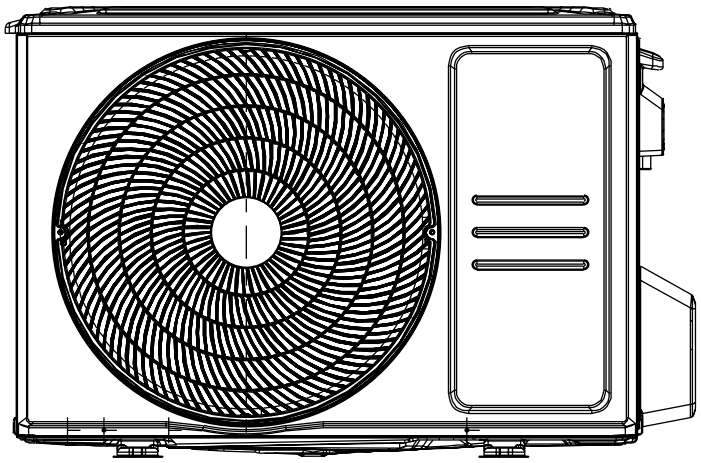
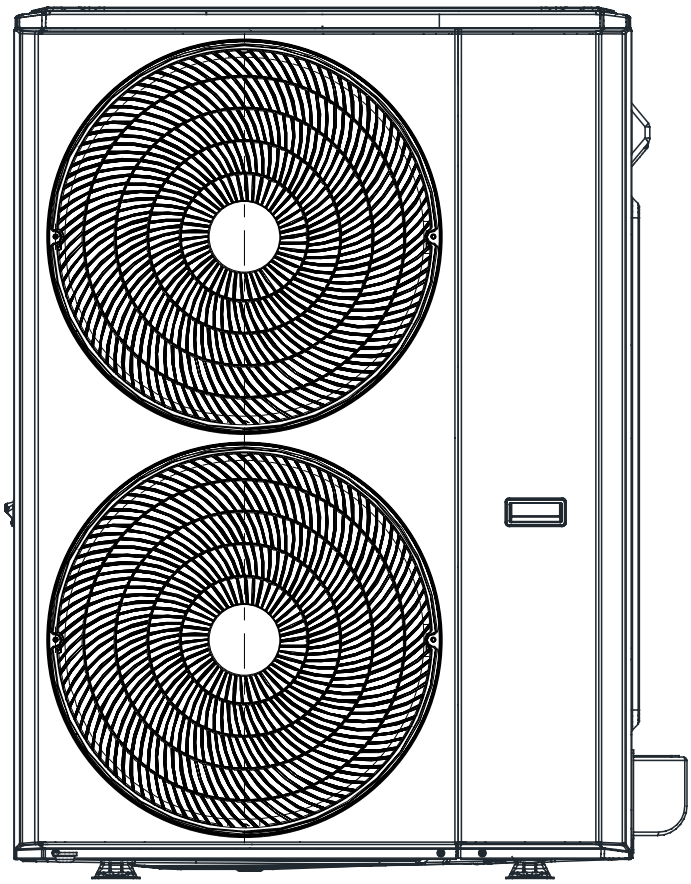
Service Manual
Single-Zone Oudoor Unit
For 6,000 - 60,000 BTU Systems





Units Covered In This Manual

Outdoor Unit Model	Capacity (Btu/h)	Power Supply
MO1HS-H06B-2A	6k Extreme Heat	1Ph, 208/230V~, 60Hz
MO1ES-H09B-2A	9k Advanced Heat	
MO1HS-H09B-2A	9k Extreme Heat	
MO1ES-H12B-2A	12k Advanced Heat	
MO1HS-H12B-2A	12k Extreme Heat	
MO1ES-H18B-2A	18k Advanced Heat	
MO1HS-H18B-2A	18k Extreme Heat	
MO1ES-H24B-2A	24k Advanced Heat	
MO1HS-H24B-2A	24k Extreme Heat	
MO1BS-H30B-2A	30k Advanced Heat	
MO1HS-H33B-2A	33k Extreme Heat	
MO1BS-H36B-2A	36k Advanced Heat	
MO1BU-H36B-2A		
MO1HU-H36B-2A	36k Extreme Heat	
MO1BU-H48B-2A	48k Advanced Heat	
MO1HU-H48B-2A	48k Extreme Heat	
MO1BU-H60B-2A	60k Advanced Heat	
MO1HU-H60B-2A	60k Extreme Heat	

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.
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.

⚠ 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 touches skin or clothing, immediately rinse or wash the area well with clean water.
- Do not insert hands or other objects into the air inlet or outlet while the unit is plugged in.
- Do not operate the unit with wet hands.
- Do not use a remote controller that has previously been exposed to battery damage or battery leakage.

⚠ CAUTION

- Clean and ventilate the unit at regular intervals when operating it near a stove or 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 period 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 are used for this task.
- When the unit is not to be used for an extended time, disconnect the power supply or turn off the breaker.

⚠ WARNING

Information servicing (For flammable refrigerant)

1. Installation (where refrigerant pipes are allowed)

- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry-recognized assessment specification.
- Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- That the installation of pipework shall be kept to a minimum.
- That pipework shall be protected from physical damage.
- Where refrigerant pipes shall comply with national gas regulations.
- That mechanical connections shall be accessible for maintenance purposes.
- Be more 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.
- All working procedures that affect safety means shall only be carried out by competent technicians.
- Appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- Joints shall be tested with detection equipment with a capability of 5 g/year of refrigerant or better, with the equipment in a standstill and under operation or under pressure of at least these standstill or operation conditions after installation. Detachable joints should NOT be used on the indoor side of the unit (brazed, welded joints could be used).
- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.

2. When a FLAMMABLE REFRIGERANT is used, the requirements for installation space of 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 or 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 pipework shall be pressure tested with an inert gas and then vacuum tested before refrigerant charging, according to the following requirements:
  a. 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 can not 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.
  b. The test pressure after removal of the pressure source shall be maintained for at least 1 h with no decrease of pressure indicated by the test gauge, with test gauge resolution not exceeding 5% of the test pressure.
  c. 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 and shall be the lessor 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.

3 . 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 technicians who joined the training and achieved competence should 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 of such working procedures are:

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

4. Checks to 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.

5. Work procedure

Works shall be undertaken under a controlled procedure to minimize the risk of flammable gas or vapor being present while the work is being performed.

6. General work area

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

7. 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.

8. Presence of fire extinguisher

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

9. No ignition sources

No person carrying out work on a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of a fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repair, removal, and disposal, during which refrigerant can be released into 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.

10. 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.

11. Check 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 in accordance with the room size within which the refrigerant-containing parts are installed;
- the ventilation machinery and outlets are operating adequately and are not obstructed;
- if an indirect refrigerating circuit is being used, the secondary circuits shall be checked for the presence of refrigerant;
- marking to 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.

12. Checks to 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 it is necessary to continue operation, and 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 no live electrical components and wiring are exposed while charging, recovering, or purging the system;

that there is continuity of earth bonding;

Sealed electrical components shall be replaced if it's damaged; Intrinsically safe components must be replaced if it's damaged.

Sealed electrical components shall be replaced.

Intrinsically safe components must be replaced.

13. 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.

14. 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.

15. 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.

16. 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.

17. 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.

18. 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.

19. Recovery

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

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct 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.

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

a. **Transport of equipment containing flammable refrigerants:**
Compliance with the transport regulations.

b. **Marking of equipment using signs:**
Compliance with local regulations.

c. **Disposal of equipment using flammable refrigerants**
Compliance with national regulations.

d. **Storage of equipment/appliances**
The storage of equipment should follow the manufacturer's instructions.

e. **Storage of packed (unsold) equipment**
Storage package protection should be constructed such 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.

External Appearance

6K Extreme heat
9K Advanced heat
12K Advanced heat

9K Extreme heat
12K Extreme heat

18K Extreme heat
18K Advanced heat

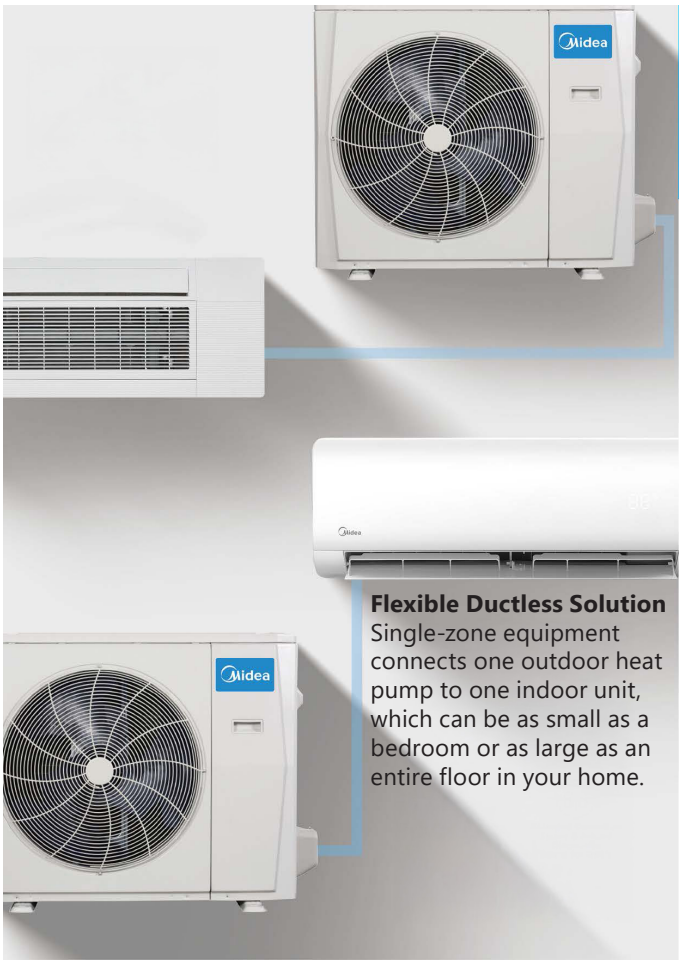
36K Extreme heat

24K & 33K Extreme heat
24K, 30K, & 36K Advanced heat

48k & 60k Extreme Heat
48k & 60k Advanced Heat

Features

Comfort in Any Climate
Midea Advanced Technology ensures extreme cooling and heating all in one.
EVI Technology brings Superior Heating at -22° F and 100% Heating Output at -13° F with COP up to 1.9
ICE-Circuit Technology brings Superior Cooling at 122°F and 100% Cooling Output at 110°F



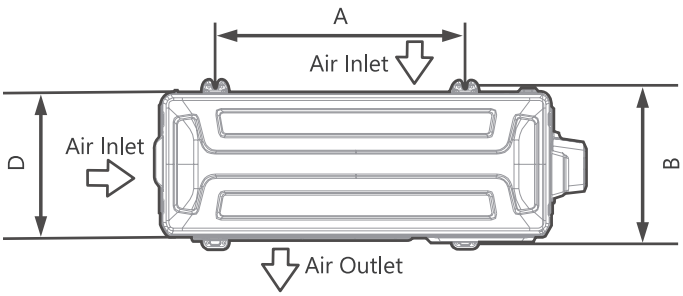
Flexible Ductless Solution
Single-zone equipment connects one outdoor heat pump to one indoor unit, which can be as small as a bedroom or as large as an entire floor in your home.

Inverter-driven Compressor
Midea inverter-driven technology eliminates the start-stop cycle, requiring the least amount of energy to maintain the desired temperature and keep the system whisper-quiet.

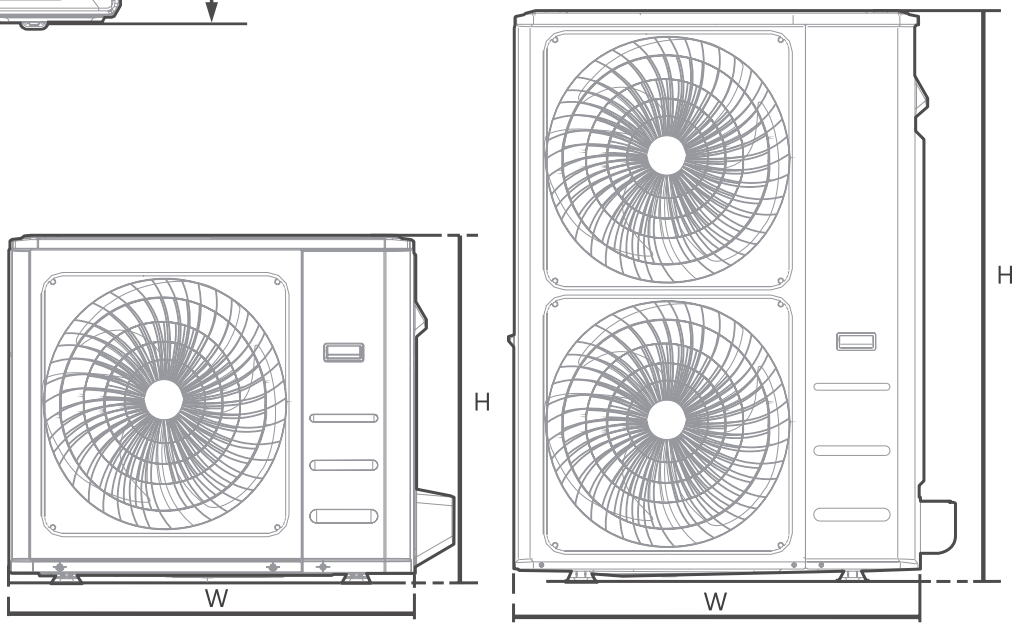
GA Inverter Technology
The GA Inverter Algorithm can analyze more factors, including temperature differences and the rate of change in temperature differences, with more frequent temperature detection to guarantee more accurate control of the system output and provide better comfort.

True Comfort Quietly
Our outdoor units operate at a level as low as 53 dB(A) — comparable to the sound of a typical conversation. And our indoor units offer whisper-quiet operation as low as 20 dB(A).

Dimension Drawing



Top View



Front View

Fig. D-1: Unit Dimensions

Outdoor Unit Model	Outdoor Unit Dimensions W x H x D	Mounting Dimensions	
		Distance A	Distance B
MO1HS-H06B-2A MO1ES-H09B-2A MO1ES-H12B-2A	30-1/8 in. x 21-7/8 in. x 11-7/8 in. (765 mm x 555 mm x 303 mm)	17- 7/8 in. (452 mm)	11-1/4 in. (286 mm)
MO1HS-H09B-2A MO1HS-H12B-2A	31-3/4 in. x 21-7/8 in. x 12-7/8 in. (805 mm x554 mm x330 mm)	20-1/8 in. (511 mm)	12-1/2 in. (317 mm)
MO1ES-H18B-2A MO1HS-H18B-2A	35 in. x 26-1/4 in. x 13-1/2 in. (890 mm x 673 mm x 342 mm)	26-1/8 in. (663 mm)	13-7/8 in. (354 mm)
MO1ES-H24B-2A MO1HS-H24B-2A, MO1BS-H30B-2A MO1HS-H33B-2A MO1BS-H36B-2A MO1BU-H36B-2A	37-1/4 in. × 31-7/8 in. × 16-1/2 in. (946 mm x 810 mm x 420 mm)	26-1/2 in. (673 mm)	15-7/8 in. (403 mm)
MO1HU-H36B-2A	38-5/8 in. × 38-3/8 in. ×16-3/8 in. (980 mm x 975 mm x 415 mm)	24-1/4 in. (616 mm)	15-5/8 in. (397 mm)
MO1BU-H48B-2A MO1HU-H48B-2A MO1BU-H60B-2A MO1HU-H60B-2A	37-1/2 in. × 52-1/2 in. ×16-3/8in (952 mm x 1333 mm x 415 mm)	25 in. (634 mm)	15-7/8 in. (404 mm)

Service Clearances

The distance between the mounted outdoor unit should meet the specifications illustrated in the following diagrams.

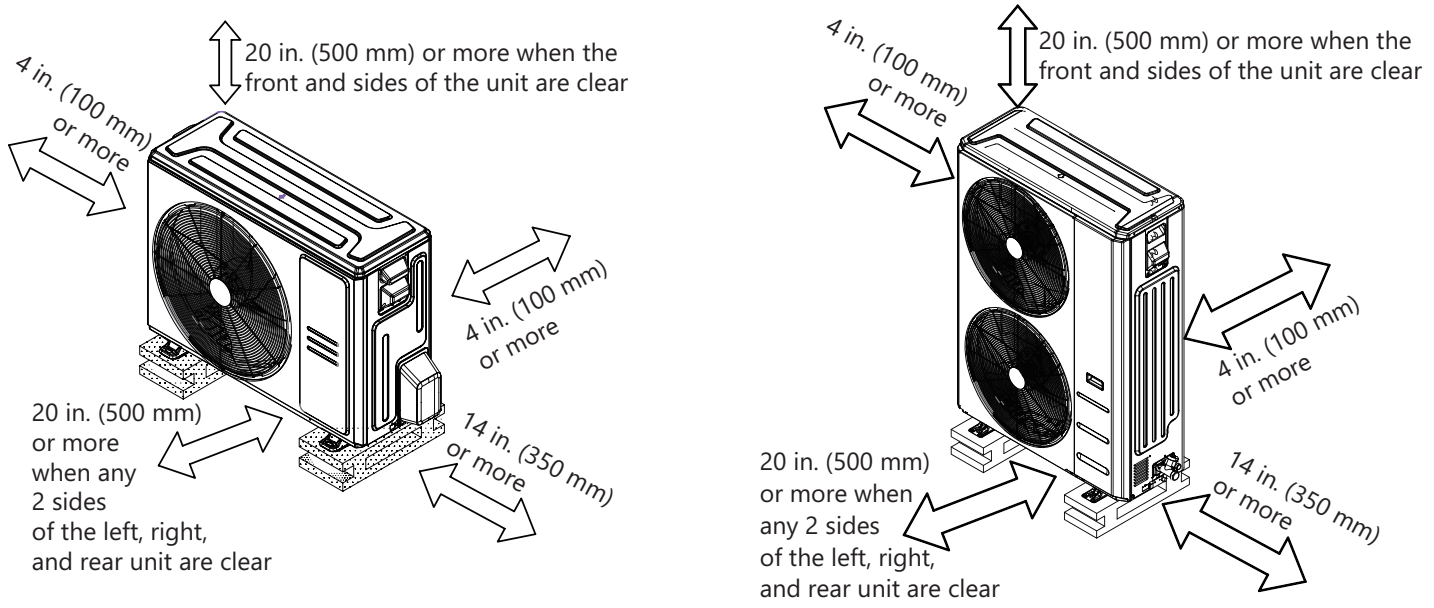


Fig. SC-1: Single Unit Clearance Dimensions

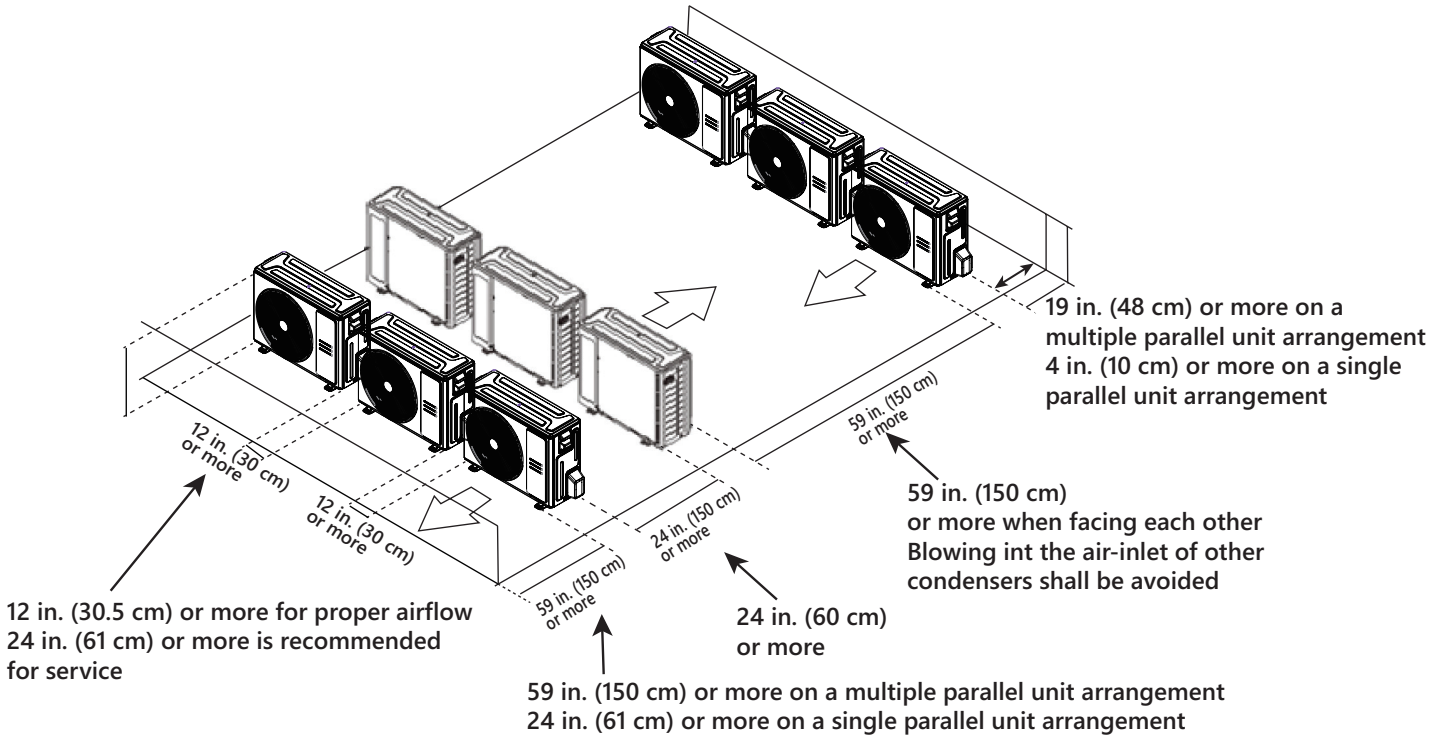
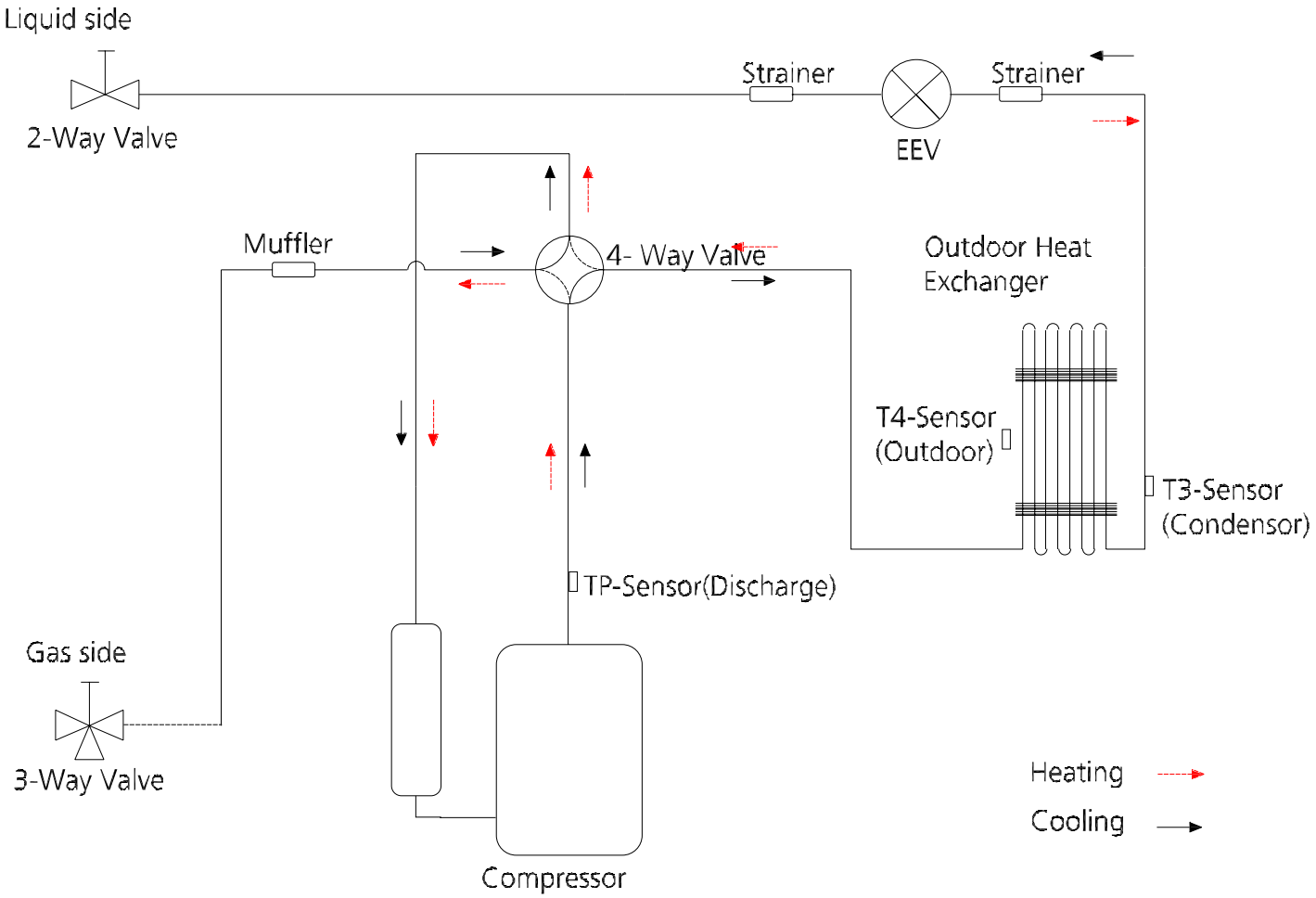
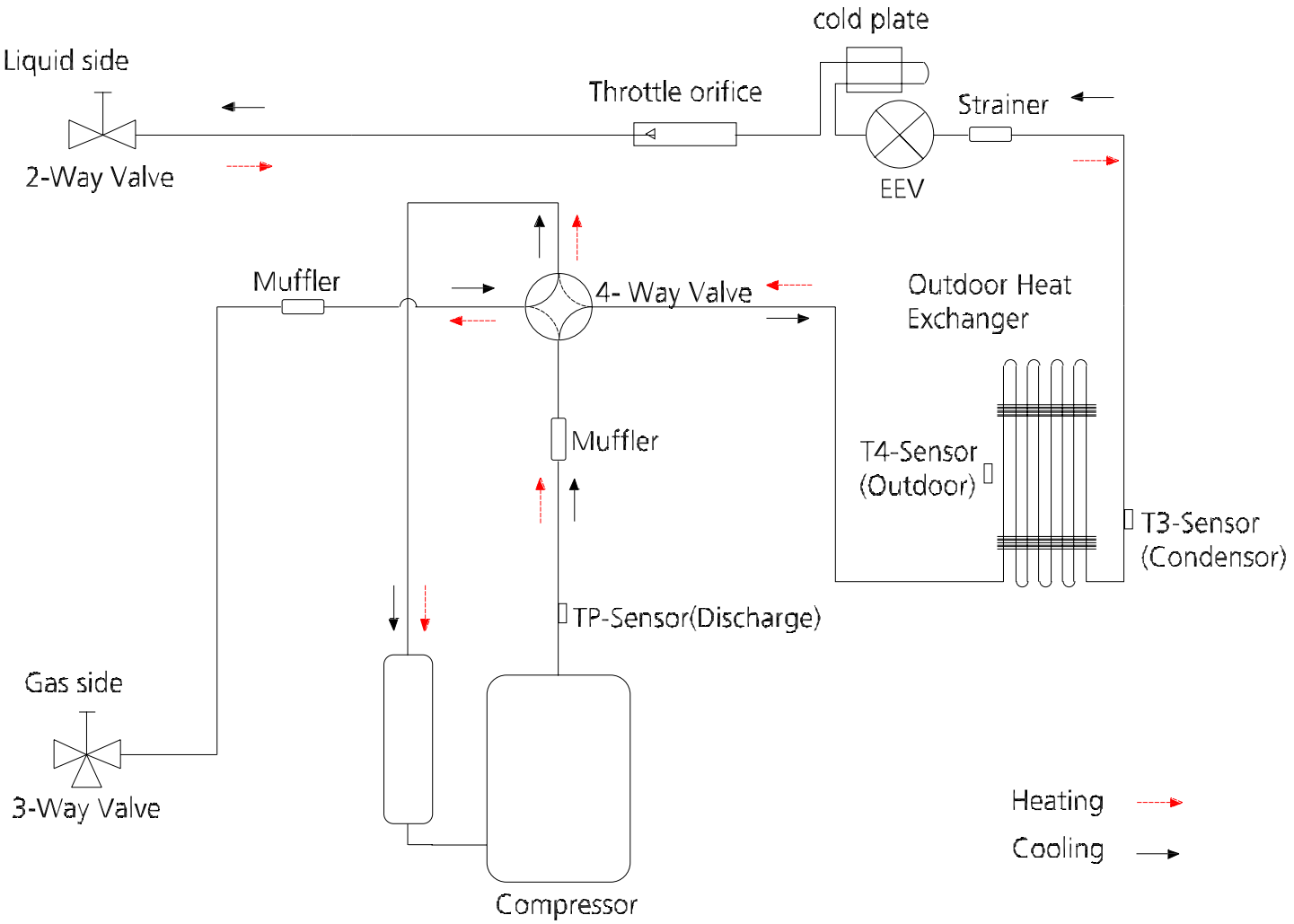


Fig. SC-2: Clearances for Multiple Units

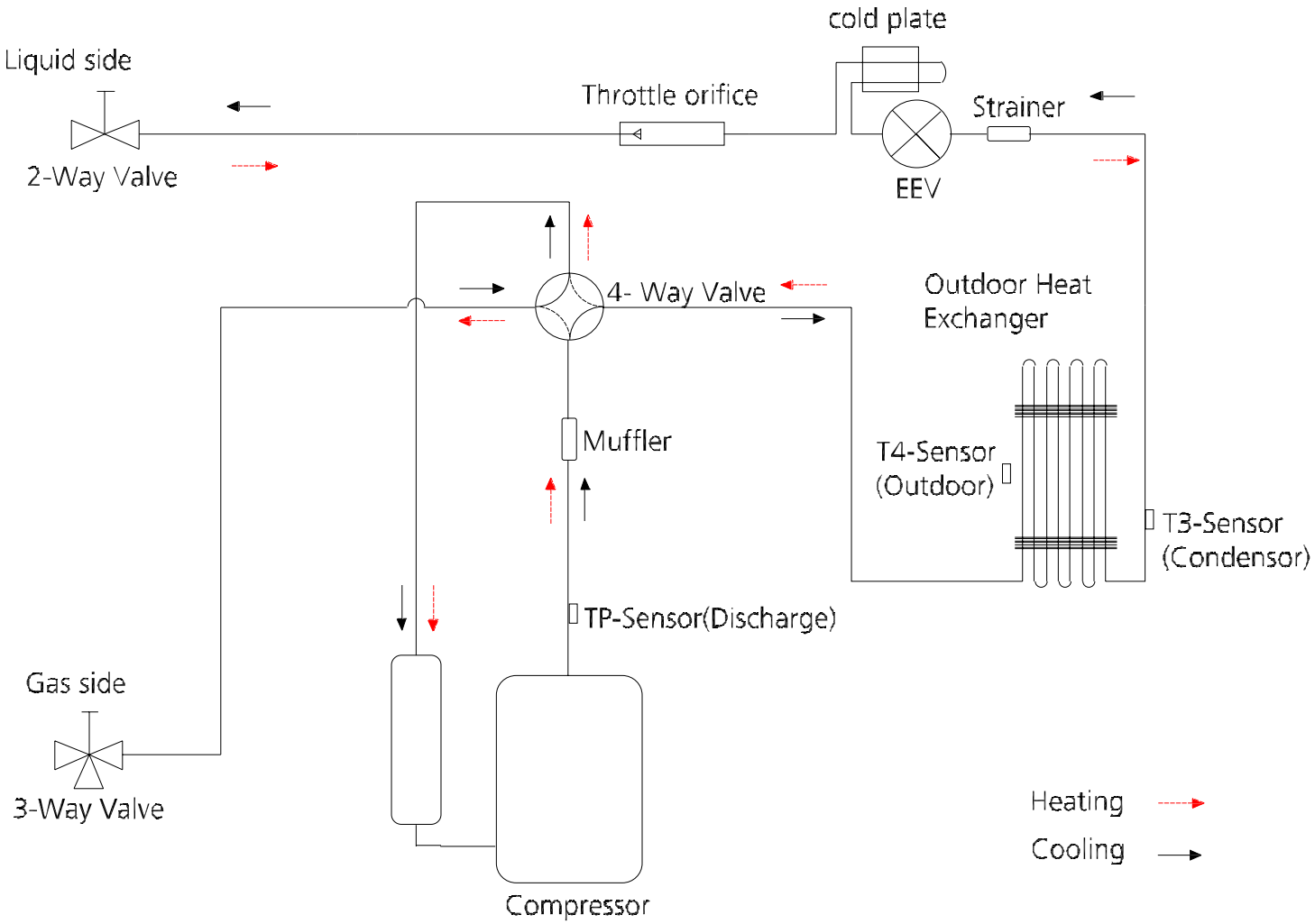
Refrigerant Cycle Diagrams



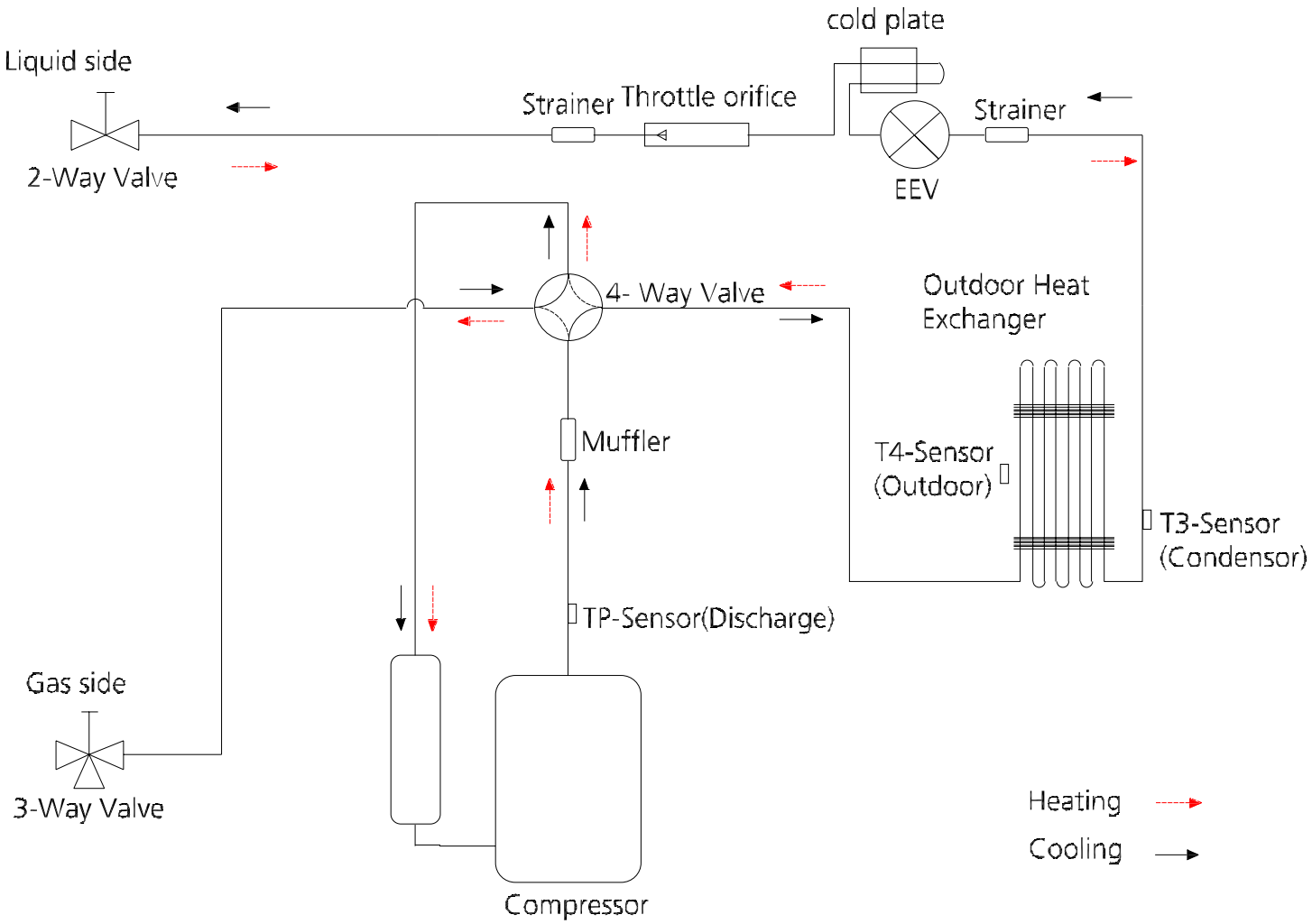
Model No.	Pipe Size (Diameter: ø) inch (mm)		Piping length (ft/m)		Elevation (ft/m)		Additional Refrigerant
	Gas	Liquid	Rated	Max.	Rated	Max.	
MO1HS-H06B-2A	3/8 (9.52)	1/4 (6.35)	24.6/7.5	82/25	0	49.2/15	0.16 oz/ft (15 g/m)
MO1ES-H09B-2A							
MO1HS-H09B-2A							
MO1ES-H12B-2A							
MO1HS-H12B-2A							



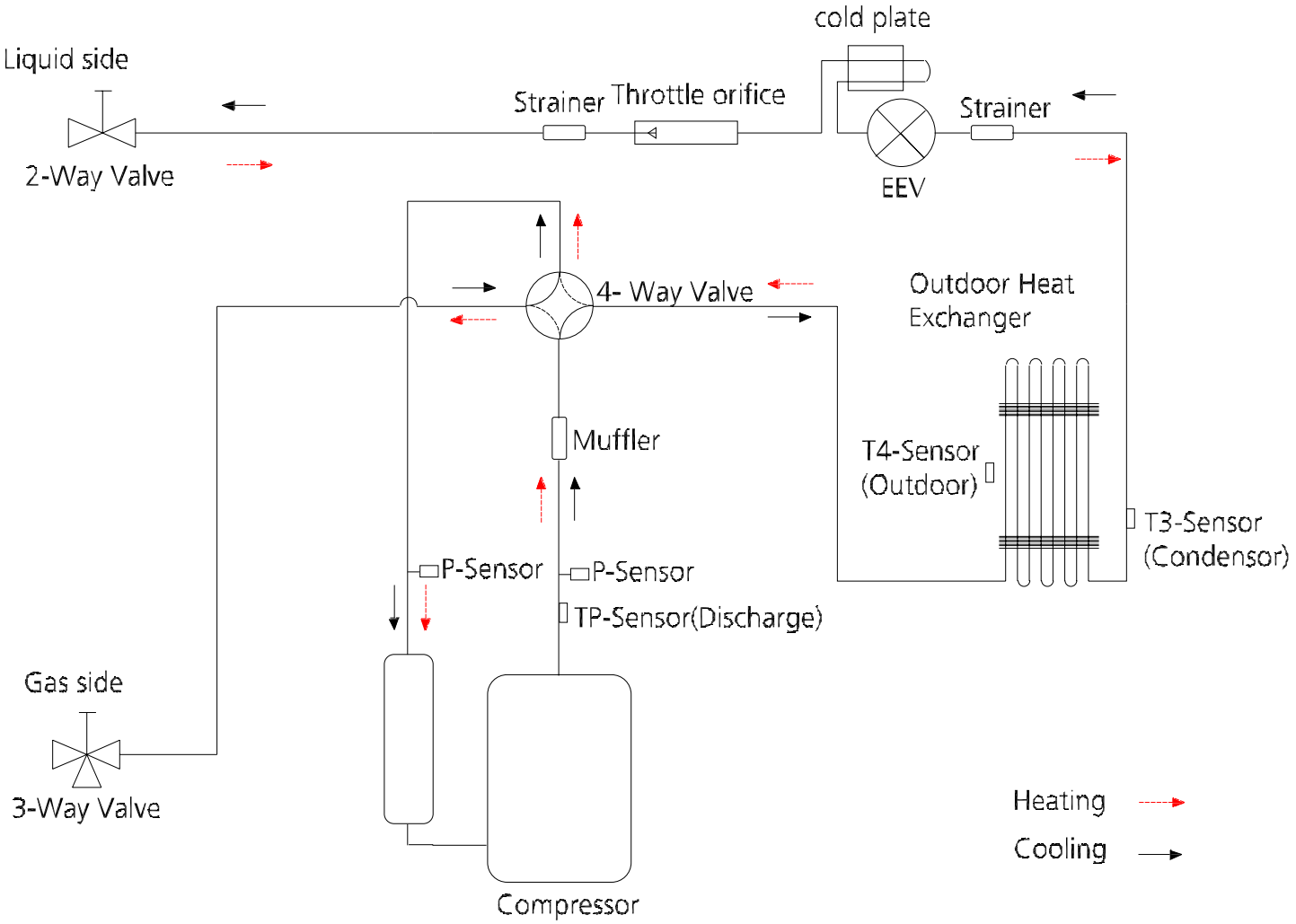
Model No.	Pipe Size (Diameter: ø) inch (mm)		Piping length (ft/m)		Elevation (ft/m)		Additional Refrigerant
	Gas	Liquid	Rated	Max.	Rated	Max.	
MO1ES-H18B-2A	1/2 (12.7)	1/4 (6.35)	24.6/7.5	98.4/30	0	65.6/20	0.16 oz/ft (15 g/m)
MO1HS-H18B-2A							



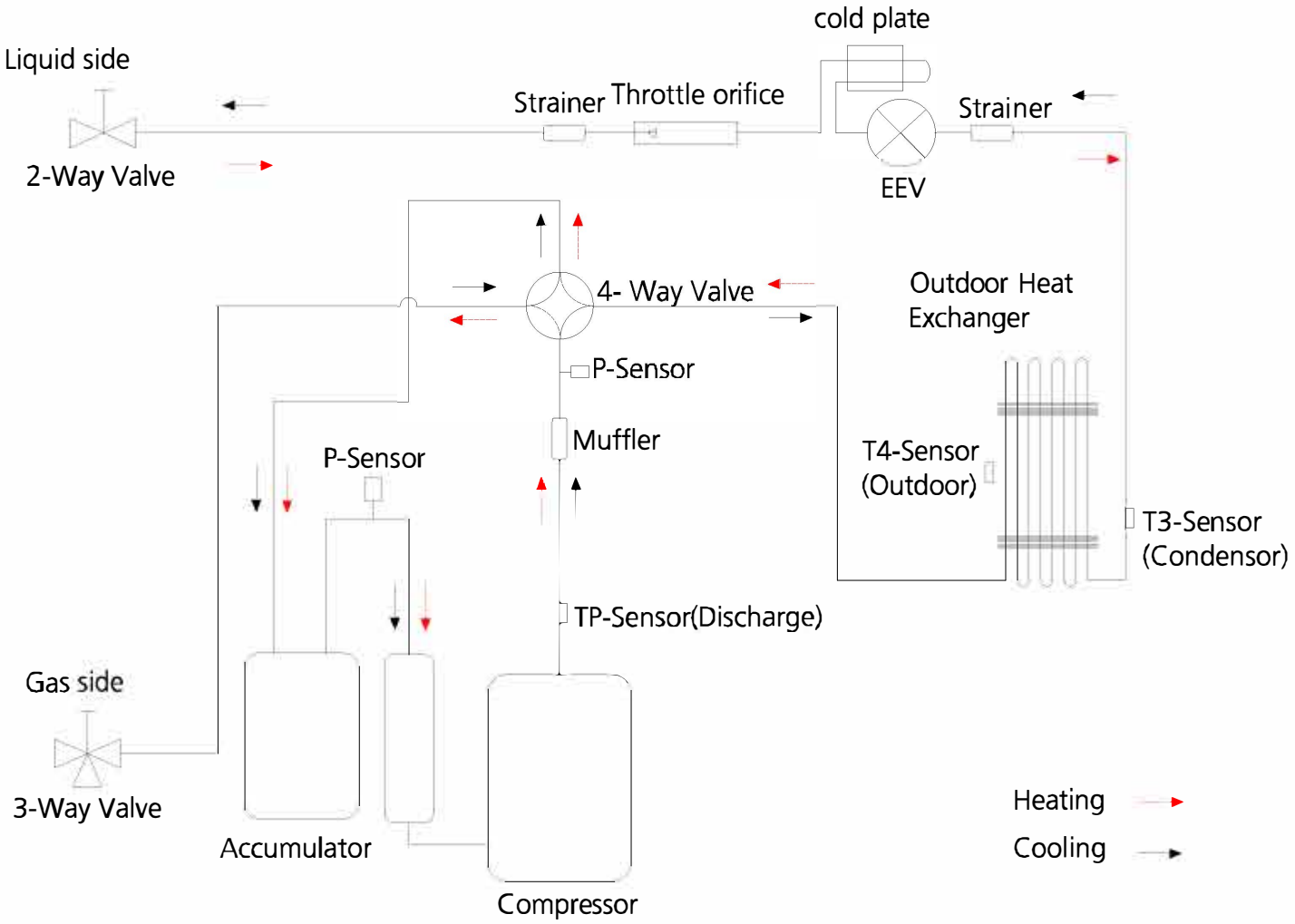
Model No.	Pipe Size (Diameter: ø) inch (mm)		Piping length (ft/m)		Elevation (ft/m)		Additional Refrigerant
	Gas	Liquid	Rated	Max.	Rated	Max.	
MO1ES-H24B-2A	5/8 (16)	3/8 (9.52)	24.6/7.5	164/50	0	82/25	0.32 oz/ft (30 g/m)



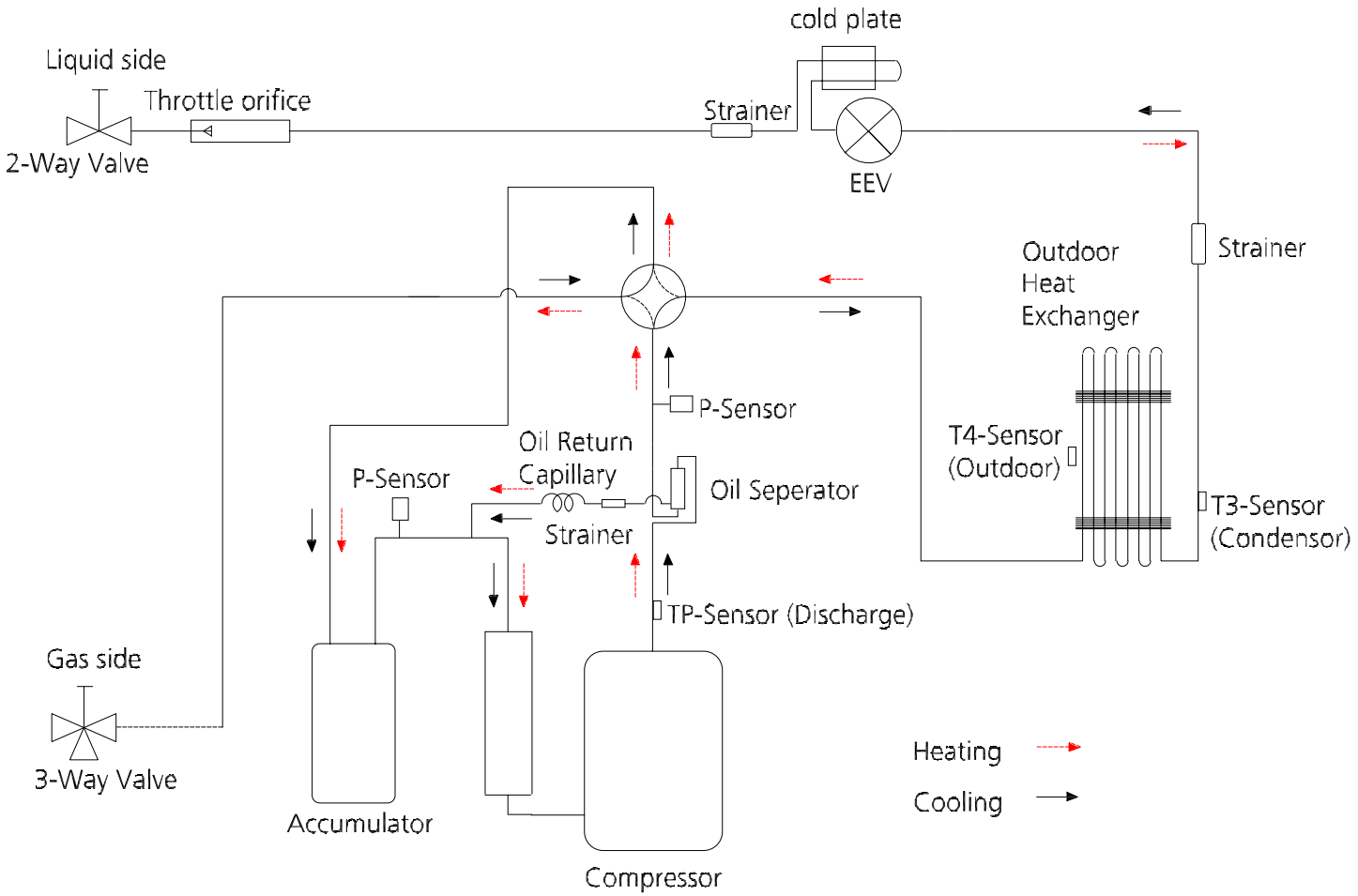
Model No.	Pipe Size (Diameter: ø) inch (mm)		Piping length (ft/m)		Elevation (ft/m)		Additional Refrigerant
	Gas	Liquid	Rated	Max.	Rated	Max.	
MO1HS-H24B-2A	5/8 (16)	3/8 (9.52)	24.6/7.5	164/50	0	82/25	0.32 oz/ft (30 g/m)
MO1BS-H30B-2A							



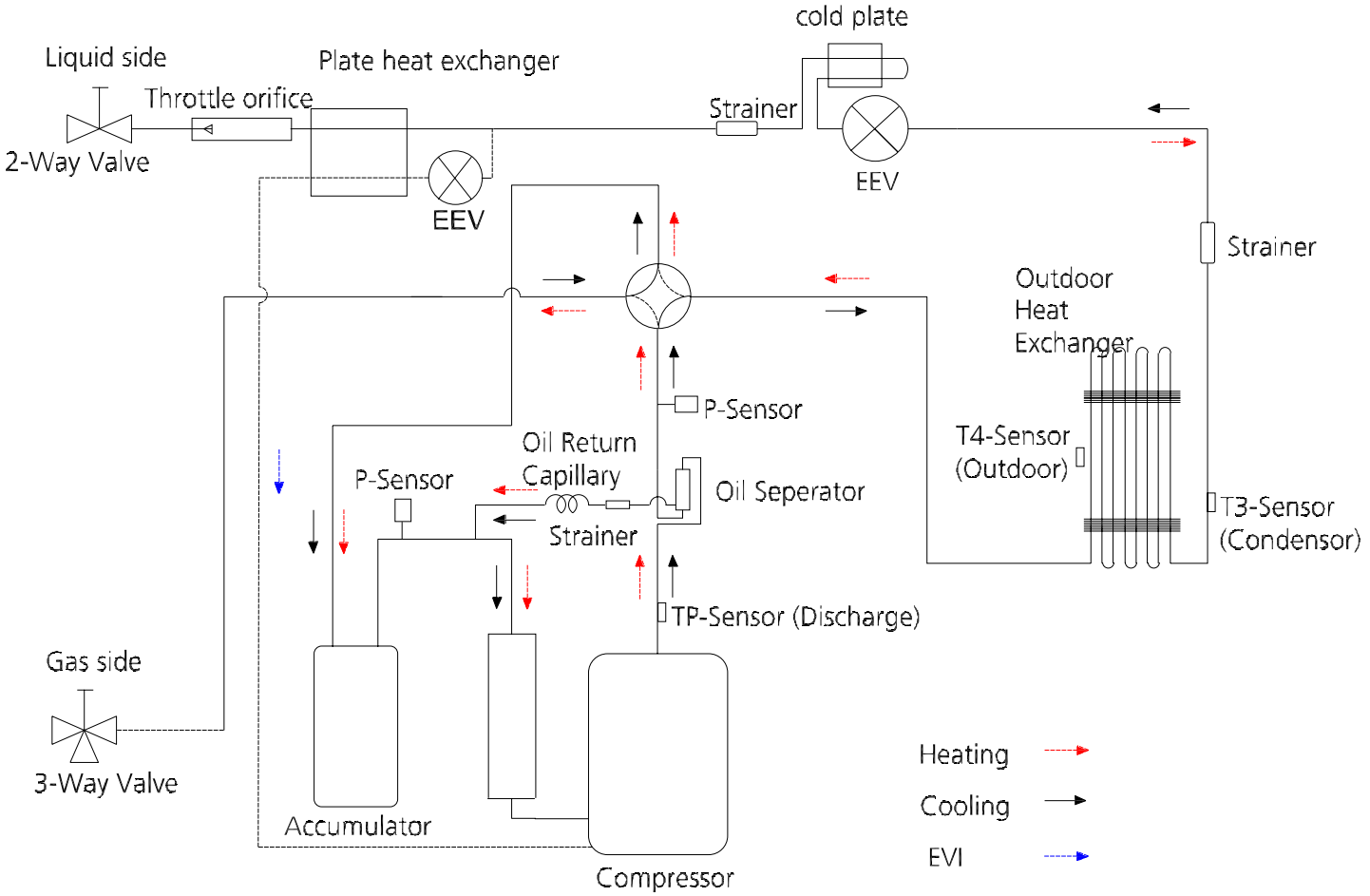
Model No.	Pipe Size (Diameter: ø) inch (mm)		Piping length (ft/m)		Elevation (ft/m)		Additional Refrigerant
	Gas	Liquid	Rated	Max.	Rated	Max.	
MO1HS-H33B-2A	3/4 (19)	3/8 (9.52)	24.6/7.5	164/50	0	82/25	0.32 oz/ft (30 g/m)



Model No.	Pipe Size (Diameter: ø) inch (mm)		Piping length (ft/m)		Elevation (ft/m)		Additional Refrigerant
	Gas	Liquid	Rated	Max.	Rated	Max.	
MO1BS-H36B-2A	5/8 (16)	3/8 (9.52)	24.6/7.5	246/75	0	98.4/30	0.32 oz/ft (30 g/m)



Model No.	Pipe Size (Diameter: ø) inch (mm)		Piping length (ft/m)		Elevation (ft/m)		Additional Refrigerant
	Gas	Liquid	Rated	Max.	Rated	Max.	
MO1BU-H36B-2A	3/4 (19)	3/8 (9.52)	24.6/7.5	246/75	0	98.4/30	0.32 oz/ft (30 g/m)
MO1BU-H48B-2A							
MO1BU-H60B-2A							

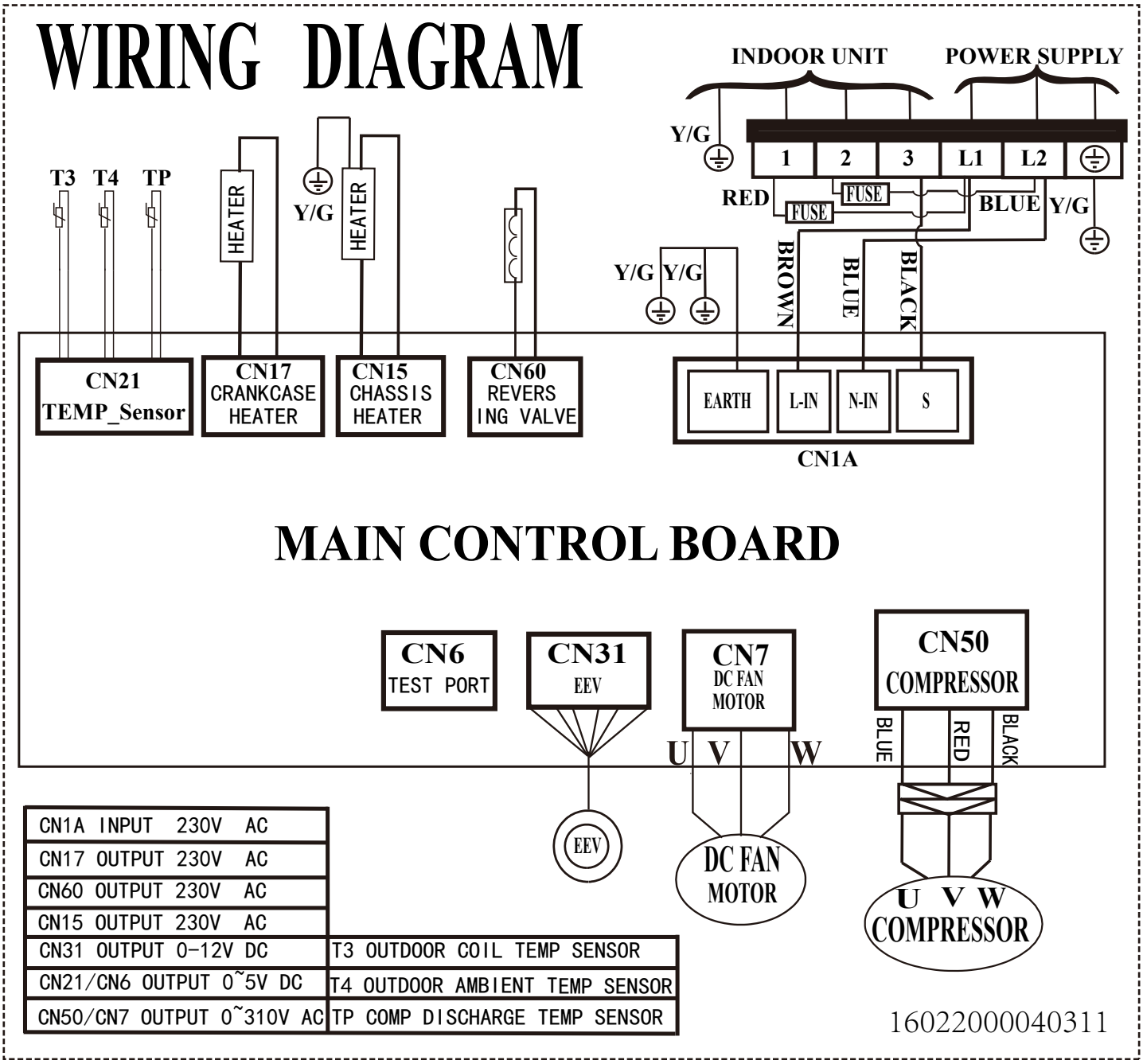


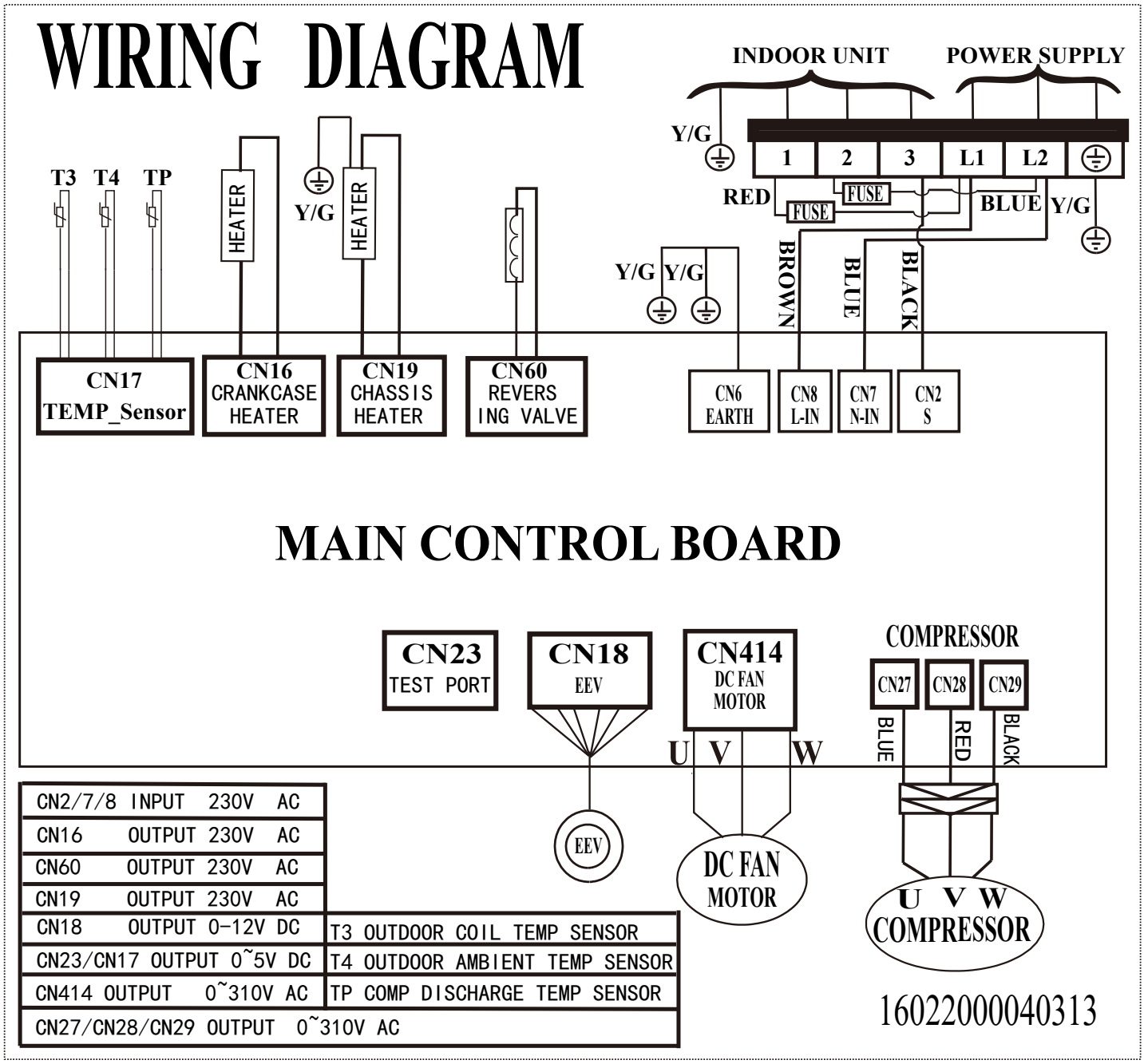
Model No.	Pipe Size (Diameter: ø) inch (mm)		Piping length (ft/m)		Elevation (ft/m)		Additional Refrigerant
	Gas	Liquid	Rated	Max.	Rated	Max.	
MO1HU-H36B-2A	3/4 (19)	3/8 (9.52)	24.6/7.5	246/75	0	98.4/30	0.32 oz/ft (30 g/m)
MO1HU-H48B-2A							
MO1HU-H60B-2A							

Electrical Wiring Diagrams

Outdoor Unit Wiring Diagram

MO1HS-H06B-2A, MO1ES-H09B-2A, MO1HS-H09B-2A, MO1ES-H12B-2A, and MO1HS-H12B-2A




WIRING DIAGRAM
INDOOR UNIT
POWER SUPPLY
Y/G
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2
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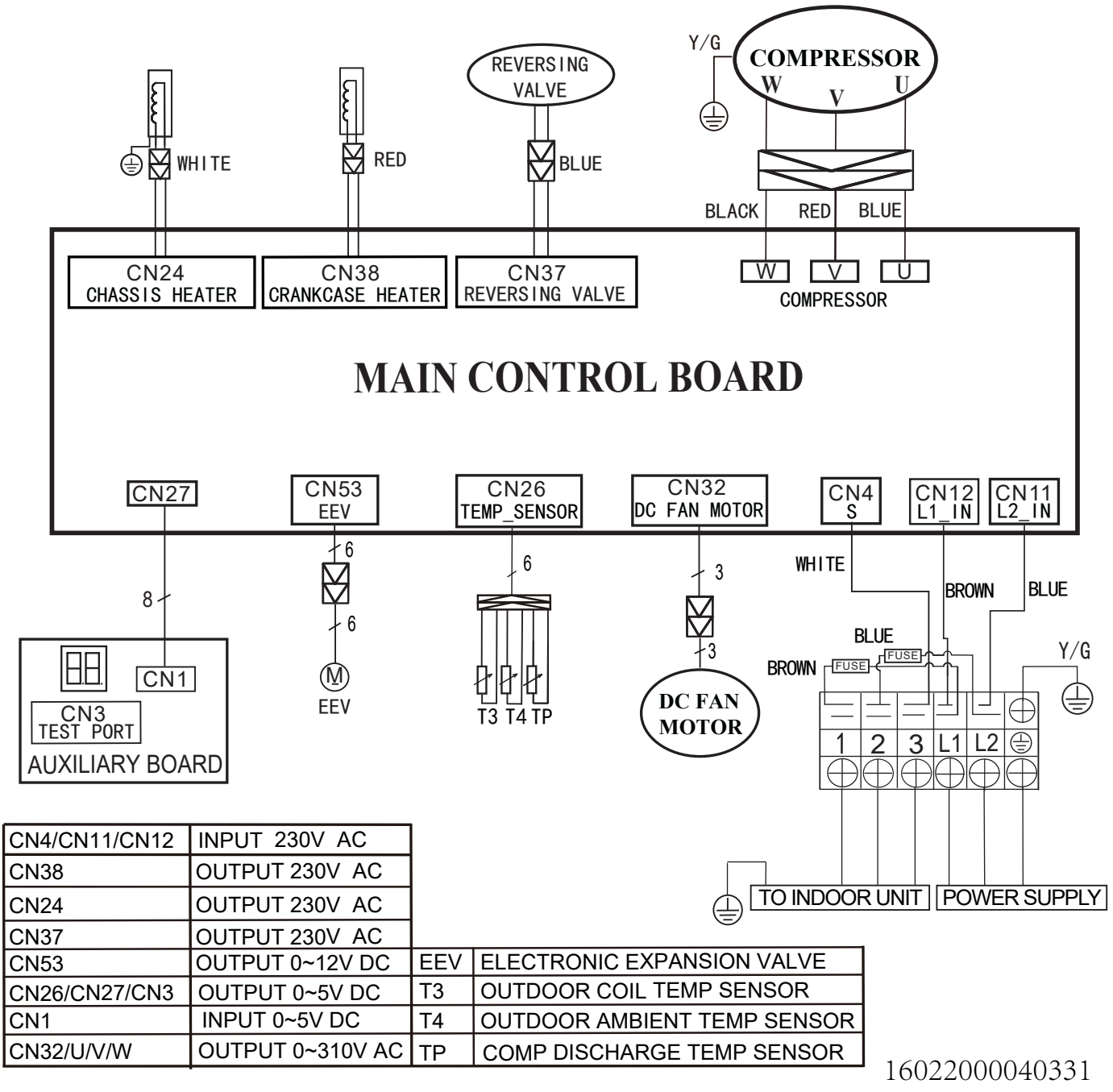
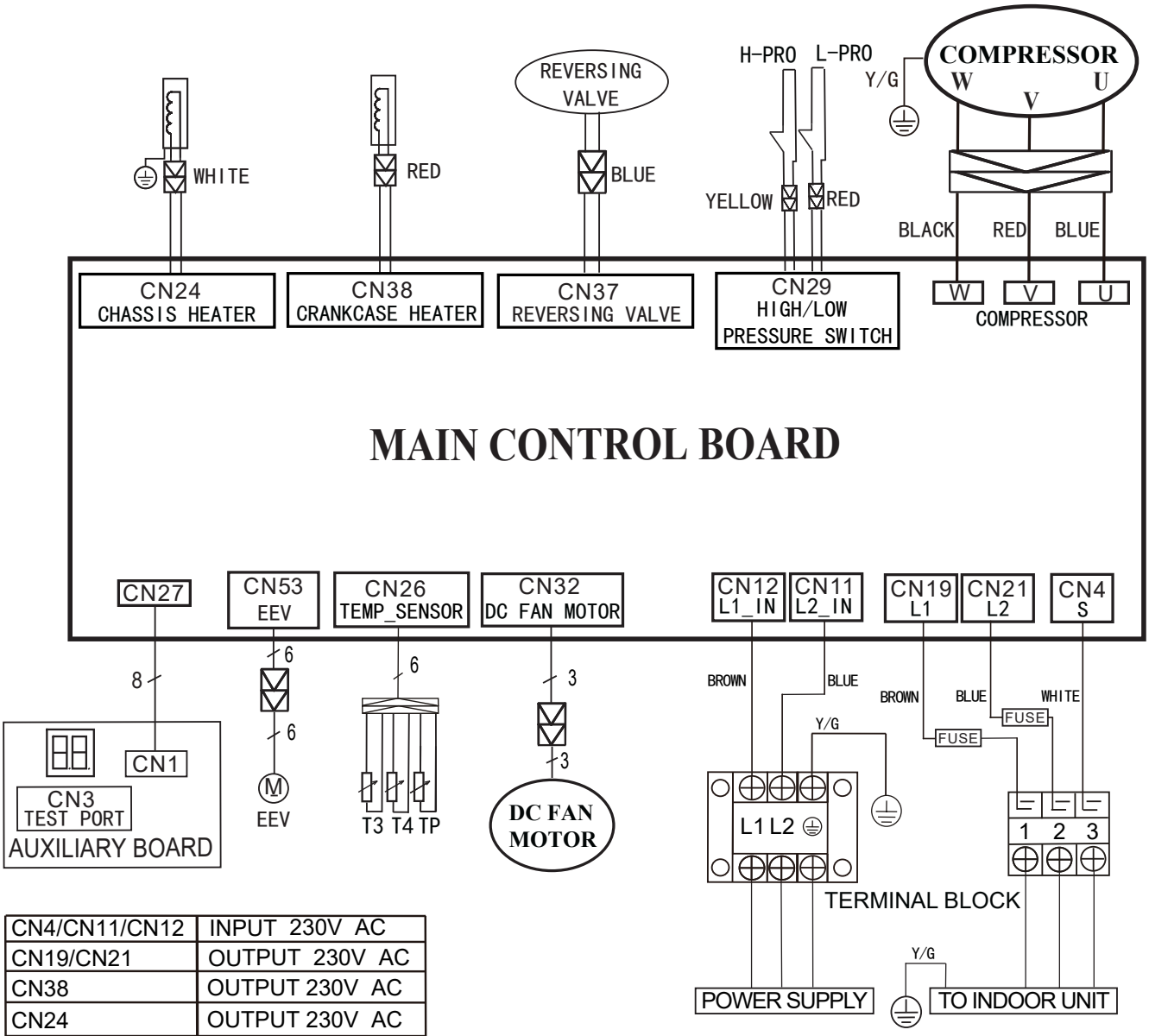
L1
L2
RED
FUSE
FUSE
BLUE
Y/G
T3
T4
TP
HEATER
Y/G
HEATER
Y/G
Y/G
BROWN
BLUE
BLACK
CN17
TEMP_Sensor
CN16
CRANKCASE
HEATER
CN19
CHASSIS
HEATER
CN60
REVERS
ING VALVE
CN6
EARTH
CN8
L-IN
CN7
N-IN
CN2
S
MAIN CONTROL BOARD
CN23
TEST PORT
CN18
EEV
CN414
DC FAN
MOTOR
U
V
W
COMPRESSOR
CN27
CN28
CN29
BLUE
RED
BLACK
EEV
DC FAN
MOTOR
U V W
COMPRESSOR
CN2/7/8 INPUT 230V AC
CN16 OUTPUT 230V AC
CN60 OUTPUT 230V AC
CN19 OUTPUT 230V AC
CN18 OUTPUT 0-12V DC
CN23/CN17 OUTPUT 0~5V DC
CN414 OUTPUT 0~310V AC
CN27/CN28/CN29 OUTPUT 0~310V AC
T3 OUTDOOR COIL TEMP SENSOR
T4 OUTDOOR AMBIENT TEMP SENSOR
TP COMP DISCHARGE TEMP SENSOR
16022000040313



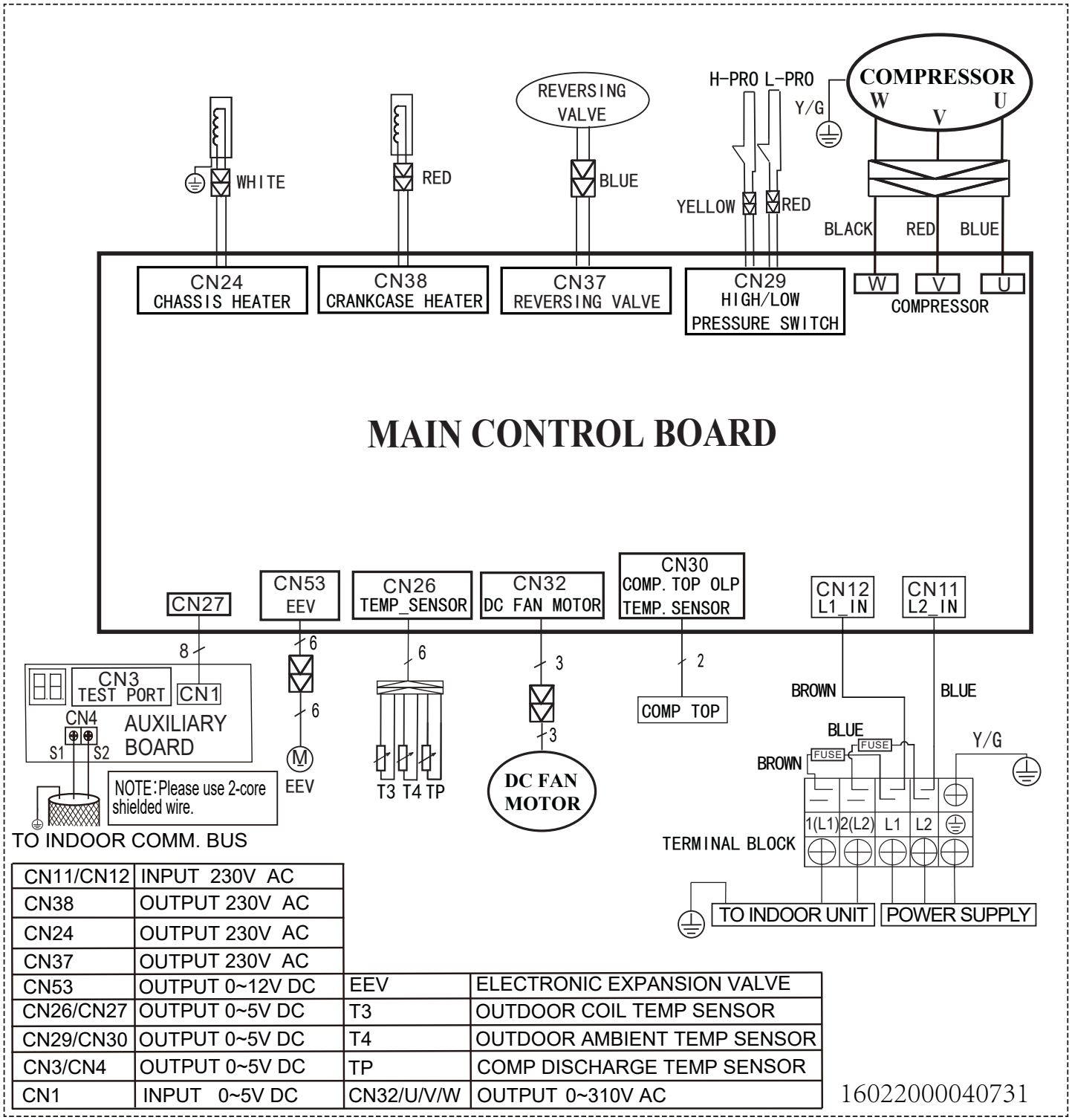
CN4/CN11/CN12	INPUT 230V AC		
CN38	OUTPUT 230V AC		
CN24	OUTPUT 230V AC		
CN37	OUTPUT 230V AC		
CN53	OUTPUT 0~12V DC	EEV	ELECTRONIC EXPANSION VALVE
CN26/CN27/CN3	OUTPUT 0~5V DC	T3	OUTDOOR COIL TEMP SENSOR
CN1	INPUT 0~5V DC	T4	OUTDOOR AMBIENT TEMP SENSOR
CN32/U/V/W	OUTPUT 0~310V AC	TP	COMP DISCHARGE TEMP SENSOR

16022000040331



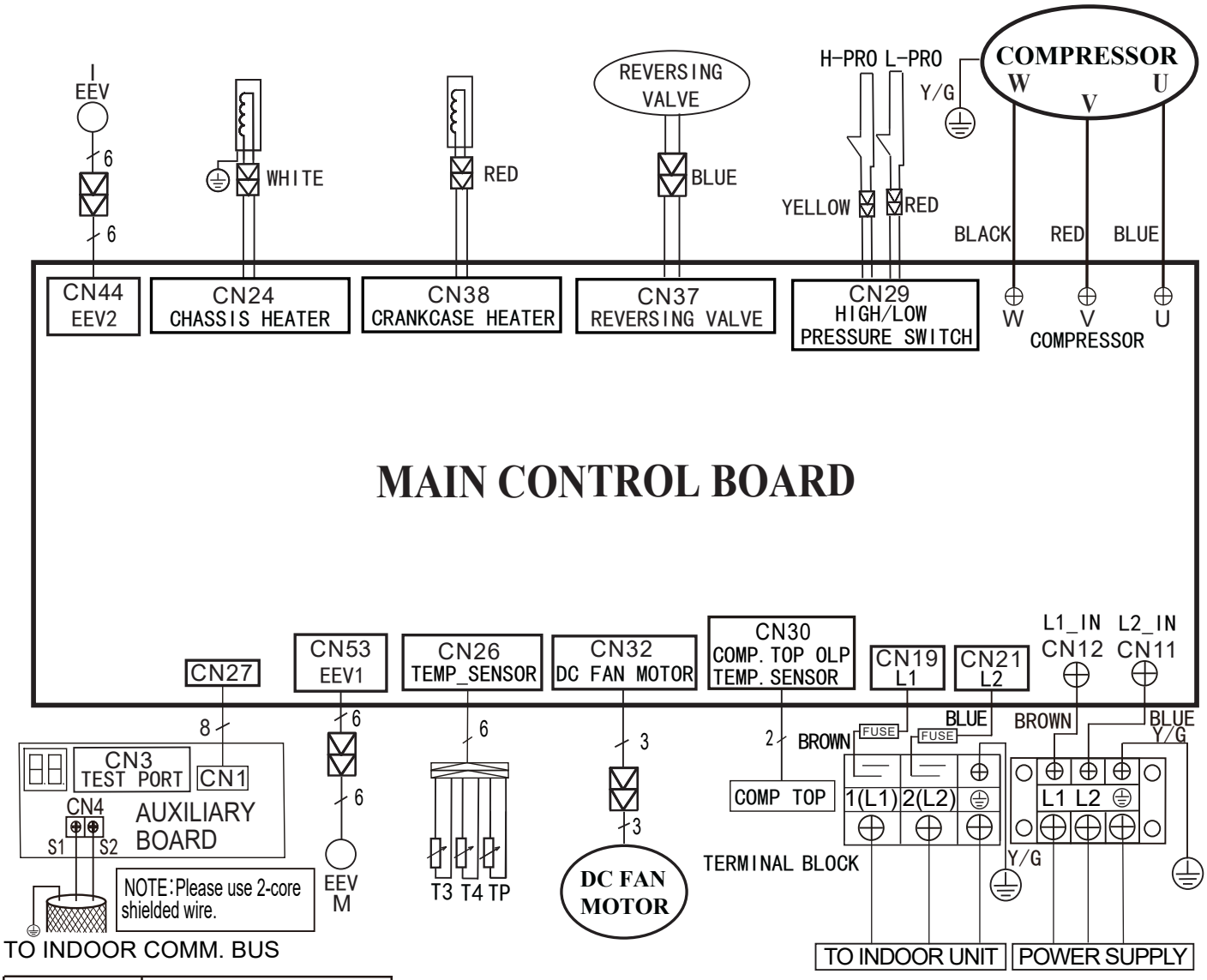
CN4/CN11/CN12	INPUT 230V AC		
CN19/CN21	OUTPUT 230V AC		
CN38	OUTPUT 230V AC		
CN24	OUTPUT 230V AC		
CN37	OUTPUT 230V AC		
CN53	OUTPUT 0-12V DC		
CN3	OUTPUT 0~5V DC	EEV	ELECTRONIC EXPANSION VALVE
CN26/CN27/CN29	OUTPUT 0~5V DC	T3	OUTDOOR COIL TEMP SENSOR
CN1	INPUT 0~5V DC	T4	OUTDOOR AMBIENT TEMP SENSOR
CN32/U/V/W	OUTPUT 0~310V AC	TP	COMP DISCHARGE TEMP SENSOR

16022000040650



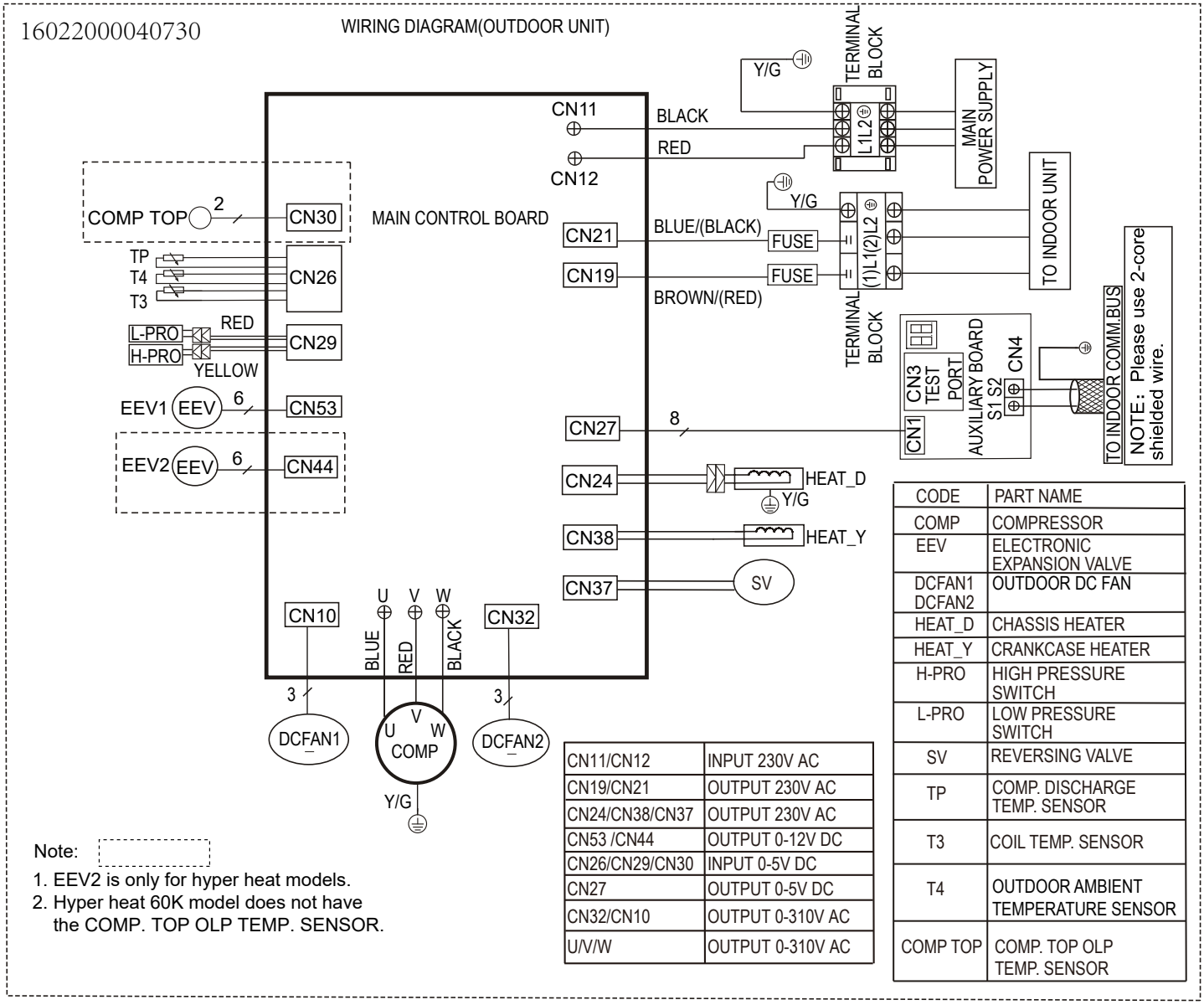
CN11/CN12	INPUT 230V AC		
CN38	OUTPUT 230V AC		
CN24	OUTPUT 230V AC		
CN37	OUTPUT 230V AC		
CN53	OUTPUT 0~12V DC	EEV	ELECTRONIC EXPANSION VALVE
CN26/CN27	OUTPUT 0~5V DC	T3	OUTDOOR COIL TEMP SENSOR
CN29/CN30	OUTPUT 0~5V DC	T4	OUTDOOR AMBIENT TEMP SENSOR
CN3/CN4	OUTPUT 0~5V DC	TP	COMP DISCHARGE TEMP SENSOR
CN1	INPUT 0~5V DC	CN32/U/V/W	OUTPUT 0~310V AC

16022000040731



CN11/CN12	INPUT 230V AC		
CN38	OUTPUT 230V AC		
CN24	OUTPUT 230V AC		
CN37	OUTPUT 230V AC	EEV	ELECTRONIC EXPANSION VALVE
CN53/CN44	OUTPUT 0~12V DC	T3	OUTDOOR COIL TEMP SENSOR
CN26/CN27	OUTPUT 0~5V DC	T4	OUTDOOR AMBIENT TEMP SENSOR
CN29/CN30	OUTPUT 0~5V DC	TP	COMP DISCHARGE TEMP SENSOR
CN3/CN4	OUTPUT 0~5V DC	CN19/CN21	OUTPUT 230V AC
CN1	INPUT 0~5V DC	CN32/U/V/W	OUTPUT 0~310V AC

16022000040733

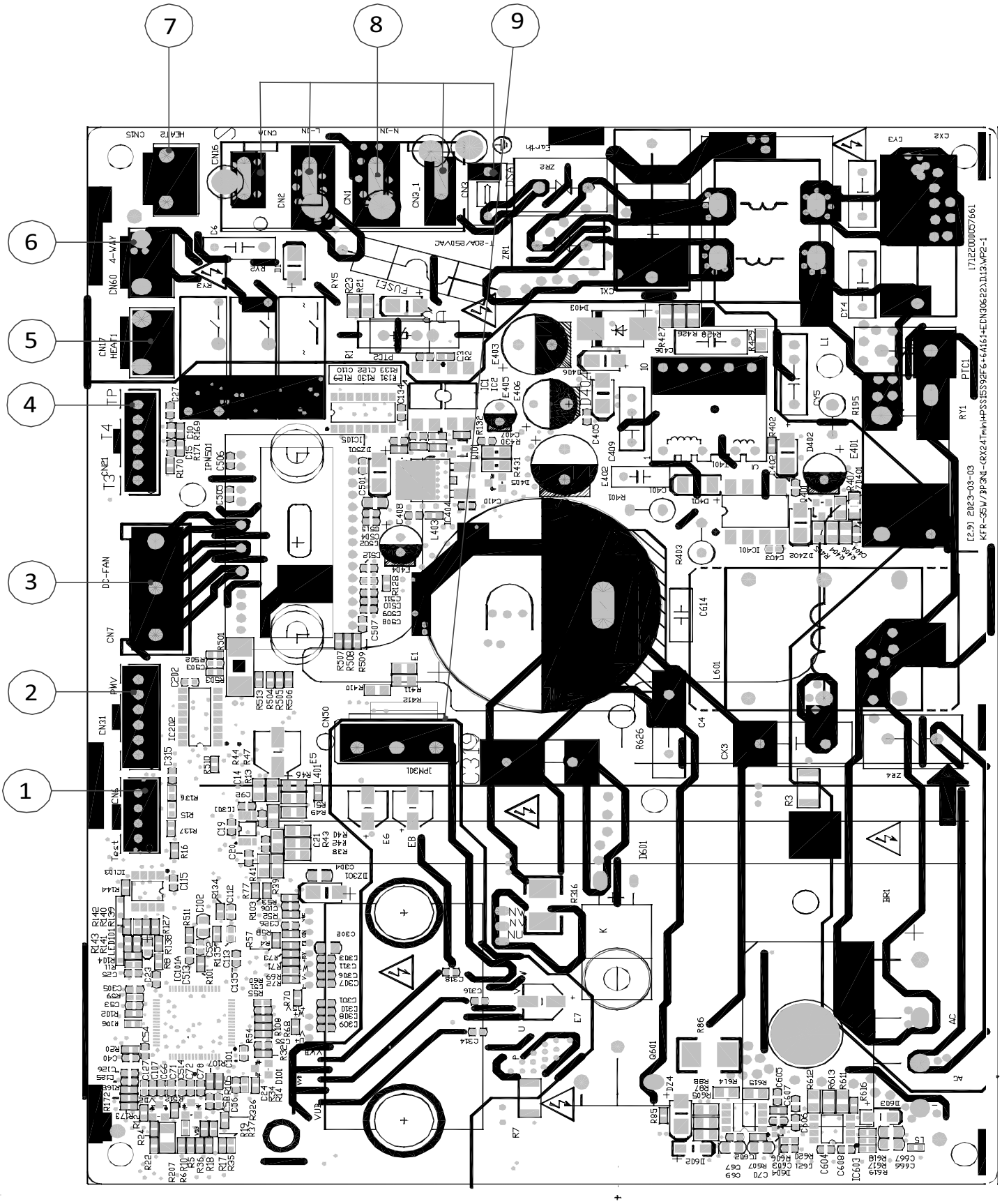


CN11/CN12	INPUT 230V AC
CN19/CN21	OUTPUT 230V AC
CN24/CN38/CN37	OUTPUT 230V AC
CN53 /CN44	OUTPUT 0-12V DC
CN26/CN29/CN30	INPUT 0-5V DC
CN27	OUTPUT 0-5V DC
CN32/CN10	OUTPUT 0-310V AC
U/V/W	OUTPUT 0-310V AC

CODE	PART NAME
COMP	COMPRESSOR
EEV	ELECTRONIC EXPANSION VALVE
DCFAN1 DCFAN2	OUTDOOR DC FAN
HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSING VALVE
TP	COMP. DISCHARGE TEMP. SENSOR
T3	COIL TEMP. SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
COMP TOP	COMP. TOP OLP TEMP. SENSOR

Outdoor unit printed circuit board diagram

MO1HS-H06B-2A, MO1ES-H09B-2A, MO1HS-H09B-2A, MO1ES-H12B-2A, and MO1HS-H12B-2A

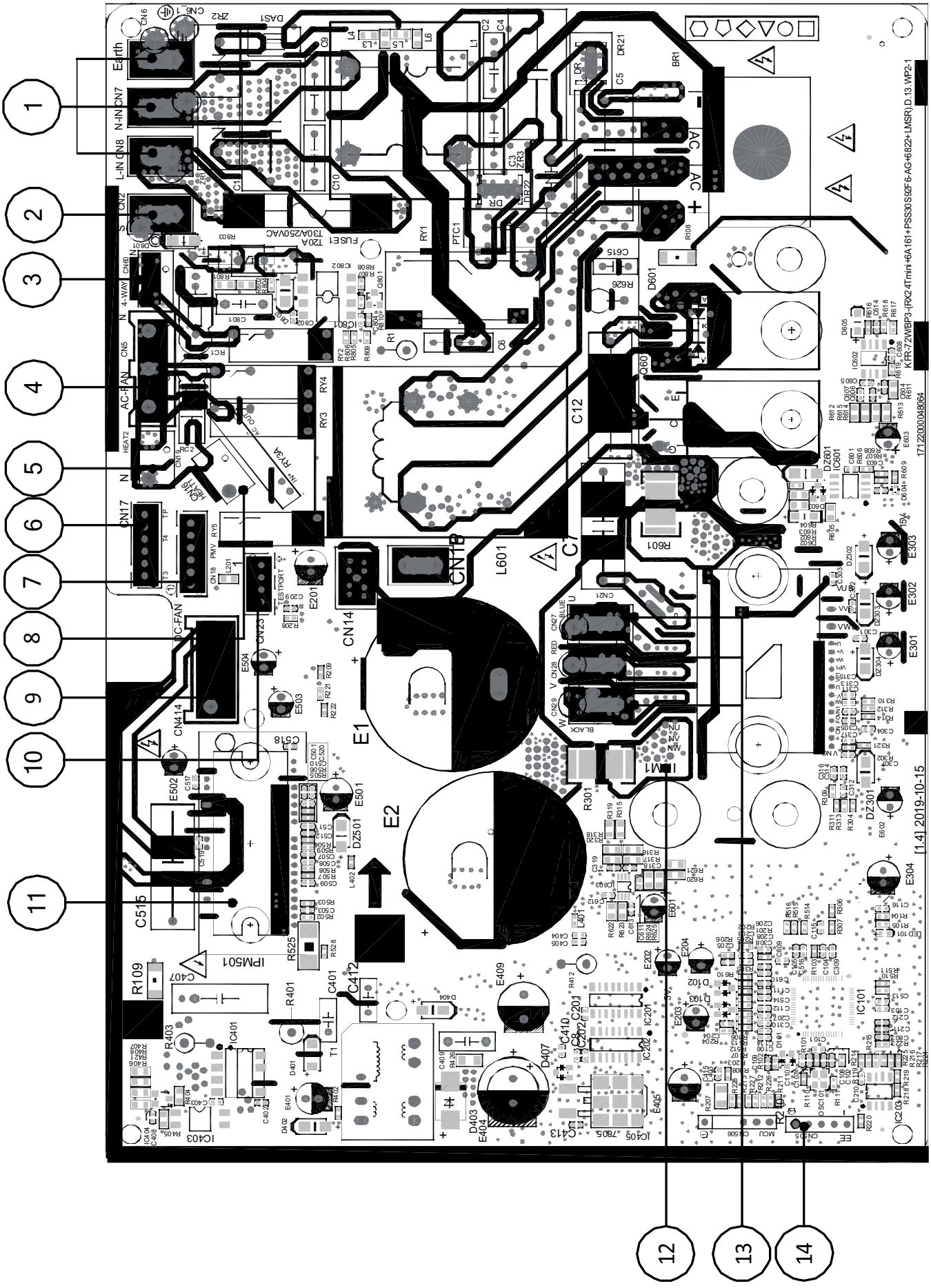


Outdoor Unit Printed Circuit Board Table: MO1HS-H06B-2A, MO1ES-H09B-2A, MO1HS-H09B-2A, MO1ES-H12B-2A, and MO1HS-H12B-2A

No.	Name	CN#	Meaning
1	TESTPORT	CN6	Used for testing
2	PMV	CN31	Connect to electric expansion valve (Output: 0~2 V DC)
3	DC-FAN	CN7	Connect to DC fan (Output: 0~310 V AC)
4	TP T4 T3	CN21	Connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP (Output: 0~5 V DC)
5	HEAT1	CN17	Connect to compressor heater (Output: 230 V AC).
6	4-WAY	CN60	Connect to 4-way valve (Output: 230 V AC)
7	HEAT2	CN15	Connect to chassis heater (Output: 230 V AC)
8	CN1A	CN16	S: connect to indoor unit communication
		CN2	L_in: connect to L-line (230 V AC input)
		CN1	N_in: connect to N-line (230 V AC input)
		CN3	Earth
9	CN50	W	Connect to compressor (Output: 0-310 V AC)
		V	
		U	

NOTE

This section is for reference only. Please take practicality as standard.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Earth
N-IN
L-IN
AC-FAN
DC-FAN
CN17
CN414
CN14
CN18
L601
E1
E2
C7
C12
C515
C412
R109
R401
R403
R525
IPM501
IC401
IC403
IC405
T1
FUSE1
T20A
T30A/250VAC
RY1
RY2
RY3
RY4
PTC1
D601
R626
C615
IC601
Q801
Q60
DZ501
DZ601
DZ301
DZ303
DZ304
DZ302
M1
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KFR-72WBP3-(RX24Tmini+6A161+PSS30S92F6-AG+6822+LMSR).D.13.WP2-1
1.41 2019-10-15

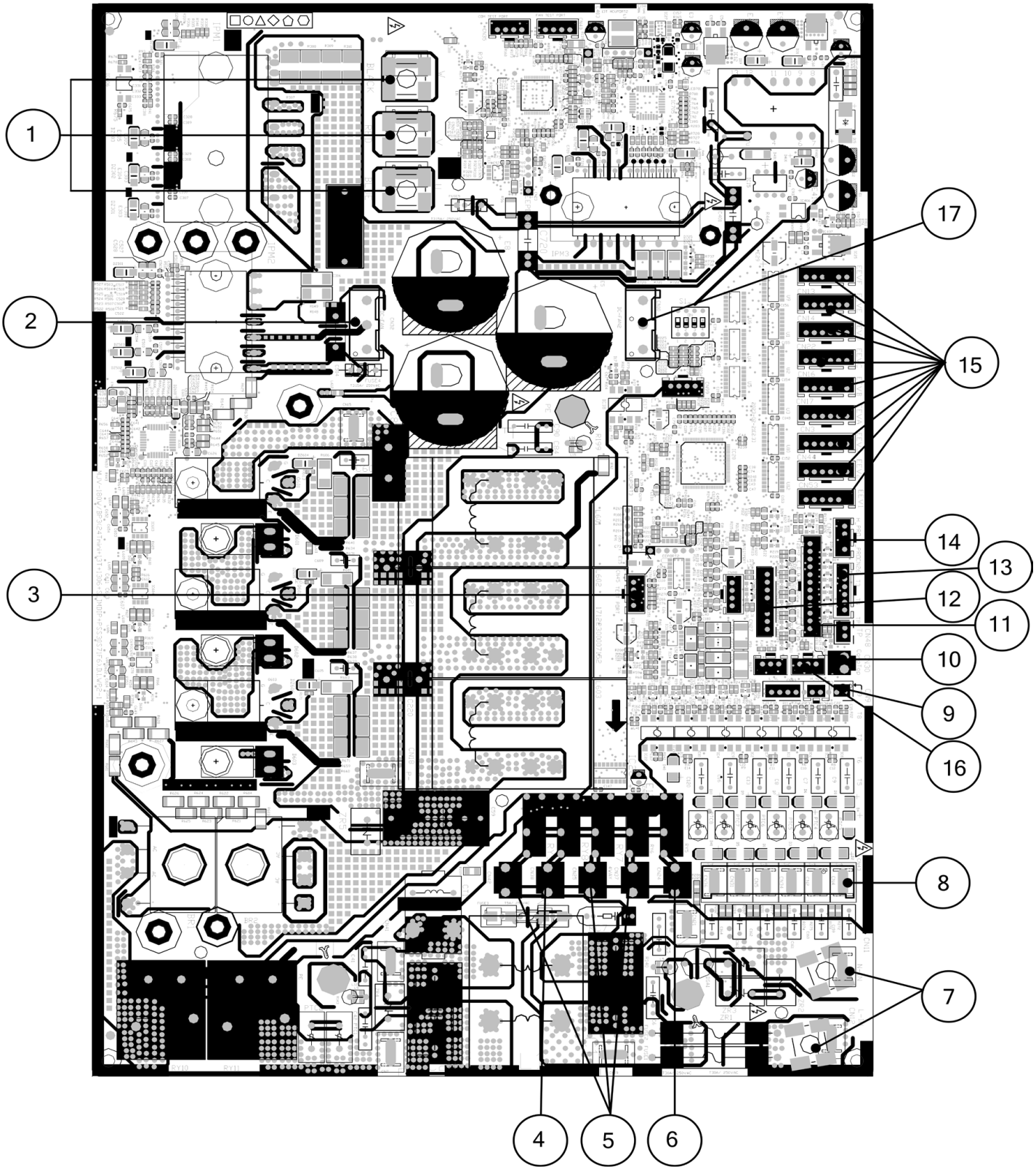
Outdoor Unit Printed Circuit Board Table: MO1ES-H18B-2A , MO1HS-H18B-2A , and MO1ES-H24B-2A

No.	Name	CN#	Meaning
1	Power Supply	CN6	Earth: connect to Ground
		CN7	N_in: connect to N-line (230 V AC input)
		CN8	L_in: connect to L-line (230 V AC input)
2	S	CN2	S: connect to indoor unit communication(230 V AC input)
3	4-WAY	CN60	Connect to 4-way valve (Output: 230 V AC)
4	AC-FAN	CN5	Connect to AC fan
5	HEAT2	CN19	Connect to chassis heater (Output: 230 V AC)
6	TP T4 T3	CN17	Connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP (Output: 0~5 V DC)
7	PMV	CN18	Connect to Electric Expansion Valve
8	HEAT1	CN16	Connect to compressor heater (Output: 230 V AC)
9	DC-FAN	CN414	Connect to DC fan (Output: 0~310 V AC)
10	TESTPORT	CN23	Used for testing
11	FAN_IPM	IPM501	IPM for DC fan
12	COMP_IPM	IPM1	IPM for compressor
13	U	CN27	Connect to compressor (Output: 0~310 V AC)
	V	CN28	
	W	CN29	
14	EE_PORT	CN505	EEPROM programmer port

NOTE

This section is for reference only. Please take practicality as standard.

Outdoor Unit Printed Circuit Board Diagram: MO1HS-H24B-2A, MO1BS-H30B-2A, MO1HS-H33B-2A, MO1BS-H36B-2A, MO1BU-H36B-2A, MO1HU-H36B-2A, MO1BU-H48B-2A, MO1HU-H48B-2A, MO1BU-H60B-2A, and MO1HU-H60B-2A



Outdoor Unit Printed Circuit Board Table: MO1HS-H24B-2A, MO1BS-H30B-2A, MO1HS-H33B-2A, MO1BS-H36B-2A, MO1BU-H36B-2A, MO1HU-H36B-2A, MO1BU-H48B-2A, MO1HU-H48B-2A, MO1BU-H60B-2A, and MO1HU-H60B-2A

No.	Name	CN#	Meaning
1	COMPRESSOR	W	Connect to compressor (Output: 0~310 V AC)
		V	
		U	
2	DC-FAN1	CN32	Connect to DC fan (Output: 0~310 V AC)
3	TESTPORT	CN45	Used for testing
4	HEAT_Y	CN38	Connect to compressor heater (Output: 230 V AC)
5	4-WAY	CN37	Connect to 4 way valve 1 (Output: 230 V AC)
		CN25	Connect to 4 way valve 2 (Output: 230 V AC)
		CN42	Connect to 4 way valve 3 (Output: 230 V AC)
6	HEAT_D	CN24	Connect to chassis heater (Output: 230 V AC)
7	Power Supply	CN11	N_in: connect to N-line (230 V AC input)
		CN12	L_in: connect to L-line (230 V AC input)
8	S-A	CN43	S: connect to indoor unit communication (230 V AC input)
	S-B		
	S-C		
	S-D		
	S-E		
	S-F		
9	TBH-IN TBH-OUT T3B TF	CN9	Connect to cold plate inlet temp. sensor TBH-IN, cold plate outlet temp. sensor TBH-OUT, condenser coil middle temp. sensor T3B, refrigerant tube inlet temp. sensor TF
10	OLP TEMP. SENSOR	CN30	Connect to compressor top temp. sensor (Output: 0~5 V DC)
11	T2B	CN28	Connect to evaporator coil outlet temperature sensor T2B
12	/	CN27	Connect to key board CN1
13	T3 T4 TP	CN26	Connect to condenser coil temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP (Output: 0~5 V DC)
14	H-PRO,L-RPO	CN29	Connect to high and low pressure switch (pin1-pin2&pin3-pin4:5VDC pulse wave)
15	EEVA	CN17	Connect to electric expansion valve (Output: 0~12 V DC)
	EEVB	CN16	
	EEVC	CN22	
	EEVD	CN14	
	EEVE	CN13	
	EEVF	CN1	
	EEV1	CN53	
	EEV2	CN44	
	EEV3	CN3	
16	H_YL	CN49	Connect to high pressure sensor
17	DC-FAN2	CN10	Connect to DC fan (Output: 0~310 V AC)

NOTE

This section is for reference only. Please take practicality as standard.

Basic Functions

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
TCDE1	Exit defrost temperature1
TCDE2	Exit defrost temperature2 (maintain for a period of time)
TIMING_ DEFROST_ TIME	Enter defrost time

In this manual, such as CDIFTEMP, HDIFTEMP2, TCDE1, TCDE2, TIMING_DEFROST_TIME...etc., they are well- setting parameters of EEPROM.

Fan Mode

When fan mode is activated:

- The outdoor fan and compressor are stopped.

Cooling Mode

Compressor Control

Reach the configured temperature:

1. When the compressor runs continuously for less than 120 minutes.
   - If the following conditions are satisfied, the compressor ceases operation:
     - Calculated frequency (fb) is less than the minimum limit frequency (FminC).
     - Compressor runs at FminC for more than ten minutes.
     - Indoor room temperature (T1) is lower than or equal to (Tsc-CDIFTEMP-0.5°C/1°F)
2. When the compressor runs continuously for more than 120 minutes.
   - If the following conditions are satisfied, the compressor ceases operation.
     - Calculated frequency (fb) is less than minimum limit frequency (FminC).
     - Compressor runs at FminC more than 10 minutes.
     - When indoor room temperature (T1) is lower than or equal to (Tsc-CDIFTEMP).

NOTE

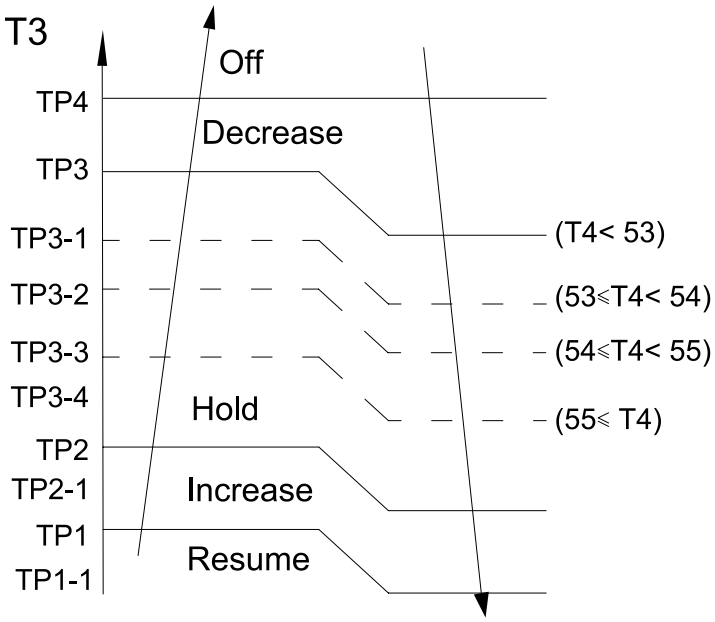
CDIFTEMP is EEPROM setting parameter. It is 4°F (2°C).

3. If one of the following conditions is satisfied, do not judge protective time.
   - Compressor running frequency is more than the test frequency.
   - When the compressor running frequency is equal to the test frequency, outdoor ambient temperature (T4) is more than 59°F (15°C) or outdoor ambient sensor (T4) fault.
   - Change the setting temperature.
   - Turning on/off turbo or sleep function
   - Various frequency limit shutdown occurs.

Outdoor Fan Control

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

Condenser Temperature Protection



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

Heating Mode (Heat Pump Units)

Compressor Control

1. Reach the configured temperature
   - If the following conditions are satisfied, the compressor ceases operation.
     - Calculated frequency (fb) is less than minimum limit frequency (FminH).
     - Compressor runs at FminH more than 10 minutes.
     - T1 is higher than or equal to Tsc+ HDIFTEMP2.

NOTE

HDIFTEMP2 is EEPROM setting parameter. It is 4°F (2°C) usually.

- If one of the following conditions is satisfied, do not judge protective time.
  - Compressor running frequency is more than the test frequency.
  - Compressor running frequency is equal to test frequency, outdoor ambient temperature (T4) is more than 59°F (15°C), or Outdoor ambient sensor (T4) fault.
  - Change the setting temperature.
  - Turning on/off turbo or sleep function.

2. When the current is higher than the predefined safe value, surge protection is activated, causing the compressor to cease operations.

Outdoor Fan Control:

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

Defrosting mode

- The unit enters defrosting mode according to the temperature value of the condenser temperature (T3) and outdoor ambient temperature (T4), as well as the compressor running time.
- In defrosting mode, the compressor continues to run, the indoor and outdoor motor will cease operation, the defrost light of the indoor unit will turn on, and the "dF" symbol is displayed.
- If any one of the following conditions is satisfied, defrosting ends and the machine switches to normal heating mode:
  - Condenser temperature (T3) rises above TCDE1.
  - Condenser temperature (T3) maintained above TCDE2 for 80 seconds.
  - Unit runs for 15 minutes consecutively in defrosting mode.
- If Outdoor ambient temperature (T4) is lower than or equal to -8 °F (-22°C) and compressor running time is more than TIMING_DEFROST_TIME, if any one of the following conditions is satisfied, defrosting ends and the machine switches to normal heating mode:
  - Unit runs for 10 minutes consecutively in defrosting mode.
  - Condenser temperature (T3) rises above 50°F/10°C.
- If any one of the following conditions is satisfied, the unit enters defrosting mode:
  - If condenser temperature (T3) or outdoor ambient temperature (T4) is lower than 26.6°F (-3°C) for 30 seconds, Ts-T1 is lower than 41°F (5°C) and compressor running time is more than EE_TIME_DEFROST7.
  - If the condenser temperature (T3) or outdoor ambient temperature (T4) is lower than 37.4°F (-3°C) for 30 seconds and the compressor running time is more than EE_ TIME_DEFROST7+30 minutes.
- If any one of the following conditions is satisfied, defrosting ends and the machine switches to normal heating mode:
  - Condenser temperature (T3) rises above TCDE1+4°C/7°F.
  - Condenser temperature (T3) maintained above TCDE2+4°C/7°F for 80 seconds.
  - Unit runs for 15 minutes consecutively in defrosting mode.

Troubleshooting

⚠ WARNING

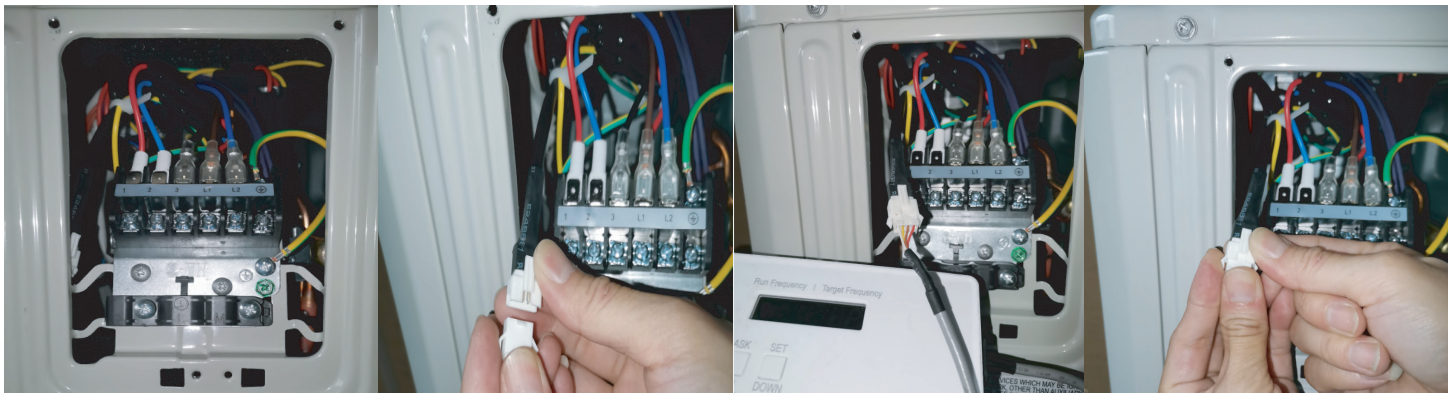
Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. While checking indoor/outdoor PCBs, please equip yourself with antistatic gloves or wrist strap to avoid damage to the board.

⚠ 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.

General Troubleshooting

Error Display

Display	Malfunction or Protection	Solution
dF	Defrosting	Normal Display, not error code
FC	Forced cooling	
EC07	ODU fan speed out of control	page 44
EC71	Over current failure of outdoor DC fan motor	
EC72	Lack phase failure of outdoor DC fan motor	page 59
EC50	ODU temp. sensor error (T3,T4.TP)	page 46
EC51	ODU EEPROM parameter error	page 40
EC52	ODU coil temp. sensor (T3) error	page 46
EC53	ODU ambient temp. sensor (T4) error	
EC54	COMP. discharge temp. sensor (TP) error	
EC55	ODU IPM module temperature sensor malfunction	page 64
EC56	IDU coil outlet temp. sensor (T2B) error	page 46
EC57	Refrigerant pipe temperature sensor error	
EL01	IDU & ODU communication error	page 41
PC00	IPM module protection	page 49
PC02	Compressor top (or IPM) temp. protection	page 56
PC06	Discharge temperature protection of compressor	page 54
PC08	Outdoor overcurrent protection	page 47
PC0A	High temperature protection of condenser	page 55
PC0F	PFC module protection	page 53
PC0L	Low ambient temperature protection	--
PC 10	ODU low AC voltage protection	page 51
PC 11	ODU main control board DC bus high voltage protection	
PC 12	ODU main control board DC bus low voltage protection /341 MCE error	
PC30	System high pressure protection	page 57
PC31	System low pressure protection	page 58
PC40	Communication error between ODU main chip and compressor driven chip	page 52
PC42	Compressor start failure of outdoor unit	page 47
PC43	ODU compressor lack phase protection	page 60
PC44	ODU zero speed protection	page 47
PC45	ODU IR chip drive failure	page 60
PC46	Compressor speed has been out of control	page 47
PC49	Compressor overcurrent failure	
LC06	High temperature protection of Inverter module (IPM)	page 56
PH90	High temperature protection of evaporator	page 62
PH91	Low temperature protection of evaporator	page 63

Outdoor Unit Point Check Function

- A check switch is included on the auxiliary PCB.
- Push SW1 to check the unit's status while running. The digital display shows the following codes each time the SW1 is pushed.

Number of Presses	Display	Remark
00	Normal display	Displays running frequency, running state, or malfunction code
01	Indoor unit capacity demand code	Actual data*HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "5.0",it means the capacity demand is 15. the digital display tube show "60",it means the capacity demand is 6.0) S communication, the digital display tube will show: "--"
02	Amendatory capacity demand code	
03	The frequency after the capacity requirement transfer	
04	The frequency after the frequency limit	
05	The frequency of sending to 341 chip	
06	Indoor unit evaporator temperature (T2)	If the temp. is lower than -9°C, the digital display tube will show "-9". If the temp. is higher than 70°C, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "--"
07	Condenser pipe temp.(T3)	
08	Outdoor ambient temp.(T4)	
09	Compressor discharge temp.(Tp)	The display value is between 0~199°C. If the temp. is lower than 0°C, the digital display tube will show "0".If the temp. is higher than 99°C, the digital display tube will show single digit and tens digit. (For example, If the display shows 0.5, so 0.5 multiplied by 10 to become 5, then added to 100 to become 105°C.)
10	AD value of current	The display value is a hex number. For example, the digital display tube shows "Cd", so C*161+d*160=12*16+13=205, it means AD value is 205. AD value is detected by the chip.
11	AD value of voltage	
12	Indoor unit running mode code	S communication: Standby:0, Cooling:1, Heating:2, Fan only 3, Drying:4, Forced cooling:6, Defrosting: 7, 485 communication: Standby:0, Fan only 1,Cooling:2, Heating:3, Forced cooling:4, Drying:6, Self clean:8
13	Outdoor unit running mode code	
14	EXV open angle	Actual data/4. If the value is higher than 99, the digital display shows single and double digits. For example, if the digital display shows "2.0", so 2.0 multiplied by 10 to become 20, then added to 100 to become 120, the EXV open angle is 120×4=480p.
15	Frequency limit symbol	Bit7: Frequency limit caused by IGBT radiator Bit6: Frequency limit caused by PFC Bit5: Frequency limit caused by high temperature of T2. Bit4: Frequency limit caused by low temperature of T2. Bit3: Frequency limit caused by T3. Bit2: Frequency limit caused by Tp. Bit1: Frequency limit caused by current Bit0: Frequency limit caused by voltage The display value is a hexidecimal number. For example, the digital display show 2A, then Bit5=1, Bit3=1, and Bit1=1. This means that a frequency limit may be caused by T2, T3, or the current.
16	Outdoor unit fan motor state	Off: 0, Turbo:1 High speed:2, Med speed: 3, Low speed: 4, Breeze:5, Super breeze: 6 other speed:7

Number of Presses	Display	Remark
17	IGBT radiator temp.	The display value is between 0~130°C. If the temp. is higher than 99°C, the digital display tube will show single digit and tens digit. (For example, the digital display tube show “0.5”,it means the IGBT radiator temp. is 105°C. the digital display tube show “1.6”,it means the IGBT radiator temp. is 116°C)
18	Indoor unit number	The indoor unit can communicate with outdoor unit well. General:1, Twins:2
19	Evaporator pipe temp. T2 of 1# indoor unit	If the temp. is lower than 0°C, the digital display tube will show “0”.If the temp. is higher than 70°C, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “--”(heating T2, cooling T2B) S communication, the digital display tube will show: “--”
20	Evaporator pipe temp. T2 of 2# indoor unit	
21	Reserved	
22	1# Indoor unit capacity demand code	Actual data*HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show “5.0”,it means the capacity demand is 15. the digital display tube show “60”,it means the capacity demand is 6.0). If the indoor unit is not connected, the digital display tube will show: “--” S communication, the digital display tube will show: “--”
23	2# Indoor unit capacity demand code	
24	Reserved	
25	Room temp. T1 of 1# indoor unit	If the temp. is lower than -9°C, the digital display tube will show “-9”. If the temp. is higher than 70°C, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “--” S communication, the digital display tube will show: “--”
26	Room temp. T1 of 2# indoor unit	If the temp. is lower than 0°C, the digital display tube will show “0”.If the temp. is higher than 70°C, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “--” S communication, the digital display tube will show: “--”
27	Average room temp. T1	If the temp. is lower than 0°C, the digital display tube will show “0”.If the temp. is higher than 70°C, the digital display tube will show “70”.
28	Reason of stop	
29	Evaporator pipe temp. T2B of 1# indoor unit	If the temp. is lower than -9°C, the digital display tube will show “-9”.If the temp. is higher than 70°C, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “--” S communication, the digital display tube will show: “--”
30	Evaporator pipe temp. T2B of 2# indoor unit	If the temp. is lower than 0°C, the digital display tube will show “0”. If the temp. is higher than 70°C, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “--” S communication, the digital display tube will show: “--”

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 tables.

Part requiring replacement	Error Code								
	EL01	EC50	EC51	EC52	EC53	EC54	EC55	EC56	EC57
Indoor PCB	√	x	x	x	x	x	x	x	x
Outdoor PCB	√	√	√	√	√	√	√	√	√
ODU coil temp. sensor	x	√	x	√	x	x	x	x	x
ODU ambient temp. sensor	x	√	x	x	√	x	x	x	x
COMP. discharge temp. sensor	x	√	x	x	x	√	x	x	x
IPM module temperature sensor	x	x	x	x	x	x	√	x	x
IDU coil outlet temp. sensor	x	x	x	x	x	x	x	√	x
Refrigerant pipe temperature sensor	x	x	x	x	x	x	x	x	√
Condenser temperature sensor	x	x	x	x	x	x	x	x	x
Reactor	√	x	x	x	x	x	x	x	x
IPM module board	√	x	x	x	x	x	x	x	x

Part requiring replacement	Error Code							
	EC07/ EC71	PC00	PC01/PC10/ PC11/PC12	PC02	PC08/PC42/PC44/ PC46/PC49	PC0F	PH90	PH91
Outdoor PCB	√	√	√	√	√	√	x	x
Outdoor fan motor	√	√	x	x	√	x	x	x
Reactor or inductance	x	√	√	x	√	√	x	x
Compressor	x	√	x	x	x	x	x	x
IPM module board	x	√	√	x	√	x	x	x
Bridge rectifier	x	√	√	x	√	x	x	x
Evaporator coil temperature sensor	x	x	x	x	x	x	√	√
PFC module	x	x	x	x	x	√	x	x
Additional refrigerant	x	x	x	x	x	x	x	x
Over load protector	x	x	x	√	x	x	x	x
ODU ambient temp. sensor	x	x	x	x	x	x	x	x
Refrigerant pipe temperature sensor	x	x	x	x	x	x	x	x
Indoor fan	x	x	x	x	x	x	√	x
Indoor PCB	x	x	x	x	x	x	√	√

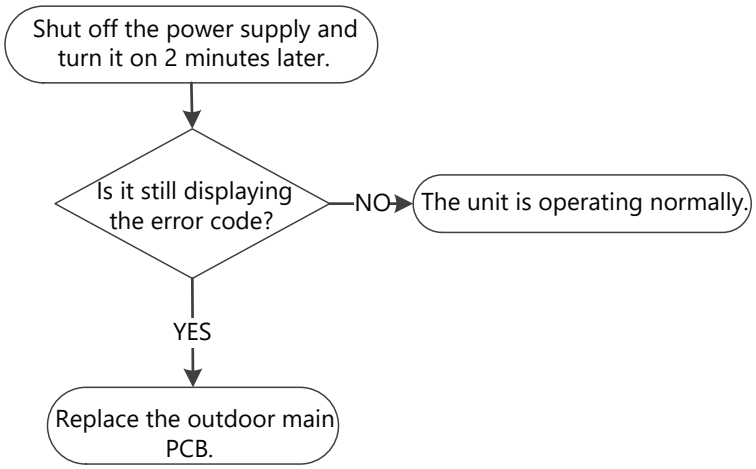
Part requiring replacement	Error Code							
	PC40	EC72	PC43	PC45	PC06	PC0a	PC30	PC31
Outdoor PCB	√	√	√	x	√	√	√	√
Outdoor fan motor	x	√	x	x	x	√	√	√
ODU coil temp. sensor	x	x	x	x	x	√	x	x
COMP. discharge temp. sensor	x	x	x	x	√	x	x	x
Compressor	x	x	√	x	x	x	x	x
IPM module board	x	x	x	√	x	x	x	x
Additional refrigerant	x	x	x	x	√	√	x	√
Electric control box	√	x	x	x	x	x	x	x
High pressure switch	x	x	x	x	x	x	√	x
Low pressure switch	x	x	x	x	x	x	x	√

Troubleshooting by Error Code

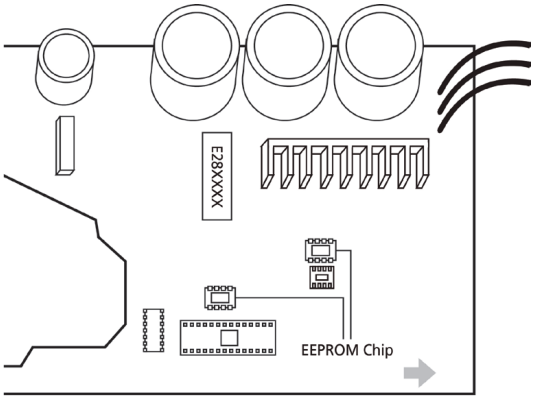
EC51 (ODU EEPROM parameter error diagnosis and solution)
Description: The Indoor or outdoor PCB main chip does not receive feedback from the EEPROM chip.
Recommended parts to prepare:

- Indoor PCB
- Outdoor PCB

Troubleshooting and repair:



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



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

EL01 (IDU & ODU communication error diagnosis and solution)

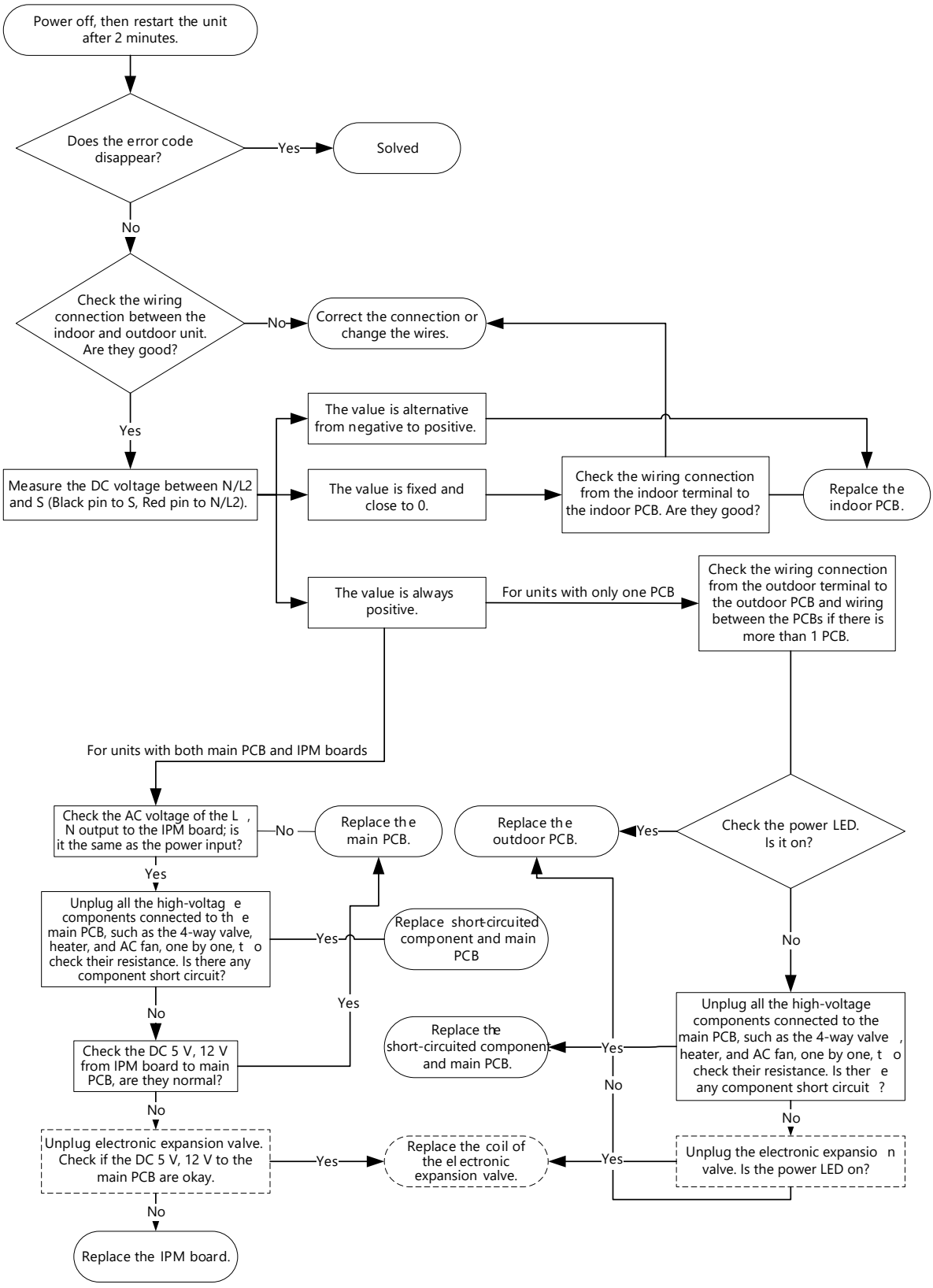
Description: The Indoor unit cannot communicate with the outdoor unit.

Recommended parts to prepare:

- Indoor PCB
- Outdoor PCB
- Reactor

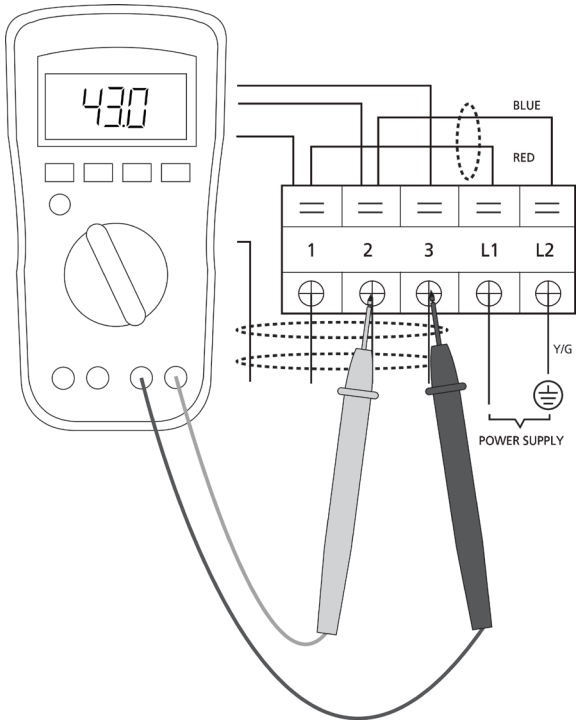
Troubleshooting and repair:

Current Loop Communication (S Communication):



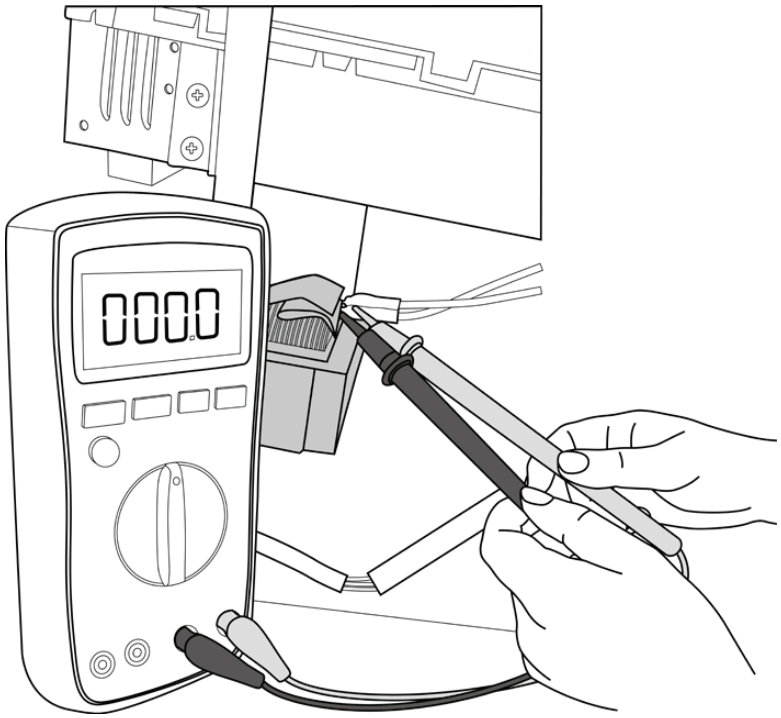
Remarks:

- 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 2 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 has a malfunction, 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.



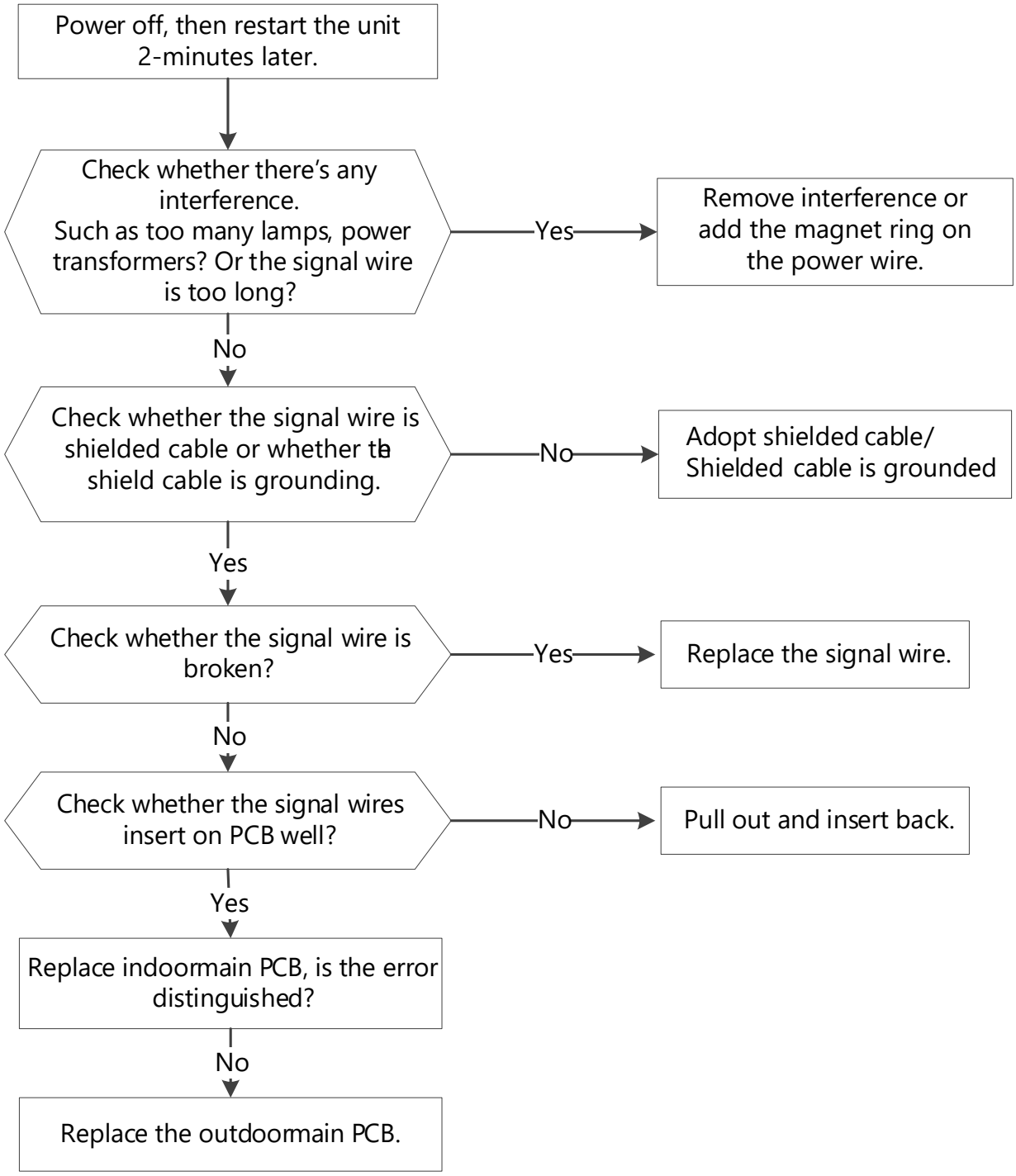
NOTE

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:



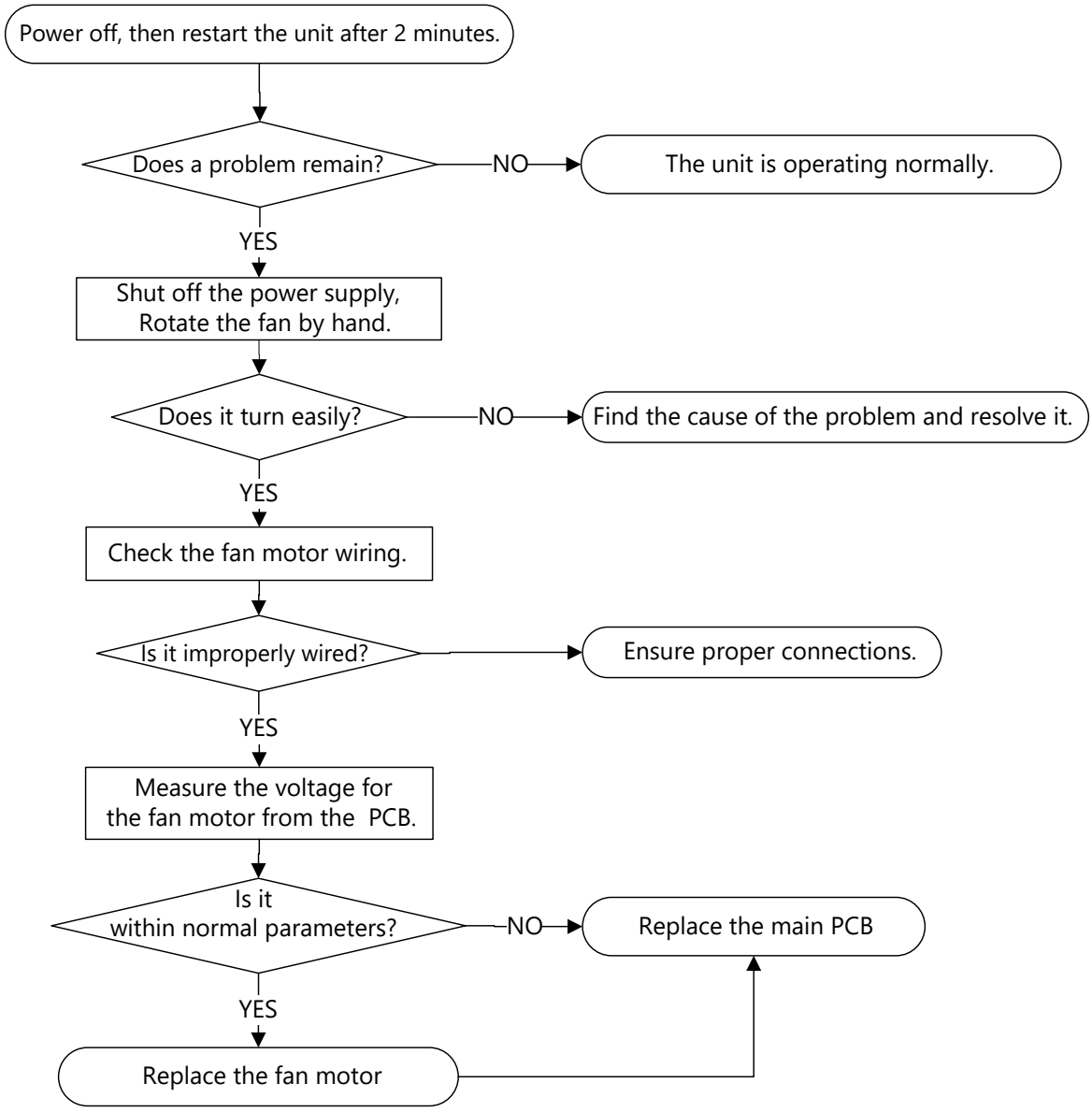
EC07 (Fan Speed Is Operating Outside of Normal Range)/EC71(Over Current Failure of Outdoor DC Fan Motor) Diagnosis and Solution

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

Recommended parts to prepare:

- Connection wires
- Fan assembly
- Fan motor
- PCB

Troubleshooting and repair:



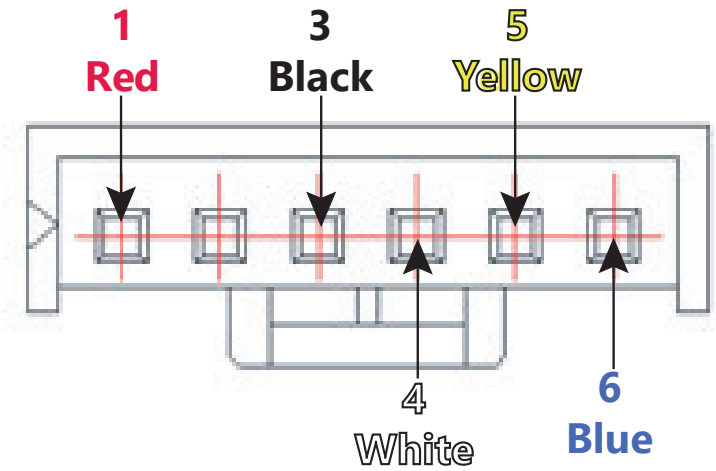
Index:

Outdoor DC Fan Motor (control chip is in the fan motor)

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

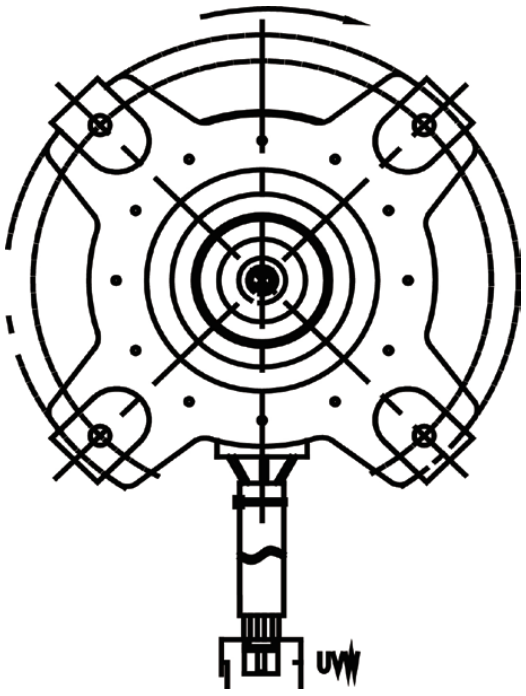
- DC motor voltage input and output (voltage: 220-240 V):

No.	Color	Signal	Voltage
1	Red	VS/VM	192 V~380 V
2	---	---	---
3	Black	GND	0 V
4	White	VCC	13.5~16.5 V
5	Yellow	VSP	0~6.5 V
6	Blue	FG	13.5~16.5 V



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

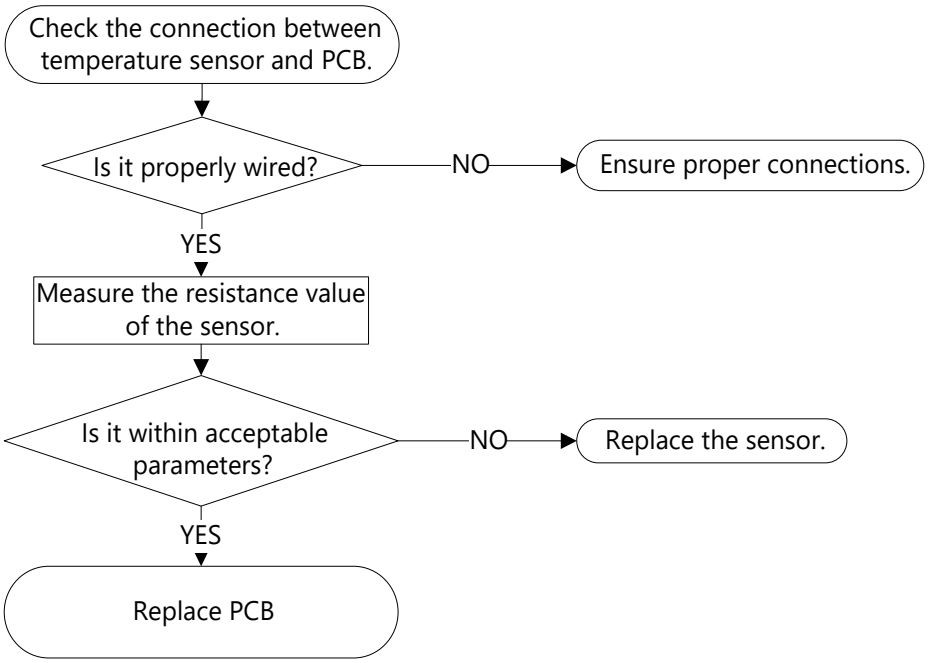
Release the UVW connector. Measure the resistance of U-V, U-W, and V-W. If the resistance is not equal, the fan motor must have problems and needs to be replaced. Otherwise, the PCB must have problems and needs to be replaced.

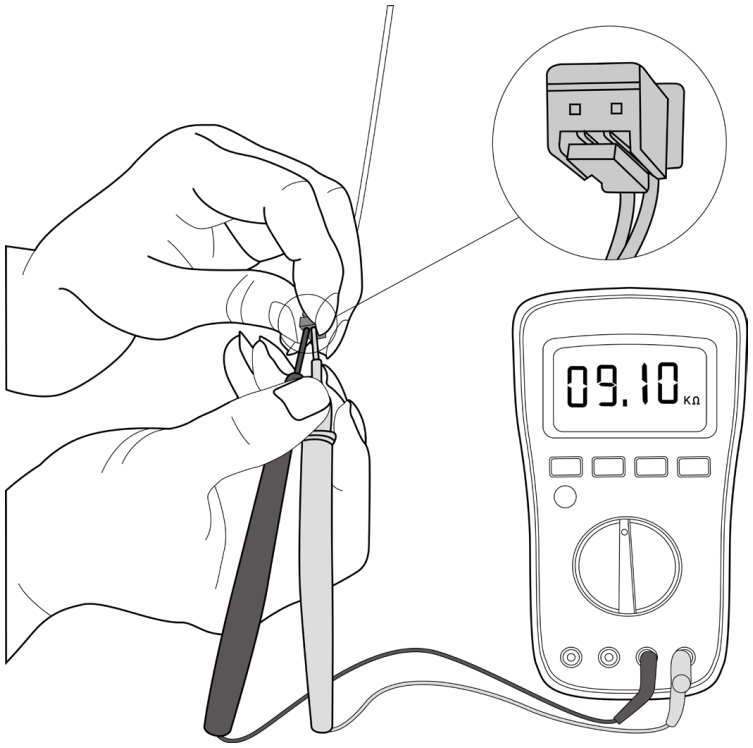


EC52/EC53/EC54/EC56/EC57/EC50 (Open circuit or short circuit of temperature sensor diagnosis and solution)
Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays the failure code.
Recommended parts to prepare:

- Connection wires
- Sensors
- Outdoor PCB

Troubleshooting and repair:



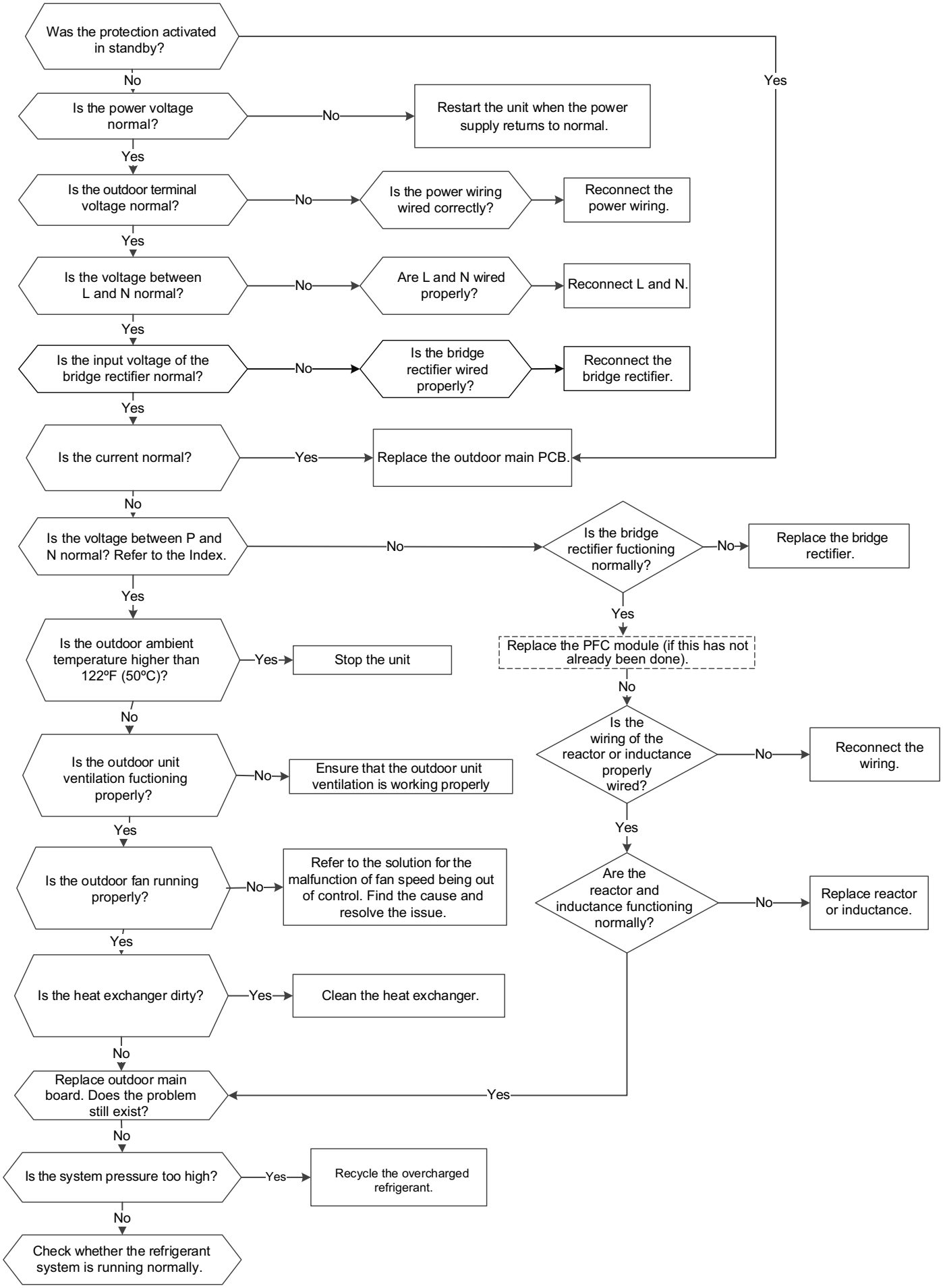


This picture and the value are only for reference; actual appearance and value may vary.

PC08 (Current overload protection)/PC42 (Compressor start failure of outdoor unit)/PC44 (ODU zero speed protection)/PC46 (Compressor speed has been out of control)/PC49 (Compressor overcurrent failure)
Description: An abnormal current rise is detected by checking the specified current detection circuit.
Recommended parts to prepare:

- Outdoor PCB
- Connection wires
- Bridge rectifier
- PFC circuit or reactor
- Refrigeration piping system
- Pressure switch
- Outdoor fan
- IPM module board

Troubleshooting and repair:


Was the protection activated in standby?
Yes
No
Is the power voltage normal?
No
Restart the unit when the power supply returns to normal.
Yes
Is the outdoor terminal voltage normal?
No
Is the power wiring wired correctly?
Reconnect the power wiring.
Yes
Is the voltage between L and N normal?
No
Are L and N wired properly?
Reconnect L and N.
Yes
Is the input voltage of the bridge rectifier normal?
No
Is the bridge rectifier wired properly?
Reconnect the bridge rectifier.
Yes
Is the current normal?
Yes
Replace the outdoor main PCB.
No
Is the voltage between P and N normal? Refer to the Index.
No
Is the bridge rectifier fuctioning normally?
No
Replace the bridge rectifier.
Yes
Replace the PFC module (if this has not already been done).
Yes
Is the outdoor ambient temperature higher than 122ºF (50ºC)?
Yes
Stop the unit
No
Is the wiring of the reactor or inductance properly wired?
No
Reconnect the wiring.
Yes
Is the outdoor unit ventilation fuctioning properly?
No
Ensure that the outdoor unit ventilation is working properly
Yes
Are the reactor and inductance functioning normally?
No
Replace reactor or inductance.
Yes
Is the outdoor fan running properly?
No
Refer to the solution for the malfunction of fan speed being out of control. Find the cause and resolve the issue.
Yes
Is the heat exchanger dirty?
Yes
Clean the heat exchanger.
No
Replace outdoor main board. Does the problem still exist?
Yes
No
Is the system pressure too high?
Yes
Recycle the overcharged refrigerant.
No
Check whether the refrigerant system is running normally.

PC00 (IPM malfunction diagnosis and solution)

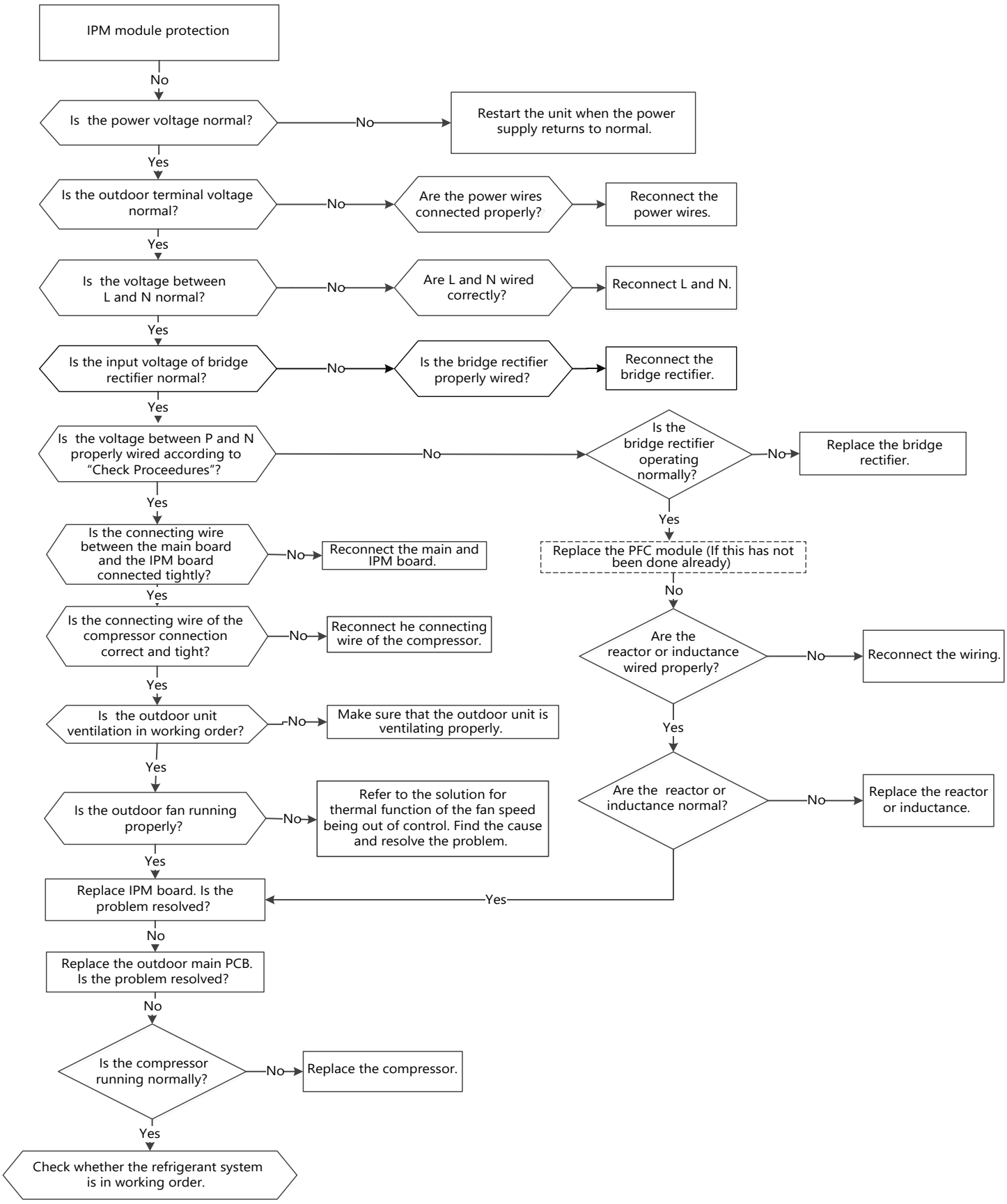
Description: When the voltage signals the IPM sends to the compressor drive chip are abnormal, the LED displays the failure code, and the AC turns off.

Recommended parts to prepare:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB
- Reactor or inductance
- Bridge rectifier

Troubleshooting and repair:

First, test the resistance between every two ports of U, V, W of IPM, and P, N. If any result of them is 0 or close to 0, the IPM is defective. Otherwise, please use the following procedure:


IPM module protection
No
Is the power voltage normal?
No
Restart the unit when the power supply returns to normal.
Yes
Is the outdoor terminal voltage normal?
No
Are the power wires connected properly?
Reconnect the power wires.
Yes
Is the voltage between L and N normal?
No
Are L and N wired correctly?
Reconnect L and N.
Yes
Is the input voltage of bridge rectifier normal?
No
Is the bridge rectifier properly wired?
Reconnect the bridge rectifier.
Yes
Is the voltage between P and N properly wired according to "Check Proceedures"?
No
Is the bridge rectifier operating normally?
No
Replace the bridge rectifier.
Yes
Replace the PFC module (If this has not been done already)
No
Are the reactor or inductance wired properly?
No
Reconnect the wiring.
Yes
Are the reactor or inductance normal?
No
Replace the reactor or inductance.
Yes
Is the connecting wire between the main board and the IPM board connected tightly?
No
Reconnect the main and IPM board.
Yes
Is the connecting wire of the compressor connection correct and tight?
No
Reconnect he connecting wire of the compressor.
Yes
Is the outdoor unit ventilation in working order?
No
Make sure that the outdoor unit is ventilating properly.
Yes
Is the outdoor fan running properly?
No
Refer to the solution for thermal function of the fan speed being out of control. Find the cause and resolve the problem.
Yes
Replace IPM board. Is the problem resolved?
Yes
No
Replace the outdoor main PCB. Is the problem resolved?
No
Is the compressor running normally?
No
Replace the compressor.
Yes
Check whether the refrigerant system is in working order.

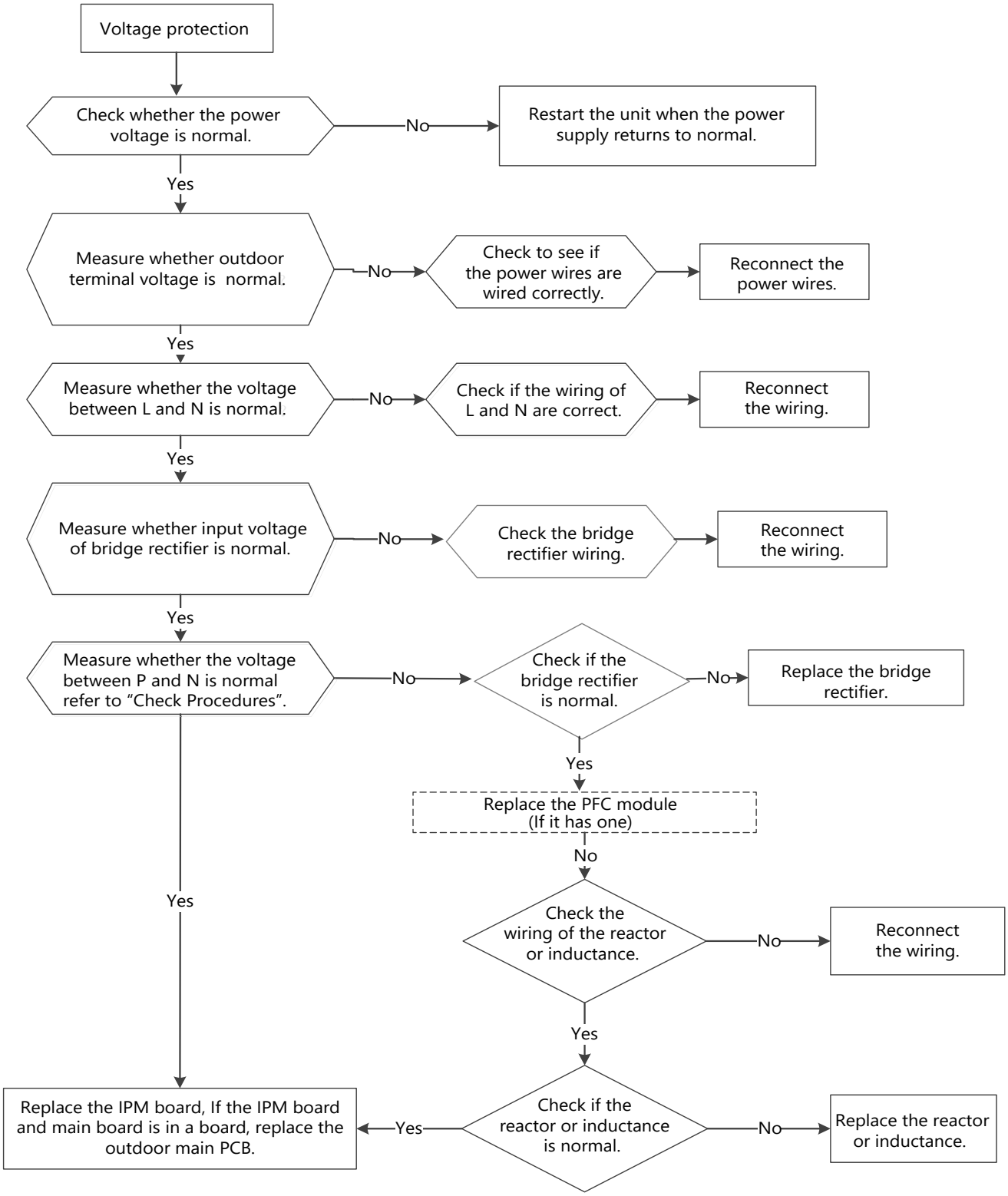
PC01 (Over voltage or too low voltage protection)/PC10 (ODU low AC voltage protection)/PC11 (ODU main control board DC bus high voltage protection)/PC12 (ODU main control board DC bus low voltage protection /341 MCE error) Diagnosis and Solution

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

Recommended parts to prepare:

- Power supply wires
- IPM module board
- Outdoor PCB
- Bridge rectifier
- PFC circuit or reactor

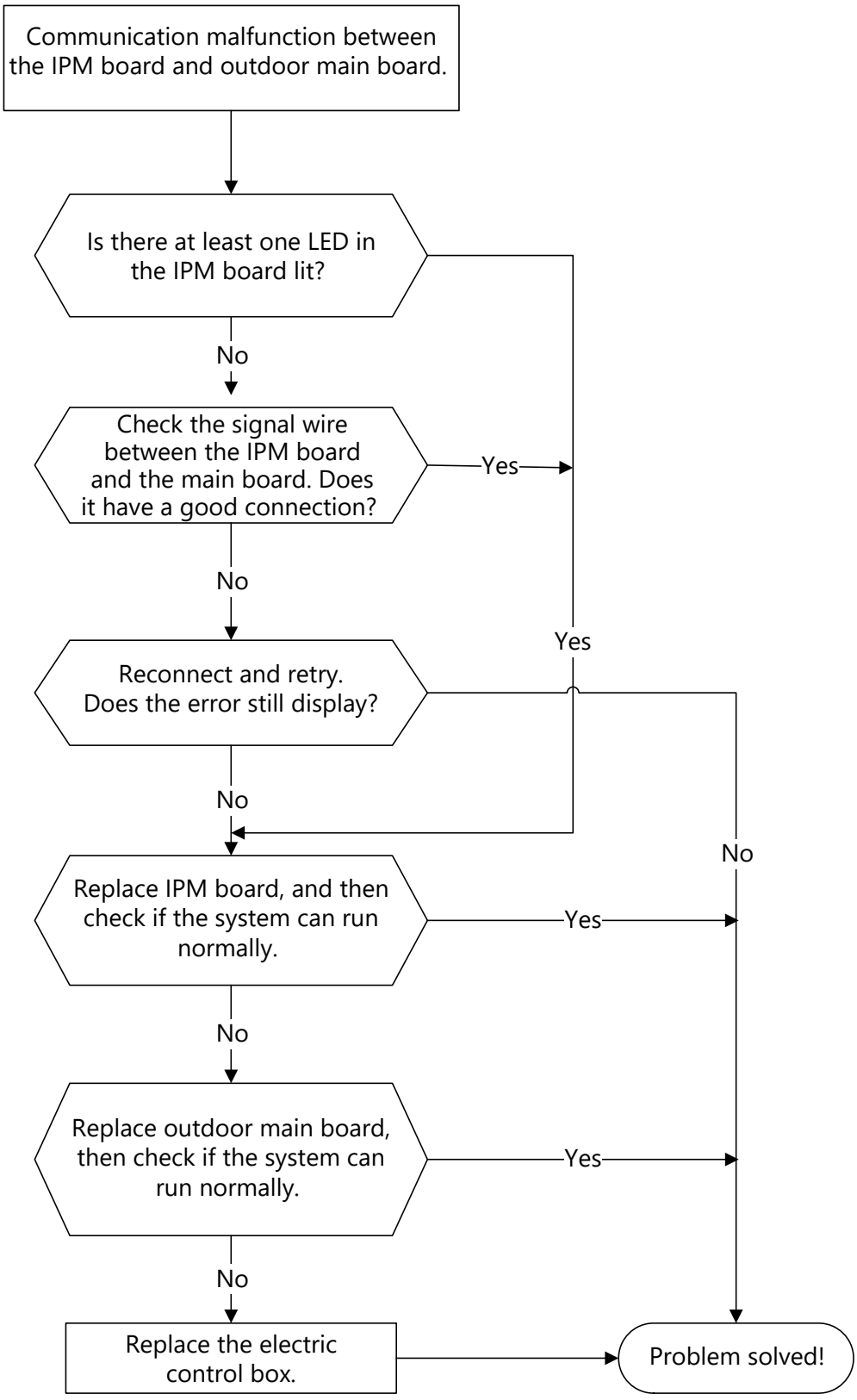
Troubleshooting and repair:



PC40 (Communication error between ODU main chip and compressor driven chip diagnosis and solution)
Description: The main PCB cannot detect the IPM board.
Recommended parts to prepare:

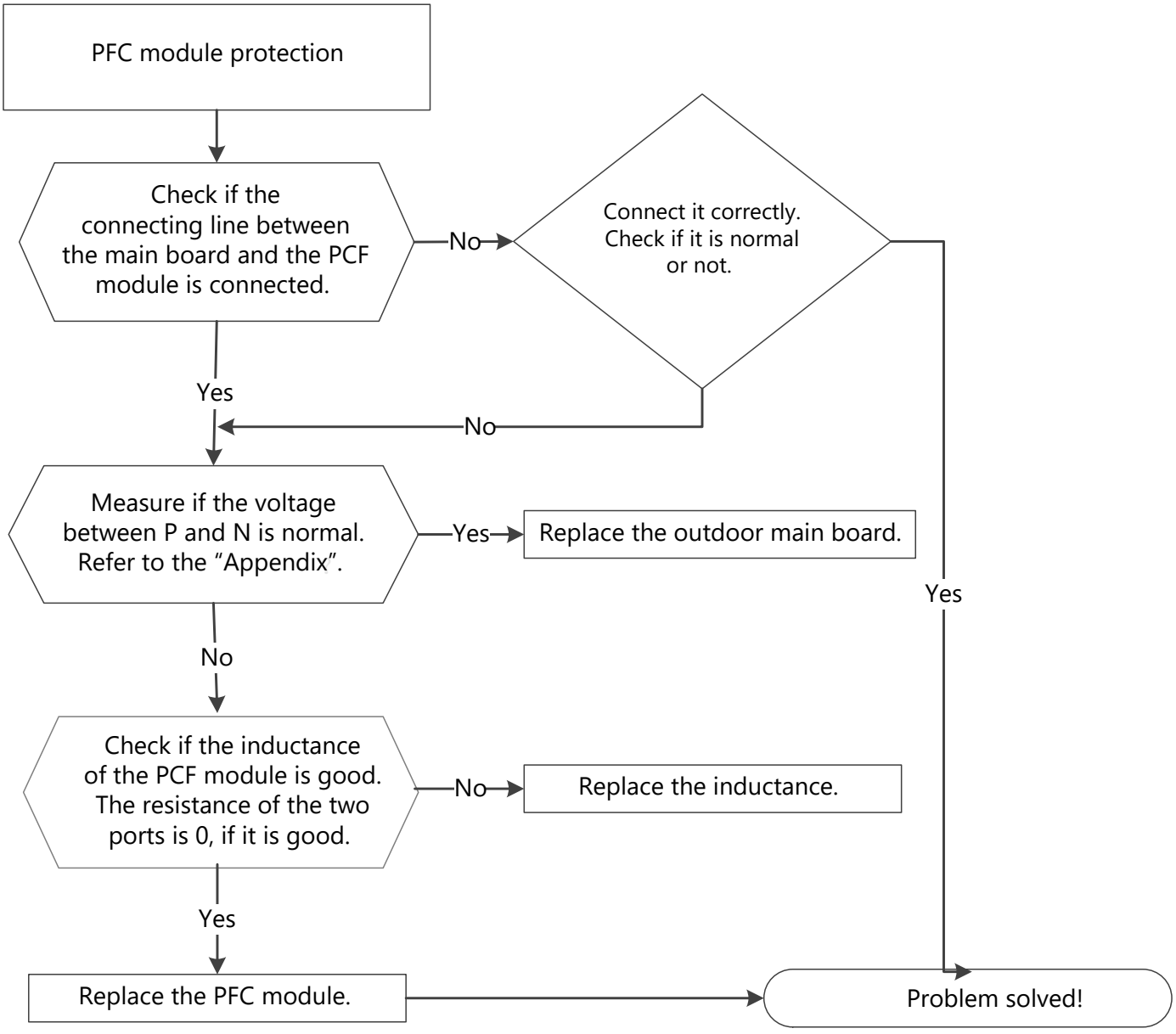
- Connection wires
- Outdoor PCB
- IPM module board
- Electric control box

Troubleshooting and repair:



PC0F (PFC module protection diagnosis and solution)
Description: Outdoor PCB detects PFC signal is low voltage or DC voltage is lower than 340V for 6s when quick check.
Recommended parts to prepare:
- Connection wires
- Outdoor PCB
- Inductance
- PFC circuit or IPM module board

Troubleshooting and repair:



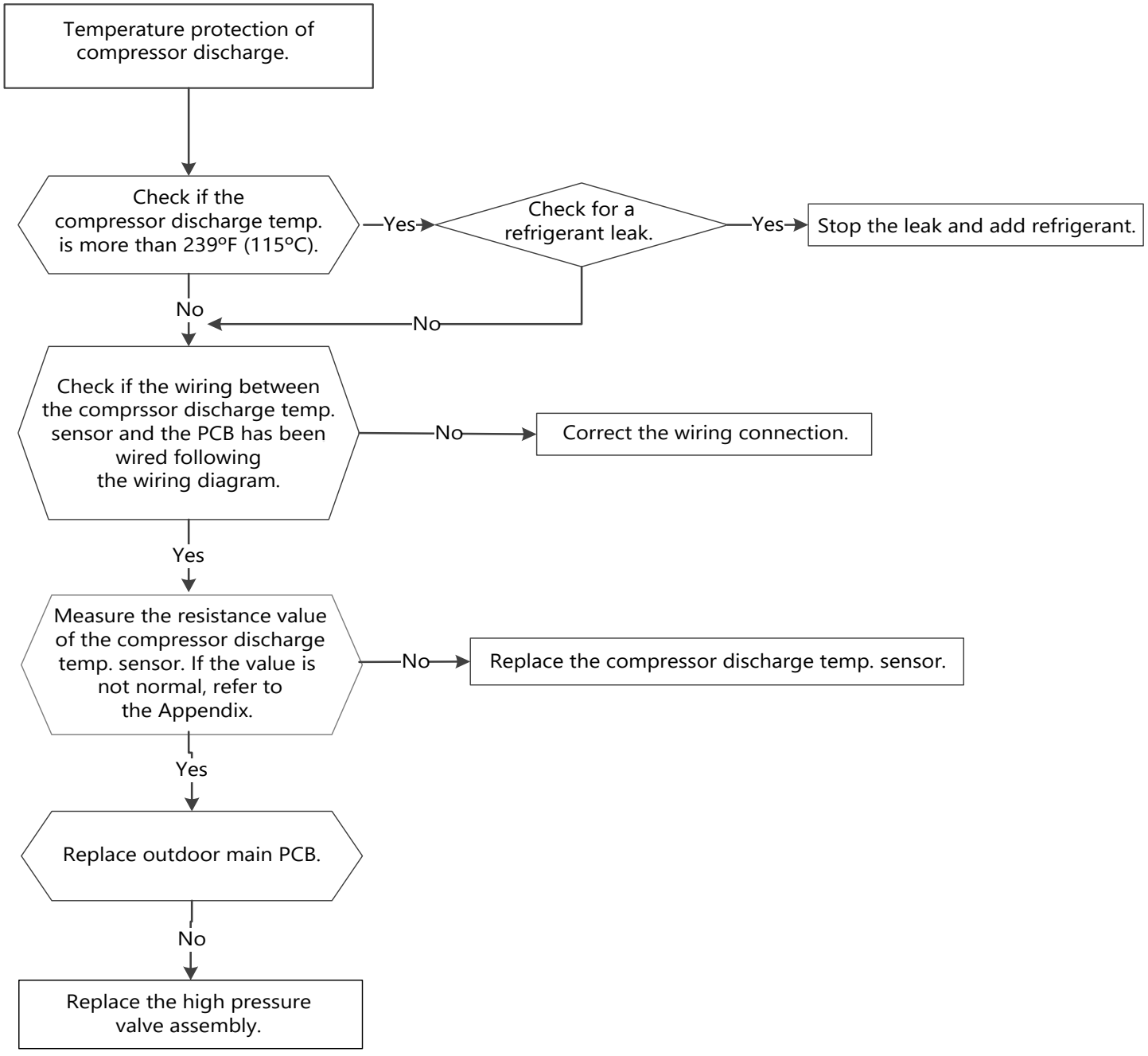
PC06 (Discharge temperature protection of compressor diagnosis and solution)

Description: When the compressor discharge temperature (TP) is more than 239°F (115°C) for 10 seconds, the compressor ceases operation and does not restart until TP is less than 194°F (90°C).

Recommended parts to prepare:

- Connection wires
- Outdoor PCB
- Discharge temperature sensor
- Refrigerant

Troubleshooting and repair:



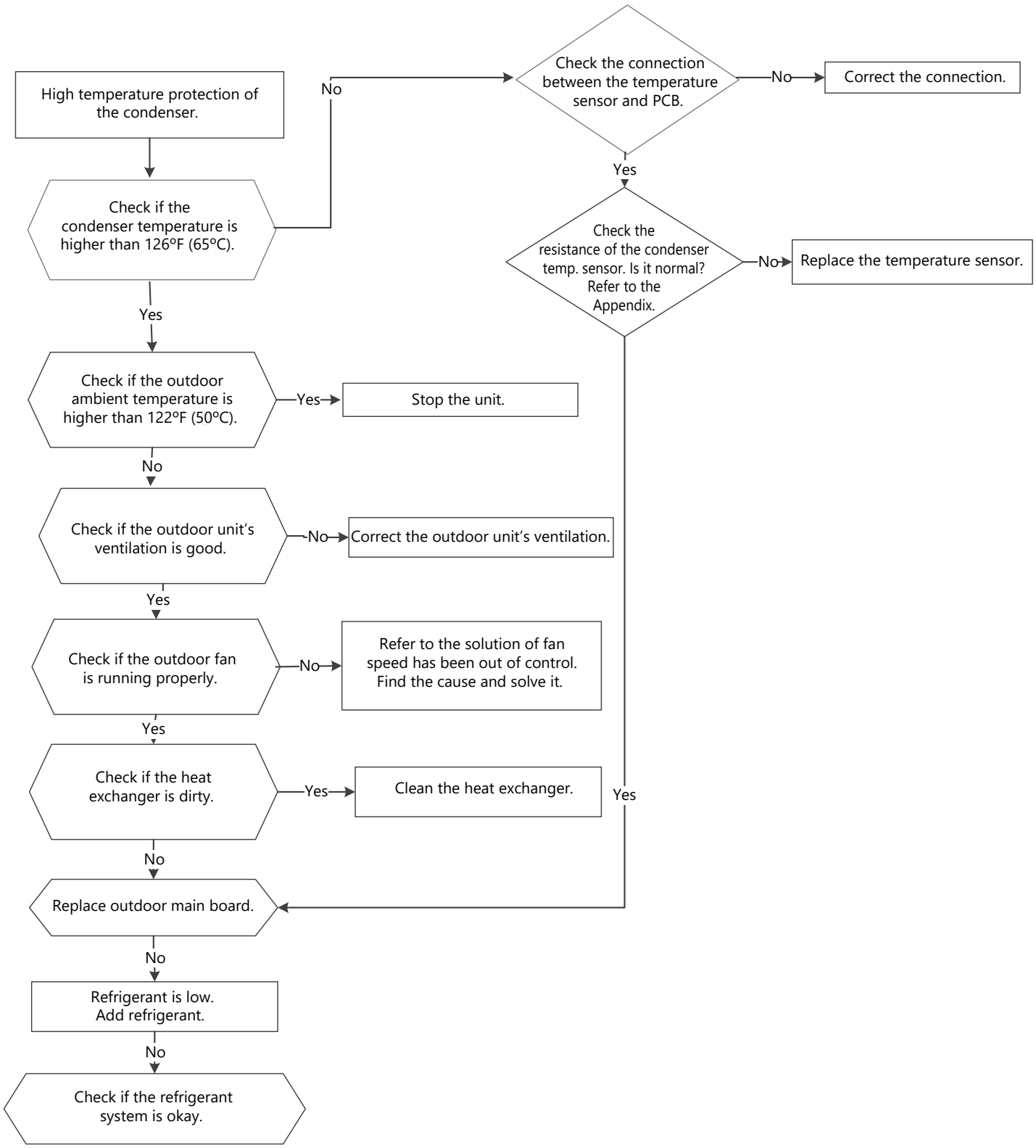
PC0A (High temperature protection of condenser diagnosis and solution)

Description: The unit will stop when the condenser temperature is higher than 149°F (65°C), and run again when it is less than 126.5°F (52°C).

Recommended parts to prepare:

- Connection wires
- Condenser temperature sensor
- Outdoor fan
- Outdoor main PCB
- Refrigerant

Troubleshooting and repair:



PC02/LC06 (Compressor top (or IPM) temp. protection/Refrigerant sensor error diagnosis and solution)

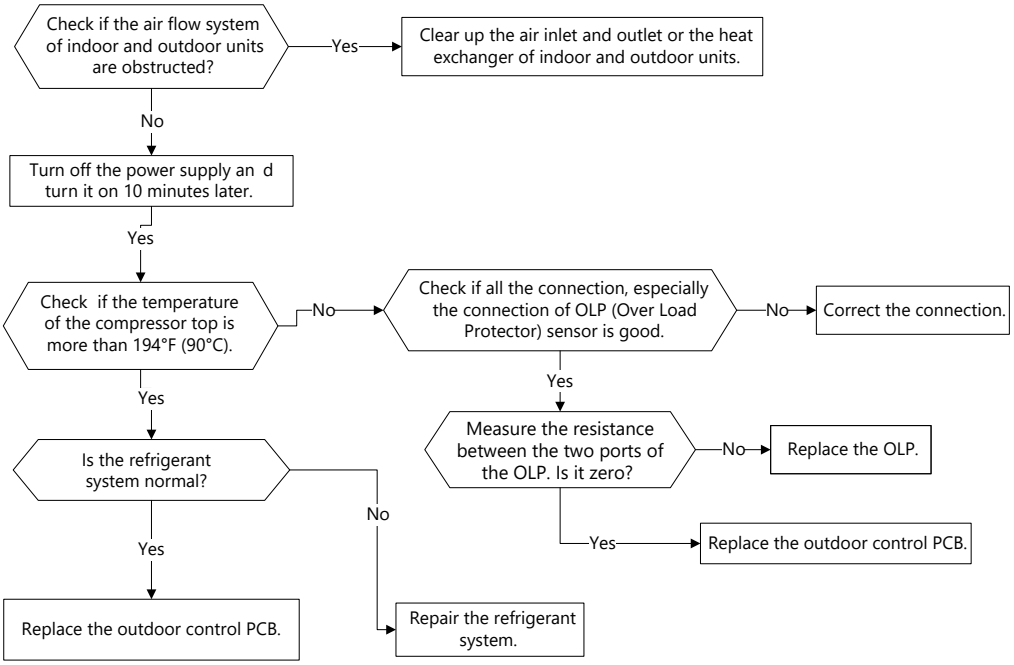
Description: For some models with overload protector, If the sampling voltage is not 5 V, the LED will display the failure. If the temperature of IPM module is higher than a certain value, the LED displays the failure code.

Models without overload protector should be diagnosed according to the second flowchart.

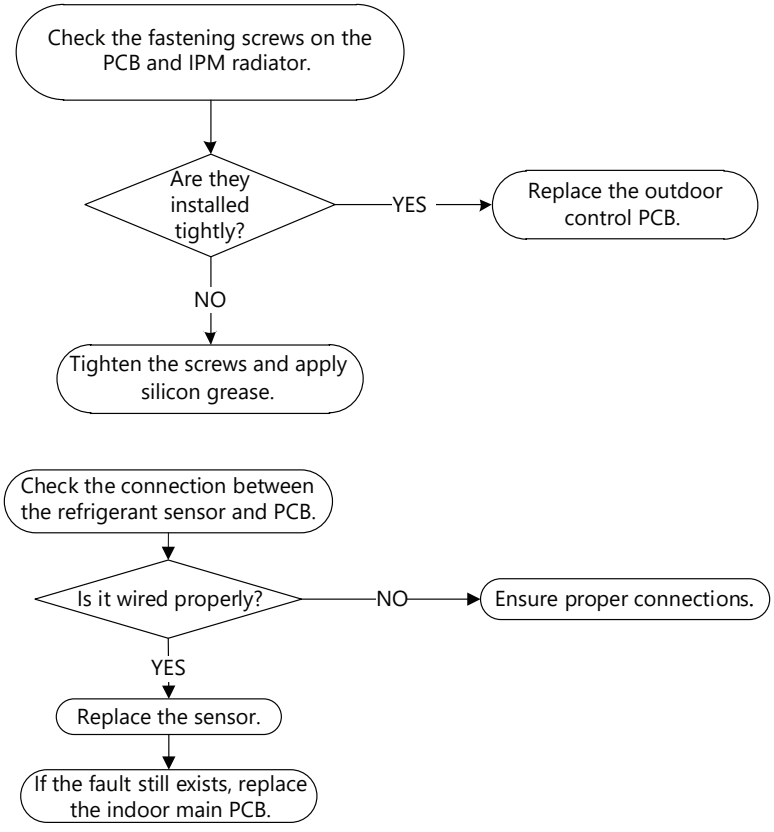
Recommended parts to prepare:

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

Troubleshooting and repair:



or



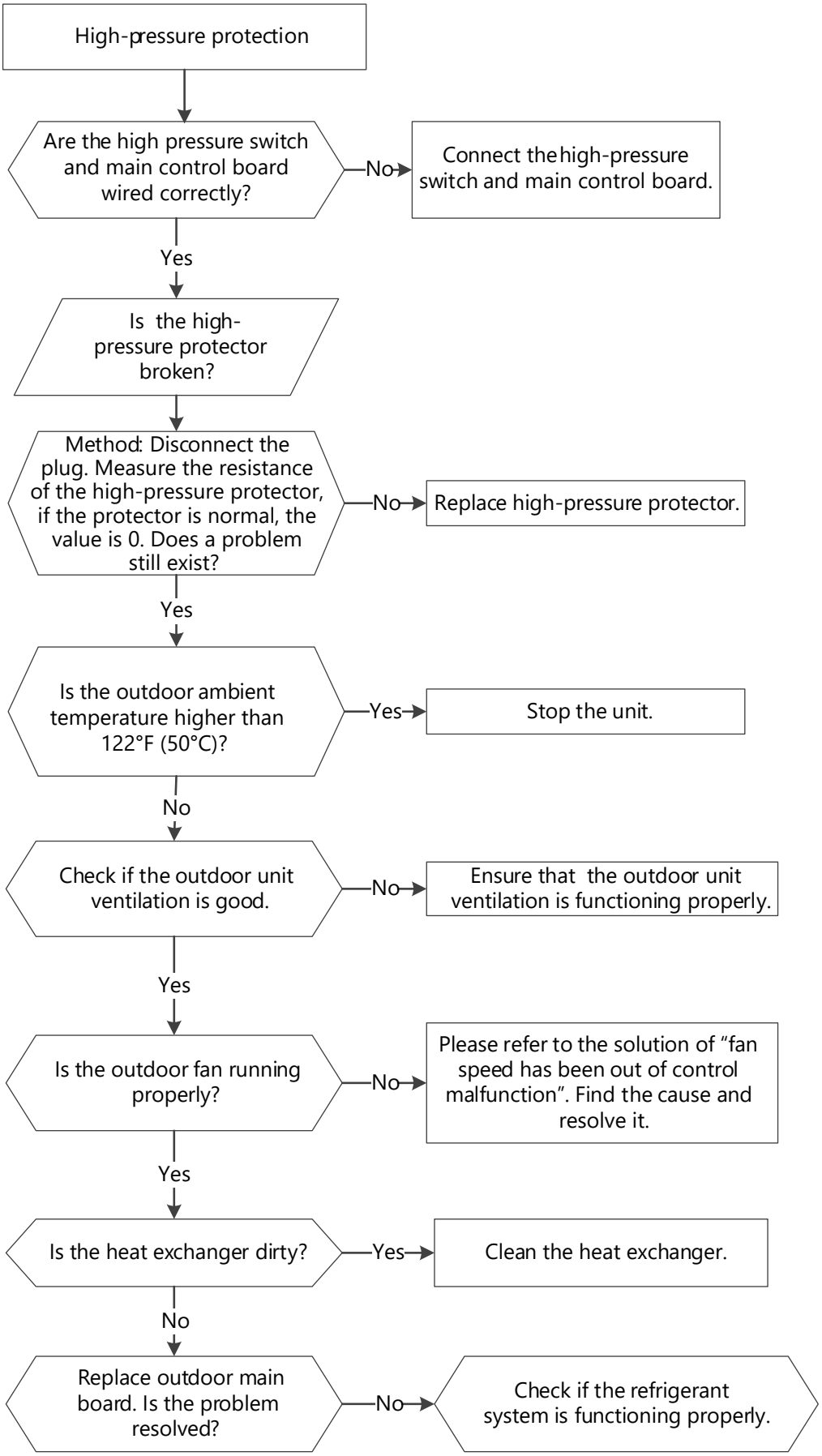
PC30 (System high-pressure protection diagnosis and solution)

Description: The Outdoor pressure switch cuts off the system because high pressure is higher than 4.4 MPa

Recommended parts to prepare:

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

Troubleshooting and repair:



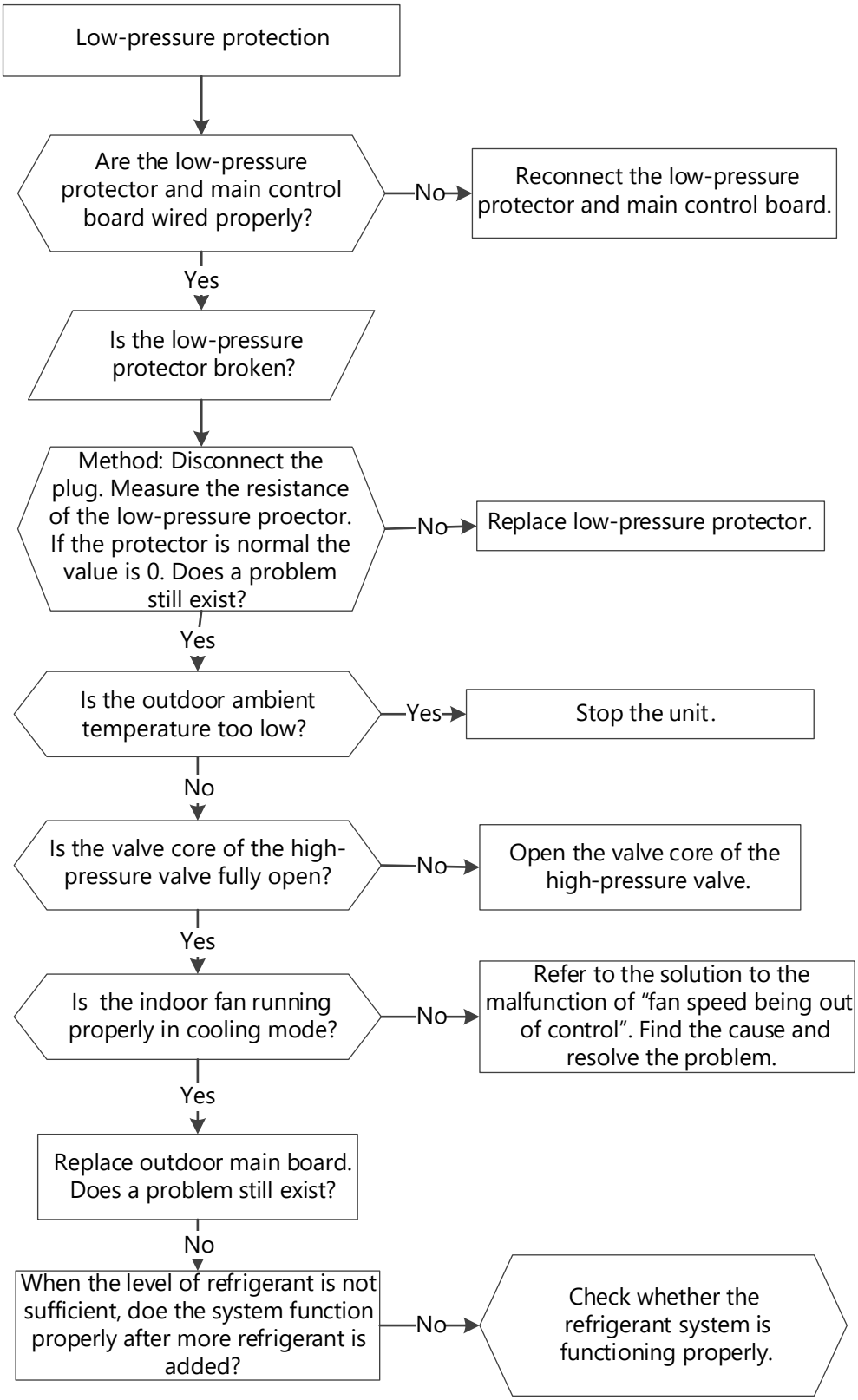
PC31 (System low-pressure protection diagnosis and solution)

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

Recommended parts to prepare:

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

Troubleshooting and repair:



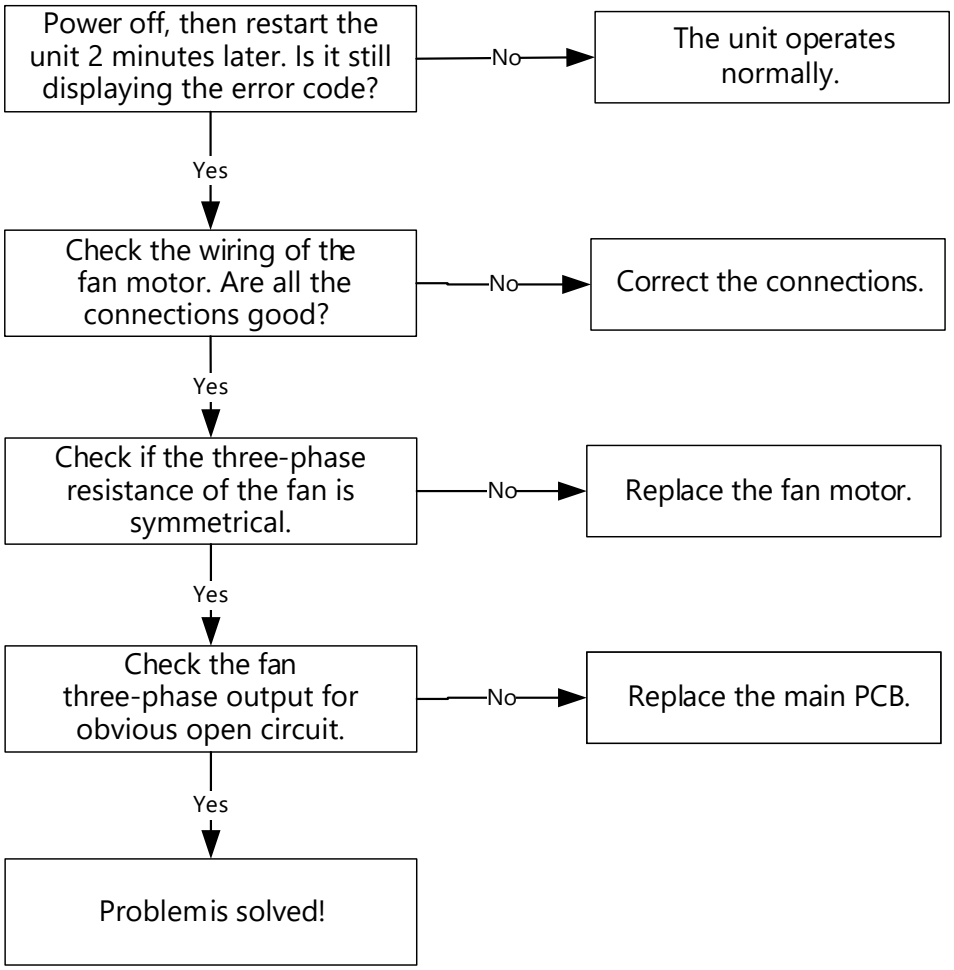
EC72 (Lack phase failure of outdoor DC fan motor diagnosis and solution)

Description: When the three-phase sampling current of the DC motor is abnormal, especially when the current of one or more phases is always small and almost 0, the LED displays the failure code.

Recommended parts to prepare:

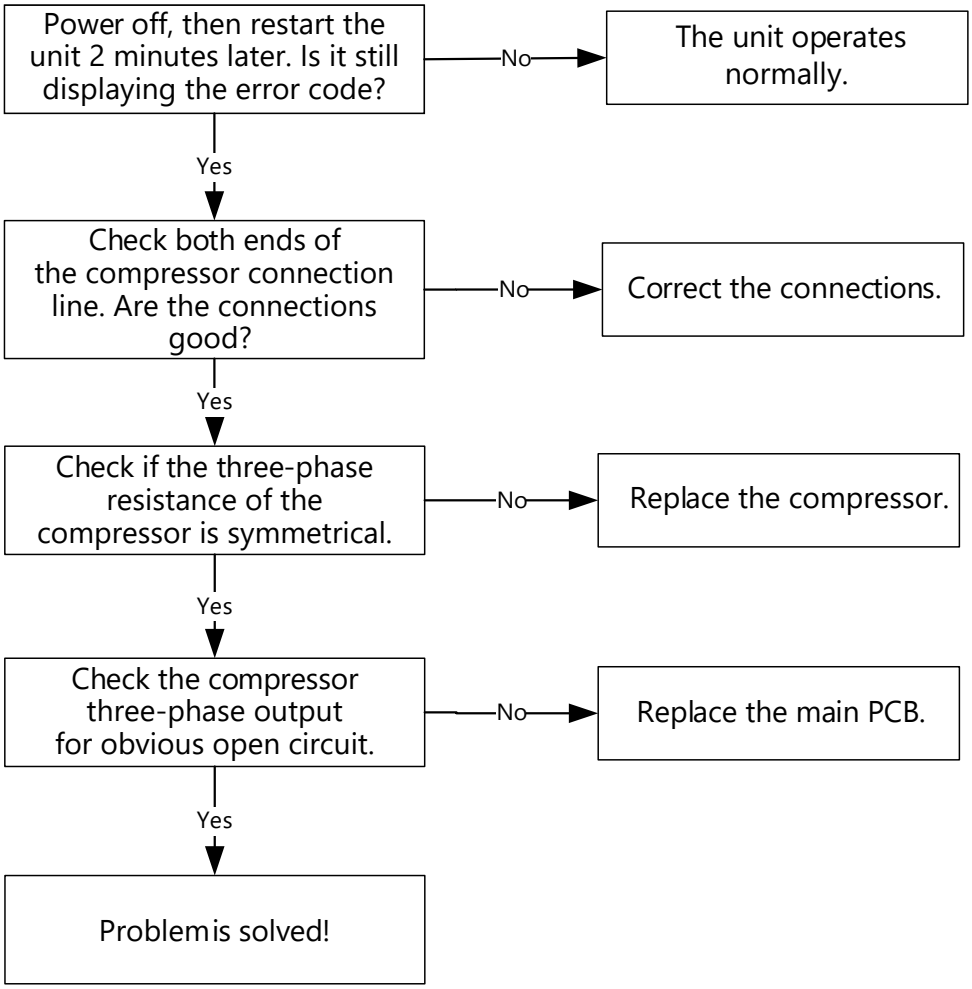
- Connection wire
- Fan motor
- Outdoor PCB

Troubleshooting and repair:



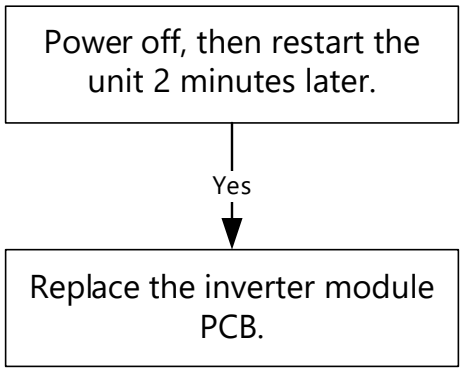
PC43 (ODU compressor lacks phase protection diagnosis and solution)
Description: When the three-phase sampling current of the compressor is abnormal, especially when the current of one or more phases is always small and almost 0, the LED displays the failure code
Recommended parts to prepare:
- Connection wire
- Compressor
- Outdoor PCB

Troubleshooting and repair:



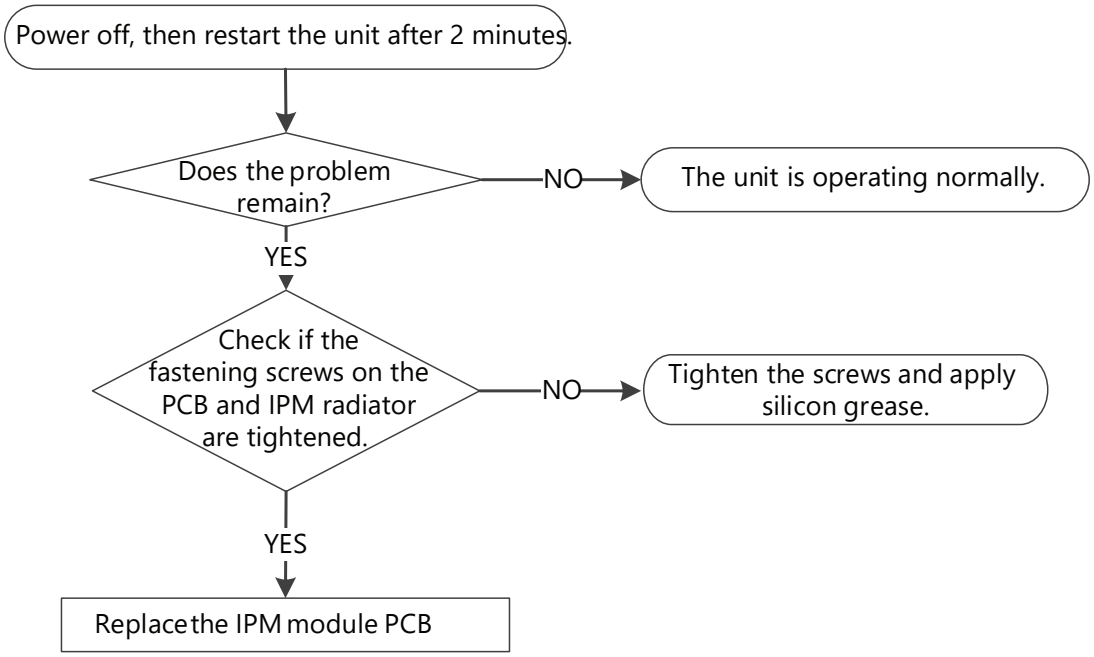
PC45 (ODU IR chip drive failure diagnosis and solution)
Description: When the IR chip detects its parameter error, the LED displays the failure code when powered on.
Recommended parts to prepare:
- Inverter module PCB.

Troubleshooting and repair:

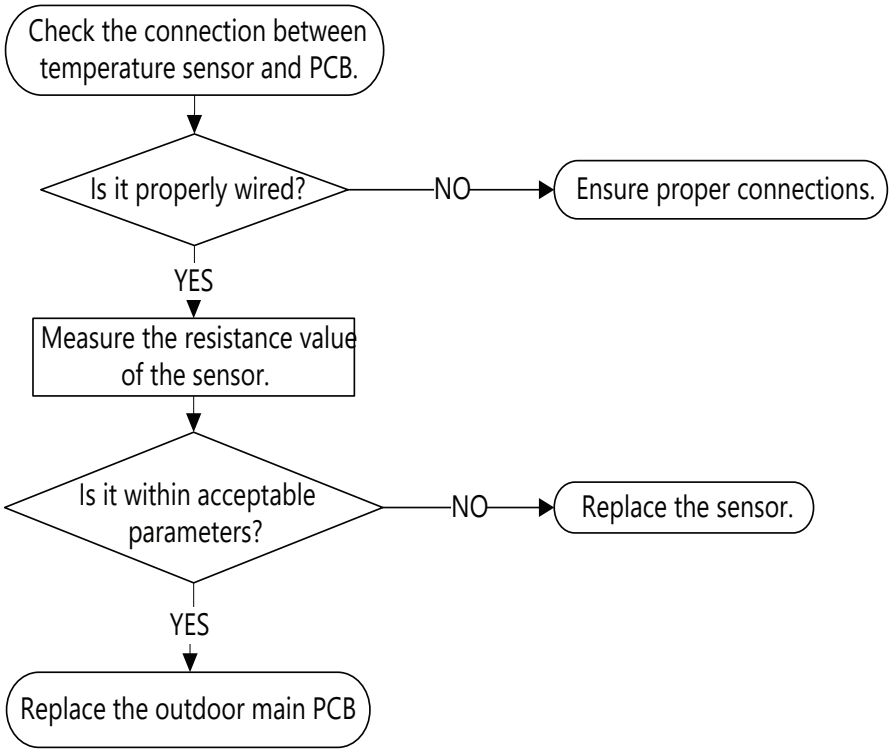


EC55 (ODU IPM module temperature sensor malfunction diagnosis and solution)
Description: If the sampling voltage is 0 V or 5 V, the LED displays the failure code.
Recommended parts to prepare:
- IPM module PCB
- Connection wires
- Sensors
- Outdoor main PCB

Troubleshooting and repair:
If the radiator has no sensor, follow the steps below to resolve,



If the radiator has a sensor (TH), follow the steps below to resolve,



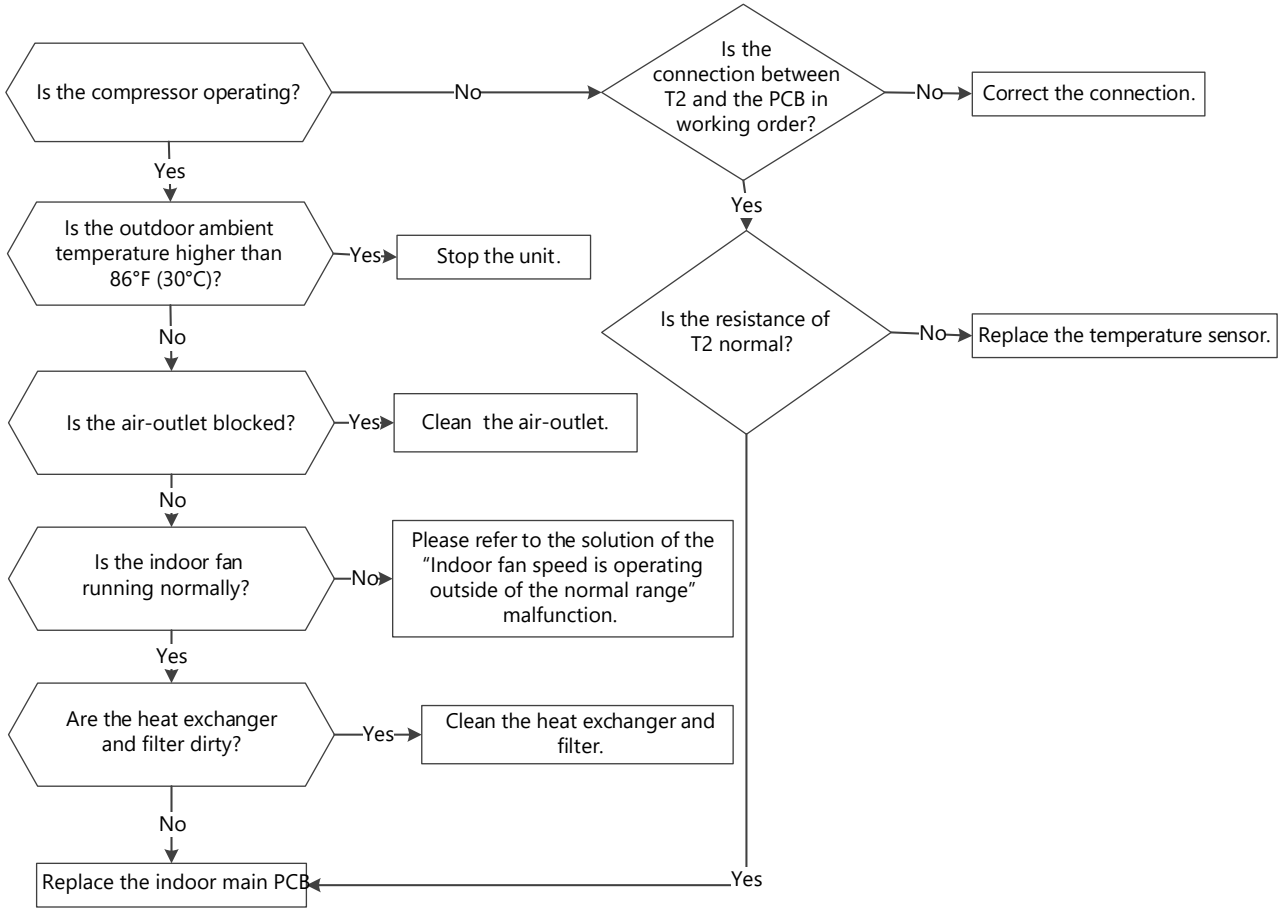
PH90 (High temperature protection of evaporator diagnosis and solution)

Description: When the evaporator coil temperature is more than 140°F (60°C) in heating mode, the unit stops. It starts again only when the evaporator coil temperature is less than 1265°F (52°C).

Recommended parts to prepare:

- Connection wires
- Evaporator coil temperature sensor (T2)
- Indoor fan
- Indoor main PCB

Troubleshooting and repair:



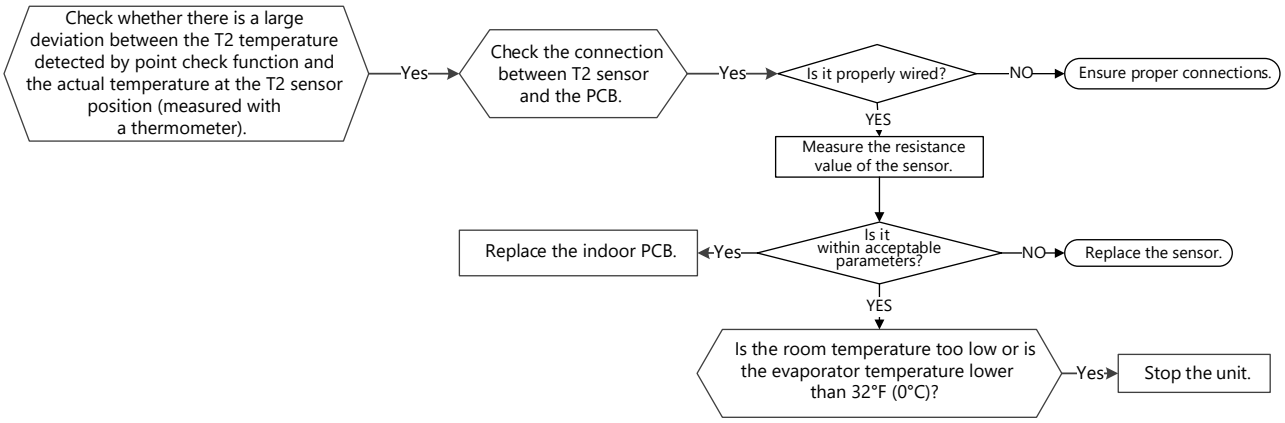
PH91 (Low temperature protection of evaporator diagnosis and solution)

Description: When the evaporator coil temperature is lower than 32°F (0°C) in cooling mode or drying mode, the unit stops. It starts again only when the evaporator coil temperature is more than 41°F (5°C).

Recommended parts to prepare:

- Connection wires
- Evaporator coil temperature sensor (T2)
- Indoor main PCB

Troubleshooting and repair:



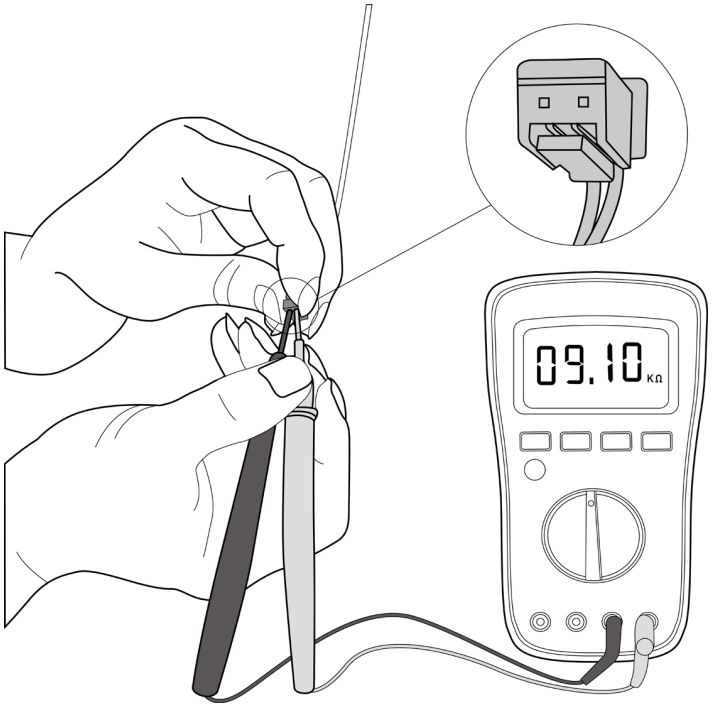
Check Procedures

Temperature Sensor Check

⚠ WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid an 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 and Outdoor Unit Disassembly").
2. Measure the resistance value of the sensor using a multimeter.
3. Check the corresponding temperature sensor resistance value table (Refer to Chapter "Appendix").

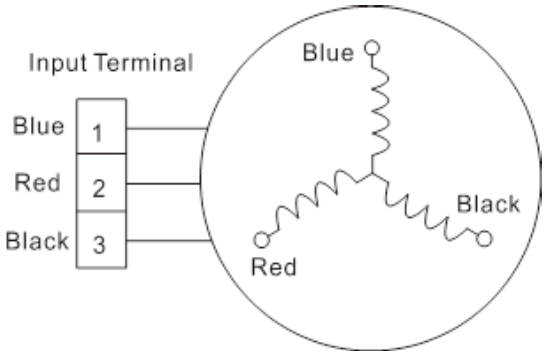


NOTE

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

Compressor Check

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



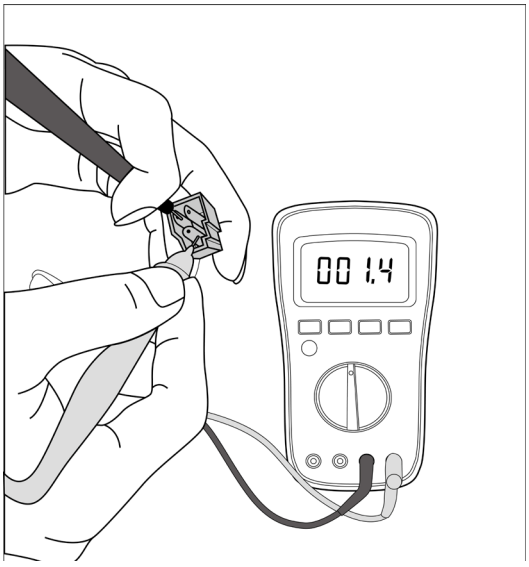
Resistance Value	KSK103D33UEZ3	KSN140D58UFZ	KTF250D22UMT	KTN110D42UFZ	KTF420D62UNT
Blue-Red	2.13Ω	1.86Ω	0.75Ω	1.82Ω	0.86Ω
Blue-Black					
Red-Black					

Resistance Value	KTN150D30UFZA	KTM240D46UKT2	KTF310D43UMT	ETPQ420D1UMUA ETPQ440D1UMUB KTQ420D1UMU EKPQ440D1UMUB	MTH356UKRC8FQL
Blue-Red	1.02Ω	1.04Ω	0.65Ω	0.37Ω	0.487Ω
Blue-Black					
Red-Black					

Resistance Value	MTH550UKPC8FU
Blue-Red	0.295Ω
Blue-Black	
Red-Black	

NOTE

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



IPM Continuity Check

⚠ WARNING

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

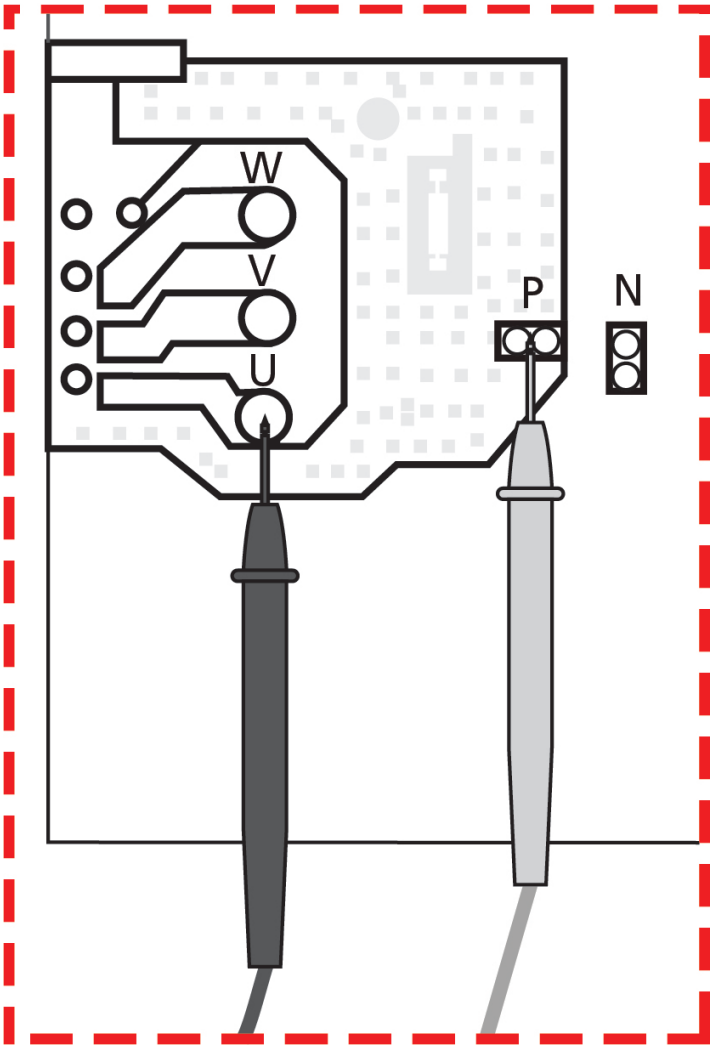
1. Turn off outdoor unit and disconnect power supply.
2. Discharge electrolytic capacitors and ensure all energy-storage units have been discharged.
3. Disassemble outdoor PCB or disassemble IPM board.
4. Measure the resistance value between P and U (V, W, N); U (V, W) and N.

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

Or test the conductivity of IPM with diode mode.

Needle-Type Tester		Normal Value	Needle-Type Tester		Normal Value
Red	Black		Red	Black	
P	U	Open-Circuit	N	U	0.3-0.5 V
	V			V	
	W			W	

Needle-Type Tester		Normal Value	Needle-Type Tester		Normal Value
Black	Red		Black	Red	
P	U	0.3-0.5 V	N	U	Open-Circuit
	V			V	
	W			W	



NOTE

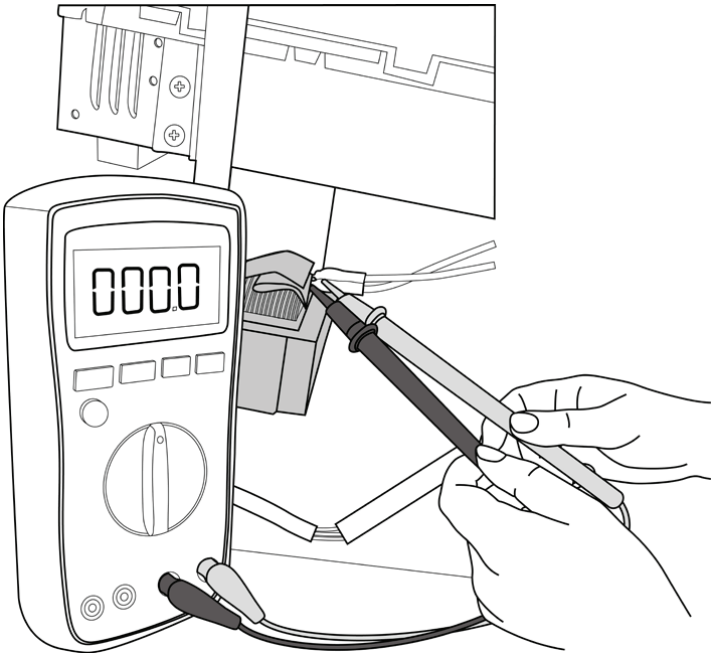
The picture and the value are only for reference, actual condition and specific value may vary.

Normal Voltage Of P And N

208-230 V (1-phase)		
In Standby		
Around 310VDC		
In Operation		
With passive PFC module	With partial active PFC module	With fully active PFC module
>200VDC	>310VDC	>370VDC

Reactor Check

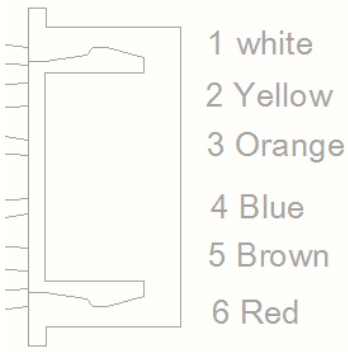
Measure the resistance and voltage (to ground) of the reactor. The normal resistance should be around 0.1 ohm. Otherwise, the reactor must have malfunction.



4-Way Valve Check

1. Power on, use a digital tester to measure the voltage, when the unit operates in cooling, it is 0V. When the unit operates in heating, it is about equal to power supply voltage.
   If the value of the voltage is not in the range, the PCB must have problems and need to be replaced.
2. Turn off the power, use a digital tester to measure the resistance. The value should be 1.8~2.5 KΩ.

EXV Check



1. Turn off the outdoor unit and disconnect the power supply.
2. Disconnect the connectors of the EXV.
3. Measure the resistance value between Red and Blue (Yellow), Brown and Orange (White).

Resistance to EXV coil

Color of Lead Wire	Normal Value
Red- Blue	About 50Ω
Red - Yellow	
Brown-Orange	
Brown-White	

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			

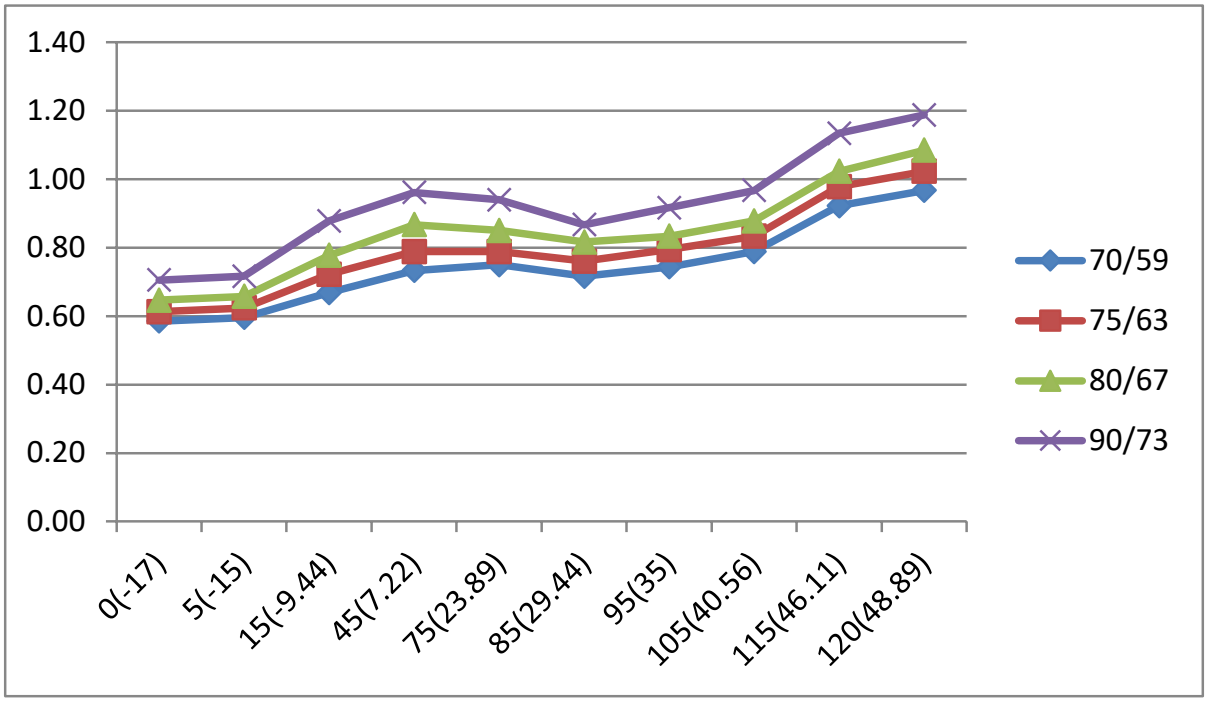
Other Temperature Sensors Resistance Value Table (°C – K)

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

Pressure On Service Port

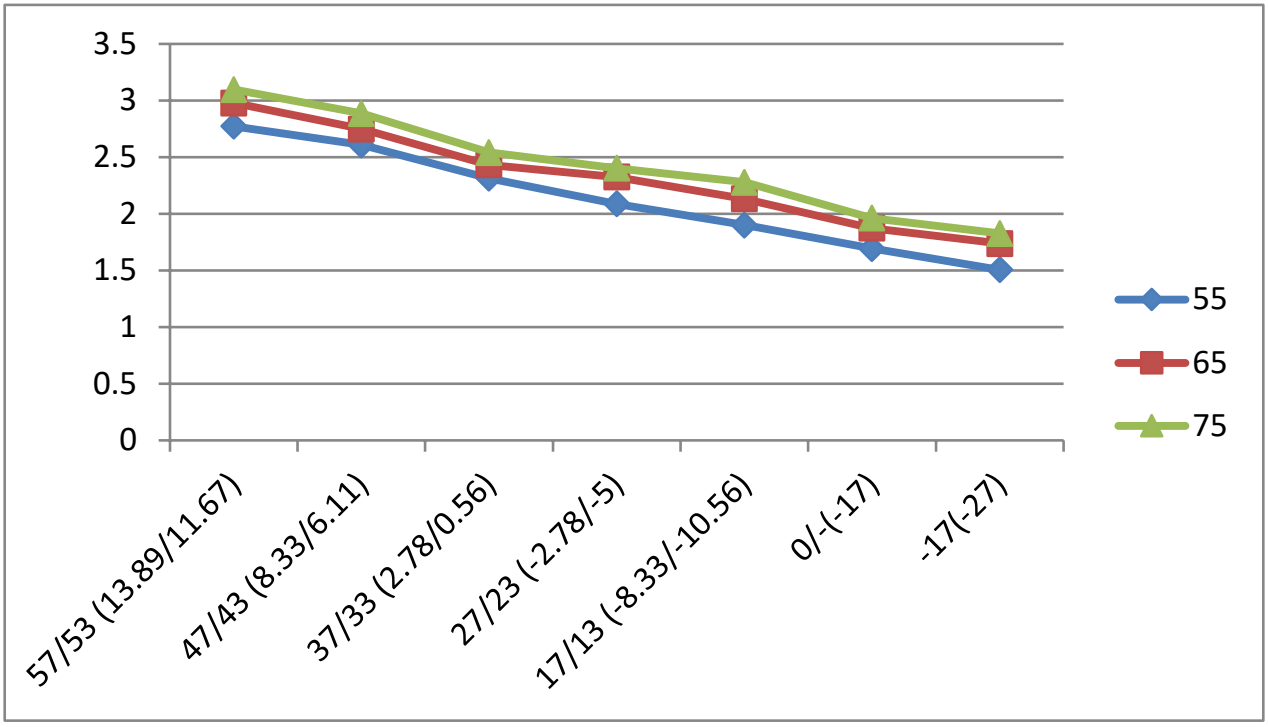
Cooling chart(R454B):

°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
437.92	4.38	63.51	-15	5	3025	30.25	438.72	53	127.4

System Pressure Table-R454B (continued)

Pressure			Temperature		Pressure			Temperature	
Kpa	**bar**	**PSI**	**°C**	**°F**	**Kpa**	**bar**	**PSI**	**°C**	**°F**
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

Single-Zone Oudoor Unit SM Rev. 1 07222025