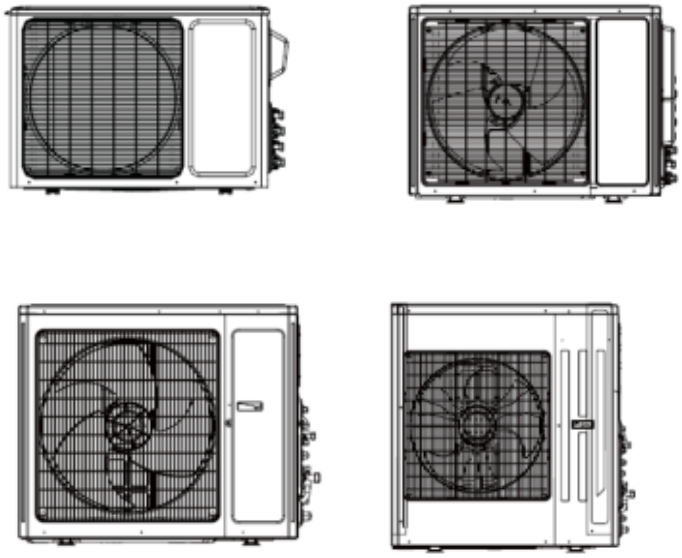
Service Manual

"M" SERIES
INVERTER-DRIVEN
AIR CONDITIONING
UNITS

Type	Model
OUTDOOR UNIT	DHM18CMB21S DHM24CMB21S DHM30CMB21S DHM36CMB21S DHM42CMB21S



IMPORTANT:

READ AND UNDERSTAND THIS MANUAL BEFORE USING THIS INVERTER-DRIVEN AIR CONDITIONING UNIT. KEEP THIS MANUAL FOR FUTURE REFERENCE.

Important Notice

- Johnson Controls, Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls, Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls, Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This inverter air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls, Inc.
- This inverter-driven (cooling or heat pump) air conditioning unit will be operated and serviced in the United States of America and comes with all required Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this inverter-driven (cooling or heat pump) air conditioning unit which you operate, as well for other models.
- This inverter-driven (cooling or heat pump) air conditioning unit has been designed for a specific temperature range. For optimum performance and long life, operate this unit within range limits.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

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1. Introduction

This manual concentrates on inverter-driven cooling or heat pump air conditioning units. Read this manual carefully before installation.

This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

2. Important Safety Instructions

Safety Messages

	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. *Refer back to these safety instructions as needed.*

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic ‘’Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls, Inc. will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they…
  - May create hazards which could result in death, serious injury or equipment damage.
  - Will void product warranties.
  - May invalidate product regulatory certifications.
  - May violate OSHA standards.

NOTICE	Take the following precautions to reduce the risk of property damage.

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of condensate can overflow from the condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- When a wireless zone controller is used, locate at a distance of at least 3.3 ft. (approximately 1 meter) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain boss. If you do, you may have water flowing back which may cause leaks.
- Be sure the condensate hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

⚠WARNING	To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into…
  - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
  - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
  - Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
  - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
  - A snowy area (only for heat pump model): Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
  - Explosive or flammable atmosphere
  - Where fire, oil, steam, or powder can directly enter the unit, such as in close proximity or directly above a kitchen stove.
  - Where oil (including machinery oil) may be present.
  - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or hot spring.
  - Where dense, salt-laden airflow is heavy, such as in coastal regions.
  - Where the air quality is of high acidity.
  - Where harmful gases can be generated from decomposition.

- Do not position the condensate pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the condensate pipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If condensate piping becomes clogged, moisture can back up and can drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a run test to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.
- During transportation, do not allow the backrest of the forklift to make contact with the unit, otherwise, it may cause damage to the heat exchanger and also may cause injury when stopped or started suddenly.
- Remove gas inside the closing pipe when the brazing work is performed. If the brazing filler metal is melted with remaining gas inside, the pipes will be blown off and it may cause injury.
- Be sure to use nitrogen gas for an airtight test. If other gases such as oxygen gas, acetylene gas or fluorocarbon gas are accidentally used, it may cause explosion or gas intoxication.

After installation work for the system has been completed, explain the “Safety Precautions,” the proper use and maintenance of the unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions

⚠WARNING	To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit’s intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit’s faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country’s requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.42 kg/m3 based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- The design pressure for this product is 601 psi (4.15MPa). The pressure of R410A refrigerant is 1.4 times higher than that of the refrigerant R22. Therefore, the refrigerant piping for R410A shall be thicker than that for R22. Make sure to use the specified refrigerant piping. If not, the refrigerant piping may rupture due to an excessive refrigerant pressure. Besides, pay attention to the piping thickness when using copper refrigerant piping. The thickness of copper refrigerant piping differs depending on its material.
- The refrigerant R410A is adopted. The refrigerant oil tends to be affected by foreign matters such as moisture, oxide film, (or fat). Perform the installation work with care to prevent moisture, dust, or different refrigerant from entering the refrigerant cycle. Foreign matter can be introduced into the cycle from such parts as expansion valve and the operation may be unavailable.
- To avoid the possibility of different refrigerant or refrigerant oil being introduced into the cycle, the sizes of the charging connections have been changed from R407C type and R22 type. It is necessary to prepare the appropriate tools before performing the installation work.
- Use refrigerant pipes and joints which are approved for use with R410A.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is

under pressure and never open pressurized system parts.

- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.
- When pipes are removed out from under the piping cover, after the insulation work is completed, cover the gap between the piping cover and pipes by a packing (field-supplied). If the gap is not covered, the unit may be damaged if snow, rain water or small animals enter the unit.
- Do not apply an excessive force to the spindle valve at the end of opening. Otherwise, the spindle valve flies out due to refrigerant pressure. At the run test, fully open the gas and liquid valves, otherwise, these devices will be damaged. (It is closed before shipment.)
- If the arrangement for outdoor units is incorrect, it may cause flowback of the refrigerant and result in failure of the outdoor unit.
- The refrigerant system may be damaged if the slope of the piping connection kit exceeds $\pm 15^{o}$.

Electrical Precautions

⚠WARNING	Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Perform all electrical work in strict accordance with this installation and maintenance manual and all the relevant regulatory standards.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- The new air conditioner may not function normally in the following instances:
  - If electrical power for the new air conditioner is supplied from the same transformer as the device* referred to below.
  - If the power source cables for this device* and the new air conditioner unit are located in close proximity to each other.

    Device*: (Example): A lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor and large-sized switch.

    Regarding the cases mentioned above, surge voltage may be inducted into the power supply cables for the packaged air conditioner due to a rapid change in power consumption of the device and an activation of a switch.

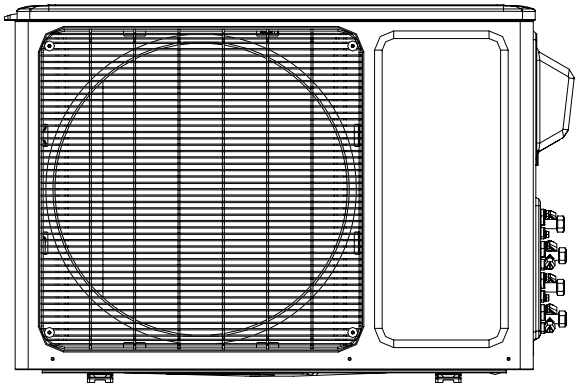
    Check field regulations and standards before performing electrical work in order to protect the power supply for the new air conditioner unit.

- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirments.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After ceasing operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.
- Perform all electrical work in accordance with this manual and in compliance with all regulations and safety standards.
- Do not open a service access cover or panel of an indoor or outdoor unit without first turning OFF the power at the main power supply.
- Residual voltage can cause electric shock. At all times, check for residual voltage after disconnecting from the power source before starting work on the unit.
- This equipment can be installed with a Ground Fault Circuit Breaker (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers/fuses/ overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.

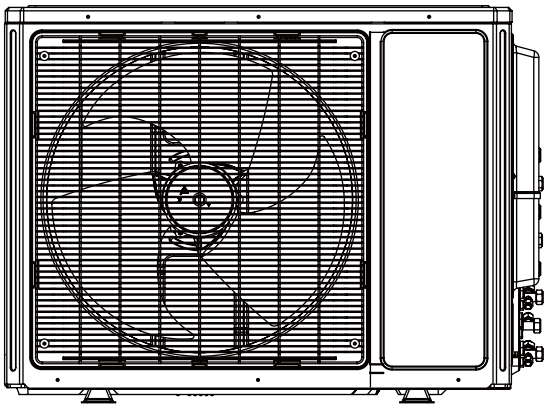
1. Units and Features

Outdoor Unit

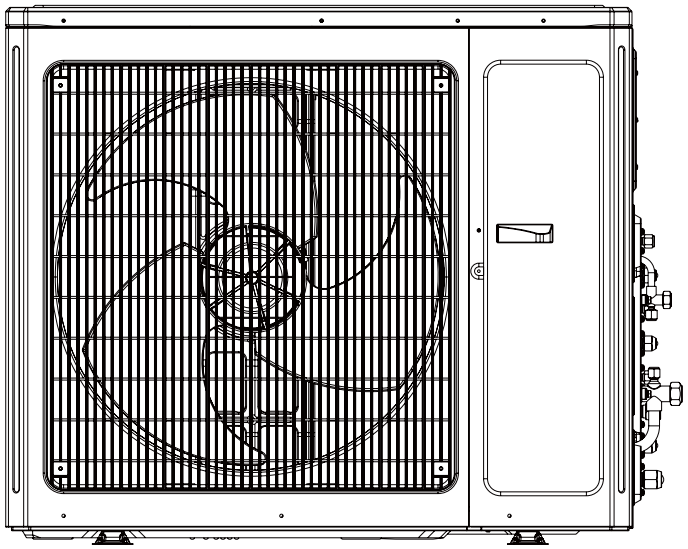
DHM18CMB21S



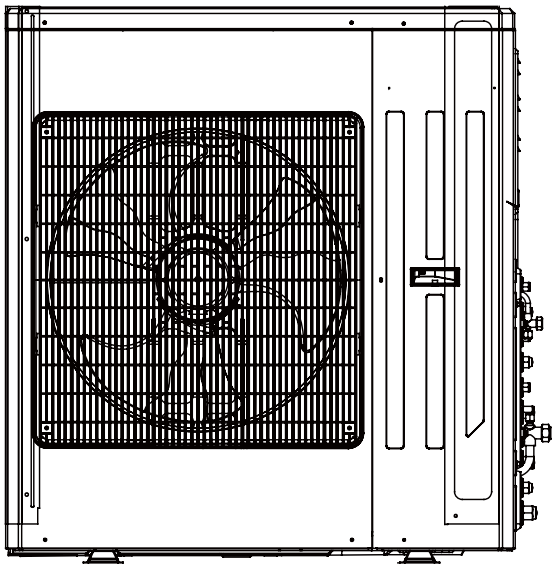
DHM24CMB21S
DHM30CMB21S



DHM36CMB21S



DHM42CMB21S



2. Specifications

Model of Outdoor Unit		DHM18CMB21S	DHM24CMB21S
Compressor Manufacturer/trademark		MITSUBISHI ELECTRIC (GUANGZHOU)COMPRESSOR CO. LTD	MITSUBISHI ELECTRIC (GUANGZHOU)COMPRESSOR CO. LTD
Compressor Model		SNB130FGYMC	TNB220FLHMC
Compressor Oil		PVE/FV50S	PVE/FV50S
Compressor Type		Rotary	Rotary
L.R.A.	A	27	45
Compressor RLA	A	8.4	9.7
Compressor Power Input	W	1245	2200
Overload Protector		1NT11L-6578	CS-7C-1595
Throttling Method		Electron expansion valve	Electron expansion valve
Starting Method		Transducer starting	Transducer starting
Cooling Working Temp Range	ºC	-5 ≤ T ≤ 48	-5 ≤ T ≤ 48
Heating Working Temp Range	ºC	-15 ≤ T ≤ 27	-15 ≤ T ≤ 27
Condenser	mm	Aluminum fin-copper tube	Aluminum fin-copper tube
Pipe Diameter	mm	Φ7.94	Φ9.52
Coil length (l) X height (H)X coil width (L)	mm	770X38X550	890X44X660
Fan Motor Speed (rpm) (H/M/L)	rpm	830/670/500	690/600/500
Output of Fan Motor	W	60	60
Fan Motor RLA	A	0.54	0.59
Fan Motor Capacitor	μF	3.5	3.5
Air Flow Volume of Outdoor Unit	m^3/h	2600/2300/1600	3300/2900/2400
Fan Type		Axial-flow	Axial-flow
Fan Diameter	mm	Φ445	Φ520
Defrosting Method		Automatic Defrosting	Automatic Defrosting
Climate Type		T1	T1
Isolation		I	I
Moisture Protection		IP24	IP24
Permissible Excessive Operating Pressure for the Discharge Side(MPa)	MPa	4.3	4.3
Permissible Excessive Operating Pressure for the Suction Side(MPa)	MPa	2.5	2.5
Sound Pressure Level (H)	dB (A)	56	58
Sound Power Level (H)	dB (A)	66	68
Dimension (WXHXD)	mm	899X596X378	946X700X396
Dimension of Carton Box (LXWXH)	mm	945X417X630	1029X458X750
Dimension of Package (LXWXH)	mm	948X420X645	1032X461X765
Net Weight/Gross Weight	kg	43/48	61/66
Refrigerant Charge	kg	R410A/1.35	R410A/2.2

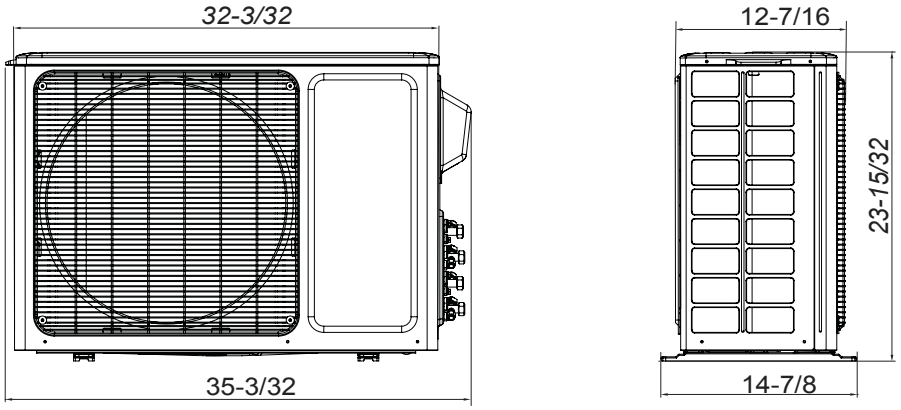
The above data is subject to change without notice. Please refer to the nameplate of the unit.

Model of Outdoor Unit		DHM30CMB21S	DHM36CMB21S	DHM42CMB21S
Compressor Manufacturer/trademark		"MITSUBISHI ELECTRIC (GUANGZHOU) COMPRESSOR CO. LTD"	MITSUBISHI ELECTRIC(GUANGZHOU) COMPRESSOR CO.LTD	MITSUBISHI ELECTRIC(GUANGZHOU) COMPRESSOR CO.LTD
Compressor Model		TNB220FLHMC	TNB220FLHMC	TNB306FPGMC
Compressor Oil		PVE/FV50S	PVE/FV50S	PVE(FV50S)
Compressor Type		Rotary	Inverter Scroll	Inverter Scroll
L.R.A.	A	45	/	/
Compressor RLA	A	9.7	21	13.5
Compressor Power Input	W	2200	2200	3010
Overload Protector		CS-7C-1595	internal protect units	CS01F272H01
Throttling Method		Electron expansion valve	Electronic Expansion Valve	Electronic Expansion Valve
Starting Method		Transducer starting	Transducer starting	Transducer starting
Cooling Working Temp Range	ºC	-5 ≤ T ≤ 48	-5 ≤ T ≤ 48	-5 ≤ T ≤ 48
Heating Working Temp Range	ºC	-15 ≤ T ≤ 27	-15 ≤ T ≤ 27	-15 ≤ T ≤ 27
Condenser	mm	Aluminum fin-copper tube	Aluminum fin-copper tube	Aluminum fin-copper tube
Pipe Diameter	mm	Φ9.52	Φ7.94	Φ7.94
Coil length (l) X height (H) X coil width (L)	mm	890X44X660	908.4X38.1X748	1022.3X38.1X1056
Fan Motor Speed (H/M/L)	rpm	690/600/500	820	860
Output of Fan Motor	W	60	120	140
Fan Motor RLA	A	0.59	/	1.1
Fan Motor Capacitor	μF	3.5	/	7
Air Flow Volume of Outdoor Unit	m^3/h	3300/2900/2400	3700	5500
Fan Type		Axial-flow	Axial-flow	Axial-flow
Fan Diameter	mm	Φ520	Φ552	Φ570
Defrosting Method		Automatic Defrosting	Automatic Defrosting	Automatic Defrosting
Climate Type		T1	T1	T1
Isolation		I	I	I
Moisture Protection		IP24	IPX4	IPX4
Permissible Excessive Operating Pressure for the Discharge Side(MPa)	MPa	4.3	4.3	4.3
Permissible Excessive Operating Pressure for the Suction Side(MPa)	MPa	2.5	2.5	2.5
Sound Pressure Level (H)	dB (A)	59	59	58
Sound Power Level (H)	dB (A)	69	69	68
Dimension (WXHXD)	mm	946X700X396	920X427X789	1015X440X1103
Dimension of Carton Box (LXWXH)	mm	1029X458X750	1080X485X840	1155X480X1115
Dimension of Package (LXWXH)	mm	1032X461X765	1083X488X855	1158X493X1235
Net Weight/Gross Weight	kg	62/67	69/74	102/112
Refrigerant Charge	kg	R410A/2.2	R410A/2.9	R410A/4.8

The above data is subject to change without notice. Please refer to the nameplate of the unit.

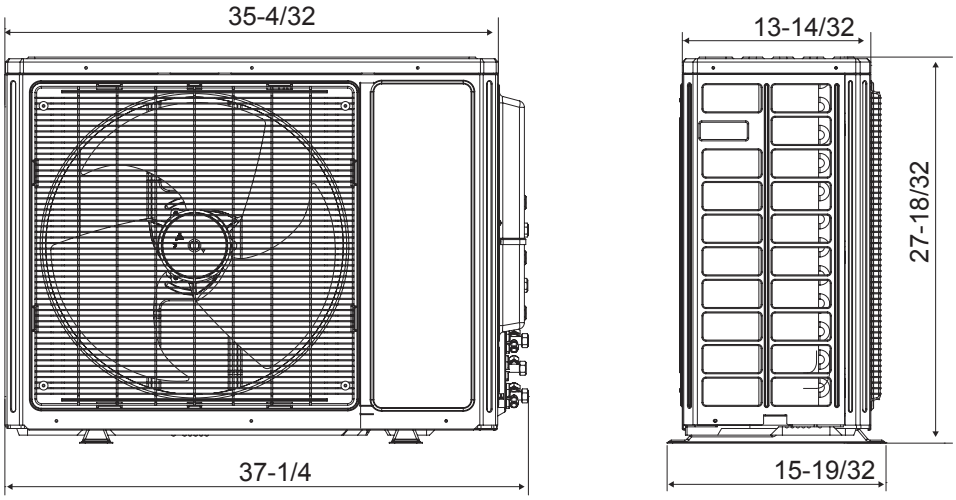
3. Construction Views

(1)DHM18CMB21S



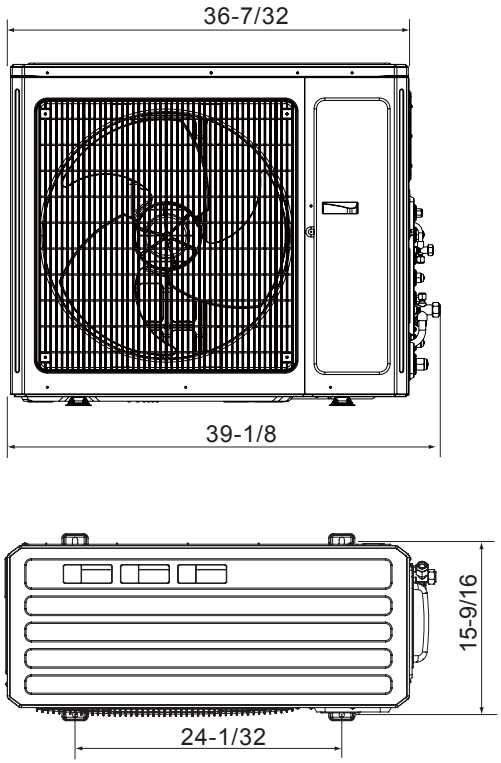
Unit:inch

(2)DHM24CMB21S DHM30CMB21S



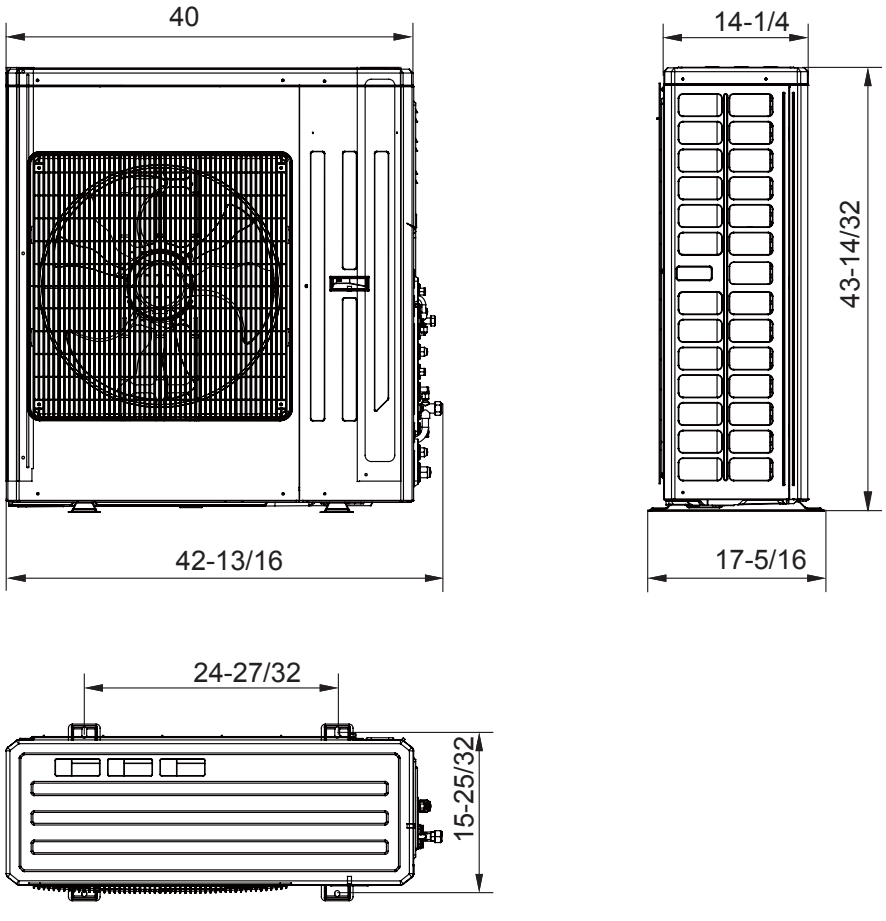
Unit:inch

(3)DHM36CMB21S



Unit:inch

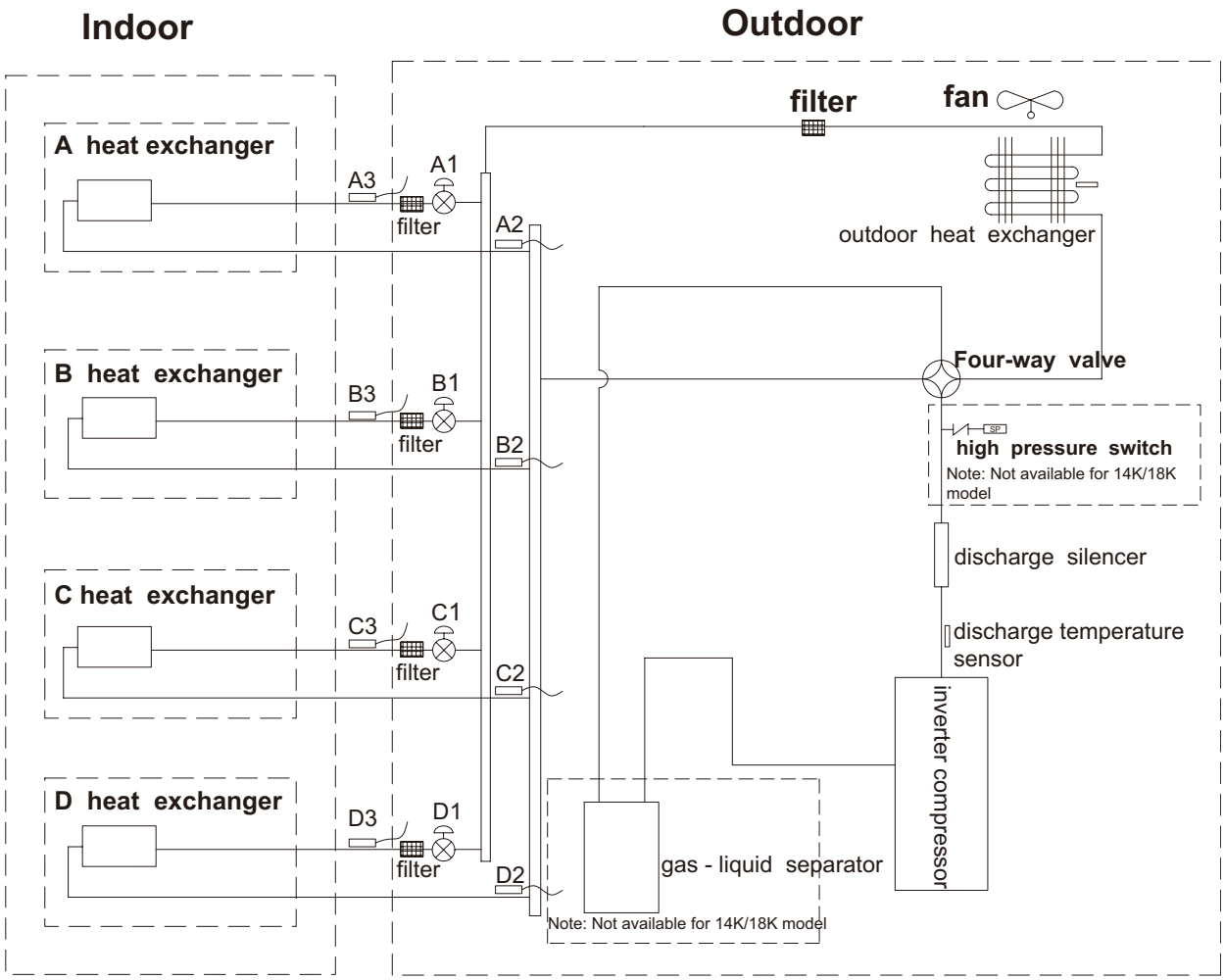
(4)DHM42CMB21S



Unit:inch

4. Refrigerant System Diagram

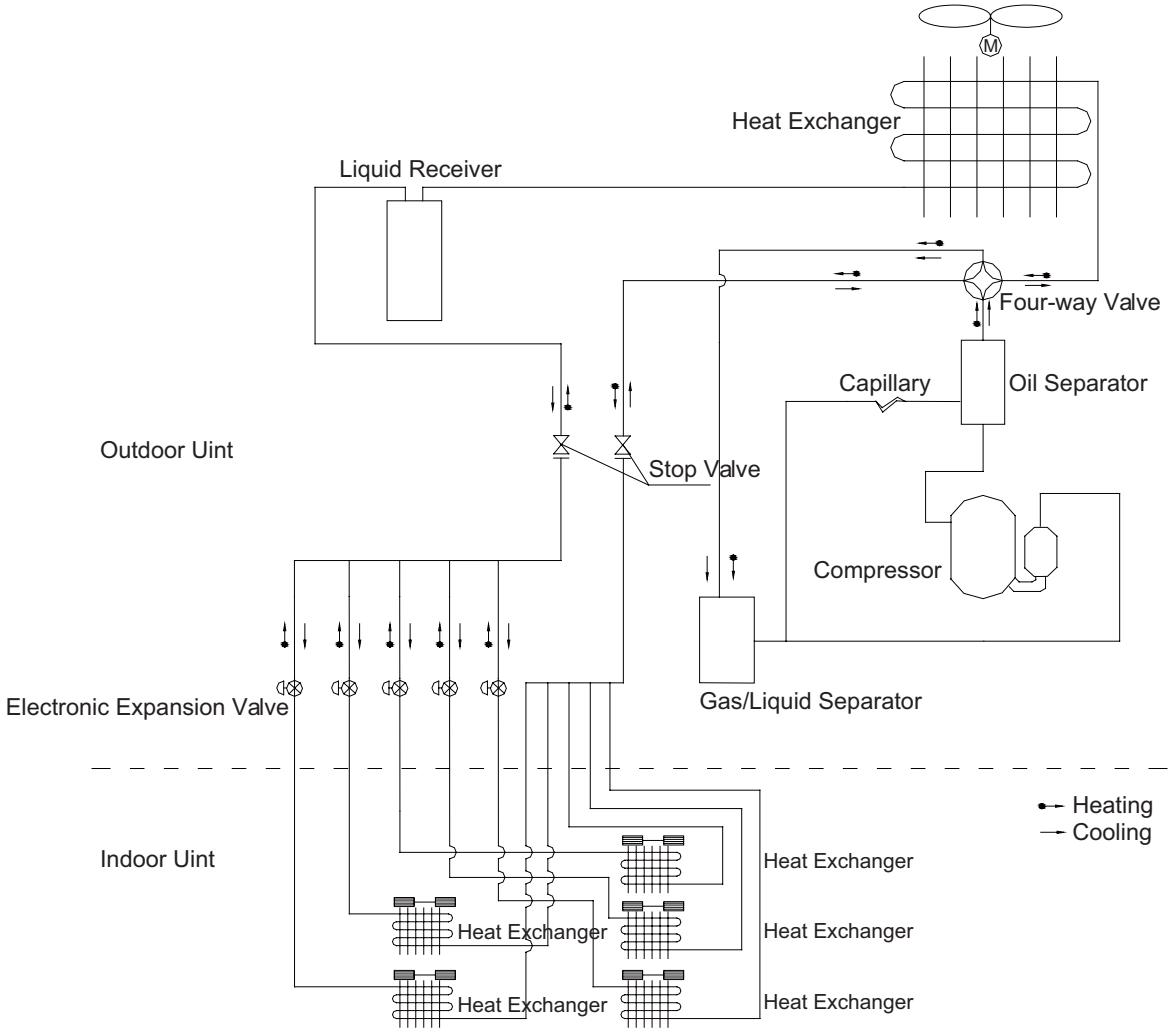
(1)DHM18CMB21S DHM24CMB21S DHM30CMB21S



A1:A- unit electronic expansion valve **B1:B-unit electronic expansion valve**
C1:C-unit electronic expansion valve **D1:D-unit electronic expansion valve**
A2:A-unit gas pipe temperature sensor **B2:B-unit gas pipe temperature sensor**
C2:C-unit gas pipe temperature sensor **D2:D-unit gas pipe temperature sensor**
A3:A- unit liquid pipe temperature sensor **B3:B-unit liquid pipe temperature sensor**
C3:C-unit liquid pipe temperature sensor **D3:D-unit liquid pipe temperature sensor**

(2)DHM36CMB21S DHM42CMB21S

Schematic Diagram of "M" Series Inverter Heat Pump System



Schematic Diagram of "M" Series Inverter Heat Pump System

The outdoor and indoor units start to work once the power is switched on. During the cooling operation, the low temperature and low pressure refrigerant gas from the heat exchanger of each indoor unit combine and then go into the compressor to be compressed into high temperature, high pressure gas, which go to the heat exchanger of the outdoor unit to exchange heat with the outdoor air and then is turned into refrigerant liquid. After passing through the metering device, the temperature and pressure of the refrigerant liquid will further decrease and then go through the main valve. After that, it will be divided and go to the heat exchanger of each indoor unit to exchange heat with the air which needs to be conditioned. Consequently, the refrigerant liquid decreases to a lower temperature, low pressure refrigerant gas again. Such a refrigeration cycle achieves the desired refrigeration purpose. During the heating operation, the four-way valve is involved to make the refrigeration cycle run in reverse. The refrigerant radiates heat in the heat exchanger of the indoor unit (as do the electric heating devices) and absorbs heat in the heat exchanger of the outdoor unit for a heat pump heating cycle so as to achieve the desired heating.

5. Schematic Diagram

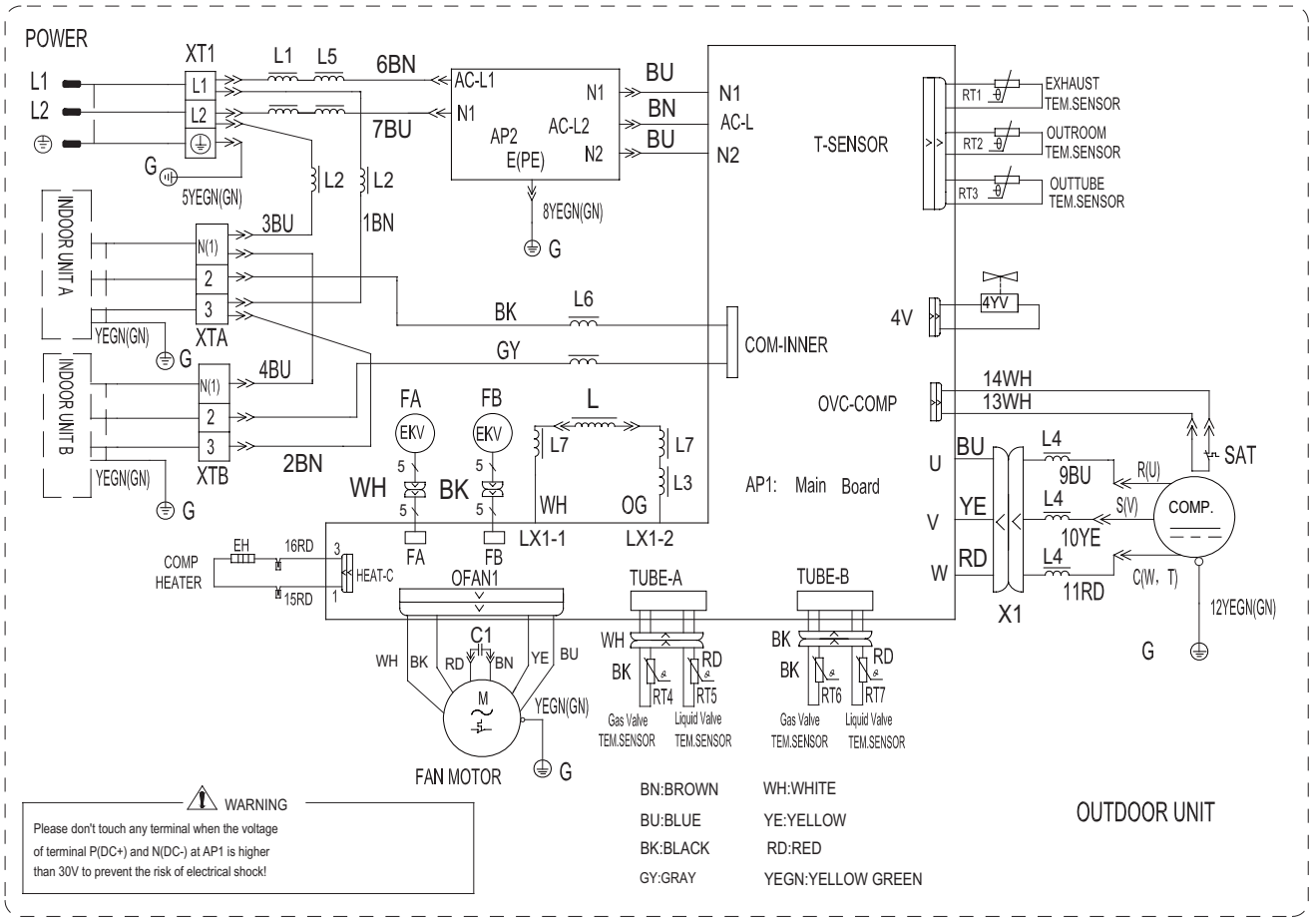
5.1 Electrical Data

Meaning of Symbols

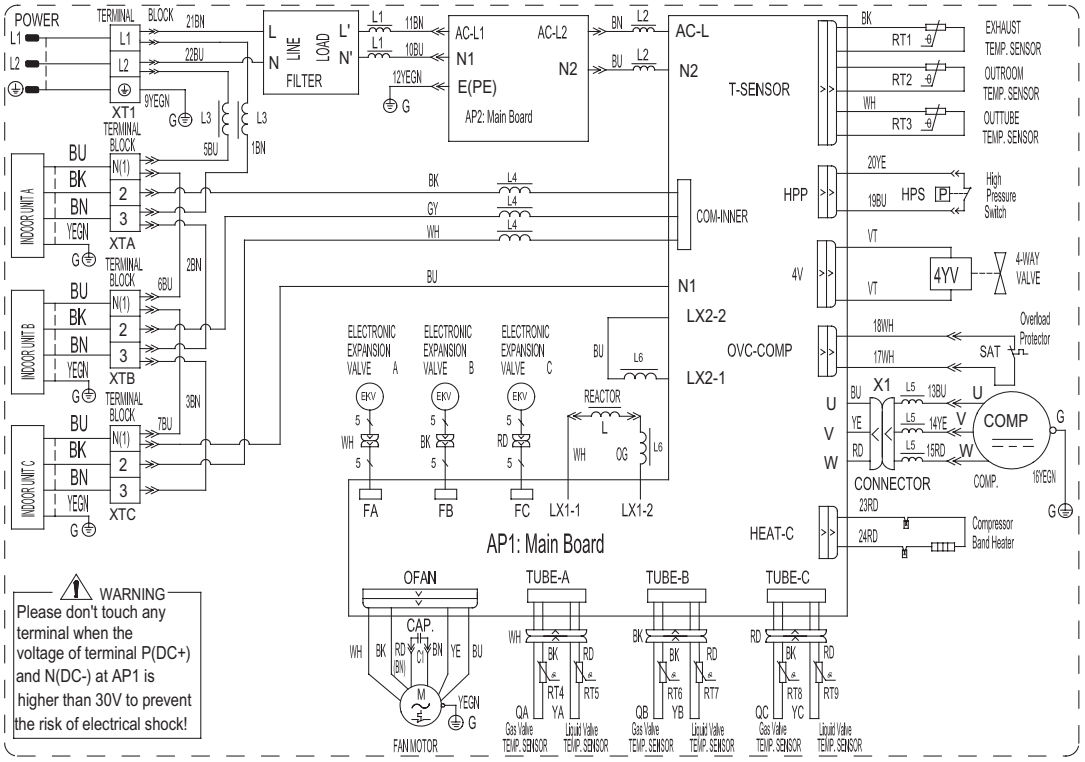
Symbol	Color symbol	Symbol	Color symbol	Symbol	Parts name
WH	WHITE	**GN**	GREEN	**SAT**	OVERLOAD
YE	YELLOW	**BN**	BROWN	**COMP**	COMPRESSOR
RD	RED	**BU**	BLUE	⏚	PROTECTIVE GROUND
YEGN	YELLOW GREEN	**BK**	BLACK	/	/
VT	VIOLET	**OG**	ORANGE	/	/

5.2 Electrical Wiring

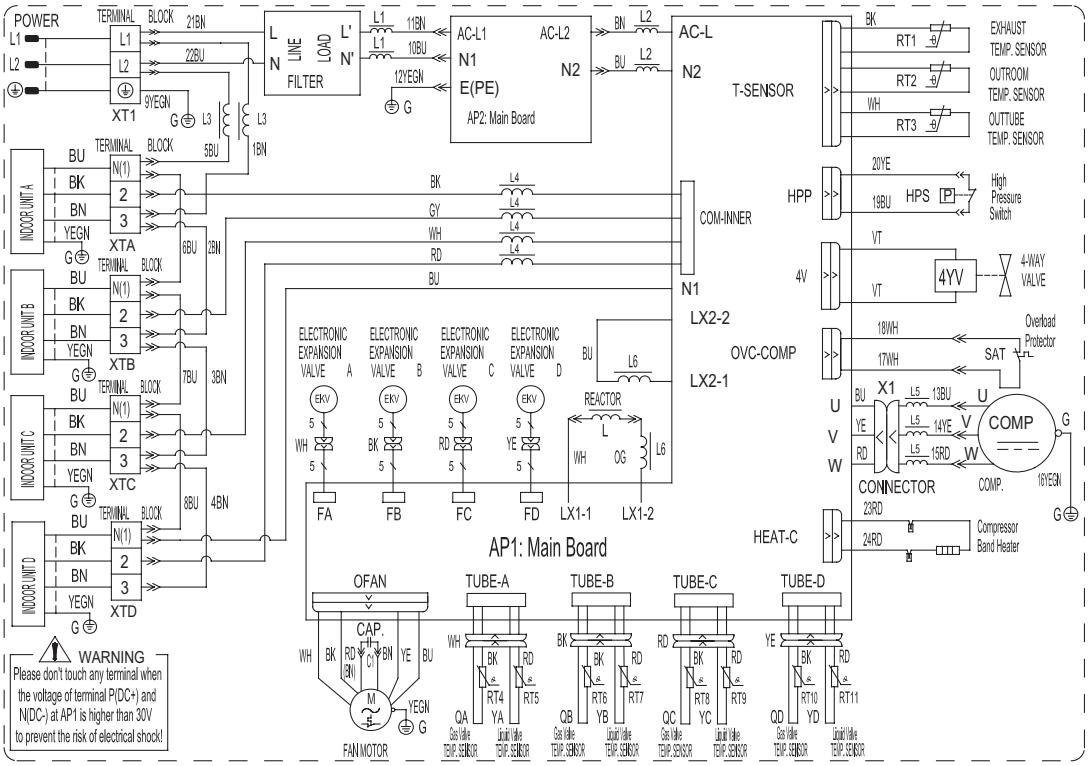
(1)DHM18CMB21S



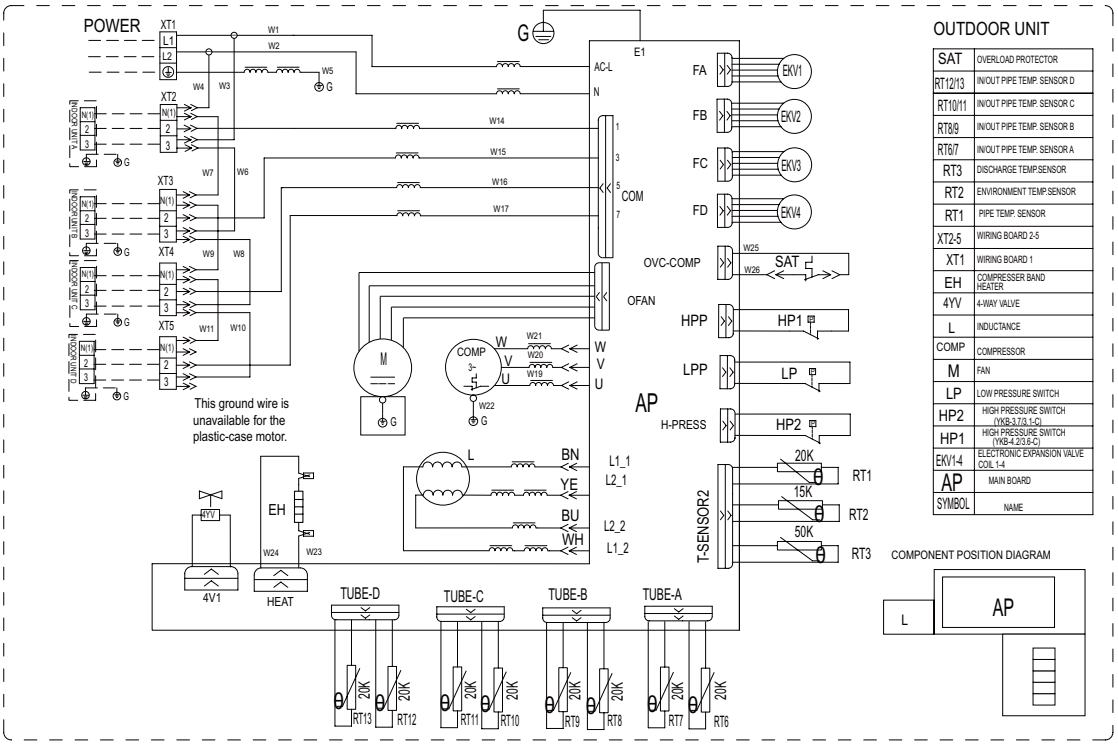
(2)DHM24CMB21S



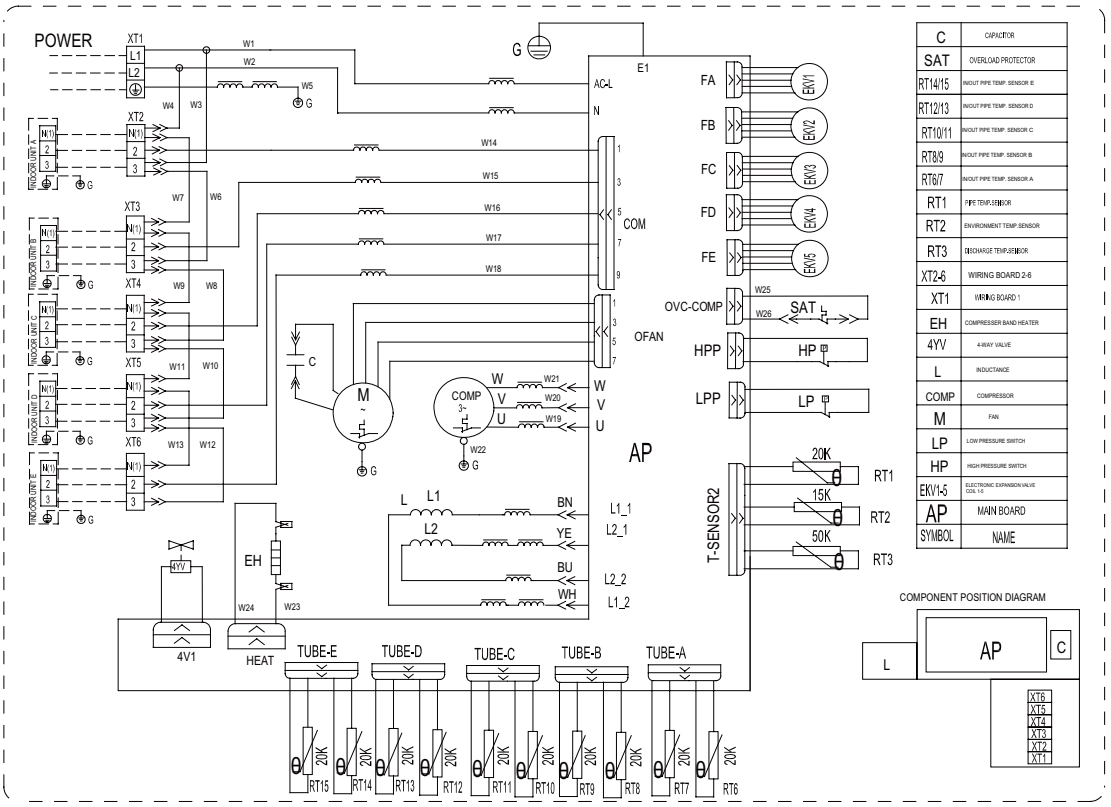
(3)DHM30CMB21S



(4)DHM36CMB21S



(5)DHM42CMB21S

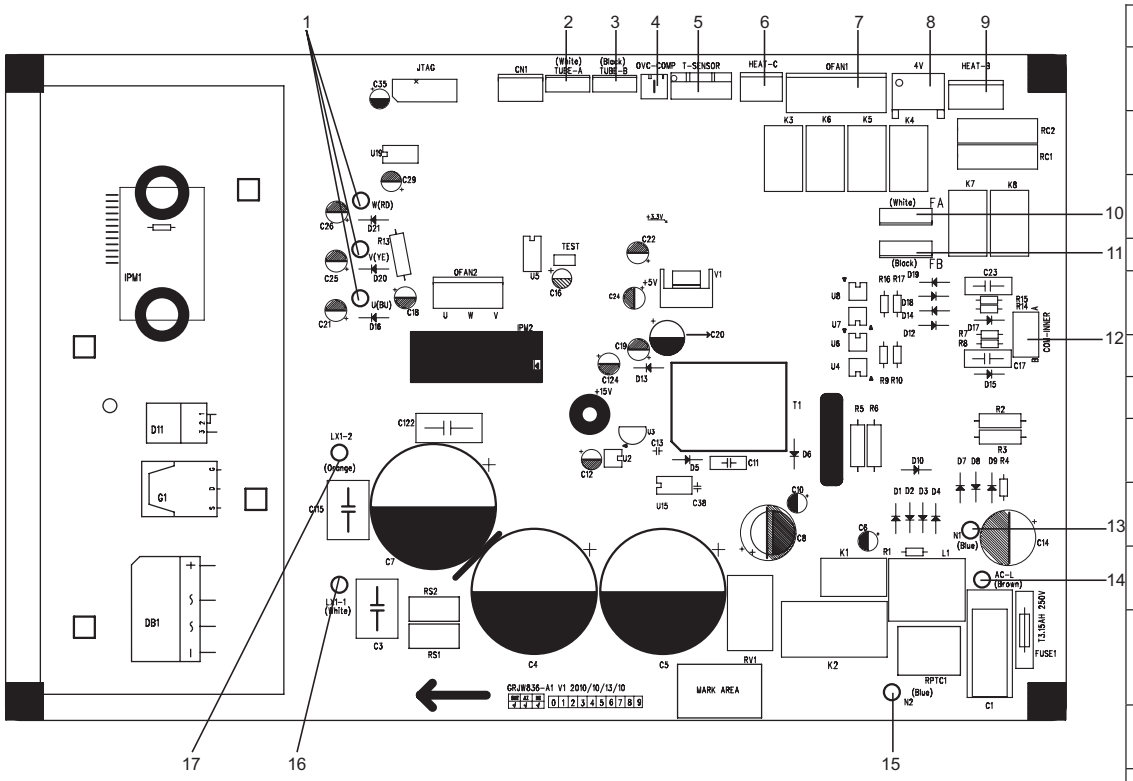


These circuit diagrams are subject to change without notice. Please refer to the one supplied with the unit.

5.3 Printed Circuit Board

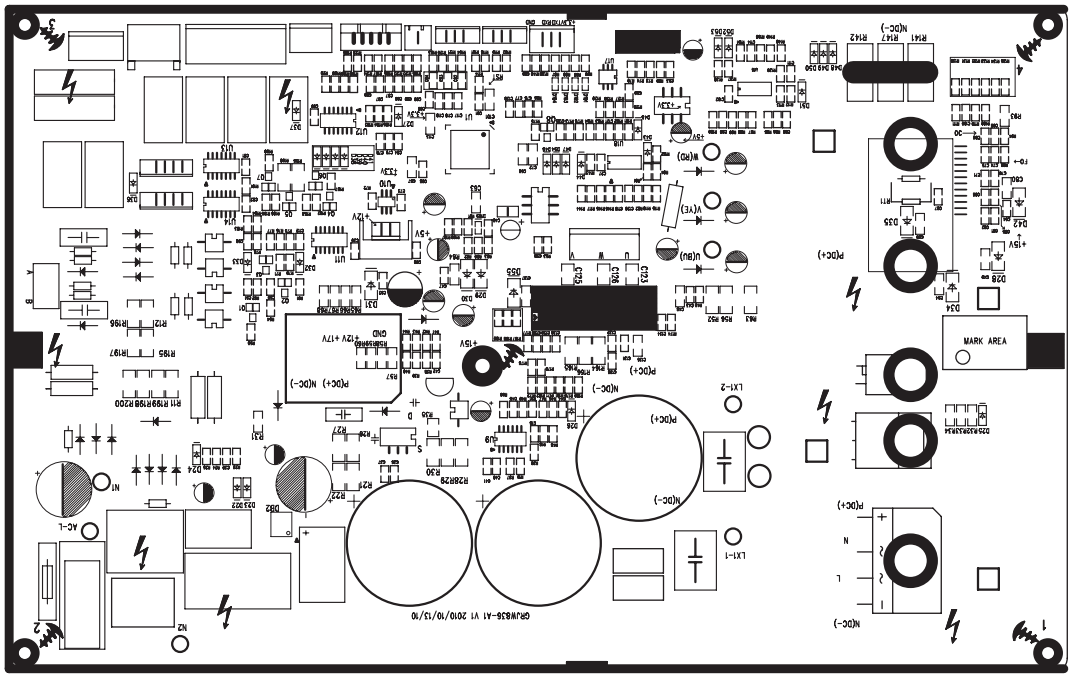
(1)DHM18CMB21S

● TOP VIEW



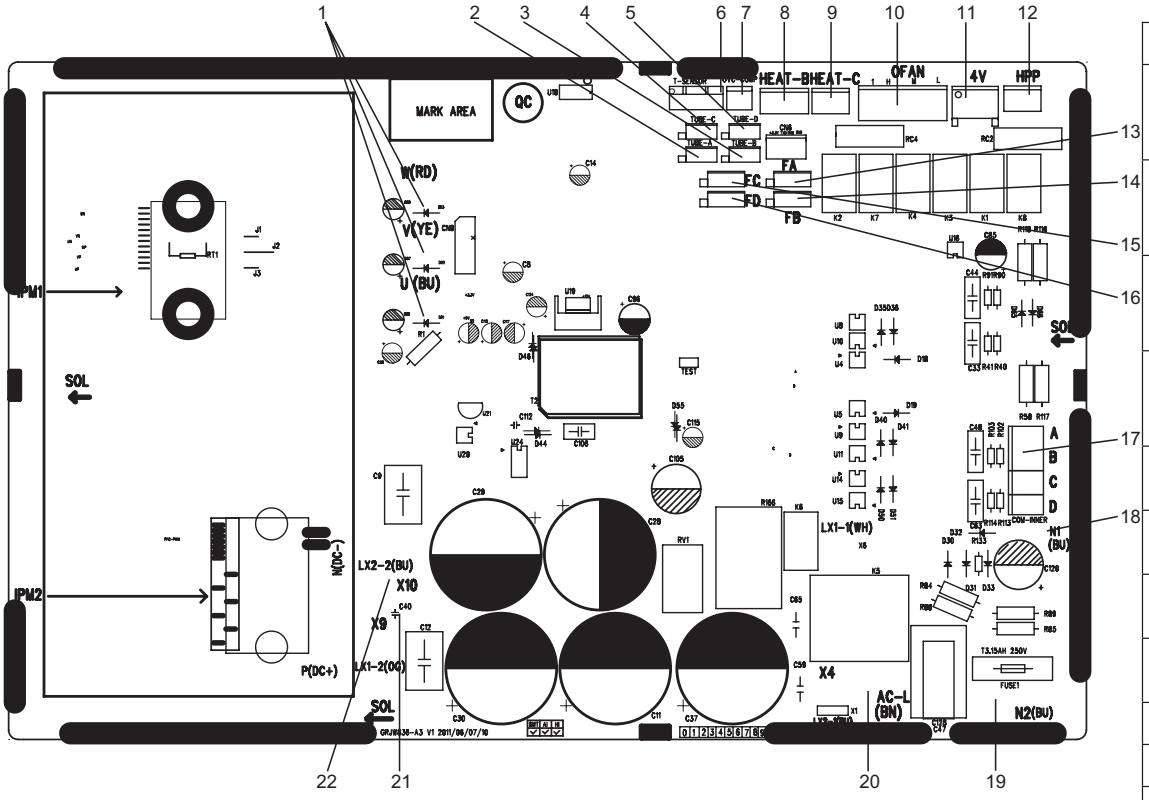
1	Compressor interface
2	Unit A liquid valve and gas valve
3	Unit B liquid valve and gas valve
4	Compressor overload protector
5	Temperature sensor
6	Compressor electric heater
7	Outdoor fan
8	4-way valve
9	Chassis electric heater (reserved)
10	Unit A electronic expansion valve
11	Unit B electronic expansion valve
12	Communication interface with indoor unit
13	Communication neutral wire
14	Live wire of power supply
15	Neutral wire of power supply
16	Reactor interface1
17	Reactor interface2

● BOTTOM VIEW



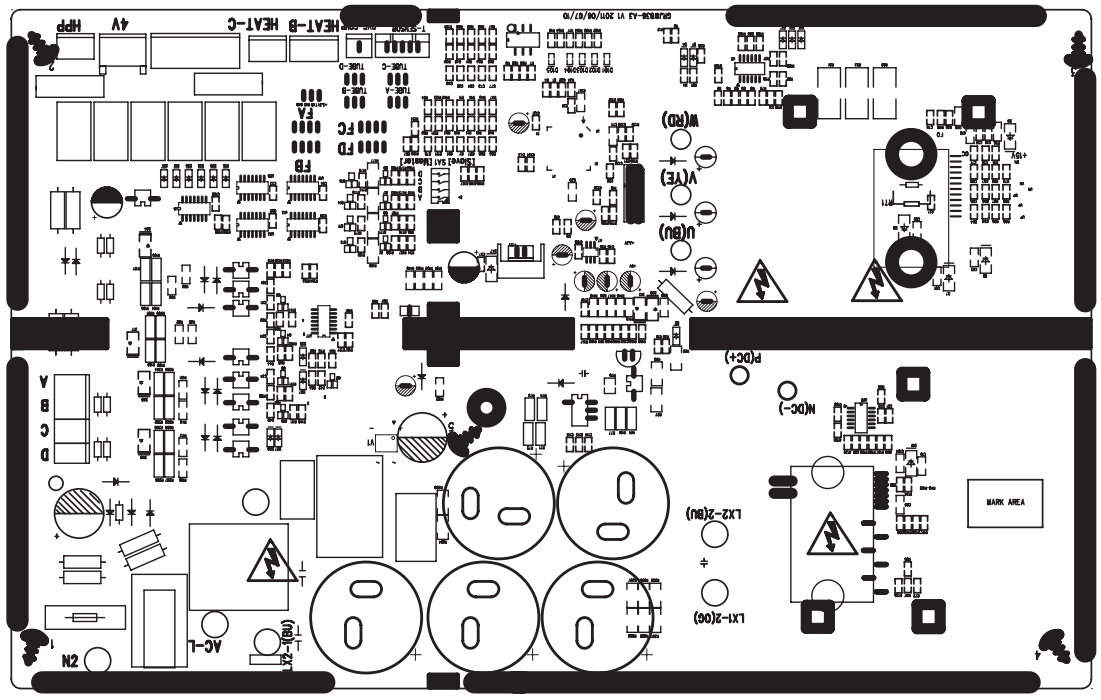
(2) DHM24CMB21S DHM30CMB21S

● TOP VIEW



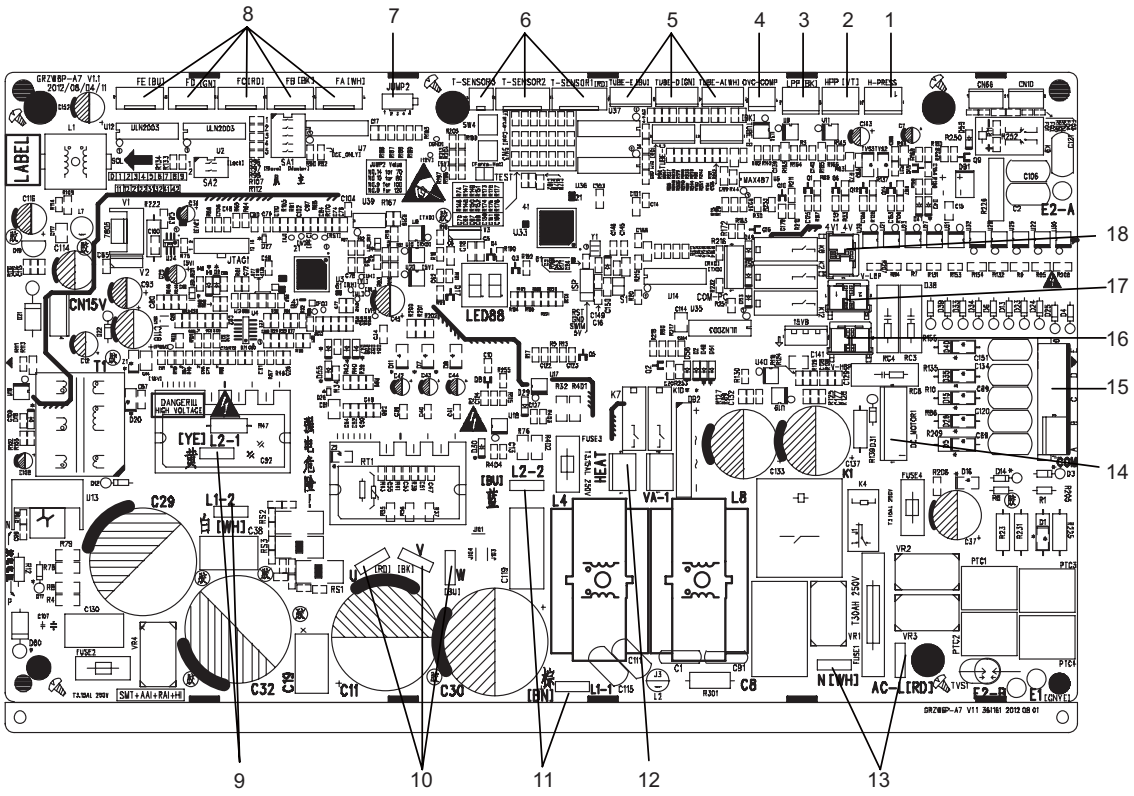
1	Compressor interface
2	Temperature sensor interface of unit A liquid valve and gas valve
3	Temperature sensor interface of unit B liquid valve and gas valve
4	Temperature sensor interface of unit C liquid valve and gas valve
5	Temperature sensor interface of unit D liquid valve and gas valve
6	Temperature sensor interface
7	Interface of compressor overload protector
8	Interface of chassis electric heater
9	Interface of compressor electric heater belt
10	Outdoor fan interface
11	4-way valve interface
12	High voltage protection interface
13	Interface of electronic expansion valve A
14	Interface of electronic expansion valve B
15	Interface of electronic expansion valve C
16	Interface of electronic expansion valve D
17	Communication wire interface
18	Communication neutral wire interface
19	Input neutral wire interface
20	Input live wire interface
21	PFC input live wire interface
22	PFC input neutral wire interface

● BOTTOM VIEW



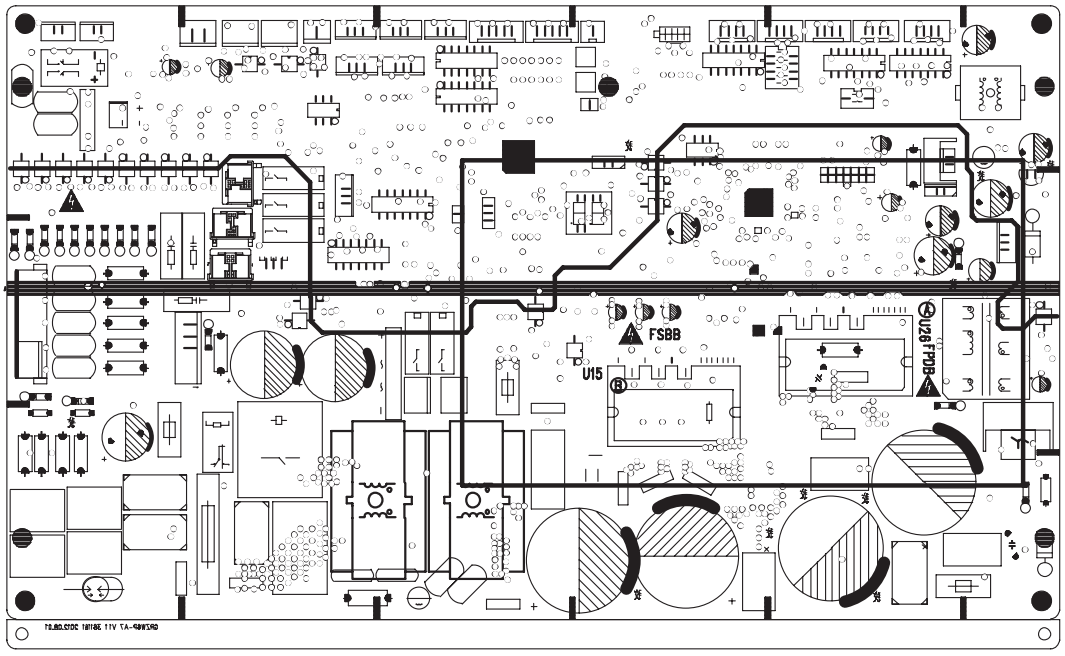
(3)DHM36CMB21S

● TOP VIEW



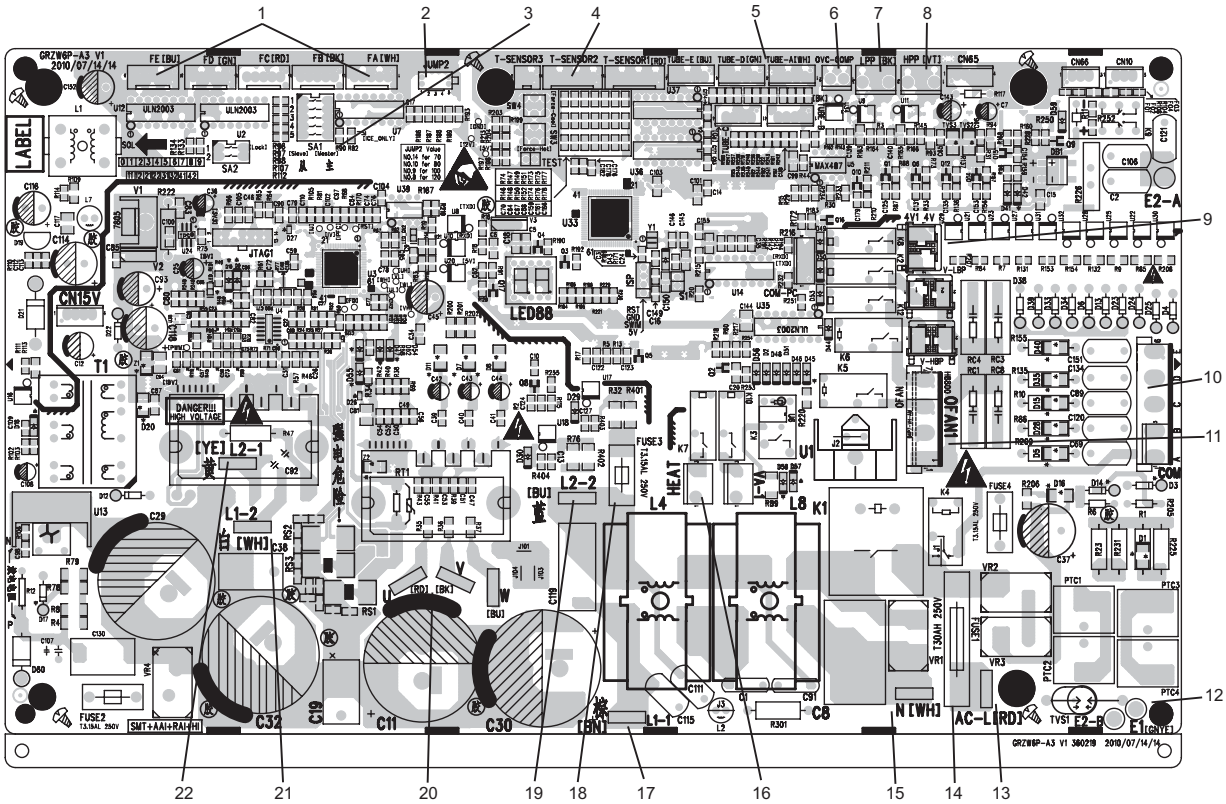
1	High-pressure protection 1
2	High-pressure protection 2
3	Low-pressure protection
4	Overload protection
5	Temperature sensor
6	Temperature sensor
7	Jumper cap
8	Electronic expansion valve
9	Yellow and white wires of PFC induction
10	Compressor wire
11	Brown and blue wires of PFC induction
12	Chassis electric heating of compressor
13	Neutral wire and live wire
14	Wiring terminal of DC fan
15	Communication of neutral wire and live wire
16	Gas by-pass valve
17	Liquid by-pass valve
18	4-way valve

● BOTTOM VIEW



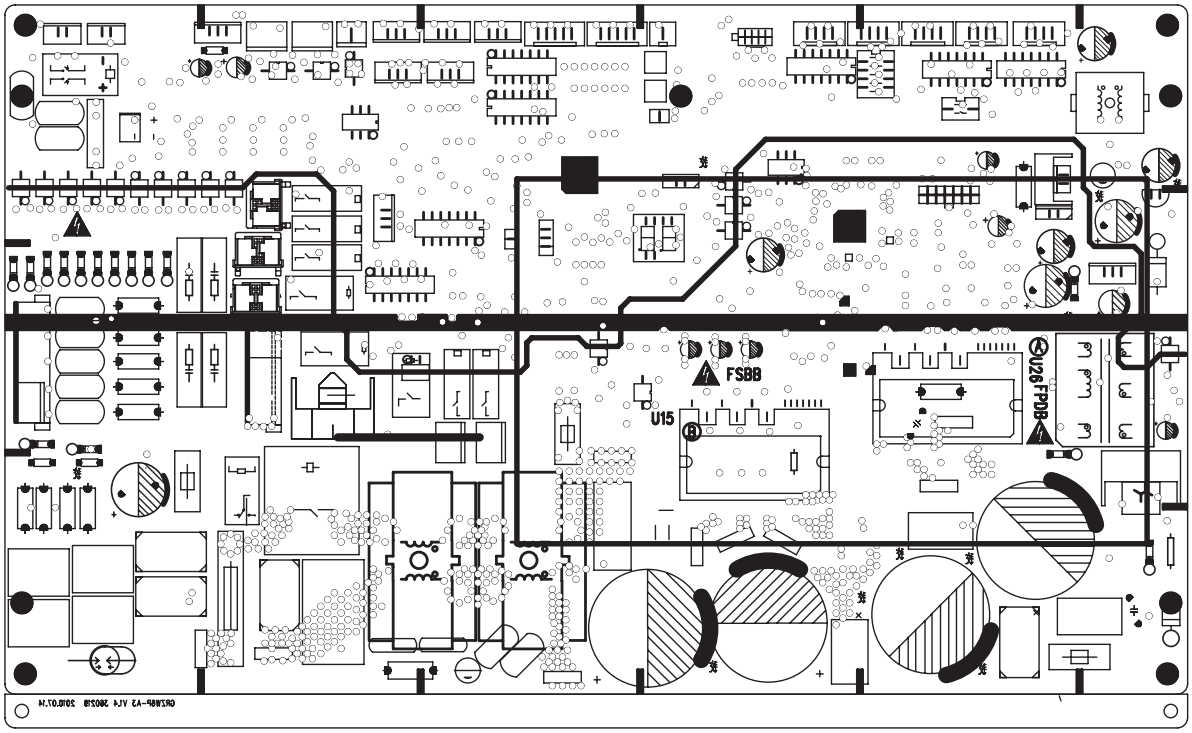
(4)DHM42CMB21S

- **TOP VIEW**



1	FA-FE: Terminals of EEV(Electronic Expansion Valve)	12	E1:Terminals of Ground
2	JUMP2: The code of capacity	13	AC-L:Terminals of line wire
3	SA1: Master select switch	14	FUSE1: Fuse
4	T-SENSOR2:Terminals of temperature sensor	15	N:Terminals of neutral wire
5	TUBE-A - TUBE-E:Terminals of tube temperature sensor	16	HEAT:Teminals of compressor band heater
6	OVC-COMP:Terminals of overload protector	17	L1-1:Terminals of reactor's brown wire
7	LPP:Terminals of low pressure switch	18	FUSE3: Fuse of fan
8	HPP:Terminals of high pressure switch	19	L2-2:Terminals of reactor's blue wire
9	4V1:Terminals of 4-way valve	20	U/V/W:Terminals of compressor
10	COM:Terminals of communication	21	L1-2:Terminals of reactor's white wire
11	OFAN1:Terminals of fan	22	L2-1:Terminals of reactor's yellow wire

● **BOTTOM VIEW**



6. Function and Control

(1)DHM18CMB21S DHM24CMB21S DHM30CMB21S

1 Basic Functions of the System

1.1 Cooling Mode

1.1.1 Cooling conditions and process:

If the compressor is in stop status and the unit is started for cooling (when one of the indoor units reaches a cooling condition), the unit starts In this instance, the electronic expansion valve, the outdoor fan and the compressor start operation.

1.1.2 Stop in cooling operation

1.1.2.1 Compressor stops

The compressor stops immediately. The outdoor fan stops after 1 minute.

1.1.2.2 Some of the indoor units reach the stop condition (the compressor does not stop).

The compressor operates immediately according to the required frequency. For the indoor unit with no requirement, the corresponding electronic expansion valve is closed.

1.1.3 Cooling mode transfers to heating mode

When the unit transfers to heating mode, the 4-way valve is energized after the compressor stops for 2 minutes. The other functions are the same as stopping in cooling mode.

1.1.4 4-way valve: In this mode, the 4-way valve is de-energized.

1.1.5 Outdoor fan control in cooling mode

The outdoor fan starts before 5 seconds of the starting of compressor. The outdoor fan will run in high speed for 3 minutes after starting and then it will run in the set speed. The fan will run at every speed for at least 80 seconds. (When the quantity of running indoor units is changed, the unit will enter the control described in 1.3.5.1 and 1.3.5.2).

When the compressor stops, the outdoor fan runs at present speed and stops after 1 minute.

1.2 Dry Mode

1.2.1 The dry conditions and process are the same as those in cooling mode.

1.2.2 The status of 4-way valve: De-engergized.

1.2.3 The temperature setting range: 60.8°F - 86°F (16°C - 30℃).

1.2.4 Protection function: The same as those in cooling mode.

1.2.5 In dry mode, the maximum value A of the capacity requirement percentage of a single unit is 90% of that in cooling mode. The open condition of the electronic expansion valve, outdoor fan and compressor is the same as those in cooling mode.

1.3 Heating Mode

1.3.1 Cooling conditions and process:

When one of the indoor units reaches the heating operation condition, the unit starts the heating operation.

1.3.2 Stop in heating operation:

1.3.2.1 When all the indoor units reach the stop condition, the compressor stops and the outdoor fan stops after 1 minute.

1.3.2.2 Some of the indoor units reach the stop condition.

The compressor reduces the frequency immediately and operates according to the required frequency.

1.3.2.3 Heating mode transfers to cooling mode (dry mode), fan mode.

a. The compressor stops.
b. The power of 4-way valve is cut off after 2 min.
c. The outdoor fan stops after 1 min. d. The status of 4-way valve: energized.

1.3.3 Outdoor fan control in heating mode

The outdoor fan starts before 5 seconds of starting of compressor and then it will run in high speed for 40 seconds.

The fan should run at every speed for at least 80 seconds.

When the compressor stops, the outdoor fan stops after 1 minute.

1.3.4 Defrosting function

When the defrost condition is met, and the reversing valve de-energized, the EEV valves open, the outdoor fan stops, until the defrost parameters are met. (Defrost Logic is based on time and temperature.)

Note : the indoor fan motor will be stopped also during the defrost cycle

1.3.5 Oil-returned control in heating mode

1.3.5.1 Oil-returned condition

The entire unit is operating in low frequency.

1.3.5.2 Oil-returned process in heating mode

The indoor unit displays “H1”

1.3.5.3 Oil-returned finished condition in heating mode

The duration reaches 5 minutes.

1.4 Fan Mode

Fan mode is to circulate the indoor air. The outdoor unit will have no operation. Temperature setting range is 80.6°F - 86°F (16℃ - 3 0℃）.

2. Protection Function

2.1 Mode Conflict Protection of Indoor Unit

When the setting mode is different from another indoor unit, the unit runs in below status:

a. The mode of the first operating indoor unit is the basic mode, then compare the mode of the other indoor units to see if there is a conflict. Cooling mode (dry mode) is in conflict with heating mode.

b. Fan mode is in conflict with heating mode and the heating mode is the basic mode. No matter which indoor unit operates first, the unit will run in heating mode.

2.2 Overload Protection Function

When the tube temperature is a little low, the compressor raises the operation frequency; when the tube temperature is a little high, the compressor frequency is restricted or decreases the operation frequency; when the tube temperature is too high, the compressor protection stops running.

If the discharge temperature protection continuously appears for 6 times, the compressor can’t resume running. The compressor can resume running after cutting off the power and then putting through the power. (If the running time of the compressor is longer than 7 minutes, the protection times record will be cleared.)

2.3 Discharge Protection Function

When the discharge temperature is a little low, the compressor raises the operation frequency; when the discharge temperature is a little high, the compressor frequency is restricted or decreases the operation frequency; when the discharge temperature is too high, the compressor protection stops running.

If the discharge temperature protection continuously appears for 6 times, the compressor can’t resume running. The compressor can resume running after cutting off the power and then putting through the power again. (If the running time of the compressor is longer than 7 minutes, the protection times record will be cleared.)

2.4 Communication Malfunction

Detection of the quantity of installed indoor units:

After 3 minutes of energizing, if the outdoor unit doesn't receive communication signal / data, the outdoor unit will react as if there is no indoor unit installed.

2.5 Overcurrent Protection

a. Overcurrent protection of complete unit. b. Phase wire current protection. c. Compressor phase current protection.

2.6 Compressor High-pressure Protection

2.6.1 When the high-pressure switch detects a cut off continuously for 3 seconds, the compressor will enter high-pressure protection as it stops when reaching a set temperature. Meanwhile, the outdoor unit will send the error code of “high-pressure protection” to the indoor units.

2.6.2 After the appearance of high-pressure protection, when the high-pressure switch is detected closed continuously for 6 seconds, the compressor can resume running only after cutting off the power and then putting through the power again.

2.7 Compressor Overload Protection

If the compressor overload switch is detected, the indoor unit will display the corresponding malfunction or error code as it stops when the indoor temperature reaches a set temperature. When the compressor stops for more than 3 minutes and the compressor overload switch is reset, the unit will resume operation status automatically. If the protection appears for more than 6 times (if the running time of the compressor is longer than 30 minutes, the protection times record will be cleared), the unit can not resume operation status automatically, but can resume running only after resetting of the main power to the outdoor unit.

2.8 Compressor Phase Lock-out Protection

When the compressor starts, if one of the three phases is detected open, the compressor will enter phase lock-out protection/error code. The error code will be cleared after 1 minute, the unit will restart and then detect if there is still phase-lock-out protection. If the phase lock-out protection is detected continuously 6 times, the compressor will not restart but can resume running only after resetting of the main power to the outdoor unit. If the running time of the compressor is longer than 7 minutes, the protection times record will be cleared.

2.9 IPM Protection

2.9.1 When the IPM module protection is detected, the unit will stop as the indoor temperature reaches a set temperature, with the PFC closed, and displays IPM protection malfunction. After the compressor stops for 3 minutes, the unit will resume operation status automatically. If IPM protection is detected continuously for more than 6 times, the system will stop and send the signal of module protection to the indoor unit. If the running time of the compressor is longer than 7minutes, the protection times record will be cleared. The unit can not resume operation status automatically, but can resume running only after cutting off the power and then putting through the power.

2.9.2 IPM module overheating protection

2.9.2.1 When T_{IPM} > 185°F (85℃), raising frequency is prohibited.

2.9.2.2 When T_{IPM}≥ 194°F (90°C), the operation frequency of the compressor decreases by 15% every 90 seconds according to the present capacity requirement of the complete unit. The outdoor fan will run for 90 seconds at high spped after decreasing the frequency. After decreasing the frequency, if T_{IPM}≥ 194°F (90°C) the unit will circulate the outdoor fan to drop temperature below 85°C until reaching the minimum frequency. If 185°F (85℃) < T_{IPM} < 194°F (90℃), the unit will run at this frequency. When T_{IPM}≤ 185°F (85 ℃), the unit will run at the frequency according to the capacity requirement.

2.9.2.3 When T_{IPM}≥ 203° F (95 ℃), the compressor stops. After the compressor stops for 3 minutes, if T_{IPM} < 185°F (85℃), the compressor and the outdoor fan will resume operation.

(2)DHM36CMB21S DHM42CMB21S

1.Function Control

1) Cooling mode

a. Turning on the unit for cooling operation, and if any one of the indoor units satisfies the cooling operation condition, the system will start the cooling operation; and the electronic expansion valve, the outdoor fan and the compressor start operation.
b. When some of the indoor units satisfy the stop condition while some indoor units do not satisfy the stop condition, the compressor does not stop. The compressor adjusts the frequency according to demand. When the indoor unit satisfies a stop condition, the corresponding electronic expansion valve will be closed.
c. Change Cooling mode to heating mode
When changing the unit to heating mode from cooling mode, the whole system will stop first. Then the system will restart in heating mode after the compressor stops.
d. 4-way valve
In this mode, the 4-way valve is energized.
e. Outdoor fan control in cooling mode
The outdoor fan starts within 5 seconds of starting the compressor. The outdoor fan will run in middle speed after starting, and then it will run in the set speed.

2) Dry mode (dehumidification mode)
This mode is the same as cooling mode.

3) Heating mode
a. Turning on the unit for heating operation. If any one of the indoor units satisfies the heating condition, the system will start to run in heating mode.
b. If all the indoor units satisfy the stop condition, the compressor stops and the outdoor fan stops after 1 minute.
c. If only part of the indoor units satisfy the stop condition, the compressor decreases the frequency immediately and operates according to demand.
d. When changing heating mode to cooling mode or dehumidification mode, the entire system will stop first, then restart under the required mode.
e. Defrosting function
When the defrosting condition is met, the 4-way valve de-energizes and the outdoor fan stops. After the 4-way valve reverses direction, the frequency of compressor increases, and the unit will start defrosting under the cooling cycle.
f. Oil-return control in heating mode
a)If the whole system runs in low frequency, the system will run an oil-return operation at high frequency, the indoor unit displays “H1”, and the oil-return operation will run for 3 minutes.

4) Fan mode
Only the indoor fan runs. The compressor, outdoor fan and 4-way valve are closed.

2.Protection Function

1) Mode conflict protection of indoor units

When the setting mode is different than another indoor unit, the unit runs in the below status:
a. The system mode is determined by first unit that makes first call cooling or heating, dry mode. Fan mode doesn't make a call to the outdoor unit. Cooling mode (dry mode) is in conflict with heating mode.
b. If the first unit turned on is in fan mode, and the second unit turned on is in cooling or heating more, then the system will run in cooling or heating mode.

2) Overload protection
If the tube temperature at the high pressure side is higher than normal, the compressor frequency is restricted or decreased to normal operation frequency.

3) High exhaust temperature protection
If the exhaust temperature is higher than the protection value, the compressor stops running.
If the exhaust temperature protection continuously appears for 6 times, the compressor can’t resume running. In this case, only by resetting the main power to the outdoor unit. and then re-energizing can the compressor restart. If the running duration of the compressor is longer than 7 minutes, the protection times will be cleared to zero.

4) Communication malfunction

Detection of the quantity of installed indoor units: After 3 min of energizing, if the outdoor unit doesn't receive communication signal / data, the outdoor unit will treat as if there is no indoor unit is installed. The outdoor unit will recognize that the indoor unit is not installed. If the outdoor unit receives the communication data of that particular indoor unit later, the communication malfunction will be cleared.

5) System high-pressure protection

a. When the high-pressure switch detects a system pressure higher than the limit, then the high-pressure switch cuts off and the system will stop.

b.If high-pressure protection is detected twice within one hour, only by resetting the main power on the outdoor unit and then the compressor can be restarted.

6)System low-pressure protection

a. When the low-pressure switch detects a system pressure lower than the lower limit, then the low-pressure switch is open, and the system stops running.

b. If low-pressure protection is detected twice within one hour, only by resetting of the main outdoor power and then the compressor can be restarted.

7) Compressor overload protection

No matter if the compressor is on or off, when the compressor overload switch is detected as activated, the system will stop and the indoor unit will display H3. If the compressor overload protection appears for more than 6 times, in this case, only by resetting of the main outdoor power and then the compressor can be restarted. If the running duration of the compressor is longer than 30 minutes, the protection times will be cleared to zero.

3.Other functions

1) Refrigerant Recovery

When the unit is powered on and runs under the COOL mode, it is possible within 5 minutes to go the refrigerant recovery mode by pressing the “LIGHT” button on the wireless zone controller three times in three seconds with “Fo”displayed.

How to quit the refrigerant recovery:

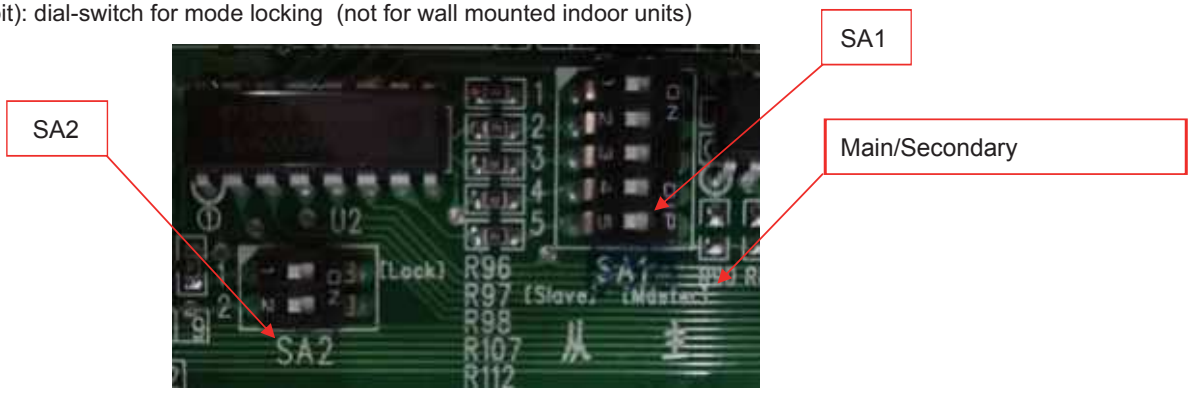
When the refrigerant recovery has started, it will quit when there is a signal from the wireless zone controller or it has run for 10 minutes.

2) Setting function of main/secondary indoor unit

Picture of DIP switch on outdoor mainboard :

SA1(5-bit): dial-switch for main/secondary indoor unit,

SA2(2-bit): dial-switch for mode locking (not for wall mounted indoor units)



5-bit dial-switch to set the main and secondary indoor units. It corresponds to indoor unit numbers 1 to 5. Dial the switch to ON which is the main side - right side - to set that indoor unit as the main indoor unit. Dial the switch to the secondary side - left side - to set the indoor unit as the secondary indoor unit. There can be only one main unit in a system. If more than one indoor unit is set as the main unit, the unit with the smallest number is the main unit. (The smallest number here means number 1 to number 5 on the switch.)

2-bit dial-switch to set mode locking:

Note:

1. Only use No.1 bit. No. 2 bit is for future use.
2. This function is only for duct and cassette units, not for wall mounted units.

Locked mode: Switch No.1 bit to the “ON” side (lock side, or right side, in the picture). Even if the main indoor unit is off, the system will run according to the mode before the main unit is off.

Unlocked mode: Switch No.1 bit to the left side in the picture. If the main indoor unit is off, the system will not care what the main unit mode was. It will run according to the mode of the first secondary indoor unit being turned on.

Note: For a wall-mounted indoor unit, unlocked mode is default, and locked mode is invalid.

7. Troubleshooting

7.1 Malfunction Indicator

(1)DHM18CMB21S DHM24CMB21S DHM30CMB21S

Note: ○: off ●: on ◎: blink

When several malfunctions occur at the same time, they will be displayed in circulation and every malfunction is displayed for 5 seconds.

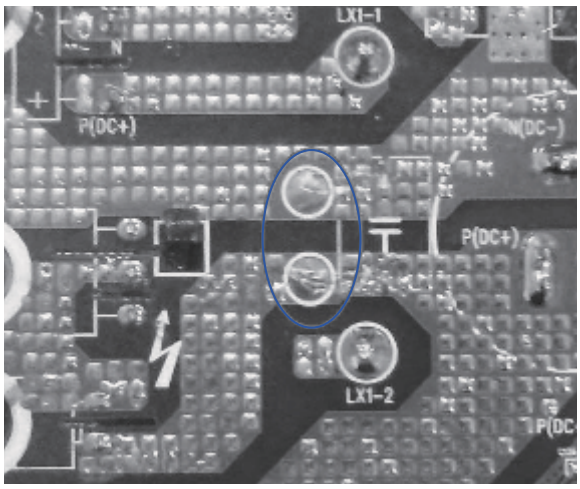
NO	Malfunction description	LED1	LED2	LED3	LED4
0	Normal stop	○	○	○	○
1	Compressor run	●	○	○	○
2	Compressor overload protection	◎	○	○	○
3	Discharge protection	○	●	○	○
4	Outdoor unit overload protection	●	●	○	○
5	High pressure protection	◎	●	○	○
6	Over current protection	○	◎	○	○
7	IMP protection	●	◎	○	○
8	IMP over heating protection	◎	◎	○	○
9	PFC protection (including PFC overheating protection)	○	○	●	○
10	Phase current protection	●	○	●	○
11	Over voltage protection	◎	○	●	○
12	Insufficient voltage protection	○	●	●	○
13	Start failure	●	●	●	○
14	Compressor desynchronizing	◎	●	●	○
15	Compressor phase-lacking protection	○	◎	●	○
16	Compressor phase current detection malfunction	●	◎	●	○
17	Memory chip mistake	◎	◎	●	○
18	DC power supply circuit-short	○	○	◎	○
19	Defrosting	●	○	◎	○
20	Oil return	◎	○	◎	○
21	Complete unit frequency restriction protection	○	●	◎	○
22	Complete unit frequency dropping protection	●	●	◎	○
23	Unit A frequency restriction or frequency dropping protection	◎	●	◎	○
24	Unit B frequency restriction or frequency dropping protection	○	◎	◎	○
25	Unit C frequency restriction or frequency dropping protection	●	◎	◎	○
26	Unit D frequency restriction or frequency dropping protection	◎	◎	◎	○
27	Outdoor ambient temperature sensor protection	○	○	○	●
28	Outdoor tube temperature sensor protection	●	○	○	●
29	Discharge temperature sensor protection	◎	○	○	●
30	IPM thermal resistance malfunction	○	●	○	●
31	Unit A liquid pipe temperature sensor malfunction	●	●	○	●
32	Unit A gas pipe temperature sensor malfunction	◎	●	○	●
33	Unit B liquid pipe temperature sensor malfunction	○	◎	○	●
34	Unit B gas pipe temperature sensor malfunction	●	◎	○	●
35	Unit C liquid pipe temperature sensor malfunction	◎	◎	○	●
36	Unit C gas pipe temperature sensor malfunction	○	○	●	●
37	Unit D liquid pipe temperature sensor malfunction	●	○	●	●
38	Unit D gas pipe temperature sensor malfunction	◎	○	●	●
39	Unit A mode conflict	○	●	●	●
40	Unit B mode conflict	●	●	●	●
41	Unit C mode conflict	◎	●	●	●
42	Unit D mode conflict	○	◎	●	●

43	Communication failure with Unit A	●	◎	●	●
44	Communication failure with Unit B	◎	◎	●	●
45	Communication failure with Unit C	○	○	◎	●
46	Communication failure with Unit D	●	○	◎	●
47	Unit A freeze protection	◎	○	◎	●
48	Unit B freeze protection	○	●	◎	●
49	Unit C freeze protection	●	●	◎	●
50	Unit D freeze protection	◎	●	◎	●
51	Unit A overheating prevention protection	○	◎	◎	●
52	Unit B overheating prevention protection	●	◎	◎	●
53	Unit C overheating prevention protection	◎	◎	◎	●
54	Unit D overheating prevention protection	○	○	○	◎
55	Unit A communication wire misconnection or expansion valve malfunction	●	○	○	◎
56	Unit B communication wire misconnection or expansion valve malfunction	◎	○	○	◎
57	Unit C communication wire misconnection or expansion valve malfunction	○	●	○	◎
58	Unit D communication wire misconnection or expansion valve malfunction	●	●	○	◎

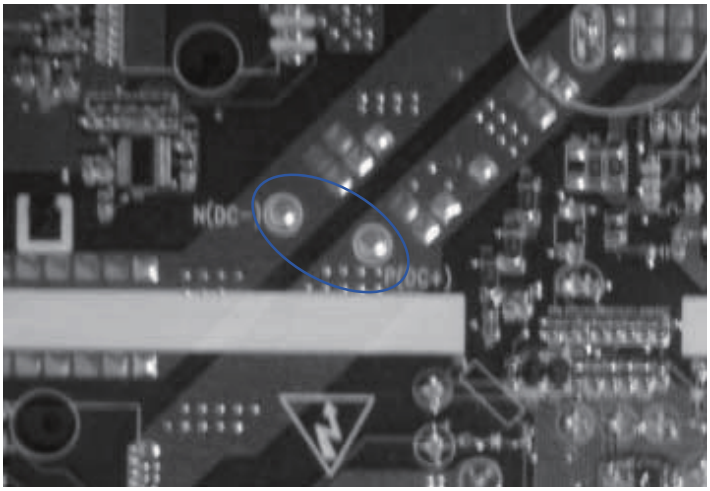
7.2 Malfunction Checking and Elimination

Note: Discharge the position in below pictures with discharge resistance after opening the top cover and check if the voltage is below 20V with a universal meter, then begin to check.

18K:



24/30K:

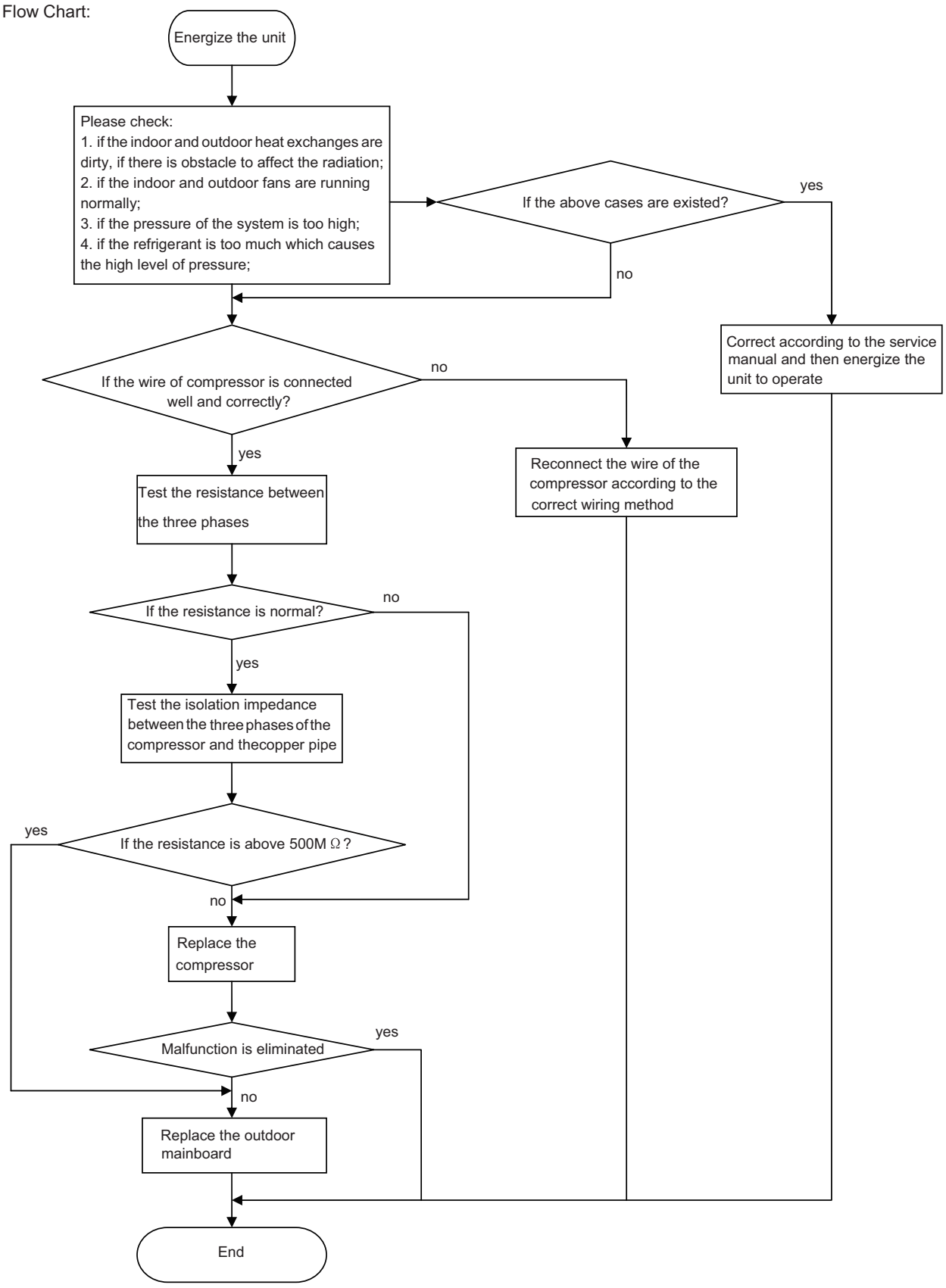


(1) IPM protection malfunction:

Main checking point:

- If the input voltage of the unit is within normal range?
- If the connection wire of compressor is connected well? Is it loose? If the connection sequence is correct?
- If the resistance of compressor coil is normal? If the isolation of compressor coil with copper pipe is good?
- If the unit is overloaded? If the heat radiation of the unit is good?
- If the refrigerant charge is suitable?

Flow Chart:

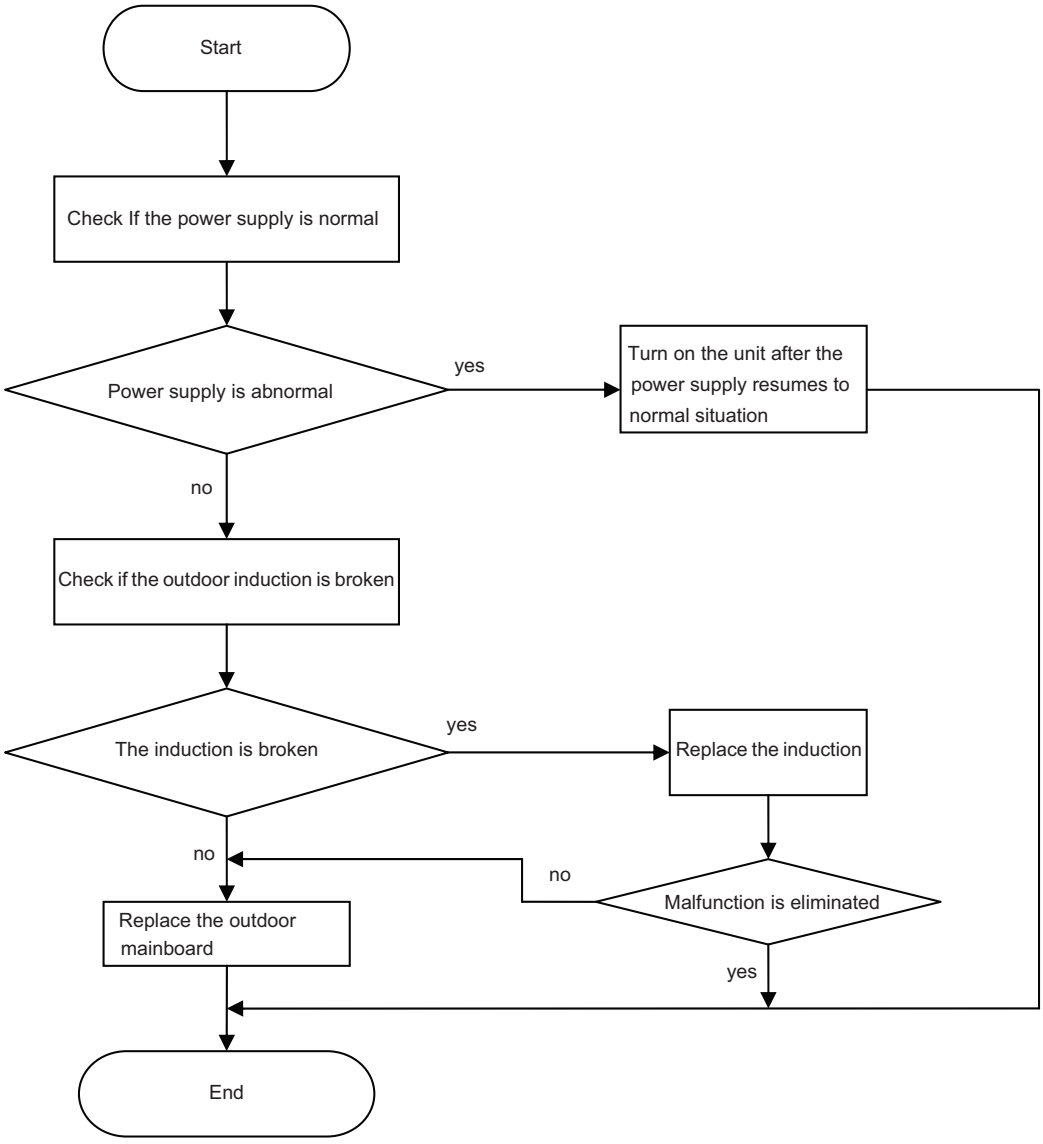

Energize the unit
Please check:
1. if the indoor and outdoor heat exchanges are dirty, if there is obstacle to affect the radiation;
2. if the indoor and outdoor fans are running normally;
3. if the pressure of the system is too high;
4. if the refrigerant is too much which causes the high level of pressure;
If the above cases are existed?
yes
no
Correct according to the service manual and then energize the unit to operate
If the wire of compressor is connected well and correctly?
no
Reconnect the wire of the compressor according to the correct wiring method
yes
Test the resistance between the three phases
If the resistance is normal?
no
yes
Test the isolation impedance between the three phases of the compressor and thecopper pipe
If the resistance is above 500M Ω ?
yes
no
Replace the compressor
Malfunction is eliminated
yes
no
Replace the outdoor mainboard
End

(2) PFC protection malfunction

Main checking points:

- If the power supply is normal.
- Check if the connection wire of induction is connected well and if the induction is broken.

Flow chart:

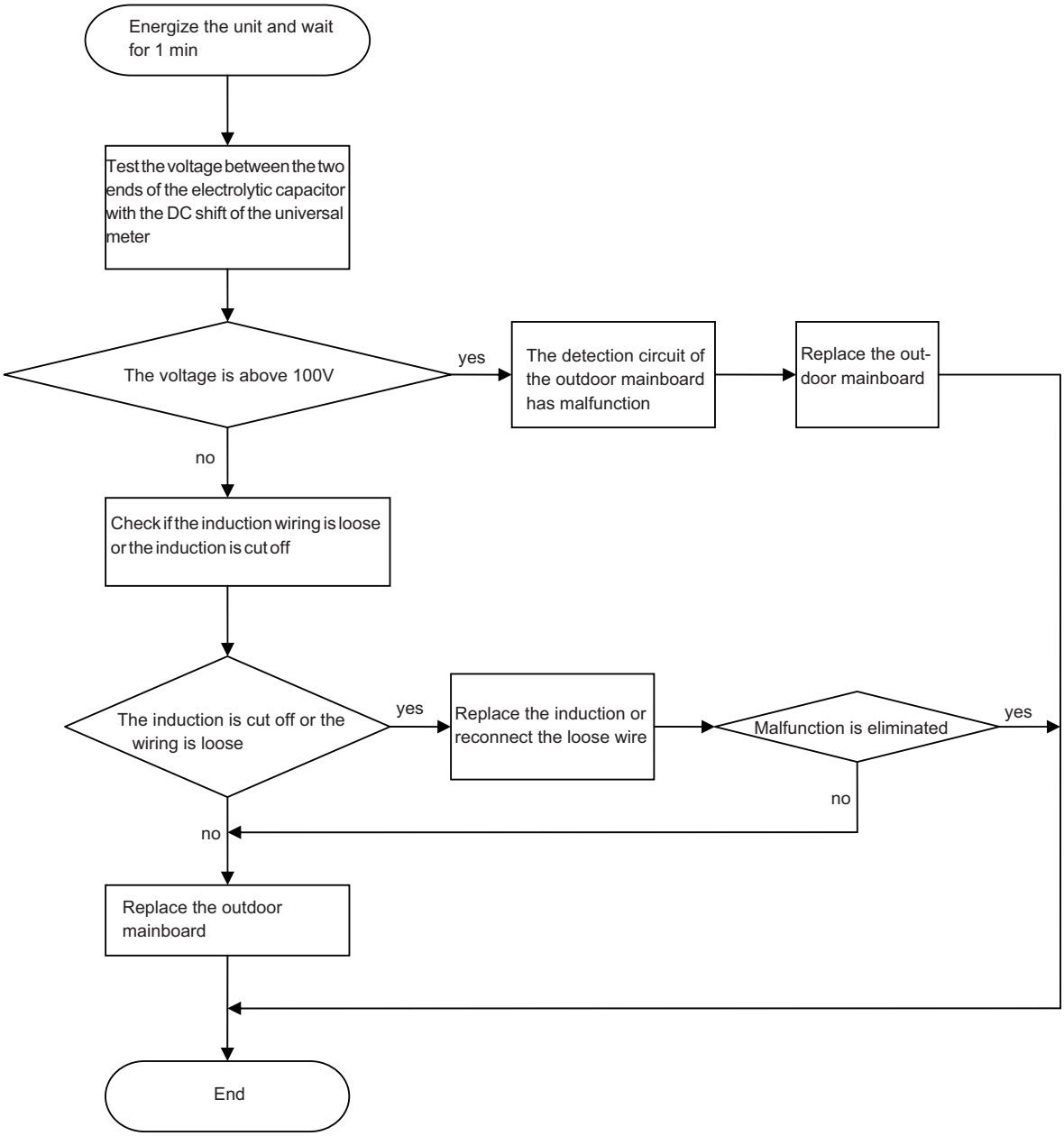


(3) Capacity charging malfunction

Main checking points:

- If the wiring of the induction is connected well and if the induction is broken.
- If the mainboard is broken.

Flow chart:

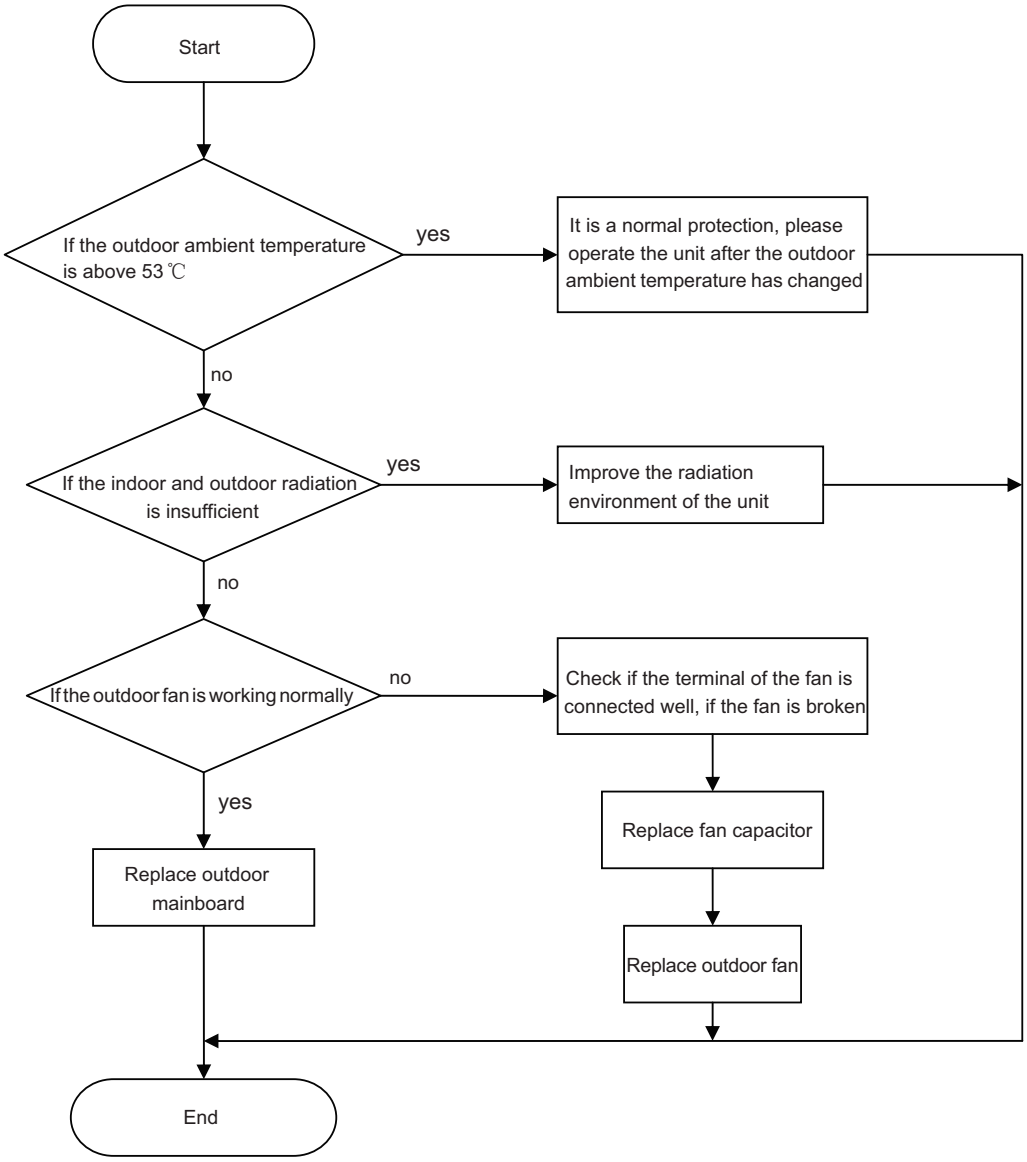


(4) Anti-high temperature and overload malfunction

Main checking points:

- If the outdoor ambient temperature is within the normal range.
- If the outdoor fan is running normally.
- If the indoor and outdoor radiation environment is good.

Flow chart:

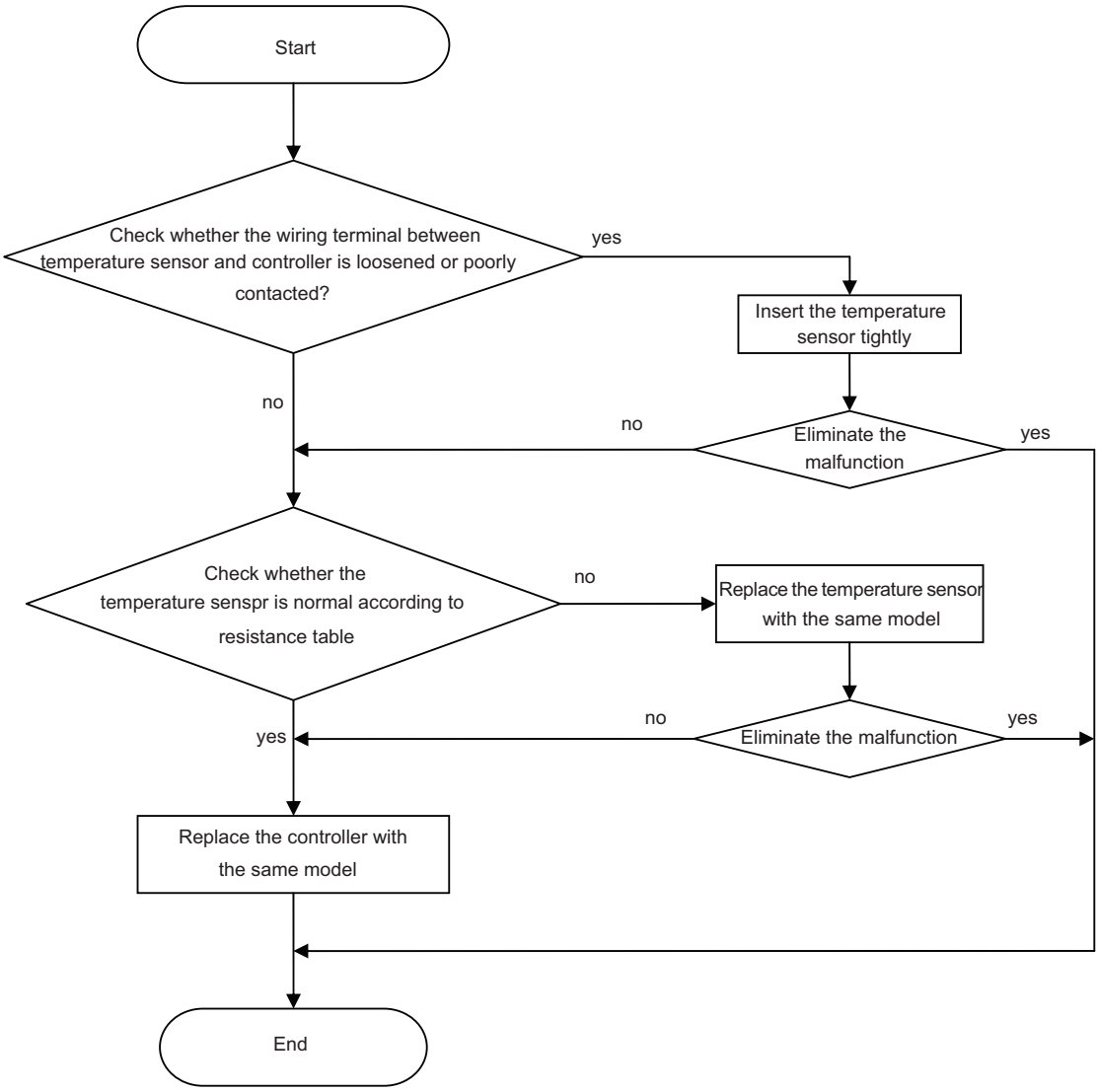


(5) Temperature sensor malfunction

Main checking points:

- If the temperature sensor is damaged or broken.
- I f the terminal of the temperature sensor is loosended or not connected.
- I f the mainboard is broken.

Flow chart:

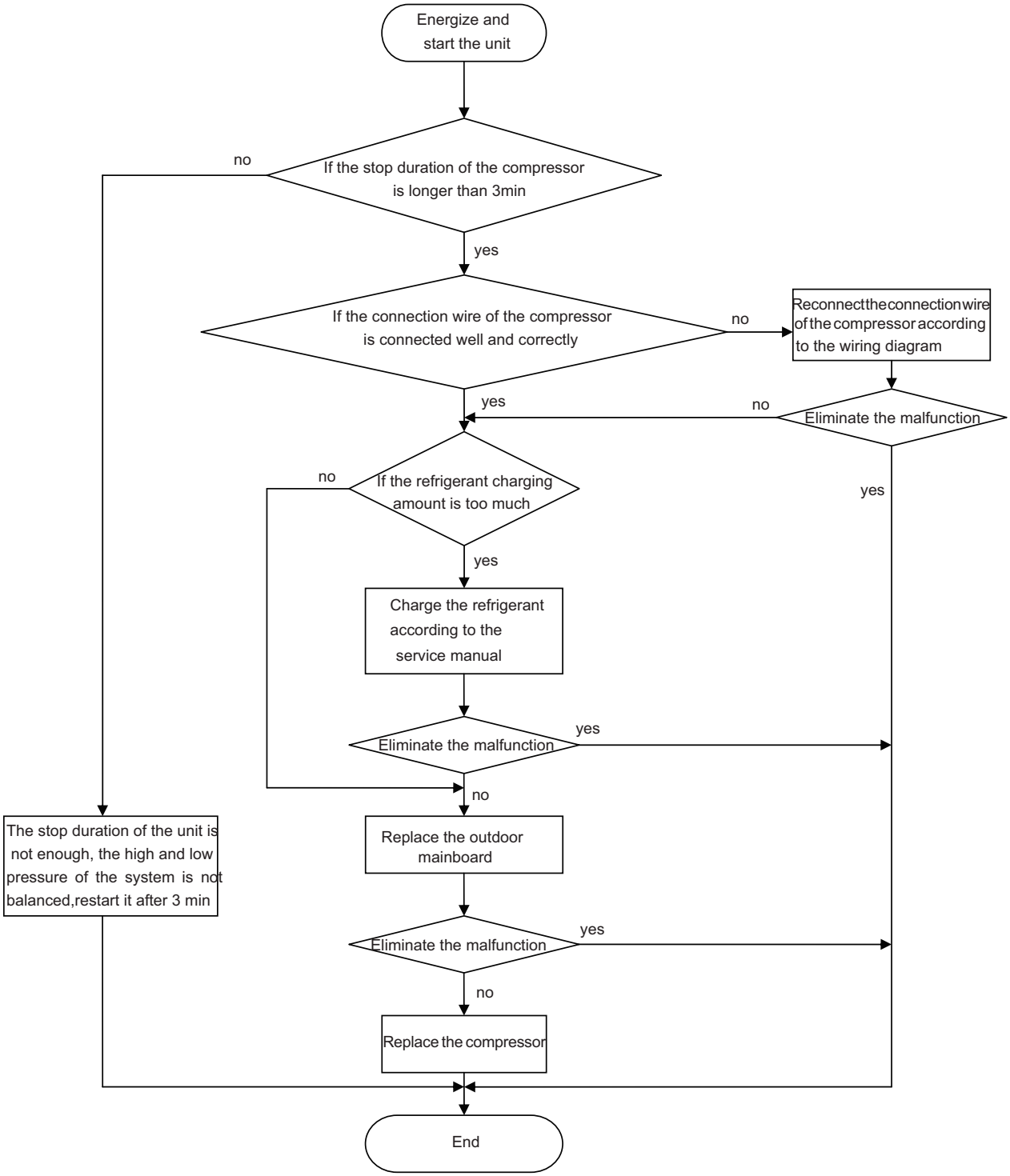


(6) Start failure malfunction

Main checking points:

- If the connection wire of the compressor is connected properly.
- I f the stop duration of the compressor is sufficient.
- I f the compressor is broken.
- ;If the refrigerant charging amount is too much.

Flow chart:

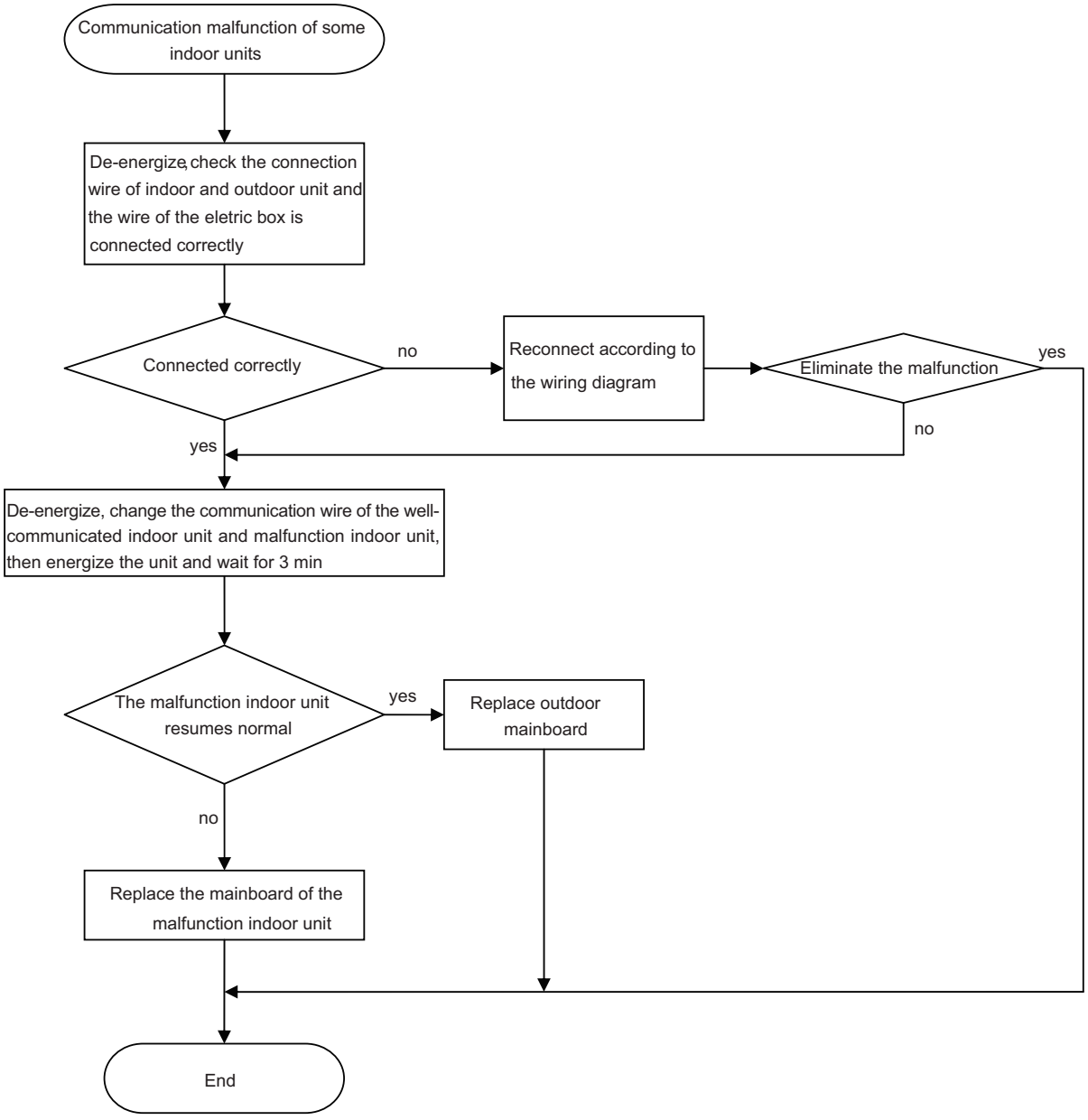


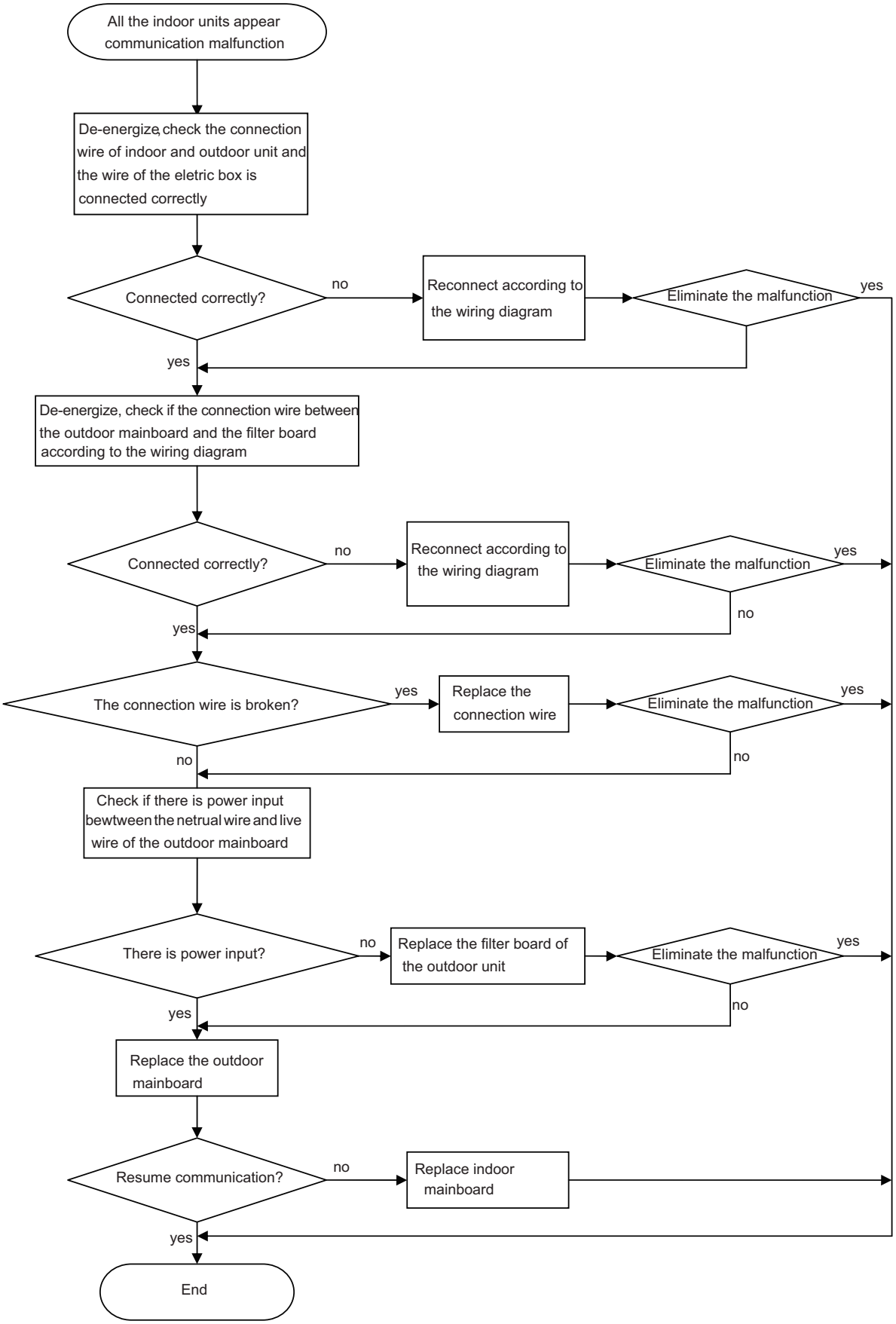
(7) Communication malfunction

Main checking points:

- If the connection wire between the indoor unit and outdoor unit is connected well, if the wires inside the unit are connected well
- I f the indoor mainboard or outdoor main board is broken

Flow chart:



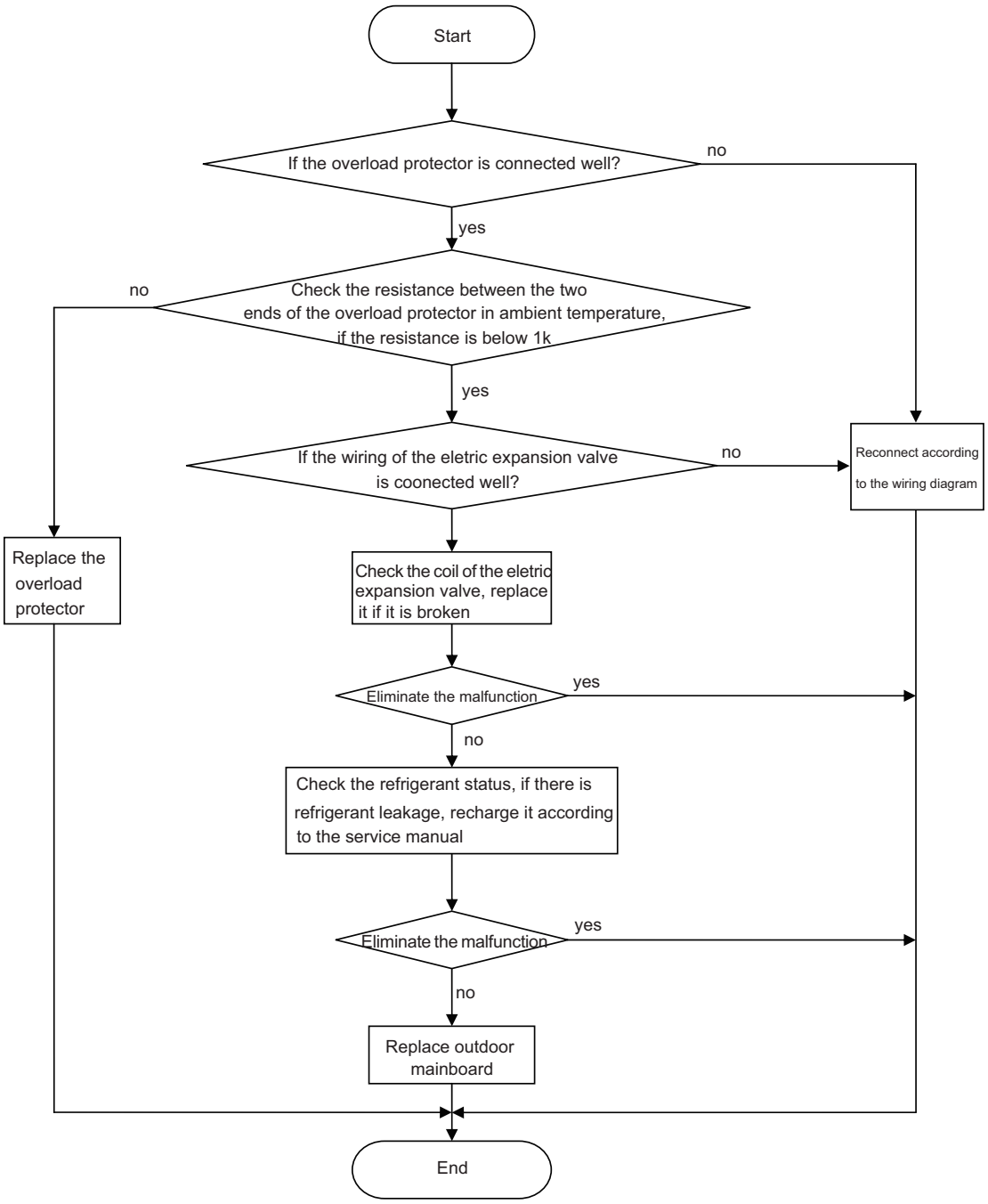

All the indoor units appear communication malfunction
De-energize, check the connection wire of indoor and outdoor unit and the wire of the eletric box is connected correctly
Connected correctly?
no
Reconnect according to the wiring diagram
Eliminate the malfunction
yes
yes
De-energize, check if the connection wire between the outdoor mainboard and the filter board according to the wiring diagram
Connected correctly?
no
Reconnect according to the wiring diagram
Eliminate the malfunction
yes
no
yes
The connection wire is broken?
yes
Replace the connection wire
Eliminate the malfunction
yes
no
no
Check if there is power input bewtween the netrual wire and live wire of the outdoor mainboard
There is power input?
no
Replace the filter board of the outdoor unit
Eliminate the malfunction
yes
no
yes
Replace the outdoor mainboard
Resume communication?
no
Replace indoor mainboard
yes
End

(8) Compressor overload, diacharge protection malfunction

Main checking points:

- If the eletric expansion valve is connected well or it is broken
- I f there is refrigerant leakage
- I f the overload protector is broken

Flow chart:



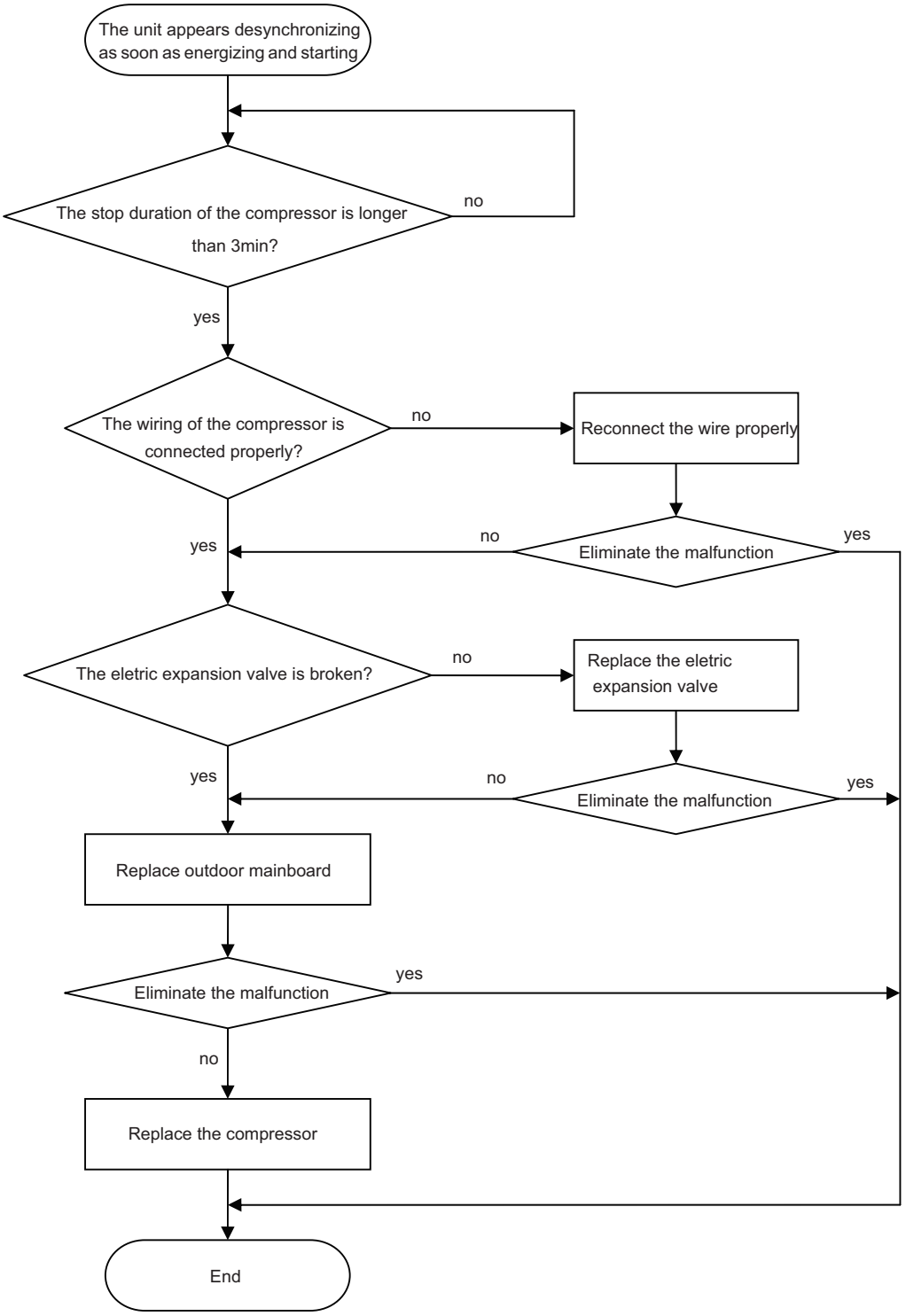
Note: The detection method of the coil of the eletric expansion valve: there are five pieces of the coil of the eletric expansion valve, the resistance of one of them (the leftmost or the rightmost one) is almost the same as the resistance of other terminal (within 100 Ω). Judge the condition of the electronic expansion valve through detecting the resistance.

(9) Compressor desynchronizing malfunction

Main checking points:

- If the pressure of the system is too high;
- If the eletric expansion valve is working normally or it is broken;
- If the radiation of the unit is good;

Flow chart:



(2)DHM36CMB21S DHM42CMB21S

⚠ WARNING!

① . In the event of abnormal conditions (an odor), please shut off the main power supply immediately and then contact your contractor; otherwise the continuous abnormal running would damage the air conditioning unit and also would cause electric shock or fire hazard etc.

②. Do not repair the air conditioning personally but instead contact the professionally skilled personnel at the contractor, as the incorrect repair would cause electric shock or fire hazard etc.

1.Check before Contacting Service Center

Please check the following items before contacting the maintenance serviceman.

Table 13

Conditions	Causes	Corrective Actions
The unit does not run	Blown fuse or opened breaker.	Change the fuse or close the breaker.
	Power off.	Restart the unit when power on.
	Power supply plug is loose.	Plug the power supply properly.
	Insufficient batteries voltage of the remote controller	Change new batteries.
	Remoter controller out of the control scope.	Keep the control distance within 8 meters.
The unit stops soon after it starts	Clogged inlet/outlet of the indoor/ outdoor unit.	Clear the obstacle.
Cooling/Heating is abnormal	Clogged inlet/outlet of the indoor/ outdoor unit.	Clear the obstacle.
	Improperly set temperature.	Adjust the setting of the remote or wired controller.
	Too low set fan speed.	Adjust the setting of the remote or wired controller.
	Improper airflow direction.	Adjust the setting of the remote or wired controller.
	Opened door and window.	Close the door and window.
	Direct sunlight.	Hang a curtain or blinds over the window.
	Too many people in the room.	
	Too many heat sources in the room.	Reduce the heat sources.
	Dirty filter screen.	Clean the filter screen.

Note:

If the air conditioning unit still runs abnormally after the above check and handling, please contact the maintenance serviceman at the local appointed service center and also give a description of the error that occurred as well as the model of the unit.

2.Problem Handling

The conditions listed below are not classified as errors.

Table 14

Conditions		Causes
The unit does not run	When restarting the unit soon after it is stopped.	The overload protection switch of the unit let the startup delay for three minutes.
	As soon as power is on.	The unit will stand by for approximate one minute.
The unit blows out mist	When the cooling operation starts.	The hi-humidity air indoor is cooled quickly.
The unit generates noise	The unit “clatters” as soon as it starts running.	It is the sound generated during the initialization of the electronic expansion valve.
	The unit “swishes” during the cooling operation.	It is the sound when the refrigerant gas runs inside the unit.
	The unit “swishes” when it is started or stopped.	It is the sound when the refrigerant gas stops running.
	The unit “swishes” when it is in and after the running.	It is the sound when the draining system is operating.
	The unit “squeaks” when it is in and after the running.	It is the sound of friction generated by the side plate etc which swells due to the temperature change.
The unit blows out dust	When the unit restarts after it is not used for a long time.	The dust inside the unit is blown out again.
The unit emits odors	When the unit is running.	The odors absorbed are blown out again.

3.Error Description

If an error occurs when the unit is running, the error code will be displayed on the wired zone controller and the main board  of the outdoor unit. Check for more details about the meaning of each error, as shown in table 15(a) and 15(b).

The error codes for duct, cassette and floor ceiling type units are shown in the following table 15(a):

Table 15(a)

Error Item	Outdoor Unit 88 Display	Indicating LED Flashing Times			88 Display	Wired Zone Controller Display	Error Type
		Running LED	Cooling LED	Heating LED			
High Pressure Protection	E1	Flash once	/	/	E1	E1	Outdoor
Shutdown for Whole Unit Anti-Freeze Protection	E2	Flash twice	/	/	E2	E2	System Error
Low Pressure Protection	E3	Flash 3 times	/	/	E3	E3	Outdoor

High Discharge Temp Protection	E4	Flash 4 times	/	/	E4	E4	Outdoor
Communication Error	E6	Flash 6 times	/	/	E6	E6	Outdoor & Indoor
Indoor Unit Water Full Error	E9	Flash 9 times	/	/	E9	E9	Indoor
Refrigerant Recovery Mode	Fo	Quick Flashing	Quick Flashing	/	Fo	Fo	Special Mode
Outdoor Ambient Temp Sensor Error	F3	/	Flash 3 times	/	F3	F3	Outdoor
Outdoor Mid-Coil Temp Sensor Error	F4	/	Flash 4 times	/	F4	F4	Outdoor
Outdoor Discharge Air Temp Sensor Error	F5	/	Flash 5 times	/	F5	F5	Outdoor
Oil Return for Cooling	F7	/	/	/	/	/	Special Mode
Forced Defrosting	H1	Quick Flashing	/	/	H1	H1	Special Mode
Oil Return for Heating or Defrosting	H1	/	/	Flash once	H1		Special Mode
Compressor Overheat Protection	H3	/	/	Flash 3 times	H3	H3	Drive Error
IPM Protection	H5	/	/	Flash 5 times	H5	H5	Drive Error
Motor Desynchronizing	H7	/	/	Flash 7 times	H7	H7	Drive Error
PFC Error	Hc	/	/	Flash 6 times	Hc	Hc	Drive Error
Startup Failure	Lc	/	/	Flash 11 times	Lc	Lc	Drive Error
DC Fan Motor Error	LA	/	/	/	/	/	Outdoor
Phase Loss	Ld	Flash 3 times	Flash 3 times	Flash 3 times	Ld	Ld	Drive Error
Compressor Stalling	LE	Flash 3 times	Flash 3 times	Flash 3 times	LE	LE	Drive Error
Over-Speed	LF	Flash 3 times	Flash 3 times	Flash 3 times	LF	LF	Drive Error
IPM Reset	P0	Flash 3 times	Flash 3 times	Flash 3 times	P0	P0	Drive Error
Compressor Current Protection	P5	/	/	Flash 15 times	P5	P5	Drive Error
Communication Error between the Inverter Drive and the Main Controller	P6	Flash 16 times	/	/	P6	P6	Drive Error
Radiator Temp Sensor Error	P7	/	/	Flash 18 times	P7	P7	Drive Error
Radiator Overheat Protection	P8	/	/	Flash 19 times	P8	P8	Drive Error
AC Contactor Protection	P9	Flash 3 times	Flash 3 times	Flash 3 times	P9	P9	Drive Error
Current Sensor Error	Pc	/	/	Flash 12 times		U1	Drive Error
Sensor Connection Protection	Pd	Flash 3 times	Flash 3 times	Flash 3 times	Pd	Pd	Drive Error
Over Voltage Protection	PH	/	Flash 11 times	/	PH	PH	Drive Error

Low Voltage Protection	PL	/	/	Flash 21 times	PL	PL	Drive Error
Temp Drift Protection	PE	Flash 3 times	Flash 3 times	Flash 3 times	PE	PE	Drive Error
Drive Board Ambient Temp Sensor Error	PF	Flash 3 times	Flash 3 times	Flash 3 times	PF	PF	Drive Error
AC Current Protection	PA	Flash 5 times	/	/	E5	E5	Drive Error
Charging Circuit Error	PU	/	/	Flash 17 times	PU	PU	Drive Error
AC Input Voltage Anomaly	PP	Flash 3 times	Flash 3 times	Flash 3 times	PP	PP	Drive Error
Unit n communication error	See Table 16	Flash 6 times	/	/	E6	E6	Indoor
Unit n indoor pipe midway temperature sensor error	See Table 16	/	Flash twice	/	E2	E2	Indoor
Indoor Evaporator Temp Sensor Short/ Open-Circuit	See Table 16	/	Flash twice	/	F2	F2	Indoor
(Air Valve) Unit n indoor unit pipe outlet temperature sensor error	See Table 16	/	Flash 22 times	/	b7	b7	Indoor
(Liquid Valve) Unit n indoor pipe inlet temperature sensor error	See Table 16	/	Flash 19 times	/	b5	b5	Indoor
Unit n mode conflict	See Table 16	/	Flash once	/	F1	F1	Indoor
Mode Conflict	See Table 16	Flash 7 times	/	/	E7	E7	Indoor

The error codes for wall mounted type unit are shown in the following table:Table 15(b):

Table 15(b)

Error Item	Outdoor Unit 88 Display	Indicating LED Flashing Times			88 Display	Wired Controler Display	Error Type
		Running LED	Cooling LED	Heating LED			
High Pressure Protection	E1	Flash once	/	/	E1	E1	Outdoor
Shutdown for Whole Unit Anti-Freeze Protection	E2	Flash twice	/	/	E2	E2	System Error
Low Pressure Protection	E3	Flash 3 times	/	/	E3	E3	Outdoor
High Discharge Temp Protection	E4	Flash 4 times	/	/	E4	E4	Outdoor
Communication Error	E6	Flash 6 times	/	/	E6	E6	Outdoor & Indoor
Indoor Unit Water Full Error	E9	Flash 9 times	/	/	E9	E9	Indoor
Refrigerant Recovery Mode	Fo	Flash once	Flash once	/	Fo	Fo	Special Mode

Outdoor Ambient Temp Sensor Error	F3	/	Flash 3 times	/	F3	F3	Outdoor
Outdoor Mid-Coil Temp Sensor Error	F4	/	Flash 4 times	/	F4	F4	Outdoor
Outdoor Discharge Air Temp Sensor Error	F5	/	Flash 5 times	/	F5	F5	Outdoor
Oil Return for Cooling	F7	/	Flash 7 times	/	/	/	Special Mode
Forced Defrosting	H1	Quick Flashing	/	/	H1	H1	Special Mode
Oil Return for Heating or Defrosting	H1	/	/	Flash once	H1		Special Mode
Compressor Overheat Protection	H3	/	/	Flash 3 times	H3	H3	Drive Error
IPM Protection	H5	/	/	Flash 5 times	H5	H5	Drive Error
Motor Desynchronizing	H7	/	/	Flash 7 times	H7	H7	Drive Error
PFC Error	Hc	/	/	Flash 6 times	Hc	Hc	Drive Error
Startup Failure	Lc	/	/	Flash 11 times	Lc	Lc	Drive Error
DC Fan Motor Error	LA	Flash 24 times	/	/	LA	LA	Outdoor
Phase Loss	Ld	/	/	/	Ld	Ld	Drive Error
Compressor Stalling	LE	/	/	/	LE	LE	Drive Error
Over-Speed	LF	/	/	/	LF	LF	Drive Error
IPM Reset	P0	/	/	/	P0	P0	Drive Error
Compressor Current Protection	P5	/	/	Flash 15 times	P5	P5	Drive Error
Communication Error between the Inverter Drive and the Main Controller	P6	Flash 16 times	/	/	P6	P6	Drive Error
Radiator Temp Sensor Error	P7	/	/	Flash 18 times	P7	P7	Drive Error
Radiator Overheat Protection	P8	/	/	Flash 19 times	P8	P8	Drive Error
AC Contactor Protection	P9	/	/	/	P9	P9	Drive Error
Sensor Connection Protection	Pd	/	/	/	Pd	Pd	Drive Error
Over Voltage Protection	PH	/	Flash 11 times	/	PH	PH	Drive Error
Low Voltage Protection	PL	/	/	Flash 21 times	PL	PL	Drive Error
Temp Drift Protection	PE	/	/	/	PE	PE	Drive Error
Drive Board Ambient Temp Sensor Error	PF	/	/	/	PF	PF	Drive Error
Charging Circuit Error	PU	/	/	Flash 17 times	PU	PU	Drive Error
Unit n communication error	See Table 16	Flash 6 times	/	/	E6	E6	Indoor

Unit n indoor pipe midway temperature sensor error	See Table 16	/	Flash twice	/	E2	E2	Indoor
Indoor Evaporator Temp Sensor Short/ Open-Circuit	See Table 16	/	Flash twice	/	F2	F2	Indoor
(Air Valve) Unit n indoor unit pipe outlet temperature sensor error	See Table 16	/	Flash 22 times	/	b7	b7	Indoor
(Liquid Valve) Unit n indoor pipe inlet temperature sensor error	See Table 16	/	Flash 19 times	/	b5	b5	Indoor
Unit n mode conflict	See Table 16	/	Flash once	/	F1	F1	Indoor
Mode Conflict	See Table 16	Flash 7 times	/	/	E7	E7	Indoor

Table 16

Error Code	Error Description	Error Code	Error Description	Error Code	Error Description
13	Unit A indoor unit pipe outlet temperature sensor error	23	Unit B indoor unit pipe outlet temperature sensor error	33	Unit C indoor unit pipe outlet temperature sensor error
14	Unit A indoor pipe inlet temperature sensor error	24	Unit B indoor pipe inlet temperature sensor error	34	Unit C indoor pipe inlet temperature sensor error
15	Unit A indoor ambient temperature sensor error	25	Unit B indoor ambient temperature sensor error	35	Unit C indoor ambient temperature sensor error
16	Unit A mode conflict	26	Unit B mode conflict	36	Unit C mode conflict
17	Unit A anti-freezing protection	27	Unit B anti-freezing protection	37	Unit C anti-freezing protection
41	Unit D communication error	46	Unit D mode conflict	54	Unit E indoor pipe inlet temperature sensor error
42	Unit D indoor pipe midway temperature sensor error	47	Unit D anti-freezing protection	55	Unit E indoor ambient temperature sensor error
43	Unit D indoor unit pipe outlet temperature sensor error	51	Unit E communication error	56	Unit E mode conflict
44	Unit D indoor pipe inlet temperature sensor error	52	Unit E indoor pipe midway temperature sensor error	57	Unit E anti-freezing protection
45	Unit D indoor ambient temperature sensor error	53	Unit E indoor unit pipe outlet temperature sensor error	C5	Jumper terminal error

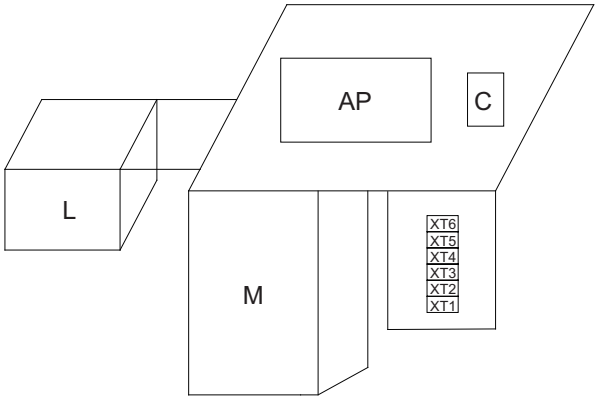


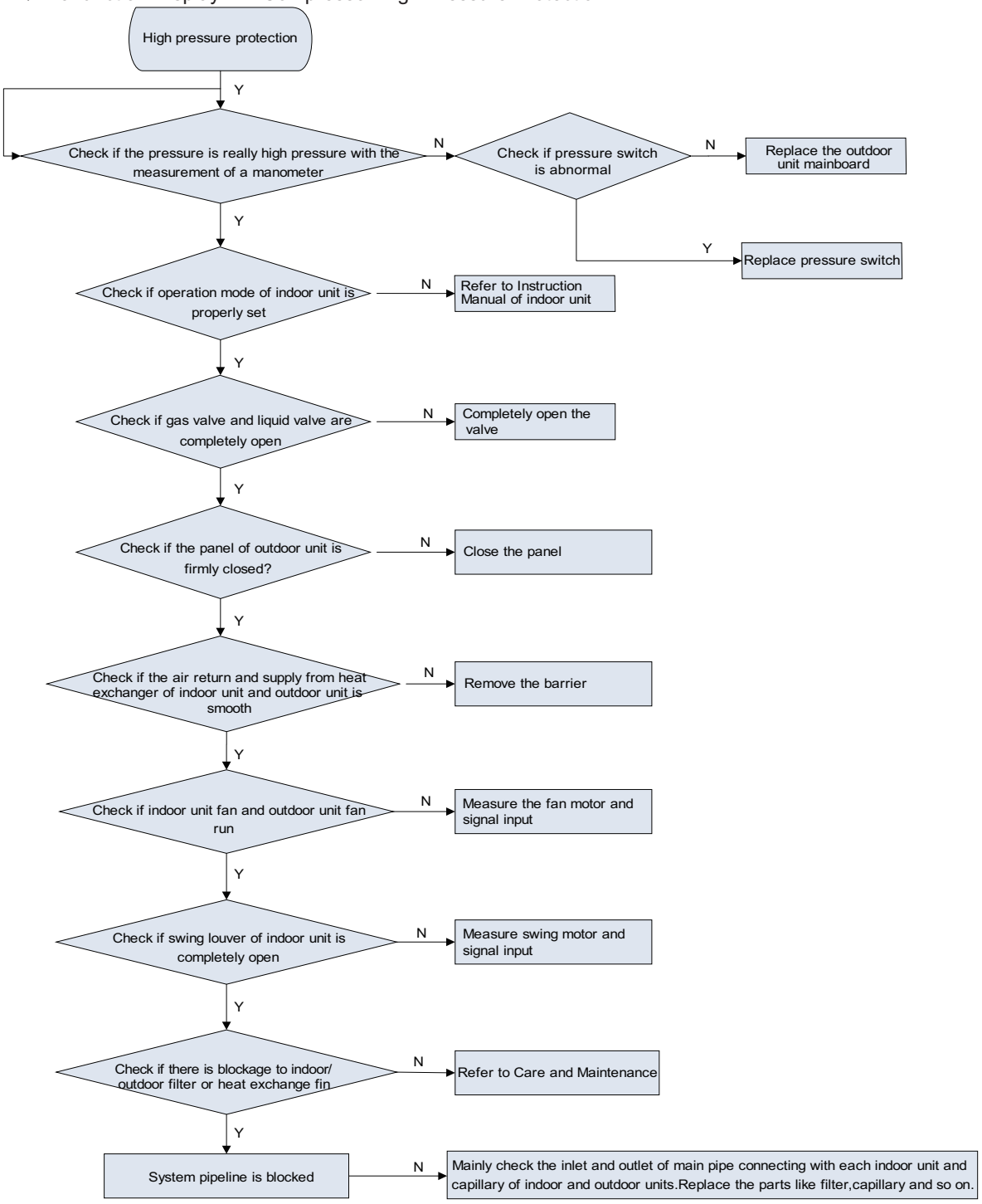
Fig.10 Outdoor Unit: DHM36CMB21S DHM42CMB21S

(Note: Refer to the real products for the exact position of each component.)

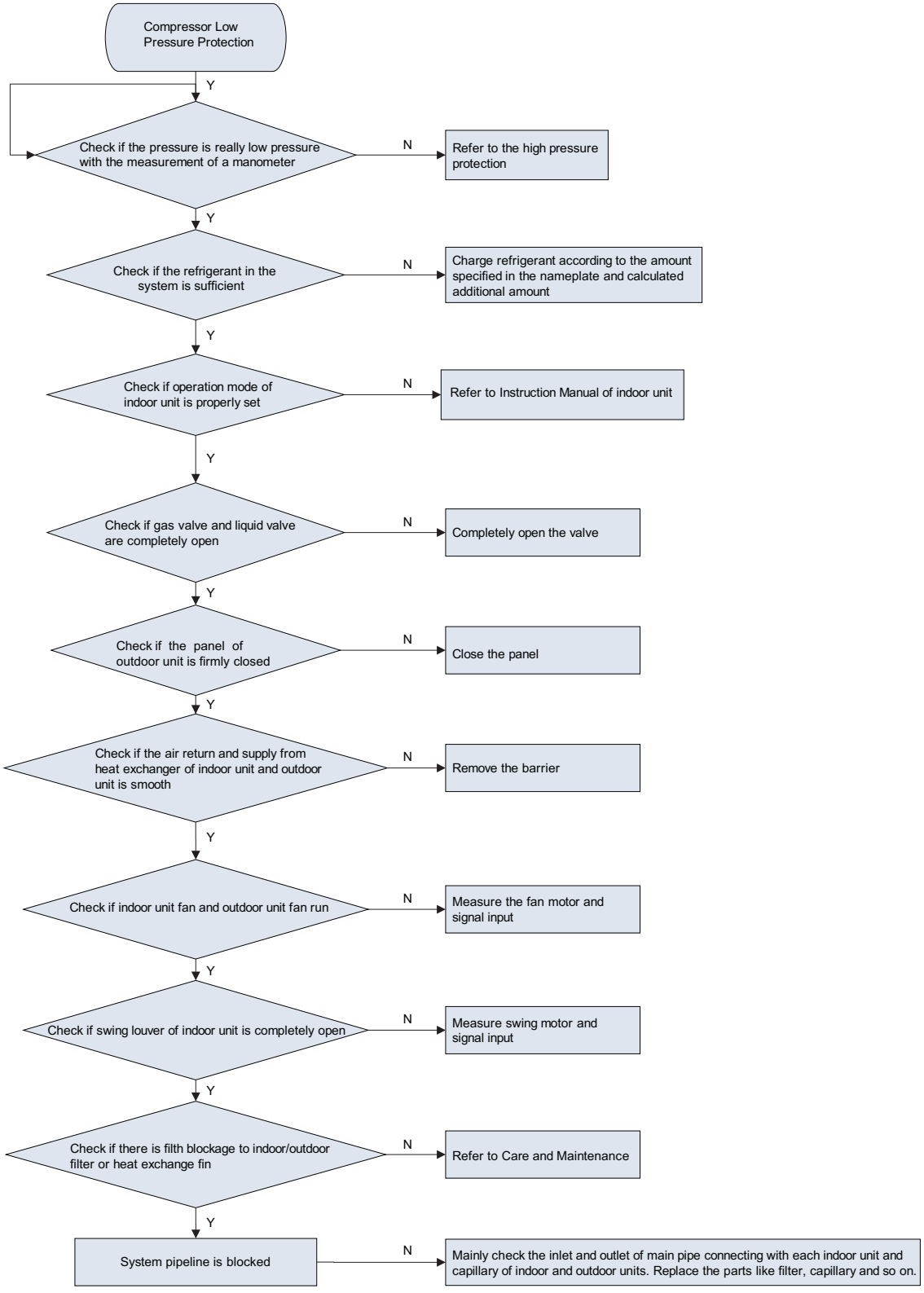
Once errors are displayed on the controller, please shut off the air conditioning unit and contact the a certified technician for troubleshooting.

4.After-Sales Service If there is any quality or other issue, please contact your distributor.

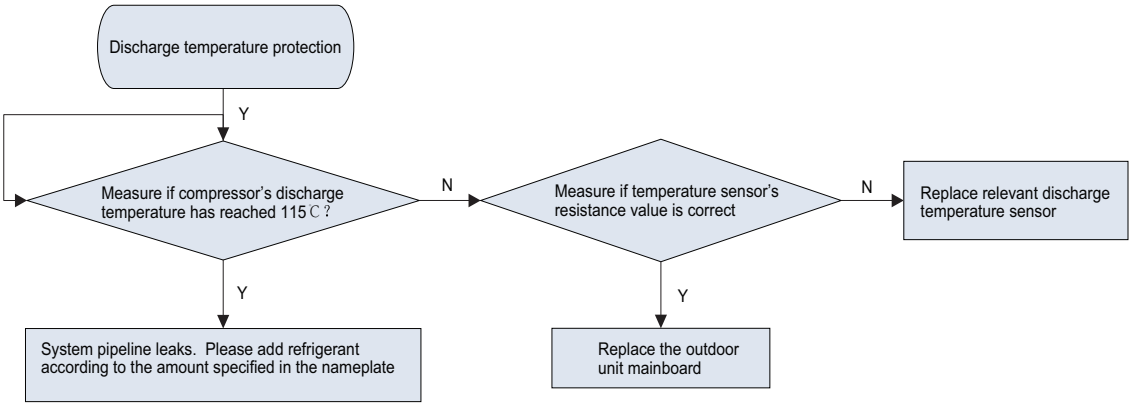
◆ Malfunction Display: E1 Compressor High Pressure Protection



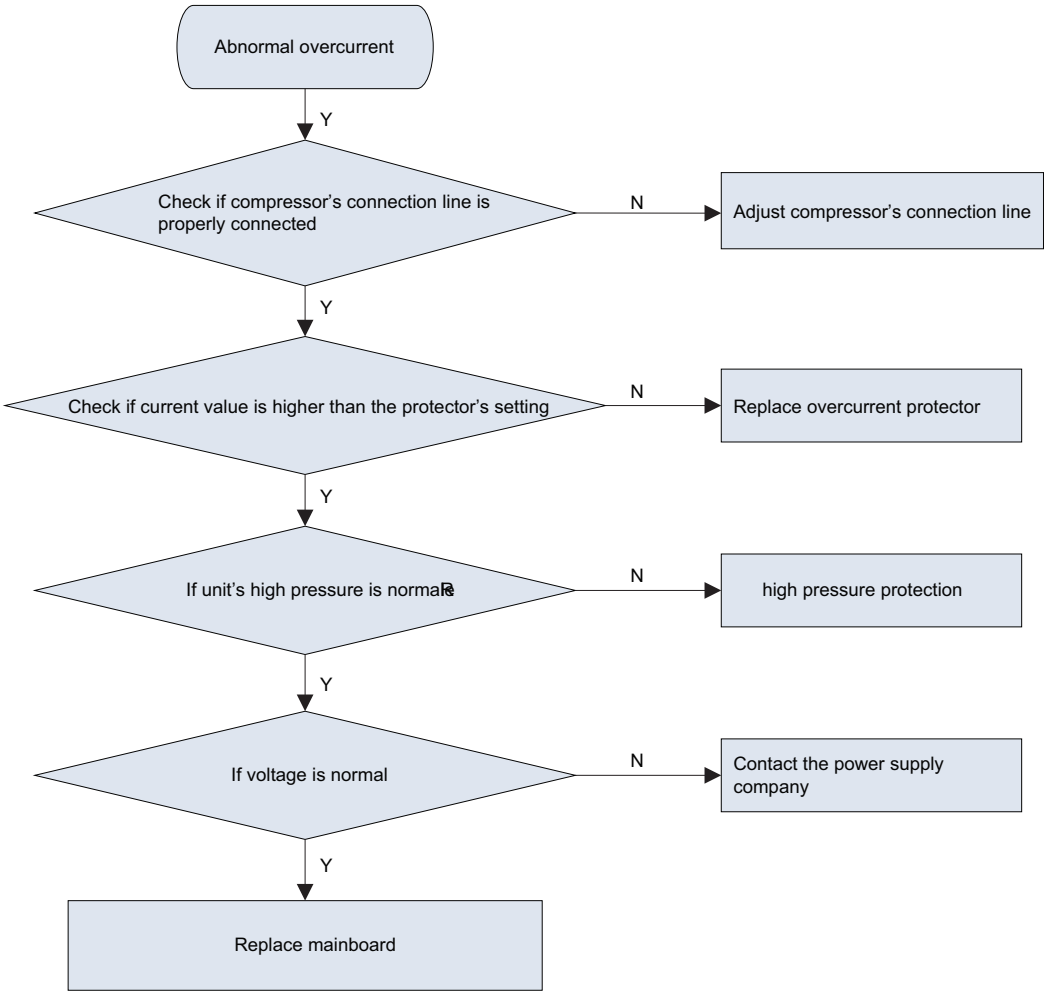
◆ Malfunction Display: E3 Compressor Low Pressure Protection



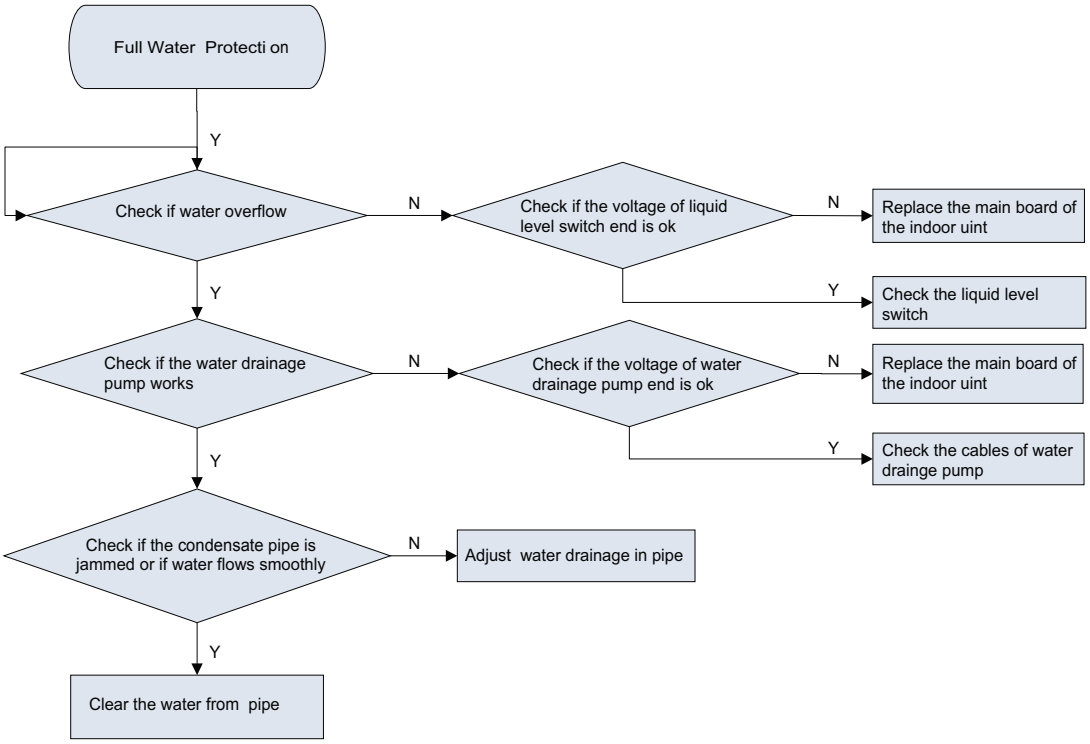
◆ Malfunction Display: E4 Compressor Exhaust High Temperature Protection



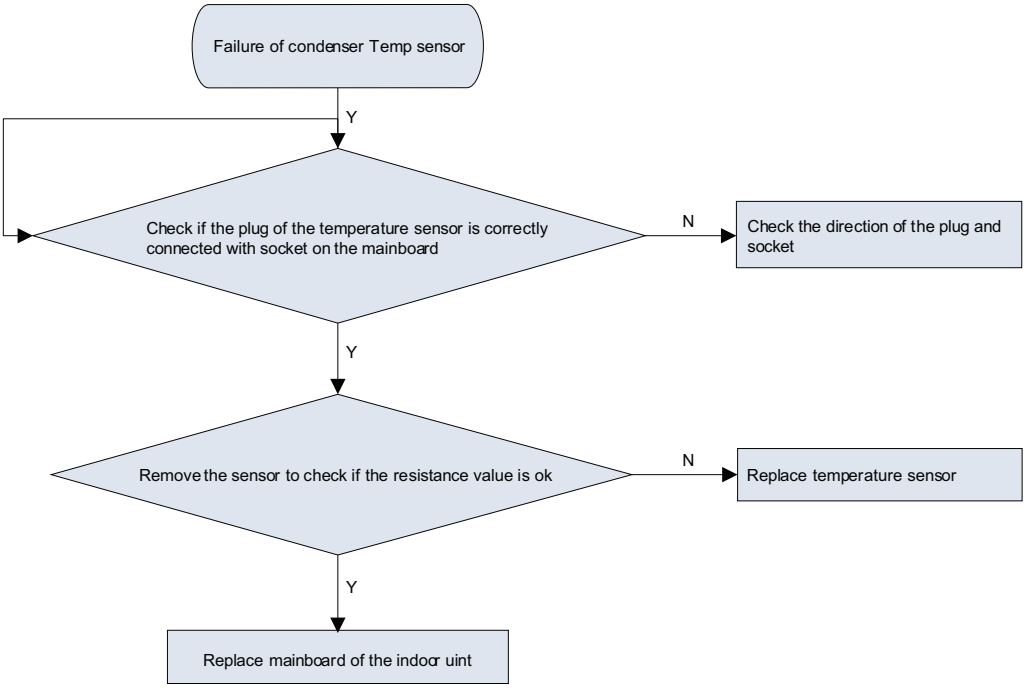
◆ Malfunction Display: E5 Compressor Overheat



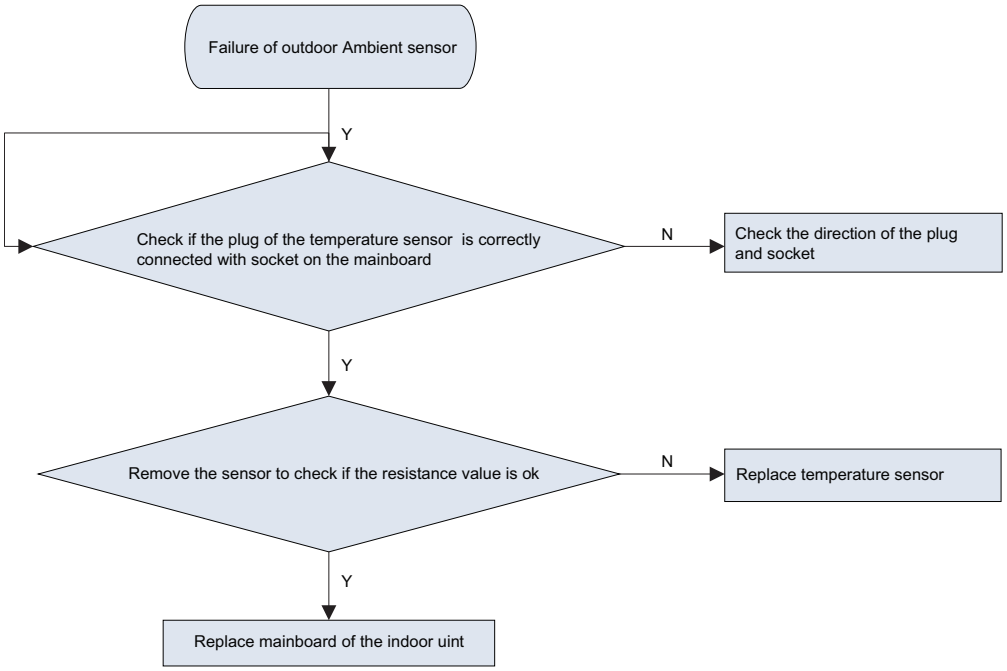
◆ Malfunction Display: E9 Full Water Protection



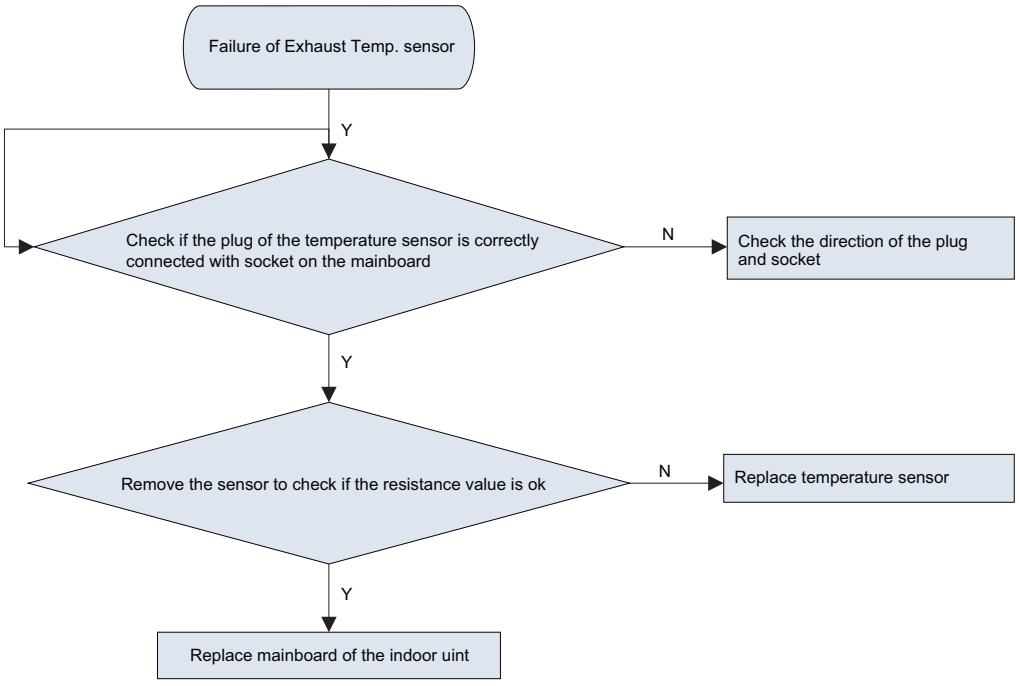
◆ Malfunction Display: F2 Failure of Evaporator Temp. Sensor



◆ Malfunction Display: F3 Failure of Outdoor Ambient Sensor



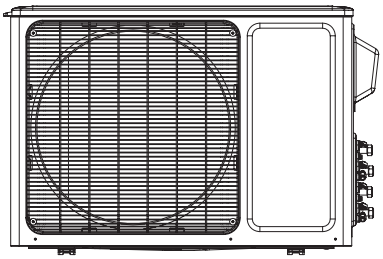
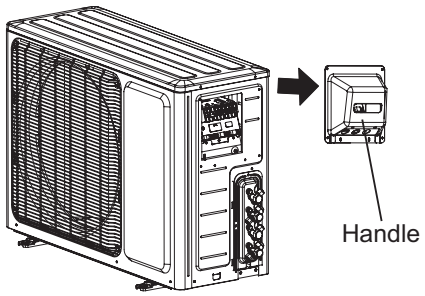
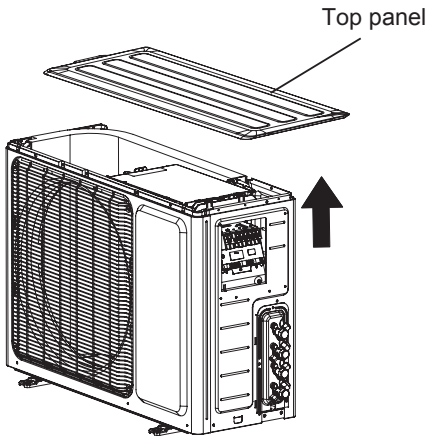
◆ Malfunction Display: F5 Failure of Exhaust Temp. Sensor



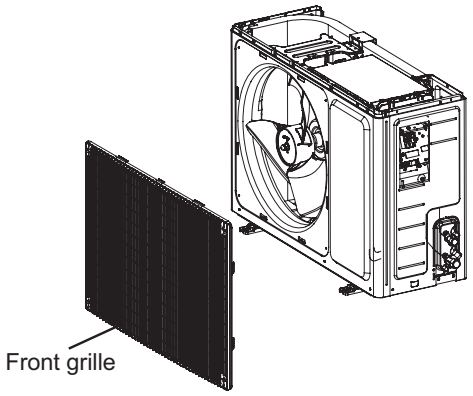
8. Removal Procedures

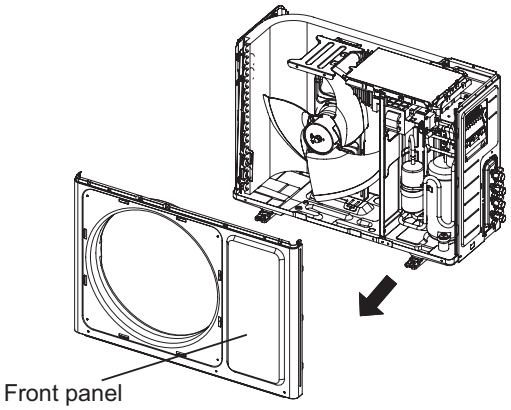
Warning: Be sure to wait for a minimum of 10 minutes after turning off all power supplies before disassembly.

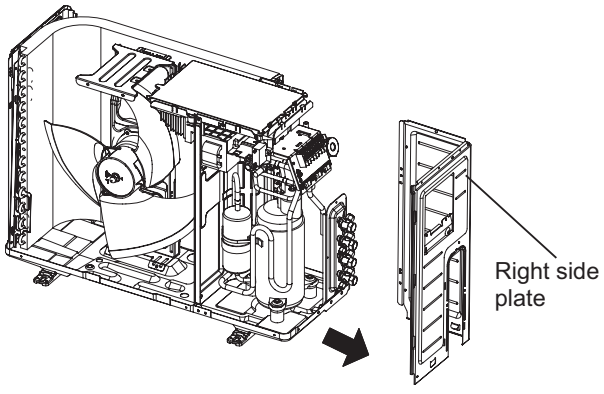
8.1 Removal Procedures (18K)

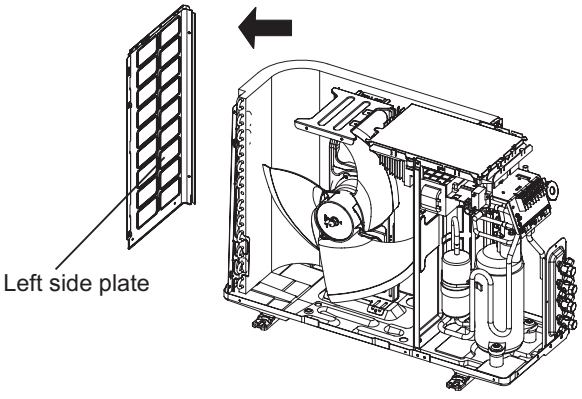
Steps	Procedures	
1. Remove top cover and handle		
1	Before disassembly.	
2	Twist off the screws securing the handle. Pull the handle upward to remove it.	
3	Twist off the screws securing the top panel. Pull the top panel upward to remove it.	

Steps	Procedures
2.Remove front grille and front panel	
1	Remove the screws connecting the front grille and the front panel. Remove the front grille.
2	Twist off the screws securing the panel, pull it upward, loosen the clasp on the right side, rotate it to the left and then remove the front panel.
3.Remove right side plate	
1	Remove the screws connecting the right side plate with the chassis, the valve support and the electric box. Then remove the right side plate assembly.
2	Remove the screws connecting the left side plate and the chassis. Then remove the left side plate assembly.

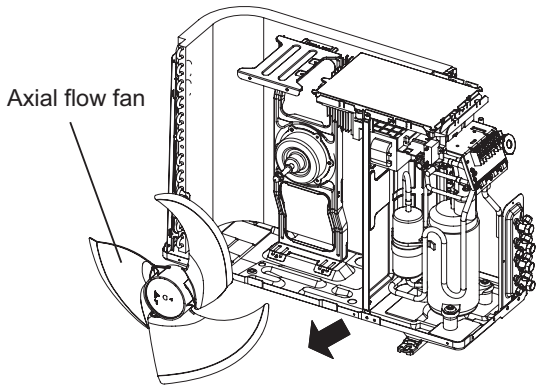


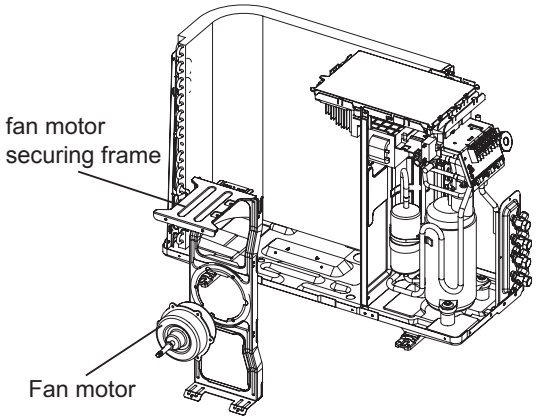


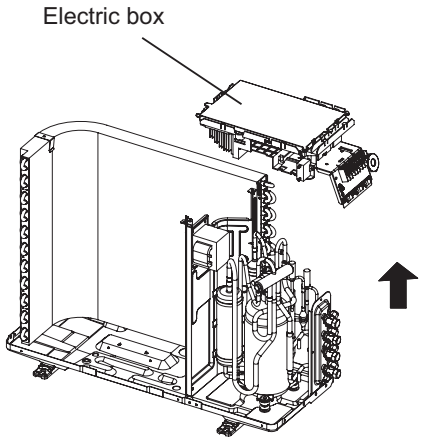


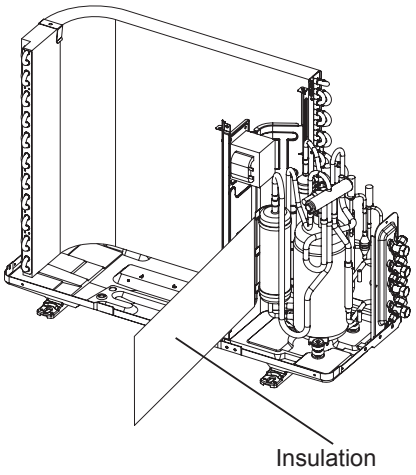
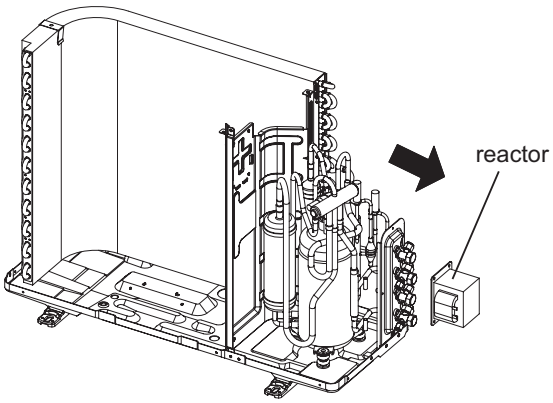
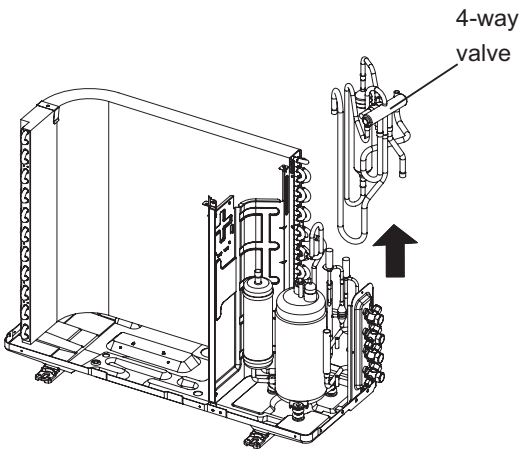


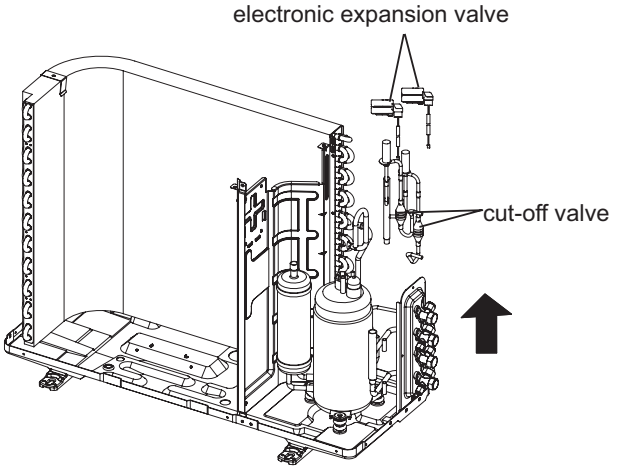
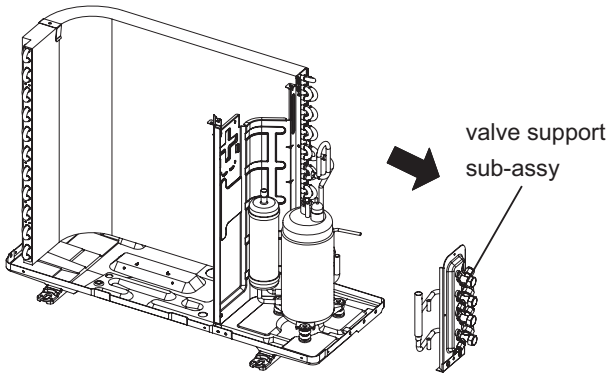
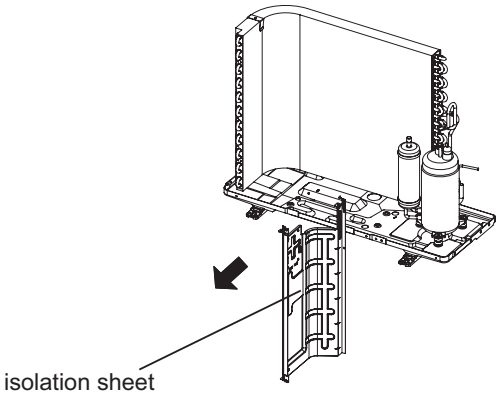
Steps	Procedures
4.Remove the axial flow fan	
1	Remove the nuts securing the blade and then remove the axial flow fan.
2	Remove the four tapping screws securing the motor; disconnect the leading wire insert of the motor and then remove the motor. Remove the two tapping screws securing the motor support. Then pull the motor support upward to remove it.
5.Remove Electric Box Assembly	
	Remove the screws securing the electric box sub-assembly; loosen the wire bundle; pull out the wiring terminals. Then pull the electric box upward to remove it.



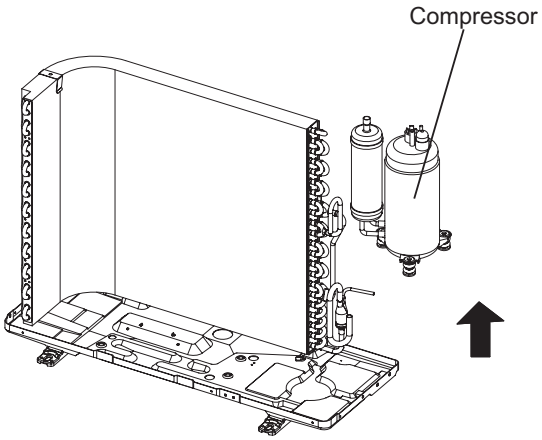


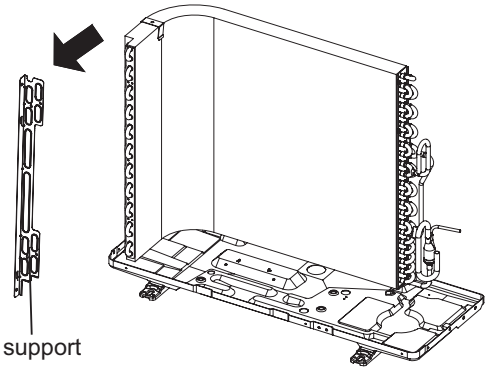


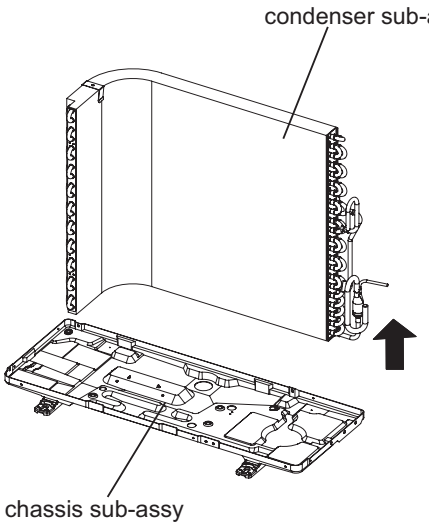
Steps	Procedures
6. Remove insulation Remove the insulation carefully.	
7. Remove reactor Remove screws connecting reactor and middle isolation sheet, and then remove the reactor.	
8. Remove 4-way valve Discharge the refrigerant completely; unsolder the pipelines connecting the compressor and the condenser assembly. Then remove the 4-way valve assembly.	

Steps	Procedures
9. Remove electronic expansion valve and cut-off valve Remove electronic expansion valve and cut-off valve Unsolder the spot weld between electronic expansion valve and cut-off valve as well as the spot weld of connection pipe for condenser, and then remove the expansion valve. Meanwhile, rotate out the electronic coil, and then pull it upwards to remove it.	
10. Remove valve support sub-assy Remove screws fixing valve support and chassis, and then remove the valve support sub-assy.	
11. Remove isolation sheet Remove screws fixing isolation sheet and then remove the isolation sheet.	

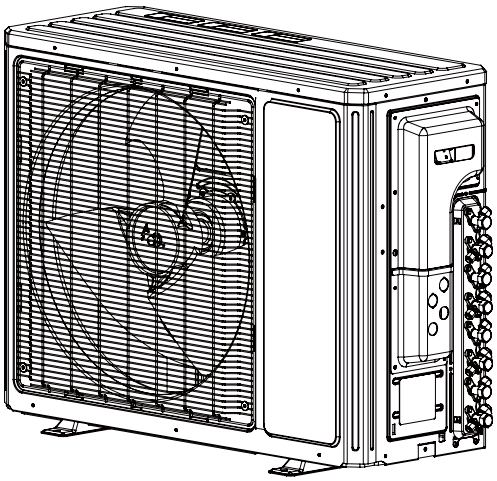
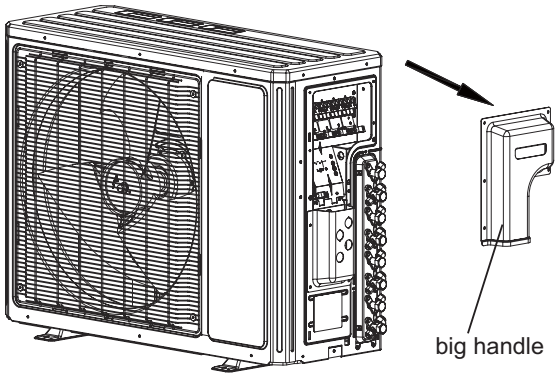
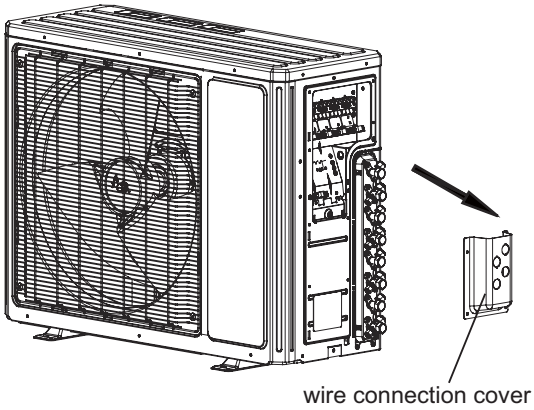
Steps	Procedures
12. Remove compressor	
	Twist off the three foot nuts on compressor and then remove the compressor.
13. Remove condenser sub-assembly	
1	Remove the screws connecting the support (condenser) and condenser assembly, and then remove the support (condenser).
2	Disassemble the chassis sub-assembly and condenser sub-assembly.

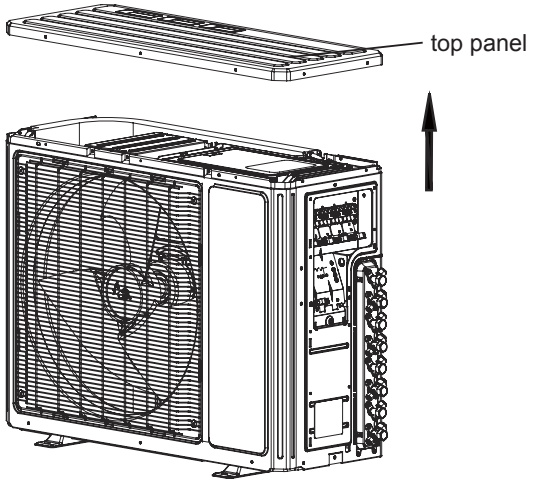
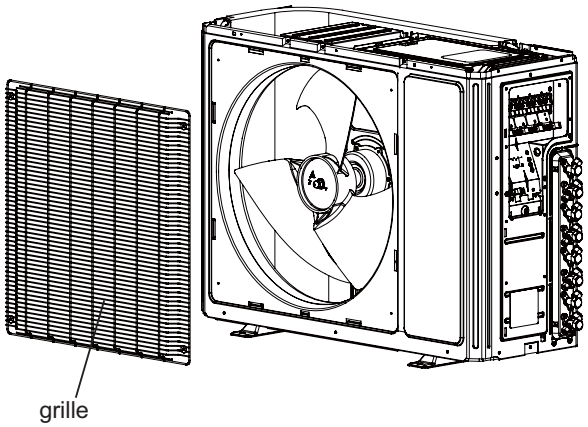
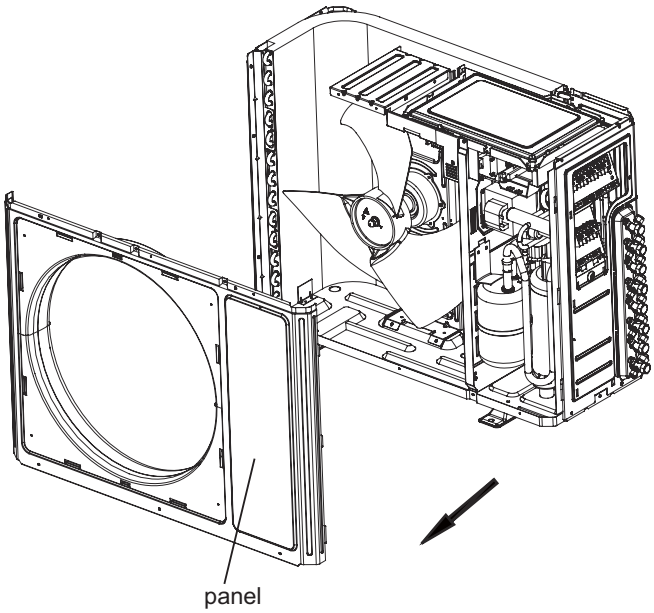


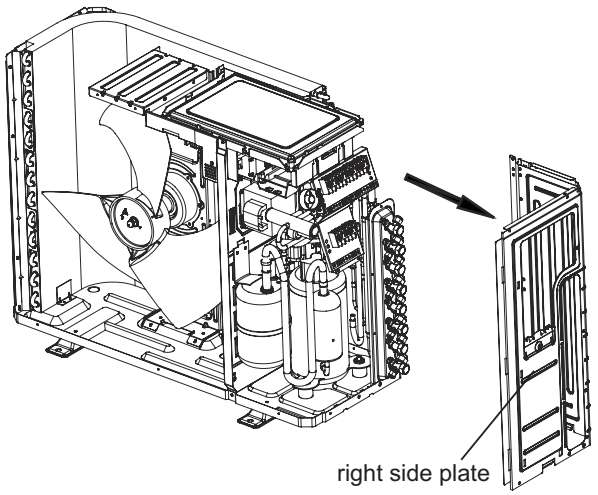
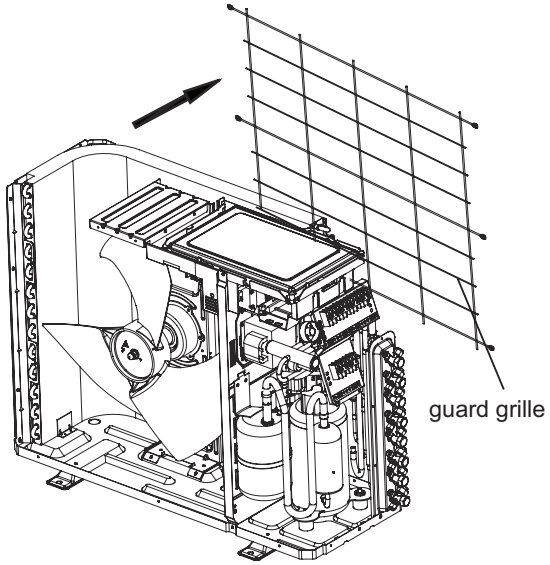
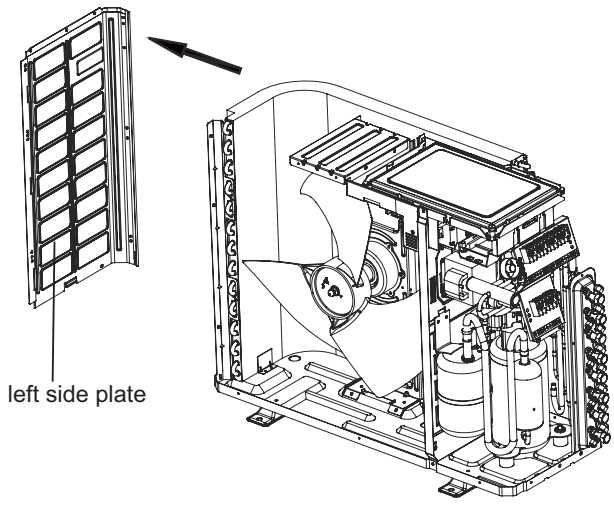


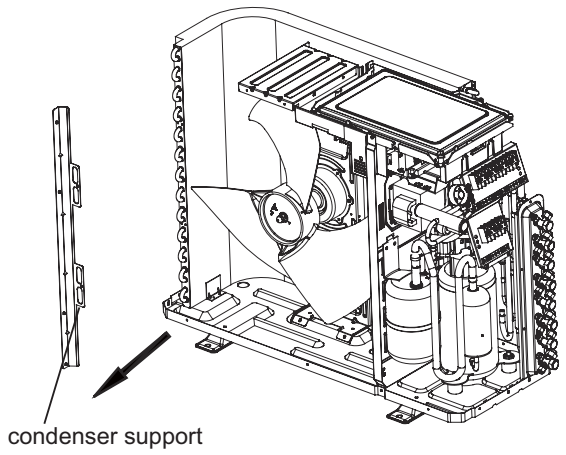
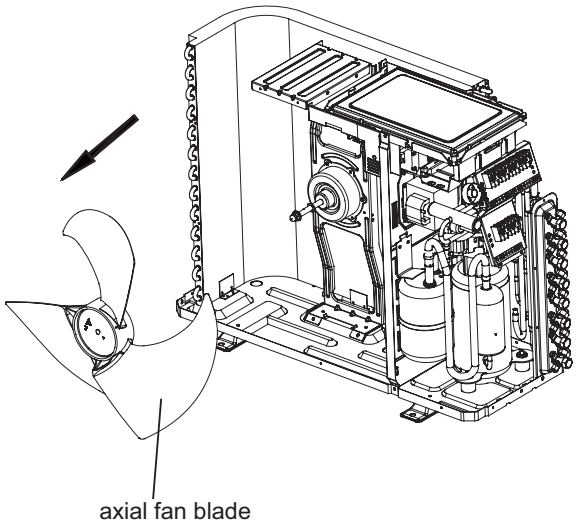
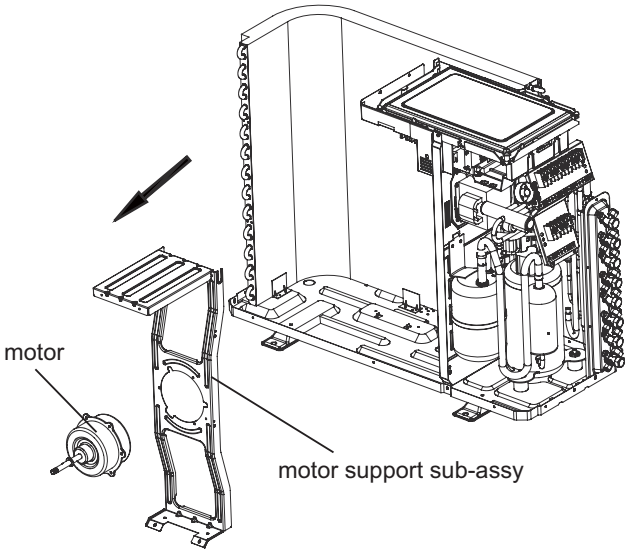


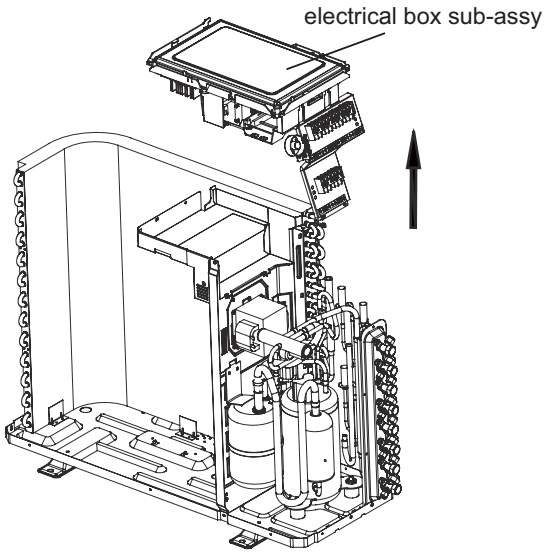
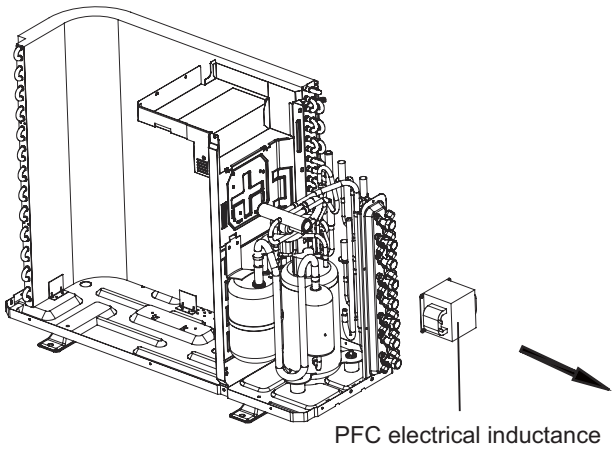
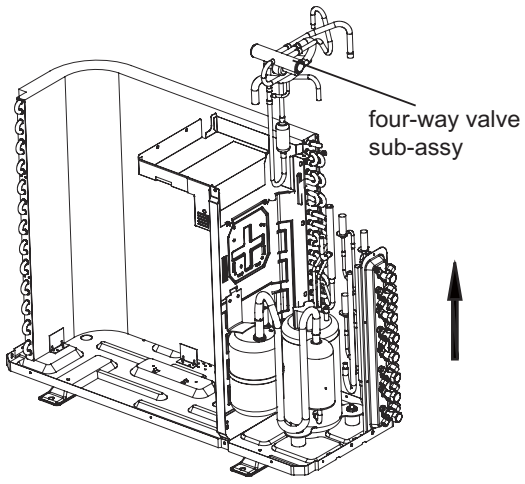
8.2 Removal Procedures (24K/30K)

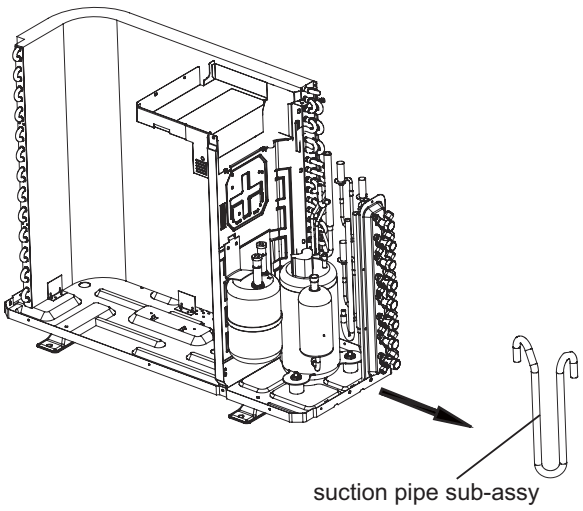
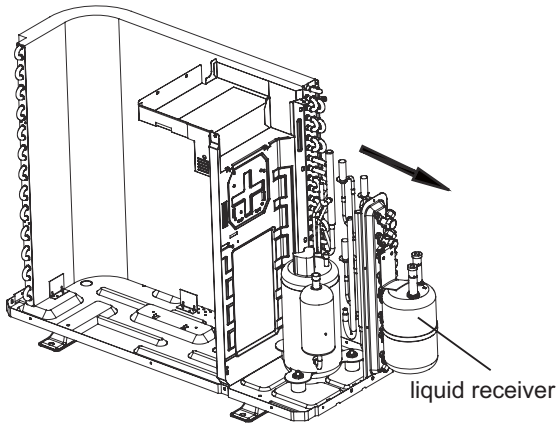
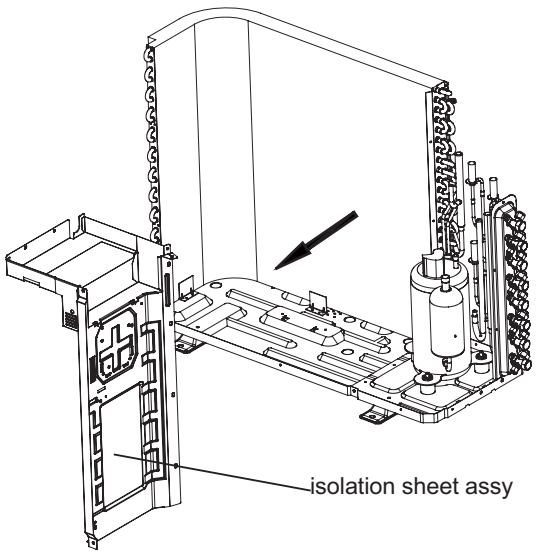
Steps	Procedures
1. Remove big handle and wire connection cover	
Before disassembly	
Remove the screws securing big handle and right side plate to remove the big handle.	
Remove the screws fixing wire connection cover and right side plate to remove the wire connection cover.	

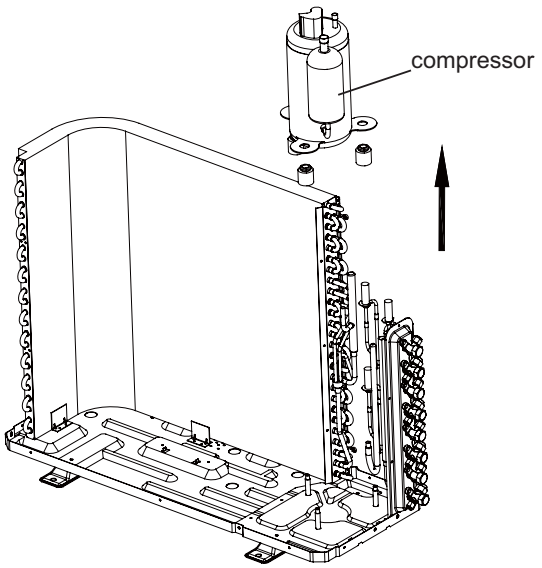
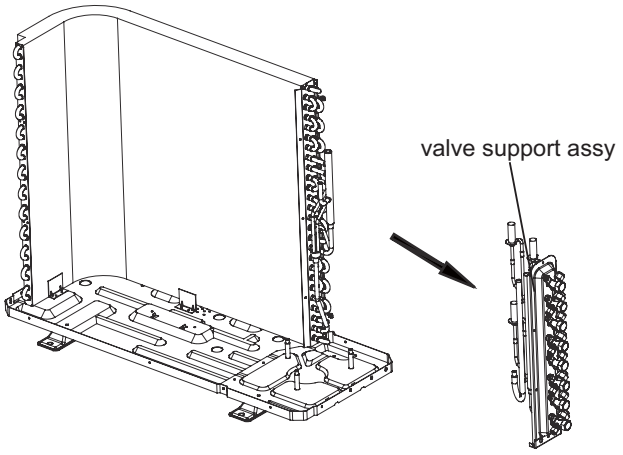
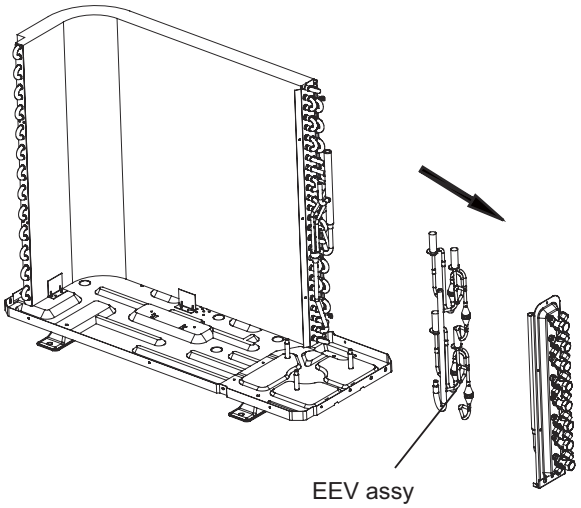
Steps	Procedures
2.Remove top panel	
Remove the screws securing top panel, and left and right side plate to remove top panel.	
3.Remove grille	
Remove the screws securing grille and panel to remove the grille on the panel.	
4.Remove panel	
Remove the screws securing panel, chassis and motor support to remove the panel.	

Steps	Procedures
5.Remove right side plate	
Remove the screws fixing right side plate, valve support and guard grille, to remove the right side plate.	
6.Remove guard grille	
Remove the screws fixing guard grille and left side plate to remove guard grille.	
7.Remove left side plate	
Remove the screws fixing chassis and condenser support to remove the left side plate.	

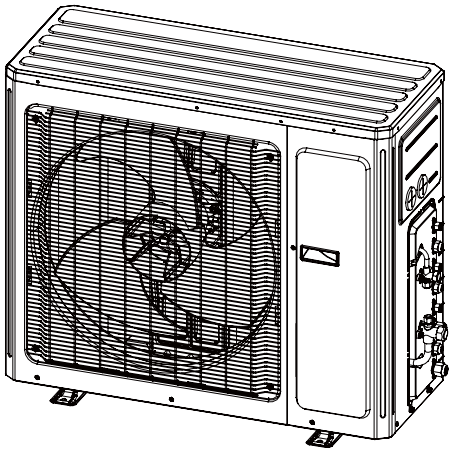
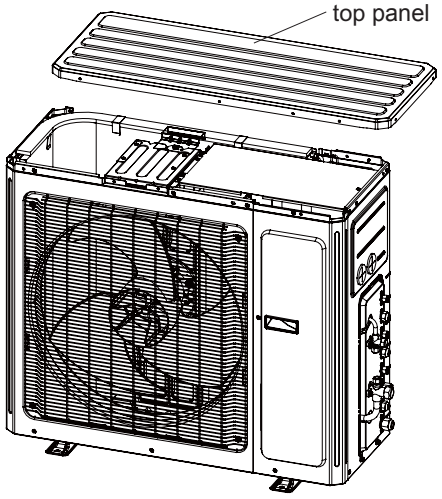
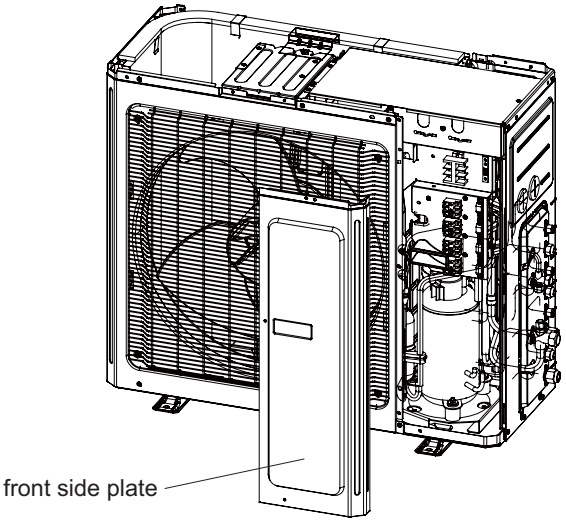
Steps	Procedures
8.Remove condenser support	
Remove the screws securing support and chassis to remove the condenser support.	
9.Remove axial fan blade	
Remove the screw nuts securing fan blade with wrench to remove the fan blade.	
10.Remove motor and motor support sub-assy	
Remove the tapping screws securing motor, pull out the pin of leading wire for motor. Remove the screws securing motor support and chassis to remove the motor and motor support sub-assy.	

Steps	Procedures
11.Remove electric box sub-assy	
Remove the tapping screws securing isolation sheet. Loosen the wire binds, pull out the terminal. Lift to remove the electrical box sub-assy.	
12.Remove PFC electrical inductance	
Remove the screws securing PFC electrical inductance and isolation sheet to remove the PFC electrical inductance.	
13.Remove four-way valve sub-assy	
Weld cut the welding point joining the four-way valve with blowtorch to remove the four-way valve sub-assy. **(Note: Please make sure there's no refrigerant in the unit before removing any tube or compressor.)**	

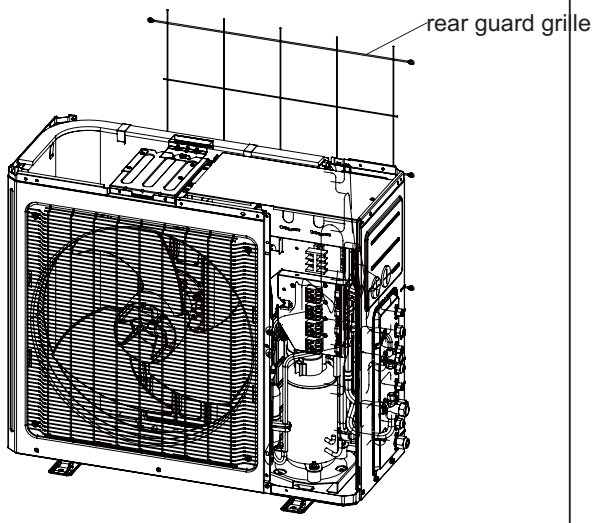
Steps 14. Remove suction pipe sub-assy	**Procedures**
Weld cut the welding point joining the suction pipe sub-assy, compressor and liquid receiver to remove the suction pipe sub-assy.	
15.Remove liquid receiver Remove the screws securing isolation sheet and liquid receiver and lift to remove the liquid receiver.	
16.Remove the isolation sheet assy Remove the screws securing isolation sheet and condenser side plate to remove the isolation sheet assy.	

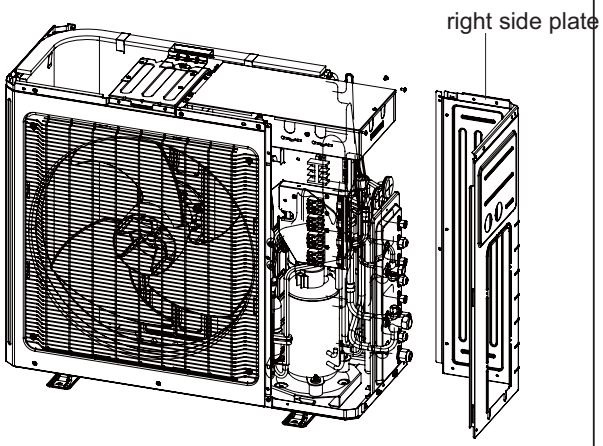
Steps	Procedures
17.Remove compressor	
Remove the screw nuts securing compressor feet and chassis with wrench, as well as the foot cushion to remove the compressor.	
18.Remove valve support assy	
Remove the screws securing valve support assembly and chassis sub-assembly to remove the valve support assembly.	
19.Remove EEV assy	
Weld cut the welding point joining EEV sub-assembly and refrigerant collection pipe to remove the EEV assembly. **(Note: Fully pack the big valve with wet cloth when weld cutting to avoid high temperature damage of valve.)**	

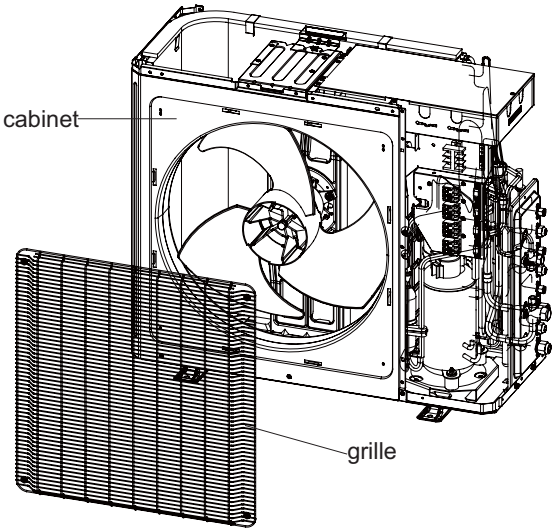
8.3 Removal Procedures (36K)

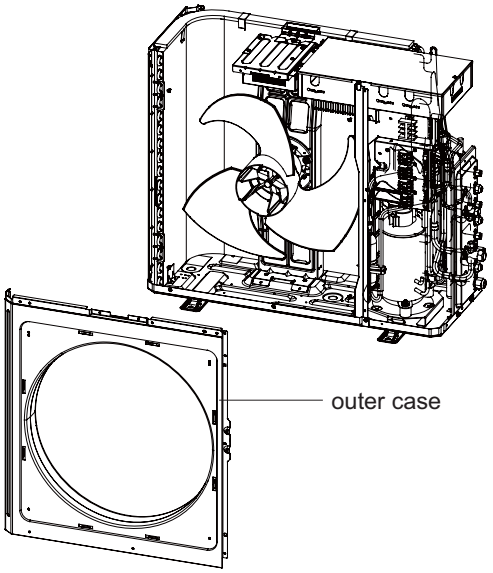
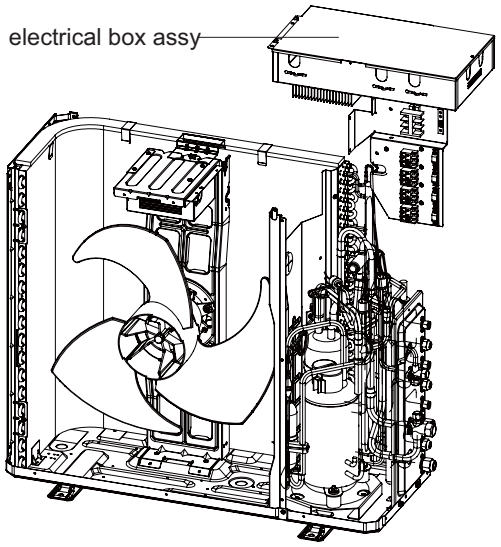
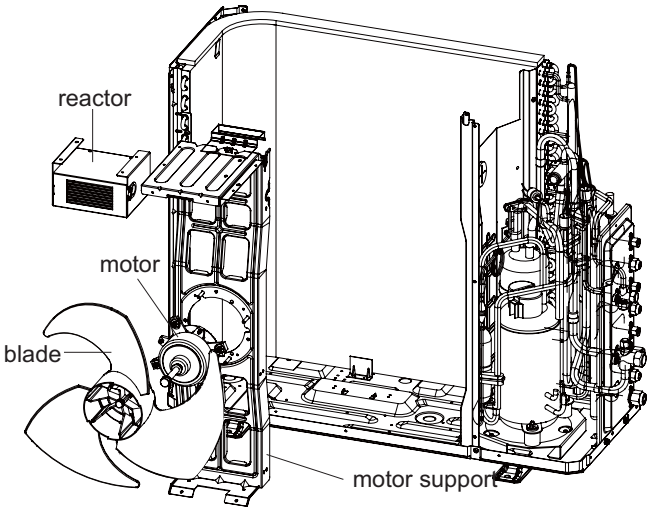
Steps	Procedures
1. Before disassembly	
2. Remove top panel Remove the screws connecting the top panel with outer case, right side plate and left side plate. Lift the top panel upward to remove it.	
3.Remove front side plate Remove the screws connecting the front side plate with chassis and middle isolation sheet, and then remove the front side plate	

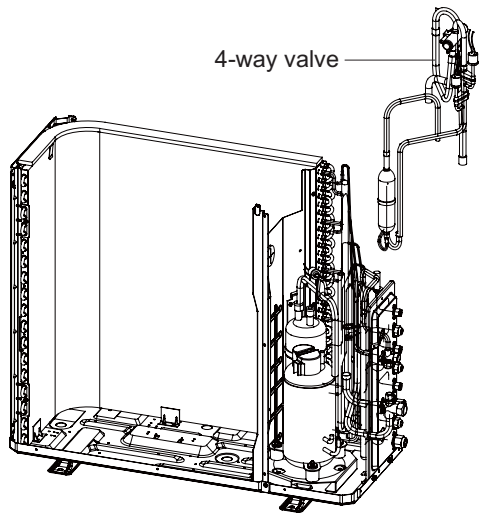
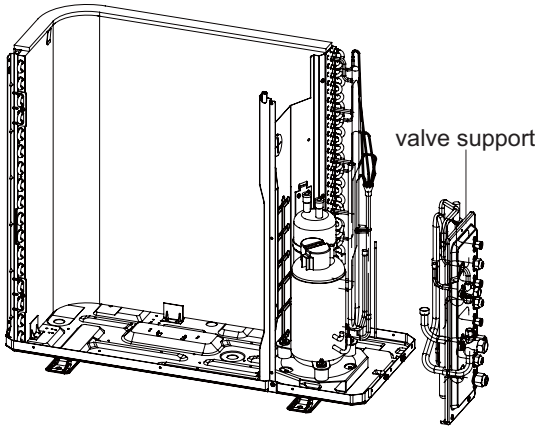
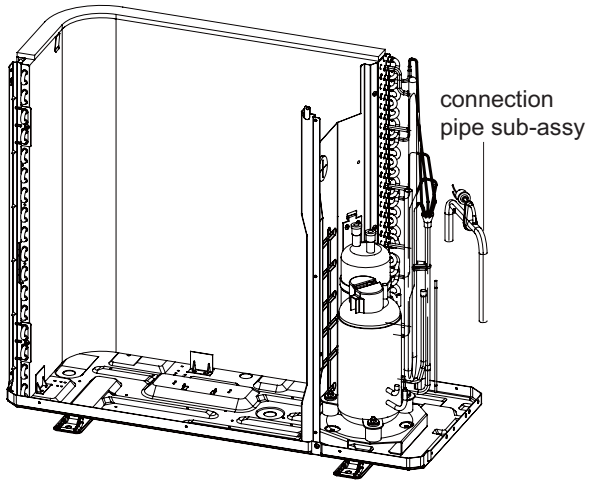
Steps	Procedures
4.Remove rear guard grille	
	Remove the six screws connecting the grille with right side plate and left side plate, and then remove the rear guard grille.
5.Remove right side plate	
	Remove the screws connecting the right side plate with electric box assembly, valve support, chassis and condenser side plate. Then remove the right side plate.
6.Remove grille and cabinet	
	Remove the four screws connecting the grille and outer case, and then remove the panel grille.



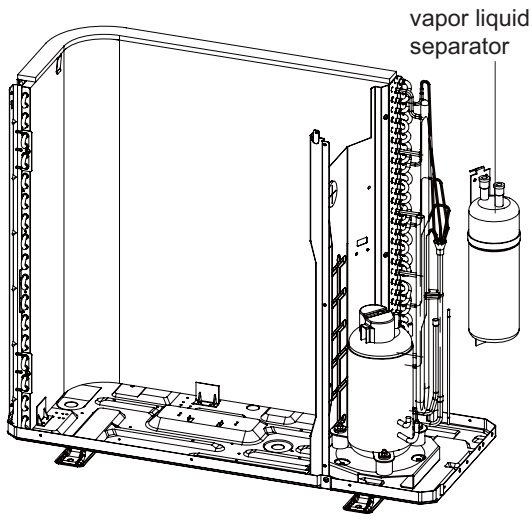


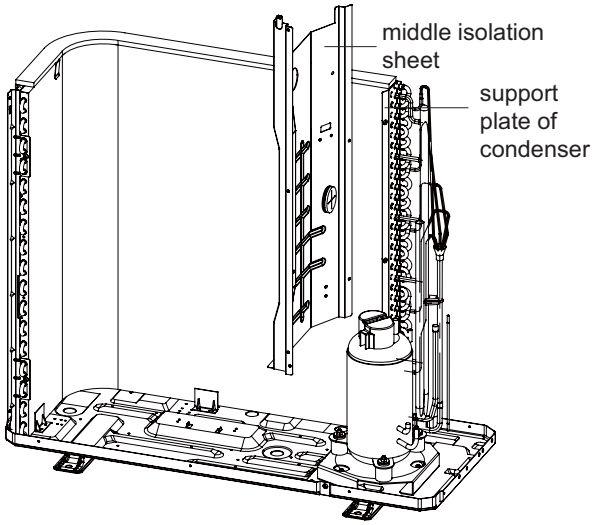


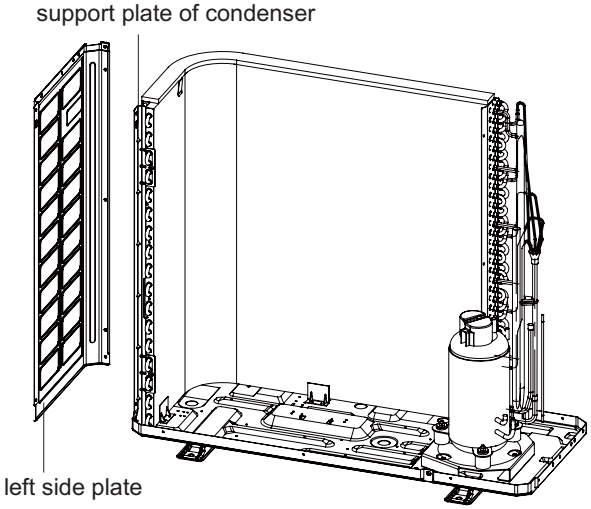
Steps	Procedures
7. Remove outer case	
Remove screws connecting outer case and motor support, middle isolation sheet and chassis. Pull the outer case upward slightly, loosen clasps between outer case and right side plate, left side plate, and then remove the outer case.	
8. Remove electric box assy	
1.Remove the grounding wire screw on the electrical box assembly and then remove the grounding wire. 2.Disconnect the wiring terminals of reactor, compressor, high and low pressure switch, compressor overload protector, temperature sensor, outdoor fan motor and 4-way valve. (See fig 2) Note: Keep pressing the circlip when disconnecting the wiring terminal of reactor; keep pressing the retainer when disconnecting other wiring terminals. 3.Remove the wire inside the wiring groove.	
9. Remove blade, motor, motor support, reactor	
1.Remove nuts securing axial flow blade with wrench and then remove the axial flow blade. 2.Remove two screws connecting motor support and chassis, loosen damper block and then remove the motor support. 3.Remove four screws securing motor, and then remove the motor. 4.Remove four screws securing reactor sub-assembly and motor support. Then remove the reactor sub-assembly.	

Steps	Procedures
10 Remove 4-way valve	
	Unsolder the spot weld between 4-way valve and vapor liquid separator, compressor cut-off valve sub-assembly and condenser, and then remove the 4-way valve. Note: When unsoldering the spot weld, wrap the 4-way valve with wet cloth completely to avoid damage to valve due to high temperature.
	
11. Remove valve support	
	Unsolder all spot welds connected with valve support and then remove the valve support. Note: When unsoldering the spot weld, wrap the gas valve and liquid valve with wet cloth completely to avoid damage to valve due to high temperature.
	
12. Remove connection pipe sub-assembly	
	Remove all spot welds connected with connection pipe, and then remove the connection pipe sub-assembly.
	

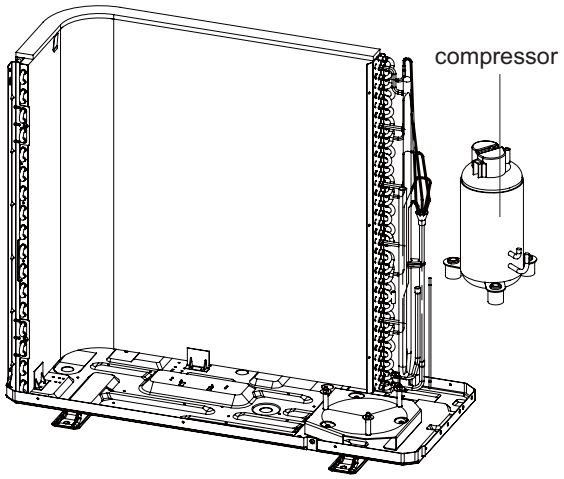
Steps	Procedures
13. Remove vapor liquid separator	
	Unsolder spot welds connected with vapor liquid separator, remove screws connecting vapor liquid separator and middle isolation sheet, and then remove the vapor liquid separator.
14. Remove middle isolation sheet	
	Remove screws connecting middle isolation sheet and support plate of condenser, chassis, and then remove the middle isolation sheet.
15. Remove left side plate	
	Remove screws connecting left side plate and support plate of condenser, chassis, and then remove the left side plate.

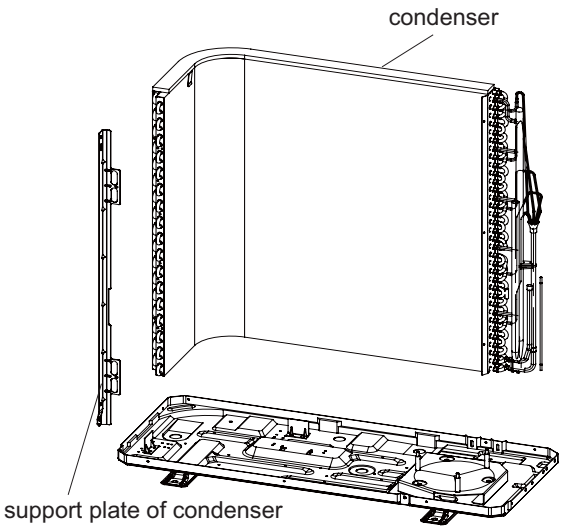




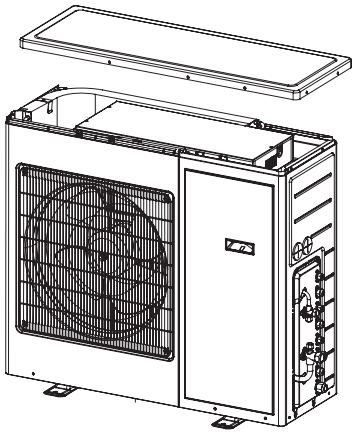
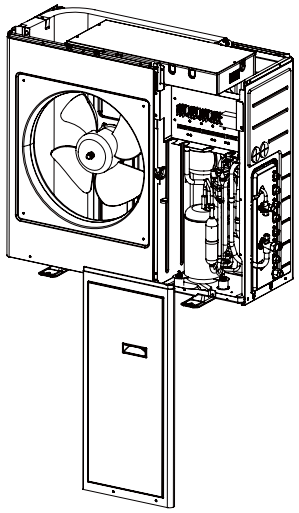
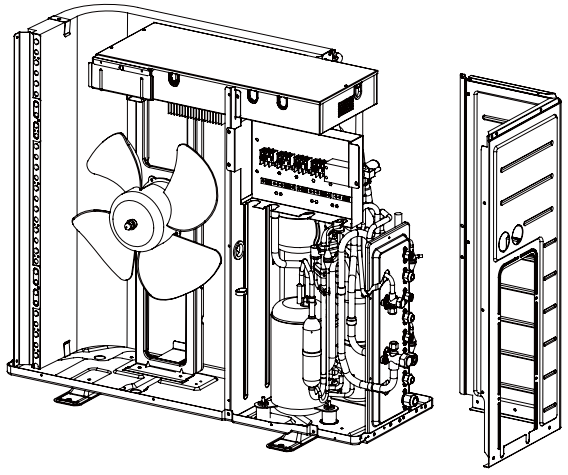


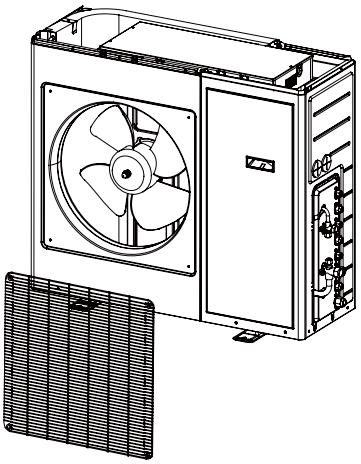
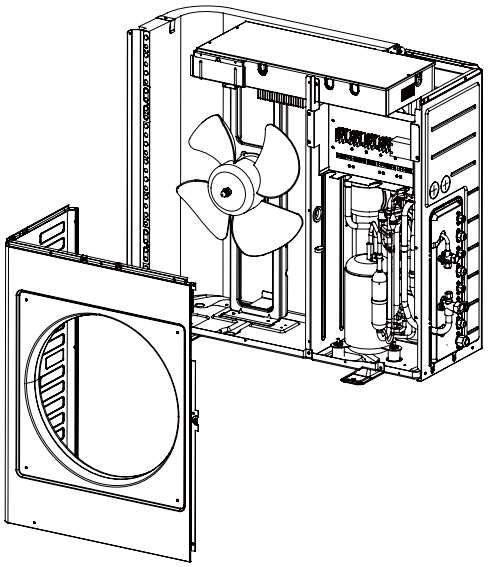
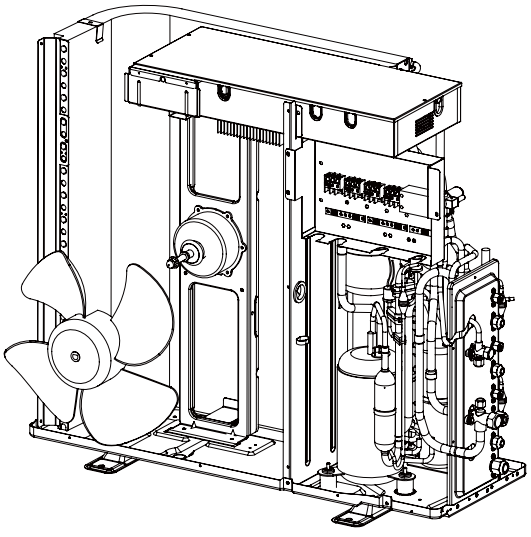
Steps	Procedures
16.Remove compressor	
	Remove the three foot nuts securing compressor and then lift the compressor upward to remove the compressor and damping cushion. Note: Keep the ports of discharge pipe and suction pipe from foreign objects.
17. Remove condenser	
	Remove five screws connecting condenser and chassis and then remove the condenser. Remove two screws connecting support plate of condenser and condenser, and then remove the support plate of condenser.



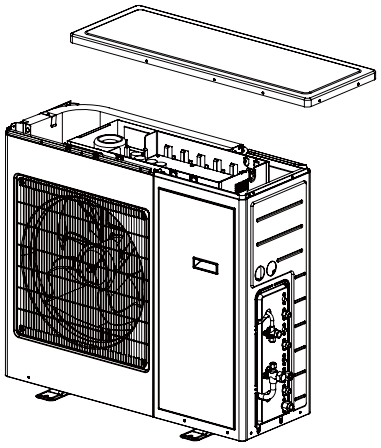


8.4 Removal Procedures (42K)

Disassembly and Assembly of Outer Casing	
Steps	**Procedures**
1. Disassemble the cover plate	
① Remove the securing screws on the cover plate by using a screwdriver. ② Remove the cover plate.	
2. Disassemble the front panel	
① Remove the securing screws on the front panel by using a screwdriver. ② Remove the front panel.	
3. Disassemble the panel on the right side	
① Remove the securing screws on the panel by using a screwdriver. ② Remove the panel on the right side.	

Steps	Procedures
4. Remove the grille	
① Remove the securing screws on the grille by using a screwdriver. ② Remove the grille.	
5. Disassemble the outer casing	
① Remove the securing screws on the outer casing by using a screwdriver. ② Remove the outer casing.	
6. Disassemble the fan blades	
① Remove the securing screws on the fan blades by using a wrench. ② Remove the fan blades.	

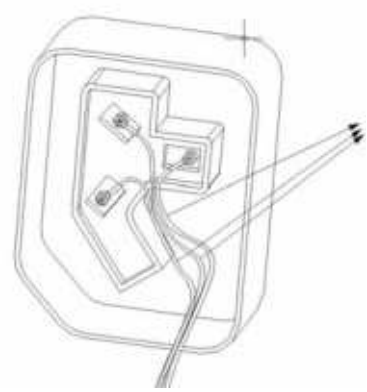
Steps	Procedures
7. Assemble the disassembled main parts as per the reverse disassembly order mentioned above	
	Assemble the disassembled main parts as per the reverse disassembly order mentioned above and energize the unit for trial test.



Disassembly and Assembly of Compressor

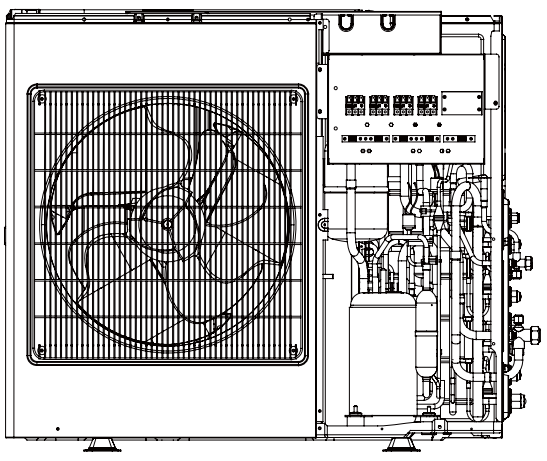
Remark: Make sure that there is no refrigerant in pipe system and the power supply is cut off before disassembling the compressor.

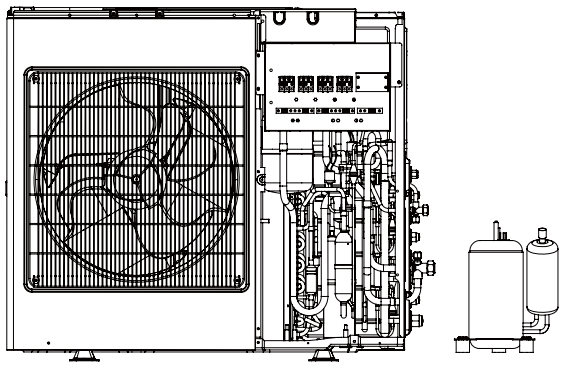
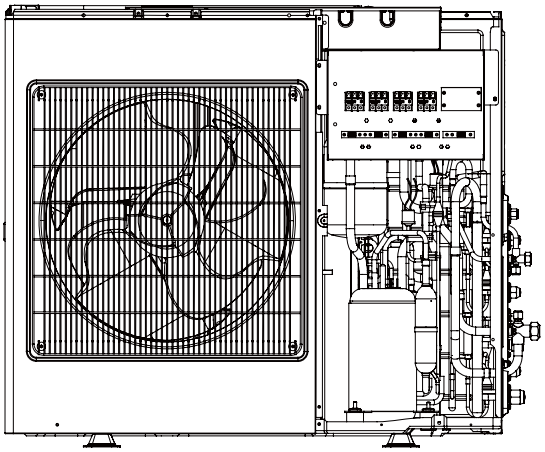
Steps	Procedures
1. Disconnect the power cord	
	① Remove the securing screws on the power cord by using a screwdriver. ② Draw out the power cord. **Note:** **Please note the color of each power cord and also the corresponding terminal number when removing the power cord in case of misconnection.**



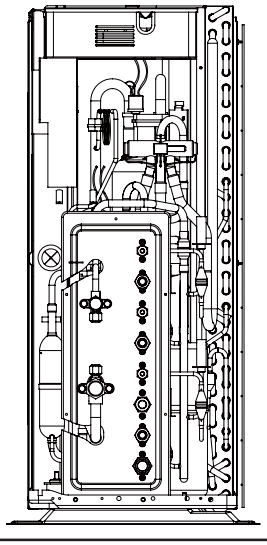
Note the color of each power cord and also the corresponding terminal

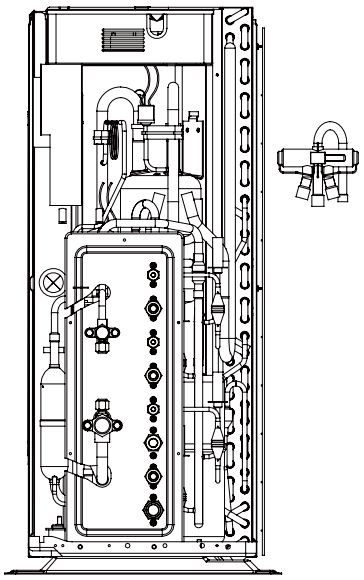
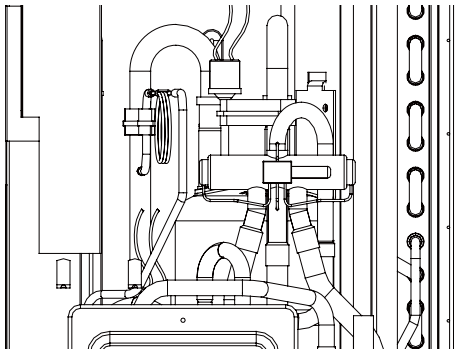
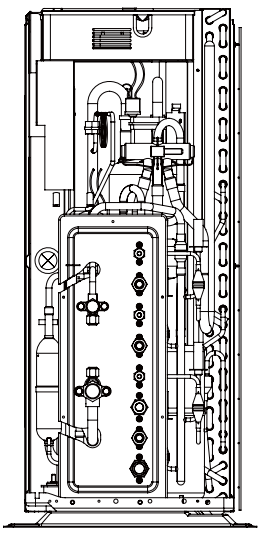
2. Disassemble the pipeline connected with compressor	
	Disconnect the pipeline connected with compressor.

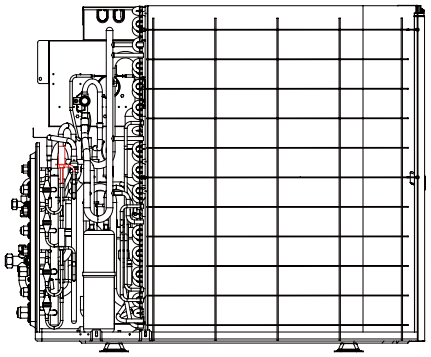
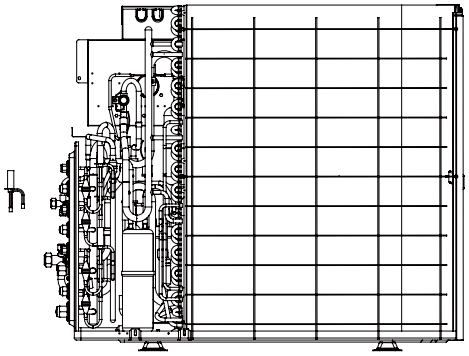
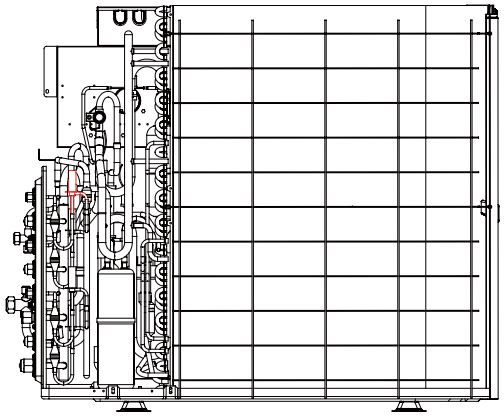
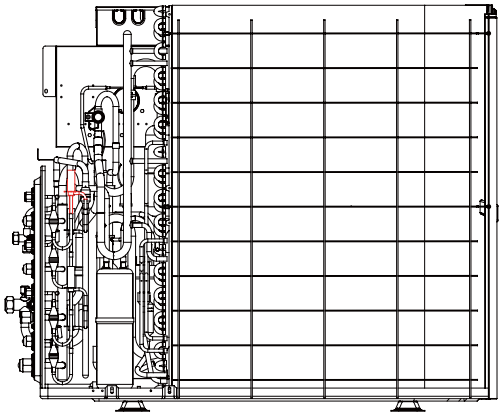


Steps	Procedures
3. Take down the faulty compressor	
	① Remove the bolts on the compressor using a socket wrench ② Take down the faulty compressor from the bottom plate.
4. Place the new compressor on the bottom plate and connect the suction inlet and discharge outlet with the pipe system	
	① Place the compressor on the bottom plate. ② Tighten the nuts using a socket wrench.

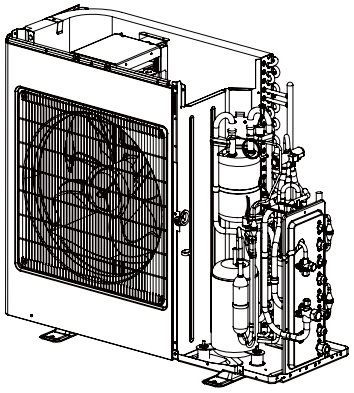
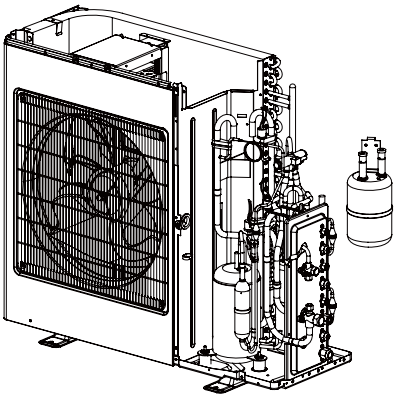
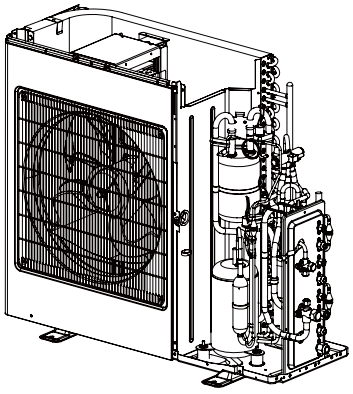
Disassembly and Assembly of 4-way Valve

Steps	Procedures
1. Remove the 4-way valve coil	
	① Remove the screws on the secured coil by using a screwdriver. ② Remove the 4-way valve coil.

Steps	Procedure
2. Disconnect the 4-way valve and the connected pipe by soldering. Take down the faulty 4-way valve.	
Disconnect the 4-way valve and the connected pipe with a welding gun. Take down the faulty 4-way valve.	
3. Replace the 4-way valve and reconnect it with the pipeline.	
① Place the new 4-way valve in the right place. ② Re-weld the new 4-way valve with the pipeline.	
4. Install the 4-way valve coil	
① Set the 4-way valve coil securely. ② Tighten the screws with a screwdriver.	

Disassembly and Assembly of Electronic Expansion Valve	
Steps	**Procedures**
1. Remove the electronic expansion valve coil	
	Remove the electronic expansion valve coil by rotating it until the lock is unfixed.
2. Disconnect the electronic expansion valve and the connected pipe by soldering	
	Disconnect the electronic expansion valve and the connected pipe using a welding gun.
3. Replace the electronic expansion valve	
	Place the new electronic expansion valve in the right place.
4. Reconnect the electronic expansion valve with the pipeline	
	Reconnect the electronic expansion valve with the pipeline by welding.
5. Install the electronic expansion valve coil	
	Set the electronic expansion valve coil on the valve body and adjust the lock to the right place.

Disassembly and Assembly of Vapor Liquid Separator

Steps	Procedures
1. Disconnect the liquid separator and the connected pipeline	
Disconnect the liquid separator and the connected pipeline.	
2. Remove the liquid separator	
① Remove the bolt securing the liquid separator using a socket wrench that fits the bolts. ② Remove the liquid separator from the middle baffle.	
3. Secure the new liquid separator and connect it with the pipeline	
① Fix the new liquid separator on the middle baffle securely. ② Tighten the bolt using a socket wrench and reconnect the new liquid separator with the pipeline by welding.	

Appendix 1: Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(15K)

Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)
-19	138.1		20	18.75		59	3.848		98	1.071
-18	128.6		21	17.93		60	3.711		99	1.039
-17	121.6		22	17.14		61	3.579		100	1.009
-16	115		23	16.39		62	3.454		101	0.98
-15	108.7		24	15.68		63	3.333		102	0.952
-14	102.9		25	15		64	3.217		103	0.925
-13	97.4		26	14.36		65	3.105		104	0.898
-12	92.22		27	13.74		66	2.998		105	0.873
-11	87.35		28	13.16		67	2.896		106	0.848
-10	82.75		29	12.6		68	2.797		107	0.825
-9	78.43		30	12.07		69	2.702		108	0.802
-8	74.35		31	11.57		70	2.611		109	0.779
-7	70.5		32	11.09		71	2.523		110	0.758
-6	66.88		33	10.63		72	2.439		111	0.737
-5	63.46		34	10.2		73	2.358		112	0.717
-4	60.23		35	9.779		74	2.28		113	0.697
-3	57.18		36	9.382		75	2.206		114	0.678
-2	54.31		37	9.003		76	2.133		115	0.66
-1	51.59		38	8.642		77	2.064		116	0.642
0	49.02		39	8.297		78	1.997		117	0.625
1	46.6		40	7.967		79	1.933		118	0.608
2	44.31		41	7.653		80	1.871		119	0.592
3	42.14		42	7.352		81	1.811		120	0.577
4	40.09		43	7.065		82	1.754		121	0.561
5	38.15		44	6.791		83	1.699		122	0.547
6	36.32		45	6.529		84	1.645		123	0.532
7	34.58		46	6.278		85	1.594		124	0.519
8	32.94		47	6.038		86	1.544		125	0.505
9	31.38		48	5.809		87	1.497		126	0.492
10	29.9		49	5.589		88	1.451		127	0.48
11	28.51		50	5.379		89	1.408		128	0.467
12	27.18		51	5.197		90	1.363		129	0.456
13	25.92		52	4.986		91	1.322		130	0.444
14	24.73		53	4.802		92	1.282		131	0.433
15	23.6		54	4.625		93	1.244		132	0.422
16	22.53		55	4.456		94	1.207		133	0.412
17	21.51		56	4.294		95	1.171		134	0.401
18	20.54		57	4.139		96	1.136		135	0.391
19	19.63		58	3.99		97	1.103		136	0.382

Appendix 2: Resistance Table of Outdoor and Indoor Tube Temperature Sensors(20K)

Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)
-19	181.4		20	25.01		59	5.13		98	1.427
-18	171.4		21	23.9		60	4.948		99	1.386
-17	162.1		22	22.85		61	4.773		100	1.346
-16	153.3		23	21.85		62	4.605		101	1.307
-15	145		24	20.9		63	4.443		102	1.269
-14	137.2		25	20		64	4.289		103	1.233
-13	129.9		26	19.14		65	4.14		104	1.198
-12	123		27	18.13		66	3.998		105	1.164
-11	116.5		28	17.55		67	3.861		106	1.131
-10	110.3		29	16.8		68	3.729		107	1.099
-9	104.6		30	16.1		69	3.603		108	1.069
-8	99.13		31	15.43		70	3.481		109	1.039
-7	94		32	14.79		71	3.364		110	1.01
-6	89.17		33	14.18		72	3.252		111	0.983
-5	84.61		34	13.59		73	3.144		112	0.956
-4	80.31		35	13.04		74	3.04		113	0.93
-3	76.24		36	12.51		75	2.94		114	0.904
-2	72.41		37	12		76	2.844		115	0.88
-1	68.79		38	11.52		77	2.752		116	0.856
0	65.37		39	11.06		78	2.663		117	0.833
1	62.13		40	10.62		79	2.577		118	0.811
2	59.08		41	10.2		80	2.495		119	0.77
3	56.19		42	9.803		81	2.415		120	0.769
4	53.46		43	9.42		82	2.339		121	0.746
5	50.87		44	9.054		83	2.265		122	0.729
6	48.42		45	8.705		84	2.194		123	0.71
7	46.11		46	8.37		85	2.125		124	0.692
8	43.92		47	8.051		86	2.059		125	0.674
9	41.84		48	7.745		87	1.996		126	0.658
10	39.87		49	7.453		88	1.934		127	0.64
11	38.01		50	7.173		89	1.875		128	0.623
12	36.24		51	6.905		90	1.818		129	0.607
13	34.57		52	6.648		91	1.736		130	0.592
14	32.98		53	6.403		92	1.71		131	0.577
15	31.47		54	6.167		93	1.658		132	0.563
16	30.04		55	5.942		94	1.609		133	0.549
17	28.68		56	5.726		95	1.561		134	0.535
18	27.39		57	5.519		96	1.515		135	0.521
19	26.17		58	5.32		97	1.47		136	0.509

Appendix3: Resistance Table for Outdoor Discharge Temperature Sensor (50K)

Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)
-29	853.5		10	98		49	18.34		88	4.75
-28	799.8		11	93.42		50	17.65		89	4.61
-27	750		12	89.07		51	16.99		90	4.47
-26	703.8		13	84.95		52	16.36		91	4.33
-25	660.8		14	81.05		53	15.75		92	4.20
-24	620.8		15	77.35		54	15.17		93	4.08
-23	580.6		16	73.83		55	14.62		94	3.96
-22	548.9		17	70.5		56	14.09		95	3.84
-21	516.6		18	67.34		57	13.58		96	3.73
-20	486.5		19	64.33		58	13.09		97	3.62
-19	458.3		20	61.48		59	12.62		98	3.51
-18	432		21	58.77		60	12.17		99	3.41
-17	407.4		22	56.19		61	11.74		100	3.32
-16	384.5		23	53.74		62	11.32		101	3.22
-15	362.9		24	51.41		63	10.93		102	3.13
-14	342.8		25	49.19		64	10.54		103	3.04
-13	323.9		26	47.08		65	10.18		104	2.96
-12	306.2		27	45.07		66	9.83		105	2.87
-11	289.6		28	43.16		67	9.49		106	2.79
-10	274		29	41.34		68	9.17		107	2.72
-9	259.3		30	39.61		69	8.85		108	2.64
-8	245.6		31	37.96		70	8.56		109	2.57
-7	232.6		32	36.38		71	8.27		110	2.50
-6	220.5		33	34.88		72	7.99		111	2.43
-5	209		34	33.45		73	7.73		112	2.37
-4	198.3		35	32.09		74	7.47		113	2.30
-3	199.1		36	30.79		75	7.22		114	2.24
-2	178.5		37	29.54		76	7.00		115	2.18
-1	169.5		38	28.36		77	6.76		116	2.12
0	161		39	27.23		78	6.54		117	2.07
1	153		40	26.15		79	6.33		118	2.02
2	145.4		41	25.11		80	6.13		119	1.96
3	138.3		42	24.13		81	5.93		120	1.91
4	131.5		43	23.19		82	5.75		121	1.86
5	125.1		44	22.29		83	5.57		122	1.82
6	119.1		45	21.43		84	5.39		123	1.77
7	113.4		46	20.6		85	5.22		124	1.73
8	108		47	19.81		86	5.06		125	1.68
9	102.8		48	19.06		87	4.90		126	1.64

Note: The information above is for reference only.

Support Contact Information:

	Phone	Email
Technical Support Support during installation, commissioning, service and troubleshooting	1(844) 873-4443	BE-VRFTechSupport@jci.com
Applications and Design Presale assistance with equip applications and design support, as well as use of selection tool	1(844) 873-6755	BE-VRFApplicationDesign@jci.com
Customer Service Assistance ordering equipment, parts and accessories	1(844) 873-4445	BE-VRFCustomerService@jci.com
Warranty Assistance with warranty registration, warranty claims, etc.	1(844) 873-9768	BE-VRFWarranty@jci.com
Parts Equipment and parts pre- and post-sale support	1(844) 873-4445	BE-VRFParts@jci.com

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