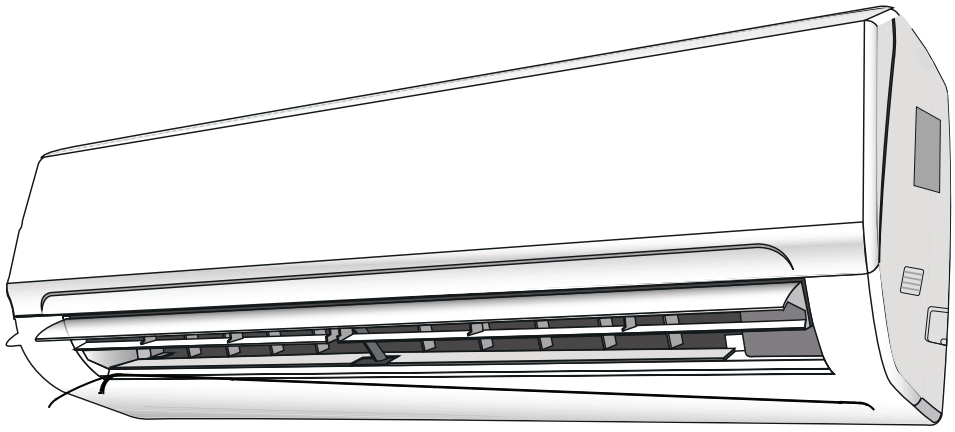
innovair®

innovative ideas in air conditioning

PÜRE

HEAT PUMP SYSTEM

Service & Technical Manual



PIN09H1V51
PIN09H2V51
PIN12H1V51
PIN12H2V51
PIN18H2V51
PIN24H2V51

- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments
- Installation or repairs made by unqualified persons can resu t in hazards to you and others.
- Failure to carefully read and follow all instructions in thi manual can result in equipment malfunction, property damage, personal injury and/or death.
- This service is only for service engineer to use

Contents

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. 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.

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, prop-erty 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 Innovair 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.

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.

Safety Precaution

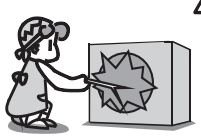
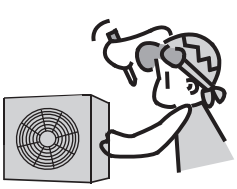
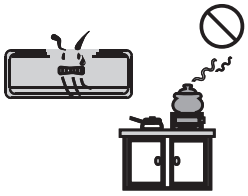
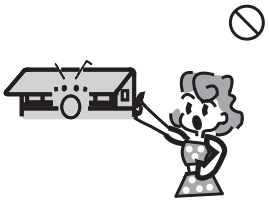
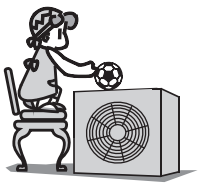
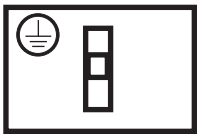
Symbols in this Use and Care Manual are interpreted as shown below.

Be sure not to do.

Grounding is essential.

ºPay attention to such a situation.

Warning: Incorrect handling could cause a serious hazard,

Use correct power supply in accordance with the rating plate requirement. Otherwise, serious faults or hazard may occur or a fire maybe break out.	 Keep the power supply circuit breaker or plug from dirt. Connect the power supply cord to it firmly and correctly, lest an electric shock or a fire break out due to insufficient contact.	 Do not use the power supply circuit breaker or pull off the plug to turn it off during operation. This may cause a fire due to spark, etc.
 Do not knit, pull or press the power supply cord, lest the power supply cord be broken. An electric shock or fire is probably caused by a broken power supply cord.	 Never insert a stick or similar obstacle to the unit. Since the fan rotates at high speed, this may cause an injury.	 It is harmful to your health if the cool air reaches you for a long time. It is advisable to let the air flow be deflected to all the room.
 Turn off the appliance by remote control firstly before cutting off power supply if malfunction occurs.	 Do not repair the appliance by yourself. If this is done incorrectly, it may cause an electric shock, etc.	 Prevent the air flow from reaching the gas burners and stove.
 Do not touch the operation buttons when your hands are wet.	 Do not put any objects on the outdoor unit.	 It is the user's responsibility to make the appliance be grounded according to local codes or ordinances by a licenced technician.

Safety Instructions

- To guarantee the unit work normally, please read the manual carefully before installation, and try to install strictly according to this manual.
- Do not let air enter the refrigeration system or discharge refrigerant when moving the air conditioner.
- Properly ground the air conditioner into the earth.
- Check the connecting cables and pipes carefully, make sure they are correct and firm before connecting the power of the air conditioner.
- There must be an air-break switch.
- After installing, the consumer must operate the air conditioner correctly according to this manual,keep a suitable storage for maintenance and moving of the air conditioner in the future.

- The Fuse of the unit:

Model	Fuse of Indoor unit	Fuse ot outdoor unit
9K(115V)	T 3.15A 250V	T 20A 250V
12K(115V)	T 3.15A 250V	T 20A 250V
9K-12K(208/230V)	T 3.15A 250V	T 15A 250V
18K(208/230V)	T 3.15A 250V	T 20A 250V
24K(208/230V)	T 3.15A 250V	T 30A 250V

- A residual current device(RCD)with the rating of above 10mA shall be incorporated in the fixed wiring according to the national rule
- Warning: Risk of electric shock can cause injury or death: Disconnect all remote electric power supplies before servicing .
- The best length of the connecting pipe between the indoor unit and outdoor unit is less than 7.5 meters(24.6ft). It will affect the efficiency of the air conditioner if the distance longer than that length.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- The batteries in remote controller must be recycled or disposed of properly. Disposal of Scrap Batteries --- Please discard the batteries as sorted municipal waste at the accessible collection point.
- If the appliance is fixed wiring, the appliance must be fitted with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III conditions, and these means must be incorporated in the fixed wiring in accordance with the wiring rules.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The appliance shall be installed in accordance with local electrical safety regulations and National Electrical Codes(NEC).
- The air conditioner must be installed by professional or qualified persons.
- The appliance shall not be installed in the laundry.

Preparation before use

Note

- When charging refrigerant into the system, make sure to charge in liquid state,if the refrigerant of the appliance is R41 0A.Otherwise, chemical composition of refrigerant (R410A) inside the system may change and thus affect performance of the air conditioner.
- According to the character of refrigerant (R410A,the value of GWP is 2088), the pressure of the tube is very high, so be sure to be careful when you install and repair the appliance.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The air conditioner must be installed by a professional engineer.
- The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube .

Preset

Before using the air conditioner, be sure to check and preset the following.

Remote Control presetting

Each tim e after the remote control is replaced with new batteries or is energized, re mote control auto presetting heat pump.If the air conditioner you purchased is a Cooling Only one, heat pump remote controller can also be used.

Back-light function of Remote Control(optional)

Hold down any button on remote control to activate the back light. It automatically shuts off 10 seconds later.

Note: Back-light is an optional function.

Auto Restart Presetting

The air conditioner has an Auto-Restart function.

Safeguarding the environment

This appliance is made of recyclable or re-usable material. Scrapping must be carried out in compliance with local waste disposal regulations. Before scrapping it, make sure to cut off the mains cord so that the appliance cannot be re-used.
For more detailed information on handling and recycling this product, contact your local authorities who deal with the separate collection of rubbish or the shop where you bought the appliance.

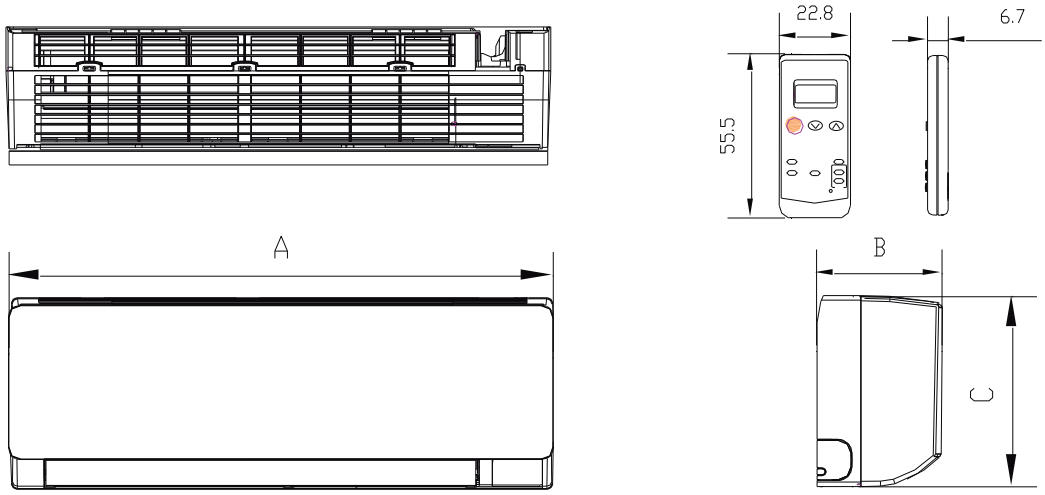
SCRAPPING OF APPLIANCE

This marking indicates that this product should not be disposed with other household wastes throughout the North America. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased.

They can take this product for environmental safe recycling.

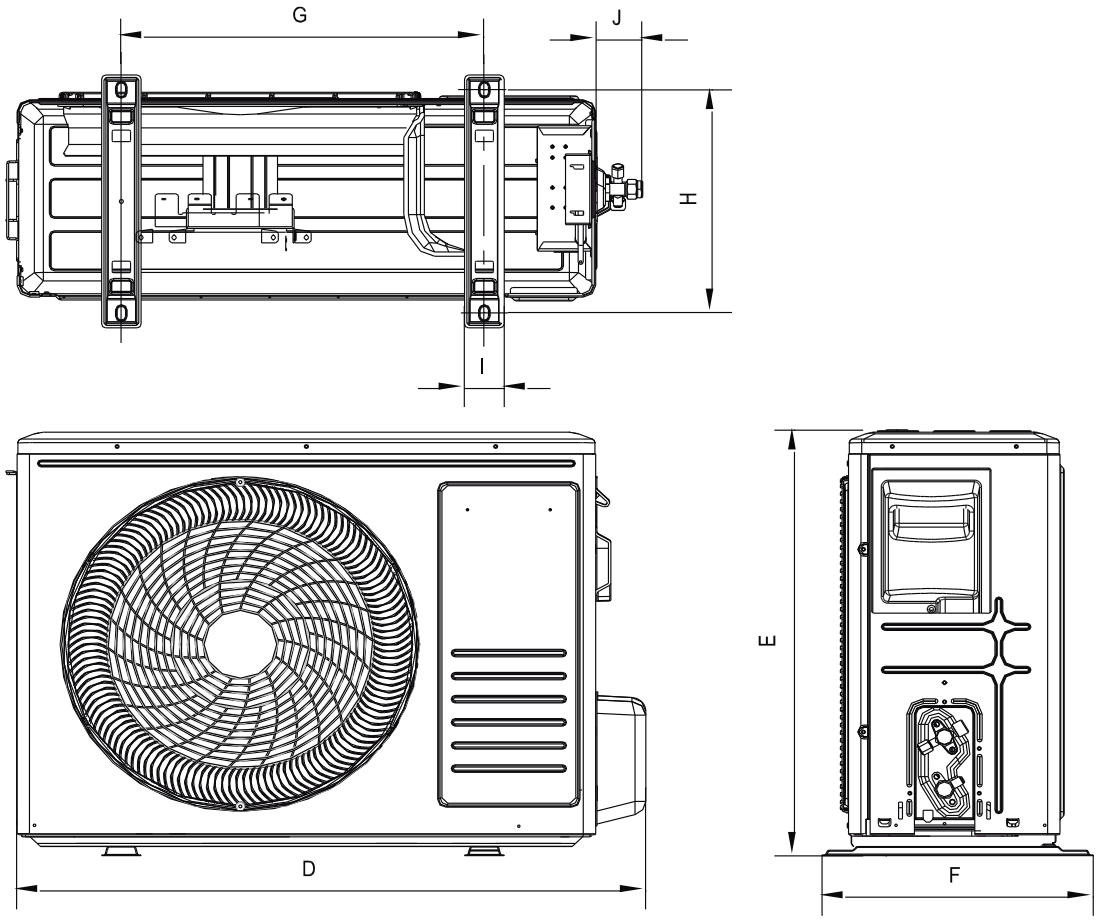
2. Product Dimensions

Indoor Unit:



Model	Indoor unit(mm/inch)		
	A	B	C
PIN09H1V51(I)	811(31.9)	292(11.5)	203(7.99)
PIN12H1V51(I)	811(31.9)	292(11.5)	203(7.99)
PIN09H2V51(I)	811(31.9)	292(11.5)	203(7.99)
PIN12H2V51(I)	811(31.9)	292(11.5)	203(7.99)
PIN18H2V51(I)	1010(39.8)	315(12.4)	220(8.7)
PIN24H2V51(I)	1186 (46.7)	340(13.4)	258(10.2)

Outdoor Unit:



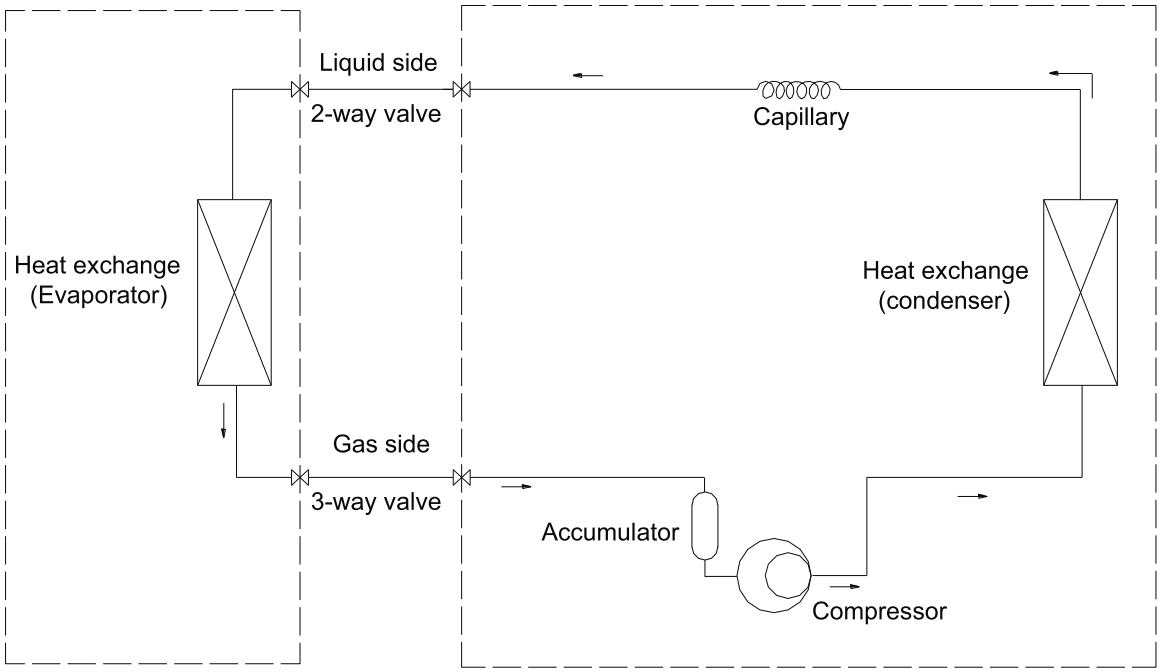
Model	Outdoor unit(mm/inch)						
	D	E	F	G	I	J	K
PIN09H1V51(O	787(31.0)	498(19.6)	290(11.4)	415(16.3)	225(8.9)	48.5(1.9)	52(2)
PIN12H1V51(O)	787(31.0)	498(19.6)	290(11.4)	415(16.3)	225(8.9)	48.5(1.9)	52(2)
PIN09H2V51(O)	810(31.9)	549(21.6)	305(12.0)	433.8(17.1)	278(10.9)	48(1.9)	62(2.4)
PIN12H2V51(O)	810(31.9)	549(21.6)	305(12.0)	433.8(17.1)	278(10.9)	48(1.9)	62(2.4)
PIN18H2V51(O)	863(34)	602(23.7)	349(13.7)	516(20.3)	314(12.4)	54(2.1)	63(2.5)
PIN24H2V51(O)	927(36.5)	699(27.5)	380(15)	586(23)	347.5(13.7)	58.6(2.3)	63(2.5)

3. Detailed Specifics

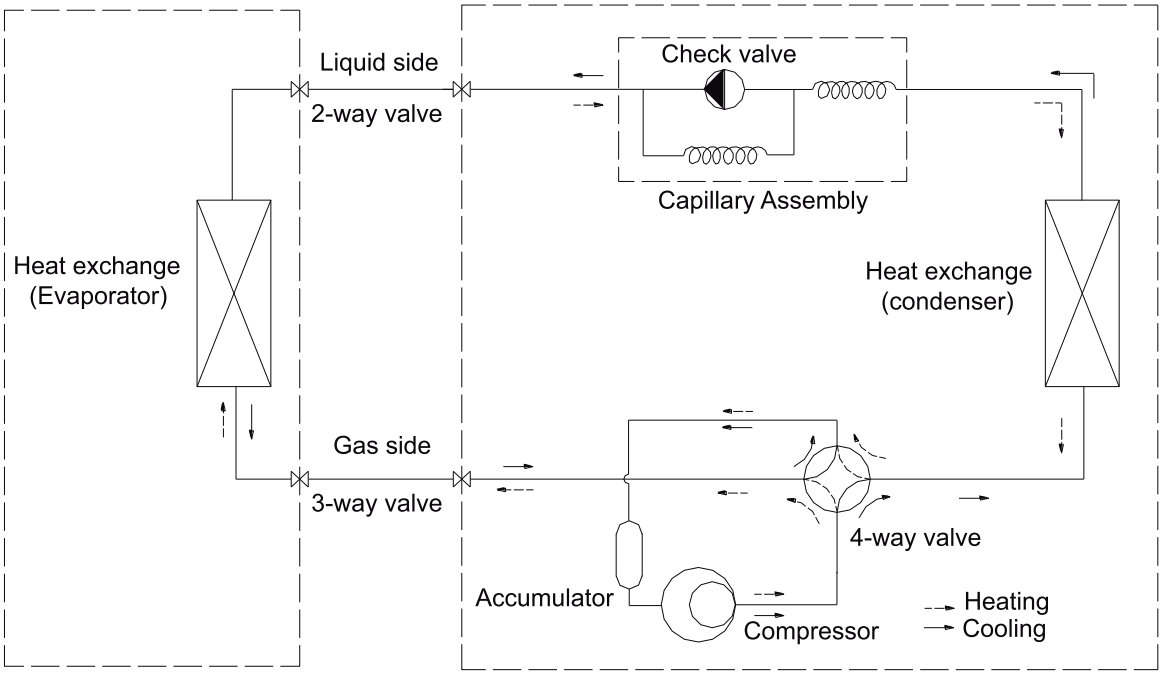
Model			PIN09H1V51	PIN12H1V51	PIN09H2V51	PIN12H2V51	PIN18H2V51	PIN24H2V51
Type			Heat Pump Inverter	Heat Pump Inverter	Heat Pump Inverter	Heat Pump Inverter	Heat Pump Inverter	Heat Pump Inverter
Control type			Wireless Remote	Wireless Remote	Wireless Remote	Wireless Remote	Wireless Remote	Wireless Remote
Wifi			Yes	Yes	Yes	Yes	Yes	Yes
Power supply			115V~/60Hz/1P	115V~/60Hz/1P	208-230V~/60Hz/1P	208-230V~/60Hz/1P	230V~/60Hz/1P	230V~/60Hz/1P
Rated cooling capacity		Btu/h	9,000	12,000	9,000	12,000	18,000	24,000
Rated Heating capacity		Btu/h	9,500	12,000	10,000	12,500	19,000	24,500
SEER		Btu/W.h	20.0	20.0	19.0	19.0	19.0	18.0
HSPF Rating (Region IV)		Btu/W.h	10.0	10.0	10.0	9.5	10.0	10.0
EER		Btu/W.h	10.5	10.0	10.0	9.5	10.0	9.5
COP		W/W	13.4	3.0	3.0	3.2	3.0	3.0
Minimum Circuit		A	17	19	9	10	12	18
Max current	Cooling	A	8.5	12.1	4.6	6.1	9.7	13.1
	Heating	A	8.7	12.1	5.5	6.1	9.7	13.1
Max Power input	Cooling	W	940	1,340	1,010	1,360	2,150	2,890
	Heating	W	960	1,340	1,210	1,360	2,150	2,890
Rated current	Cooling	A	6.8	9.7	3.7	4.9	7.8	10.5
	Heating	A	7.0	9.7	4.4	4.9	7.8	10.5
Rated input	Cooling	W	750	1070	810	1,090	1,720	2,310
	Heating	W	770	1070	970	1,090	1,720	2,310
Maximum Fuse Size		A	20	25	15	15	20	30
Moisture removal		Liters/h	1.1	1.6	1.1	1.6	2.45	2.6
Indoor noise level at cooling	High	dB(A)	38	40	38	40	44	50
	Med.	dB(A)	35	37	35	37	39	46
	Low	dB(A)	32	34	32	34	34	42
Outdoor noise level		dB(A)	50	52	50	52	55	58
Connecting Pipe	Gas	inches	3/8"	3/8"	3/8"	3/8"	3/8"	1/2"
	Liquid	inches	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
Connecting Wiring	Size x Core number		4×16AWG	4×16AWG	4×16AWG	4×16AWG	4×16AWG	4×16AWG
Suitable area		ft^2	100 ~ 350	200 ~ 450	100 ~ 350	200 ~ 450	350 ~ 650	550 ~ 1000
Net dimensions (W x H x D)	Indoor	mm	811x292x205	811x292x205	811x292x205	811x292x205	1010×315×220	1186×340×260
		inch	31.92x11.49x8.07	31.92x11.49x8.07	31.92x11.49x8.07	31.92x11.49x8.07	39.76x12.40x8.66	46.69x13.38x10.23
	Outdoor	mm	728x550x285	728x550x285	715x492x240	715x492x240	780×605×290	845×699×380
		inch	28.66x21.65x11.22	28.66x21.65x11.22	28.14x19.37x9.44	28.14x19.37x9.44	30.70x23.81x11.41	33.26x27.51x14.96
Net weight	Indoor	kg/lbs	8/17.6	8/17.6	8/17.6	8/17.6	13/28.7	17/37.5
	Outdoor	kg/lbs	29/63.9	29/63.9	27/59.5	27/59.5	33.5/73.8	45/99.2
Indoor Packing dimensions (W x H x D)		mm	885x366x278	885x366x278	885x366x278	885x366x278	1094×386×300	1265×415×338
		inch	34.84x14.40x10.94	34.84x14.40x10.94	34.84x14.40x10.94	34.84x14.40x10.94	43.07x15.19x11.81	49.80x16.33x13.30
Outdoor Packing dimensions (W x H x D) (with 5m pipe)		mm	835x600x340	835x600x340	818x520x325	818x520x325	890×645×385	960×750×430
		inch	32.87x23.62x13.39	32.87x23.62x13.39	32.25x20.5x12.75	32.25x20.5x12.75	35.03x25.39x15.15	37.79x29.53x16.92
Gross weight	Indoor	kg/lbs	10/22.1	11/24.2	10/22.1	11/24.2	16/35.3	21/46.3
	Outdoor(without pipe)	kg/lbs	30/66	32/70.5	30/66	31/68.3	37/81.5	50/110.2
*** Indoor Unit ***								
Indoor Motor	Motor Brand		Weilling/Broad-Ocean	Weilling/Broad-Ocean	Weilling/Broad-Ocean	Weilling/Broad-Ocean	Weilling/Broad-Ocean	Weilling/Broad-Ocean
	Motor Model(Factory Code)		AC	AC	AC	AC	DC	DC
Indoor air circulation/Hi		CFM	355	390	325	395	315	885
Evaporator		mm	Φ7x2	Φ7x2	Φ7x2	Φ7x2	Φ7x2	Φ7x2
*** Outdoor Unit ***								
Compressor Brand			GMCC	GMCC	GMCC	GMCC	SANYO	SANYO
Outdoor Motor	Motor Brand		Weilling/Broad-Ocean/SHIBURA	Weilling/Broad-Ocean/SHIBURA	Weilling/Broad-Ocean/SHIBURA	Weilling/Broad-Ocean/SHIBURA	Weilling/Broad-Ocean	Weilling/Broad-Ocean
	Motor Model		DC	DC	DC	DC	DC	DC
Condenser		mm	Φ7x2	Φ7x2	Φ7x2	Φ7x2	Φ7x2	Φ7x2
Factory Refrigerant charge(7.5m pipe)		g/oz	810g / 28.57oz	1002g / 35.34ozs	800g / 28.22oz	950g / 33.51oz	1150g / 40.56oz	1550g / 54.67oz
Factory Precharge Line		(m/ft)	7.5 / 25	7.5 / 25	7.5 / 25	7.5 / 25	7.5 / 25	7.5 / 25
Maximum Line Length		(m/ft)	15 / 50	15 / 50	15 / 50	15 / 50	15 / 50	15 / 50
Maximum Height Difference Indoor and Outdoor		(m/ft)	5 /16.4	5 /16.4	5 /16.4	5 /16.4	5 /16.4	5 /16.4
Operation temperature		°F	62 ~ 86	62 ~ 86	62 ~ 86	62 ~ 86	62 ~ 86	62 ~ 86
Outdoor Ambient Temperature	Cooling	°F	5 ~ 122	5 ~ 122	5 ~ 122	5 ~ 122	5 ~ 122	5 ~ 122
	Heating	°F	-13 ~ 86	-13 ~ 86	-13 ~ 86	-13 ~ 86	-13 ~ 86	-13 ~ 86

4. Refrigeration cycle diagram

Cooling only

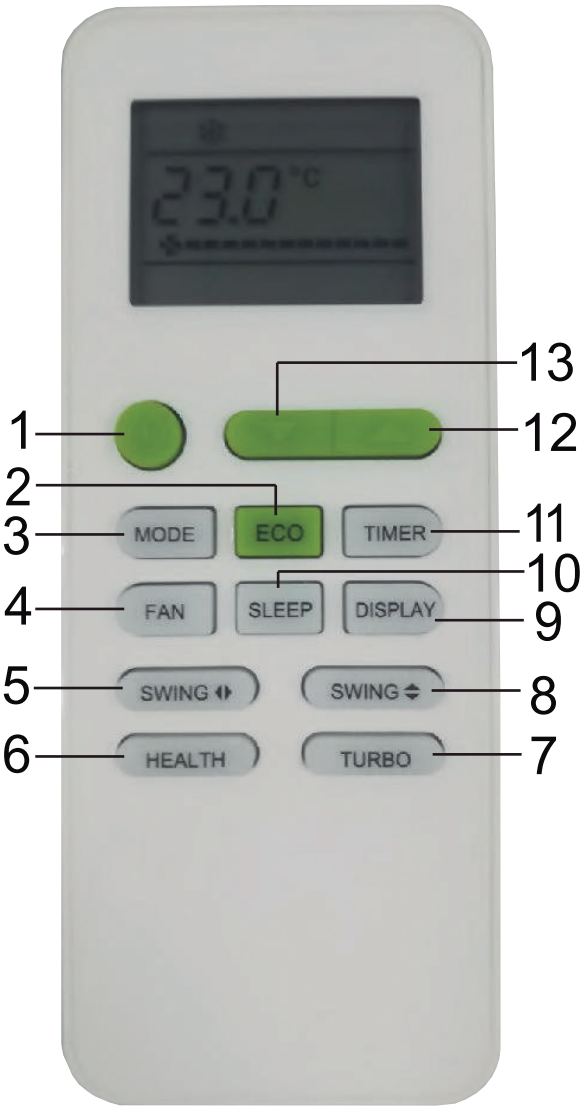


Heat pump



5. Operation Details

Remote controller



1 ON/OFF button
To switch the conditioner on and off.

2 ECO button
In cooling mode,press this button ,the temperature will increase 2℃ on the base of setting temperature:
In heating mode, press this button, the temperature will decrease 2℃ on the base of setting temperature.

3 MODE button
To select the mode of operation.

4 FAN SPEED button
To select the fan speed of auto/low/mid/high.

5 SWING button
To activate or deactivate of the movement of the "DEFLECTORS".

6 HEALTH button
To switch - on /off HEALTHY funtion. It is a button which controls the ionizer or plasma generator only for inverter type.

7 TURBO button
In cooling mode, press this button, the unit will give the maximum cooling temperature with 16℃
In heating mode, press this button, the unit will give the maximum heating temperature with 31℃.

8 SWING button
To activate or deactivate of the movement of the "DEFLECTORS".

9 DISPLAY button
To switch on/off the LED display (if present)

10 SLEEP button
To activate the function "SLEEP".

11 TIMER button
To set automatic switching-on/off.

12 TEMP UP button
Increase the temperature or time by 1 unit.

13 TEMP DOWN button
Decrease the temperature or time by 1 unit.

Note: Each mode and relevant function will be further specified in following pages.

Remote Control
The remote controller is not presetting as Cooling Only Air Conditioner or Heat Pump by manufacturer.
Each time after the remote controller replace batteries or is energized, the arrowhead will flashes on the front of "Heat" or "Cool" on LCD of the remote controller.
User can preset the remote controller type depending on the air conditioner type you have purchased as follows:
Press any button when the arrowhead flashes on the front of "Cool", Cooling Only is set.
Press any button when the arrowhead flashes on the front of "Heat", Heat Pump is set.
If you don't press any button within 10 seconds, the remote controller is preset as Heat Pump automatically.

Note :
If the air conditioner you purchased is a Cooling Only one, but you preset the remote controller as Heat Pump, it doesn't bring any matter. But if the air conditioner you purchased is a Heat Pump one, and you preset the remote controller as Cooling Only, then you CAN NOT preset the Heating operation with the remote controller.

5.2 Electronic Controller

5.2.1 Safety Protection

(1) Time Delay for Safety protection

3 minutes delay for compressor ---The compressor is ceased for 3minutes before restarting to balance the pressure in the refrigeration cycle in order to protect the compressor.

2 minutes delay for 4-way valve ---The 4-way valve will be ceased for 2 minutes late after compressor to prevent the refrigerant-gas abnormal noise when the HEATING operation is OFF or switch to the other operation mode.

(2) Discharge temperature protection

There is a temperature sensor on top of compressor, when temperature on top of compressor exceeded the limit, system control will shut down the compressor and the display board will show the error code.

(3) Lower voltage protection

When AC voltage ≤158V and keep it for 10 seconds, unitwill be shut down for protection.

(4) Over voltage protection

When AC voltage ≥260V, unit will be shut down and recover while AC≤255V.

(5) Over current protection

When the current of outdoor unit is overload, controller shut down the unit immediately and show error code.

(6) Compressor abnormity protection

When compressor start on or in the process of running, if there is no feedback to controller or load of compressor is abnormity, the air conditioner will shut down, and show error code.

(7) **IPM** module protection

IPM module has high temperature & over current protection itself, if there is signal feedback to IPM, the outdoor unit will shut down, LED on outdoor PCB will show the error code.

5.2.2 “Feel” Mode Operation

(8) When the “Feel” mode is selected, the operation mode and initial temperature set are determined by the initial room temperatureat start-up of the operation exceptto turn off the air conditioner and operates it again.

(9) If the mode is change to “Feel” from other mod e, the “Feel” mode doesn’t operate until compressor stop for more than 3 minutes.

Mode	Initial Room Temperature	Initial Set Temperature
COOLING	RT=26°C(78.8°F)	23°C(73.4°F)
DRY	26°C>RT≥20°C(68°F)	RT-2°C(35.6°F)
HEATING for Heat Pump/ FAN for Cooling Only	RT<20°C(68°F)	-

In the “Feel” mode, when the controller receives theup or down signal of temperature, the set temperature can adjust by 1°C(33.8°F) upper or lower. The biggest you can adjust by 2°C(35.6 °F) upper or lower.

5.2.3. “COOLING” Mode Operation

(1) Compressor frequency control

According to difference room temperature and set temperature (**δt = RT-ST**), running frequency of compressor is controlled by electronic controller. When room temperature is much higher than set temperature, the compressor will start at a high frequency, and as room temperature goes

down, the compressor running frequency will go down. When room temperature is lower than set temperature, the compressor will run at very low frequency. In general, unit will change its running frequency according to **δt** to make room temperature closing to set temperature.

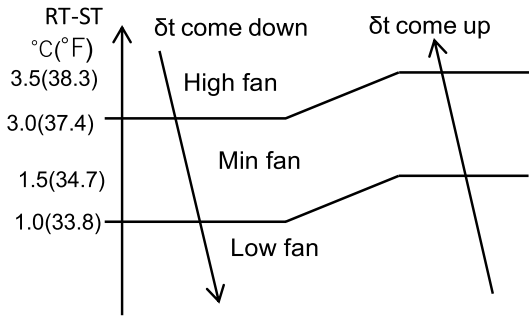
(2) Outdoor temperature affects running frequency of the compressor

Outdoor temperature affect compressor's running frequency. Difference inlet temperature of outdoor unit is adapted by difference compressor running frequency. While outdoor temperature is about 30°C, the compressor will run in high frequency.

If unit run in "cooling" mode and outdoor temperature is less than -2°C(-35.6°F), the controller will shut down compressor and show error code, while the ambient temperature is over 1°C(33.8°F), the compressor will run automatically.

(3) Auto fan control in cooling mode

In cooling mode (include cooling in "Feel" mode), fan speed is determined by **δt**, as the following diagram:



5.2.4. "DRY" Mode Operation

(1) The system for DRY operation used the same refrigerant circle as the cooling one.

(2) When the system operates in DRY mode, at first it operates in cooling mode, the set temperature (**ST**) is "RT-2°C(35.6°F)". After that, t he system will operate in cooling mode with lowest fan speed for 30 minutes and then change to middle speed for 30seconds as a cycle. During the course of this operation, you can't use remote controller to adjust the fan speed but you can control the vane direction.

(3) In the dry mode, when RT≤12°C(53.6°F), the compressor will stop and operates again at RT ≥ 14°C(57.2°F).

5.2.5. "HEATING" Mode Operation (available for Heat Pump only)

(1) Frequency control

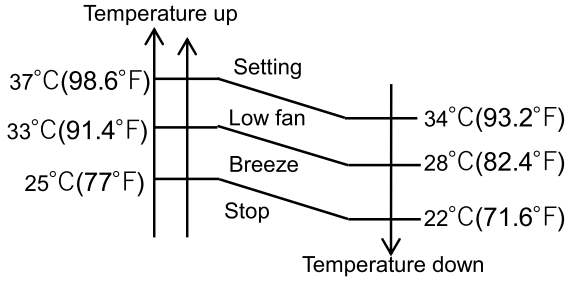
Same as the frequency control in cooing mode, the running frequency of compressor is controlled by controller. Unit change its running frequency according to **δt** to make the room temperature closing to the set temperature.

(2) Indoor fan motor control

1) Cold Air Prevention Control

The function is intended to prevent cold air from being discharged when heating mode selected or while in defrosting.

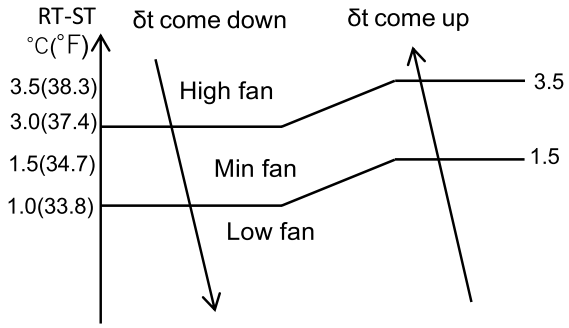
The indoor fan speed will be controlled as following.



In heating operation, if air conditioner turn off, the indoor fan motor will run most for 30 seconds since the stop of compressor.

2) Auto fan control (heating)

In heating mode (include in "FEEL" mode), fan speed is determined by δt as the following:



(3) 4-way valve control

In heating mode, 4-way valve will power on ahead of compressor for 5 seconds, and cut off for 2 minutes later than compressor . 4-way valve will not power off unless the machine to be switched off, mode changed or on the process of defrosting.

(4) Defrosting

Defrosting is controlled by the microprocessor.

When one of the following conditions is satisfied, unit comes into defrosting:

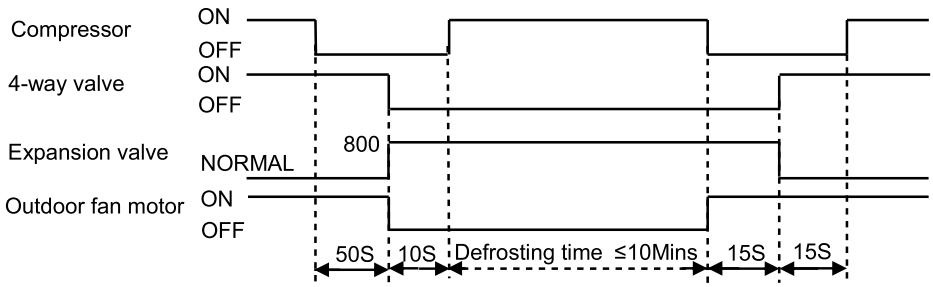
a. Outdoor heat exchanger Temperature (OPT) is continuously less than 3°C(37.4°F) while the unit runs for more than 40 minutes, and OPT is keeping under -6°C for more than 3 minutes.

b. Outdoor heat exchanger Temperature (OPT) is continuously less than 3°C (37.4°F) meanwhile the unit runs for more than 80 minutes, and OPT is keeping under -4°C(-39.2°F) for more than 3 minutes.

c. Outdoor heat exchanger Temperature (OPT) is continuously less than 3°C(37.4°F) while the unit runs for more than 120 minutes, and OPT is keeping below -2°C (35.6°F) for more than 3 minutes.

Before the air con comes into defrosting, compressor running frequency drop down to a lower frequency firstly, then the compressor shuts down.

In defrosting, the max. frequency of compressor is F9 (a little less than the highest frequency). In this period all protection function are available.



In defrosting, LED showing by winking.

No matter what AC come into or out of defrosting, indoor fan motor speed is the same as Cold Air Prevention Control.

While one of the following conditions is satisfied, unit comes out of defrosting and shifts to heating mode:

a. Outdoor coil Temperature (OPT) ≥ 15°C(59°F).

b. The time of defrosting keeps for more than 10 minutes.

(5) Indoor exchanger overheat protection

When Indoor exchanger Temperature (IPT) is higher than 55°C(131°F) , unit comes into indoor exchanger overheat protection. The compressor drops its frequency towardto F1 level until IPT≤ 52°C(125.6°F)

If IPT≤ 52°C(125.6°F) and keep for 5 minutes, control system doesn't limit running frequency.

If IPT>62°C(143.6°F), control system shut down compressor, and recover while IPT drop less than 50°C(122°F)

5.2.6 "SLEEP"

When the SLEEP button is pressed, the AC operatesas following:

The indoor fan speed is set at low speed, the power lamp and the sleep lamp is on, the display of temperature will close after 5 minutes.

When selecting COOLING/DRY operation with SLEEP mode, the set temperature will be raised by 1°C(33.8°F)1 hour later and by 2°C(35.6°F)2 hour later.

When selecting HEATING operation with SLEEP mode, the set temperaturewill be dropped by 1°C(33.8°F)1 hour later and 2°C(35.6°F)2 hours later.

After the System operates in SLEEP mode for 8 hours, it will stop automatically.

5.2.7 EMERGENCY Operation

When the EMERGENCY Operation switch is pressed one time, COOLING mode is selected and if the EMERGENCY Operation switch press again within 3s , HEATING mode selected, while press once again, the unit will switch off.

When the remote controller missing, failed or the batteries run down, press the EMERGENCY Operation switch on front of the indoor unit for function test.

NOTE: Do not press the EMERGEMCY Operation switch during normal operation. **5.2.8 AUTO-RESTART Function (Option)**

While air conditioner is operating in one mode, all of its operation data, such as working mode, preset temperature etc. wouldbe memorized into IC by main PCB. If power supply cut off due to reasons and recover again, the AUTO-RESTART function will set synchronously and the air conditioner would work at the same mode as before.

Auto-restart Pre-setting (optional):

If Auto-restart functionis needed, follow the steps below to activate this function:

1) Pulling the air-con's plug out of socket.
2) Pressing and holding the Emergency button (ON/OFF) on the indoor, then insert the plug into the socket again.
3) Keep pressing the Emergency button for more than 10 seconds until three short beeps heard, the Auto-restart function been activated.

5.2.9 Protection and Failure Display

When protection display is available, controller will show error code, digital LED shows error code and setting temperature by turns.

If there is more than one failure, it will show error codes according to the error list sequence.

To insure the signal communication of indoor and outdoor unit, any failure code relates to outdoor unit will remain display for 2 minutes maximum after it's recovered.

Among all the failure codes, sensor failu re can be recovery automatically once it comes normal.

Error list

Failure Type	LED Code	Digital LED Code
Indoor and outdoor communication fault	RUN、TIMER–both winking	E0
Outdoor communication failure	RUN、TIMER–both winking	EC
Indoor room temperature sensor (IRT) fault	RUN-1 time/8s	E1
Indoor coil temperature sensor (IPT) fault	RUN-2 times /8s	E2
Outdoor coil temperature sensor (OPT)	RUN-3 times /8s	E3
System abnormity	RUN-4 times /8s	E4
Model configuration wrong	RUN-5 times /8s	E5
Indoor fan motor fault	RUN-6 times /8s	E6
Outdoor temperature sensor	RUN-7 times /8s	E7
Exhaust temp. sensor	RUN-8 times /8s	E8
IPM drive and module fault	RUN-9 times /8s	E9
Outdoor fan motor fault (DC motor)	RUN-10 times /8s	EF
Current sensor fault	RUN– 11 times /8s	EA
EEPROM fault	RUN-12 times /8s	EE
Temp. switch fault (on top of the compressor)	RUN-13 times /8s	EP
Voltage sensor fault	RUN-14 times /8s	EU
Air filter duty		CL

Protection display code list:

Protection Type	Function Indicator (flash)	Digital LED Code
Overvoltage /lower voltage protection	RUN: Blink; TIMER: 1 blink /8 sec	P1
Overcurrent protection	RUN: Blink; TIMER: 2 blink /8 sec	P2
Exhaust over temperature protection	RUN: Blink; TIMER: 4 blink /8 sec	P4
Too cool protection in cooling mode	RUN: Bright; TIMER: 5 blink /8 sec	P5
Overheat protection in cooling mode	RUN: Bright; TIMER: 6 blink /8 sec	P6
Overheat protection in heating mode	RUN: Bright; TIMER: 7 blink /8 sec	P7
Outdoor over temperature / lower temperature protection	RUN: Bright; TIMER: 8 blink /8 sec	P8
Drive protection (software control)	RUN: Blink; TIMER: 9 blink /8 sec	P9
Module protection (hardware control)	RUN: Blink; TIMER: 10 blink /8 sec	P0

Outdoor failure display

There is a LED on outdoor power board, it blinks 1s ON and 1s OFF while compressor standby and it always light (ON) whilecompressor running; If there is failure happened on ODU, The indicator (LED) alerts the fault in a cycle as such that it is bright for 0.5 seconds, dark for 0.5 seconds, blinks “n” times and then dark for 3 seconds. For details as table below:

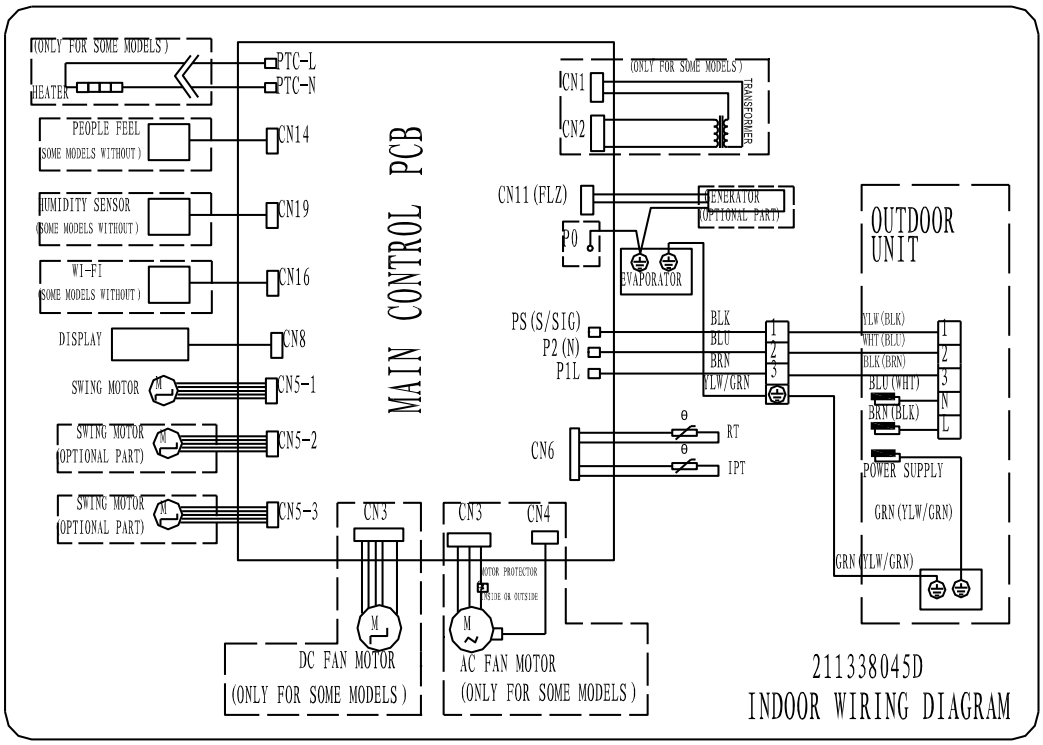
Display on outdoor power source board:

blink time (n)	Failure
1	IPM protection
2	Over voltage /lower voltage
3	Overcurrent
4	Exhaust over temperature protection
5	Outdoor coil over temperature protection
6	Drive fault and protection (V1, VP1)
7	Communication fault with indoor unit
8	Compressor overheat fault (compressor top switch)
9	Short-circuit / open-circuit fault of outdoor temperature sensor
10	Short circuit / open-circuit fault of outdoor heat exchanger temperature sensor
11	Short-circuit / open-circuit fault of exhaust temperature sensor
12	Voltage sensor fault
13	Current sensor fault
14	IPM fault
15	Communication fault between power source board and IPM
16	No feedback from DC fan motor(outdoor unit)
17	Defrost state
18	Suction temperature sensor fault
19	Outdoor EEPROM fault
20	Outdoor fan motor protection
21	Indoor fan motor protection
23	System fault
24	Model configuration wrong
25	Indoor room temperature sensor fault
26	Indoor coil temperature sensor fault
27	Indoor EEPROM fault
28	Indoor fan motor fault
30	IPM drive fault
31	Outdoor environment temperature protection
32	Indoor anti-frosting protection
33	Indoor over-heat protection

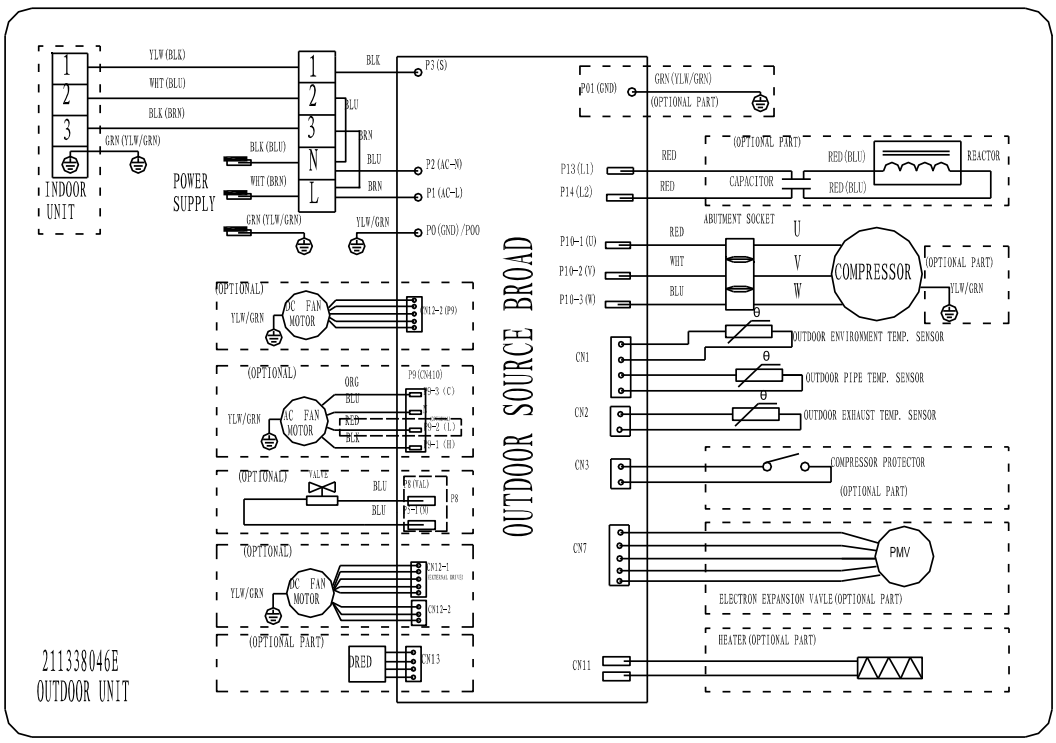
6. Wiring diagram

MODEL: PIN09H1V51 , PIN12H1V51

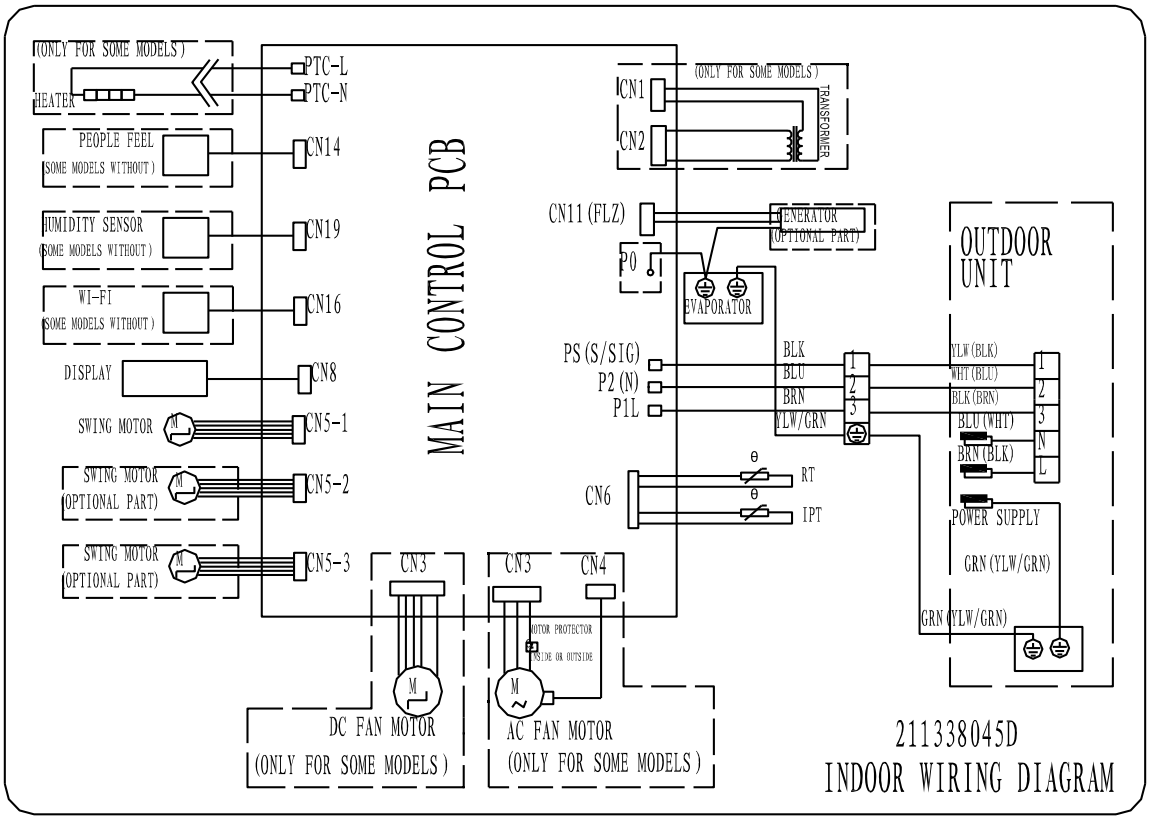
INDOOR UNIT:



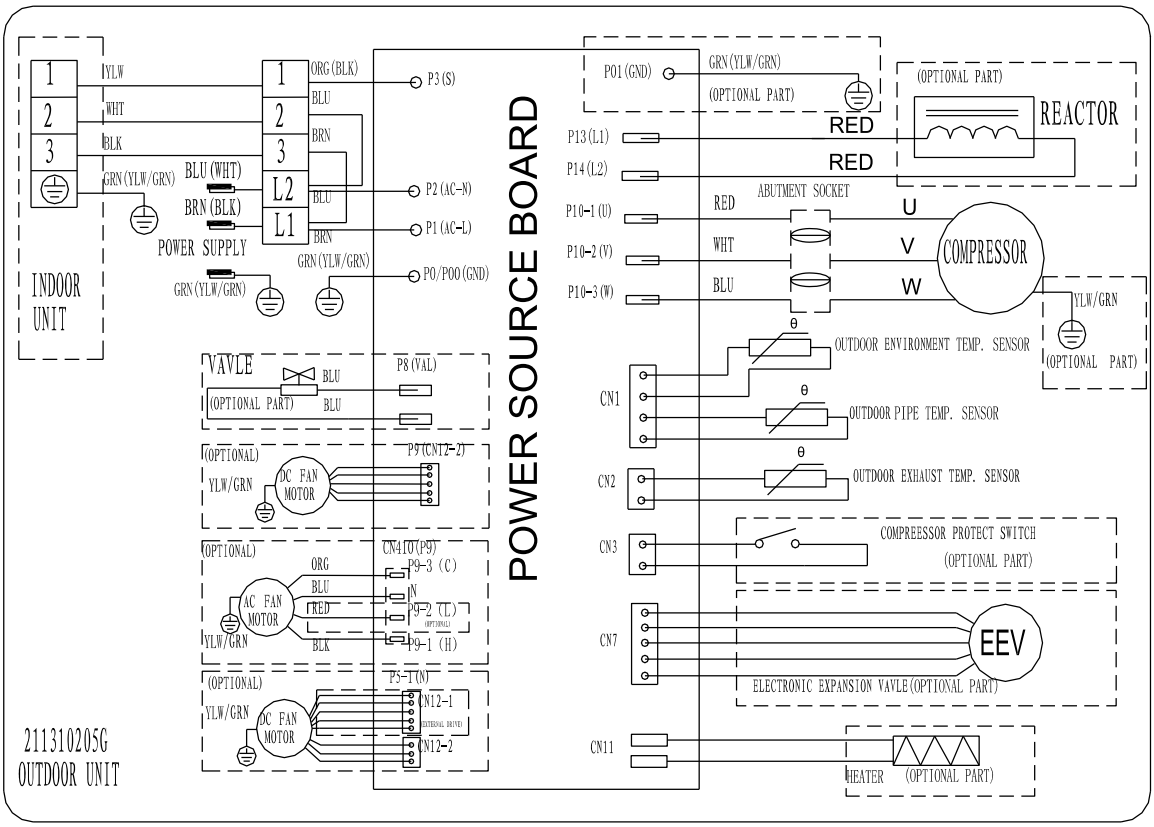
OUTDOOR UNIT



MODEL: PIN12H2V51

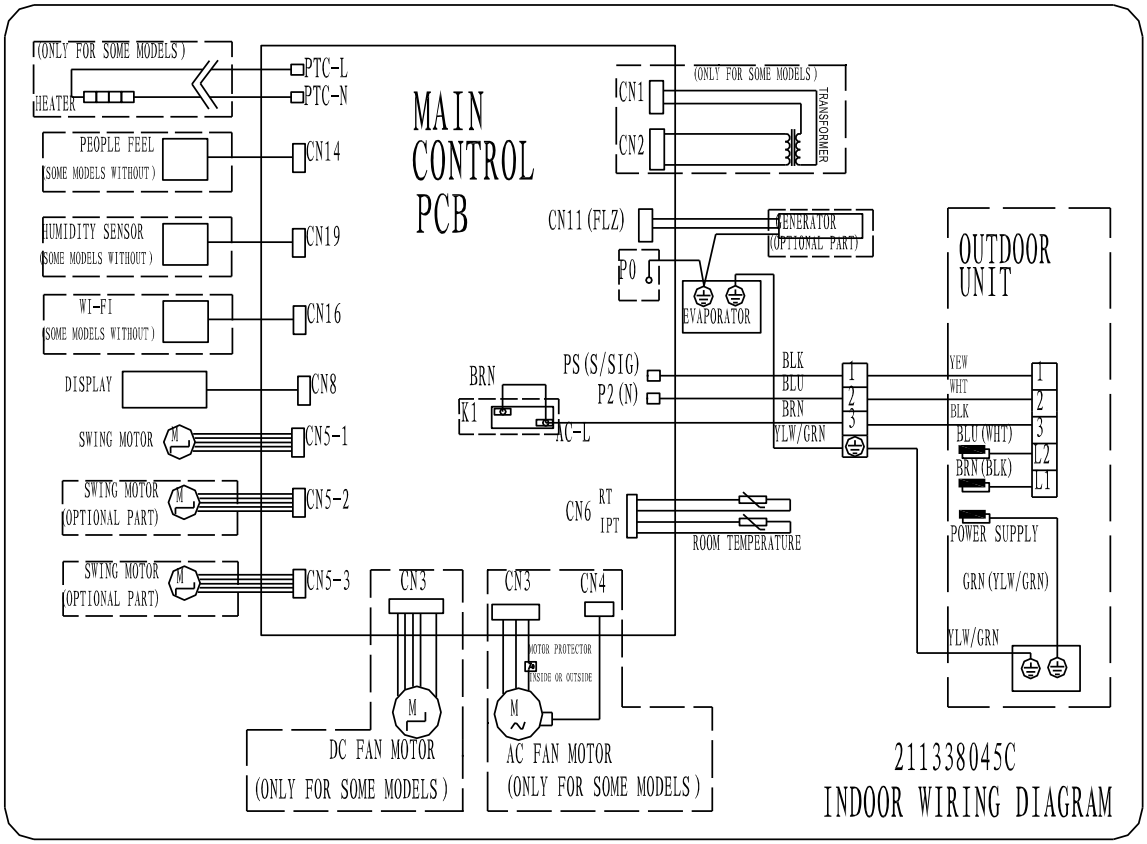


OUTDOOR UNIT

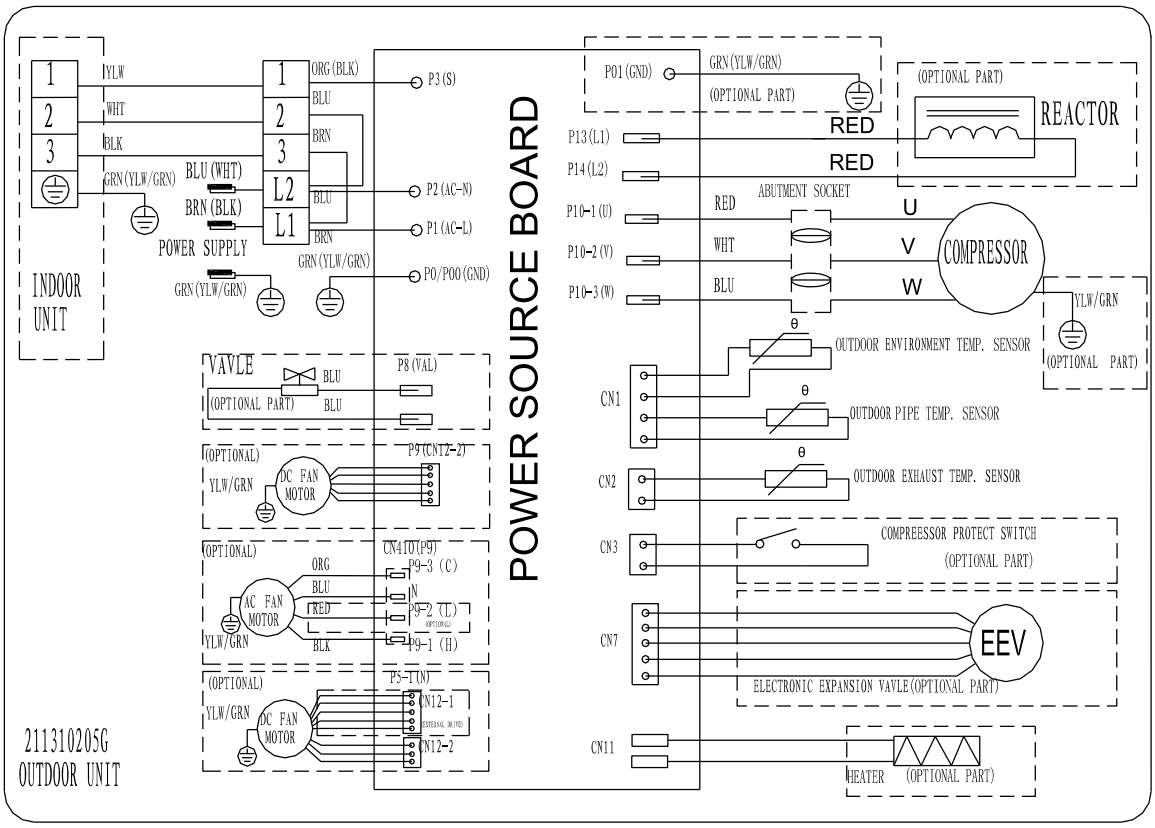


PIN09H2V51, PIN18H2V51, PIN24H2V51

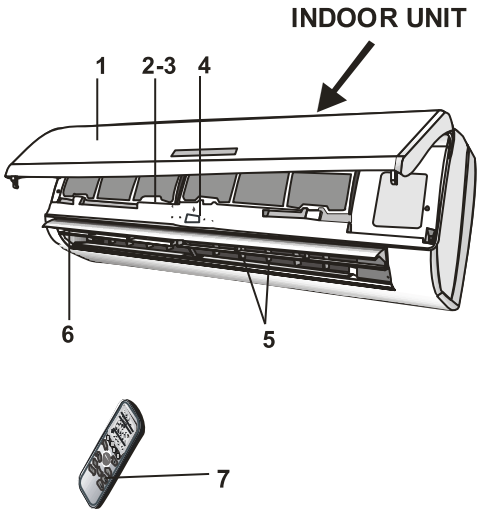
INDOOR UNIT



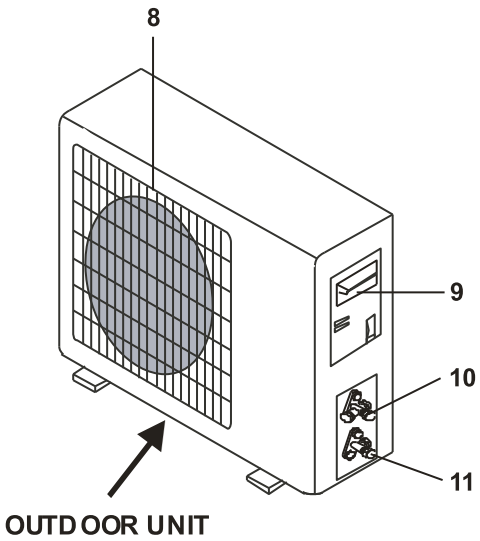
OUTDOOR UNIT



7.Names of parts



Indoor unit	
No.	Name
1	Front panel
2	Air filter
3	Special filter(option)
4	Display PCB
5	Vertical vane
6	Horizontal vane
7	Remote controller



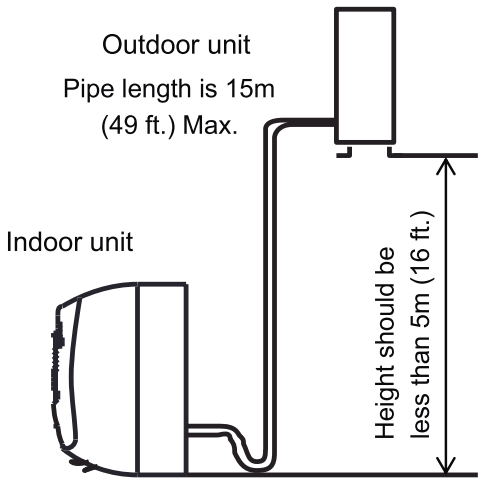
Outdoor unit	
No.	Name
8	Air outlet grille
9	Electronic box cover
10	2-way valve
11	3-way valve

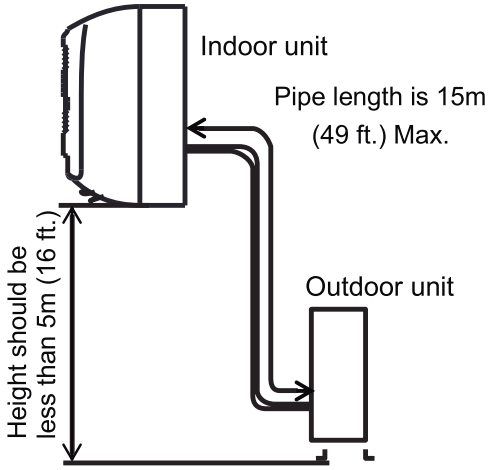
8. Installation manual

8.1 Installation Details

Connecting pipe length

Model	Pipe size(Inch)	
	Liquid	Gas
PIN09H1V51	1/4	3/8
PIN09H2V51	1/4	3/8
PIN12H1V51	1/4	3/8
PIN12H2V51	1/4	3/8
PIN18H2V51	1/4	3/8
PIN24H2V51	1/4	1/2





Model	Standard length: m (ft)	Refrigerant piping Max. length: m (ft.) A	Additional refrigerant B Calculation: ×g=Bg/m(A-5m)
PIN09H1V51	5.0(16)	15(49)	20g/m(0.22oz/ft.)
PIN09H2V51	5.0(16)	15(49)	20g/m(0.22oz/ft.)
PIN12H1V51	5.0(16)	15(49)	20g/m(0.22oz/ft.)
PIN12H2V51	5.0(16)	15(49)	20g/m(0.22oz/ft.)
PIN18H2V51	5.0(16)	15(49)	30g/m(0.33oz/ft.)
PIN24H2V51	5.0(16)	15(49)	30g/m(0.33oz/ft.)

Connecting cables

The power cord should be selected according to the following specifications sheet.

Appliance Amps	Wire Size
5	AWG21/0.75 mm2
10	AWG18/1.0 mm2
13	AWG15 /1. 5 mm2
18	AWG14/1.6 mm2
25	AWG12/2.0 mm2
30	AWG10/2.5 mm2

8.2 Installation for the first time

Indoor unit

Install the indoor unit level on a strong wall that is not subject to vibrations

The inlet and outlet ports should not be obstructed: the air should be able to blow all over the room.

Do not install the unit near a source of heat, steam, or flammable gas.

Install the unit near an electric socket or private circuit.

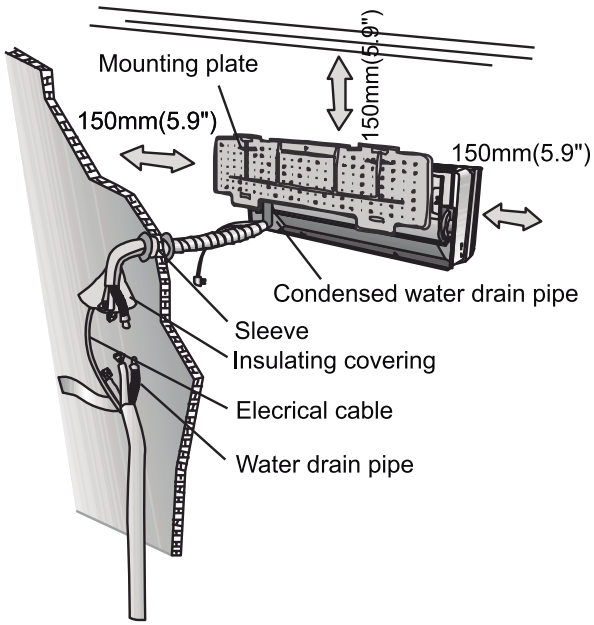
Do not install the unit where it will be exposed to direct sunlight.

Install the unit where connection between indoor and outdoor unit is as easy as possible.

Install the unit where it is easy to drain the condensed water.

Check the machine operation regularly and leave the necessary spaces as shown in the picture.

Install the indoor unit where the filter can be easily accessible.



Minimum space to be left showing in the picture.

OUTDOOR UNIT

Do not install the outdoor unit near sources of heat, steam or flammable gas.

Do not installthe unit intoo windy or dusty places.

Do not install the unit where people often pass. Select a place where the air discharge and operating sound level will not disturb the neighbours.

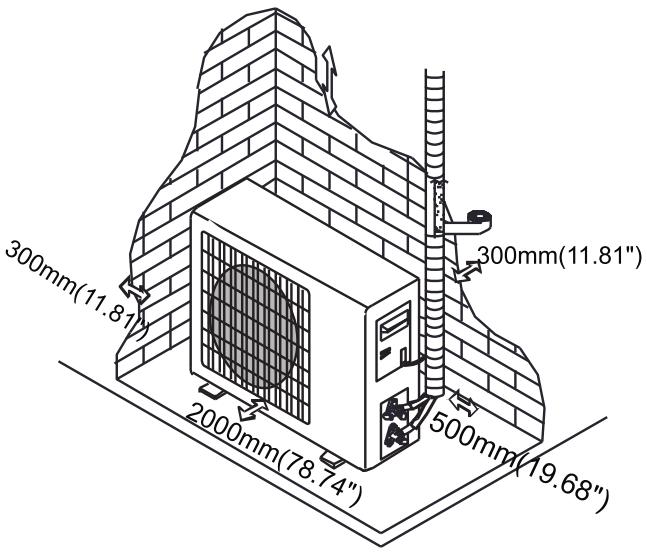
Avoid installing the unit where it will be exposed to direct sunlight (other wise use a protection, if necessary, that should not interfere with the air flow).

Leave the spaces as shown in the picture for The air to circulate freely.

Install the outdoor unit in a safe and solid place.

If the outdoor unit is subject to vibration, place rubber gaskets onto the feet of the unit.

Install the indoor unit in the roomto be air conditioning, avoiding to installation in corridors or communal areas.



Install the indoor unit at a height of at least 2.5m(0.1") from the ground.

To install, proceed as follows:

8.2.1 Installation of the mounting plate.

8.2.2.1 By using a level, put the mounting plate in a perfect square position vertically and horizontally.

8.2.1.2 Drill 32mm(1.26") deep holes in the wall to fix the plate.

8.2.1.3 Insert the plastic anchors into the hole.

8.2.1.4 Fix the mounting plate by using the provided tapping screws.

8.2.1.5 Check that the mounting plate is correctly fixed.

Note: The shape of the mounting plate may be different from the one above, but installation method is similar.

9.2.2 Drilling a hole in the wall for the piping

1) Decide where to drill the hole in the wall for the piping (if necessary) according to the position of the mounting plate

2) Install a flexible flange through the hole in the wall to keep the latter intact and clean.

The hole must slope downwards towards the exterior.

Note: Keep the drain pipe down towards the direction of the wall hole, otherwise leakage may occur.

8.2.3 Electrical connections---Indoor unit

1).Lift the front panel.

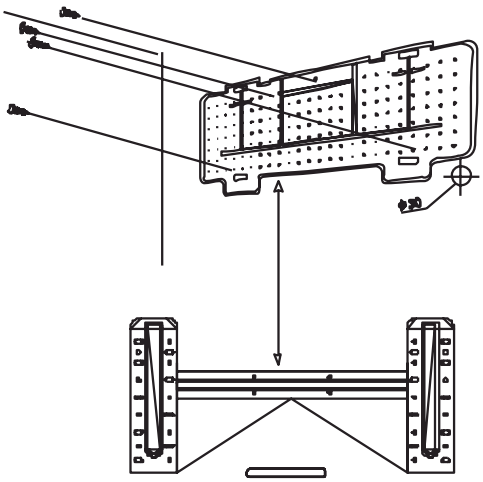
2).Take off the cover as indicated in the picture (by removing a screw or by breaking the hooks).

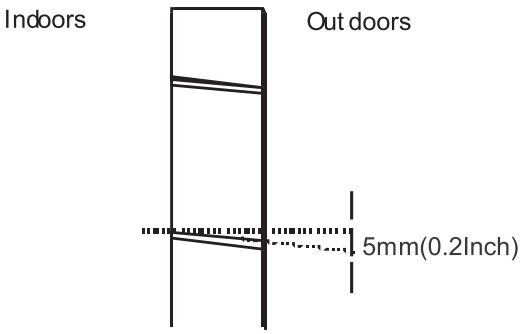
3).For the electrical connections, see the circuit diagram on the right part of the unit under the front panel.

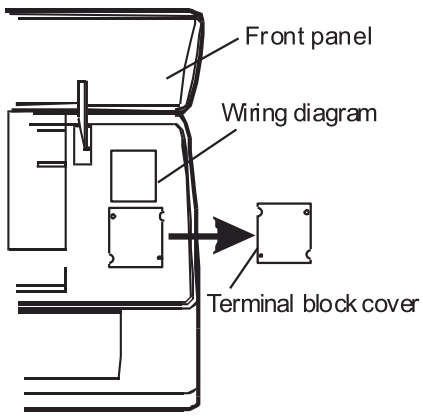
4).Connect the cable wires to the screw terminals by following the numbering, Use wire size suitable to the electric power input (see name plate on the unit) and according to all current national safety code requirements.

5).The cable connecting the outdoor and indoor units must be suitable for outdoor use.

6).The plug must be accessible also after the appliance has been installed so that it can be pulled out if necessary.







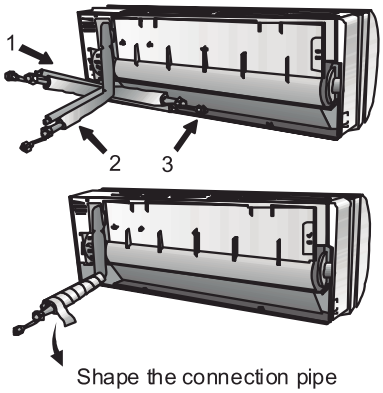
7).An efficient earth connection must be ensured.

8).If the power cable is damaged, it must be replaced by an authorized Service Centre.

8.2.4 Refrigerant piping connection

The piping can be run in the 3 directions indicated by numbers in the picture. When the piping is run in direction 1 or 3, cut a notch along the groove on the side of the indoor unit with a cutter.

Run the piping in the direction of the wall hole and bind the copper pipes, the drain pipe and the power cables together with the tape with the drain pipe at the bottom, so that water can flow freely.



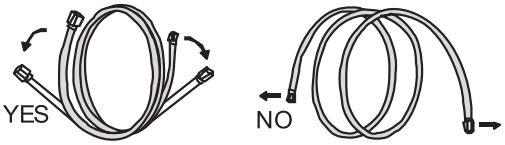
Shape the connection pipe

8.2.5 Connecting the pipes.

Do not remove the cap from the pipe until connecting it, to avoid dampness or dirt from entering.

If the pipe is bent or pulled too often, it will become stiff. Do not bend the pipe more than three times at one point.

When extending the rolled pipe, straighten the pipe by unwinding it gently as shown in the picture.



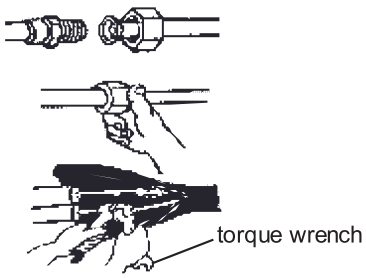
Extending the rolled pipe

8.2.6 Connections to the indoor unit

1).Remove the indoor unit pipe cap (check that there is no debris inside).

2).Insert the fare nut and create a flange at the extreme end of the connection pipe.

3).Tighten the connections by using two wrenches working in opposite directions.



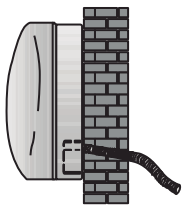
8.2.7 Indoor unit condensed water drainage

The indoor unit condensed water drainage is fundamental for the success of the installation.

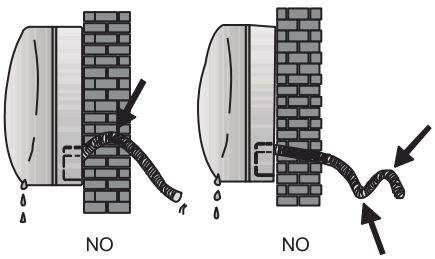
1).Place the drain hose below the piping, taking care not to create siphons.

2).The drain hose must slant downwards to aid drainage.

3).Do not bend the drain hose or leave it protruding or twisted and do not put the end of it in water. If an extension is connected to the drain hose, ensure that it is lagged when it passes into the indoor unit.



YES



4).If the piping is installed to the right, the pipes, power cable and drain hose must be lagged and secured onto the rear of the unit with a pipe connection.

Insert the pipe connection into the relative slot.

Press to join the pipe connection to the base.

8.2.8 Electronic connections

1. Take the cover away.
2. Connect the cable wires to the terminal board using the same numbering as in the indoor unit.
3. For the electrical connections, see the wiring diagram on the back of the cover
4. Fasten the cables with a cable-clamp.
5. An efficient earth connection must be ensured.
6. Replace the covers.

8.2.9 Connecting the pipe

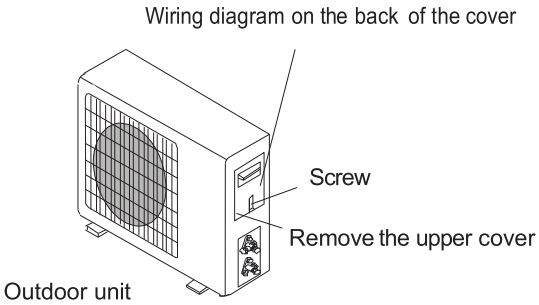
Screw the flare nuts to the outdoor unit coupling with the same tightening procedures described for the indoor unit.

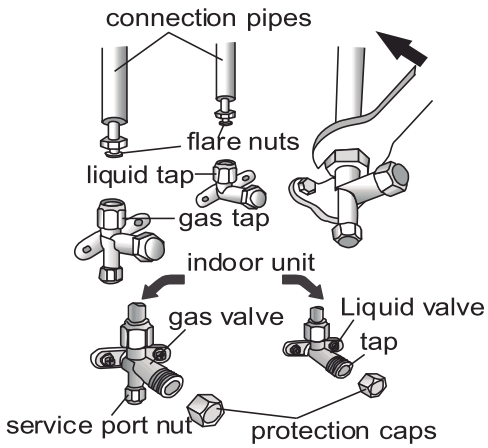
Note: If the tightening torque is not sufficient, there will probably be some leakage. With excessive tightening torque there will also be some leakage, as the flange could be damaged.

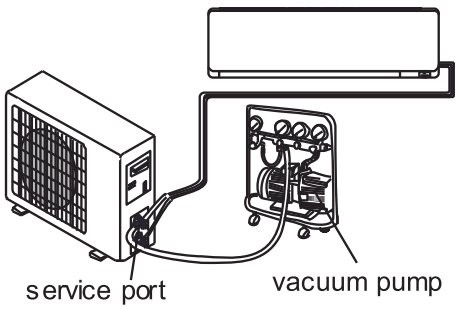
8.2.10 Bleeding

Air and humidity left inside the refrigerant circuit can cause compressor malfunction. After having connected the indoor and outdoor units, bleed the air and humidity from the refrigerant circuit by using a vacuum pump.

The air and humidity left inside the refrigerant circulation can cause compressor malfunction. After having connected the indoor and outdoor units, bleed the air and humidity from the refrigerant circulation using a vacuum pump.







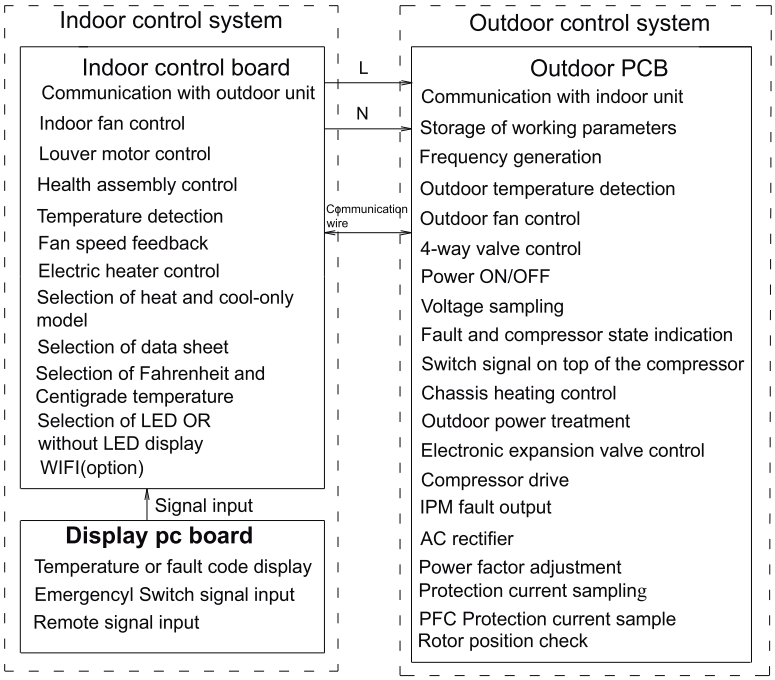
9. Toubleshooting

Error Code Explainer

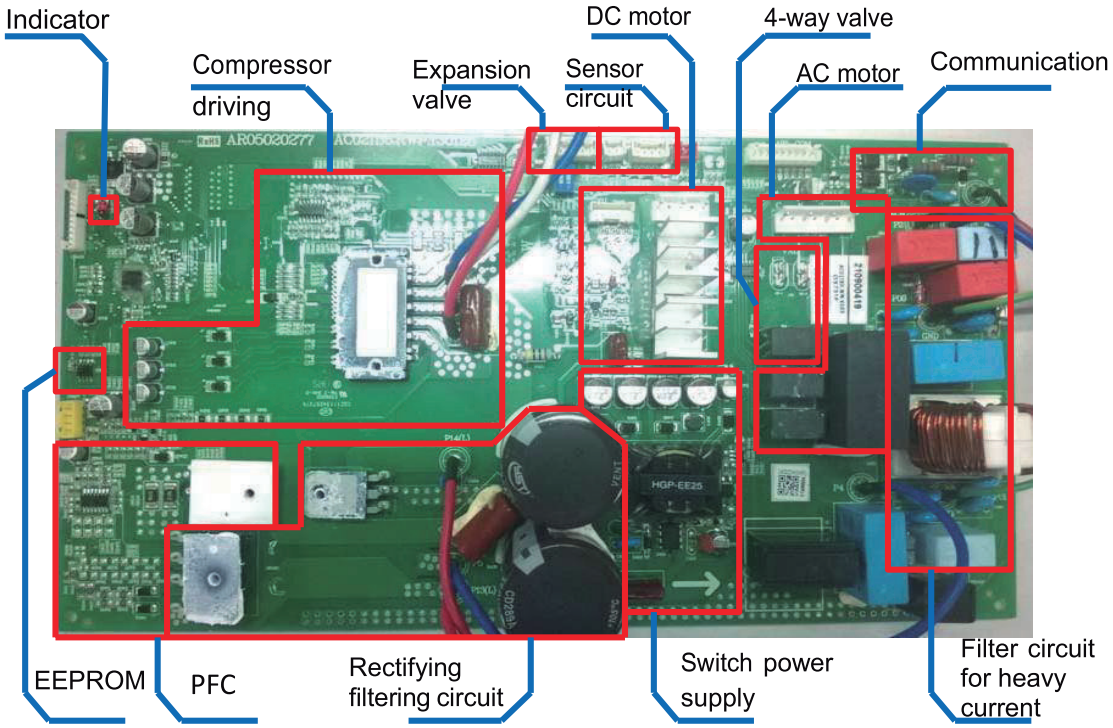
(See below for solutions)

Error Code Display	Reasons
E1 or E2	The sensor connection terminal is loose or not plugged in
E6	The indoor motor connection terminal is loose or not plugged in
E3	The outdoor pipe sensor connection terminal is loose or not plugged in
E7	The outdoor ambient sensor connection terminal is loose or not plugged in
E8	Outdoor disrchare pipe sensor connection terminal is loose or not plugged in
E0	Indoor / Outdoor Communication Issue
E5	Indoor / Outdoor Communication Issue
EA	Possible refrigerant leakage or outdoor control board damaged
E9	Outdoor control board drive circuit damaged
P0	Outdoor control board drive circuit damaged
P9	Outdoor control board drive circuit damaged
EU	Voltage sensor damaged
EE	EEPROM Fault
CL	Clean the air filter. Unit operating for 500 hours and will remind to clean filter

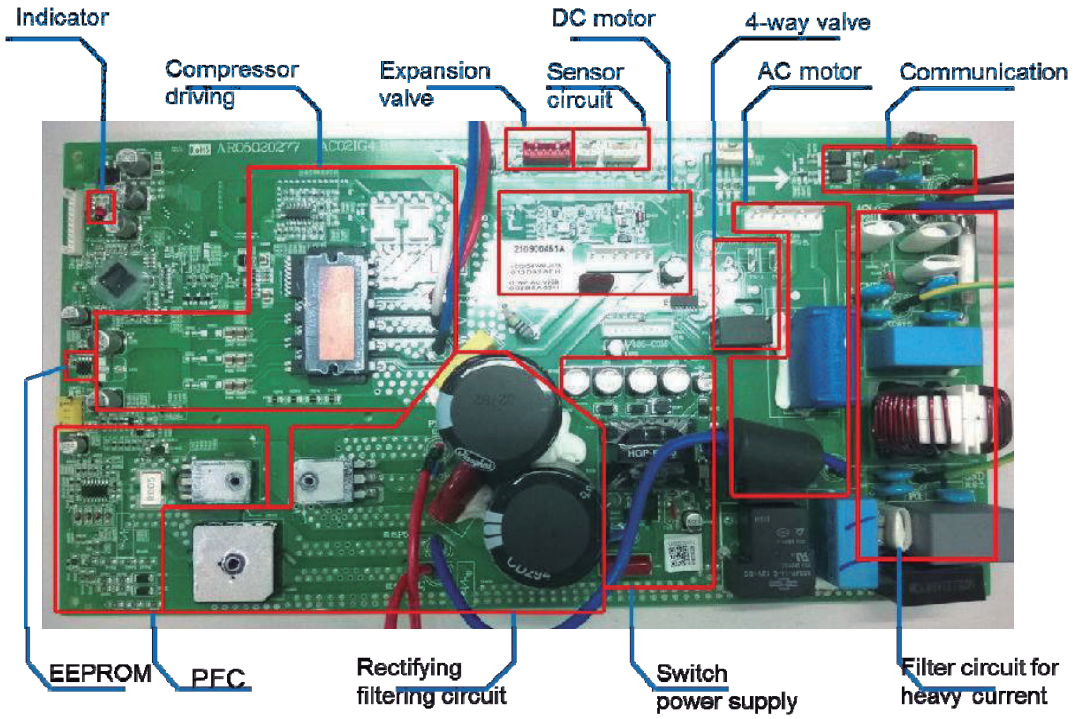
9.1 Outdoor control diagram



9.2 The structure of ODU PCB PIN09H1V51, PIN09H2V51, PIN12H1V51, PIN12H2V51

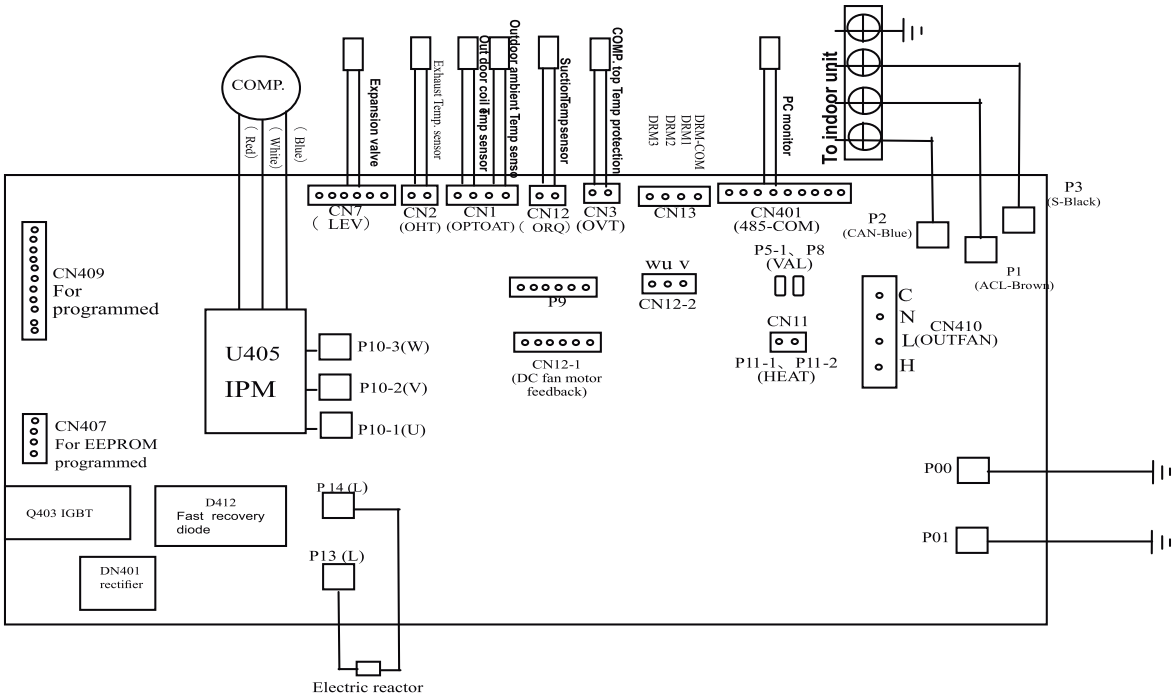


PIN18H2V51, PIN24H2V51

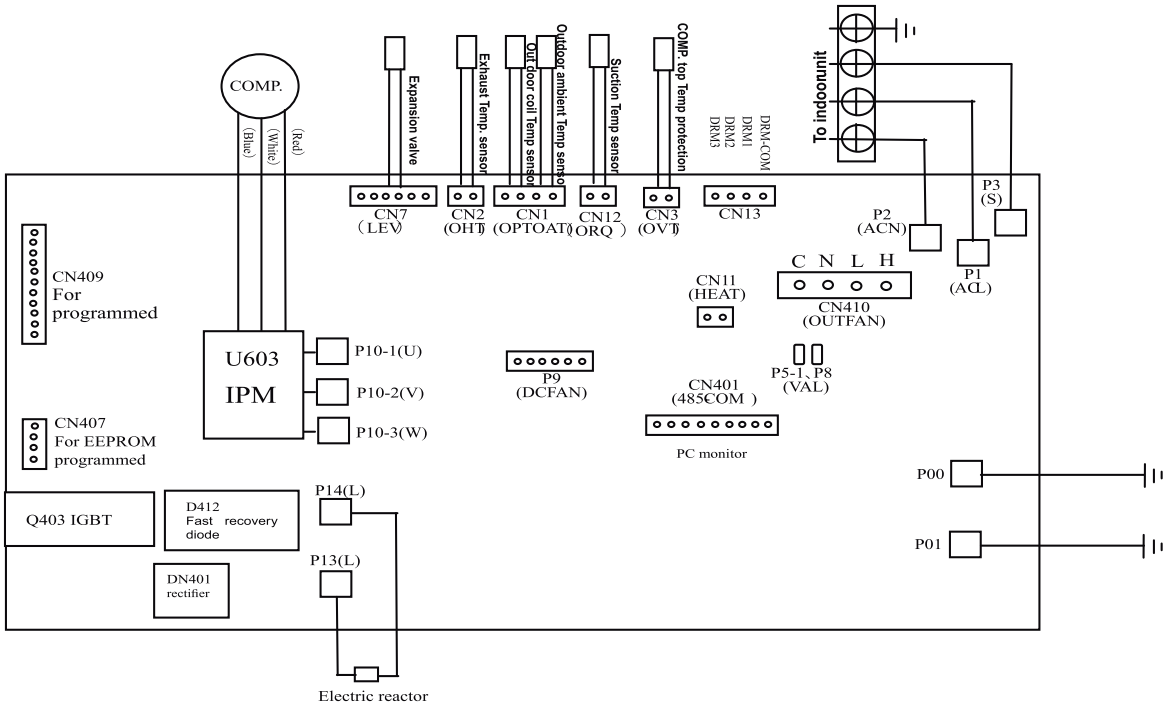


9.3 Connection of ODU PCB

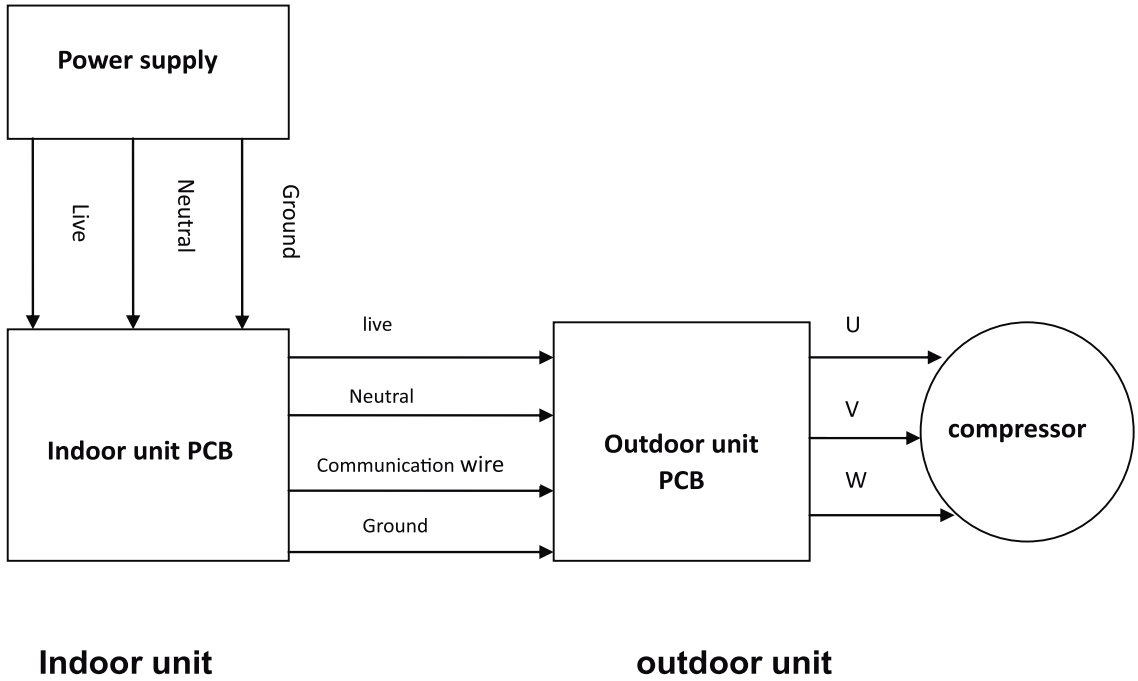
PIN09H1V51, PIN09H2V51, PIN12H1V51, PIN12H2V51



PIN18H2V51, PIN24H2V51



9.4 Current flow

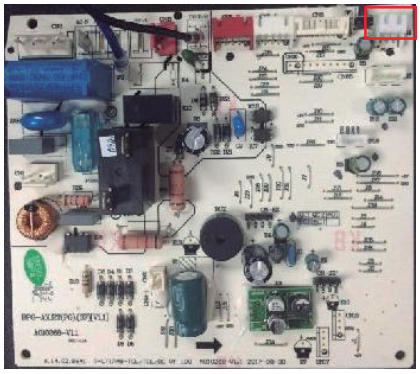


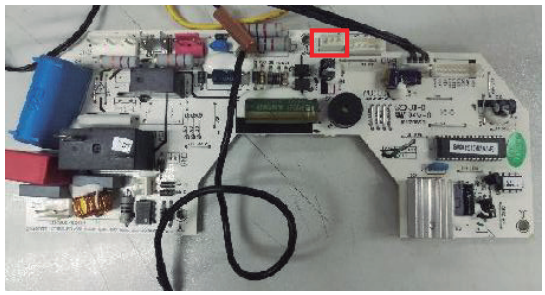
9.5 Examples of repairing

9.5.1 Display E1 or E2

Reasons :

1) The sensor connection terminal loose or not plugged in.

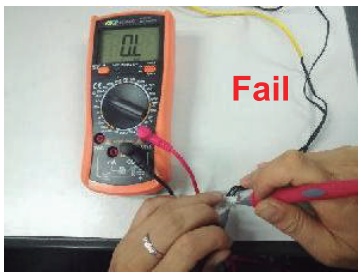




Solution: Check the connecter of sensor and slot (CN6), if loose or not plugged in, please connect again.

2) Room temperature sensor (IRT) and Indoor pipe (coil) temperature sensor (IPT) damage (short or broken).

Solution: check the resistance of the sensor R (25℃) =5 kΩ, if short or broken please replace it.

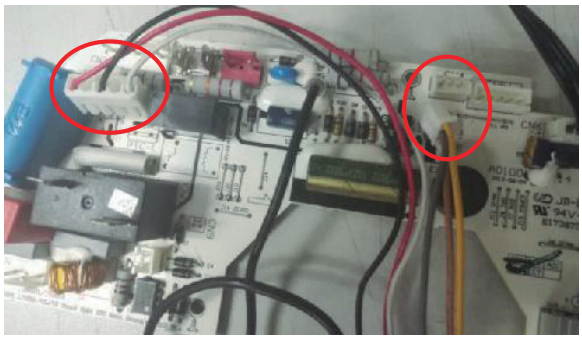


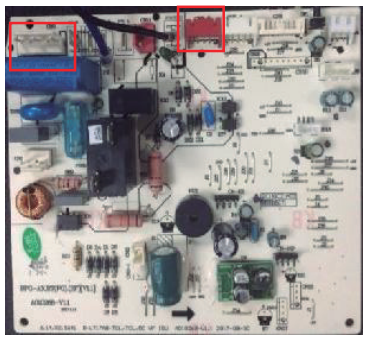
3) The PCB fail.
Solution: Replace the indoor main PCB.

9.5.2 Display E6

Reasons:

1) The indoor motor connection terminal loose or not plugged in.

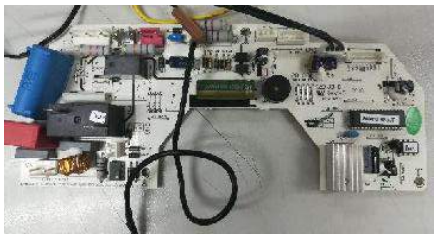
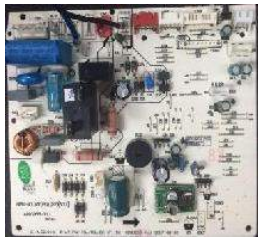




Solution: Check the connecter of indoor motor and slot (CN3) and (CN4),if loose or not plugged in, please connect again.

2) The indoor motor damage.
Solution: Check and replace the motor.


3) The indoor main PCB damage.

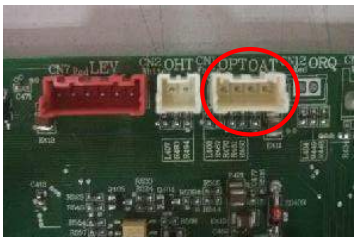



Solution: Replace the indoor main PCB.

9.5.3 Display E3, E7

Reasons:

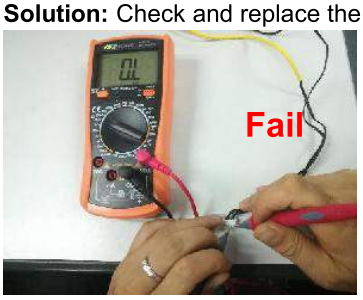
1) Outdoor pipe temp sensor, outdoor temp sensor connection terminal loose or not plugged in.




Solution: Check the connecter of sensor and slot, if loose or not plugged in, please connect again.

2) Outdoor pipe temp sensor and outdoor temp sensor damage (short or broken).

Solution: Check and replace the sensor.



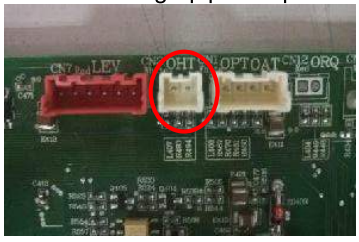
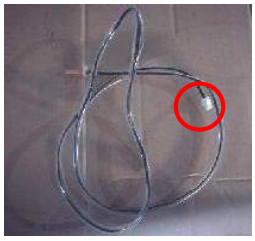
3) Outdoor PCB damage.

Solution: Check and replace the outdoor PCB.

9.5.4 Display E8

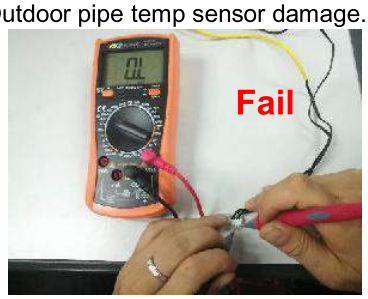
Reasons:

1) Outdoor discharge pipe temp sensor connection terminal loose or not plugged in.

Solution: Check the connecter of sensor and slot, if loose or not plugged in, please connect again.

2) Outdoor pipe temp sensor damage.



Solution: Check and replace the sensor.

3) Outdoor PCB damage.

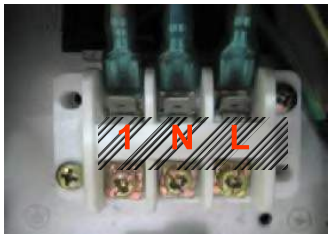
Solution: Check and replace the outdoor PCB.

9.5.5 Display E0,E5

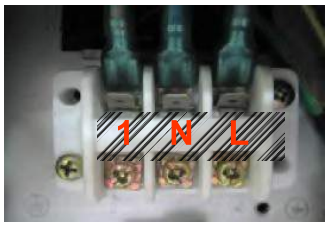
Reason: Indoor / outdoor communication damage.

Solution:

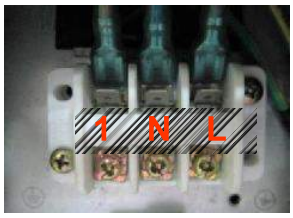
1) Check if the indoor and outdoor connections are correct. The terminal L and N which connect to indoor unit shall correspond to each other on indoor and outdoor units. Measure the voltage on outdoor terminal L and N (before display of E0 fault). If the voltage is “0”, please replace indoor main PCB.



2) If the 1 & N which connect to indoor unit voltage is normal, measure the voltage between the outdoor terminal 1 and N. If the voltage change occurs between 0~24V (change pulse voltage), please replace indoor PCB.

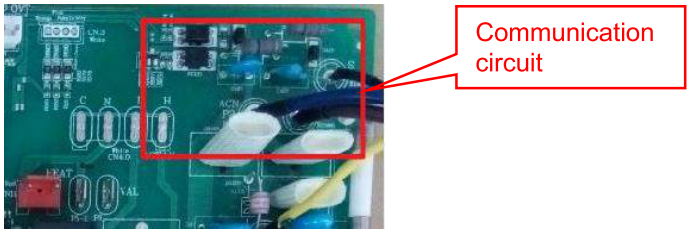


3) If the 1 & N which connect to indoor unit voltage is normal, measure the voltage between the outdoor terminal 1 and N. If the voltage change occurs between 0~12V(change pulse voltage), but there is no 24V, please replace outdoor PCB.

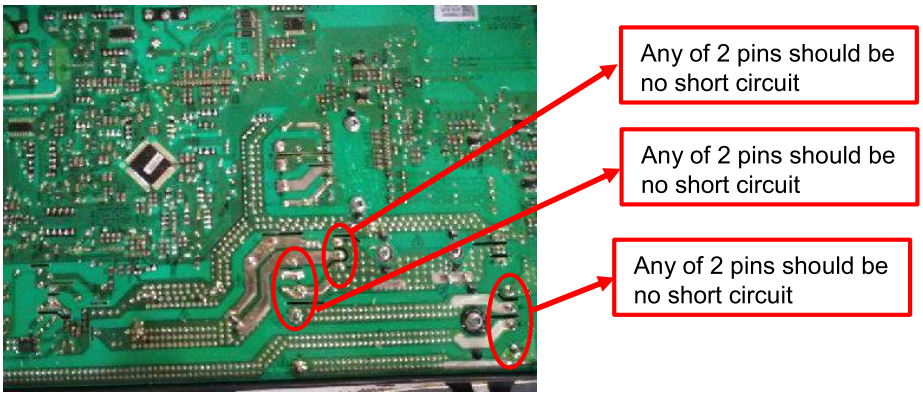


4) If the 1 & N voltage is normal, measure the voltage between the outdoor terminal 1 and N. If the voltage has no change, firstly replace the indoor main PCB. If the fault remains unsolved, replace the outdoor PCB.

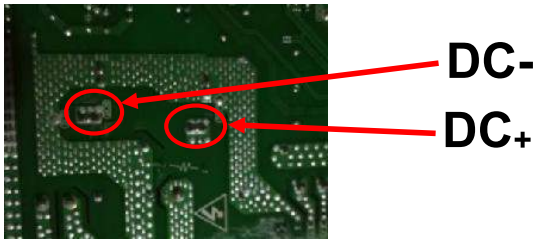
5) Communication fault if resistance or optical coupler broken, replace outdoor PCB.



6) Is there any burnt on PCB? If no, test the rectifier, FRD, IGBT etc. any component broken, replace PCB.



7) Test the DC voltage between DC+ and DC-. If the voltage is less than 50V approximately, please replace outdoor PCB.



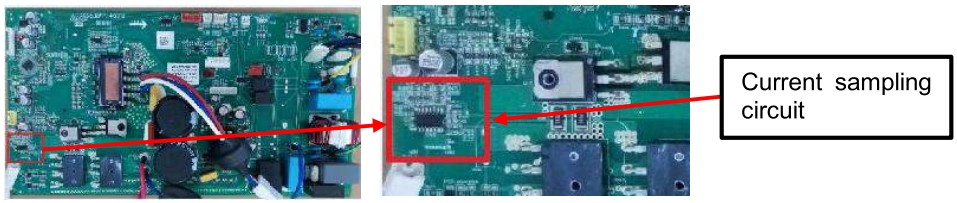
9.5.6 Display EA

Reason: Current sensor fault.

Solution:

1) Check for refrigerant leakage, to find the leakage point and recharge the refrigerant.

2) Current sampling circuit broken on the outdoor PCB and replace outdoor PCB.



9.5.7 Display E9(P0 or P9)

Reason: Outdoor PCB drive circuit damage.

Solution:

Re-energize and check the protection code on display. Firstly display P0.

1) If this code is displayed when the compressor is started for several seconds or even not started, check the compressor connection for correctness, if no insert wrong, replace outdoor PCB.

2) Check if the outdoor module is tightly installed onto the radiating fins and if the silicone is applied evenly, fix the screws again if loose.

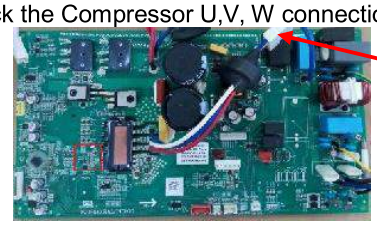
Heat radiation problem easily happened while the screw is not fixed tightly.

3) Check the system pressure, recharge refrigerant if the pressure is low, and discharge some refrigerant if the pressure is too high.

4) Check the outdoor ventilation and if there is any obstruction that affects the normal radiating of the air conditioner, and installation again.

5) If the above inspections are normal, but the fault remains unsolved, please replace the outdoor PCB. Re-energize and check the protection code on display. Firstly display P9.

a) Check the Compressor U,V, W connection, if is correctness or loose please connect again.

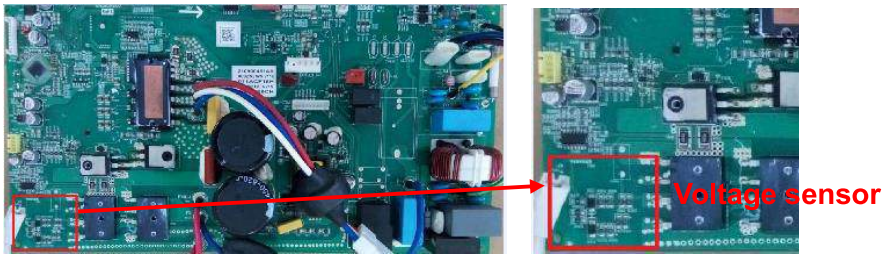


b) If this code is displayed when the compressor is started for several seconds or even not started, check the compressor connection for correctness, if no insert wrong, replace outdoor PCB.

9.5.8 Display EU.

Reason: Voltage sensor damage.

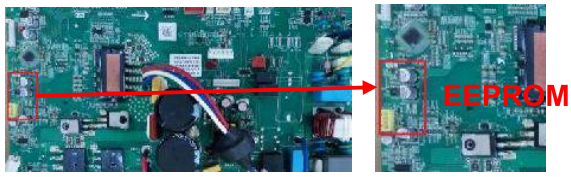
Solution: Please replace outdoor PCB.



9.5.9 Display EE

Reason: EEPROM fault.

Solution: Shut down power supply and reenergize it, if the fault remains there, check the EEPROM installation, if no problem, please replace outdoor PCB.



9.5.10 Display CL

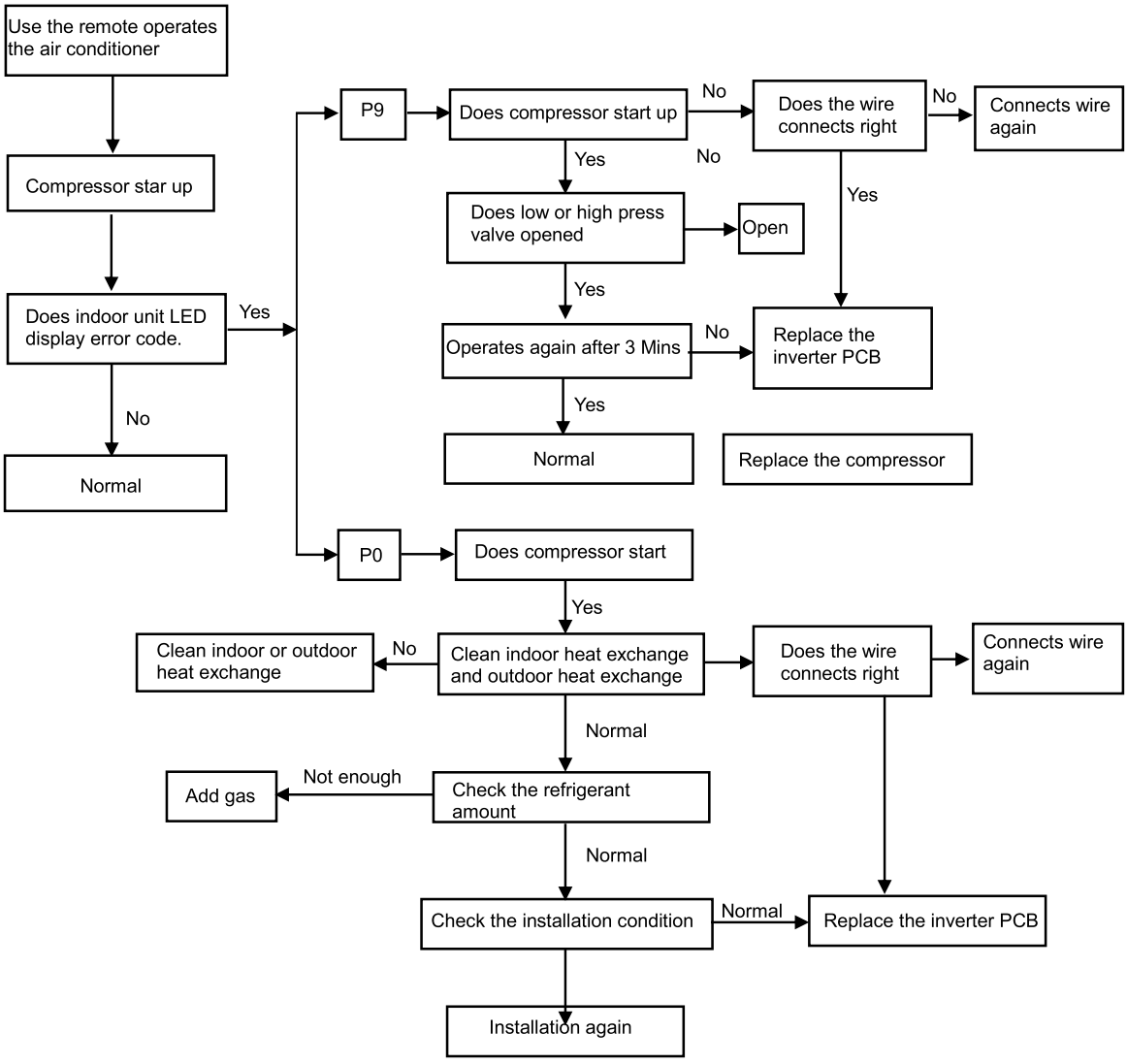
Cause: Air filter duty, the unit operation Cumulative time 500 hours, the controller will confirmation the filter dirty and display CL.

Solution: Clean the air filter then cut off the power and suppl y again.

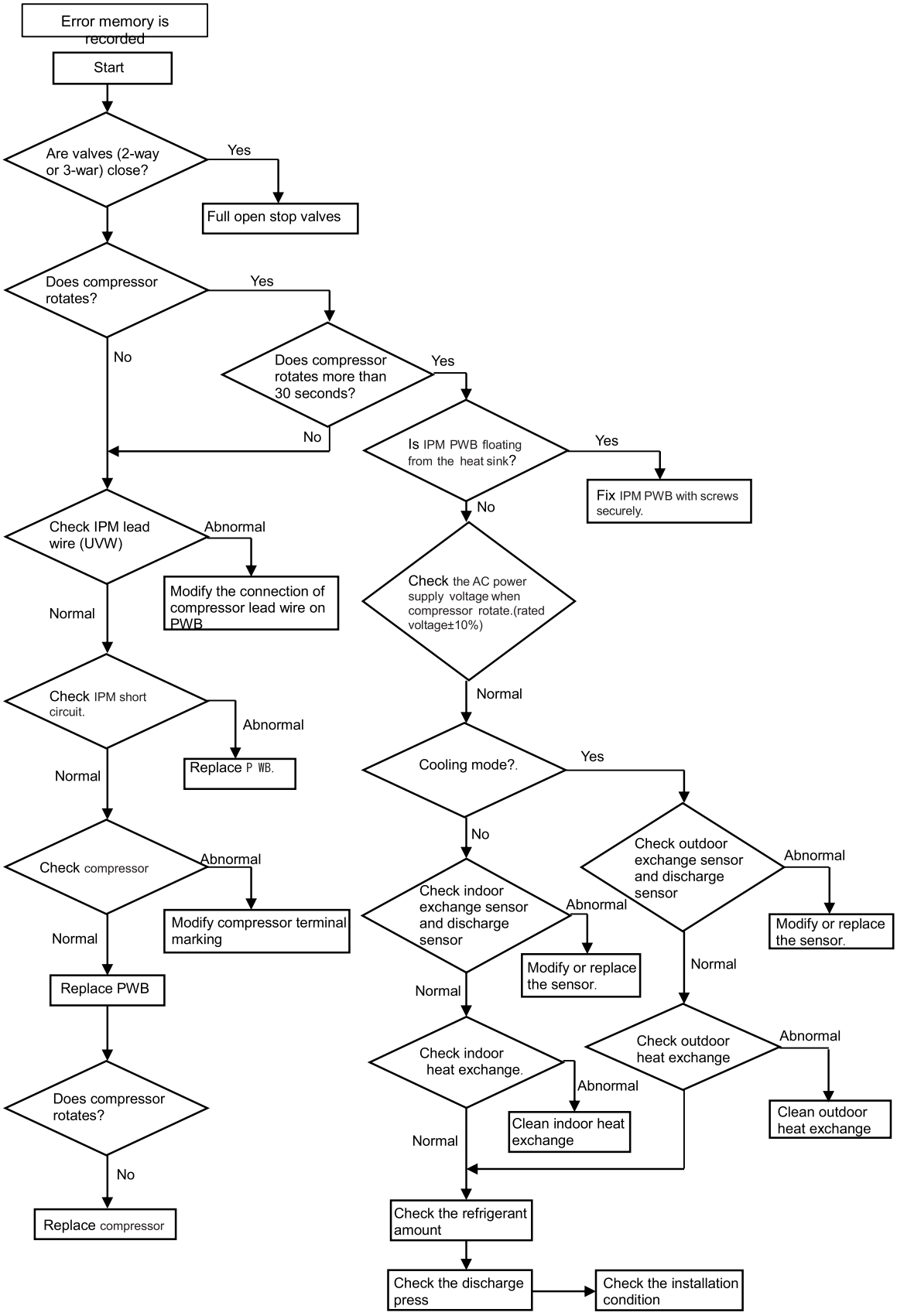
9.6 MALFUNCTION (PARTS) CHECK METHOD

9.6.1 Procedure for determining defective outdoor unit IPM/compressor

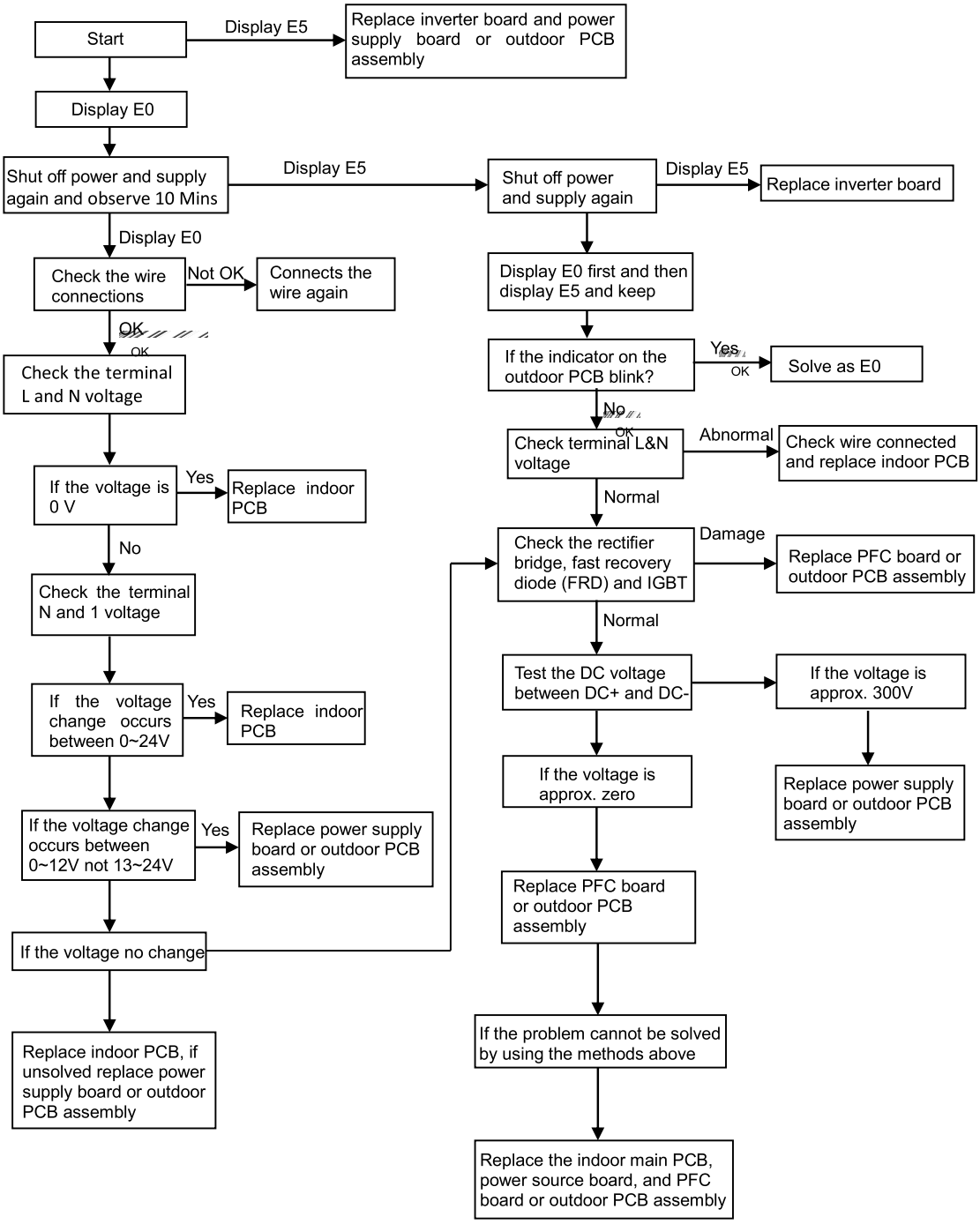
The following flow chart shows a procedure for locating the cause of a malfunction when the compressor does not start up and a DC overcurrent indication error occurs.



9.6.2 DC Over Current Error

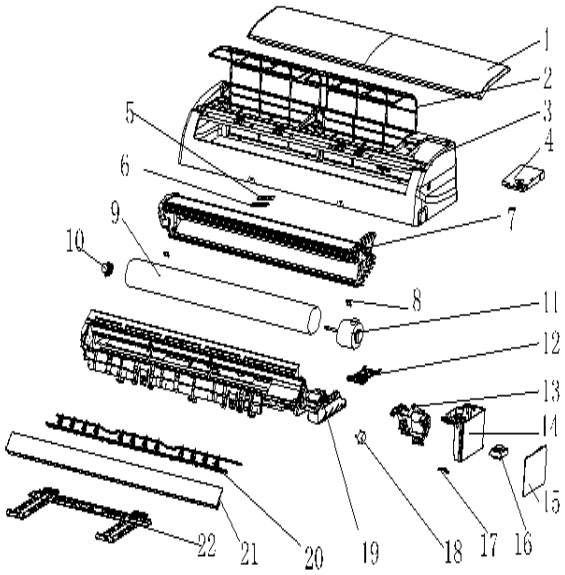


9.6.3 E0,E5 Error



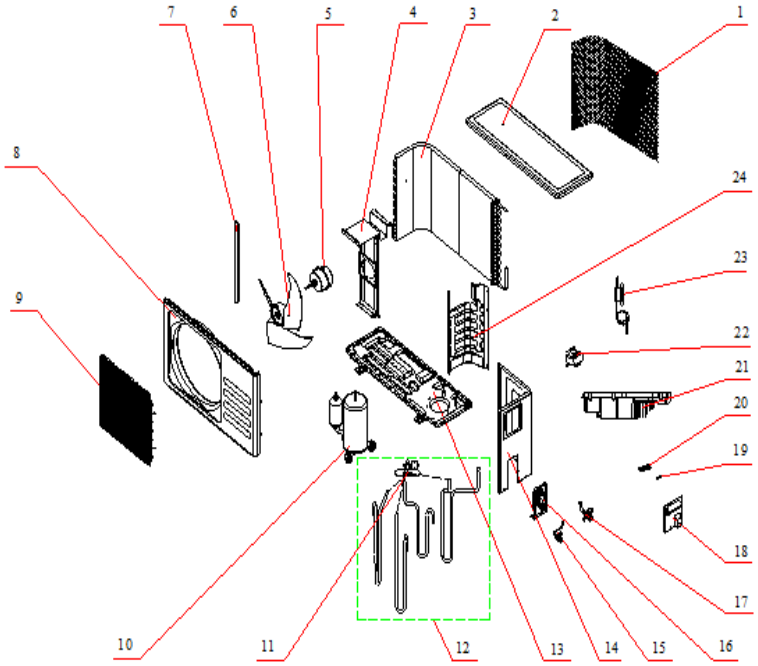
10. Toubleshooting

10.1 PIN12H1V51(I)



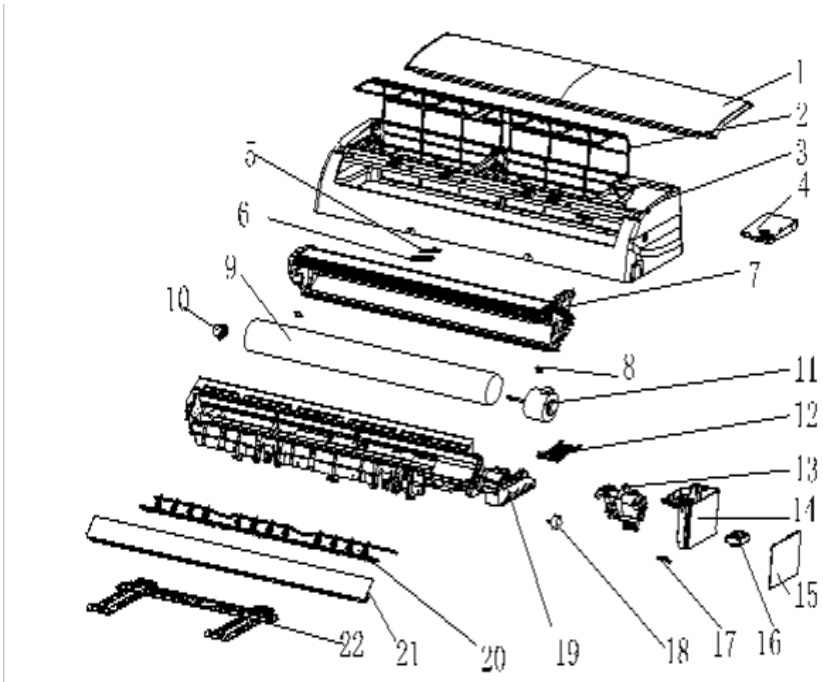
No.	Part No.	Part Name	Q'ty
1	41106-002054	Front Panel	1
2	42008-000039	Air Filter	2
3	41106-002375	Face Frame	1
4	41211-000077	Electrical Box Cover	1
5	31102-000085	Display PCB	1
6	42003-000001	Display PCB Box	1
7	92011-003149	Evaporator	1
8	41108-000066	Screw Cover	2
9	42004-000001	Cross Fan	1
10	42007-000001	Bearing Mount	1
11	22001-000307	Indoor Motor	1
12	41101-000242	In And Out Pipe Fixer	1
13	42003-000051	Indoor Motor Cover	1
14	41105-000134	Electrical Box	1
15	31101-000265	Main PCB	1
16	NO	Transformer	1
17	42001-000103	Cable Clamp	1
18	22001-000313	Vane Motor 1	1
19	41102-000091	Base	1
20	41101-000082	Vertical Vane Assembly	2
21	41103-000102	Vane	1
22	41109-000041	Installation Plate	1
23	10104-100014	Indoor Sensor Assembly	1
24	22013-001263	Remote Controller	1
25	42009-000011	Drainage Hose	1
26	32001-000094	wifi	1
27	A1101-001823	Indoor Carton	1
28	41110-000230	Left Foaming	1
29	41110-000274	Right Foaming	1

10.2 PIN12H1V51(O)



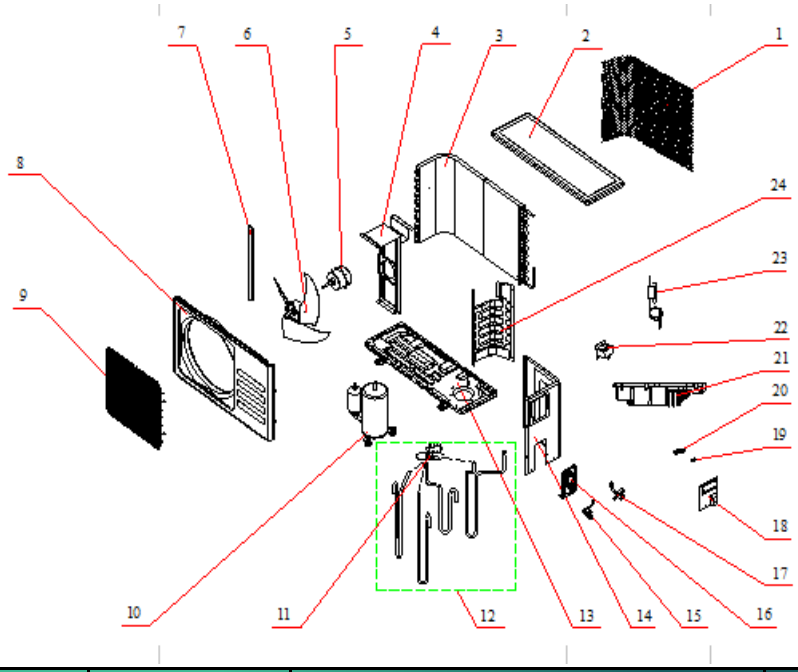
No.	Part No.	Part Name	Q'ty
1	42011-000185	Grille	1
2	41207-000040	Top Cover	1
3	92011-000804	Condenser	1
4	41203-000047	Outdoor Motor Supporter	1
5	22001-000049	Outdoor Motor	1
6	42004-000103	Propeller Fan	1
7	41205-000120	Left grille supporter	1
8	41206-000059	Front Plate	1
9	42011-000041	Fan Guard	1
10	92014-000142	Compressor	1
11	92008-000208	4-way Valve	1
12	92007-000990	4-way Valve Assembly	1
13	41202-000228	Base	1
14	41205-000086	Right Plate	1
15	92007-001050	Two-way Valve	1
16	41204-000018	Valve Supporter	1
17	92007-001041	Three-way Valve	1
18	41201-000044	Electrical Box Cover	1
19	11304-100046	Terminal	1
20	42001-000036	Cable clamp1	1
21	31201-000973	Outdoor PCB Assembly	1
22	22011-000011	Inductor	1
23	92007-002097	Capillary assembly	1
24	41208-000147	Partition plate	1
25	10104-100036	Pipe Temp. sensor and outdoor Temp. sensor	1
26	10104-100033	Discharge Temp. sensor	1
27	A2005-000541	Base carton	1
28	A1201-002981	Cabinet carton	1
29	A1202-000025	Base foaming	1
30	41110-000203	Cover foaming	1

10.3 PIN12H2V51(I)



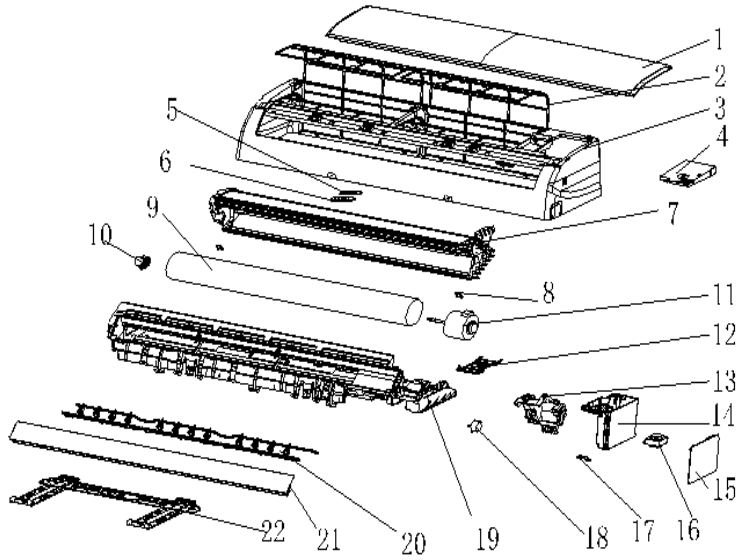
No.	Part No.	Part Name	Q'ty
1	41106-002054	Front Panel	1
2	42008-000039	Air Filter	2
3	41106-002375	Face Frame	1
4	41211-000077	Electrical Box Cover	1
5	31102-000085	Display PCB	1
6	42003-000001	Display PCB Box	1
7	92011-003149	Evaporator	1
8	41108-000066	Screw Cover	2
9	42004-000001	Cross Fan	1
10	42007-000001	Bearing Mount	1
11	22001-000267	Indoor Motor	1
12	41101-000242	In And Out Pipe Fixer	1
13	42003-000051	Indoor Motor Cover	1
14	41105-000134	Electrical Box	1
15	31101-000226	Main PCB	1
16	NO	Transformer	1
17	42001-000103	Cable Clamp	1
18	22001-000313	Vane Motor 1	1
19	41102-000091	Base	1
20	41101-000082	Vertical Vane Assembly	2
21	41103-000102	Vane	1
22	41109-000041	Installation Plate	1
23	10104-100014	Indoor Sensor Assembly	1
24	22013-001263	Remote Controller	1
25	42009-000011	Drainage Hose	1
26	32001-000094	wifi	1
27	A1101-001823	Indoor Carton	1
28	41110-000230	Left Foaming	1
29	41110-000274	Right Foaming	1

10.4 PIN12H2V51(O)



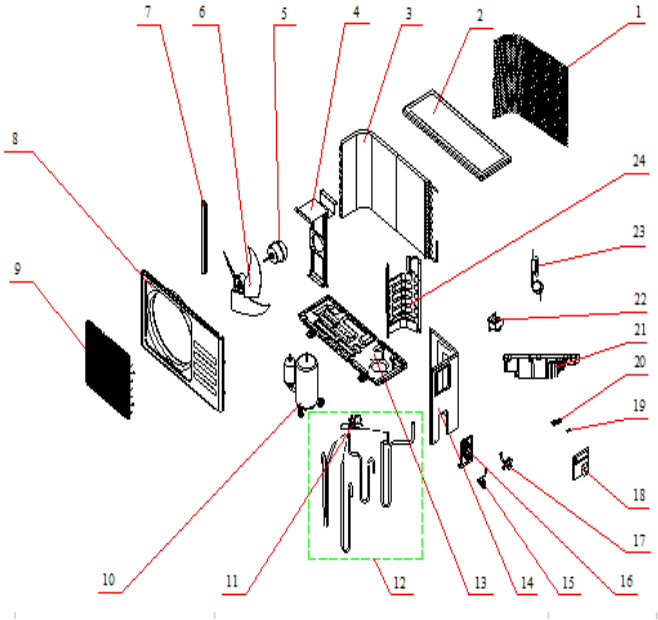
No.	Part No.	Part Name	Q'ty
1	42011-000184	Grille	1
2	41207-000029	Top cover	1
3	92011-000706	Condenser	1
4	41203-000055	Outdoor motor supporter	1
5	22001-000049	Outdoor motor	1
6	42004-000107	Propeller fan	1
7	41205-000133	Left grille supporter	1
8	41206-000052	Front plate	1
9	42011-000038	Fan guard	1
10	92014-000142	Compressor and accessories	1
11	92008-000209	4-way valve	1
12	92007-000969	4-way valve assembly	1
13	41202-000216	Base	1
14	41205-000085	Right plate	1
15	92007-001050	Two-way valve	1
16	41204-000018	Valve supporter	1
17	92007-001041	Three-way valve	1
18	41201-000044	Eelectronic Box Cover	1
19	42001-000036	Cable clamp	1
20	11304-100045	Terminal	1
21	31201-000976	Outdoor PCB Assembly	1
22	22011-000002	Inductor	1
23	92007-002063	Capillary assembly	1
24	41208-000141	Partition plate	1
25	10104-100047	Pipe Temp. sensor and outdoor Temp. sensor	1
26	10104-100036	Discharge Temp. sensor	1
27	A2005-000523	Base carton	1
28	A1201-003463	Cabinet carton	1
29	A1202-000031	Base foaming	1
30	41213-000023	Cover foaming	1

10.5 PIN18H2V51(I)



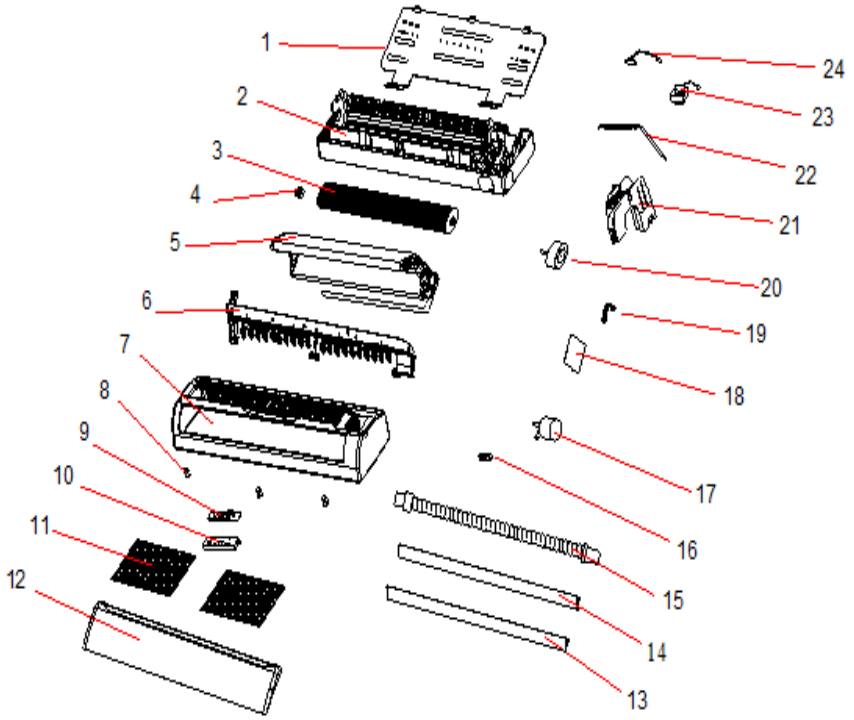
No.	Part No.	Part Name	Q'ty
1	41106-002088	Front Panel	1
2	42008-000001	Air Filter	2
3	41106-002351	Face Frame	1
4	41211-000079	Electrical Box Cover	1
5	31102-000085	Display PCB	1
6	42003-000001	Display PCB Box	1
7	92011-003113	Evaporator	1
8	41108-000066	Screw Cover	2
9	42004-000002	Cross Fan	1
10	42007-000001	Bearing Mount	1
11	22001-000240	Indoor Motor	1
12	41101-000224	In And Out Pipe Fixer	1
13	42003-000045	Indoor Motor Cover	1
14	41105-000134	Electrical Box	1
15	31101-000238	Main PCB	1
16	NO	Transformer	1
17	42001-000103	Cable Clamp	1
18	22001-000321	Vane Motor 1	1
	22001-000318	Vane Motor 1	1
19	41102-000069	Base	1
20	41101-000042	Vertical Vane Assembly	3
21	41103-000142	Vane	1
22	41109-000019	Installation Plate	1
23	10104-100014	Indoor Sensor Assembly	1
24	22013-001263	Remote Controller	1
25	42009-000011	Drainage Hose	1
26	A1101-002076	Indoor Carton	1
27	32001-000094	wifi	1
28	A2006-000060	Left Foaming	1
29	A2006-000059	Right Foaming	1
30	42005-000069	Middle support	1

10.6 PIN18H2V51(O)



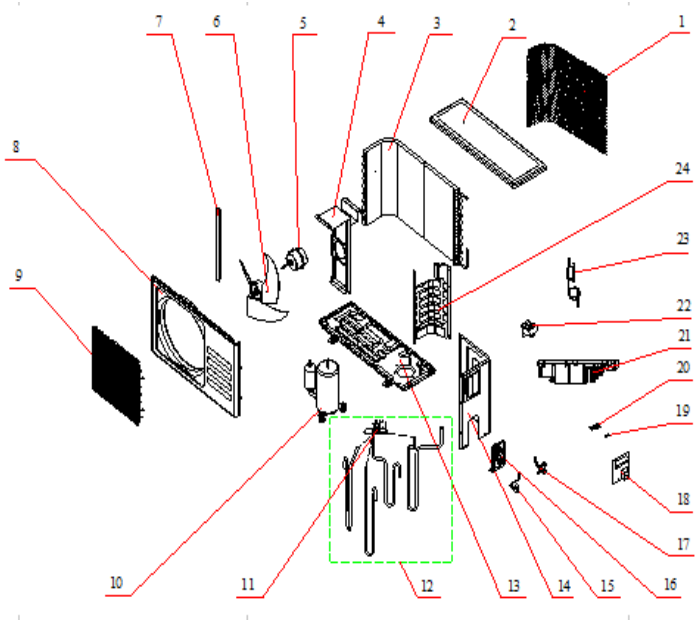
No.	Part No.	Part Name	Q'ty
1	42011-000168	Grille	1
2	41207-000033	Top Cover	1
3	92011-000757	Condenser	1
4	41203-000052	Outdoor Motor Supporter	1
5	22001-000096	Outdoor Motor	1
6	42004-000104	Propeller Fan	1
7	41205-000119	Left grille supporter	1
8	41206-000057	Front Plate	1
9	42011-000040	Fan Guard	1
10	92014-000318	Compressor	1
11	92008-000207	4-way Valve	1
12	92007-000971	4-way Valve Assembly	1
13	41202-000252	Base	1
14	41205-000087	Right Plate	1
15	92007-001052	Two-way Valve	1
16	41204-000018	Valve Supporter	1
17	92007-001041	Three-way Valve	1
18	41201-000044	Electrical Box Cover	1
19	11304-100045	Terminal	1
20	42001-000038	Cable clamp1	1
	42001-000036	Cable clamp2	1
21	31201-000967	Outdoor PCB Assembly	1
22	22011-000014	Inductor	1
23	92007-002112	Capillary Assembly	1
24	41208-000154	Partition plate	1
25	10104-100038	Pipe Temp. sensor and outdoor Temp. sensor	1
26	10104-100036	Discharge Temp. sensor	1
27	A2005-000540	Base carton	1
28	A1201-000396	Cabinet carton	1
29	A1202-000026	Base foaming	1
30	41213-000019	Cover foaming	1

10.7 PIN24H2V51(I)



No.	Part No.	Part Name	Q'ty
1	41109-000028	Installation Plate	1
2	41199-002746	Base	1
3	42004-000042	Cross Fan	1
4	42007-000001	Bearing Mount	1
	41101-000251	Bearing Mount Cover	1
5	92011-003138	Evaporator	1
6	41103-000050	Water Drainage Assembly	1
7	41106-002275	Face Frame	1
8	41108-000066	Screw Cover	3
9	31102-000109	Display PCB	1
10	42003-000001	Display PCB Box	1
11	42008-000041	Air Filter	2
12	41106-002086	Front Panel	1
13	41103-000317	Up Vane	1
14	41103-000312	Down Vane	1
15	42009-000004	Drainage Hose	1
16	42001-000103	Cable Clamp	1
17	41103-000050	Vane Motor	2
	22001-000357	Vane Motor	2
18	31101-000280	Main PCB	1
19	41108-000006	Indoor Motor Cover	1
20	22001-000240	Indoor Motor	1
21	41105-000139	Electrical Box	1
22	41211-000080	Electrical Box Cover	1
23	NO	Transformer	1

10.8 PIN24H2V51(O)



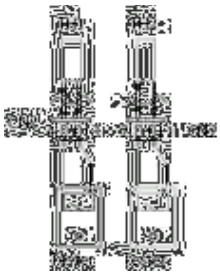
No.	Part No.	Part Name	Q'ty
1	42011-000187	Grille	1
2	41207-000028	Top Cover	1
3	92011-000788	Condenser	1
4	41203-000046	Outdoor Motor Supporter	1
5	22001-000120	Outdoor Motor	1
6	42004-000105	Propeller Fan	1
7	41205-000117	Left grille supporter	1
8	41206-000058	Front Plate	1
9	42011-000039	Fan Guard	1
10	92014-000474	Compressor	1
11	92008-000207	4-way Valve	1
12	92007-000983	4-way Valve Assembly	1
13	41202-000237	Base	1
14	41205-000088	Right Plate	1
15	92007-001057	Two-way Valve	1
16	41204-000018	Valve Supporter	1
17	92007-001054	Three-way Valve	1
18	41201-000044	Electrical Box Cover	1
19	11304-100045	Terminal	1
20	42001-000038	Cable clamp1	1
	42001-000036	Cable clamp2	1
21	31201-000978	Outdoor PCB Assembly	1
22	22011-000004	Inductor	1
23	92007-002125	Capillary Assembly	1
24	41208-000155	Partition plate	1
25	10104-100039	Pipe Temp. sensor and outdoor Temp. sensor	1
26	10104-100037	Discharge Temp. sensor	1
27	A2005-000521	Base carton	1
28	A1201-000639	Cabinet carton	1
29	A1202-000030	Base foaming	1

THERMISTOR TEMPERATURE CHARACTERISTICS

1. Indoor unit and outdoor exchange temperature and outside air temperature sensor temperature characteristics

-30(-86)	63.513	4.628	15(59)	7.447	2.968	60(140)	1.464	1.115
-29(-84.2)	60.135	4.609	16(60.8)	7.148	2.918	61(141.8)	1.418	1.088
-28(-82.4)	56.956	4.589	17(62.6)	6.863	2.868	62(143.6)	1.374	1.061
-27(-89.6)	53.963	4.568	18(64.4)	6.591	2.819	63(145.40	1.331	1.035
-26(-78.8)	51.144	4.547	19(66.2)	6.332	2.769	64(147.2)	1.290	1.009
-25(-77)	48.488	4.524	20(68)	6.084	2.720	65(149)	1.250	0.984
-24(-75.2)	45.985	4.501	21(69.8)	5.847	2.671	66(150.8)	1.212	0.960
-23(-73.4)	43.627	4.477	22(71.6)	5.621	2.621	67(152.6)	1.175	0.936
-22(-71.6)	41.403	4.452	23(73.4)	5.404	2.572	68(154.4)	1.139	0.913
-21(-69.8)	39.305	4.426	24(75.2)	5.198	2.524	69(156.2)	1.105	0.890
-20(-68)	37.326	4.399	25(77)	5.000	2.475	70(158)	1.072	0.868
-19(-66.2)	35.458	4.371	26(78.8)	4.811	2.427	71(159.8)	1.040	0.847
-18(-64.4)	33.695	4.343	27(89.6)	4.630	2.379	72(161.6)	1.009	0.825
-17(-62.6)	32.030	4.313	28(82.4)	4.457	2.332	73(163.4)	0.979	0.805
-16(-60.8)	30.458	4.283	29(84.2)	4.292	2.285	74(165.2)	0.950	0.785
-15(-59)	28.972	4.252	30(86)	4.133	2.238	75(167)	0.922	0.765
-14(-57.2)	27.567	4.219	31(87.8	3.981	2.192	76(168.8)	0.895	0.746
-13(-55.4)	26.239	4.186	32(89.6)	3.836	2.146	77(170.6)	0.869	0.728
-12(-53.6)	24.984	4.152	33(91.4)	3.697	2.101	78(172.4)	0.843	0.710
-11(-51.8)	23.795	4.117	34(93.2)	3.563	2.057	79(174.2)	0.819	0.692
-10(-50)	22.671	4.082	35(95)	3.435	2.012	80(176)	0.795	0.675
-9(-48.2)	21.606	4.045	36(96.8)	3.313	1.969	81(177.8)	0.773	0.658
-8(-46.4)	20.598	4.008	37(98.6)	3.195	1.926	82(179.6)	0.751	0.641
-7(44.6)	19.644	3.969	38(100.4)	3.082	1.883	83(181.4)	0.729	0.625
-6(-42.8)	18.732	3.930	39(102.2)	2.974	1.842	84(183.2)	0.709	0.610
-5(-41)	17.881	3.890	40(104)	2.870	1.800	85(185)	0.689	0.595
-4(-39.2)	17.068	3.850	41(105.8)	2.770	1.760	86(186.8)	0.669	0.580
-3(37.4)	16.297	3.808	42(107.6)	2.674	1.720	87(188.6)	0.651	0.566
-2(-35.6)	15.565	3.766	43(109.4)	2.583	1.681	88(190.4)	0.633	0.552
-1(-33.8)	14.871	3.723	44(111.2)	2.494	1.642	89(192.2)	0.615	0.538
0(32)	14.212	3.680	45(113)	2.410	1.604	90(194)	0.598	0.525
1(33.8)	13.586	3.635	46(114.8)	2.328	1.567	91(195.8)	0.582	0.512
2(35.6)	12.991	3.590	47(116.6)	2.250	1.530	92(197.6)	0.566	0.499
3(37.4)	12.426	3.545	48(118.4)	2.174	1.495	93(199.4)	0.550	0.487
4(39.2)	11.889	3.499	49(120.2)	2.102	1.459	94(201.2)	0.535	0.475
5(41)	11.378	3.452	50(122)	2.032	1.425	95(203)	0.521	0.463
6(42.8)	10.893	3.406	51(123.8)	1.965	1.391	96(204.8)	0.507	0.452
7(44.6)	10.431	3.358	52(125.6)	1.901	1.357	97(206.6)	0.493	0.441
8(46.4)	9.991	3.310	53(127.4)	1.839	1.325	98(208.4)	0.480	0.430
9(48.2)	9.573	3.262	54(129.2)	1.779	1.293	99(210.2)	0.467	0.419
10(50)	9.174	3.214	55(131)	1.721	1.262	100(212)	0.455	0.409
11(51.8)	8.795	3.165	56(132.8)	1.666	1.231			
12(53.6)	8.433	3.116	57(134.6)	1.613	1.201			
13(55.4)	8.089	3.067	58(136.4)	1.561	1.172			
14(57.2)	7.760	3.017	59(138.2)	1.512	1.143			

Resistance at 25℃(7 7°F): 5 kΩ.



TH1: indoor room temperaturesensor and outside air temperature sensor

TH2: indoor exchange temperature sensor and outside exchange temperature sensor

Before measuring resistance, disconnect connectorsas shown above.

2. Outdoor unit sensor temperature characteristics

TEMP. ℃(°F)	R min (k Ohm)	R(t) (k Ohm)	R max (k Ohm)	TEMP. ℃(°F)	R min (k Ohm)	R(t) (k Ohm)	R max (k Ohm)	TEMP. ℃(°F)	R min (k Ohm)	R(t) (k Ohm)	R max (k Ohm)
-30(-86)	283.3	322.9	367.7	24(75.2)	19.36	20.89	22.52	78(172.4)	2.563	2.654	2.745
-29(-84.2)	267.4	304.4	346.3	25(77)	18.55	20	21.54	79(174.2)	2.481	2.567	2.654
-28(-82.4)	252.5	287.1	307.4	26(78.8)	17.77	19.14	20.6	80(176)	2.402	2.484	2.567
-27(-89.6)	238.5	270.9	307.4	27(89.6)	17.03	18.32	19.7	81(177.8)	2.327	2.404	2.483
-26(-78.8)	225.4	255.7	289.8	28(82.4)	16.32	17.55	18.85	82(179.6)	2.254	2.327	2.401
-25(-77)	213.1	241.4	273.3	29(84.2)	15.65	16.81	18.04	83(181.4)	2.183	2.253	2.323
-24(-75.2)	201.5	228	257.9	30(86)	15	16.1	17.27	84(183.2)	2.115	2.182	2.248
-23(-73.4)	190.6	215.5	243.4	31(87.8	14.39	15.43	16.54	85(185)	2.05	2.113	2.176
-22(-71.6)	180.3	203.6	229.8	32(89.6)	13.81	14.79	15.34	86(186.8)	1.985	2.047	2.109
-21(-69.8)	170.7	192.5	217	33(91.4)	13.25	14.18	15.17	87(188.6)	1.922	1.983	2.045
-20(-68)	161.6	182.1	205	34(93.2)	12.72	13.6	14.54	88(190.4)	1.861	1.922	1.983
-19(-66.2)	153.1	172.3	193.7	35(95)	12.21	13.05	13.93	89(192.2)	1.802	1.862	1.923
-18(-64.4)	145	163.1	183.2	36(96.8)	11.72	12.52	13.36	90(194)	1.746	1.805	1.865
-17(-62.6)	137.5	154.4	173.2	37(98.6)	11.26	12.01	12.81	91(195.8)	1.692	1.75	1.809
-16(-60.8)	130.3	146.2	163.9	38(100.4)	10.82	11.53	12.29	92(197.6)	1.639	1.697	1.755
-15(-59)	123.6	138.5	155.1	39(102.2)	10.29	11.07	11.78	93(199.4)	1.589	1.646	1.703
-14(-57.2)	117.3	131.3	146.8	40(104)	9.986	10.63	11.31	94(201.2)	1.54	1.596	1.653
-13(-55.4)	111.3	124.4	139	41(105.8)	9.6	10.21	10.85	95(203)	1.493	1.549	1.604
-12(-53.6)	105.6	118	131.7	42(107.6)	9.231	9.813	10.42	96(204.8)	1.448	1.502	1.558
-11(-51.8)	100.3	111.9	124.7	43(109.4)	8.878	9.43	10	97(206.6)	1.404	1.458	1.512
-10(-50)	95.24	106.2	118.2	44(111.2)	8.54	9.064	9.612	98(208.4)	1.362	1.415	1.469
-9(-48.2)	90.49	100.8	112.1	45(113)	8.217	8.714	9.233	99(210.2)	1.321	1.373	1.426
-8(-46.4)	85.99	95.68	106.3	46(114.8)	7.908	8.38	8.872	100(212)	1.284	1.335	1.387
-7(44.6)	81.75	90.86	100.8	47(116.6)	7.612	8.06	8.526	101(213.8)	1.245	1.296	1.348
-6(-42.8)	77.74	86.31	95.74	48(118.4)	7.328	7.754	8.196	102(215.6)	1.209	1.258	1.309
-5(-41)	73.94	82.01	90.88	49(120.2)	7.057	7.461	7.88	103(217.4	1.173	1.222	1.272
-4(-39.2)	70.35	77.95	86.29	50(122)	6.797	7.18	7.578	104(219.2)	1.139	1.187	1.236
-3(37.4)	66.96	74.11	81.96	51(123.8)	6.548	6.912	7.289	105(221)	1.105	1.153	1.202

-2(-35.6)	63.74	70.48	77.87	52(125.6)	6.309	6.655	7.013	106(222.8)	1.073	1.12	1.168
-1(-33.8)	60.69	67.05	74	53(127.4)	6.08	6.409	6.748	107(224.6)	1.042	1.089	1.136
0(32)	57.81	63.8	70.34	54(129.2)	5.861	6.173	6.495	108(226.4)	1.013	1.058	1.104
1(33.8)	55.08	60.72	66.88	55(131)	5.651	5.947	6.253	109228.2)	0.9833	1.028	1.074
2(35.6)	52.49	57.81	63.61	56(132.8)	5.449	5.73	6.02	110(230)	0.9553	0.9997	1.045
3(37.4)	50.03	55.05	60.52	57(134.6)	5.255	5.522	5.798	111 (231.8)	0.9283	0.9719	1.016
4(39.2)	47.71	52.44	57.59	58(136.4)	5.07	5.323	5.585	112(233.6)	0.9021	0.9451	0.9892
5(41)	45.5	49.97	54.82	59(138.2)	4.891	5.132	5.381	113(235.4)	0.8765	0.9191	0.9626
6(42.8)	43.41	47.62	52.2	60(140)	4.72	4.949	5.101	114(237.2)	0.8524	0.894	0.9367
7(44.6)	41.42	45.4	49.71	61(141.8)	4.556	4.774	4.997	115(239)	0.8087	0.8595	0.9117
8(46.4)	39.53	43.2	42.33	62(143.6)	4.398	4.605	4.817	116(240.8)	0.8059	0.8461	0.8875
9(48.2)	37.74	41.29	45.12	63(145.40	4.247	4.448	4.644	117(242.6)	0.7837	0.8233	0.8641
10(50)	36.04	39.39	43.01	64(147.2)	4.101	4.288	4.479	118(244.4)	0.7623	0.8012	0.8413
11(51.8)	34.42	37.59	41	65(149)	3.961	4.139	4.32	119(246.2)	0.7415	0.7798	0.8193
12(53.6)	32.89	35.87	39.1	66(150.8)	3.827	3.995	4.167	120(248)			
13(55.4)	31.43	34.25	37.29	67(152.6)	3.698	3.858	4.021	121(249.8)	0.702	0.7386	0.7773
14(57.2)	30.04	32.71	35.58	68(154.4)				122(251.6)	0.6631	0.7195	0.7572
15(59)	29.72	31.24	33.95	69(156.2)				123(253.4)	0.6649	0.7007	0.7378
16(60.8)				70(158)	3.339	3.476	3.616	124(255.2)	0.6472	0.6824	0.7189
17(62.6)				71(159.8)	3.229	3.359	3.491	125(257)	0.6301	0.6647	0.7006
18(64.4)	25.13	27.26	29.55	72(161.6)	3.122	3.246	3.372	126(258.8)	0.6135	0.6476	0.6829
19(66.2)	24.05	26.07	28.23	73(163.4)	3.02	3.138	3.257	127(260.6)	0.5974	0.6309	0.6657
20(68)	23.02	24.93	26.97	74(165.2)	2.921	3.033	3.146	128(262.4)	0.5818	0.6148	0.649
21(69.8)	22.04	23.84	25.77	75(167)	2.827	2.933	3.04	129(264.2)	0.5667	0.5991	0.6328
22(71.6)	21.1	22.81	24.63	76(168.8)	2.735	2.836	2.938	130(266)	0.5521	0.5839	0.6171
23(73.4)	20.21	21.83	23.55	77(170.6)	2.647	2.743	2.84				

R—Resistance

Resistance at 25°Q7 7°F): 20 kΩ

TH3: Outdoor unit discharge pipe sensor

Before measuring resistance, disconnect connectorsas shown above.