This product utilizes **R-454B** *refrigerant*

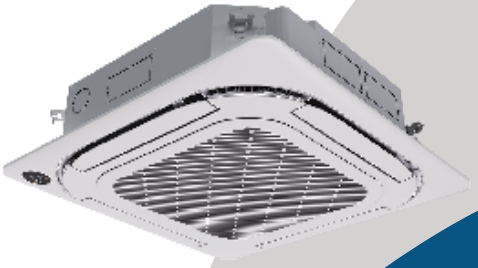
Olympus Series Multi-Zone Mini-Split System

Service Manual

MODELS:

MULTI*-*HP230C-O
O-*-HP-WMAH-230C-O
DUCT-*HP-230B-O
CASSETTE*HP-230C-O









Read this manual carefully before installation and keep it where the operator can easily find it for future reference.

Due to updates and constantly improving performance, the information and instructions within this manual are subject to change without notice.

Version Date: May 14, 2025
Please visit www.mrcool.com/documentation to ensure you have the latest version of this manual.

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COMFORT MADE SIMPLE

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Safety Precautions

Read Before Using

Incorrect usage may cause serious damage or injury.

The symbols below are used throughout this manual to indicate instructions that should be followed closely or actions that should be avoided to prevent death, injury, and/or property damage.

WARNING	Indicates the possibility of personal injury or loss of life.
CAUTION	Indicates the possibility of property damage or serious consequences.

WARNING FOR PRODUCT INSTALLATION

INSTALLATION MUST BE PERFORMED BY AN AUTHORIZED DEALER OR SPECIALIST. DEFECTIVE INSTALLATION CAN CAUSE WATER LEAKAGE, ELECTRICAL SHOCK, OR FIRE.

******ELECTRICAL WORK MUST BE COMPLETED BY A QUALIFIED ELECTRICAL TECHNICIAN******

- ⊘ ***DO NOT*** **install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it could cause fire.**
- ⊘ ***DO NOT*** **turn on the power until the installation and all work has been completed.**

1. Installation must be performed according to the installation instructions. Improper installation could cause water leakage, electrical shock, or fire.
2. Contact an authorized service technician for repair or maintenance of this unit.
3. This appliance must be installed in accordance with national wiring regulations.
4. Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and/or failure of the unit.
5. Install the unit in a firm location that can support the unit's weight. If the location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and damage.
6. Install the drainage piping according to the instructions in this manual. Improper drainage could cause water damage to your home and/or property.
7. When moving or relocating the air conditioner, consult experienced service technicians for disconnection and re-installation of the unit.
8. For detailed information of how to install the indoor and outdoor units to their respective supports, please refer to the indoor unit installation and outdoor unit installation sections of this manual.
9. USB device access, replacement, and maintenance operations must be carried out by professional staff.

WARNING FOR CLEANING & MAINTENANCE

1. **DO NOT** clean the unit with excessive amounts of water.
2. **DO NOT** clean the unit with combustible cleaning agents, as these could cause deformation and/or fire.
3. Turn off the device and disconnect the power before cleaning. Failure to do this could result in electrical shock.

TAKE NOTE OF FUSE SPECIFICATIONS

- The unit's circuit board (PCB) is designed with a fuse to provide over-current protection.
- The specifications of the fuse are printed on the circuit board, examples of such are T5A/250VAC and T10A/250VAC.

Note: Only a blast-proof ceramic fuse can be used.

1 SAFETY

WARNING FOR PRODUCT USE

- ⊘ ***DO NOT*** **insert fingers, rods, or other objects into the air inlet or outlet. This could cause injury, since the fan may be rotating at high speeds.**
- ⊘ ***DO NOT*** **use flammable sprays such as hair spray, lacquer or paint near the unit, as this could cause fire and/or an explosion.**
- ⊘ ***DO NOT*** **operate the unit in places near or around combustible gases. Emitted gas may collect around the unit and cause an explosion.**
- ⊘ ***DO NOT*** **allow children to play with the appliance. Children must be supervised around the unit at all times.**
- ⊘ ***DO NOT*** **operate the unit in a room where it could be exposed to excessive amounts of water, such as a bathroom or laundry room. Exposure to excessive water amounts can cause the electrical components to short circuit.**
- ⊘ ***DO NOT*** **expose your body directly to direct cool airflow from the unit for a prolonged period of time.**

1. If the unit operates abnormally (emits strange noises or a burning smell), immediately turn off the unit and disconnect the power in order to avoid electric shock, fire, and/or injury. Call your local dealer, or MRCOOL® tech support at (270) 366-0457, for further assistance.
2. If the air conditioner is used together with burners or other heating devices, thoroughly ventilate the room in order to avoid an oxygen deficiency.
3. In certain functional environments (such as kitchens and server rooms etc.), the use of specially designed air-conditioning units is highly recommended.
4. This appliance is not intended for use by persons(including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
5. Turn off the unit and disconnect the power before performing any cleaning, installation, or repairing. Failure to do so can cause electric shock.

CAUTION

- ⊘ ***DO NOT*** **allow the air conditioner to operate for extended periods of time with the doors or windows open, or in very high humidity.**
- ⊘ ***DO NOT*** **operate the air conditioner with wet hands, as this could cause electric shock.**
- ⊘ ***DO NOT*** **use device for any other purpose than its intended use.**
- ⊘ ***DO NOT*** **climb onto or place objects on top of the outdoor unit.**

1. Make sure that water condensation can drain smoothly and unhindered from the unit.
2. Turn off the unit and disconnect the power if the unit will not be used for an extended period of time.
3. Turn off and unplug the unit during storms.

ELECTRICAL WARNINGS

******ELECTRICAL WORK MUST BE COMPLETED BY A QUALIFIED ELECTRICAL TECHNICIAN******

- ⊘ ***DO NOT*** **share the power supply with other appliances. An improper or insufficient power supply could cause fire and/or electrical shock.**

1. Only use the specified wire. If the wire is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
2. The product must be properly grounded during installation or electrical shock could occur.
3. Appropriate wiring standards, regulations, and the installation manual must be followed for all electrical work.
4. If connecting power to fixed wiring, an all-pole disconnection device must be incorporated in the fixed wiring in accordance with the wiring rules and must meet the following requirements: at least 3 mm of clearances in all poles, a leakage current that may exceed 10 mA, and a residual current device (RCD) having a rated residual operating current not exceeding 30 mA.
5. Connect cables tightly and clamp them securely to prevent external forces from damaging the terminal.

ELECTRICAL WARNINGS

Improper electrical connections could overheat, causing fire and/or electrical shock.

5. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
6. All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not properly closed, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.
7. Disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

FLAMMABLE REFRIGERANT WARNINGS

1. The installation of pipe-work should be kept to a minimum and should be protected from physical damage.
2. Refrigerant pipes should comply with national gas regulations.
3. All mechanical connections and ventilation openings should be kept clear of obstruction.
4. Utilize proper disposal processes based on national regulations.
5. Any person 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.
6. 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.
7. Do not use any means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
8. The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).
9. Do not allow foreign matter (oil, water, etc.) to enter the piping, and securely seal the opening by pinching, taping, etc.
10. Do not pierce or burn.
11. Refrigerants may not contain an odor.
12. Working procedures that affect safety should only be carried out by competent persons.
13. The unit should be stored in a well-ventilated area where the room size corresponds to the room area as specific for operation, and should be stored so as to prevent potential mechanical damage from occurring.
14. Joints should be tested with detection equipment with a capability of 5 g/year of refrigerant or better, with the equipment in standstill and under operation or under a pressure of at least these standstill or operation conditions after installation. Detachable joints should NOT be used in the indoor side of the unit (brazed, welded joint could be used).
15. A leak detection system is installed. The unit must be powered except for service. For units with a refrigerant sensor, the indoor unit will display an error code and emit a buzzing sound, the compressor of the outdoor unit will immediately stop, and the indoor fan will start running. The service life of the refrigerant sensor is 15 years. When the refrigerant sensor malfunctions, the indoor unit will display the error code "FHCC". The refrigerant sensor cannot be repaired and can only be replaced by the manufacturer. It should only be replaced with the sensor specified by the manufacturer.
16. When a flammable refrigerant is used, the requirements for installation space of the appliance and/or ventilation requirements are determined according to:
    - The mass charge amount (M) used in the unit.
    - The installation location.
    - The type of ventilation of the location of the unit.
    - Piping material, pipe routing, and installation must include protection from physical damage in operation and service. This must be in compliance with local codes and standards, such as ASHRAE 15, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints must be accessible for inspection prior to being covered or enclosed.
    - Protection devices, piping and fittings must be protected as much as possible against adverse environmental effects. For example, against the danger of water collecting and freezing in relief pipes or against accumulation of dirt or debris.

FLAMMABLE REFRIGERANT WARNINGS

- Piping in refrigeration systems must be designed and installed to minimize the likelihood of hydraulic shock, resulting in damage from the system.
- Steel pipes and components must be protected against corrosion with a rust-proof coating before applying insulation.
- Precautions must be taken against excessive vibration or movement of the unit.
- The minimum floor area of the room must be mentioned in the form of a table or a single figure without reference to a formula.

17. After completion of field piping for split systems, the field pipework should be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements:
    - The minimum test pressure for the low side of the system should be the low side design pressure and the minimum test pressure for the high side of the system should be the high side design pressure, unless the high side of the system cannot be isolated from the low side of the system in which case the entire system should not be pressure tested to the low side design pressure.
    - The test pressure after removal of pressure source shall be maintained for at least 1 hour with no decrease of pressure indicated by the test gauge, with test gauge resolution not exceeding 5% of the test pressure.
18. Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repairs to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.
19. Work should be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
20. All maintenance staff and others working in the local area should be instructed on the nature of work being carried out. Avoid work in confined spaces.
21. The area should be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. no sparking, adequately sealed, or intrinsically safe.
22. If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment should be on site and readily available. Have a dry power or CO2 fire extinguisher adjacent to the charging area.
23. No person carrying out work in relation to a refrigerating system which involves exposing any pipe work should use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing, and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs should be displayed.
24. 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.
23. 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 ad service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance. The following checks should 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 should be checked for the presence of refrigerant;
    - marking to the equipment continues to be visible and legible, marking and signs that are illegible should be corrected;
    - refrigerant pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to or protected against corrosion.

FLAMMABLE REFRIGERANT WARNINGS

24. Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution should be used.
25. Initial safety checks should include:
    - that capacitors are discharged: this should be done in a safe manner to avoid the possibility of sparking;
    - that there are no live electrical components and wiring are exposed while charging, recovering, or purging the system;
    - that there is continuity of earth bonding.
26. Sealed electrical components should be replaced if damaged.
27. Intrinsically safe components should be replaced if damaged.
28. Check that wiring 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.
29. Under no circumstances should 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) should 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 should be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% minimum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine may react with the refrigerant and corrode the copper work. Examples of leak detection fluids are the bubble method, fluorescent method agents, etc. If a leak is suspected, all naked flames should be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant should be recovered from the system, or isolated (by means of shut-off valves) in a part of the system remote from the leak. See the following instructions of removal of refrigerant.
30. When breaking into the refrigerant circuit to make repairs, or for any other purpose, conventional procedures should be used. However, for flammable refrigerants, it is even more vital to follow best practice. The following procedure should be adhered to:
    - safely remove refrigerant following local and national regulations;
    - evacuate;
    - purge the circuit with inert gas;
    - evacuate;
    - continuously flush or purge with inert gas when using flame to open circuit;
    - open the circuit
31. The refrigerant charge should be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For units containing flammable refrigerants, the system should 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 should be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process should be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system should be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump should not be close to any potential ignition sources, and ventilation should be available.
32. In addition to conventional charging procedures, the following requirements should be followed:
    - Work should 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.

FLAMMABLE REFRIGERANT WARNINGS

- Ensure that the refrigeration system is grounded prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care should be taken not to overfill the refrigeration system.
- Prior to recharging the system, it should be pressure tested with oxygen-free nitrogen (OFN). The system should be leak-tested on completion of charging but prior to commissioning. A follow-up leak test shall be carried out prior to leaving the site.

33. Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is good recommended practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample should be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.
    a. Become familiar with the equipment and its operation.
    b. Isolate the 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

    Pump down refrigerant system, if possible.
    e. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
    f. Make sure that the cylinder is situated on the scales before recovery takes place.
    g. Start the recovery machine and operate in accordance with 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 equipment are removed from the site promptly and all isolation valves on the equipment are closed off.
    k. Recovered refrigerant should not be charged into another refrigeration system unless it has been cleaned and checked.
34. Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label should be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.
35. When removing refrigerant from a system, either for servicing or decommissioning, it is good recommended 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 should be 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 valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs. The recovery equipment should be in good working order with a set of instructions concerning the equipment that is at hand and should 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 should be available and in good working order. Hoses should be complete with leak-free disconnect couplings and in good condition. The recovered refrigerant should 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 and especially not in cylinders.
36. 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 should not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it should be carried out safely.
37. An unventilated area where the appliance using flammable refrigerants is installed should be constructed so that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard. If appliances connected via an air duct system to one or more rooms below the ventilation requirements,

FLAMMABLE REFRIGERANT WARNINGS

that room should never contain potential ignition sources. A flame-producing device may be installed in the space if the device is provided with an effective flame arrest. Auxiliary devices which may be a potential ignition source should not be installed in the duct work. Examples of such are hot surfaces with a temperature exceeding 1292°F (700°C) and electric switching devices. Only auxiliary devices (such as a certified heater kit) approved by the manufacturer or declared suitable with the refrigerant should be installed in connecting ductwork. False or drop ceilings may be used as a return air plenum if a refrigerant detection system is provided in the appliance and any external connections are also provided with a sensor immediately below the return air plenum duct joint. Refrigerant sensors for refrigerant detection systems should only be replaced with sensors specified by the manufacturer. A leak detection system is installed. The unit must be powered except for service.

38. Transport of equipment containing flammable refrigerants should comply with transportation regulations.
39. Marking of equipment using signs should comply with local regulations.
40. Disposal of equipment using flammable refrigerants should comply with national regulations.
41. Storage of equipment/appliances should be in accordance with the manufacturer's instructions.
42. Storage of packed (unsold) equipment should be constructed so 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.
43. 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 minutes. The vacuum pressure level should be specified in the manual, and should be the lessor of 500 microns of 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 should be tightness-tested according to the following requirements: the test method should 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 should be detected.
    - Any servicing should be performed only as recommended by MRCOOL®.
43. Any maintenance, service, or repair operations must be performed by qualified personnel. Every working procedure that affects safety should only be carried out by competent persons that are both trained and certified. The training of these procedures should be 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 should follow the ANNEX HH requirements of UL 60334-2-40 4th Edition.

    Examples of such working procedures are:
    - breaking into a refrigerant circuit
    - opening of sealed components
    - opening of ventilated enclosures

Symbols Displayed on Indoor & Outdoor Unit		
	**WARNING**	This symbol shows that this appliance uses a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	**CAUTION**	This symbol shows that the operation manual should be read carefully.
	**CAUTION**	This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.
	**CAUTION**	
	**CAUTION**	This symbol shows that information is available such as the operating manual or installation manual.

2 SPECIFICATIONS

2.1 Model Reference

Outdoor Unit Model	Capacity (Btu/h)	Power Supply
MULTI3-18HP230C-O	18K	208/230B~, 60Hz, 1Phase
MULTI4-27HP230C-O	27K	
MULTI5-36HP230C-O	36K	
MULTI6-48HP230C-O	48K	

2.2 Pipe Length & Drop Height

Be sure that the length of the refrigerant pipe and the drop height between the indoor and outdoor units meet the requirements shown in the following table.

	1 drive 2	1 drive 3	1 drive 4	1 drive 5	1 drive 6
Max. length for all rooms (ft/m)	131/40	197/60	262/80	262/80	262/80
Max. length for one IU (ft/m)	82/25	98/30	115/35	115/35	115/35
Max. Height difference between IU and OU (ft/m)	49/15	49/15	49/15	49/15	49/15
Max. Height difference between IUs (ft/m)	33/10	33/10	33/10	33/10	33/10

! CAUTION

- The refrigerant pipe diameter is different according to the indoor unit to be connected. When using the extension pipe, refer to the tables below.
- When the refrigerant pipe diameter is different from that of the outdoor units union, additional transfer connectors need to be used on the outdoor unit.

Indoor Unit		
Model	Pipe Diameter (inch(mm))	
9K, 12K	Liquid	Φ1/4(Φ6.35
	Gas	Φ3/8(Φ9.52)
18K	Liquid	Φ1/4(Φ6.35)
	Gas	Φ1/2(Φ12.7)
24K	Liquid	Φ3/8(Φ9.52)
	Gas	Φ5/8(Φ16)

Outdoor Unit				
Model	Pipe Diameter (inch(mm))		Adapter (inch(mm))	Qty
MULTI3-18HP230C-O	Liquid	Φ1/4(Φ6.35)*3	Φ3/8(Φ9.52)-->Φ1/2(Φ12.7)	2
	Gas	Φ3/8(Φ9.52)*3		
MULTI4-27HP230C-O	Liquid	Φ1/4(6.35)*4	Φ3/8(Φ9.52)-->Φ1/2(Φ12.7)	3
	Gas	Φ3/8(Φ9.52)*3	Φ1/2(Φ12.7)-->Φ3/8(Φ9.52)	1
		Φ1/2(Φ12.7)*1		
MULTI5-36HP230C-O	Liquid	Φ1/4(6.35)*5	Φ1/4(Φ6.35)-->Φ3/8(Φ9.52)	1
	Gas	Φ3/8(Φ9.52)*4	Φ1/2(Φ12.7)-->Φ5/8(Φ16)	1
		Φ1/2(Φ12.7)*1	Φ3/8(Φ9.52)-->Φ1/2(Φ12.7)	3
			Φ1/2(Φ12.7)-->Φ3/8(Φ9.52)	1
MULTI6-48HP230C-O	Liquid	Φ1/4(Φ6.35)*6	Φ1/4(Φ6.35)-->Φ3/8(Φ9.52)	2
	Gas	Φ3/8(Φ9.52)*4	Φ1/2(Φ12.7)-->Φ5/8(Φ16)	2
		Φ1/2(Φ12.7)*2	Φ3/8(Φ9.52)-->Φ1/2(Φ12.7)	2
			Φ1/2(Φ12.7)-->Φ3/8(Φ9.52)	2

2.3 Indoor Unit Combination

Indoor unit combination for the MULTI3-18HP230C-O

Available Indoor	One Unit	Two Units
Wall mounted(AG/EP): 9K/12K/18K; Cassette/Duct/Console: 9K/12K/18K	12	9+9
	18	9+12
		12+12

Indoor unit combination for the MULTI4-27HP230C-O

Available Indoor	One Unit	Two Units	Three Units	Four Units
Wall mounted(AG/EP): 9K/12K/18K/24K; Cassette/Duct/Console: 9K/12K/18K/24K;	18	9+9	9+9+9	9+9+9+9
	24	9+12	9+9+12	
		9+18	9+9+18	
		9+24	9+12+12	
		12+12	12+12+12	
		12+18		
		12+24		
		18+18		

Indoor unit combination for the MULTI5-36HP230C-O

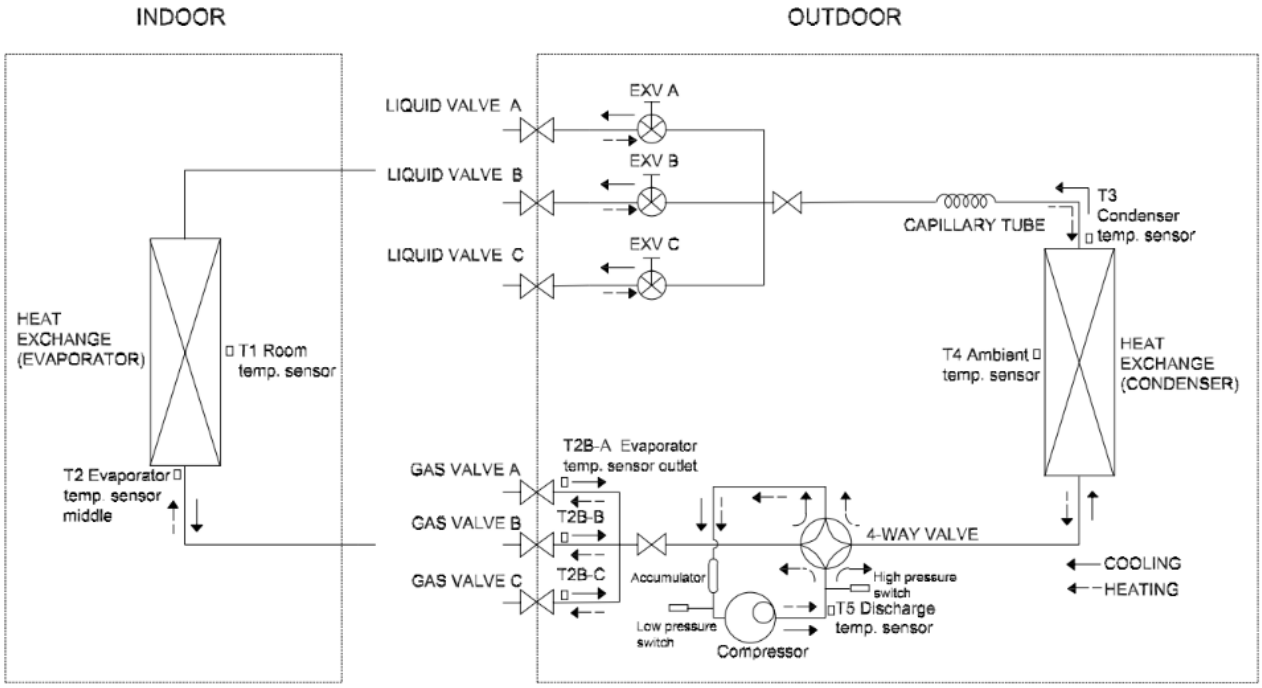
Available Indoor	One Unit	Two Units	Three Units	Four Units	Five Units
Wall mounted(AG/EP): 9K/12K/18K/24K; Cassette/Duct/Console: 9K/12K/18K/24K;	24	9+9	9+9+9	9+9+9+9	9+9+9+9+9
		9+12	9+9+12	9+9+9+12	9+9+9+9+12
		9+18	9+9+18	9+9+9+18	
		9+24	9+9+24	9+9+12+12	
		12+12	9+12+12	9+9+12+18	
		12+18	9+12+18	9+12+12+12	
		12+24	9+12+24	12+12+12+12	
		18+18	9+18+18		
			12+12+12		
			12+12+18		
			12+12+24		
			12+18+18		

Indoor unit combination for the MULTI6-48HP230C-O & MULTI6-55HP230D-O

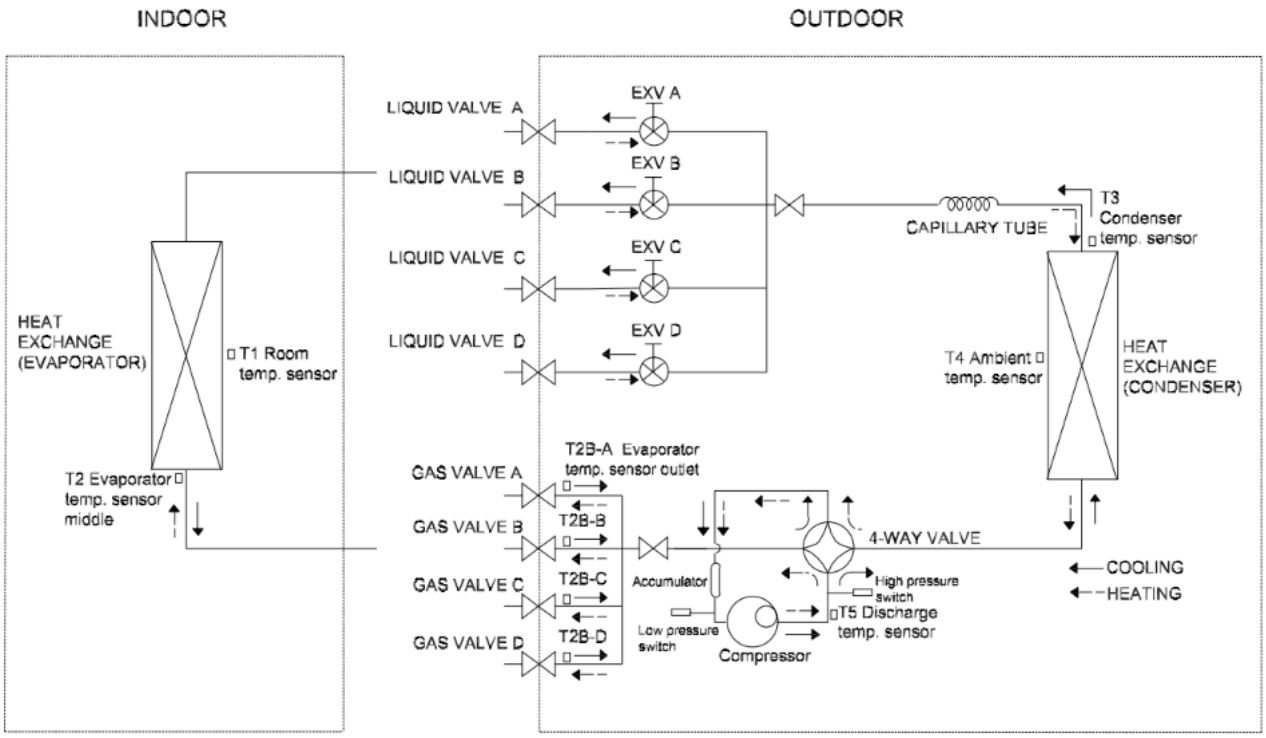
Available Indoor	One Unit	Two Units	Three Units	Four Units	Five Units	Six Units
Wall mounted(AG/EP): 9K/12K/18K/24K/36K; Cassette/Duct/Console: 9K/12K/18K/24K;	36	9+18	9+9+9	9+9+9+9	9+9+9+9+9	9+9+9+9+9+9
		9+24	9+18+24	9+9+9+12	9+9+9+9+12	9+9+9+9+9+12
		9+36	9+18+36	9+9+9+18	9+9+9+9+18	9+9+9+9+9+18
		12+12	12+12+12	9+9+9+24	9+9+9+9+24	9+9+9+9+12+12
		12+18	12+12+18	9+9+12+12	9+9+9+12+12	9+9+9+12+12+12
		12+24	12+12+24	9+9+12+18	9+9+9+12+18	
		12+30	12+12+36	9+9+12+24	9+9+9+12+24	
		12+36	12+18+18	9+9+18+18	9+9+9+18+18	
		18+18	12+18+24	9+9+18+24	9+9+12+12+12	
		18+24	18+18+18	9+12+12+12	9+9+12+12+18	
		18+30		9+12+12+18	9+12+12+12+12	
		18+36		9+12+12+24	9+12+12+12+18	
		24+24		9+12+18+18	12+12+12+12+12	
		24+36		9+12+18+24		
				9+18+18+18		
				12+12+12+12		
				12+12+12+18		
				12+12+12+24		
				12+12+18+18		

2.4 Refrigeration Cycle Diagrams

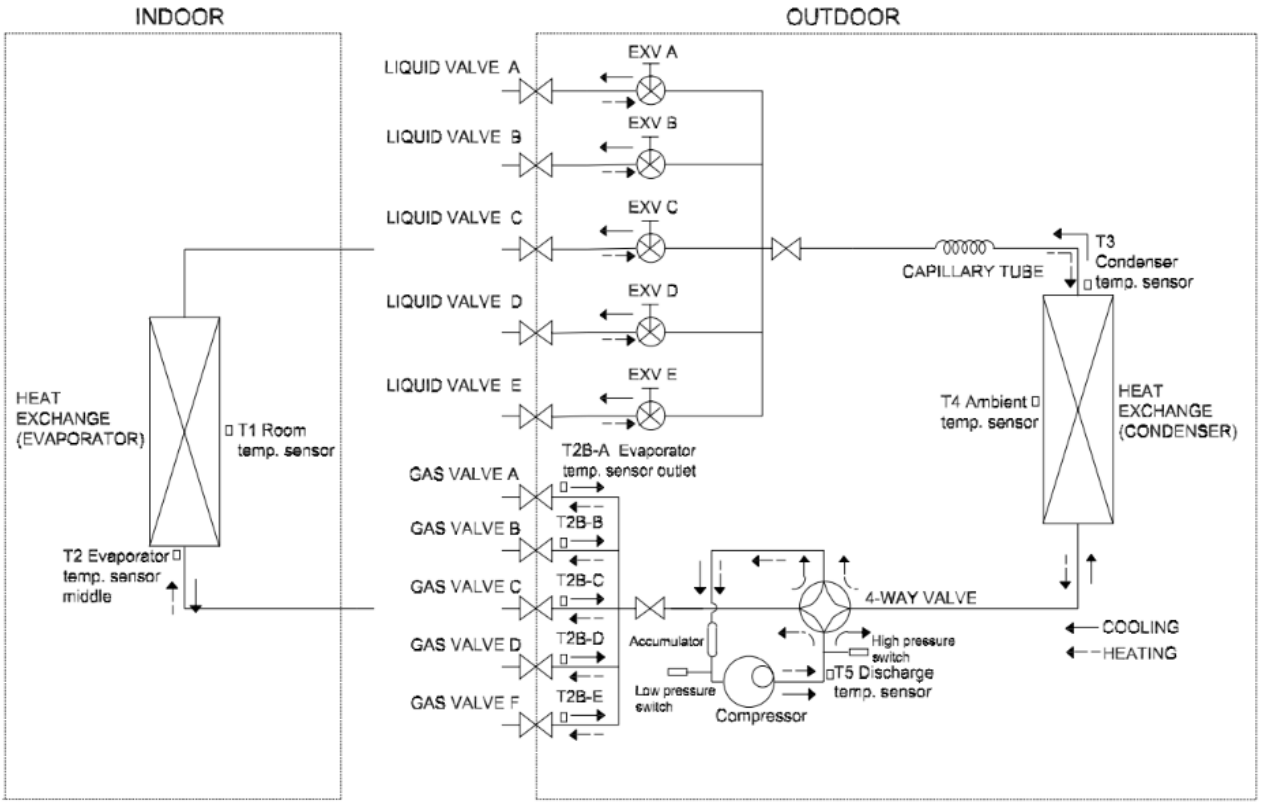
Refrigeration Cycle Diagram of the MULTI3-18HP230C-O



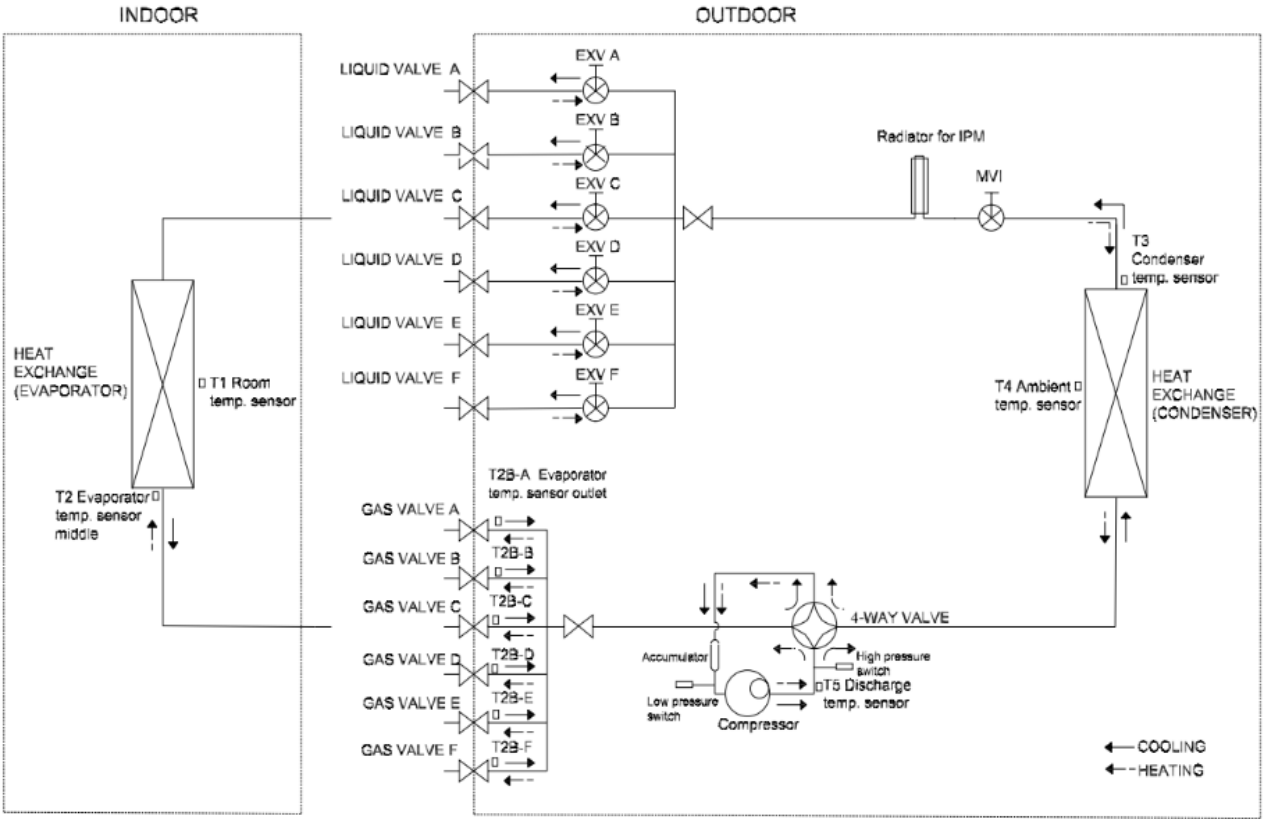
Refrigeration Cycle Diagram of the MULTI4-27HP230C-O



Refrigeration Cycle Diagram of the MULTI5-36HP230C-O



Refrigeration Cycle Diagram of the MULTI6-48HP230C-O & MULTI6-55HP230C-O



2.5 Electrical Wiring Diagrams

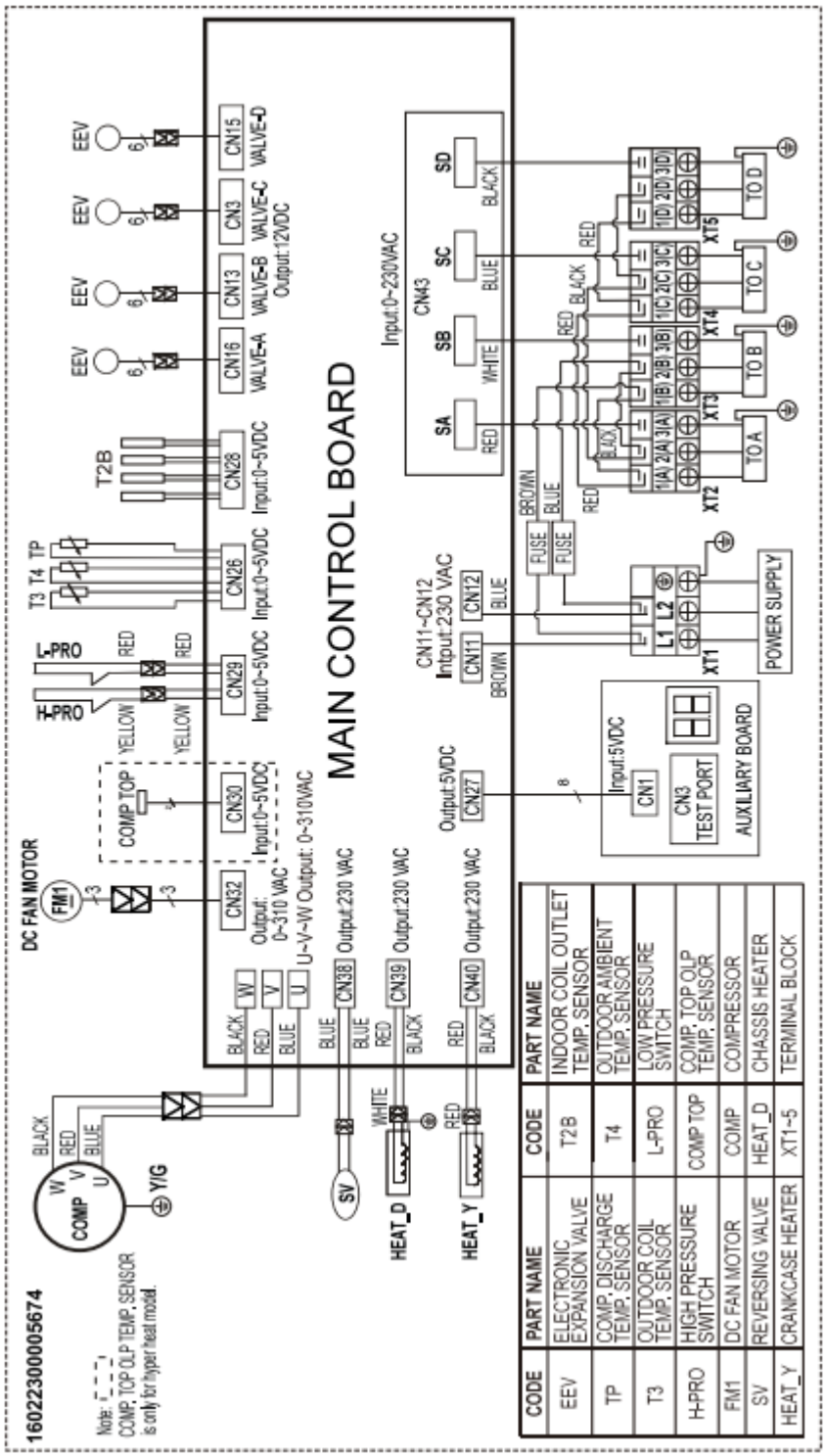
Outdoor Unit Wiring Diagram

Outdoor Unit	
ODU Model	ODU Wiring Diagram
MULTI3-18HP230C-O	16022000040630
MULTI4-27HP230C-O	16022300005674
MULTI5-36HP230C-O	16022300005893
MULTI6-48HP230C-O	16022000040750

Outdoor Unit Printed Circuit Board Diagram

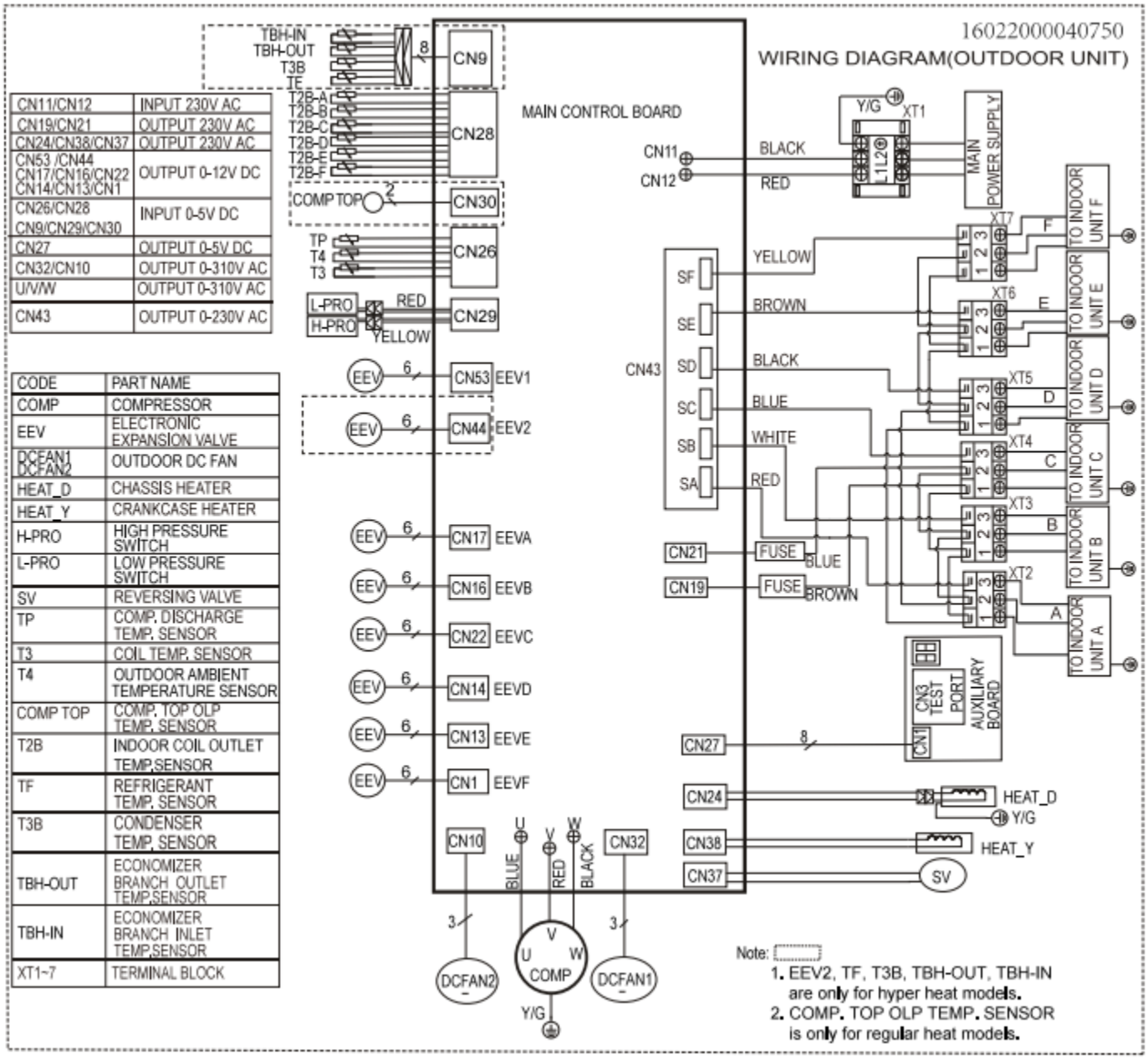
Outdoor Unit	
ODU Model	ODU Wiring Diagram
MULTI3-18HP230C-O	17122000062845
MULTI4-27HP230C-O	
MULTI5-36HP230C-O	17122300008875
MULTI6-48HP230C-O	17122300007152

Outdoor Unit Wiring Diagram: 16022300005674



CODE	PART NAME	CODE	PART NAME
EEV	ELECTRONIC EXPANSION VALVE	T2B	INDOOR COIL OUTLET TEMP. SENSOR
TP	COMP. DISCHARGE TEMP. SENSOR	T4	OUTDOOR AMBIENT TEMP. SENSOR
T3	OUTDOOR COIL TEMP. SENSOR	L-PRO	LOW PRESSURE SWITCH
H-PRO	HIGH PRESSURE SWITCH	COMP TOP	COMP. TOP OLP TEMP. SENSOR
FM1	DC FAN MOTOR	COMP	COMPRESSOR
SV	REVERSING VALVE	HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER	XT1~5	TERMINAL BLOCK

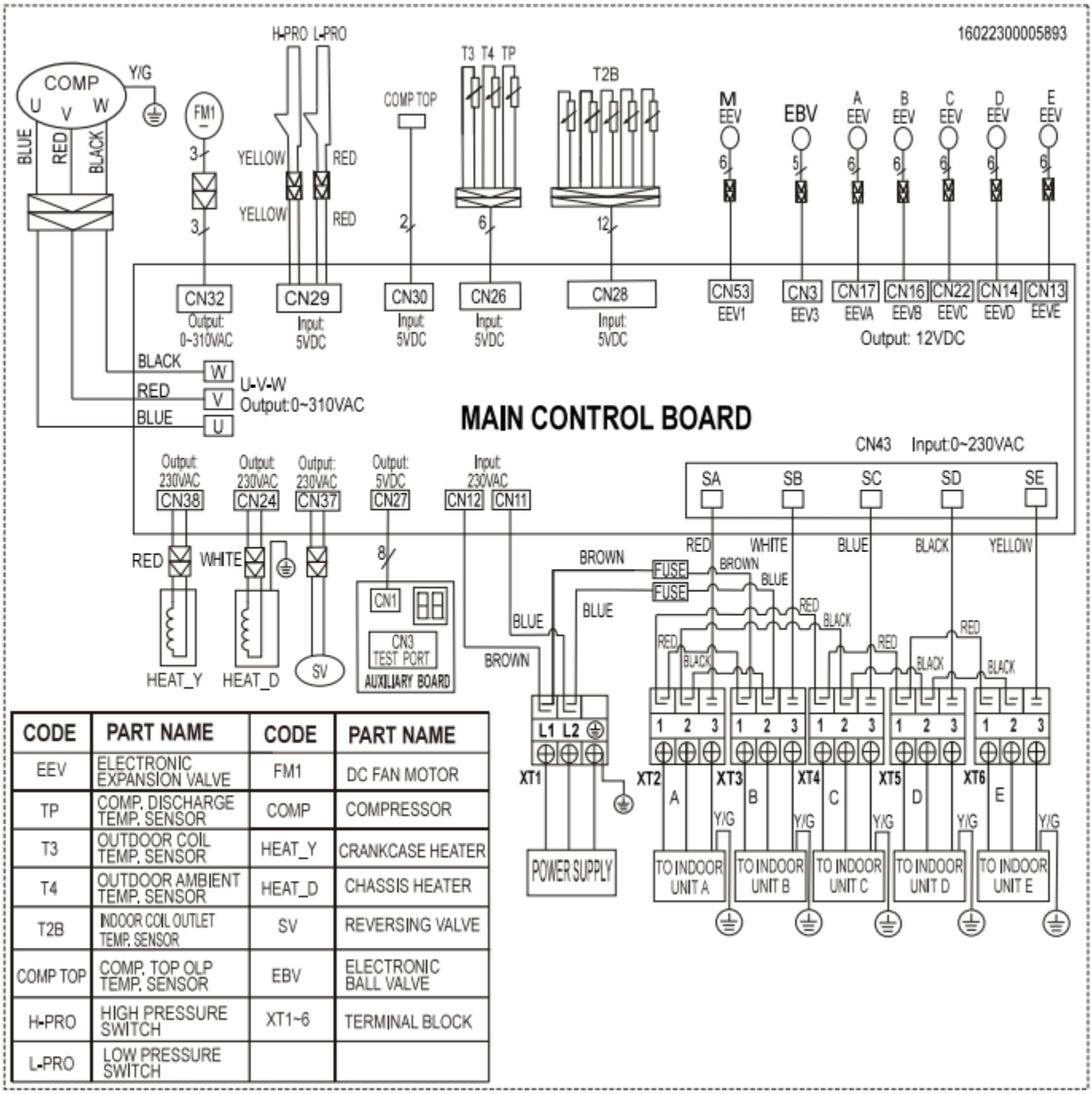
Outdoor Unit Wiring Diagram: 16022000040750



CN11/CN12	INPUT 230V AC
CN19/CN21	OUTPUT 230V AC
CN24/CN38/CN37	OUTPUT 230V AC
CN53 /CN44 CN17/CN16/CN22 CN14/CN13/CN1	OUTPUT 0-12V DC
CN26/CN28 CN9/CN29/CN30	INPUT 0-5V DC
CN27	OUTPUT 0-5V DC
CN32/CN10	OUTPUT 0-310V AC
U/V/W	OUTPUT 0-310V AC
CN43	OUTPUT 0-230V AC

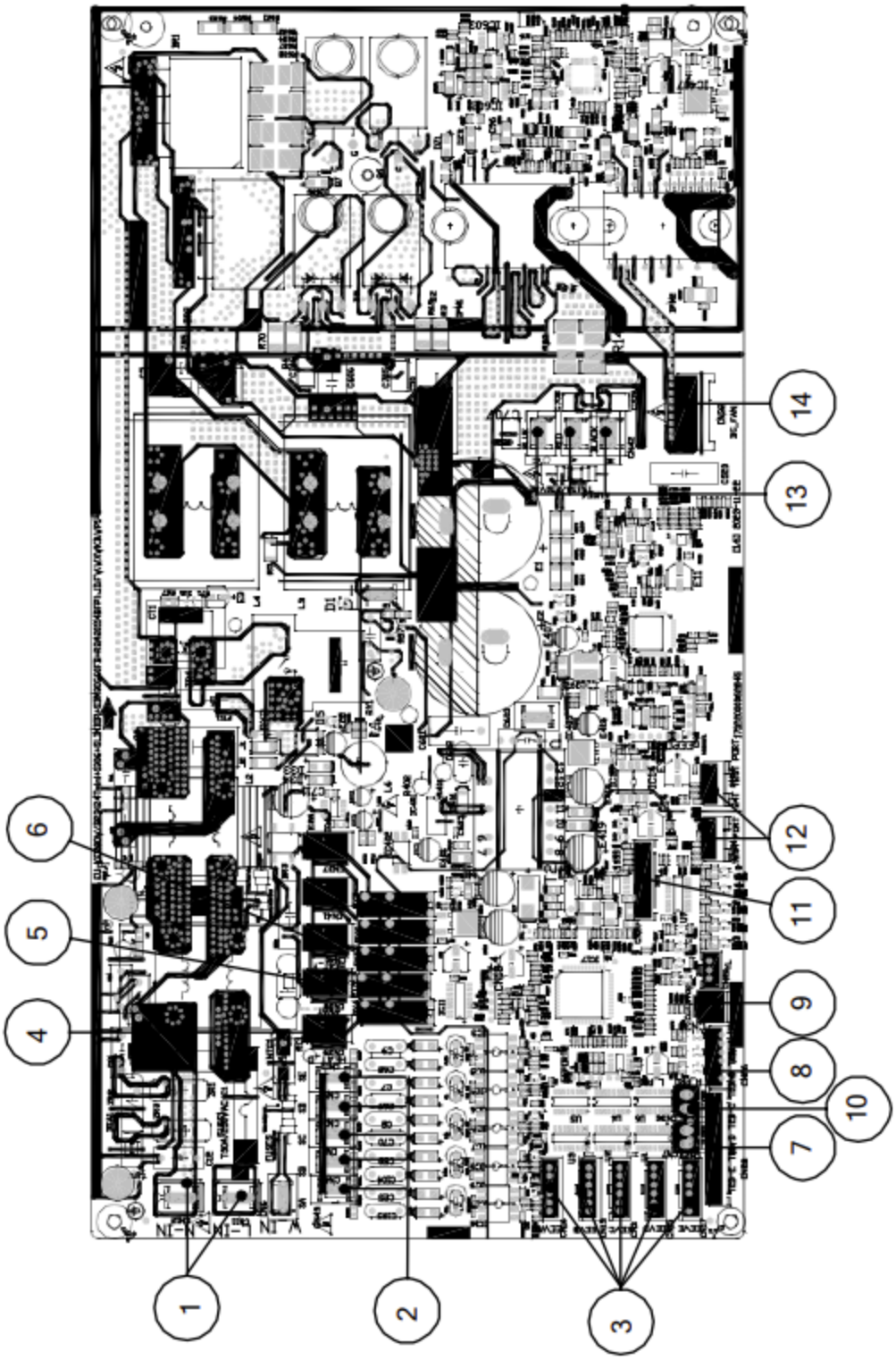
CODE	PART NAME
COMP	COMPRESSOR
EEV	ELECTRONIC EXPANSION VALVE
DCFAN1 DCFAN2	OUTDOOR DC FAN
HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSING VALVE
TP	COMP. DISCHARGE TEMP. SENSOR
T3	COIL TEMP. SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
COMP TOP	COMP. TOP OLP TEMP. SENSOR
T2B	INDOOR COIL OUTLET TEMP.SENSOR
TF	REFRIGERANT TEMP. SENSOR
T3B	CONDENSER TEMP. SENSOR
TBH-OUT	ECONOMIZER BRANCH OUTLET TEMP.SENSOR
TBH-IN	ECONOMIZER BRANCH INLET TEMP.SENSOR
XT1~7	TERMINAL BLOCK

Outdoor Unit Wiring Diagram: 16022300005893



CODE	PART NAME	CODE	PART NAME
EEV	ELECTRONIC EXPANSION VALVE	FM1	DC FAN MOTOR
TP	COMP. DISCHARGE TEMP. SENSOR	COMP	COMPRESSOR
T3	OUTDOOR COIL TEMP. SENSOR	HEAT_Y	CRANKCASE HEATER
T4	OUTDOOR AMBIENT TEMP. SENSOR	HEAT_D	CHASSIS HEATER
T2B	INDOOR COIL OUTLET TEMP. SENSOR	SV	REVERSING VALVE
COMP TOP	COMP. TOP OLP TEMP. SENSOR	EBV	ELECTRONIC BALL VALVE
H-PRO	HIGH PRESSURE SWITCH	XT1~6	TERMINAL BLOCK
L-PRO	LOW PRESSURE SWITCH		

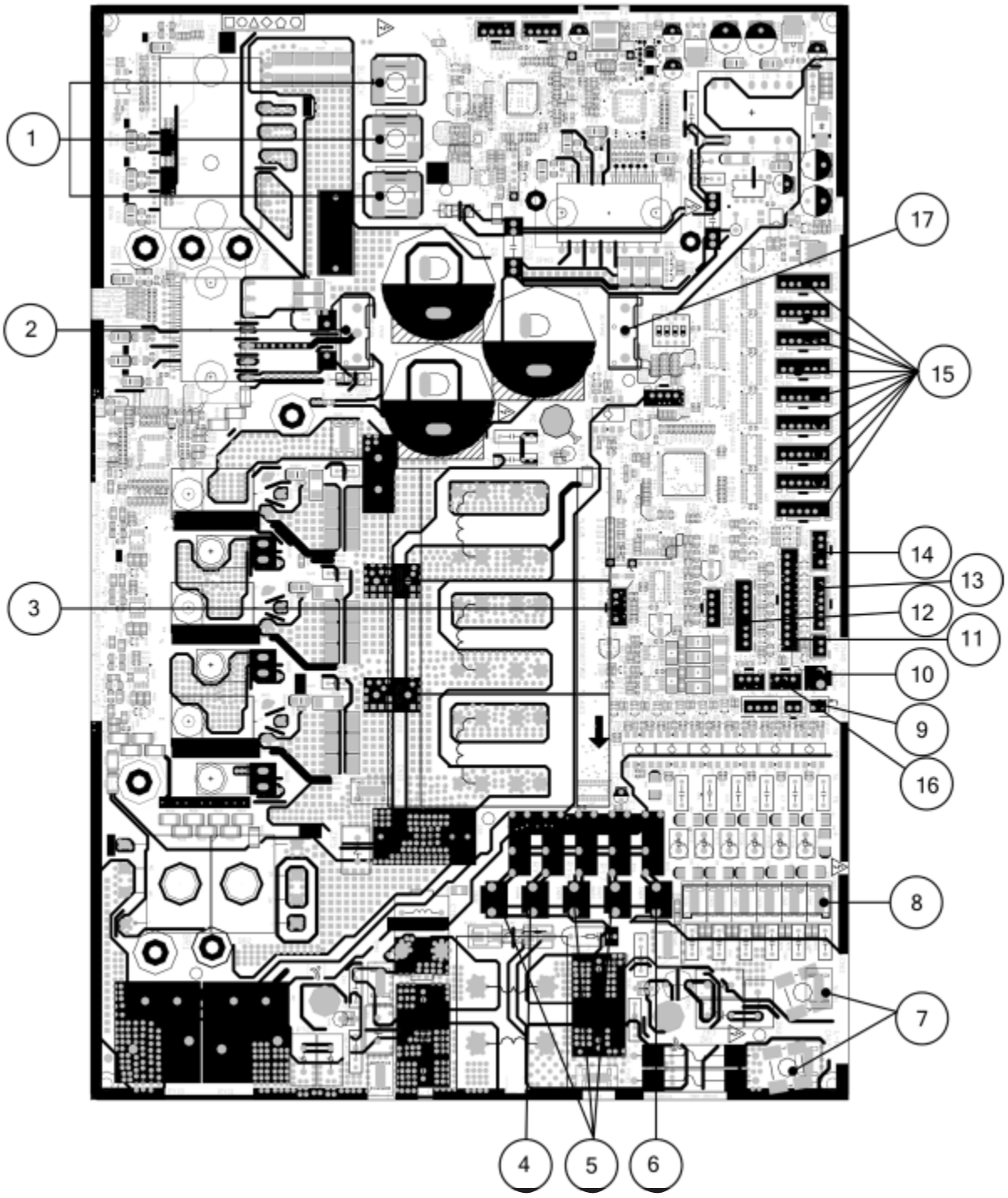
Outdoor Unit Wiring Diagram: 17122000062845



No.	Name	NC#	Meaning
1	Power Supply	CN11	L_in: connects to N-line (208-230VAC input)
		CN12	N_in: Connects to L-line (208-230VAC input)
2	S-A	CN4	S: Connects to indoor unit communication (pin1-pin2: 24VDC Pulse wave; pin2-pin3: 208-240VAC input)
	S-B	CN2	
	S-C	CN34	
	S-D	CN5	
	S-E	CN10	
3	EEV-A	CN10	Connects to electric expansion valve
	EEV-B	CN13	
	EEV-C	CN3	
	EEV-D	CN15	
	EEV-E	CN17	
4	HEAT_D	CN39	Connects to chassis heater, 208-240VAC when ON
5	4-WAY	CN38	Connects to 4 way valve, 208-240VAC when ON
6	HEAY_Y	CN40	Connects to compressor heater, 208-240VAC when ON
7	T2B	CN28	Connects to evaporator coil outlet temperature sensor T2B
8	T3 T4 TP	CN26	Connects to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP
9	OLP TEMP. SENSOR	CN30	Connects to compressor top temp. sensor (5VDC Pulse wave)
10	H-PRO, L-PRO	CN29	Connects to high and low pressure switch (pin1-pin2 & pin3-pin4: 5VDC pulse wave)
11	/	CN27	Connects to key board CN1
12	TESTPORT	CN24/CN14	Used for testing
13	Compressor	U	Connects to compressor: 0VAC (standby), 10-200VAC (running)
		V	
		W	
14	DC-FAN	CN32	Connects to DC fan

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

Outdoor Unit Wiring Diagram: 17122300007152



No.	Name	NC#	Meaning
1	COMPRESSOR	U	Connects to compressor (Output: 0~30VAC)
		V	
		W	
2	DC-FAN1	CN32	Connects to DC fan (Output: 0~310VAC)
3	TESTPORT	CN45	Used for testing
4	HEAT_Y	CN38	Connects to compressor heater (Output: 230VAC)
5	4-WAY	CN37	Connects to 4 way valve 1 (Output: 230VAC)
		CN25	Connects to 4 way valve 2 (Output: 230VAC)
		CN42	Connects to 4 way valve 3 (Output: 230VAC)
6	HEAT_D	CN24	Connects to chassis heater (Output: 230VAC)
7	Power Supply	CN11	N_in: Connects to N-line (230VAC input)
		CN12	L_in: Connects to L-line (230VAC input)
8	S-A	CN43	S: Connects to indoor unit communication (230VAC input)
	S-B		
	S-C		
	S-D		
	S-E		
	S-F		
9	TBH-IN TBH-OUT T3B TF	CN9	Connects 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	Connects to compressor top temp. sensor (Output 0~5VDC)
11	T2B	CN28	Connects to evaporator coil outlet temperature sensor T2B
12	/	CN27	Connects to key board CN1
13	T3 T4 TP	CN26	Connects to condenser coil temp. sensor T3, ambient temp. sensor T4, Exhaust temp. sensor TP (Output: 0~5VDC)
14	H-PRO, L-PRO	CN29	Connects to high and low pressure switch (pin1-pin2 & pin3-pin4:5VDC pulse wave)

No.	Name	NC#	Meaning
15	EEVA	CN17	Connects to electric expansion valve (Output: 0~12VDC)
	EEVB	CN16	
	EEVC	CN22	
	EEVE	CN14	
	EEVD	CN12	
	EEVF	CN1	
	EEV1	CN53	
	EEV2	CN44	
	EEV3	CN3	
16	H_YL	CN49	Connects to high pressure sensor
17	DC-FAN2	CN10	Connects to DC fan (Output: 0~310VAC)

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

Unit Element Abbreviations:

Abbreviation	Element
T1	Indoor room temperature sensor
T2	Middle indoor heat exchanger coil temperature
T2B	Indoor heat exchanger exhaust coil temperature (located on the outdoor unit)
T3	Coil temperature of condenser
T4	Outdoor ambient temperature
T3B	Condenser middle temperature
T5	Refrigerant pipe inlet temperature
T6A	Economizer branch inlet temperature
T6B	Economizer branch outlet temperature
TP	Compressor discharge temperature

NOTE: T3B, T5, T6A & T6B are only for hyper heat models.

Main Protection:

Sensor Redundancy and Automatic Shutoff
- If one temperature sensor (T3, T4, T2B, or TP) malfunctions, the unit ceases operation and displays the corresponding error code.

Automatic Shutoff Based on Fan
- If the outdoor fan speed is operating outside of the normal range, fna lack of phase or fan zero speed failure, the unit ceases operation.

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

Indoor/Outdoor Units Communication Protection
- If the indoor units do not receive the feedback signal from the outdoor units for 2 consecutive minutes or the outdoor units do not receive the feedback signal from any one of the indoor units for 3 consecutive minutes, the unit ceases operation and displays a failure code.

EEPROM Parameter Error
- If the main chip does not receive feedback from EEPROM chip or parameter check error, the unit ceases operation.

Automatic Shutoff Based on Compressor
- If the compressor speed has been out of control, compressor lack of phase or voltage too low failure, the unit ceases operation.

Temperature Protection of Compressor Discharge
- When the discharge temperature of the compressor rises, the running frequency is limited. If the discharge temperature is too high, the compressor stops and then restarts until the discharge temperature is reduced to normal range.

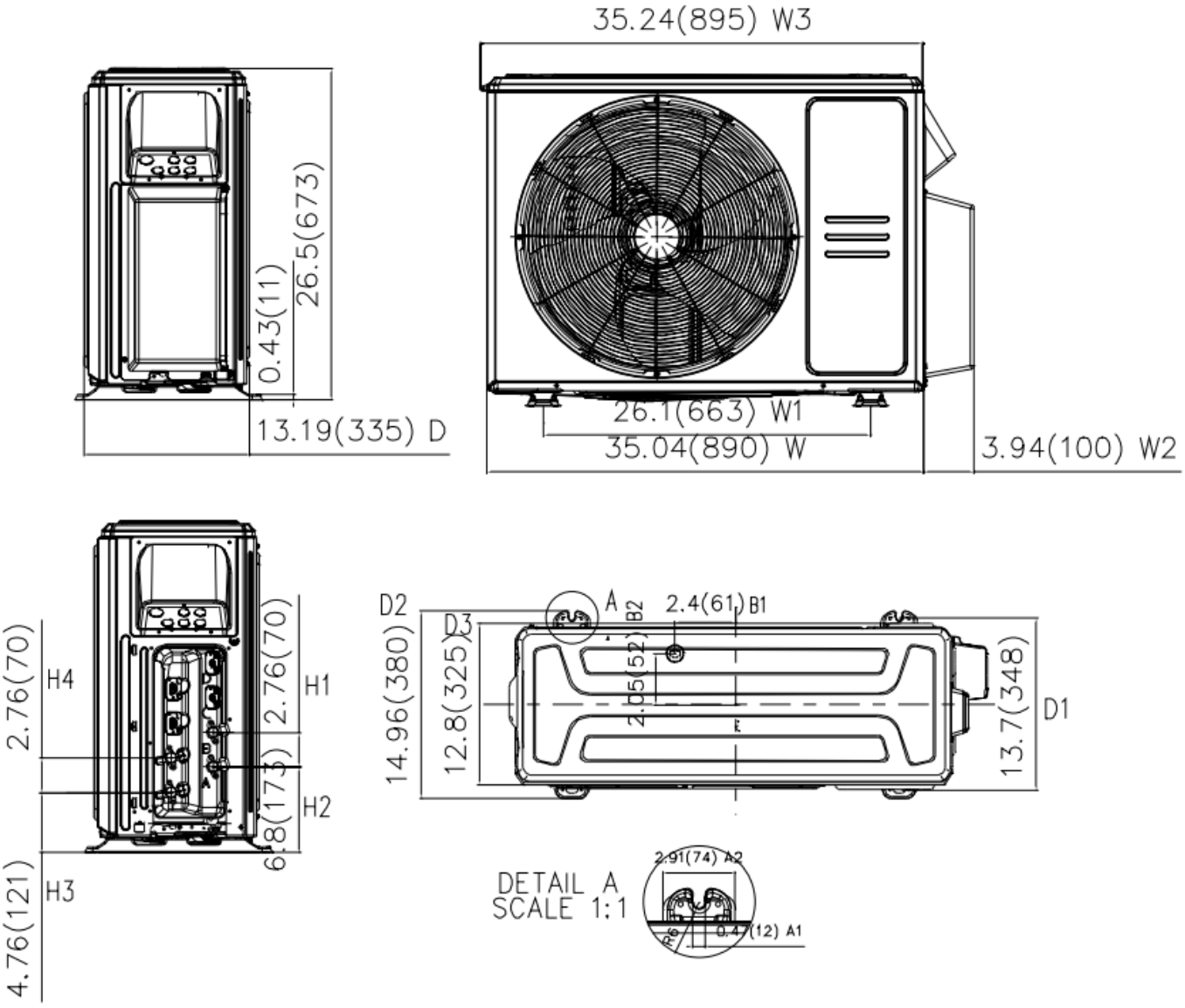
Evaporator Anti-Freezing Protection
- The T2 sent from the indoor unit to the outdoor unit is low, and the unit limits the compressor to run at a low frequency.

Oil Return
1. If the unit runs at low frequency for a long time, the unit will run the oil return program to increase the frequency of the compressor;
2. After the units runs continuously for a period of time, the unit will run the oil return program to increase the compressor frequency.

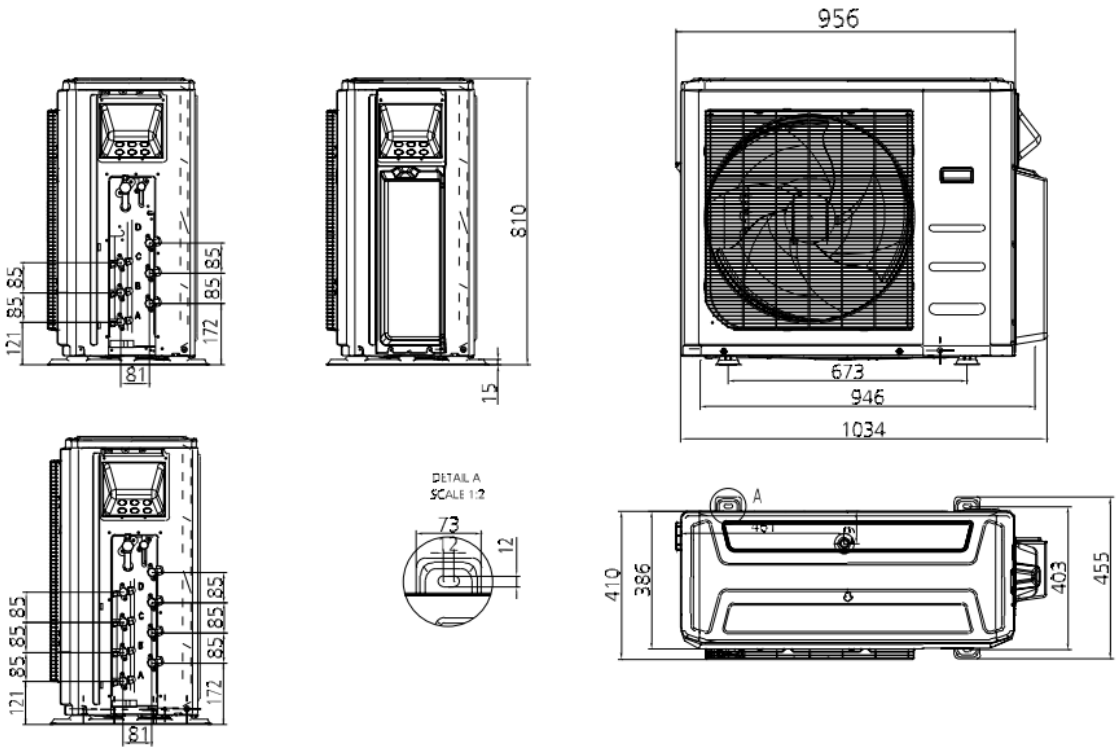
4.1 Dimensions

ODU Model	Panel Plate	PCB Board
MULTI3-18HP230C-O	X430	PCB board 6
MULTI4-27HP230C-O	D30	PCB board 9
MULTI5-36HP230C-O		
MULTI6-48HP230C-O	E30	PCB board 10

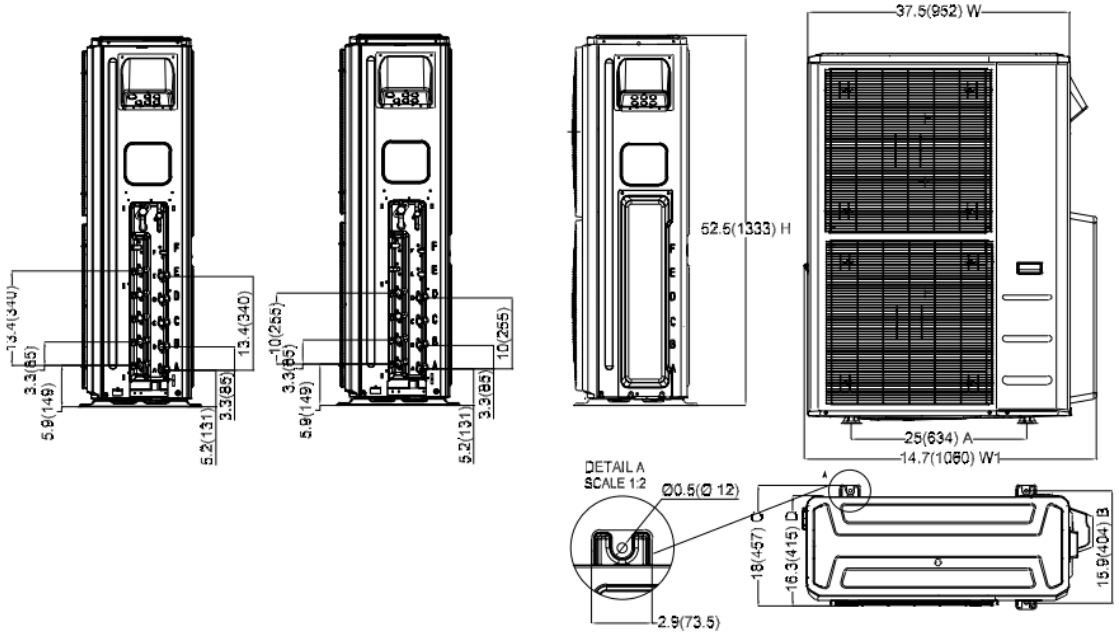
Panel Plate X430 (1 drive 2)



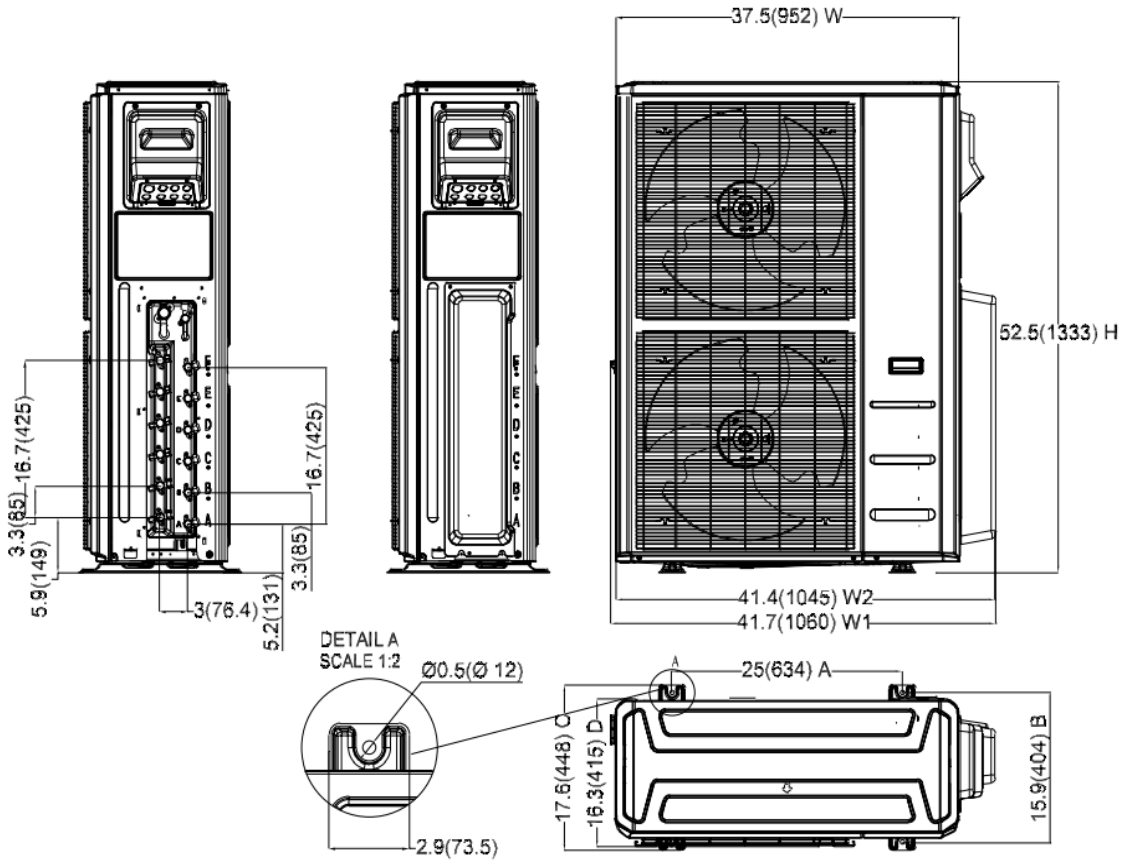
Panel Plate D30 (1 drive 3 & 1 drive 4)



Panel Plate E30 (1 drive 4 & 1 drive 5)

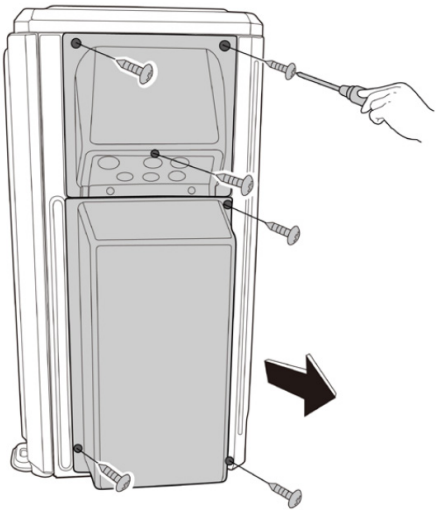
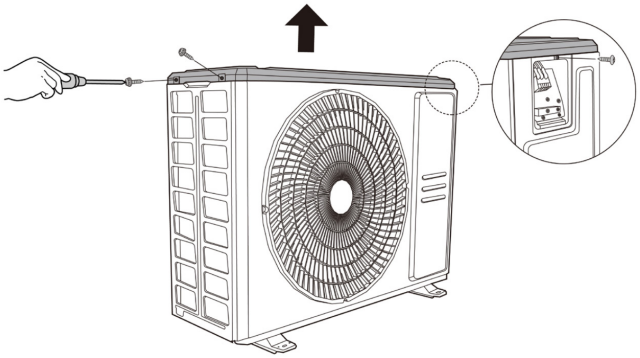


Panel Plate E30 (1 drive 6)

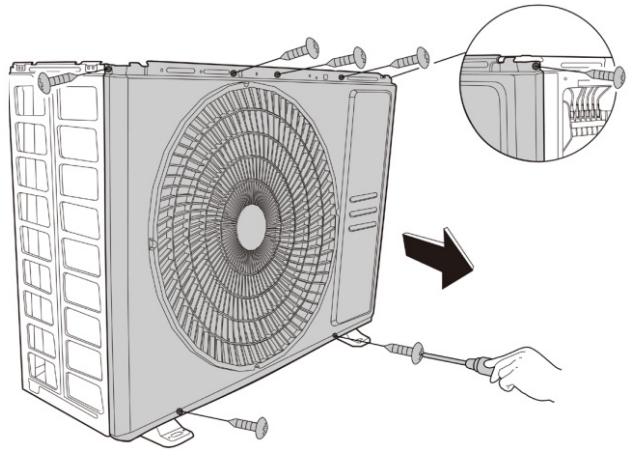
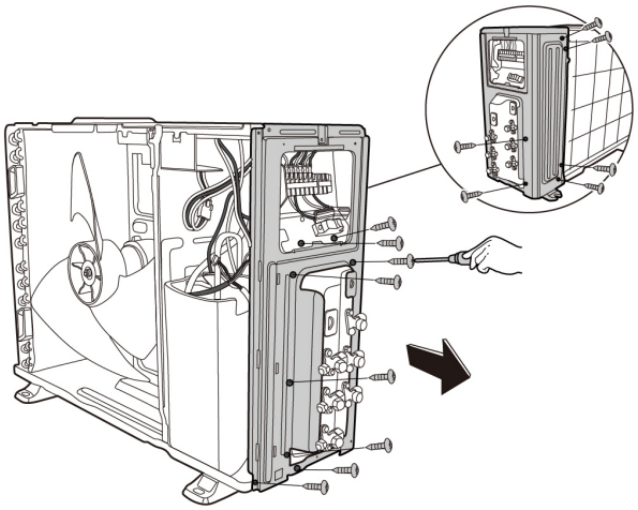


4.2 Outdoor Disassembly

Panel Plate X430

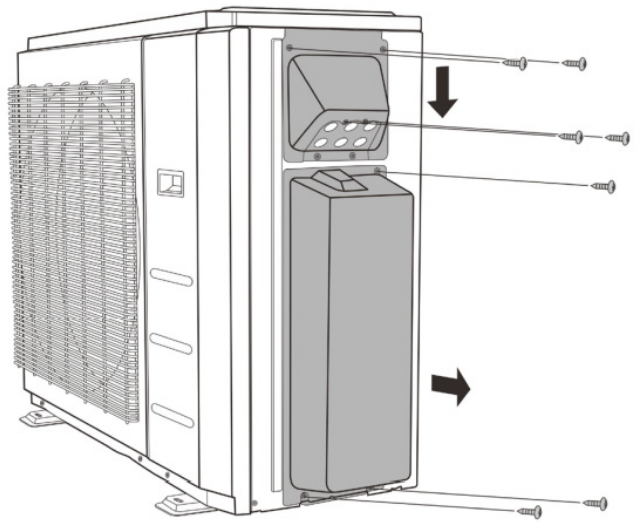
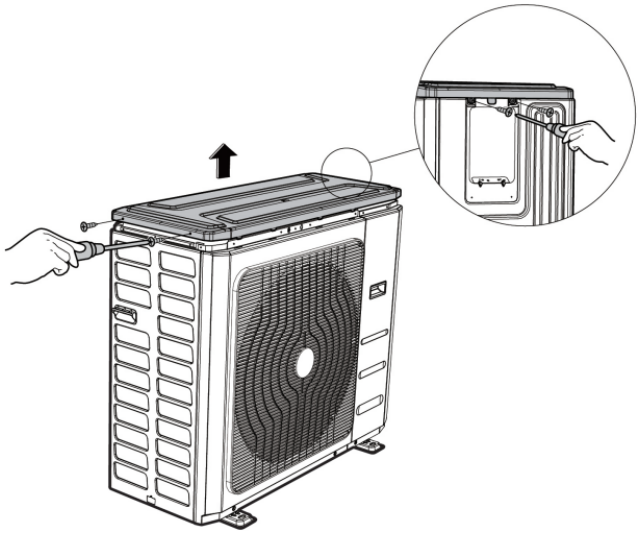
Procedure	Illustration
1. Turn off the air conditioner and the power breaker. 2. Remove the screws of the big handle assembly and water collector then remove them. (6 screws)	
3. Remove the screws of the top cover and then remove the top cover (3 screws). One of the screws is located underneath the big handle.	

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

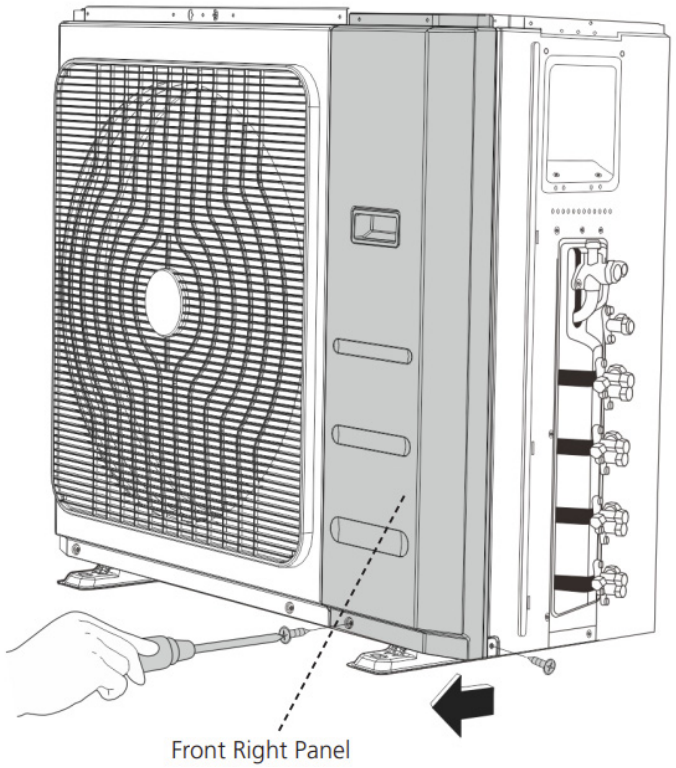
Procedure	Illustration
4. Remove the screws of the front panel and then remove the front panel (7 screws).	
5. Remove the screws of the right panel and then remove the right panel (14 screws, two of them are used to fix the optional rear net).	

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

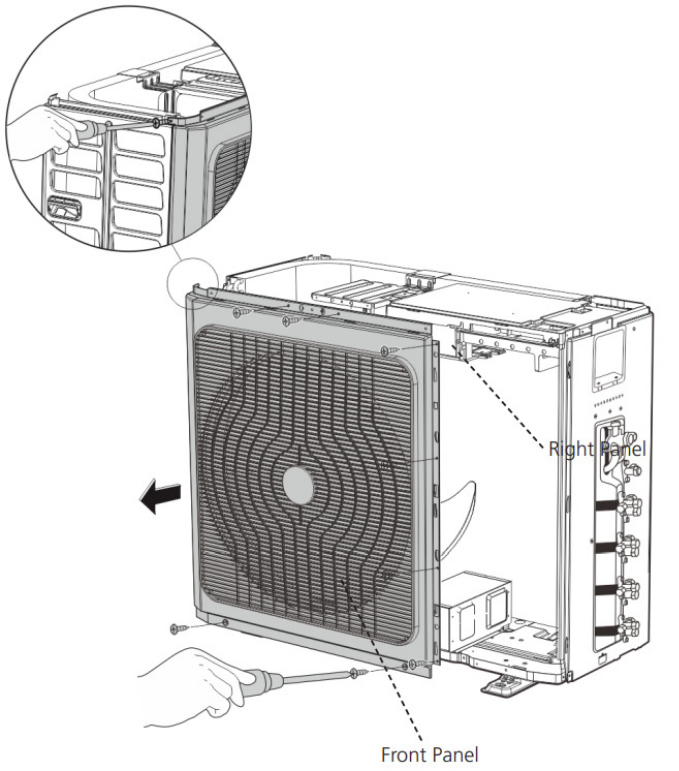
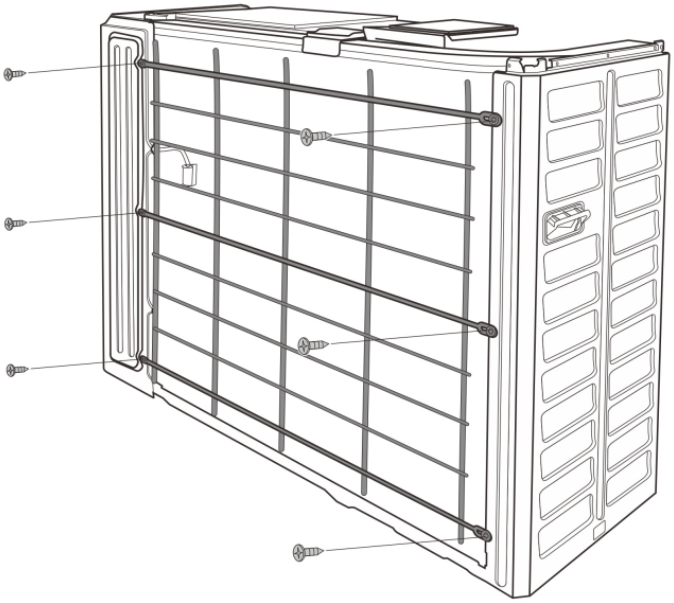
D30

Procedure	Illustration
1. Turn off the air conditioner and the power breaker. 2. Remove four screws and then remove the big handle. 3. Remove three screws and then remove the water collecting cover.	
4. Remove the screws on the top cover and then remove the top cover (4 screws). Two of the screws are located underneath the big handle.	

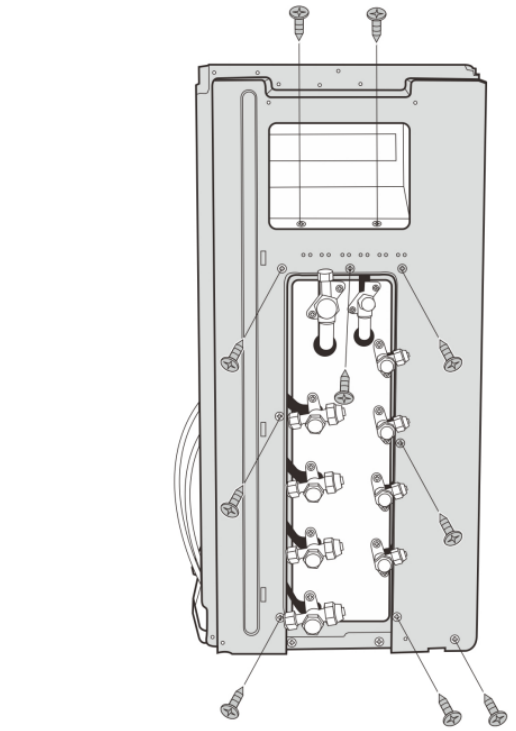
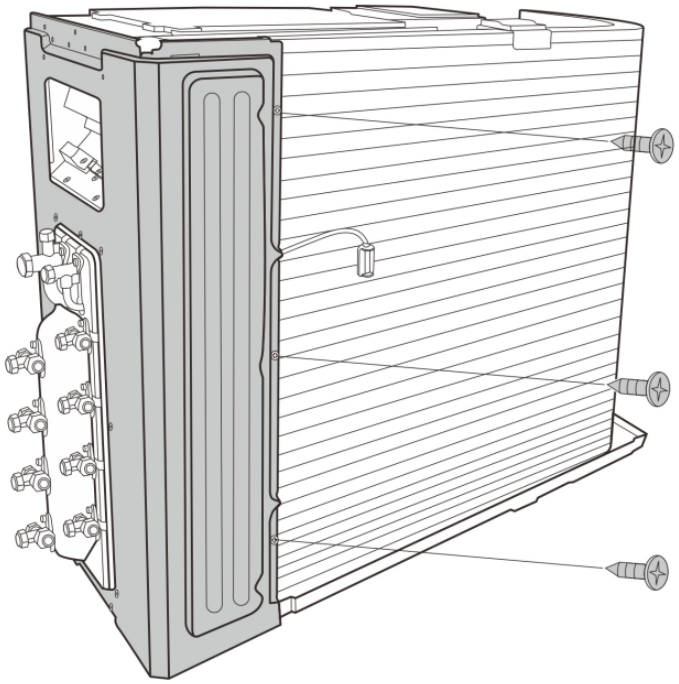
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
5. Remove the screws of the front right panel and then remove the front right panel (2 screws).	

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

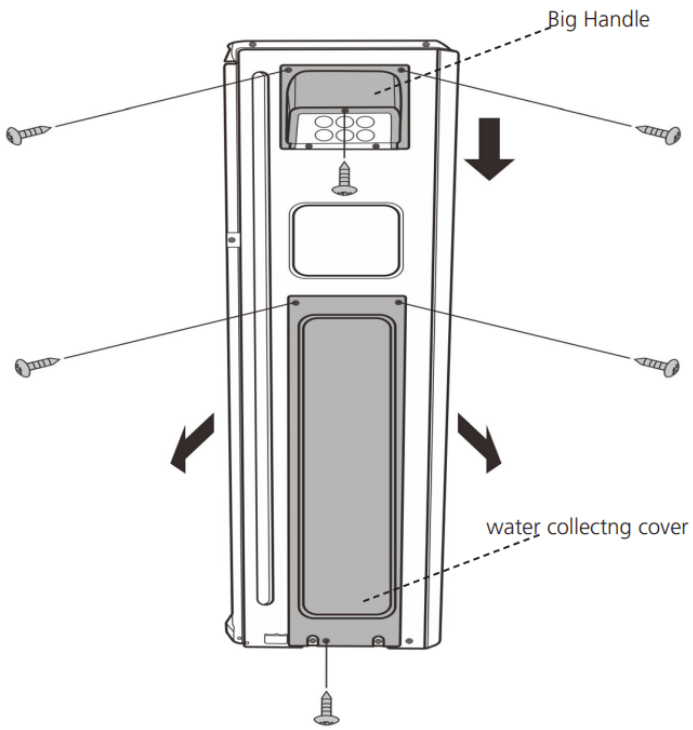
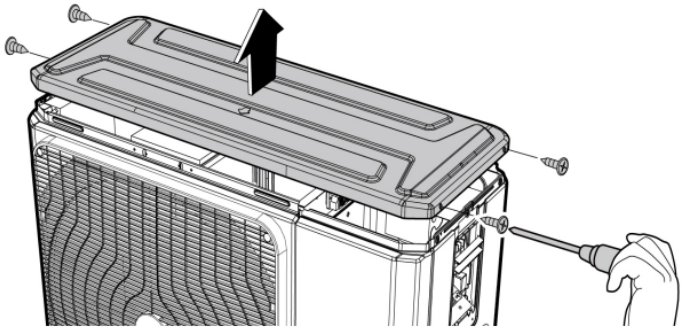
Procedure	Illustration
6. Remove the screws of the front panel and then remove the front panel (9 screws).	
7. Remove the screws of the rear net and then remove the rear net (6 screws).	

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

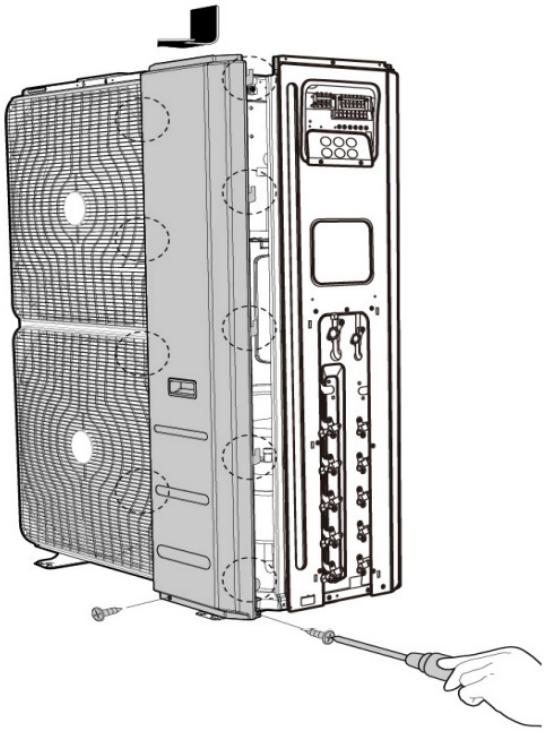
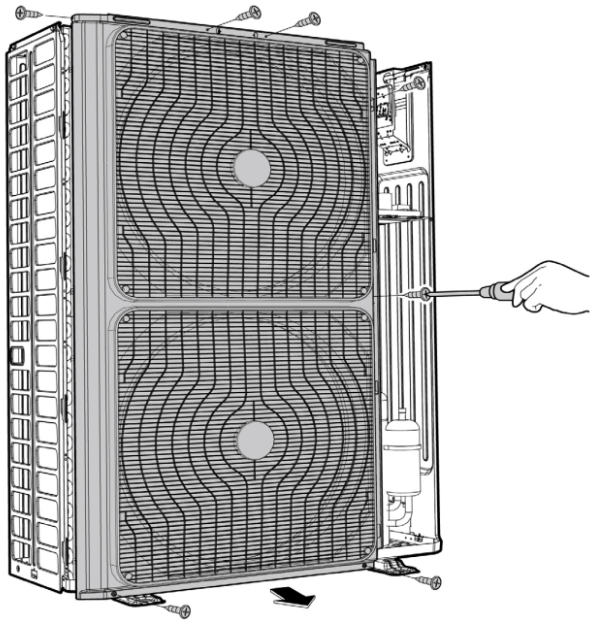
Procedure	Illustration
6. Remove the screws of the right panel and then remove the right panel (12 screws)	 

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

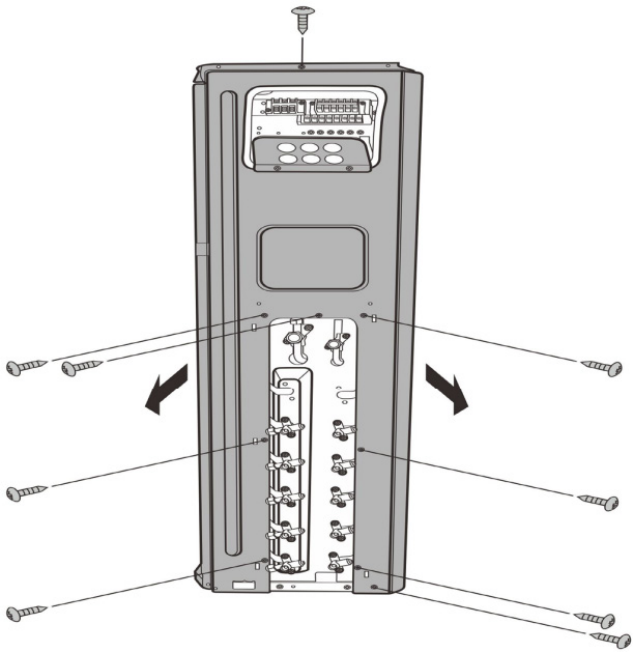
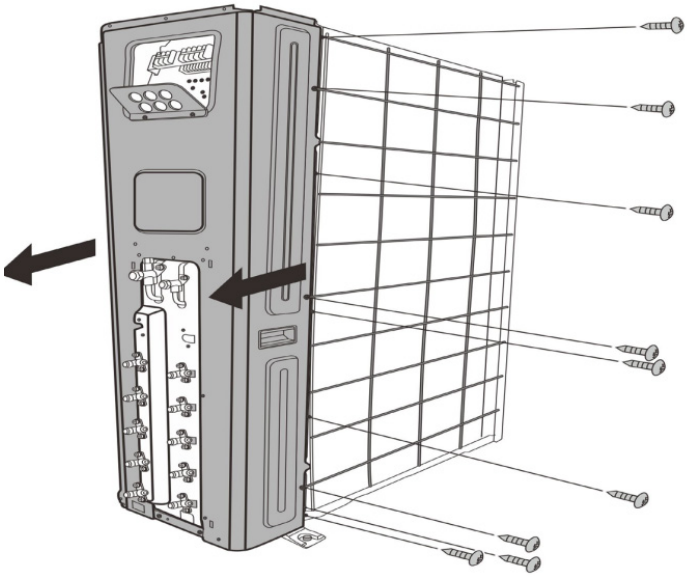
E30

Procedure	Illustration
1. Turn off the air conditioner and the power breaker. 2. Remove the screws of the big handle and then remove it (3 screws). 3. Remove the screws of the water collecting cover and then remove it (3 screws).	
4. Unfix the four screws of the top cover and then remove it.	

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

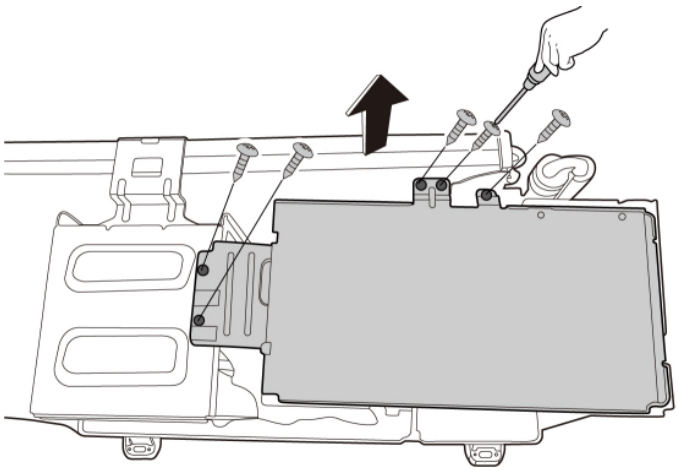
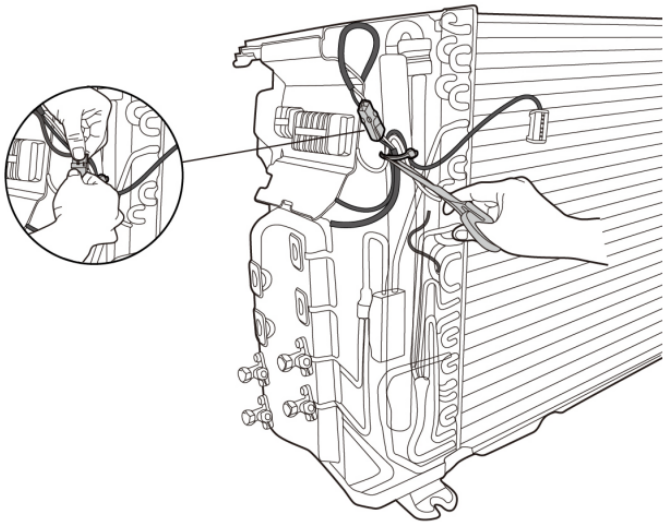
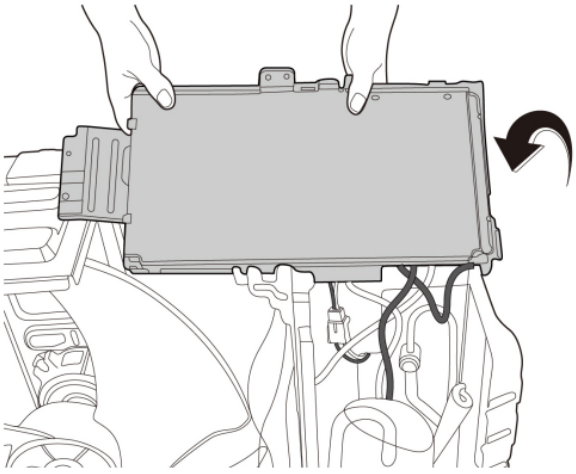
Procedure	Illustration
5. Remove the two screws of the right front panel and then push it down to unhook the right front panel from the 9 hooks.	
6. Remove the 7 screws of the front panel then remove the front panel.	

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

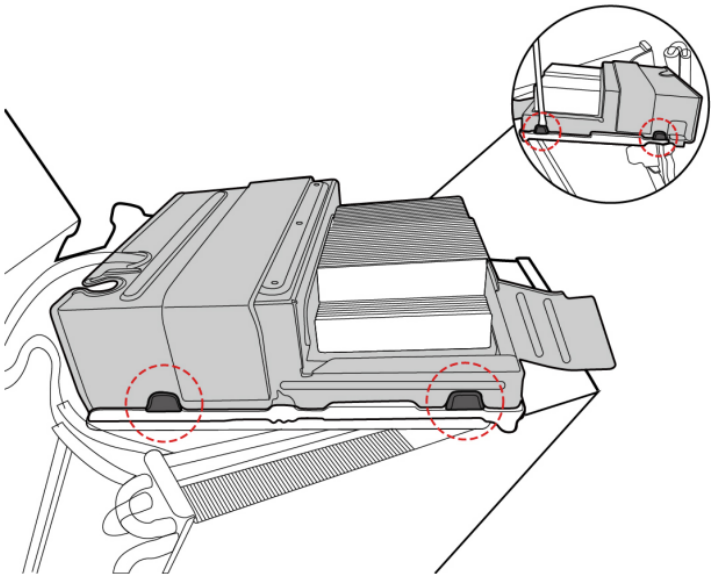
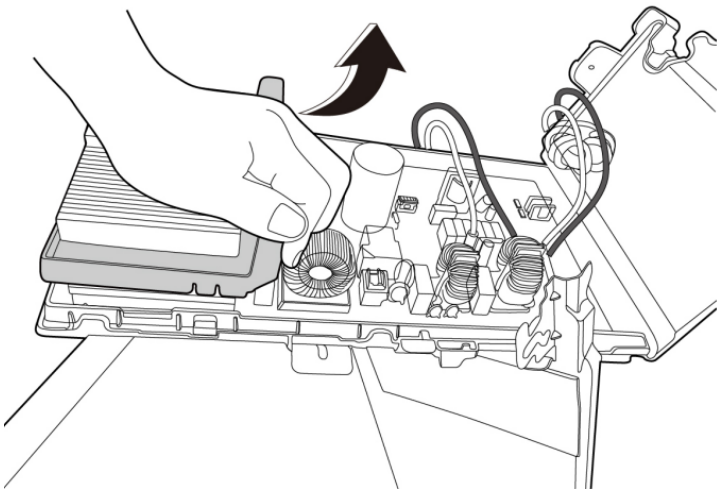
Procedure	Illustration
7. Unfix the screws on the right side of the right panel (9 screws).	
8. Remove the screws on the back of the right panel and then remove the right panel and rear net (9 screws).	

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

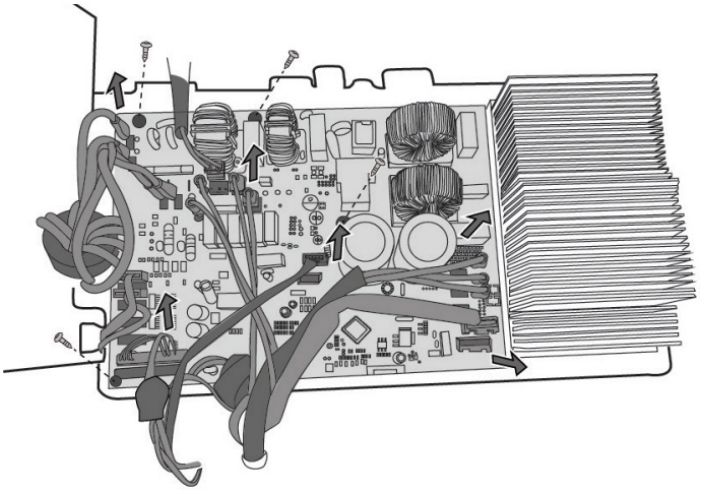
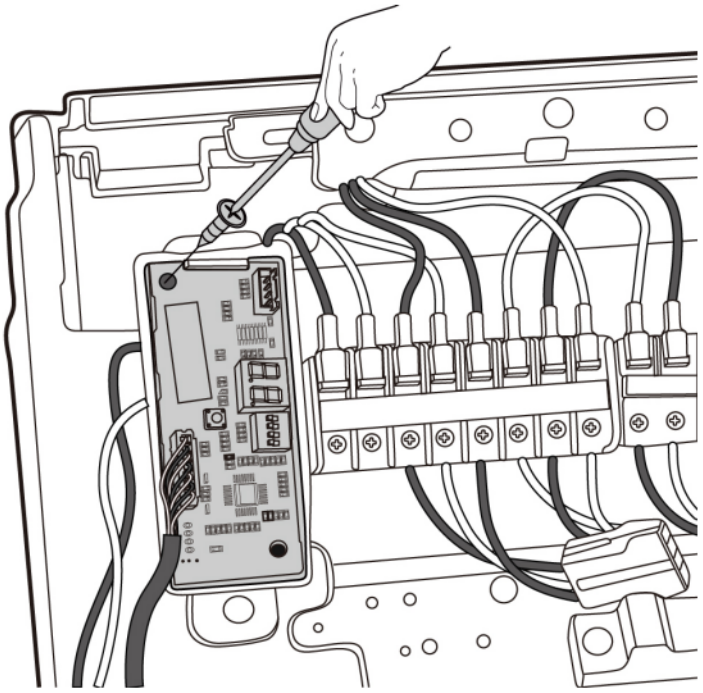
PCB board 6

Procedure	Illustration
1. Remove 5 screws of the electrical control box cover and remove it.	
2. Cut the ribbon by a shear and disconnect the 4-way valve connector.	
3. Turn over the electronic control box subassembly.	

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

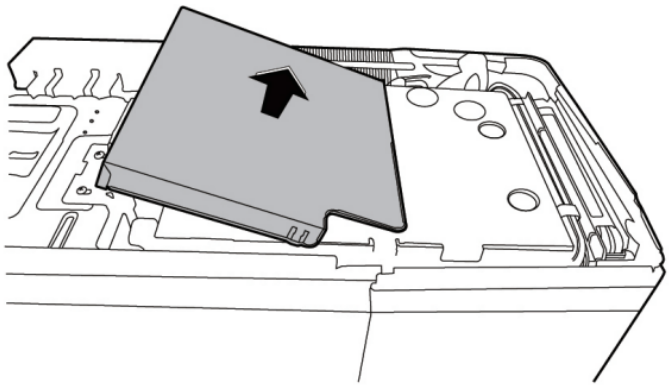
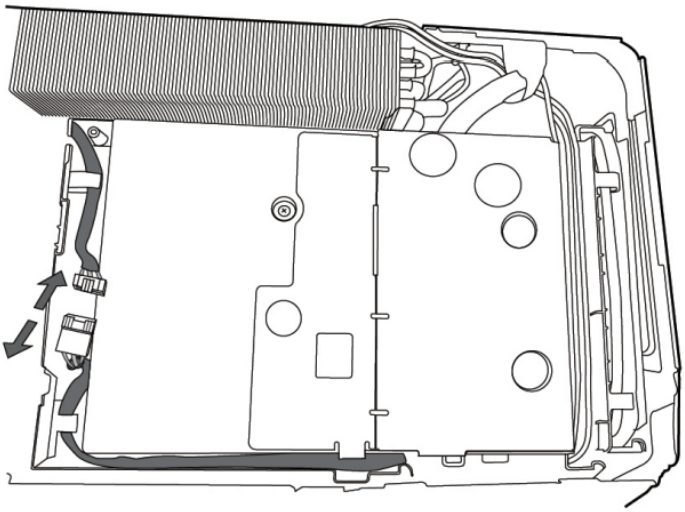
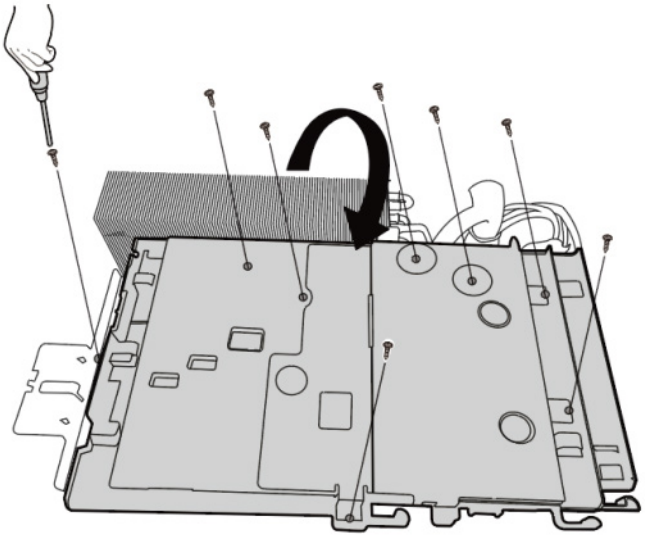
Procedure	Illustration
4. Remove the electronic installing box subassembly (4 hooks).	
5. Remove the support of the electronic control box.	

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

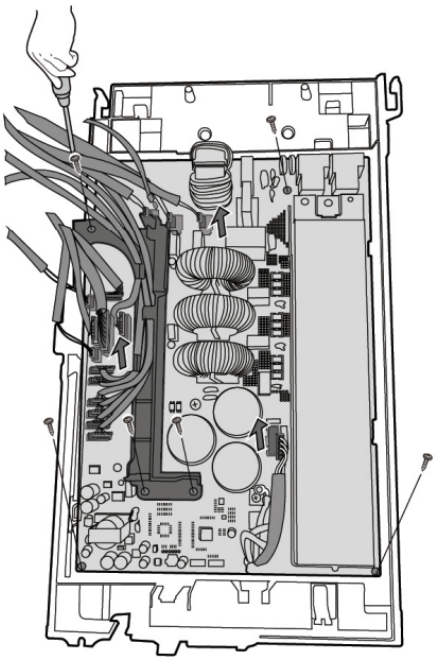
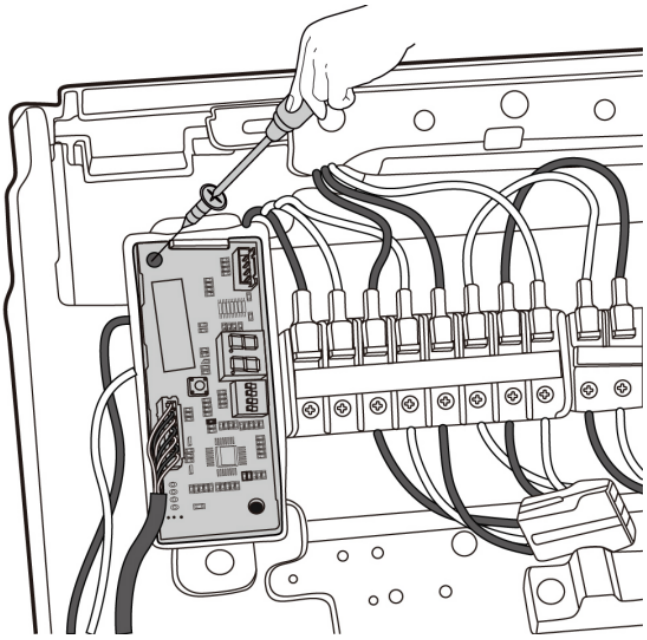
Procedure	Illustration
6. Disconnect the connectors from the electronic control board. 7. Remove the 4 screws and then remove the electronic control board.	
8. Pull out the connector, remove one screw, and then remove the key board subassembly on the terminal board.	

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

PCB board 9

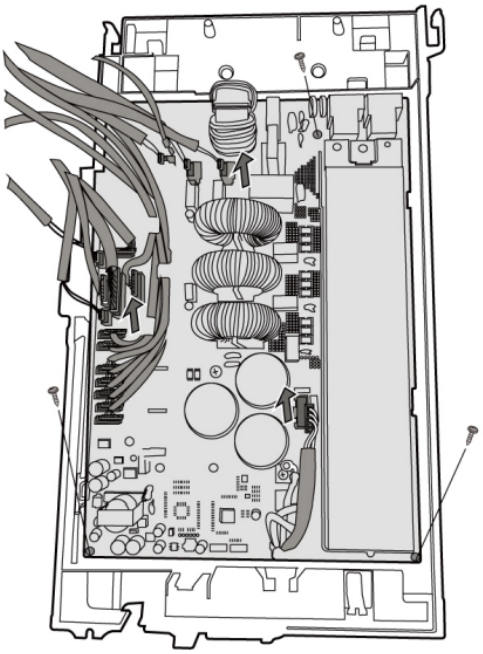
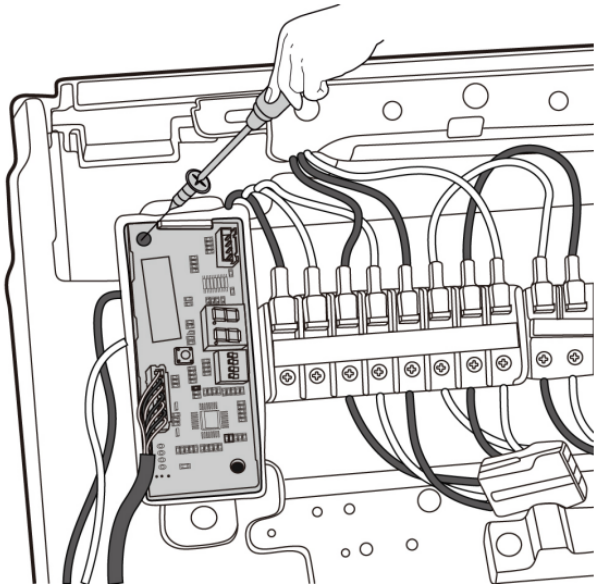
Procedure	Illustration
1. Remove the cover of the electrical control box.	
2. Disconnect the fan motor connector.	
3. Remove 8 fixing screws. 4. Turn over the electronic control box subassembly.	

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

Procedure	Illustration
5. Remove 3 screws and then remove the bracket. 6. Disconnect the connectors from the electronic control board. 7. Remove 3 screws and then remove the electronic control board.	
8. Pull out the connector, remove one screw and then remove the key board subassembly on the terminal board.	

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

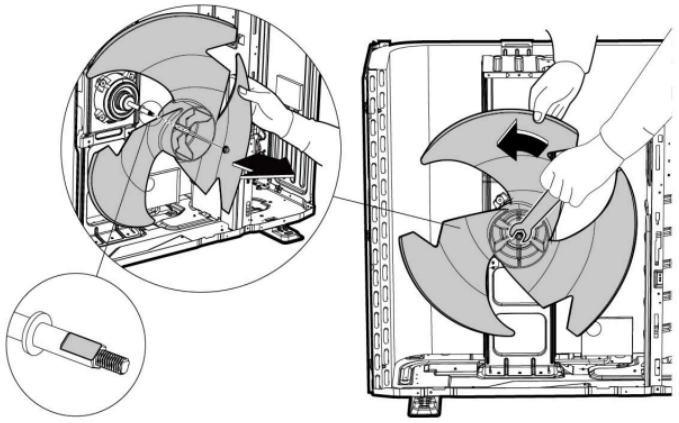
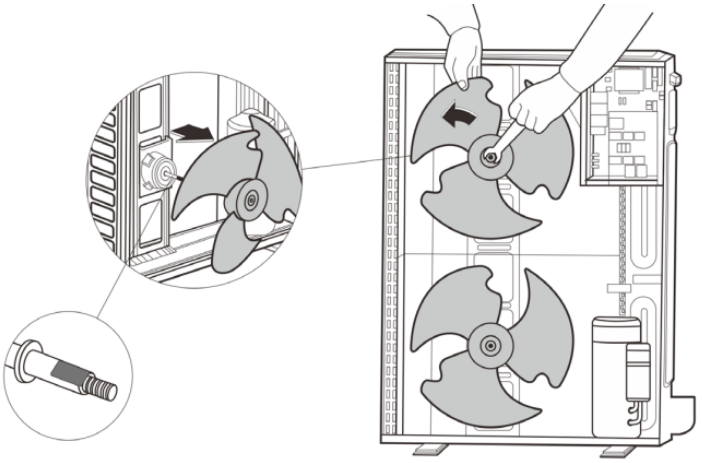
PCB board 10

Procedure	Illustration
9. Disconnect the connectors from the electronic control board. 10. Remove 3 screws and then remove the electronic control board.	
11. Pull out the connector, remove one screw and then remove the key board subassembly on the terminal board.	

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

4.3 Fan Assembly

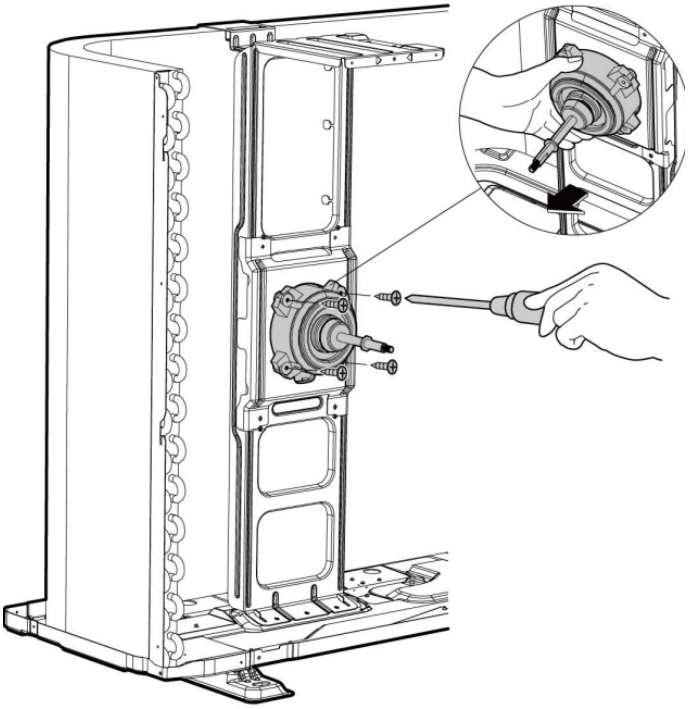
NOTE: Remove the panel plate before disassembling the fan.

Procedure	Illustration
1. Remove the nut securing the fan with a crescent wrench. 2. Remove the fan.	 

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

Fan Motor

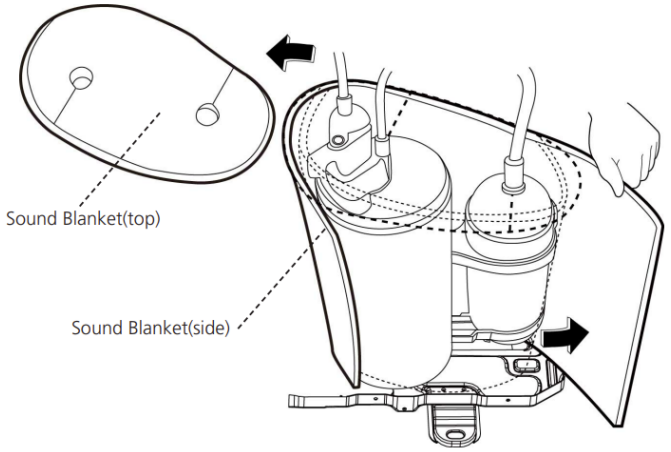
NOTE: Remove the panel plate and the connection of the fan motor on the PCB before disassembling the fan motor.

Procedure	Illustration
3. Remove the fixing screws of the fan motor (4 screws). 4. Remove the fan motor.	

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

Sound Blanket

NOTE: Remove the panel plate before disassembling the sound blanket.

Procedure	Illustration
1. Remove the sound blanket (side and top).	

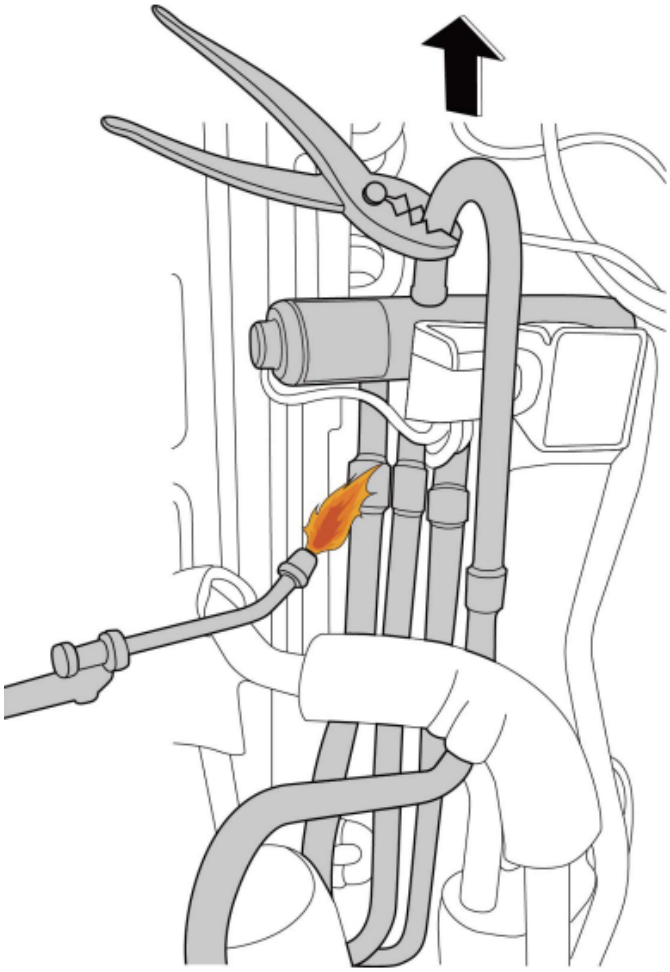
Note: This section is for reference only. Actual unit appearance may vary.

Four-Way Valve

WARNINGS

Evacuate the system and confirm that there is no refrigerant left in the system before removing the four-way valve and the compressor.

NOTE: Remove the panel plate, connection of the four-way valve on PCB before disassembling the sound blanket.

Procedure	Illustration
1. Heat up the brazed parts and then detach the four-way valve and the pipe. 2. Remove the four-way valve assembly with pliers.	

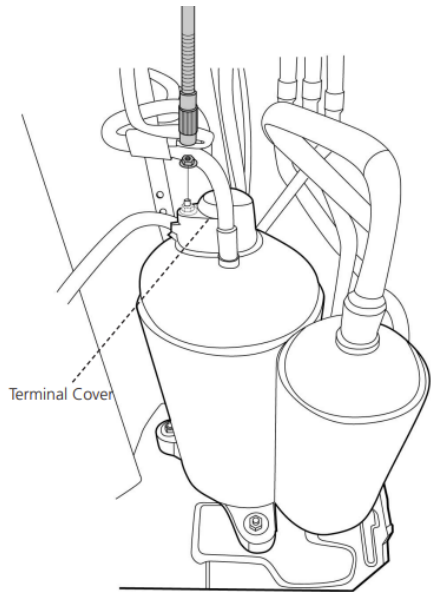
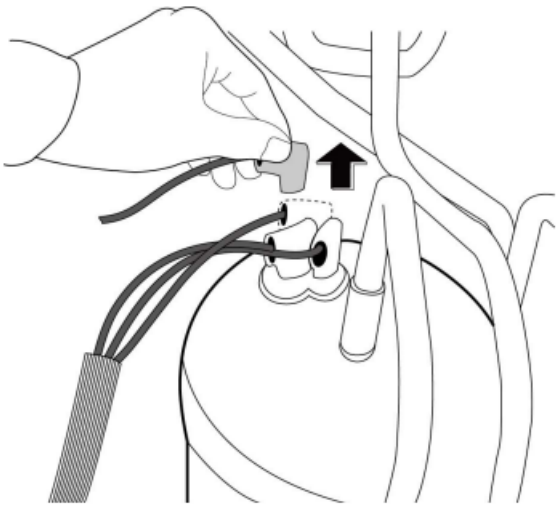
Note: This section is for reference only. Actual unit appearance may vary.

Compressor

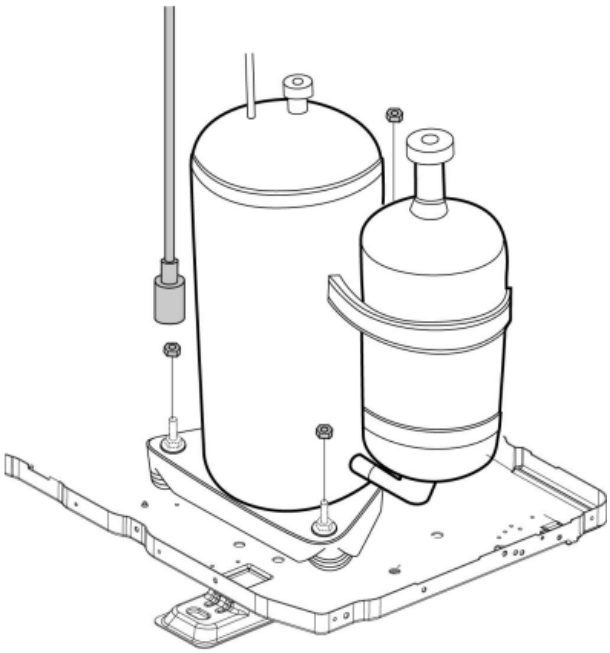
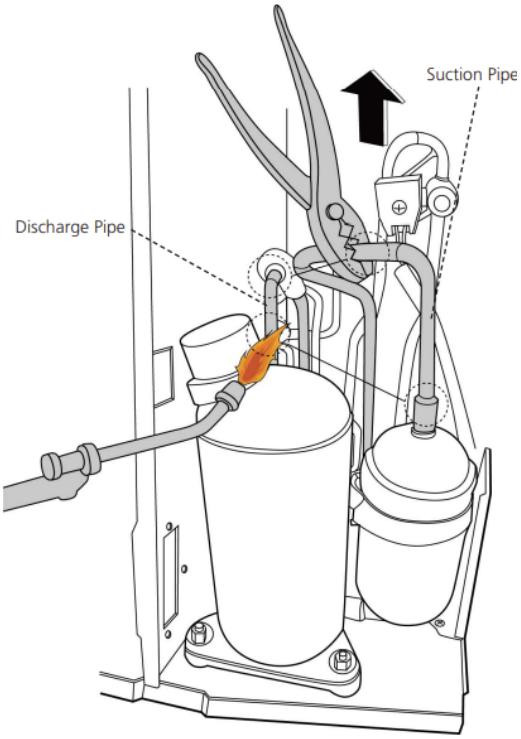
WARNINGS

Evacuate the system and confirm that there is no refrigerant left in the system before removing the four-way valve and the compressor.

NOTE: Remove the panel plate, connection of the four-way valve on PCB before disassembling the sound blanket.

Procedure	Illustration
1. Remove the flange nut of the terminal cover and remove the terminal cover.	
2. Disconnect the connectors.	

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

Procedure	Illustration
3. Remove the hex nuts and washers securing the compressor, located on the bottom plate.	
4. Heat up the brazed parts and then remove the discharge pipe and the suction pipe. 5. Lift the compressor from the base pan assembly with pliers.	

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

WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. While checking the indoor/outdoor PCB, please equip yourself with anti-static gloves or a wrist strap to avoid damaging the board.
Electricity will remain in capacitors even when the power supply is off. Ensure the capacitors are fully discharged before troubleshooting

5.1 Error Display

Display	Error Information	Solution
DF	Defrost	Normal display, not error code
FC	Forced cooling	
EC 07	ODU fan speed out of control	TS16
EC 71	Over current failure of outdoor DC fan motor	TS16
EC 72	Lack phase failure of outdoor DC fan motor	TS23
EC 50	ODU temp. sensor error (T3,T4, TP)	TS18
EC 51	ODU EEPROM parameter error	TS12
EC 52	ODU coil temp. sensor (T3) error	TS18
EC 53	ODU ambient temp. sensor (T4) error	TS18
EC 54	COMP. discharge temp. sensor (TP)	TS18
EC 55	ODU IPM module temperature sensor malfunction	TS42
EC 56	IDU coil outlet temp. sensor (T2B) error	TS18
EC 57	Refrigerant pipe temperature sensor error	TS18
EC 5A	Failure of enthalpy inlet temperature sensor	TS18
EC 5b	Failure of enthalpy outlet temperature sensor	TS18
EC 5E	Condenser temperature sensor (T3B) failure	TS18
EC 5C	Pressure sensor failure	TS43
EH C1	Refrigerant sensor detects leakage	TS41
EL 01	IDU & ODU communication error	TS13
PC 00	IPM module protection	TS21
PC 02	Compressor top (or IPM) temp. protection	TS21
PC 06	Discharge temperature protection of compressor	TS29
PC 08	Outdoor overcurrent protection	TS19
PC 0A	High temperature protection of condenser	TS30
PC 0F	PFC module protection	TS27
PC 0L	Low ambient temperature protection	--
PC 10	ODU low AC voltage protection	TS23
PC 11	ODU main control board DC bus high voltage protection	TS23
PC 12	ODU main control board DC bus low voltage protection / 341 MCE error	S23
PC 13	The AC power is cut off or the AC voltage detection circuit fails	TS44
PC 30	System high pressure protection	TS34
PC 31	System low pressure protection	TS36
PC 40	Communication error between ODU main chip and compressor driven chip	TS26
PC 43	ODU compressor lack phase protection	TS39
PC 44	ODU zero speed protection	TS19
PC 45	ODU IR chip drive failure	TS40
PC 46	Compressor speed has been out of control	TS19
PC 49	Compressor overcurrent failure	TS19
PC A1	Condensation protection of refrigerant pipe	TS45
LC 06	High temperature protection of Inverter module (IPM)	TS32

5.2 Outdoor Unit Point Check Function

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

Number of Presses	Display	Remark
00	Normal display	Display running frequency, running state or malfunction code
01	Quantity of indoor units with working connection	Display Number of indoor unit
02	Outdoor unit running mode code	Standby: 0, Fan only: 1, Cooling/Drying: 2, Heating: 3, Forced cooling: 6, Forced defrosting: A
03	Indoor unit A capacity	The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following: "--" (6K:0.6HP, 7K:0.8HP, 9K:1.0HP, 12K:1.2HP, 18K:1.5HP, 24K:2.5HP, 30K:3.0HP, 36K:3.2HP)
04	Indoor unit B capacity	
05	Indoor unit C capacity	
06	Indoor unit D capacity	
07	Indoor unit E capacity	
08	Indoor unit A capacity demand code	Normal code*HP (6K:0.6HP, 7K:0.8HP, 9K:1.0HP, 12K:1.2HP, 18K:1.5HP, 24K:2.5HP, 30K:3.0HP, 36K:3.2HP)
09	Indoor unit B capacity demand code	
10	Indoor unit C capacity demand code	
11	Indoor unit D capacity demand code	
12	Indoor unit E capacity demand code	
13	Outdoor unit amendatory capacity demand code	
14	The frequency corresponding to the total indoor units' amendatory capacity demand	
15	The frequency after the frequency limit	
16	The frequency sending to compressor control chip	
17	Indoor unit A evaporator outlet temperature (T2B)	If the temperature is lower than -9°C, the digital display shows "-9". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows "--".
18	Indoor unit B evaporator outlet temperature (T2B)	
19	Indoor unit C evaporator outlet temperature (T2B)	
20	Indoor unit D evaporator outlet temperature (T2B)	
21	Indoor unit E evaporator outlet temperature (T2B)	

Number of Presses	Display	Remark
22	Indoor unit A room temperature (T1A)	If the room temperature is lower than 0°C, the digital display shows "0". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows: "--".
23	Indoor unit B room temperature (T1B)	
24	Indoor unit C room temperature (T1C)	
25	Indoor unit D room temperature (T1D)	
26	Indoor unit E room temperature (T1E)	
27	Indoor unit A evaporator temperature (T2A)	If the temperature is lower than -9°C, the digital display shows "-9". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows "--".
28	Indoor unit B evaporator temperature (T2B)	
29	Indoor unit C evaporator temperature (T2C)	
30	Indoor unit D evaporator temperature (T2D)	
31	Indoor unit E evaporator temperature (T2E)	
32	Condenser pipe temperature (T3)	
33	Outdoor ambient temperature (T4)	
34	Compressor discharge temperature (TP)	The display value is between 30-129°C. If the temperature is lower than 30°C, the digital display shows "30". If the temperature is higher than 99°C, the digital display shows single and double digits. 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.
35	AD value of current	The display value is 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 for DIY-MULTI5-36HP230D-O the actual AD value is AD value plus 60.
36	AD value of AC voltage	
37	AD value of DC voltage	
38	EXV open angle for A indoor unit	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.
39	EXV open angle for B indoor unit	
40	EXV open angle for C indoor unit	
41	EXV open angle for D indoor unit	
42	EXV open angle for E indoor unit	
43	MVI open angle (for some models)	
44	EXI open angle (for some models)	

<table>
<tr><th>Number of Presses</th><th>Display</th><th colspan="3">Remark</th></tr>
<tr><td rowspan="8">45</td><td rowspan="8">Frequency limit symbol</td><td>Bit7</td><td>Reserved</td><td rowspan="8">The display value is a hexadecimal number. For example, the digital display shows 2A, the corresponding binary is 101010, so Bit5=1, Bit3=1, and Bit1=1.
This means that a frequency limit may be caused by current, IPM or T3.</td></tr>
<tr><td>Bit6</td><td>Frequency limit caused by voltage</td></tr>
<tr><td>Bit5</td><td>Frequency limit caused by voltage</td></tr>
<tr><td>Bit4</td><td>Reserved</td></tr>
<tr><td>Bit3</td><td>Frequency limit caused by IPM</td></tr>
<tr><td>Bit2</td><td>Frequency limit caused by Compressor discharge temperature (T5)</td></tr>
<tr><td>Bit1</td><td>Frequency limit caused by Outdoor heat exchanger pipe temperature (T3)</td></tr>
<tr><td>Bit0</td><td>Frequency limit caused by Middle indoor heat exchanger coil temperature (T2)</td></tr>
<tr><td>46</td><td>T2B fault</td><td colspan="3">00:No fault, 01:T2B-A fault, 02:T2B-B fault, 03:T2B-C fault, 04:T2B-D fault, 05:T2B-E fault, 06:T2B-F fault(the display priority is A-B-C-D-E-F)</td></tr>
<tr><td>47</td><td>Average value of T2</td><td colspan="3">(Sum T2 value of all indoor units)(number of indoor units in good connection)(The heating is the average value of T2, and the cooling is the average value of T2B)
If the temperature is lower than -9°C, the digital display shows "-9"</td></tr>
<tr><td>48</td><td>Outdoor unit fan speed</td><td colspan="3">See next list</td></tr>
<tr><td>49</td><td>Reason of stop</td><td colspan="3"></td></tr>
<tr><td>50~59</td><td>Reserved</td><td colspan="3"></td></tr>
<tr><td>60</td><td>Air injection enthalpy inlet temperature (for hyper heat models)</td><td colspan="3" rowspan="4">If the temperature is lower than -9°C, the digital display shows "-9". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows: "--".</td></tr>
<tr><td>61</td><td>Air injection enthalpy outlet temperature (for hyper heat models)</td></tr>
<tr><td>62</td><td>Condenser coil middle temperature (for hyper heat models)</td></tr>
<tr><td>63</td><td>Refrigerant tube inlet temperature (for hyper heat models)</td></tr>
<tr><td>64</td><td>Target discharge temperature</td><td colspan="3">The display value is between 0-199°C, If the temperature is lower than 30°C, the digital display shows "30". If the temperature is higher than 99°C, the digital display shows single and double digits. 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.</td></tr>
<tr><td>65</td><td>Indoor Unit F capacity</td><td colspan="3">The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following "--".</td></tr>
<tr><td>66</td><td>Indoor unit F capacity demand code</td><td colspan="3">Normal code*HP
(9K: 1HP, 12K: 1.2HP, 18K: 1.5HP)</td></tr>
</table>

Number of Presses	Display	Remark
67	Indoor unit F evaporator outlet temperature (T2BF)	If the temperature if lower than -9°C, the digital display shows "-9". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows: "--".
68	Indoor unit F room temperature (T1F)	If the temperature is lower than 0°C, the digital display shows "0". If the temperature is higher than 70°C, the digital display shows "70'. If the indoor unit is not connected, the digital display shows "--".
69	Indoor unit F evaporator temperature (T2F)	If the temperature is lower than -9°C, the digital display shows "-9". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows "--".
70	EXV open angle for F indoor unit	Actual data/4 If the value is higher than 99, the digital display shows single and double digits.
71	IPM module temperature	The display value is between 0-199°C. If the temperature is higher than 99°C, the digital display shows single and double digits. For example, if the display shows 5.0, so 5.0 multiplied by 10 to become 50, then added to 100 to become 150°C.
72	The high pressure sensor detects the pressure corresponding to the condensation temperature (Tc)	The digital display shows: "--"
73	Reserved	
74		

Outdoor unit fan speed corresponding table:

Outdoor Unit Fan Speed	Display
>600rpm	02
>300rpm & <=600rpm	03
<=300rpm	04

5.3 Quick Maintenance by Error Code

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

Part Requiring Replacement	Error Code											
	EL 01	EC 50	EC 51	EC 52	EC 53	EC 54	EC 55	EC 56	EC 57	EC 5A	EC 5b	EC 5E
Indoor PCB	√	x	x	x	x	x	x	x	x	x	x	x
Outdoor PCB	√	√	√	√	√	√	√	√	√	√	√	√
ODU coil temp. sensor	x	√	x	√	x	x	x	x	x	x	x	x
ODU ambient temp. sensor	x	√	x	x	√	x	x	x	x	x	x	x
COMP. Discharge temp. sensor	x	√	x	x	x	√	x	x	x	x	x	x
IPM module temperature sensor	x	x	x	x	x	x	√	x	x	x	x	x
IDU coil outlet temp. sensor	x	x	x	x	x	x	x	√	x	x	x	x
Refrigerant pipe temperature sensor	x	x	x	x	x	x	x	x	√	x	x	x
Enthalpy inlet temperature sensor	x	x	x	x	x	x	x	x	x	√	x	x
Enthalpy outlet temperature sensor	x	x	x	x	x	x	x	x	x	x	√	x
Condenser temperature sensor	x	x	x	x	x	x	x	x	x	x	x	√
Reactor	√	x	x	x	x	x	x	x	x	x	x	x
IPM module board	√	x	x	x	x	x	x	x	x	x	x	x

Part Requiring Replacement	Error Code									
	EC 5C	EH C1	EC 07/ EC 71	PC 00	PC 01/ PC 10/ PC 11/ PC 12	PC 02	PC 08/ PC 44/ PC 46/ PC 49	PC 13	PC A1	PC 0F
Outdoor PCB	√	x	√	√	√	√	√	√	√	√
Outdoor fan motor	x	x	√	√	x	x	√	x	x	x
Reactor or inductance	x	x	x	√	√	x	√	x	x	√
Compressor	x	x	x	√	x	x	x	x	x	x
IPM module board	x	x	x	√	√	x	√	x	x	x
Bridge rectifier	x	x	x	√	√	x	√	x	x	x
Pressure sensor	√	x	x	x	x	x	x	x	x	x
PFC module	x	x	x	x	x	x	x	x	x	√
Additional refrigerant	x	√	x	x	x	x	x	x	x	x
Over load protector	x	x	x	x	x	√	x	x	x	x
ODU ambient temp. sensor	x	x	x	x	x	x	x	x	√	x
Refrigerant pipe sensor	x	x	x	x	x	x	x	x	√	x

Part Requiring Replacement	Error Code							
	PC 40	EC 72	PC 43	PC 45	PC 06	PC 0A	PC 30	PC 31
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	√

5.4 Troubleshooting by Error Code

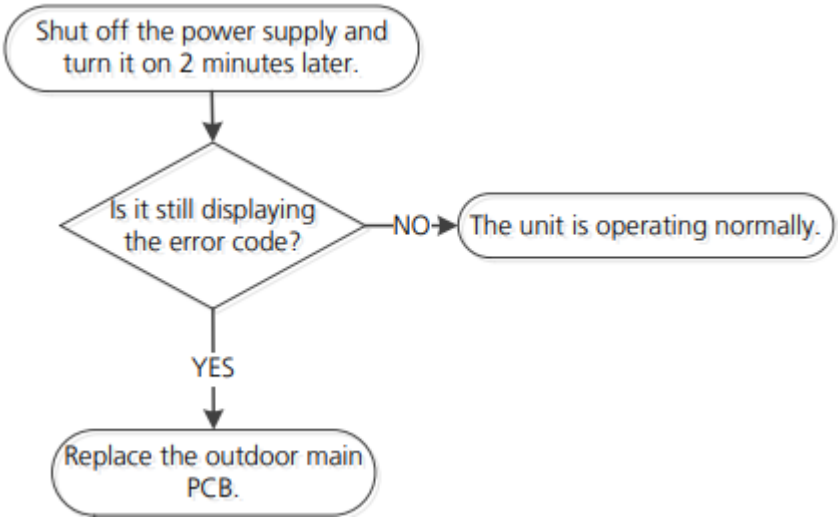
EC 51: EEPROM malfunction error diagnosis and solution.

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

Recommended parts to prepare:

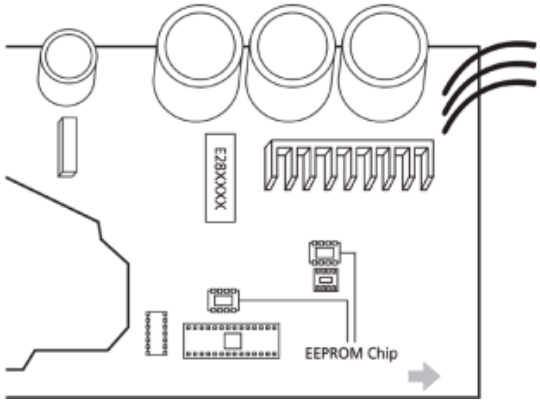
- Indoor PCB
- Outdoor PCB

Troubleshooting and repair:



Remarks:

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



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

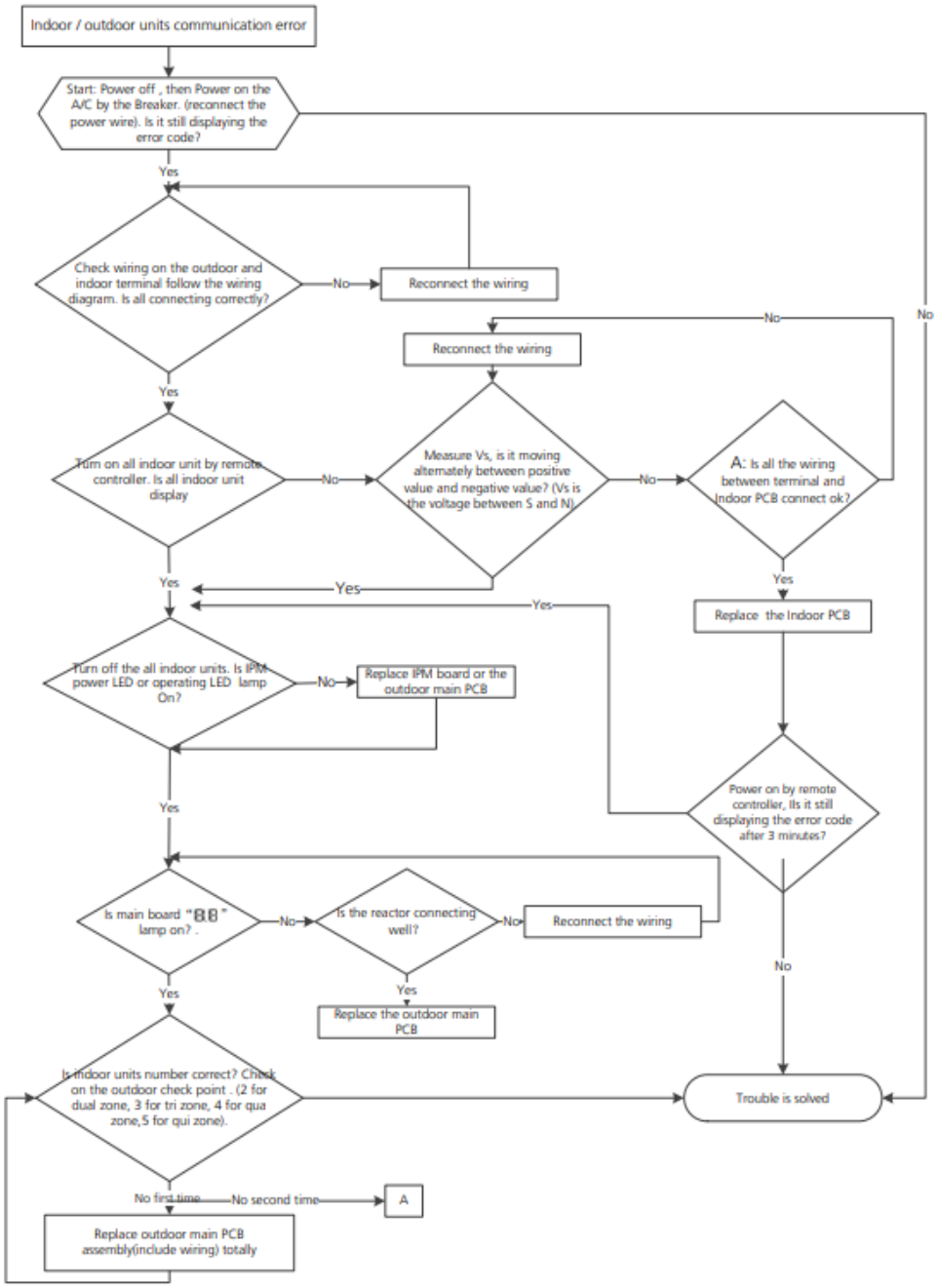
EL 01: IDU & ODU communication error diagnosis and solution.

Description: The indoor unit does not receive the feedback from the outdoor unit during 110 seconds and this condition happens 4 times continuously.

Recommended parts to prepare:

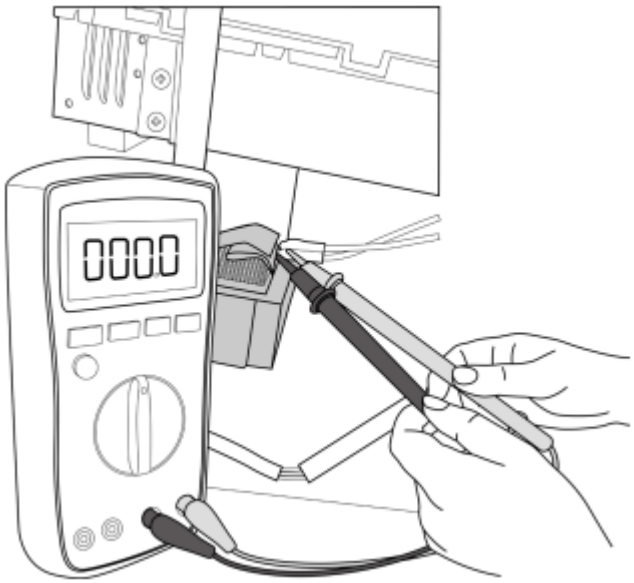
- Indoor PCB
- Outdoor PCB
- IPM module board
- Reactor

Troubleshooting and repair:



Remarks:

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



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

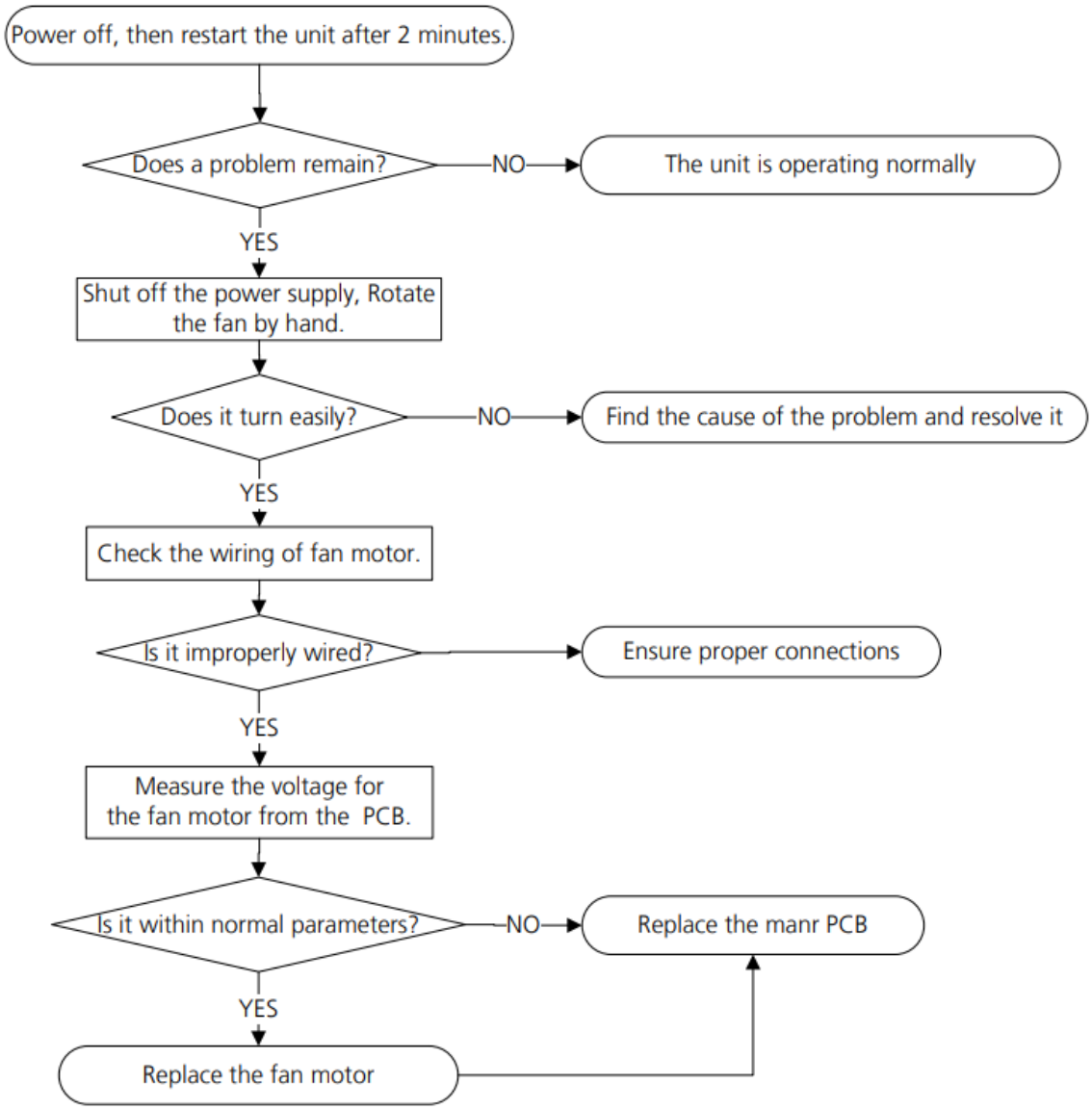
EC 07: Fan speed is operating outside of normal range. EC 71: Overcurrent failure of outdoor DC fan motor diagnosis and solution.

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

Recommended parts to prepare:

- Connection wires
- Fan assembly
- Fan motor
- PCB

Troubleshooting and repair:

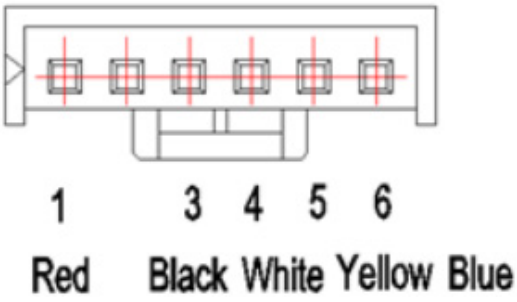


Index:

1. Outdoor DC fan motor (control chip is in fan motor)

Power on and make sure the unit is in 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 showing in the tables below the PCB will have problems and will need to be replaced.

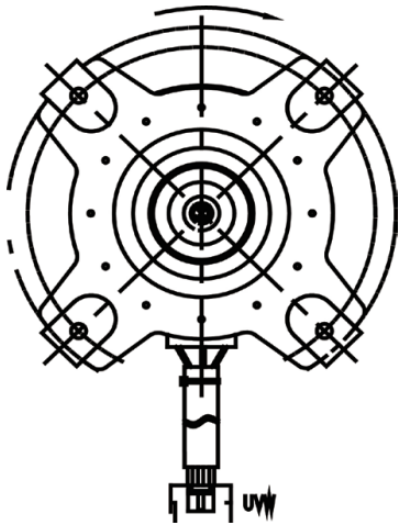
NO.	Color	Signal	Voltage
1	Red	Vs/Vm	192V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5-16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5-16.5V



Index:

1. Outdoor DC fan motor (control chip is in outdoor PCB)

Release the UVW connector and measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other the fan motor has a problem and needs to be replaced. Otherwise the PCB has a problem and needs to be replaced.



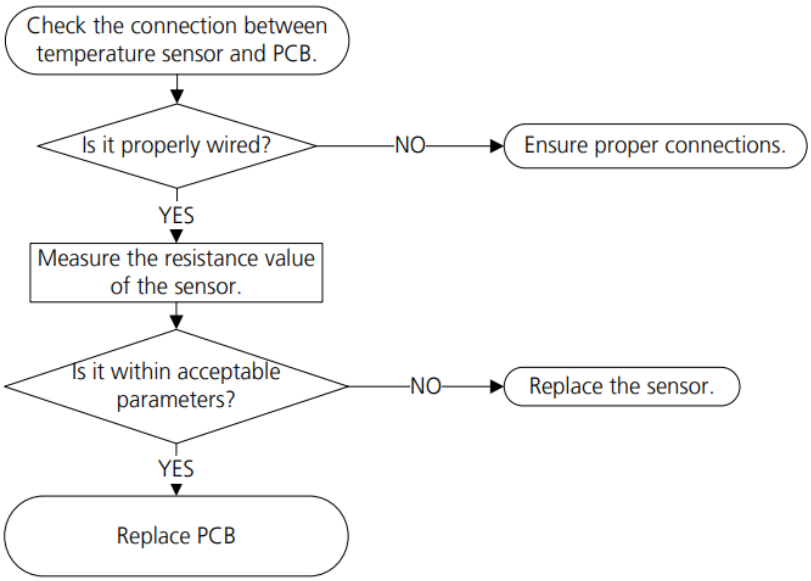
EC 52/ EC 53/ EC 54/ EC 56/ EC 57/ EC 5A/ EC 5b/ EC 5E/ EC 50: Open circuit or short circuit of temperature sensor diagnosis and solution.

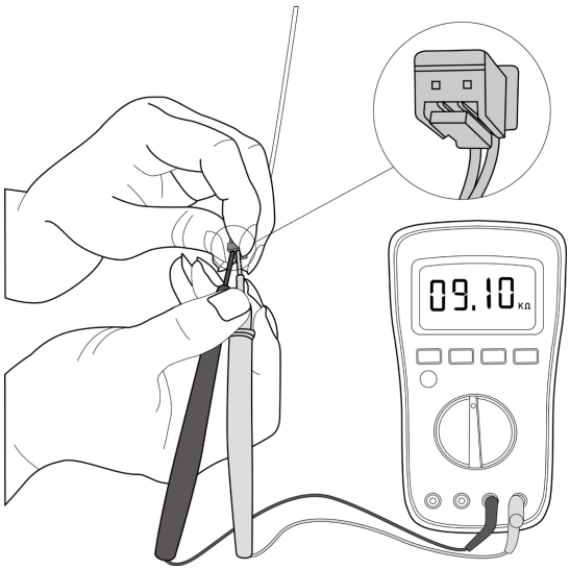
Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays a fault code.

Recommended parts to prepare:

- Connection wires
- Sensors
- PCB

Troubleshooting and repair:





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

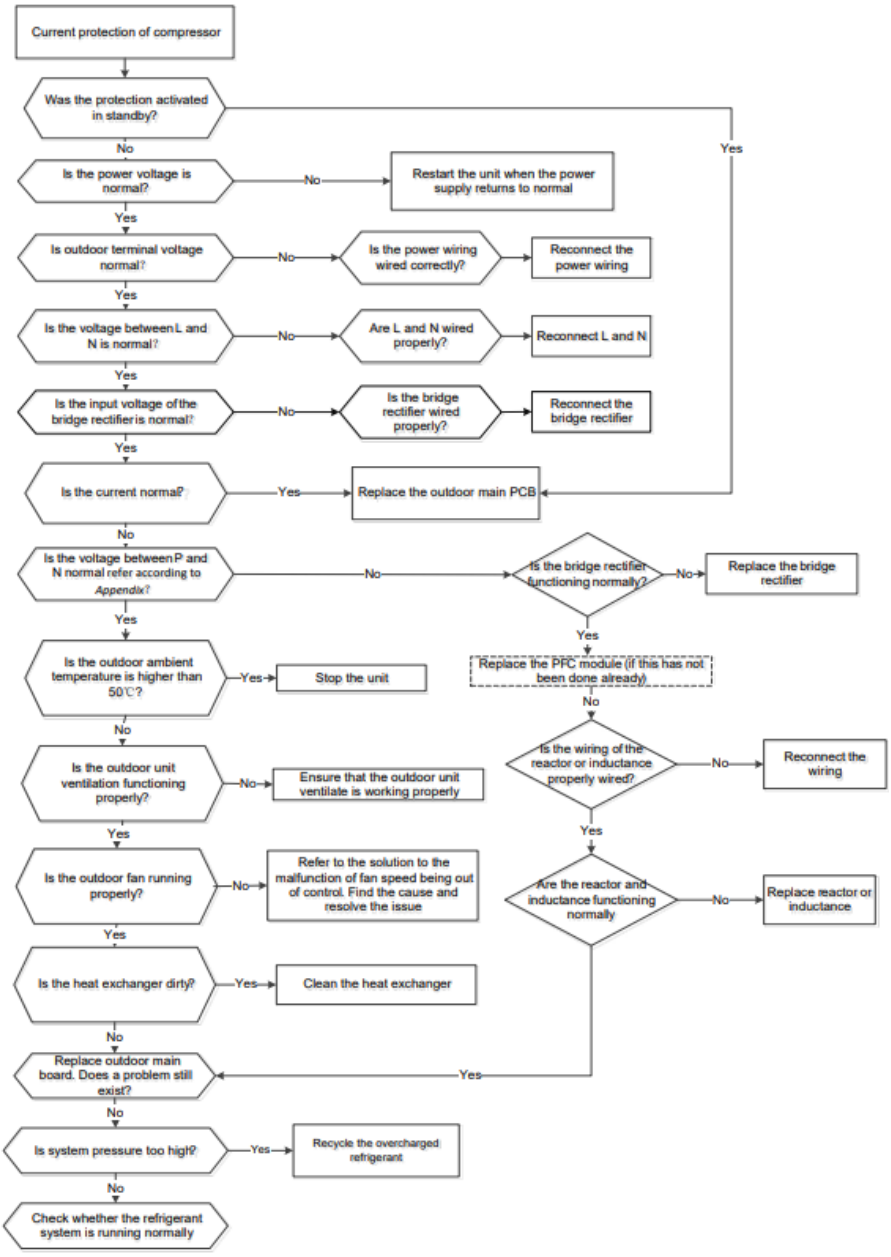
PC 08: Current overload protection. PC 44: ODU zero speed protection. PC 46: Compressor speed has been out of control. PC 49: Compressor overcurrent failure.

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:



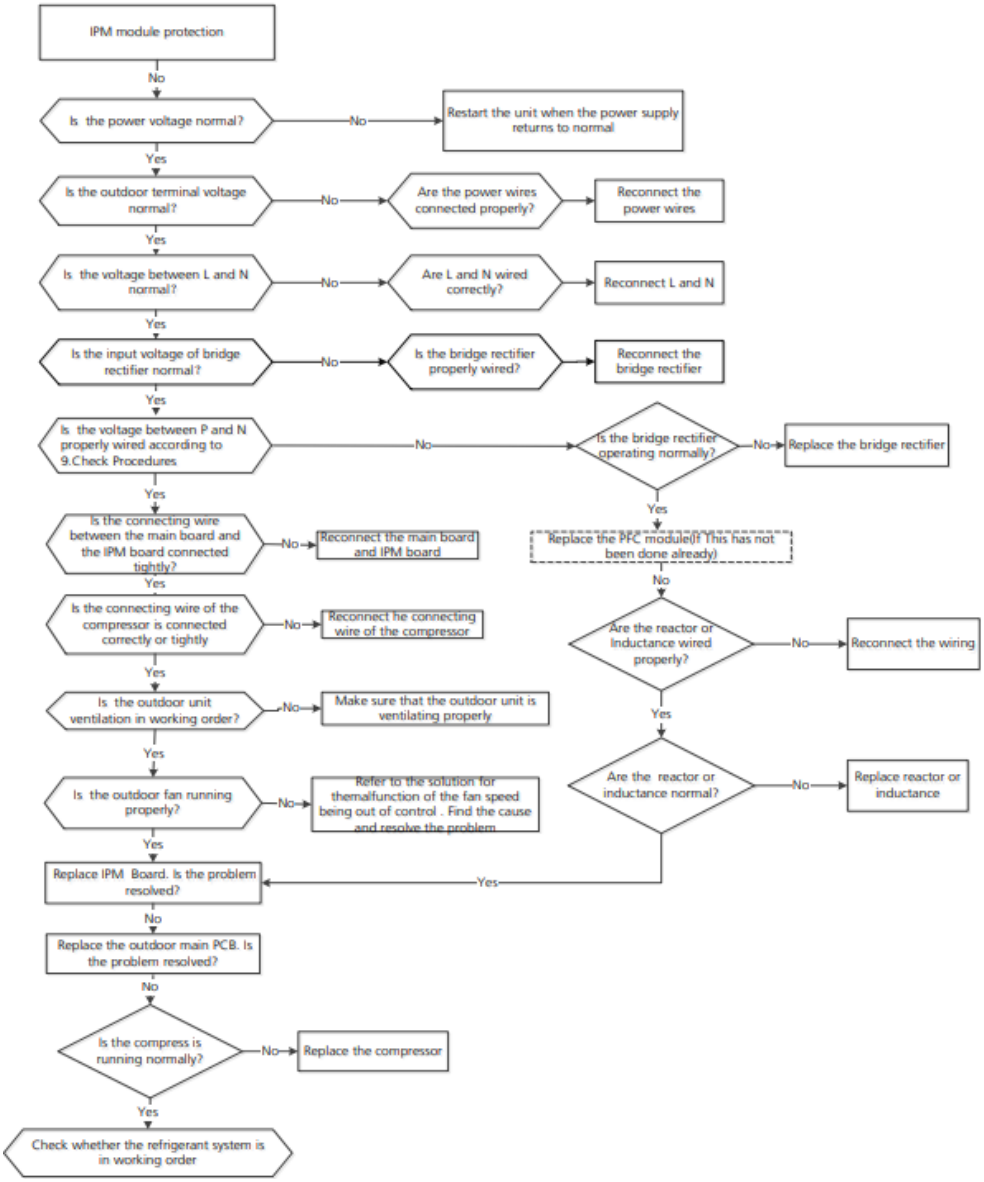
PC 00: IPM malfunction diagnosis and solution.

Description: When the voltage signal the IPM sends to the compressor drive chip is abnormal, the LED displays a fault code and the system 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: At first test the resistance between every two ports of U, V, W of the IPM and P, N. If any result of them is 0 or close to 0, the IPM is defective. Otherwise, please follow the procedure below:



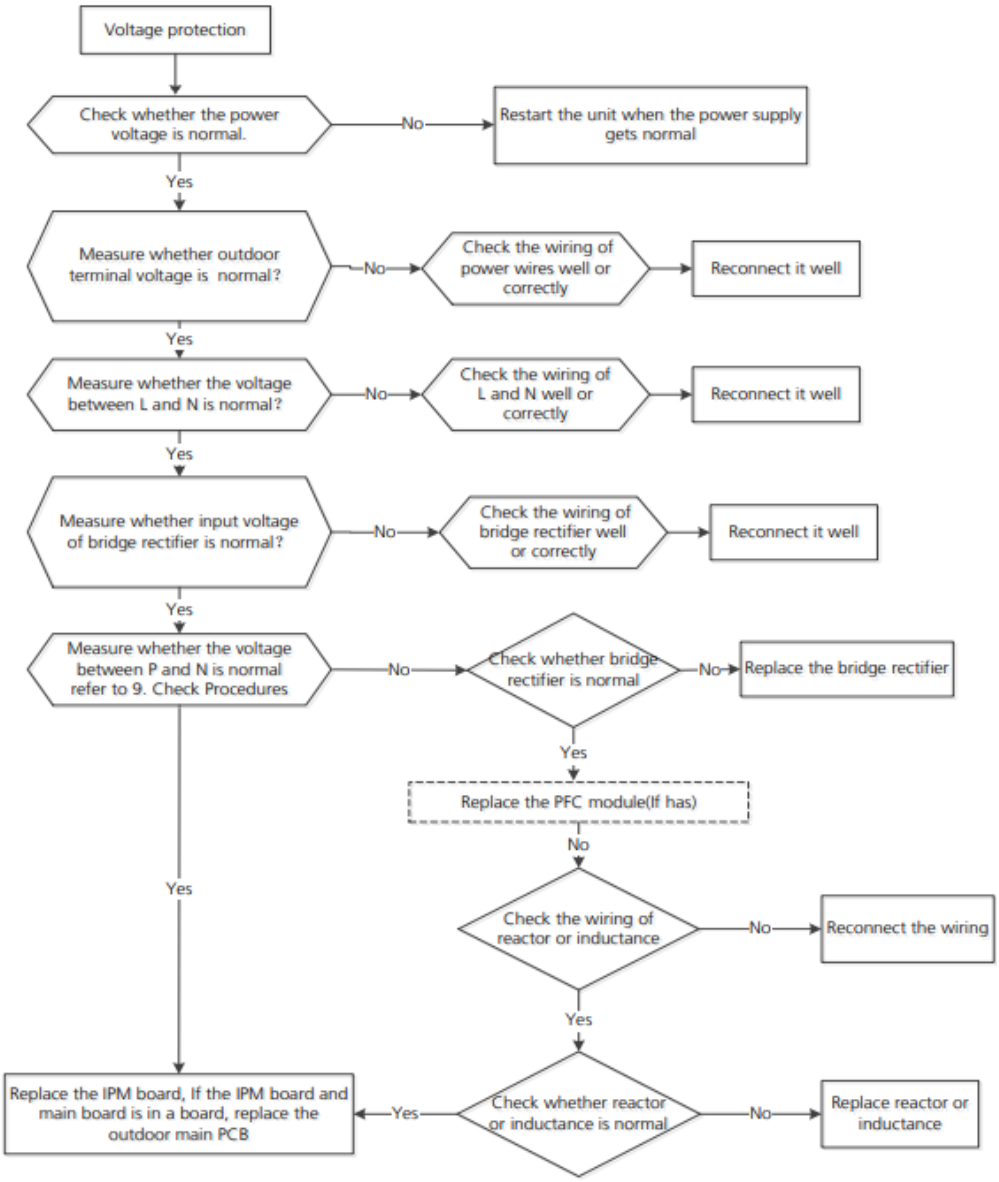
PC01: over voltage or too low voltage protection. PC 10: ODU low AC voltage protection. PC 11: ODU main control board DC bus high voltage protection. PC 12: ODU main control board DC bus low voltage protection/ 341 MCE error diagnosis and solution.

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

Recommended parts to prepare:

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

Troubleshooting and repair:



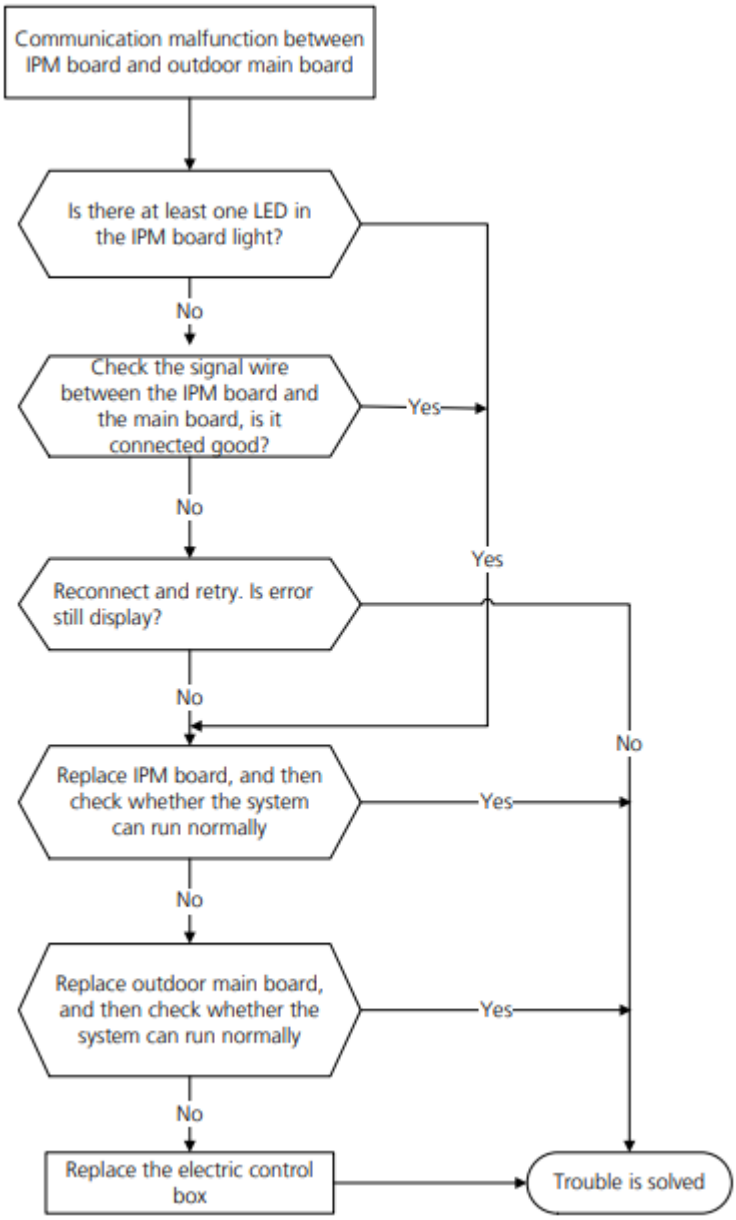
PC 40: Communication error between ODU main chip and compressor driven chip diagnosis and solution.

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:



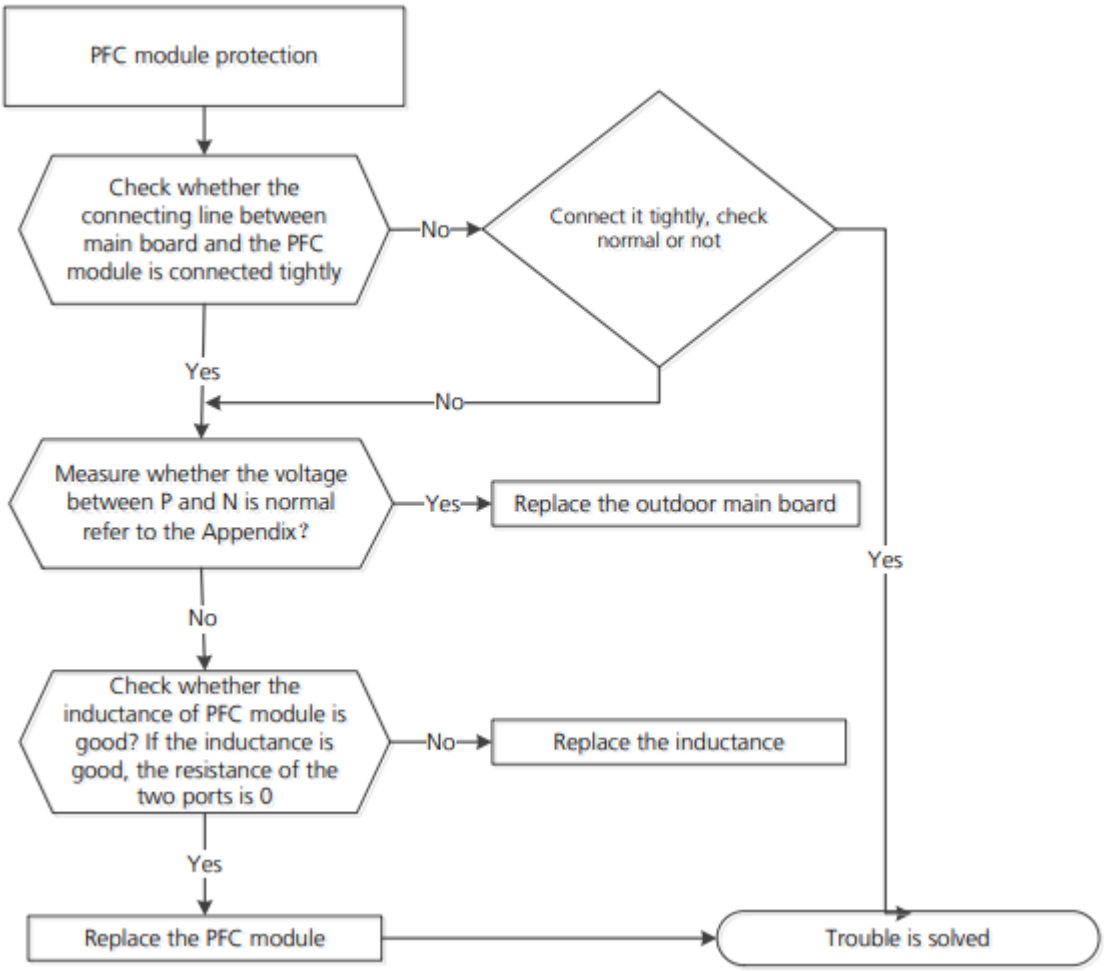
PC 0F: PFC module protection diagnosis and solution.

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:



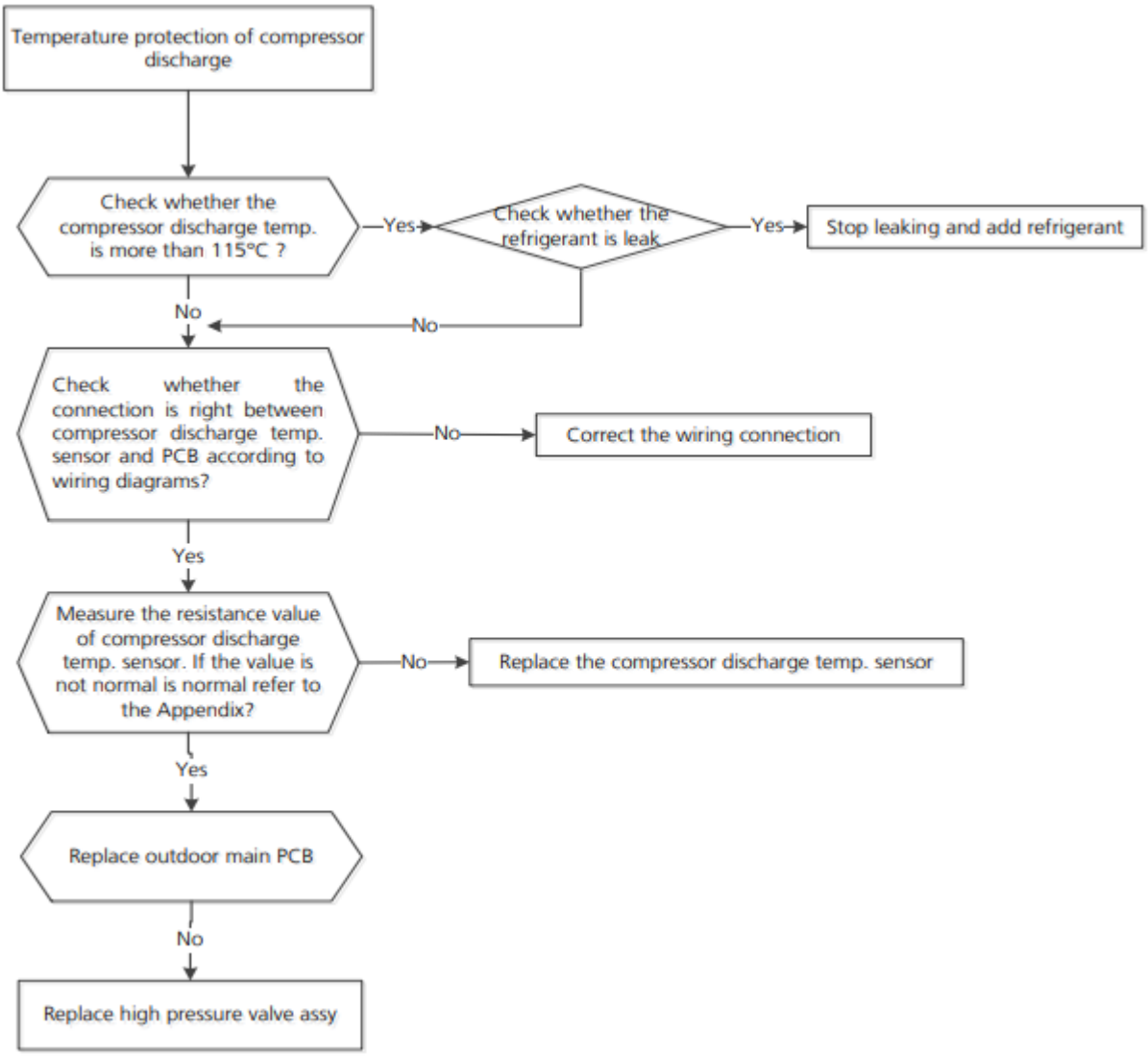
PC 06: Discharge temperature protection of compressor diagnosis and solution.

Description: When the compressor discharge temperature (T5) is more than 115°C for 10 seconds, the compressor ceases operation and does not restart until T5 is less than 90°C.

Recommended parts to prepare:

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

Troubleshooting and repair:



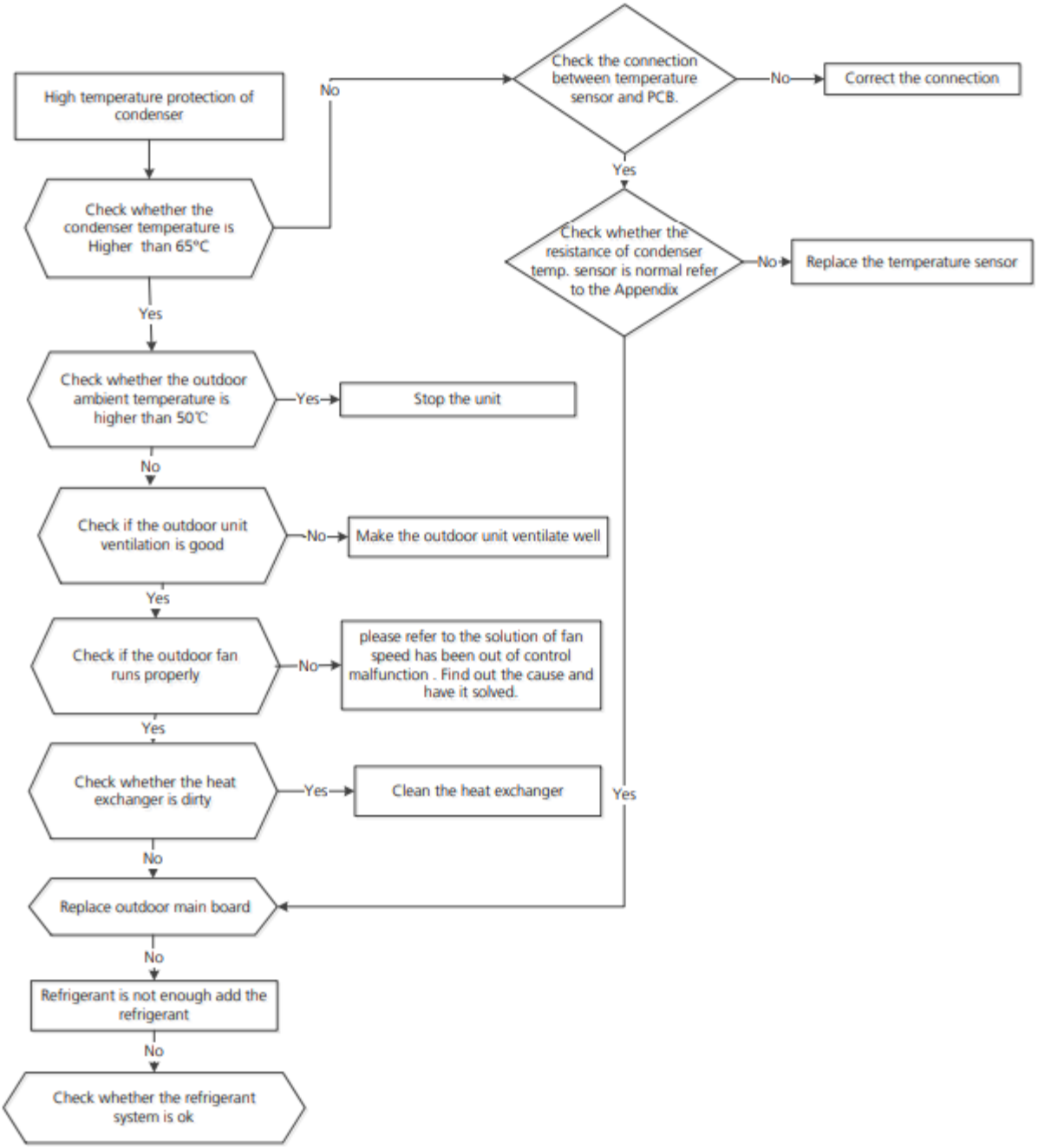
PC 0A: High temperature protection of condenser diagnosis and solution.

Description: The unit will stop when the condenser temperature is higher than 65°C, and runs again when it is less than 52°C.

Recommended parts to prepare:

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

Troubleshooting and repair:



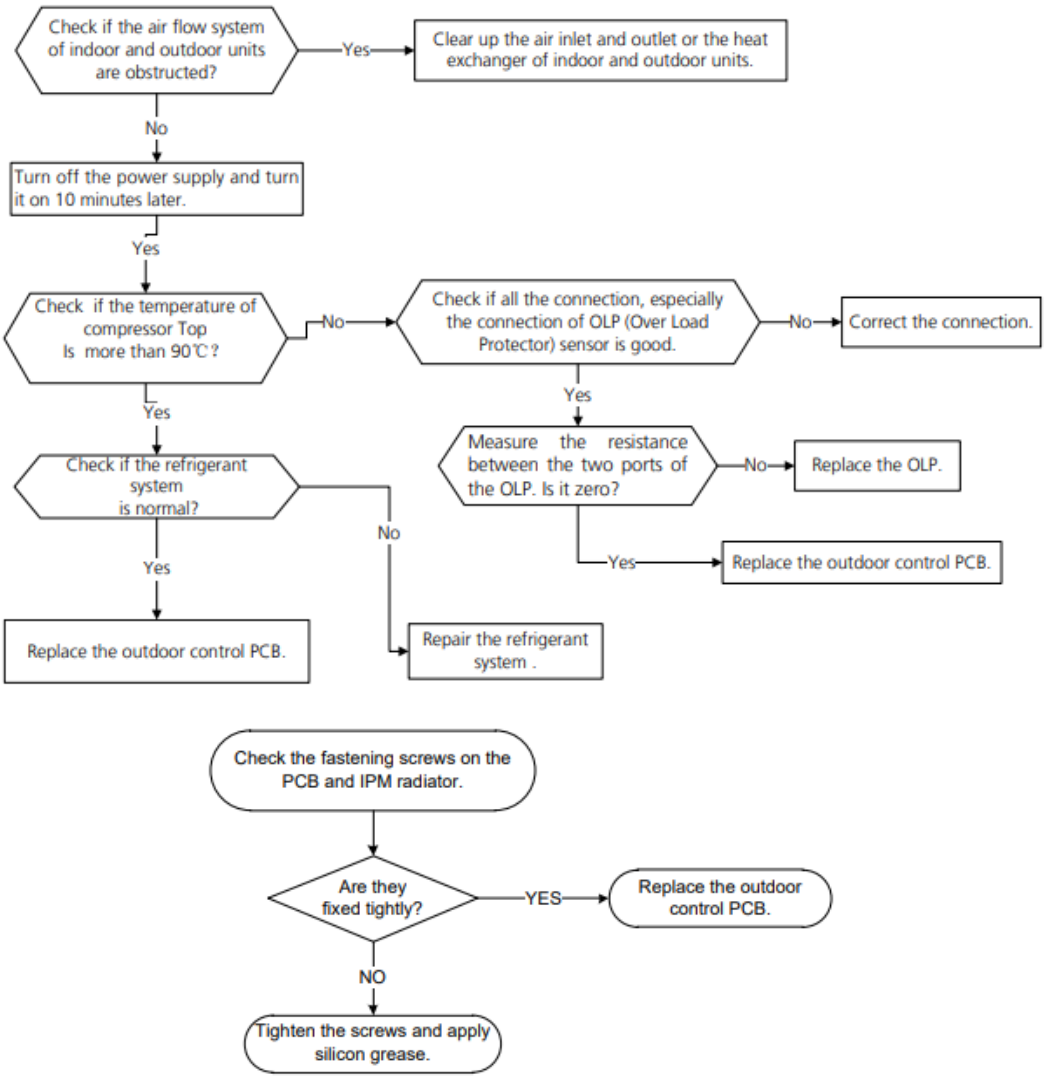
PC 02/ LC 06: Compressor top (or IPM) temp. protection diagnosis and solution.

Description: For some models with an overload protector, if the sampling voltage is not 5V, the LED will display a fault code. If the temperature of the IPM module is higher than a certain value, the LED will display a fault code. Models without an 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:



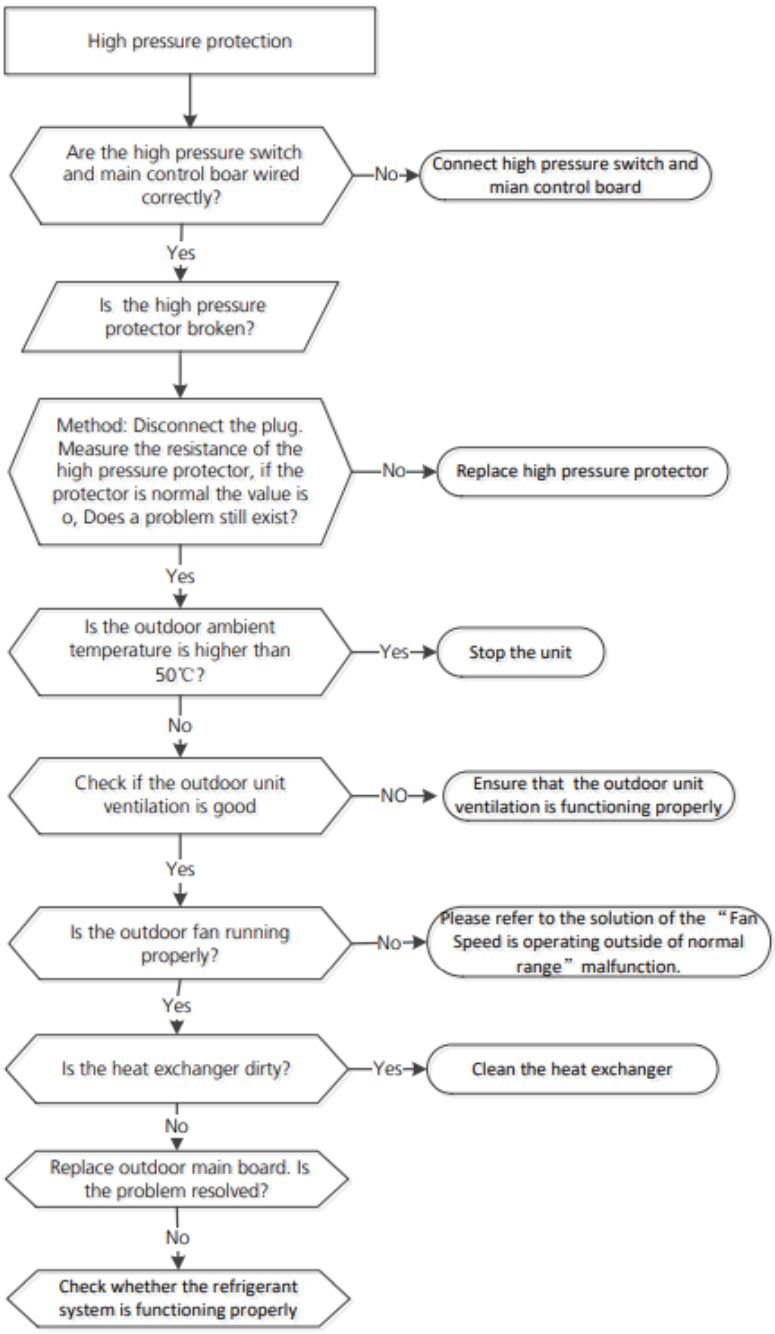
PC 30: System high pressure protection diagnosis and solution.

Description: The outdoor pressure switch cuts off the system because of high pressure (being higher than 638PSI (4.4MPA)) .

Recommended parts to prepare:

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

Troubleshooting and repair:



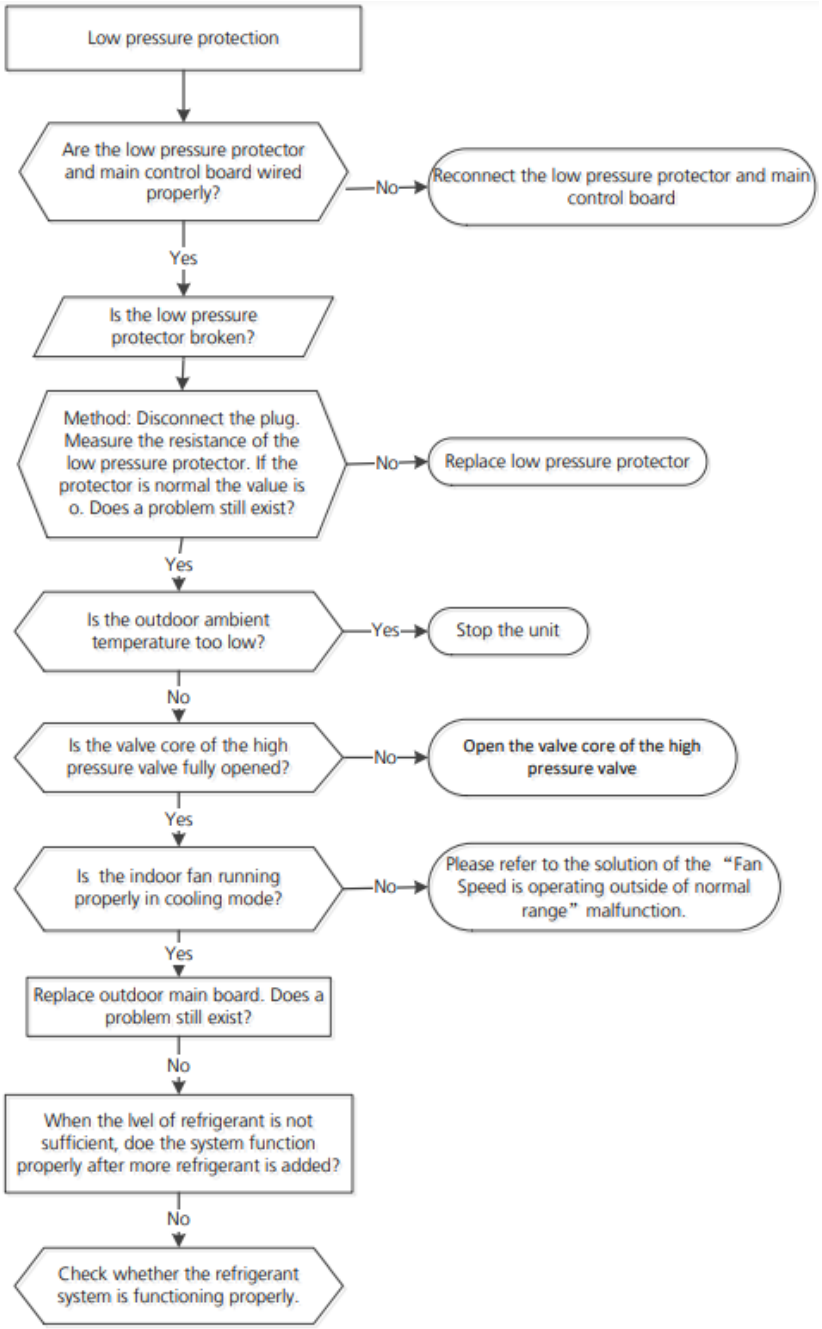
PC 31: System low pressure protection diagnosis and solution.

Description: The outdoor pressure switch cuts off the system because of low pressure (being lower than 18.85PSI (0.13MPA)) .

Recommended parts to prepare:

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

Troubleshooting and repair:



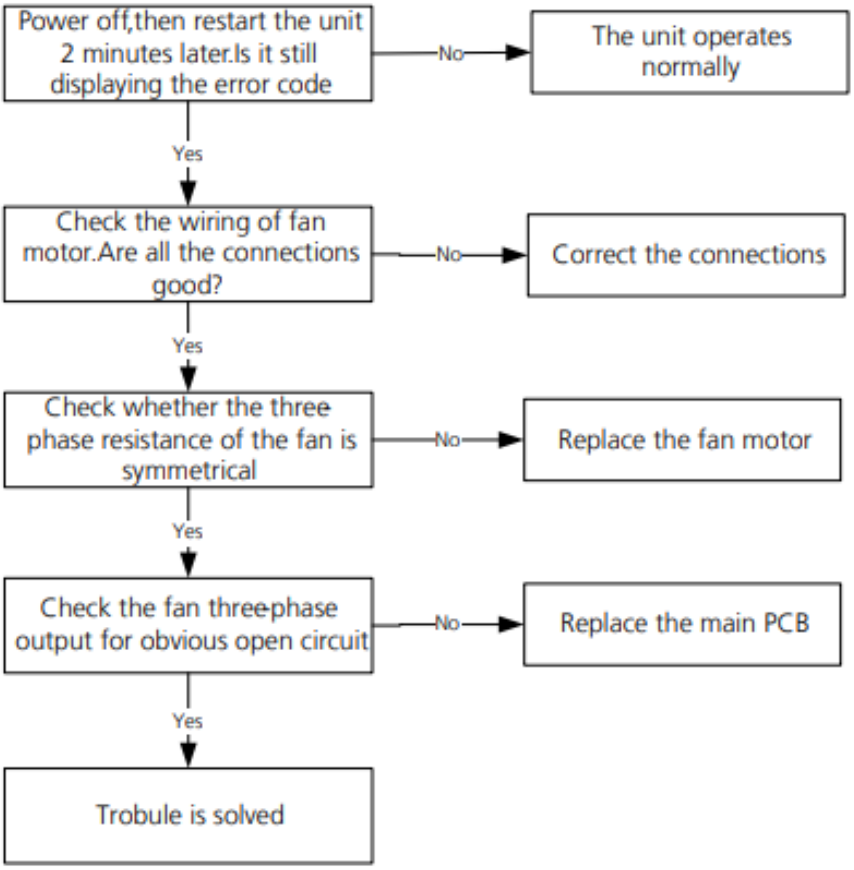
EC 72: Lack phase failure of the outdoor DC fan motor diagnosis and solution.

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 an error code.

Recommended parts to prepare:

- Connection wires
- Fan motor
- Outdoor PCB

Troubleshooting and repair:



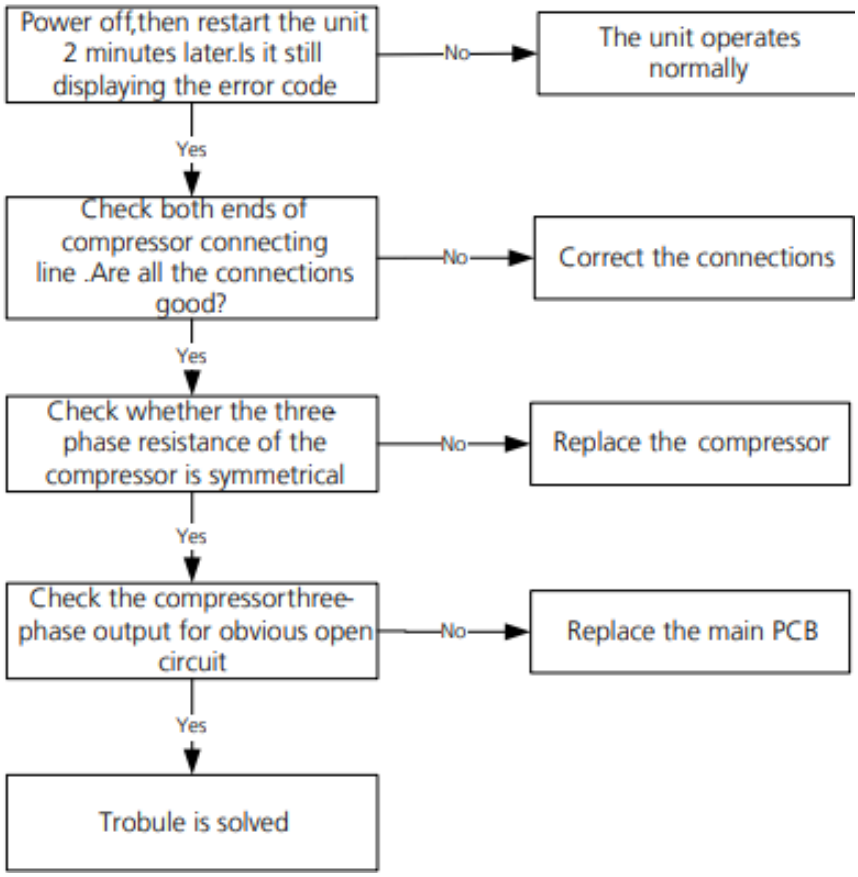
PC 43: ODU compressor lack phase protection diagnosis and solution.

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 an error code.

Recommended parts to prepare:

- Connection wires
- Compressor
- Outdoor PCB

Troubleshooting and repair:



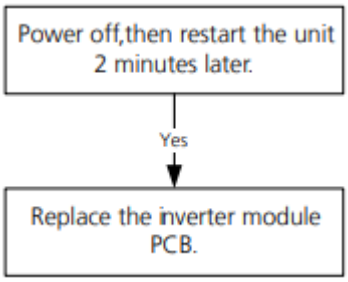
PC 45: ODU IR chip drive failure diagnosis and solution.

Description: When the IR chip detects its own parameter error, the LED displays the fault code when powered on.

Recommended parts to prepare:

- Inverter module PCB

Troubleshooting and repair:



CE: Automatic correction of wiring/piping error.

Press the "check switch" on the outdoor units PCB board for 5 seconds until the LED displays "CE" which means this function is working. Approximately 5-10 minutes after the switch is pressed, the "CE" will disappear and the wiring/piping error will be corrected.

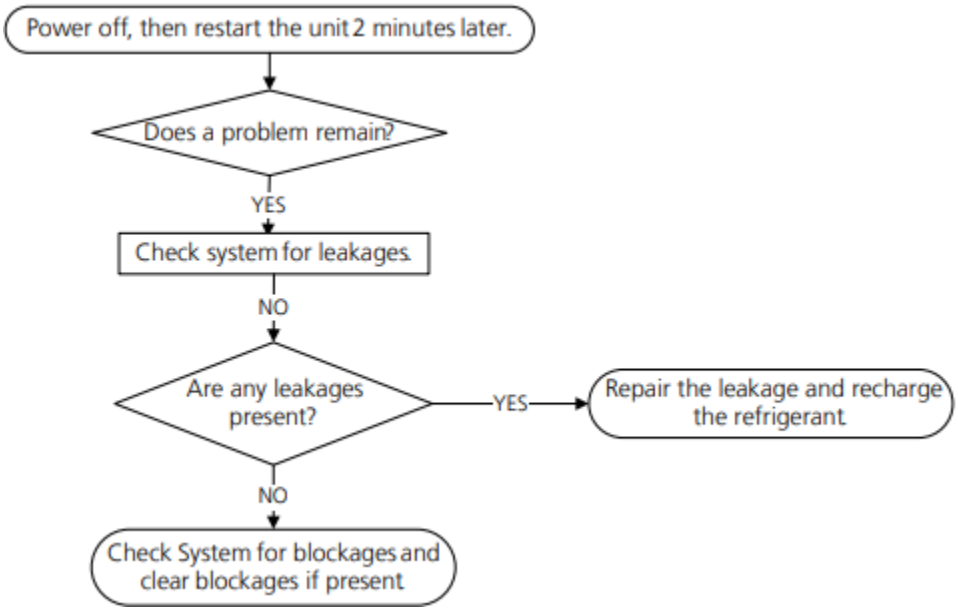
EH C1: Refrigerant sensor detects leakage or working condition of the refrigerant sensor is out of range and leakage is detected diagnosis ans solution.

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

Recommended parts to prepare:

- Additional refrigerant

Troubleshooting and repair:



EC 55: ODU IPM module temperature sensor malfunction diagnosis and solution.

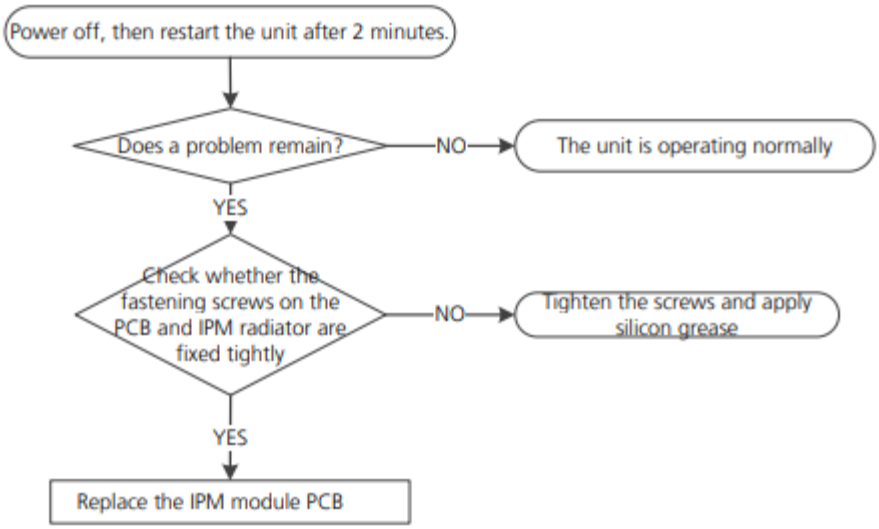
Description: If the sampling voltage is 0V or 5V, the LED displays a fault code.

Recommended parts to prepare:

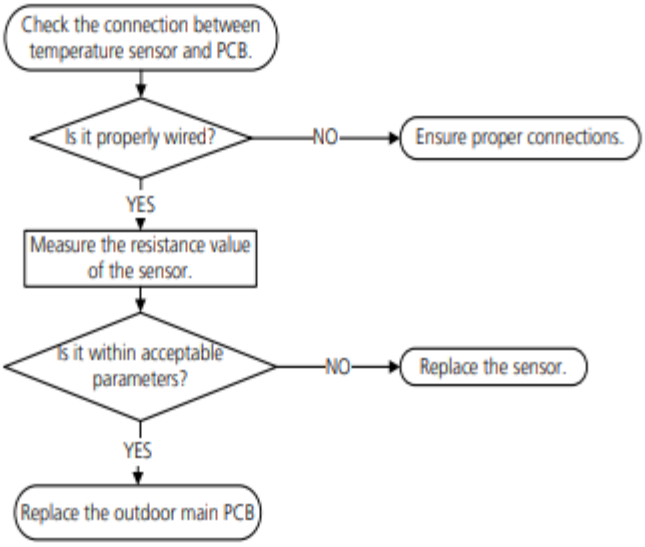
- IPM module PCB
- Connection wires
- Sensors
- Outdoor main PCB

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,



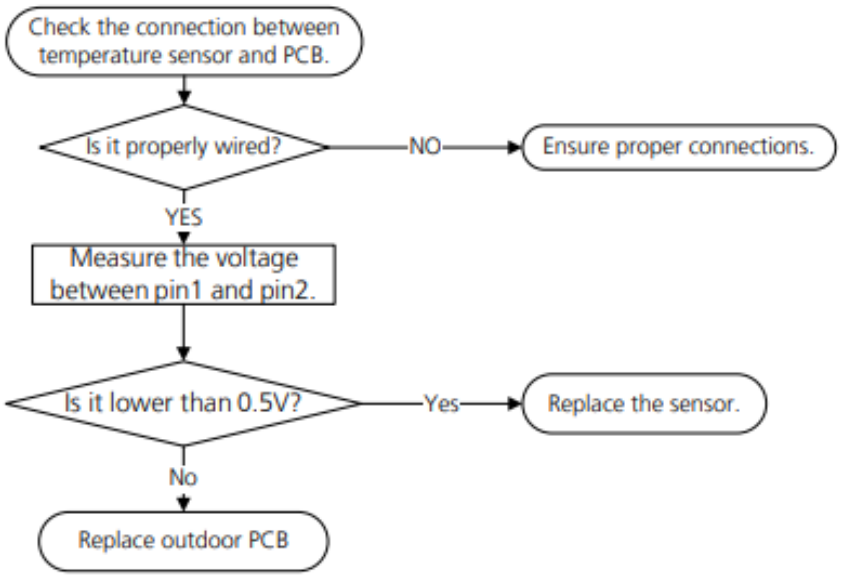
EC 5C: Pressure sensor failure diagnosis and solution.

Description: If the sampling voltage is lower than 2V or higher than 254V.

Recommended parts to prepare:

- Connection wires
- Sensor
- Outdoor PCB

Troubleshooting and repair:



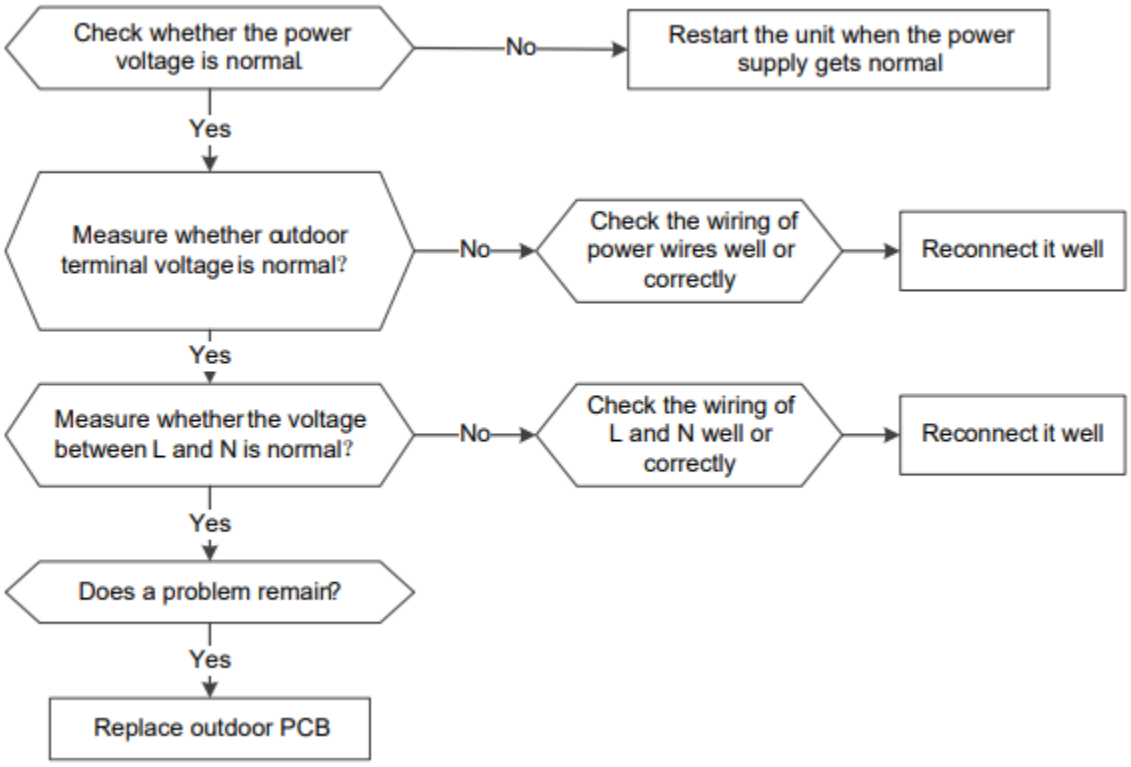
PC 13: The AC power is cut off or the AC voltage detection circuit fails diagnosis and solution.

Description: The machine equipped safety shut-off has detected a power outage from the main power.

Recommended parts to prepare:

- Outdoor PCB

Troubleshooting and repair:



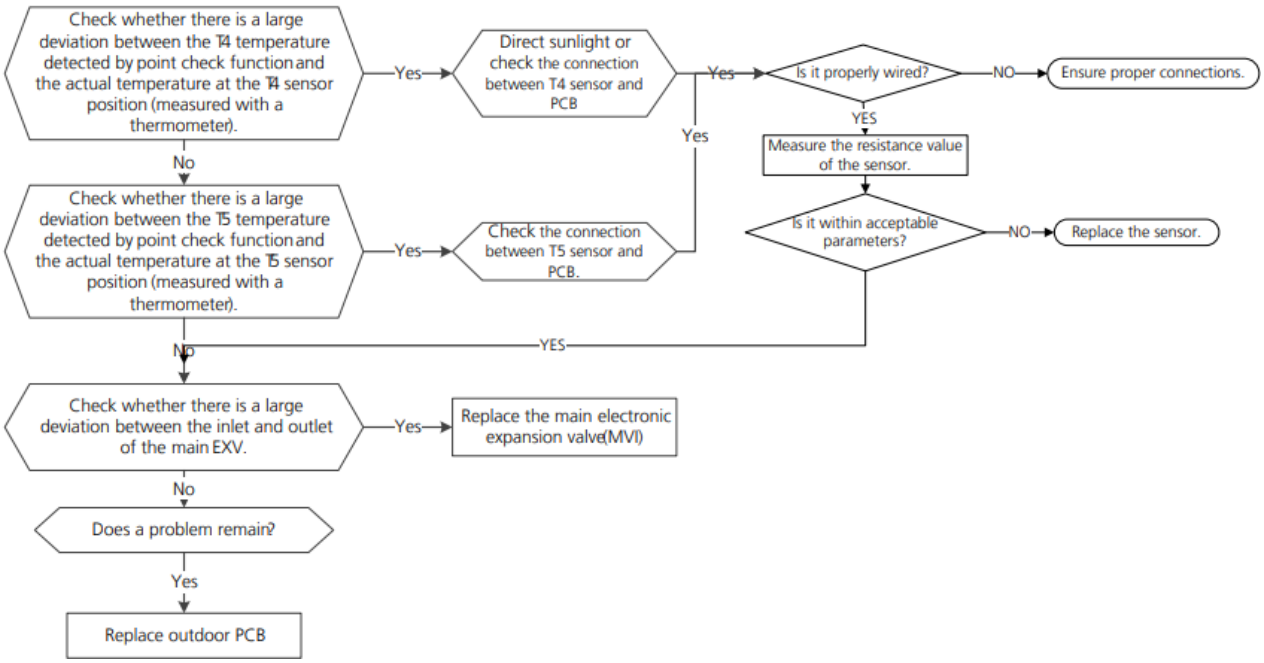
PC A1: Condensation protection of refrigerant pip diagnosis and solution.

Description: If the outdoor ambient temperature is higher than a certain set value of the refrigerant pipe temperature for a period of time, the LED displays a fault code.

Recommended parts to prepare:

- T4 sensor
- T5 sensor
- Main EXV
- Outdoor PCB

Troubleshooting and repair:



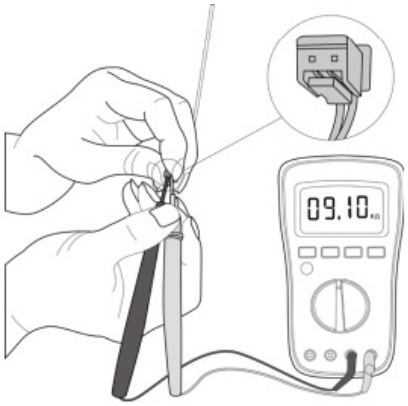
5.5 Check Procedures

WARNING

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

Temperature Sensor Check:

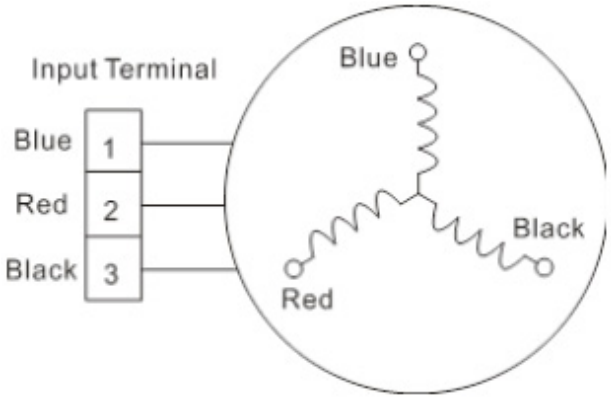
1. Disconnect the temperature sensor from the PCB.
2. Measure the resistance value of the sensor using a multi-meter.
3. Check corresponding temperature sensor resistance value table.



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

Compressor Check:

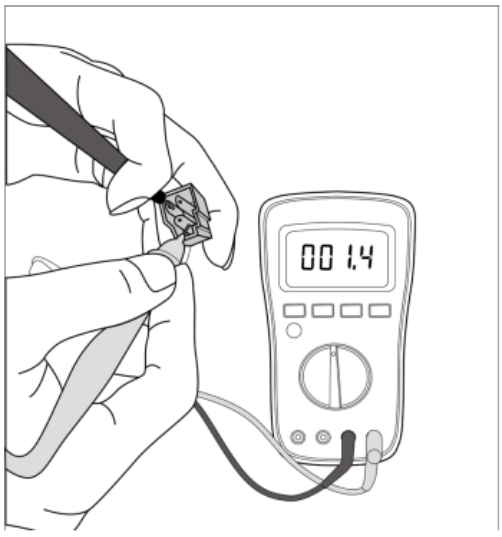
1. Disconnect the compressor power cord from the outdoor PCB.
2. Measure the resistance value of each winding using a multi-meter.
3. Check the resistance value of each winding in the following table.



Resistance Value	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 for reference only, actual condition and specific values 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.

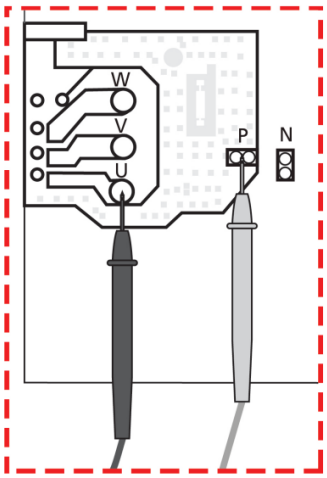
1. Turn off the outdoor unit and disconnect the power supply.
2. Discharge electronic capacitors and ensure all energy-storage units have been discharged.
3. Disassemble the outdoor PCB or disassemble the IPM board.
4. Measure the resistance value between P and U (U,W,N), U(V,W) and N.

Digital tester		Resistance Value	Digital Tester		Resistance Value
(+)Red	(-)Black		(+)Red	(-)Black	
P	N	∞	U	N	∞
	U		V		
	V	(Several MΩ)	W		(Several MΩ)
	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	0.3-0.5V
	V			V	
	W			W	

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



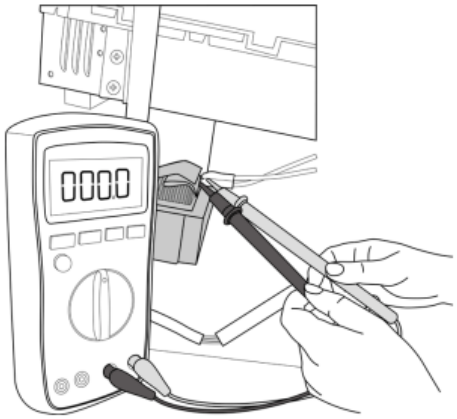
Note: The picture and the value are for reference only, actual condition and specific values may vary.

Normal Voltage of P and N:

208-230V (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 of the reactor. The normal resistance should be around 0.1 ohm and if not the reactor has a malfunction.



4-Way Valve Check:

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

EXV (EEV) 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 Winding	Normal Value
Red-Blue	About 50Ω
Red-Yellow	
Brown-Orange	
Brown-White	

Temperature Sensor Resistance Value Table (°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	1.171
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			

6 TEMPERATURE SENSOR RESISTANCE TABLE

Other Temperature Sensor 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	1.89627	107	225	0.51426
-12	10	70.1698	28	82	8.71983	68	154	1.83003	108	226	0.49989
-11	12	66.0898	29	84	8.3356	69	156	1.76647	109	228	0.486
-10	14	62.2756	30	86	7.97078	70	158	1.70547	110	230	0.47256
-9	16	58.7079	31	88	7.62411	71	160	1.64691	111	232	0.45957
-8	18	56.3694	32	90	7.29464	72	162	1.59068	112	234	0.44699
-7	19	52.2438	33	91	6.98142	73	163	1.53668	113	235	0.43482
-6	21	49.3161	34	93	6.68355	74	165	1.48481	114	237	0.42304
-5	23	46.5725	35	95	6.40021	75	167	1.43498	115	239	0.41164
-4	25	44	36	97	6.13059	76	169	1.38703	116	241	0.4006
-3	27	41.5878	37	99	5.87359	77	171	1.34105	117	243	0.38991
-2	28	39.8239	38	100	5.62961	78	172	1.29078	118	244	0.37956
-1	30	37.1988	39	102	5.3689	79	174	1.25423	119	246	0.36954
0	32	35.2024	40	104	5.17519	80	176	1.2133	120	248	0.35982
1	34	33.3269	41	106	4.96392	81	178	1.17393	121	250	0.35042
2	36	31.5635	42	108	4.76253	82	180	1.13604	122	252	0.3413
3	37	29.9058	43	109	4.5705	83	181	1.09958	123	253	0.33246
4	39	28.3459	44	111	4.38736	84	183	1.06448	124	255	0.3239
5	41	26.8778	45	113	4.21263	85	185	1.03069	125	257	0.31559
6	43	25.4954	46	115	4.04589	86	187	0.99815	126	259	0.30754
7	45	24.1932	47	117	3.88673	87	189	0.96681	127	261	0.29974
8	46	22.5662	48	118	3.73476	88	190	0.93662	128	262	0.29216
9	48	21.8094	49	120	3.58962	89	192	0.90753	129	264	0.28482
10	50	20.7184	50	122	3.45097	90	194	0.8795	130	266	0.2777
11	52	19.6891	51	124	3.31847	91	196	0.85248	131	268	0.27078
12	54	18.7177	52	126	3.19183	92	198	0.82643	132	270	0.26408
13	55	17.8005	53	127	3.07075	93	199	0.80132	133	271	0.25757
14	57	16.9341	54	129	2.95896	94	201	0.77709	134	273	0.25125
15	59	16.1156	55	131	2.84421	95	203	0.7537	135	275	0.24512
16	61	15.3418	56	133	2.73823	96	205	0.73119	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	2.4467	99	210	0.64862	139	282	0.22231

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	14401	10	50
68.615	0.69	9.95	-57	-70.6	1022.8	10.23	148.34	11	51.8
72.402	.072	10.50	-56	-68.8	1053.3	10.53	152.76	12	53.6
76.354	0.76	11.07	-55	-67	1084.5	10.85	157.29	13	55.4
80.478	0.80	11.67	-54	-65.2	1116.4	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	1182.3	11.82	171.47	16	60.8
93.923	0.94	13.62	-51	-59.8	1216.3	12.16	176.40	17	62.6
98.781	0.99	14.33	-50	-58	1251.1	12.51	181.45	18	64.4
103.84	1.04	15.06	-49	-56.2	1286.6	12.87	186.60	19	66.2
109.1	1.09	15.82	-48	-54.4	1322.8	13.23	191.85	20	68
114.56	1.15	16.61	-47	-52.6	1359.9	13.60	197.23	21	69.8
120.25	1.20	17.44	-46	-50.8	1397.7	13.98	202.71	22	71.6
126.15	1.26	18.30	-45	-49	1436.3	14.36	208.31	23	73.4
132.28	1.32	19.18	-44	-47.2	1475.7	14.76	214.02	24	75.2
138.64	1.39	20.11	-43	-45.4	1515.9	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	1598.9	15.99	231.89	27	80.6
159.18	1.59	23.09	-40	-40	1641.6	16.42	238.09	28	82.4
166.54	1.67	24.15	-39	-38.2	1685.2	16.85	244.41	29	84.2
174.15	1.74	25.26	-38	-36.4	1729.7	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	1821.3	18.21	264.15	32	89.6
198.65	1.99	28.81	-35	-31	1868.4	18.68	270.98	33	91.4
207.39	2.07	30.08	-34	-29.2	1916.5	19.17	277.95	34	93.2
216.42	2.16	31.39	-33	-27.4	1965.6	19.66	285.08	35	95
225.76	2.26	32.74	-32	-25.6	2015.5	20.16	292.31	36	96.8
235.41	2.35	34.14	-31	-23.8	2066.5	20.67	299.71	37	98.6
245.37	2.45	35.59	-30	-22	2118.4	21.18	307.24	38	100.4
255.67	2.56	37.08	-29	-20.2	2171.3	21.71	314.19	39	102.2
266.29	2.66	38.62	-28	-18.4	2225.2	22.25	322.73	40	104
277.25	2.77	40.21	-27	-16.6	2280.2	22.80	330.70	41	105.8
288.56	2.89	41.85	-26	-14.8	2336.1	23.36	38.81	42	107.6
300.22	3.00	43.54	-25	-13	2393.2	23.93	347.09	43	109.4
312.24	3.12	45.28	-24	-11.2	2451.3	24.51	355.52	44	111.2
324.63	3.25	47.08	-23	-9.4	2510.4	25.10	364.09	45	113
337.39	3.37	48.93	-22	-7.6	2570.7	25.71	372.84	46	114.8
350.54	3.51	50.84	-21	-5.8	2632.1	26.32	381.74	47	116.6
364.08	3.64	52.80	-20	-4	2694.7	26.95	390.82	48	118.4
378.02	3.78	54.83	-19	-2.2	2758.33	27.58	400.04	49	120.2
392.37	3.92	56.91	-18	-0.4	2823.2	28.23	409.46	50	122
407.13	4.07	59.05	-17	1.4	2889.3	28.89	419.04	51	123.8

System Pressure Table-R454B Cont.

Pressure			Temperature		Pressure			Temperature	
Kpa	Bar	PSI	°C	°F	Kpa	Bar	PSI	°C	°F
422.31	4.22	61.25	-16	3.2	2956.5	29.57	428.79	52	125.6
437.92	4.38	63.5	-15	5	3025	30.25	438.72	53	127.4
453.98	4.54	65.84	-14	6.8	3094.7	30.95	448.83	54	129.2
470.47	4.70	68.23	-13	8.6	3165.7	31.66	459.13	55	131
487.43	4.87	70.69	-12	10.4	3238.1	32.38	469.63	56	132.8
504.84	5.05	73.22	-11	12.2	3311.7	33.12	480.30	57	134.6
522.73	5.23	75.81	-10	14	3386.7	33.87	491.18	58	136.4
541.1	5.41	78.48	-9	15.8	3463	34.63	502.25	59	138.2
559.95	5.60	81.21	-8	17.6	3540.7	35.41	513.52	60	140
579.31	5.79	84.02	-7	19.4	3619.9	36.20	525.00	61	141.8
599.16	5.99	86.90	-6	21.2	3700.5	37.01	536.69	62	143.6
619.54	6.20	89.85	-5	23	3782.7	37.83	548.61	63	145.4
640.43	6.40	92.88	-4	24.8	3866.3	38.66	560.74	64	147.2
661.86	6.62	95.99	-3	26.6	3951.5	39.52	573.10	65	149
683.82	6.84	99.18	-2	28.4	4038.3	40.38	585.69	66	450.28
706.34	7.06	102.44	-1	30.2	4126.8	41.27	598.52	67	152.6
729.41	7.29	105.79	0	32	4217	42.17	611.60	68	154.4
753.06	7.53	109.22	1	33.8	4309	43.09	624.95	69	156.2
777.28	7.77	112.73	2	35.6	4402.9	44.03	638.56	70	158
802.08	8.02	116.33	3	37.4	4498.7	44.99	652.46	71	159.8
827.47	8.27	120.01	4	39.2	4596.5	45.97	666.64	72	161.6
853.49	8.53	123.78	5	41	4696.5	46.97	681.15	73	163.4
880.11	8.80	127.64	6	42.8	4798.9	47.99	696.00	74	165.5
907.35	9.07	131.60	7	44.6	4904.1	49.04	711.25	75	167

MRCOOL®

COMFORT MADE SIMPLE

Olympus Series Multi-Zone Mini-Split System

Service Manual

The design and specifications of this product and/or manual are subject to change without prior notice.
Consult with the sales agency or manufacturer for details.