Service Manual

"Y" SERIES INVERTER-DRIVEN AIR CONDITIONING UNITS

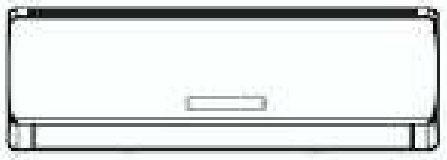
Type	Model
INDOOR UNITS	DHY09NWB21S DHY12NWB21S DHY18NWB21S DHY24NWB21S

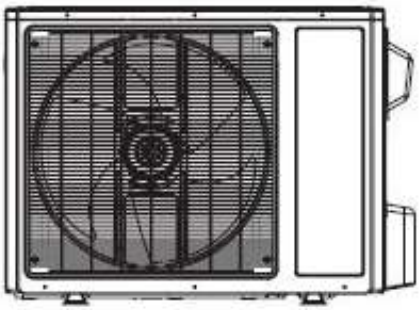
Type	Model
OUTDOOR UNITS	DHY09CSB21S DHY12CSB21S DHY18CSB21S DHY24CSB21S

Type	Model
CONTROLLER	DRCY

IMPORTANT:

PLEASE 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.

Table of Contents

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

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

General Precautions

⚠WARNING	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.

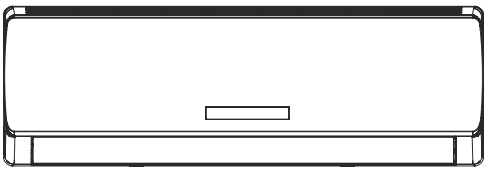
- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling 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. Features

Summary of Features

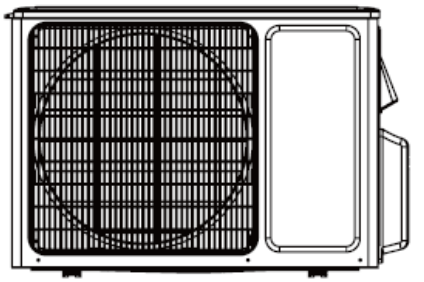
Indoor Unit:

DHY09NWB21S
DHY12NWB21S
DHY18NWB21S
DHY24NWB21S

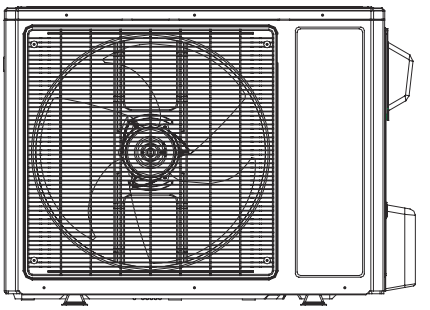


Outdoor Unit:

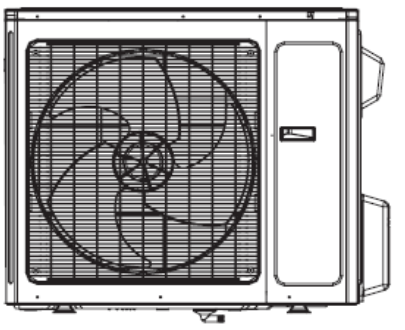
DHY09CSB21S
DHY12CSB21S
DHY24CSB21S



DHY18CSB21S



DHY24CSB21S



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2. Specifications

2.1 Specification Sheet

Model			DHY09NWB21S DHY09CSB21S
Power Supply	Rated Voltage	V~	208/230
	Rated Frequency	Hz	60
	Phases		1
Power Supply Mode			Outdoor
Cooling Capacity(Min~Max)		Btu/h	9000(3500~9600)
Heating Capacity(Min~Max)		Btu/h	9800(2200~11000)
Cooling Power Input(Min~Max)		W	600(330~1200)
Heating Power Input(Min~Max)		W	650(100~1250)
Cooling Power Current		A	5.7
Heating Power Current		A	7
Rated Input		W	1300
Rated Current		A	9
Air Flow Volume(SH/H/MH/M/ML/L/SL)		CFM	418/300/283/218/182/118/-
Dehumidifying Volume		Pint/hr	1.9
EER		(Btu/h)/W	14.5
COP		(Btu/h)/W	13
SEER			27
HSPF			10
Indoor Unit	Model of indoor unit		DHY09NWB21S
	Fan Type		Cross-flow
	Diameter Length(DXL)	inch	Φ3 6/7X26
	Fan Motor Cooling Speed (SH/H/MH/M/ML/L/SL)	r/min	1400/1050/1000/900/800/700/500
	Fan Motor Heating Speed (SH/H/MH/M/ML/L/SL)	r/min	1400/1150/1080/1030/980/900/850
	Output of Fan Motor	W	10
	Fan Motor RLA	A	0.07
	Fan Motor Capacitor	μF	/
	Evaporator Form		Aluminum Fin-copper Tube
	Pipe Diameter	inch	Φ2/7
	Row-fin Gap	inch	2-1/17
	Coil Length (LXDXW)	inch	26 1/50X1X10 2/5
	Swing Motor Model		MP24HC
	Output of Swing Motor	W	2.4
	Fuse	A	3.15
	Sound Pressure Level (SH/H/MH/M/ML/L/SL)	dB (A)	42/38/36/34/30/26/23
	Sound Power Level (SH/H/MH/M/ML/L/SL)	dB (A)	52/48/46/44/40/36/33
	Dimension (WXHXD)	inch	34X11 1/2X8 2/9
	Dimension of Carton Box (LXWXH)	inch	37X11 1/9X14 5/7
	Dimension of Package (LXWXH)	inch	37 1/8X11 2/3X14 5/6
	Net Weight	lb	24.3
	Gross Weight	lb	30.9

Outdoor Unit	Model of Outdoor Unit		DHY09CSB21S
	Compressor Manufacturer/ Trademark		MITSUBISHI ELECTRIC (GUANGZHOU) COMPRESSOR CO.LTD
	Compressor Model		KNB092FTAMC
	Compressor Oil		FV50S (PVE)
	Compressor Type		Rotary
	Compressor RLA	A	3.2
	Compressor Power Input	W	860
	Overload Protector		1NT11L-6578
	Metering Device		Electronic expansion valve
	Operation temp	ºF	60.8~86
	Ambient temp (cooling)	ºF	0~118.4
	Ambient temp (heating)	ºF	-4~86
	Condenser Form		Aluminum Fin-copper Tube
	Coil Tubing Diameter	inch	Φ1/3
	Rows-fin Gap	inch	2.5-1/17
	Coil Length (LXDXW)	inch	30X2 1/5X21 7/10
	Fan Motor Speed	rpm	600/750/850
	Output of Fan Motor	W	40
	Fan Motor RLA	A	0.18
	Fan Motor Capacitor	μF	/
	Maximum Airflow Volume	CFM	1177
	Fan Type		Axial-flow
	Fan Diameter	inch	Φ17 1/2
	Defrosting Method		Automatic Defrosting
	Permissible Excessive Operating Pressure for the Discharge Side	PSIG	550
	Permissible Excessive Operating Pressure for the Suction Side	PSIG	240
	Sound Pressure Level (H/M/L)	dB (A)	49/-/-
	Sound Power Level (H/M/L)	dB (A)	59/-/-
	Dimension (WXHXD)	inch	35 2/5X23 1/2X15
	Dimension of Carton Box (LXWXH)	inch	37 1/5X16 2/5X24 4/5
	Dimension of Package (LXWXH)	inch	37 2/7X16 1/2X25 2/5
	Net Weight	lb	86.0
	Gross Weight	lb	90.4
	Refrigerant		R410A
	Refrigerant Charge	oz	45.9
Connection Pipe	Length	ft	24.6
	Gas Additional Charge	oz/ft	0.2
	Outer Diameter Liquid Pipe	inch	1/4
	Outer Diameter Gas Pipe	inch	1/2
	Max Distance Height	ft	32.8
	Max Distance Length	ft	49.2

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

Model			DHY12NWB21S DHY12CSB21S
Power Supply	Rated Voltage	V~	208/230
	Rated Frequency	Hz	60
	Phases		1
Power Supply Mode			Outdoor
Cooling Capacity(Min~Max)		Btu/h	12000(3100~13000)
Heating Capacity(Min~Max)		Btu/h	13000(2400~14000)
Cooling Power Input(Min~Max)		W	882(380~1300)
Heating Power Input(Min~Max)		W	960(100~1350)
Cooling Power Current		A	6
Heating Power Current		A	7.5
Rated Input		W	1400
Rated Current		A	9
Air Flow Volume(SH/H/MH/M/ML/L/SL)		CFM	453/312/288/221/182/118/-
Dehumidifying Volume		Pint/hr	2.96
EER		(Btu/h)/W	12.8
COP		(Btu/h)/W	12
SEER			25
HSPF			10
Indoor Unit	Model of indoor unit		DHY12NWB21S
	Fan Type		Cross-flow
	Diameter Length(DXL)	inch	Φ3 6/7X26
	Fan Motor Cooling Speed (SH/H/MH/M/ML/L/SL)	r/min	1450/1070/1000/900/800/700/500
	Fan Motor Heating Speed (SH/H/MH/M/ML/L/SL)	r/min	1450/1150/1080/1030/980/900/850
	Output of Fan Motor	W	10
	Fan Motor RLA	A	0.07
	Fan Motor Capacitor	μF	/
	Evaporator Form		Aluminum Fin-copper Tube
	Coil Tubing Diameter	inch	Φ2/7
	Row-fin Gap	inch	2-1/17
	Coil Length (LXDXW)	inch	26 1/50X1X10 2/5
	Swing Motor Model		MP24HC
	Output of Swing Motor	W	2.4
	Fuse	A	3.15
	Sound Pressure Level (SH/H/MH/M/ML/L/SL)	dB (A)	44/38/36/34/30/26/24/-
	Sound Power Level (SH/H/MH/M/ML/L/SL)	dB (A)	54/48/36/44/40/36/34/-
	Dimension (WXHXD)	inch	34X11 1/2X8 2/9
	Dimension of Carton Box (LXWXH)	inch	37X11 1/9X14 5/7
	Dimension of Package (LXWXH)	inch	37 1/8X11 2/3X14 5/6
	Net Weight	lb	24.3
	Gross Weight	lb	30.9

Outdoor Unit	Model of Outdoor Unit		DHY12CSB21S
	Compressor Manufacturer/ Trademark		MITSUBISHI ELECTRIC (GUANGZHOU) COMPRESSOR CO.LTD
	Compressor Model		KNB092FTAMC
	Compressor Oil		FV50S (PVE)
	Compressor Type		Rotary
	Compressor RLA	A	3.2
	Compressor Power Input	W	860
	Overload Protector		1NT11L-6578
	Metering Method		Electronic expansion valve
	Operation temp	ºF	60.8~86
	Ambient temp (cooling)	ºF	0~118.4
	Ambient temp (heating)	ºF	-4~86
	Condenser Form		Aluminum Fin-copper Tube
	Coil Tubing Diameter	inch	Φ2/7
	Rows-fin Gap	inch	2.5-1/17
	Coil Length (LXDXW)	inch	30X2 1/5X21 7/10
	Fan Motor Speed	rpm	600/750/850
	Output of Fan Motor	W	40
	Fan Motor RLA	A	0.18
	Fan Motor Capacitor	μF	/
	Maximum Air Flow Volume	CFM	1177
	Fan Type		Axial-flow
	Fan Diameter	inch	Φ17 1/2
	Defrosting Method		Automatic Defrosting
	Permissible Excessive Operating Pressure for the Discharge Side	PSIG	550
	Permissible Excessive Operating Pressure for the Suction Side	PSIG	240
	Sound Pressure Level (H/M/L)	dB (A)	49/-/-
	Sound Power Level (H/M/L)	dB (A)	59/-/-
	Dimension (WXHXD)	inch	35 2/5X23 1/2X15
	Dimension of Carton Box (LXWXH)	inch	37 1/5X16 2/5X24 4/5
	Dimension of Package (LXWXH)	inch	37 2/7X16 1/2X25 2/5
	Net Weight	lb	87.1
	Gross Weight	lb	91.5
	Refrigerant		R410A
	Refrigerant Charge	oz	45.9
Connection Pipe	Standard Length	ft	24.6
	Additional Refrigerant (over 24.6 ft)	oz/ft	0.2
	Outer Diameter Liquid Pipe	inch	1/4
	Outer Diameter Gas Pipe	inch	1/2
	Max Height Difference (indoor/outdoor)	ft	32.8
	Max Lineset Length	ft	65.6

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

Model			DHY18NWB21S DHY18CSB21S	DHY24NWB21S DHY24CSB21S
Power Supply	Rated Voltage	V~	208/230	208/230
	Rated Frequency	Hz	60	60
	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
Cooling Capacity(Min~Max)		Btu/h	17999(4606~22178)	24000(6800~29300)
Heating Capacity(Min~Max)		Btu/h	19000(3412~24907)	25000(7500~34000)
Cooling Power Input(Min~Max)		W	1500(180~2450)	2000(450~3050)
Heating Power Input(Min~Max)		W	1580(232~2500)	2090(450~3300)
Cooling Power Current		A	7.36	9.10
Heating Power Current		A	7.75	11.36
Rated Input		W	2500	3200
Rated Current		A	11.1	16.0
Air Flow Volume(SH/H/MH/M/ML/L/SL)		CFM	589/512/465/371/330/283/-	706/647/589/530/471/412/353
Dehumidifying Volume		Pint/hr	3.8	5.3
EER		(Btu/h)/W	12	12
COP		(Btu/h)/W	12	12
SEER			21	21
HSPF			9.8	9.2
Indoor Unit	Model of indoor unit		DHY18NWB21S	DHY24NWB21S
	Fan Type		Cross-flow	Cross-flow
	Diameter Length(DXL)	inch	Φ4X30 1/8	Φ4 1/6X35
	Fan Motor Cooling Speed (SH/H/MH/M/ML/L/SL)	r/min	1250/1150/1050/950/850/750/650	1400/1300/1200/1100/1000/900/800
	Fan Motor Heating Speed (SH/H/MH/M/ML/L/SL)	r/min	1400/1200/1100/1000/900/800/700	1350/1350/1250/1150/1050/900/800
	Output of Fan Motor	W	25	30
	Fan Motor RLA	A	0.1	/
	Fan Motor Capacitor	μF	/	/
	Evaporator Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Coil Tubing Diameter	inch	Φ2/7	Φ2/7
	Row-fin Gap	inch	2-1/17	2-1/17
	Coil Length (LXDXW)	inch	30 1/9X1X13 1/2	35 3/5X1X15
	Swing Motor Model		MP28VC/MP35DA/MP24AA	MP35CJ/MP24HB/MP24HC
	Output of Swing Motor	W	2/2.5/1.5	2.5/1.5/1.5
	Fuse	A	/	/
	Sound Pressure Level (SH/H/MH/M/ML/L/SL)	dB (A)	48/46/43/41/38/35/32	52/49/47/45/43/41/38
	Sound Power Level (SH/H/MH/M/ML/L/SL)	dB (A)	58/56/53/51/48/45/42	62/59/57/55/53/51/48
	Dimension (WXHXD)	inch	40X12 5/9X9	46 3/8X12 5/6X10 2/5
	Dimension of Carton Box (LXWXH)	inch	43X15 1/2X12 4/5	49X16 1/6X13 3/4
	Dimension of Package (LXWXH)	inch	43 1/5X15 5/8X13 2/5	49 1/2X16 2/7X14 1/3
	Net Weight	lb	33.1	39.7
	Gross Weight	lb	44.1	52.9

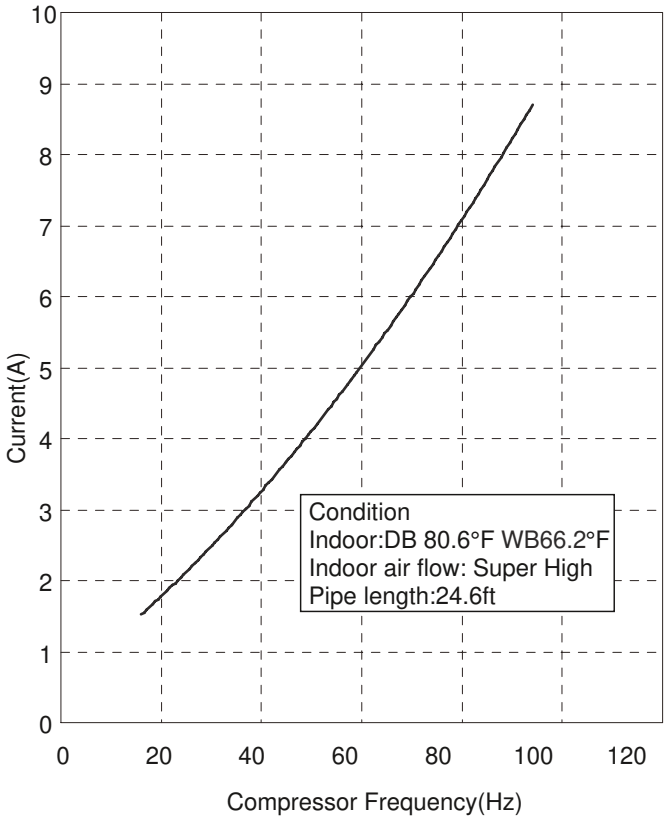
Outdoor Unit	Model of Outdoor Unit		DHY18CSB21S	DHY24CSB21S
	Compressor Manufacturer/ Trademark		MITSUBISHI ELECTRIC (GUANGZHOU)COMP	ZHUHAI LANDA COMPRESSOR CO,LTD/Gree
	Compressor Model		SNB130FGYMC-L1	QXAS-D23zX090
	Compressor Oil		FV50S (PVE)	FV50S (PVE)
	Compressor Type		Rotary	Rotary
	Compressor RLA	A	8.4	12.0
	Compressor Power Input	W	1245	2450
	Overload Protector		1NT11L-6578	1NT11L-6233
	Metering Method		Electronic expansion valve	Electronic expansion valve
	Operation temp	ºF	60.8~86	60.8~86
	Ambient temp (cooling)	ºF	50~118.4	50~118.4
	Ambient temp (heating)	ºF	5~75.2	5~75.2
	Condenser Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Coil Tubing Diameter	inch	Φ3/8	Φ1/3
	Rows-fin Gap	inch	2-1/18	3-1/18
	Coil Length (LXDXW)	inch	32X1 2/3X26	37 1/2X2 1/4X30
	Fan Motor Speed	rpm	700	780/390
	Output of Fan Motor	W	60	90
	Fan Motor RLA	A	0.28	/
	Fan Motor Capacitor	μF	/	/
	Air Flow Volume of Outdoor Unit	CFM	1883	2354
	Fan Type		Axial-flow	Axial-flow
	Fan Diameter	inch	Φ20 1/2	Φ21 3/4
	Defrosting Method		Automatic Defrosting	Automatic Defrosting
	Permissible Excessive Operating Pressure for the Discharge Side	PSIG	550	550
	Permissible Excessive Operating Pressure for the Suction Side	PSIG	240	240
	Sound Pressure Level (H/M/L)	dB (A)	56/-/-	56/-/-
	Sound Power Level (H/M/L)	dB (A)	66/-/-	66/-/-
	Dimension (WXHXD)	inch	38X27 5/9X15 3/5	38 4/7X31 1/9X16 4/5
	Dimension of Carton Box (LXWXH)	inch	40 2/5X18X29	42 1/2X19X33
	Dimension of Package (LXWXH)	inch	40 1/2X18 1/32X29 1/2	42 2/3X19 1/5X33 2/3
	Net Weight	lb	110.3	154.3
	Gross Weight	lb	121.3	165.3
	Refrigerant		R410A	R410A
	Refrigerant Charge	oz	56.5	88.2
Connection Pipe	Standard Length	ft	24.6	24.6
	Additional Charge (over 24.6 ft)	oz/ft	0.5	0.5
	Outer Diameter Liquid Pipe	inch	1/4	1/4
	Outer Diameter Gas Pipe	inch	5/8	5/8
	Max Distance Height	ft	32.8	32.8
	Max Distance Length	ft	82.0	82.0

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

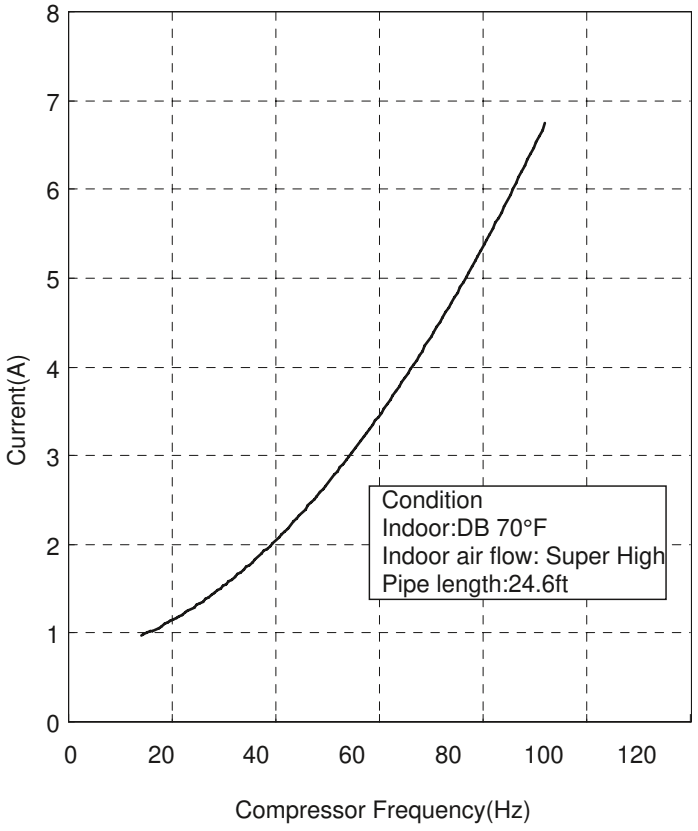
2.2 Operation Characteristic Curve

09K 12K

Cooling

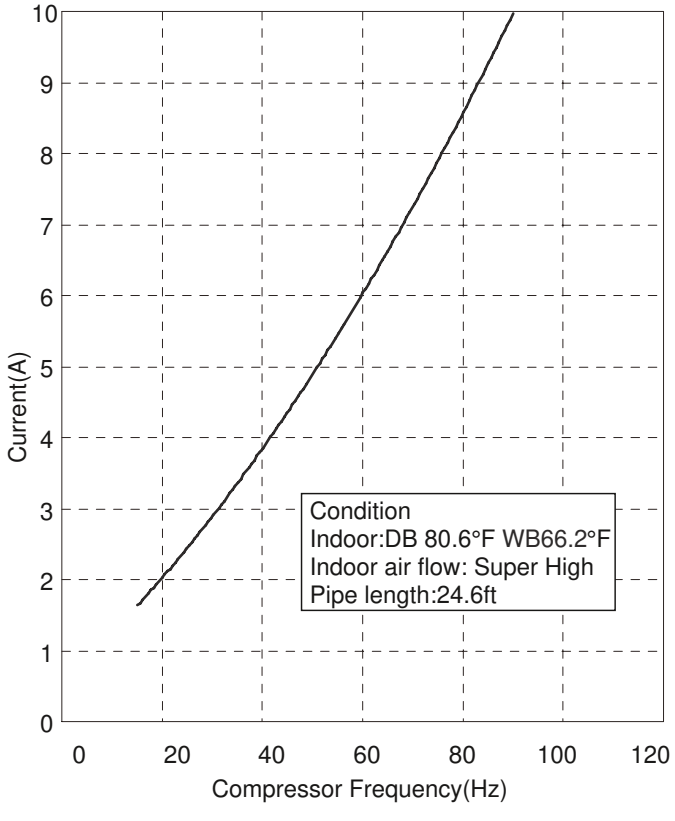


Heating

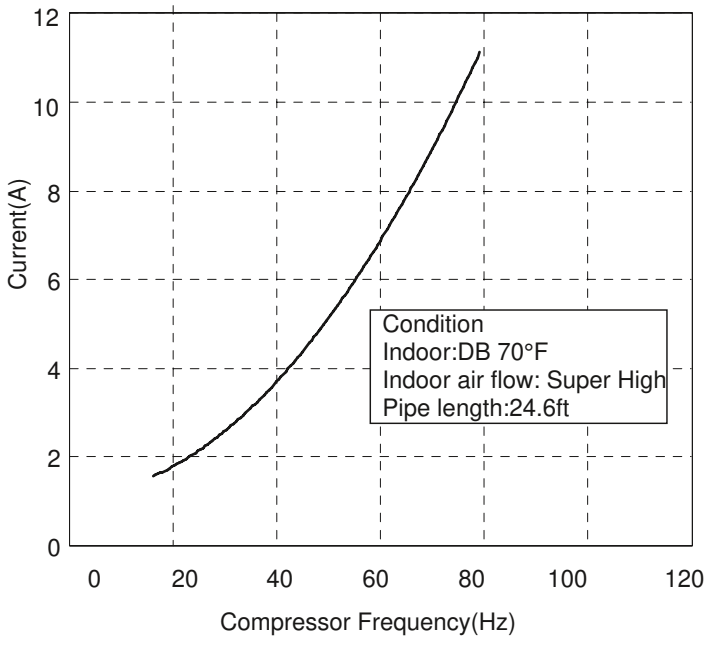


18K

Cooling

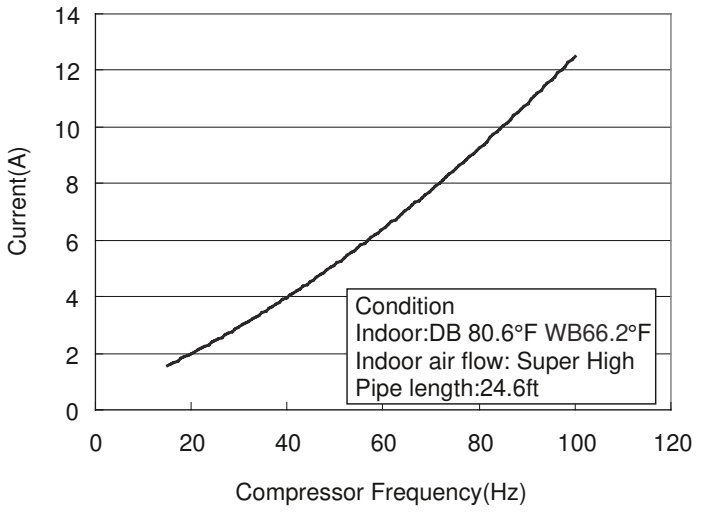


Heating

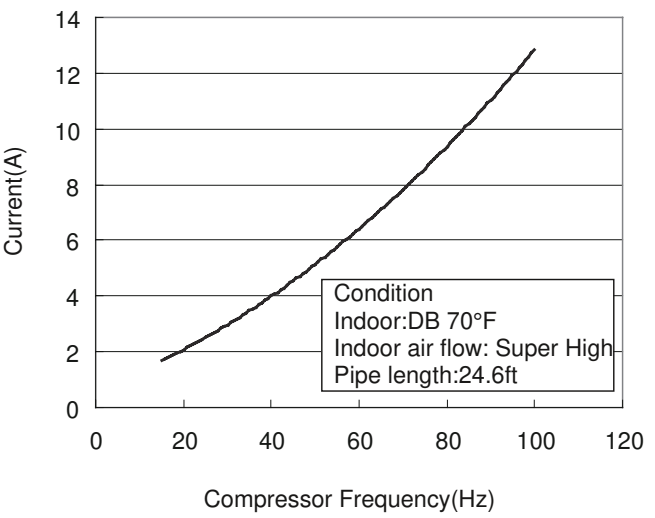


24K

Cooling



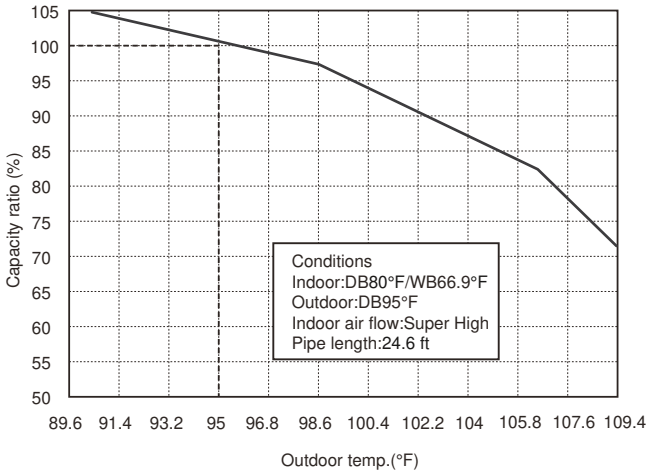
Heating



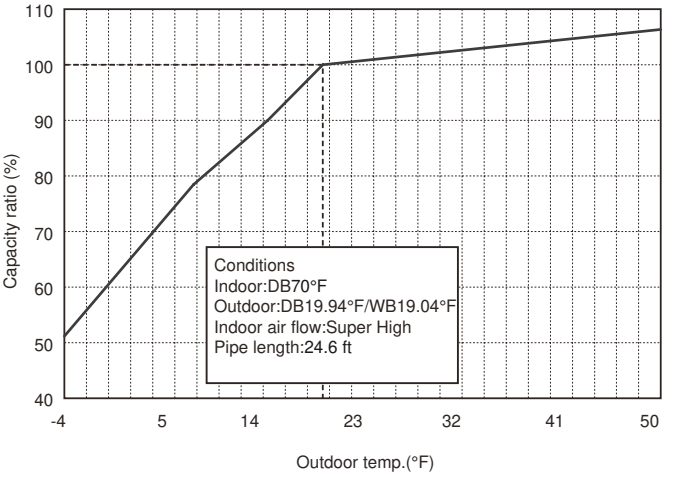
2.3 Capacity Variation Ratio According to Temperature

09/12K

Cooling

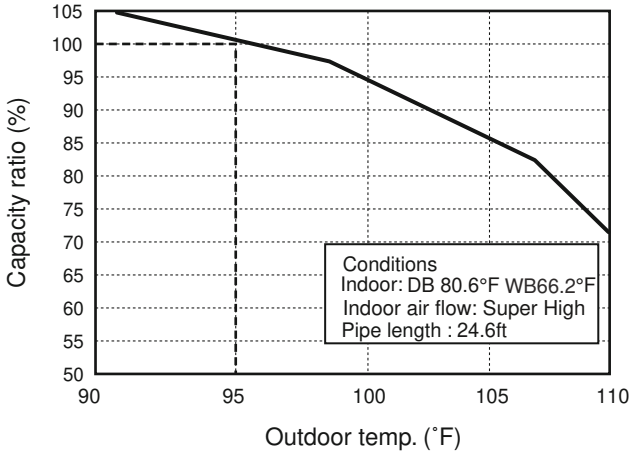


Heating

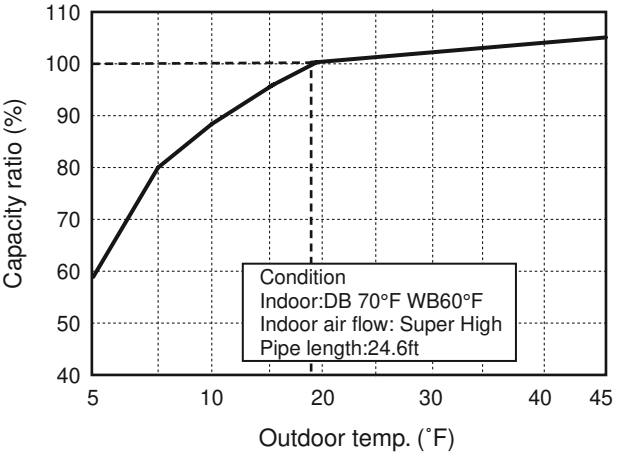


18/24K

Cooling

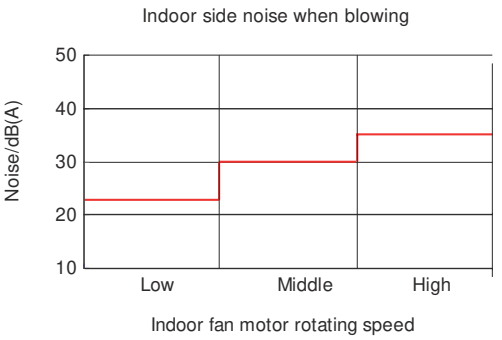


Heating

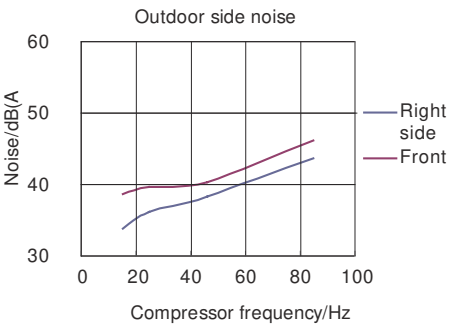


2.4 Noise Curve

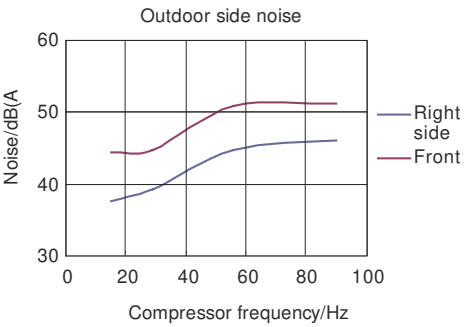
09K



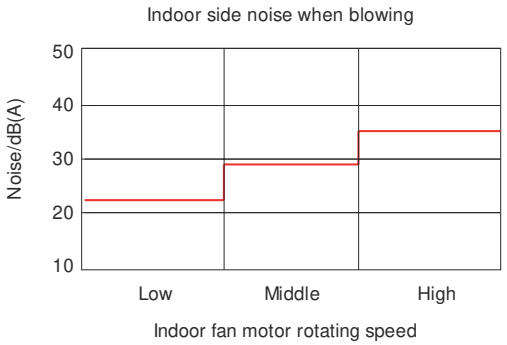
Cooling



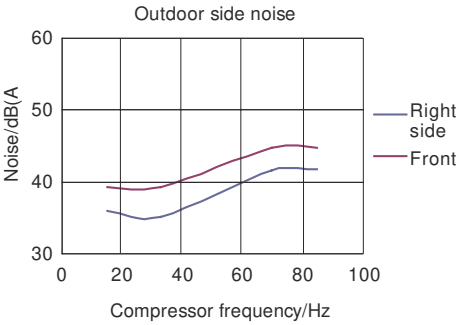
Heating



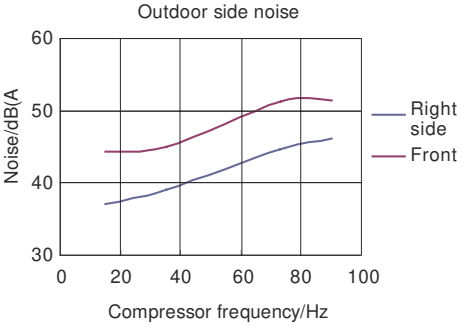
12K



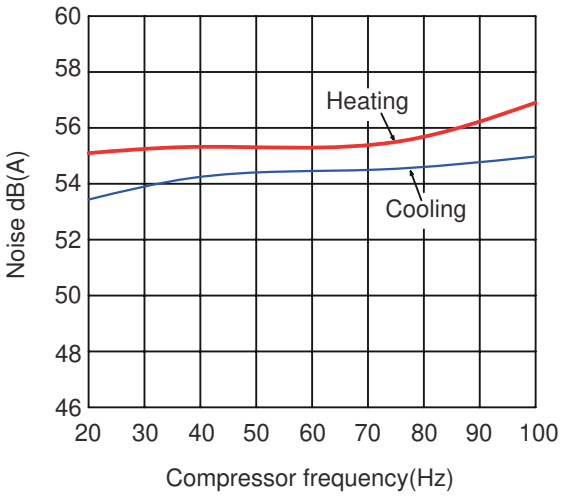
Cooling

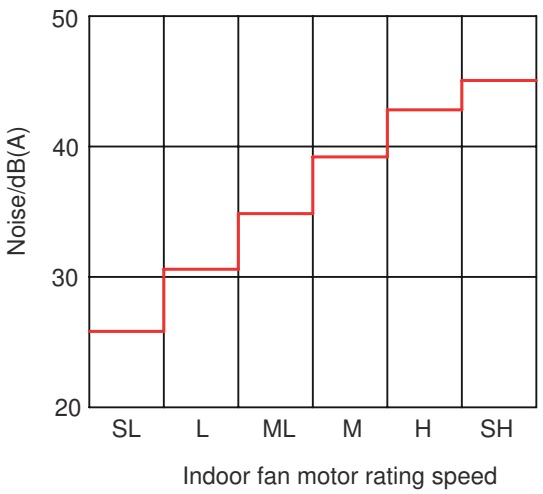


Heating



18/24K





2.5. Cooling and Heating Data Sheet in Rated Frequency

Cooling:

Rated cooling condition(°F) (DB/WB)		Model	Pressure of gas pipe connecting indoor and outdoor unit	Inlet and outlet pipe temperature of heat exchanger		Fan speed of indoor unit	Fan speed of outdoor unit	Compressor frequency (Hz)
Indoor	Outdoor		P (MPa)	T1 (°F)	T2 (°F)			
80.6/66.2	95/75	09K	0.9 to 1.1	53.6 to 57.2	158 to 104	Super High	High	46
80.6/66.2	95/75	12K	0.9 to 1.1	53.6 to 57.2	158 to 104	Super High	High	70
80.6/66.2	95/75	18/24K	0.9 to 1.1	53.6 to 57.2	176 to 104	Super High	High	75

Heating:

Rated heating condition(°F) (DB/WB)		Model	Pressure of gas pipe connecting indoor and outdoor unit	Inlet and outlet pipe temperature of heat exchanger		Fan speed of indoor unit	Fan speed of outdoor unit	Compressor frequency (Hz)
Indoor	Outdoor		P (MPa)	T1 (°F)	T2 (°F)			
70/-	19.94/19.04	09K	2.2 to 2.4	158 to 95	35.6 to 39.2	Super High	High	56
70/-	19.94/19.04	12K	2.2 to 2.4	158 to 95	35.6 to 39.2	Super High	High	73
70/60	17/15.8	18/24K	2.5 to 2.7	158 to 104	33.8 to 41.0	Super High	High	75

Instruction:

T1: Inlet and outlet pipe temperature of evaporator

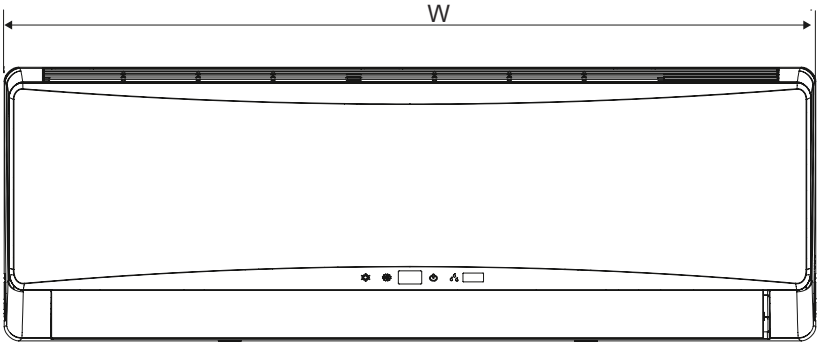
T2: Inlet and outlet pipe temperature of condenser

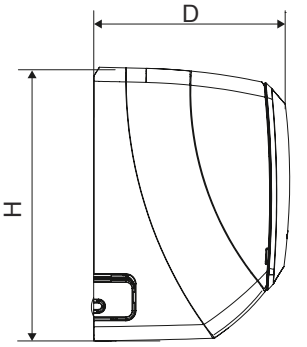
P: Pressure at the side of big valve

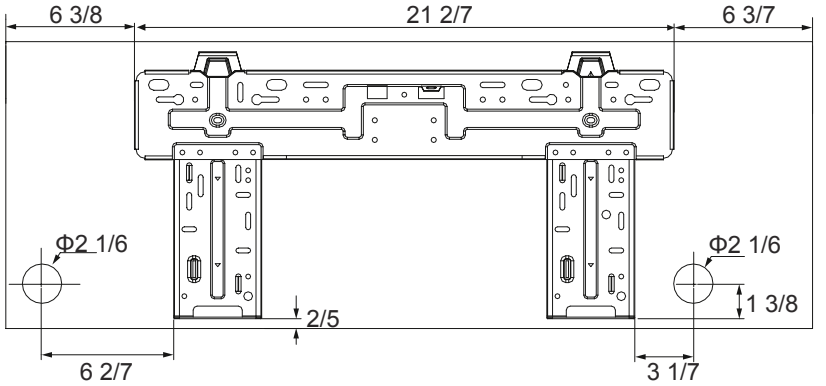
Connection pipe length: 24.6ft.

3. Outline Dimension Diagram

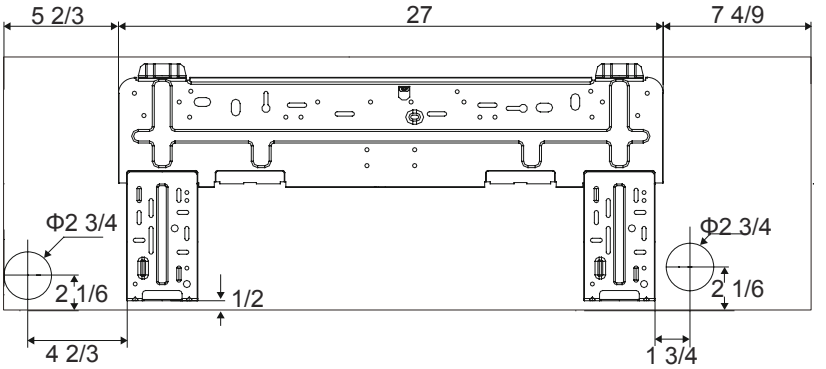
3.1 Indoor Unit



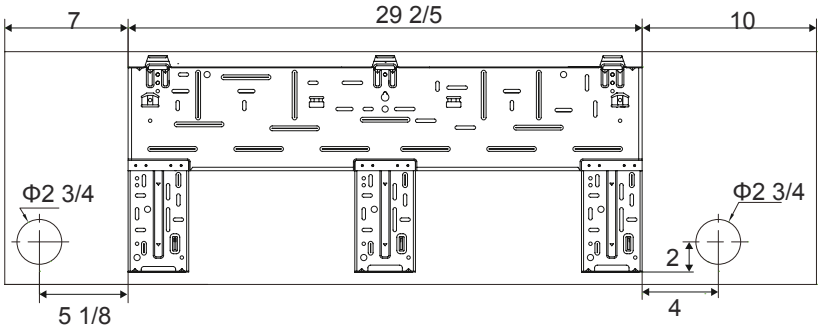




09/12K



18K



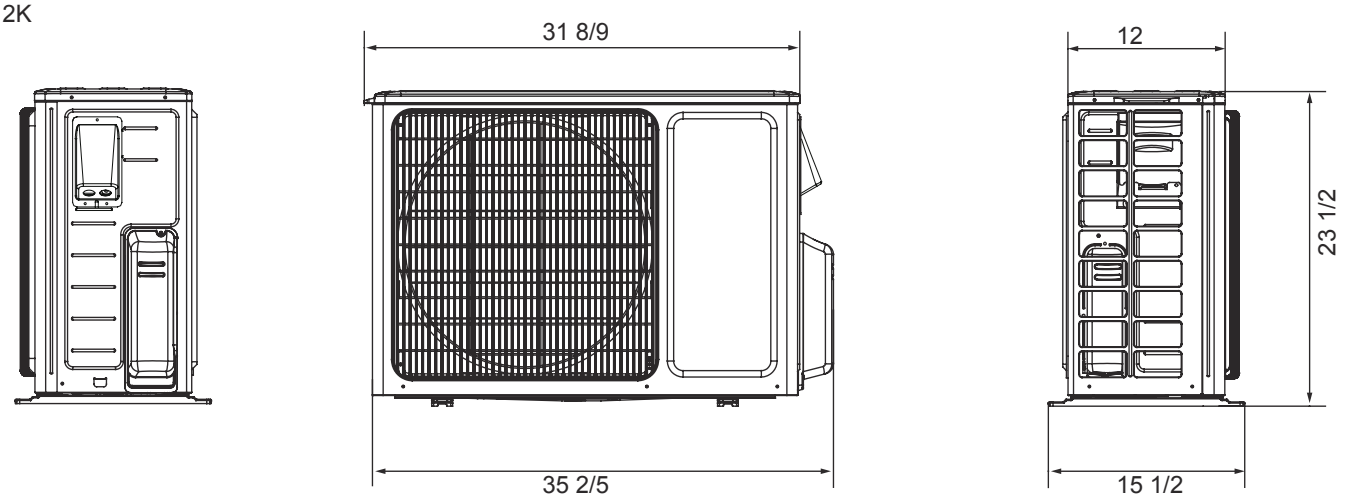
24K

Model	W	H	D
09/12K	34	11 1/2	8 2/9
18K	40	12 5/9	9
24K	46 3/8	12 5/6	10 2/5

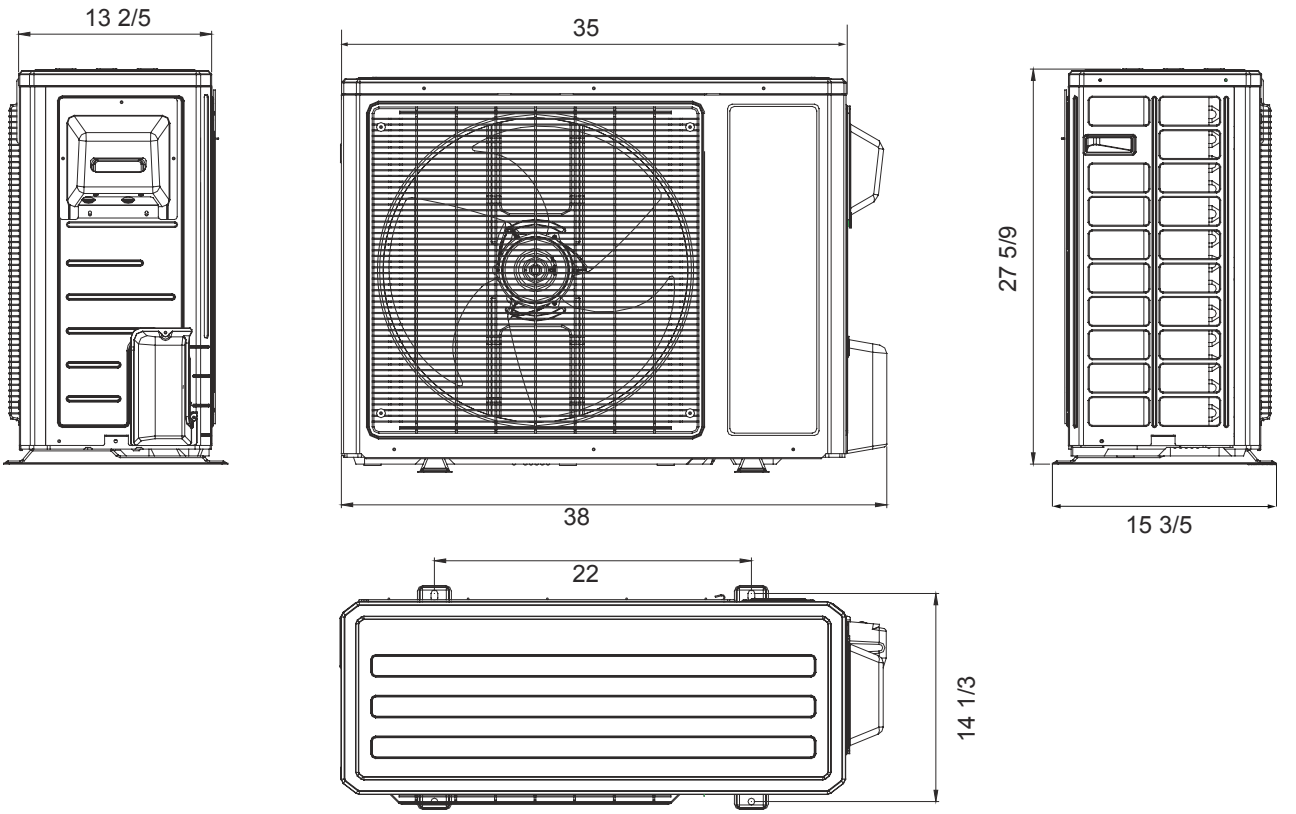
Unit:inch

3.2 Outdoor Unit

09/12K

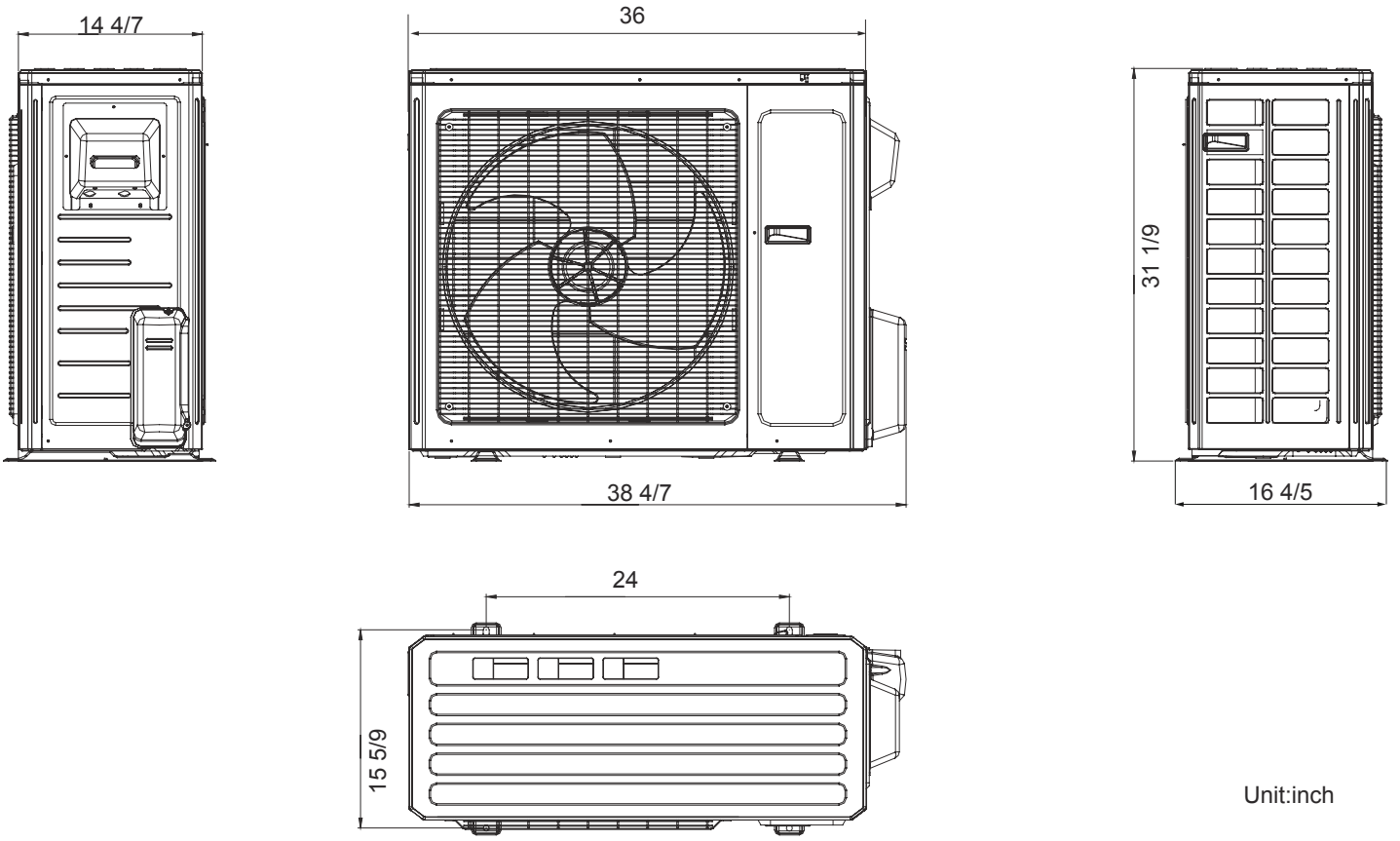


18K



Unit: inch

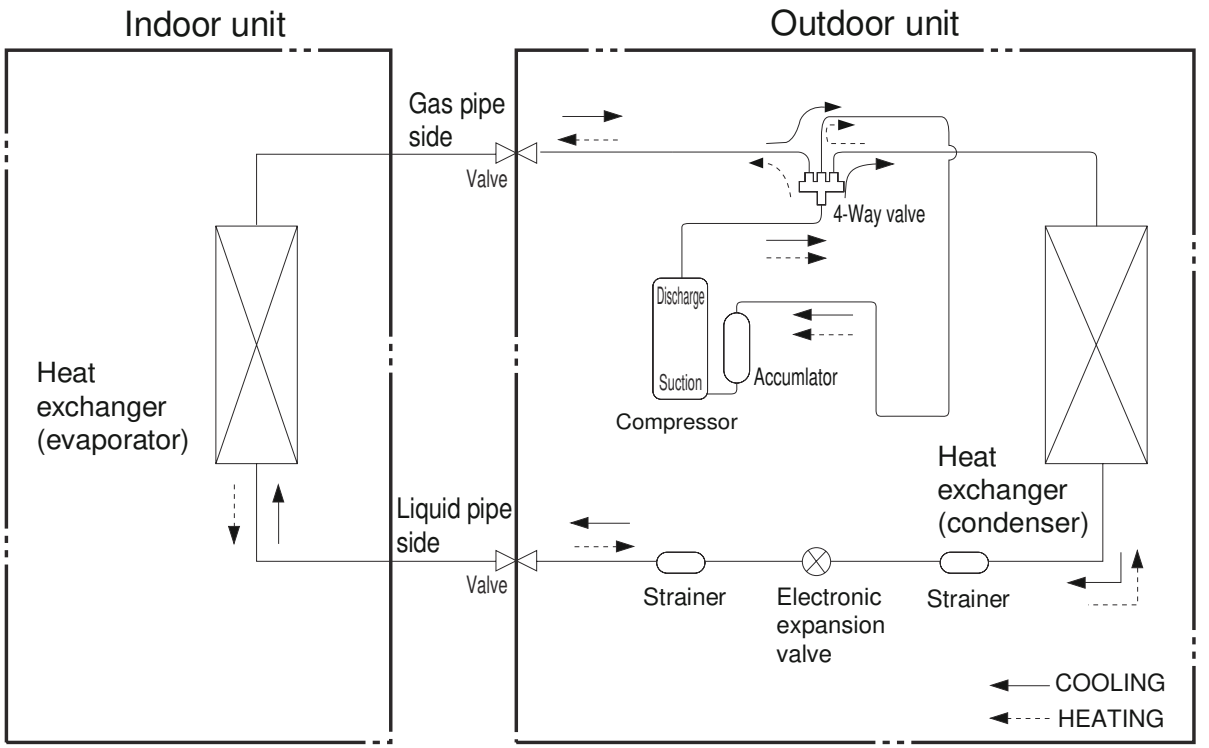
24K



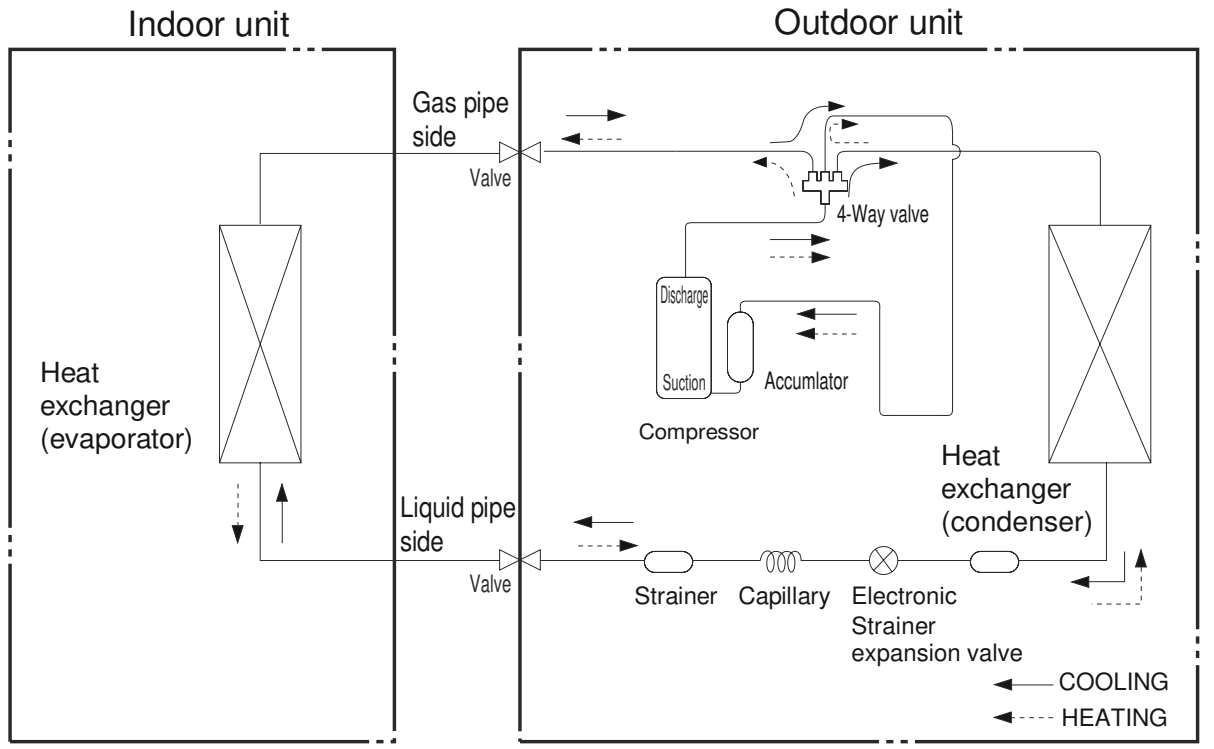
Unit:inch

4. Refrigerant System Diagram

18K



09/12/24K



Connection pipe specification:

Liquid pipe:1/4"inch

Gas pipe:1/2"inch (09/12K)

Gas pipe:5/8"inch (18/24K)

5. Electrical Parts

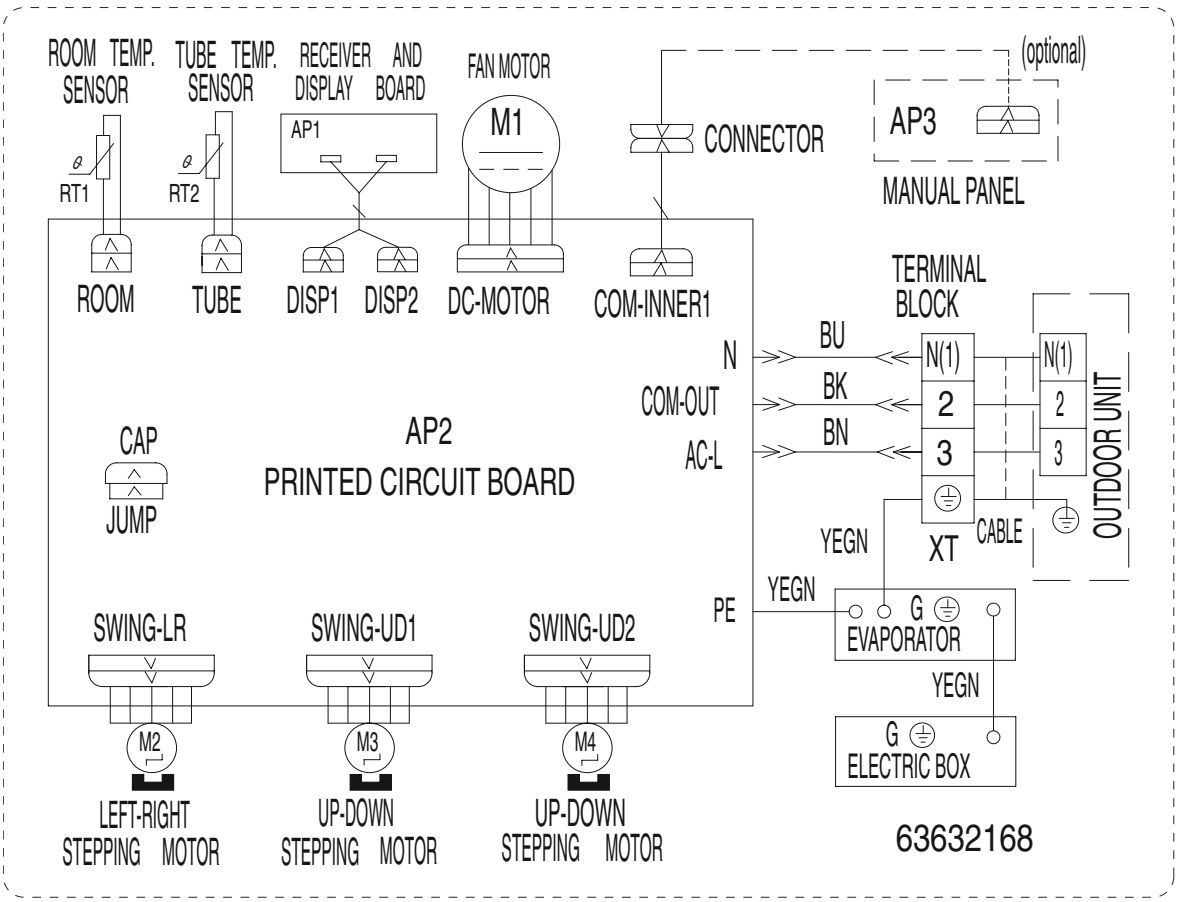
5.1 Wiring Diagram

● Instruction

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
WH	White	GN	Green	CAP	Jumper cap
YE	Yellow	BN	Brown	COMP	Compressor
RD	Red	BU	Blue	⏚	Grounding wire
YEGN	Yellow/Green	BK	Black	/	/
VT	Violet	OG	Orange	/	/

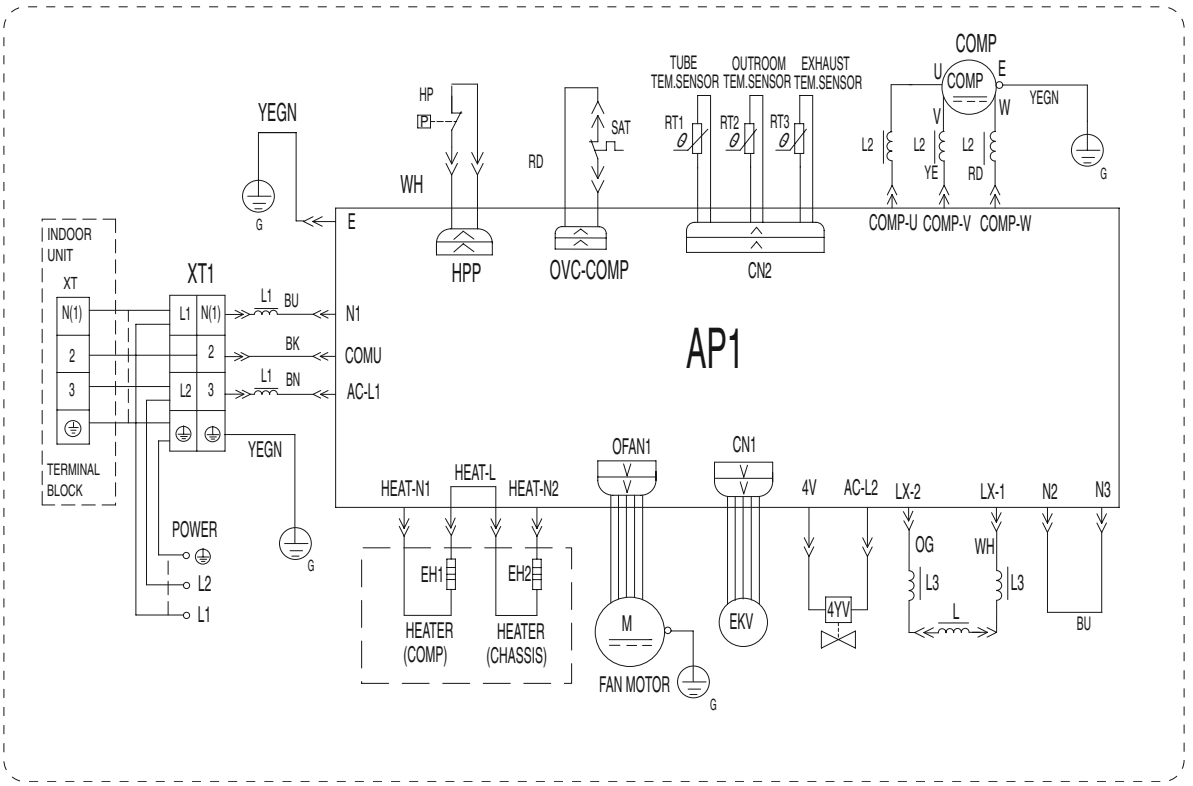
Note: Jumper cap is used to determine fan speed and the swing angle of horizontal lover for this model.

● Indoor Unit

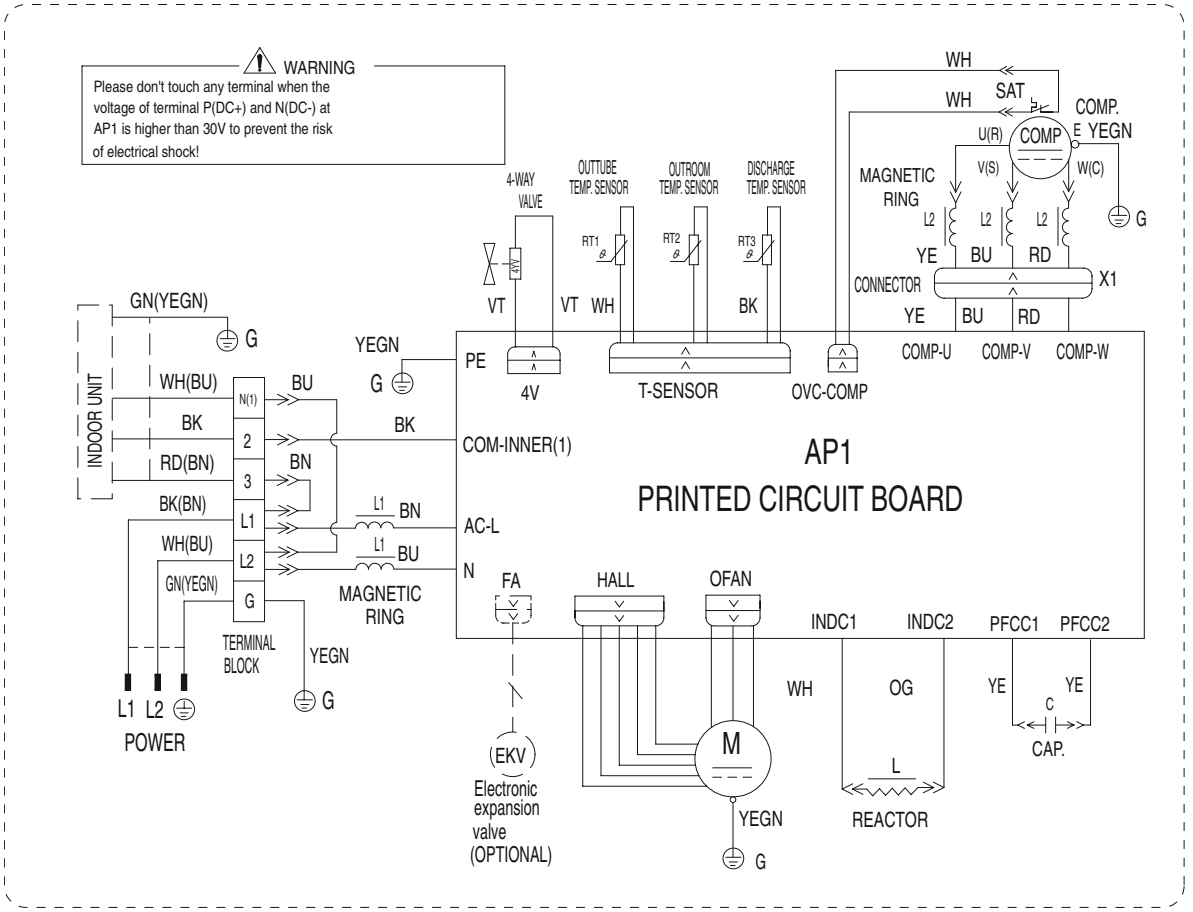


● Outdoor Unit

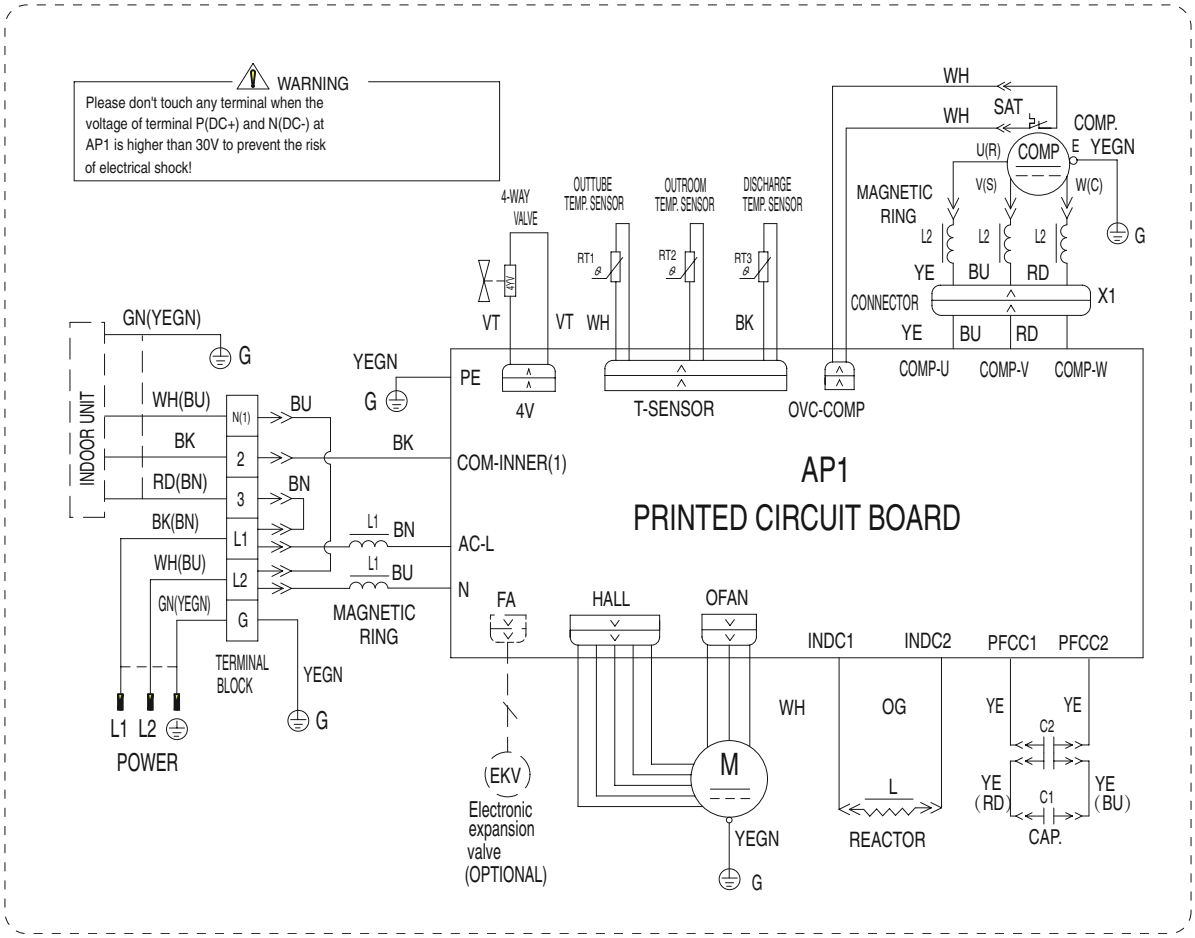
09/12K



18K



24K

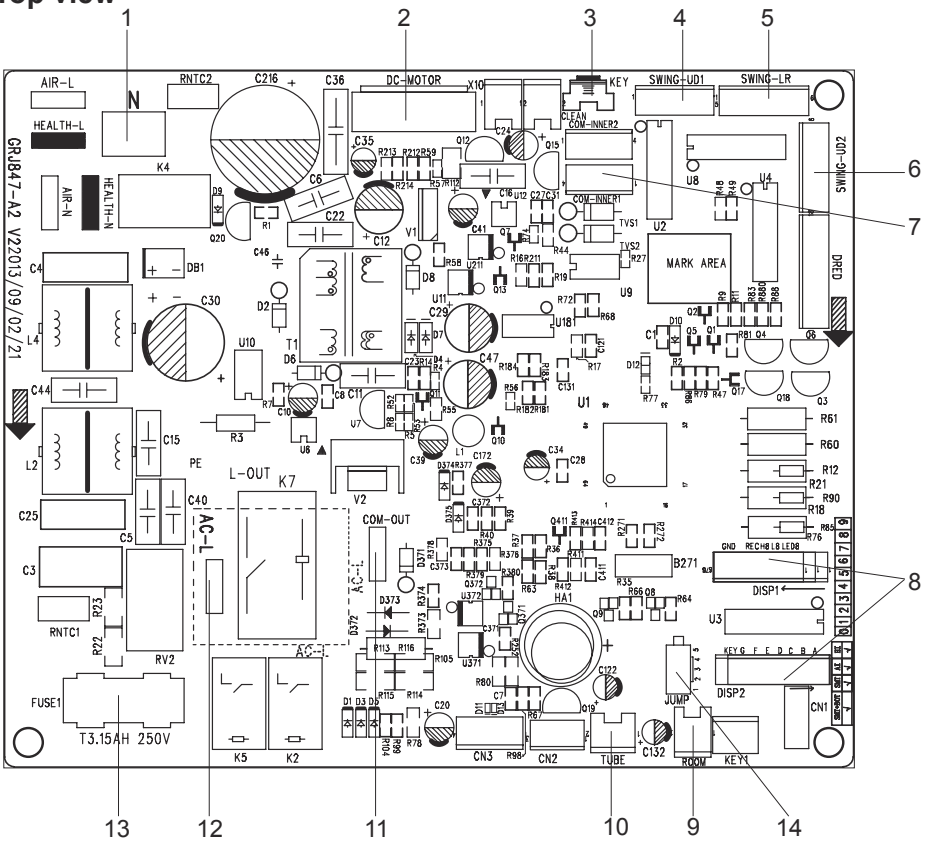


The above data is subject to change without notice. Please refer to the nameplate of the unit.

5.2 PCB Printed Diagram

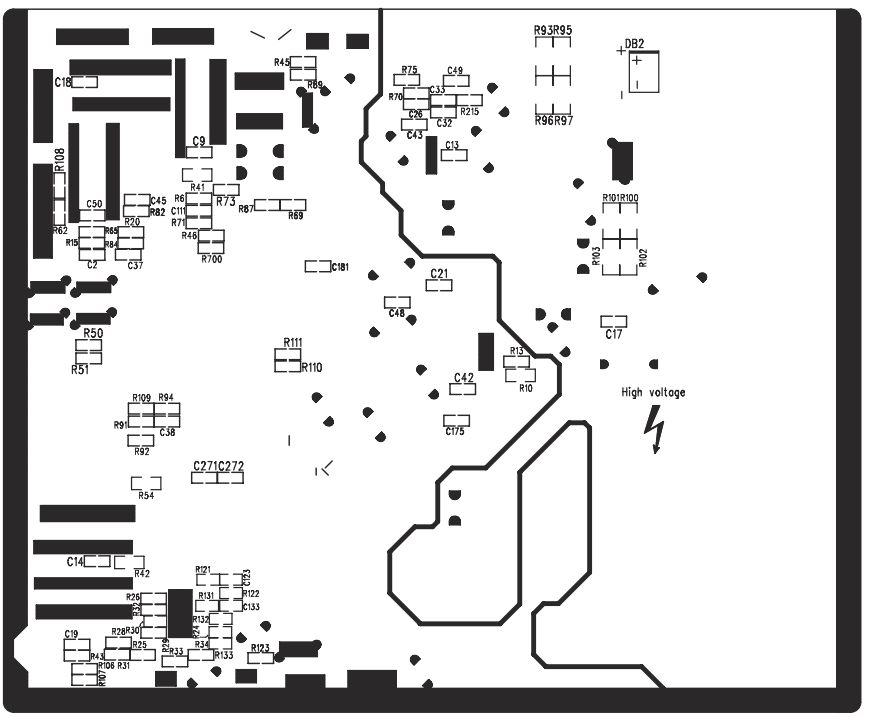
Indoor Unit

● **Top view**



1	Neutral wire
2	DC fan
3	Auto button
4	Small up and down swing
5	Left and right swing
6	Big up&down swing
7	Interface of wired zone controller
8	Display interface
9	Ambient temperature sensor
10	Tube temperature sensor
11	Communication interface between indoor unit and outdoor unit
12	Interface of live wire
13	Fuse
14	Jumper interface

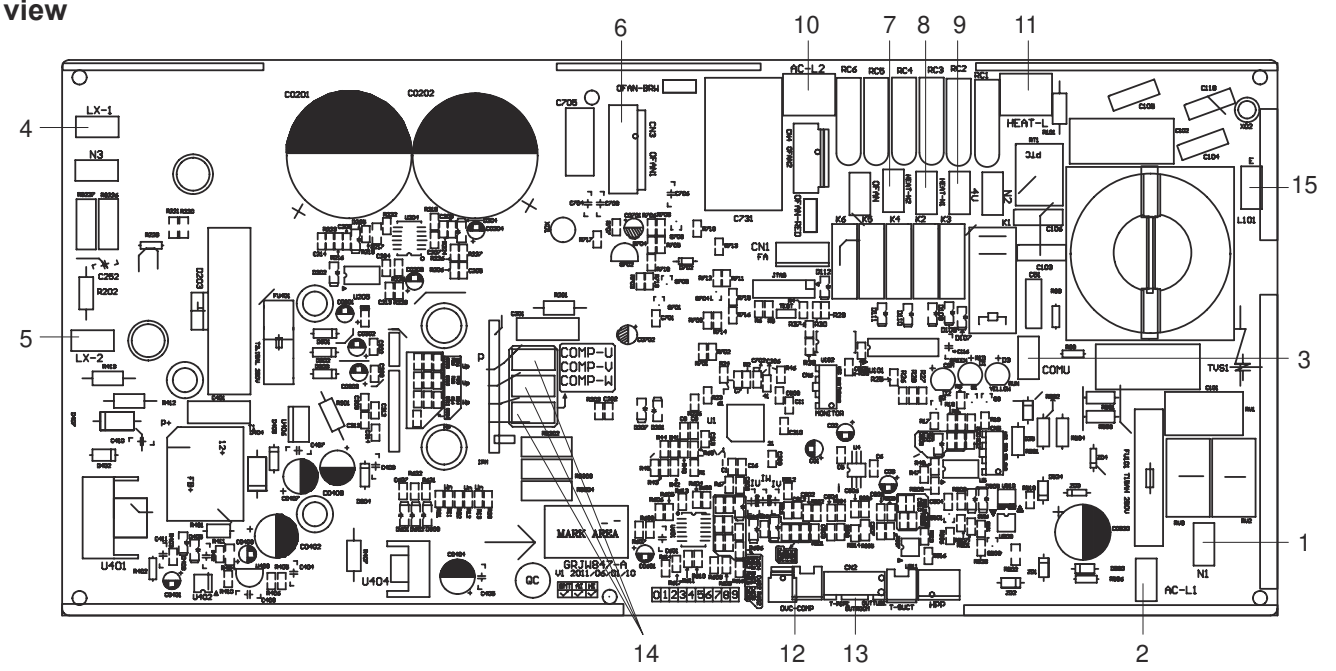
● **Bottom view**



Outdoor Unit

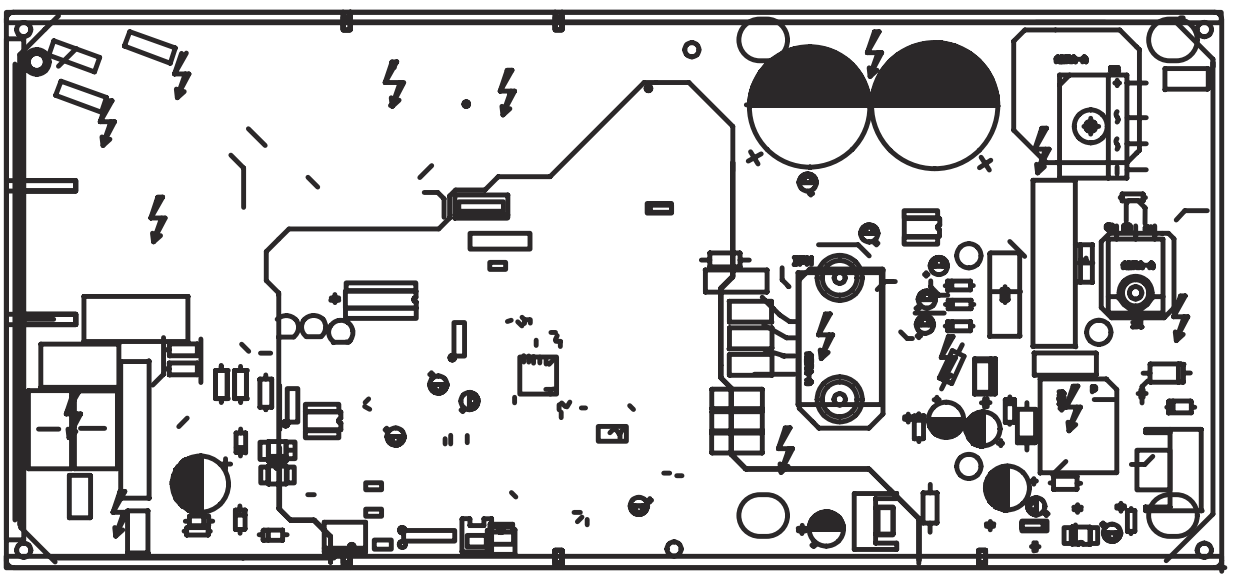
09/12K

• Top view



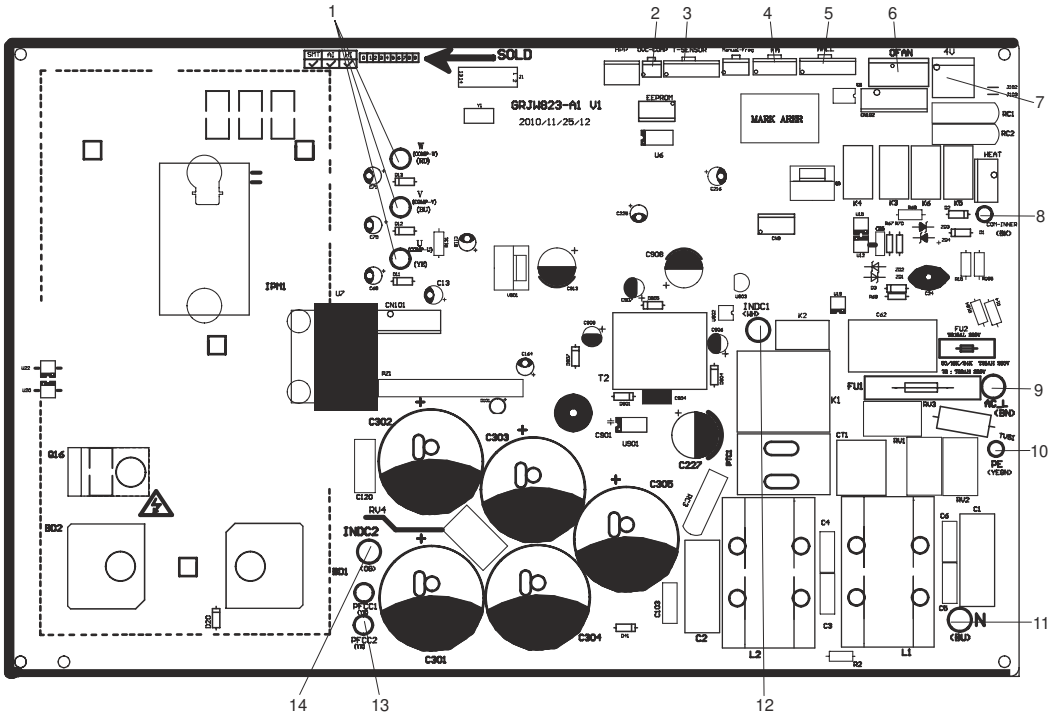
1	Input of neutral wire of power	4	Interface 1 of electric reactor	7	Neutral wire of electric heater of chassis	10	Live wire of 4-way valve	13	Temp sensor
2	Input of live wire of power	5	Interface 2 of electric reactor	8	Neutral wire of electric heater of compressor	11	Live wire of electric heater	14	U,V,W three phases of compressor
3	Communication interface	6	Interface of fan	9	Neutral wire of 4-way valve	12	Input of overload	15	Input of ground wire of power

• Bottom view



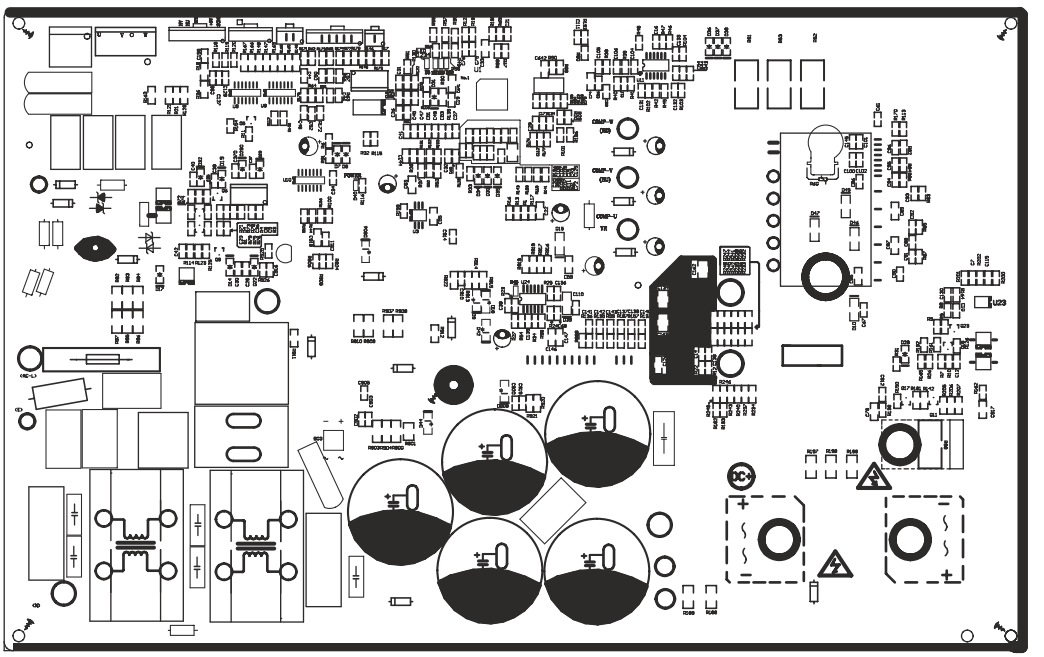
18K

● Top view



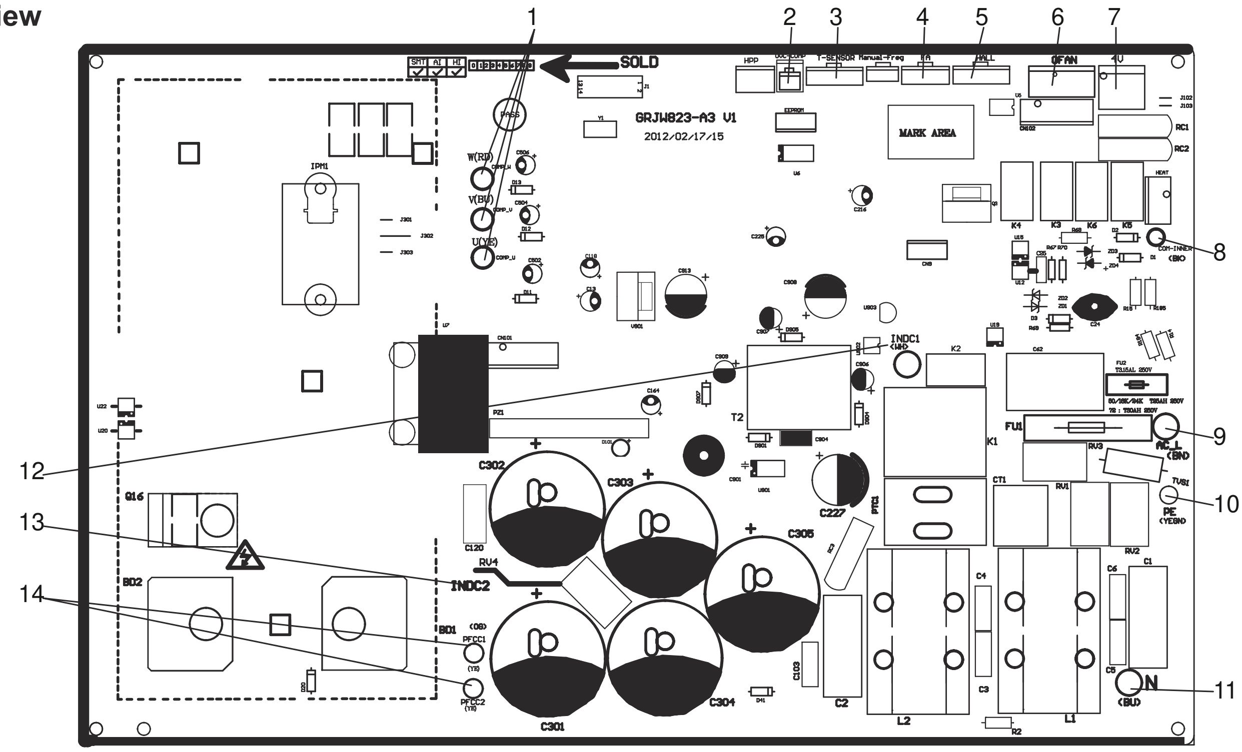
1	Compressor interface	2	Compressor overload protector	3	Temperature sensor	4	Electronic expansion valve
5	Fan HALL interface	6	Outdoor fan	7	4-way valve	8	Communication interface with indoor unit
9	Live wire	10	Grounding wire	11	Neutral wire	12	Reactor interface 1
13	PFC capacitor interface 1	14	Reactor interface 2				

● Bottom view



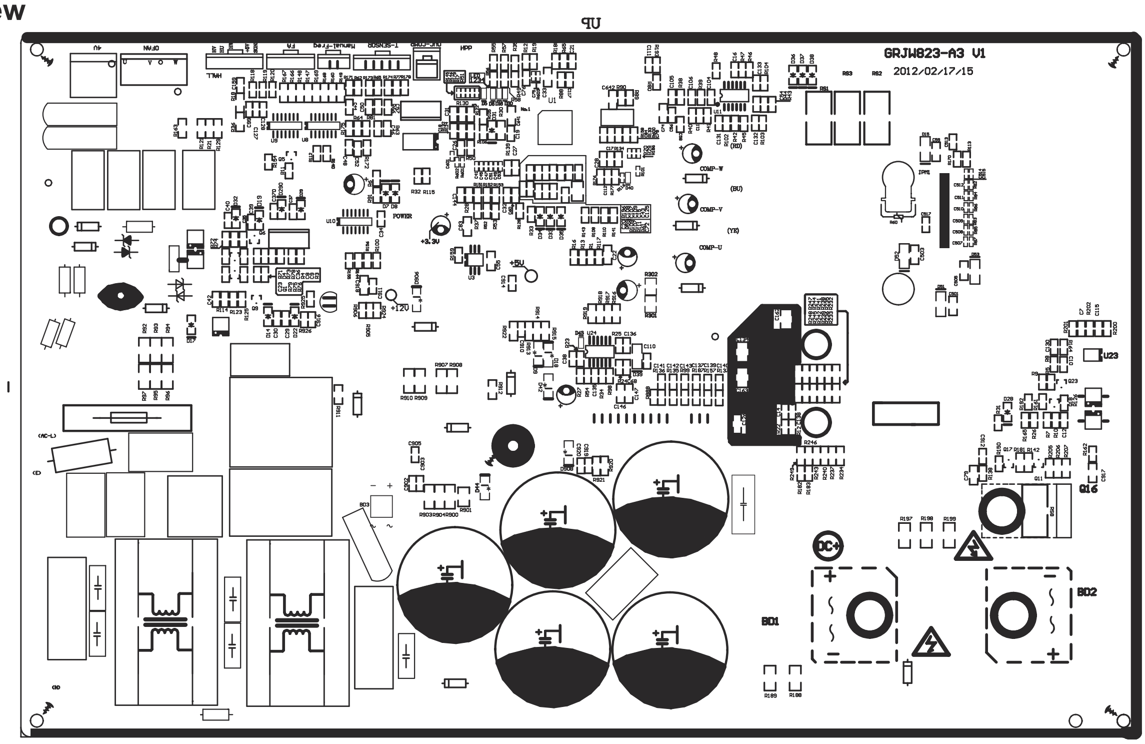
24K

- **Top view**



No.	Name	No.	Name	No.	Name	No.	Name
1	Compressor connection wire	5	EEV terminal	9	Live wire	13	Electric reactor connecting wire1
2	Compressor overload interface	6	Outdoor fan interface	10	Ground wire	14	PFC capacitor connecting wire
3	Temp. sensor terminal	7	Four-way valve interface	11	Neutral wire		
4	Outdoor tube temp. sensor terminal	8	Communication cable of IDU	12	Electric reactor connecting wire2		

- **Bottom view**



6. Function and Control

6.1 Remote Controller Introduction

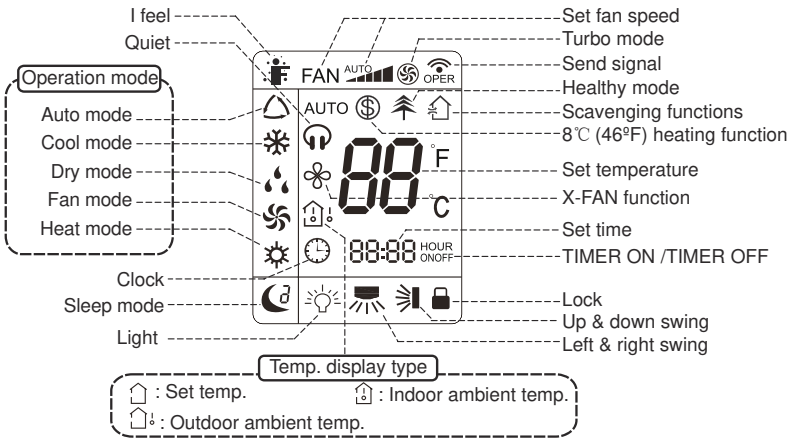
Buttons on Remote Controller

(before opening cover)

(after opening cover)

1. ON/OFF button
2. FAN button
3. MODE button
4. +/- button
5. TURBO button
6. button
7. button
8. CLOCK button
9. TIMER ON/ TIMER OFF button
10. TEMP button
11. / button
12. I FEEL button
13. LIGHT button
14. X-FAN button
15. QUIET button
16. SLEEP button

Introduction for Icons on Display Screen



Introduction for Buttons on Remote Controller

Note:

● After initial power-up, the air conditioner will give out a sound.Operation indictor " " is ON (red indicator). After that, you can operate the air conditioner by using remote controller.

● With the unit on, pressing any button on the remote controller, the signal icon " " on the display of remote controller will blink once and the air conditioner will give out a beep sound, which confirms the signal has been sent to the air conditioner.

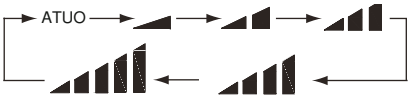
● With the unit off, set temperature and clock icon will be displayed on the screen of remote controller (If timer on, timer off and light functions are set, the corresponding icons will be displayed on the display of remote controller at the same time). Under on status, the display will show the corresponding set function icons.

1. ON/OFF button

Pressing this button once, the unit will be turned on. Press it once more, the unit will be turned off. Sleep function will be canceled if the ON/ OFF button is pressed when the unit is OFF.

2. FAN button

Press this button, Auto, Low, Medium-low, Medium, Medium-high, High speed can be sequentially selected. After initial power is applied, Auto fan speed is default. Under DRY mode, Low fan speed only can be set up.

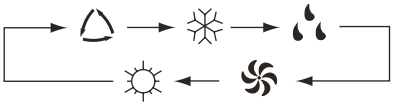


Note: It's Low fan speed under Dry mode.

Low fan Medium-low fan Medium fan Medium-high fan High fan

3. MODE button

Press this button, Auto, Cool, Dry, Fan, Heat mode can be selected. Auto mode is default while power on. Under Auto mode, the temperature will not be displayed. Under Heat mode, initial value is 28°C(82°F);Under other modes, the initial value is 25°C (77°F). the



AUTO COOL DRY FAN HEAT

(Only for cooling and heating unit. As for cooling only unit, it won't have any action when it receives the signal of heating operation.)

4. +/- button

● Presetting temperature can be increased.

By pressing the + button,the temperature can be raised, continuously press this button and hold for two seconds, the relative contents can quickly change, until releasing this button and send the order that the °C (°F) signal will be displayed all the time.The temperature adjustment is unavilable under the Auto mode.Temperature of Celsius degree setting:16-30; for Fahrenheit degree setting:61-86.

● Presetting temperature can be decreased.

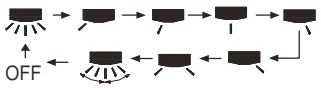
By pressing the - button, the temperature can be lowered, continuously press this button and hold for two seconds, the relative contents can quickly change, until releasing this button and send the order that the °C (°F) signal will be displayed all the time.The temperature adjustment is unavailable under the Auto mode.

5. TURBO button

Under Cool or Heat mode, pressing this button will turn on or turn off the Turbo function. After the Turbo function is turned on, the signal of Turbo will display. The signal will be automatically cancel if changing the mode or fan speed.

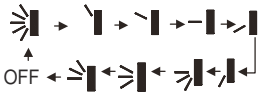
6. button

Press this button to set left and right swing angle which sequentially changes as below:



7. button

Press this button to set swing angle, which sequentially changes as below:



This remote controller is universal. If it receives three of any of the following status,the swing angle will remain.

If guide louver is stopped when it is swinging up and down, it will remain in its present position.

indicates guide louver swings back and forth in the five positions, as shown in the figure.

8. CLOCK button

Press this button, the clock can be set up,signal blink and display. Within 5 seconds, the value can be adjusted by pressing + or - button, if continuously pressing this button for 2 seconds above, in every 0.5 seconds, the value on ten place of Minute will be increased 1.During blinking,repress the Clock button or Confirm button,signal will be constantly displayed and it denotes the setting succeeded. After initial power, 12:00 is defaulted to display and signal will be displayed. If there is signal displayed that denotes the current time value is Clock value, otherwise it is Timer value.

9. TIMER ON/TIMER OFF button

● Timer On setting: Signal "ON"will blink and display,signal will conceal,the numerical section will become the timer on setting status. During 5 seconds of blinking, by pressing + or - button to adjust the time value of numerical section, every press of that button, the value will be increased or decreased 1 minute. Hold pressing + or - button, 2 seconds later it quickly changes,the way of change is: During the initial 2.5 seconds,ten numbers change in the space of a minute, then the one place is constant, ten numbers change in the ten splace of minute at 2.5 seconds speed and carry. During 5s blinking,press the Timer button, the timer setting succeeds.The Timer On has been set up, repress the timer button, theTimer On will be canceled. Before setting theTimer, please adjust the Clock to the current actual time.

● One press of this key to enter into TIMER OFF setup, in which case the TIMER OFF icon will blink. The method of setting is the same as TIMER ON.

10. TEMP button

Press this button, you can see indoor set temperature, indoor ambient temperature or outdoor ambient temperature on indoor unit's display. The setting on the controller is selected sequentially as below:

When selecting " " with remote controller or no display, temperature indicator on indoor unit displays set temperature; When selecting " " with remote controller,temperature indicator on indoor unit displays indoor ambient temperature; When selecting " " with remote controller, temperature indicator on indoor unit displays outdoor ambient temperature. 3s later it will return to the setting temprature or it depends on the other received signal within 3s.

Note: When displaying the outdoor ambient, the displaying range is 32-99°F and 0-60°C.When it goes beyond the range, it keeps the threshold data (the smallest— 32°F or 0°C and the largest 99°F or 60°C).

Tip: When operating buttons on the cover please make sure the cover is closed completely.

11. / button(This function is only available for some models)

Press this button to achieve the on and off of healthy and scavenging functions in operation status.Press this button for the first time to start scavenging function;LCD displays" ".Press the button for the second time to start healthy and scavenging functions simultaneously;LCD displays" "and " " .Press this button for the third time to quit healthy and scavenging functions simultaneously. Press the button for the fourth time to start healthy function; LCD display" " .Press this button again to repeat the operation above.

12. I FEEL button

Press this button once, to turn on the I FEEL function, then the figure of "I FEEL" will be displayed, after every press of other function button, every 200ms to send I FEEL once, after this function started,the remote control will send temperature to the main un it in every 10 minutes.When repress this button, this function will be turned off.

13. LIGHT button

Press this button at unit On or Off status,Light On and Light Off can be set up.After powered on, Light On is defaulted.

14. X-FAN button

Pressing X-FAN button in COOL or DRY mode,the icon is displayed and the indoor fan will continue operation for 2 minutes in order to dry the indoor unit even though you have turned off the unit.After energization, X-FAN OFF is defaulted. X-FAN is not available in AUTO,FAN or HEAT mode.

15. QUIET button

Press this button,the Quiet status is under the Auto Quiet mode (display and "Auto"signal) and Quiet mode display signal) and Quiet OFF(there is no signal displayed),after initial power is applied, the Quiet OFF is defaulted. Under the Quiet mode (Display signal), the fan speed is not available.

16. SLEEP button

●Press this button, can select Sleep 1 ( ), Sleep 2 ( ),Sleep 3 ( ) and cancel the Sleep, circulate between these, after initial power is applied, Sleep Cancel is defaulted.

●Sleep 1 is Sleep mode 1, in Cool, Dehumidify modes: sleep status after running for one hour, the main unit setting temperature will increase 1°C(1ºF~2ºF), 2 hours,setting temperature increased 2°C(3ºF~4ºF), the unit will run at this setting temperature; In Heat mode: sleep status after running for one hour, the setting temperature will decrease 1°C (1ºF~2ºF), 2 hours, setting temperature will decrease 2°C(3ºF~4ºF), then the unit will run at this setting temperature.

●Sleep 2 is sleep mode 2, that is air conditioner will run according to presetting a group of sleep temperature curve.

In Cool mode:

(1) When setting the initial temperature 16~23°C(61ºF~74ºF), after turned on Sleep function, the temperature will be increased 1°C(1ºF~2ºF) in every hour,after 3°C(5ºF~6ºF) the temperature will be maintained, after 7 hours, the temperature will be decreased 1°C (1ºF~2ºF), after that the unit will keep on running under this temperature.

(2) When setting the initial temperature 24~27°C (75ºF~81ºF), after turning on Sleep function, the temperature will be increased 1°C (1ºF~2ºF) in every hour, after 2°C (3ºF~4ºF) the temperature will be maintained, after 7 hours,the temperature will be decreased 1°C (1ºF~2ºF), after that the unit will keep on running under this temperature.

(3) When setting the initial temperature 28~29°C(82ºF~85ºF), after turning on Sleep function, the temperature will be increased 1°C (1ºF~2ºF) in every hour, after 1°C (1ºF~2ºF) the temperature will be maintained, after 7hours,the temperature will be decreased 1°C (1ºF~2ºF), after that the unit will keep on running under this temperature.

(4) When setting the initial temperature 30°C (86ºF), under this temperature setting, after 7 hours, the temperature will be decreased 1°C (1ºF~2ºF), after that the unit will keep on running under this temperature.

In Heat mode:

(1) Under the initial presetting temperature 16°C(61ºF), it will run under this setting temperature continuously.

(2) Under the initial presetting temperature 17~20°C (62ºF~68ºF), after Sleep function started up, the temperature will decrease 1°C (1ºF~2ºF) in every hour, after 1°C (1ºF~2ºF) decreased, this temperature will be maintained.

(3) Under the initial presetting temperature 21~27°C(69ºF~81ºF), after Sleep function started up, the temperature will decrease 1°C(1ºF~2ºF) in every hour, after 2°C (3ºF~4ºF) decreased, this temperature will be maintained.

(4) Under the initial presetting temperature 28~30°C (82ºF~86ºF), after Sleep function started up, the temperature will decrease 1°C (1ºF~2ºF) in every hour, after 3°C (5ºF~6ºF) decreased, this temperature will be maintained.

●Sleep 3- the sleep curve setting under Sleep mode is user defined:

(1) Under Sleep 3 mode, press "Turbo" button for a long time, remote control enters into user individuation sleep setting status, at this time, the time of remote control will display "1hour ", the setting temperature "88" will display the corresponding temperature of last setting sleep curve and blink. The first entering will display according to the initial curve setting value set at the factory.

(2) Adjust "+" and "-" button, could change the corresponding setting temperature, after adjusted, press "Turbo "button for confirmation.

(3) At this time, 1 hour will be automatically increased at the timer postion on the remote control, ("2hours" or "3hours" or "8hours "), the place of setting temperature "88" will display the corresponding temperature of the last setting sleep curve and blink.

(4) Repeat the above step (2)~(3) operation, until 8hours temperature setting is finished, sleep curve setting finished, at this time, the remote control will resume the original timer display; temperature display will resume to original setting temperature.

●Sleep3- the sleep curve setting under Sleep mode User Defined (default setting):

The default User Defined Sleep Mode settings are set by entering into user individual sleep setting status, but not changing the temperature, press "Turbo" button directly for confirmation.

Note: In the above presetting or enquiry procedure, if continuously within10s, there is no button pressed, the sleep curve setting status will automatically quit and resume to display the original displaying. In the presetting or enquiry procedure, press "ON/OFF" button, "Mode" button, "Timer" button or "Sleep" button, the sleep curve setting or enquiry status will quit similarly.

17. About X-FAN function

This function indicates that moisture on evaporator of indoor unit will be removed using the fan blower after the unit is stopped to avoid mold.

(1)Having set X-FAN function on: After turning off the unit by pressing ON/OFF button indoor fan will continue running for about 2 min. at low speed. In this period, press X-FAN button to stop indoor fan immediately.

(2) Having set X-FAN off: After turning off the unit by pressing ON/OFF button, the complete unit will immediately be off. When AUTO RUN mode is selected, the setting temperature will not be displayed on the LCD, the unit will be in accordance with the room temp. automatically to select the suitable running method and to make ambient temperature comfortable.

18. About AUTO RUN

When AUTO RUN mode is selected, the setting temperature will not be displayed on the LCD, the unit will be in accordance with the room temp. automatically to select the suitable running method and to make indoor ambient comfortable.

19. About turbo function

If starting this function, the unit will run at super-high fan speed to cool or heat quickly so that the indoor ambient temp. approachs the preset temp. as soon as possible.

20. About lock

Press + and - buttons simultaneously to lock or unlock the keyboard. If the remote controller is locked, the icon will be displayed on it, in which case, press any button, the mark will flicker three times. If the keyboard is unlocked, the mark will disappear.

21. About swing up and down

(1)Press swing up and down button continuously more than 2s,the main unit will swing back and forth from up to down, and then release the button. The unit will stop swinging and present position of guide louver will be kept immediately.

(2)Under swing up and down mode, when the status is switched from off to , if pressing this button again 2s later, status will switch to off status directly; if press this button again within 2s,the change of swing status will also depend on the sequence stated above.

22. About swing left and right

(1)Press swing left and right button continuously more than 2s,the main unit will swing back and forth from left to right, and then release the button, the unit will stop swinging and present position of guide louver will be kept immediately.

(2)Under swing left and right mode, when the status is switched from off to , if press this button again 2s later, status will switch to off status directly; if pressing this button again within 2s,the change of swing status will also depend on the sequence stated above.

23. About switch between Fahrenheit and Centigrade

Under status of unit off, press MODE and - buttons simultaneously to switch °C and °F.

24. Combination of " TEMP" and "CLOCK" buttons : About Energy-saving Function

Press “TEMP” and “CLOCK” simultaneously in COOL mode to start energy-saving function. LCD on the remote controller displays “SE”. Repeat the operation to quit the function.

25. Combination of " TEMP" and "CLOCK" buttons : About 8°C (46ºF) Heating Function

Press “TEMP” and “CLOCK” simultaneously in HEAT mode to start 8°C(46ºF) Heating Function. LCD on the remote controller displays" "and a selected temperature of “8°C” (46°F if Fahrenheit is adopted). Repeat the operation to quit the function.

26. About Auto Quiet function

When auto quiet function is selected:

(1)Under cooling mode: indoor fan operates at notch 4 speed. 10 minutes later or when indoor ambient temperature≤28°C(82ºF), indoor fan will operate at notch 2 speed or quiet mode according to the comparison between indoor ambinet temperature and set temperature.

(2)Under heating mode: indoor fan operates at notch 3 speed or quiet mode according to the comparison between indoor ambient temperature and set temperature.

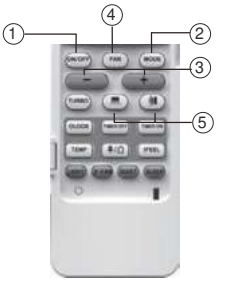
(3)Under dry, fan mode: indoor fan operates at quiet mode.

(4)Under auto mode: the indoor fan operates at the auto quiet mode according to actual cooling, heating or fan mode.

27. About Sleep function

Under the Fan and Auto mode, the Sleep function cannot be set up, under Dehumidify mode, only Sleep 1 can be selected.Select and enter into any kind of Sleep mode, the Quiet function will be attached and started, different Quiet status could be optional and turned off.

Operation Guide



1. General operation

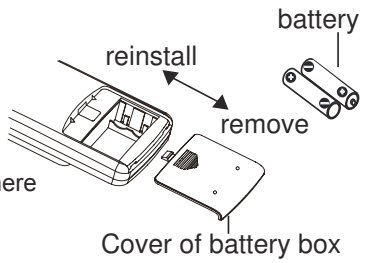
(1)After initial power is applied, press ON/OFF button, the unit will start to run. (Note: When it is powered on, the guide louver of main unit will close automatically.)
(2)Press MODE button, select desired running mode.
(3)Pressing + or - button, to set the desired temperature (It is unnecessary to set the temp. at AUTO mode.)
(4)Pressing FAN button, set fan speed, can select AUTO FAN,LOW, MEDIUM-LOW, MEDIUM, MEDIUM-HIGH and HIGH.
(5)Press add vertical and horizontal swing icons here to select the swing.

2. Optional operation

(1)Press SLEEP button, to set sleep.
(2)Press TIMER ON and TIMER OFF button, can set the scheduled timer on or timer off.
(3)Press LIGHT button, to control the on and off of the displaying part of the unit (This function may be not available for some units).
(4)Press TURBO button, to set the ON and OFF of TURBO function.

Replacement of Batteries in Remote Controller

1. Press the back side of remote controller marked with " ",as shown in the figure,and then slide the cover of battery box along the arrow direction.
2. Replace two 7# (AAA 1.5V) dry batteries, and make sure the position of "+" polar and "-" polar are correct.
3. Reinstall the cover of battery box.



Note:

- During operation, point the remote control signal sender at the receiving window on indoor unit.
- The distance between signal sender and receiving window should be no more than 26ft (8m), and there should be no obstacles between them.
- Signal interference could result in the room where there is a fluorescent lamp or wireless telephone; remote controller should be close to indoor unit during operation.
- Replace new batteries of the same model when replacement is required.
- When you don't use remote controller for a long time, please take out the batteries.
- If the display on remote controller is fuzzy or there's no display, please replace batteries.

6.2 Brief Description of Modes and Functions

● Indoor Unit

1.Temperature Parameters

Indoor preset temperature (Tpreset)

Indoor ambient temperature (Tamb.)

2.Basic functions (The temperature in this manual is expressed by Centigrade. If Fahrenheit is used, the switchover between them Tf=TcX1.8+32.)

Once the compressor is energized, there should be a minimum interval of 3 minutes between two start-ups. But if the unit is de-energized and then energized, the compressor can restart within 3 minutes.

(1)Cooling mode

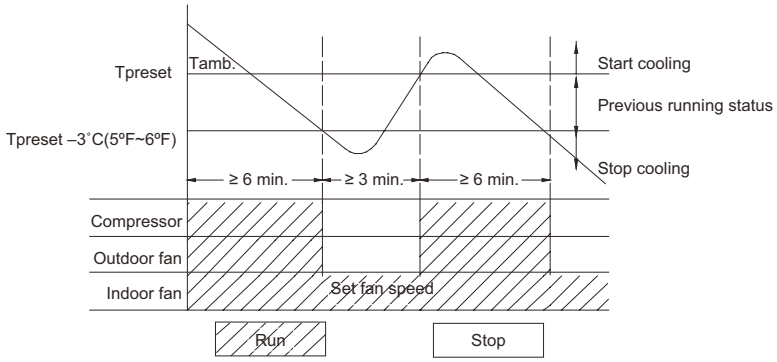
① Cooling conditions and process

When Tamb. ≥Tpreset, the unit starts cooling operation. In this case, the compressor and the outdoor fan operate and the indoor fan operates at set speed.

When Tamb. ≤Tpreset-3°C(5ºF~6ºF), the compressor and the outdoor fan stop while the indoor fan runs at set speed.

When Tpreset-3°C(5ºF~6ºF)<Tamb.<Tpreset, the unit will maintain its previous running status.

In cooling mode, temperature setting range is 16~30°C(61ºF~86ºF); the indoor unit displays operation icon, cooling icon and set temperature.



② When outdoor unit has malfunction or stops for protection, indoor unit will keep previous operation status and display malfunction code.

③ The protection status is as the same as the cooling mode.

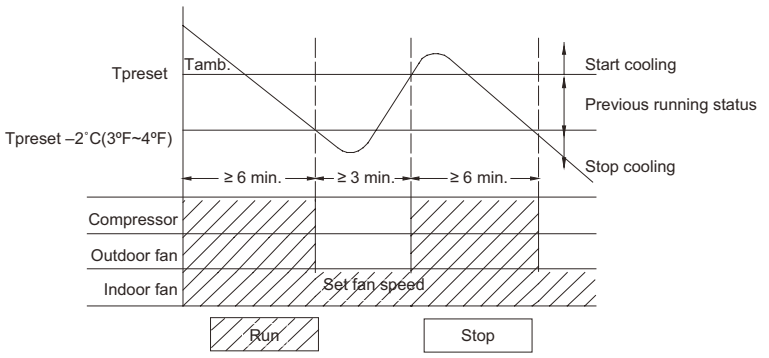
(2)Dry Mode

When Tamb.>Tpreset, the unit operates in cooling mode. Meanwhile, compressor and outdoor fan operate, and indoor fan operates at set fan speed (low fan speed, quiet fan speed or auto quiet fan speed).

When Tpreset-2°C(3ºF~4ºF)<Tamb. ≤Tpreset, the unit keeps previous operation status.

When Tamb.≤Tpreset-2°C(3ºF~4ºF), compressor, outdoor fan and indoor fan operate at set fan speed (low fan speed, quiet fan speed or auto quiet fan speed).

Under this mode, the temperature setting range is 16~30°C(61ºF~86ºF). Display displays operation icon, drying icon and set temperature.



(3)Heating mode (not available for cooling only type)

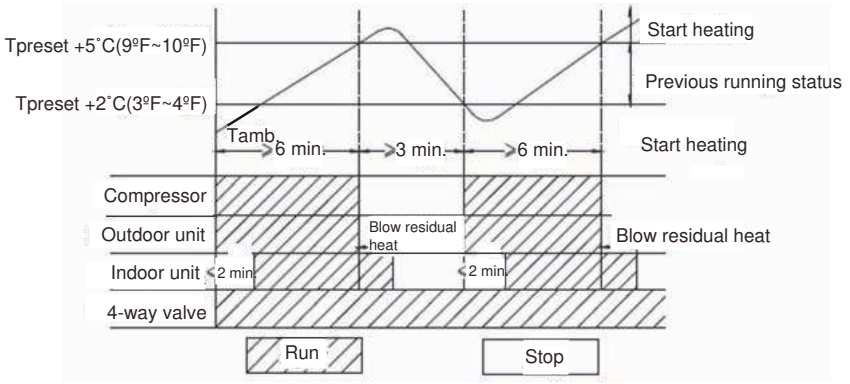
① Heating conditions and process

When Tamb. ≤Tpreset+2°C(3ºF~4ºF), the unit starts heating operation. In this case, compressor and outdoor fan operate simultaneously; the indoor fan operates at cold-air prevention mode.

When Tamb.≥Tpreset+5°C(6ºF~7ºF), the compressor and outdoor fan stop operation; the indoor fan blows residual heat.

When Tpreset+2°C(3ºF~4ºF)<Tamb.<Tpreset +5°C(9ºF~10ºF), the unit will maintain its previous running status.

Under this mode, temperature setting range is 16~30°C(61ºF~86ºF); the indoor unit displays operation icon, heating icon and set temperature.



② Defrosting and Oil Return

When receiving the signal of defrosting and oil return, the horizontal louver(big one) will rotate to the position where the angle is minimum and the other horizontal louver(small one) will close. In 10 seconds later, indoor fan will stop operation. During defrosting, oil return and 5 minutes after quit, all indoor pipe temperature sensors will not be detected. When receiving oil return signal or defrosting signal sent by outdoor unit, Heating indicator on indoor unit is off for 0.5s and then blinks for 10s.

③ Blow residual heat

In heating mode, when temperature reaches the set temperature, the compressor and outdoor fan will stop.

The horizontal louver (big one) will rotate to the default position for cooling and the other one (small one) will close. Indoor unit will operate at set speed for 60s and then stop operation.

When the unit is in heating mode or auto heating mode, and also the compressor and indoor fan are operating, if turning off the unit,compressor and outdoor fan will stop. Horizontal louver (big one) will rotate to the position where gentle wind is blown out (default position for cooling) and the other horizontal louver (small one) will close. Indoor unit will operate at low speed for 10 seconds and then the unit will be turned off.

(4)Fan Mode

In this mode, indoor fan operates at set speed while compressor and outdoor fan stop operation. The set temperature range is 16~30°C(61ºF~86ºF). Operation icon and set temperature are displayed.

(5)Auto Mode

In this mode, operation mode (Cool, Heat, Fan) will be automatically selected according to change of ambient temperature. Operation icon, actual operation icon and set temperature will be displayed. There is 30s delay for protection when changing mode. The protection function is as the same as that under each mode.

① When Tamb.≥26°C(79ºF) the unit will operate at cooling mode, the default set temperature is 25°C(77ºF).

② When Tamb. ≤21°C(69ºF) the unit will operate at heating mode, the default set temperature is 20°C(68ºF) if the cooling only unit operates at fan mode, the default set temperature is 25°C(77ºF);

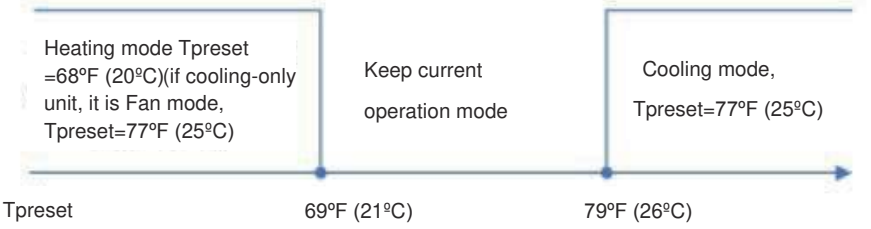
③ When 22°C(70ºF)≤Tamb.≤25°C(77ºF) and the unit is turned on for the first time, if it changes to auto mode from other mode, the previous operation mode will be maintained; If it changes to auto mode from dry mode, the unit will operate at fan mode.

④ When the unit operates at auto mode, the frequency of compressor is as the same as that under cooling mode, while it is as the same as that under heating mode.

Protection function

A. Under cooling mode, the protection function is the same as that under cooling mode.

B. Under heating mode, the protection function is the same as that under heating mode.

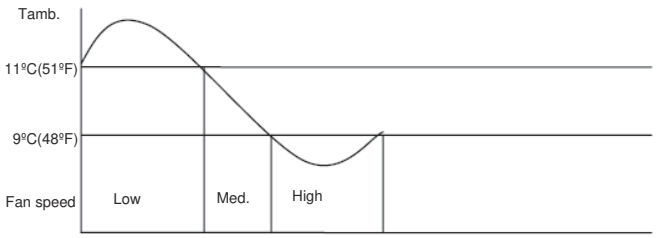


(6) "46ºF (8°C)" Heating

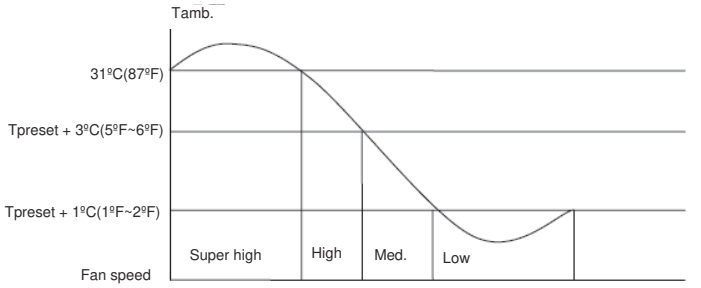
Under heating mode, press buttons "Temp" and "Clock" simultaneously, the 46ºF (8°C) heating function will be activated and "cold air prevention" will be shielded.

① 46ºF (8°C) heating can't co-exist with sleep function. If 46ºF (8°C) heating function is set, it can be cancelled by pressing sleep button, In that case, the set temperature will be that before entering 8 heating; If sleep function is set, press buttons "Temp" and "Clock" simultaneously to activate 46ºF (8°C) function and cancel sleep function at the same time.

② Set temperature is 46ºF (8°C) and it is displayed on the indoor display panel.
③ In this mode, TURBO can't be set and fan speed can't be adjusted.
④ In this mode, when compressor operates, fan speed will be adjusted as follows; when compressor stops operation, indoor unit will operate at blowing residual heat.
When Tindoor amb. ≤48ºF (9°C), indoor fan operates at high fan speed;
When 48ºF (9°C) ＜ Tindoor amb. ＜ 51ºF（11°C), indoor fan operates at medium fan speed;
When Tindoor amb.≥51ºF (11°C), indoor fan operates at low fan speed;
When changing among low high, medium, and low speeds, the minimum operation time is 210 seconds.
⑤ The unit with memory function can memorize 46ºF (8°C) heating mode.



(7)Energysaving Function
① In cooling mode, when receiving command of energysaving sent by remote control, the controller enters energy saving mode; If the unit is under energysaving mode already, such command will not be executed.
② When remote control is set to display set temperature, "dual 8"LCD displays "SE".
③ In this mode, when compressor operates, fan speed will be adjusted according to auto fan mode under energysaving operation; when compressor stops operation, indoor fan will operate at low speed.
a. When Tamb.≥87ºF (31°C), indoor fan will operate at super high speed;
b. When 87ºF (31°C)>Tamb.≥Tpreset+5ºF~6ºF (3°C), indoor fan will operate at high speed;
c. When Tpreset+1°C(1ºF~2ºF)<Tamb.<Tpreset+5ºF~6ºF (3°C) indoor fan will operate at medium speed;
d. When Tamb.≤Tpreset+1ºF~2ºF (1°C) indoor fan will operate at low speed;
Note: The switchover among superhigh speed, high speed, medium speed and low speed requires minimum 210seconds of operation.



④ In this mode, set temperature will be automatically adjusted according to actual operation conditions.

3.Other Control

(1)Clock Timer

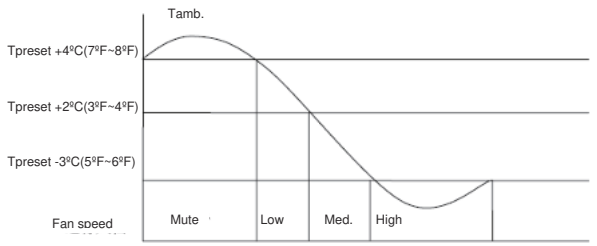
Timer ON
If timer ON is set during operation of the unit, the unit will continue to operate. If timer ON is set at unit OFF, upon ON time reaches the unit will start to operate according to previous setting status.
Timer OFF
If timer OFF is set at unit OFF, the system will keep standby status. If timer OFF is set at unit ON, upon OFF time reaches the unit will stop operation.
Timer Change
Although timer has been set, the unit still can be turned on/off by pressing ON/OFF button of the remote controller. You can also set the timer once again, and then the unit will operate according to the last setting.
If timer ON and timer OFF are set at the same time during operation of the unit, the unit will keep operating at current status till OFF time reaches.
If timer ON and timer OFF are set at the same time at unit OFF, the unit will keep off status until ON time reaches.
Each day in future, the system will operate according to preset mode till OFF time reaches and stop operation until ON time reaches.
If ON time and OFF time are the same, OFF command will prevail.

(2)Auto Button

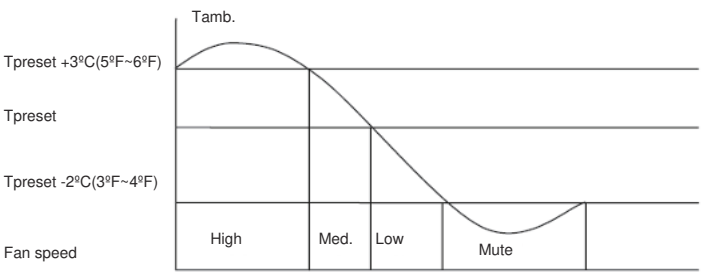
If this button is pressed, the unit will operate in AUTO mode and indoor fan will operate at auto speed; meanwhile, the swing motor operates. Press this button again to turn off the unit.

(3)Buzzer
Upon energization or availably operating the unit or remote controller, the buzzer will give out a beep.
(4)Sleep Function
In SLEEP mode, the unit will automatically select appropriate sleep curve to operate according to different temperature setting.
(5)Turbo Function
This function can be set in cooling or heating mode to quickly cool or heat the room.
(6)X-FAN Function
① When the unit is operating at COOL or DRY mode(it is not available under AUTO, HEAT, FAN modes), the X-FAN function can be turned on/off. When it is turned on,once pressing ON/OFF button to turn off the unit, indoor fan will continue operation at low speed for 2 minutes. Within the 2 minutes, horizontal louver will keep its previous status. Then the complete unit will be turned off. When X-FAN function is set to be off,once pressing ON./OFF button, the complete unit will be turned on immediately.

② During X-FAN operation, press X-FAN button, the indoor fan, horizontal louver, cold plasma and static-dedusting will be turned off immediately.
(7)Control of Indoor Fan
Indoor fan can be set by remote control within the range of Mute, Fan speed 1, Fan speed 2, Fan speed 3, Fan speed 4, Fan speed 5 and Turbo and Fan will operate at low, med. high or super high speed accordingly. And also, auto fan speed can be set. Under auto fan speed mode, indoor fan will automatically select high, med., low or mute speed according to change of ambient temperature.
① Under Auto Heat mode or regular Heat mode, auto fan speed will be as follows:
When Tamb.<Tpreset-3°C(5ºF~6ºF), indoor fan will operate at high speed;
When Tpreset-5ºF~6ºF (3°C)≤Tamb.<Tpreset+3ºF~4ºF (2°C) indoor fan will operate at med. speed;
When Tpreset+3ºF~4ºF (2°C)≤Tamb.<Tpreset+7ºF~8ºF (4°C), indoor fan will operate at low fan
speed. When Tamb≥Tpreset+7ºF~8ºF (4°C) indoor fan will operate at mute.
Control Diagram of Auto Fan Speed under HEAT Mode

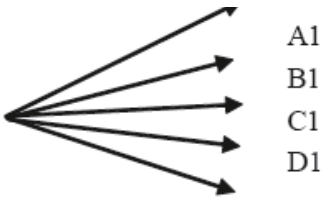


② Under FAN or COOL mode: if it is auto cooling mode or regular cooling mode, auto fan speed will be as follows:
When Tamb.≥Tpreset+5ºF~6ºF (3°C), indoor fan will operate at high speed;
When Tpreset<Tamb.<Tpreset+5ºF~6ºF (3°C) indoor fan will operate at med.
speed. When Tpreset-3ºF~4ºF (2°C)<Tamb.≤Tpreset, indoor fan will operate at low
speed. When Tamb.≤Tpreset-3ºF~4ºF (2°C) indoor fan will operate at mute.
③ There is no auto fan speed under DRY mode
Note: Fan speed “High”, “Med.” and “Low” are respectively corresponding to “Fan speed 5”, “Fan speed 3” and “Fan speed 1”. There is 210 seconds delay for fan speed switchover of auto fan.

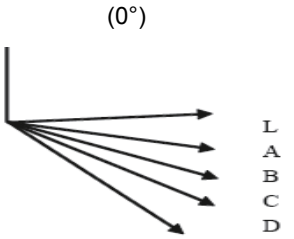


(8)Vertical Swing
① Small Horizontal Louver
After energization, vertical swing motor will first have the horizontal louver rotate anticlockwise to position O to close air outlet. If swing function has not been set after startup of the unit, horizontal louver will turn clockwise to position D1 in HEAT mode. If swing function is set when starting up the unit, the horizontal louver will swing between O and D1.There are 7 swing status of horizontal louver: Positions O, A1, B1, C1 and D1, swing between O and D1 and stop at any position between L and D (angles between O and

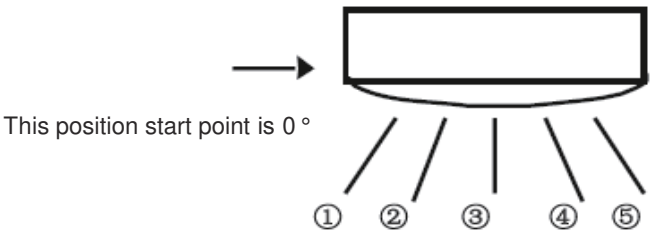
D1 are equiangular). Upon turning off the unit, the horizontal louver will close at position O. Swing function is available only when swing function is set and indoor fan is operating.
Note:
a. If the position is set between O and D1, A 1and C1 or B1 and D1 by remote controller, the horizontal louver will swing between O and D1.
b. For model 9K/12K, only when big horizontal louver rotates to the second position for heating (62°of corresponding angle), this louver will be activated. For model 18K, only when big horizontal louver rotates to the first position for heating(63°of corresponding angle), this louver will be activated,For model 24K, only when big horizontal louver rotates to the first position for heating(40°of corresponding angle), this louver will be activated.
c. Under cooling mode, this horizontal louver will be always in the position O.



② Big Horizontal Louver
After energization, up and down swing motor will first have the horizontal louver rotate counterclockwise to position O to close air outlet. If swing function has not been set after startup of the unit, horizontal louver will turn clockwise to position D in HEAT mode, or turn clockwise to level position L in other modes. If swing function is set when starting up the unit, the horizontal louver will swing between L and D.There are 7 swing status of horizontal louver: Positions L, A, B, C and D, swing between L and D and stop at any position between L and D (angles between L and D are equiangular). Upon turning off the unit, the horizontal louver will close at position O. Note: If the position is set between L and B, A and C or B and D by remote controller, the horizontal louver will swing between L and D.



(9)Horizontal Swing
Upon energization, the vertical louver will be reset to the start position first and then stop in the middle position. When setting horizontal swing, there are 7 status: Position ① , Position ② , Position ③ , Positon ④ , Position ⑤ , swing between① and ⑤ and stop at any position between① and ⑤ . If setting horizontal swing during operation of the unit, the horizontal swing motor will drive the louver to swing horizontally. When cancelling horizontal swing or it is not set when turning on the unit, the louver will stop in the current.



(10)Display
① Operation and Mode Icons
Upon energization, the unit will display all icons within 3 seconds. Under standby state, LED lamp of standby is on. If the unit is turned on by remote controller, LED lamp of operation is on; meanwhile, the mark of current running mode will be displayed. If the light button is turned off, no mark will be displayed.
② Display of LCD on Indoor Unit
When energized and started for the first time, the indoor unit defaults to displaying current set temperature 61ºF~86ºF (16~30°C). When set temperature display is set by remote controller, it will display set temperature; when room temperature display is set, it will display room or outdoor temperature. After that, when operating the remote controller for other settings, the temperature display method

will keep original. When operating the remote controller during room temperature display, the set temperature will be displayed for 5 seconds first and then room temperature display returns. If there is malfunction, corresponding malfunction code will be displayed. For example, if ambient temperature sensor has malfunction, “F1” will be displayed; if indoor pipe temperature has malfunction, “F2” will be displayed; if jumper cap has malfunction, “C5” will be displayed.

(11)Memory Function

① Memory when power failure upon turning on the unit

◆ Memory content: ON status, mode, up and down swing, light, set temperature, set fan speed, general timer, Fahrenheit/ Centigrade ◆ General timer can be retained. Timer will be recalculated from the time of energization.

◆ Clock timer can’t be retained.

② Memory when power failure upon turning off the unit

◆ Memory content: ON status, mode, up&down swing, light, set temperature, set fan speed, general timer, Fahrenheit/ Centigrade ◆ General timer can be retained. Timer will be recalculated from the time of energization.

◆ Clock timer can’t be retained.

(12)I Feel function

When I FEEL command is received by controller, and also the ambient temperature is received from remote control, the controller will operate according to the ambient temperature sent by the remote controller (For cold blow prevention, the unit operates according to the ambient temperature sensed by the air conditioner). The remote controller will send ambient temperature data to the controller for every 10 minutes. When the data has not been received for 11 minutes, the unit will operate according to the temperature sensed by the air conditioner. If I FEEL function is not selected, the ambient temperature will be that sensed by the air conditioner. Ambient temperature of I FEEL displayed by controller is 33ºF~138ºF (1 ~59°C).

(13)Health and Cold Plasma Function

When the unit is operating, turn health or cold plasma to be ON/OFF by health button in remote control (if there is no such button in remote control, the health is on as default). Only when health or cold plasma is turned on and indoor fan is operation, such function can be activated.

(14)Static Dedusting Function

When the unit is operating, turn static dedusting ON/OFF by health button in remote control (if there is no such button in remote control, the health is on as default). Only when static dedusting is turned on and indoor fan is operation, such function can be activated.

(15)Fahrenheit Display

LCD displays current set temperature. If remote signal is Fahrenheit, the temperature will be displayed in Fahrenheit. The set temperature range is 61ºF~86ºF (16°~30°C). Under Auto mode, in COOL operation and FAN operation, 77ºF (25°C) will be displayed, while in HEAT operation and FAN operation, 70ºF (20°C) will be displayed. For cooling-only controller, only 77ºF (25°C) will be displayed.

(16)Locked protection to Indoor Fan Motor

If the indoor fan motor keeps low rotation speed for a continuous period of time after startup, the unit will stop operation and display“H6”.

(17)Mute Mode

① Auto Mute: When selecting fan speed of auto mute, the fan speed will be adjusted according to change of ambient temperature; when temperature meets the requirement of the setting, the unit will operate at lowest speed.

② Mute mode: When selecting fan speed of mute, the unit will directly operate at lowest fan speed.

This position is start point

(18)Compulsive Defrosting Function

① Start up compulsory defrosting function

Under ON status, set heating mode with remote controller and adjust the temperature to 61ºF (16ºC). Press “+, -, +, -, +,-” button successively within 5s and the complete unit will enter into compulsory defrosting status. Meanwhile, heating indicator on indoor unit will be ON 10s and OFF 0.5s successively. (Note: If complete unit has malfunction or stops operation due to protection, compulsory defrosting function can be started up after malfunction or protection is resumed.

② Exit compulsory defrosting mode

After compulsory defrosting is started up, the complete unit will exit defrosting operation according to the actual defrosting result, and the complete unit will resume normal heating operation.

(19)Refrigerant Recycling Function

① Enter refrigerant recycling function

Within 5min after energizing(unit ON or OFF status is ok), continuously press LIGHT button for 3 times within 3s to enter refrigerant Recycling mode; Fo is displayed and refrigerant recycling function is started, At this moment, the Liquid Valve must be closed manually. After 5min, test the maintenance valve thimble. If there is no refrigerant spraying out, close the gas valve Immediately and then turn off the unit to remove the connection pipe.

② Exit refrigerant recycling function

After entering refrigerant recycling mode, when receive any remote control signal or enter refrigerant recycling mode for 25min, the Unit will exit refrigerant recycling mode automatically. If the unit is in standby mode before refrigerant recycling, it will be still in standby mode after finishing refrigerant recycling; If the unit is in ON status before refrigerant recycling, it will still run in original operation mode.

● Outdoor Unit

1. Compensation function of input parameters
According to the structure of wall-mounting unit, considering the comfortability for operation, indoor ambient temperature when the compressor is at OFF status is higher than set temperature under heating mode.
2. Control of detecting the availability of parameters
For ensuring the safety and reliability of operation, please insert the outdoor discharge temperature sensor into the corresponding temperature sensor bushing to make sure that the control system can detect system discharge temperature accurately. Otherwise, the unit will stop operation and it displays malfunction of discharge temperature sensor (discharge temperature sensor hasn't been inserted well), which can only be resumed by pressing ON/OFF button on remote controller. Basic functions:
3. Cooling mode
3.1 Working condition and process for cooling
3.1.1 If compressor is at OFF status, and $(T_{preset}-(T_{indoor\ amb.}-\Delta T_{indoor\ amb.\ compensation\ of\ cooling}))\leq 0ºC(32ºF)$, the unit operates in cooling mode;
3.1.2 During cooling operation, if $0ºC(32ºF)\leq(T_{preset}-(T_{indoor\ amb.}-\Delta T_{indoor\ amb.\ compensation\ of\ cooling}))<3ºC(37ºF)$,the unit still operates in cooling mode;
3.1.3 During cooling operation, if $3ºC(37ºF)\leq(T_{preset}-(T_{indoor\ amb.}-\Delta T_{indoor\ amb.\ compensation\ of\ cooling}))$, the unit stops operation when reaching the temperature point in cooling.
3.2 Temperature setting range:
3.2.1 If $T_{outdoor\ amb.}\geq T_{cooling\ temperature(low\ temperature)}$, the temperature setting range is 16-30ºC(61~86ºF)(cooling in room temperature);
3.2.2 If $T_{outdoor\ amb.}<T_{cooling\ temperature(low\ temperature)}$, the temperature setting range is 25-30ºC(77~86ºF). That is: the lower limit of set temperature for outdoor unit is 25ºC(77ºF).
4. Dry mode
4.1 Working conditioner and process for drying is same as that for cooling mode;
4.2 Temperature setting range is 16-30ºC(61~86ºF);
5. Fan mode
5.1 Compressor, outdoor fan and 4-way valve are all turned off;
5.2 Temperature setting range is 16-30ºC(61~86ºF).
6. Heating ode
6.1 Working conditioner and process of heating: ($T_{indoor\ amb.}$ is the actual temperature detected by indoor ambient temperature sensor; $\Delta T_{indoor\ amb.\ compensation\ of\ heating}$ is indoor ambient temperature compensation during heating operation).
6.1.1 If compressor is at OFF status, and $(T_{indoor\ amb.}-\Delta_{indoor\ amb.\ compensation\ of\ heating})\ T_{preset})\leq -1ºC(30ºF)$, the unit operates in heating mode.
6.1.2 During heating operation, if $0ºC(32ºF)\leq(T_{indoor\ amb.}-\Delta_{indoor\ amb.\ compensation\ of\ heating})-T_{preset})\ 2ºC(35ºF)$, the unit still operates in heating mode. 6.1.3 During heating mode, if $2(35ºF)\leq(T_{indoor\ amb.}-\Delta_{indoor\ amb.\ compensation\ of\ heating})-T_{preset})$ the unit stops operation when reaching the temperature point in heating.
6.2 Under this mode, the temperature setting range is 61°F~86ºF (16°C-30ºC).
7. Defrosting control（heating mode）
7.1 If it turns to defrosting time and it detected that the defrosting temperature is satisfied for 3mins successively, the unit turns into defrosting process.
7.2 Defrosting-starting: compressor stops operation and restart it up after 55s delayed,
7.3 Defrosting-ending: Compressor stops operation and it starts up after 55s delayed.
7.4 When any one of below defrosting-ending conditions is satisfied, the unit will quit from defrosting operation:
7.4.1 $T_{outdoor\ tube}\geq T_{quit\ temperature\ 1}$ for defrosting;
7.4.2 Defrosting operation time is reached $T_{max.defrosting\ time.}$
8. Control of compressor
8.1Frequecny of compressor intangibly controls the frequency according to the relation between ambient temperature and set temperature, and the change speed of ambient temperature;
8.2 Under cooling, heating or drying mode, compressor will be started up after outdoor fan is started for 5s.
8.3 At the OFF status, stop operation because of protection and switchover to fan mode, the compressor stops operation immediately.
8.4 Under each mode: Once the compressor is started up, it can be stopped only after operation.
8.5 Under each mode, one the compressor is stopped, it can be restarted up only after 3min delayed
9. Control of outdoor fan
9.1 When turn off the unit by remote controller, stop operation because of protection or stop operation after reaching the temperature point, outdoor can stop operation only after the compressor is stopped for 1min;
9.2 Under fan mode: outdoor fan stops operation.
9.3 defrosting-starting: enter into defrosting. Outdoor fan stops operation after compressor stops for 50s.
9.4 Defrosting-ending: quit defrosting. When the compressor stops operation, the outdoor fan operates.
10. Control of 4-way valve
10.1 4-way valve status under cooling, drying and fan modes: OFF;
10.2 When the unit turned on and operated in heating mode, the 4-way valve is energized immediately.
10.3 If turn off unit or switch to other mode in heating mode, the 4-way valve is de-energized after the compressor stops for 2min;
10.4 When the unit is turned off because of each protection, the 4-way valve is de-energized after 4 mins delayed.
10.5 Defrosting-starting: enter into defrosting. After the compressor stops for 50s, the 4-way valve will be de-energized.
10.6 Defrosting-ending: quit defrosting. After the compressor stops for 50s, the 4-way valve is energized.
11. Freeze protection
11.1 Under cooling or drying mode, if it's detected that $T_{inner\ tube}<0$ for 3min successively, the unit will stop operation due to freeze protection. If $T_{limit\ temperature\ of\ freeze\ protection}<T_{inner\ tube}$, and compressor stops for 3min, the complete can resume operation;

11.2 Under cooling or drying mode, if $T_{inner\ tube}$ <6, the operation frequency of compressor may increase or decrease;
11.2.1 If the unit is stopped because of freeze protection for 6 times successively, it can't resume operation automatically and the malfunction will be displayed continuously, which can only be resumed by pressing ON/OFF button. During operation, if operation time of compressor is over, the times of stop operation because of freeze protection will be cleared. If turn off the unit or switch to fan/heating mode, malfunction and times of malfunction is eliminated immediately.
12. Overload protection
12.1 Overload protection under cooling or drying mode: If $T_{overload\ stop\ operation\ temp.\ in\ cooling} \leq T_{outdoor\ tube}$, the unit stops operation because of overload in cooling; if $T_{outdoor\ tube} < T_{overload\ limit\text{-}frequecny\ temp\ in\ cooling}$ and the compressor has stopped for 3min, the complete unit can resume operation.
12.2 Under cooling or drying mode, if $T_{overload\ limit\text{-}frequecny\ temp.\ in\ cooling} \leq T_{outdoor\ tube}$, the frequency of compressor may increase or decrease;
12.3 Overload protection under heating mode: If $T_{overload\ stop\ operation\ temp.\ in\ heating} \leq T_{indoor\ tube}$, the unit stops operation because of overload in heating; if $T_{indoor\ tube} < T_{overload\ limit\text{-}frequecny\ temp.\ in\ heating}$ and the compressor has stopped for 3min, the complete unit can resume operation.
12.4 Under heating mode. If $T_{overload\ limit\text{-}frequecny\ temp.\ in\ heating} \leq T_{indoor\ tube}$, operation frequency of compressor may increase or decrease;
12.5 If the unit is stopped because of overload protection for 6 times successively, it can't resume operation automatically and the malfunction will be displayed continuously, which can only be resumed by pressing ON/OFF button. During operation, if operation time of compressor is over, the times of stop operation because of overload protection will be cleared. If turn off the unit, fan or switch to fan/heating mode, malfunction and times of malfunction is eliminated immediately.
13. Discharge temperature protection of compressor
13.1 If $T_{stop\ operation\ temperature\ for\ discharge} \leq T_{discharge}$, the unit stops operation because of discharge protection; If $T_{discharge} < T_{limit\text{-}frequecny\ temperature\ for\ discharge}$ and compressor has stopped for 3min, the complete unit can resume operation;
13.2 If $T_{normal\ speed\ decrease\text{-}frequency\ for\ discharge} \leq T_{discharge}$, operation frequency of compressor may decrease or increase;
13.3 If the unit is stopped because of discharge protection of compressor for 6 times successively, it can't resume operation automatically, which can only be resumed by pressing ON/OFF button. During operation, if operation time of compressor is over, the times of stop operation because of discharge protection will be cleared. If turn off the unit, or switch to fan/heating mode, malfunction and times of malfunction is eliminated immediately.
14. Current protection function
14.1 If $13A \leq I_{AC\ current,}$ operation frequency of compressor may decrease or increase;
14.2 If $17A \leq I_{AC\ current,}$ the system will stop operation because of overcurrent; the complete unit can resume operation only after the compressor stops for 3min;
14.3 If the unit is stopped because of overcurrent for 6 times successively, it can't resume operation automatically, which can only be resumed by pressing ON/OFF button. During operation, if operation time of compressor is over, the times of stop operation because of overcurrent protection will be cleared.
15. Voltage drop protection
During operation of compressor, if the voltage is decreasing quickly, the system may stop operation and voltage drop malfunction is caused. 3min later, the system will be restarted up automatically.
16. Communication malfunction
When it hasn't received the correct signal from indoor unit for 3min, the unit will stop operation because if communication malfunction; If communication malfunction is eliminated and compressor has stopped for 3in, the complete unit can resume operation.
17. OPM module protection
After compressor is turned on, if the overcurrent happens for IPM module, or control voltage is too low because of abnormal causes, IPM will detect module protection signal immediately. Once it detected the module protection signal, the unit will stop operation because of module protection. If module protection is resumed and compressor has stopped for 3min, the complete unit will resume operation.
If the unit is stopped because of module protection for 3 times successively, the unit can resume operation automatically unless press ON/OFF button. If the operation time for compressor is over, the times of stop operation because of module protection will be cleared.
18. Overheat protection of module
18.1 If $T_{normal\ speed\ frequency\text{-}decreasing\ temp.\ of\ module} \leq T_{module}$, the operation frequency of compressor may decrease or increase;
18.2 If $T_{stop\ operation\ temperature\ of\ module} \leq T_{module}$, the syste will stop operation for protection. If $T_{module} < T_{frequency\text{-}limiting\ temperature\ of\ module}$ and compressor has stopped for 3min, the complete unit will resume operation;
18.3 If the unit is stopped because of overheating of compressor module for 6 times successively, it can't resume operation automatically, which can only be resumed by pressing ON/OFF button. During operation, if operation time of compressor is over, the times of stop operation because of compressor overheating protection will be cleared. If turn off the unit, or switch to fan mode, times of malfunction is eliminated immediately.
19. Overload protection of compressor
19.1 If it detected that the overload switch for compressor is open for 3min successively, the complete unit will stop operation for protection;
19.2 If overload protection is resumed and compressor has stopped for 3min, the complete unit can resume operation;
19.3 If the unit stops operation because of overload protection for compressor for 3times successively, it can't resume operation automatically, which can only be resumed by pressing ON/OFF button. After compressor has operated for 30min, overload protection times for compressor will be eliminated.

7. Troubleshooting

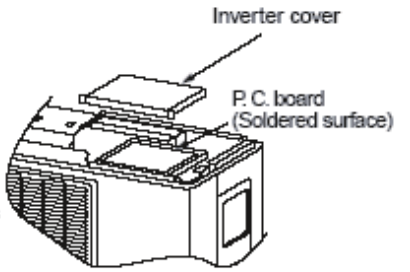
7.1 Precautions before Performing Inspection or Repairs

Be cautious during installation and maintenance. Follow safety regulations at all times to avoid electric shock and casualty or even death due to drop from high attitude.
* Static maintenance is is performed while the unit is d-energized.
For static maintenance, make sure that the unit is de-energized and the plug is disconnected.
*dynamic maintenance is the maintenance during energization of the unit.
Before dynamic maintenance, check that the unit is properly grounded using a voltage tester. Check the copper piping and housing of the unit to ensure there are no voltage leaks. After ensure insulation place and the safety, the maintenance can be performed.
Take sufficient care to avoid directly touching any of the circuit parts without first turning off the power.
At times such as when the circuit board is to be replaced, place the circuit board assembly in a vertical position.
Please follow troubleshooting procedures as described below.(Refer to the check points written on the wiring diagrams attached to the indoor/outdoor units.)

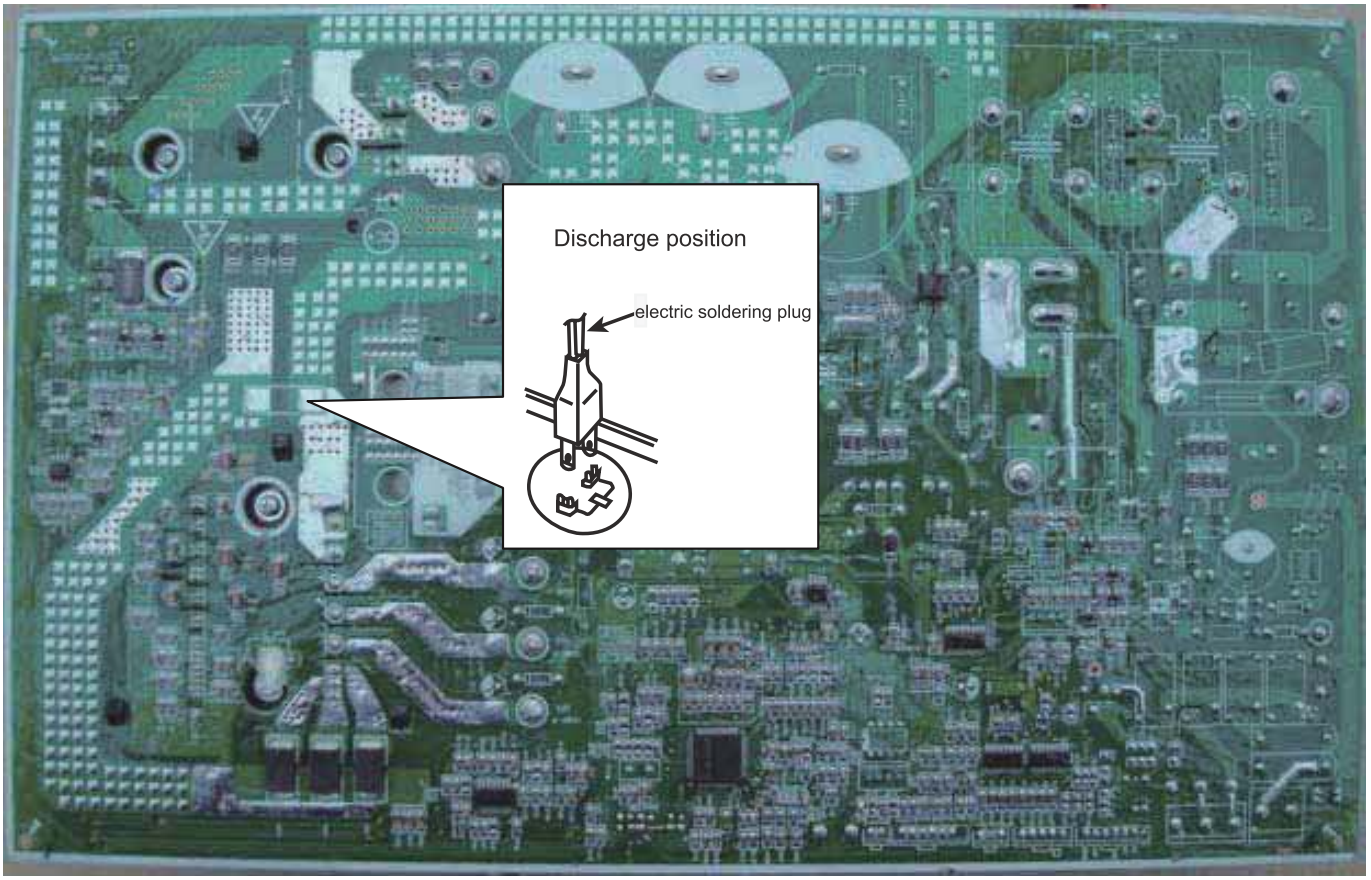
No.	Troubleshooting procedures
1	Confirmation
2	Judgment by Flashing LED of Indoor/Outdoor Unit
3	How to Check the Main Parts

NOTE:
A large-capacity electrolytic capacitor is used in the outdoor unit controller(inverter).Therefore,if the power supply is turned off, charge(charging voltage DC280V to 380V)remains and discharging takes a lot of time. After turning off the power source,if touching the charging section before discharging, an electrical shock may be caused.

Discharging method
(1)remove the inverter cover(Outoor Unit)



(2)As shown below,connect the discharge rescharge resistance(approx.100Ω,20W) or plug of the soldering iron to voltage between + - terminals of the electrolytic capacitor (test 3*D* and *E* point) on PC Board for 30s ,and then perform discharging



7.2 Confirmation

(1)Confirmation of Power Supply
Confirm that the power breaker operates(ON) normally;
(2)Confirmation of Power Voltage
Confirm that power voltage is AC 208-230 ±10%. If power voltage is not in this range, the unit may not operate normally.

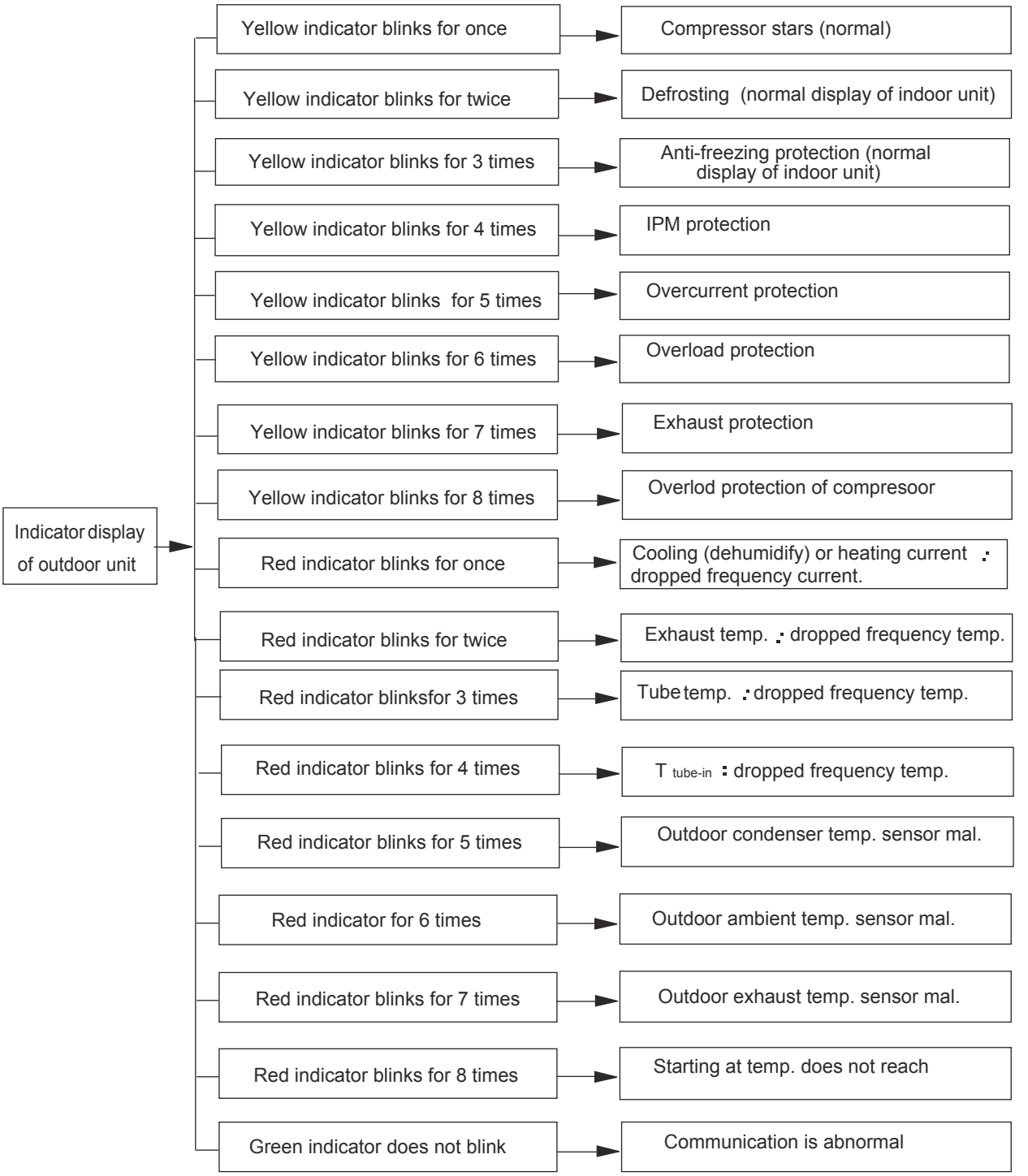
7.3 Flashing LED of Indoor/Outdoor Unit and Primary Judgment

(1)Models:09/12K:

Malfunction and Status Display Table								
No.	Malfunction Name	Malfunction Type	Display of Malfunction of Indoor Unit				Malfunction of Outdoor Unit	
			Display Nixie Tube	Status of LED Lamp			Status of LED Lamp	
				LED Lamp for Operation	LED Lamp for Cooling	LED Lamp for Heating	Yellow LED Lamp	Red LED Lamp
1	Malfunction of Circuit for zero cross detection	Malfunction of hardware	U8	Blinks for 17 times				
2	Malfunction protection for jumper cap		C5	Blinks for 15 times				
3	No feedback from indoor motor		H6	Blinks for 11 times				
4	Indoor ambient temp sensor has open or short circuit		F1		Blinks once			
5	Indoor evaporator temp sensor has open or short circuit		F2		Blinks twice			
6	Liquid valve temp sensor has open or short circuit		b5		Blinks for 19 times			
7	Gas valve temp sensor has open or short circuit		b7		Blinks for 22 times			
8	Module temp sensor has open or short circuit		P7			Blinks for 18times		
9	Outdoor ambient temp sensor has open or short circuit		F3		Blinks for 3 times			Blinks for 6 times
10	Outdoor inlet pipe temp sensor of condenser has open or circuit (for commercial use)		A5					
11	Outdoor middle pipe temp sensor of condenser has open or short circuit		F4		Blinks for 4 times			Blinks for 5 times
12	Outdoor outlet pipe of condenser has open or short circuit (for commercial use)		A7					
13	Outdoor discharge temp sensor has open or short circuit		F5		Blinks for 5 times			Blinks for 7 times
14	Communication malfunction of indoor and outdoor units		E6	Blinks for 6 times				
15	Malfunction of circuit for detecting phase current of compressor		U1			Blinks for 12 times		
16	Demagnetization protection of compressor		HE			Blinks for 14 times		
17	Malfunction of voltage drop of DC bus bar		U3			Blinks for 20 times		
18	Module temperature protection		P8			Blinks for 19 times	Blinks for 10 times	
19	Lack of refrigerant or block protection for the system (not applicable to residential air conditioner)		F0		Blinks for 10 times			Blinks for 9 times
20	Malfunction of charging for capacitor		PU			Blinks for 17 times		
21	High pressure protection for the system		E1	Blinks once				
22	Low pressure protection for the system （reserved）		E3	Blinks for 3 times				
23	Lock of compressor (for commercial air conditioner)		LE	/	/	/		
24	Reset of drive module (for commercial air conditioner)		P0	/	/	/		
25	Overspeed (for commercial air conditioner)		LF	/	/	/		
26	Malfunction of		PF	/	/	/		
27	AC contactor protection (for commercial air conditioner)		P9	/	/	/		
28	Temperature drift protection(for commercial air conditioner)		PE	/	/			
29	Sensor connection protection (for commercial air conditioner)		Pd	/	/	/		
30	Communication malfunction for drive board(for commercial air conditioner)		P6	Blinks for 16 times				
31	Thermal overload protection for compressor		H3			Blinks for 3 times	Blinks for 8 times	
32	Non-match between indoor and outdoor units		LP				Blinks for 16 times	
33	Malfunction of memory chip		EE			Blinks for 15 times		

34	Wrong connection of communication wire or malfunction of expansion valve (free match)		dn	/	/	/		
35	Malfunction of current detection for the complete unit		U5		Blinks for 13 imes			
36	Wrong connection of communication wire or status of detecting malfunction of expansion valve (free match)		dd	/	/	/		
37	Mode conflict		E7	Blinks for 7 times				
38	Refrigerant reclaiming mode		Fo	Blinks once	Blinks once			
39	Oil return under defrosting or heating		H1			Blinks once	Blinks twice	
40	Nominal cooling or heating (capacity test code)		P1	/	/	/		
41	Max. cooling or heating (capacity test code)		P2	/	/	/		
42	Middle cooling or heating(capacity test code)		P3	/	/	/		
43	Min. cooling or heating(capacity test code)		P0	/	/			
44	Failure of startup of compressor		Lc			Blinks for 11 times		
45	High discharge temperature protection of compressor		E4	Blinks for 4 times			Blinks for 7 times	
46	Overload protection		E8	Blinks for 8 times			Blinks for 6 times	
47	Overcurrent protection for the complete unit		E5	Blinks for 5 times			Blinks for 5 times	
48	Overcurrent protection for the complete unit		P5			Blinks for 15 times		
49	Desynchronizing of compressor		H7			Blinks for 7 times		
50	Lack/reverse phase protection of		Ld	/	/	/		
51	Module current protection (IPM protection)		H5			Blinks for 5 times	Blinks for 4 times	
52	Overlow voltage protection for DC bus bar		PL			Blinks for 21 times	Blinks for 12 times	
53	Overhigh voltage protection for DC bus bar		PH		Blinks for 11 times		Blinks for 13 times	
54	PFC protection		HC			Blinks for 6 times	Blinks for 14 times	
55	Overhigh power protection (not for outdoor		L9	Blinks for 20 times			Blinks for 9 times	
56	Abnormal reversing of 4-way valve		U7		Blinks for 20 times			
57	Frequency limit/decrease for current protection of the complete unit		F8		Blinks for 8 times			Blinks once
58	Frequency limit/decrease for current protection of the module (phase current)	Display is controlled by remote control	En	/	/	/		
59	Frequency limit/decrease for high discharge temperature		F9		Blinks for 9 times			Blinks twice
60	Frequency limit/decrease for freeze protection		FH		Blinks twice	Blinks twice		Blinks for 4 times
61	Frequency limit/decrease for overload		F6		Blinks for 6 times			Blinks for 3 times
62	Frequency limit/decrease for module temperature protection		EU		Blinks for 6 times	Blinks for 6 times		Blinks for 11 times
63	Oil return in cooling		F7		Blinks for 7 times			
64	Cold air prevention		E9	Blinks for 9 times				
65	Freeze protection		E2	Blinks twice			Blinks for 3 times	
66	Reading malfunction of EEPROM						Blinks for 11 times	
67	Reaching temperature for turning on the unit							Blinks for 8 times
68	Frequency limit (power)							Blinks for 13times
69	Malfunction of outdoor fan							Blinks for 14 times

If malfunction occurs,corresponding code will display and the unit will resume normal until protection or malfunction disappears.



Analysis or processing of some of the malfunction display:

1. Compressor discharge protection

Possible reasons: shortage of refrigerant; blockage of air filter; poor ventilation or air flow short pass for condenser;the system has noncondensing gas (such as air, water etc.); blockage of capillary assy (including filter); leakage inside four-way valve causes incorrect operation; malfunction of compressor; malfunction of protection relay; malfunction of discharge sensor; outdoor temperature too high.

Processing method: refer to the malfunction analysis in the above section.

2. Low voltage overcurrent protection

Possible reason: Sudden drop of supply voltage.

3. Communication malfunction

Processing method: Check if communication signal cable is connected reliably.

4. Sensor open or short circuit

Processing method: Check whethers ensor is normal, connected with the corre sponding position on the controller and if damage of lead wire is found.

5. Compressor overload protection

Possible reasons: insufficient or too much refrigrant; blockage of capillary an dincrease of suction temp.; improper running of compressor, burning in or stuck of bearing, damage of discharge valve; malfunction of protector.

Processing method: adjust refrige rant amount; replace the capillary; replace the compressor; use univers al meter to check if the contactor of compress or is fine when it is not over heated, if not replace the protector.

6. System malfunction

Overload protection.When tube temperature(Check the temperature of outdoor heat exchanger when cooling and check the temperature of indoor heat exchanger when heating) is too high, protection will beactivated.

Possible reasons: Outdoor tempera ture is too high when cooling; insufficient outdoor air circulation; refrigerant flow malfunction.

Please refer to the malfunction analysis in the previous section for handling method .

7. IPM module protection

Processing method:Once the module malfunction happens,if it persists for a long time and can not be self-canceled, cut off the power and turn off the unit,and then re-energize the unit again after about 10 min.After repeating the procedure for sever times, if the malfunction still exists,replace the module.

(2)Models:18/24K:

NO.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit (Indicator has 3 kinds of display status and they will be displayed circularly every 5s.)				A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			□OFF ■Illuminated ☆ Blink					
			Operation Indicator	Cool Indicator	Heating Indicator	D5 (D40)	D6 (D41)	D16 (D42)	D30 (D43)		
1	High pressure protection of system	E1	OFF 3s and blink once			□	☆	☆	☆	During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops.	Possible reasons: 1. Refrigerant was superabundant; 2. Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.
2	Antifreezing protection	E2	OFF 3S and blink twice			■	□	■	□	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates.	1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty.
3	High discharge temperature protection of compressor	E4	OFF 3S and blink 4 times			■	□	■	☆	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	Please refer to the malfunction analysis (discharge protection, overload).
4	Overcurrent protection	E5	OFF 3S and blink 5 times			□	■	☆	□	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	1. Supply voltage is unstable; 2. Supply voltage is too low and load is too high; 3. Evaporator is dirty.
5	Communi-cation Malfunction	E6	OFF 3S and blink 6 times			□	□	□	☆	During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the corresponding malfunction analysis.
6	High temperature resistant protection	E8	OFF 3S and blink 8 times			■	□	■	■	During cooling operation: compressor will stop while indoor fan will operate. During heating operation, the complete unit stops.	Refer to the malfunction analysis (overload, high temperature resistant).
7	Internal motor (fan motor) do not operate	H6	OFF 3S and blink 11 times							Internal fan motor, external fan motor, compressor and electric heater stop operation,guide louver stops at present location.	1. Bad contact of DC motor feedback terminal. 2. Bad contact of DC motor control end. 3. Fan motor is stalling. 4. Motor malfunction. 5. Malfunction of mainboard rev detecting circuit.
8	Malfunction protection of jumper cap	C5	OFF 3S and blink 15 times							Wireless remote receiver and button are effective, but can not dispose the related command	1. No jumper cap insert on mainboard. 2. Incorrect insert of jumper cap. 3. Jumper cap damaged. 4. Abnormal detecting circuit of mainboard.
9	Indoor ambient temperature sensor is open/short circuited	F1		OFF 3S and blink once						During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.	1. Loosening or bad contact of indoor ambient temp. sensor and mainboard terminal. 2. Components in mainboard fell down leads short circuit. 3. Indoor ambient temp. sensor damaged.(check with sensor resistance value chart) 4. Mainboard damaged.
10	Overcurrent protection of phase current for compressor	P5		OFF 3S and blink 15 times		□	☆	□	□	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.

NO.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit (Indicator has 3 kinds of display status and they will be displayed circularly every 5s.)				A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			□OFF ■Illuminated ☆ Blink					
			Operation Indicator	Cool Indicator	Heating Indicator	D5 (D40)	D6 (D41)	D16 (D42)	D30 (D43)		
11	Indoor evaporator temperature sensor is open/short circuited	F2		OFF 3S and blink twice						AC stops operation once reaches the setting temperature. Cooling, drying: internal fan motor stops operation while other loads stop operation; heating: AC stop operation	1. Loosening or bad contact of Indoor evaporator temp. sensor and mainboard terminal. 2. Components on the mainboard fall down leads short circuit. 3. Indoor evaporator temp. sensor damaged.(check temp. sensor value chart for testing) 4. Mainboard damaged.
12	Outdoor ambient temperature sensor is open/short circuited	F3		OFF 3S and blink 3 times		□	□	☆	■	During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
13	Outdoor condenser temperature sensor is open/short circuited	F4		OFF 3S and blink 4 times		□	□	☆	□	During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
14	Outdoor discharge temperature sensor is open/short circuited	F5		OFF 3S and blink 5 times		□	□	☆	☆	During cooling and drying operation, compressor will sop after operating for about 3 mins, while indoor fan will operate; During heating operation, the complete unit will stop after operating for about 3 mins.	1.Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor) 2.The head of temperature sensor hasnt been inserted into the copper tube
15	Limit/ decrease frequency due to overload	F6		OFF 3S and blink for 6 times		■	□	☆	☆	All loads operate normally, while operation frequency for compressor is decreased	Refer to the malfunction analysis (overload, high temperature resistant)
16	Decrease frequency due to overcurrent	F8		OFF 3S and blink 8 times		■	■	□	■	All loads operate normally, while operation frequency for compressor is decreased	The input supply voltage is too low; System pressure is too high and overload
17	Decrease frequency due to high air discharge	F9		OFF 3S and blink 9 times		■	■	□	□	All loads operate normally, while operation frequency for compressor is decreased	Overload or temperature is too high; Refrigerant is insufficient; Malfunction of electric expansion valve (EKV)
18	Voltage for DC bus-bar is too high	PH		OFF 3S and blink 11 times		□	■	□	☆	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 265VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
19	Malfunction of complete units current detection	U5		OFF 3S and blink 13 times		□	■	☆	■	During cooling and drying operation, the compressor will stop while indoor fan will operate; During heating operating, the complete unit will stop operation.	Theres circuit malfunction on outdoor units control panel AP1, please replace the outdoor units control panel AP1.

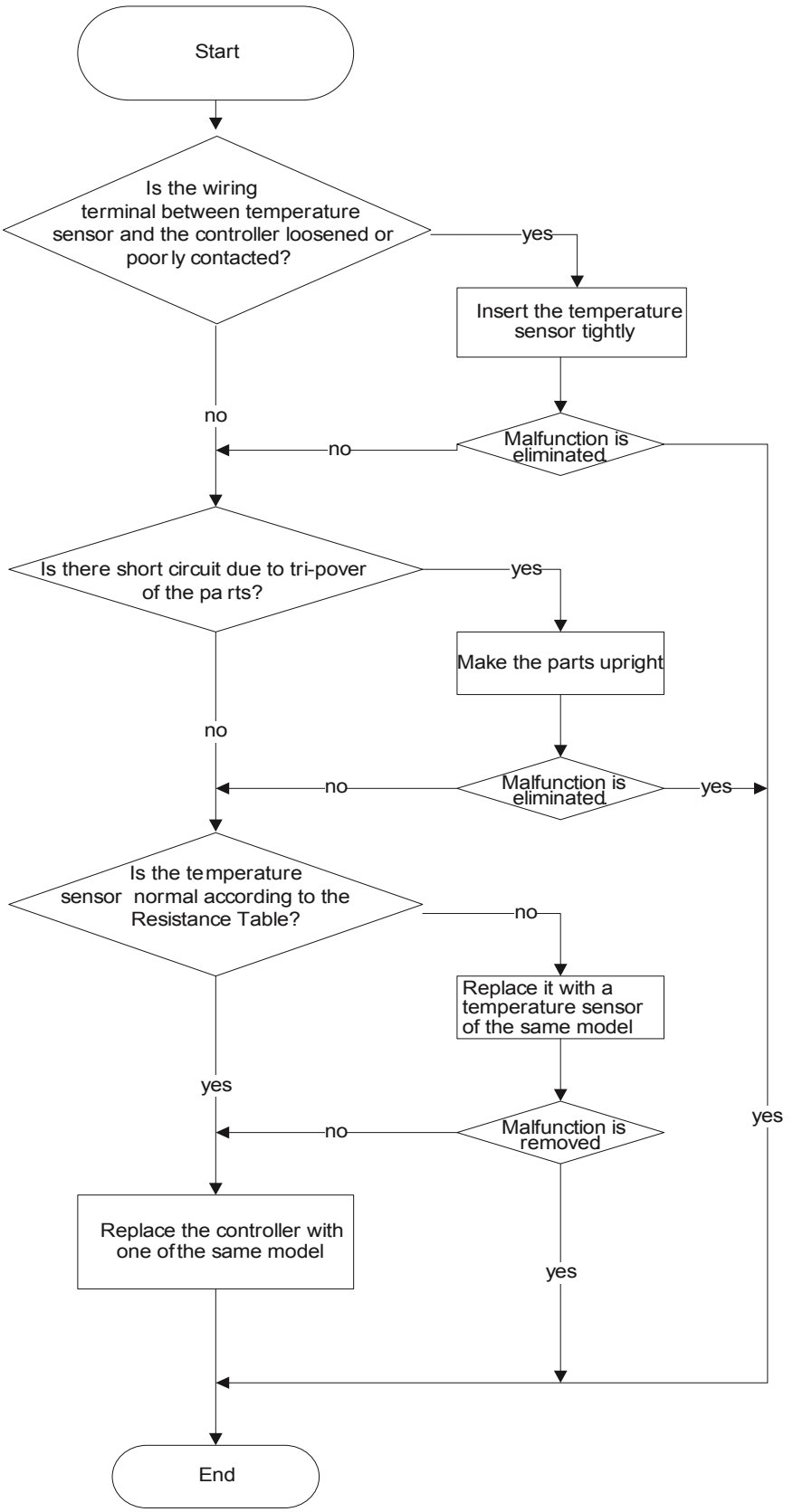
NO.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit (Indicator has 3 kinds of display status and they will be displayed circularly every 5s.)				A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			□OFF ■Illuminated ☆ Blink					
			Operation Indicator	Cool Indicator	Heating Indicator	D5 (D40)	D6 (D41)	D16 (D42)	D30 (D43)		
20	Defrosting	H1			OFF 3S and blink once					Defrosting will occur in heating mode. Compressor will operate while indoor fan will stop operation.	Its the normal state
21	Static dedusting protection	H2			OFF 3S and blink twice						/
22	Overload protection for compressor	H3			OFF 3S and blink 3 times	□	☆	☆	□	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Wiring terminal OVC-COMP is loosened. In normal state, the resistance for this terminal should be less than 1ohm. 2.Refer to the malfunction analysis (discharge protection, overload)
23	System is abnormal	H4			OFF 3S and blink 4 times	■	□	■	■	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (overload, high temperature resistant)
24	IPM protection	H5			OFF 3S and blink 5 times	□	☆	□	■	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
25	PFC protection	HC			OFF 3S and blink 6 times	□	■	☆	☆	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
26	Desynchron-izing of compressor	H7			OFF 3S and blink 7 times	□	☆	■	☆	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
27	Decrease frequency due to high temperature resistant during heating operation	H0			OFF 3S and blink 10 times	■	□	☆	☆	All loads operate normally, while operation frequency for compressor is decreased	Refer to the malfunction analysis (overload, high temperature resistant)
28	Failure start-up	LC			OFF 3S and blink 11 times	□	☆	□	☆	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
29	Malfunction of phase current detection circuit for compressor	U1			OFF 3S and blink 13 times	□	☆	■	□	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1

NO.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit (Indicator has 3 kinds of display status and they will be displayed circularly every 5s.)				A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			□OFF ■Illuminated ☆ Blink					
			Operation Indicator	Cool Indicator	Heating Indicator	D5 (D40)	D6 (D41)	D16 (D42)	D30 (D43)		
30	EEPROM malfunction	EE			OFF 3S and blink 15 times	□	□	□	■	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
31	Charging malfunction of capacitor	PU			OFF 3S and blink 17 times	□	■	□	■	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Refer to the part three—charging malfunction analysis of capacitor
32	Malfunction of module temperature sensor circuit	P7			OFF 3S and blink 18 times	□	□	■	☆	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
33	Module high temperature protection	P8			OFF 3S and blink 19 times	■	□	☆	■	During cooling operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	After the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
34	Malfunction of voltage dropping for DC bus-bar	U3			OFF 3S and blink 20 times	□	■	■	■	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Supply voltage is unstable
35	Voltage of DC bus-bar is too low	PL			OFF 3S and blink 21 times	□	■	■	□	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 150VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
36	Limit/ decrease frequency due to high temperature of module	EU				■	■	■	☆	All loads operate normally, while operation frequency for compressor is decreased	Discharging after the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
37	The four-way valve is abnormal	U7				■	□	☆	□	If this malfunction occurs during heating operation, the complete unit will stop operation.	1.Supply voltage is lower than AC175V; 2.Wiring terminal 4V is loosened or broken; 3.4V is damaged, please replace 4V.
38	Zero-crossing malfunction of outdoor unit	U9				■	■	☆	□	During cooling operation, compressor will stop while indoor fan will operate; during heating,the complete unit will stop operation.	Replace outdoor control panel AP1
39	Limit/ decrease frequency due to antifreezing	FH				■	■	■	□	All loads operate normally, while operation frequency for compressor is decreased	Poor air-return in indoor unit or fan speed is too low

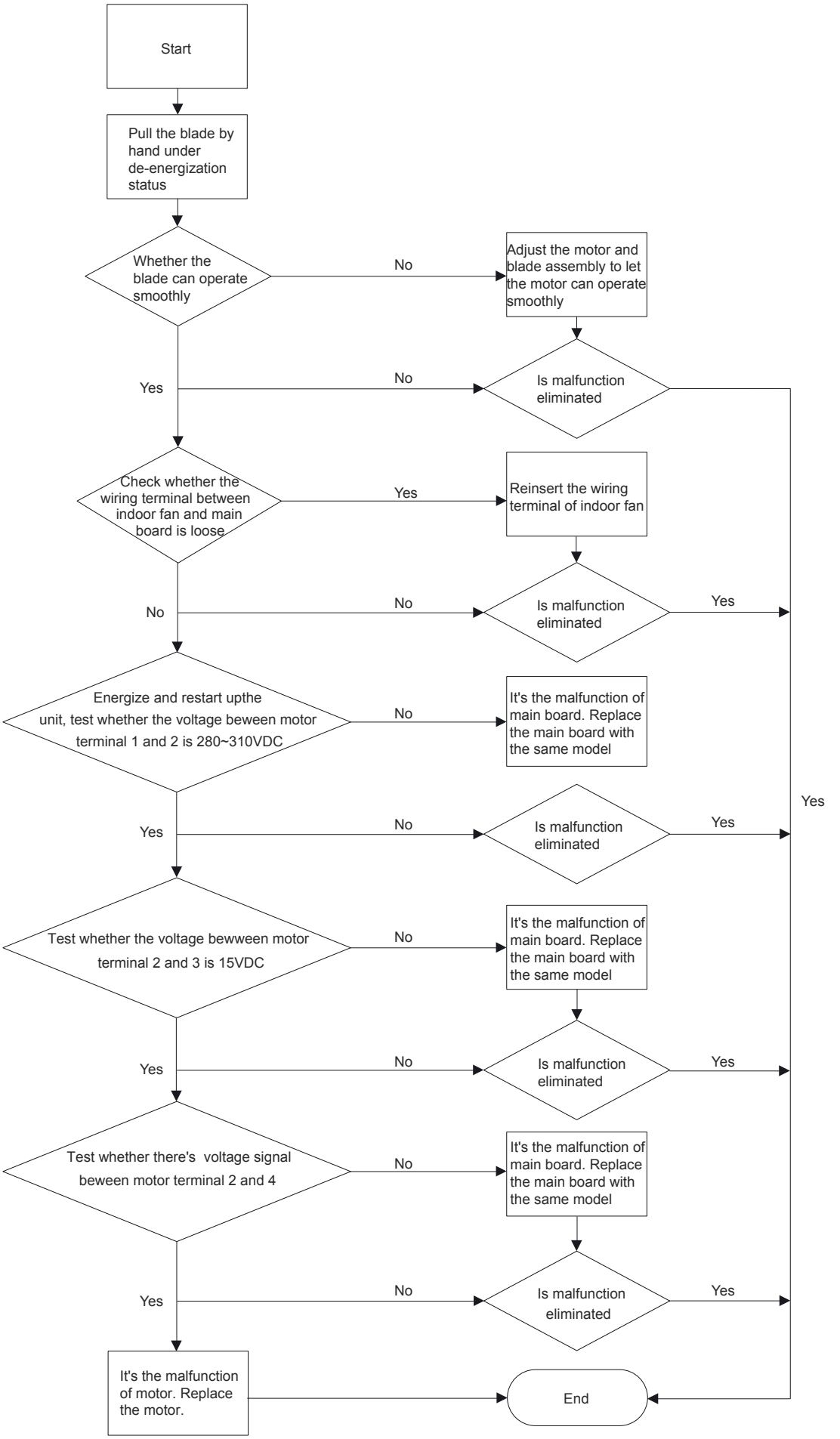
7.4 Checking the Main Parts

Indoor unit:

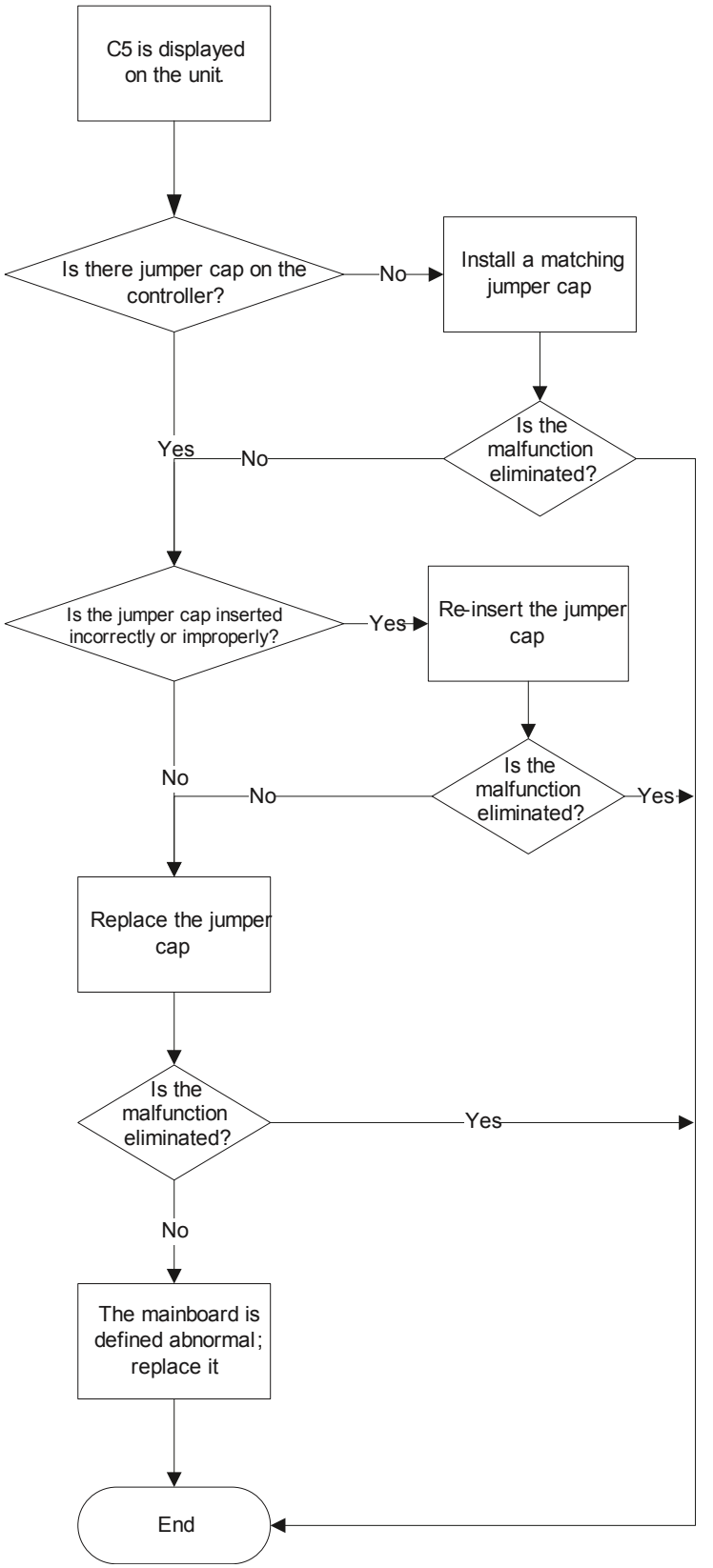
(1)Temperature sensor malfunction



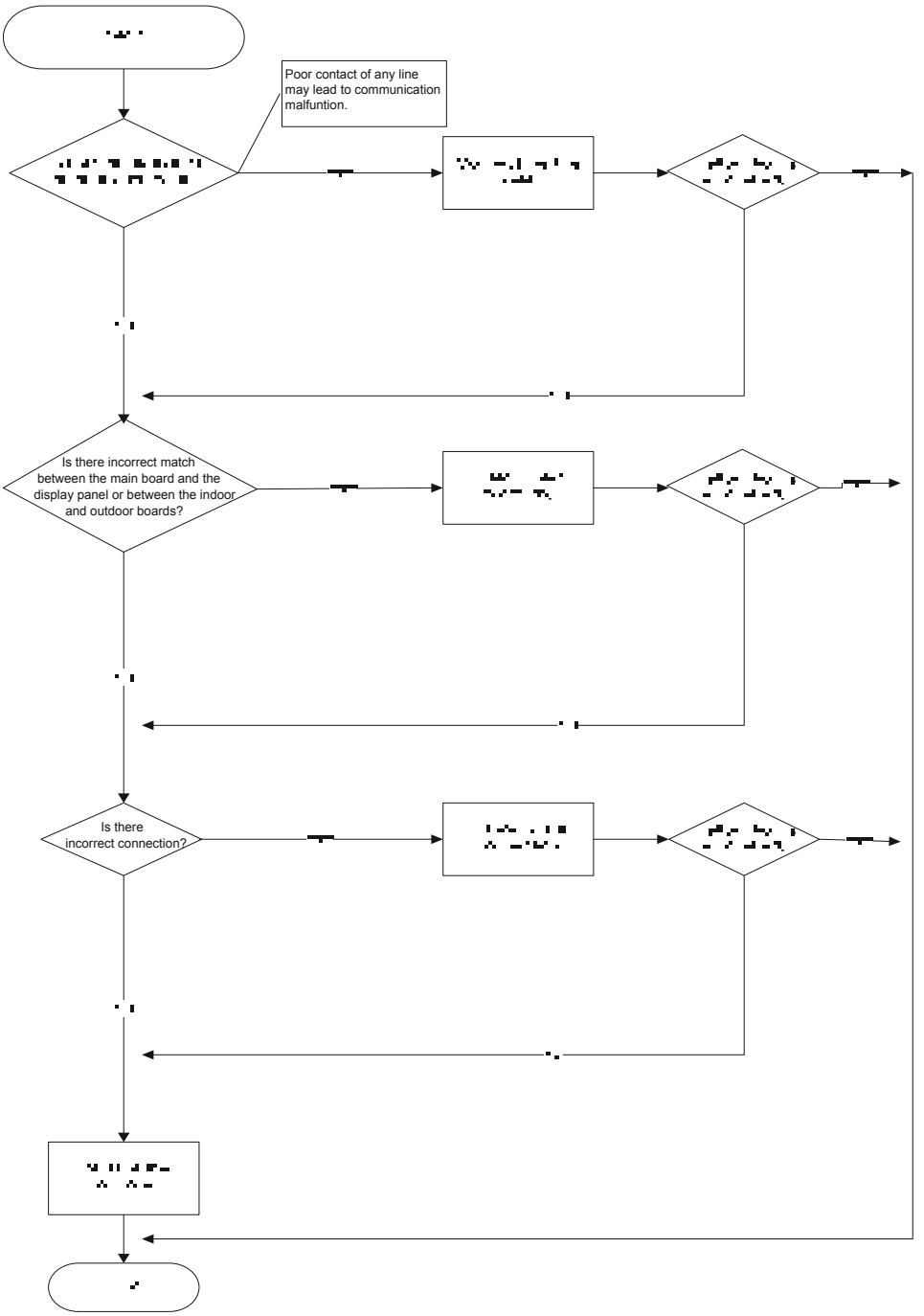
(2)Indoor fan does not operate (H6)



(3)Jumper cap malfunction (C5)



(4) Communication malfunction (E6)



Note:

1.Before replacing mainboard of indoor unit, make sure the correct replacement is on hand. The following tests should be done:

a.Check if protective tube FUSE 1 has open circuit. If so, replace it with a protective tube of the same model.

b.Energize the unit and check buzzer sounds. If not, the mainboard of indoor unit can't be used.

c.Energize the unit with display and check if all icons are displayed after energization and if the display is normal. If not, the main board can't be used.

2.The mainboard for replacement shall has the same model with the original mainboard, so do the jumper cap.

3.The wiring and assembly methods shall also be the same with that of the original mainboard when replacing the mainboard.

Outdoor unit:

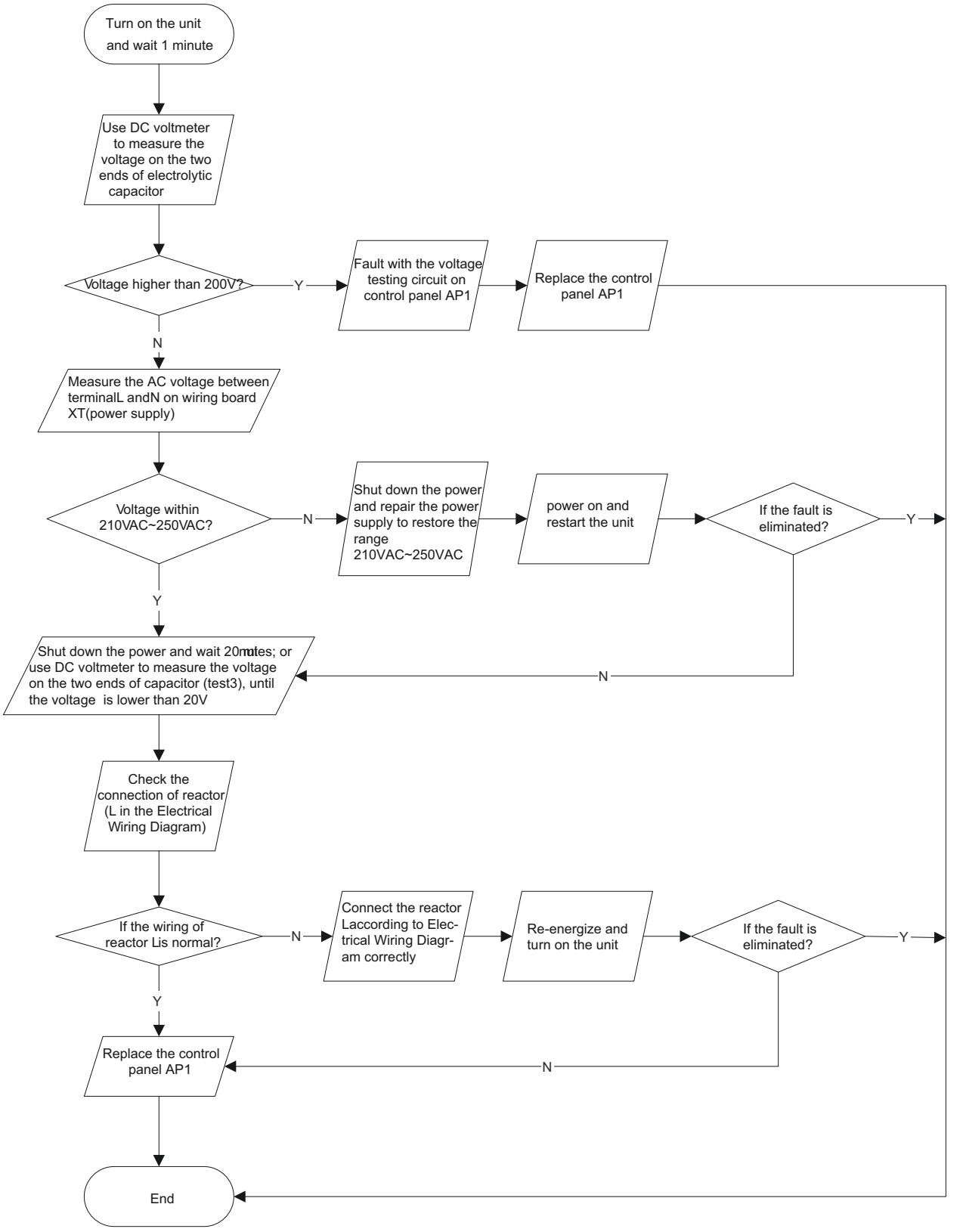
(1) Capacity charging malfunction (outdoor unit malfunction) (AP1 below is control board of outdoor unit)

Main detection point:

● Detect if the voltage of L and N terminal of wiring board is between 210AC-240AC by alternating voltage meter;

● Is reactor (L) well connected? Is connection wire loosened or pull-out? Is reactor (L) damaged?

Malfunction diagnosis process:



(2) IPM protection, desynchronizing malfunction, phase current of compressor is overcurrent (AP1 below is control board of outdoor unit)

Main detection point:

If control board AP1 and compressor COMP is well connected? If they are loosened? If the connection sequence is correct?

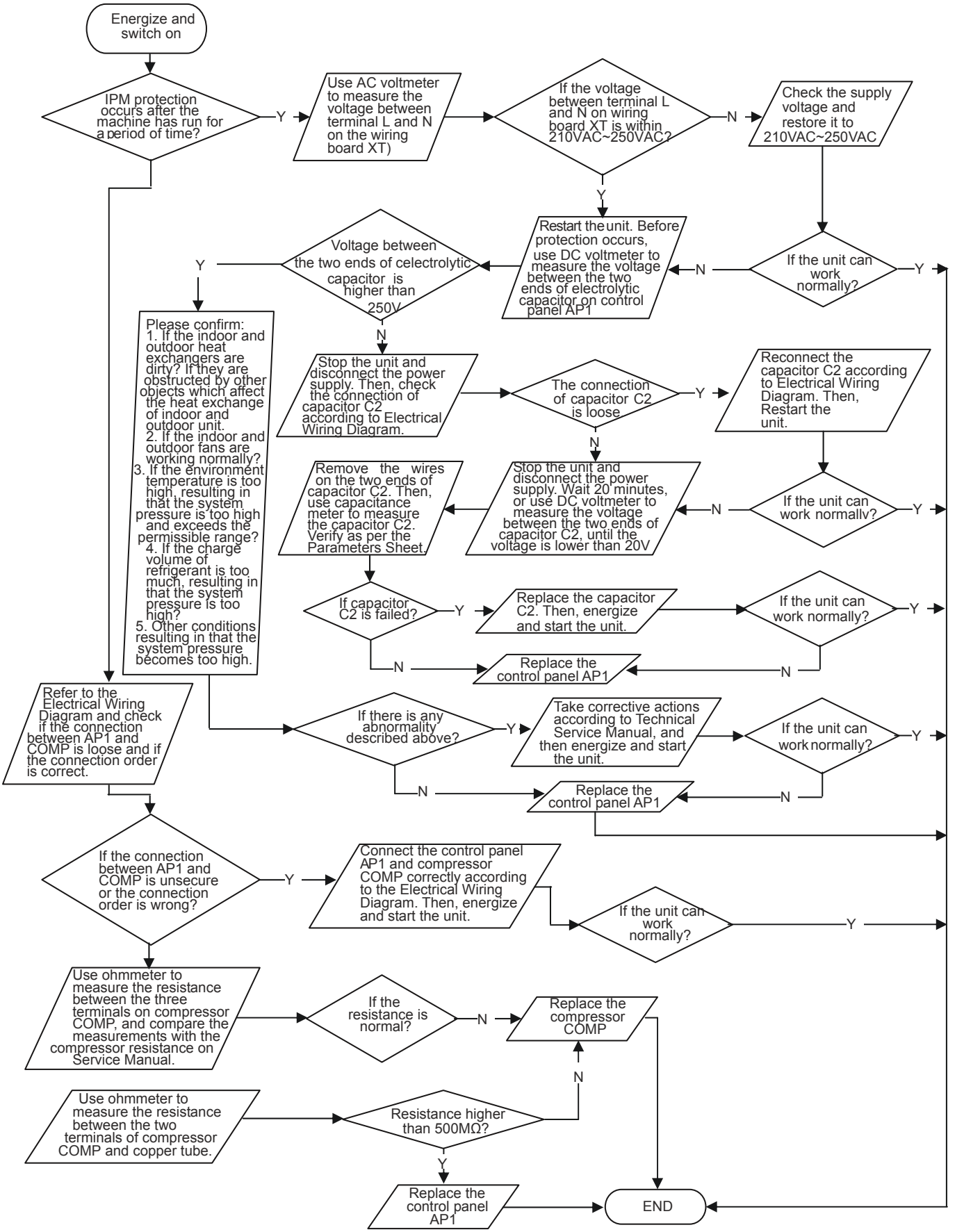
Is voltage input in the normal range (Test the voltage between L, N of wiring board XT by DC voltage meter)?

If coil resistance of compressor is normal? Is compressor coil insulating to copper pipe well?

If the work load of unit is heavy? If radiating of unit is well?

If the refrigerant charging is appropriate?

Malfunction diagnosis process:

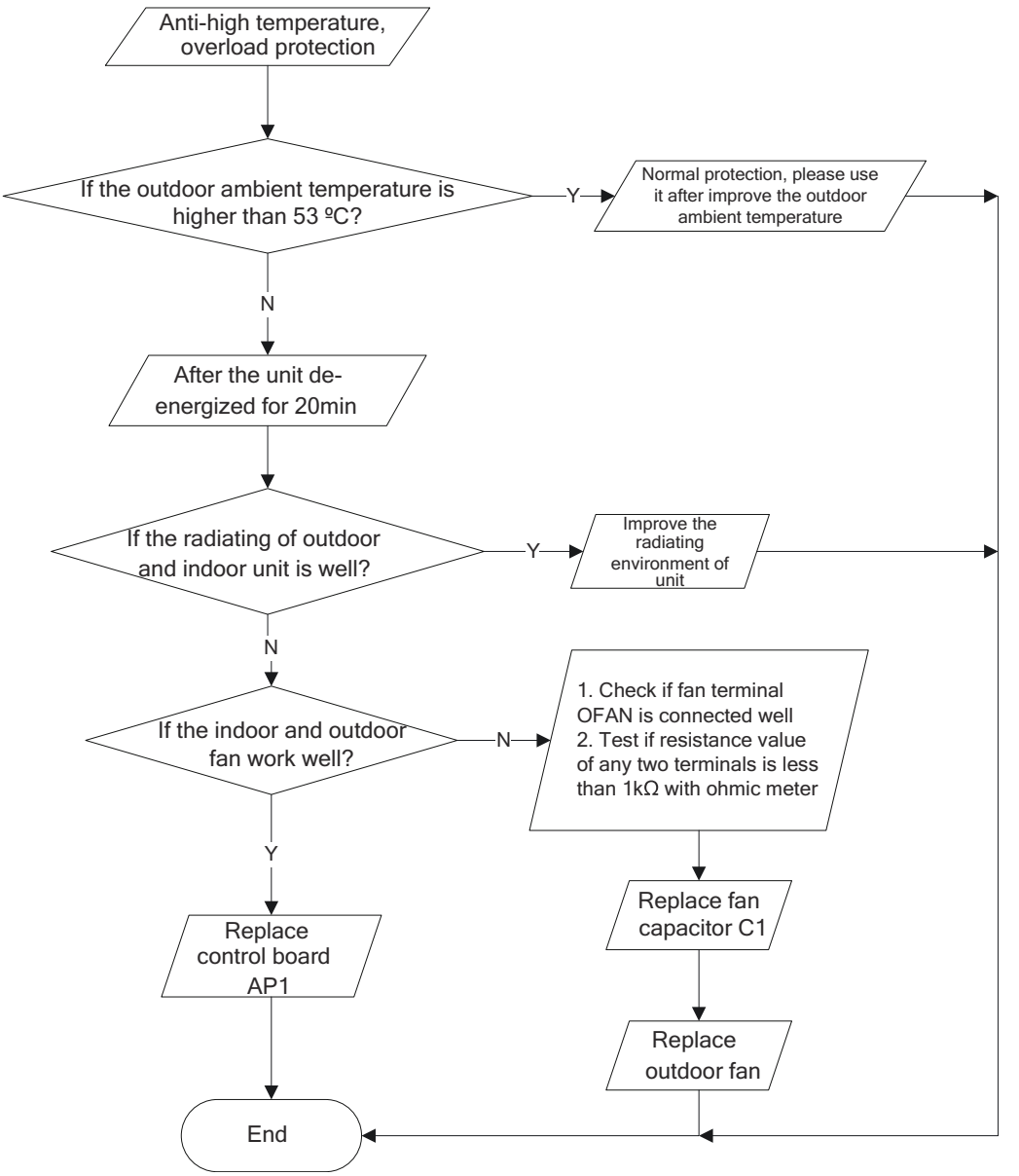

Energize and switch on
IPM protection occurs after the machine has run for a period of time?
Y
Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
If the voltage between terminal L and N on wiring board XT is within 210VAC~250VAC?
N
Check the supply voltage and restore it to 210VAC~250VAC
Y
Restart the unit. Before protection occurs, use DC voltmeter to measure the voltage between the two ends of electrolytic capacitor on control panel AP1
N
If the unit can work normally?
Y
Voltage between the two ends of celectrolytic capacitor is higher than 250V
Y
N
Please confirm:
1. If the indoor and outdoor heat exchangers are dirty? If they are obstructed by other objects which affect the heat exchange of indoor and outdoor unit.
2. If the indoor and outdoor fans are working normally?
3. If the environment temperature is too high, resulting in that the system pressure is too high and exceeds the permissible range?
4. If the charge volume of refrigerant is too much, resulting in that the system pressure is too high?
5. Other conditions resulting in that the system pressure becomes too high.
Stop the unit and disconnect the power supply. Then, check the connection of capacitor C2 according to Electrical Wiring Diagram.
The connection of capacitor C2 is loose
Y
Reconnect the capacitor C2 according to Electrical Wiring Diagram. Then, Restart the unit.
N
Remove the wires on the two ends of capacitor C2. Then, use capacitance meter to measure the capacitor C2. Verify as per the Parameters Sheet.
Stop the unit and disconnect the power supply. Wait 20 minutes, or use DC voltmeter to measure the voltage between the two ends of capacitor C2, until the voltage is lower than 20V
N
If the unit can work normallv?
Y
If capacitor C2 is failed?
Y
Replace the capacitor C2. Then, energize and start the unit.
If the unit can work normally?
Y
N
Replace the control panel AP1
N
Refer to the Electrical Wiring Diagram and check if the connection between AP1 and COMP is loose and if the connection order is correct.
If there is any abnormality described above?
Y
Take corrective actions according to Technical Service Manual, and then energize and start the unit.
If the unit can work normally?
Y
N
Replace the control panel AP1
N
If the connection between AP1 and COMP is unsecure or the connection order is wrong?
Y
Connect the control panel AP1 and compressor COMP correctly according to the Electrical Wiring Diagram. Then, energize and start the unit.
If the unit can work normally?
Y
Use ohmmeter to measure the resistance between the three terminals on compressor COMP, and compare the measurements with the compressor resistance on Service Manual.
If the resistance is normal?
N
Replace the compressor COMP
N
Use ohmmeter to measure the resistance between the two terminals of compressor COMP and copper tube.
Resistance higher than 500MΩ?
Y
Replace the control panel AP1
END

(3) Diagnosis for anti-high temperature, overload protection (AP1 below is control board of outdoor unit)

Main detection point:

- If the outdoor ambient temperature is in normal range;
- If the indoor and outdoor fan is running normal;
- If the radiating environment of indoor and outdoor unit is well.

Malfunction diagnosis process:

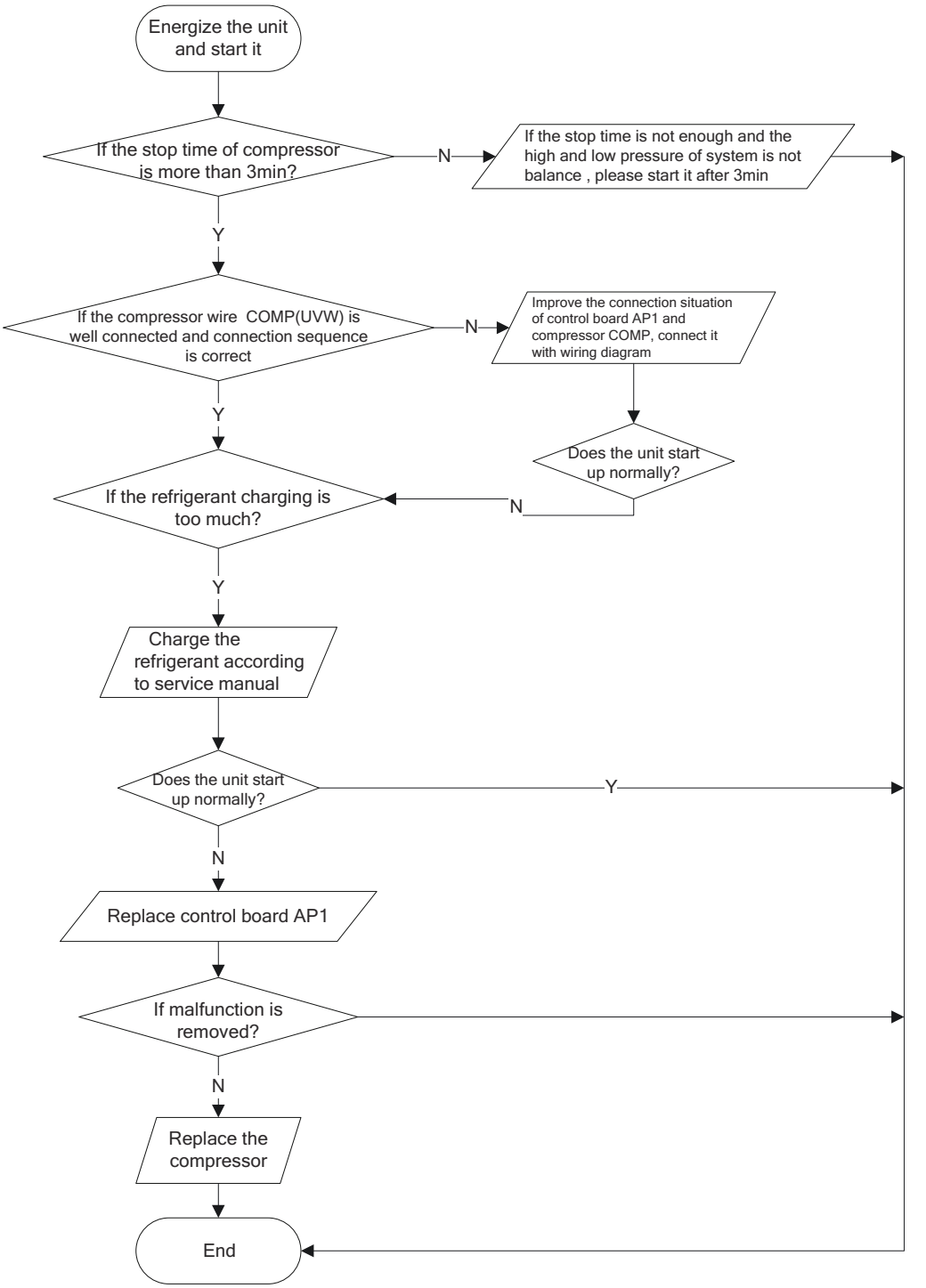


(4) Diagnosis for failure start up malfunction (AP1 below is control board of outdoor unit)

Main detection point:

- If the compressor wiring is correct?
- If the stop time of compressor is enough?
- If the compressor is damaged?
- If the refrigerant charging is too much?

Malfunction diagnosis process:

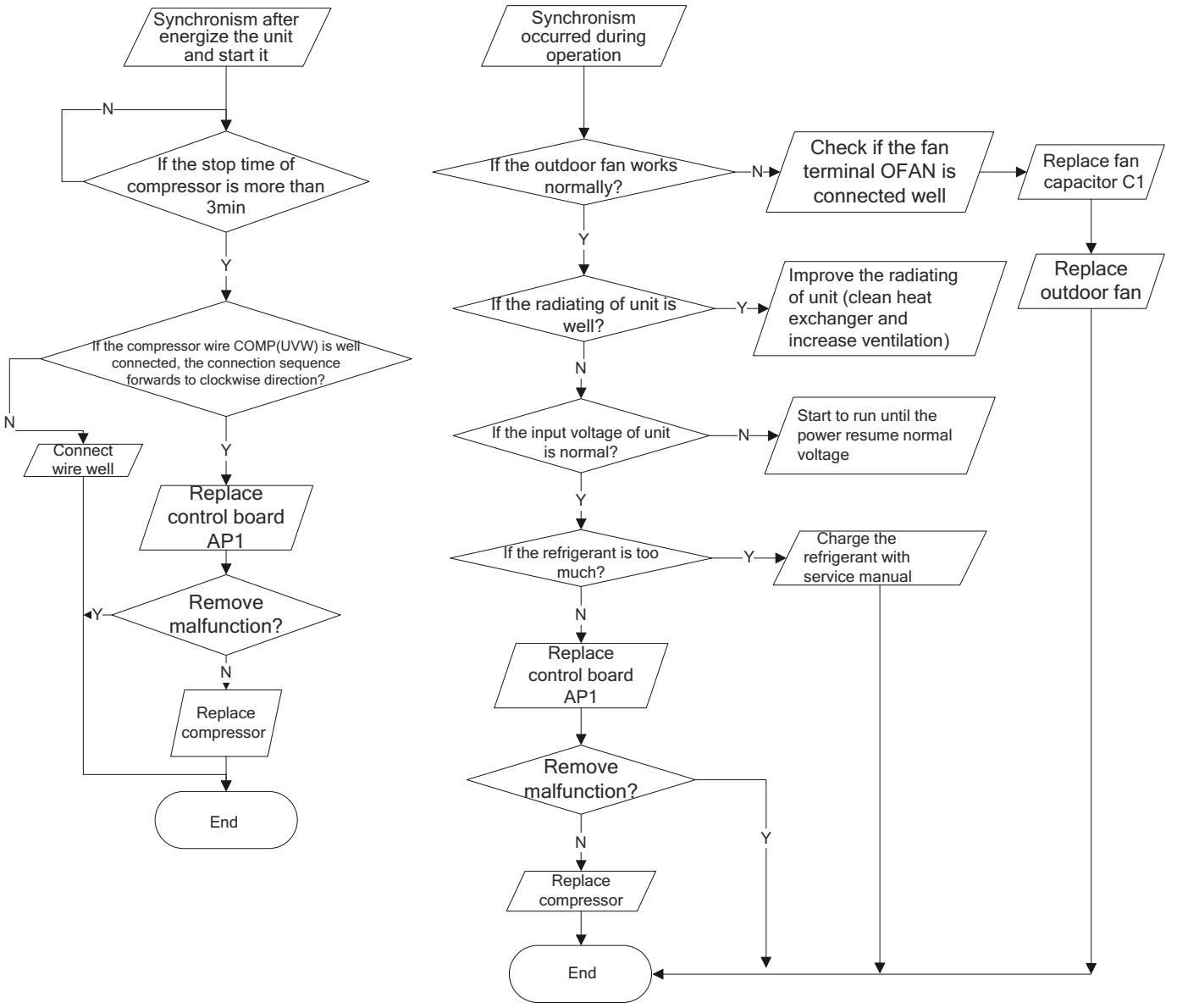


(5) Diagnosis for compressor synchronism (AP1 below is control board of outdoor unit)

Main detection point:

- If the system pressure is over-high?
- If the work voltage is over-low?

Malfunction diagnosis process:

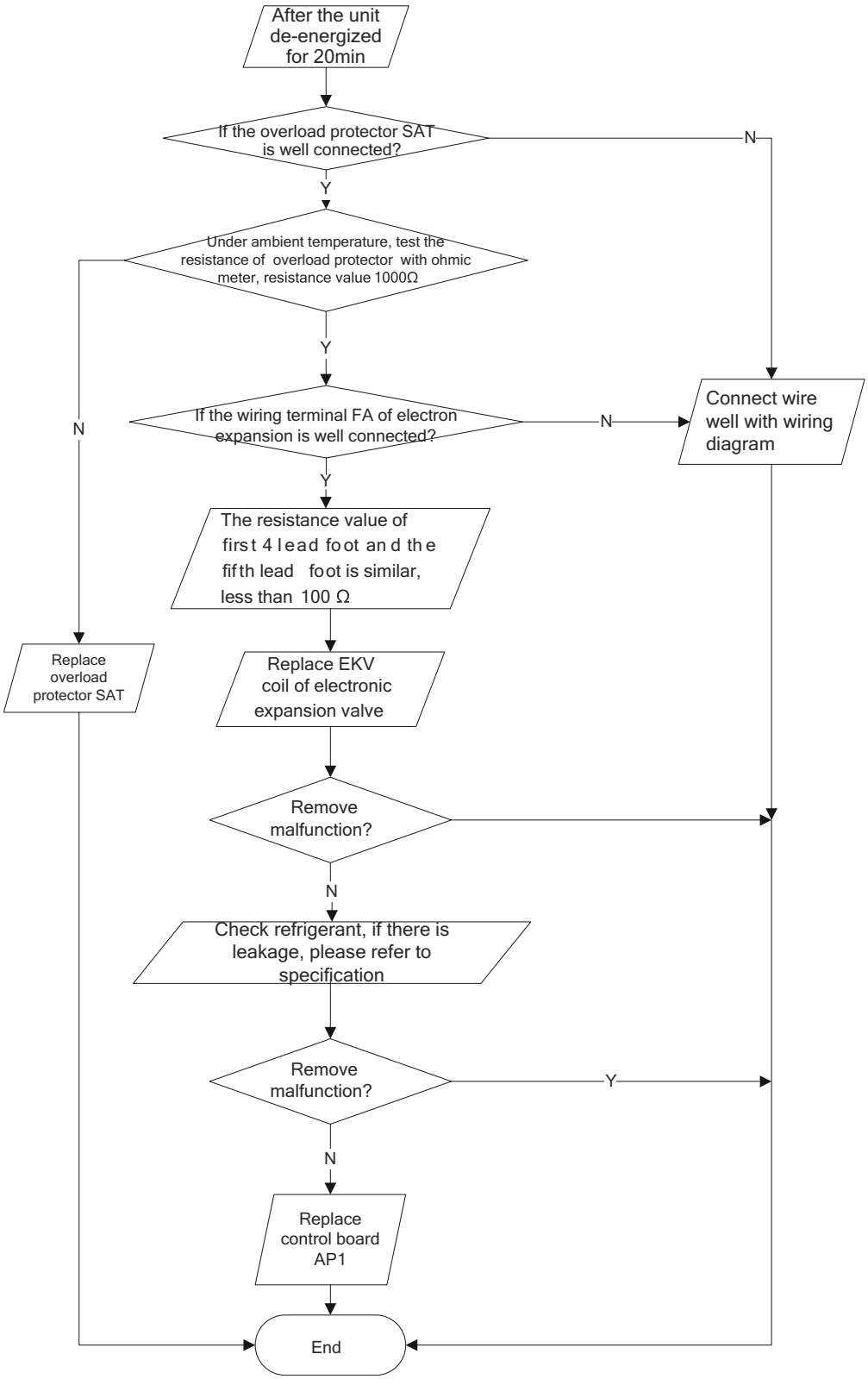


(6) Diagnosis for overload and discharge malfunction (AP1 below is control board of outdoor unit)

Main detection point:

- If the electron expansion valve is connected well? Is the expansion valve damaged?
- If the refrigerant is leakage?
- If the overload protector is damaged?

Malfunction diagnosis process:

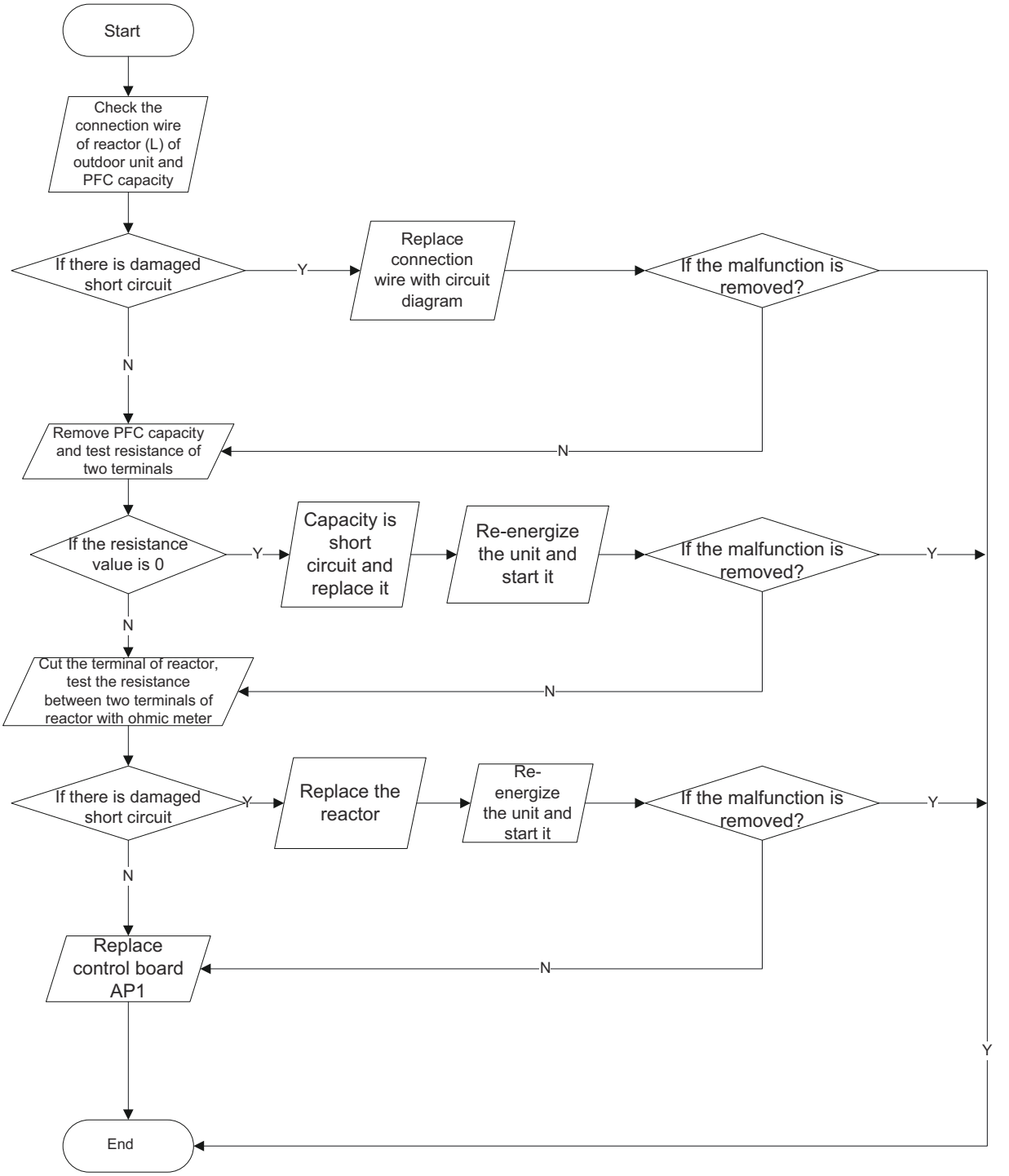


(7) PFC (correction for power factor) malfunction (outdoor unit malfunction) (AP1 below is control board of outdoor unit)

Main detection point:

● Check if reactor (L) of outdoor unit and PFC capacity are damaged.

Malfunction diagnosis process:



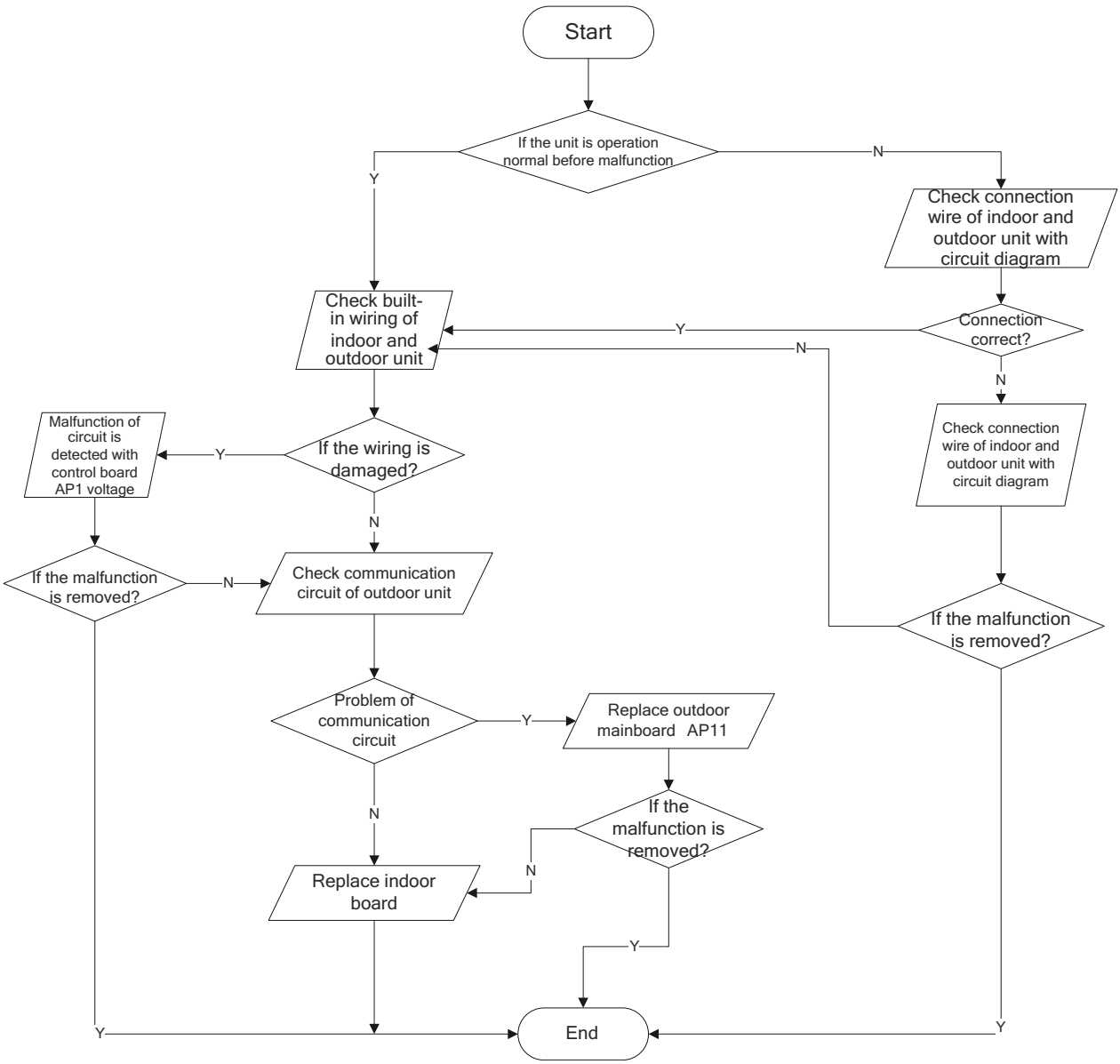
(8) Communication malfunction (AP1 below is control board of outdoor unit)

Main detection point:

● Check if the connection wire and the built-in wiring of indoor and outdoor unit is connected well and no damaged;

● If the communication circuit of indoor mainboard is damaged? If the communication circuit of outdoor mainboard (AP1) is damaged

Malfunction diagnosis process:



7.5 Troubleshooting for Normal Malfunction

1. Air Conditioner can't Be Started Up

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
No power supply, or poor connection for power plug	After energization, operation indicator isn't bright and the buzzer can't give out sound	Confirm whether it's due to power failure. If yes, wait for power recovery. If not, check power supply circuit and make sure the power plug is connected well.
Wrong wire connection between indoor unit and outdoor unit, or poor connection for wiring terminals	Under normal power supply circumstances, operation indicator isn't bright after energization	Check the circuit according to circuit diagram and connect wires correctly. Make sure all wiring terminals are connected firmly
Electric leakage for air conditioner	After energization, room circuit breaker trips off at once	Make sure the air conditioner is grounded reliably Make sure wires of air conditioner is connected correctly Check the wiring inside air conditioner. Check whether the insulation layer of power cord is damaged; if yes, place the power cord.
Model selection for air switch is improper	After energization, air switch trips off	Select proper air switch
Malfunction of remote controller	After energization, operation indicator is bright, while no display on remote controller or buttons have no action.	Replace batteries for remote controller Repair or replace remote controller

2. Poor Cooling (heating) for Air Conditioner

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
Set temperature is improper	Observe the set temperature on remote controller	Adjust the set temperature
Rotation speed of the IDU fan motor is set too low	Small wind blow	Set the fan speed at high or medium
Filter of indoor unit is blocked	Check the filter to see it's blocked	Clean the filter
Installation position for indoor unit and outdoor unit is improper	Check whether the installation postion is proper according to installation requirement for air conditioner	Adjust the installation position, and install the rainproofing and sunproofing for outdoor unit
Refrigerant is leaking	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unit's pressure is much lower than regulated range	Find out the leakage causes and deal with it. Add refrigerant.
Malfunction of 4-way valve	Blow cold wind during heating	Replace the 4-way valve
Malfunction of capillary	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unit't pressure is much lower than regulated range. If refrigerant isn't leaking, part of capillary is blocked	Replace the capillary
Flow volume of valve is insufficient	The pressure of valves is much lower than that stated in the specification	Open the valve completely
Malfunction of horizontal louver	Horizontal louver can't swing	Refer to point 3 of maintenance methods for details
Malfunction of the IDU fan motor	The IDU fan motor can't operate	Refer to troubleshooting for H6 for maintenance method in details
Malfunction of the ODU fan motor	The ODU fan motor can't operate	Refer to point 4 of maintenance methods for details
Malfunction of compressor	Compressor can't operate	Refer to point 5 of maintenance methods for details

3. Horizontal louver can't Swing

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Stepping motor is damaged	Stepping motor can't operate	Repair or replace stepping motor
Main board is damaged	Others are all normal, while horizontal louver can't operate	Replace the main board with the same model

4. ODU Fan Motor can't Operate

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Capacity of the ODU fan motor is damaged	Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor.	Replace the capacity of fan
Power voltage is a little low or high	Use universal meter to measure the power supply voltage. The voltage is a little high or low	Suggest to equip with voltage regulator
Motor of outdoor unit is damaged	When unit is on, cooling/heating performance is bad and ODU compressor generates a lot of noise and heat.	Change compressor oil and refrigerant. If no better, replace the compressor with a new one

5. Compressor can't Operate

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Capacity of compressor is damaged	Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor.	Replace the compressor capacitor
Power voltage is a little low or high	Use universal meter to measure the power supply voltage. The voltage is a little high or low	Suggest to equip with voltage regulator
Coil of compressor is burnt out	Use universal meter to measure the resistance between compressor terminals and it's 0	Repair or replace compressor
Cylinder of compressor is blocked	Compressor can't operate	Repair or replace compressor

6. Air Conditioner is leaking

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Drain pipe is blocked	Water leaking from indoor unit	Eliminate the foreign objects inside the drain pipe
Drain pipe is broken	Water leaking from drain pipe	Replace drain pipe
Wrapping is not tight	Water leaking from the pipe connection place of indoor unit	Wrap it again and bundle it tightly

7. Abnormal Sound and Vibration

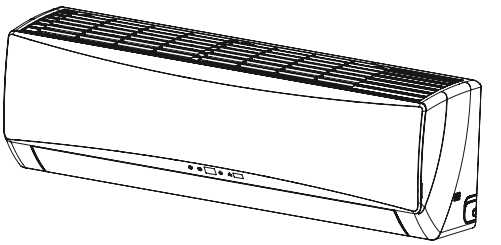
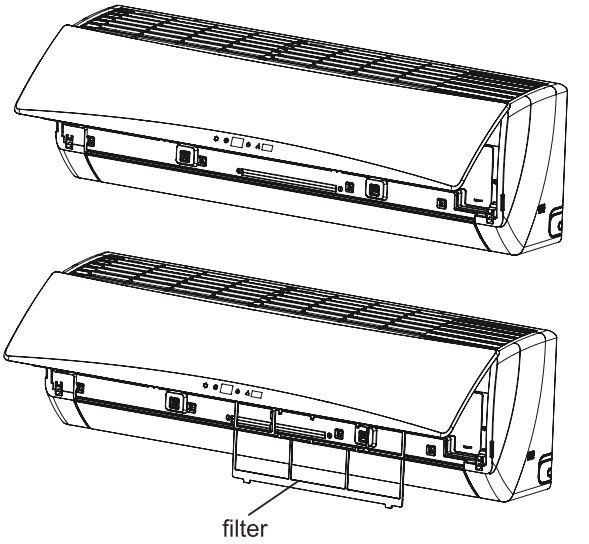
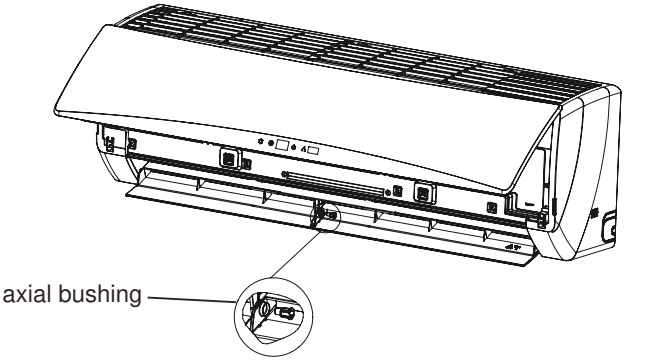
Possible causes	Discriminating method (air conditioner status)	Troubleshooting
When turn on or turn off the unit, the panel and other parts will expand and there's abnormal sound	There's the sound of "PAPA"	Normal phenomenon. Abnormal sound will disappear after a few minutes.
When turn on or turn off the unit, there's abnormal sound due to flow of refrigerant inside air conditioner	Water-running sound can be heard	Normal phenomenon. Abnormal sound will disappear after a few minutes.
Foreign objects inside the indoor unit or there're parts touching together inside the indoor unit	There's abnormal sound fro indoor unit	Remove foreign objects. Adjust all parts' position of indoor unit, tighten screws and stick damping plaster between connected parts
Foreign objects inside the outdoor unit or there're parts touching together inside the outdoor unit	There's abnormal sound fro outdoor unit	Remove foreign objects. Adjust all parts' position of outdoor unit, tighten screws and stick damping plaster between connected parts
Short circuit inside the magnetic coil	During heating, the way valve has abnormal electromagnetic sound	Replace magnetic coil
Abnormal shake of compressor	Outdoor unit gives out abnormal sound	Adjust the support foot mat of compressor, tighten the bolts
Abnormal sound inside the compressor	Abnormal sound inside the compressor	If add too much refrigerant during maintenance, please reduce refrigerant properly. Replace compressor for other circumstances.

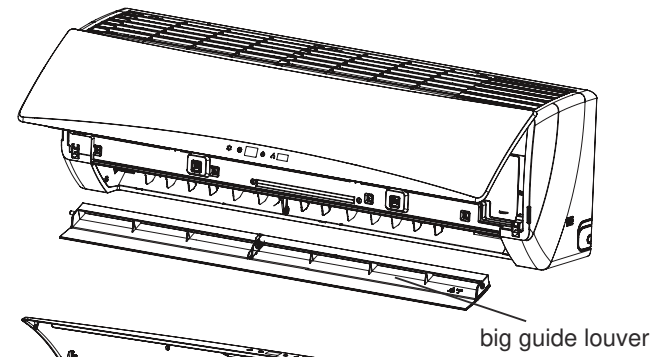
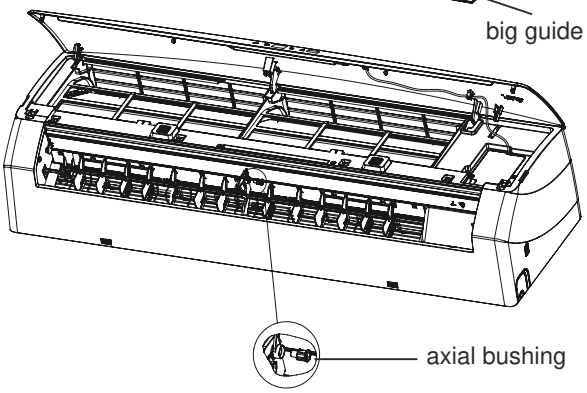
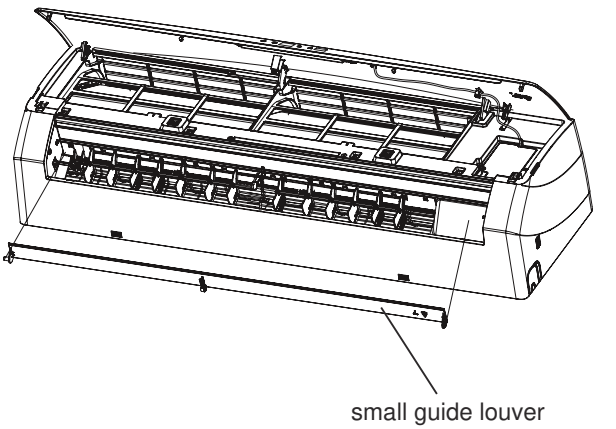
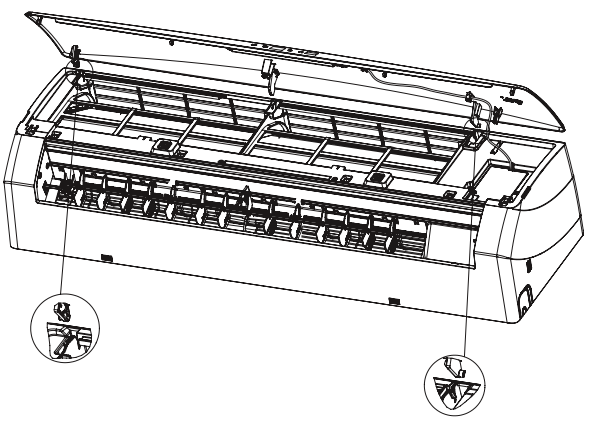
8. Removal Procedures

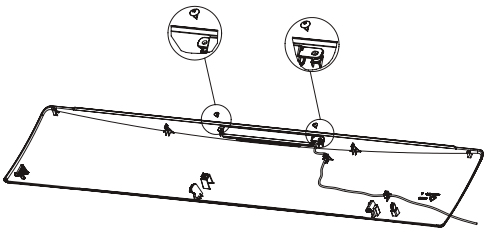
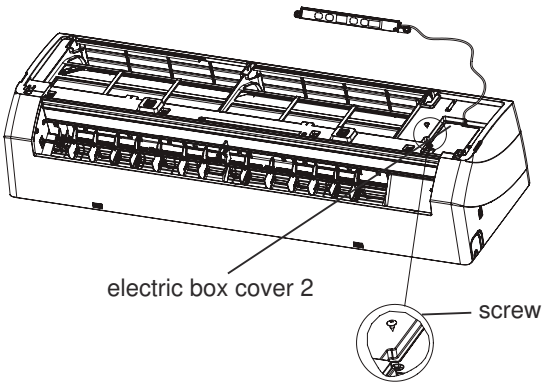
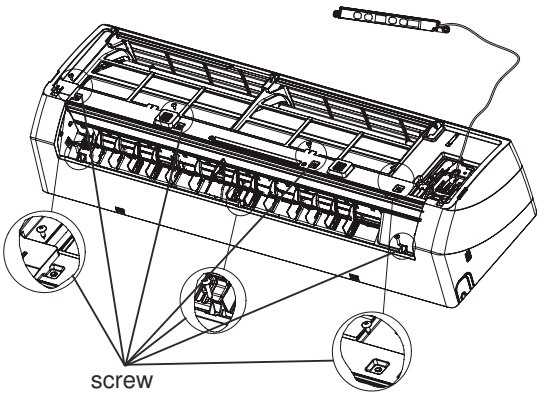
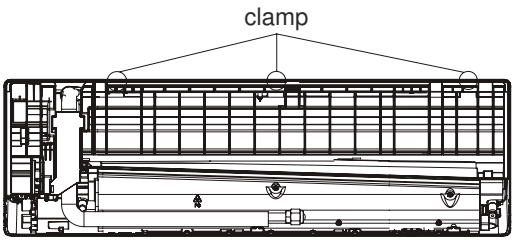
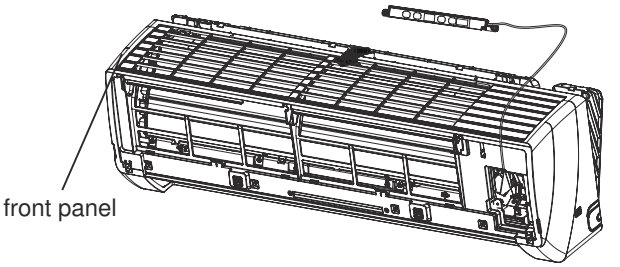
Warning: Be sure to wait for a minimum of 20 minutes after turning off all power supplies and discharge the refrigerant completely before removal.

8.1 Removal Procedures for Indoor Unit

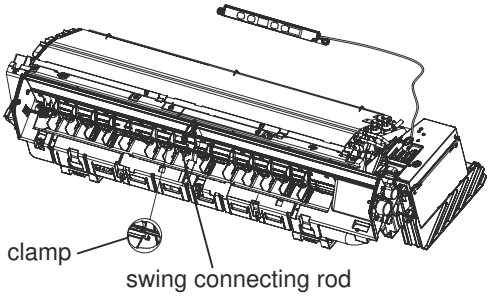
(1)Models:09/12K

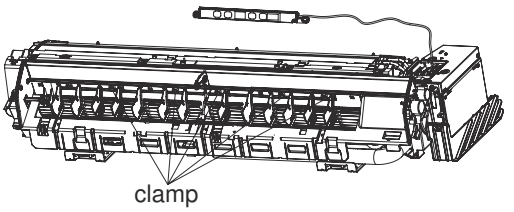
Steps		Procedure
1. Before disassembling the unit		
	Before disassembling the unit.	
2. Remove filter		
a	Open the panel.	
b	Loosen the clasps on the filter, push the filter inward and then pull it upward. Then the filter can be removed.	
3.Remove guide louver		
a	Remove the axial bushing of big guide louver.	

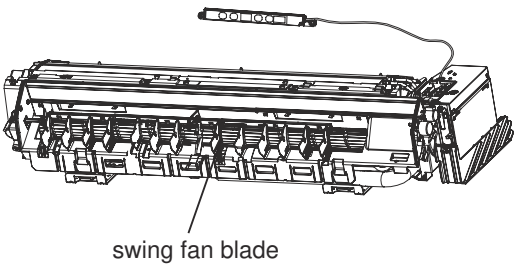
Steps	Procedure	
b	Remove the rotating shaft of big guide louver from the groove, slightly bend the big guide louver to remove it.	
c	Remove the axial bushing of small guide louver.	
d	Remove the rotating shaft of small guide louver from the groove; slightly bend the small guide louver to remove it.	
4.Remove panel		
a	Loosen the clamps of the panel to remove the panel.	

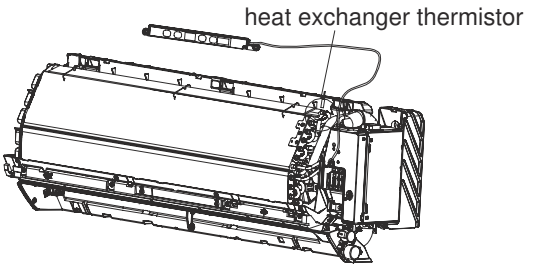
Steps	Procedure	
b	Remove the screws fixing display on the panel to remove the display.	
5.Remove front case		
a	Remove the screws securing electric box cover 2 to remove the electric box cover 2.	
b	Remove the screws fixing front panel; loosen the clamps to remove the front panel.	  

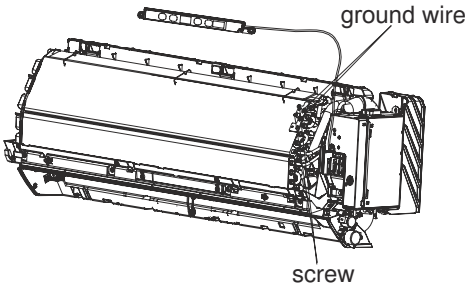
Steps	Procedure
6.Remove swing fan blade	
a	Loosen the clamps fixing swing connecting rod, to remove the swing connecting rod.
b	Remove the clamps fixing swing fan blade, to remove the swing fan blade.
7.Remove electric box sub-assy	
a	Remove the indoor tube temp. sensor.
b	Remove the screws securing ground wire to remove the ground wire.

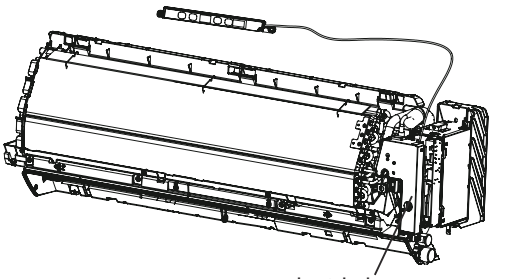
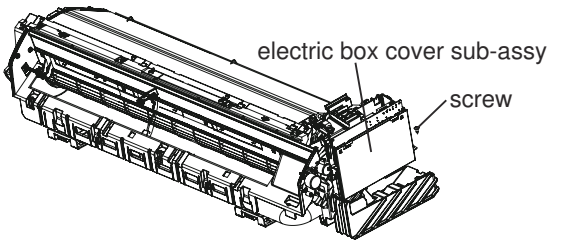
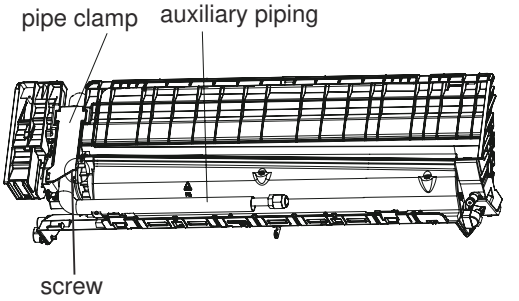
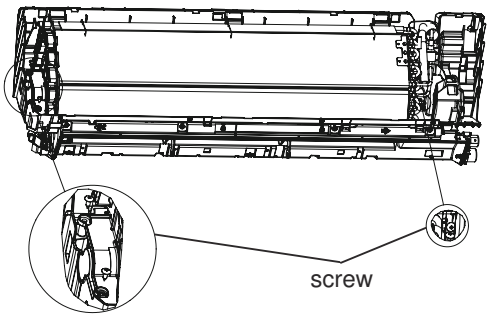


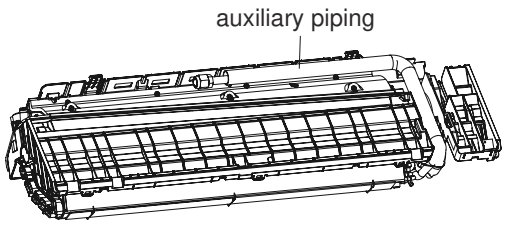
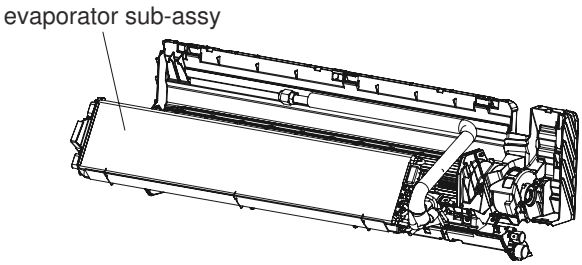
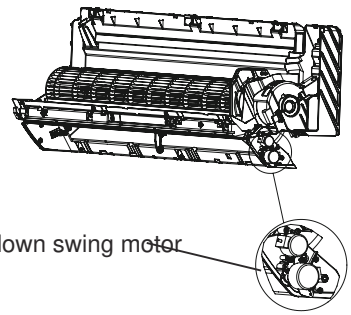
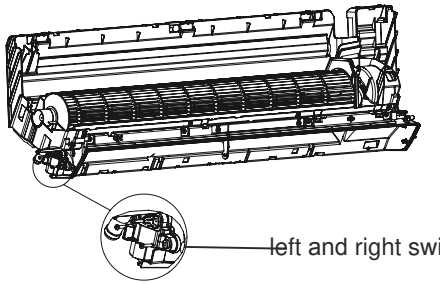


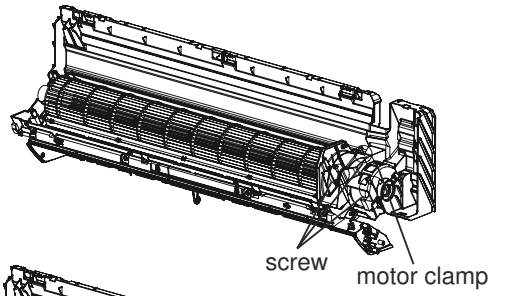
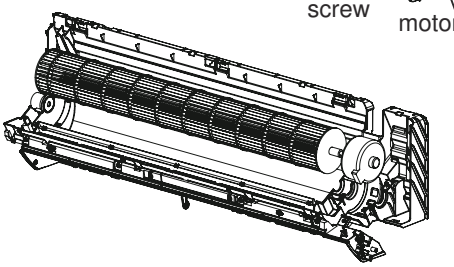
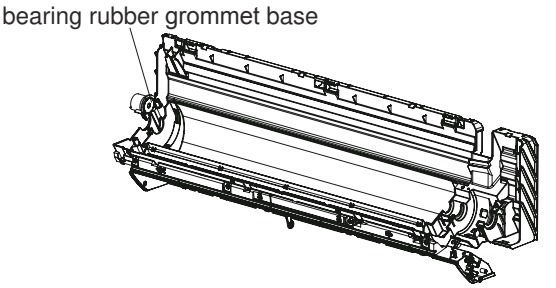
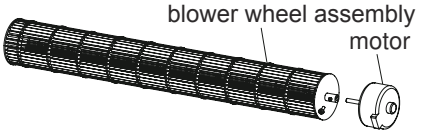




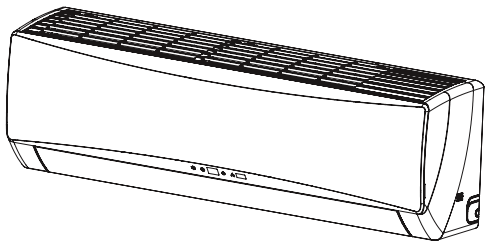
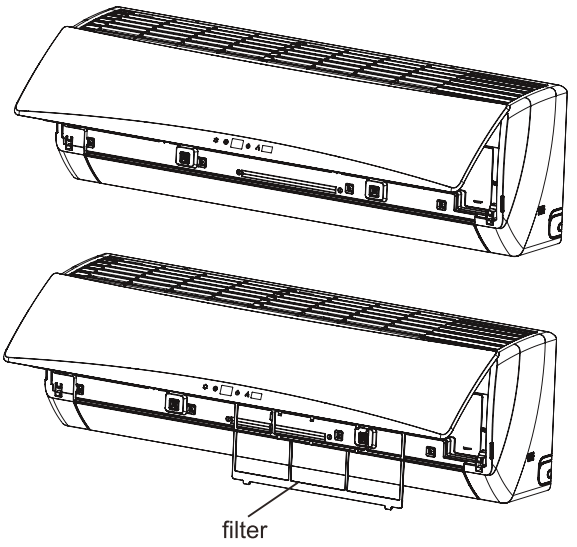
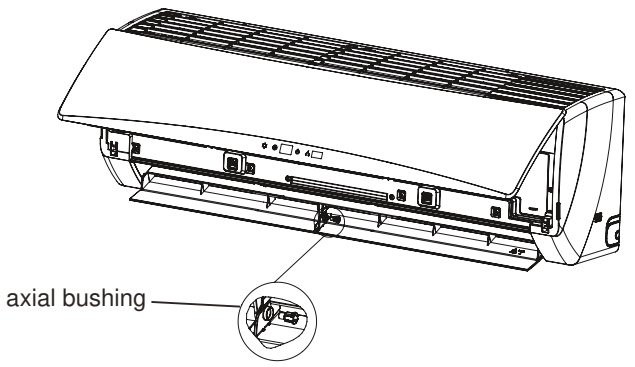


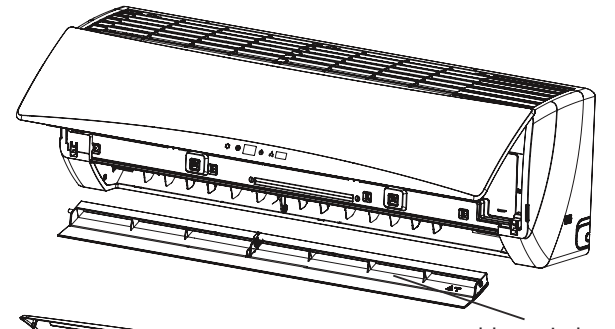
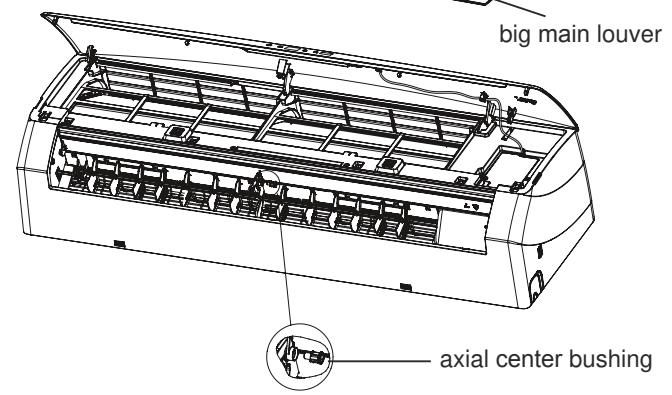
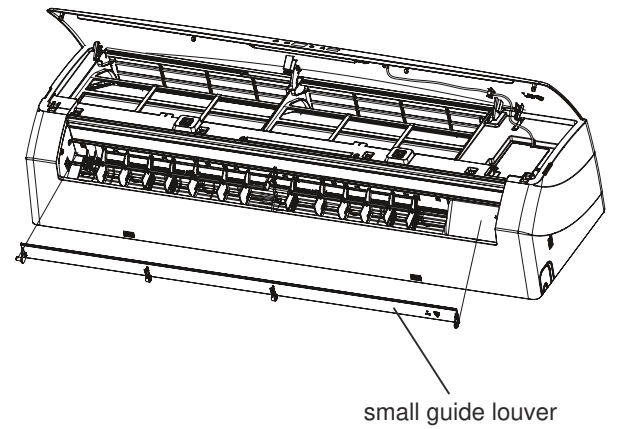
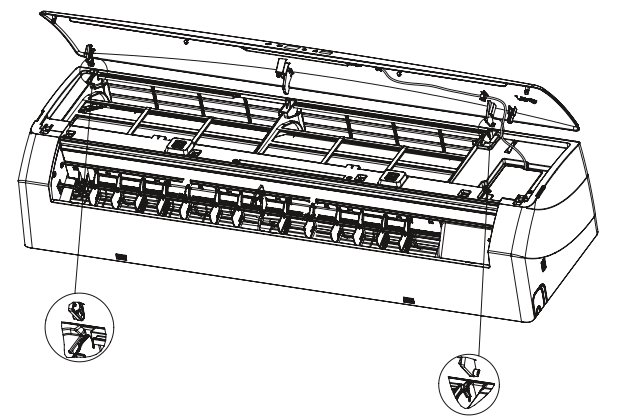
Steps	Procedure	
c	Remove the clamps fixing electric box cover to remove the cover.	
d	Remove each wiring terminal, and remove the screws fixing electric box cover, to remove the electric box cover sub-assy.	
8.Remove evaporator sub-assy		
a	Remove the screws fixing connection pipe clamp, to remove the connection pipe clamp.	 

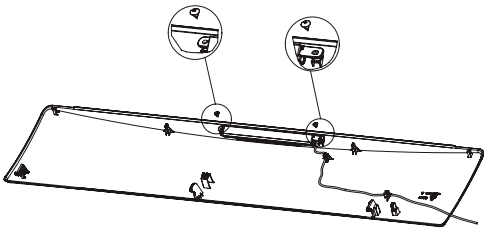
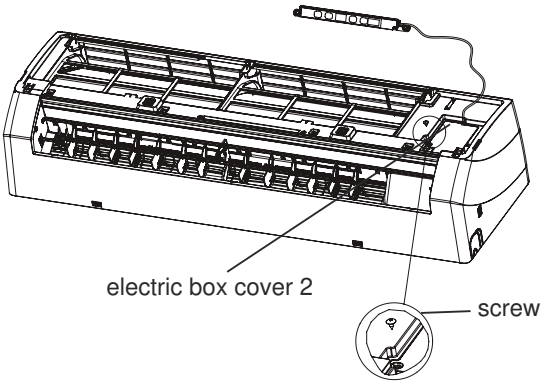
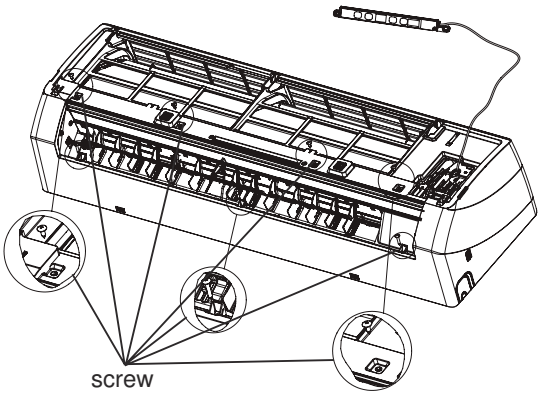
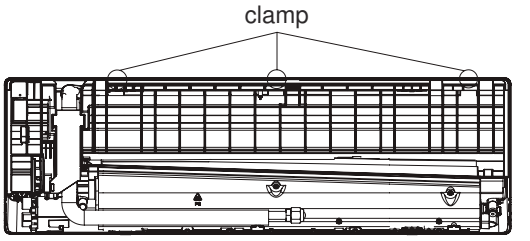
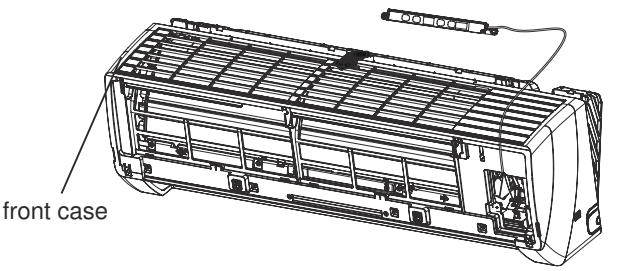
Steps	Procedure	
b	Remove the screws holding the coil in place, then gently bend tube assembly and remove coil.	 
9.Remove cross fan blade and motor		 
a	Remove the screws attaching up/down louver stepper motor.	
b	Remove the screws attaching the left/right stepper motor.	

Steps	Procedure	
c	Remove the screws holding the blower motor clamp.	
d	Remove the cross fan blade and motor.	
e	Remove rubber grommet from bearing assembly.	
f	Loosen the set screw on the motor shaft then remove the blower wheel assembly.	

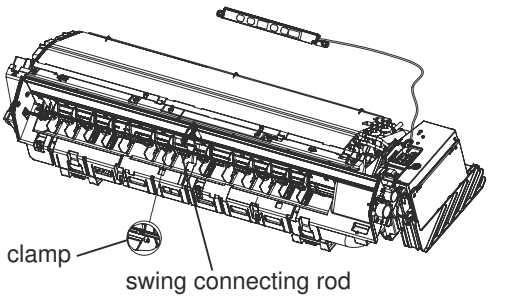
18K

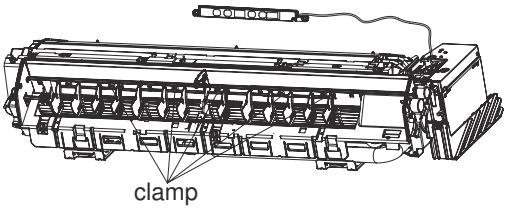
Steps	Procedure
1. Before disassembling the unit	
Before disassembling the unit.	
2. Remove filter	
a Open the panel.	
b Loosen the clasps on filter, push the filter inward and then pull it upward. Then the filter can be removed.	
3.Remove main louver	
a Remove the center bushing of main louver.	

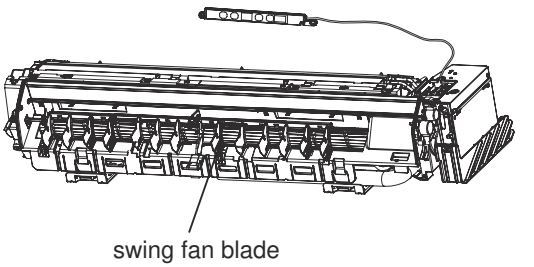
Steps	Procedure	
b	Remove the shaft of the main louver and while slightly bending the louver, remove it.	
c	Remove the axial center bushing of small guide louver.	
d	Remove the rotating shaft of small guide louver from the groove. Slightly bend the small guide louver to remove it.	
4.Remove panel		
a	Loosen the clamps of the panel to remove the panel.	

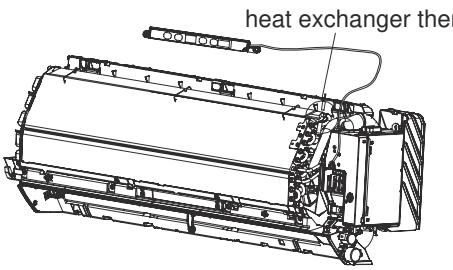
Steps	Procedure	
b	Remove the screws fixing display on the panel, to remove the display.	
5.Remove front case		
a	Remove the screws fixing electric box cover 2, to remove the electric box cover 2.	
b	Remove the screws fixing front panel, and loosen the clamps to remove the front case.	  

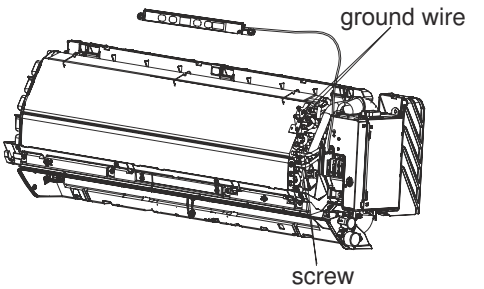
Steps	Procedure
6.Remove swing fan blade	
a	Loosen the clamps fixing swing connecting rod, to remove the swing connecting rod.
b	Remove the clamps fixing swing fan blade, to remove the swing fan blade.
7.Remove electric box sub-assy	
a	Remove the indoor tube temperature sensor.
b	Remove the screws fixing ground wire to remove the ground wire.

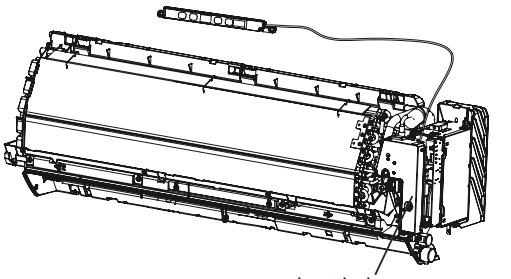
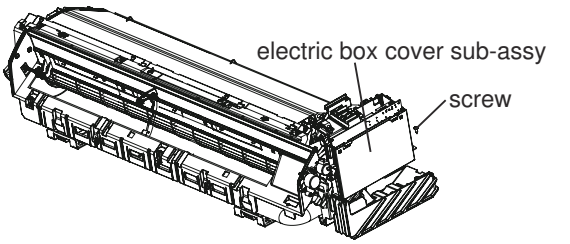
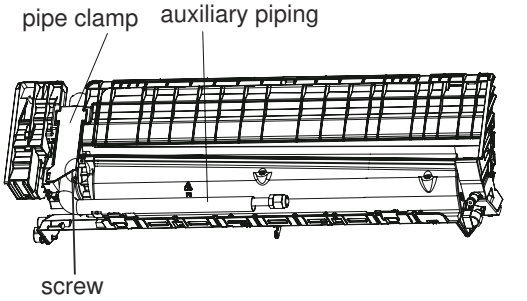
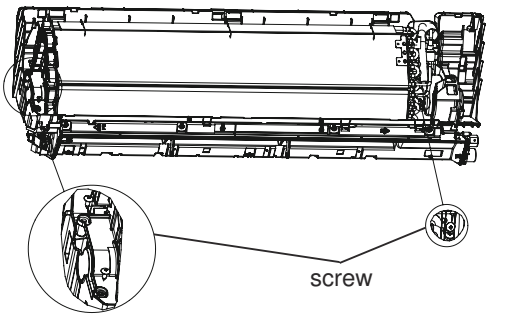


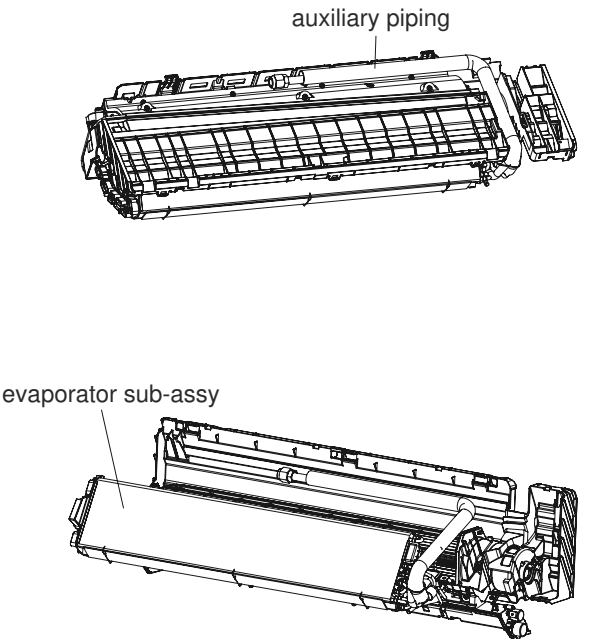
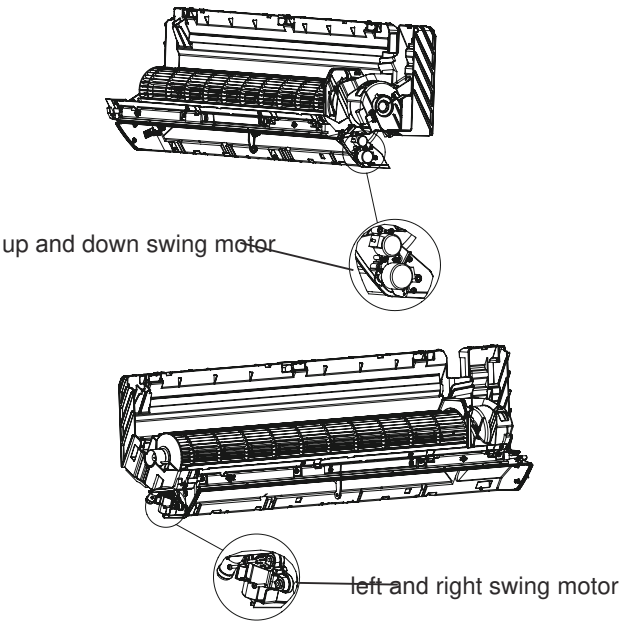


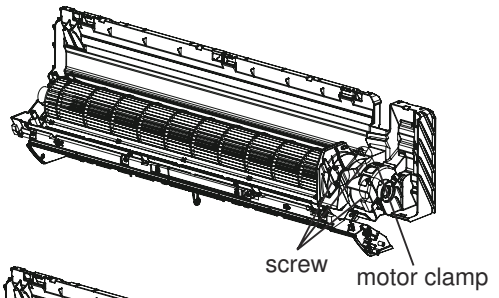
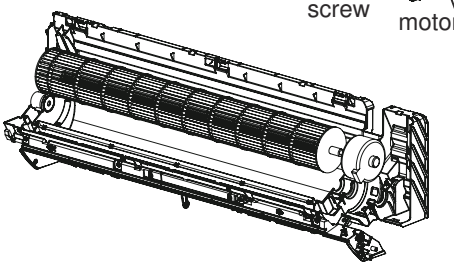
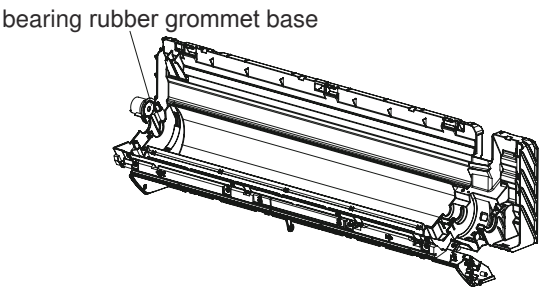
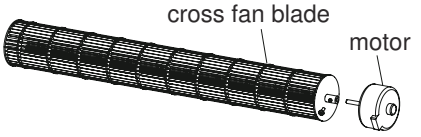




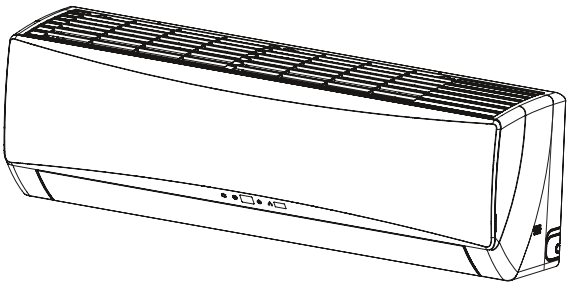
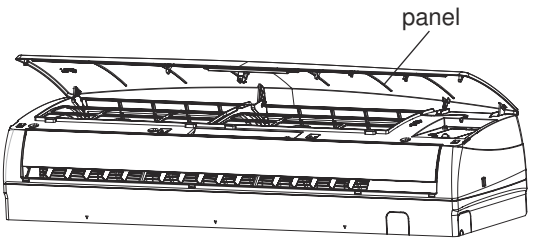
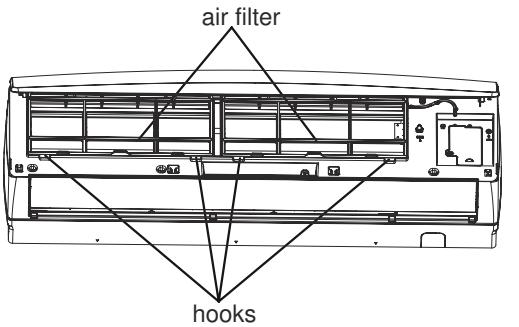
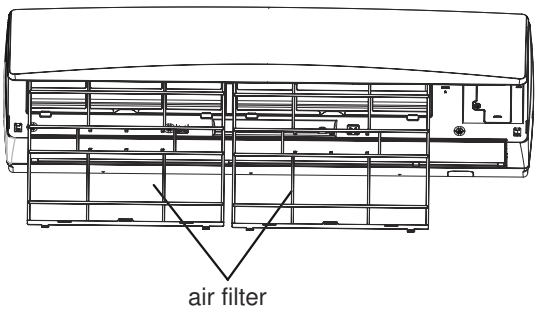


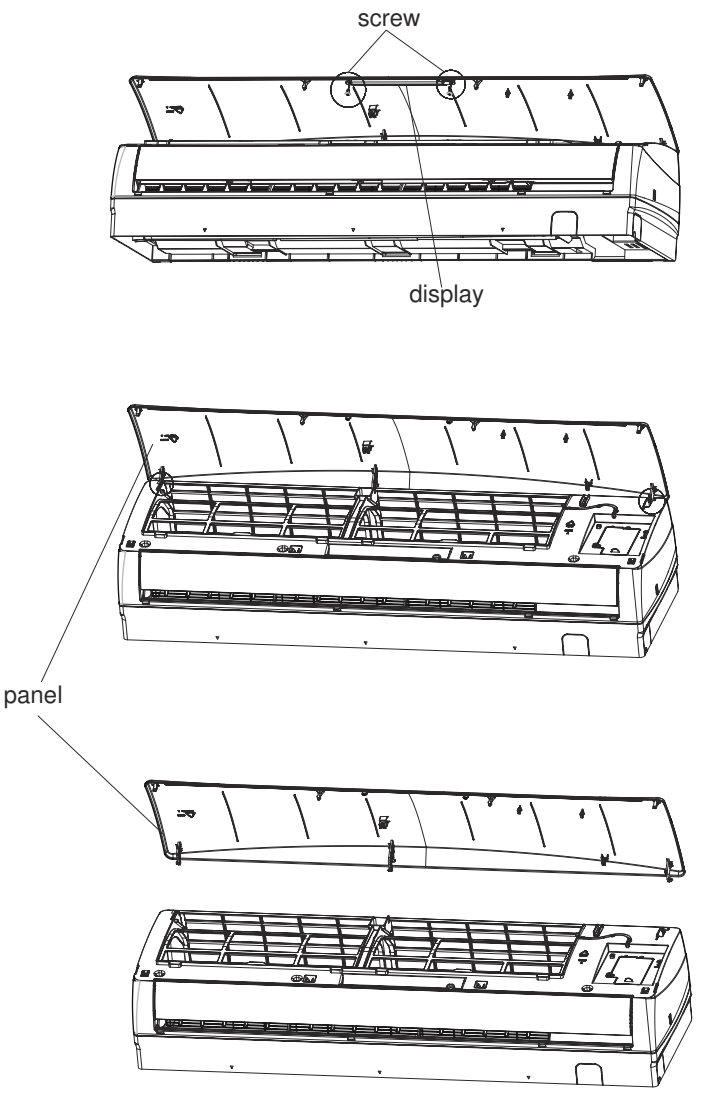
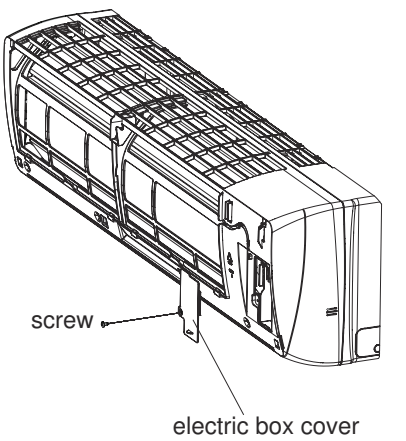
Steps	Procedure	
c	Remove the clamps fixing electric box cover, to remove the cover.	
d	Remove each wiring terminal, and remove the screws fixing electric box cover, to remove the electric box cover sub-assy.	
8.Remove evaporator sub-assy		
a	Remove the screws fixing connection pipe clamp, to remove the connection pipe clamp.	 

Steps	Procedure	
b	Remove the screws fixing evaporator sub-assy, slightly regulate the tube, to remove the evaporator sub-assy.	
9.Remove cross fan blade and motor		
a	Remove the screws attaching up/down louver stepper motor.	
b	Remove the screws from left and right swing motor to remove the motor.	

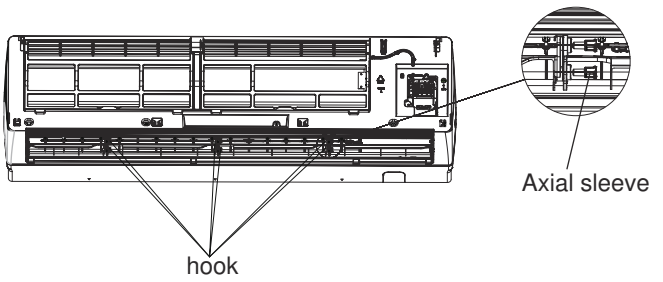
Steps	Procedure	
c	Remove the screws holding the blower motor clamp.	
d	Remove the cross fan blade and motor.	
e	Remove rubber grommet from bearing assembly.	
f	Loosen the set screw on the motor shaft then remove the blower wheel assembly.	

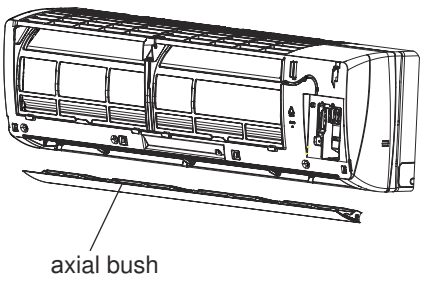
24K

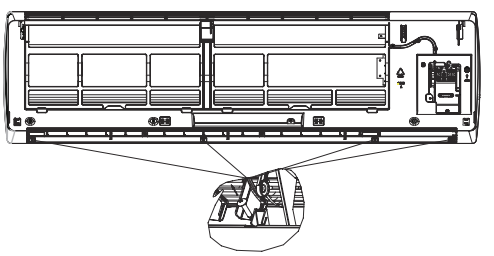
Steps	Procedure
1. Before disassembly of the unit	
Before disassembling the unit.	
2. Remove filter	
a Open the panel.	
b Loosen the clasps on filter, push the filter inward and then pull it upward. Then the filter can be removed.	

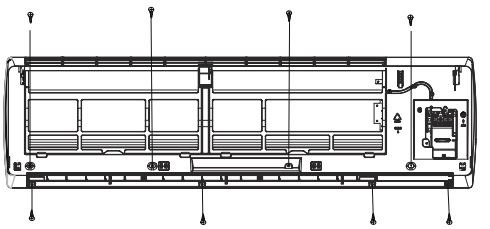
Steps	Procedure
3. Remove the panel	
a	Remove the screws fixing display on the panel, to remove the display.
b	Along the groove fixing front panel, slide the rotor shaft outward to remove the front panel.
c	Remove the panel.
4. Remove electric box cover	
	Unscrew a screw of electric box cover with screwdriver. Then take out the electric box cover.

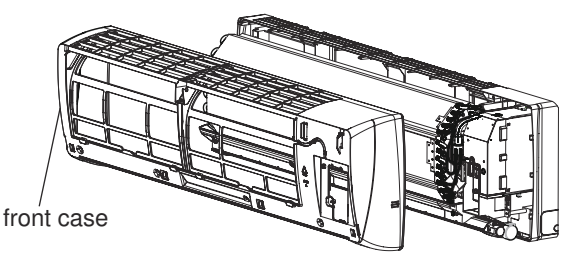
Steps	Procedure
5. Remove axial bush	
a	Remove the axial bush of horizontal louver to remove the axial bush.
b	Remove axial bush
6. Remove front case	
a	Remove the screw cover of front case, unscrew the eight screws of front case with screwdriver.
b	Remove the front cover from the main coil assembly.



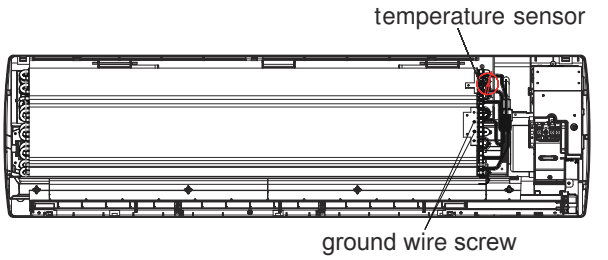


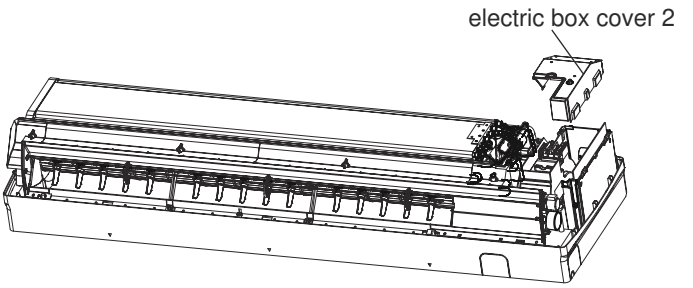


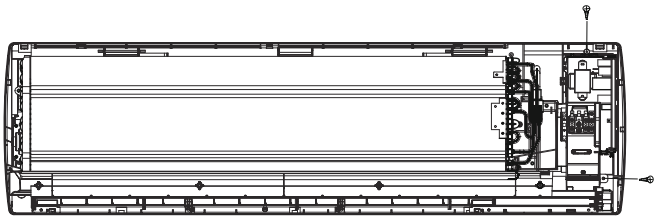


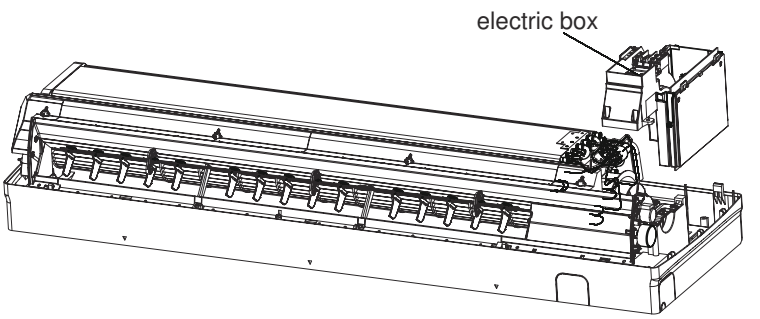


Steps	Procedure
7. Remove electric box	
a	Remove Temperature Sensor. Twist off the ground wire screw fixing the evaporator.
b	Remove the screw of electric box.Take out the electric box cover to separate the electric box cover 2.
c	Remove each wiring terminal, and remove the screws fixing electric box to remove the electric box sub-assy.

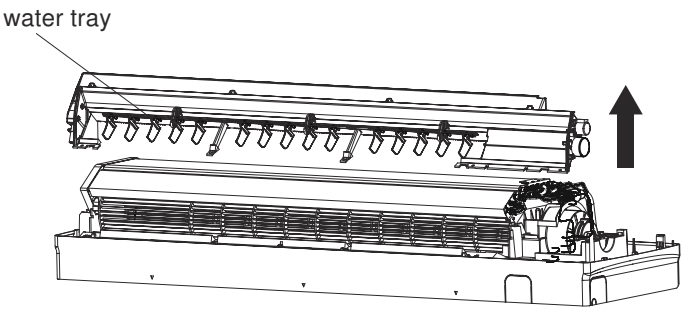


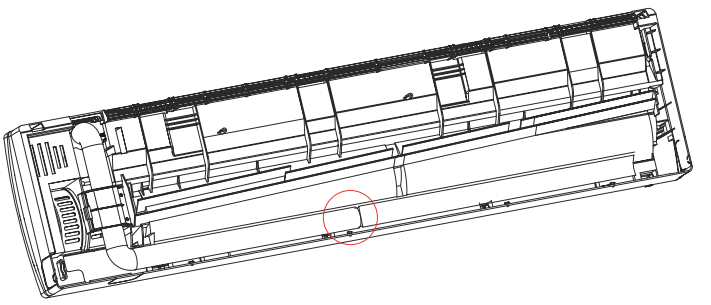


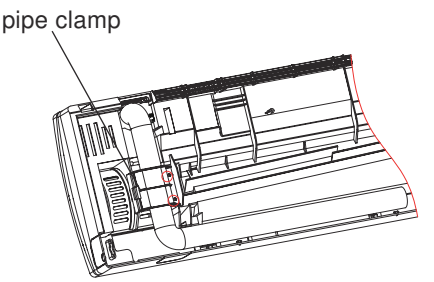


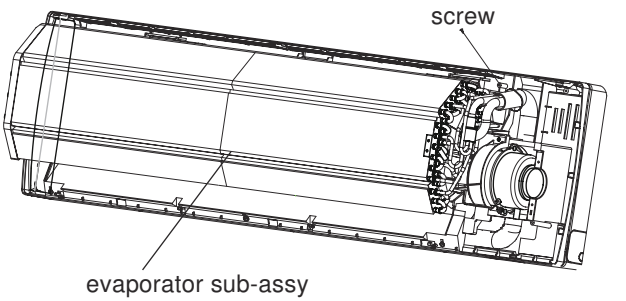


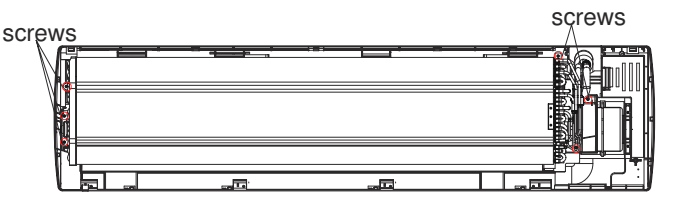
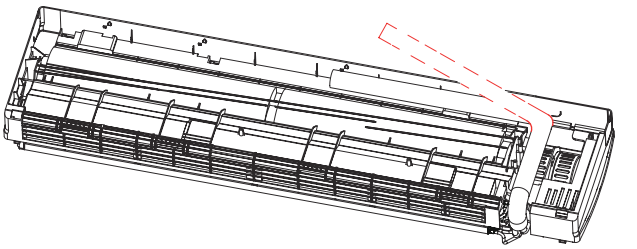
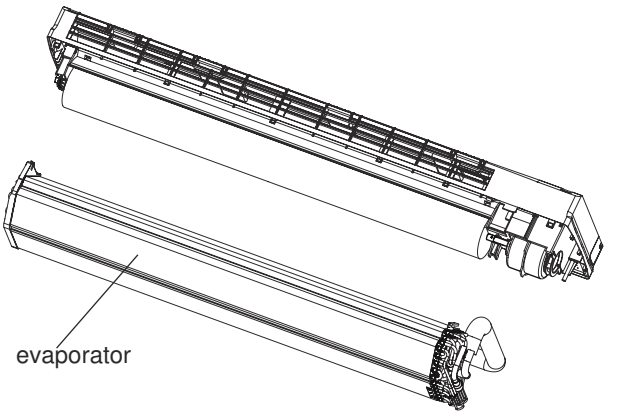
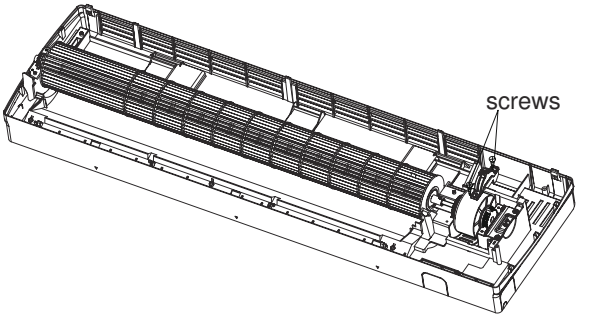
Steps	Procedure
8. Remove evaporator sub-assy	
a	Loosen the clasps connecting the water tray and chassis, and then remove the water tray.
b	Remove the screws fixing connection pipe clamp, to remove the connection pipe clamp.
c	Remove the screws fixing evaporator sub-assy, slightly regulate the tube, to remove the evaporator sub-assy.

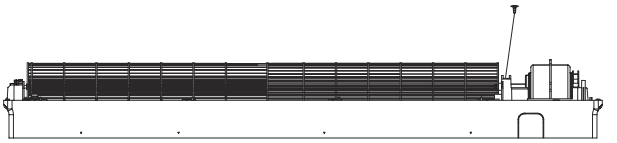
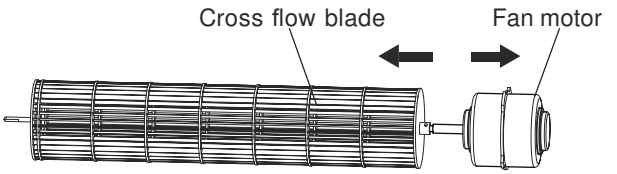
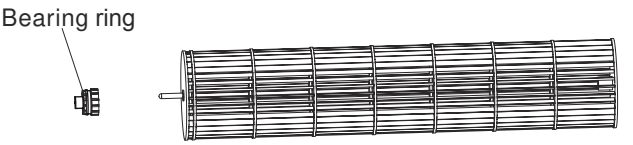




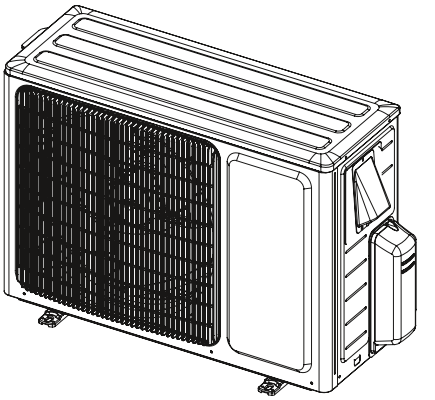
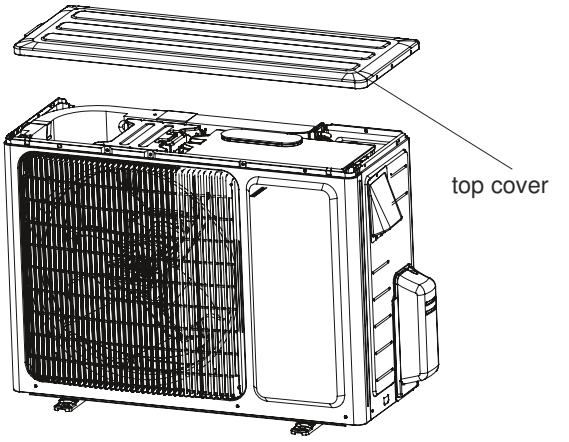
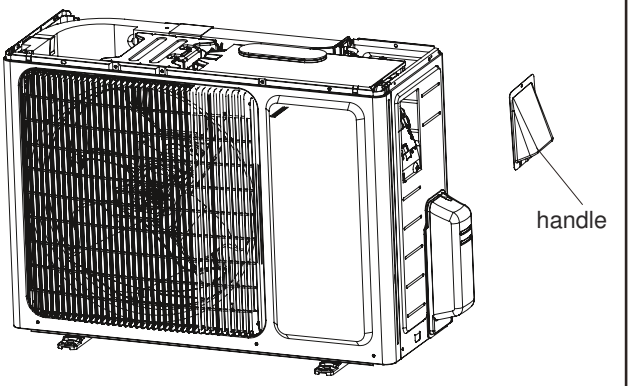


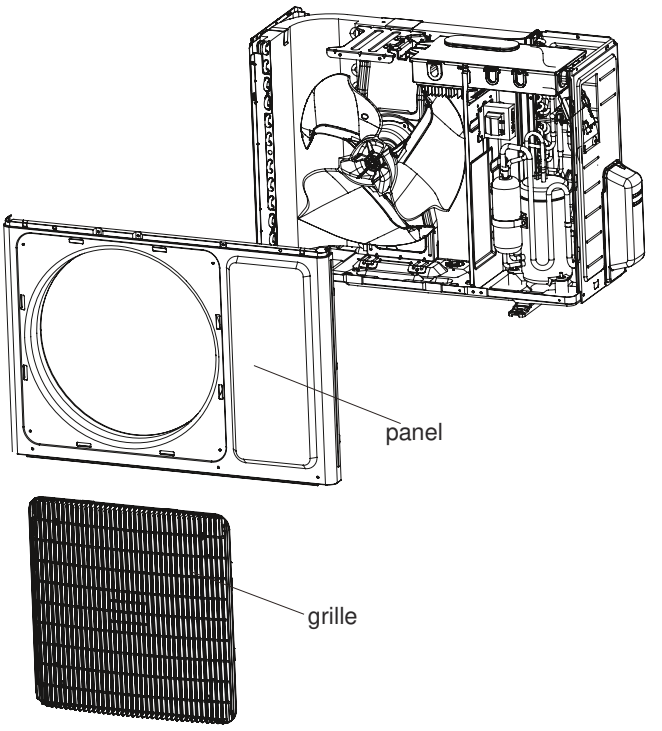
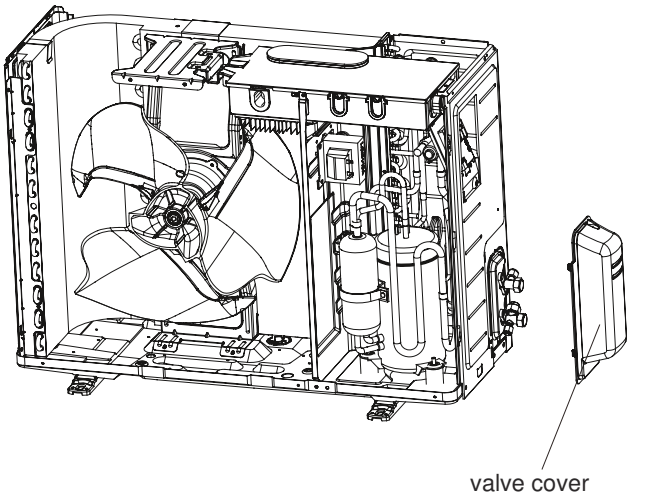


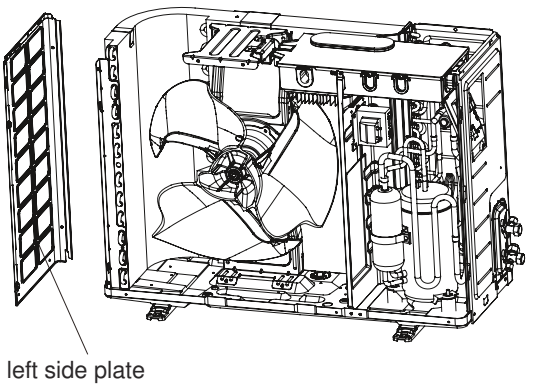
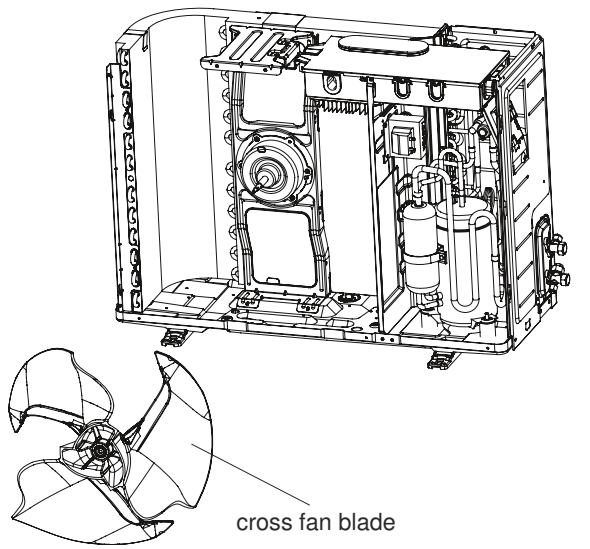
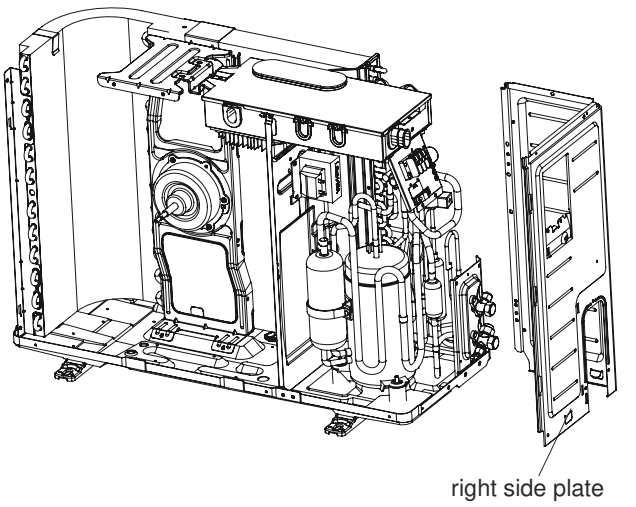
Steps	Procedure	
d	Turn over the indoor unit and adjust the pipe line to the position as shown by the broken line.	 
e	Lift up the evaporator, and then remove the evaporator.	
9. Remove the cross-flow louver and motor		
a	Remove the 2 screws of step motor with screwdriver, and remove the step motor.	

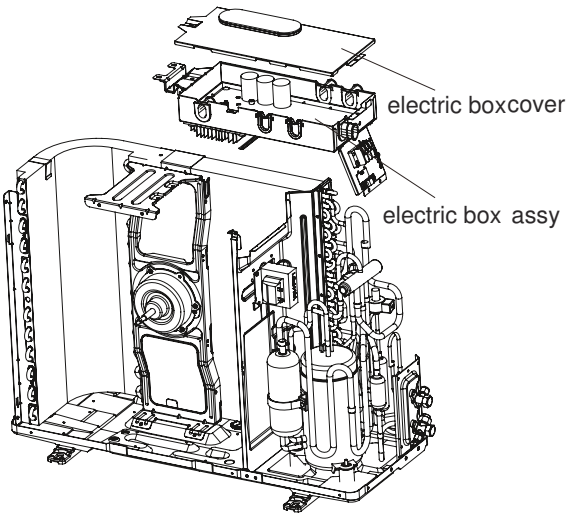
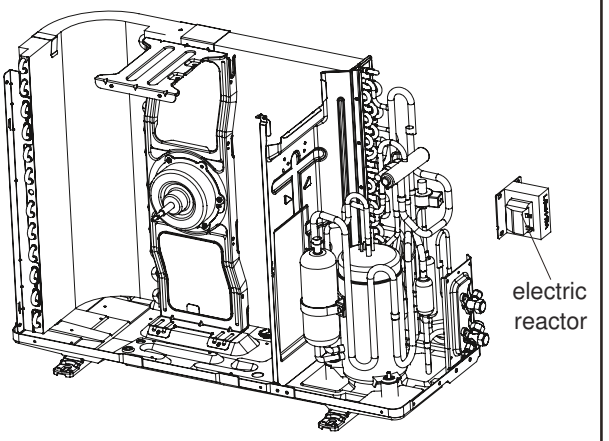
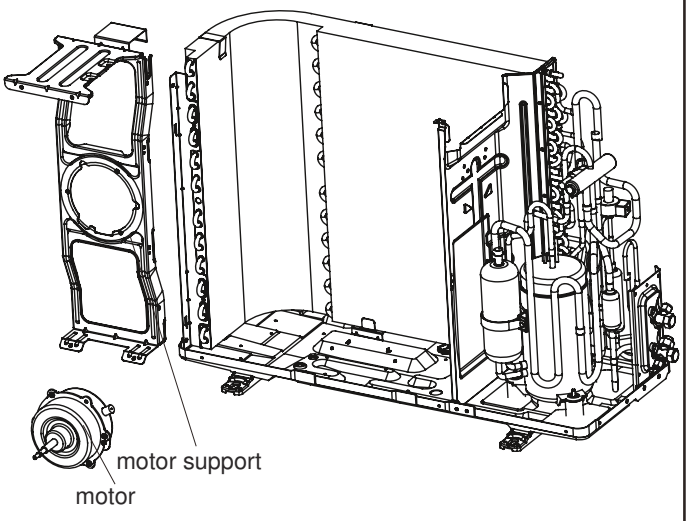
Steps	Procedure	
b	Remove screws fixing cross flow blade and motor.	
c	Remove the motor sub-assy.	
d	Pull out the plug of bearing ring.	

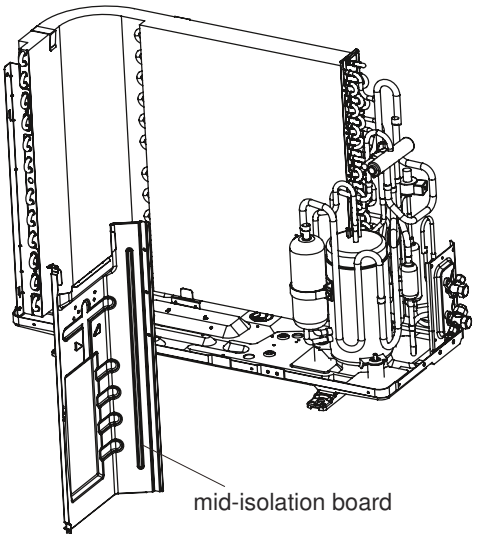
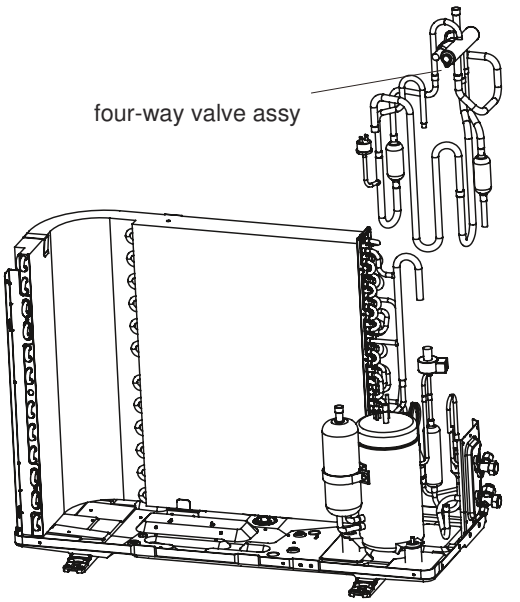
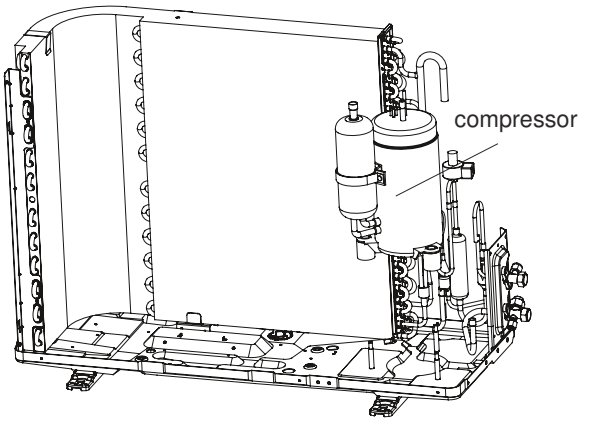
8.2 Removal Procedures for Outdoor Unit

Steps	Procedure
1. Before disassembly	
2. Remove top cover Remove the screws connecting top cover, left and right side plate, as well as panel, to remove the top cover.	
3. Remove handle Remove the screws connecting handle and right side plate, to remove the handle.	

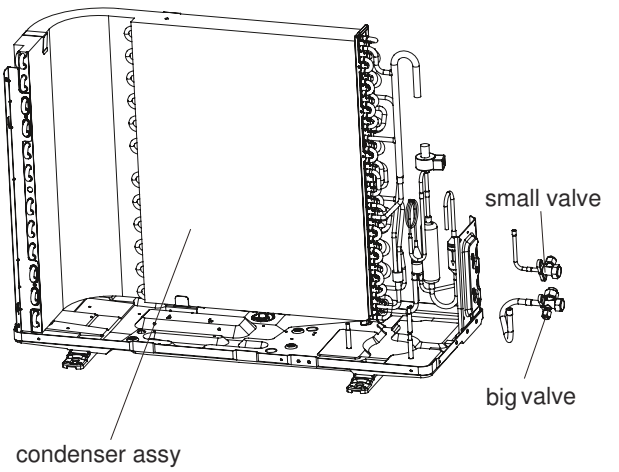
Steps	Procedure
4. Remove panel and grille	
Remove the screws fixing panel, to remove the panel. Remove the screws connecting panel grille and panel, and loosen the clamp, to remove the panel grille.	
5. Remove valve cover	
Remove the screw fixing valve cover, to remove the cover.	

Steps	Procedure
6. Remove left side plate	
Remove the screws attaching the left side panel to the chassis, then remove panel.	
7. Remove cross fan blade	
Remove the screw nut fixing cross fan blade, remove the gasket and spring cushion, to remove the cross fan blade.	
8. Remove right side plate	
Remove the screws fixing right side plate and valve support, to remove the right side plate.	

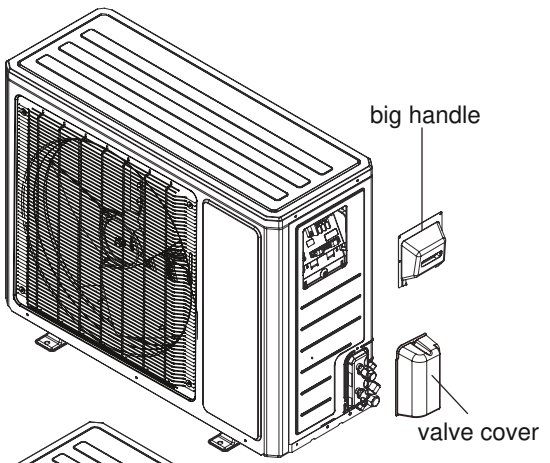
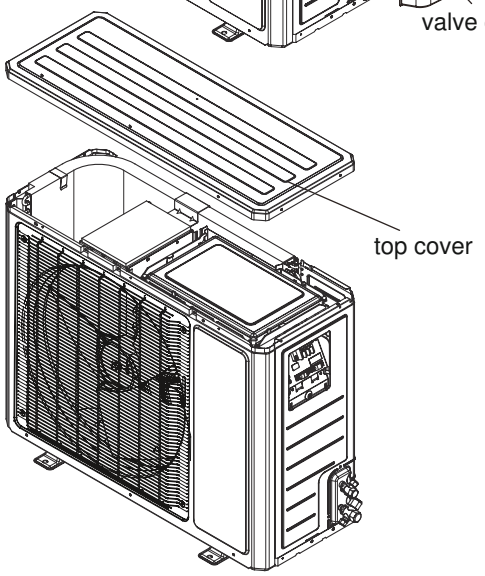
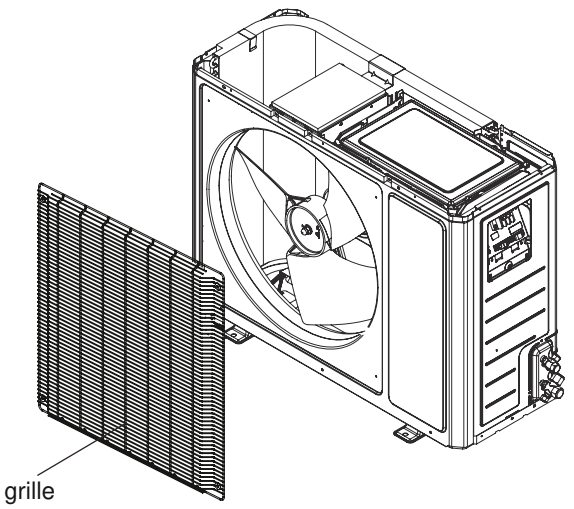
Steps	Procedure
9. Remove electric box assy	
Remove screws fixing electric box assy and mid-isolation board, loosen the bonding tie, pull off the wiring terminal, lift to remove the electric box assy.	
10. Remove electric reactor	
Remove the screws fixing electric reactor, to remove the electric reactor.	
11. Remove motor and motor support	
Remove the four tapping screws fixing motor, pull out the contact tag of motor wiring, to remove the motor. Remove the two tapping screws fixing motor support and chassis, and lift to remove the motor support.	

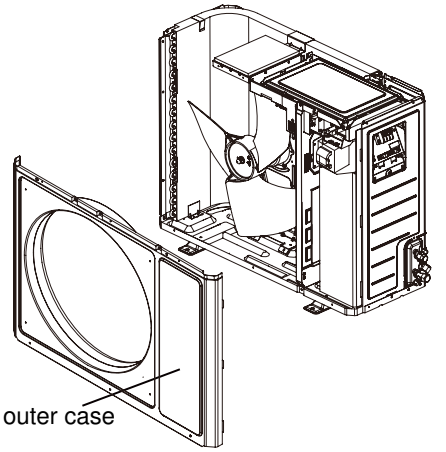
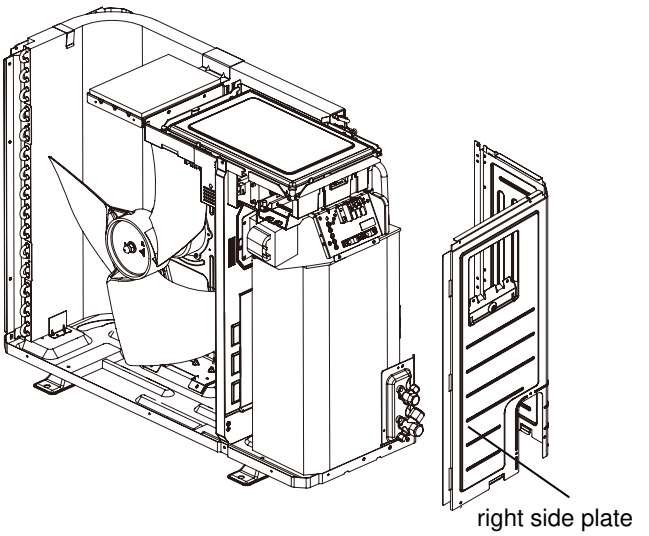
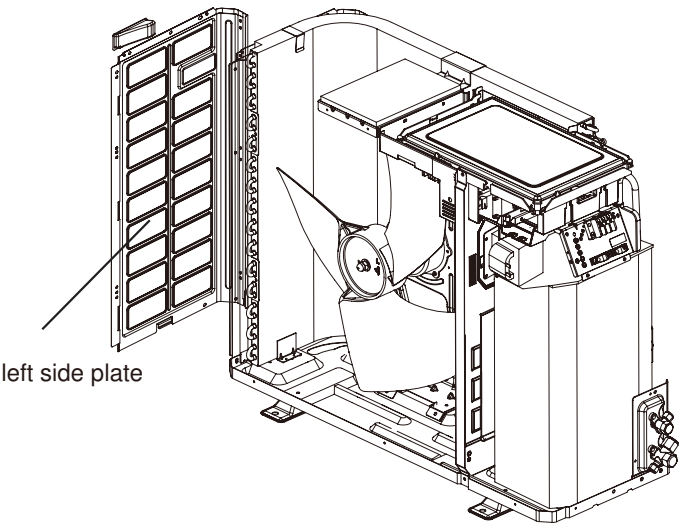
Steps	Procedure
12. Remove mid-isolation board	
Remove the screws connecting mid-isolation board, chassis and condenser assy, to remove the mid-isolation board.	
13. Remove four-way valve assy	
Welding cut the spot weld of four-way valve assy, compressor air suction/discharging valve and condenser pipe outlet. Lift to remove the four-way valve assy. (Note: Release the refrigerant before welding cutting.)	
14. Remove compressor	
Remove the three foot-screw nuts fixing compressor, to remove the compressor.	

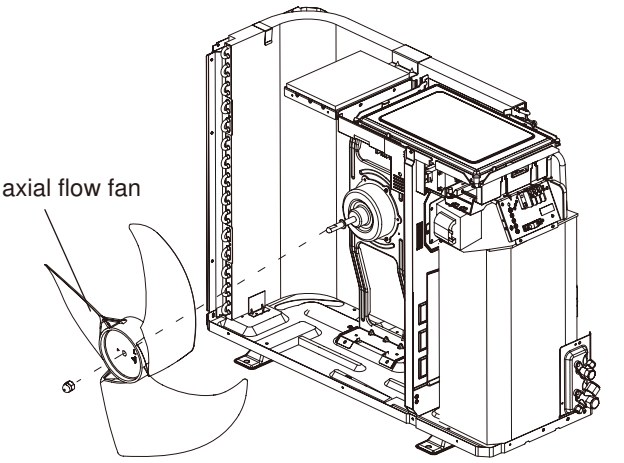
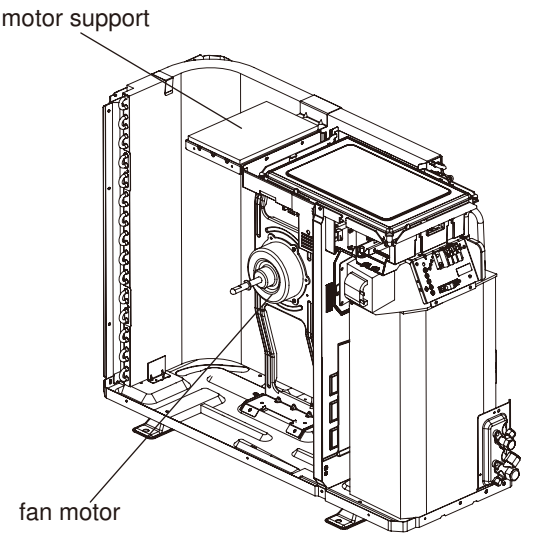
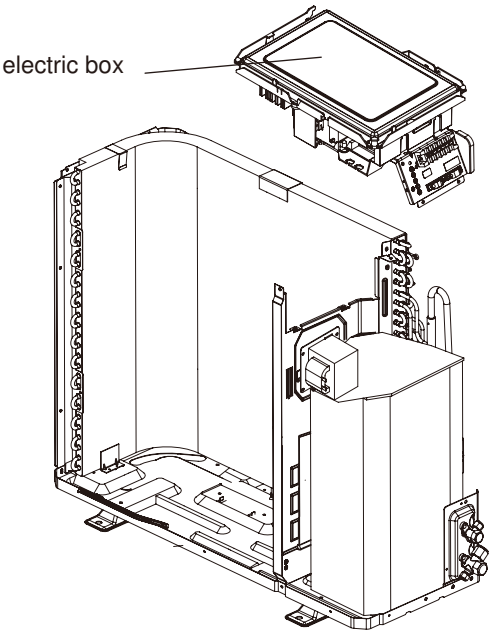
Steps	Procedure
15. Remove big and small valve assy	
	Remove screws connecting condenser assy and chassis, to remove the condenser assy. Remove the screws fixing big and small valve, to remove the valves.

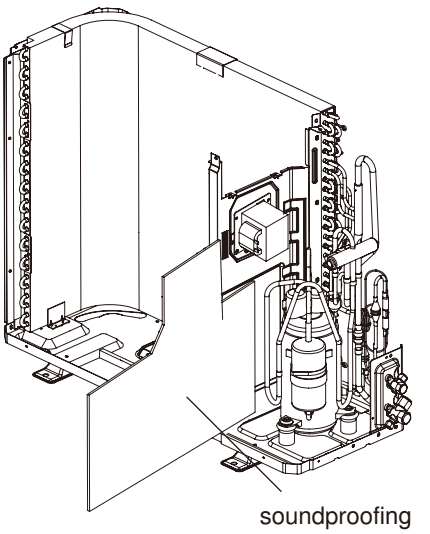
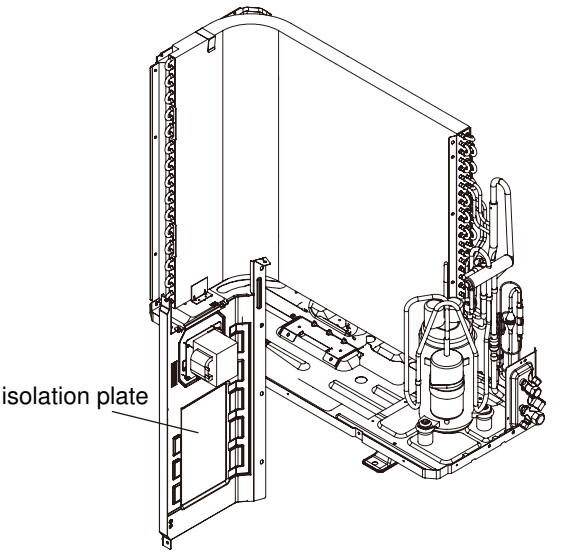
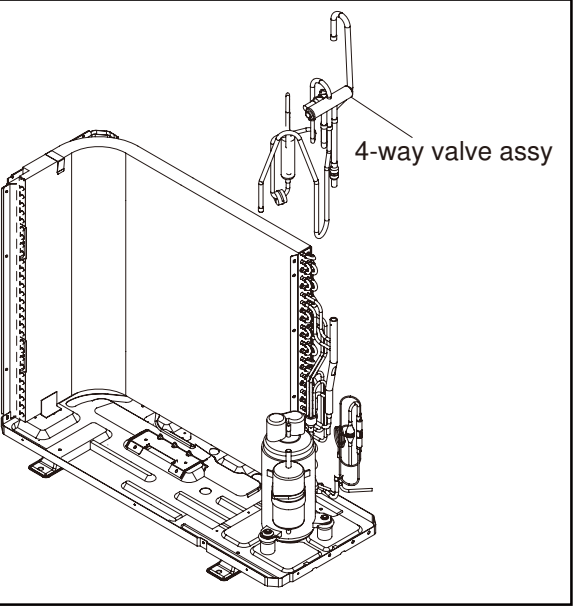


18K

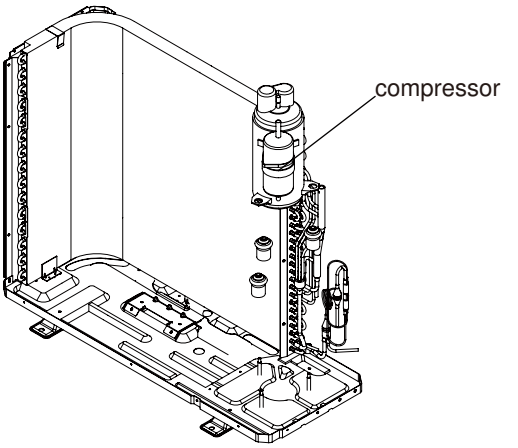
Steps	Procedure	
1. Remove big handle, valve cover and top cover		
	Remove the screw connecting the big handle and right side plate, and then remove the big handle. Remove the screw connecting the valve cover and right side plate, and then remove the valve cover.	
	Remove the screws connecting the top cover with the outer case, right side plate and left side plate; lift the top cover upward to remove it.	
2. Remove grille and outer case		
	Remove the four screws connecting the grille and outer case, and then remove the grille panel.	

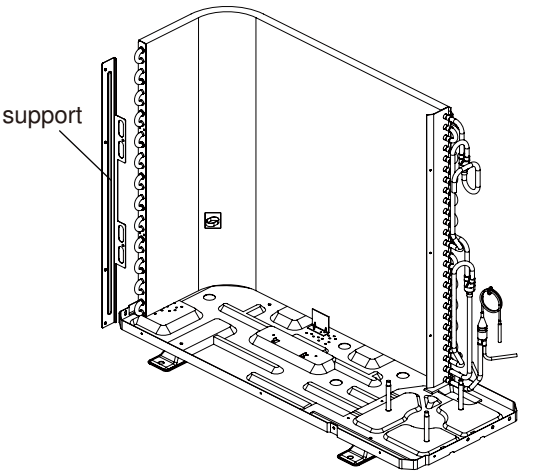
Steps	Procedure	
	Remove the screws connecting the outer case with the motor support, isolation plate and chassis; lift the outer case upwards; loosen the clasps of the outer case with right side plate and left side plate, and then remove the outer case.	
3. Remove right and left side plates		
	Remove the screws connecting the right side plate with electric box assy, valve support, chassis and condenser side plate. Then remove the right side plate.	
	Remove the screws connecting the left side plate with chassis, and then remove the left side plate.	

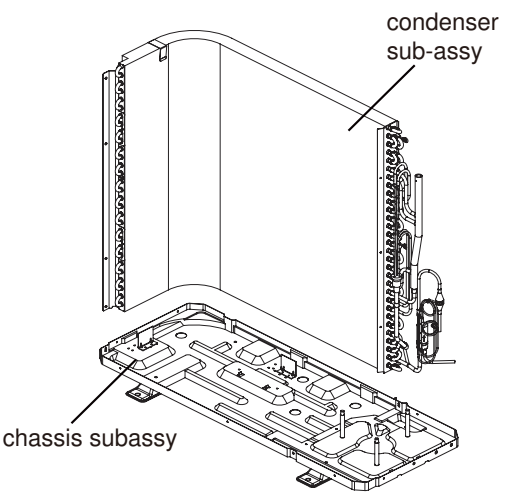
Steps	Procedure
4. Remove axial flow blade	
Remove the nut fixing the axial flow blade and then remove the blade.	
Remove the six screws fixing the motor and then remove the motor. Remove the two screws connecting the motor support and chassis, and then loosen the stopper to remove the motor support.	
5. Remove electric box	
Remove the screws fixing the electric box sub-assy; loosen the wire bundle; pull out the wiring terminals and then pull the electric box upwards to remove it.	

Steps	Procedure
6. Remove the soundproofing material	
Remove the self adhesive strip then remove the soundproofing material.	
7. Remove isolation plate	
Remove the two screws connecting the isolation plate and condenser side plate; remove the three screws connecting the isolation plate and chassis, and then remove the isolation plate.	
8. Remove 4-way valve assy	
Unsolder the welding joints connecting the 4-way valve assy with capillary sub-assy, compressor and condenser. Remove the 4-way valve. Note: Before unsoldering the welding joint, wrap the 4-way valve with a wet cloth completely to avoid damage to the valve caused by high temperature.	

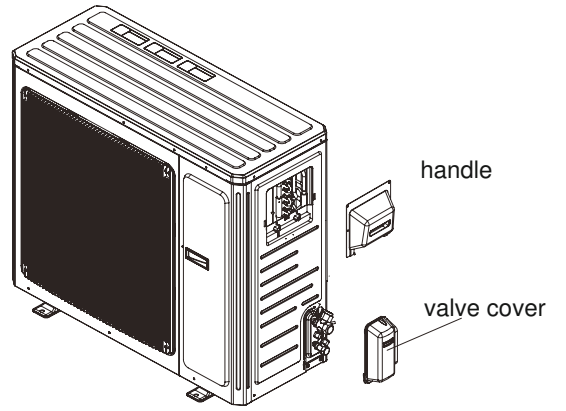
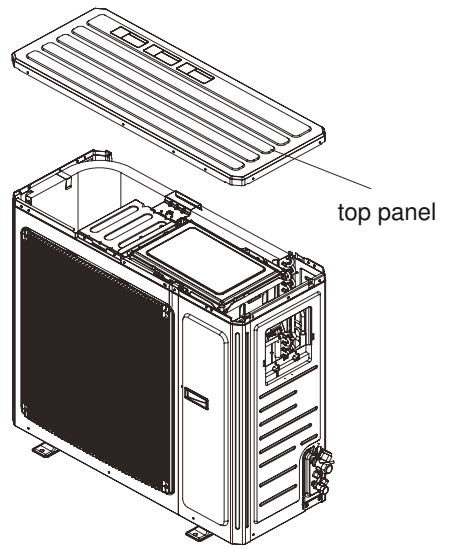
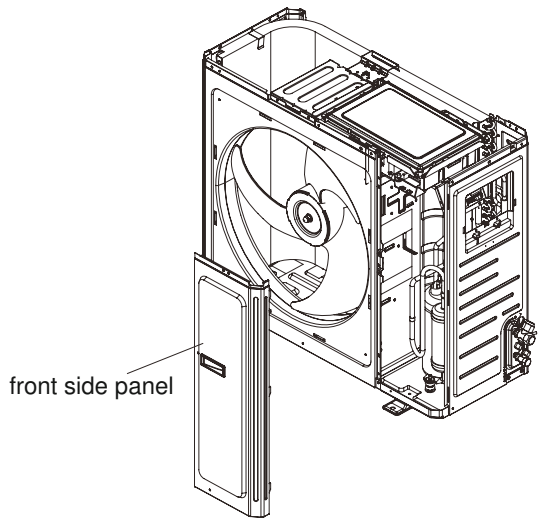
Steps	Procedure
9. Remove compressor	
	Remove the three foot nuts fixing compressor and then lift the compressor upwards to remove the compressor and rubber vibration bushings. Note: Keep the ports of discharge pipe and suction pipe from foreign objects.
10. Remove condenser sub-assy	
	Remove the screws connecting the support (condenser) and condenser assy. Then remove the support (condenser).
	Remove the two screws fixing the condenser and chassis, and then lift the condenser upwards to remove it.

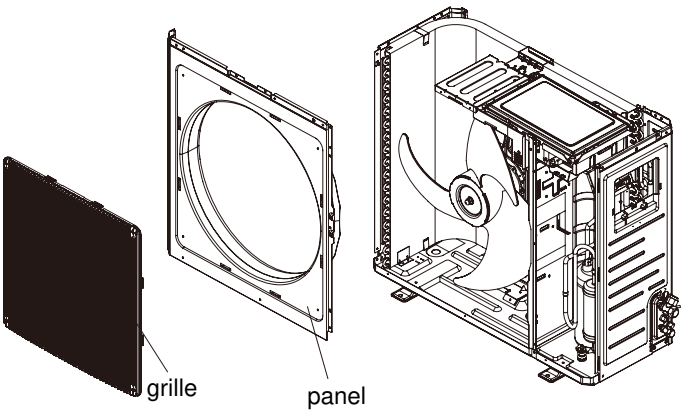
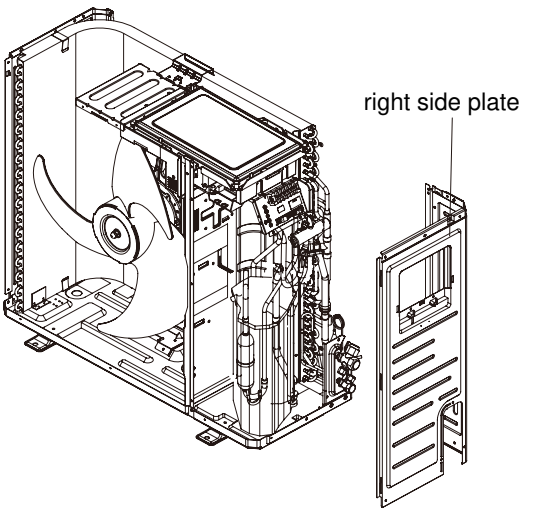
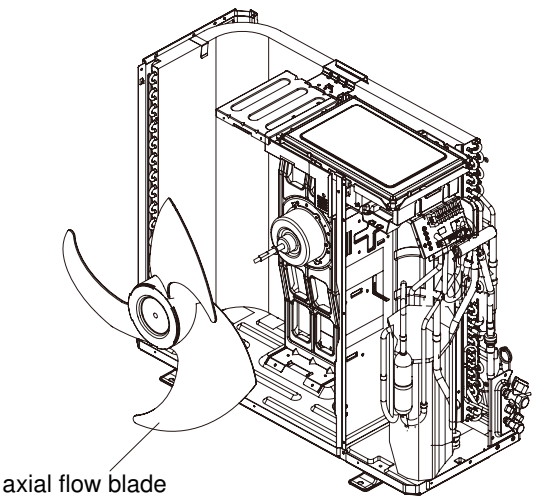




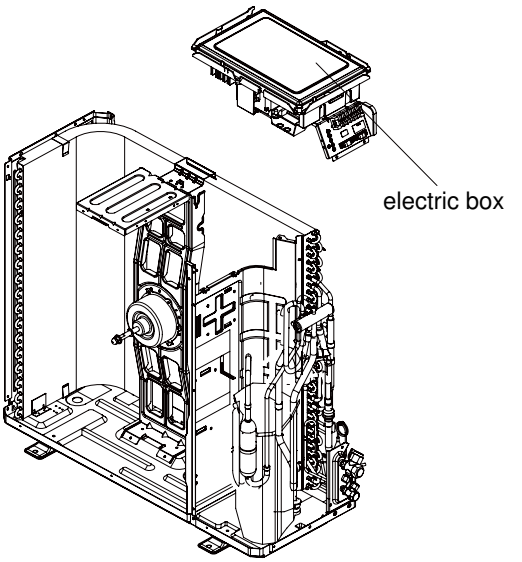


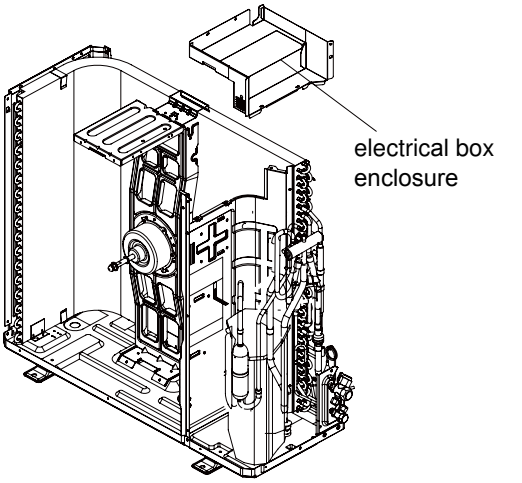
DHY24CSB21S

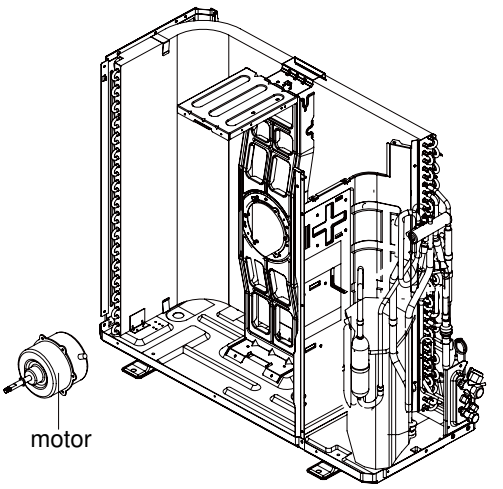
Steps	Procedure
1. Remove big handle, valve cover and top cover	
	Remove the screw connecting the big handle and right side plate, and then remove the big handle. Remove the screw connecting the valve cover and right side plate, and then remove the valve cover.
	
2.Remove top panel	
	Remove the screws connecting the top panel with the front panel and left and right side plates, and then remove the top panel.
	
3.Remove front side panel	
	Loosen the screws connecting the front side panel and chassis. Remove the front side panel.
	

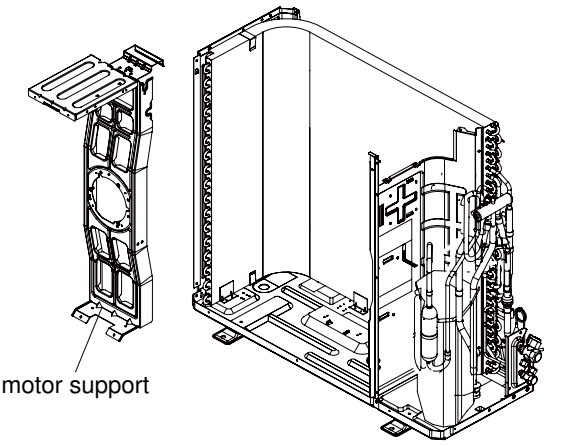
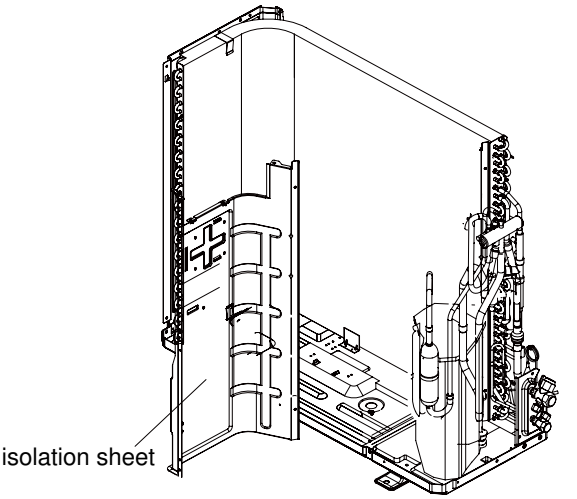
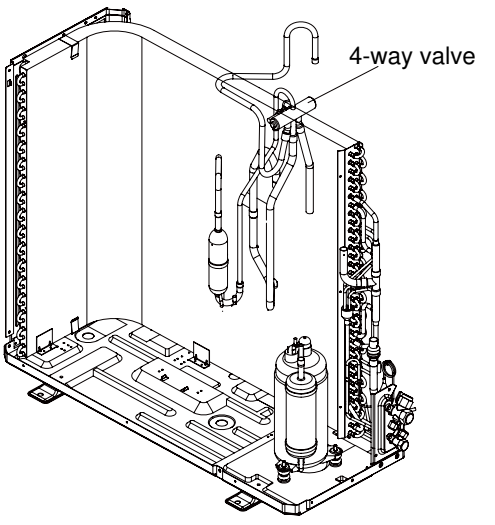
Steps	Procedure
4.Remove grille and panel	
Twist off the screws connecting the grille and panel, and then remove the grille. Twist off the screws connecting the panel, chassis and motor support with screwdriver, and then remove the panel.	
5.Remove right side plate	
Twist off the screws connecting the right side plate and chassis, valve support and condenser, and then remove the right side plate.	
6.Remove axial flow blade	
Twist off the nuts on blade with a wrench and then remove the axial flow blade.	

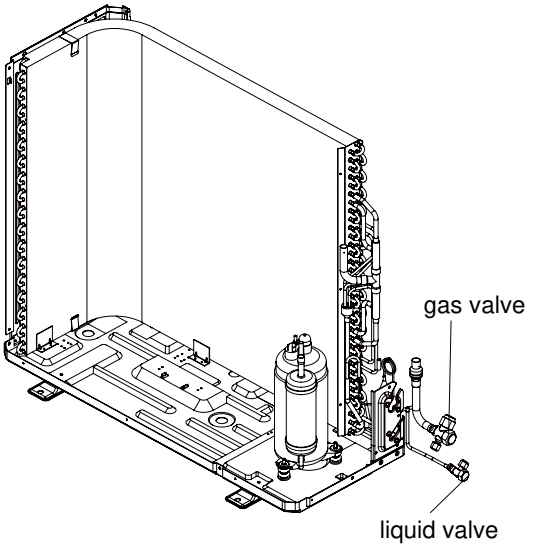
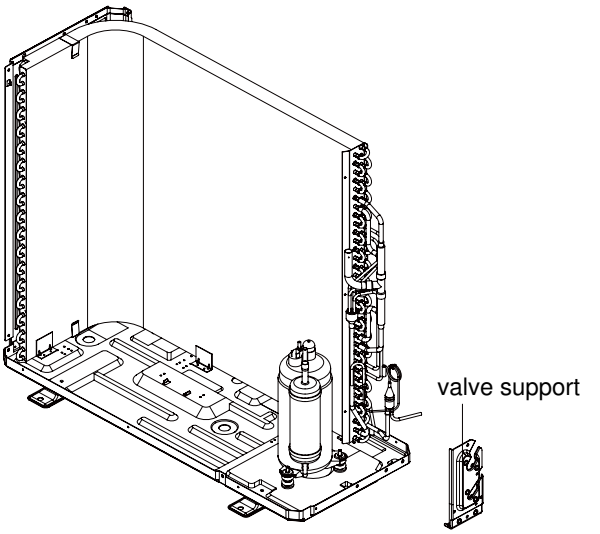
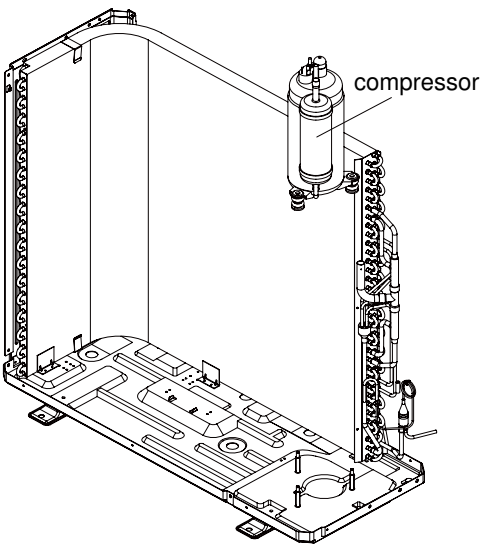
Steps	Procedure
7.Remove electric box	
	Twist off the screws on electric box, cut off the tieline with scissors or pliers, pull out the wiring terminal, and pull it upwards to remove the electric box.
	Remove the screws from the electrical box enclosure, then remove the enclosure.
8.Remove motor	
	Twist off the tapping screws fixing the motor, pull out the pin of leading wire for motor and then remove the motor.

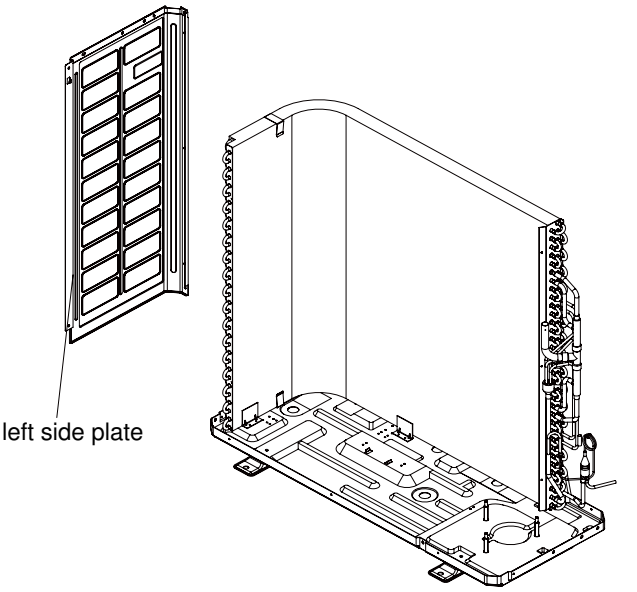
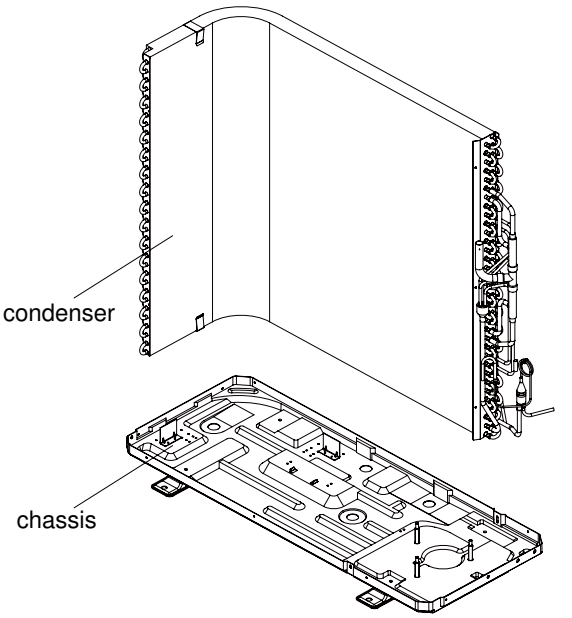






Steps	Procedure
9.Remove motor support	
	Twist off the tapping screws fixing the motor support, pull it upwards and then remove the motor support.
	
10.Remove isolation sheet	
	Twist off the screws connecting isolation sheet and end plate of condenser and chassis, and then remove the isolation sheet.
	
11.Remove 4-way valve	
	Unsolder the pipeline between compressor, condenser, gas and liquid valve, and then remove the 4-way valve. (Note: Release all refrigerant before unsoldering).
	

Steps	Procedure
12.Remove gas valve and liquid valve	
Twist off the two bolts fixing the valve sub-assy. Unsolder the soldering joint between gas valve and air-return pipe and then remove the gas valve. (Note: Make sure to release all refrigerant first. When unsoldering the soldering joint, wrap the gas valve with wet cloth completely to avoid damage to the valve.) Unsolder the soldering joint between liquid valve and connection pipe of liquid valve, and then remove the liquid valve.	
13.Remove valve support	
Twist off the screws connecting valve support and chassis, and then remove the valve support.	
14.Remove compressor	
Twist off the three foot nuts on compressor and then remove the compressor.	

Steps	Procedure
15.Remove left side plate	
Twist off the screws connecting the left side plate and chassis with screwdriver, and then remove the left side plate.	
16.Remove chassis and condenser	
Pull it upwards to separate the chassis and condenser.	

Appendix:

Appendix 1: Reference Sheet of Celsius and Fahrenheit

Conversion formula for Fahrenheit degree and Celsius degree: Tf=Tcx1.8+32

Set temperature

Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)
61	60.8	16		69/70	69.8	21		78/79	78.8	26
62/63	62.6	17		71/72	71.6	22		80/81	80.6	27
64/65	64.4	18		73/74	73.4	23		82/83	82.4	28
66/67	66.2	19		75/76	75.2	24		84/85	84.2	29
68	68	20		77	77	25		86	86	30

Ambient temperature

Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)
32/33	32	0		55/56	55.4	13		79/80	78.8	26
34/35	33.8	1		57/58	57.2	14		81	80.6	27
36	35.6	2		59/60	59	15		82/83	82.4	28
37/38	37.4	3		61/62	60.8	16		84/85	84.2	29
39/40	39.2	4		63	62.6	17		86/87	86	30
41/42	41	5		64/65	64.4	18		88/89	87.8	31
43/44	42.8	6		66/67	66.2	19		90	89.6	32
45	44.6	7		68/69	68	20		91/92	91.4	33
46/47	46.4	8		70/71	69.8	21		93/94	93.2	34
48/49	48.2	9		72	71.6	22		95/96	95	35
50/51	50	10		73/74	73.4	23		97/98	96.8	36
52/53	51.8	11		75/76	75.2	24		99	98.6	37
54	53.6	12		77/78	77	25				

Appendix 2: Configuration of Connection Pipe

1.Standard length of connection pipe

● 16.40ft, 24.61ft, 26.25ft.

2.Min. length of connection pipe is 9.84ft.

3.Max. length of connection pipe and max. high difference.

4.The additional refrigerant oil and refrigerant charging required after prolonging connection pipe

● After the length of connection pipe is prolonged for 32.81ft at the basis of standard length, you should add 5ml of refrigerant oil for each additional 16.40ft of connection pipe.

● The calculation method of additional refrigerant charging amount (on the basis of liquid pipe):

Cooling capacity	Max length of connection pipe	Max height difference
5000 Btu/h(1465 W)	49.21ft	16.40ft
7000 Btu/h(2051 W)	49.21ft	16.40ft
9000 Btu/h(2637 W)	49.21ft	32.81ft
12000 Btu/h(3516 W)	65.62ft	32.81ft
18000 Btu/h(5274 W)	80.02ft	32.81ft
24000 Btu/h(7032 W)	80.02ft	32.81ft
28000 Btu/h(8204 W)	98.43ft	32.81ft
36000 Btu/h(10548 W)	98.43ft	65.62ft
42000 Btu/h(12306 W)	98.43ft	65.62ft
48000 Btu/h(14064 W)	98.43ft	65.62ft

● When the length of connection pipe is above 16.40ft, add refrigerant according to the prolonged length of liquid pipe. The additional refrigerant charging amount per meter is different according to the diameter of liquid pipe. See the following sheet.

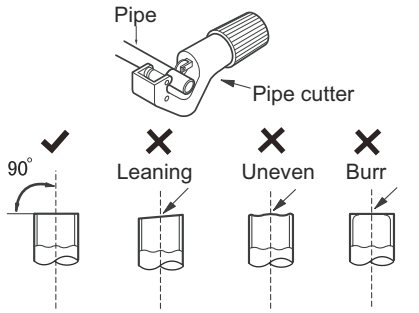
● Additional refrigerant charging amount = prolonged length of liquid pipe X additional refrigerant charging amount per meter

Additional refrigerant charging amount for R22, R407C, R410A and R134a			
Diameter of connection pipe		Outdoor unit throttle	
Liquid pipe(inch)	Gas pipe(inch)	Cooling only(oz/ft.)	Cooling and heating(oz/ft.)
Φ1/4	Φ3/8or Φ1/2	0.2	0.2
Φ1/4 or Φ3/8	Φ5/8 or Φ3/4	0.2	0.2
Φ1/2	Φ3/4 or Φ7/8	0.3	1.3
Φ5/8	Φ1 or Φ1 1/4	0.7	1.3
Φ3/4	/	2.7	2.7
Φ7/8	/	3.8	3.8

Appendix 3: Pipe Flaring Method

⚠ **Note:**

Improper pipe flaring is the main cause of refrigerant leakage. Please flare the pipe according to the following steps:



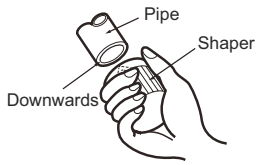
A:Cut the pipe

● Confirm the pipe length according to the distance of indoor unit and outdoor unit.

● Cut the required pipe with pipe cutter.

B:Remove the burrs

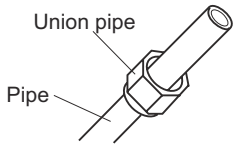
● Remove the burrs with shaper and prevent the burrs from getting into the pipe.



C:Put on suitable insulating pipe

D:Put on the union nut

● Remove the union nut on the indoor connection pipe and outdoor valve; install the union nut on the pipe.



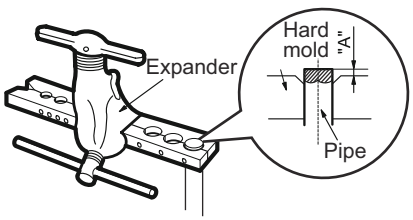
E:Flare the pipe

● Flare the port with expander.

⚠ **Note:**

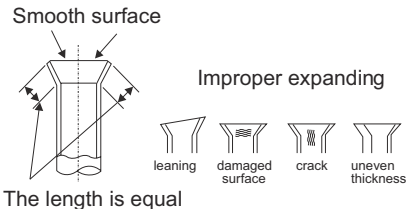
● "A" is different according to the diameter, please refer to the sheet below:

Outer diameter(inch)	A(inch)	
	Max	Min
Φ1/4	2/39	1/36
Φ3/8	1/16	1/51
Φ1/2	1/14	1/51
Φ5/8	5/53	2/23



F:Inspection

● Check the quality of expanding port. If there is any blemish, flare the port again according to the steps above.



Appendix 4: Resistance Values for Temperature Sensors

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

Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)
-2.2	138.1		68	18.75		138.2	3.848		208.4	1.071
-0.4	128.6		69.8	17.93		140	3.711		210.2	1.039
1.4	121.6		71.6	17.14		141.8	3.579		212	1.009
3.2	115		73.4	16.39		143.6	3.454		213.8	0.98
5	108.7		75.2	15.68		145.4	3.333		215.6	0.952
6.8	102.9		77	15		147.2	3.217		217.4	0.925
8.6	97.4		78.8	14.36		149	3.105		219.2	0.898
10.4	92.22		80.6	13.74		150.8	2.998		221	0.873
12.2	87.35		82.4	13.16		152.6	2.896		222.8	0.848
14	82.75		84.2	12.6		154.4	2.797		224.6	0.825
15.8	78.43		86	12.07		156.2	2.702		226.4	0.802
17.6	74.35		87.8	11.57		158	2.611		228.2	0.779
19.4	70.5		89.6	11.09		159.8	2.523		230	0.758
21.2	66.88		91.4	10.63		161.6	2.439		231.8	0.737
23	63.46		93.2	10.2		163.4	2.358		233.6	0.717
24.8	60.23		95	9.779		165.2	2.28		235.4	0.697
26.6	57.18		96.8	9.382		167	2.206		237.2	0.678
28.4	54.31		98.6	9.003		168.8	2.133		239	0.66
30.2	51.59		100.4	8.642		170.6	2.064		240.8	0.642
32	49.02		102.2	8.297		172.4	1.997		242.6	0.625
33.8	46.6		104	7.967		174.2	1.933		244.4	0.608
35.6	44.31		105.8	7.653		176	1.871		246.2	0.592
37.4	42.14		107.6	7.352		177.8	1.811		248	0.577
39.2	40.09		109.4	7.065		179.6	1.754		249.8	0.561
41	38.15		111.2	6.791		181.4	1.699		251.6	0.547
42.8	36.32		113	6.529		183.2	1.645		253.4	0.532
44.6	34.58		114.8	6.278		185	1.594		255.2	0.519
46.4	32.94		116.6	6.038		186.8	1.544		257	0.505
48.2	31.38		118.4	5.809		188.6	1.497		258.8	0.492
50	29.9		120.2	5.589		190.4	1.451		260.6	0.48
51.8	28.51		122	5.379		192.2	1.408		262.4	0.467
53.6	27.18		123.8	5.197		194	1.363		264.2	0.456
55.4	25.92		125.6	4.986		195.8	1.322		266	0.444
57.2	24.73		127.4	4.802		197.6	1.282		267.8	0.433
59	23.6		129.2	4.625		199.4	1.244		269.6	0.422
60.8	22.53		131	4.456		201.2	1.207		271.4	0.412
62.6	21.51		132.8	4.294		203	1.171		273.2	0.401
64.4	20.54		134.6	4.139		204.8	1.136		275	0.391
66.2	19.63		136.4	3.99		206.6	1.103		276.8	0.382

Resistance Table of Tube Temperature Sensors for Outdoor and Indoor(20K)

Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)
-2.2	181.4		68	25.01		138.2	5.13		208.4	1.427
-0.4	171.4		69.8	23.9		140	4.948		210.2	1.386
1.4	162.1		71.6	22.85		141.8	4.773		212	1.346
3.2	153.3		73.4	21.85		143.6	4.605		213.8	1.307
5	145		75.2	20.9		145.4	4.443		215.6	1.269
6.8	137.2		77	20		147.2	4.289		217.4	1.233
8.6	129.9		78.8	19.14		149	4.14		219.2	1.198
10.4	123		80.6	18.13		150.8	3.998		221	1.164
12.2	116.5		82.4	17.55		152.6	3.861		222.8	1.131
14	110.3		84.2	16.8		154.4	3.729		224.6	1.099
15.8	104.6		86	16.1		156.2	3.603		226.4	1.069
17.6	99.13		87.8	15.43		158	3.481		228.2	1.039
19.4	94		89.6	14.79		159.8	3.364		230	1.01
21.2	89.17		91.4	14.18		161.6	3.252		231.8	0.983
23	84.61		93.2	13.59		163.4	3.144		233.6	0.956
24.8	80.31		95	13.04		165.2	3.04		235.4	0.93
26.6	76.24		96.8	12.51		167	2.94		237.2	0.904
28.4	72.41		98.6	12		168.8	2.844		239	0.88
30.2	68.79		100.4	11.52		170.6	2.752		240.8	0.856
32	65.37		102.2	11.06		172.4	2.663		242.6	0.833
33.8	62.13		104	10.62		174.2	2.577		244.4	0.811
35.6	59.08		105.8	10.2		176	2.495		246.2	0.77
37.4	56.19		107.6	9.803		177.8	2.415		248	0.769
39.2	53.46		109.4	9.42		179.6	2.339		249.8	0.746
41	50.87		111.2	9.054		181.4	2.265		251.6	0.729
42.8	48.42		113	8.705		183.2	2.194		253.4	0.71
44.6	46.11		114.8	8.37		185	2.125		255.2	0.692
46.4	43.92		116.6	8.051		186.8	2.059		257	0.674
48.2	41.84		118.4	7.745		188.6	1.996		258.8	0.658
50	39.87		120.2	7.453		190.4	1.934		260.6	0.64
51.8	38.01		122	7.173		192.2	1.875		262.4	0.623
53.6	36.24		123.8	6.905		194	1.818		264.2	0.607
55.4	34.57		125.6	6.648		195.8	1.736		266	0.592
57.2	32.98		127.4	6.403		197.6	1.71		267.8	0.577
59	31.47		129.2	6.167		199.4	1.658		269.6	0.563
60.8	30.04		131	5.942		201.2	1.609		271.4	0.549
62.6	28.68		132.8	5.726		203	1.561		273.2	0.535
64.4	27.39		134.6	5.519		204.8	1.515		275	0.521
66.2	26.17		136.4	5.32		206.6	1.47		276.8	0.509

Resistance Table of Discharge Temperature Sensor for Outdoor(50K)

Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)		Temp.(°F)	Resistance(kΩ)
-20.2	853.5		50	98		120.2	18.34		190.4	4.754
-18.4	799.8		51.8	93.42		122	17.65		192.2	4.609
-16.6	750		53.6	89.07		123.8	16.99		194	4.469
-14.8	703.8		55.4	84.95		125.6	16.36		195.8	4.334
-13	660.8		57.2	81.05		127.4	15.75		197.6	4.204
-11.2	620.8		59	77.35		129.2	15.17		199.4	4.079
-9.4	580.6		60.8	73.83		131	14.62		201.2	3.958
-7.6	548.9		62.6	70.5		132.8	14.09		203	3.841
-5.8	516.6		64.4	67.34		134.6	13.58		204.8	3.728
-4	486.5		66.2	64.33		136.4	13.09		206.6	3.619
-2.2	458.3		68	61.48		138.2	12.62		208.4	3.514
-0.4	432		69.8	58.77		140	12.17		210.2	3.413
1.4	407.4		71.6	56.19		141.8	11.74		212	3.315
3.2	384.5		73.4	53.74		143.6	11.32		213.8	3.22
5	362.9		75.2	51.41		145.4	10.93		215.6	3.129
6.8	342.8		77	49.19		147.2	10.54		217.4	3.04
8.6	323.9		78.8	47.08		149	10.18		219.2	2.955
10.4	306.2		80.6	45.07		150.8	9.827		221	2.872
12.2	289.6		82.4	43.16		152.6	9.489		222.8	2.792
14	274		84.2	41.34		154.4	9.165		224.6	2.715
15.8	259.3		86	39.61		156.2	8.854		226.4	2.64
17.6	245.6		87.8	37.96		158	8.555		228.2	2.568
19.4	232.6		89.6	36.38		159.8	8.268		230	2.498
21.2	220.5		91.4	34.88		161.6	7.991		231.8	2.431
23	209		93.2	33.45		163.4	7.726		233.6	2.365
24.8	198.3		95	32.09		165.2	7.47		235.4	2.302
26.6	199.1		96.8	30.79		167	7.224		237.2	2.241
28.4	178.5		98.6	29.54		168.8	6.998		239	2.182
30.2	169.5		100.4	28.36		170.6	6.761		240.8	2.124
32	161		102.2	27.23		172.4	6.542		242.6	2.069
33.8	153		104	26.15		174.2	6.331		244.4	2.015
35.6	145.4		105.8	25.11		176	6.129		246.2	1.963
37.4	138.3		107.6	24.13		177.8	5.933		248	1.912
39.2	131.5		109.4	23.19		179.6	5.746		249.8	1.863
41	125.1		111.2	22.29		181.4	5.565		251.6	1.816
42.8	119.1		113	21.43		183.2	5.39		253.4	1.77
44.6	113.4		114.8	20.6		185	5.222		255.2	1.725
46.4	108		116.6	19.81		186.8	5.06		257	1.682
48.2	102.8		118.4	19.06		188.6	4.904		258.8	1.64

Appendix 5: Wired Zone Controller

1 Controller Interface

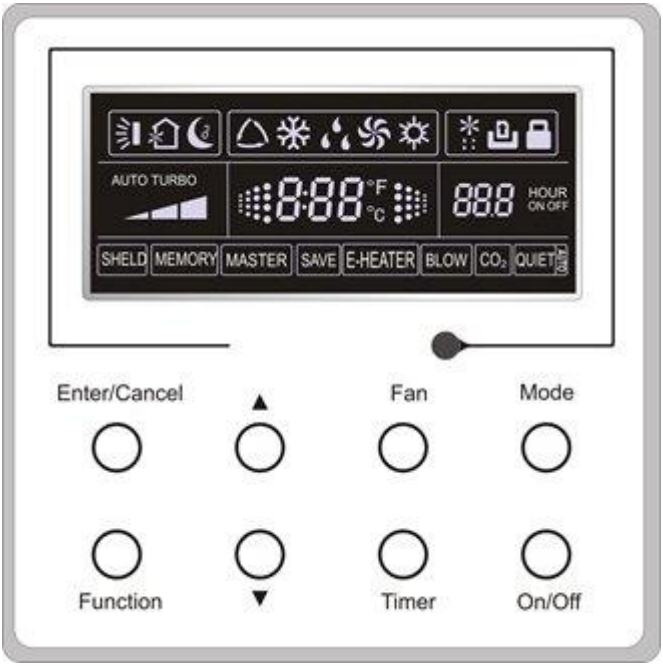


Fig1.1.1 Wired Zone Controller Interface

1.1 Appearance and LCD Icons

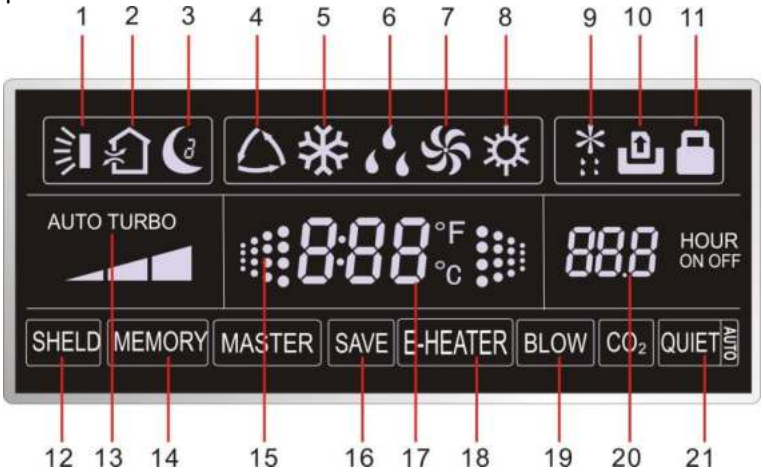


Fig.1.1.2 LCD Display

1.2 Introduction to the LCD Icons

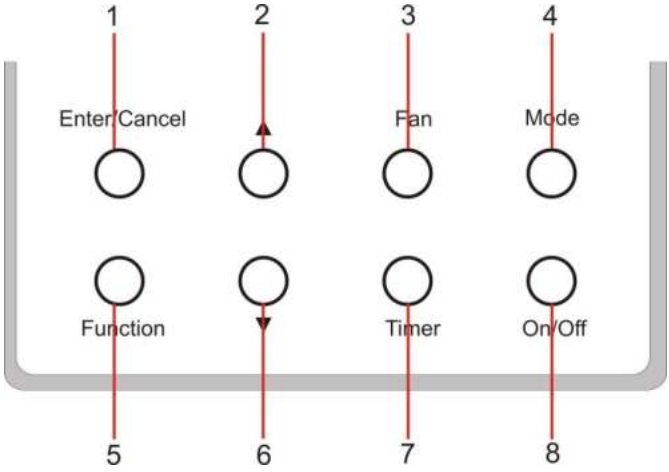
Table 1.1

No.	Symbols	Description
1		Swing function
2		Air exchange function (This function is currently unavailable for this unit.)
3		Sleep function (only Sleep 1).
4		Each kind of running mode of indoor unit (auto mode)
5		Cooling mode
6		Dry mode
7		Fan mode
8		Heating mode
9		Defrosting function for the outdoor unit.
10		Keycard control (This function is currently unavailable for this unit.)
11		Lock function.
12	SHIELD	Shield function: The button operation, temperature setting, "On/Off" operation, "Mode" setting, and "Save" setting are disabled.
13	Turbo	Turbo function state
14	MEMORY	Memory function (The indoor unit resumes the original setting state after power failure and then power recovery.)
15		It blinks under On state of the unit without operation of any button.
16	SAVE	Energy-saving function (This function is currently unavailable for this unit).
17		Ambient/setting temperature value
18	E-HEATER	Electric auxiliary heating function.
19	BLOW	Blower function.

20		Timing value.
21	QUIET	Quiet function (Two types: quiet and auto quiet) (This function is currently unavailable for this unit).

2 Buttons

2.1 Layout of Buttons



2.2 Functions of Buttons

Table 2.1

No.	Name	Function
1	Enter/Cancel	Function selection and cancellation.
2	▲	①.Running temperature setpoint of the indoor unit, range: 60ºF to 86ºF (16ºC to 30ºC). ②.Timer setting, range: 0.5 hr. to 24 hrs.
6	▼	
3	Fan	Select high/middle/low/auto fan speed.
4	Mode	Select Cooling/Heating/Fan/Dry/Auto mode of the indoor unit.
5	Function	Switching between the functions of Turbo/Save/E-heater/Blow
7	Timer	Timer setting.
8	On/Off	Turns the indoor unit on/off
4+2	▲+ Mode (Memory)	Press and hold these buttons for five seconds while the unit is OFF to enter/cancel the Memory function. (If memory is set for the indoor unit after a power failure, power recovery will resume as the original setting state. If not, the indoor unit is defaulted to be OFF after power recovery. Memory OFF is the default factory setting.).

2+6	▲+▼ (Lock)	Upon start-up of a unit that had no malfunction or when the unit is OFF, press them at the same time for five seconds to enter a lock state. In this instance, no other buttons will respond if pressed. Press them again for five seconds to discontinue this condition.

3 Operation Instructions

3.1 On/Off

Press On/Off to turn ON the unit and turn it OFF by pressing the button again.

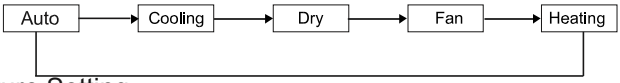
Note: Fig.3.1.1 indicates the “Off” state of the unit after applying power. Fig.3.1.2 indicates the “On” state of the unit after applying power.

Fig.3.1.1 “Off” State

Fig.3.1.2 “On” State

3.2 Mode Setting

Under the “On” state of the unit, press the Mode button to switch the operation modes as in the following sequence: Auto–Cooling–Dry–Fan–Heating.



3.3 Temperature Setting

Press ▲or ▼ to increase/decrease the preset temperature. If pressing either of them continuously, the temperature will be increased or decreased by 1°F every 0.5 second, as shown in Fig.3.3.1. below

In the Cooling, Dry, Fan or Heating mode, the temperature setting range is 60.8°F to 86°F (16°Cto 30°C).

In the Auto mode, the setting temperature is not adjustable.

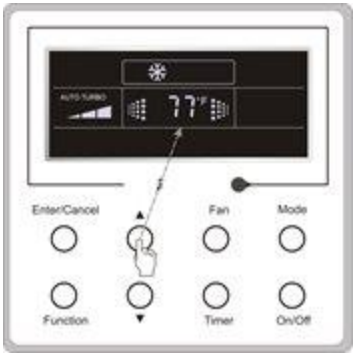


Fig.3.3.1

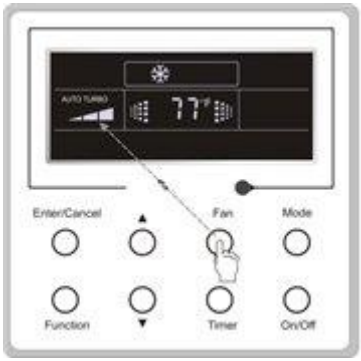
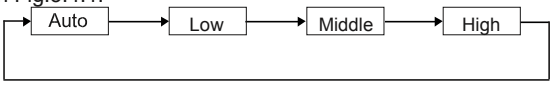


Fig.3.4.1

3.4 Fan Setting

In the “On” state of the unit, press Fan and then the fan speed of the indoor unit will change sequentially as shown in Fig.3.4.1.



3.5 Timer Setting

In the “On” state of the unitpress the Timer button to set the timer ”Off” on the unit. In the “Off”-state of the unit, press the Timer button to set the timer ”On” in the same way.

• Timer “On” setting:

In the “Off” state of the unit without a timer setting, if the Timer button is pressed, the LCD will display the hourwith ON blinking. In this case, press the ▲ or ▼ button to adjust the timer. Then press Timer to confirm.

• Timer “Off” setting:

In the “On”-state of the unit without a timer setting, if the Timer button is pressed, the LCD will display the hour with OFF blinking. In this case, press the ▲ or ▼ button to adjust the timer ON. Then press Timer to confirm.

• Cancel timer:

After setting the timer, if the Timer button is pressed, the LCD won’t display that the hour so the timer setting is canceled.

Timer “Off” setting under the “On” state of the unit is shown in Fig.3.5.1 below.

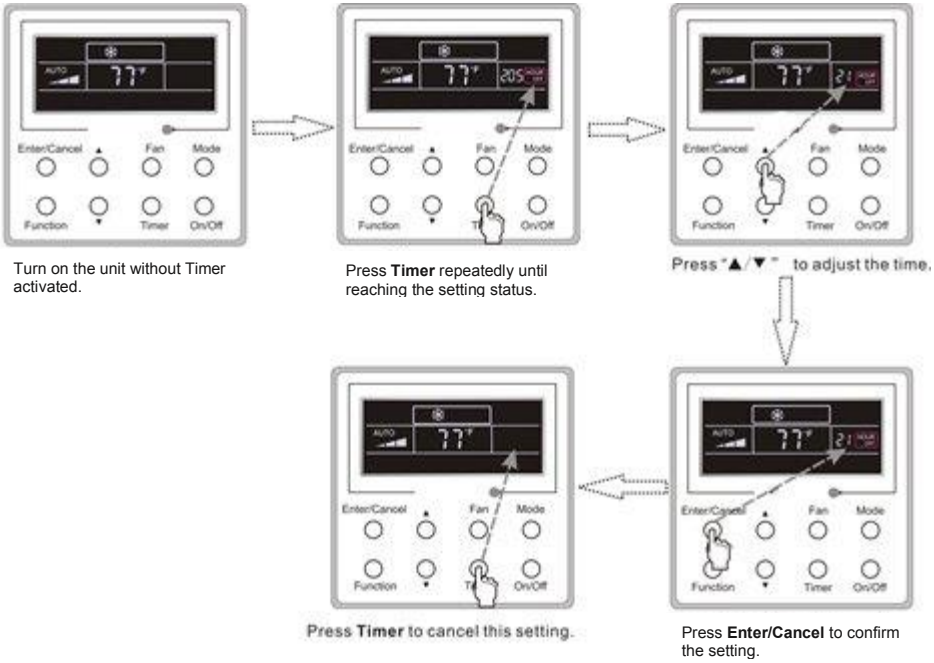


Fig.3.5.1 Timer

Off" Setting under the "On" State of the Unit

Timer "On" setting under the "Off" state of the unit is shown in Fig.3.5.2 below.

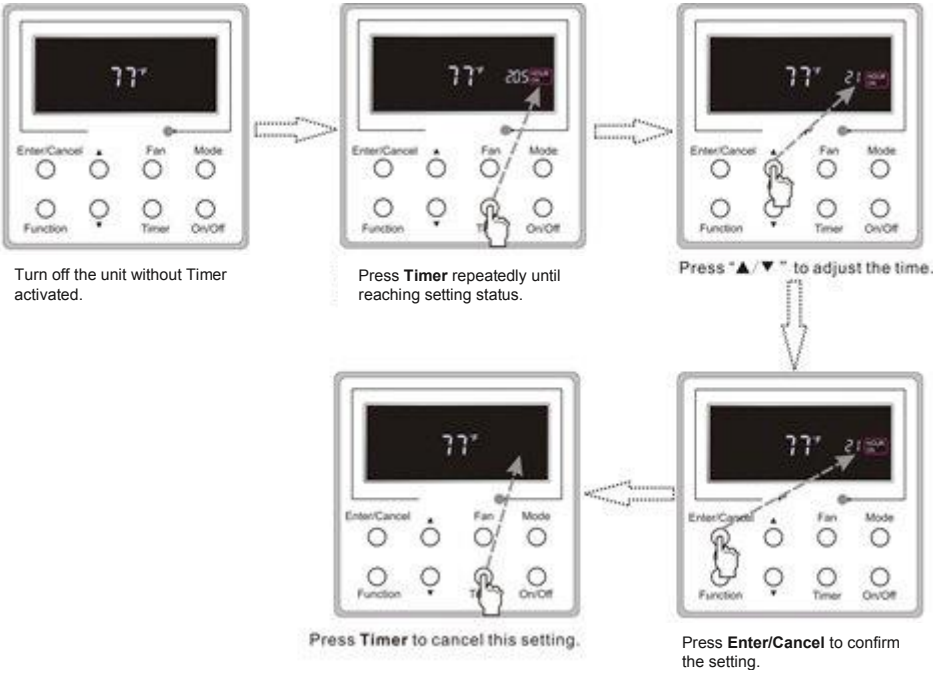


Fig.3.5.2 Timer "On" Setting under the "Off" State of the Unit

Timer range: 0.5 hr. to 24hrs. Every press of ▲or ▼ will increase or decrease the set time by 0.5 hr. If either of them is pressed continuously, the set time will increase/decrease by 0.5 hr. every 0.5 second.

3.6 Swing Setting

Swing On: Press "Function "in the "On" state of the unit to activate the swing function. In this case, will blink. After that, press Enter/Cancel to confirm.

Swing Off: When the Swing function is "On", press "Function" to enter the Swing setting interface seen as blinking. After that, press "Enter/Cancel" to cancel this function.

The Swing setting is shown in Fig.3.6.1 below.

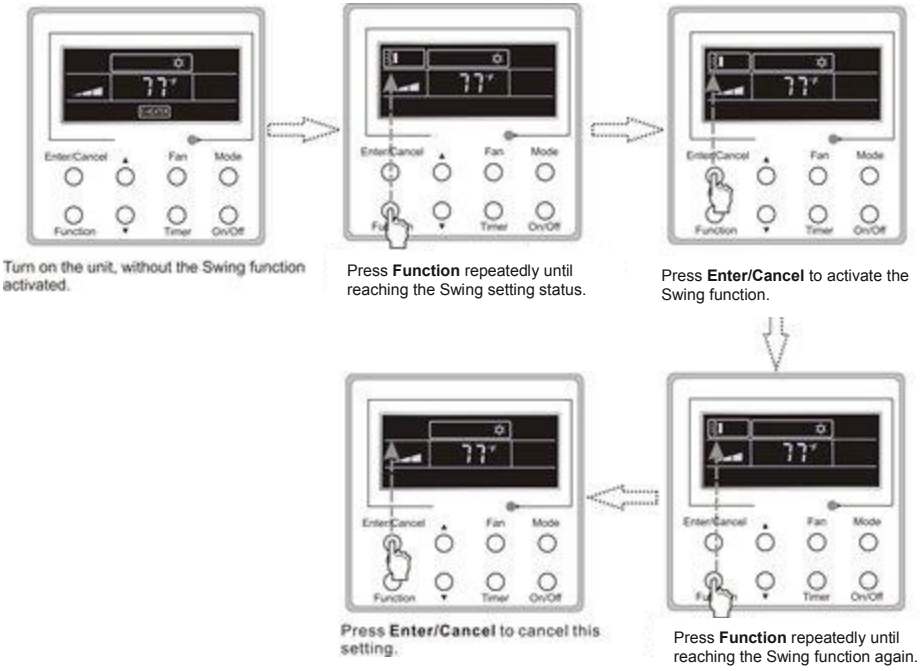


Fig.3.6.1 Swing Setting

Notes:

①. Access Sleep, Turbo or Blow setting the same as the Swing setting.

②. After the setting has been done, press “Enter/Cancel” to return to the setting status or quit automatically five seconds later.

3.7 Sleep Setting

Sleep On: Press “Function” in the “On” state of the unit until entering the Sleep setting state. After that, press “Enter/Cancel” to confirm this setting.
Sleep Off: When the Sleep function is activated, press “Function” to enter the Sleep setting status. After that, press “Enter/Cancel” to cancel this function.

In the Cooling or Dry mode, the temperature will increase by 1°F after the unit runs under Sleep1 for one hour and 1°F after another hour. After that, the unit will continue to run at this temperature.

In the Heating mode, the temperature will decrease by 1°F after the unit runs under Sleep 1 for one hour and 1°F after another hour. After that, the unit will continue to run at this temperature.

Sleep setting is shown in Fig.3.7.1 below.

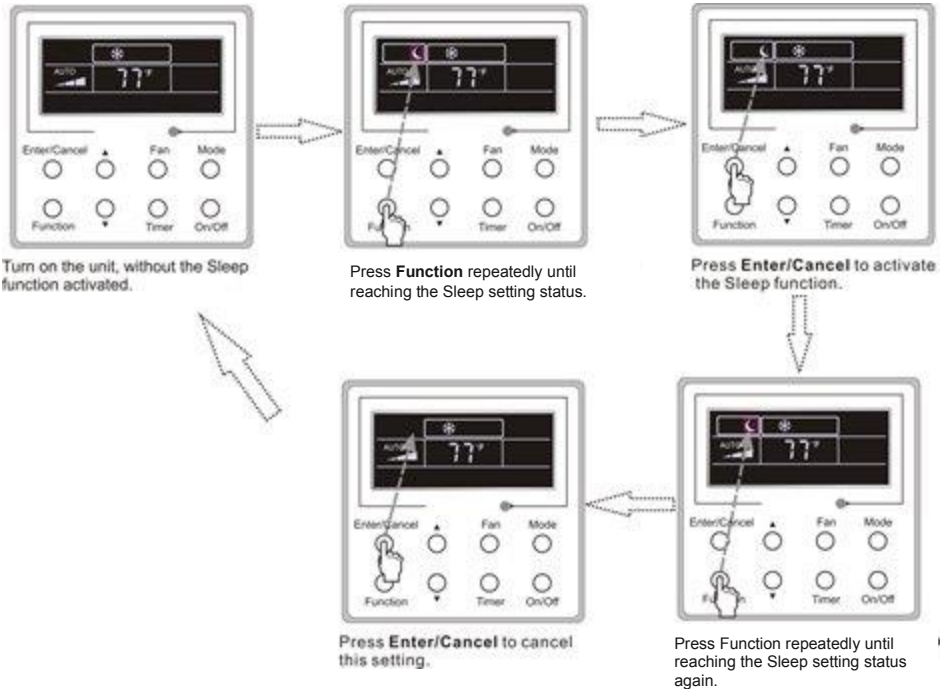


Fig.3.7.1. Sleep Setting

3.8 Turbo Setting

Turbo function: The unit at the high fan speed can realize quick cooling or heating so that the room temperature can quickly approach the setting value.

In the Cooling or Heating mode, press “Function” until the unit enters the Turbo setting status. Then press “Enter/Cancel” to confirm the setting.

When the Turbo function is activated, press “Function” to enter the Turbo setting status. Then press “Enter/Cancel” to cancel this function.

Turbo function setting is shown in Fig.3.8.1 below.

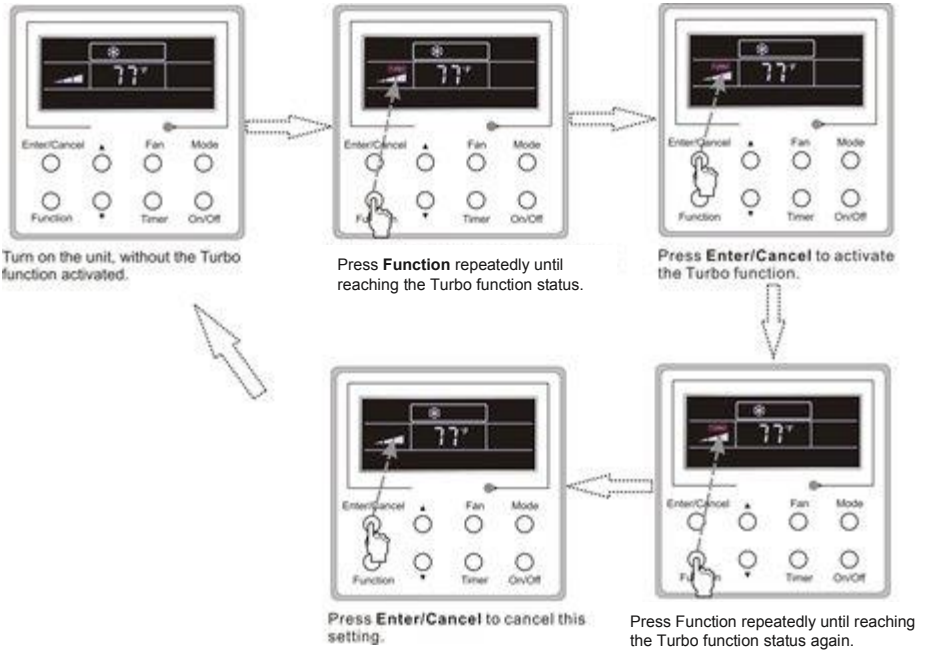


Fig.3.8.1 Turbo Setting

3.9 E-heater Setting

E-heater (auxiliary electric heating function): In the Heating mode, E-heater can be turned on for improved efficiency.

Once the wired zone controller or the remote controller enters the Heating mode, this function will turn on automatically.

Press “Function” in the Heating mode to enter the E-heater setting interface. Then press “Enter/Cancel” to cancel this function.

Press “Function” to enter the E-heater setting status if the E-heater function is not activated. Then press “Enter/Cancel: to activate it.

The setting of this function is shown in Fig.3.9.1 below.

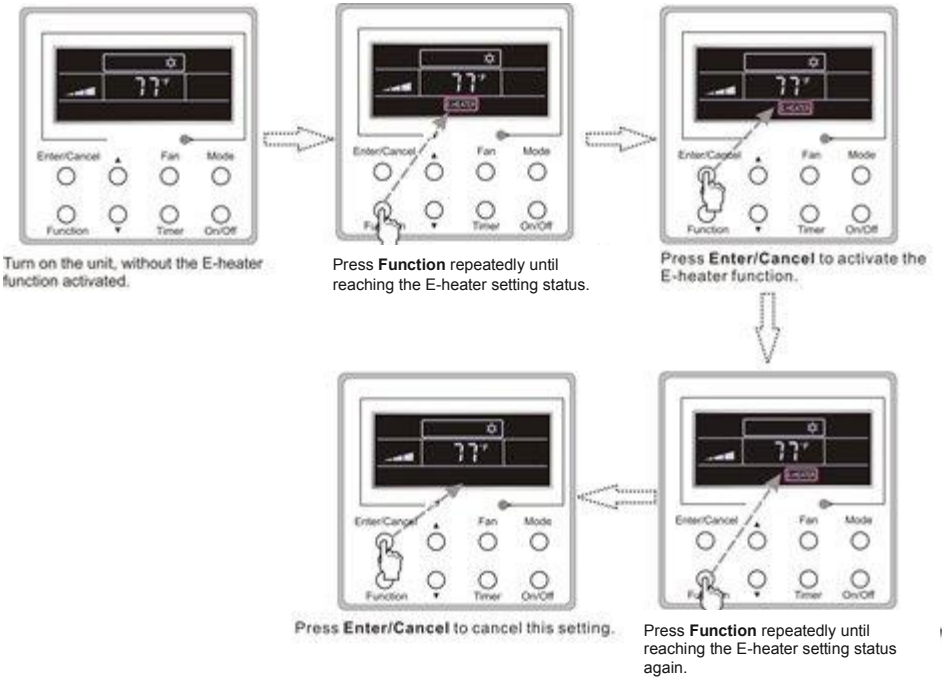


Fig.3.9.1 E-heater Setting

3.10 Blow Setting

Blow function: After the unit is turned off, this function assists in water evaporation to avoid mildew in the indoor unit.

In the Cooling or Dry mode, press “Function” until the unit enters the Blow setting status. Then press “Enter/Cancel” to activate this function.

When the Blow function is activated, press “Function” repeatedly until reaching the Blow setting status. Then press “Enter/Cancel” to cancel this function.

The Blow function setting is shown in Fig.3.10.1 below.

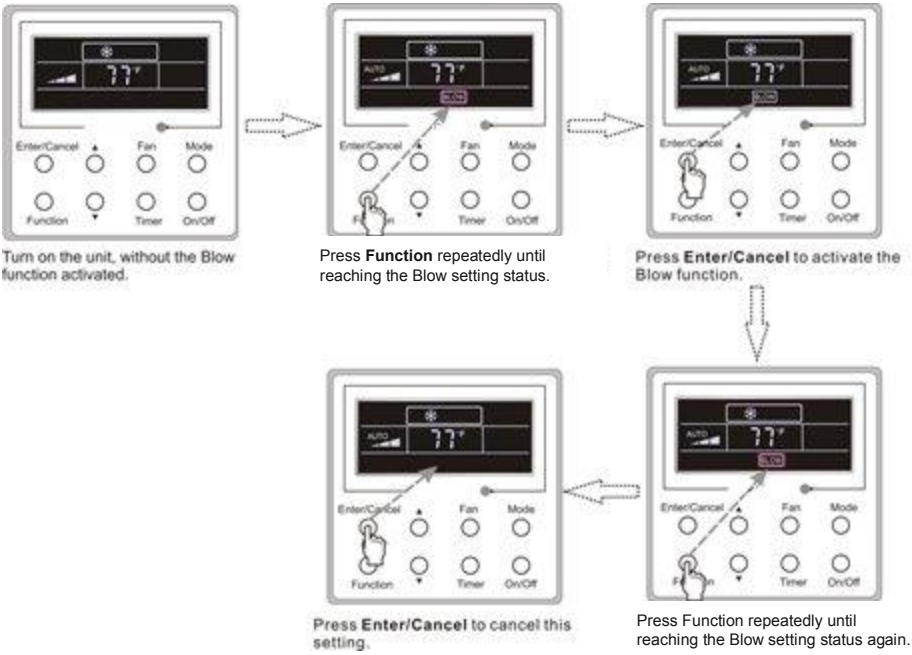


Fig.3.10.1 Blow Setting

Notes:

①. When the Blow function is activated, if turning off the unit by pressing On/Off or using the remote controller, the indoor fan will run at the low fan speed for two minutes, with “BLOW” displayed on the LCD. But if the Blow function is deactivated, the indoor fan will turn off automatically.

②. Blow function is not available in the Fan or Heating mode.

3.11 Other Functions

a. Lock

Upon start-up of a unit with no malfunction or under the “Off” state of the unit, press ▲ and ▼ at the same time for five seconds until the wired zone controller enters the Lock function. In this case, the LCD displays .

After that, repress these two buttons at the same time for five seconds to quit this function.

Under the Lock state, any other button pressed won’t work.

b. Memory

Memory switch-over: In the “Off” state of the unit, press “Mode” and ▲ at the same time for five seconds to switch memory states between memory ON and memory OFF. When this function is activated, Memory will be displayed. If this function is not set, the unit will be in the “Off” state after a power failure and then power recovery.

Memory recovery: If this function has been set for the wired zone controller, after a power failure the wired zone controller will resume its original running state upon power recovery.

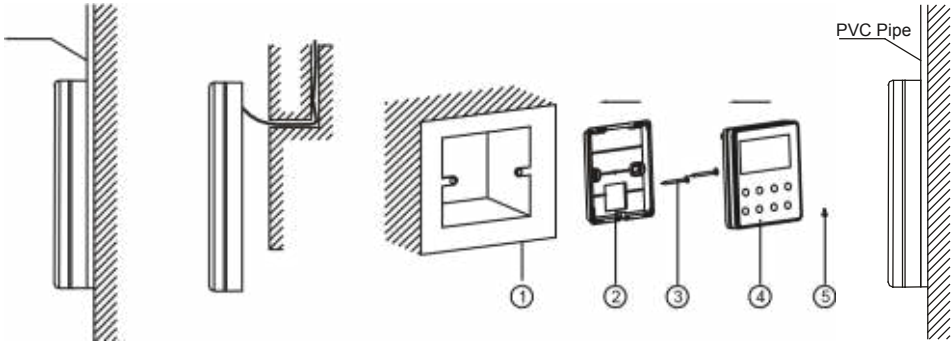
Memory contents: On/ Off Mode, set temperature, set fan speed and Lock function.

Note: It will take about five seconds to save data. Therefore, please do not turn off the power at this time, or data will not be saved.

4 Installation and Removal

4.1 Connection of Signal Wire of the Wired Zone Controller

- Open the cover of the electrical control box of the indoor unit.
- Place the single line of the wired zone controller through the rubber ring.
- Connect the signal line of the wired zone controller to the 4-pin socket of the indoor unit PCB.
- Tighten the signal wire with ties.
- The communication distance between the main board and the wired zone controller can be up to 65 ft. (20m). The standard distance is 26-1/4 ft. (8m).



4.2 Installation of the Wired Zone Controller

Fig.4.1 Accessories for Installation of the Wired Zone Controller

Table 4.1

No.	1	2	3	4	5
Name	Socket box embedded in the wall	Soleplate of the Wired Zone Controller	Screw M4X25	Front Panel of the Wired Zone Controller	Screw ST 2.9X6

⚠CAUTION

Please pay special attention to the following during the connection to avoid malfunction of the air conditioning unit due to electromagnetic interference (EMI).

1) Separate the signal and communication cables of the wired zone controller from the power cord and connection cables between the indoor and outdoor unit with a minimum interval of 8 in. (20cm). Otherwise, the communication of the unit will probably work abnormally.

2) If the air conditioning unit is installed where it is vulnerable to electromagnetic interference (EMI), then the signal and communication cables of the wired zone controller must be shielded communication cable.

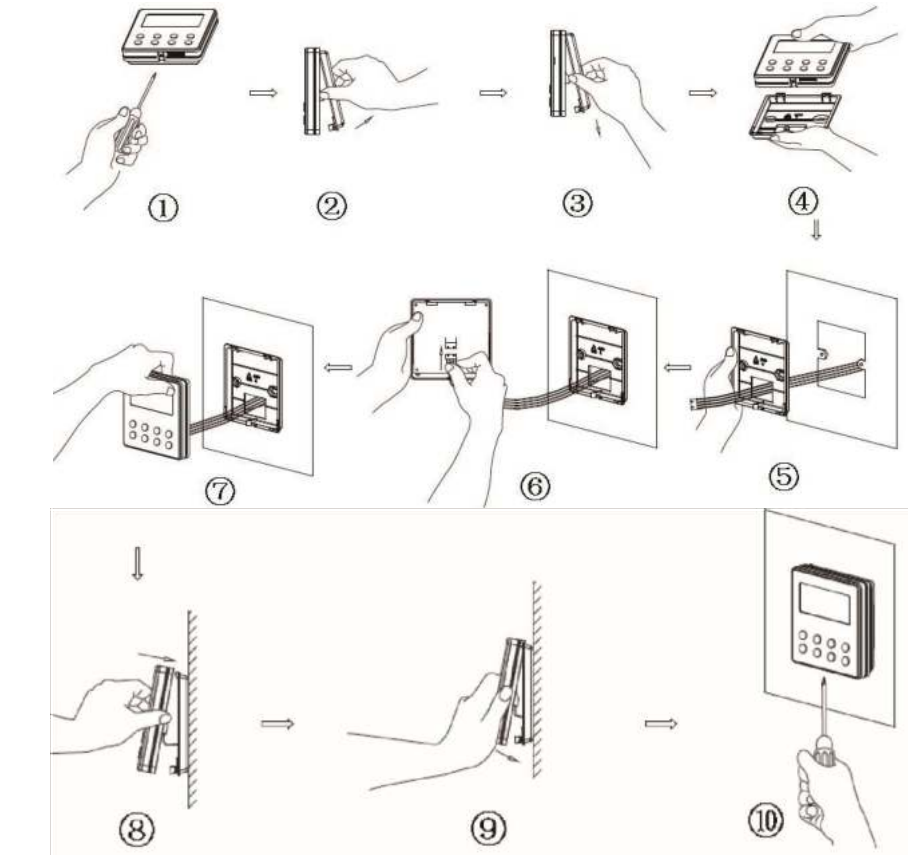


Fig.4.2

Fig.4.2 shows the installation steps for the wired zone controller. Pay attention to the following before completing the installation.

1) Prior to the installation, first DISCONNECT THE POWER SUPPLY of the wire buried in the installation opening. No operation should be performed with the power on during the entire installation.

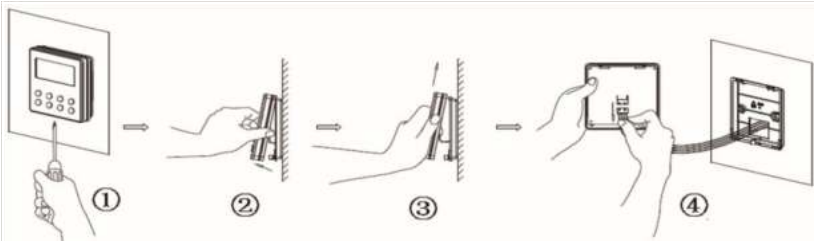
2) Pull out the four conductor communication cable from the installation opening and then place it through the rectangular opening behind the soleplate of the wired zone controller.

3) Place the soleplate of the wired zone controller on the wall over the installation opening and secure it with screws M4X25.

4) Insert the four conductor communication cable into the slot of the wired zone controller and then secure the front panel and the soleplate of the wired zone controller together.

5) Finally, secure the front panel and the soleplate of the wired zone controller tightly with screws ST2.9X6.

4.3 Removal of the Wired Zone Controller



5 Errors Display

If there is an error occurring during the operation of the system, the error code will be displayed on the LCD, as show in Fig.5.1. If multiple errors occur at the same time, their codes will be displayed in a sequential fashion.

Note: If an error code is displayed, reference Table 5.1 below for error code explanation and contact you service representative for further assistance.

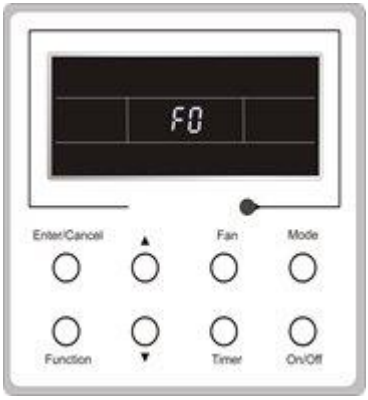


Fig.5.1

Table 5.1 Definition of Each Error

Error	Error Code	Error	Error Code
Return air temperature sensor open/ short circuited	F1	Drive board communication error	P6
Evaporator temperature sensor open/ short circuited	F2	Compressor overheating protection	H3
Indoor unit liquid valve temperature sensor open/short circuited	b5	Indoor and outdoor units unmatched	LP
Indoor gas valve temperature sensor open/ short circuited	b7	Communication line misconnected or expansion valve error	dn
IPM temperature sensor open/short circuited	P7	Running mode conflict	E7
Outdoor ambient temperature sensor open/ short circuited	F3	Pump-down	Fo
Outdoor unit condenser mid-tube temperature sensor open/short circuited	F4	Jumper error	C5

Discharge temperature sensor open/ short circuited	F5	Forced defrosting	H1
Indoor and outdoor communication error	E6	Compressor startup failure	Lc
DC bus under-voltage protection	PL	High discharge temperature protection	E4
DC bus over-voltage protection	PH	Overload protection	E8
Compressor phase current sensing circuit error	U1	Whole unit over-current protection	E5
Compressor demagnetization protection	HE	Over phase current protection	P5
PFC protection	Hc	Compressor desynchronizing	H7
IPM Temperature Protection	P8	IPM Current protection	H5
Over-power protection	L9	Compressor phase loss/reversal protection	Ld
System charge shortage or blockage protection	F0	Frequency restricted/reduced with whole unit current protection	F8
Capacitor charging error	PU	Frequency restricted/reduced with IPM current protection	En
High pressure protection	E1	Frequency restricted/reduced with high discharge temperature	F9
Low pressure protection	E3	Frequency restricted/reduced with antifreeze protection	FH
Compressor stalling	LE	Frequency restricted/reduced with overload protection	F6
Over-speeding	LF	Frequency restricted/reduced with IPM temperature protection	EU
Drive board temperature sensor error	PF	Indoor unit condensation error	E9
AC contactor protection	P9	Anti-freezing protection	E2
Temperature drift protection	PE	AC input voltage abnormal	PP
Sensor connection protection	Pd	Whole unit current sensing circuit error	U5
DC bus voltage drop error	U3	4-way valve reversing error	U7
Outdoor fan 1 error protection	L3	Motor stalling	H6
Outdoor fan 2 error protection	LA	PG motor zero-crossing protection	U8

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

Product improvement, specifications and appearance in this manual are subject to change without prior notice.

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