SAMSUNG

SPLIT-TYPE AIR CONDITIONER

Model Code:

INDOOR UNIT	OUTDOOR UNIT
AR40H09C1AMNEU	AR40H09C1AMXEU
AR40H12C1AMNEU	AR40H12C1AMXEU
AR40H18C1AMNEU	AR40H18C1AMXEU
AR40H24C1AMNEU	AR40H24C1AMXEU
AR40H09C1BMNEU	AR40H09C1BMXEU
AR40H12C1BMNEU	AR40H12C1BMXEU

SERVICE Manual

AIR CONDITIONER

AR40H09C1AMNEU AR40H12C1AMNEU
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AR40H18C1AMXEU AR40H24C1AMXEU
AR40H09C1BMXEU AR40H12C1BMXEU

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1. Precautions

To prevent personal injury, or property or unit damage, adhere to all precautionary measures and instructions outlined in this manual. Before servicing a unit, refer to this service manual and its relevant sections.

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

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

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

1-1 In case of Accidents or Emergency

WARNING

- If a gas leak is suspected, immediately turn off the gas and ventilate the area if a gas leak is suspected before turning the unit on.
- If strange sounds or smoke is detected from the unit, turn the breaker off and disconnect the power supply cable.
- If the unit comes into contact with liquid, contact an authorized service center.
- If liquid from the batteries makes contact with skin or clothing, immediately rinse or wash the area well with clean water.
- Do not insert hands or other objects into the air inlet or outlet while the unit is plugged in.
- Do not operate the unit with wet hands.
- Do not use a remote controller that has previously been exposed to battery damage or battery leakage.

CAUTION

- Clean and ventilate the unit at regular intervals when operating it near a stove or near similar devices.
- Do not use the unit during severe weather conditions. If possible, remove the product from the window before such occurrences.

1-2 Pre-Installation and Installation

WARNING

- Use this unit only on a dedicated circuit.
- Damage to the installation area could cause the unit to fall, potentially resulting in personal injury, property damage, or product failure.
- Only qualified personnel should disassemble, install, remove, or repair the unit.
- Only a qualified electrician should perform electrical work. For more information, contact your dealer, seller, or an authorized service center.

CAUTION

- While unpacking be careful of sharp edges around the unit as well as the edges of the fins on the condenser and evaporator.

1-3 Operation and Maintenance

WARNING

- Do not use defective or under-rated circuit breakers.
- Ensure the unit is properly grounded and that a dedicated circuit and breaker are installed.
- Do not modify or extend the power cable. Ensure the power cable is secure and not damaged during operation.
- Do not unplug the power supply plug during operation.
- Do not store or use flammable materials near the unit.
- Do not open the inlet grill of the unit during operation.
- Do not touch the electrostatic filter if the unit is equipped with one.
- Do not block the inlet or outlet of air flow to the unit.
- Do not use harsh detergents, solvents, or similar items to clean the unit. Use a soft cloth for cleaning.
- Do not touch the metal parts of the unit when removing the air filter as they are very sharp.
- Do not step on or place anything on the unit or outdoor units.
- Do not drink water drained from the unit
- Avoid direct skin contact with water drained from the unit.
- Use a firm stool or step ladder according to manufacturer procedures when cleaning or maintaining the unit.

CAUTION

- Do not install or operate the unit for an extended period of time in areas of high humidity or in an environment directly exposing it to sea wind or salt spray.
- Do not install the unit on a defective or damaged installation stand, or in an unsecure location.
- Ensure the unit is installed at a level position
- Do not install the unit where noise or air discharge created by the outdoor unit will negatively impact the environment or nearby residences.
- Do not expose skin directly to the air discharged by the unit for prolonged periods of time.
- Ensure the unit operates in areas water or other liquids.
- Ensure the drain hose is installed correctly to ensure proper water drainage.
- When lifting or transporting the unit, it is recommended that two or more people are used for this task.
- When the unit is not to be used for an extended time, disconnect the power supply or turn off the breaker.

1-4 Information servicing(For flammable materials)

4.1 Checks to the area

- Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized.
- For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

4.2 Work procedure

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

4.3 Work procedure

- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out.
- Work in confined spaces shall be avoided.
- The area around the work space shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

4.4 Checking for presence of refrigerant

- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. no sparking, adequately sealed or intrinsically safe.

4.5 Presence of fire extinguisher

- If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand.
- Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

4.6 No ignition sources

- No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion.
- All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space.
- Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks.
- NO SMOKING signs shall be displayed.

4.7 Ventilated area

- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

4.8 Checks to the refrigeration equipment

- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance. The following checks shall be applied to installations using flammable refrigerants:
  - the charge size is in accordance with the room size within which the refrigerant containing parts are installed;
  - the ventilation machinery and outlets are operating adequately and are not obstructed;
  - if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant; marking to the equipment continues to be visible and legible.
  - markings and signs that are illegible shall be corrected;
  - refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

4.9 Checks to electrical devices

- Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include:

- that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- that there no live electrical components and wiring are exposed while charging, recovering or purging the system;
- that there is continuity of earth bonding.

4.10 Repairs to sealed components

- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
  - Ensure that apparatus is mounted securely.
  - Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE: The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

4.11 Repair to intrinsically safe components

- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.
- Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

4.12 Cabling

- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

4.13 Detection of flammable refrigerants

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

4.14 Leak detection methods

- The following leak detection methods are deemed acceptable for systems containing flammable refrigerants. Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
  - If a leak is suspected, all naked flames shall be removed or extinguished.
  - If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the systemremote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

4.15 Removal and evacuation

- When breaking into the refrigerant circuit to make repairs or for any other purpose, conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration.
- The following procedure shall be adhered to:
  - remove refrigerant;
  - purge the circuit with inert gas;
  - evacuate;
  - purge again with inert gas;
  - open the circuit by cutting or brazing.

- The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be flushed with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task. Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.
- Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

4.16 Charging procedures

- In addition to conventional charging procedures, the following requirements shall be followed:
  - Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
  - Cylinders shall be kept upright.
  - Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
  - Label the system when charging is complete (if not already).
  - Extreme care shall be taken not to overfill the refrigeration system.
  - Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

4.17 Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken.

In case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

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

4.18 Labelling

- Equipment shall be labelled stating that it has been de-commissioned and emptied of
- refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

4.19 Recovery

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct numbers of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order.

- Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order.
- Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

2. Product Specifications

2-1 The Feature of Product

Cool Summer Offer

On those hot sweltering summer days and long restless nights, there is no better escape from the heat than the cool comforts of home. Your new air conditioner brings an end to exhausting hot summer days and lets you rest. Beat the heat with your own air conditioner this summer.

Cost Efficient System

Your new air conditioner not only provides maximum cooling power in the summer, but also can be an efficient heating method in the winter with the advanced "Heat pump" system. "Heat pump" system is 3 times more efficient compare to the other electrical heating appliance, so you can further reduce its running cost. Now, meet year-round needs with one air conditioner.

Look for Everywhere

The elegant and harmonious design gives priority to the esthetics of your space and complements any of your existing interior décor. With its soft color and rounded-edge shape, the new air conditioner adds class to any room. Enjoy what your air conditioner offers both functionally and

Easy Filter

There is no grille to remove before separating the filter from the air conditioner! Therefore, filter can be cleaned easily, more frequently! Frequent filter cleaning will prevent dust from entering into the product or accumulating on the filter.

good'sleep function

good'sleep function will allow you to have deep, good night's sleep by adjusting the temperature, fan speed and air flow direction.

2-2 Product Specifications

Model			AR40H09C1AMNEU	AR40H12C1AMNEU
Indoor			AR09TXHQASINEU	AR12TXHQASINEU
Power supply		V-Hz-Ph	220-240V,1Ph,50Hz	220-240V,1Ph,50Hz
Design	Indoor			
	Outdoor			
Cooling (Standard conditions)	Capacity	Btu/h	9000	12000
	standard	Btu/h	2.6	3.5
	min/max	kW	0.91 - 3.40	1.11 - 4.16
	Pdesign c	kW	2.8	3.6
	Input	kW	770	1213
	Current	W	3.3	5.3
	EER	A	3.43	2.90
	SEER	℃	6.3	6.1
	Energy Efficiency Class		A++	A++
	annual energy consumption		156	211
Heating (Standard conditions)	Capacity	Btu/h	10000	13000
	standard	kW	2.9	3.8
	min/max	kW	0.82 - 3.37	1.08 - 4.22
	Pdesign h （warmer)	kW	2.6	2.5
	Pdesign h （average)	kW	2.6	2.7
	Input	W	750	1088
	Current	A	3.2	4.7
	COP	W/W	3.91	3.5
	SCOP（warmer）		4.6	4.6
	SCOP（average）		4.0	3.9
	Energy Efficiency Class （warmer)		A++	A+
	Energy Efficiency Class （average)		A+	A
	annual energy consumption （warmer)		791	875
	annual energy consumption （average)		910	969
Tol		℃	-15	-15
Rated Power Input（indoor）		W	20	23
Rated Current（indoor）		A	0.2	0.2
Rated Power Input		W	2150	2150
Rated Current		A	10	10

Start Current		A	inverter model start current is small	inverter model start current is small
Indoor fan motor	Model		YKFG-13-4-38L-4	YKFG-13-4-38L-4
	Input	W	40	40
	Capacitor	uF	1.2	1.2
	Speed(20%/40%/60%/80%/100%/Turbo)	r/min	C: 670/760/850/940/1030/1248 H: 674/768/862/956/1050/1248	C: 746/842/938/1034/1130/1248 H: 750/850/950/1050/1150/1248
Indoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	19.5x11.6	19.5x11.6
	c.Fin spacing	mm	1.2	1.2
	d.Fin type		Hydrophilic aluminum	Hydrophilic aluminum
	e.Tube outside dia.and type	mm	Φ5,Inner groove tube	Φ5,Inner groove tube
	f.Coil length x height x width	mm	595x78x23.2+595x117x23.2+595x78x23.2	595x78x23.2+595x117x23.2+595x78x23.2
	g.Number of circuits		4	4
Moisture Removal		(l/hr	0.9	1.2
Indoor air flow (Hi/Mi/Lo)		m3/h	466/360/325	540/430/314
Indoor sound pressure level (Tu/Hi/Mi/Lo)		dB(A)	45.5/41.0/35.5/32.0	46.0/43.0/39.0/32.0
Indoor sound power level (Cool/Heat)		dB(A)	55	55
Indoor unit	Dimension(W*D*H)	mm	805x194x285	805x194x285
	Packing (W*D*H)	mm	880x285x360	880x285x360
	Net/Gross weight	Kg	8.1/10.7	8.1/10.7
Qty'per 20' /40' /40'HQ		Indoor unit	340/700/810	340/700/810
Compressor	Model		KSK103D33UEZ3	KSK103D33UEZ3
	Type		/	/
	Brand		GMCC	GMCC
	Capacity	W	3250	3250
	Input	W	829	829
	Rated current(RLA)	A	5.6	5.6
	Locked rotor Amp(LRA)	A	/	/
	Thermal protector		/	/
	Thermal protector position		/	/
	Capacitor	μF	/	/
	Refrigerant oil/oil charge	ml	VG74 310	VG74 310
Outdoor fan motor	Model		ZKFN-34-10-1	ZKFN-34-10-1
	Input	W	34	34
	Capacitor	uF	/	/
	Speed	r/min	760	790
Outdoor coil	a.Number of rows		1	1
	b.Tube pitch(a)x row pitch(b)		21x22	21x22
	c.Fin spacing		1.3	1.3
	d.Fin type		Hydrophilic aluminum	Hydrophilic aluminum

	e.Tube outside dia.and type		Φ7,Inner groove tube	Φ7,Inner groove tube
	f.Coil length x height x width	mm	740x462x22	740x462x22
	g.Number of circuits		2	2
Outdoor sound pressure level		dB(A)	55	55
Outdoor sound power level (Cool/Heat)		dB(A)	62	65
Throttle type			Capillary	Capillary
Outdoor unit	Dimension(W*D*H)	mm	720x270x495	720x270x495
	Packing (W*D*H)	mm	835x300x540	835x300x540
	Net/Gross weight	Kg	23.2/25.5	23.2/25.5
Refrigerant type		g	R32/550	R32/0.55
Design pressure		MPa	4.3/1.7	4.3/1.7
Refrigerant piping	Liquid side/ Gas side	mm (inch)	Φ6.35/Φ9.52(1/4"/3/8")	Φ6.35/Φ9.52(1/4"/3/8")
	Max. refrigerant pipe length	m	25	25
	Max. difference in level	m	10	10
Thermostat type			Remote Control	Remote Control
Operation temperature		℃	17-30	17~30
Room temperature	Indoor(cooling/ heating)	℃	17 ~ 32/0 ~ 30	17 ~ 32/0 ~ 30
	Outdoor(cooling/heating)	℃	-15 ~ 50/-15 ~ 24	-15 ~ 50/-15 ~ 24
Qty'per 20' /40' /40'HQ		Outdoor unit	216/432/432	216/432/432
Qty'per 20' /40' /40'HQ		set	130/240/260	130/240/260
Connection wiring			1.5X5(Optional)	1.5X5(Optional)
power cable			No	No

Model			AR40H09C1BMNEU	AR40H12C1BMNEU
Indoor			AR09TXHQBWKNEU	AR12TXHQBWKNEU
Power supply		V-Hz-Ph	220-240V,1Ph,50Hz	220-240V,1Ph,50Hz
Design	Indoor			
	Outdoor			
Cooling (Standard conditions)	Capacity	Btu/h	9000	12000
	standard	Btu/h	2.6	3.5
	min/max	kW	0.91 - 3.40	1.11 - 4.16
	Pdesign c	kW	2.8	3.6
	Input	kW	770	1213
	Current	W	3.3	5.3
	EER	A	3.43	2.90
	SEER	℃	6.3	6.1
	Energy Efficiency Class		A++	A++
	annual energy consumption		156	211
Heating (Standard conditions)	Capacity	Btu/h	10000	13000
	standard	kW	2.9	3.8
	min/max	kW	0.82 - 3.37	1.08 - 4.22
	Pdesign h （warmer)	kW	2.6	2.5
	Pdesign h （average)	kW	2.6	2.7
	Input	W	750	1088
	Current	A	3.2	4.7
	COP	W/W	3.91	3.5
	SCOP（warmer）		4.6	4.6
	SCOP（average）		4.0	3.9
	Energy Efficiency Class （warmer)		A++	A+
	Energy Efficiency Class （average)		A+	A
	annual energy consumption （warmer)		791	875
	annual energy consumption （average)		910	969
Tol		℃	-15	-15
Rated Power Input（indoor）		W	20	23

Rated Current（indoor）		A	0.2	0.2
Rated Power Input		W	2150	2150
Rated Current		A	10	10
Start Current		A	inverter model start current is small	inverter model start current is small
Indoor fan motor	Model		YKFG-13-4-38L-4	YKFG-13-4-38L-4
	Input	W	40	40
	Capacitor	uF	1.2	1.2
	Speed(20%/40%/60%/80%/100%/Turbo)	r/min	C: 670/760/850/940/1030/1248 H: 674/768/862/956/1050/1248	C: 746/842/938/1034/1130/1248 H: 750/850/950/1050/1150/1248
Indoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	19.5x11.6	19.5x11.6
	c.Fin spacing	mm	1.2	1.2
	d.Fin type		Hydrophilic aluminum	Hydrophilic aluminum
	e.Tube outside dia.and type	mm	Φ5,Inner groove tube	Φ5,Inner groove tube
	f.Coil length x height x width	mm	595x78x23.2+595x117x23.2+595x78x23.2	595x78x23.2+595x117x23.2+595x78x23.2
	g.Number of circuits		4	4
Moisture Removal		(l/hr	0.9	1.2
Indoor air flow (Hi/Mi/Lo)		m3/h	466/360/325	540/430/314
Indoor sound pressure level (Tu/Hi/Mi/Lo)		dB(A)	45.5/41.0/35.5/32.0	46.0/43.0/39.0/32.0
Indoor sound power level (Cool/Heat)		dB(A)	55	55
Indoor unit	Dimension(W*D*H)	mm	805x194x285	805x194x285
	Packing (W*D*H)	mm	880x285x360	880x285x360
	Net/Gross weight	Kg	8.1/10.7	8.1/10.7
Qty'per 20' /40' /40'HQ		Indoor unit	340/700/810	340/700/810
Compressor	Model		KSK103D33UEZ3	KSK103D33UEZ3
	Type		/	/
	Brand		GMCC	GMCC
	Capacity	W	3250	3250
	Input	W	829	829
	Rated current(RLA)	A	5.6	5.6
	Locked rotor Amp(LRA)	A	/	/
	Thermal protector		/	/
	Thermal protector position		/	/
	Capacitor	μF	/	/
	Refrigerant oil/oil charge	ml	VG74 310	VG74 310

Outdoor fan motor	Model		ZKFN-34-10-1	ZKFN-34-10-1
	Input	W	34	34
	Capacitor	uF	/	/
	Speed	r/min	760	790
Outdoor coil	a.Number of rows		1	1
	b.Tube pitch(a)x row pitch(b)		21x22	21x22
	c.Fin spacing		1.3	1.3
	d.Fin type		Hydrophilic aluminum	Hydrophilic aluminum
	e.Tube outside dia.and type		Φ7,Inner groove tube	Φ7,Inner groove tube
	f.Coil length x height x width	mm	740x462x22	740x462x22
	g.Number of circuits		2	2
Outdoor sound pressure level		dB(A)	55	55
Outdoor sound power level (Cool/Heat)		dB(A)	62	65
Throttle type			Capillary	Capillary
Outdoor unit	Dimension(W*D*H)	mm	720x270x495	720x270x495
	Packing (W*D*H)	mm	835x300x540	835x300x540
	Net/Gross weight	Kg	23.2/25.5	23.2/25.5
Refrigerant type		g	R32/550	R32/0.55
Design pressure		MPa	4.3/1.7	4.3/1.7
Refrigerant piping	Liquid side/ Gas side	mm (inch)	Φ6.35/Φ9.52(1/4"/3/8")	Φ6.35/Φ9.52(1/4"/3/8")
	Max. refrigerant pipe length	m	25	25
	Max. difference in level	m	10	10
Thermostat type			Remote Control	Remote Control
Operation temperature		℃	17-30	17~30
Room temperature	Indoor(cooling/ heating)	℃	17 ~ 32/0 ~ 30	17 ~ 32/0 ~ 30
	Outdoor(cooling/heating)	℃	-15 ~ 50/-15 ~ 24	-15 ~ 50/-15 ~ 24
Qty'per 20' /40' /40'HQ		Outdoor unit	216/432/432	216/432/432
Qty'per 20' /40' /40'HQ		set	130/240/260	130/240/260
Connection wiring			1.5X5(Optional)	1.5X5(Optional)
power cable			No	No

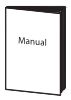
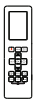
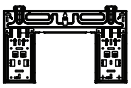
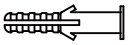
Model			AR40H18C1AMNEU	AR40H24C1AMNEU
Indoor			AR18BXHQASINEU	AR24BXHQASINEU
Power supply		V-Hz-Ph	220-240V,1Ph,50Hz	220-240V,1Ph,50Hz
Design	Indoor			
	Outdoor			
Cooling (Standard conditions)	Capacity	Btu/h	18000	24000
	standard	Btu/h	5.3	7.0
	min/max	kW	1.81-6.15	2.08-7.91
	Pdesign c	kW	5.3	7.0
	Input	kW	1645	2510
	Current	W	7.4	11.2
	EER	A	3.21	2.80
	SEER	℃	7.1	6.1
	Energy Efficiency Class		A++	A++
	annual energy consumption		261	402
Heating (Standard conditions)	Capacity	Btu/h	18000	25000
	standard	kW	5.3	7.3
	min/max	kW	1.28-6.74	1.61-7.91
	Pdesign h （warmer)	kW	4.6	6.4
	Pdesign h （average)	kW	4.2	4.7
	Input	W	1482	2442
	Current	A	6.7	11.0
	COP	W/W	3.56	3.00
	SCOP（warmer）		4.6	4.0
	SCOP（average）		4.0	3.9
	Energy Efficiency Class （warmer)		A++	A+
	Energy Efficiency Class （average)		A+	A
	annual energy consumption （warmer)		1400	2240
	annual energy consumption （average)		1470	1687
Tol		℃	-15	-15
Rated Power Input（indoor）		W	36	58

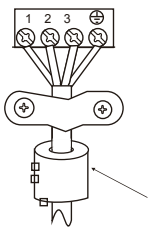
Rated Current（indoor）		A	0.1	0.3
Rated Power Input		W	2500	3500
Rated Current		A	13.0	15.5
Start Current		A	inverter model start current is small	inverter model start current is small
Indoor fan motor	Model		ZKFP-30-8-3	ZKFP-58-8-1-5
	Input	W	36	58
	Capacitor	uF	/	/
	Speed(20%/40%/60%/80%/100%/Turbo)	r/min	C: 760/870/980/1090/1200/1248 H: 750/850/950/1050/1150/1248	C: 830/910/990/1070/1150/1224 H: 830/910/990/1070/1150/1224
Indoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21x13.37
	c.Fin spacing	mm	1.2	1.3
	d.Fin type		Hydrophilic aluminum	Hydrophilic aluminum
	e.Tube outside dia.and type	mm	Φ7,Inner groove tube	Φ7,Inner groove tube
	f.Coil length x height x width	mm	750x189x26.74+750x105x26.74	780x210x26.74+780x105x26.74
	g.Number of circuits		3	4
Moisture Removal		(l/hr	2.30	3.1
Indoor air flow (Hi/Mi/Lo)		m3/h	660/520/360	850/720/590
Indoor sound pressure level (Tu/Hi/Mi/Lo)		dB(A)	47/46/41/33	48/47/44/39
Indoor sound power level (Cool/Heat)		dB(A)	55/57	59/59
Indoor unit	Dimension(W*D*H)	mm	957x213x302	1040x220x327
	Packing (W*D*H)	mm	1035x295x385	1120x405x315
	Net/Gross weight	Kg	10.9/14.3	13/17.7
Qty’per 20’ /40’ /40'HQ		Indoor unit	254/520/600	200/420/480
Compressor	Model		KSN140D21UFZ	KTM240D43UKT
	Type		ROTARY	Twin-ROTARY
	Brand		GMCC	GMCC
	Capacity	W	4385	7600
	Input	W	1140	2045
	Rated current(RLA)	A	7.50	9.30
	Locked rotor Amp(LRA)	A	/	/
	Thermal protector		/	/
	Thermal protector position		/	NA

	Capacitor	μF	/	/
	Refrigerant oil/oil charge	ml	VG74 440	ESTER OIL VG74 620
Outdoor fan motor	Model		ZKFN-34-10-1-3	ZKFN-80-8-3
	Input	W	34	80
	Capacitor	uF	/	/
	Speed	r/min	740/740	830/800
Outdoor coil	a.Number of rows		2	1.6
	b.Tube pitch(a)x row pitch(b)		21x22	21x22
	c.Fin spacing		1.3	1.3
	d.Fin type		Hydrophilic aluminum	Hydrophilic aluminum
	e.Tube outside dia.and type		Φ7,Inner groove tube	Φ7,Inner groove tube
	f.Coil length x height x width	mm	860*504*44	900*44*609
	g.Number of circuits		4	5
Outdoor sound pressure level		dB(A)	57.5	59.5
Outdoor sound power level (Cool/Heat)		dB(A)	63/68	67.5/68
Throttle type			Capillary	Capillary
Outdoor unit	Dimension(W*D*H)	mm	805x330x554	890x342x673
	Packing (W*D*H)	mm	915x370x615	995x398x740
	Net/Gross weight	Kg	32.7/35.4	42.9/45.9
Refrigerant type		g	R32/550	R32/1.08
Design pressure		MPa	4.3/1.7	4.3/1.7
Refrigerant piping	Liquid side/ Gas side	mm (inch)	Φ6.35/Φ12.7(1/4"/1/2")	Φ9.52/Φ15.9(3/8"/5/8")
	Max. refrigerant pipe length	m	30	50
	Max. difference in level	m	20	25
Thermostat type			Remote Control	Remote Control
Operation temperature		℃	17-30	17~30
Room temperature	Indoor(cooling/ heating)	℃	17 ~ 32/0 ~ 30	17 ~ 32/0 ~ 30
	Outdoor(cooling/heating)	℃	-15 ~ 50/-15 ~ 30	-15 ~ 50/-15 ~ 24
Qty'per 20' /40' /40'HQ		Outdoor unit	114/234/312	99/198/198
Qty'per 20' /40' /40'HQ		set	85/174//202	65/132/154
Connection wiring			1.5X5(Optional)	2.5X5(Optional)
power cable			No	No

2-3 Accessories

The air conditioning system comes with the following accessories. Use all of the installation parts and accessories to install the air conditioner. Improper installation may result in water leakage, electrical shock and fire, or cause the equipment to fail. The items are not included with the air conditioner must be purchased separately.

Name of Accessories	Q'ty(pc)	Shape	Name of Accessories	Q'ty(pc)	Shape
Manual	2~3		**Remote controller**	1	
Drain joint (for cooling & heating models)	1		**Battery**	2	
Seal (for cooling & heating models)	1		**Remote controller holder(optional)**	1	
Mounting plate	1		**Fixing screw for remote controller holder(optional)**	2	
Anchor	5~8 (depending on models)		Small Filter (Need to be installed on the back of main air filter by the authorized technician while installing the machine)	1~2 (depending on models)	
Mounting plate fixing screw	5~8 (depending on models)				

Name	Shape		Quantity(PC)
Connecting pipe assembly	**Liquid side**	**Φ6.35(1/4in)**	Parts you must purchase separately. Consult the dealer about the proper pipe size of the unit you purchased.
		Φ9.52(3/8in)	
	Gas side	**Φ9.52(3/8in)**	
		Φ12.7(1/2in)	
		Φ16(5/8in)	
		Φ19(3/4in)	
Magnetic ring and belt (if supplied ,please refer to the wiring diagram to install it on the connective cable.)	  Pass the belt through the hole of the Magnetic ring to fix it on the cable		Varies by model

3. Alignment and Adjustments

3-1 Checking before use

Operation ranges

The table below indicated the temperature and humidity ranges the air conditioner can be operated within.
Refer to the table for efficient use.

Mode	Indoor temperature	Outdoor temperature	Indoor humidity
Cooling	-16 °C~ 30°C	-10 °C ~ 46 °C	Restive humidity 80% less
Heating	0°C~30°C	-15 °C~24°C	-
Dry	10°C~32°C	-10 °C ~ 46°C	-

▶ If the air conditioner opreate in cooling mode for ling period of time in high humidity area, dew may be formed.

Maintaining your air conditioner

Internal protectionsvia the unit control system

▶ This internal protection operate self an internal fault occurs the air conditioner.

Type	Description
Protect compressor	The air conditioner does not start operating immediately to help protect the compressor of the outdoor unit after it has been started.

2.1 Error Display (Indoor Unit)

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

No.	LED Display	Error Information
1	EH00	Indoor unit EEPROM parameter error
2	EL01	Indoor / outdoor unit communication error
3	EH02	Zero-crossing signal detection error(for some models)
4	EH03	The indoor fan speed is operating outside of the normal range
5	EC51	Outdoor unit EEPROM parameter error(for some models)
6	EC52	Condenser coil temperature sensor T3 is in open circuit or has short circuited
7	EC53	Outdoor room temperature sensor T4 is in open circuit or has short circuited
8	EC54	Compressor discharge temperature sensor TP is in open circuit or has short circuited
9	EH60	Indoor room temperature sensor T1 is in open circuit or has short circuited
10	EH61	Evaporator coil temperature sensor T2 is in open circuit or has short circuited
11	EC07	The outdoor fan speed is operating outside of the normal range(for some models)
12	EH0b	Indoor PCB / Display board communication error(for some models)
13	EL0C	Refrigerant leak detected
14	PC00	IPM malfunction or IGBT over-strong current protection
15	PC01	Over voltage or over low voltage protection
16	PC02	Top temperature protection of compressor or High temperature protection of IPM module
17	PC04	Inverter compressor drive error
18	PC0L	Low ambient temperature protection
19	EH0R	Indoor unit EEPROM parameter error

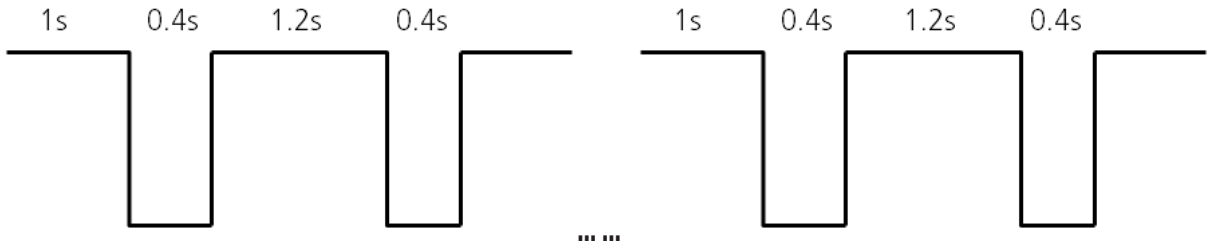
For other errors:

The display board may show a garbled code or a code undefined by the service manual. Ensure that this code is not a temperature reading.

Troubleshooting:

Test the unit using the remote control. If the unit does not respond to the remote, the indoor PCB requires replacement. If the unit responds, the display board requires replacement.

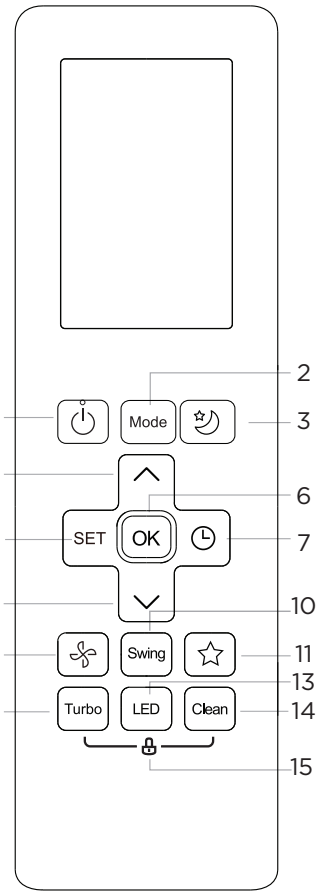
LED flash frequency:



3-3 Checking the remote controller

- Point the remote controller towards the remote controller receiver of the indoor unit.
- When you properly press the button on the remote controller, you will hear beep sound from the indoor unit and a transmit indicator( ) appears on the remote controller display.

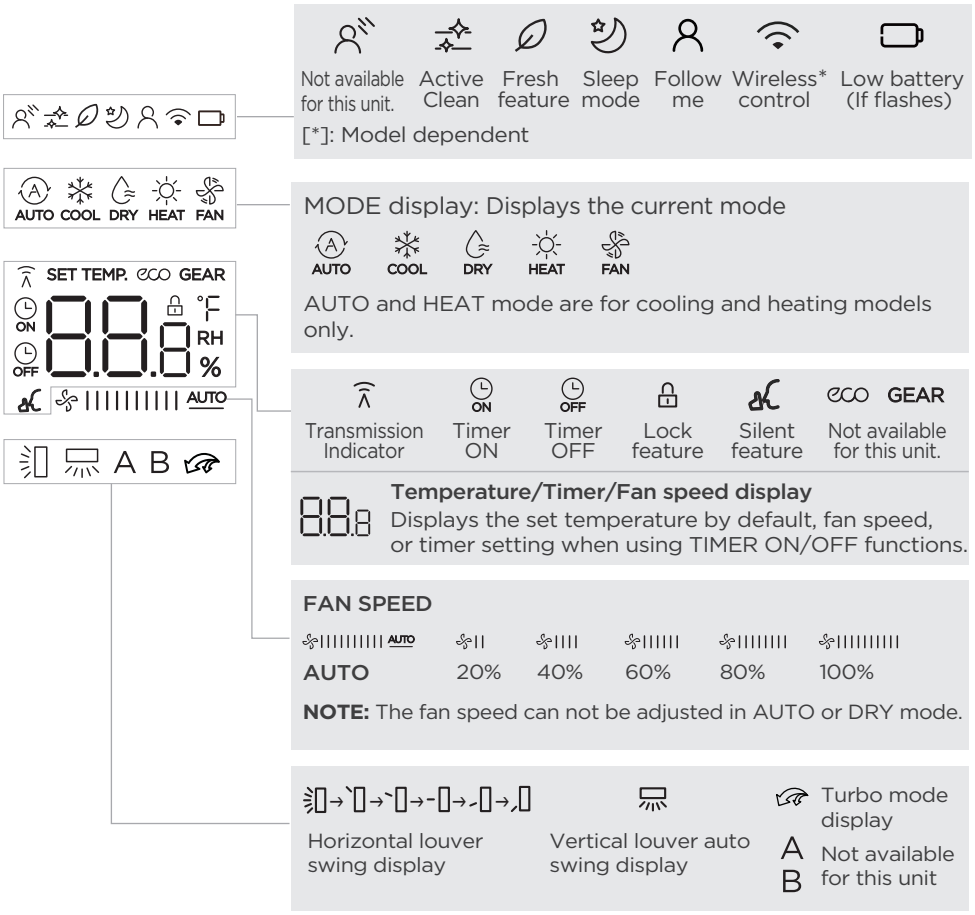
Remote controller buttons



	Description
1	⏻ : Power button.
2	**Mode**: Auto > Cool > Dry > Heat > Fan Note: Auto and Heat mode are not available for the cooling only appliance.
3	**Sleep:** Used to save energy during sleeping hours.
4	**Temp Up**: Increases temperature in 1°C (1°F) increments. Max. temperature is 30°C (86°F). Note: Press ^ & v buttons at the same time for 3 seconds will alternate the temperature display between the °C & °F.
5	SET: Fresh/UV lamp* > Follow Me > AP mode* [*]: Model dependent
6	**OK**: Used to confirm the selected functions.
7	**Timer**: Set timer to turn unit on or off.
8	**Temp Down:** Decreases temperature in 1°C (1°F) increments. Min. temperature is 16°C (60°F).
9	**Fan Speed**: AU > 20% >40% > 60% > 80% > 100%.
10	**Swing**: Starts and stops the horizontal louver movement. Hold down for 2 seconds to initiate vertical louver auto swing feature (some units).
11	**SHORTCUT**: Used to restore the current settings or resume previous settings.
12	**Turbo:** Enables unit to reach preset temperature in shortest possible time.
13	**LED:** Turns LED display & air conditioner buzzer on and off.
14	**Clean:** Used to start/stop the Clean function.
15	**Lock:** Long press both Turbo and Clean buttons simultaneously for 5 seconds to lock the keyboard. Press together these two buttons again for 2 seconds to unlock the keyboard.

Remote Screen Indicators

Information are displayed when the remote controller is power up.



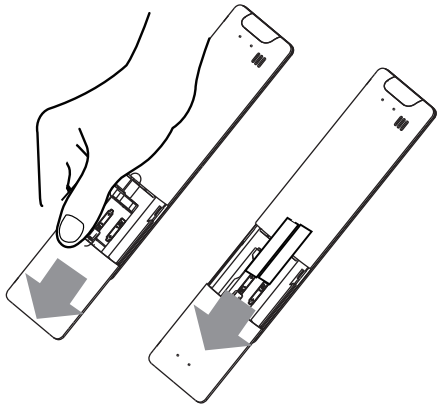
Note: While using the remote controller, only relevant function indicator will be shown. The indicators above are for reference only.

Handling the Remote Controller

Inserting and Replacing Batteries

Your air conditioning unit may come with two batteries(some units). Put the batteries in the remote control before use.

1. Slide the back cover from the remote control downward, exposing the battery compartment.
2. Insert the batteries, paying attention to match up the (+) and (-) ends of the batteries with the symbols inside the battery compartment.
3. Slide the battery cover back into place.



BATTERY NOTES

For optimum product performance:

- Do not mix old and new batteries, or batteries of different types.
- Do not leave batteries in the remote control if you don't plan on using the device for more than 2 months.

BATTERY DISPOSAL

Do not dispose of batteries as unsorted municipal waste. Refer to local laws for proper disposal of batteries.

TIPS FOR USING REMOTE CONTROL

- The remote control must be used within 8 meters of the unit.
- The unit will beep when remote signal is received.
- Curtains, other materials and direct sunlight can interfere with the infrared signal receiver.
- Remove batteries if the remote will not be used more than 2 months.

NOTES FOR USING REMOTE CONTROL

The device could comply with the local national regulations.

- In Canada, it should comply with CAN ICES-3(B)/NMB-3(B).
- In USA, this device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
  (1) This device may not cause harmful interference, and
  (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- Changes or modifications not approved by the party responsible for compliance could void user's authority to operate the equipment.

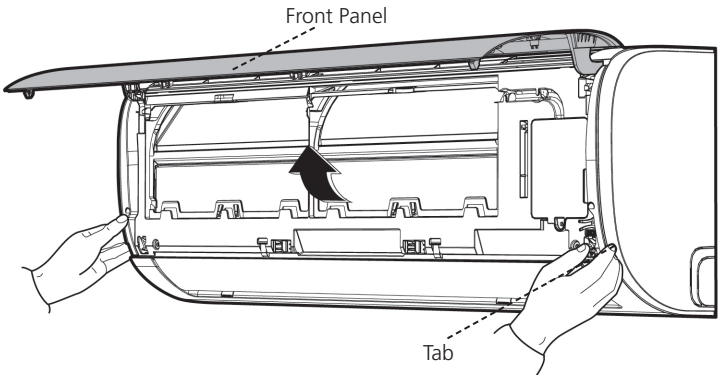
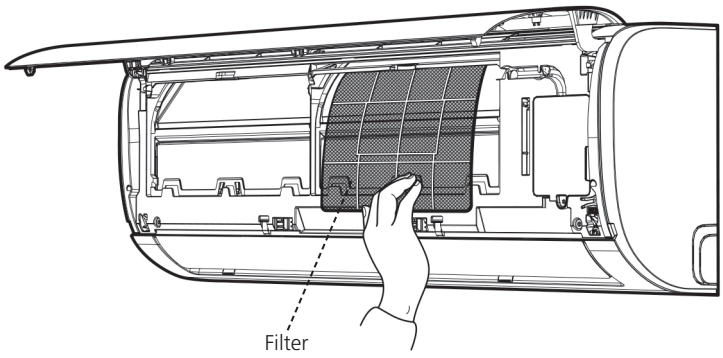
4. Disassembly and Reassembly

■ **Necessary Tools**

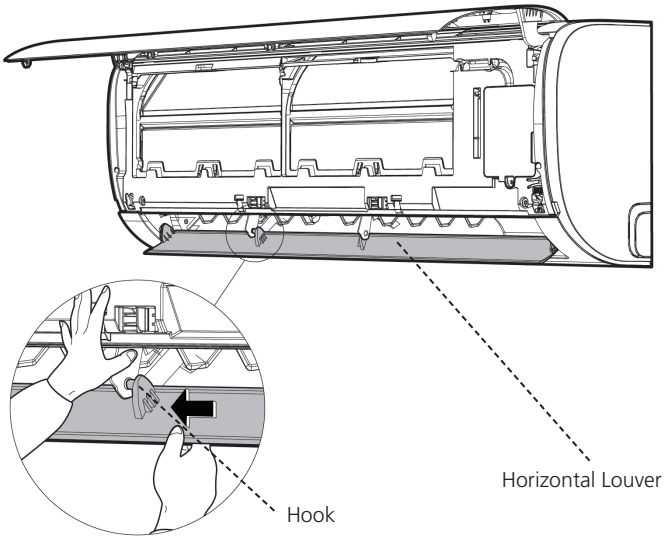
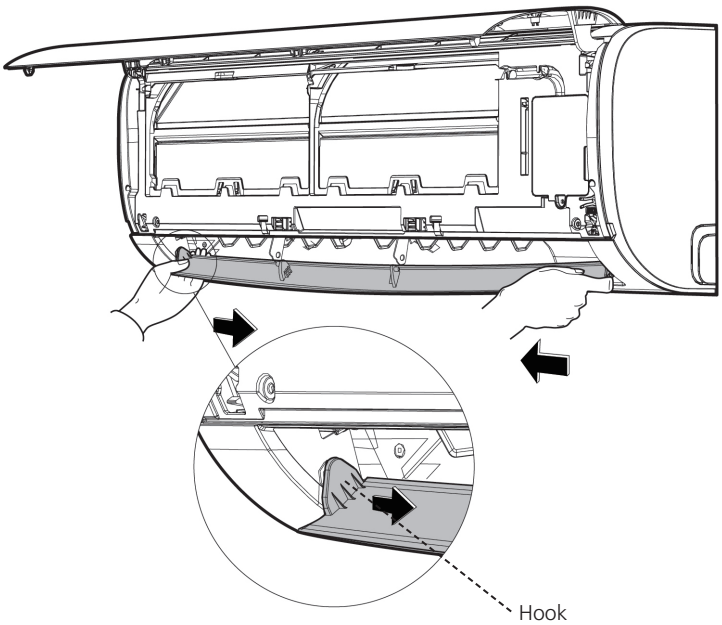
Item	Remark
+SCREW DRIVER	
MONKEY SPANNER	
- SCREW DRIVER	

4-1 Indoor Unit

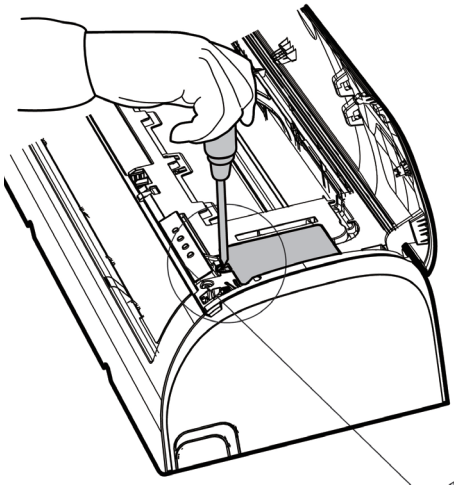
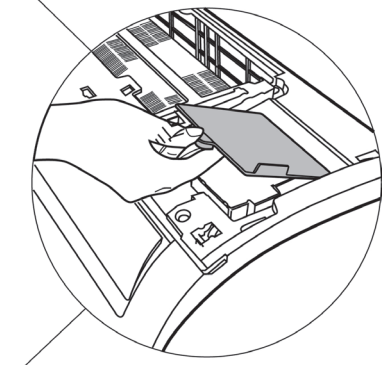
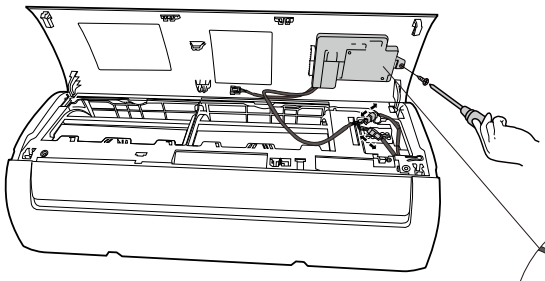
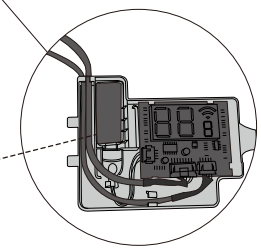
1. Front Panel

Procedure	Illustration
1) Hold the front panel by the tabs on the both sides and lift it (see CJ_AF_001).	 CJ_AF_001
2) Push up the bottom of an air filter, and then pull it out downwards (see CJ_AF_002).	 CJ_AF_002

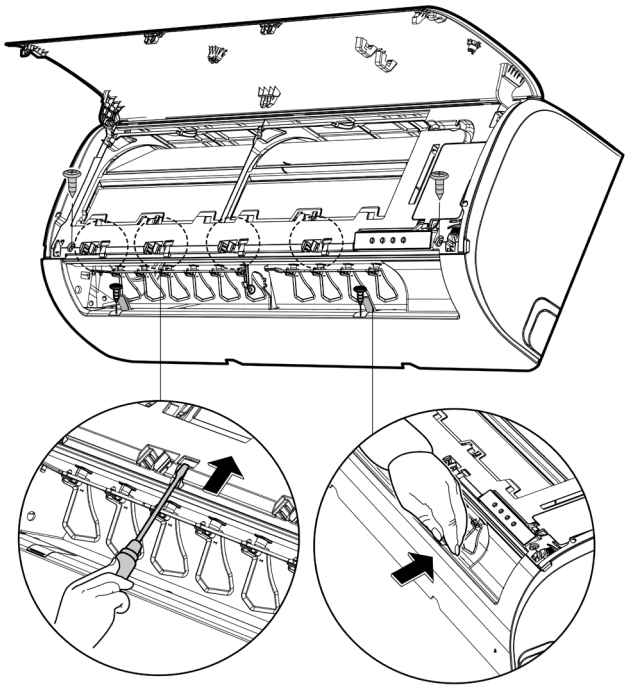
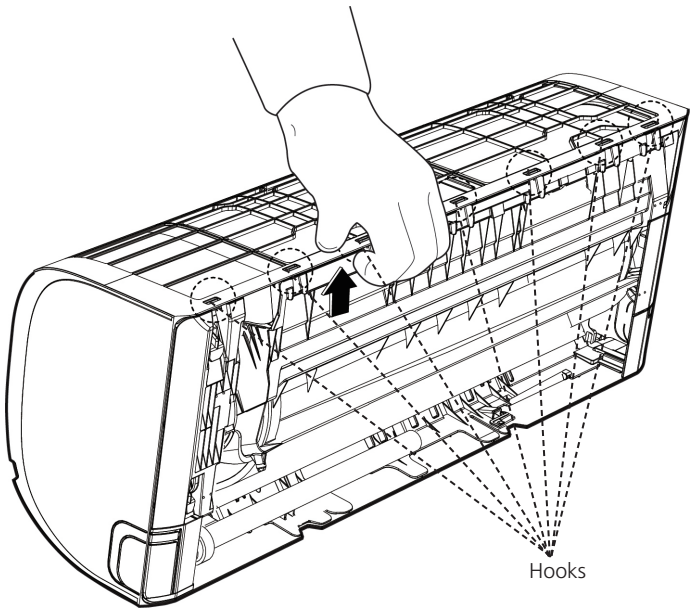
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Open the horizontal louver and push the hook towards left to open it (see CJ_AF_003). 4) Bend the horizontal louver lightly by both hands to loosen the hooks, then remove the horizontal louver (see CJ_AF_004).	 **CJ_AF_003**  **CJ_AF_004**

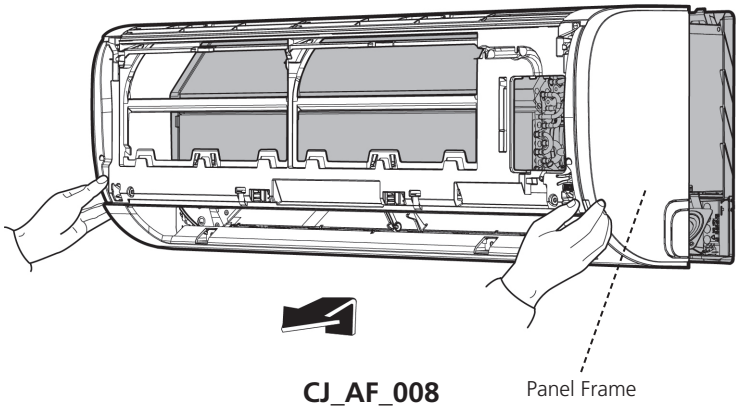
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
5) Remove 1 screw and then remove the electrical cover(see CJ_AF_005-1 and CJ_AF_005-2). 6) Disconnect the connectors for display board (see CJ_AF_005-3) . 7) Remove 1 screw of the display board (see CJ_AF_005-3) . 8) Remove the display board(see CJ_ AF_005-4). 9) Remove the WIFI module subassemnbly (see CJ_AF_005-4) .	 CJ_AF_005-1  CJ_AF_005-2  CJ_AF_005-3  WIFI module subassembly CJ_AF_005-4 **CJ_AF_005**

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

Procedure	Illustration
10) Open the screw caps(2) and the remove the screws(see CJ_AF_006). 11) Release the 4 hooks.	
	CJ_AF_006
12) Release the seven hooks in the back (see CJ_AF_007).	
	CJ_AF_007

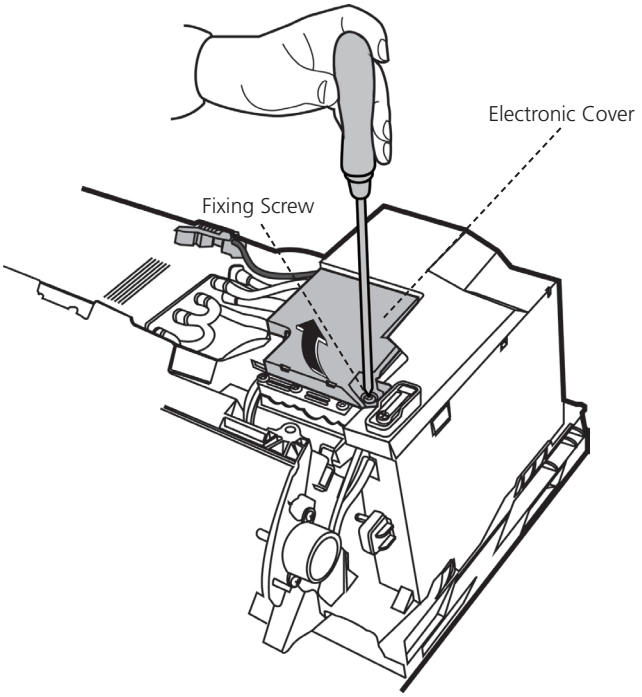
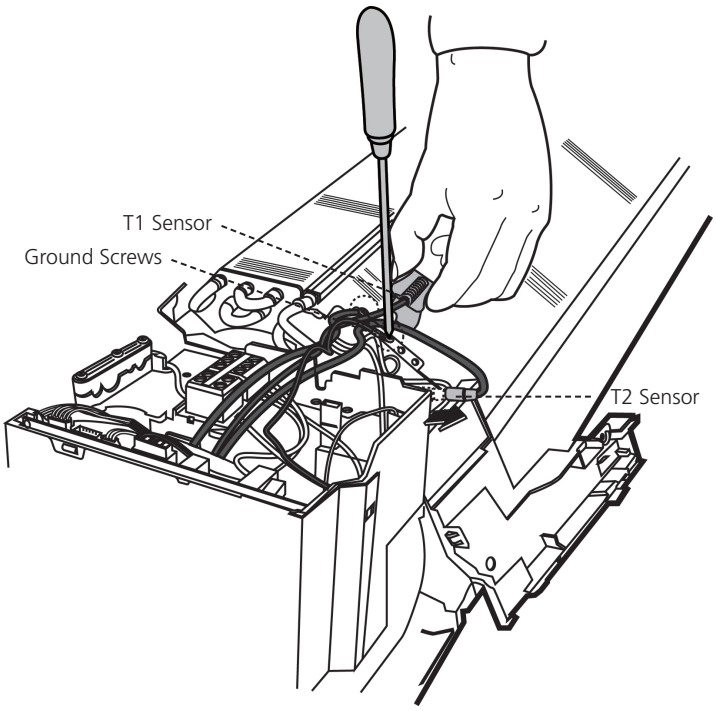
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
13)Pull out the panel frame while pushing the hook through a clearance between the panel frame and the heat exchanger (see CJ_AF_008).	 **CJ_AF_008**

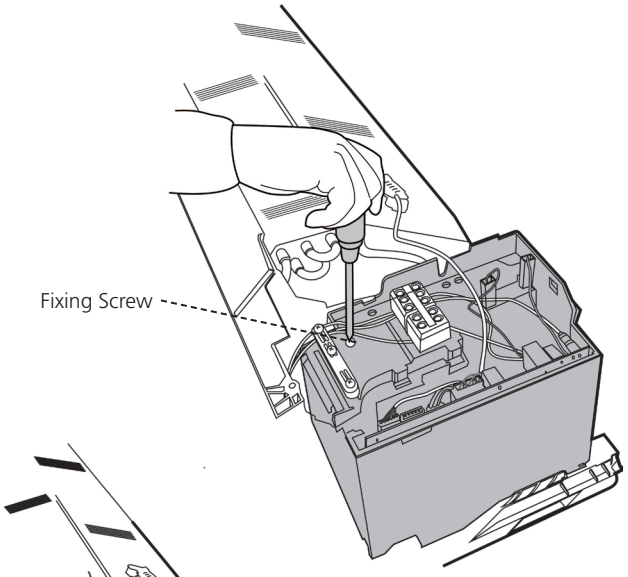
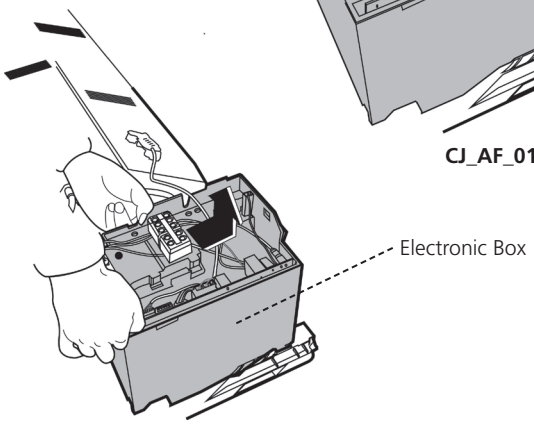
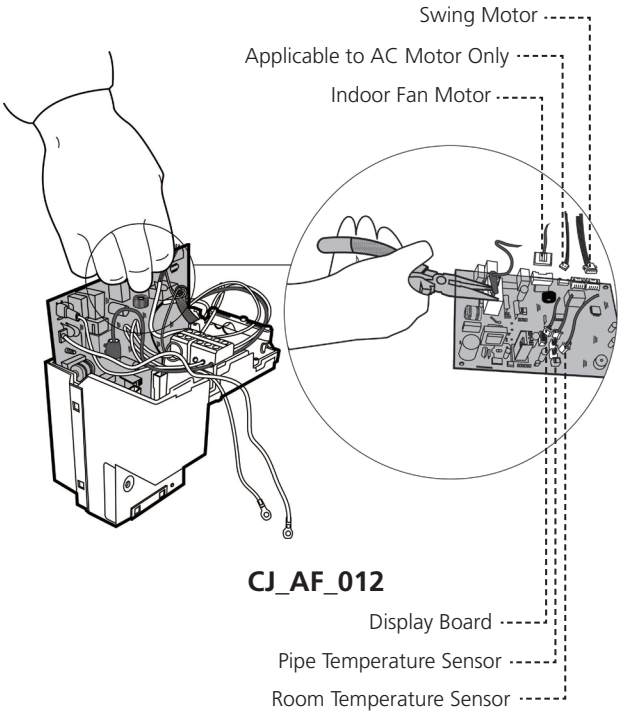
Note: This section is for reference only. Actual unit appearance may vary.

2. Electrical parts

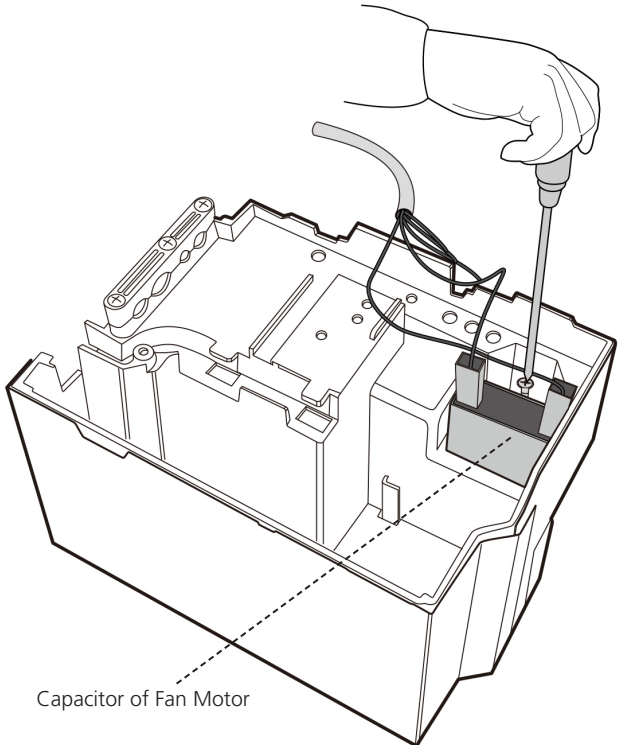
Note: Remove the front panel (refer to 1. Front panel) before disassembling electrical parts.

Procedure	Illustration
1) Remove the fixing screw and then remove the cover of electronic box and the terminal cover (see CJ_AF_009).	 **CJ_AF_009**
2) Pull out the room temperature sensor (T1) and the coil temperature sensor (T2) (see CJ_AF_010). 3) Remove the two screws used for the ground connection (see CJ_AF_010).	 **CJ_AF_010**

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

Procedure	Illustration
4) Remove the fixing screw (see CJ_ AF_011-1). 5) Pull out the Electrical control box along the direction indicated in right image. to remove it (CJ_AF_011-2). 6) Disconnect the wires. Then remove the electronic main board (CJ_AF_012).	 CJ_AF_011-1  CJ_AF_011-2  CJ_AF_012

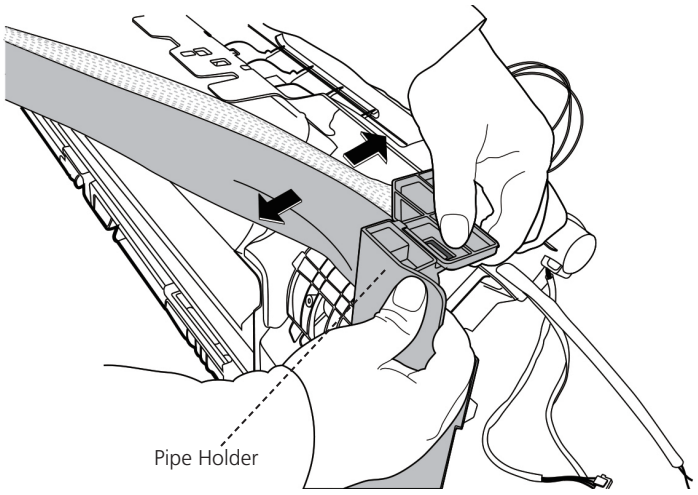
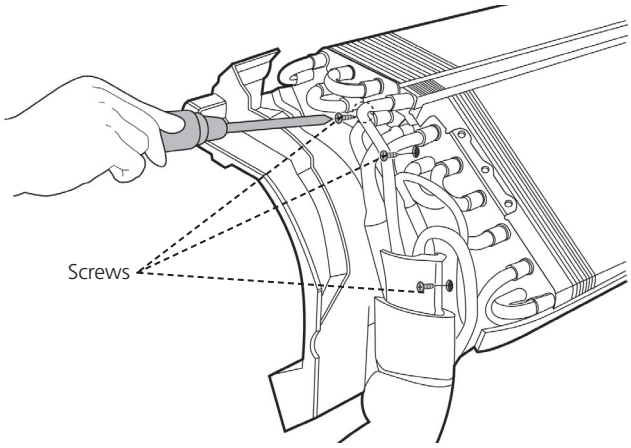
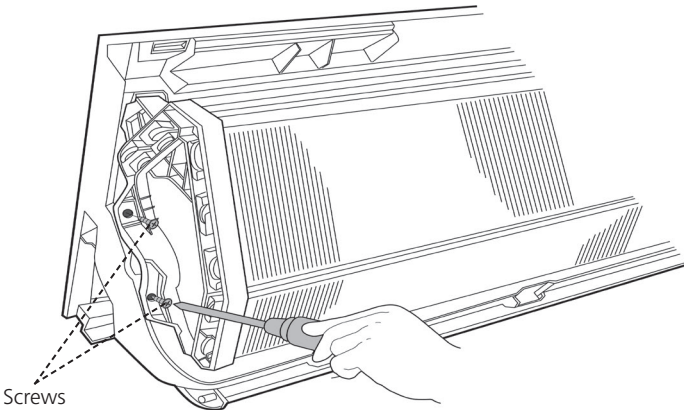
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
7) Remove the fixing screw, then remove the capacitor of fan motor (see CJ_AF_013).	 CJ_AF_013

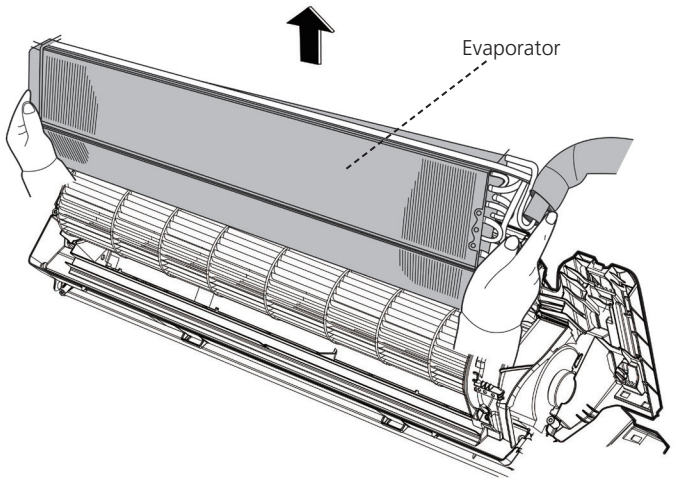
Note: This section is for reference only. Actual unit appearance may vary.

3. Evaporator

Note: Remove the front panel and electrical parts (refer to 1. Front panel and 2. Electrical parts) before disassembling evaporator.

Procedure	Illustration
1) Disassemble the pipe holder located at the rear of the unit (see CJ_AF_014).	 **CJ_AF_014**
2) Remove the screws on the evaporator located at the fixed plate (see CJ_AF_015).	 **CJ_AF_015**
3) Remove the two screws on the evaporator located at the base of the bearing side (see CJ_AF_016).	 **CJ_AF_016**

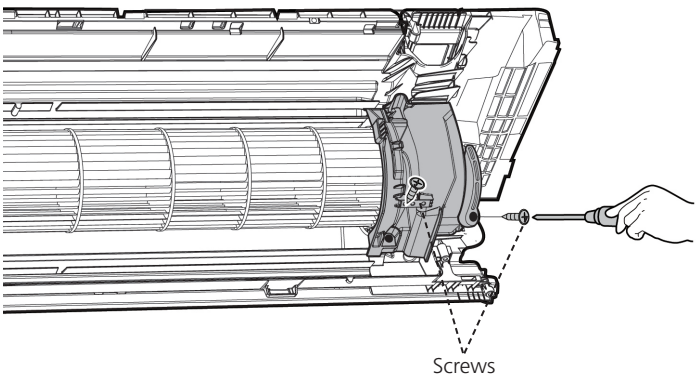
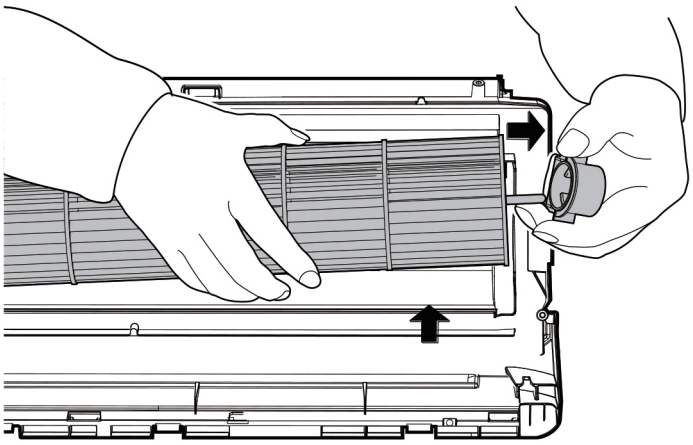
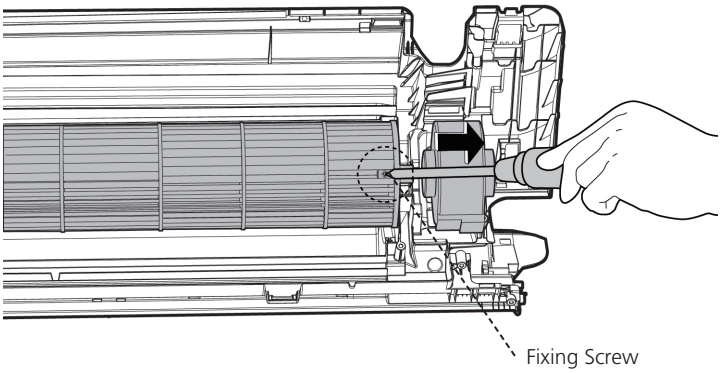
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
4) Pull out the evaporator (see CJ_AF_017).	 CJ_AF_017

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

4. Fan motor and fan

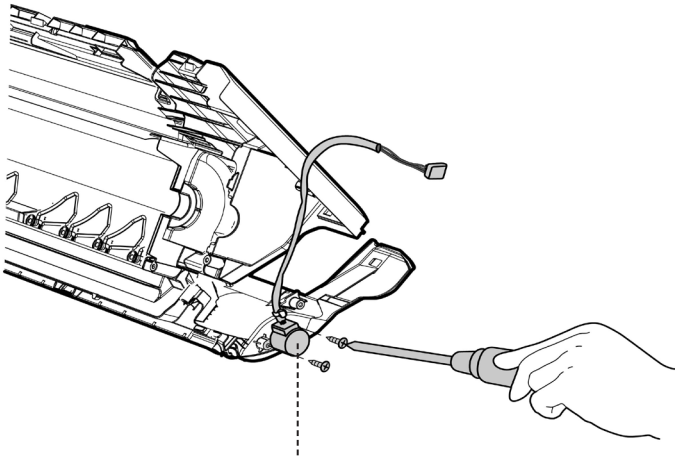
Note: Remove the front panel, electrical parts and evaporator (refer to 1. Front panel, 2. Electrical parts, and 3. Evaporator). before disassembling fan motor and fan.

Procedure	Illustration
1) Remove the two screws and remove the fixing board of the fan motor (see CJ_ AF_018).	 CJ_AF_018
2) Remove the Bearing sleeve(see CJ_ AF_019).	 CJ_AF_019
3) Remove the fixing screw (see CJ_AF_020). 4) Pull out the fan motor and fan assembly from the side.	 CJ_AF_020

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

5. Step motor

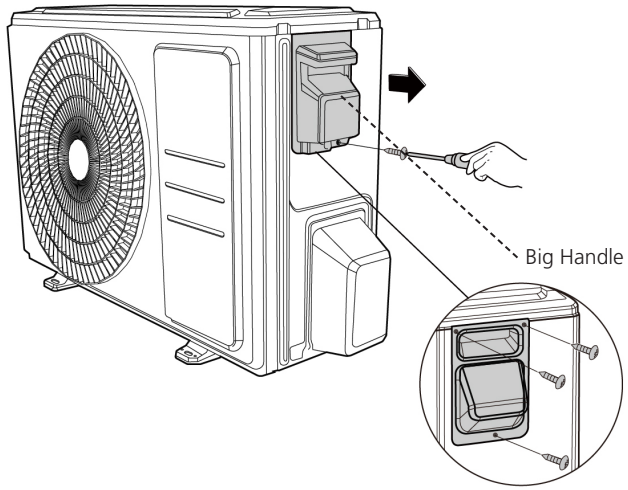
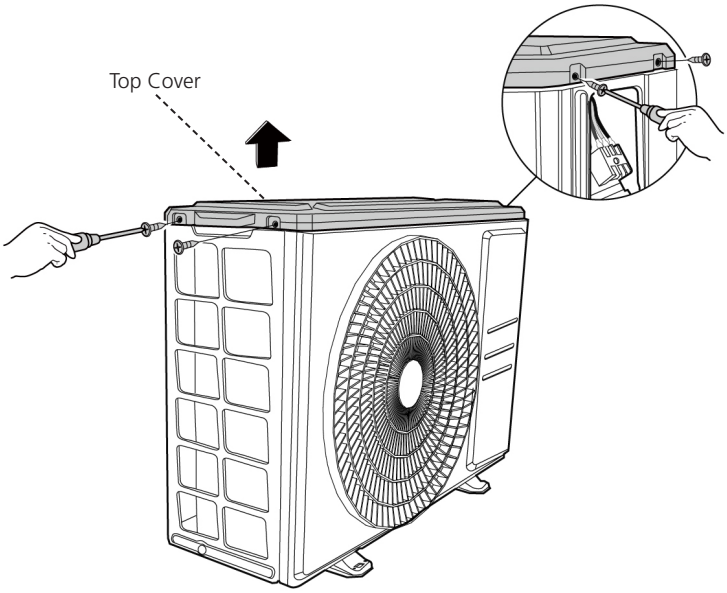
Note: Remove the front panel and electrical parts (refer to 1. Front panel, 2. Electrical parts) before disassembling step motor.

Procedure	Illustration
1) Remove the two screws, then remove the stepping motor (see CJ_AF_021).	 CJ_AF_021

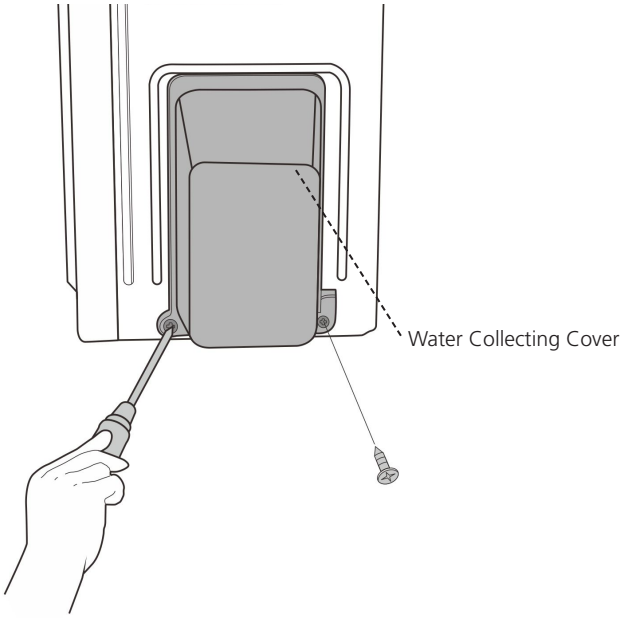
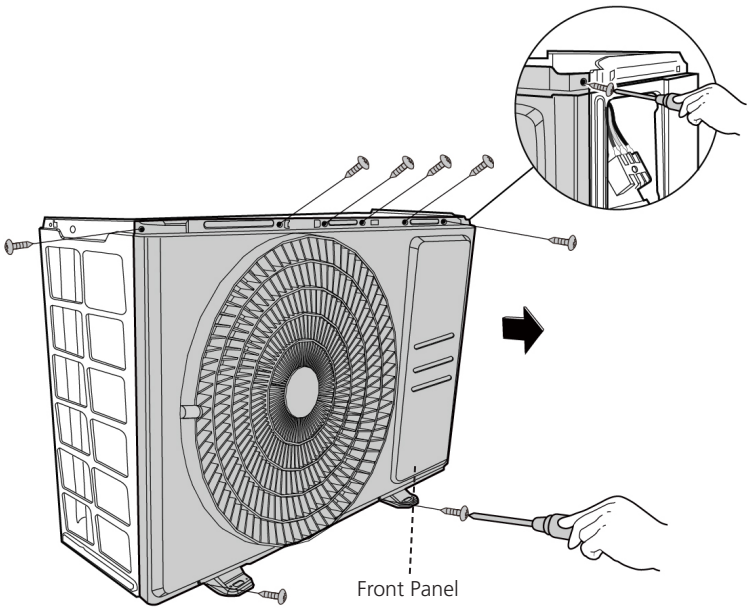
Note: This section is for reference only. Actual unit appearance may vary.

1 Panel Plate

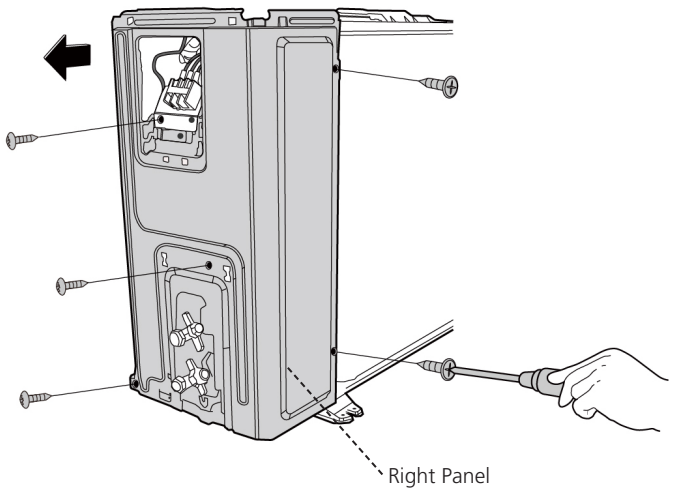
1.1. X330 (Model 18K)

Procedure	Illustration
1) Turn off the air conditioner and the power breaker. 2) Remove the screw of the big handle and then remove the big handle (1 screws) (see CJ_X230_001).	 **CJ_X230_001**
3) Remove the screws of the top cover and then remove the top cover (4 screws). One of the screws is located underneath the big handle (see CJ_ X230_002).	 **CJ_X230_002**

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

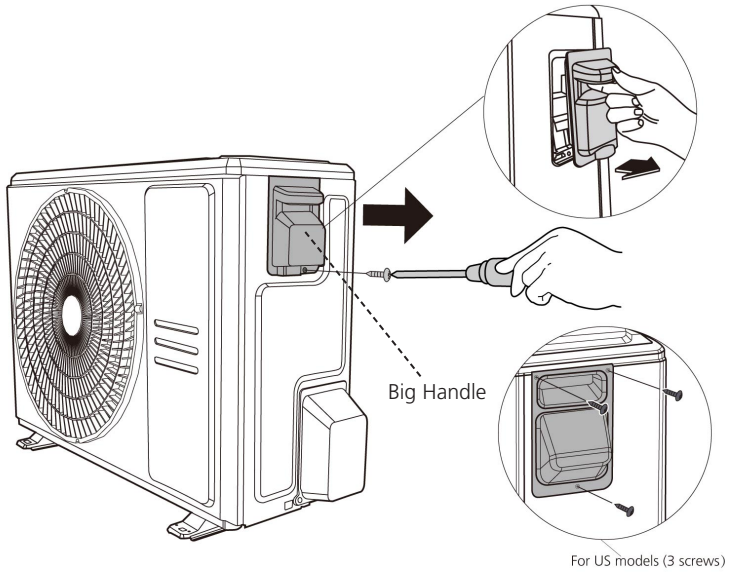
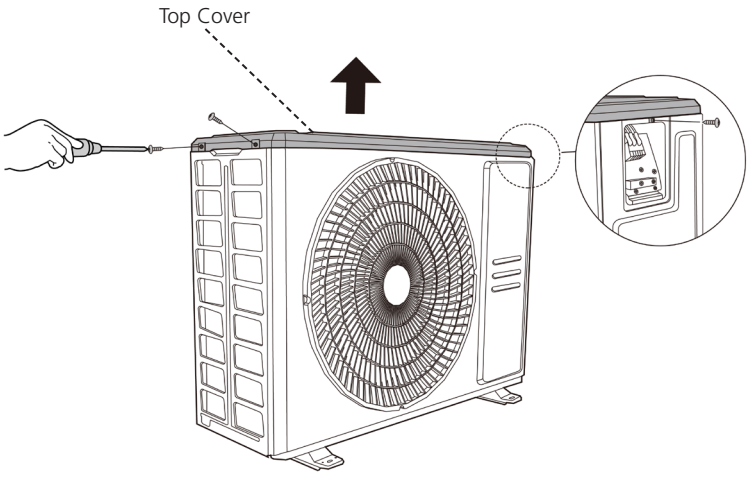
Procedure	Illustration
4) Remove the screws of water collecting cover and then remove the water collecting cover (2 screws) (see CJ_X230_003).	 **CJ_X230_003**
5) Remove the screws of the front panel and then remove the front panel (7 screws(onoff models) or 9 screws(inverter models) (see CJ_X230_004).	 **CJ_X230_004**

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

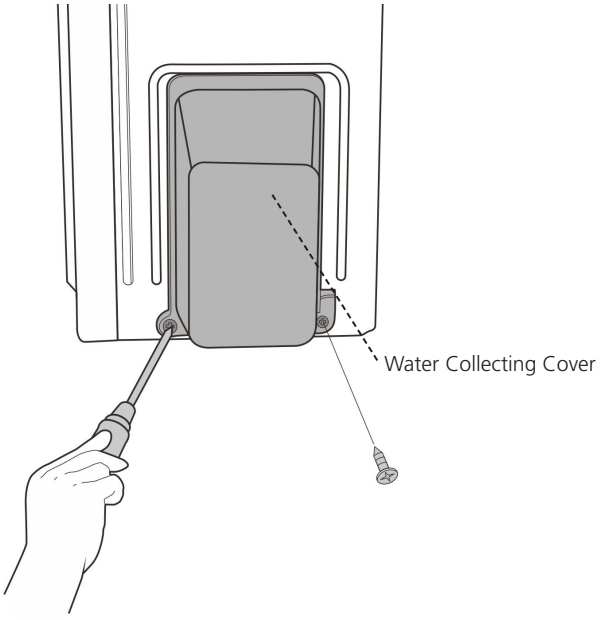
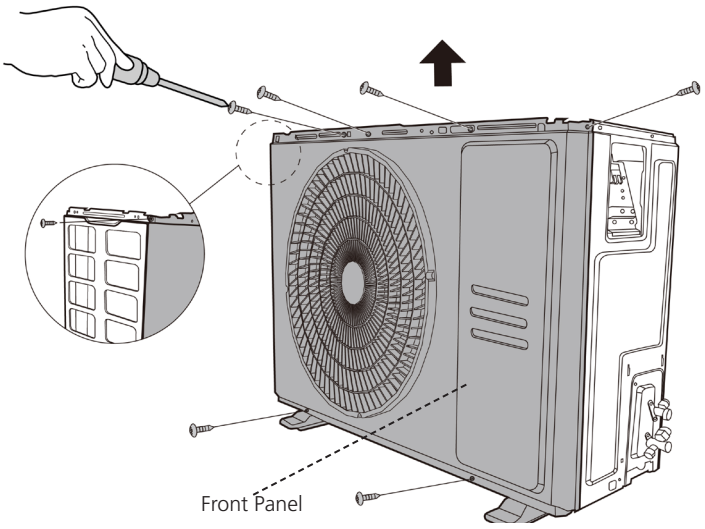
Procedure	Illustration
6) Remove the screws of the right panel and then remove the right panel (5 screws) (see CJ_X230_005).	 **CJ_X230_005**

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

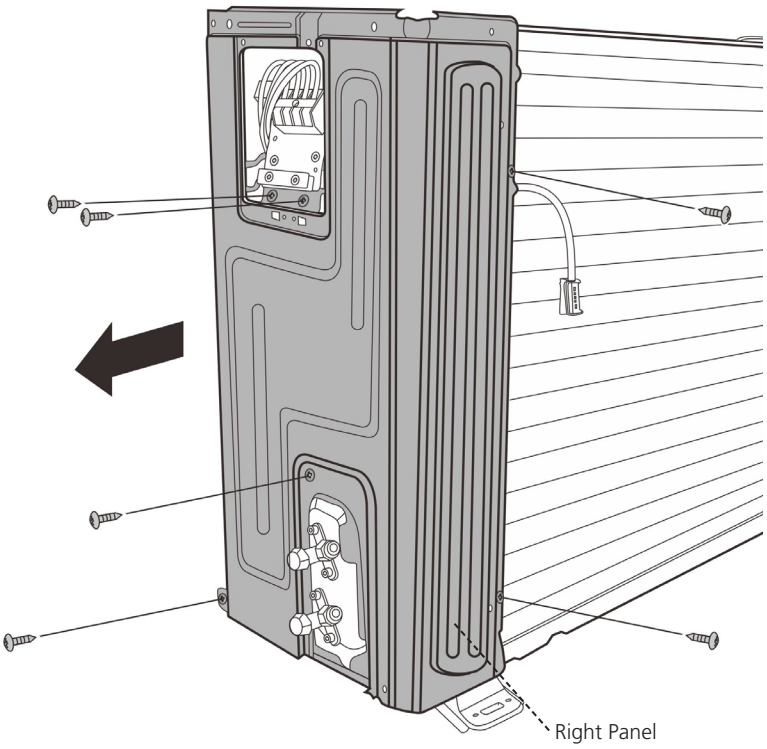
1.2. X430 (Model 24K)

Procedure	Illustration
1) Turn off the air conditioner and the power breaker. 2) Remove the screw of the big handle and then remove the big handle (1 screw) (see CJ_X430_001).	 **CJ_X430_001**
3) Remove the screws of the top cover and then remove the top cover (3 screws). One of the screws is located underneath the big handle (see CJ_ X430_002).	 **CJ_X430_002**

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

Procedure	Illustration
4) Remove the screws of water collecting cover and then remove the water collecting cover (2 screws) (see CJ_X430_003).	 **CJ_X430_003**
5) Remove the screws of the front panel and then remove the front panel (7 screws(onoff models) or 9 screws(inverter models) (see CJ_X430_004).	 **CJ_X430_004**

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

Procedure	Illustration
6) Remove the screws of the right panel and then remove the right panel (6 screws) (see CJ_X430_005).	 **CJ_X430_005**

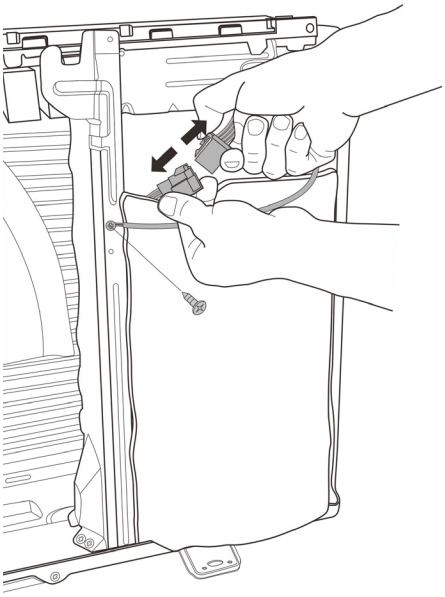
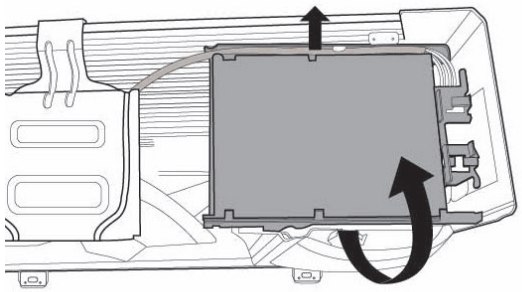
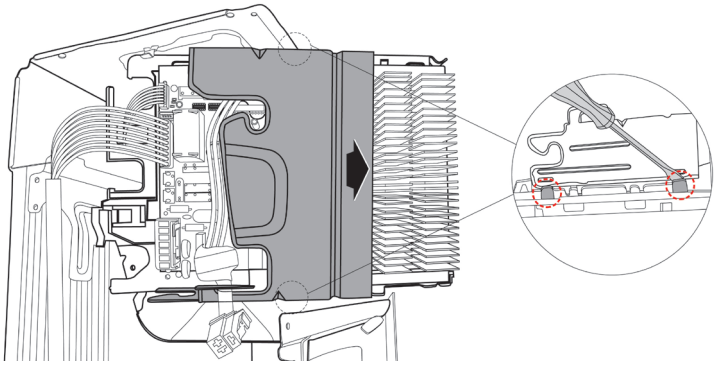
Note: This section is for reference only. Actual unit appearance may vary.

2 Electrical parts

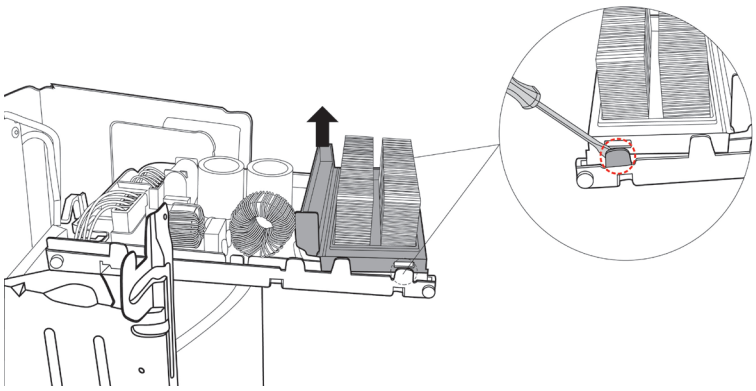
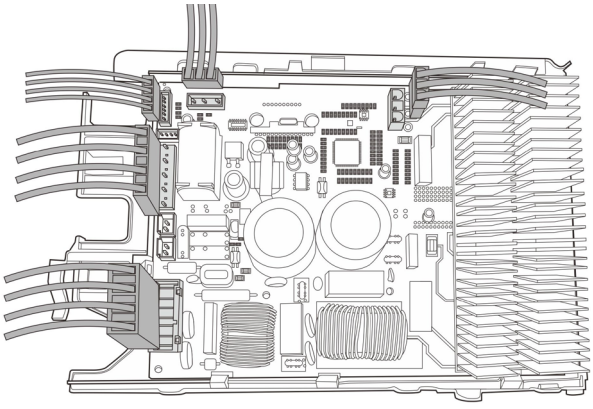
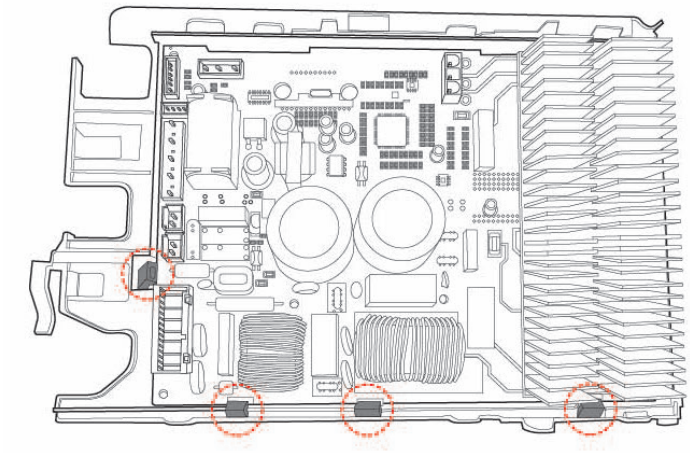
WARNING: Antistatic gloves must be worn when you disassemble the electronic box.

Note: Remove the air outlet grille(refer to 3.1 Panel Plate) before disassembling electrical parts.

2.1 PCB board (Model 9K/12K/18K)

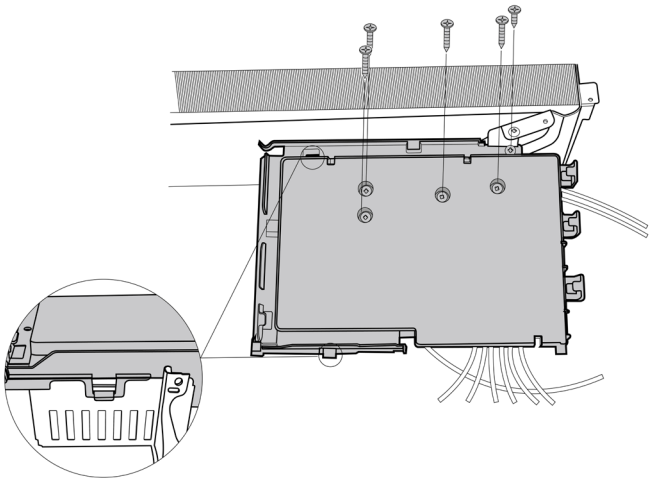
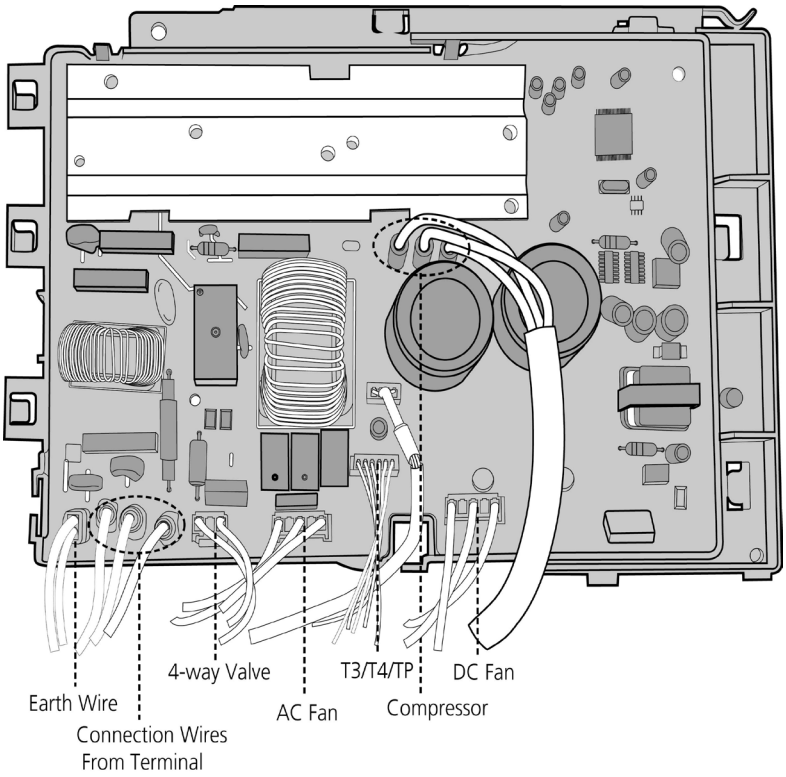
Procedure	Illustration
1) Disconnect the connector for compressor and release the ground wire(1 screw). (see CJ_ODU_PCB_009-1).	 CJ_ODU_PCB_009-1
2) Pull out the wires from electrical supporting plate and turn over the electronic control assembly. (see CJ_ODU_PCB_009-2).	 CJ_ODU_PCB_009-2
3) Remove the electronic installing box subassembly (4 hooks) (see CJ_ODU_PCB_009-3).	 CJ_ODU_PCB_009-3

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

Procedure	Illustration
4) Remove the fixing board (2 hooks) (see CJ_ODU_PCB_009-4).	 CJ_ODU_PCB_009-4
5) Disconnect the connectors from the electronic control board (see CJ_ODU_PCB_009-3).	 CJ_ODU_PCB_009-5
6) Then remove the electronic control board (4 hooks).	 CJ_ODU_PCB_009-6

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

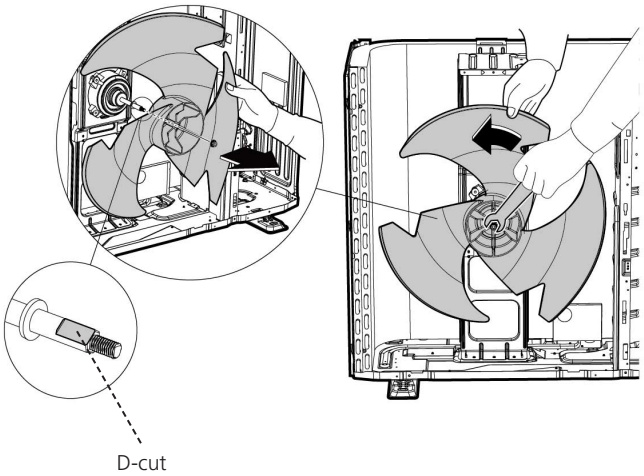
2.2 PCB board (Model 24)

Procedure	Illustration
1) Remove the screws and unfix the hooks, then open the electronic control box cover (5 screws and 2 hooks)(see CJ_ODU_PCB_006-1).	 **CJ_ODU_PCB_006-1**
2) Disconnect the connector for fan motor from the electronic control board (see CJ_ODU_PCB_006-2). 3) Remove the connector for the compressor (see CJ_ODU_PCB_006-2). 4) Pull out the two blue wires connected with the four way valve (see CJ_ODU_PCB_006-2). 5) Pull out connectors of the condenser coil temp. sensor(T3),outdoor ambient temp. sensor(T4) and discharge temp. sensor(TP) (see CJ_ODU_PCB_006-2). 6) Disconnect the electronic expansion valve wire (see Fig CJ_ODU_PCB_006-2). 7) Remove the connector for the DR and reactor (see Fig CJ_ODU_PCB_006-2). 8) Then remove the electronic control board.	 **CJ_ODU_PCB_006-2**

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

3 Fan Assembly

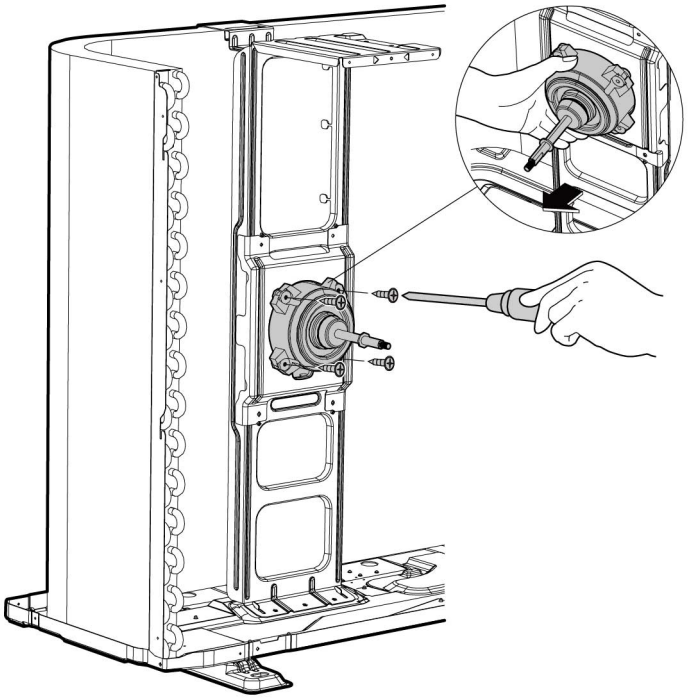
Note: Remove the panel plate (refer to 3.1 Panel Plate) before disassembling fan.

Procedure	Illustration
1) Remove the nut securing the fan with a spanner (see CJ_ODU_FAN_001). 2) Remove the fan.	 **CJ_ODU_FAN_001**

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

4 Fan Motor

Note: Remove the panel plate and the connection of fan motor on PCB (refer to 3.1 Panel Plate and 3.2 Electrical parts) before disassembling fan motor.

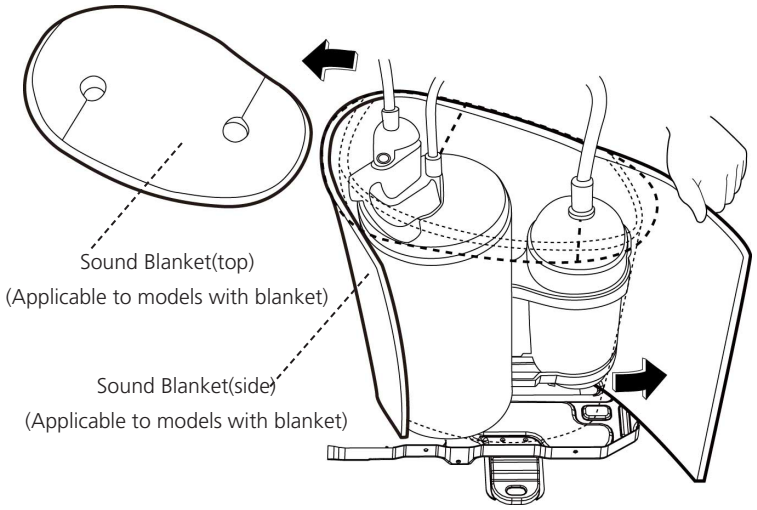
Procedure	Illustration
3) Remove the fixing screws of the fan motor (4 screws) (see CJ_ODU_MOTOR_001). 4) Remove the fan motor.	

CJ_ODU_MOTOR_001

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

5 Sound blanket

Note: Remove the panel plate (refer to 3.1 Panel plate) before disassembling sound blanket.

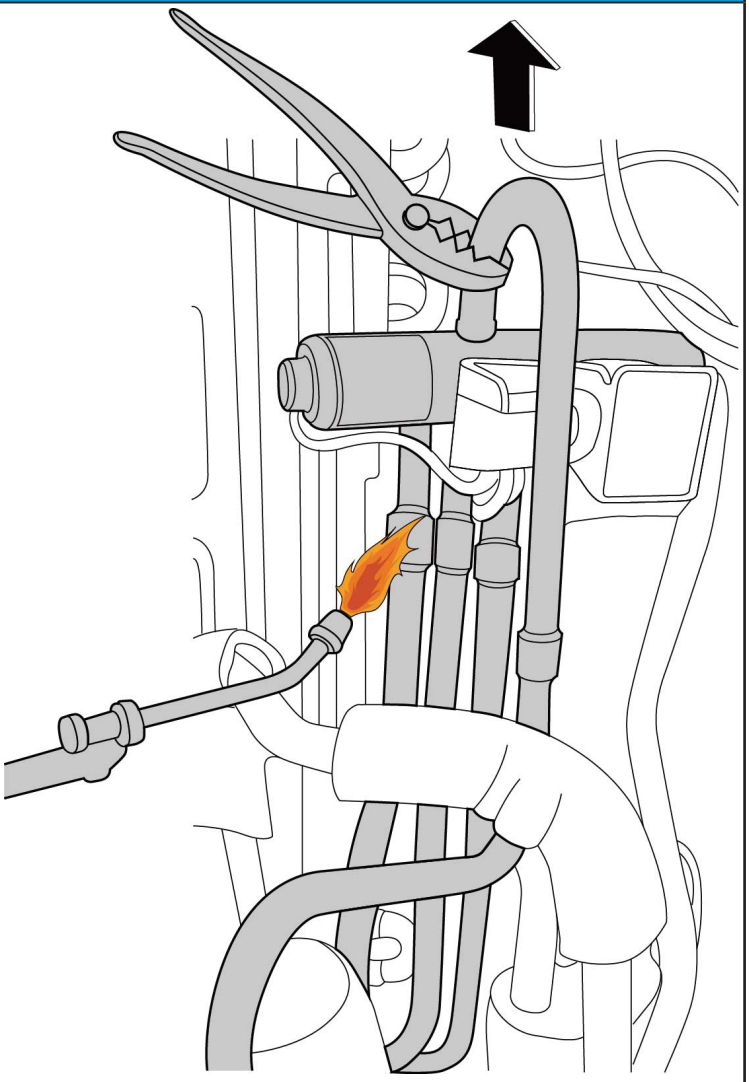
Procedure	Illustration
1) Remove the sound blanket (side and top) (see CJ_ODU_BLANKET_001).	 **CJ_ODU_BLANKET_001**

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

6 Four-way valve (for heat pump models)

WARNING: Evacuate the system and confirm that there is no refrigerant left in the system before removing the four-way valve and the compressor. (For R32 & R290, you should evacuate the system with the vacuum pump; flush the system with nitrogen; then repeat the two steps before heating up the brazed parts. The operations above should be implemented by professionals.)

Note: Remove the panel plate, connection of four-way valve on PCB (refer to 3.1 Panel plate and 3.2 Electrical parts) before disassembling sound blanket.

Procedure	Illustration
1) Heat up the brazed parts and then detach the the four-way valve and the pipe (see CJ_ODU_VALVE_001). 2) Remove the four-way valve assembly with pliers.	

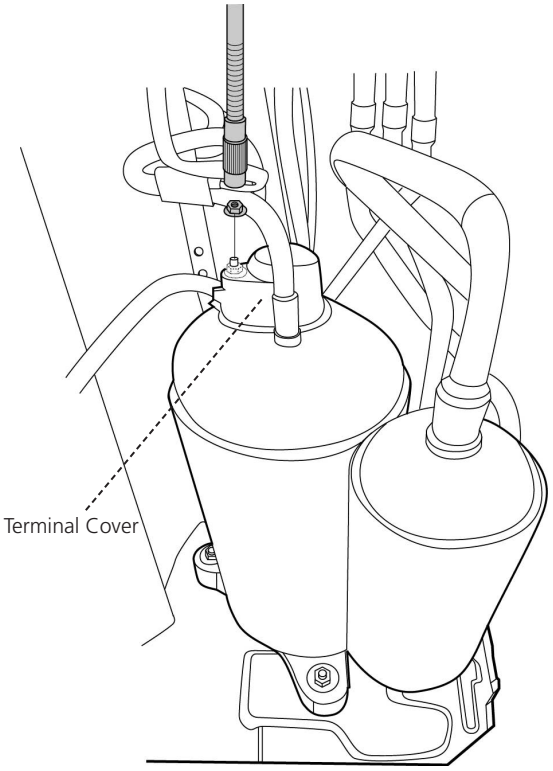
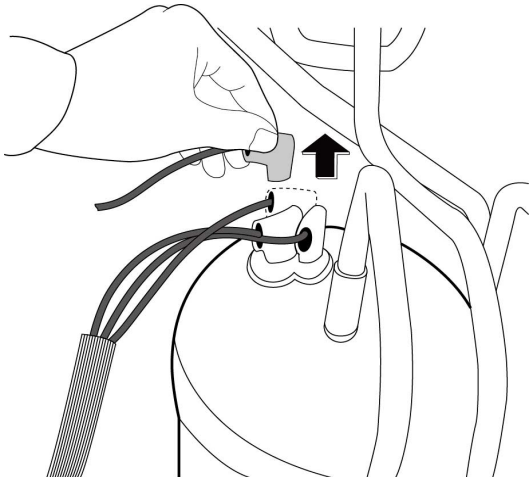
CJ_ODU_VALVE_001

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

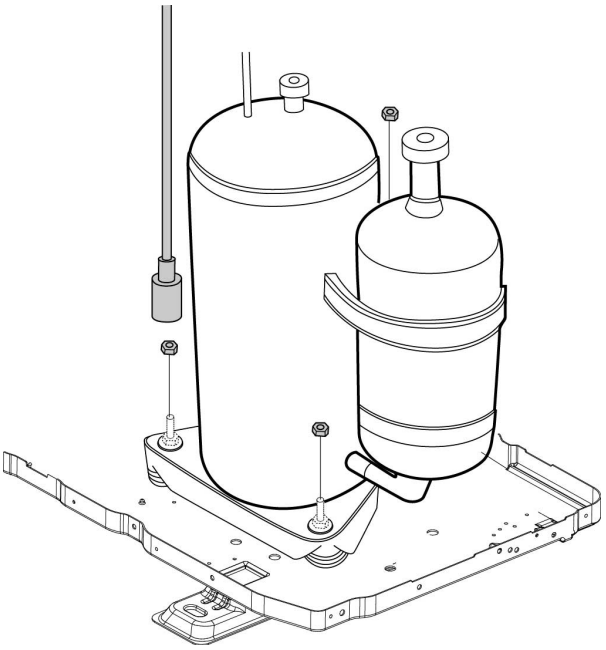
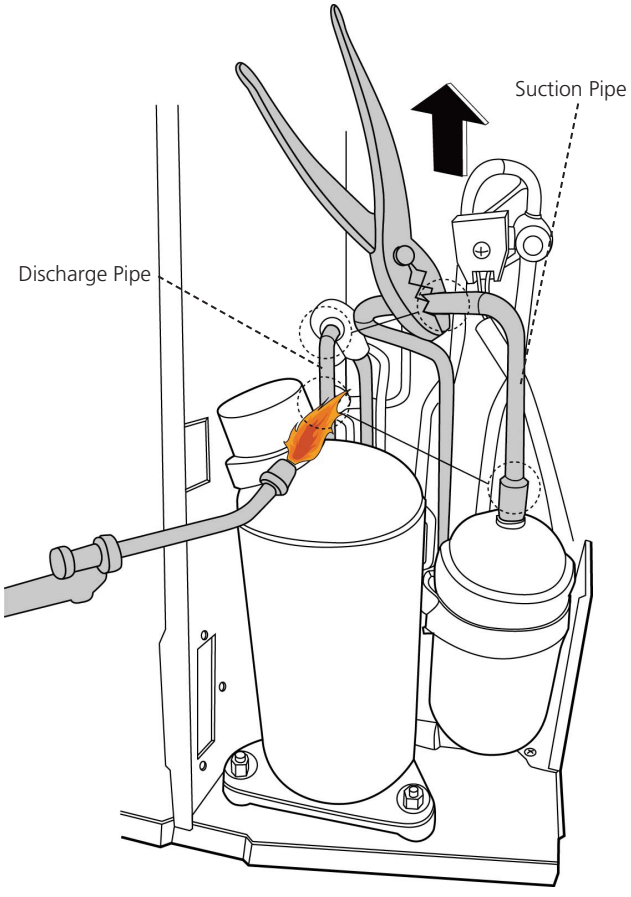
7 Compressor

WARNING: Evacuate the system and confirm that there is no refrigerant left in the system before removing the four-way valve and the compressor. (For R32 & R290, you should evacuate the system with the vacuum pump; flush the system with nitrogen; then repeat the two steps before heating up the brazed parts. The operations above should be implemented by professionals.)

Note: Remove the panel plate, connection of compressor on PCB (refer to 3.1 Panel plate and 3.2 Electrical parts) before disassembling sound blanket.

Procedure	Illustration
1) Remove the flange nut of terminal cover and remove the terminal cover (see CJ_ ODU_COMP_001).	 CJ_ODU_COMP_001
2) Disconnect the connectors (see CJ_ODU_ COMP_002).	 CJ_ODU_COMP_002

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

Procedure	Illustration
3) Remove the hex nuts and washers securing the compressor, located on the bottom plate (see CJ_ODU_COMP_003).	 CJ_ODU_COMP_003
4) Heat up the brazed parts and then remove the the discharge pipe and the suction pipe (see CJ_ODU_COMP_004). 5) Lift the compressor from the base pan assembly with pliers.	 CJ_ODU_COMP_004

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

5. Wiring Diagram

Indoor unit abbreviations

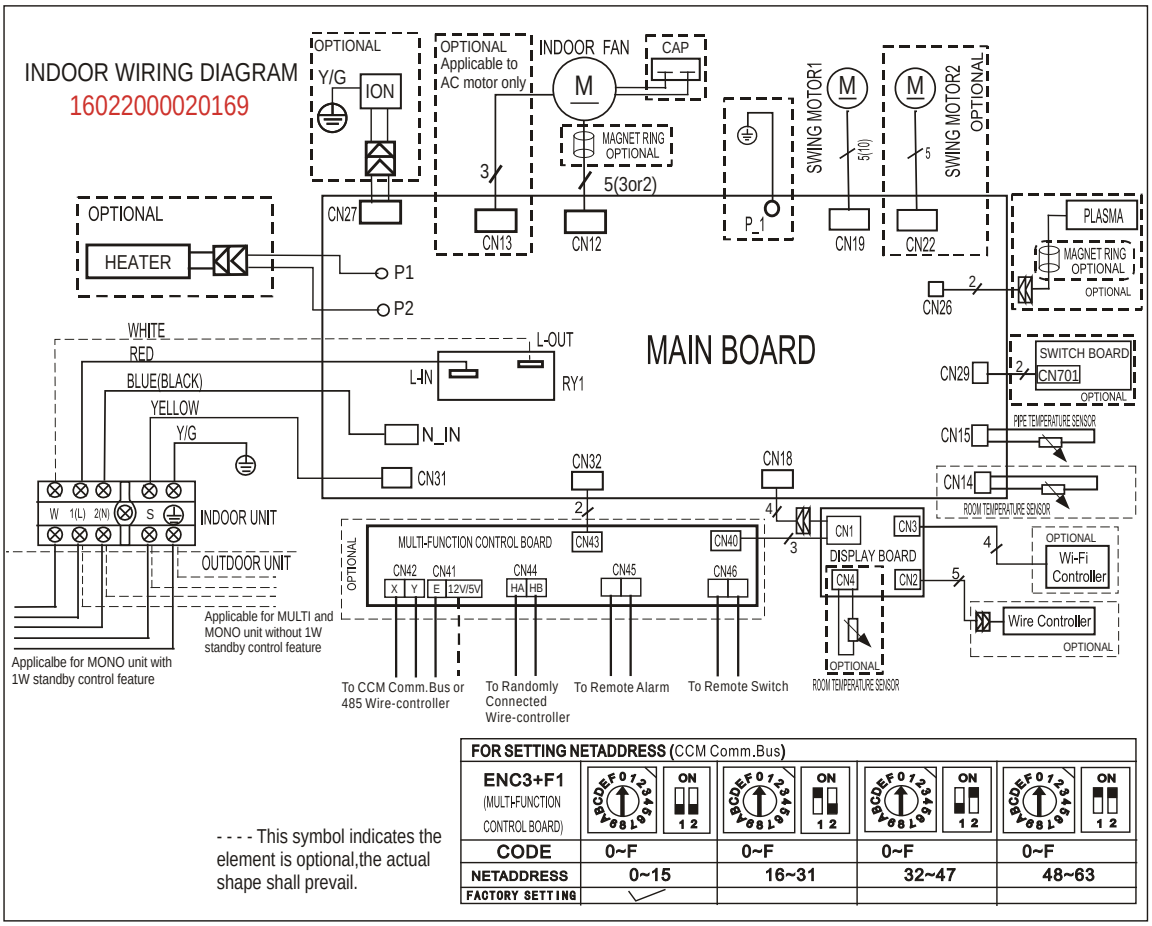
Abbreviation	Paraphrase
Y/G	Yellow-Green Conductor
ION	Positive and Negative Ion Generator
CAP	Capacitor
PLASMA	Electronic Dust Collector
L	LIVE
N	NEUTRAL
Heater	The Electric Heating Belt of Indoor Unit
T1	Indoor Room Temperature
T2	Coil Temperature of Indoor Heat Exchanger

Outdoor unit abbreviations

Abbreviation	Paraphrase
4-WAY	Gas Valve Assembly/4-WAY VALVE
AC-FAN	Alternating Current FAN
DC-FAN	Direct Current FAN
CT1	AC Current Detector
COMP	Compressor
T3	Coil Temperature of Condenser
T4	Outdoor Ambient Temperature
TH	Compressor Suction Temperature
TP	Compressor Discharge Temperature
EEV	Electronic Expansion Valve
L-PRO	Low Pressure Switch
H-PRO	High Pressure Switch

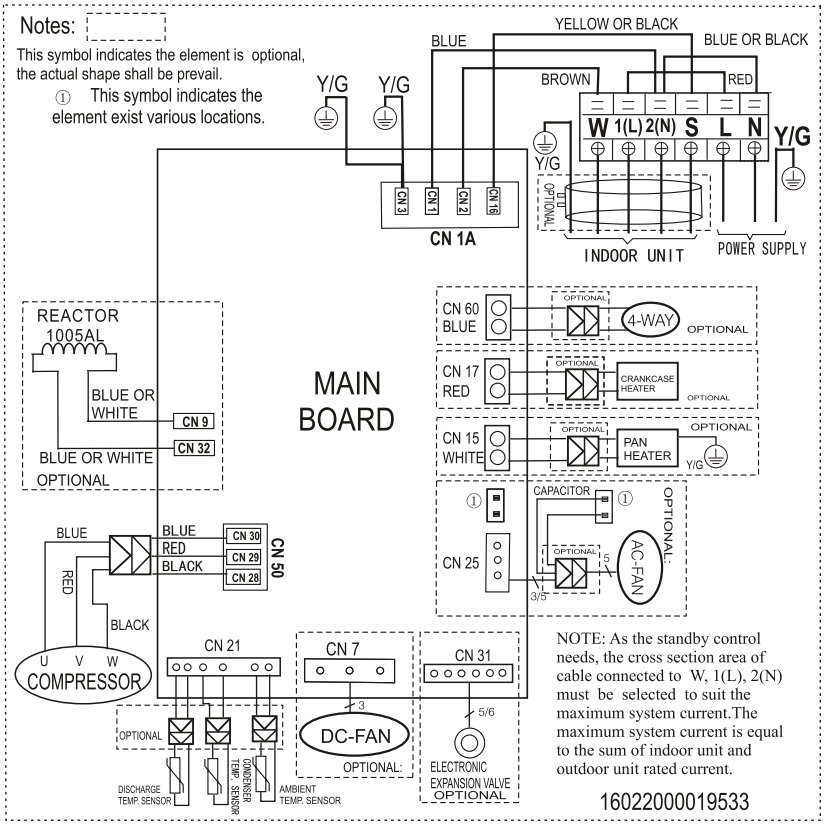
5-1 Indoor Unit

Model 9K/12K/18K/24K

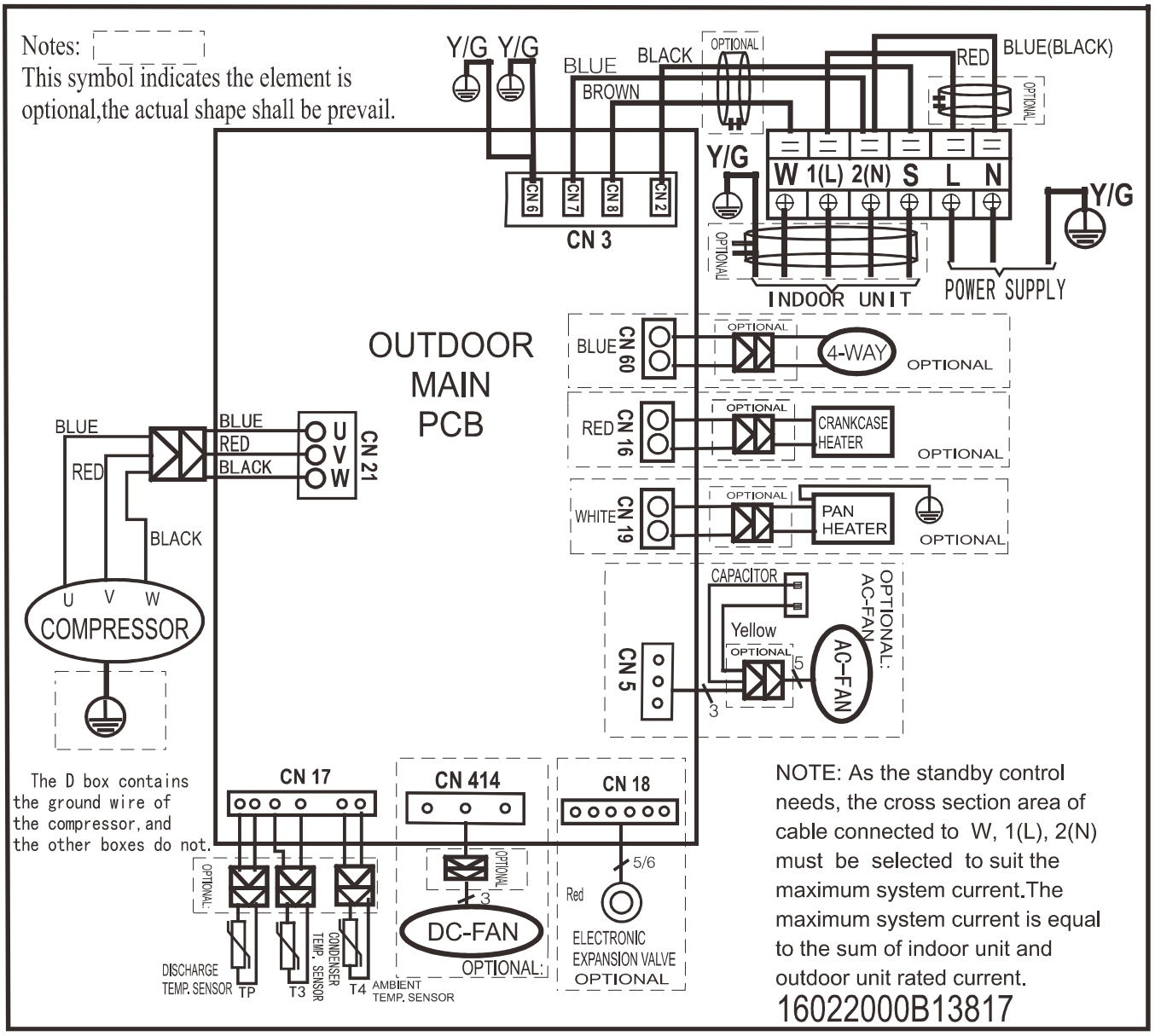


5-2 Outdoor Unit

Model 9K/12K/18K



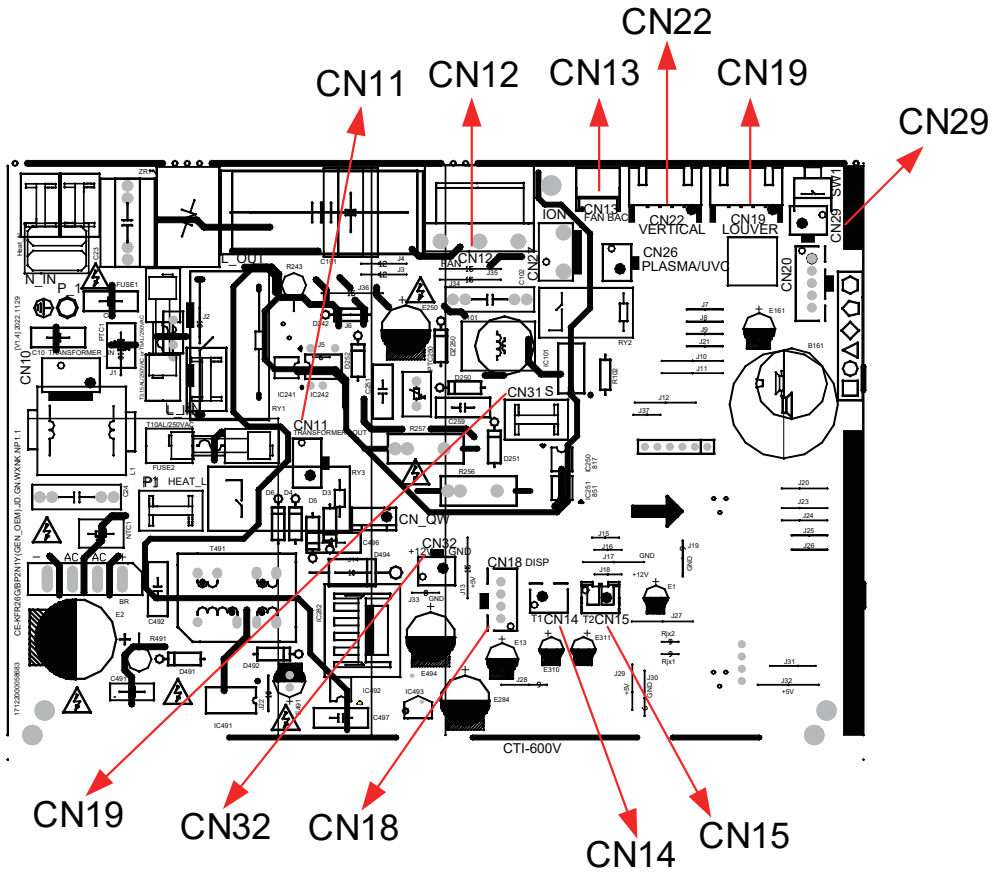
Model 24K


Notes:
This symbol indicates the element is optional,the actual shape shall be prevail.
Y/G Y/G
BLUE
BLACK
BROWN
OPTIONAL
RED
BLUE(BLACK)
Y/G
W 1(L) 2(N) S L N
Y/G
CN 6
CN 7
CN 8
CN 2
CN 3
INDOOR UNIT
POWER SUPPLY
OUTDOOR MAIN PCB
BLUE
CN 60
4-WAY
RED
CN 16
CRANKCASE HEATER
WHITE
CN 19
PAN HEATER
BLUE
RED
BLACK
U V W
CN 21
U V W
COMPRESSOR
CAPACITOR
Yellow
CN 5
AC-FAN
OPTIONAL: AC-FAN
The D box contains the ground wire of the compressor, and the other boxes do not.
CN 17
CN 414
CN 18
DC-FAN
OPTIONAL:
5/6
Red
ELECTRONIC EXPANSION VALVE
OPTIONAL
DISCHARGE TEMP. SENSOR TP
T3
CONDENSER TEMP. SENSOR
T4
AMBIENT TEMP. SENSOR
NOTE: As the standby control needs, the cross section area of cable connected to W, 1(L), 2(N) must be selected to suit the maximum system current.The maximum system current is equal to the sum of indoor unit and outdoor unit rated current.
16022000B13817

6. PCB Diagram

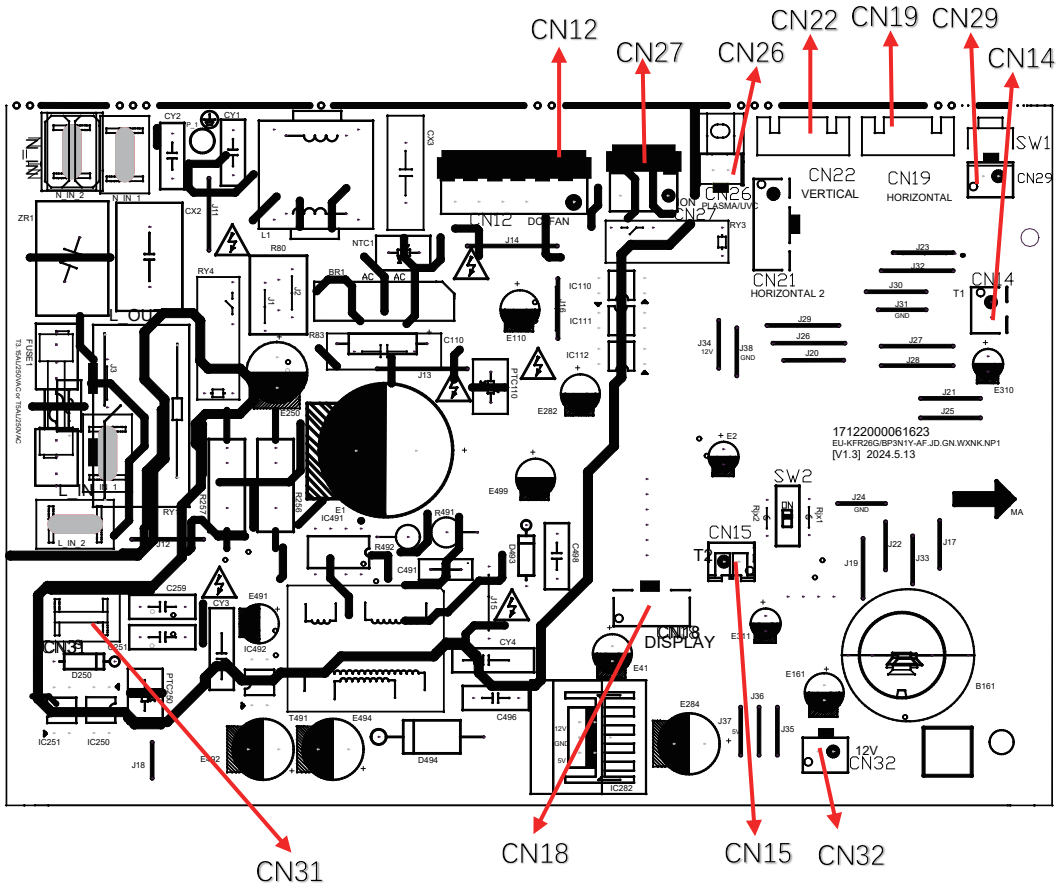
6-1. Indoor Main PCB

9k/12k



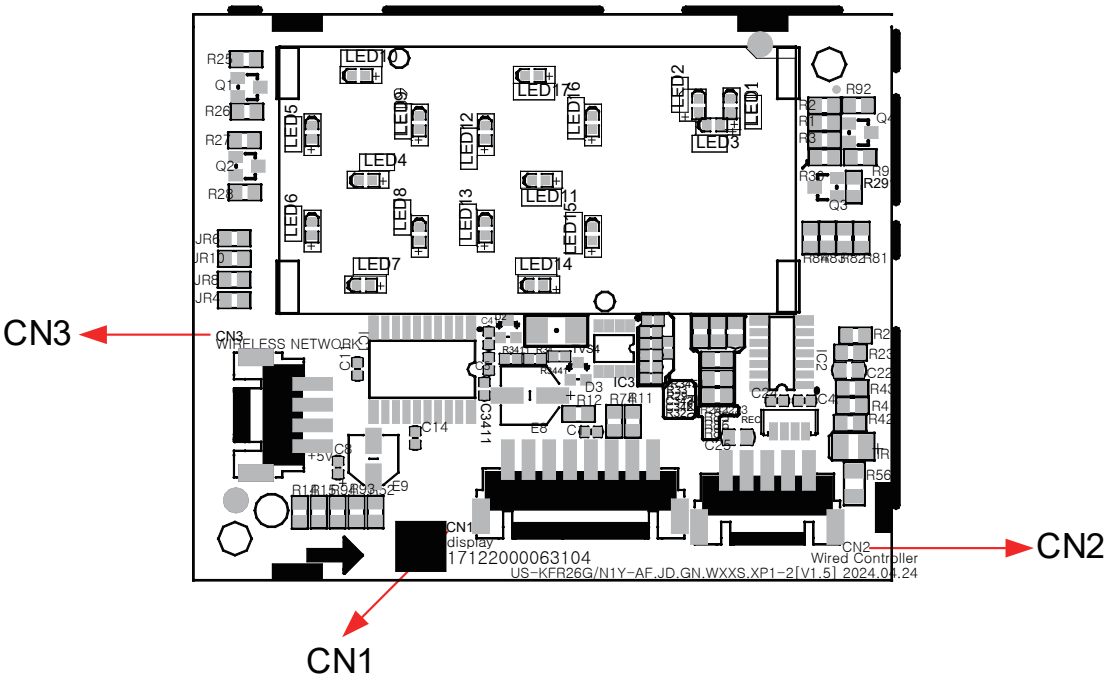
CN12-FAN_IN	CN13- FAN BACK	CN22-SWING MOTOR2	CN19- SWING MOTOR1
#1 : FAN CAP	#1: +12V	#1~#4: STEP MOTOR SIGNAL	#1~#4: STEP MOTOR SIGNAL
#2: FAN CONTROL-L	#2: FEEDBACK SIGNAL	#5: +12V	#5: +12V
#3: FAN CONTROL-N	#3: GND		
CN27-ION	**CN29- SWITCH BOARD**	**CN31- COMMUNICATION LINE S**	**CN15-TEMPERATURE SENSOR**
#1: ION CONTROL-L	#1: SWITCH SIGNAL	#1: S	#1: PIPE SENSOR
#2: ION CONTROL-N	#2: GND		#2: +5V
CN18-DISPLAY	**CN14- TEMPERATURE SENSOR**	**CN32- MULTI-FUNCTION BOARD 12V POWER**	**CN26- PLASMA**
#1: GND	#1: ROOM SENSOR	#1: +12V	#1: PLASMA CONTROL
#2: +5V	#2: +5V	#2: GND	#2: +12V
#3#4: DISPLAY SIGNAL			

18k/24k



CN12-FAN_IN	CN27- ION	CN22-SWING MOTOR2	CN19- SWING MOTOR1
#1: Vm 310V	#1: ION CONTROL-L	#1~#4: STEP MOTOR SIGNAL	#1~#4: STEP MOTOR SIGNAL
#2: NOT USE	#2: ION CONTROL-N	#5: +12V	#5: +12V
#3: GND			
#4: Vcc 15V			
#5: Vsp 0~6.5V			
#6: FG 15V			
CN26-PLASMA	**CN29- SWITCH BOARD**	**CN14- TEMPERATURE SENSOR**	**CN15-TEMPERATURE SENSOR**
#1: PLASMA CONTROL	#1: SWITCH SIGNAL	#1: ROOM SENSOR	#1: PIPE SENSOR
#2: +12V	#2: GND	#2: +5V	#2: +5V
CN18-DISPLAY	**CN32- MULTI-FUNCTION BOARD 12V POWER**	**CN31- COMMUNICATION LINE S**	
#1: GND	#1: +12V	#1: S	
#2: +5V	#2: GND		
#3,#4: DISPLAY SIGNAL			

6-2 Display PCB

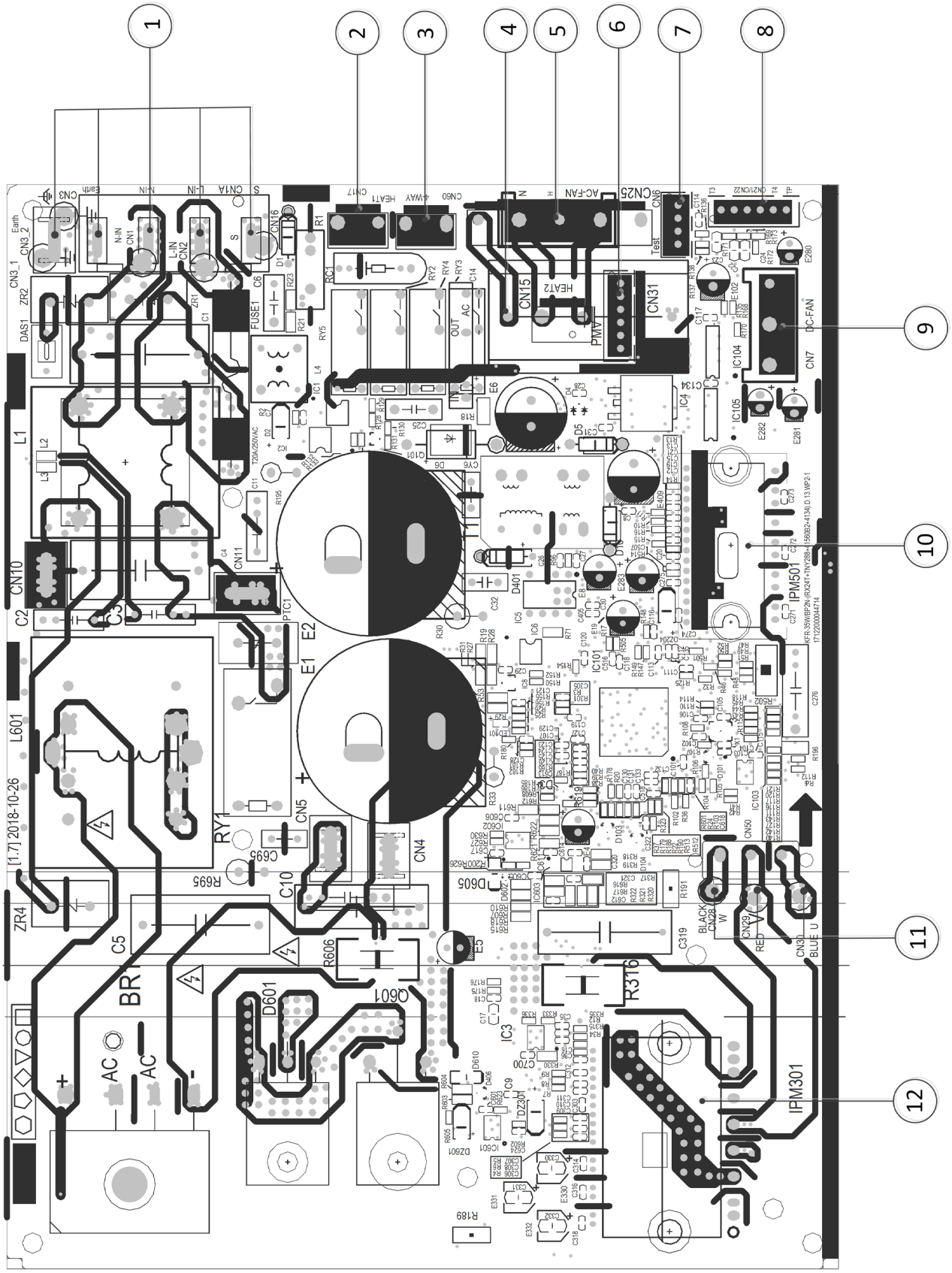


CN1-Display	CN2-Wire controller	CN3-WIFI controller
#1: GND	#1: +5V	#1: GND
#2: +5V	#2: GND	#2: +5V
#3: REC SIGNAL	#3,#4: REC SIGNAL	#3: REC1 SIGNAL
#4: 164 SDA SIGNAL	#5: NOT USE	#4: REC SIGNAL
#5: COM2		#5: NOT USE
#6: COM3		
#7: COM1		
#8: 164 SCL SIGNAL		

6-3 WIFI Module

Model 9K/12K/18K

Outdoor unit printed circuit board diagram: 17122000046453

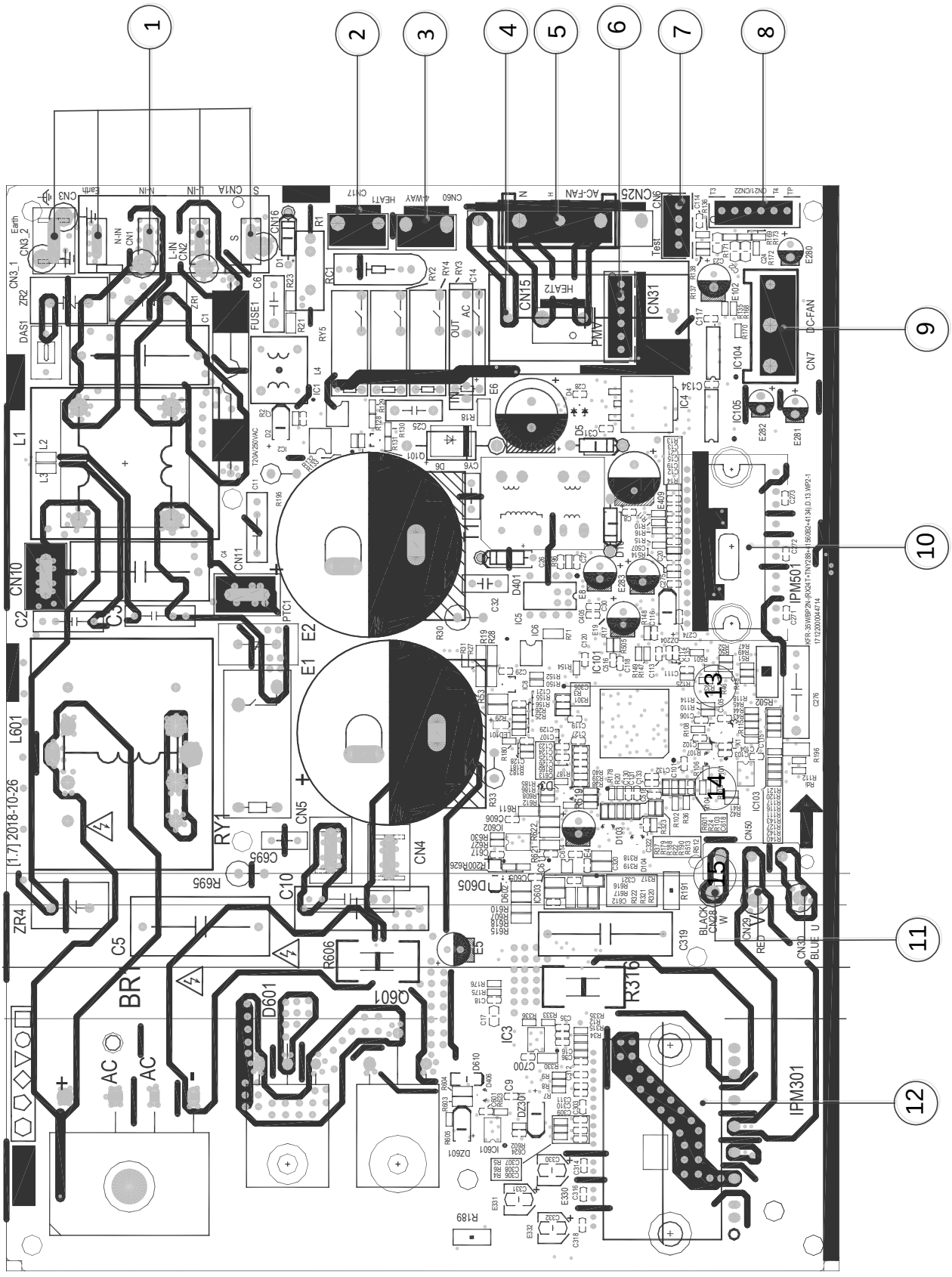


No.	Name	CN#	Meaning
1	CN1A	CN3	Earth: connect to Ground
		CN1	N_in: connect to N-line (208-230V AC input)
		CN2	L_in: connect to L-line (208-230V AC input)
		CN16	S: connect to indoor unit communication
2	HEAT1	CN17	connect to compressor heater, 208-230V AC when is ON
3	4-WAY	CN60	connect to 4 way valve, 208-230V AC when is ON.
4	HEAT2	CN15	connect to chassis heater, 208-230V AC when is ON
5	AC-FAN	CN25	connect to AC fan
6	PMV	CN31	connect to Electric Expansion Valve
7	TESTPORT	CN6	used for testing
8	TP T4 T3	CN21/CN22	connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP
9	DC-FAN	CN7	connect to DC fan
10	FAN_IPM	IPM 501	IPM for DC fan
11	W	CN28	connect to compressor
	V	CN29	0V AC (standby)
	U	CN30	10-200V AC (running)
12	COMP_IPM	IPM 301	IPM for compressor

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

Model 24K

Outdoor unit printed circuit board diagram: 17122000048121



No.	Name	CN#	Meaning
1	CN1A	CN3	Earth: connect to Ground
		CN1	N_in: connect to N-line (208-230V AC input)
		CN2	L_in: connect to L-line (208-230V AC input)
		CN16	S: connect to indoor unit communication
2	HEAT1	CN17	connect to compressor heater, 208-230V AC when is ON
3	4-WAY	CN60	connect to 4 way valve, 208-230V AC when is ON.
4	HEAT2	CN15	connect to chassis heater, 208-230V AC when is ON
5	AC-FAN	CN25	connect to AC fan
6	PMV	CN31	connect to Electric Expansion Valve
7	TESTPORT	CN6	used for testing
8	TP T4 T3	CN21/CN22	connect to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP
9	DC-FAN	CN7	connect to DC fan
10	FAN_IPM	IPM 501	IPM for DC fan
11	W	CN28	connect to compressor
	V	CN29	0V AC (standby)
	U	CN30	10-200V AC (running)
12	COMP_IPM	IPM 301	IPM for compressor

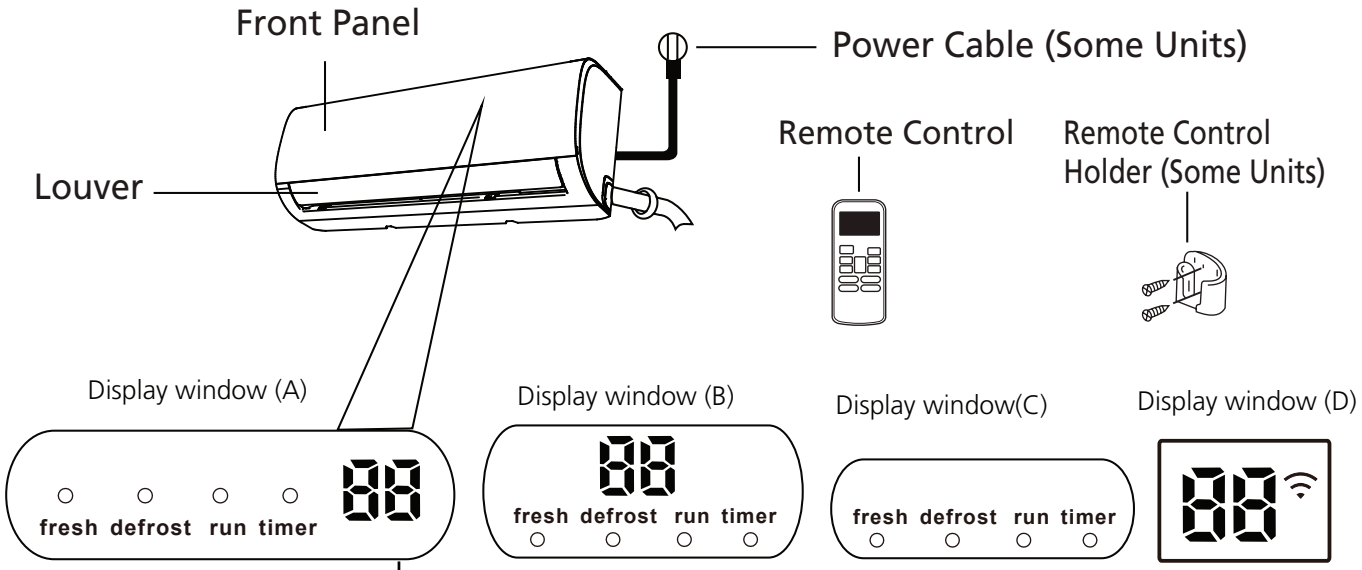
Note: This section is for reference only. Please take practicality as standard.

7. Operating Instructions

7-1 Name of Each Part

NOTE: Different models have different front panel and display window. Not all the indicators describing below are available for the air conditioner you purchased. Please check the indoor display window of the unit you purchased.

Illustrations in this manual are for explanatory purposes. The actual shape of your indoor unit may be slightly different. The actual shape shall prevail.



" " when Wireless Control feature is activated (For APP control units).

" " Displays temperature, operation feature and Error codes:

Display Code Meanings

" " for 3 seconds when:
- TIMER ON is set (if the unit is OFF, " " remains on when TIMER ON is set).
- SWING, TURBO, or SILENCE feature is turned on.

" " for 3 seconds when:
- TIMER OFF is set.
- SWING, TURBO, or SILENCE feature is turned off.

" " when defrosting.

" " when Active Clean feature is turned on.

" " when 46°F (8°C) heating feature is turned on.

8. Troubleshooting

1. Safety Caution

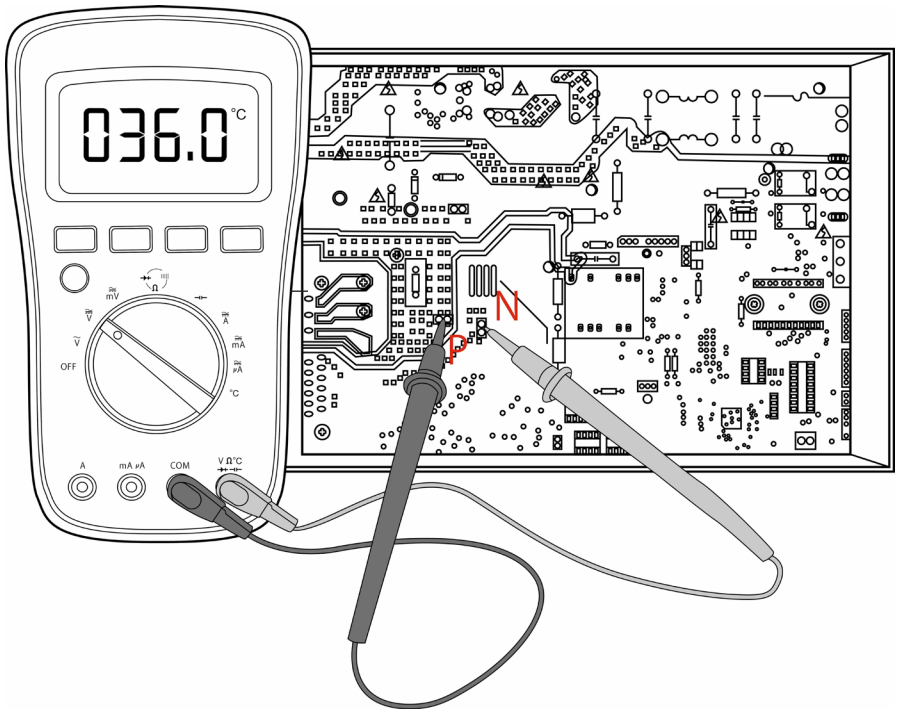
WARNING

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

WARNING

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

Test the voltage between P and N on back of the main PCB with multimeter. If the voltage is 36V, the capacitors are fully discharged.



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

2. General Troubleshooting

2.1 Error Display (Indoor Unit)

When the indoor unit encounters a recognized error on different models ,
1. the running LED with flash in a corresponding series, the timer LED may turn on or begin flashing;
2. an error code will be displayed;
3. both 1 and 2.

These error codes are described in the following tables:

Timer Display Lamp	Error Information	Solution
dF	Defrost	--
SC	Self clean	--
CL	Filter cleaning reminder(power on display for 15 seconds)	--
CL	Active clean(for some series)	--
nF	Filter replacement reminder(power on display for 15 seconds)	--
FP	Heating in room temperature under 8°C&12°C	--
FC	Forced cooling	--
AP	AP mode of WIFI connection	--
CP	Remote switched off	--
EH00/EH0A	Indoor unit EEPROM parameter error	TS01-IDU
EL01	Indoor/outdoor unit communication error	TS02-S-INV
EH02	Zero-crossing signal detection error	TS03
EH03	The indoor fan speed is operating outside of the normal range	TS04-S-IDU
EC51	Outdoor unit EEPROM parameter error	TS01-ODU
EC52	Condenser coil temperature sensor T3 is in open circuit or has short circuited	TS05-ODU
EC53	Outdoor room temperature sensor T4 is in open circuit or has short circuited	TS05-ODU
EC54	Compressor discharge temperature sensor TP is in open circuit or has short circuited	TS05-ODU
EC56	Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for free-match indoor units)	TS05-ODU

EH60	Indoor room temperature sensor T1 is in open circuit or has short circuited	TS05-IDU
EH61	Evaporator coil middle temperature sensor T2 is in open circuit or has short circuited	TS05-IDU
EC07	The outdoor fan speed is operating outside of the normal range	TS04-ODU
EH0b	Indoor PCB/Display board communication error	TS07
EL0C	Refrigerant leakage detection	TS06-INV
PC00	IPM malfunction or IGBT over-strong current protection	TS09-S
PC01	Over voltage or over low voltage protection	TS10-S
PC02	Top temperature protection of compressor or High temperature protection of IPM module or High pressure protection	TS11-S-INV
PC0L	Low ambient temperature protection	
PC40	Communication error between outdoor main chip and compressor driven chip	TS33
PC03	Low pressure protection	TS13-INV
--	Indoor units mode conflict(match with multi outdoor unit)	TS14

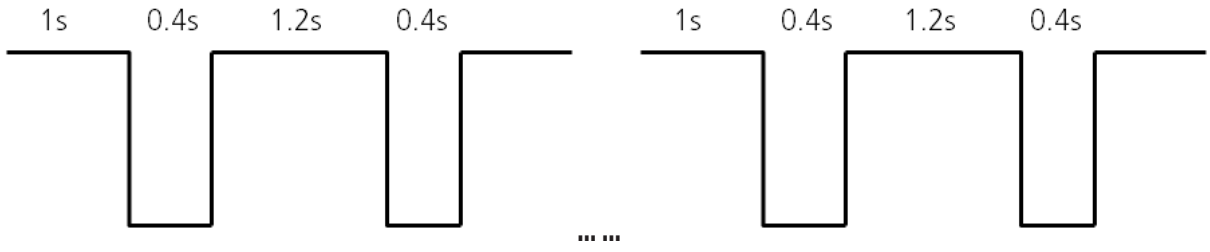
For other errors:

The display board may show a garbled code or a code undefined by the service manual. Ensure that this code is not a temperature reading.

Troubleshooting:

Test the unit using the remote control. If the unit does not respond to the remote, the indoor PCB requires replacement. If the unit responds, the display board requires replacement.

88 flash frequency:



3. Complain Record Form

Complain Record Form

Request No.: Date:

Installation Date: Service Date:

Customer Information			
Name		Telephone No.	
Home Address			
Email			
Product Information			
Indoor Unit Model		Outdoor Unit Model	
Serial No. of indoor unit			
Serial No. of outdoor unit			
Working Mode	☐Cooling ☐Heating ☐Fan only ☐Dry		
Setting temperature	_____°C / °F	Fan speed	☐Turbo ☐High ☐Medium ☐Low ☐Auto
Temperature of air inlet	_____°C / °F	Temperature of air outlet	_____°C / °F
Installation / Condition Information			
Indoor temperature	_____°C / °F	Indoor humidity	_____%RH
Outdoor temperature	_____°C / °F	Outdoor humidity	_____%RH
Length of Connecting pipe		Pipe diameter	Gas pipe: Liquid pipe:
Length of Wiring		wire diameter	
System Running Pressure	_____MPa or _____Bar or _____PSI		
Room size (L*W*H)			
Photo of Installation of In-door unit (Photo #1)		Photo of Installation of Outdoor unit (Photo #2)	
Failure Description			
Error Code of Indoor unit		Code of Outdoor PCB	
Unit does not start			
Remote control does not work			
Indoor display shows nothing			
No cooling or heating at all			
Less cooling or heating			
Unit starts but stops shortly			
High noise			
High vibration			

T2	Indoor coil temperature		
T3	Outdoor coil temperature		
T4	Ambient temperature		
Tb	Outlet temperature of indoor coil		
TP	Discharge temperature		
TH	Sunction temperature		
FT	Targeted Frequency		
Fr	Actual Frequency		
IF	Indoor fan speed		
OF	Outdoor fan speed		
LA	EXV opening steps		
CT	Compressor continuous running time		
ST	Causes of compressor stop.		
A0, A1, b0, b1, b2, b3, b4, b5, b6, dL, Ac, Uo, Td, dA, dS, dT	Reserved		

Approval from Manufacturer	
☐Approved	
☐More Proof needed	
☐Rejected	

4. Information Inquiry

- To enter information inquiry status, complete the following procedure within ten seconds:
  - Press LED(or DO NOT DISTURB) 3 times.
  - Press SWING(or AIR DIRECTION) 3 times.
- Finish 1 and 2 within 10 seconds, you will hear beeps for two seconds, which means the unit goes into parameter checking mode.
- Use the LED(or DO NOT DISTURB) and SWING(or AIR DIRECTION) buttons to cycle through information displayed.
- Pressing LED(or DO NOT DISTURB) will display the next code in the sequence. Pressing SWING(or AIR DIRECTION) will show the previous.
- The following table shows information codes. The screen will display this code for two seconds, then the information for 25 seconds.

Displayed code	Explanation	Displayed value	Meaning	Additional Notes
T1	Room temperature	-1F,-1E,-1d,-1c,-1b,-1A -19—99 A0,A1,…A9 b0,b1,…b9 c0,c1,…c9 d0,d1,…d9 E0,E1,…E9 F0,F1,…F9	-25,-24,-23,-22,-21,-20 -19—99 100,101,…109 110,111,…119 120,121,…129 130,131,…139 140,141,…149 150,151,…159	1. All displayed temperatures use actual values. 2. All temperatures are displayed in °C regardless of remote used. 3. T1, T2, T3, T4, and T2B display ranges from -25 to 70 °C. TP display ranges from -20 to 130 °C. 4. The frequency display ranges from 0 to 159HZ. 5. If the actual values exceed or fall short of the defined range, the values closest to the maximum and minimum values will be displayed.
T2	Indoor coil temperature			
T3	Outdoor coil temperature			
T4	Ambient temperature			
TB	Outlet temperature of indoor coil			
TP	Discharge temperature			
TH	Suction temperature			
FT	Targeted frequency			
FR	Actual frequency			
IF	Indoor fan speed	0 1,2,3,4	OFF Low speed, Medium speed, High speed, Turbo.	N/A Used for some large capacity motors.
OF	Outdoor fan speed	14-FF	Actual fan speed is equal to the display value converted to decimal value and multiplied by 10. This is measured in RPM.	Used for some small capacity motors. The display value is 14-FF (hexadecimal). The corresponding fan speed ranges from 200 to 2550RPM.
LR	EXV opening angle	0-FF	Actual EXV opening value is equal to the display value converted to decimal value and then multiplied by 2.	-
CT	Compressor continuous running time	0-FF	0-255 minutes	If the actual value exceeds or falls short of the defined range, the value closest to the maximum and minimum will be displayed.
ST	Causes of compressor stop	0-99	For a detailed explanation, contact technical support.	-

Displayed code	Explanation	Displayed value	Meaning	Additional Notes
A0	Reserved	0-FF 2-28 5-20 5-25	-	-
A1				
b0				
b1				
b2				
b3				
b4				
b5				
b6				
dL				
Rc				
Uo				
Td				
dR				
dS				
dT				

5. Error Diagnosis and Troubleshooting Without Error Code

WARNING

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

5.1 Remote maintenance

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

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

5.2 Field maintenance

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

1.Remote Maintenance	Electrical Circuit							Refrigerant Circuit							
Possible causes of trouble	Power failure	The main power tripped	Loose connections	Faulty transformer	The voltage is too high or too low	The remote control is powered off	Broken remote control	Dirty air filter	Dirty condenser fins	The setting temperature is higher/lower than the room's(cooling/heating)	The ambient temperature is too high/low when the mode is cooling/heating	Fan mode	SILENCE function is activated(optional function)	Frosting and defrosting frequently	
Unit will not start	☆	☆	☆	☆											
The power switch is on but fans will not start			☆	☆	☆										
The temperature on the display board cannot be set						☆	☆								
Unit is on but the wind is not cold(hot)										☆	☆	☆			
Unit runs, but shortly stops					☆					☆	☆				
The unit starts up and stops frequently					☆						☆			☆	
Unit runs continuously but insufficient cooling(heating)								☆	☆	☆	☆		☆		
Cool can not change to heat															
Unit is noisy															
Test method / remedy	Test voltage	Close the power switch	Inspect connections - tighten	Change the transformer	Test voltage	Replace the battery of the remote control	Replace the remote control	Clean or replace	Clean	Adjust the setting temperature	Turn the AC later	Adjust to cool mode	Turn off SILENCE function.	Turn the AC later	

1.Remote Maintenance	Others					
Possible causes of trouble	Heavy load condition	Loosen hold down bolts and / or screws	Bad airproof	The air inlet or outlet of either unit is blocked	Interference from cell phone towers and remote boosters	Shipping plates remain attached
Unit will not start						
The power switch is on but fans will not start					☆	
The temperature on the display board cannot be set						
Unit is on but the wind is not cold(hot)						
Unit runs, but shortly stops						
The unit starts up and stops frequently				☆		
Unit runs continuously but insufficient cooling(heating)	☆		☆	☆		
Cool can not change to heat						
Unit is noisy		☆				☆
Test method / remedy	Check heat load	Tighten bolts or screws	Close all the windows and doors	Remove the obstacles	Reconnect the power or press **ON/OFF** button on remote control to restart operation	Remove them

2.Field Maintenance	Electrical Circuit														
Possible causes of trouble	Power failure	Blown fuse or varistor	Loose connections	Shorted or broken wires	Safety device opens	Faulty thermostat / room temperature sensor	Wrong setting place of temperature sensor	Faulty transformer	Shorted or open capacitor	Faulty magnetic contactor for compressor	Faulty magnetic contactor for fan	Low voltage	Faulty stepping motor	Shorted or grounded compressor	Shorted or grounded fan motor
Unit will not start	☆	☆	☆	☆	☆			☆							
Compressor will not start but fans run				☆		☆			☆	☆				☆	
Compressor and condenser (outdoor) fan will not start				☆		☆				☆					
Evaporator (indoor) fan will not start				☆					☆		☆				☆
Condenser (Outdoor) fan will not start				☆		☆			☆		☆				☆
Unit runs, but shortly stops										☆		☆			
Compressor short-cycles due to overload										☆		☆			
High discharge pressure															
Low discharge pressure															
High suction pressure															
Low suction pressure															
Unit runs continuously but insufficient cooling															
Too cool						☆	☆								
Compressor is noisy															
Horizontal louver can not revolve			☆	☆									☆		
Test method / remedy	Test voltage	Inspect fuse type & size	Inspect connections - tighten	Test circuits with tester	Test continuity of safety device	Test continuity of thermostat / sensor & wiring	Place the temperature sensor at the central of the air inlet grille	Check control circuit with tester	Check capacitor with tester	Test continuity of coil & contacts	Test continuity of coil & contacts	Test voltage	Replace the stepping motor	Check resistance with multimeter	Check resistance with multimeter

2.Field Maintenance	Refrigerant Circuit																			Others					
Possible causes of trouble	Compressor stuck	Shortage of refrigerant	Restricted liquid line	Dirty air filter	Dirty evaporator coil	Insufficient air through evaporator coil	Overcharge of refrigerant	Dirty or partially blocked condenser	Air or incompressible gas in refrigerant cycle	Short cycling of condensing air	High temperature condensing medium	Insufficient condensing medium	Broken compressor internal parts	Inefficient compressor	Expansion valve obstructed	Expansion valve or capillary tube closed completely	Leaking power element on expansion valve	Poor installation of feeler bulb	Heavy load condition	Loosen hold down bolts and / or screws	Shipping plates remain attached	Poor choices of capacity	Contact of piping with other piping or external plate
Unit will not start																									
Compressor will not start but fans run	☆																								
Compressor and condenser (outdoor) fan will not start																									
Evaporator (indoor) fan will not start																									
Condenser (Outdoor) fan will not start																									
Unit runs, but shortly stops		☆	☆				☆	☆								☆	☆								
Compressor short-cycles due to overload		☆					☆	☆																	
High discharge pressure							☆	☆	☆	☆	☆	☆													
Low discharge pressure		☆												☆											
High suction pressure							☆							☆				☆	☆						
Low suction pressure		☆	☆	☆	☆	☆									☆	☆	☆								
Unit runs continuously but insufficient cooling		☆	☆	☆	☆	☆		☆	☆	☆				☆					☆			☆			
Too cool																									
Compressor is noisy							☆						☆							☆	☆		☆		
Horizontal louver can not revolve																									
Test method / remedy	Replace the compressor	Leak test	Replace restricted part	Clean or replace	Clean coil	Check fan	Change charged refrigerant volume	Clean condenser or remove obstacle	Purge, evacuate and recharge	Remove obstruction to air flow	Remove obstruction in air or water flow	Remove obstruction in air or water flow	Replace compressor	Test compressor efficiency	Replace valve	Replace valve	Replace valve	Fix feeler bulb	Check heat load	Tighten bolts or screws	Remove them	Choose AC of lager capacity or add the number of AC	Rectify piping so as not to contact each other or with external plate		

6. Quick Maintenance by Error Code

If you do not have the time to test which specific parts are faulty, you can directly change the required parts according the error code.

You can find the parts to replace by error code in the following table.

Part requiring replacement	Error Code								
	EH00	EL01	EH02	EH03	EH60	EH61	EH0b	EL0C	EC56
Indoor PCB	✓	✓	✓	✓	✓	✓	✓	✓	x
Outdoor PCB	x	✓	x	x	x	x	x	x	✓
Display board	x	x	x	x	x	x	✓	x	x
Indoor fan motor	x	x	x	✓	x	x	x	x	x
T1 sensor	x	x	x	x	✓	x	x	x	x
T2 Sensor	x	x	x	x	x	✓	x	✓	x
T2B Sensor	x	x	x	x	x	x	x	x	✓
Reactor	x	✓	x	x	x	x	x	x	x
Compressor	x	x	x	x	x	x	x	x	x
Additional refrigerant	x	x	x	x	x	x	x	✓	x

Part requiring replacement	EC53	EC52	EC54	EC51	EC07	PC00	PC01	PC02	PC03	PC04
Outdoor PCB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Indoor fan motor	x	x	x	x	x	x	x	x	x	x
Outdoor fan motor	x	x	x	x	✓	✓	x	✓	x	✓
T3 Sensor	x	✓	x	x	x	x	x	x	x	x
T4 Sensor	✓	x	x	x	x	x	x	x	x	x
TP Sensor	x	x	✓	x	x	x	x	x	x	x
Reactor	x	x	x	x	x	x	✓	x	x	x
Compressor	x	x	x	x	x	✓	x	x	x	✓
IPM module board	x	x	x	x	x	✓	✓	✓	x	✓
High pressure protector	x	x	x	x	x	x	x	✓	x	x
Low pressure protector	x	x	x	x	x	x	x	x	✓	x
Additional refrigerant	x	x	x	x	x	x	x	x	✓	x

Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

7. Troubleshooting by Error Code

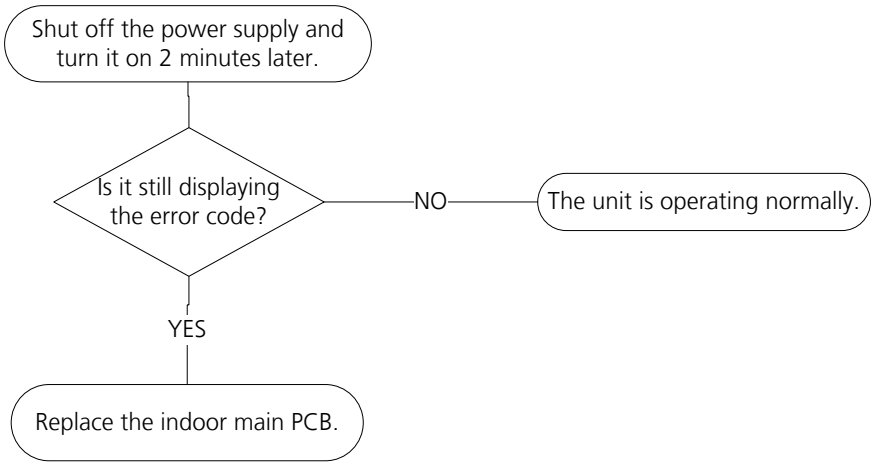
TS01-IDU: Indoor EEPROM parameter error diagnosis and solution

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

Recommended parts to prepare:

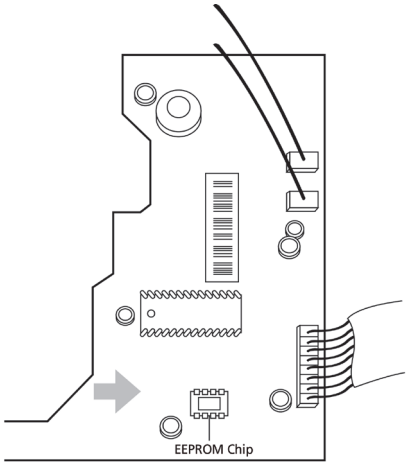
- Indoor PCB

Troubleshooting and repair:



Remarks:
EEPROM: A read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

The location of the EEPROM chip on the indoor PCB is shown in the following image:



Note: This pictures are only for reference, actual appearance may vary.

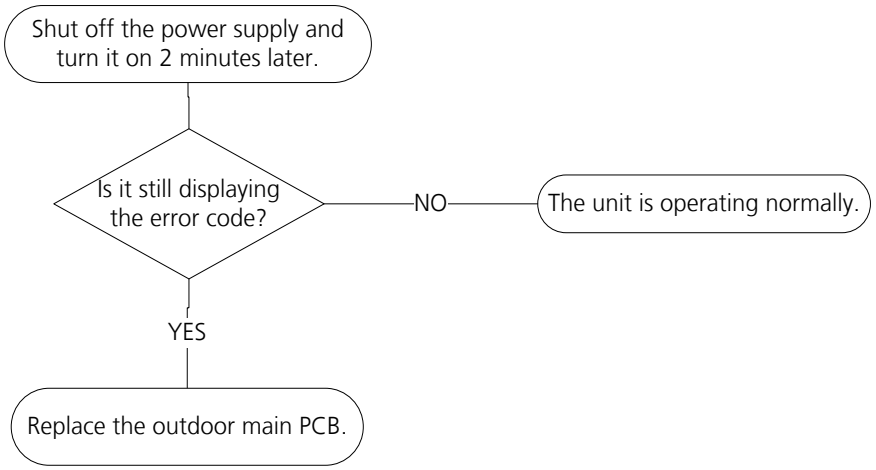
TS01-ODU: Outdoor EEPROM parameter error or Compressor driven chip EEPROM parameter error diagnosis and solution

Description: Outdoor PCB main chip does not receive feedback from EEPROM chip or compressor driven chip.

Recommended parts to prepare:

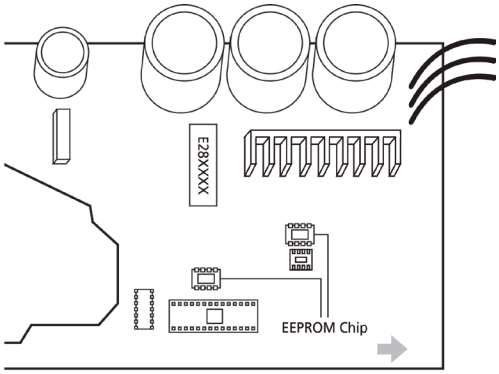
- Outdoor PCB

Troubleshooting and repair:



Remarks:
EEPROM: A read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

The location of the EEPROM chip on the outdoor PCB is shown in the following image:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole. This pictures are only for reference, actual appearance may vary.

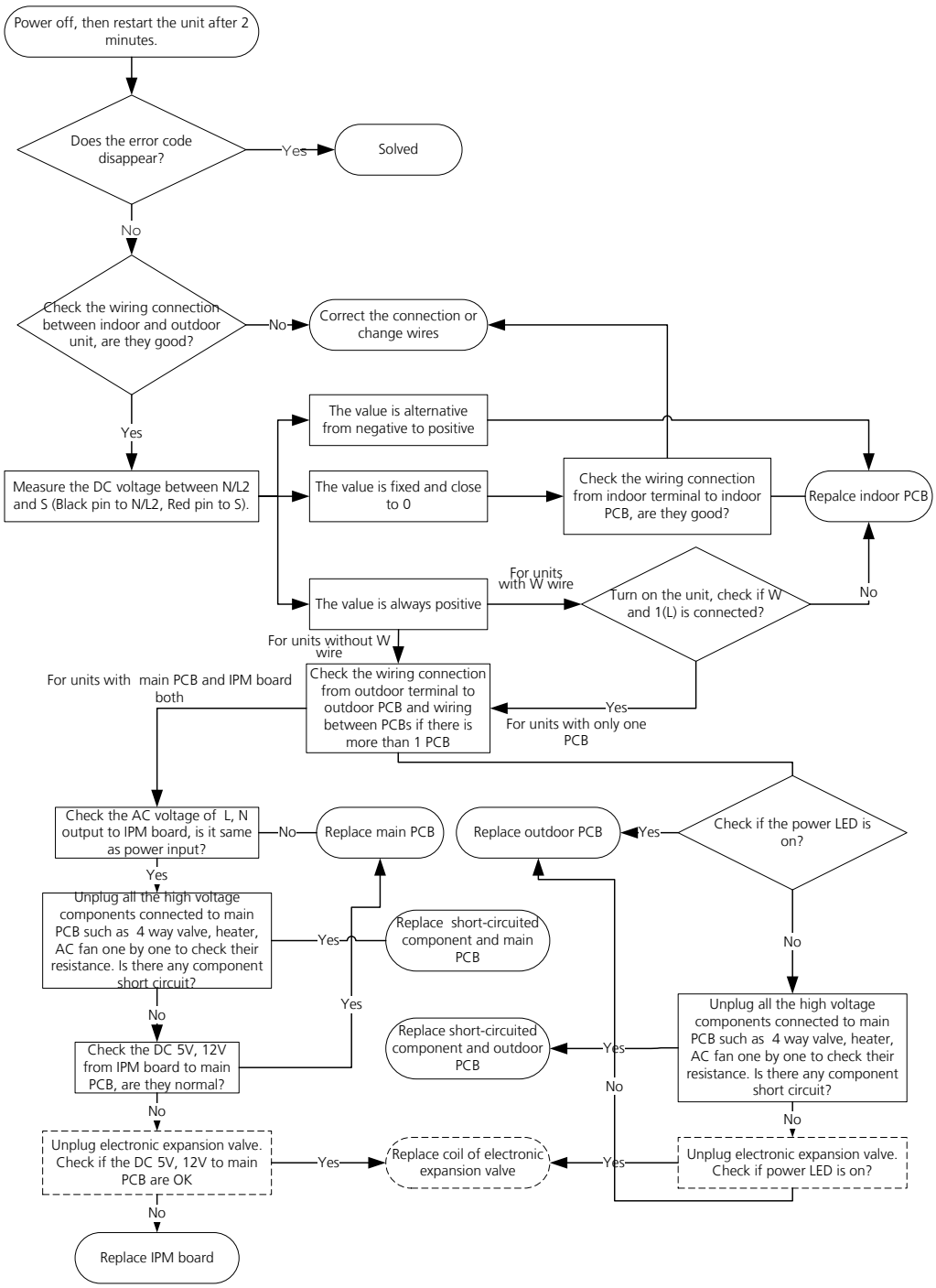
TS02-S-INV: Indoor and outdoor unit communication error diagnosis and solution

Description: Indoor unit can not communicate with outdoor unit

Recommended parts to prepare:

- Indoor PCB
- Outdoor PCB
- Short-circuited component

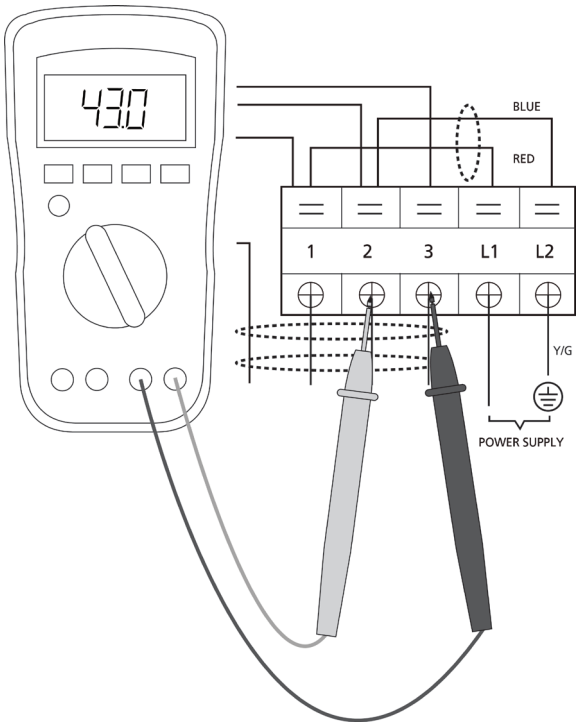
Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric

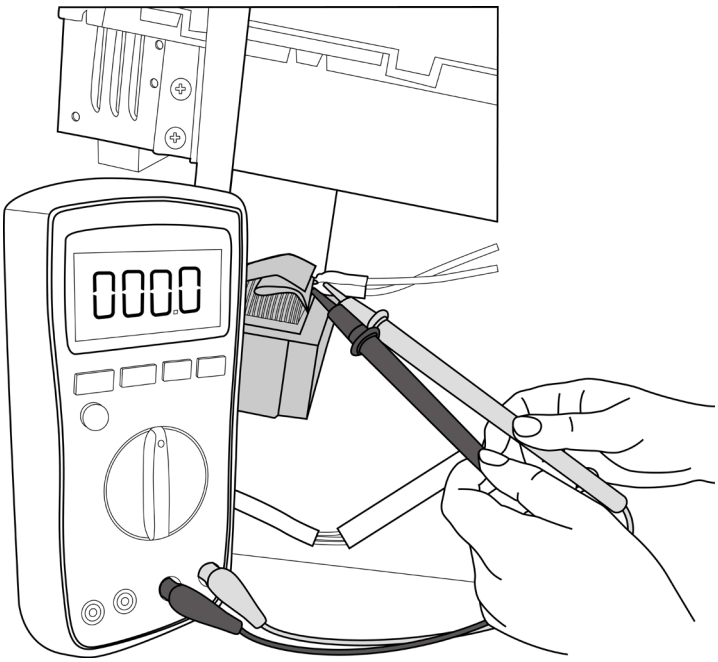
Remarks:

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



S and N or L2 and S or 2 and 3

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



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

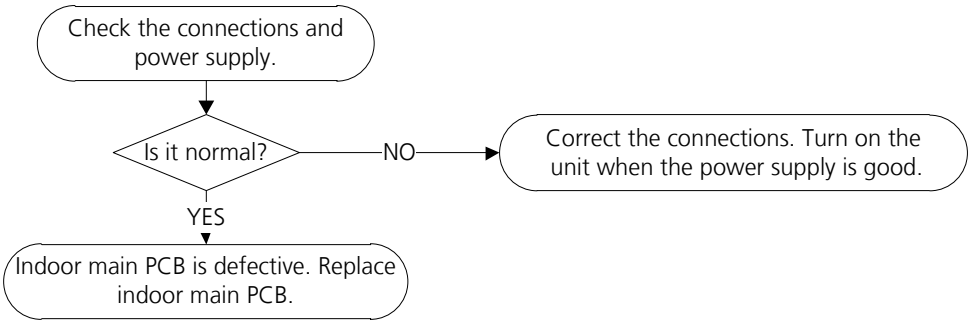
TS03: Zero crossing detection error diagnosis and solution

Description: When PCB does not receive zero crossing signal feedback for 4 minutes or the zero crossing signal time interval is abnormal.

Recommended parts to prepare:

- Connection wires
- Indoor main PCB

Troubleshooting and repair:



Note: Zero crossing detection error is only valid for the unit with AC fan motor, for other models, this error is

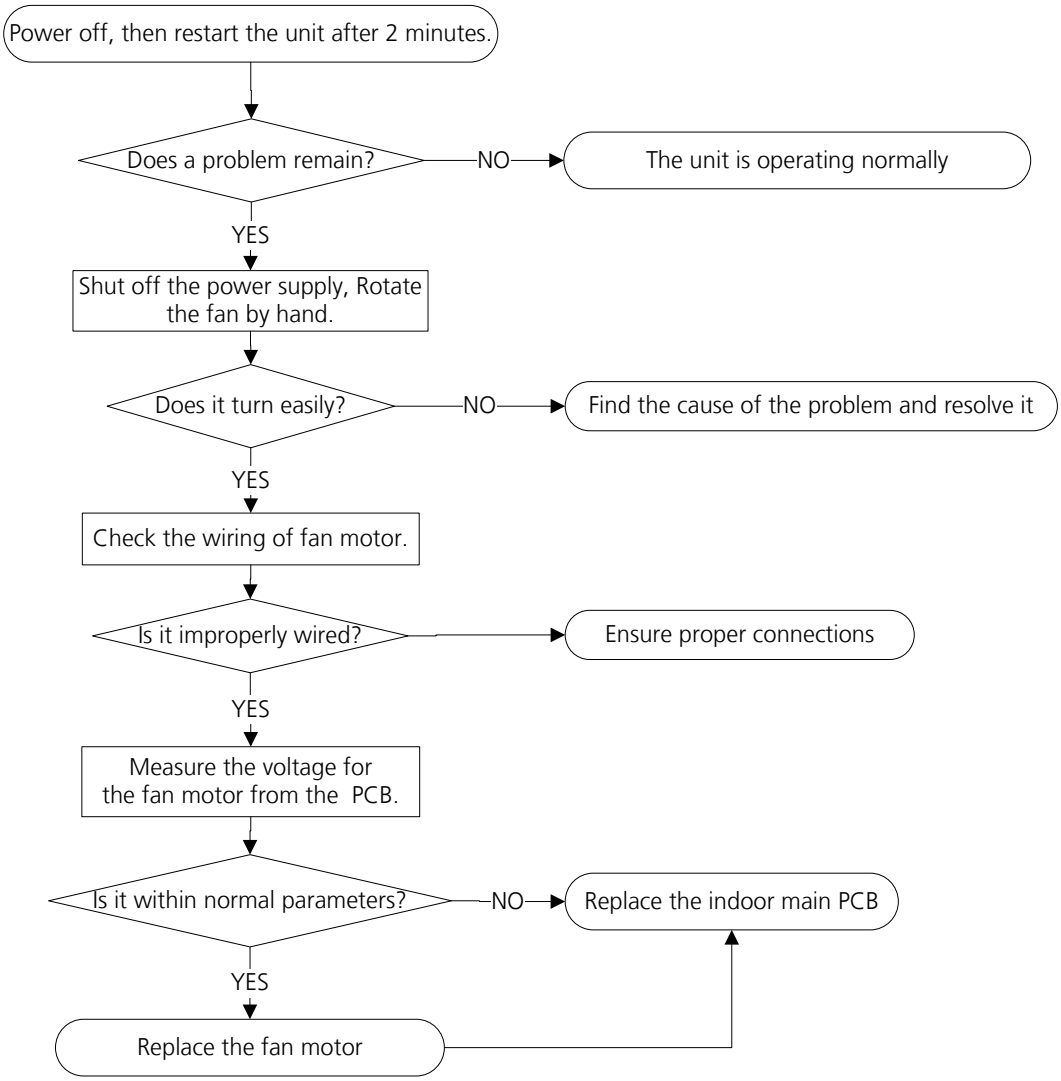
TS04-S-IDU: The Indoor fan speed is operating outside of normal range diagnosis and solution)

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

Recommended parts to prepare:

- Connection wires
- Fan assembly
- Fan motor
- Indoor main PCB

Troubleshooting and repair:



Index:

1. DC Fan Motor(control chip is in fan motor)

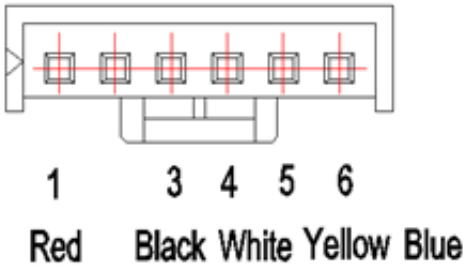
Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must has problems and need to be replaced.

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

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

- DC motor voltage input and output (voltage: 115V~):

No.	Color	Signal	Voltage
1	Red	Vs/Vm	140V~190V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5-16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5-16.5V



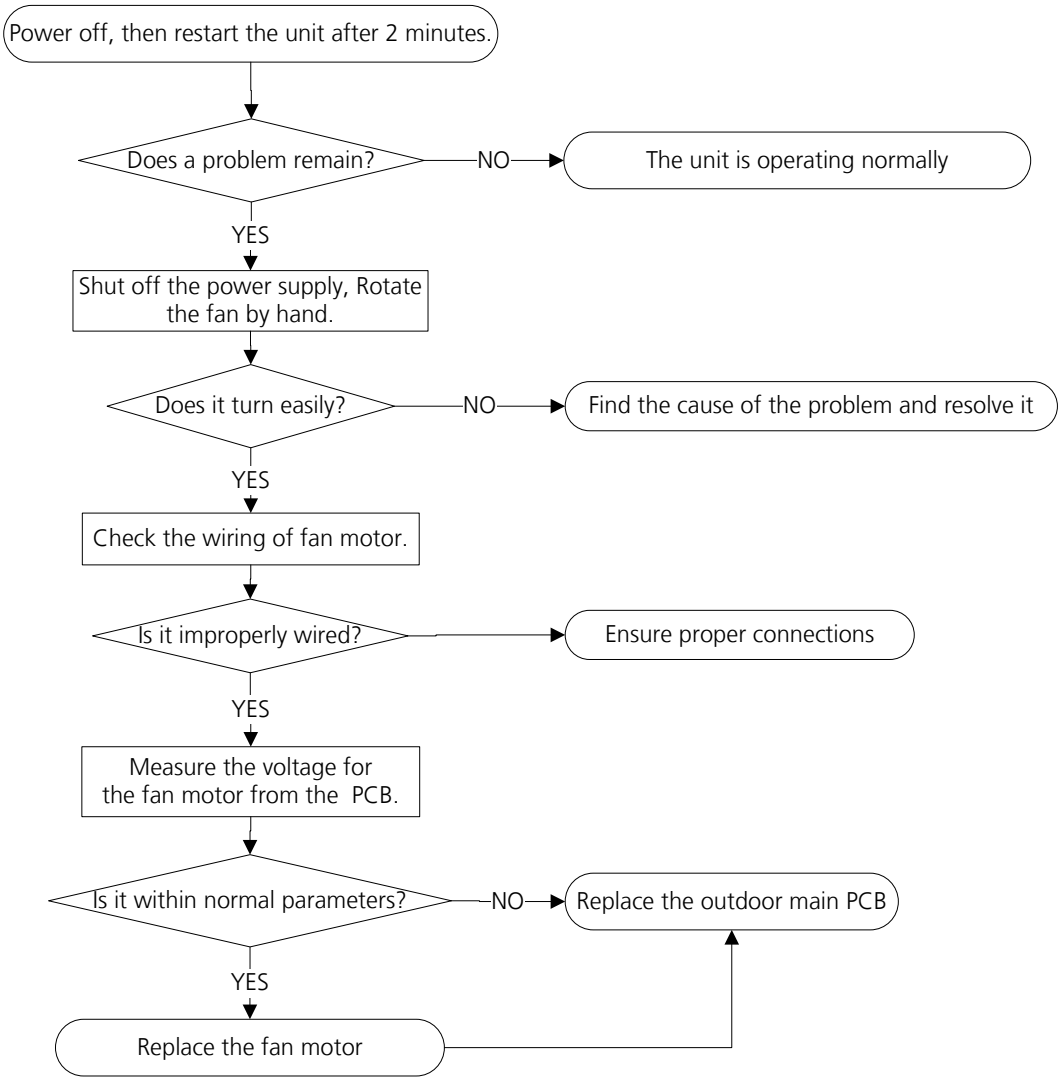
TS04-ODU: The outdoor fan speed is operating outside of normal range diagnosis and solution)

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

Recommended parts to prepare:

- Connection wires
- Fan assembly
- Fan motor
- Outdoor main PCB

Troubleshooting and repair:

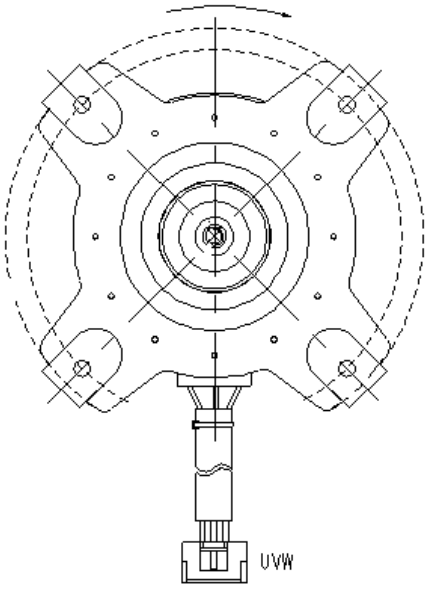


Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

Index:

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

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



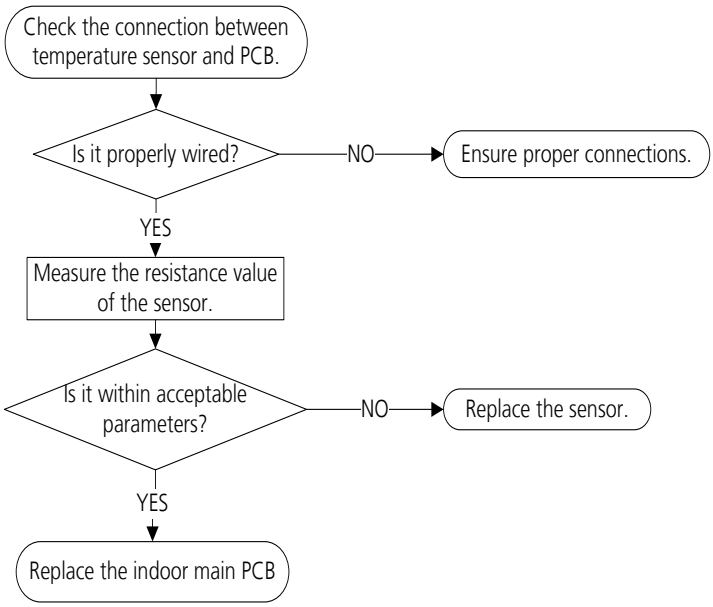
TS05-IDU: Open circuit or short circuit of indoor temperature sensor(T1, T2) diagnosis and solution

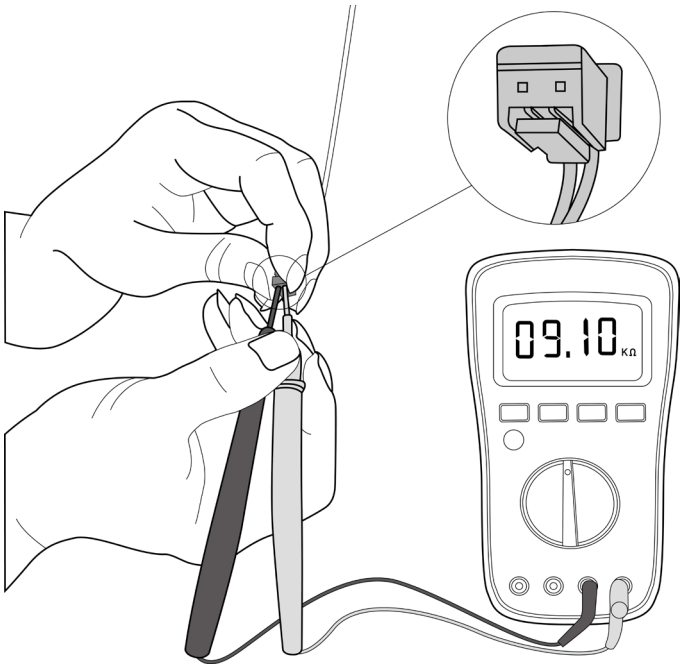
Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays the failure code.

Recommended parts to prepare:

- Connection wires
- Sensors
- Indoor main PCB

Troubleshooting and repair:





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

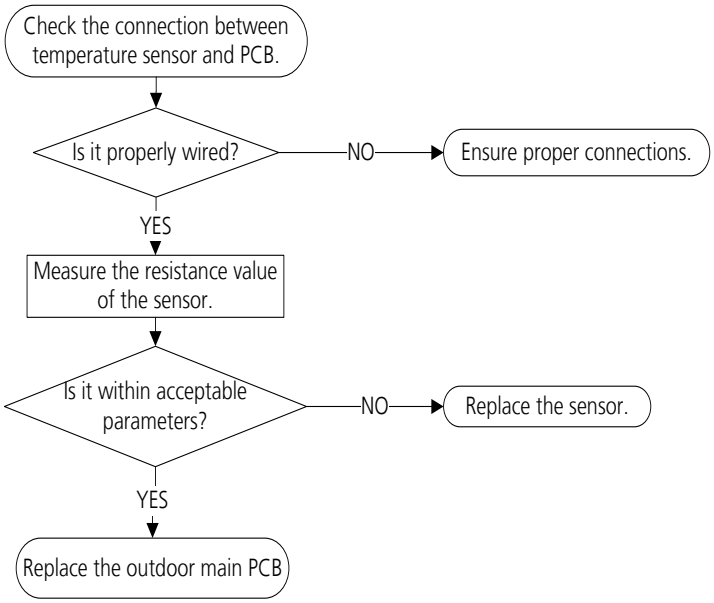
TS05-ODU: Open circuit or short circuit of outdoor temperature sensor(T3, T4, TP, T2B,TH) diagnosis and solution

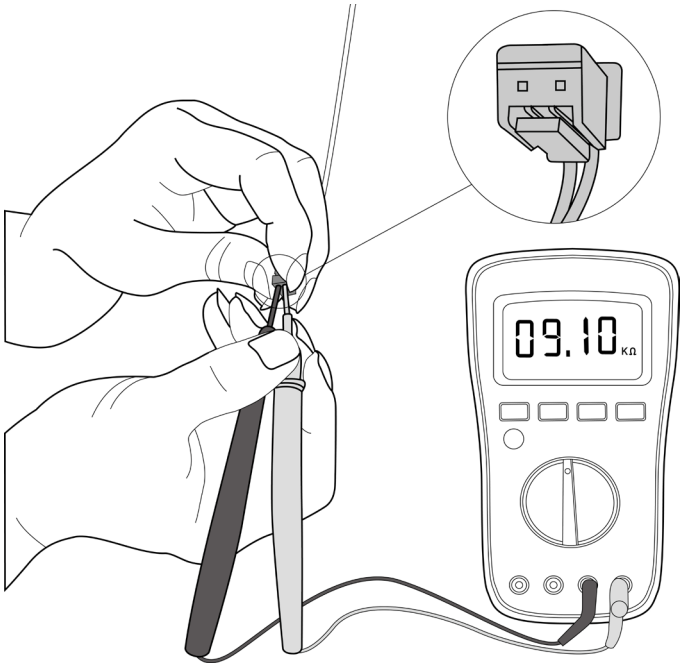
Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays the failure code.

Recommended parts to prepare:

- Connection wires
- Sensors
- Outdoor main PCB

Troubleshooting and repair:





Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole. For certain models, outdoor unit uses combination sensor, T3,T4 and TP are

TS06-INV: Refrigerant Leakage Detection diagnosis and solution

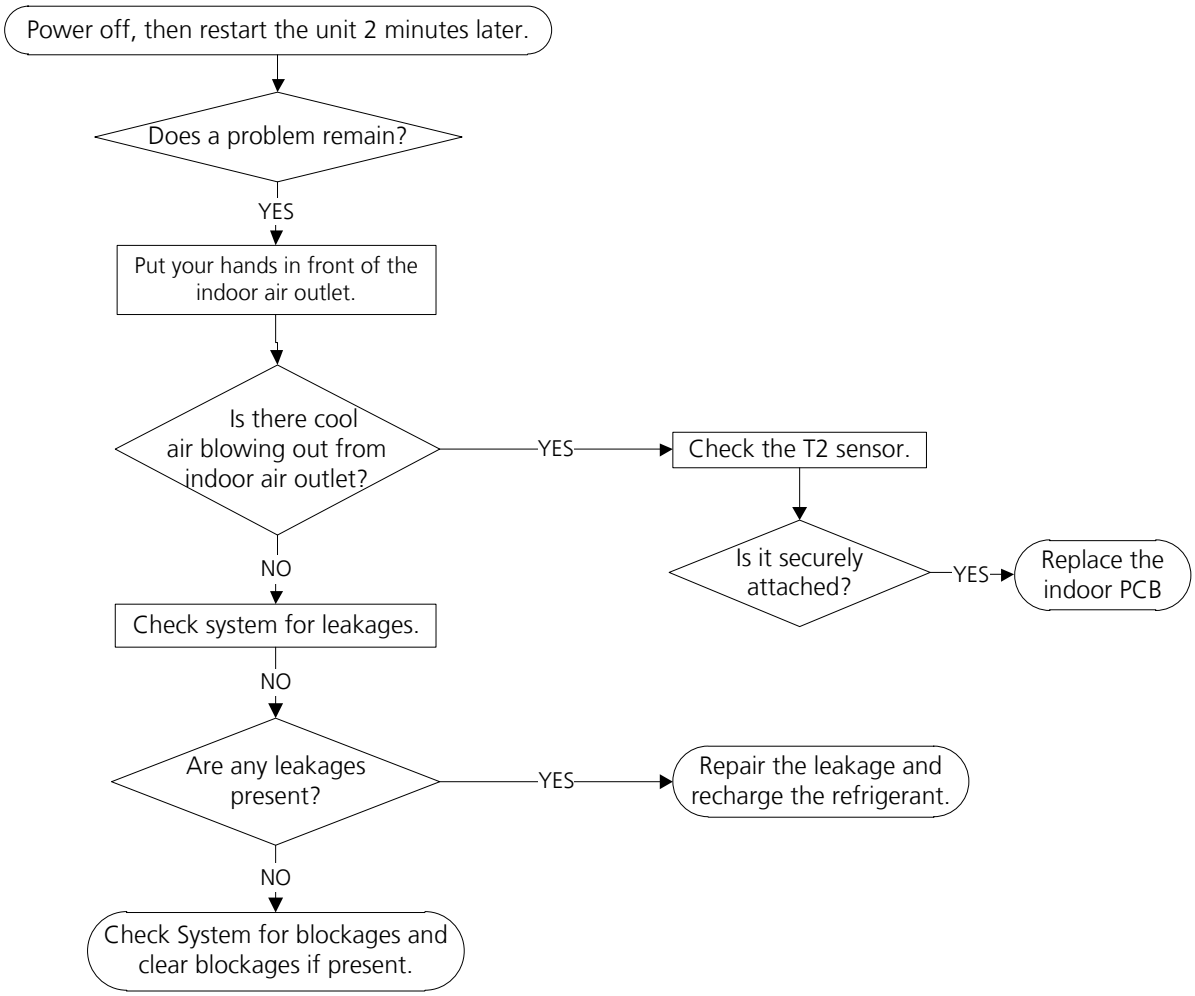
Description: Define the evaporator coil temperature T2 of the compressor just starts running as Tcool.

In the beginning 5 minutes after the compressor starts up, if T2 < Tcool-1°C(1.8°F) does not keep continuous 4 seconds and compressor running frequency higher than 50Hz does not keep for 3 minutes, and this situation happens 3 times, the LED displays the failure code and the AC turns off.

Recommended parts to prepare:

- T2 sensor
- Indoor PCB
- Additional refrigerant

Troubleshooting and repair:



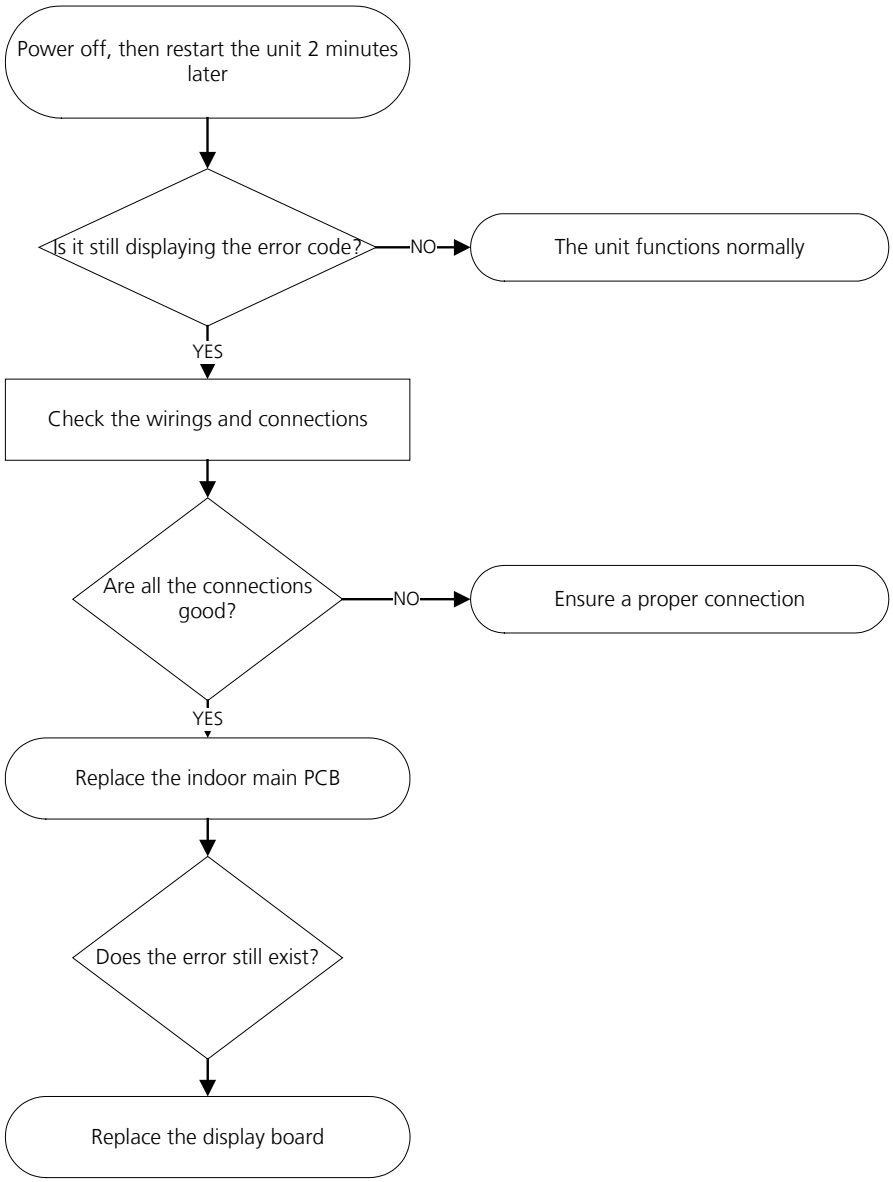
TS07: Indoor PCB / Display board communication error diagnosis and solution

Description: Indoor PCB does not receive feedback from the display board.

Recommended parts to prepare:

- Communication wire
- Indoor PCB
- Display board

Troubleshooting and repair:



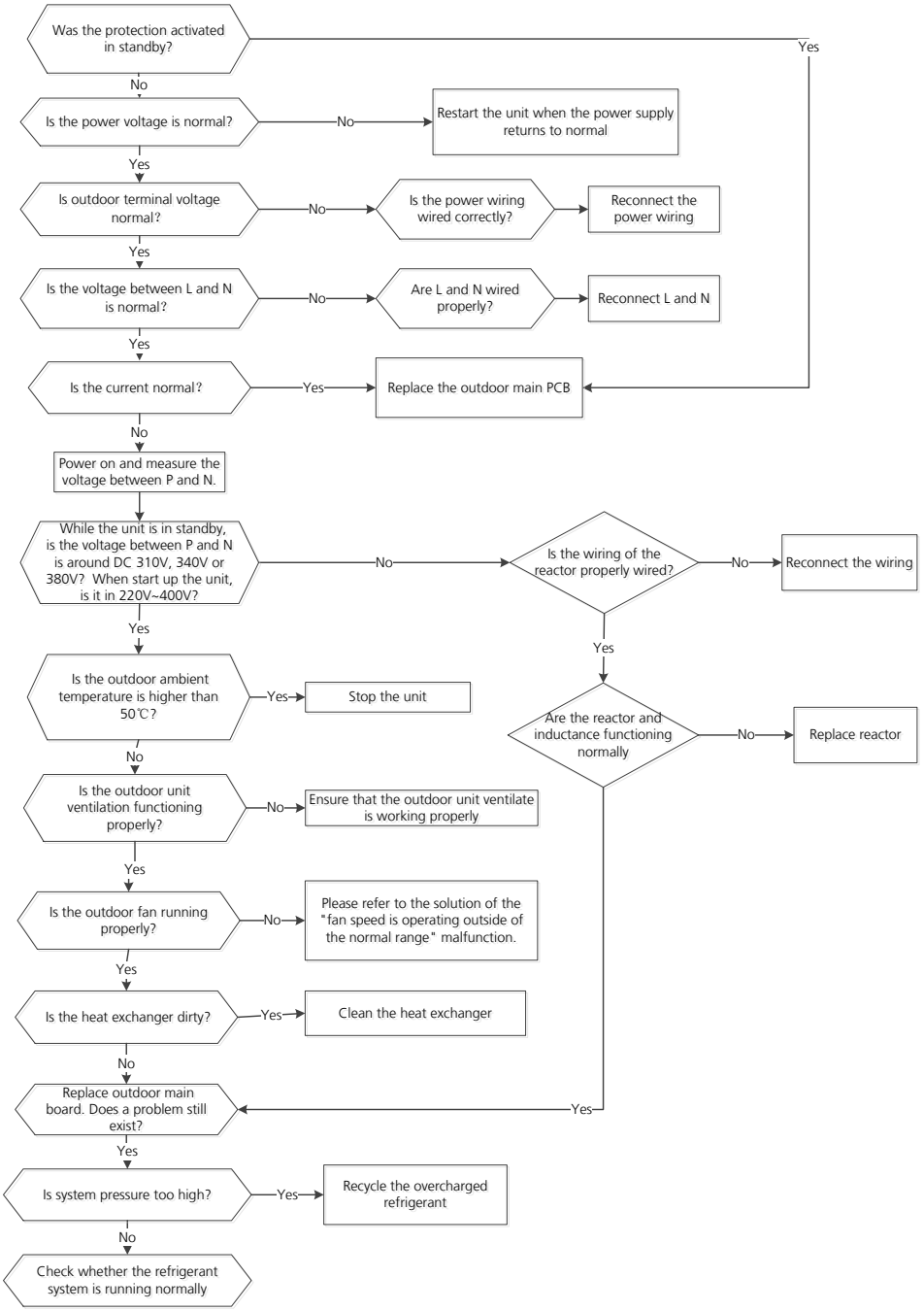
TS08-S: Current overload protection diagnosis and solution

Description: An abnormal current rise is detected by checking the specified current detection circuit.

Recommended parts to prepare:

- Connection wires
- Reactor
- Outdoor fan
- Outdoor PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

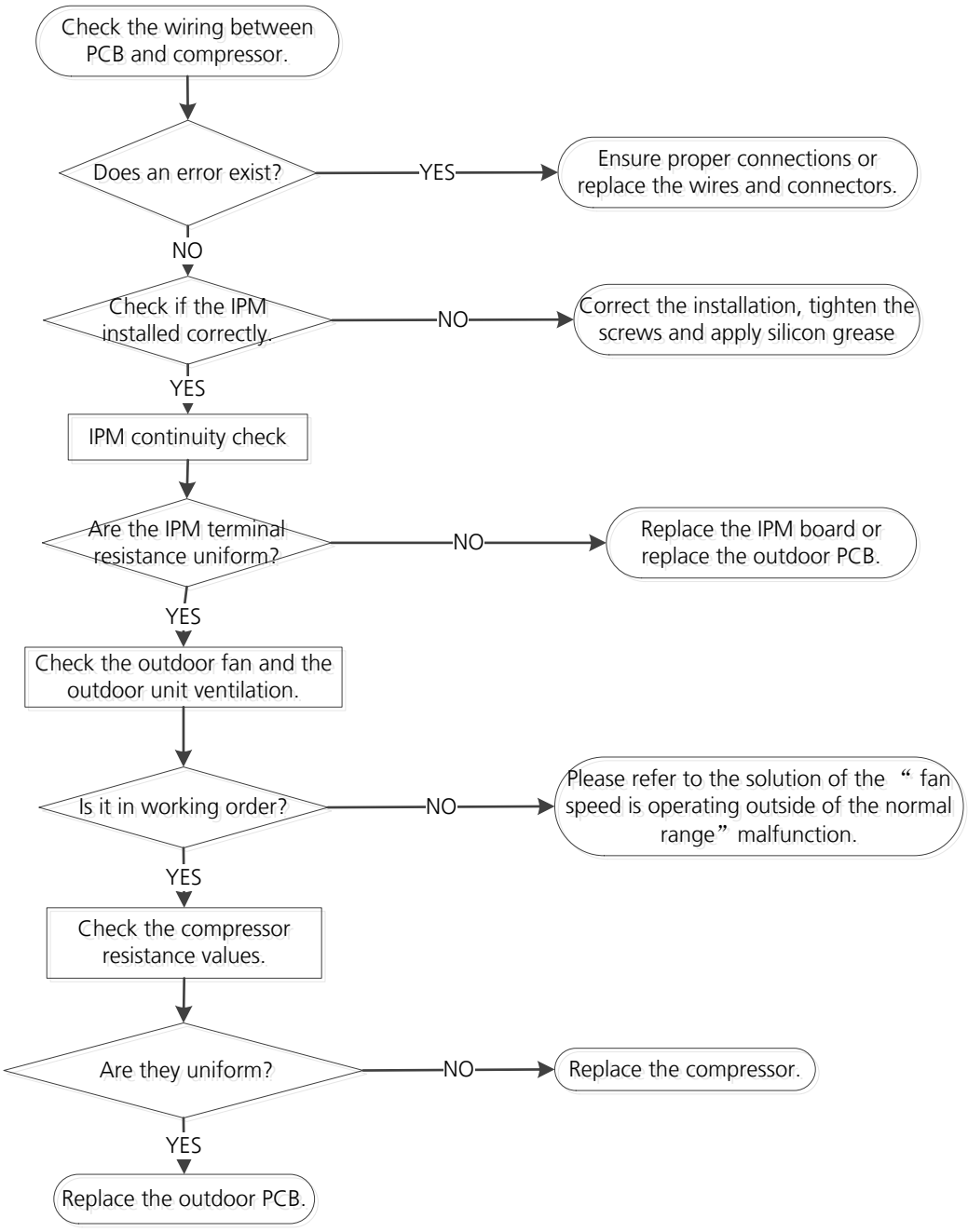
TS09-S: IPM malfunction or IGBT over-strong current protection diagnosis and solution

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

Recommended parts to prepare:

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

Troubleshooting and repair:



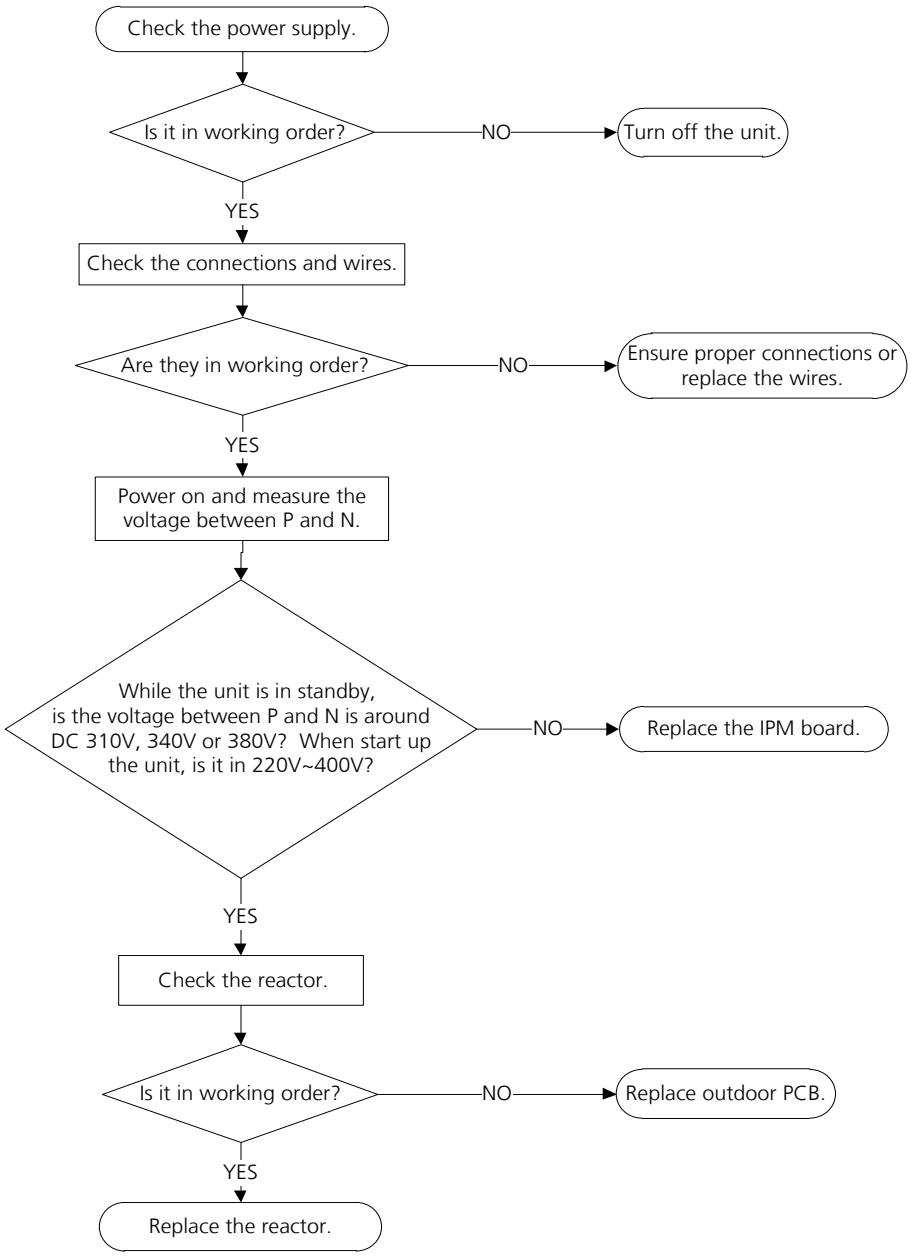
TS10-S: Over voltage or too low voltage protection diagnosis and solution

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

Recommended parts to prepare:

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

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

TS11-S-INV: Top temperature protection of compressor or High temperature protection of IPM module or High pressure protection diagnosis and solution

Description: For some models with overload protection, If the sampling voltage is not 5V, the LED will display the failure.

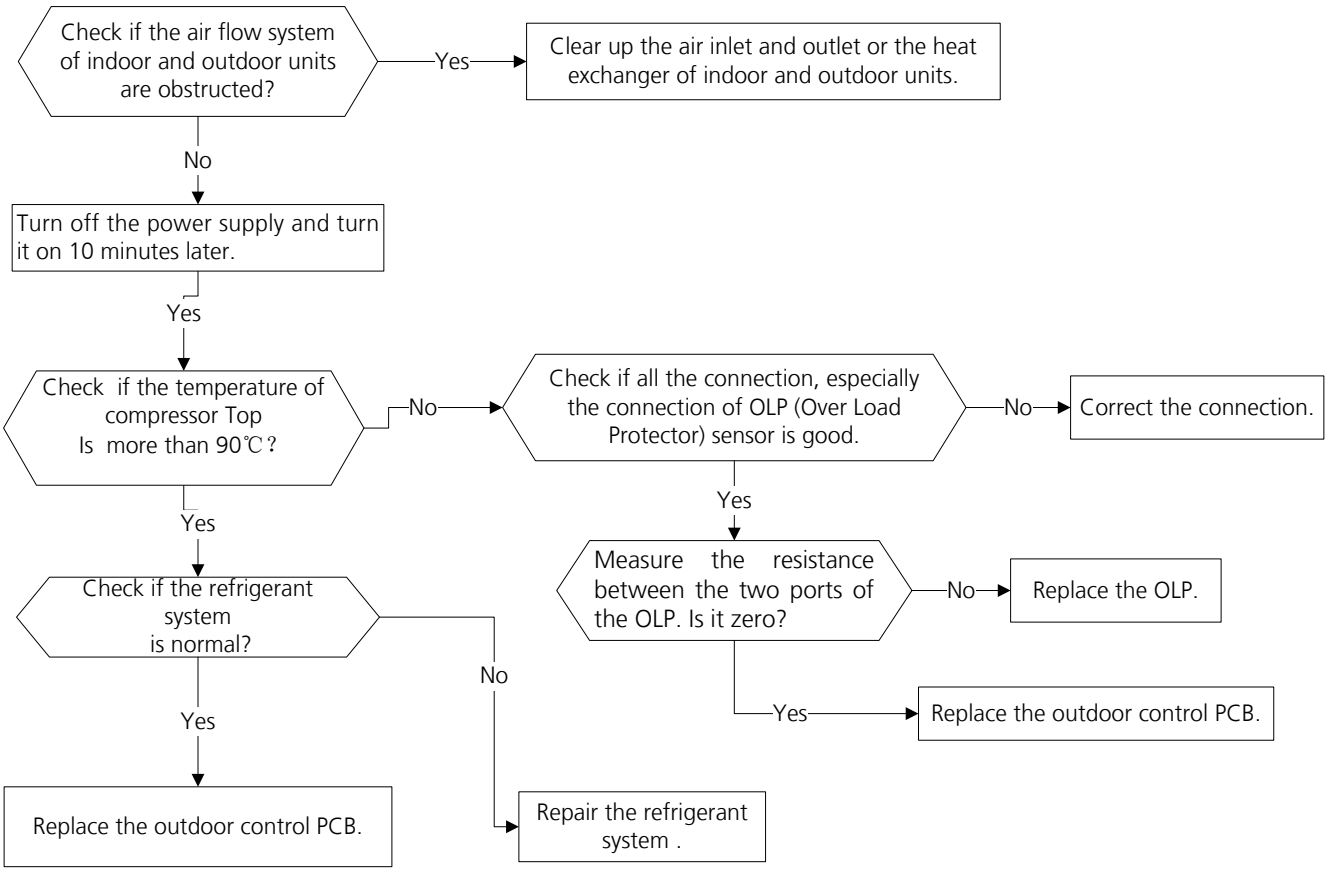
If the temperature of IPM module is higher than a certain value, the LED displays the failure code.

For some models with high pressure switch, outdoor pressure switch cut off the system because high pressure is higher than 4.4 MPa, the LED displays the failure code.

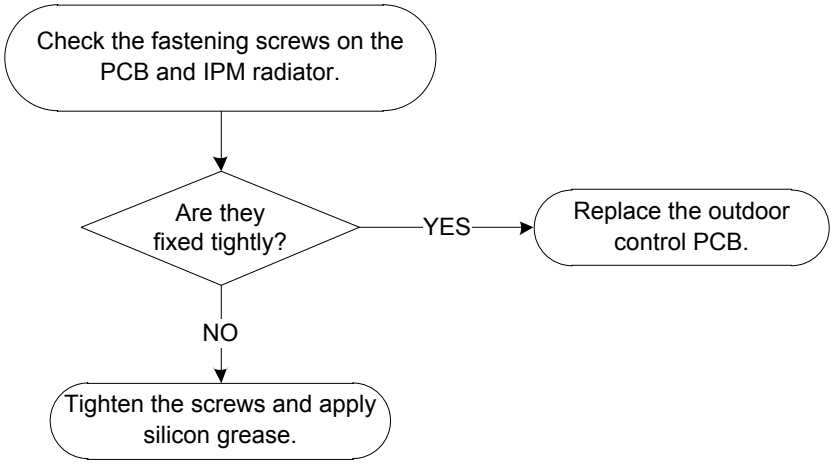
Recommended parts to prepare:

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

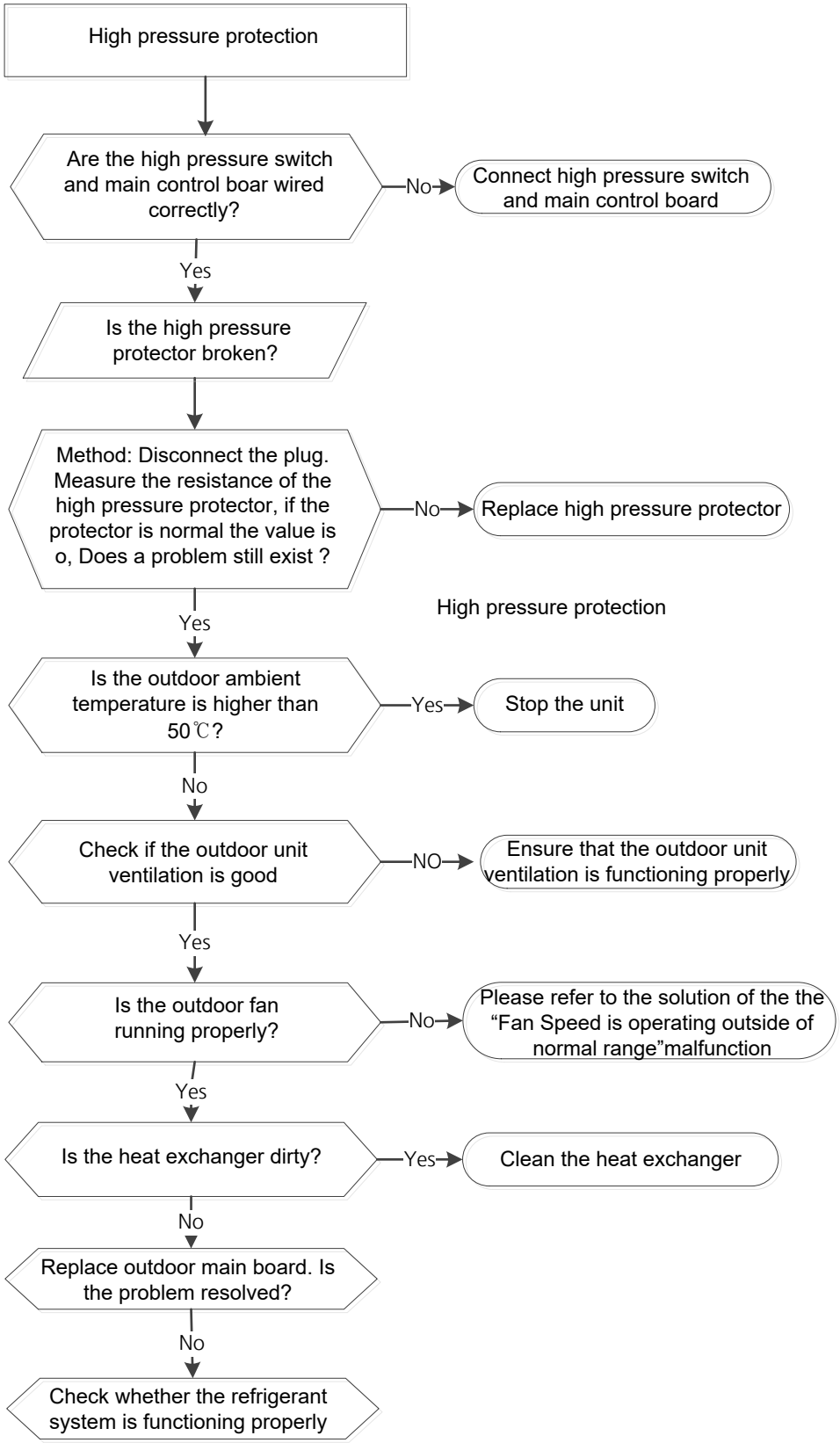
Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

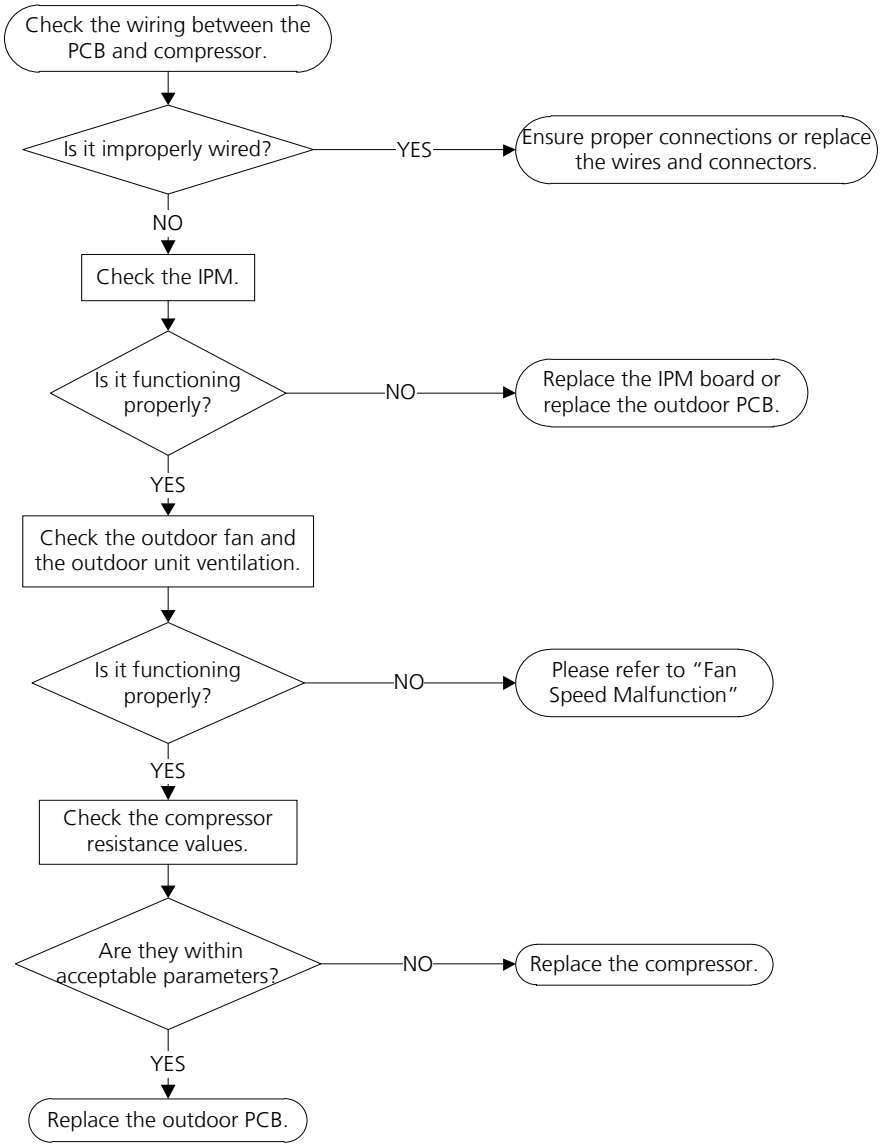
TS12-S: Inverter compressor drive error diagnosis and solution

Description: An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on.

Recommended parts to prepare:

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

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

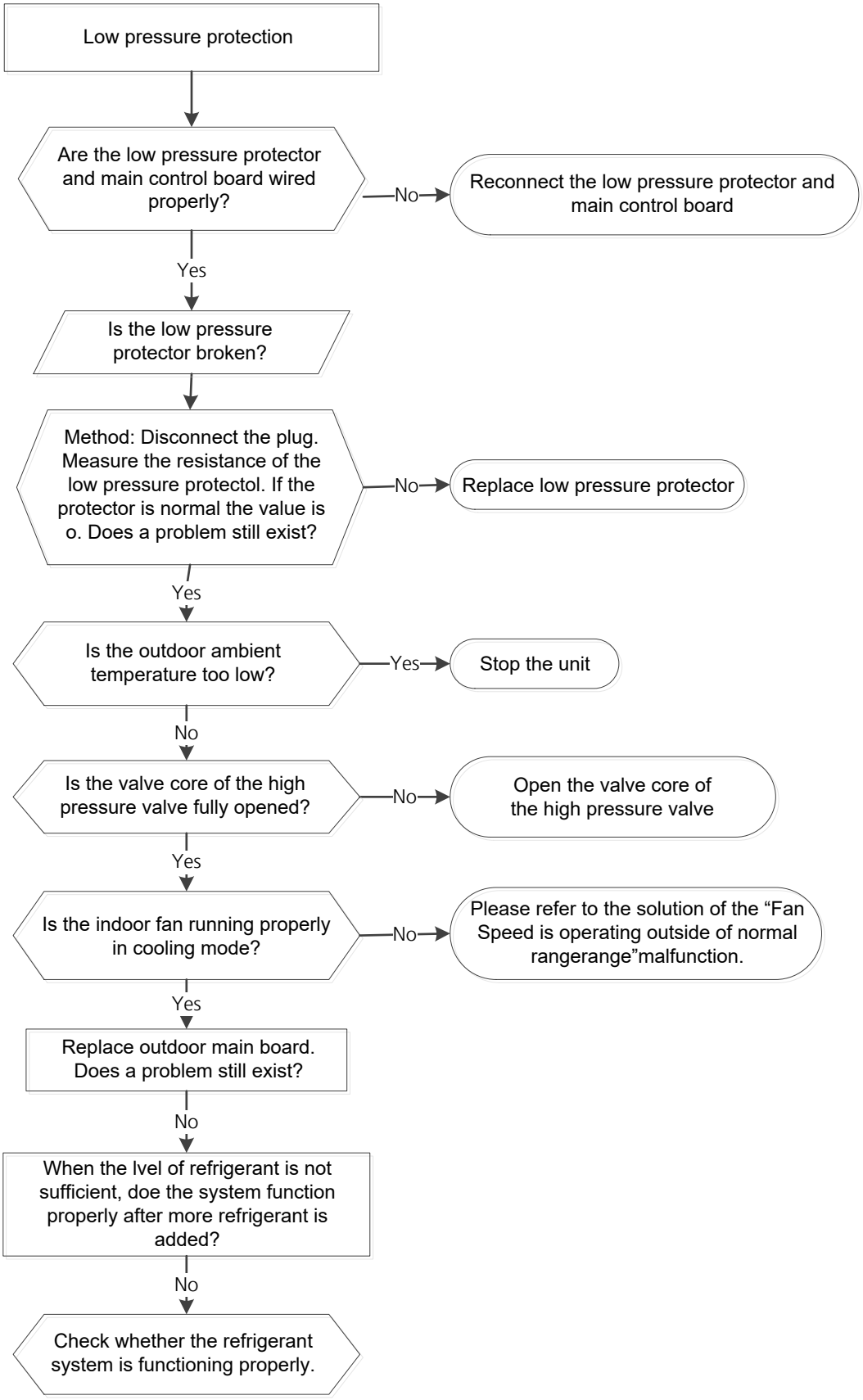
TS13-INV: Low pressure protection diagnosis and solution

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

Recommended parts to prepare:

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

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

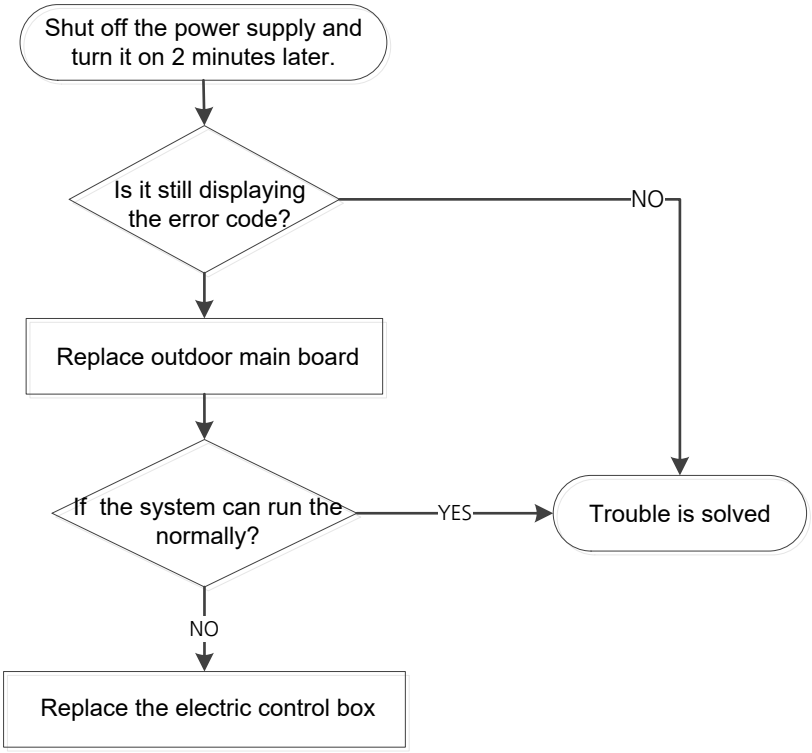
TS33: Communication error between outdoor main chip and compressor driven chip diagnosis and solution

Description: The main chip cannot detect the compressor driven chip

Recommended parts to prepare:

- Outdoor main PCB
- Electric control box

Troubleshooting and repair:



TS14: Indoor units mode conflict (match with multi outdoor unit)

Description: The indoor units cannot work cooling mode and heating at same time. Heating mode has a priority.

- Suppose Indoor unit A working in cooling mode or fan mode, and indoor unit B is set to heating mode, then A will change to off and B will work in heating mode.
- Suppose Indoor unit A working in heating mode, and indoor unit B is set to cooling mode or fan mode, then B will change to stand by and A will be no change.

	Cooling mode	Heating Mode	Fan	Off
Cooling mode	No	Yes	No	No
Heating Mode	Yes	No	Yes	No
Fan	No	Yes	No	No
Off	No	No	No	No

Note:

No: No mode conflict

Yes: Mode conflict

i) Temperature Sensor Resistance Value Table for T1,T2,T3 and T4 (°C – K)

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	115.266	20	68	12.6431	60	140	2.35774	100	212	0.62973
-19	-2	108.146	21	70	12.0561	61	142	2.27249	101	214	0.61148
-18	0	101.517	22	72	11.5	62	144	2.19073	102	216	0.59386
-17	1	96.3423	23	73	10.9731	63	145	2.11241	103	217	0.57683
-16	3	89.5865	24	75	10.4736	64	147	2.03732	104	219	0.56038
-15	5	84.219	25	77	10	65	149	1.96532	105	221	0.54448
-14	7	79.311	26	79	9.55074	66	151	1.89627	106	223	0.52912
-13	9	74.536	27	81	9.12445	67	153	1.83003	107	225	0.51426
-12	10	70.1698	28	82	8.71983	68	154	1.76647	108	226	0.49989
-11	12	66.0898	29	84	8.33566	69	156	1.70547	109	228	0.486
-10	14	62.2756	30	86	7.97078	70	158	1.64691	110	230	0.47256
-9	16	58.7079	31	88	7.62411	71	160	1.59068	111	232	0.45957
-8	18	56.3694	32	90	7.29464	72	162	1.53668	112	234	0.44699
-7	19	52.2438	33	91	6.98142	73	163	1.48481	113	235	0.43482
-6	21	49.3161	34	93	6.68355	74	165	1.43498	114	237	0.42304
-5	23	46.5725	35	95	6.40021	75	167	1.38703	115	239	0.41164
-4	25	44	36	97	6.13059	76	169	1.34105	116	241	0.4006
-3	27	41.5878	37	99	5.87359	77	171	1.29078	117	243	0.38991
-2	28	39.8239	38	100	5.62961	78	172	1.25423	118	244	0.37956
-1	30	37.1988	39	102	5.39689	79	174	1.2133	119	246	0.36954
0	32	35.2024	40	104	5.17519	80	176	1.17393	120	248	0.35982
1	34	33.3269	41	106	4.96392	81	178	1.13604	121	250	0.35042
2	36	31.5635	42	108	4.76253	82	180	1.09958	122	252	0.3413
3	37	29.9058	43	109	4.5705	83	181	1.06448	123	253	0.33246
4	39	28.3459	44	111	4.38736	84	183	1.03069	124	255	0.3239
5	41	26.8778	45	113	4.21263	85	185	0.99815	125	257	0.31559
6	43	25.4954	46	115	4.04589	86	187	0.96681	126	259	0.30754
7	45	24.1932	47	117	3.88673	87	189	0.93662	127	261	0.29974
8	46	22.5662	48	118	3.73476	88	190	0.90753	128	262	0.29216
9	48	21.8094	49	120	3.58962	89	192	0.8795	129	264	0.28482
10	50	20.7184	50	122	3.45097	90	194	0.85248	130	266	0.2777
11	52	19.6891	51	124	3.31847	91	196	0.82643	131	268	0.27078
12	54	18.7177	52	126	3.19183	92	198	0.80132	132	270	0.26408
13	55	17.8005	53	127	3.07075	93	199	0.77709	133	271	0.25757
14	57	16.9341	54	129	2.95896	94	201	0.75373	134	273	0.25125
15	59	16.1156	55	131	2.84421	95	203	0.73119	135	275	0.24512
16	61	15.3418	56	133	2.73823	96	205	0.70944	136	277	0.23916
17	63	14.6181	57	135	2.63682	97	207	0.68844	137	279	0.23338
18	64	13.918	58	136	2.53973	98	208	0.66818	138	280	0.22776
19	66	13.2631	59	138	2.44677	99	210	0.64862	139	282	0.22231

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

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	542.7	20	68	68.66	60	140	13.59	100	212	3.702
-19	-2	511.9	21	70	65.62	61	142	13.11	101	214	3.595
-18	0	483	22	72	62.73	62	144	12.65	102	216	3.492
-17	1	455.9	23	73	59.98	63	145	12.21	103	217	3.392
-16	3	430.5	24	75	57.37	64	147	11.79	104	219	3.296
-15	5	406.7	25	77	54.89	65	149	11.38	105	221	3.203
-14	7	384.3	26	79	52.53	66	151	10.99	106	223	3.113
-13	9	363.3	27	81	50.28	67	153	10.61	107	225	3.025
-12	10	343.6	28	82	48.14	68	154	10.25	108	226	2.941
-11	12	325.1	29	84	46.11	69	156	9.902	109	228	2.86
-10	14	307.7	30	86	44.17	70	158	9.569	110	230	2.781
-9	16	291.3	31	88	42.33	71	160	9.248	111	232	2.704
-8	18	275.9	32	90	40.57	72	162	8.94	112	234	2.63
-7	19	261.4	33	91	38.89	73	163	8.643	113	235	2.559
-6	21	247.8	34	93	37.3	74	165	8.358	114	237	2.489
-5	23	234.9	35	95	35.78	75	167	8.084	115	239	2.422
-4	25	222.8	36	97	34.32	76	169	7.82	116	241	2.357
-3	27	211.4	37	99	32.94	77	171	7.566	117	243	2.294
-2	28	200.7	38	100	31.62	78	172	7.321	118	244	2.233
-1	30	190.5	39	102	30.36	79	174	7.086	119	246	2.174
0	32	180.9	40	104	29.15	80	176	6.859	120	248	2.117
1	34	171.9	41	106	28	81	178	6.641	121	250	2.061
2	36	163.3	42	108	26.9	82	180	6.43	122	252	2.007
3	37	155.2	43	109	25.86	83	181	6.228	123	253	1.955
4	39	147.6	44	111	24.85	84	183	6.033	124	255	1.905
5	41	140.4	45	113	23.89	85	185	5.844	125	257	1.856
6	43	133.5	46	115	22.89	86	187	5.663	126	259	1.808
7	45	127.1	47	117	22.1	87	189	5.488	127	261	1.762
8	46	121	48	118	21.26	88	190	5.32	128	262	1.717
9	48	115.2	49	120	20.46	89	192	5.157	129	264	1.674
10	50	109.8	50	122	19.69	90	194	5	130	266	1.632
11	52	104.6	51	124	18.96	91	196	4.849			
12	54	99.69	52	126	18.26	92	198	4.703			
13	55	95.05	53	127	17.58	93	199	4.562			
14	57	90.66	54	129	16.94	94	201	4.426			
15	59	86.49	55	131	16.32	95	203	4.294			
16	61	82.54	56	133	15.73	96	205	4.167			
17	63	78.79	57	135	15.16	97	207	4.045			
18	64	75.24	58	136	14.62	98	208	3.927			
19	66	71.86	59	138	14.09	99	210	3.812			

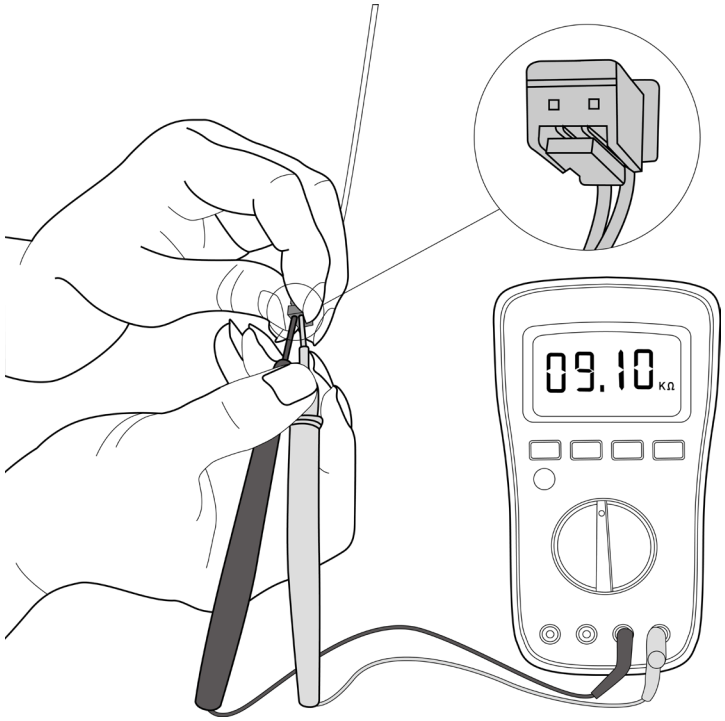
8. Check Procedures

8.1 Temperature Sensor Check

WARNING

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

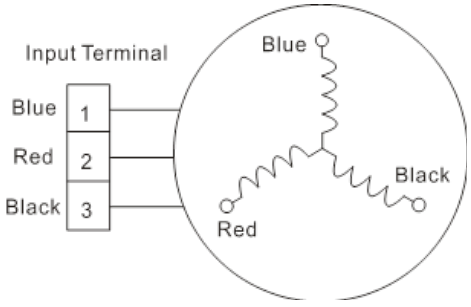
1. Disconnect the temperature sensor from PCB (Refer to Chapter 5&6. Indoor&Outdoor Unit Disassembly).
2. Measure the resistance value of the sensor using a multi-meter.
3. Check corresponding temperature sensor resistance value table (Refer to Chapter 8. Appendix).



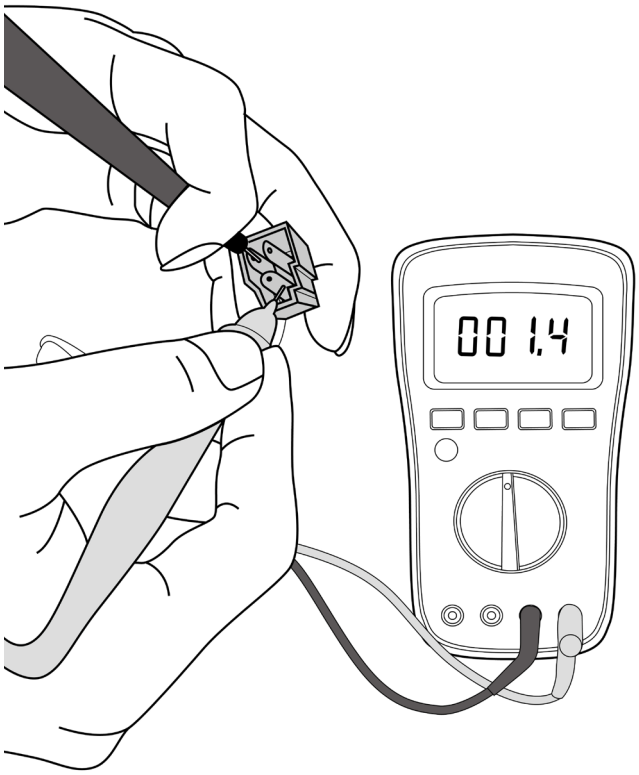
Note: The picture and the value are only for reference, actual condition and specific value may vary.

8.2 Compressor Check

1. Disconnect the compressor power cord from outdoor PCB (Refer to Chapter 6. Outdoor Unit Disassembly)).
2. Measure the resistance value of each winding using a multi-meter.
3. Check the resistance value of each winding in the following table.



Resistance Value	KSK103D33UEZ3	KSN140D21UFZ	KTM240D43UKT
Blue-Red	1.03Ω	1.28Ω	1.03Ω
Blue-Black			
Red-Black			



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

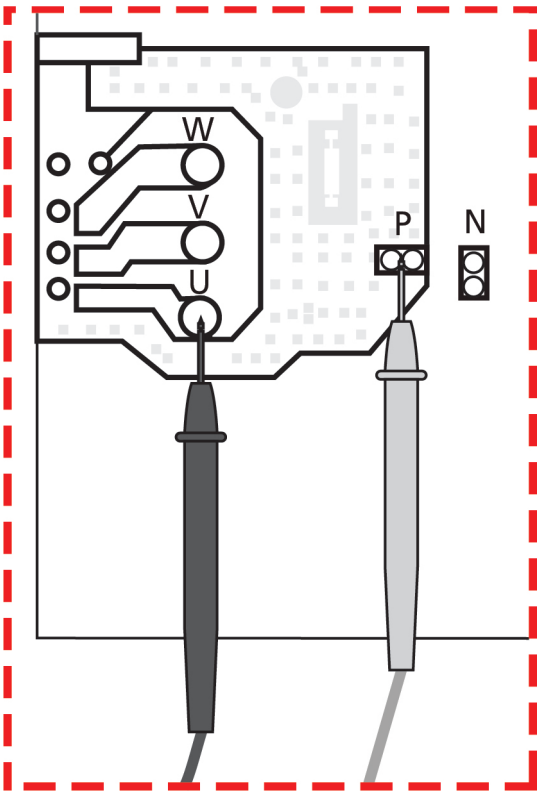
8.3 IPM Continuity Check

WARNING

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

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

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



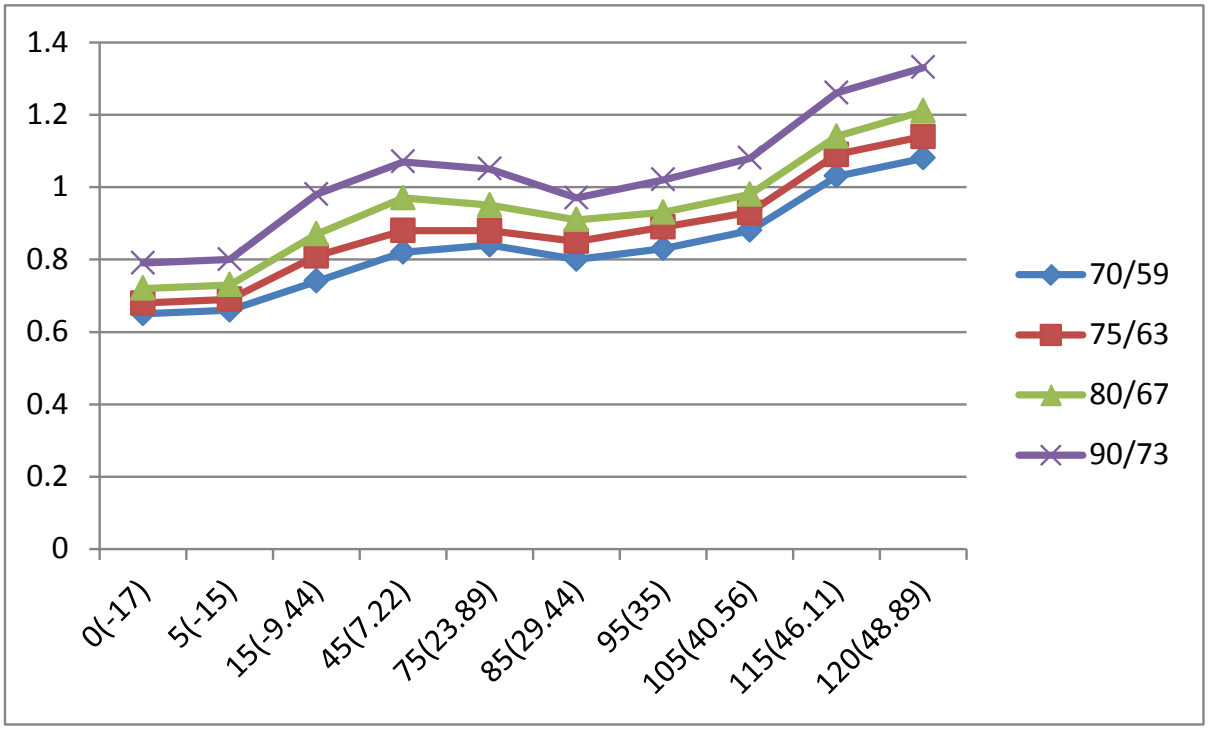
Note: The picture and the value are only for reference, actual condition and specific value may vary.

9. Reference Sheet

9-1 Low Refrigerant Pressure Distribution

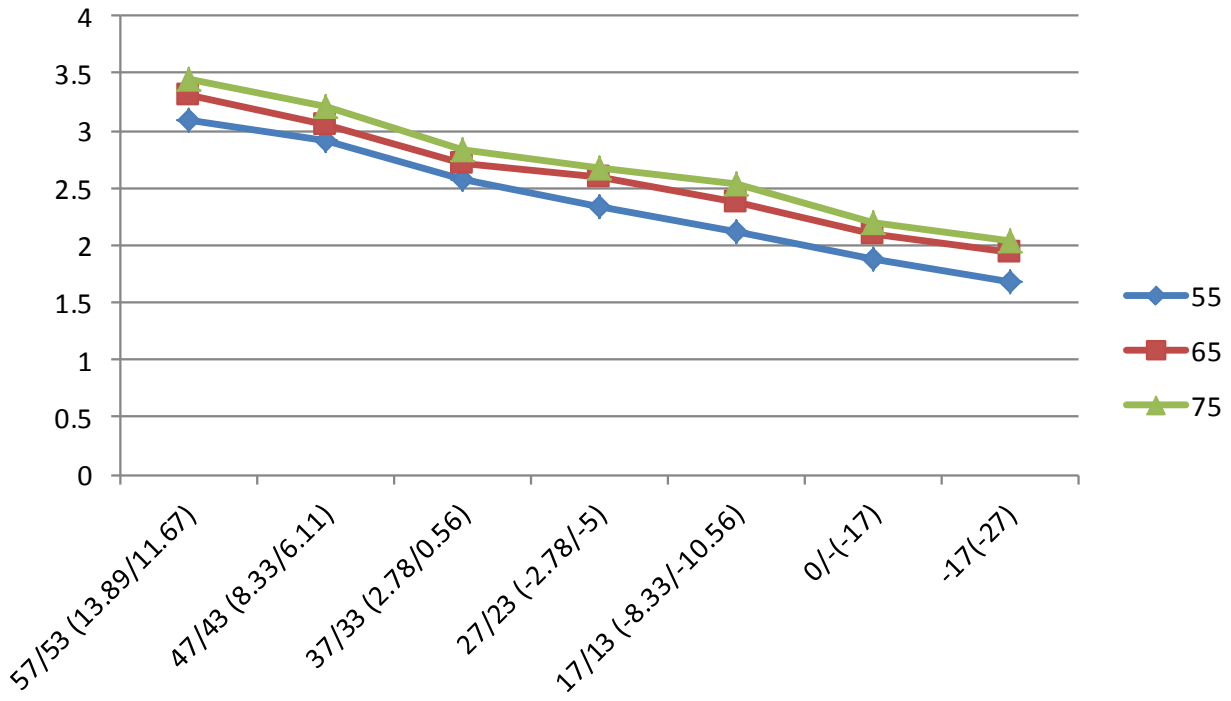
Cooling chart(R32):

°F(°C)	ODU(DB) / IDU(DB/WB)	0(-17)	5(-15)	15 (-9.44)	45 (7.22)	75 (23.89)	85 (29.44)	95 (35)	105 (40.56)	115 (46.11)	120 (48.89)
BAR	70/59 (21.11/15)	6.5	6.6	7.4	8.2	8.4	8.0	8.3	8.8	10.3	10.8
	75/63 (23.89/17.22)	6.8	6.9	8.1	8.8	8.8	8.5	8.9	9.3	10.9	11.4
	80/67 (26.67/19.44)	7.2	7.3	8.7	9.7	9.5	9.1	9.3	9.8	11.4	12.1
	90/73 (32.22/22.78)	7.9	8.0	9.8	10.7	10.5	9.7	10.2	10.8	12.6	13.3
PSI	70/59 (21.11/15)	95	96	108	118	121	115	119	128	150	157
	75/63 (23.89/17.22)	99	101	117	128	126	122	129	135	158	165
	80/67 (26.67/19.44)	105	106	125	141	138	132	135	143	165	176
	90/73 (32.22/22.78)	114	115	142	155	152	141	148	157	184	193
MPa	70/59 (21.11/15)	0.65	0.66	0.74	0.82	0.84	0.80	0.83	0.88	1.03	1.08
	75/63 (23.89/17.22)	0.68	0.69	0.81	0.88	0.88	0.85	0.89	0.93	1.09	1.14
	80/67 (26.67/19.44)	0.72	0.73	0.87	0.97	0.95	0.91	0.93	0.98	1.14	1.21
	90/73 (32.22/22.78)	0.79	0.80	0.98	1.07	1.05	0.97	1.02	1.08	1.26	1.33



Heating chart(R32):

°F(°C)	QDU(DB/WB) / IDU(DB)	57/53 (13.89/11.67)	47/43 (8.33/6.11)	37/33 (2.78/0.56)	27/23 (-2.78/-5)	17/13 (-8.33/-10.56)	0/-2 (-17/-19)	-17/-18 (-27/-28)
BAR	55(12.78)	30.9	29.1	25.8	23.3	21.2	18.9	16.8
	65(18.33)	33.2	30.6	27.1	25.9	23.8	20.9	19.4
	75(23.89)	34.5	32.1	28.4	26.8	25.4	21.9	20.4
PSI	55(12.78)	448	421	374	337	308	273	244
	65(18.33)	480	444	394	375	346	303	282
	75(23.89)	499	466	411	389	369	318	296
MPa	55(12.78)	3.09	2.91	2.58	2.33	2.12	1.89	1.68
	65(18.33)	3.32	3.06	2.71	2.59	2.38	2.09	1.94
	75(23.89)	3.45	3.21	2.84	2.68	2.54	2.19	2.04



9-2 Pressure & Capacity mark

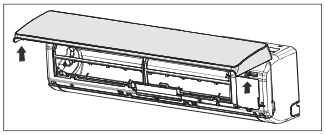
■ **Power/Heat**

W	cal/s	kcal/h	Btu/h	HP	kg.m/s	lb.m/s
1	0.23885	0.85985	3.4121	0.001341	0.10197	0.73756
4.1868	1	3.6	14.286	0.0056146	0.42693	3.088
1.163	0.27778	1	3.9683	0.0015596	0.11859	0.85778
0.29307	0.06999	0.252	1	3.9302×10^{-4}	0.029885	0.21616
745.7	178.11	641.19	2,544.4	1	76.04	550
9.8067	2.3423	8.4322	33.462	0.013151	1	7.233
1.3558	0.32383	1.0658	4.6262	0.0018182	0.13826	1

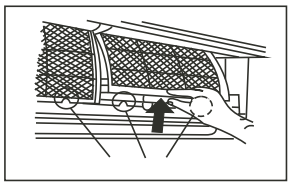
9-3 Cleaning/Filter Change

Removing the Air filter

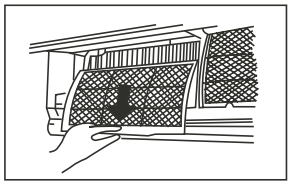
1. Lift the indoor unit panel up to an angle until it stops with a dicking sound. For some models, please use suspension bars to prop up the panel



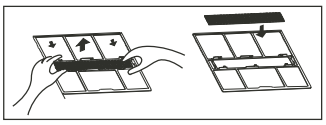
2. Take hold of the handle of the air filter and lift it up slightly to take it out from the filter holder, then pull it downwards.



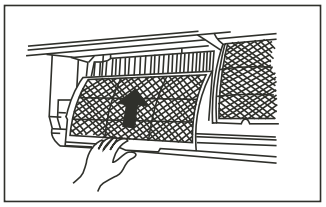
3. Remove the AIR FILTER from the indoor unit.
   Remove the Air Freshening Filter from its supporting frame (on some models).



Air freshening filter

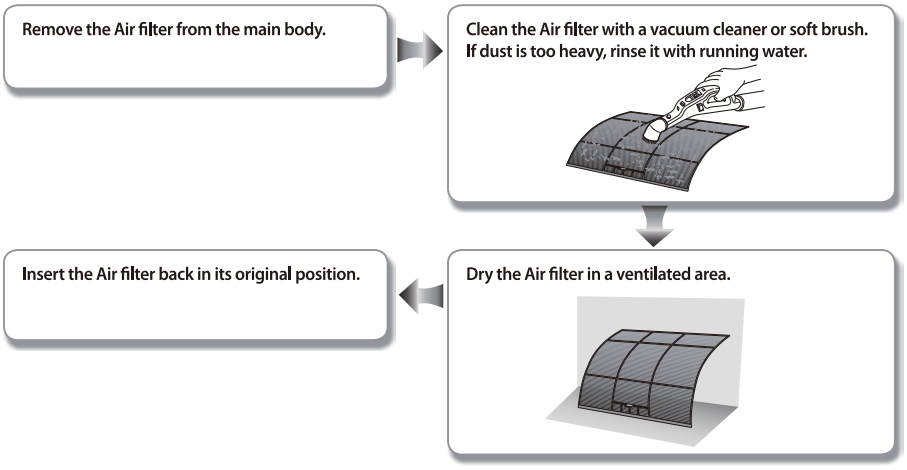


4. Install the air freshening filter back into position.



Cleaning the air filter

Washable foam based air filter captures large particles from the air. The filter is clean with a vacuum or by hand washing.



9-4 Installation

9-4-1 Before Installation

Keep the air conditioner outlet and inlet free from its surroundings.
In case of installation, keep the symmetry and fix it to prevent vibration.
The pipe length shall meet the standard as far as possible.

9-4-2 Installation Procedure

■ Location

Install the product in an area to guarantee the best cooling effect, convenience of piping and electric work, and inexistence of vibration or wnd.

■ Wall Drilling

Drill the wall downward in a diameter of 60 to 65mm.

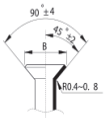
■ Fixing Indoor Unit & Outdoor Unit

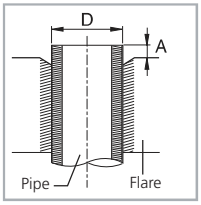
Fix the air conditioner indoor unit securely to the wall. Secure the outdoor unit in a suitable position.

■ Pipe Spooling & Connecting

You shall cut the pipe with a pipe cutter and grind all the burrs of the cut surface.
pipe expansion may continue until the pipe surface becomes uneven or torn apart.
Be sure to use a torque wrench to tighten pipes or flare nuts.

TORQUE REQUIREMENTS

Outer Diameter of Pipe (mm)	Tightening Torque (N•m)	Flare dimension(B) (mm)	Flare shape
Ø 6.35 (Ø 0.25")	18~20(180~200kgf.cm)	8.4~8.7 (0.33~0.34")	
Ø 9.52 (Ø 0.375")	32~39(320~390kgf.cm)	13.2~13.5 (0.52~0.53")	
Ø 12.7 (Ø 0.5")	49~59(490~590kgf.cm)	16.2~16.5 (0.64~0.65")	
Ø 16 (Ø 0.63")	57~71(570~710kgf.cm)	19.2~19.7 (0.76~0.78")	
Ø 19 (Ø 0.75")	67~101(670~1010kgf.cm)	23.2~23.7 (0.91~0.93")	



■ Leak Test

Put an inset gas like nitrogen in the outdoor unit pipe and put soap bubbles or other test liguids on the pipe surface for the leak test.

■ Drain Hose Connecting

Install the drain hose downwards to drain water naturally. Be sure to pour water into the hose to check if it drains well.

■ Electric & Earth Work

Electric and earth work shall meet the "Electric Facility Technology Standard"and the "Internal Wire Regulation"of the Electric Business Laws.

■ Inspection & Trial Run

Upon completion of the tests, you shall make a trial run while you explain the main functions of the air conditioner to finish the installation.

9-5 Installation Diagram of Indoor Unit and Outdoor Unit

9-5-1 Air-Purge Procedure

1) Connect each assembly pipe to the appropriate valve on the outdoor unit and tighten the flare nut.

2) Connect the charging hose of low pressure side of manifold gauge to the packed valve having a service pore(3/8"Packed valve) as shown at the figure.

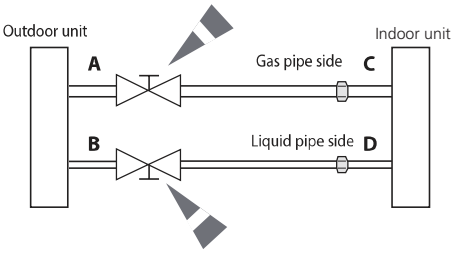
3) Open the valve of the low pressure side of manifold gauge counter-clockwise.

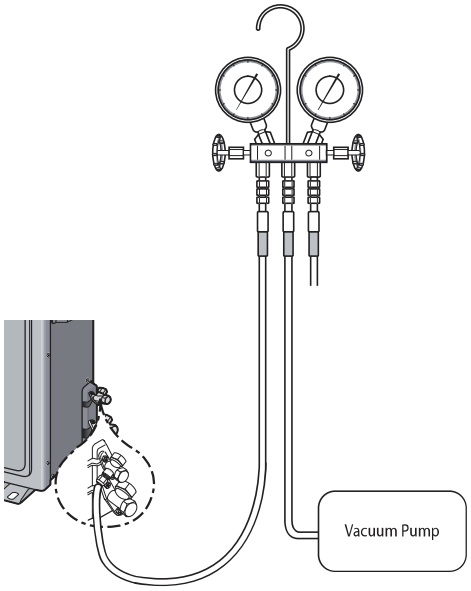
4) Purge the air from the system using vacuum pump for about 30 minutes.
-After that, please recheck that pressure is stabilized.
-Close the valve of the low pressure side of manifold gauge clockwise.
-Remove the hose of the low pressure side of manifold gauge.

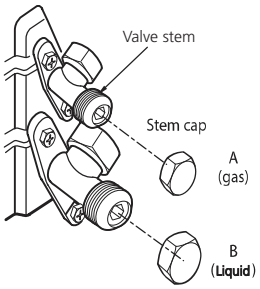
5) Set valve cork of both liquid side and gas side of packed valve to the open position.

6) Mount the valve stem nuts to the 2 way and 3 way valves. And mount the service port cap to 3 way valves.

7) Check for gas leakage.
-At this time, especially check for gas leakage from the 3 way valve's stem nuts, and from the service port cap.







9-5-2 "Pump down"Procedure

Pump down will be carried out when an evaporator is replaced or when the unit is relocated in another area.

1) Remove the caps from the 3 way valve and the 3 way valve.

2) Turn the 3 way valve clockwise to close and connect a pressure gauge(low pressure side) to the service valve, and open the 3 way valve again.

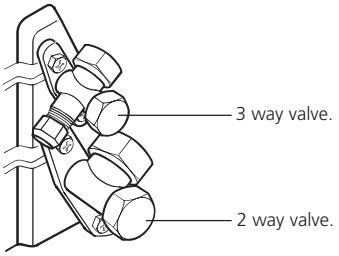
3) Set the unit to cool operation mode. (Check if the compressor is operating.)

4) Turn the 3 way valve clockwise to close.

5) When the pressure gauge indicates"0"turn the 3 way valve clockwise to close.

6) Stop operation of the air conditioner.

7) Close the cap of each valve



Remarks

Relocation of the air conditioner

- Refer to this procedure when the unit is replaced.
- Carry out the pump down procedure(refer to the details of 'pump down').
- Remove the power cord.
- Disconnect the assembly cable from the indoor and outdoor units.
- Remove the flare nut connecting the indoor unit and the pipe.
- At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
- Disconnect the pipe connected to the outdoor unit.
  At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
- Make sure you do not bend the connection pipes in the middle and store together with the cables.
- Move the indoor and outdoor units to a new location.
- Remove the mounting plate for the indoor unit and move it to a new location.

9-6 Index for Model Name

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th
Product		Series		Year	Capa (K BTU)		Cooling Type	AI Level	Derivation	CMF	SET Type	Country	
A	R	5	0	F	1	2	C	1	A	H	N/X	E	U

Digit NO	1	2	3	4				5	6	7	8			
	Product		Series					Year	Capa (K BTU)		Cooling Type			
Code	A	R	7	0				F	0	9	D			
		Type			ALL-IN-1 LEVEL	FILTER	WIND FREE					INV.	HP	REF
AR	Airconditioner	Room	90	Infinite	Integrated control of Temperature and humidity	PM1.0	O	T : 2020	5	5K BTU/H	A	O	O	R290
AF		Floor	80	Premium		PM1.0	O	A : 2021	7	7K BTU/H	B	O	-	R290
AW		Window	70	Deluxe		PM2.5	O	B : 2022	9	9K BTU/H	C	O	O	R32
			60	Standard		-	O	C : 2023	12	12K BTU/H	D	O	-	R32
			50	Entry		-	-	D : 2024	15	15K BTU/H	E	O	O	R410a
			40	Entry (O/S)		-	-	F : 2025	18	18K BTU/H	F	O	-	R410a
									24	24K BTU/H	G	-	O	R32
									30	30K BTU/H	H	-	-	R32
											J	-	O	R410a
											K	-	-	R410a

9						10		11			12		13	14
AI Level						Derivation		CMF			SET Type		Country	
1						A		W			N		E	U
	VISION	VIDEO	SET BIXBY	SENSOR	WIFI				Color	Design				
4	O	O	O	RADAR	O	A	1st MODEL	W	White	GEO	/	CBU SET		
3	-	O	O	RADAR	O	B	2nd MODEL	B	Black	AIRISE	N	CBU IDU		
2	-	-	O	MDS/CSI	O	C	3rd MODEL	H	White	AIRISE	X	CBU ODU		
A	-	-	-	MDS	O	D	4th MODEL	M	Mint	BESPOKE	1	CKD SET		
1	-	-	-	-	O	E	5th MODEL	G	Grey	BESPOKE	U	CKD IDU		
0	-	-	-	-	-	F	6th MODEL				W	CKD ODU		
						1	Grade 1, 1★				2	SKD SET		
						2	Grade 2, 2★				Y	SKD IDU		
						3	Grade 3, 3★_India MR/RR							
						4	Grade 4, 4★_India MR/RR							
						5	Grade 5, 5★_India MR/RR							
						S	Energy Star (High efficiency)							
						L	India_Online 3★							
						M	India_Online 4★							
						N	India_Online 5★							
						P	India_Reliance 3★							
						Q	India_Reliance 4★							
						R	India_Reliance 5★							
						X	India_Disty 3★							
						Y	India_Disty 4★							
						Z	India_Disty 5★							
						V	Power Volt							

SAMSUNG

ELECTRONICS

GSPN (GLOBAL SERVICE PARTNER NETWORK)

Area	Web Site
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