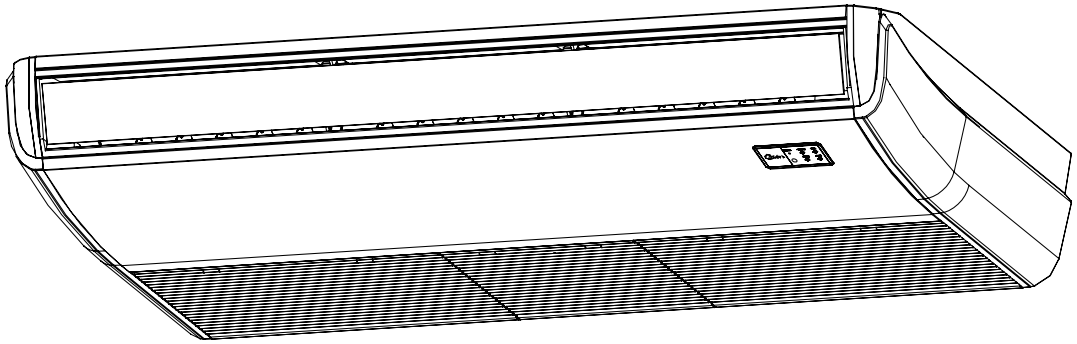
Service Manual
Floor Ceiling Inverter
For 18,000 - 60,000 BTU Systems



Units Covered In This Manual

BTU/H	VOLTAGE/ PHASE	AIR HANDLER MODEL
18,000	208/230-1	MFBHU-H18B-2A
24,000	208/230-1	MFBHU-H24B-2A
36,000	208/230-1	MFBHS-H36B-2A
48,000	208/230-1	MFBHS-H48B-2A
60,000	208/230-1	MFBHS-H60B-2A

A2L

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Safety Precautions

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

⚠ WARNING

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

⚠ CAUTION

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

NOTE

A property-damage-only hazard, meaning no personal injury is possible.

IMPORTANT

Is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

IMPORTANT

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Have a fire extinguisher available. Consult local building codes and the current editions of the National Electrical Code (NEC) NFPA 70.

IMPORTANT

In Canada, refer to the current editions of the Canadian Electrical Code CSA C22.1. Follow the safety information.

⚠ WARNING

IN CASE OF ACCIDENTS OR EMERGENCIES

- 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 are 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 comes into contact with skin or clothing, immediately rinse or wash the affected area thoroughly 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 similar devices.
- Do not use the unit during severe weather conditions. If possible, remove the product from the window before such occurrences.

⚠ WARNING

PRE-INSTALLATION AND INSTALLATION

- 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 con- denser and evaporator.

⚠ WARNING

OPERATION AND MAINTENANCE

- Do not use defective or undersized 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 the manufacturer's procedures when cleaning or maintaining the unit.

⚠ CAUTION

- Do not install or operate the unit for an extended time in areas of high humidity or in an environment directly exposed to sea wind or salt spray.
- Do not install the unit on a defective or damaged installation stand or in an insecure 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.
- Ensure the unit does not operate in areas with 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 be 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.

⚠ WARNING

USING FLAMMABLE REFRIGERANT

1. Installation (Space)
   - That the installation of pipe work shall be kept to a minimum.
   - That pipe work shall be protected from physical damage.
   - Where refrigerant pipes shall comply with national gas regulations.
   - That mechanical connections shall be accessible for maintenance purposes.
   - In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.
   - When disposing of the used product, it must be based on national regulations, and properly processed.
2. Servicing
   - Any person who is involved with working on or breaking into a refrigerant circuit should hold a currently valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely following an industry-recognized assessment specification.
3. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of a person competent in the use of flammable refrigerants.
4. Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
5. The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).
6. Be careful that foreign matter(oil, water,etc) does not enter the piping. Also, when storing the piping, securely seal the opening by pinching, taping, etc.
7. Do not pierce or burn.
8. Be aware that refrigerants may not contain an odor.
9. All working procedures that affect safety means shall only be carried out by competent technicians.
10. Appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
11. The appliance shall be stored to prevent mechanical damage from occurring.
12. Joints shall be tested with detection equipment with a capability of 5 g/year of refrigerant or better, with the equipment in standstill and under operation or pressure of at least these standstill or operation conditions after installation. Detachable joints shall NOT be used in the indoor side of the unit (brazed, welded joints could be used).
13. When a FLAMMABLE REFRIGERANT is used, the requirements for installation space of the appliance and /or ventilation requirements are determined according to
    - the mass charge amount (M) used in the appliance,
    - the installation location,
    - the type of ventilation of the location of the appliance.
    - piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and comply with national and local codes and standards, such as ASHRAE 15, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection before being covered or enclosed.
    - that protection devices, piping, and fittings shall be protected as far as possible against adverse environmental effects, for example, the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris;
    - that piping in refrigeration systems shall be so designed and installed to minimize the likelihood of hydraulic shock damaging the system;
    - that steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation;
    - that precautions shall be taken to avoid excessive vibration or pulsation;
    - the minimum floor area of the room shall be mentioned in the form of a table or a single figure without reference to a formula;
    - after completion of field piping for split systems, the field pipe work shall be pressure tested with an inert gas and then vacuum tested before refrigerant charging, according to the following requirements:
    - The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system, cannot be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.
    - The test pressure after removal of the pressure source shall be maintained for at least 1h with no decrease of pressure indicated by the test gauge, with test gauge resolution not exceeding 5% of the test pressure.
    - During the evacuation test, after achieving a vacuum level specified in the manual or less, the refrigeration system shall be isolated from the vacuum pump, and the pressure shall not rise above 1500 microns within 10 min. The vacuum pressure level shall be specified in the manual. It shall be the lesser of 500 microns or the value required for compliance with national and local codes and standards, which may vary between residential, commercial, and industrial buildings.
    - Field-made refrigerant joints indoors shall be tightness tested according to the following requirements: The

test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure. No leak shall be detected.

- correct the minimum room area of the space Amin by multiplying by the altitude adjustment factor (AF) factor in the table below based on for building site ground level altitude (Halt) in meters.

Halt	0	200	400	600	800	1,000	1,200	1,400	1,600
AF	1.00	1.00	1.00	1.00	1.02	1.05	1.07	1.10	1.12
Halt	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	
AF	1.15	1.18	1.21	1.25	1.28	1.32	1.36	1.40	

- Warning: keep any required ventilation openings clear of obstruction;
- Any servicing shall be performed only as recommended by the manufacturer

14. Qualification of workers

Any maintenance, service, and repair operations must require the qualification of the working personnel. Every working procedure that affects safety means shall only be carried out by competent people that joined the training and achieved competence shall be documented by a certificate. The training of these procedures is carried out by national training organizations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. All training shall follow the ANNEX HH requirements of UL 60335-2- 40 4th Edition.

Examples for such working procedures are:

- breaking into the refrigerating circuit;
- opening of sealed components;
- opening of ventilated enclosures.

Information servicing (For flammable materials)

1. Checks of the area

- Before 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 before conducting work on the system.

2. Work procedure

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

3 . General work area

- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

4. Checking for the presence of refrigerant

- The area should be checked with an appropriate refrigerant detector before 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.

5. Presence of a fire extinguisher

- If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

6. No ignition sources

- No person carrying out work on a refrigeration system that 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 be released to the surrounding space.
- Before work takes 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.

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.

8. Checks on 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 actual refrigerant charge is per 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 circuits shall be checked for the presence of refrigerant.
- marking on the equipment continues to be visible and legible; marking and illegible signs shall be corrected;
- refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance that may corrode refrigerant-containing components, unless the components are constructed of materials that are inherently resistant to being corroded or are suitably protected against being so corroded.

9. Checks on electrical devices

Repair and maintenance of 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 safely to avoid the possibility of sparking;
- that there are no live electrical components and wiring

exposed while charging, recovering, or purging the system;
- that there is continuity of earth bonding.

10. Sealed electrical components shall be replaced

- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon before any removal of sealed covers, etc.
  If it is necessary to have an electrical supply to the equipment during service, 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, an excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
  - Ensure that the apparatus is mounted securely.
  - Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall follow the manufacturer's specifications.

11. Intrinsically safe components must be replaced

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.

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 before working on them.

12. Wiring

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.

13. Detection of flammable refrigerants

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

The following leak detection methods are deemed acceptable for refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, 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 also 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.

NOTE

Examples of leak-detection fluids are

- bubble method,
- fluorescent method agents.

- If a leak is suspected, all naked flames shall be removed/extinguished.
- If leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (using shut-off valves) in a part of the system remote from the leak. See the following instructions for the removal of refrigerant.

14. Removal and evacuation

When breaking into the refrigerant circuit to make repairs - or for any other purpose conventional procedures shall be used. However, for flammable refrigerants best practice must be followed since flammability is a consideration.

The following procedure shall be adhered to:

- safely remove refrigerant following local and national regulations;
- evacuate;
- purge the circuit with inert gas (optional for A2L);
- evacuate (optional for A2L);
- continuously flush or purge with inert gas when using a flame to open the circuit; and open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerant purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to the atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available..

15. Charging procedures

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

- Works shall be undertaken with appropriate tools only (In case of uncertainty, please consult the manufacturer

of the tools for use with flammable refrigerants) 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.

- Ensure that the refrigeration system is earthed before 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.
- Before recharging the system, it shall be pressure tested with oxygen-free nitrogen (OFN). The system shall be leak tested on completion of charging but before commissioning. A follow-up leak test shall be carried out before leaving the site.

16. Decommissioning

Before carrying out this procedure, the technician must be completely familiar with the equipment and all its details. It is recommended good practice that all refrigerants are recovered safely. Before the task is carried out, an oil and refrigerant sample shall be taken in case analysis is required before the re-use of recovered refrigerant. Electrical power must be available before the task commences.

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

17. Labelling

Equipment shall be labeled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

18. Recovery

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

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i. e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valves 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 the flammable refrigerant. If in doubt, the manufacturer should be consulted. 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.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units 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 compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

19. Transportation, marking, and storage for units that employ flammable refrigerants

a. **General** - The following information is provided for units that employ FLAMMABLE REFRIGERANTS.
b. **Transport of equipment containing flammable refrigerants** - Attention is drawn to the fact that additional transportation regulations may exist concerning equipment containing flammable gas. The maximum number of pieces of equipment or the configuration of the equipment permitted to be transported together will be determined by the applicable transport regulations.
   - Cylinders shall be kept upright.
c. **Marking of equipment using signs** - Signs for similar appliances used in a work area are generally addressed by local regulations and give the minimum requirements for the provision of safety and/or health signs for a work location.

   All required signs are to be maintained, and employers should ensure that employees receive suitable and sufficient instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs.

   The effectiveness of signs should not be diminished

by too many signs being placed together.
Any pictograms used should be as simple as possible and contain only essential details.

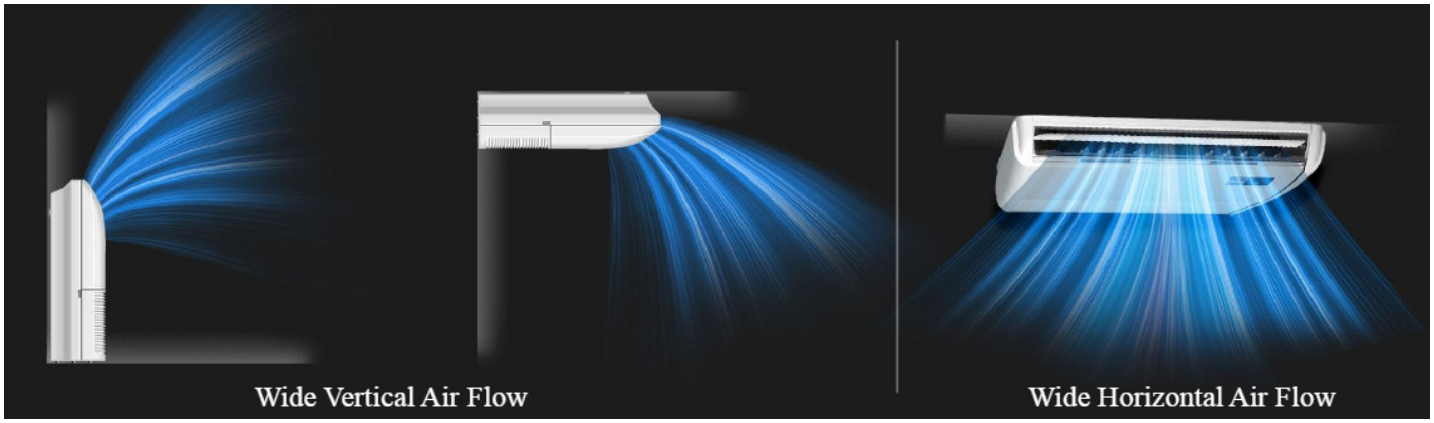
d. **Disposal of equipment using flammable refrigerants See national regulations.**

e. **Storage of equipment/appliances -** The storage of the appliance should be following the applicable regulations or instructions, whichever is more stringent.

f. **Storage of packed (unsold) equipment -** Storage package protection should be constructed in such a way that mechanical damage to the equipment inside the package will not cause a leak of the REFRIGERANT CHARGE.
The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

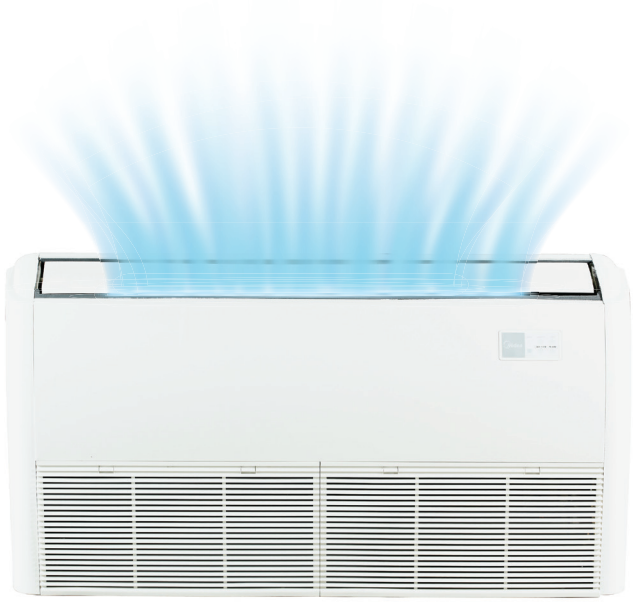
Features

3D Airflow



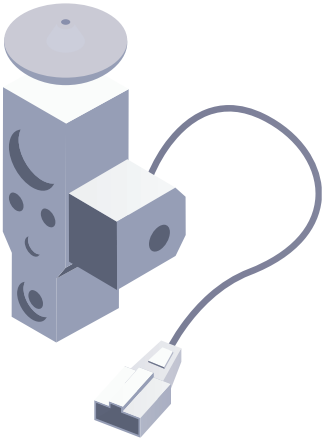
The remote controller can adjust vertical air flow and horizontal airflow to direct air flow to every corner of the room.

Easy installation-2 Style Installation
Fashionable design and streamlined appearance, suitable for different room styles.



Fresh Air
The fresh air intake function provides you with fresh and comfortable air.

Easy Maintenance-Universal Spare Parts
More than 60% of parts and assemblies (such as fan wheel, plastic cases, metal parts, etc.) are universal for 3 different bodies, which makes maintenance much easier.



Dimension Drawing

Fig. D-1: Unit Dimensions

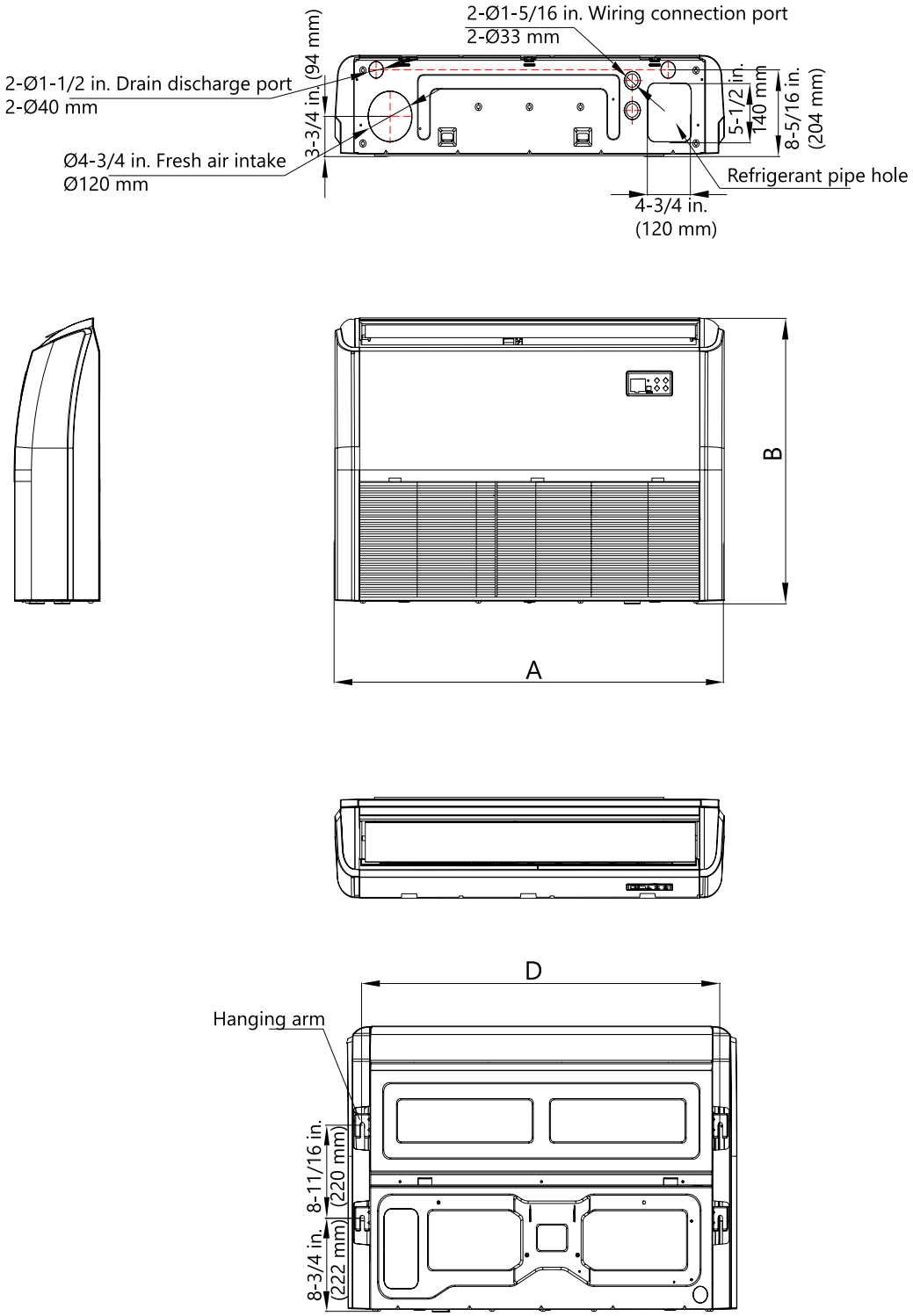
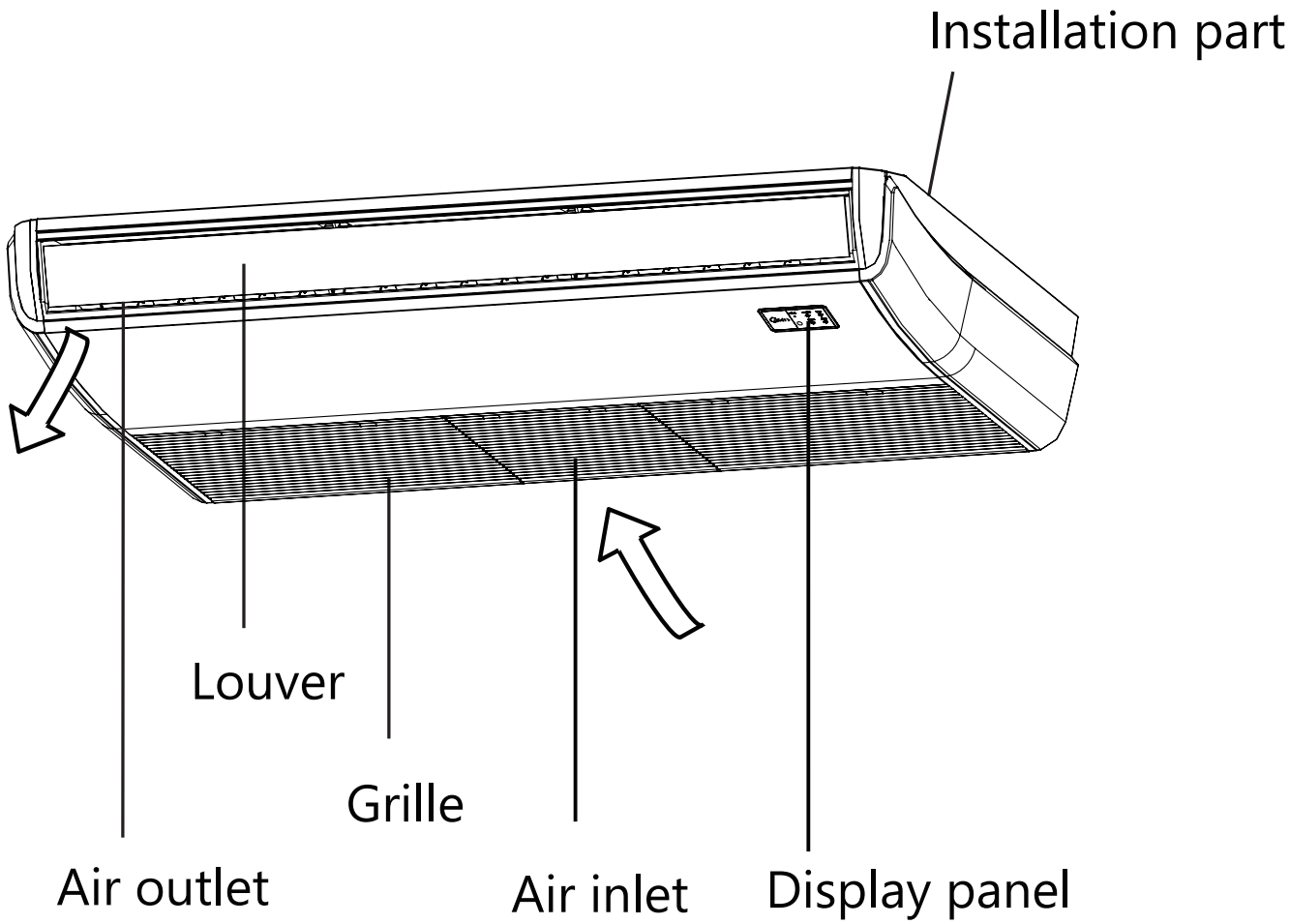


Table D-1: Dimensions

Model (Btu/h)	Unit	A	B	C	D
18-24K	mm	1068	675	235	983
	in.	42	26-1/2	9-1/2	38-3/4
36-60K	mm	1650	675	235	1565
	in.	65	26-1/2	9-1/4	61.61

Component Location



Clearances

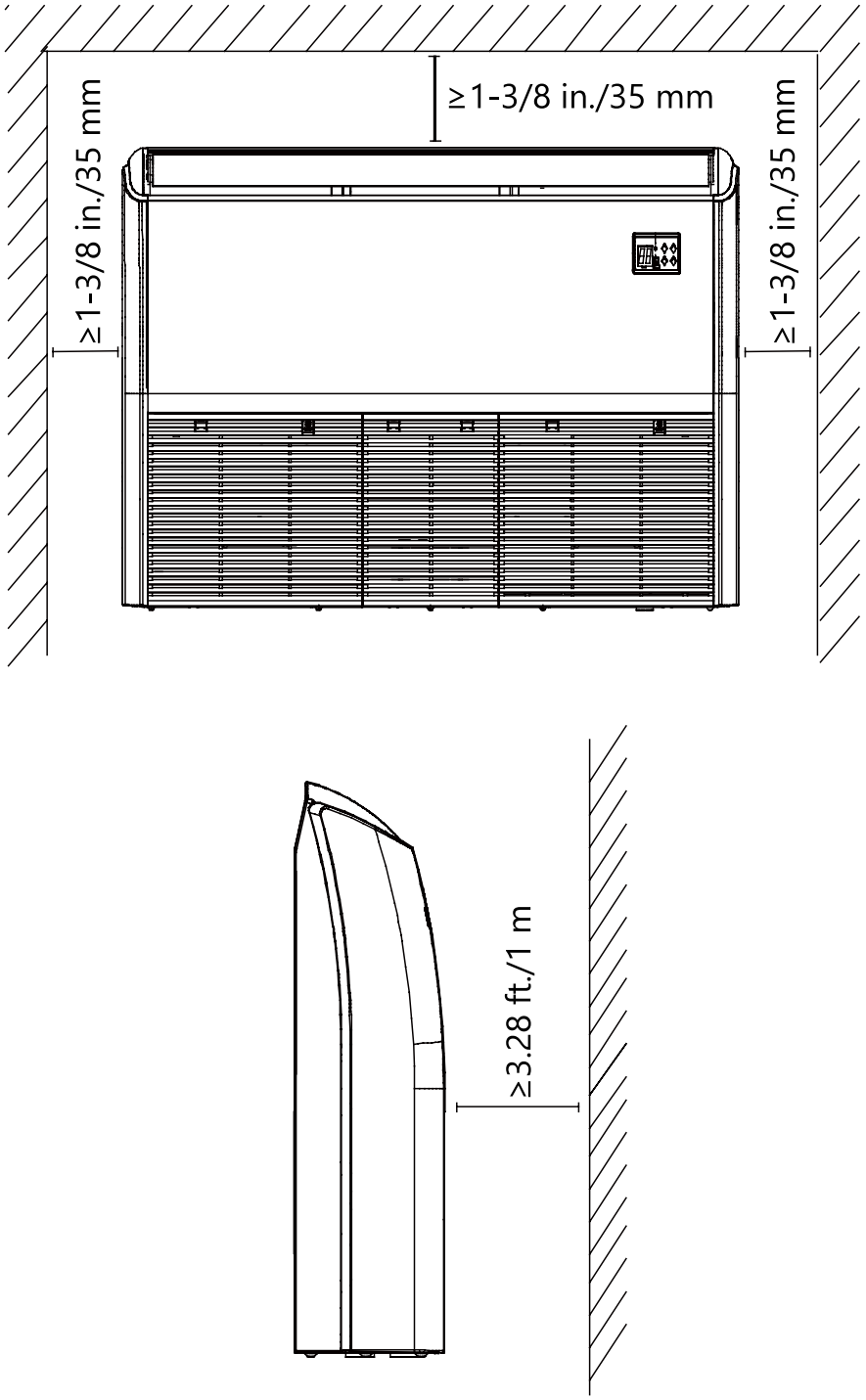


Fig. C-1: Clearance Dimensions

Accessories

The system is shipped with the following accessories. Use all the installation parts and accessories to install the system. Improper installation may result in water leakage, electrical shock, and fire, or cause the equipment to fail.

Table A-1: Included Accessories

QTY.	Part Name	Part Image
3	Manual	
1	Soundproof/ insulation sheath	
1	Outlet pipe sheath	
2	Outlet pipe clasp	
1	Drain joint	
1	Seal ring	
1	Conduit installation plate	
1	Remote control	
2	Dry battery AAA	
1	Magnetic ring	
2	Copper nut	

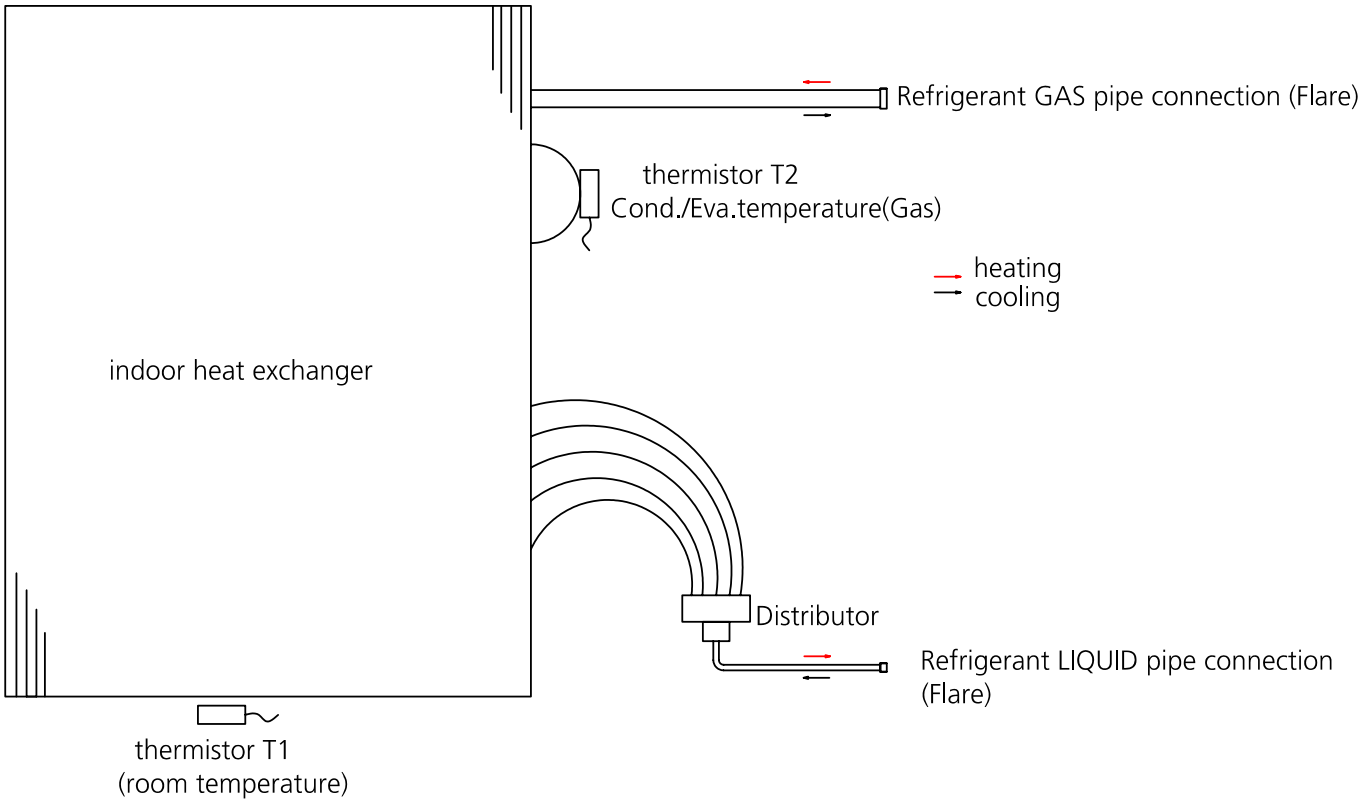
Table A-2: Optional Accessories

QTY.	Part Name	Part Image
2	Screws to attach the remote controller holder	
1	Remote control holder	

Optional accessories:

- There are two types of remote controls: wired and wireless.
- Select a remote control based on customer preferences and requirements and install it in an appropriate place.
- Refer to catalogues and technical literature for guidance on selecting a suitable remote control.

Refrigerant System Diagram

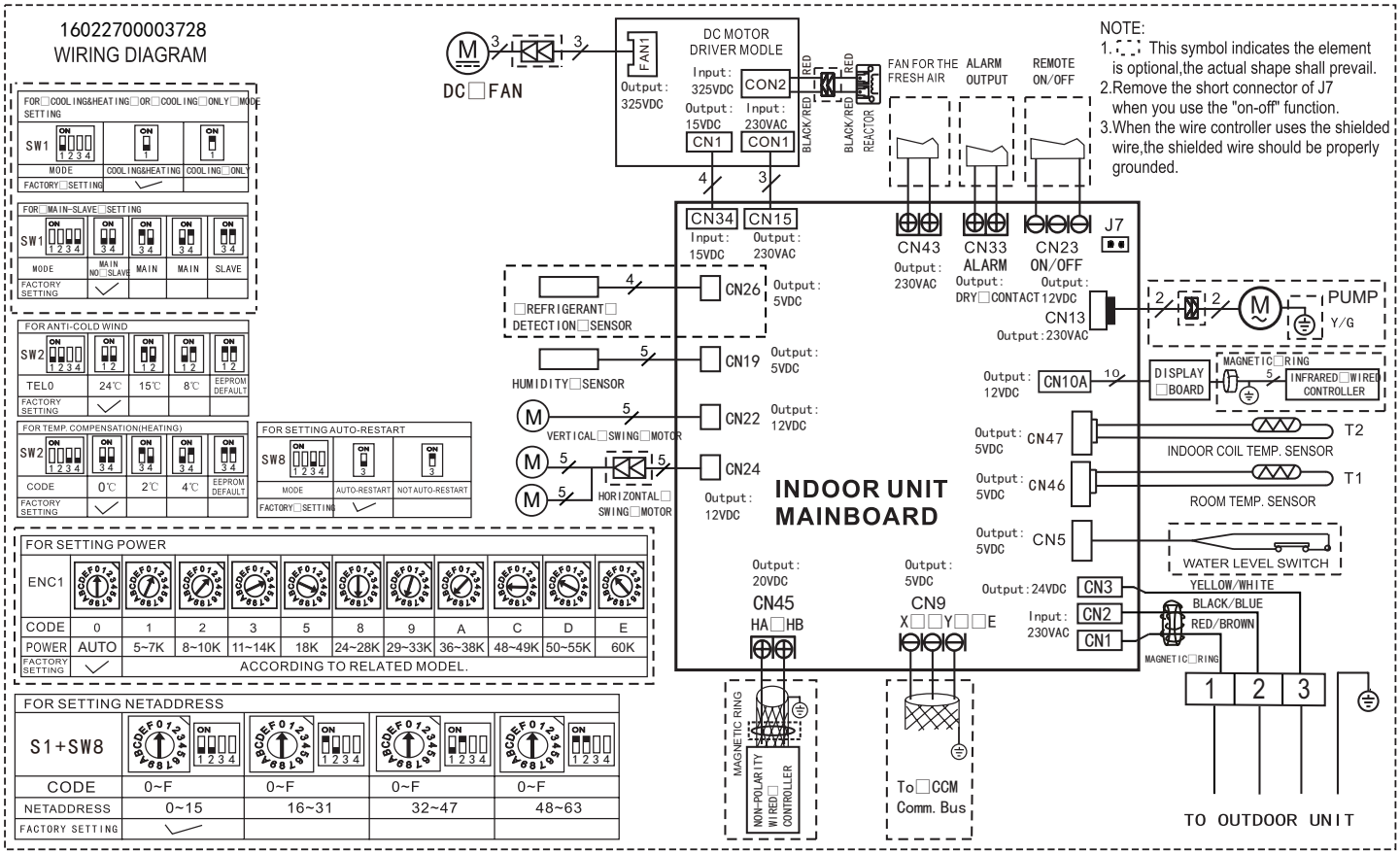


Electrical Characteristics

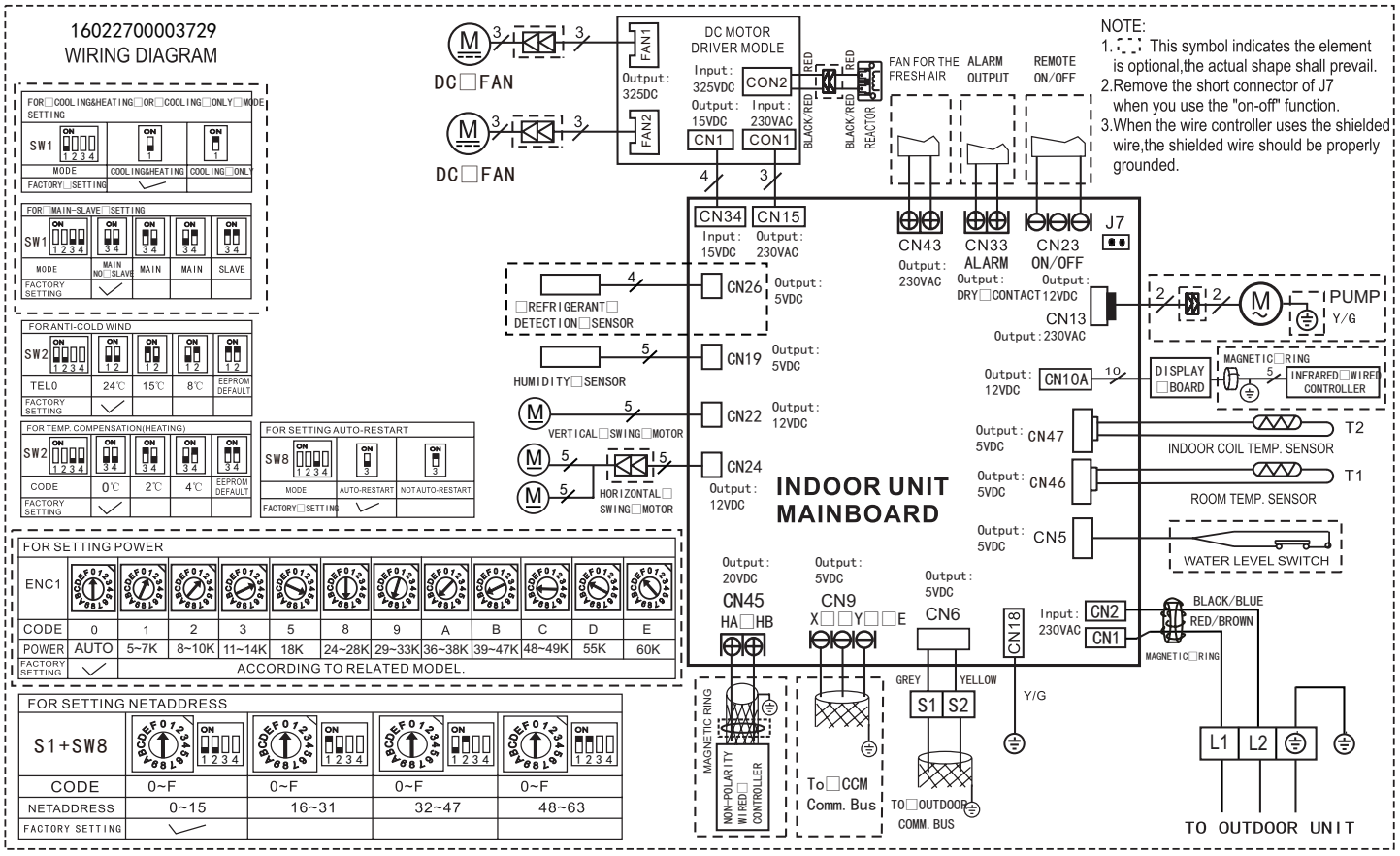
IDU Model		18k	24k	36k	48k	60k
Power	Phase	1				
	Frequency And Volt	208/230V,60Hz				
Minimum Circuit Ampacity	A	1.9	2.5			3
Max Fuse	A	15				

Electrical Wiring Diagrams

18k~24k

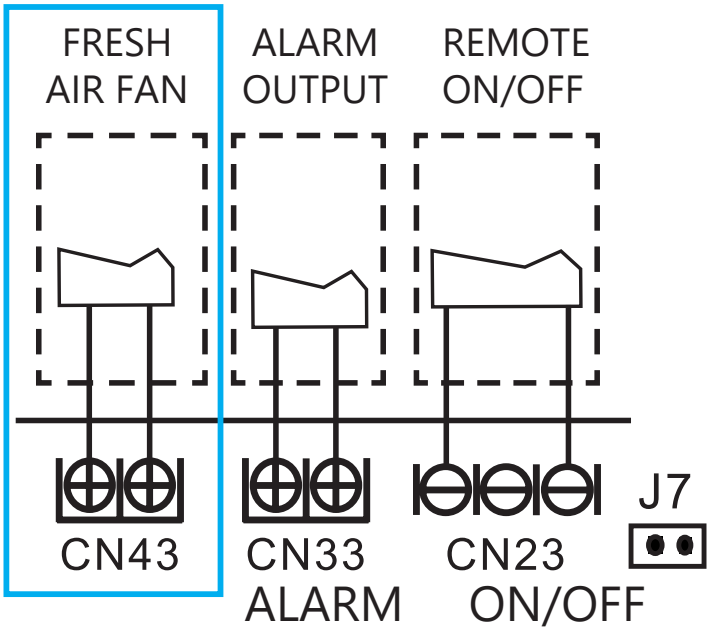


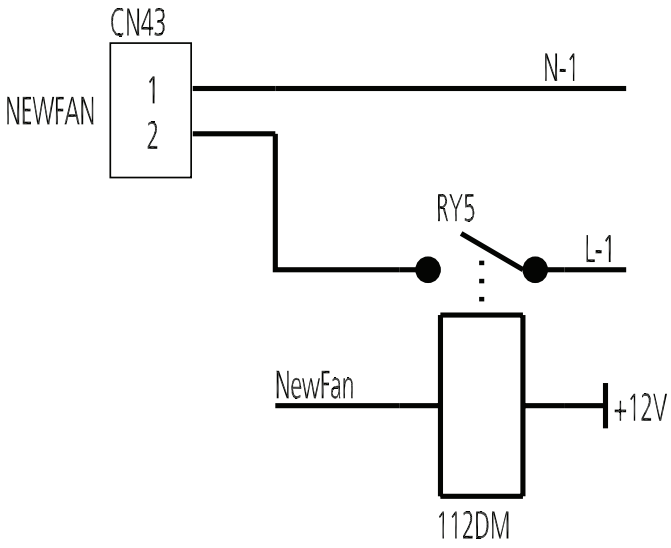
36k-60k



Optional Function Wiring

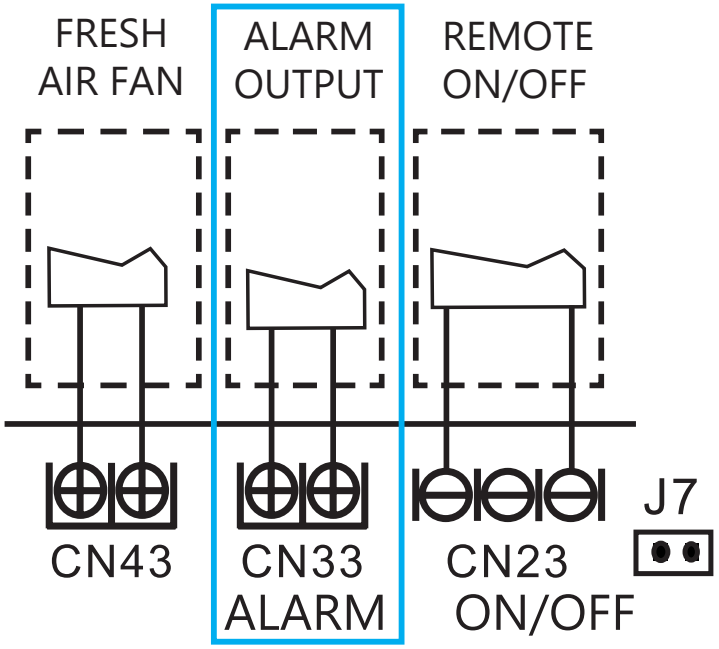
A. For a new, fresh motor terminal port (also for the Anion generator), CN43:

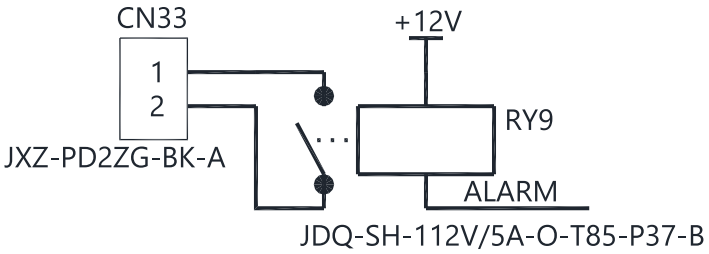




1. Connect the fan motor to the port, no need to care L/N of the motor;
2. The output voltage is the power supply;
3. The fresh motor can not exceed 200W or 1A, follow the smaller one;
4. The new fresh motor will work when the indoor fan motor works; when the indoor fan motor stops, the new fresh motor will stop;
5. When the unit enters force cooling mode or capacity testing mode, the fresh motor doesn't work.

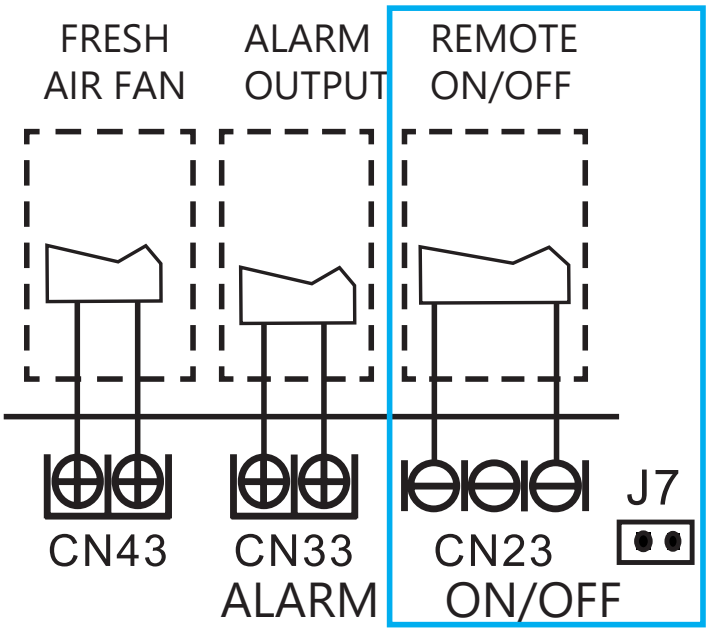
B. For Alarm Terminal Port CN33



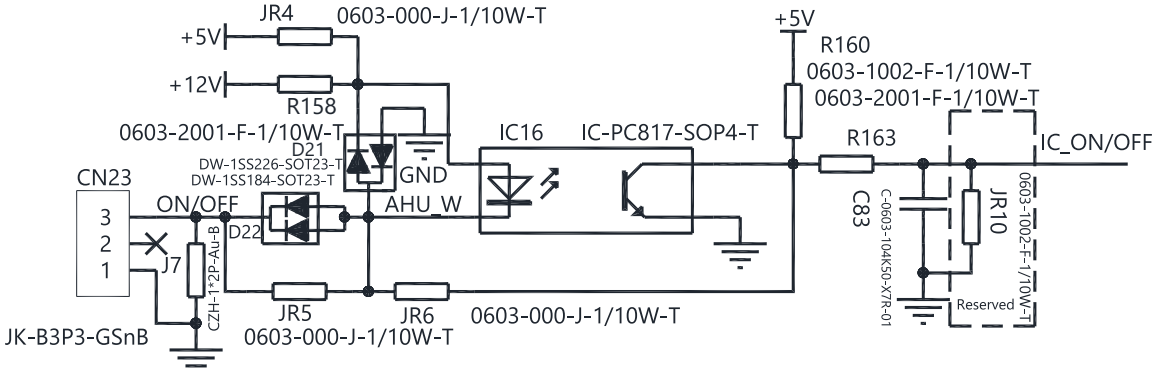


1. Provide the terminal port to connect ALARM, but no voltage on the terminal port, the power from the ALARM system (not from the unit);
2. Although the design voltage can support higher voltage, we strongly ask you to connect the power at less than 24V, current of less than 0.5A;
3. When the unit detects the problem, the relay will be closed, and then the ALARM will work.

C. For The Remote Control (ON-OFF) Terminal Port CN23 And The Short Connector Of J7



1. Remove the short connector of J7 when you use the ON-OFF function.
2. When the remote switch is off (OPEN), the unit is off;
3. When the remote switch is turned on (CLOSE), the unit is on;
4. When close/open the remote switch, the unit responds to the demand within 2 seconds;
5. When the remote switch is turned on, you can use the remote controller/ wire controller to select the mode that you want; when the remote switch is turned off, the unit will not respond to the demand from the remote controller/ wire controller. when the remote is switched off, but the remote controller/wire controller is on, the CP code would be shown on the display board.
6. The voltage of the port is 12V DC, design Max. current is 5mA.



Micro-Switch Introduction

FOR COOLING & HEATING OR COOLING ONLY MODE SETTING		
SW1 (ON, 1 2 3 4)	ON, 1	ON, 1
MODE	COOLING&HEATING	COOLING ONLY
FACTORY SETTING	✓	

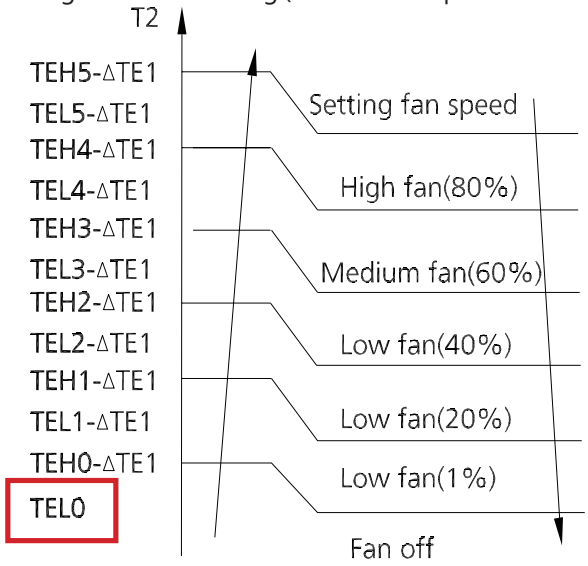
A. Micro-switch SW1 is for the selection of the mode.
Range: COOLING&HEATING, COOLING ONLY.

FOR MAIN-SLAVE SETTING				
SW1 (ON, 1 2 3 4)	ON, 3 4	ON, 3 4	ON, 3 4	ON, 3 4
MODE	MAIN NO SLAVE	MAIN	MAIN	SLAVE
FACTORY SETTING	✓			

B. Micro-switch SW1 is for setting the master or slave unit when the unit is in twin connection.
Range: Master no slave (Normal 1 drive 1 connection), Master (2 positions without difference), Slave.

FOR ANTI-COLD WIND				
SW2 (ON, 1 2 3 4)	ON, 1 2	ON, 1 2	ON, 1 2	ON, 1 2
TEL0	75°F 24°C	59°F 15°C	46°F 8°C	EEPROM DEFAULT
FACTORY SETTING	✓			

C. Micro-switch SW2 is for selection of indoor fan stop temperature (TEL0) when it is in anti-cold wind action in heating mode. Range: 75.2°F (24°C), 59°F (15°C), 46.4°F (8°C), according to EEROM setting (reserved for special customizing).

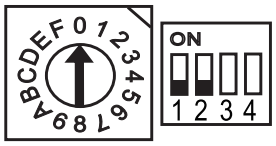
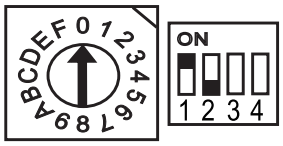
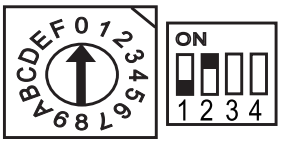
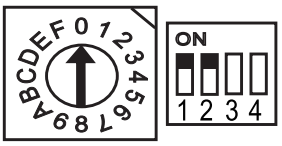


FOR TEMP. COMPENSATION(HEATING)				
SW2 (ON, 1 2 3 4)	ON, 3 4	ON, 3 4	ON, 3 4	ON, 3 4
CODE	43°F 6°C	36°F 2°C	39°F 4°C	EEPROM DEFAULT
FACTORY SETTING	✓			

D. Micro-switch SW2 is for the selection of temperature compensation in heating mode. This helps to reduce the real temperature difference between the ceiling and floor so that the unit can run properly. If the height of installation is lower, a smaller value could be chosen.
Range: 43°F (6°C), 36°F (2°C), 39°F (4°C), E function (reserved for special customizing).

FOR SETTING AUTO-RESTART		
SW8 (ON, 1 2 3 4)	ON, 3	ON, 3
MODE	AUTO-RESTART	NOT AUTO-RESTART
FACTORY SETTING	✓	

E. Micro-switch SW8 is for the selection of the auto-restart function.
Range: Active, inactive

FOR SETTING NETADDRESS				
S1+SW8				
CODE	0~F	0~F	0~F	0~F
NETADDRESS	0~15	16~31	32~47	48~63
FACTORY SETTING	✓			

F. Micro-switch S1 and dial-switch SW8 are for address setting when you want to control this unit by a central controller. Range: 00-63.

FOR SETTING POWER												
ENC1												
CODE	0	1	2	3	5	8	9	A	B	C	D	E
POWER	AUTO	5~7K	8~10K	11~14K	18K	24~28K	29~33K	36~38K	39~47K	48~49K	55K	60K
FACTORY SETTING	✓	ACCORDING TO RELATED MODEL.										

G. Dial-switch ENC1: The indoor PCB is universally designed for the whole series of units from 5K to 60K. This ENC1 setting will tell the main program what size the unit is.
Range: AUTO, 5-7K,8-10K,....,60K

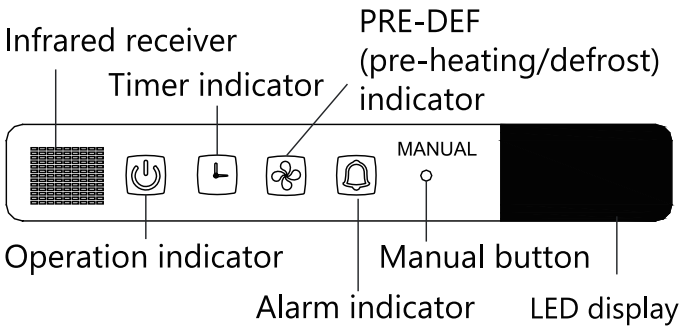
NOTE

AUTO means the indoor unit is equipped with different outdoor units, which can automatically identify the capacity of the outdoor unit, model, mono or multi zone, and match the indoor unit parameters.
Usually, there is glue on it because the switch position cannot be changed at random unless you want to use this PCB as a spare part to use in another unit. Then you have to select the right position to match the size of the unit.

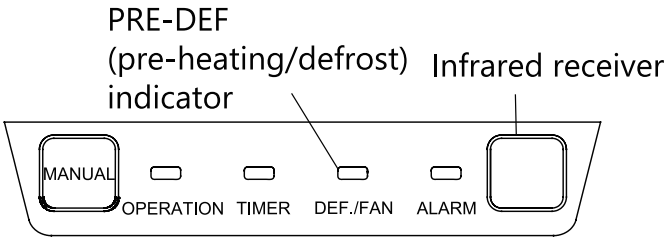
Product Features

Display Function

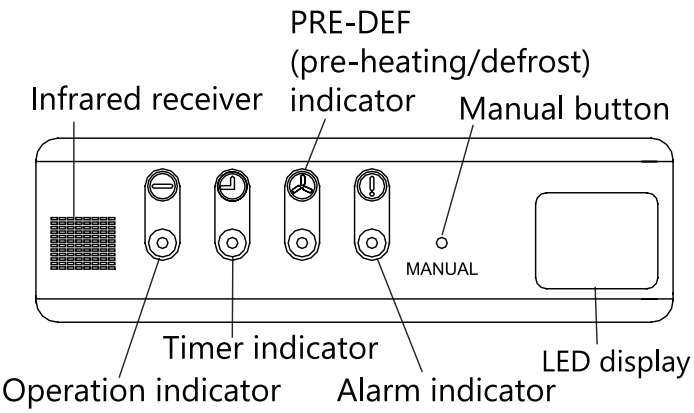
Floor Ceiling Type



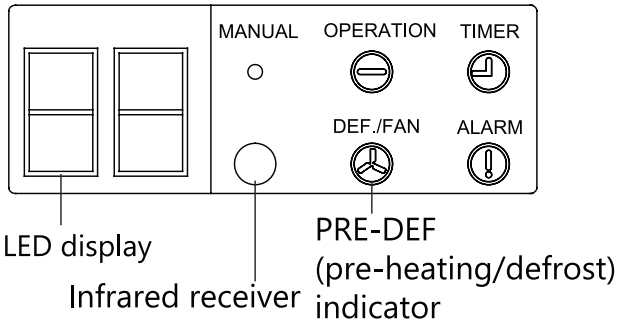
Display 1



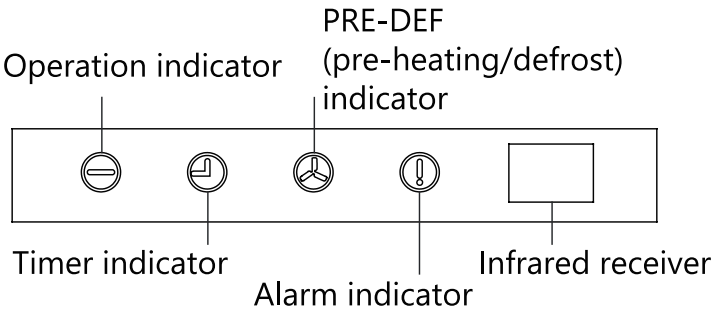
Display 2



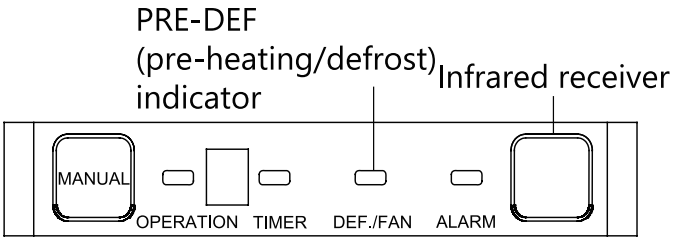
Display 3



Display 4



Display 5



Display 6

NOTE

Please select the display function according to the type of product you purchased.

Safety Features

Compressor Three-Minute Delay At Restart

Compressor functions are delayed for up to ten seconds 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 nine seconds, 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 louver is automatically activated, and the indoor fan will operate after a period of setting time or when the louver is in place.
- If the unit is in heating mode, the indoor fan is regulated by the anti-cold wind function.

Compressor Preheating

Preheating is automatically activated when the T4 sensor is lower than the set temperature.

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.

Basic Functions

Functions		Auto mode		
Cases		Case 1	Case 2	Case 3
Models	18k-60k		√	

NOTE

The detailed description of case 1 or case 2 is shown in the following function sections.

Abbreviation

Unit element abbreviations

Abbreviation	Element
T1	Indoor room temperature
T2	Coil temperature of the evaporator
T3	Coil temperature of the condenser
T4	Outdoor ambient temperature
TP	Compressor discharge temperature
Tsc	Adjusted setting temperature
CDIFTEMP	Cooling shutdown temperature
HDIFTEMP2	Heating shutdown temperature

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

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% and 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 75°F (24°C).

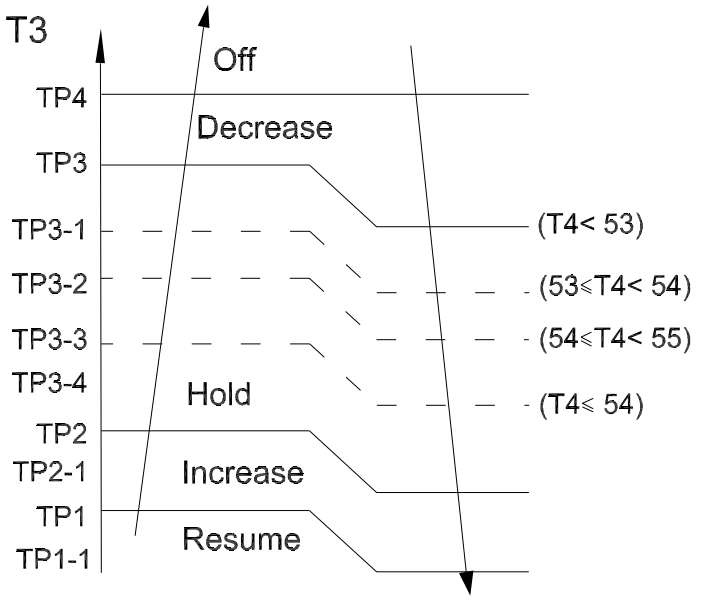
Cooling Mode

Indoor Fan Control

1. In cooling mode, the indoor fan operates continuously. The fan speed can be set to 1%-100%, or low, medium, high, and auto.
2. Auto fan action in cooling mode:

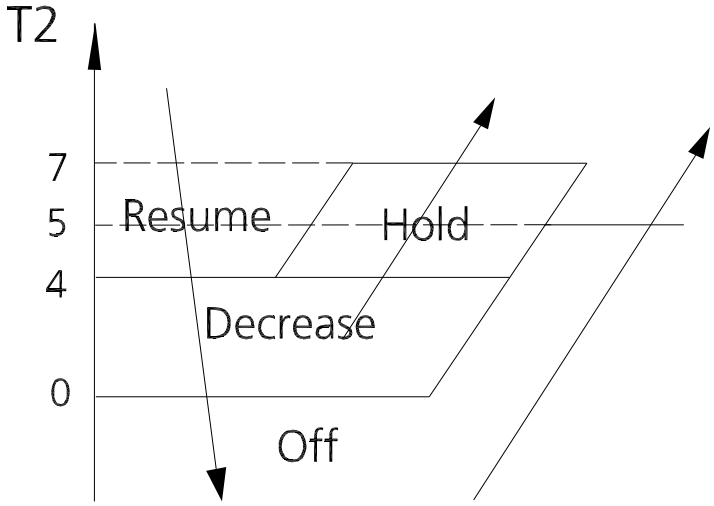
- Descent curve
  - When T1-Tsc is lower than to 3.5°C/6.3°F, fan speed reduces to 80%;
  - When T1-Tsc is lower than to 1°C/1.8°F,, fan speed reduces to 60%;
  - When T1-Tsc is lower than to 0.5°C/0.9°F, fan speed reduces to 40%;
  - When T1-Tsc is lower than to 0°C/0°F, fan speed reduces to 20%;;
  - When T1-Tsc is lower than to -0.5°C/-0.9°F, fan speed reduces to 1%;.
- Rise curve
  - When T1-Tsc is higher than or equal 0°C/0°F, fan speed increases to 20%;;
  - When T1-Tsc is higher than or equal 0.5°C/0.9°F, fan speed increases to 40%;
  - When T1-Tsc is higher than or equal 1°C/1.8°F,, fan speed increases to 60%;
  - When T1-Tsc is higher than or equal 1.5°C/2.7°F, fan speed increases to 80%;
  - When T1-Tsc is higher than or equal 4°C/7.2°F, fan speed increases to 100%.

Condenser Temperature Protection



When the condenser temperature exceeds a configured value, the compressor ceases operation.

Evaporator Temperature Protection

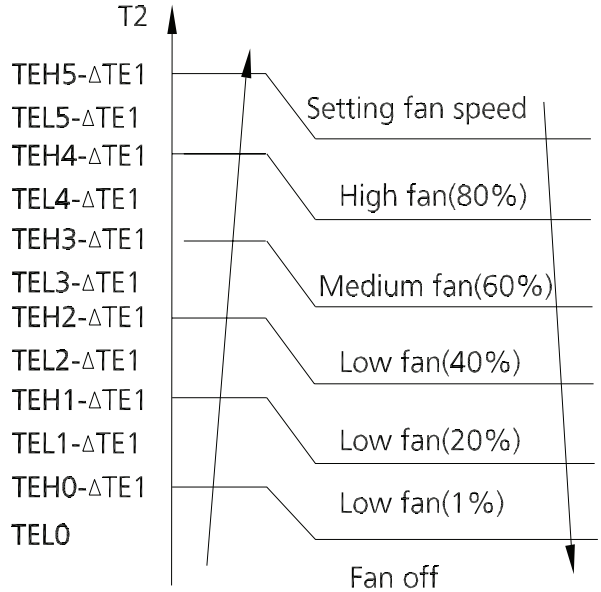


- Off: Compressor stops.
- Decrease: Decrease the running frequency to a lower level per 1 minute.
- Hold: Keep the current frequency.
- Resume: No limitation for frequency.

Heating Mode (Heat Pump Units)

Indoor Fan Control:

1. In heating mode, the indoor fan operates continuously. The fan speed can be set to 1%-100% and auto.
   - Anti-cold air function
   - If the temperature difference of T2 changes during auto fan and causes the fan speed to change, run the current fan speed for 30 seconds first, the default interval is the interval before the fan speed changes, and then judge T2 according to the anti-cold air interval.



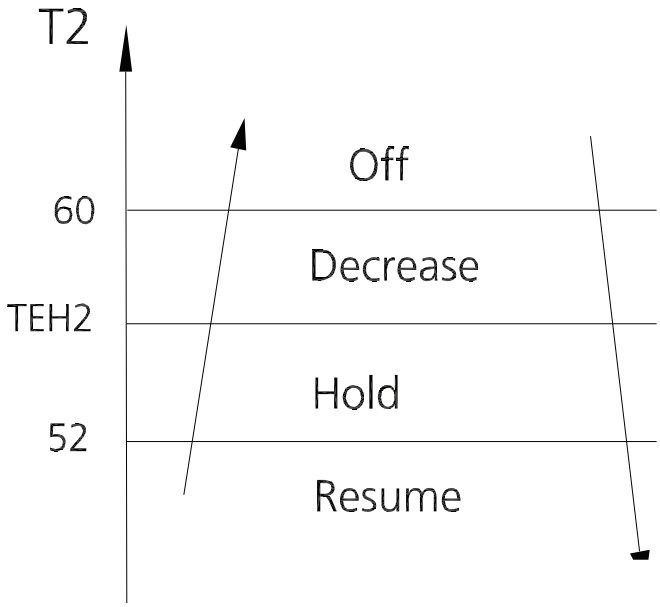
ΔTE1=0

2. Auto fan action in heating mode:

- Rise curve
  - When T1-Tsc is higher than -1.5°C/-2.7°F,, fan speed reduces to 80%;
  - When T1-Tsc is higher than 0°C/0°F, fan speed reduces to 60%;
  - When T1-Tsc is higher than 0.5°C/0.9°F, fan speed reduces to 40%;
  - When T1-Tsc is higher than 1°C/1.8°F, fan speed reduces to 20%.
- Descent curve
  - When T1-Tsc is lower than or equal to 0.5°C/0.9°F, fan speed increases to 40%;
  - When T1-Tsc is lower than or equal to 0°C/0°F, fan speed increases to 60%;
  - When T1-Tsc is lower than or equal to -1.5°C/- 2.7°F,, fan speed increases to 80%;
  - When T1-Tsc is lower than or equal to -3°C/-5.4°F, fan speed increases to 100%.

Evaporator Coil Temperature Protection

- Off: Compressor stops.
- Decrease: Decrease the running frequency to the lower level per 20 seconds.
- Hold: Keep the current frequency.
- Resume: No limitation for frequency.



Auto-mode

This mode can be selected with the remote controller, and the temperature setting can be adjusted between 61°F~86°F (16°C~30°C).

Case 1:

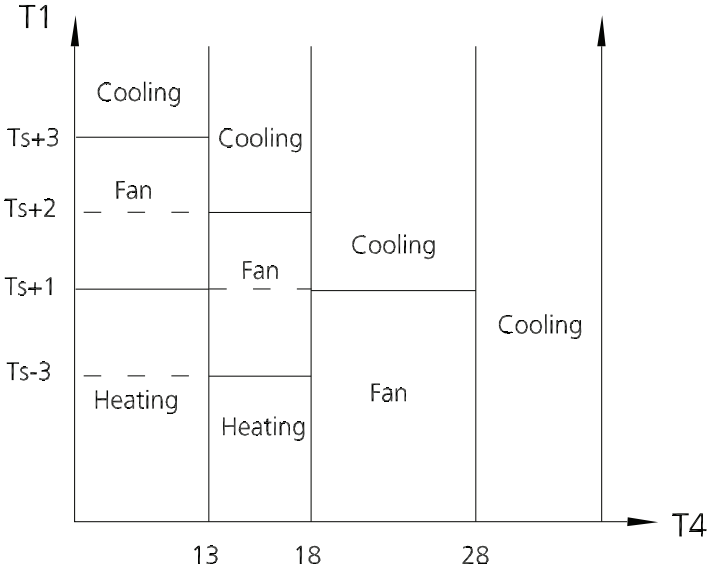
- In auto mode, the machine selects cooling, heating, or fan-only mode based on ΔT (ΔT =T1-TS).

ΔT	Running mode
ΔT> 3.6°F (2°C)	Cooling
-5.4°F ( )≤ΔT≤ 3.6°F (2°C)	Fan-only
ΔT<-5.4°F (-3°C)	Heating*

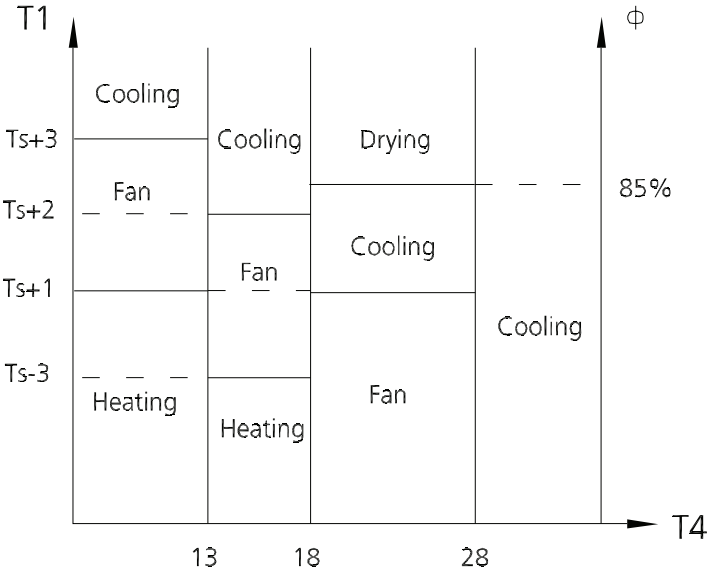
Heating*: In auto mode, cooling-only models run the fan.

- Indoor fan will run at auto fan speed.
- The louver operates the same as in the relevant mode.
- If the machine switches mode between heating and cooling, the compressor will keep stopping for a certain time, and then choose the mode according to ΔT.

Case 2:
In auto mode, the machine selects cooling, heating, or fan-only mode on the basis of T1, Ts and Outdoor ambient temperature (T4).



Case 3:
In auto mode, the machine selects cooling, heating or fan-only mode on the basis of T1,Ts, Outdoor ambient temperature (T4) and relative humidity (φ).



Drying Mode

- In drying mode, AC operates the same as the auto fan in cooling mode.
- All protections are activated and operate the same as they do in cooling mode.
- Low Room Temperature Protection

If the room temperature is lower than 50°F/10°C, the compressor ceases operations and does not resume until the room temperature exceeds 53.6°F/12°C.

Forced operation function

Press the AUTO/COOL button, and the AC will run in the following sequence:

Forced auto→Forced cooling→Off

- Forced cooling mode:

The compressor and outdoor fan continue to run, and the indoor fan runs at breeze speed. After running for 30 minutes, the AC will switch to auto mode with a preset temperature of 76°F (24°C).

- Forced auto mode:

Forced auto mode operates the same as normal auto mode with a preset temperature of 76°F (24°C).

- The unit exits forced operation when it receives the following signals:
  - Switch off
  - Changes in:
    - mode
    - fan speed
    - sleep mode
    - Follow me

Timer Function

- The timing range is 24 hours.
- Timer On. The machine turns on automatically at the preset time.
- Timer Off. The machine turns off automatically at the preset time.
- Timer On/Off. The machine turns on automatically at the preset On Time and then turns off automatically at the preset Off Time.
- Timer Off/On. The machine turns off automatically at the preset Off Time and then turns on automatically at the preset On Time.
- The timer does not change the unit's operation mode. If the unit is currently off, it will not start up immediately after the "timer off" function is activated. When the setting time is reached, the timer LED switches off and the unit's running mode remains unchanged.
- The timer uses relative time, not clock time.

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 1.8°F/1°C (to not higher than 86°F/30°C) every hour. After 2 hours, the temperature stops rising, and the indoor fan is fixed at low speed.
  - When heating, the temperature decreases 1.8°F/1°C (to not lower than 60.8°F/16°C) 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 operating time for sleep mode is 8 hours, after which, the unit exits this mode.
- The timer setting is available in this mode.

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.

8°C Heating (Heat Pump Units)

In heating mode, the temperature can be set to as low as 46.4°F/8°C, preventing the indoor area from freezing if unoccupied during severe cold weather.

Follow Me

- Once the follow me function is 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 sensor and settings.

Optional Functions

Silence (Multi-Zone Systems Do Not Have This Function)

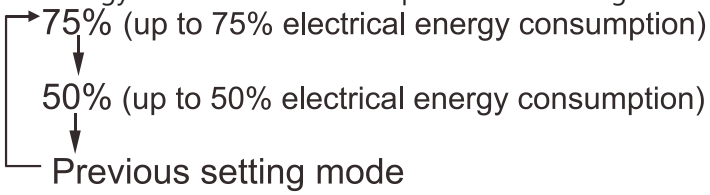
- Press "Silence" or keep pressing the Fan button for more than 2 seconds on the remote control to enable the SILENCE function. While this function is active, the compressor frequency is maintained at a lower level than F3. The indoor unit will run at a faint breeze (1%), which reduces noise to the lowest possible level.
- When matched with a multi-outdoor unit, this function is disabled.

Eco Function (Multi-Zone Systems Do Not Have This Function)

- Used to enter the energy-efficient mode.
  - Under cooling mode, press the ECO button, the remote controller will adjust the temperature automatically to 75°F/24°C, fan speed of Auto to save energy (but only if the set temperature is less than 75°F/24°C). If the set temperature is more than 75°F/24°C and 86°F/30°C, press the ECO button, the fan speed will change to Auto, and the set temperature will remain unchanged.
- When pressing the ECO button, or modifying the mode, or adjusting the set temperature to less than 75°F/24°C, the AC will quit the ECO operation.
- Operation time in ECO mode is 8 hours. After 8 hours, the AC quits this mode.

Electrical Energy Consumption Control Function (Multi-Zone Systems Do Not Have This Function)

Press the "Gear" button on the remote controller to enter the energy efficient mode in a sequence of following:



Turn off the unit or activate ECO, sleep, Super cool, 8°C Heating, Silence, or self-clean function will quit this function.

Breeze Away function (for some models) (Multi-Zone Systems do not have this function)

- This feature avoids direct airflow blowing on the body and makes you feel indulging in silky coolness.

NOTE

This feature is available under cooling mode, fan-only mode, and drying mode.

Active Clean Function (Multi-Zone Systems Do Not Have This Function)

- The Active Clean Technology washes away dust, mold, and grease that may cause odors when it adheres to the heat exchanger by automatically freezing and then rapidly thawing the frost. The internal wind wheel then keeps operating to blow-dry the evaporator, thus preventing the growth of mold and keeping the inside clean.
- When this function is turned on, the indoor unit display window appears "CL". After 20 to 45 minutes, the unit will turn off automatically and cancel the Active Clean function.

Troubleshooting

⚠ WARNING

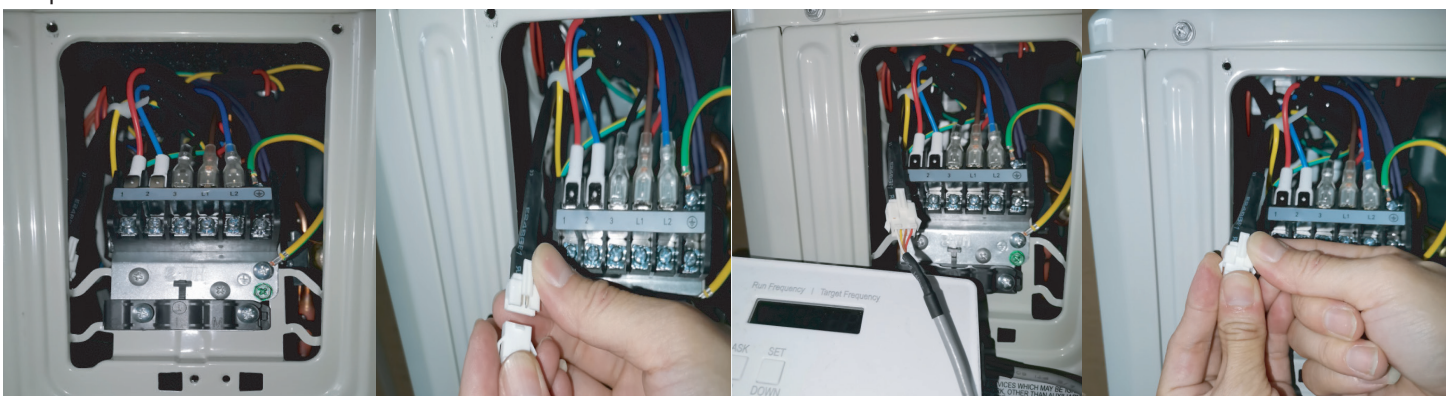
Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. While checking indoor/outdoor PCBs, please equip yourself with antistatic gloves or wrist strap to avoid damage to the board.

⚠ WARNING

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

NOTE

If using the inverter test tool for maintenance, remove the big handle, take out the detection cable, take out the female end of the cable, and connect the inverter test tool. After the maintenance is completed, insert the female end back into the port.



NOTE

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

Indoor Unit Diagnostic Guide

When the indoor unit encounters a recognized error, the operation lamp will flash in a corresponding series, the timer lamp may turn on or begin flashing, and an error code will be displayed. These error codes are described in the following table:

Indoor Unit Diagnostic Codes

Display	Error Information	Solution
FC	Forced cooling (Not an error code)	--
EC07	ODU fan speed is out of control	page 43
EC51	ODU EEPROM parameter error	page 39
EC52	ODU coil temp. sensor (T3) error	page 45
EC53	ODU ambient temp. sensor (T4) error	
EC54	COMP. discharge temp. sensor (TP) error	
EC56	IDU coil outlet temp. sensor (T2B) error(Multi-zone)	
ECC1	The other IDU refrigerant sensor detects leakage (Multi-zone)	page 56
EH00	IDU EEPROM malfunction	page 39
EH03	IDU fan speed out of control	page 43
EH0A	IDU EEPROM parameter error	page 39
EH0E	Water-level alarm malfunction	page 47
EH12	Main unit or secondary units malfunction	page 57
EH3A	External fan DC bus voltage is too low protection	page 55
EH3b	External fan DC bus voltage is too high fault	
EH60	IDU room temp. sensor (T1) error	page 45
EH61	IDU evaporator coil temp. sensor (T2) error	
EH6A	Communication error between the indoor unit and the external fan module	page 55
EHC1	Refrigerant sensor detects leakage	page 56
EHC2	Refrigerant sensor is out of range and leakage is detected	
EHC3	Refrigerant sensor is out of range	page 55
EL01	IDU & ODU communication error	page 40
EL0C	System lacks refrigerant	page 46
EL11	Communication malfunction between main unit and secondary units	page 57
FHCC	Refrigerant sensor error	page 55
PC00	ODU IPM module protection	page 48
PC01	ODU voltage protection	page 49
PC02	Compressor top (or IPM) temp. protection	page 53
PC03	Pressure protection (low or high pressure) (for some models)	page 51
PC04	Inverter compressor drive error	page 50
PC0L	Low ambient temperature protection(for some models)	page 53
----	IDUs mode conflict(Multi-zone)	--

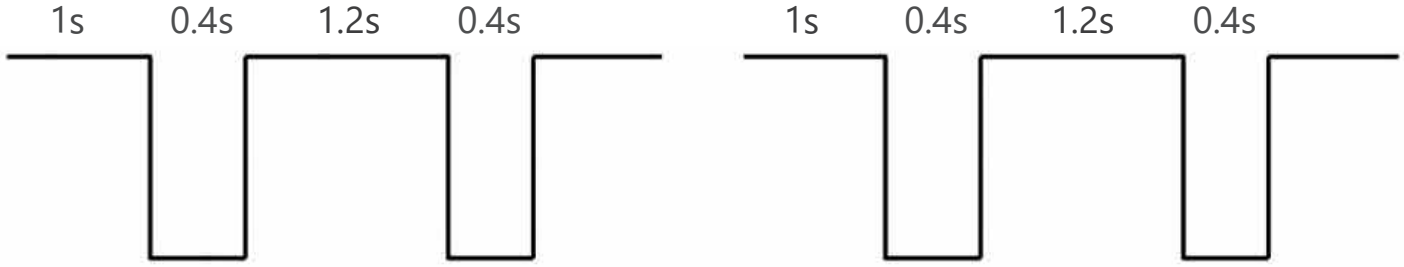
For other errors:

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.

LED flash frequency:



Error Display on Two-Way Communication Wired Controller

Display	Malfunction or Protection	Solution
EH63	Communication malfunction between wire and master control (for KJR-120X/KJR-120M/KJR-120N series wired controller)	page 54

The other error codes displayed on the wire controller are the same as those on the unit.

Engineering Mode

Information Inquiry

To enter the engineering mode, and check the data of the system (data checking mode), Please take the following steps:

1. Make sure that the AC is on standby status, or working normally in a non-locked condition.
2. Press "Power" + "Fan" buttons together for 7s until the remote controller screen shows "0", and "Auto, Cool, Dry, Heat, Battery "icons will be displayed at the same time.
3. Press the "Up" or "Down" button to choose a different channel number that you want to check (from 0-30) on the remote controller, and then the display will show the parameter value.

Channel	Code	Meaning	Remark
0		Error code	Refer to next list of error code Empty means no error
1	T1	Room temperature	Actual data, °C/°F
2	T2	Indoor coil temperature	Actual data,°C/°F
3	T3	Outdoor coil temperature	Actual data, °C/°F
4	T4	Ambient temperature	Actual data, °C/°F
5	TP	Discharge temperature	Actual data,°C/°F
6	FT	Targeted frequency	Actual data
7	Fr	Actual frequency	Actual data
8	dL	Running current	3.2A=3
9	AC	AC voltage	
10	Sn	Reserved	
11	od	Indoor operating mode	0-Off; 1-Cooling; 2-Heating; 3-Fan only; 4-Drying; 5-Auto; 7-defrosting; 12-Active clean
12	Pr	Indoor air flow	Actual data/10
13	Lr	EXV opening steps	Actual data/8
14	Ir	Indoor fan speed	Actual data/8
15	HU	Humidity (if a sensor there)	Actual data, %
16	TT	Set temperature including compensation	Actual data, °C
17	nA	Reserved	
18	nA	Reserved	
19	Uo	Outdoor DC bus voltage	
20	oT	Target Frequency calculated by indoor	Without limitation
21	TA	Evaporator coil inlet temperature	Actual data,°C/°F
22	Tb	Evaporator coil inlet temperature	Actual data,°C/°F
23~30	nA	Reserved	

Please note that:

- The Channel number indicates a certain parameter value (Check the Engineering Mode Error Codes table).
- The indoor unit display will show the code for 2s, and then the parameter value.
- In the engineering mode, the other keys or operations are invalid except for the following buttons "Power", "Up", "Down" , and "Ok".
- In order to exit from the engineering mode, press "Power" + "Fan" buttons together for 2s to quit Checking and back to the home screen.
- The engineering mode will be exited if there is no valid input data for the 60s.

Engineering Mode Error Codes

Display	Error Information
EH00	IDU EEPROM malfunction
EH0A	IDU EEPROM parameter error
EL01	IDU & ODU communication error
EH6A	Communication error between indoor unit and external fan module
EH30	Parameters error of indoor external fan
EH35	Phase failure of indoor external fan
EH36	Indoor external fan current sampling bias fault
EH37	Indoor external fan zero speed failure
EH38	Indoor external fan stall failure
EH39	Out of step failure of indoor external fan
EH3A	Low voltage protection of indoor external fan DC bus
EH3b	Indoor external fan DC bus voltage is too high fault
EH3E	Indoor external fan overcurrent fault
EH3F	Indoor external fan module protection/hardware overcurrent protection
EH03	IDU fan speed out of control
EC51	ODU EEPROM parameter error
EC52	ODU coil temp. sensor (T3) error
EC53	ODU ambient temp. sensor (T4) error
EC54	COMP. discharge temp. sensor(TP) error
EC55	IGBT temperature sensor TH is in open circuit or short circuit
EC0d	Outdoor unit malfunction
EH60	IDU room temp. sensor (T1) error
EH61	IDU coil temp. sensor(T2) error
EC71	Outdoor external fan overcurrent fault
EC75	Outdoor external fan module protection/hardware overcurrent protection
EC72	Outdoor external fan phase failure
EC74	Outdoor external fan current sampling bias fault
EC73	Zero speed failure of outdoor unit DC fan
EC07	ODU fan speed out of control(
EH65	Intelligent eye communication failure
EL0C	Refrigerant leak detected
EH0E	Water-level alarm malfunction
EH0F	Intelligent eye malfunction
FH07	Communication malfunction between indoor unit and auto-lifting panel
PC00	ODU IPM module protection
PC 10	Over low voltage protection
PC 11	Over voltage protection
PC 12	DC voltage protection
PC02	Top temperature protection of compressor or High temperature protection of IPM module
PC40	Communication error between outdoor main chip and compressor driven chip

Engineering Mode Error Codes (continued)

Display	Error Information
PC41	Current Input detection protection
PC42	Compressor start error
PC43	Lack of phase (3 phase) protection
PC44	Outdoor unit zero speed protection
PC45	341PWM error
PC46	Compressor speed malfunction
PC49	Compressor over current protection
PC06	Compressor discharge temperature protection
PC08	Outdoor current protection
PH09	Anti-cold air in heating mode
PC0F	PFC module malfunction
PC30	System overpressure protection
PC31	System pressure is too low protection
PC03	Pressure protection
PC0L	Outdoor low ambient temperature protection
PH90	Evaporator coil temperature over high protection
PH91	Evaporator coil temperature over low Protection
PC0A	Condenser high temperature protection
PH0C	Indoor unit humidity sensor failure
LH00	Frequency limit caused by T2
LH30	Indoor external fan current limit
LH31	Indoor external fan voltage limit
LC01	Frequency limit caused by T3
LC02	Frequency limit caused by TP
LC05	Frequency limit caused by voltage
LC03	Frequency limit caused by current
LC06	Frequency limit caused by PFC
LC30	Frequency limit caused by high pressure
LC31	Frequency limit caused by low pressure
LH07	Frequency limit caused by remote controller
--	IDUs mode conflict(match with multi outdoor unit)
nA	No malfunction and protection

Advanced Function Setting
To enter the engineering mode, and check the advanced function settings, please take the following steps:

If you want to check the current functions set value (Presetting Page):
1. Firstly, you need to disconnect the power supply from the unit and wait for 1 minute.
2. Then connect the power supply again to the unit (the unit should be under the standby state).
3. Press "Power" + "Fan" buttons together for 7s until the remote controller screen shows "0", and "Auto, Cool, Dry, Heat, Battery "icons will be displayed at the same time.
4. Press "Up" or "Down" button to choose different channel number that you want to check (from 0-30) on the remote controller.
5. Then Press the "Power" button for 2s until the remote controller screen shows "Ch".
6. Press "OK" button to query the current function set value while the remote controller shows "CH", and the function set value will be shown on the indoor unit display.

If you want to change the current functions set value:
1. Firstly, you need to disconnect the power supply from the unit and wait for 1 minute.
2. Then connect the power supply again to the unit (the unit should be under the standby state).
3. Press "Power" + "Fan" buttons together for 7s until the remote controller screen shows "0", and "Auto, Cool, Dry, Heat, Battery "icons will be displayed at the same time.
4. Press the "Up" or "Down" button to choose different channel number that you want to change (from 0-30) on the remote controller.
5. Then Press the "Power" button for 2s until the remote controller screen shows "Ch".
6. Press the "Up" or "Down" button to choose the desired set value from the screen of the remote control.
7. Then Press "OK" to send the new set value to the indoor unit, and the indoor unit will display "CS", which means that the new set value is uploaded successfully.
8. Finally, disconnect the power supply from the unit, and wait for 10 minutes, then connect it again.

Please note that:
1. The Channel number indicates a certain function, and each number will be shown on the indoor unit screen indicates the current function set value (Check the table below).
2. In the engineering mode, the other keys or operations are invalid except for the following buttons "Power", "Up", "Down", and "Ok".
3. To set a new set value successfully, you need to finish the steps (from 2 to 7) within 1 minute only.
4. The engineering mode will be exited if there is no valid input data for the 60s.
5. To exit from the engineering mode, please follow the following steps:
   - Press the "Power" button for 2s press until the remote controller screen shows "0".
   - Then Press "Power" + "Fan" buttons together for 2s to quit the engineering mode and back to the home screen.

Advanced Function Parameter Definitions

Channel	Function	Parameter Value Meaning	Remark
0	Capacity setting (Btu/h)	1-100K	
1	Auto-restart function	0 – Inactive 1 – Active	
2	Fan control when Ts reached	1- Fan stop 2 - Fan runs at lowest RPM 3 - Fan runs at setting RPM 4~11 - Fan stops for 4 mins and runs for 1 min	
3	Mode lock	CH–Cooling and heating (all modes) HH–Heating only (Heating + Fan only) CC–Cooling only (Cooling + Drying + Fan only) nU–Cooling and heating without Auto	Remote controller will change as well.
4	Lowest setting temperature	16-24	Remote controller will change as well.
5	Highest setting temperature	25-30	Remote controller will change as well.
6	Reserved		
7	Twins selection	0 – No twins; 1 – Master unit; 2– Secondary unit	
8	/	Nothing to set	
9	/	Nothing to set	

Advanced Function Parameter Definitions (continued)

Channel	Function	Parameter Value Meaning	Remark
10	/	Nothing to set	
11	Min. frequency limitation in cooling mode	10, 11, 12, ..., 49, 50, -- (Cancel)	
12	Min. frequency limitation in heating mode	10, 11, 12, ..., 49, 50, -- (Cancel)	
13	Max frequency selection in T4 limitation of Zone6	20, 21, 22, ..., 149, 150, -- (Cancel)	
14	/	Nothing to set	
15	Frequency selection of outdoor forced-operation	10, 11, 12, ..., 249, 250, -- (Cancel)	
16	One button reset	rS – Reset	
17	nA	Nothing to set	
18	Capacity setting(kW)	23,26,32,35,51,72,120,-- (Cancel)	
19	Max. frequency selection in cooling mode	40, 41, 42, ..., 83, 84, -- (Cancel)	
20	Max. frequency selection in heating mode	40, 41, 42, ..., 83, 84, -- (Cancel)	Without limitation
21	Cooling temperature compensation	-3.0, -2.5, -2.0, ..., 3.0, 3.5, -- (Cancel)	
22	Heating temperature compensation	-6.5, -6.0, -5.5, ..., 0.5, 1.0, 1.5, ..., 7.0, 7.5, -- (Cancel)	
23	Max. fan speed selection in cooling	-41, -40, -39, ..., 19, 20, -- (Cancel)	
24	Min. fan speed selection in cooling	-41, -40, -39, ..., 19, 20, -- (Cancel)	
25	Max. fan selection in heating	-41, -40, -39, ..., 19, 20, -- (Cancel)	
26	Min. fan speed selection in heating	-41, -40, -39, ..., 19, 20, -- (Cancel)	
27	Reserved	Nothing to set	
28	Anti-cold air Stop Fan Temperature	16~28	
29	Reserved	Nothing to set	
30	Reserved	Nothing to set	

Error Diagnosis and Troubleshooting Without Error Code

⚠ WARNING

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

Remote maintenance

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

No.	Problem	Solution
1	The unit will not start	page 34
2	The power switch is on, but the fans will not start	
3	The temperature on the display board cannot be set	
4	The unit is on, but the wind is not cold (hot)	
5	The unit runs but shortly stops	
6	The unit starts up and stops frequently	
7	Unit runs continuously but insufficient cooling (heating)	
8	Cool cannot change to heat	
9	The unit is noisy	

Field maintenance

No.	Problem	Solution
1	Unit will not start	page 36
2	Compressor will not start but fans run	
3	Compressor and condenser (outdoor) fan will not start	
4	Evaporator (indoor) fan will not start	
5	Condenser (Outdoor) fan will not start	
6	Unit runs, but shortly stops	
7	Compressor short-cycles due to overload	
8	High discharge pressure	
9	Low discharge pressure	
10	High suction pressure	
11	Low suction pressure	
12	Unit runs continuously but insufficient cooling	
13	Too cool	
14	Compressor is noisy	
15	Horizontal louver can not revolve	

Remote Troubleshooting

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 cannot 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

Remote Troubleshooting (continued)

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

Field Troubleshooting

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

Field Troubleshooting (continued)

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

Quick Maintenance by Error Code

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

Part requiring replacement	Error Code									
	EH00/ EH0A	EL01	EH03	EH60	EH61	EL0C	EHC1/ EHC2	EH0E	EC53	EH06
Indoor PCB	√	√	√	√	√	√	x	√	x	√
Outdoor PCB	x	√	x	x	x	x	x	x	√	x
Indoor fan motor	x	x	√	x	x	x	x	x	x	x
T1 sensor	x	x	x	√	x	x	x	x	x	x
T2 sensor	x	x	x	x	√	√	x	√	x	x
T3 sensor	x	x	x	x	x	x	x	x	x	x
T4 sensor	x	x	x	x	x	x	x	x	√	x
Reactor	x	√	x	x	x	x	x	x	x	x
Compressor	x	x	x	x	x	x	x	x	x	x
Additional refrigerant	x	x	x	x	x	√	√	√	x	x
Water-level switch	x	x	x	x	x	x	x	√	x	x
Water pump	x	x	x	x	x	x	x	√	x	x
Display board	x	x	x	x	x	x	x	x	x	√

Part requiring replacement	EC54	EC51	EC52	EC56	EC07	PC00	PC01	PC02	PC04	PC03	FHCC/ EHC3
Indoor PCB	x	x	x	x	x	x	x	x	x	x	√
Outdoor PCB	√	√	√	√	√	√	√	√	√	√	x
Outdoor fan motor	x	x	x	x	√	√	x	√	√	x	x
T3 sensor	x	x	√	x	x	x	x	x	x	x	x
TP sensor	√	x	x	x	x	x	x	x	x	x	x
T2B sensor	x	x	x	√	x	x	x	x	x	x	x
Refrigerant sensor	x	x	x	x	x	x	x	x	x	x	√
Reactor sensor	x	x	x	x	x	x	√	x	x	x	x
Compressor	x	x	x	x	x	√	x	x	√	x	x
IPM module board	x	x	x	x	x	√	√	√	√	x	x
Pressure protector	x	x	x	x	x	x	x	x	x	√	x
Additional refrigerant	x	x	x	x	x	x	x	x	x	√	x

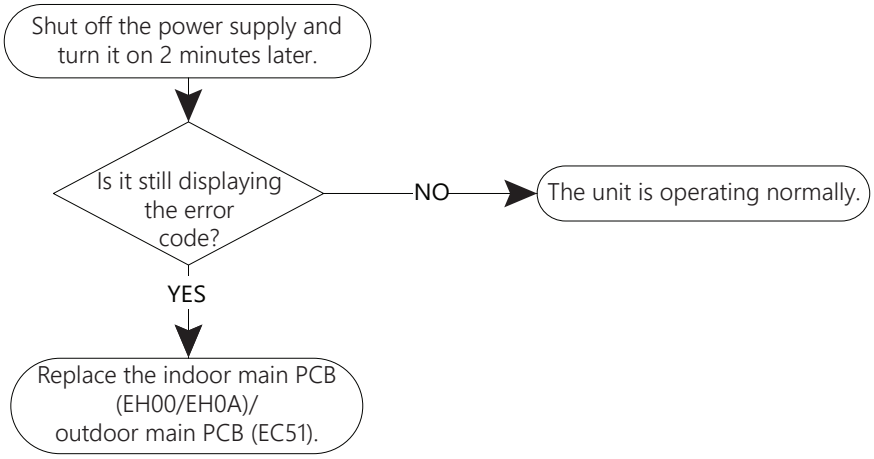
Troubleshooting by Error Code

EH00/ EH0A / EC51 (EEPROM Malfunction Error Diagnosis and Solution)

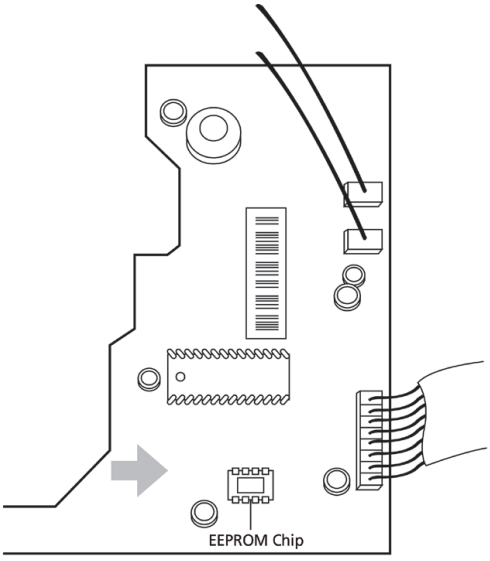
Description: The indoor or outdoor PCB main chip does not receive feedback from the EEPROM chip. Recommended parts to prepare:

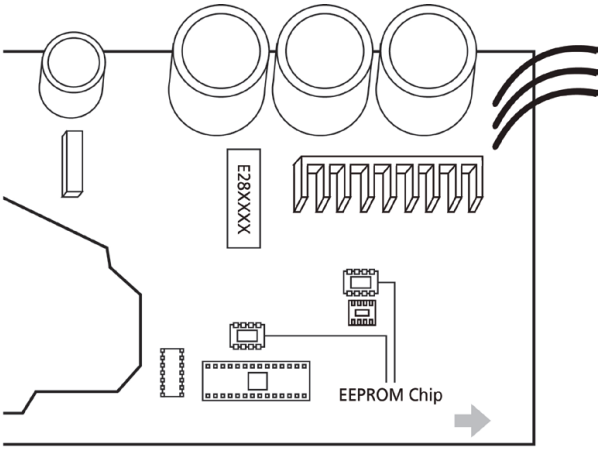
- Indoor PCB
- Outdoor PCB

Troubleshooting and repair:



EEPROM Definition: A read-only memory whose contents can be erased and reprogrammed using a pulsed voltage. The location of the EEPROM chip on the indoor and outdoor PCB is shown in the following two images:





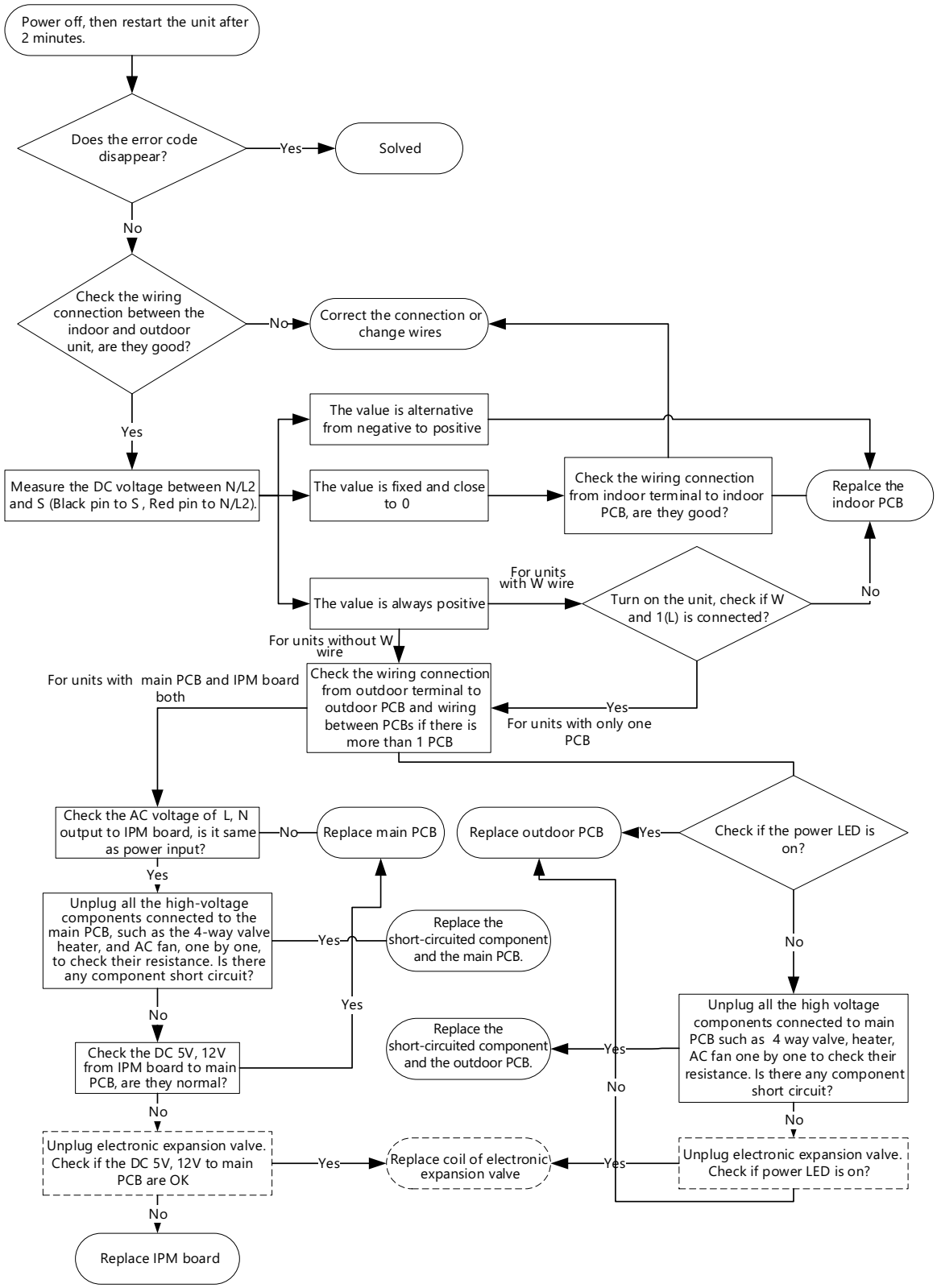
These pictures are only for reference, actual appearance may vary.

Troubleshooting and repair of compressor driven chip EEPROM parameter error and communication error between outdoor main chip and compressor driven chip are same as EC51.

EL01 (Indoor and Outdoor Unit Communication Error Diagnosis and Solution)
Description: The indoor unit cannot communicate with the outdoor unit
Recommended parts to prepare:

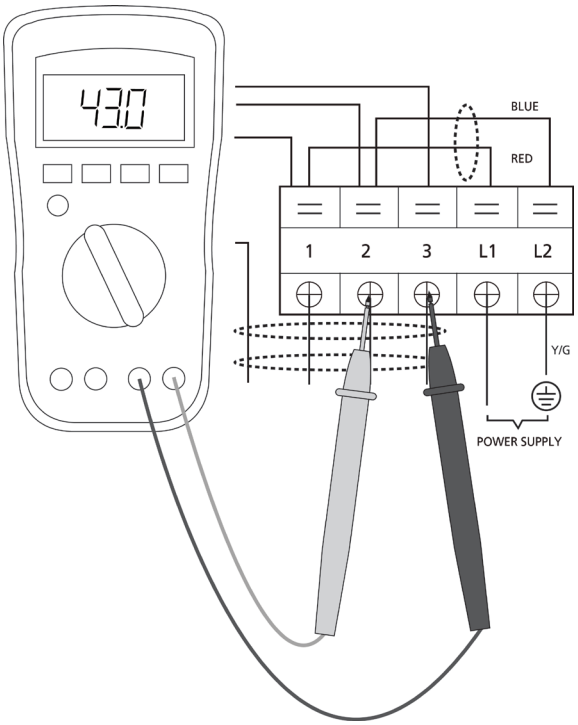
- Indoor PCB
- Outdoor PCB
- Reactor

Troubleshooting and repair:
Current loop Communication (S Communication):



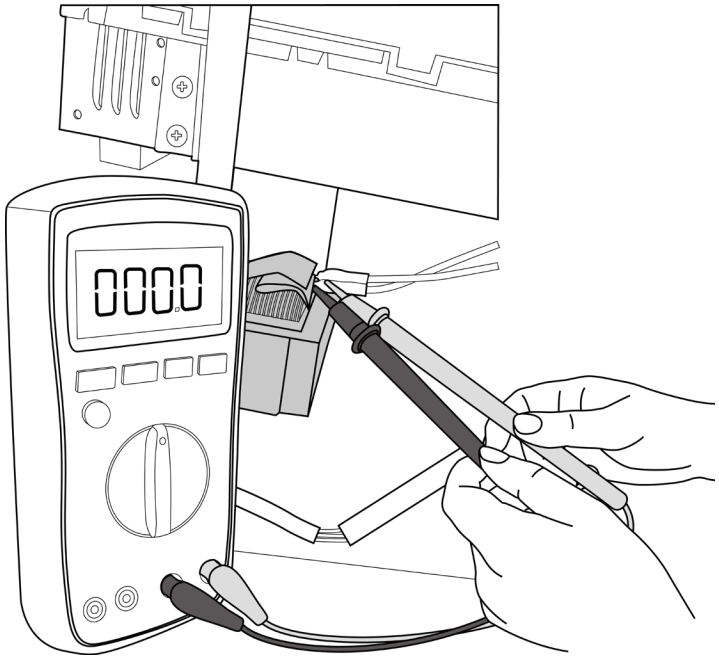
Remarks:

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



S and N or L2 and S or 2 and 3

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



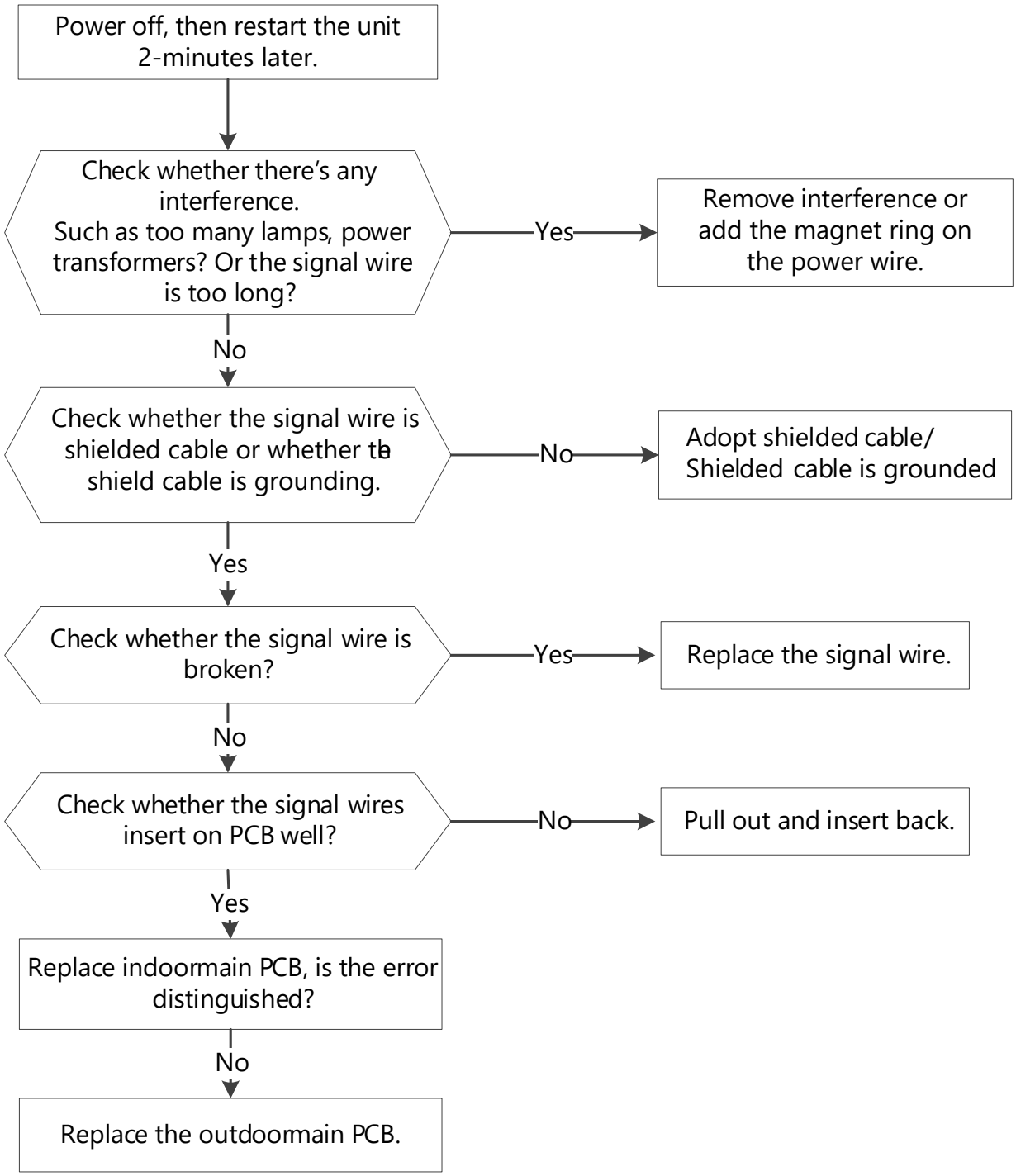
NOTE

The picture and the value are only for reference; actual condition and specific value may vary.

485 Communication (S1,S2 Communication):
Recommended parts to prepare:

- Signal wires
- Magnet ring
- Indoor PCB
- Outdoor PCB

Troubleshooting and repair:



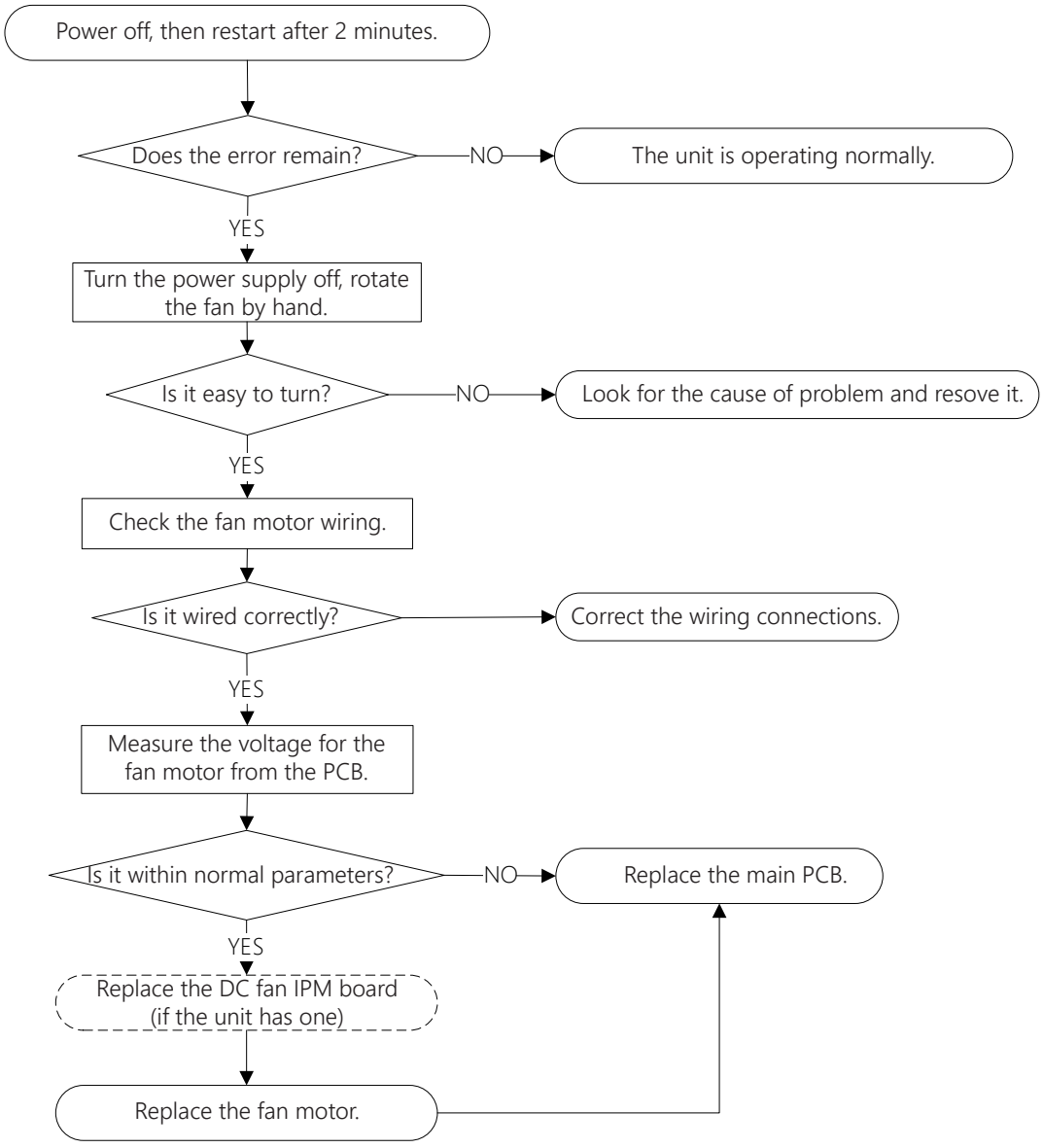
EH03 / EC07 (Fan Speed Out of Control Diagnosis and Solution)

Description: When indoor/outdoor fan speed is kept too low or too high for a certain time, the unit ceases operation and the LED displays the failure.

Recommended parts to prepare:

- Connection wires
- Fan assembly
- Fan motor
- PCB

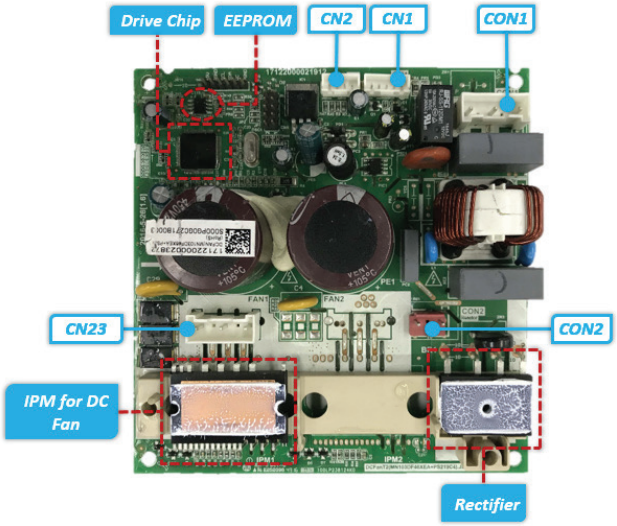
Troubleshooting and repair:



Index:

1. **Indoor DC Fan IPM Board**

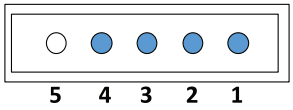
For A6 Duct Unit:



Port	Color	Signal	Remark
CON1	Power input for the PCB	230V/AC	
CN1	Communication with the main PCB	DC	
CN2	Test port	5V/DC	For the debugging board
CN23	UVW output for DC fan motor		
CON2	Ports for the reactor		

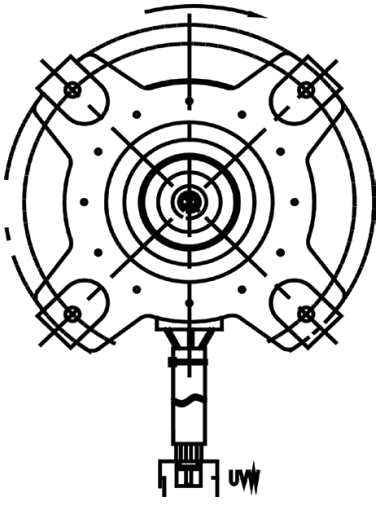
CN1 Communication With The Main PCB

No.	Signal	Voltage
1	Vcc	+15V
2	GND	
3	TXD	0~6V
4	RXD	0~15V
5	--	--



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

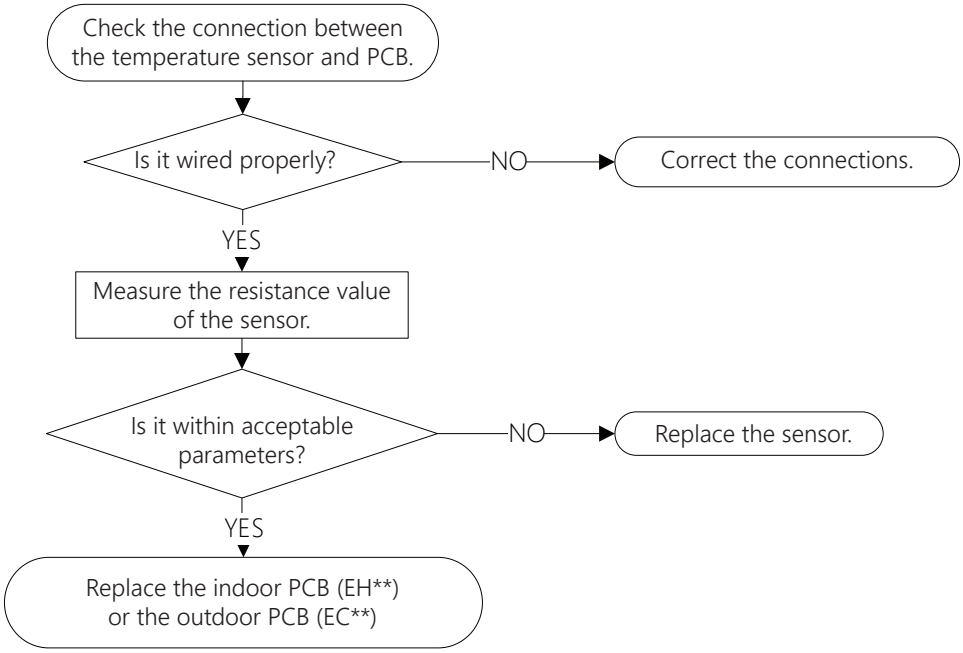
Release the UVW connector. Measure the resistance of U-V, U-W, and V-W. If the resistance is not equal, the fan motor must have problems and must be replaced. Otherwise, the PCB must have problems and need to be replaced.

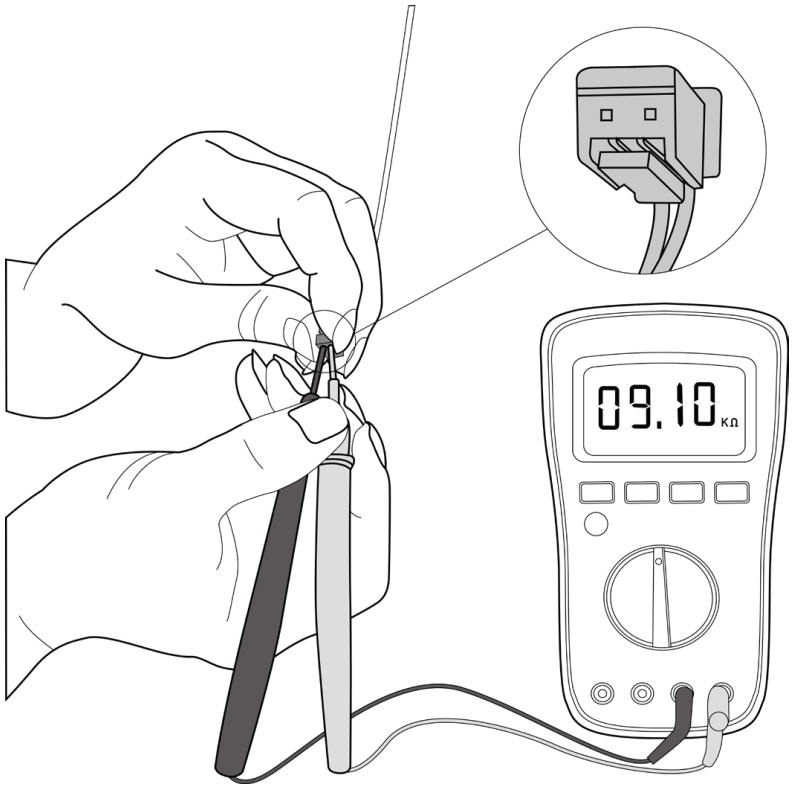


EH60/EH61/EC53/EC52/EC54/EC56 (Open Circuit or Short Circuit of Temperature Sensor Diagnosis and Solution)
Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays failure.
Recommended parts to prepare:

- Connection wires
- Sensors
- PCB

Troubleshooting and repair:





This picture and the value on the display are only for reference, actual appearance and value may vary.

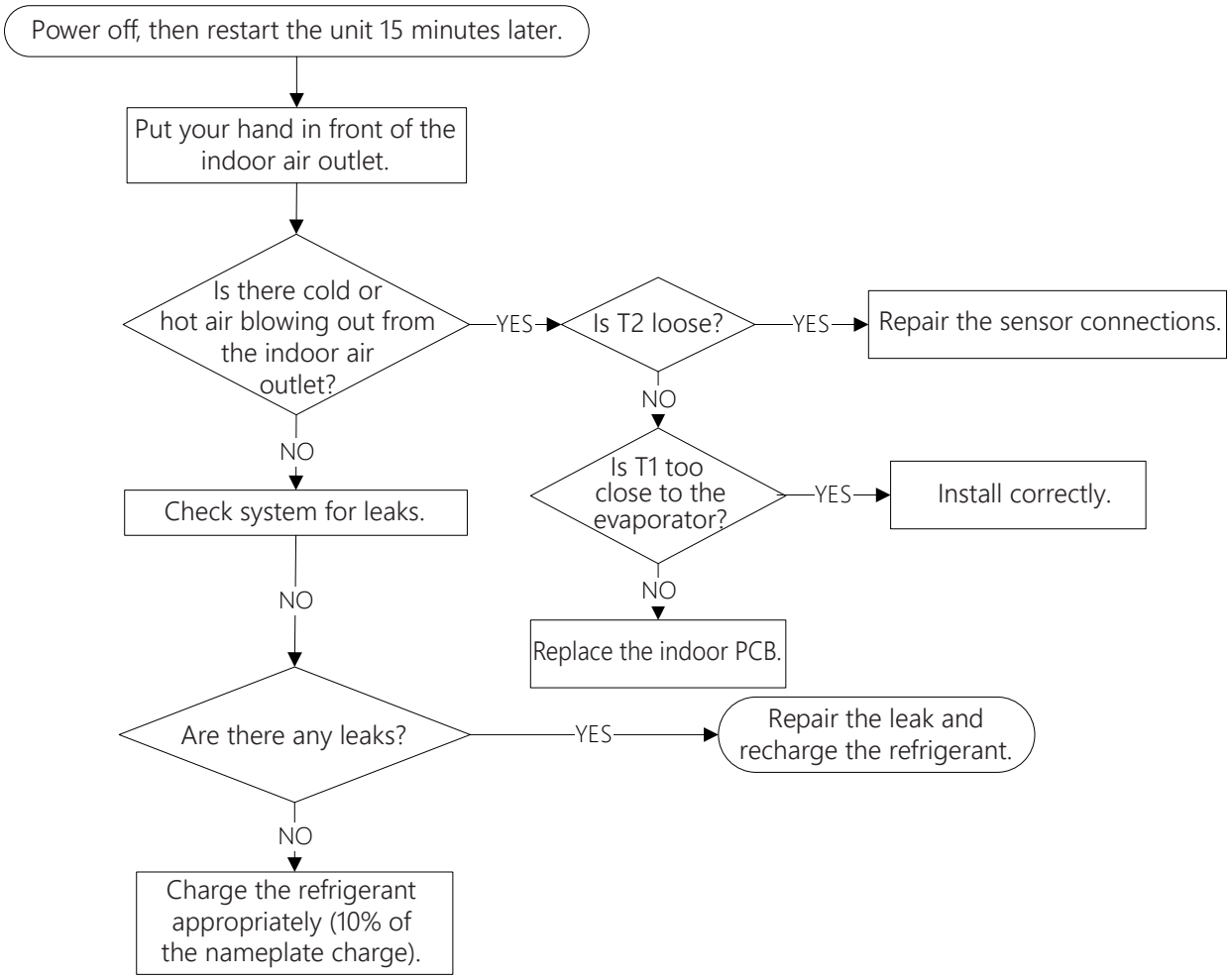
EL0C (System lacks refrigerant Diagnosis and Solution)

Description: Judging the abnormality of the refrigeration system according to the number of compressor stops and the changes in operating parameters caused by excessive exhaust temperature.

Recommended parts to prepare:

- Indoor PCB
- Additional refrigerant

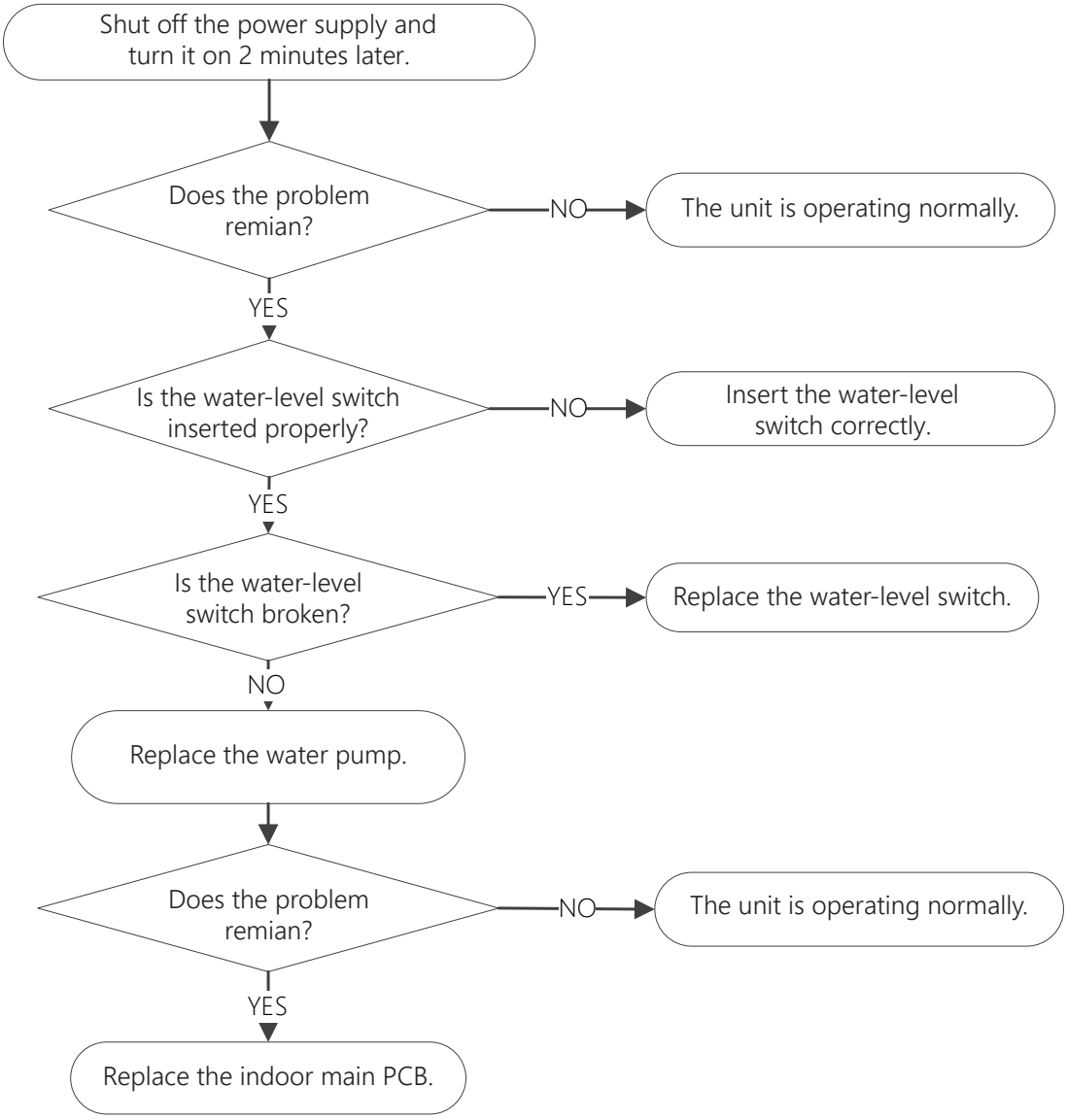
Troubleshooting and repair:



EH0E (Water-Level Alarm Malfunction Diagnosis and Solution)
Description: If the sampling voltage is not 5V, the LED displays the failure code.
Recommended parts to prepare:

- Connection wires
- Water-level switch
- Water pump
- Indoor PCB

Troubleshooting and repair:



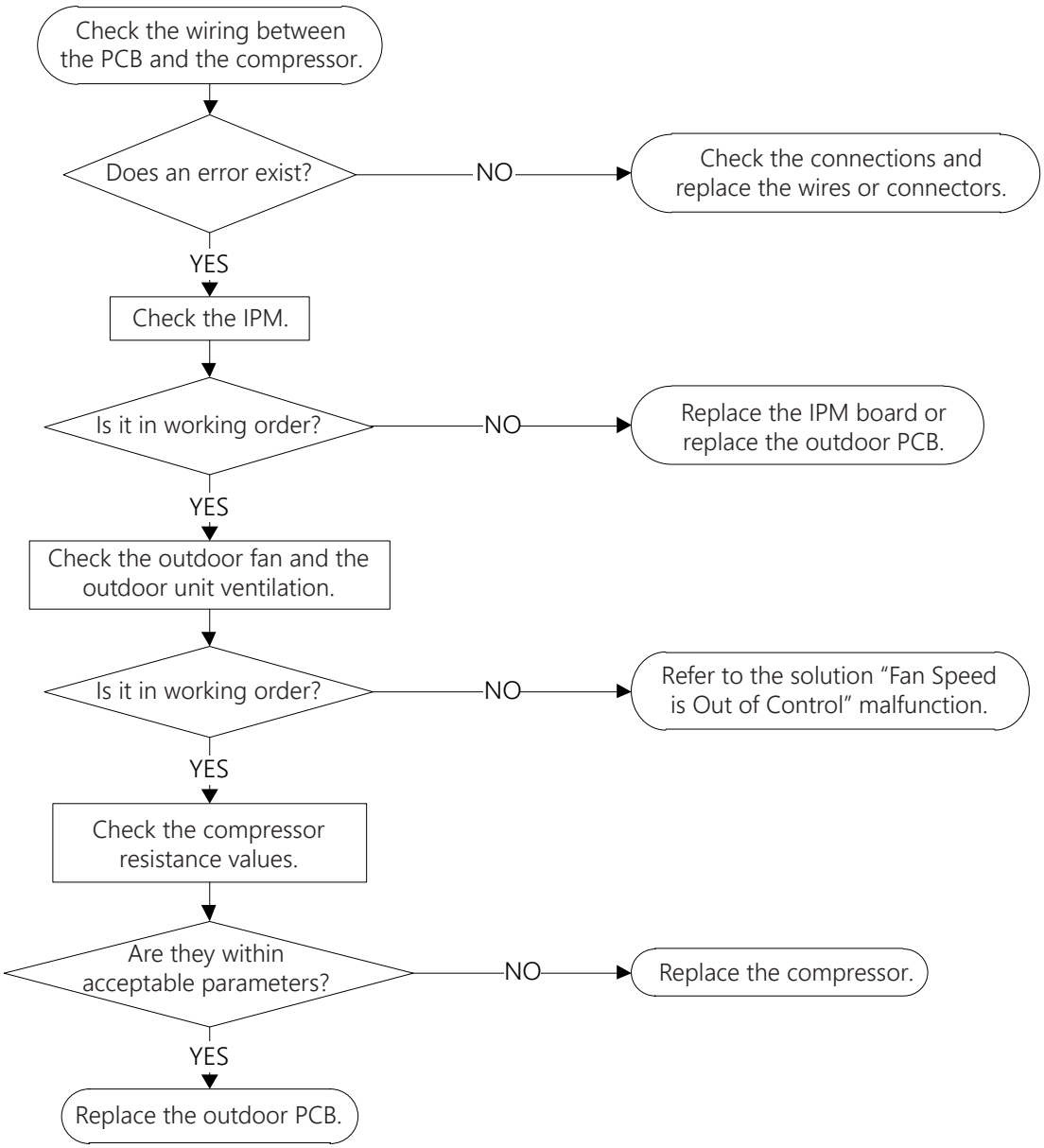
PC00 (ODU IPM module protection Diagnosis and Solution)

Description: When the voltage signal to the IPM sent to the compressor drive chip is abnormal, the display LED shows "PC00" and the AC turns off.

Recommended parts to prepare:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB

Troubleshooting and repair:



Continued on the next page.

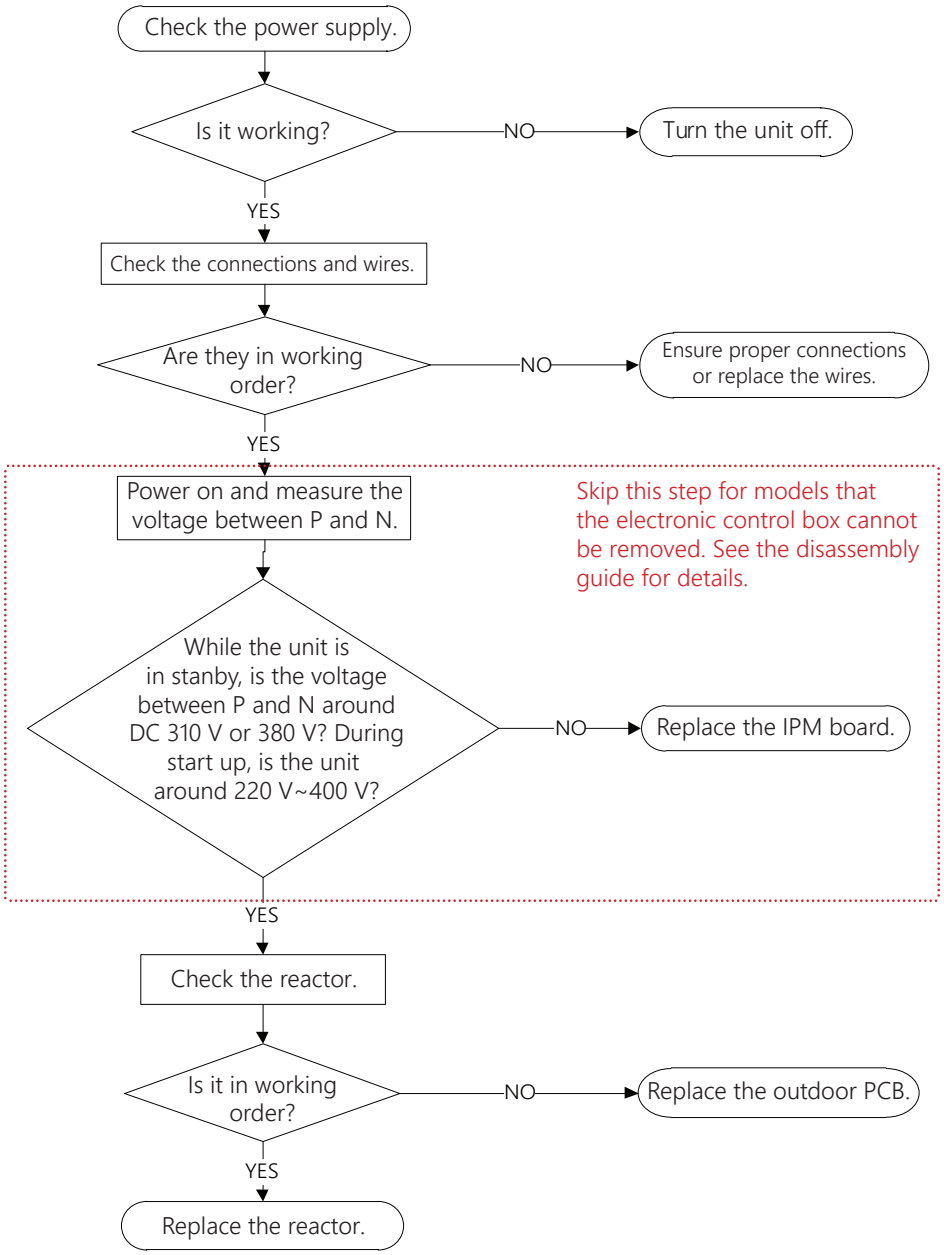
PC01 (ODU voltage protection Diagnosis and Solution)

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

Recommended parts to prepare:

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

Troubleshooting and repair:



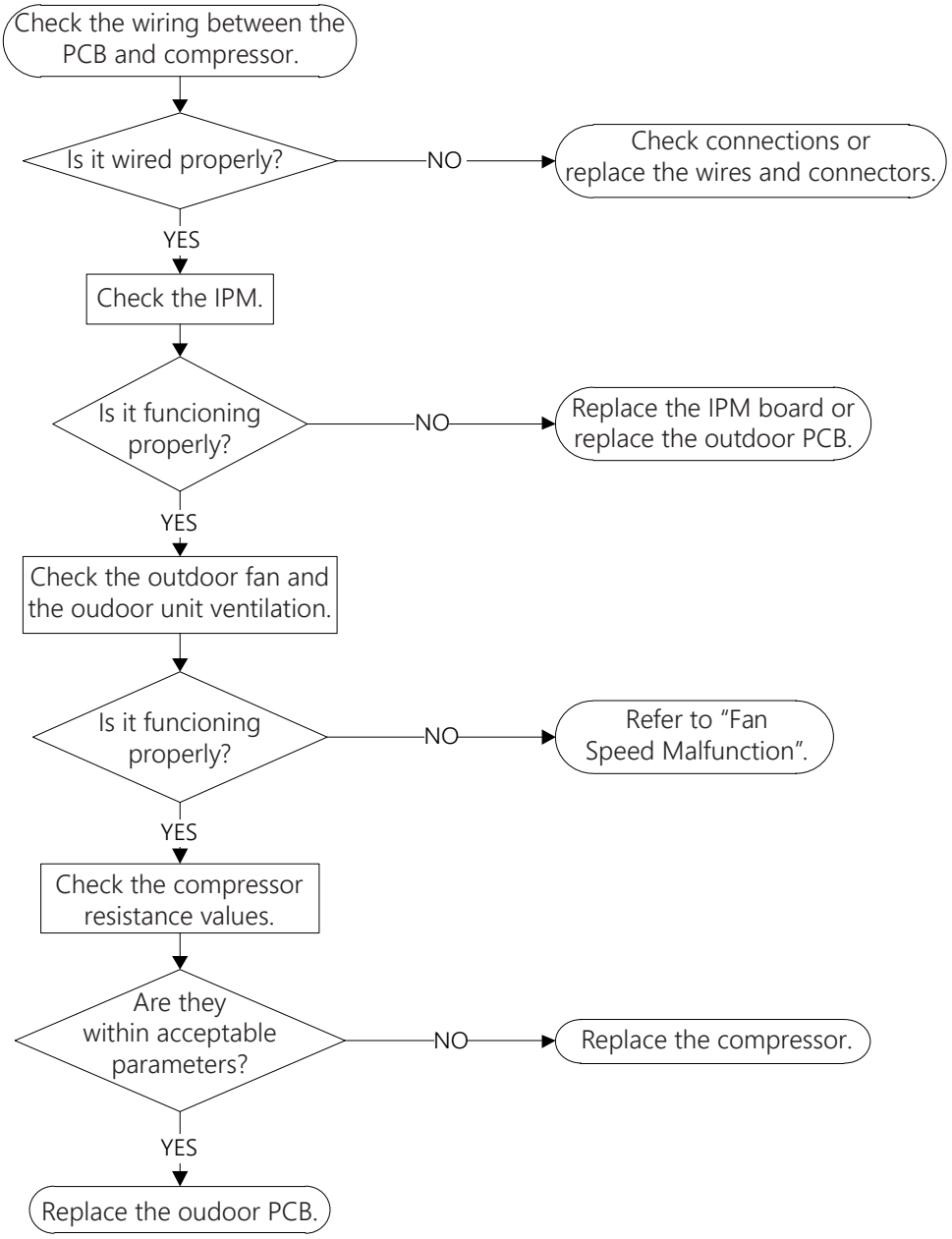
PC04 (Inverter compressor drive error Diagnosis and Solution)

Description: 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

Troubleshooting and repair:



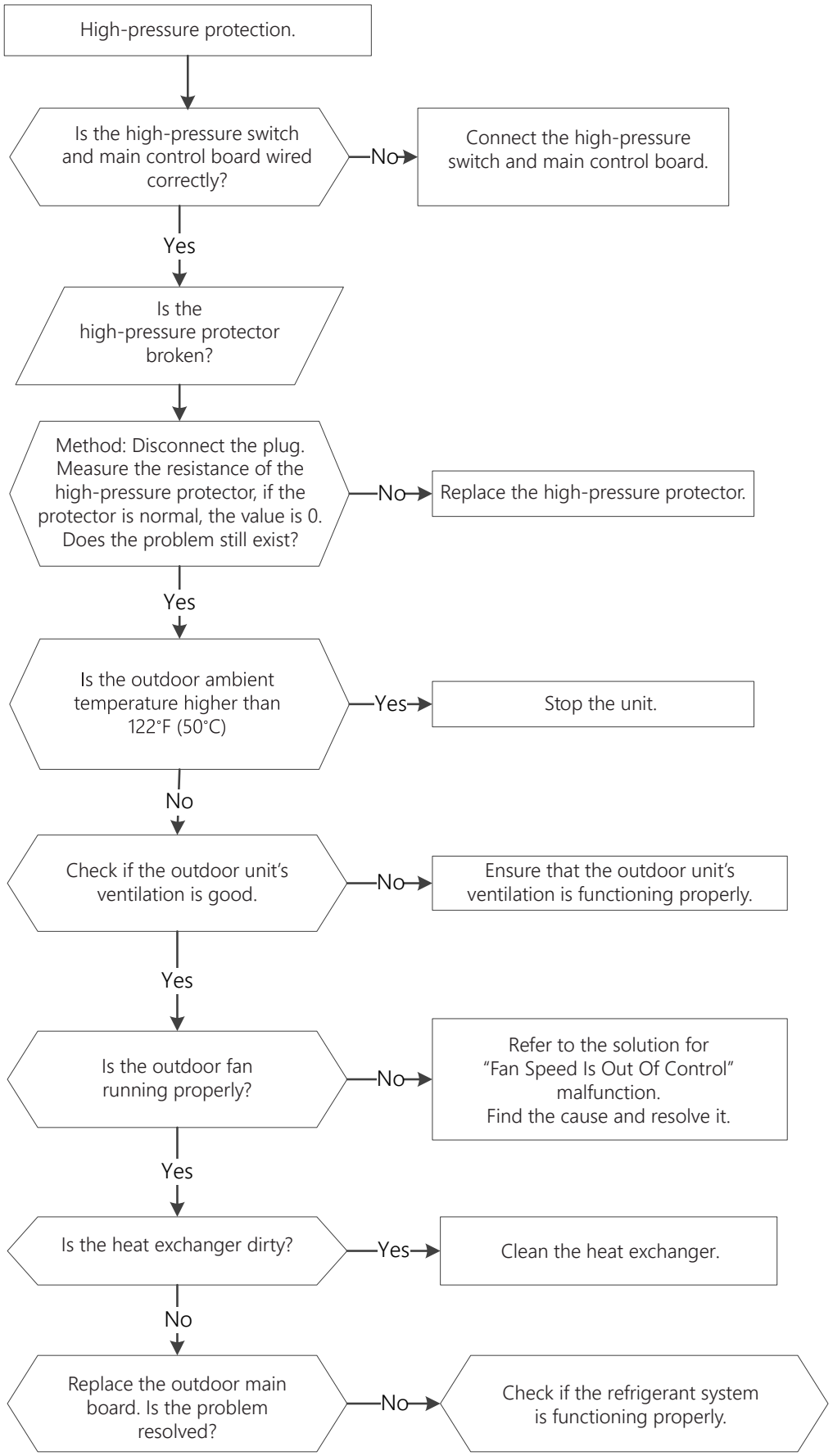
PC03 (Pressure protection (low or high pressure) Diagnosis and Solution)

Description: The outdoor pressure switch cut off the system because the high pressure is higher than 4.4 MPa or the outdoor pressure switch cut off the system because the low pressure is lower than 0.13 MPa, the LED displays the failure code.

Recommended parts to prepare:

- Connection wires
- Pressure switch
- Outdoor fan
- Outdoor main PCB
- Refrigerant

Troubleshooting and repair:



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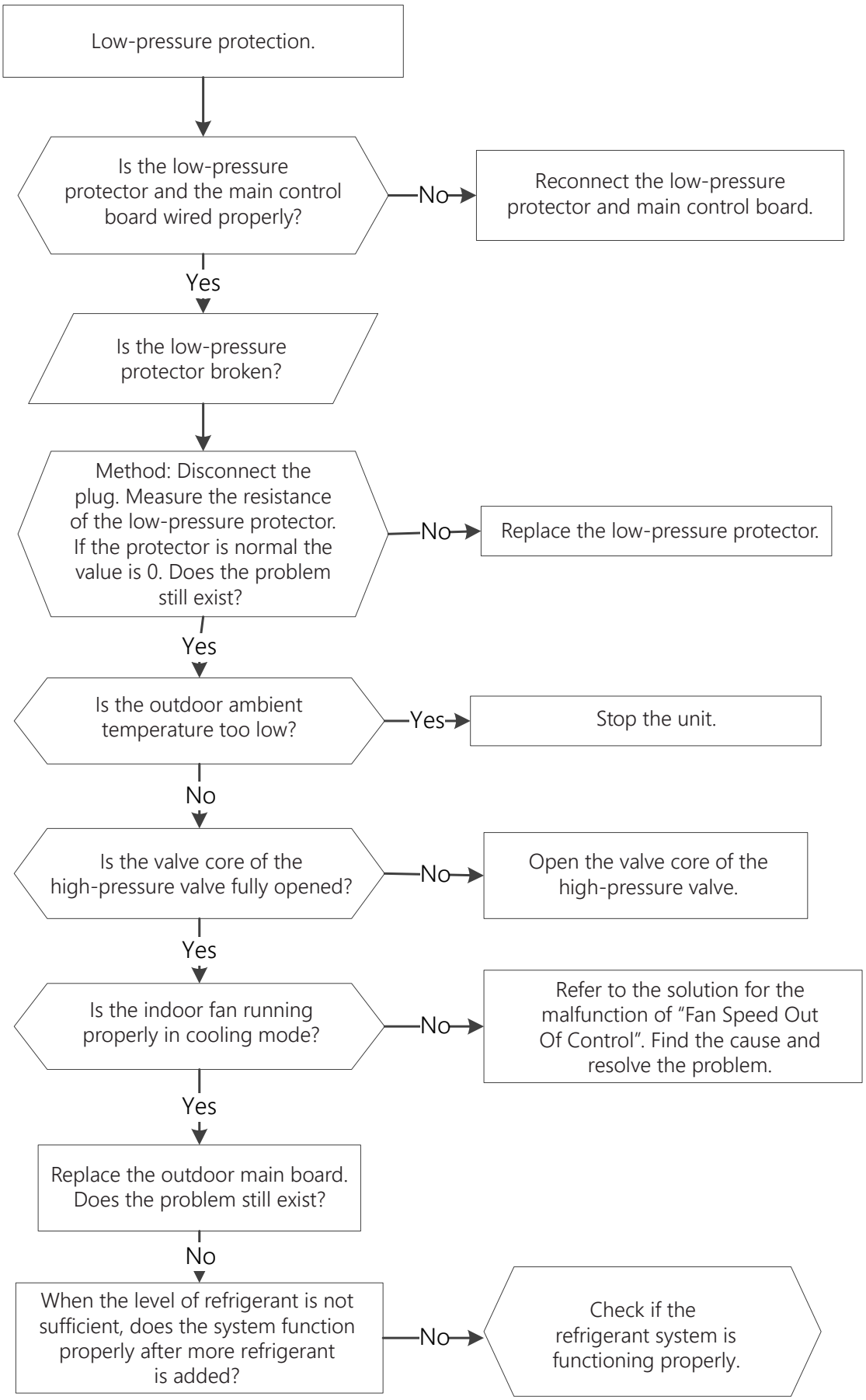
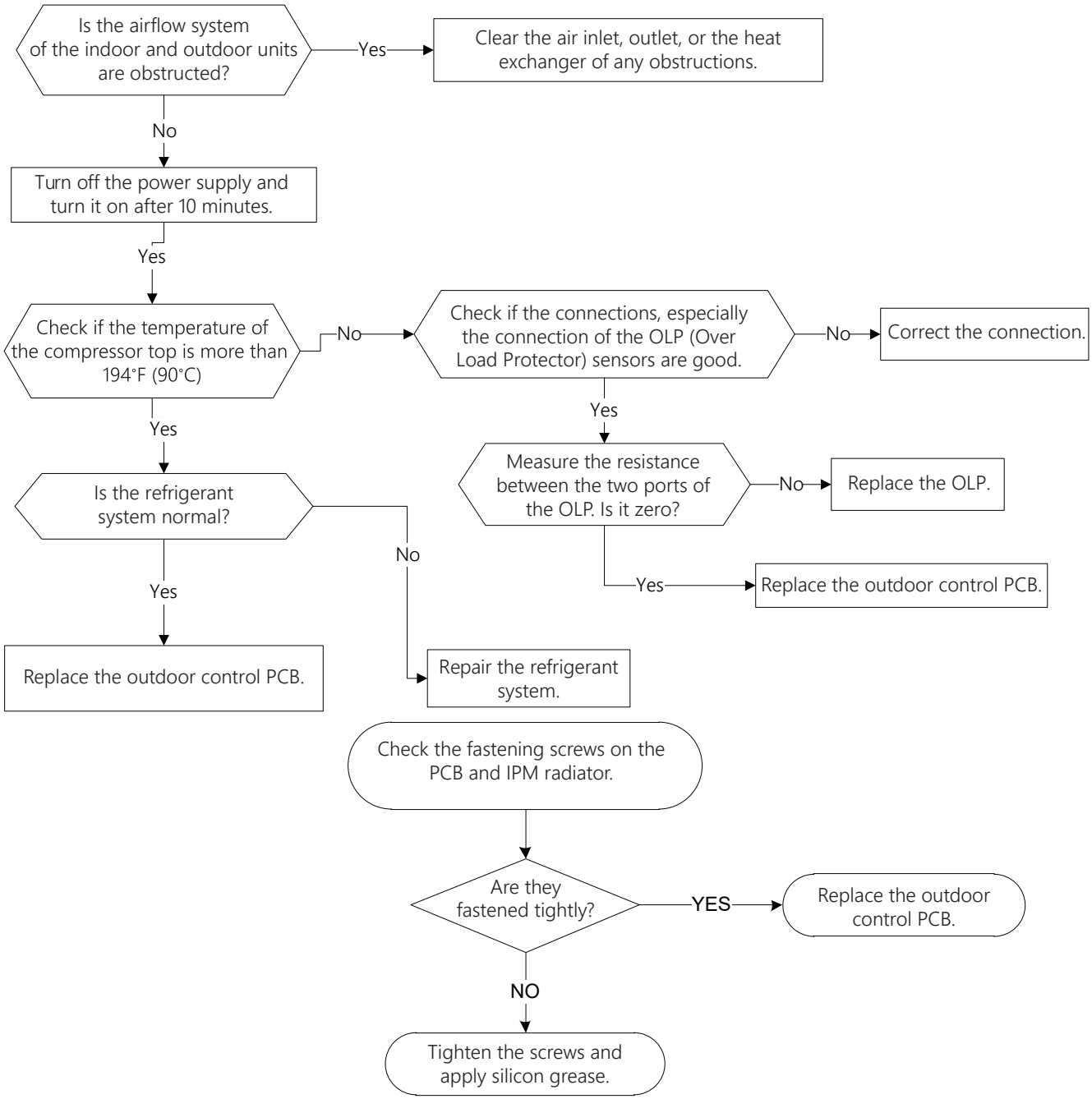


PC02 (Compressor top (or IPM) temp. protection diagnosis and solution)
Description: For some models with overload protection, If the sampling voltage is not 5 V, the LED will display the failure. If the temperature of the IPM module is higher than a certain value, the LED displays the failure code.
Models without overload protection should be diagnosed according to the second flowchart.
Recommended parts to prepare:

- Connection wires
- Outdoor PCB
- IPM module board
- High-pressure protector
- System blockages

Troubleshooting and repair:



PC0L (Low ambient temperature protection)
Description: It is a protection function. When the compressor is off, the outdoor ambient temperature (T4) is lower than -31°F (-35°C) for 10 seconds, the AC will stop and display the failure code.
When the compressor is on, the outdoor ambient temperature (T4) is lower than -40°F (-40°C) for 10 seconds, the AC will stop and display the failure code.
When the outdoor ambient temperature (T4) is no lower than -25.6°F (-32°C) for 10 seconds, the unit will exit protection.

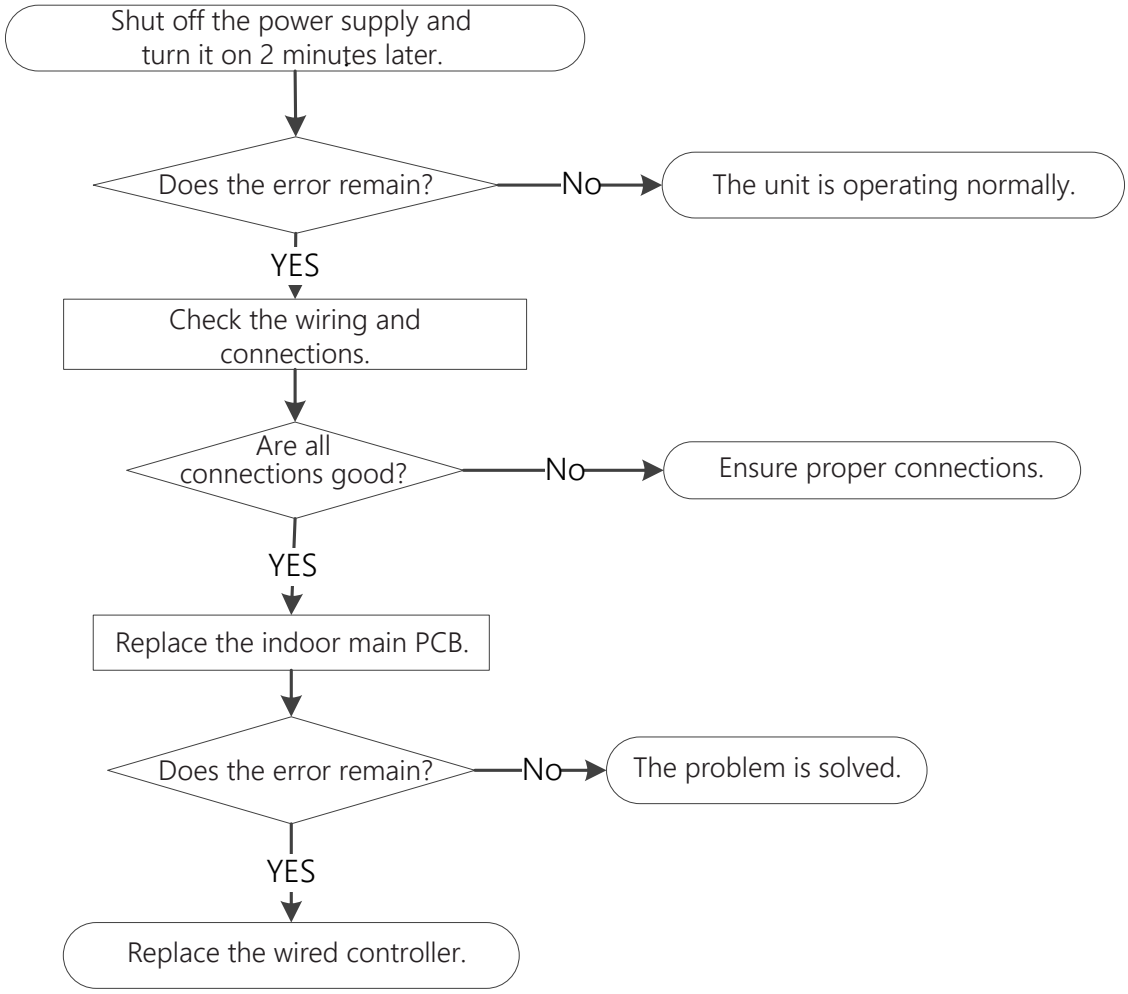
EHb3 (Communication malfunction between the wire and master control) Diagnosis and Solution

Description: If Indoor PCB does not receive feedback from the wired controller, the error is displayed on the wired controller

Recommended parts to prepare:

- Connection wires
- Indoor PCB
- Wired controller

Troubleshooting and repair:

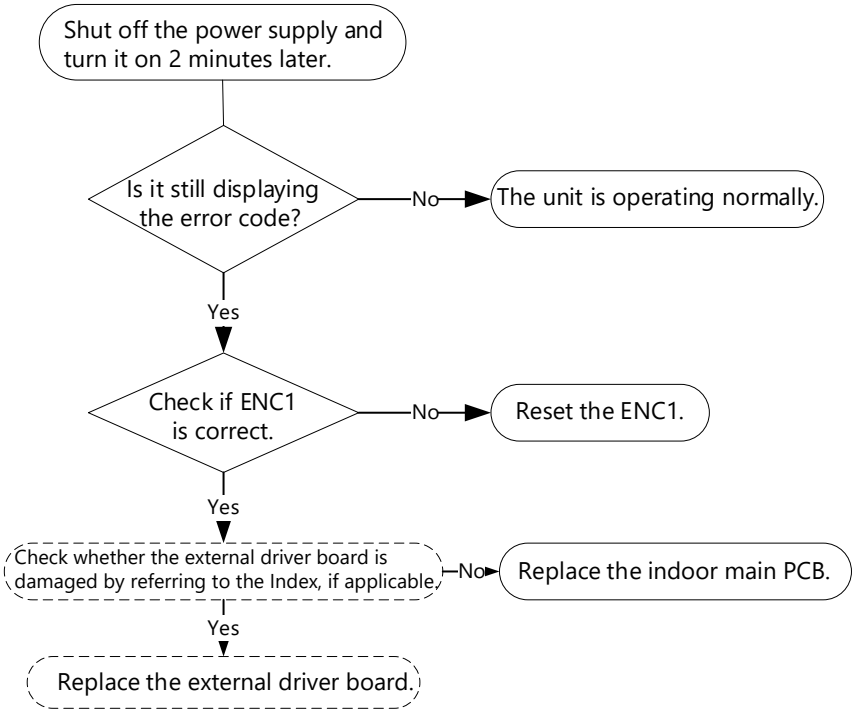


EHbA (Communication error between the indoor unit and the external fan module)/ EH3A (External fan DC bus voltage is too low protection)/ EH3b (External fan DC bus voltage is too high fault) diagnosis and solution

Description: The Indoor unit does not receive feedback from the external fan module for 150 seconds, or the Indoor unit receives abnormal increases or decreases in voltage from the external fan module.

- External drive board
- Indoor main PCB

Troubleshooting and repair:



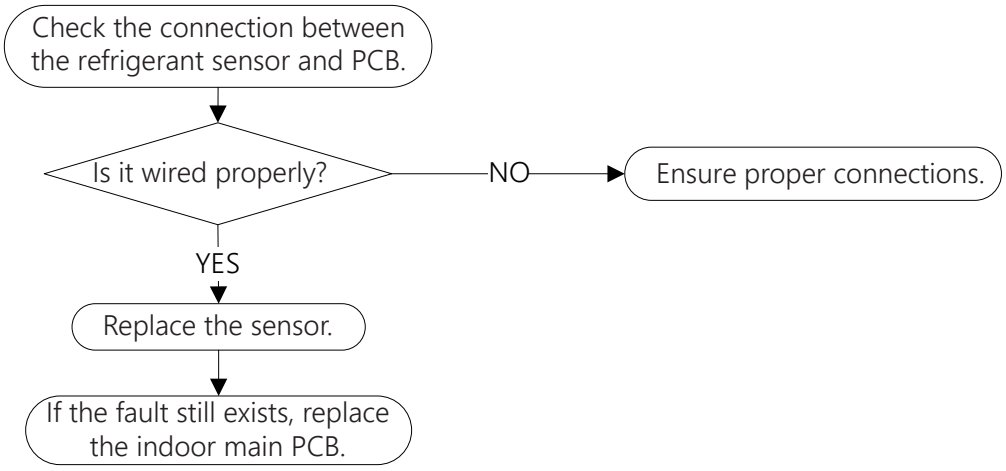
FHCC (Refrigerant sensor error) or EHC3 (Refrigerant sensor is out of range) diagnosis and solution

Description: The indoor unit receives fault signal for 10 seconds or indoor unit does not receive feedback from the refrigerant sensor for 150 seconds.

Recommended parts to prepare:

- Connection wires
- Sensors
- Indoor main PCB

Troubleshooting and repair:



EHC1 (Refrigerant sensor detects leakage) or EHC2 (Refrigerant sensor is out of range and leakage is detected) diagnosis and solution

Description:

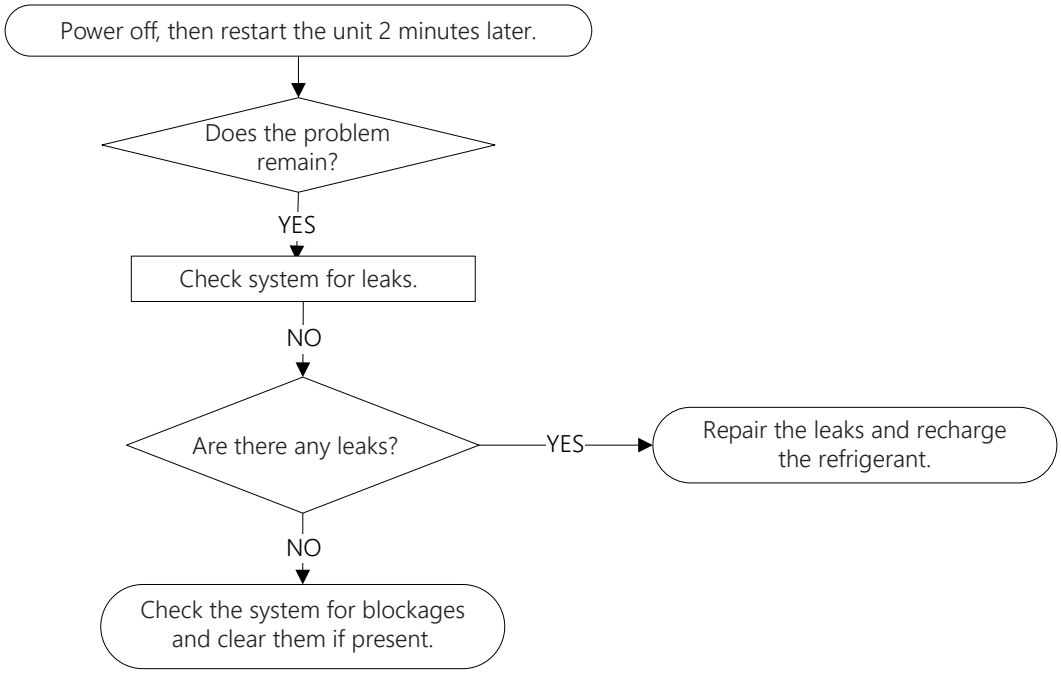
The refrigerant sensor detects a concentration higher than or equal to 10%*LFL for 10 seconds, or the refrigerant sensor detects a concentration higher than or equal to 20%*LFL, or the multi-model receives the refrigerant leakage protection fault sent by the outdoor unit.

Multi-zone: Only the buzzer of the indoor unit that detects refrigerant leakage continues to sound the alarm, the shortest sound is 10 seconds, and the longest sound is 5 minutes (you can press any key such as remote control or wire control, APP and so on to eliminate the alarm), and the other non-refrigerant leakage fault indoor unit only displays "ECC1", but the buzzer does not sound.

Recommended parts to prepare:

- Additional refrigerant

Troubleshooting and repair:



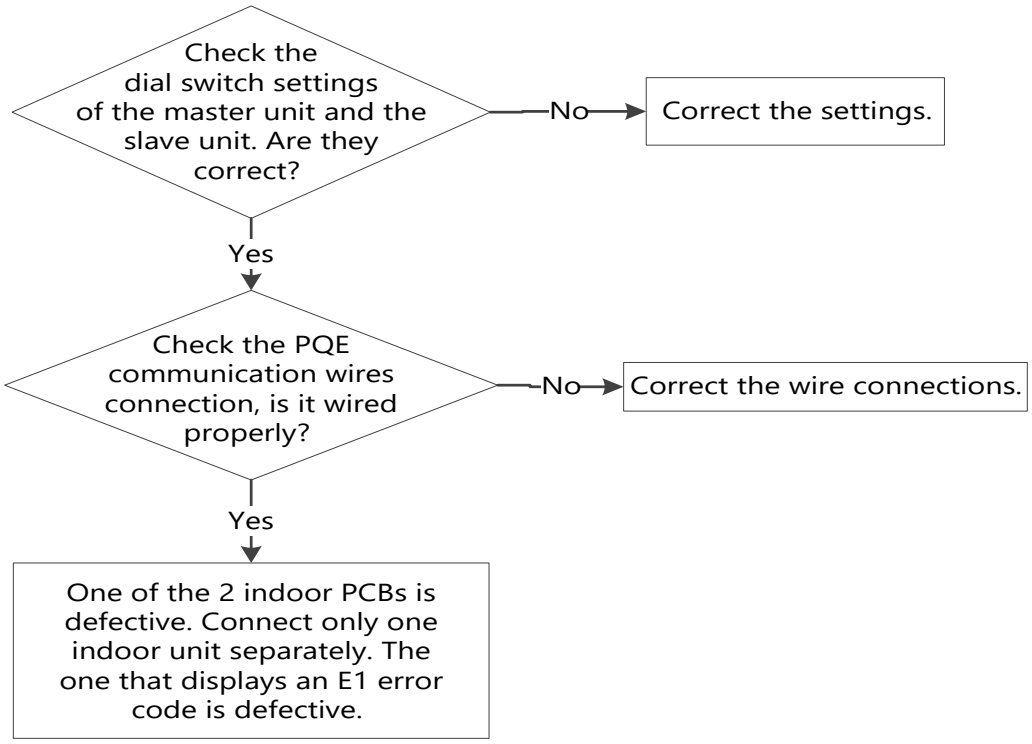
EL11 (Communication malfunction between main unit and secondary units (for twin system) Diagnosis and Solution)

Description: When set in a twin system, the master unit and slave unit cannot be recognized normally.

Recommended parts to prepare:

- Connection wires
- Indoor PCB

Troubleshooting and repair:



EH12 (Main unit or secondary units malfunction (for twin systems)) Diagnosis and Solution)

Description: When set in twin systems, one indoor unit displays this error code, which means another indoor unit is faulty. Check another indoor unit's error code and then follow the prescribed solutions to resolve the malfunction.

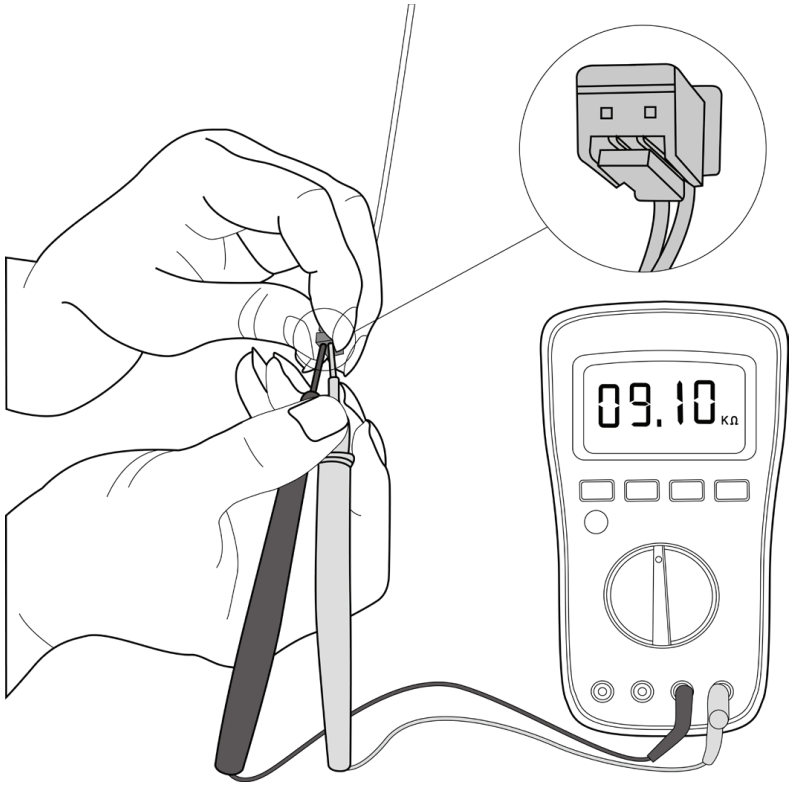
Check Proceedures

Temperature Sensor Check

⚠ WARNING

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

1. Disconnect the temperature sensor from the PCB (Refer to Indoor Disassembly and Outdoor Disassembly).
2. Measure the resistance value of the sensor using a multimeter.
3. Check the corresponding temperature sensor resistance value table in the Appendix.



NOTE

This picture and the value on the display are only for reference, actual appearance and value may vary.

Appendix

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

°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			

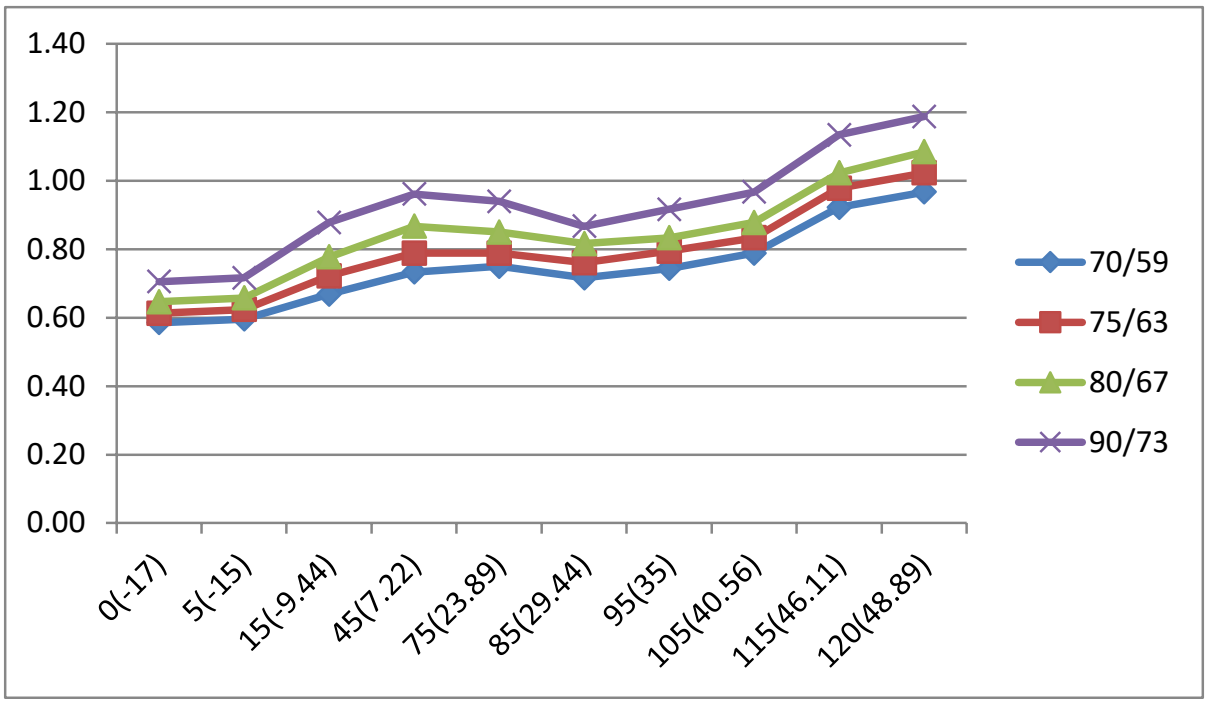
Other Temperature Sensors Resistance Value Table (°C – K)

°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	96.342	23	73	10.9731	63	145	2.11241	103	217	0.57683
-16	3	89.587	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	70.170	28	82	8.71983	68	154	1.76647	108	226	0.49989
-11	12	66.090	29	84	8.33566	69	156	1.70547	109	228	0.486
-10	14	62.276	30	86	7.97078	70	158	1.64691	110	230	0.47256
-9	16	58.708	31	88	7.62411	71	160	1.59068	111	232	0.45957
-8	18	56.369	32	90	7.29464	72	162	1.53668	112	234	0.44699
-7	19	52.244	33	91	6.98142	73	163	1.48481	113	235	0.43482
-6	21	49.316	34	93	6.68355	74	165	1.43498	114	237	0.42304
-5	23	46.573	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	41.588	37	99	5.87359	77	171	1.29078	117	243	0.38991
-2	28	39.824	38	100	5.62961	78	172	1.25423	118	244	0.37956
-1	30	37.199	39	102	5.39689	79	174	1.2133	119	246	0.36954
0	32	35.202	40	104	5.17519	80	176	1.17393	120	248	0.35982
1	34	33.327	41	106	4.96392	81	178	1.13604	121	250	0.35042
2	36	31.564	42	108	4.76253	82	180	1.09958	122	252	0.3413
3	37	29.906	43	109	4.5705	83	181	1.06448	123	253	0.33246
4	39	28.346	44	111	4.38736	84	183	1.03069	124	255	0.3239
5	41	26.878	45	113	4.21263	85	185	0.99815	125	257	0.31559
6	43	25.495	46	115	4.04589	86	187	0.96681	126	259	0.30754
7	45	24.193	47	117	3.88673	87	189	0.93662	127	261	0.29974
8	46	22.566	48	118	3.73476	88	190	0.90753	128	262	0.29216
9	48	21.809	49	120	3.58962	89	192	0.8795	129	264	0.28482
10	50	20.718	50	122	3.45097	90	194	0.85248	130	266	0.2777
11	52	19.689	51	124	3.31847	91	196	0.82643	131	268	0.27078
12	54	18.718	52	126	3.19183	92	198	0.80132	132	270	0.26408
13	55	17.801	53	127	3.07075	93	199	0.77709	133	271	0.25757
14	57	16.934	54	129	2.95896	94	201	0.75373	134	273	0.25125
15	59	16.116	55	131	2.84421	95	203	0.73119	135	275	0.24512
16	61	15.342	56	133	2.73823	96	205	0.70944	136	277	0.23916
17	63	14.618	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	13.263	59	138	2.44677	99	210	0.64862	139	282	0.22231

Pressure On Service Port

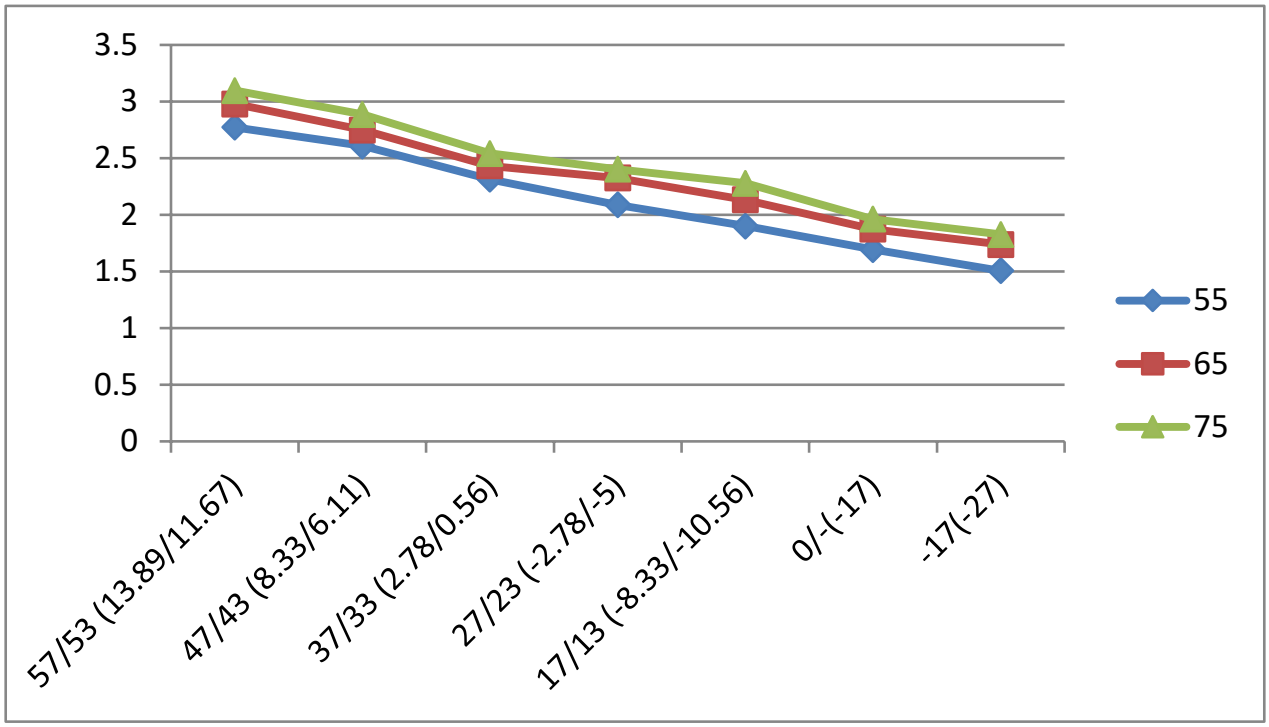
Cooling Chart (R454B):

°F (°C)	ODU(DB) / IDU(DB/WB)	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)
BAR	70/59 (21.11/15)	5.9	6.0	6.7	7.3	7.5	7.2	7.4	7.9	9.2	9.7
	75/63 (23.89/17.22)	6.1	6.2	7.2	7.9	7.9	7.6	7.9	8.3	9.8	10.2
	80/67 (26.67/19.44)	6.5	6.6	7.8	8.7	8.5	8.2	8.3	8.8	10.2	10.8
	90/73 (32.22/22.78)	7.1	7.2	8.8	9.6	9.4	8.7	9.2	9.7	11.3	11.9
PSI	70/59 (21.11/15)	85	86	97	106	109	104	108	114	134	140
	75/63 (23.89/17.22)	89	90	105	114	114	110	115	121	142	148
	80/67 (26.67/19.44)	94	95	113	126	123	118	121	127	148	157
	90/73 (32.22/22.78)	102	104	127	139	136	126	133	140	164	172
MPa	70/59 (21.11/15)	0.59	0.60	0.67	0.73	0.75	0.72	0.74	0.79	0.92	0.97
	75/63 (23.89/17.22)	0.61	0.62	0.72	0.79	0.79	0.76	0.79	0.83	0.98	1.02
	80/67 (26.67/19.44)	0.65	0.66	0.78	0.87	0.85	0.82	0.83	0.88	1.02	1.08
	90/73 (32.22/22.78)	0.71	0.72	0.88	0.96	0.94	0.87	0.92	0.97	1.13	1.19



Heating chart (R454B):

°F (°C)	ODU(DB/WB) / IDU(DB)	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/- (-17)	-17 (-27)
BAR	55(12.78)	27.7	26.1	23.1	20.9	19.0	16.9	15.1
	65(18.33)	29.8	27.5	24.3	23.2	21.3	18.7	17.4
	75(23.89)	31.0	28.8	25.4	24.0	22.8	19.6	18.3
PSI	55(12.78)	402	378	335	303	275	245	218
	65(18.33)	432	398	352	337	309	271	252
	75(23.89)	449	418	368	348	330	284	265
MPa	55(12.78)	2.77	2.61	2.31	2.09	1.90	1.69	1.51
	65(18.33)	2.98	2.75	2.43	2.32	2.13	1.87	1.74
	75(23.89)	3.10	2.88	2.54	2.40	2.28	1.96	1.83



System Pressure Table-R454B

Pressure			Temperature		Pressure			Temperature	
Kpa	bar	PSI	°C	°F	Kpa	bar	PSI	°C	°F
58.196	0.58	8.44	-60	-76	935.23	9.35	135.64	8	46.4
61.517	0.62	8.92	-59	-74.2	963.75	9.64	139.78	9	48.2
64.988	0.65	9.43	-58	-72.4	992.93	9.93	144.01	10	50
68.615	0.69	9.95	-57	-70.6	1,022.8	10.23	148.34	11	51.8
72.402	0.72	10.50	-56	-68.8	1,053.3	10.53	152.76	12	53.6
76.354	0.76	11.07	-55	-67	1,084.5	10.85	157.29	13	55.4
80.478	0.80	11.67	-54	-65.2	1,116.4	11.16	161.91	14	57.2
84.776	0.85	12.30	-53	-63.4	1149	11.49	166.64	15	59
89.256	0.89	12.95	-52	-61.6	1,182.3	11.82	171.47	16	60.8
93.923	0.94	13.62	-51	-59.8	1,216.3	12.16	176.40	17	62.6
98.781	0.99	14.33	-50	-58	1,251.1	12.51	181.45	18	64.4
103.84	1.04	15.06	-49	-56.2	1,286.6	12.87	186.60	19	66.2
109.1	1.09	15.82	-48	-54.4	1,322.8	13.23	191.85	20	68
114.56	1.15	16.61	-47	-52.6	1,359.9	13.60	197.23	21	69.8
120.25	1.20	17.44	-46	-50.8	1,397.7	13.98	202.71	22	71.6
126.15	1.26	18.30	-45	-49	1,436.3	14.36	208.31	23	73.4
132.28	1.32	19.18	-44	-47.2	1,475.7	14.76	214.02	24	75.2
138.64	1.39	20.11	-43	-45.4	1,515.9	15.16	219.85	25	77
145.24	1.45	21.06	-42	-43.6	1557	15.57	225.82	26	78.8
152.09	1.52	22.06	-41	-41.8	1,598.9	15.99	231.89	27	80.6
159.18	1.59	23.09	-40	-40	1,641.6	16.42	238.09	28	82.4
166.54	1.67	24.15	-39	-38.2	1,685.2	16.85	244.41	29	84.2
174.15	1.74	25.26	-38	-36.4	1,729.7	17.30	250.86	30	86
182.04	1.82	26.40	-37	-34.6	1775	17.75	257.43	31	87.8
190.2	1.90	27.59	-36	-32.8	1,821.3	18.21	264.15	32	89.6
198.65	1.99	28.81	-35	-31	1,868.4	18.68	270.98	33	91.4
207.39	2.07	30.08	-34	-29.2	1,916.5	19.17	277.95	34	93.2
216.42	2.16	31.39	-33	-27.4	1,965.6	19.66	285.08	35	95
225.76	2.26	32.74	-32	-25.6	2,015.5	20.16	292.31	36	96.8
235.41	2.35	34.14	-31	-23.8	2,066.5	20.67	299.71	37	98.6
245.37	2.45	35.59	-30	-22	2,118.4	21.18	307.24	38	100.4
255.67	2.56	37.08	-29	-20.2	2,171.3	21.71	314.91	39	102.2
266.29	2.66	38.62	-28	-18.4	2,225.2	22.25	322.73	40	104
277.25	2.77	40.21	-27	-16.6	2,280.2	22.80	330.70	41	105.8
288.56	2.89	41.85	-26	-14.8	2,336.1	23.36	338.81	42	107.6
300.22	3.00	43.54	-25	-13	2,393.2	23.93	347.09	43	109.4
312.24	3.12	45.28	-24	-11.2	2,451.3	24.51	355.52	44	111.2
324.63	3.25	47.08	-23	-9.4	2,510.4	25.10	364.09	45	113
337.39	3.37	48.93	-22	-7.6	2,570.7	25.71	372.84	46	114.8
350.54	3.51	50.84	-21	-5.8	2,632.1	26.32	381.74	47	116.6
364.08	3.64	52.80	-20	-4	2,694.7	26.95	390.82	48	118.4
378.02	3.78	54.83	-19	-2.2	2,758.3	27.58	400.04	49	120.2
392.37	3.92	56.91	-18	-0.4	2,823.2	28.23	409.46	50	122
407.13	4.07	59.05	-17	1.4	2,889.3	28.89	419.04	51	123.8
422.31	4.22	61.25	-16	3.2	2,956.5	29.57	428.79	52	125.6

System Pressure Table-R454B (continued)

Pressure			Temperature		Pressure			Temperature	
Kpa	**bar**	**PSI**	**°C**	**°F**	**Kpa**	**bar**	**PSI**	**°C**	**°F**
437.92	4.38	63.51	-15	5	3025	30.25	438.72	53	127.4
453.98	4.54	65.84	-14	6.8	3,094.7	30.95	448.83	54	129.2
470.47	4.70	68.23	-13	8.6	3,165.7	31.66	459.13	55	131
487.43	4.87	70.69	-12	10.4	3,238.1	32.38	469.63	56	132.8
504.84	5.05	73.22	-11	12.2	3,311.7	33.12	480.30	57	134.6
522.73	5.23	75.81	-10	14	3,386.7	33.87	491.18	58	136.4
541.1	5.41	78.48	-9	15.8	3,463	34.63	502.25	59	138.2
559.95	5.60	81.21	-8	17.6	3,540.7	35.41	513.52	60	140
579.31	5.79	84.02	-7	19.4	3,619.9	36.20	525.00	61	141.8
599.16	5.99	86.90	-6	21.2	3,700.5	37.01	536.69	62	143.6
619.54	6.20	89.85	-5	23	3,782.7	37.83	548.61	63	145.4
640.43	6.40	92.88	-4	24.8	3,866.3	38.66	560.74	64	147.2
661.86	6.62	95.99	-3	26.6	3,951.5	39.52	573.10	65	149
683.82	6.84	99.18	-2	28.4	4,038.3	40.38	585.69	66	150.8
706.34	7.06	102.44	-1	30.2	4,126.8	41.27	598.52	67	152.6
729.41	7.29	105.79	0	32	4,217	42.17	611.60	68	154.4
753.06	7.53	109.22	1	33.8	4,309	43.09	624.95	69	156.2
777.28	7.77	112.73	2	35.6	4,402.9	44.03	638.56	70	158
802.08	8.02	116.33	3	37.4	4,498.7	44.99	652.46	71	159.8
827.48	8.27	120.01	4	39.2	4,596.5	45.97	666.64	72	161.6
853.49	8.53	123.78	5	41	4,696.5	46.97	681.15	73	163.4
880.11	8.80	127.64	6	42.8	4,798.9	47.99	696.00	74	165.2
907.35	9.07	131.60	7	44.6	4,904.1	49.04	711.25	75	167

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Important!
Product Warranty Information

The Warranty Registration below is a requirement to print a warranty certificate. You're not mandated to register your products to enjoy the Midea Standard Warranty; however, registration is highly recommended. Registering your warranty within 60 days ensures easy access to support and service when needed.

The design and specifications may change without prior notice in order to enhance the product. For detailed information, please consult your sales agency or the manufacturer. Any updates to the manual will be posted on the service website, so be sure to check for the latest version.

United States

https://www.mideacomfort.us/registration.html

Canada

https://www.mideacomfortna.ca/registration.html

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