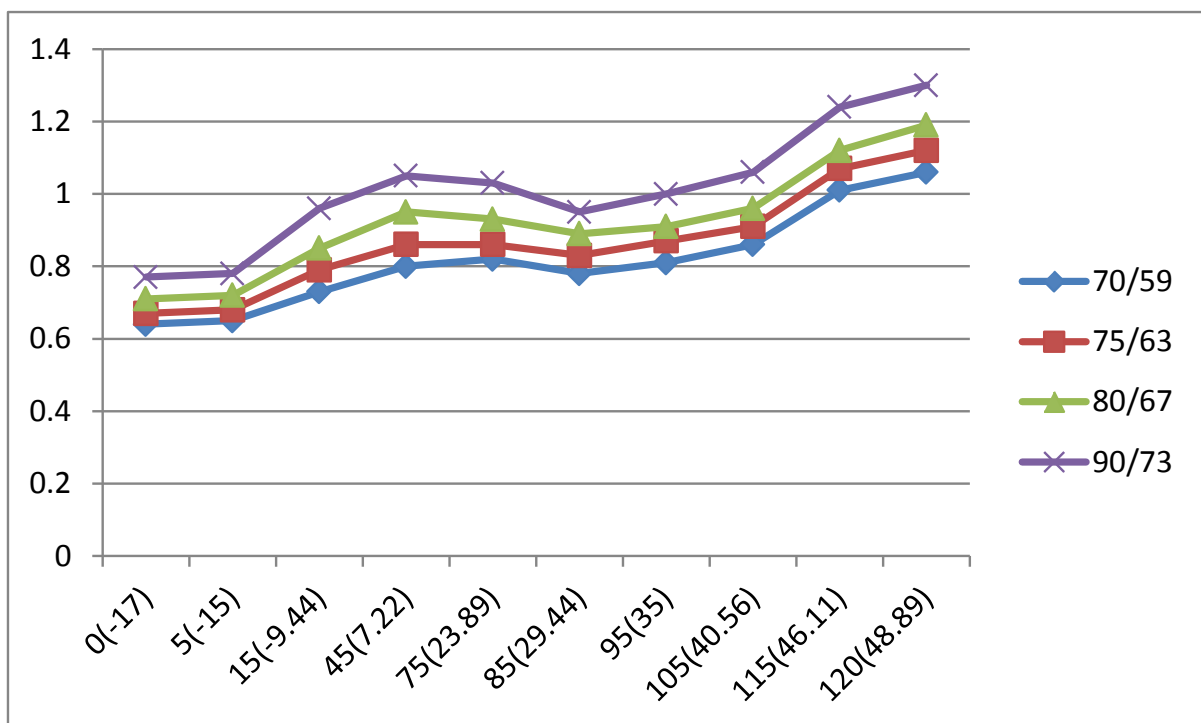
i)	Temperature Sensor Resistance Value Table for T1, T2, T3, and T4 (°C – K)	94
ii)	Temperature Sensor Resistance Value Table for TP (°C – K).....	95
iii)	Pressure On Service Port	96

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	542.7	20	68	68.66	60	140	13.59	100	212	3.702
-19	-2	511.9	21	70	65.62	61	142	13.11	101	214	3.595
-18	0	483	22	72	62.73	62	144	12.65	102	216	3.492
-17	1	455.9	23	73	59.98	63	145	12.21	103	217	3.392
-16	3	430.5	24	75	57.37	64	147	11.79	104	219	3.296
-15	5	406.7	25	77	54.89	65	149	11.38	105	221	3.203
-14	7	384.3	26	79	52.53	66	151	10.99	106	223	3.113
-13	9	363.3	27	81	50.28	67	153	10.61	107	225	3.025
-12	10	343.6	28	82	48.14	68	154	10.25	108	226	2.941
-11	12	325.1	29	84	46.11	69	156	9.902	109	228	2.86
-10	14	307.7	30	86	44.17	70	158	9.569	110	230	2.781
-9	16	291.3	31	88	42.33	71	160	9.248	111	232	2.704
-8	18	275.9	32	90	40.57	72	162	8.94	112	234	2.63
-7	19	261.4	33	91	38.89	73	163	8.643	113	235	2.559
-6	21	247.8	34	93	37.3	74	165	8.358	114	237	2.489
-5	23	234.9	35	95	35.78	75	167	8.084	115	239	2.422
-4	25	222.8	36	97	34.32	76	169	7.82	116	241	2.357
-3	27	211.4	37	99	32.94	77	171	7.566	117	243	2.294
-2	28	200.7	38	100	31.62	78	172	7.321	118	244	2.233
-1	30	190.5	39	102	30.36	79	174	7.086	119	246	2.174
0	32	180.9	40	104	29.15	80	176	6.859	120	248	2.117
1	34	171.9	41	106	28	81	178	6.641	121	250	2.061
2	36	163.3	42	108	26.9	82	180	6.43	122	252	2.007
3	37	155.2	43	109	25.86	83	181	6.228	123	253	1.955
4	39	147.6	44	111	24.85	84	183	6.033	124	255	1.905
5	41	140.4	45	113	23.89	85	185	5.844	125	257	1.856
6	43	133.5	46	115	22.89	86	187	5.663	126	259	1.808
7	45	127.1	47	117	22.1	87	189	5.488	127	261	1.762
8	46	121	48	118	21.26	88	190	5.32	128	262	1.717
9	48	115.2	49	120	20.46	89	192	5.157	129	264	1.674
10	50	109.8	50	122	19.69	90	194	5	130	266	1.632
11	52	104.6	51	124	18.96	91	196	4.849			
12	54	99.69	52	126	18.26	92	198	4.703			
13	55	95.05	53	127	17.58	93	199	4.562			
14	57	90.66	54	129	16.94	94	201	4.426			
15	59	86.49	55	131	16.32	95	203	4.294			
16	61	82.54	56	133	15.73	96	205	4.167			
17	63	78.79	57	135	15.16	97	207	4.045			
18	64	75.24	58	136	14.62	98	208	3.927			
19	66	71.86	59	138	14.09	99	210	3.812			

iii) Pressure On Service Port(R410A)

Cooling chart:

°F(°C)	ODU(DB)		0(-17)	5(-15)	15(-9.44)	45(7.22)	75(23.89)	85(29.44)	95(35)	105(40.56)	115(46.11)	120(48.89)
	IDU(DB/WB)											
BAR	70/59 (21.11/15)		6.4	6.5	7.3	8.0	8.2	7.8	8.1	8.6	10.1	10.6
	75/63 (23.89/17.22)		6.7	6.8	7.9	8.6	8.6	8.3	8.7	9.1	10.7	11.2
	80/67 (26.67/19.44)		7.1	7.2	8.5	9.5	9.3	8.9	9.1	9.6	11.2	11.9
	90/73 (32.22/22.78)		7.7	7.8	9.6	10.5	10.3	9.5	10.0	10.6	12.4	13.0
PSI	70/59 (21.11/15)		93	94	106	116	119	113	117	125	147	154
	75/63 (23.89/17.22)		97	99	115	125	124	120	126	132	155	162
	80/67 (26.67/19.44)		103	104	123	138	135	129	132	140	162	173
	90/73 (32.22/22.78)		112	113	139	152	149	138	145	154	180	189
MPa	70/59 (21.11/15)		0.64	0.65	0.73	0.8	0.82	0.78	0.81	0.86	1.01	1.06
	75/63 (23.89/17.22)		0.67	0.68	0.79	0.86	0.86	0.83	0.87	0.91	1.07	1.12
	80/67 (26.67/19.44)		0.71	0.72	0.85	0.95	0.93	0.89	0.91	0.96	1.12	1.19
	90/73 (32.22/22.78)		0.77	0.78	0.96	1.05	1.03	0.95	1	1.06	1.24	1.3



Heating chart:

°F(°C)	QDU(DB/WB)	57/53 (13.89/11.67)	47/43 (8.33/6.11)	37/33 (2.78/0.56)	27/23 (-2.78/-5)	17/13 (-8.33/- 10.56)	0/-2 (-17/-19)	-17/-18 (-27/-28)
	IDU(DB)							
BAR	55(12.78)	30.3	28.5	25.3	22.8	20.8	18.5	16.5
	65(18.33)	32.5	30.0	26.6	25.4	23.3	20.5	19.0
	75(23.89)	33.8	31.5	27.8	26.3	24.9	21.5	20.0
PSI	55(12.78)	439	413	367	330	302	268	239
	65(18.33)	471	435	386	368	339	297	276
	75(23.89)	489	457	403	381	362	312	290
MPa	55(12.78)	3.03	2.85	2.53	2.28	2.08	1.85	1.65
	65(18.33)	3.25	3.00	2.66	2.54	2.33	2.05	1.90
	75(23.89)	3.38	3.15	2.78	2.63	2.49	2.15	2.00

