SPLIT INVERTER AIR CONDITIONERS

Service Manual

Classic
AIR CONDITIONERS



IMPORTANT NOTE:

Read this manual carefully before operating your new air conditioning unit. Make sue to save this manual for future reference.

Please check the applicable models, technical data,
F-GAS(if any) and manufacturer information from the "Owner's Manual - Product Fiche " in the packaging of the outdoor unit.

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Part Ⅰ Technical Information

1. Important Notice

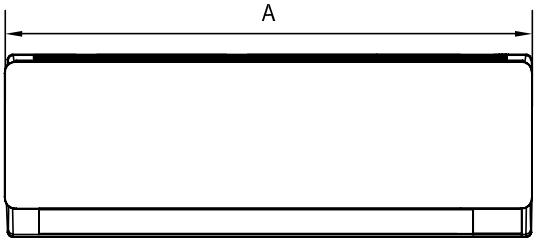
This service manual is intended for use by individuals possessing adequate backgrounds of electrical, electronic and mechanical experience. Any attempt to repair the appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

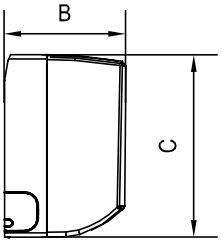
The information, specifications and parameter are subject to change due to technical modification or improvement without any prior notice. The accurate specifications are presented on the nameplate label.

2. Product Dimensions

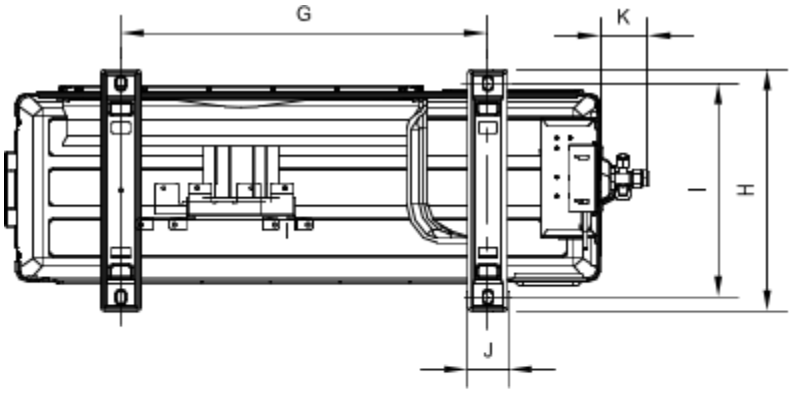
Indoor Unit:

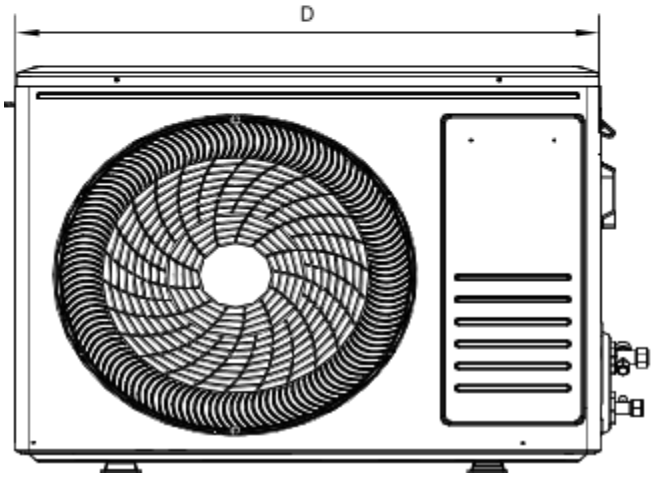


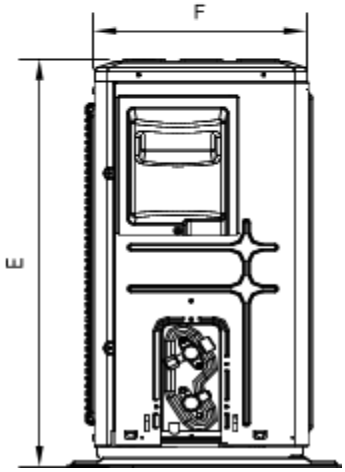




Outdoor Unit:



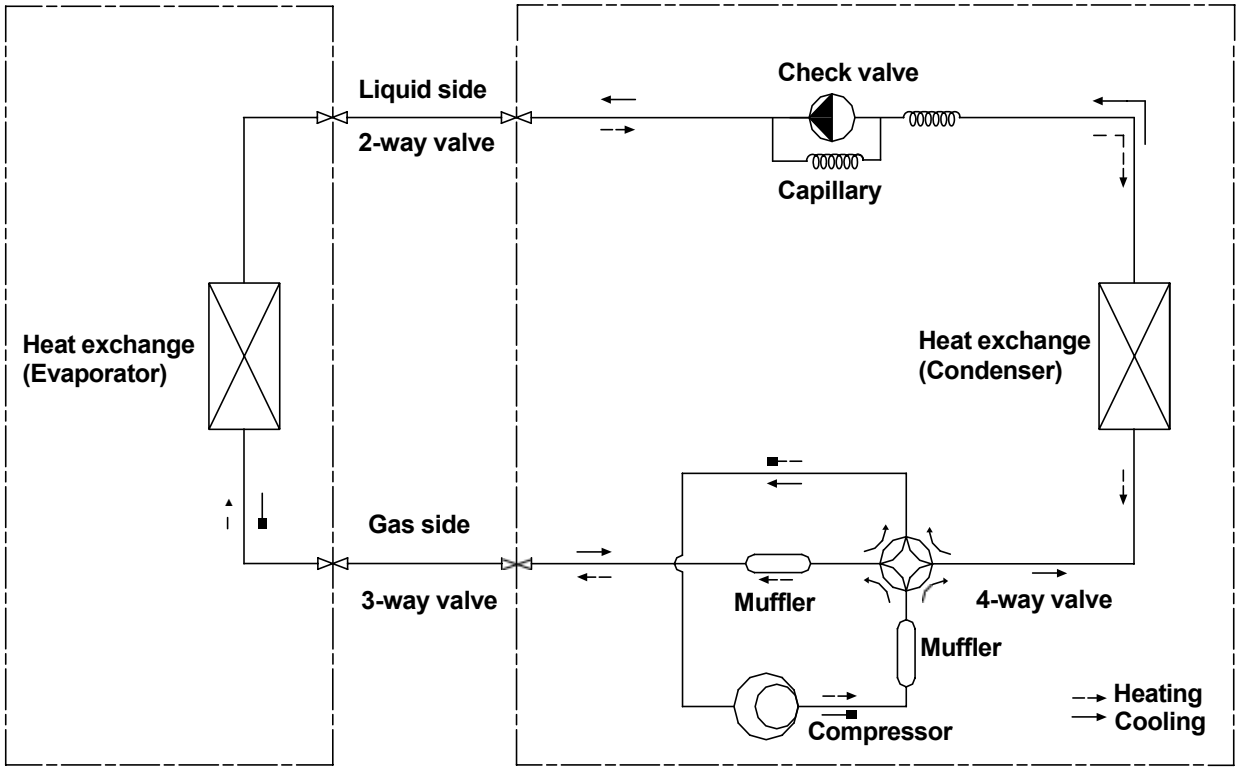




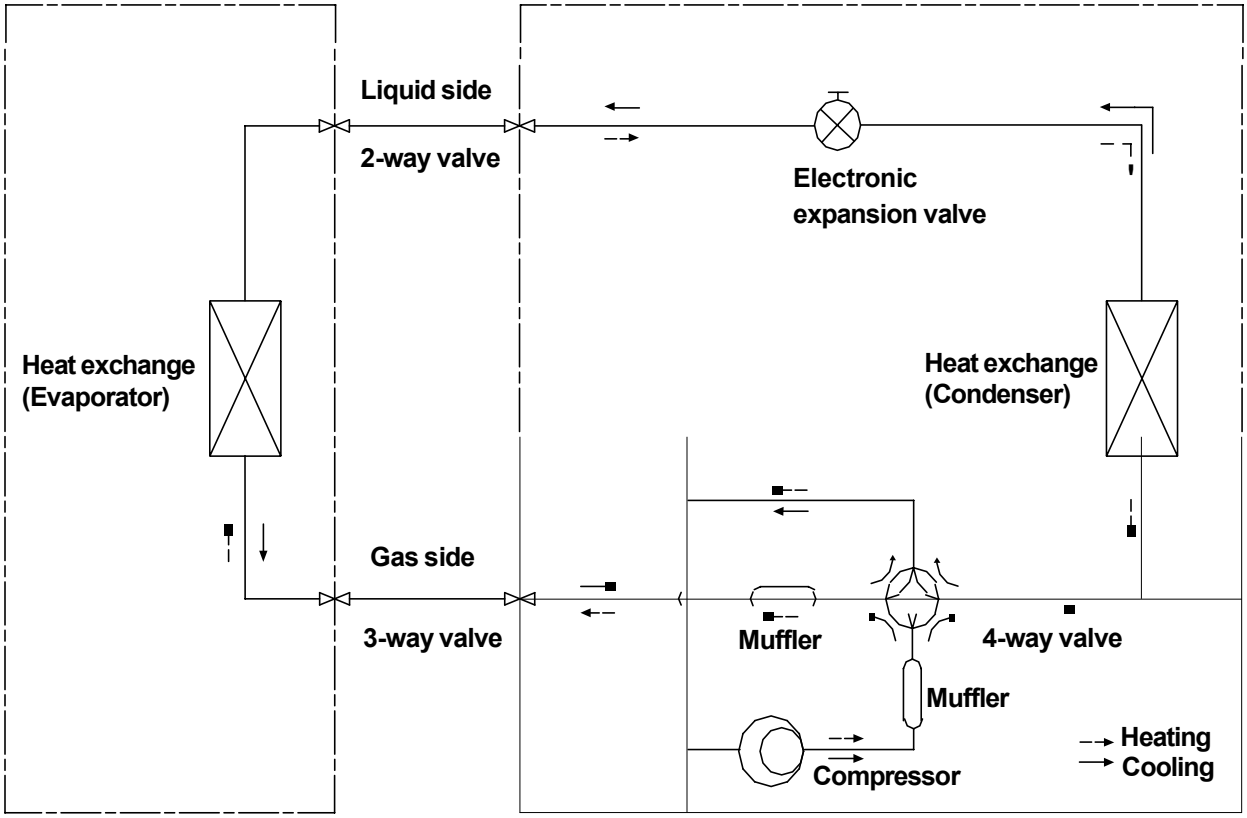
Model	Indoor unit/in			Outdoor unit/in							
	A	B	C	D	E	F	G	H	I	J	K
12K（115V）G	30.118	8.071	11.29	25.984	20.079	10.079	18.054	11.89	10.945	1.89	2.087
12K（230V）G	30.118	8.071	12.008	25.984	20.079	10.079	18.054	11.89	10.945	1.890	2.087
18K（230V）B	38.189	7.48	11.53	29.921	21.654	10.079	20	11.89	10.945	1.89	2.244
24K（230V）N	40.551	8.818	13.15	32.283	23.054	12.205	21.299	14.882	13.661	2.48	2.244
36K （230V）L	44.488	9.6	13.42	35.433	25.906	12.087	24.528	14.882	13.661	2.48	2.244

3. Refrigeration cycle diagram

Heat pump



or

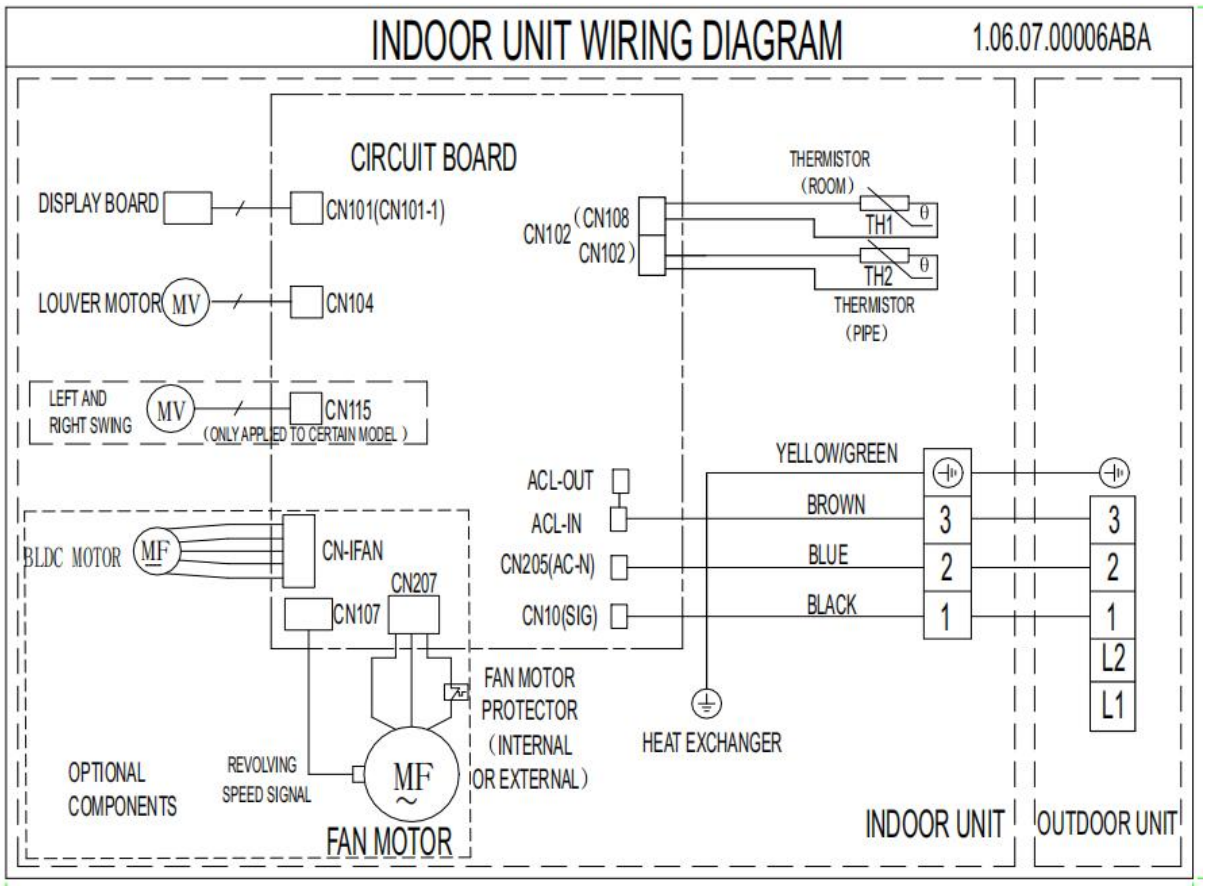


4. Wiring Diagram

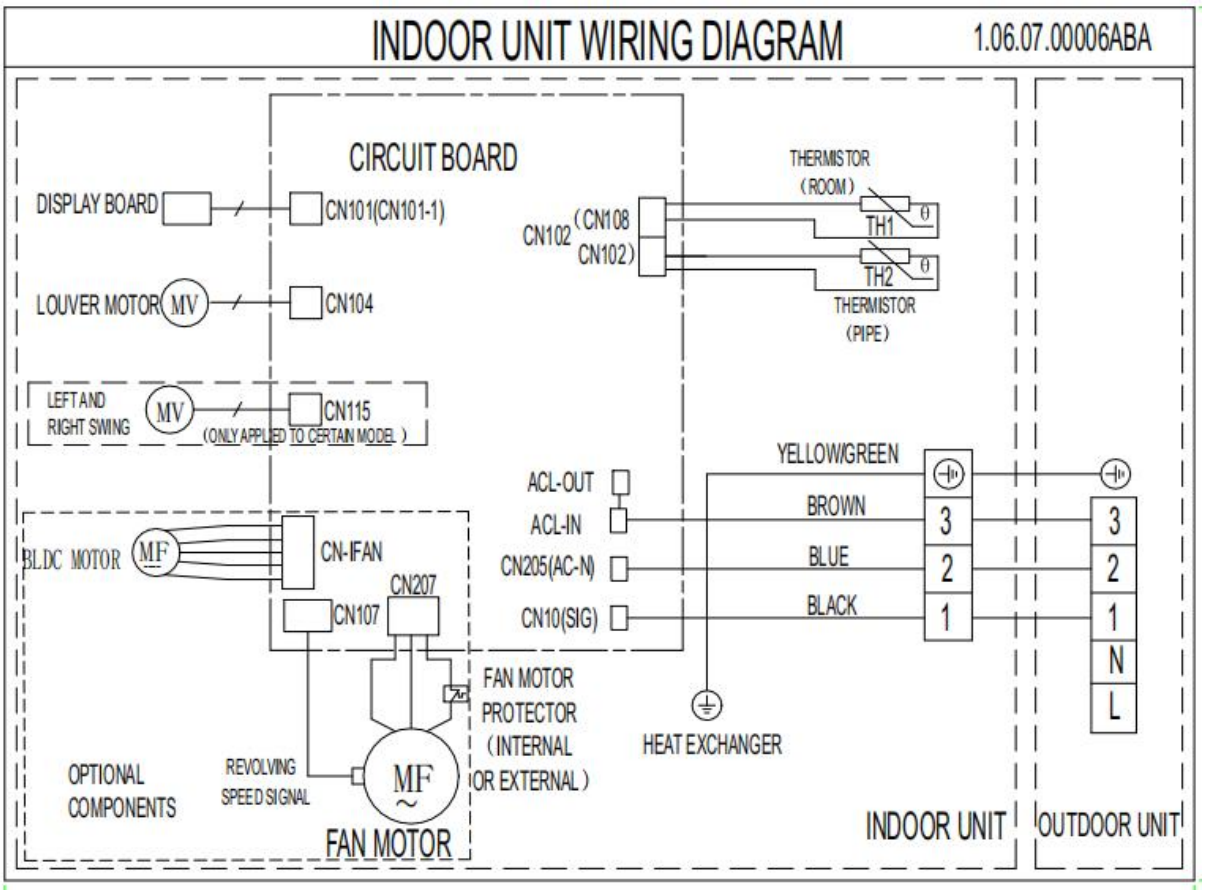
Outdoor unit power supply model

INDOOR UNIT：

230V model

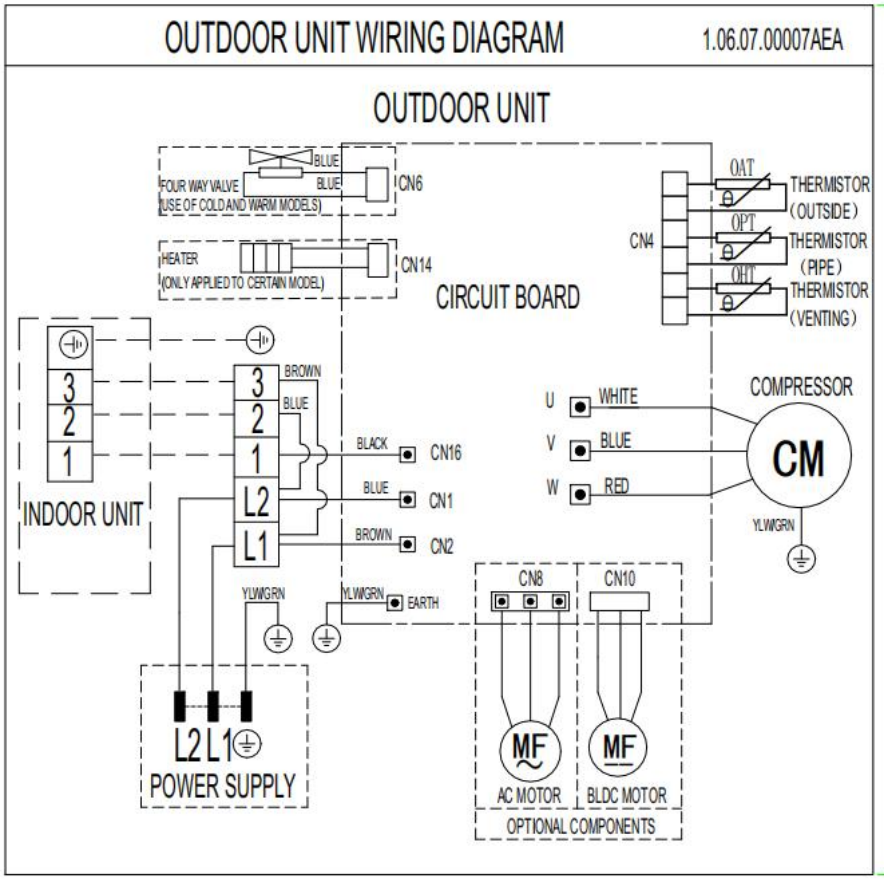


115V model

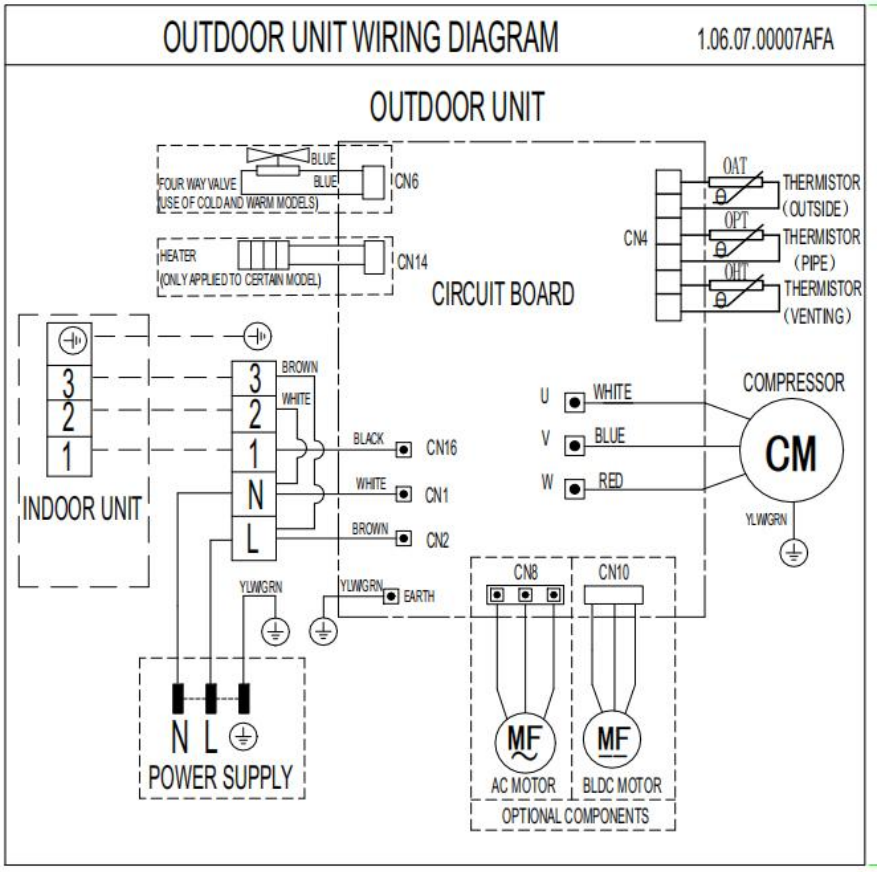


OUTDOOR UNIT:

230V model

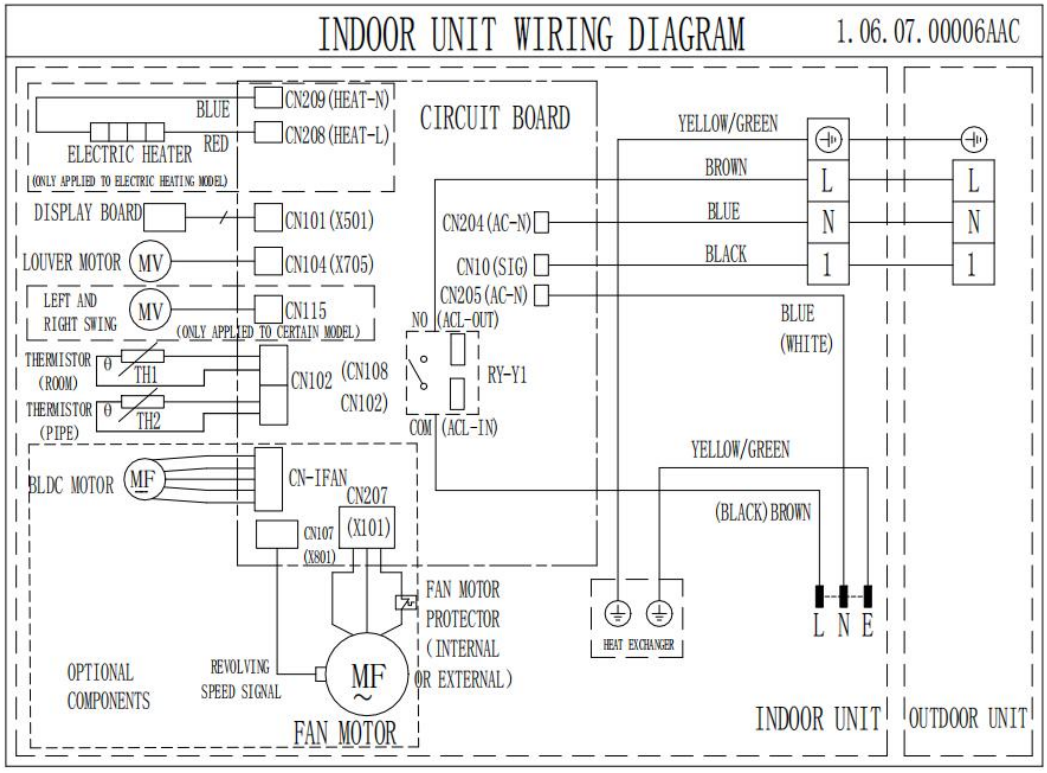


115V model

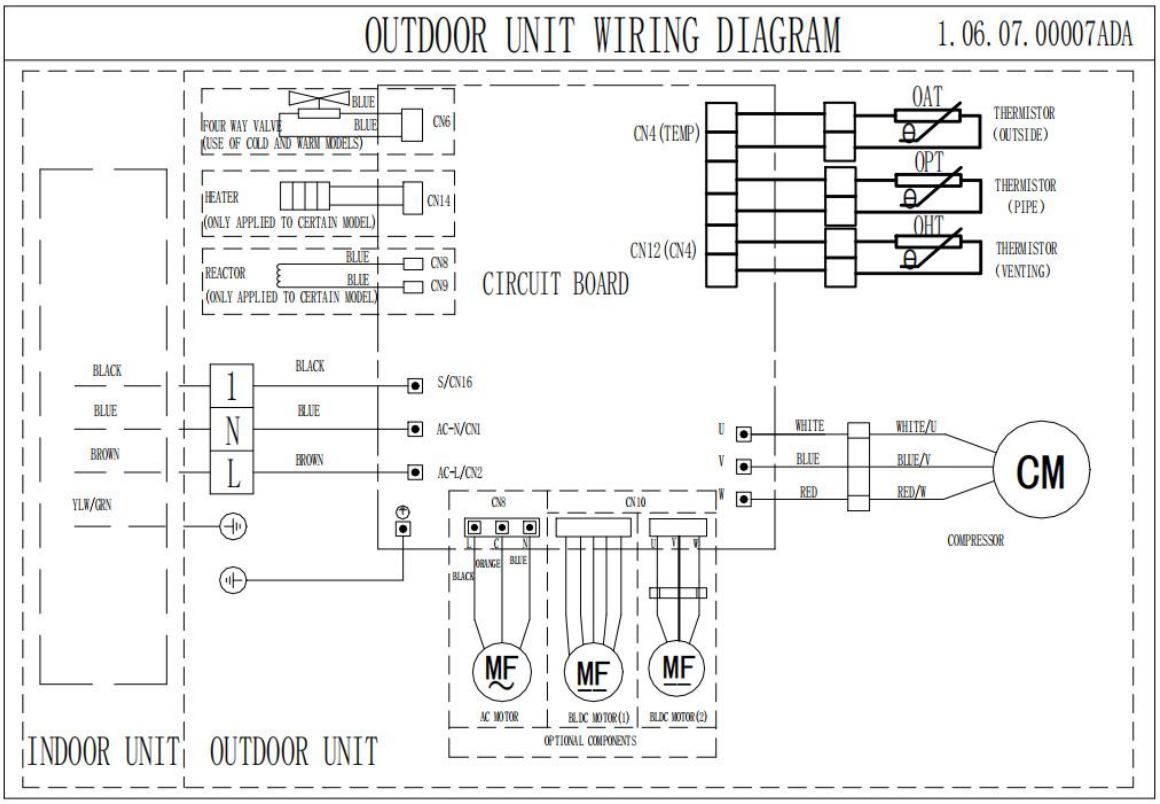


Indoor unit power supply model

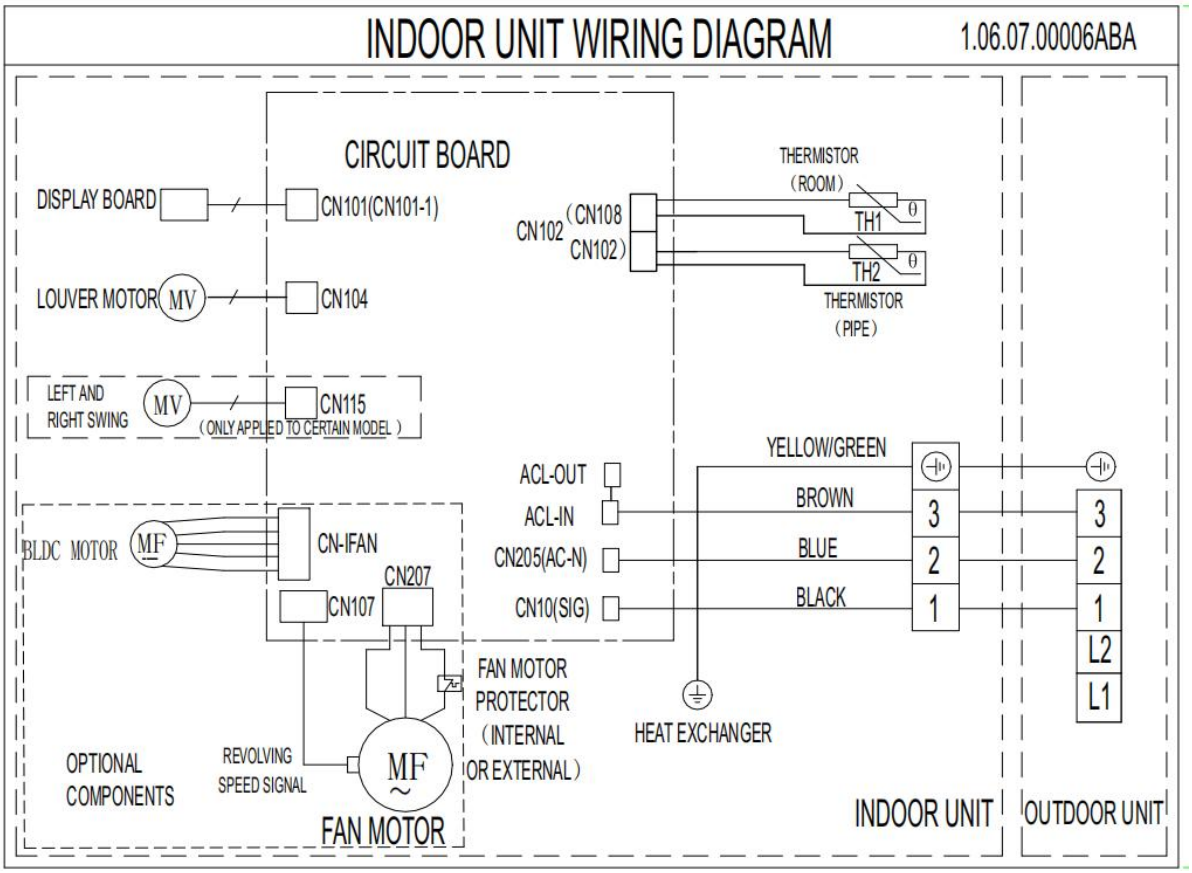
INDOOR UNIT：



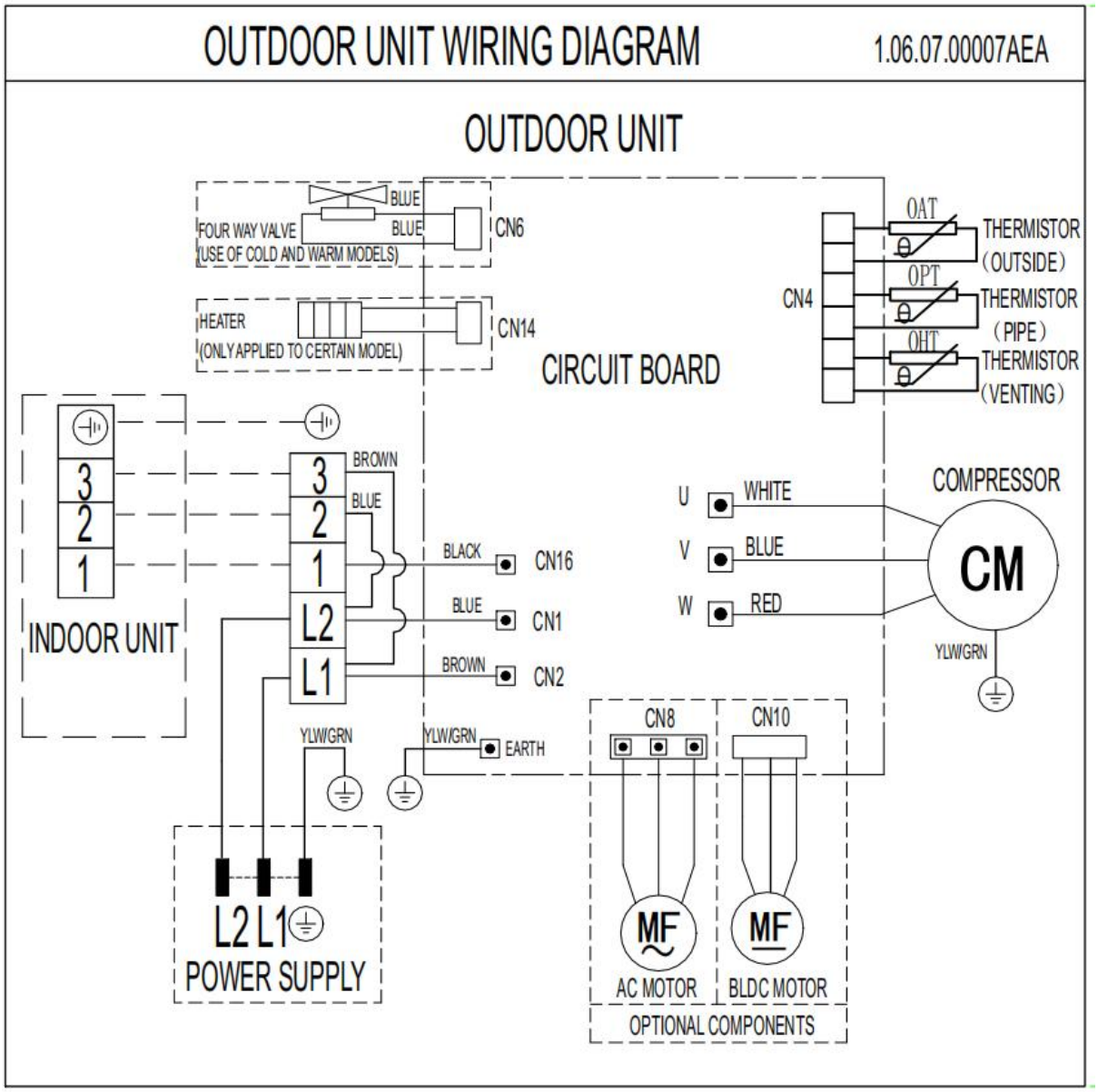
OUTDOOR UNIT：



36K INDOOR UNIT：



36K OUTDOOR UNIT：



5. Electronic Controller Introduction

5.1 Electronic Controller

RT-------Room Temperature.
IPT------Indoor Pipe (Coil) Temperature.
ST------Indoor Setting Temperature.
OPT---Outdoor Pipe Temperature.
OAT---Outdoor Ambient Temperature.
ODT---Outdoor Discharge Temperature.
CRT---Compensated Room Temperature.
IDU--- Indoor unit
ODU---Outdoor unit.

Note: When AC finishing installation, because of the air ventilation and the distance of temperature test sensor to different location of the house, the temperature for IDU PCB control need compensation.

1. Cooling mode. CRT=RT;

2. Heating mode. CRT=RT-3℃-----Split AC.

5.1.1 Auto mode

Auto mode according to the table below to determine the entry of cooling/heating/Dry/fan mode.

Heating and cooling unit

MODE	Start RT	Start ST
cooling	RT≥26℃	23℃
Dry	26℃＞RT≥20℃	RT-2℃
heating	RT＜20℃	23℃

cooling only unit

MODE	Start RT	Start ST
cooling	RT≥26℃	23℃
Dry	26℃＞RT≥20℃	RT-2℃
Fan	RT＜20℃	/

In auto mode（auto cooling or auto heating），When the temperature up and down signal of the remote control is received, the set temperature ST is adjusted to the current room temperature plus or minus 1℃, and the automatic mode adjustment temperature range is ±2℃.

Auto Dry,The compressor can be started at RT≥14 ° C. When RT < 14 ° C, the compressor cannot be started.

5.1.2 Cooling mode

1. Temperature control :16-31℃, and the operation of fan speed and vane position according to preset.

2. Compressor and process control

1). When RT-ST≥0.5 ℃ , the compressor starts up working, AC operates as customer preset; 2). When

a. RT-ST≤-2℃ and compressor keeps 5 seconds continuously; or

b. RT-ST≤-1℃ and compressor works in lowest frequency for 1 hour continuously; The compressor stops operation.

3). The compressor frequency control: Based on relation of RT & ST, and the changing speed of RT. 4). The compressor will also stop working while unit:

a. switched off.

b. under protection.

c. changed to fan mode.

5). In the process of unit operation, once the compressor ceased, it should be 3 min delay for the next procedure.

3. ODU Fan motor control:

1). While unit:

a. switched off.

b. under protection.

c. to the set temperature.

After compressor ceased, In 30 seconds,the fan motor stops working.

2). When switch on unit on cooling mode, compressor will delay 5s after ODU fan motor starts up.

4. When ODU failure or stops for protection, IDU works as preset.

5. Anti-frosting protection

Control the unit operation frequency and the frequency changing rate to achieve anti-frosting protection. 1). Frequency Slowly Increasing(FSI):

a. If 6℃≤IPT＜8℃ , the frequency increasing rate is 1Hz/25s, slowly increasing operation speed.

b. When IPT≥7℃ , unit quit from protection. 2). Frequency Limitation:

If 5℃≤IPT＜6℃ , the compressor frequency forbidden to increase

3). Normal Frequency Decreasing (NFD):

If 3℃≤IPT＜5℃ , the frequency decreasing rate is 3Hz/40s, until to the lower frequency limit. 4). Fast Frequency Decreasing (FFD):

If 1℃≤IPT＜3℃ , the frequency decreasing rate is 3Hz/20s, until to the lower frequency limit. 5). Unit stop:

a. When IPT＜1℃ for 5seconds continuously, unit stops working for anti-defrosting protection.

b. While IPT＞7℃ , and the unit stopped for 3 min already, can the unit recover to operation.

5.1.3 Dry mode

1. Fan speed: low

Vane blade position: as customer preset

2. When ODU failure or stops for protection, IDU works as preset.

3. Failure protection: as cooling mode.

4. Sleep mode: Invalid.

5.1.4 Heating mode

1. Temperature control: 16-31℃.

2. Compressor and process control.
1). When ST-CRT≥0.5 ℃, the compressor starts up working, AC operates as customer preset;;
2). When
a. ST-CRT≤-2℃ and compressor keeps 5 seconds continuously; or
b. ST-CRT≤-1℃ and compressor works in lowest frequency for 1 hour continuously; The compressor stops operation.
3). The compressor frequency control: Based on relation of RT & ST, and the changing speed of RT.
4). The compressor will also stop working while unit:
a. switched off.
b. under protection.
c. changed to fan mode.
5). In the process of unit operation, once the compressor ceased, it should be 3 min delay for the next procedure.

3. IDU time delay: When compressor stops or unit switches off while in heating mode, IDU fan motor will work for a few seconds more to prevent overheat.

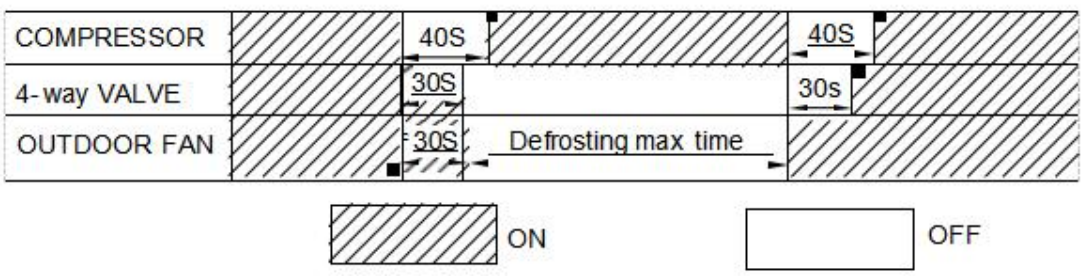
4. ODU Fan motor control:
1). While unit:
a. To be switched off
b. Under protection.
c. To the set temperature
After compressor ceased, In 30 seconds,the fan motor stops working.
2). When switch on unit on cooling mode, compressor will delay 5s after ODU fan motor starts up.
3). in the process of defrosting, the fan motor will stop operation 30s delay after compressor stopped.
4). defrosting finish, the compressor stops operation, the fan motor will start working simultaneously.

5. 4-way valve control
1). On Cooling/Dry/Fan mode,4-way valve: OFF, when unit switched on heating mode,4-way valve: ON.
2). When heating mode switched off, or changed from heating to other modes, the 4-way valve will be OFF 90 s delay after the compressor stops working.
3). Unit stops working caused by any kind of protection, the 4-way valve will be OFF 90 s delay.
4). In the process of defrosting, 4-way valve will be OFF 30s delay after compressor stopped.
5). When defrosting finish, the compressor stops operation, 4-way valve will be ON after 30s delay.

6. Defrost

After heating fixed operation for 40 minutes, one of the following conditions is met, the AC can enter the defrosting:
(1) OPT < -7 ° C and decrease by more than 2.5 ° C
(2) Continue to run for more than 300 seconds, OPT < -5 ° C and drop more than 3 ° C
(3) When OAT≥ -18 ° C, OPT < -23 ° C and lasts for more than 150 seconds
(4) Continue to run for more than 70 minutes, and OPT < -14 ℃

Defrosting start up: Compressor stops working, and re-starts to working after 50s delay;
Conditions for quitting defrosting
a. The defrosting operation time of the compressor is more than 12 minutes
b. When OAT≥-23 ° C, OPT > 8 ° C for 75 seconds
When OAT< -23 ° C, OPT > 5 ° C for 75 seconds
c. When OAT≥-23 ℃, OPT > 15 ℃
When OAT< -23 ° C, OPT≥10 ° C
When AC meet any of condition a, b or c, defrosting finish.



Defrosting end off: Compressor stops working, and re-starts to working after 40s delay;

Defrosting end off: Compressor stops working, and re-starts to working after 40s delay;

7. Cold air prevention:

This function intends to prevent cold air from being discharged when the heating operation starts up
1). I DU fan motor cold air prevention
When compressor not started:
ITP≥34℃ : fan motor will work according to preset fan speed.
34 ° C >ITP>27 ° C: low fan speed.
If ITP<25 ° C, fan motor stops.
When compressor not started:
ITP≥34℃ :fan motor will work according to preset fan speed.
31℃>ITP>27℃:low fan speed.
ITP<27℃:fan motor stops.
Note:
1. If the fan does not start, stop the fan if the inner disk temperature is less than or equal to 5 ° C after the compressor runs for 4 minutes. Inner disk temperature 25℃ > IPT > 5℃, enter the micro-risk control system, inner disk temperature IPT≥25℃, according to the set wind speed operation.
2. When the heating is in the cold air proof state, the heating running light of the display board flashes.
2). Vane blade operation for cold air prevention.
If the vane works on status of non-swing: While IPT increase to a special degree, the vane blade will change the position to:
Default angle; or
Previous position; or Customer preset.
The above operation can work one time only, when compressor stops working, the unit will once again inspect the function.
If the vane works on swing: When I DU quits from cold air prevention, vane operate as preset.

5.1.5 Fan mode

1.Fan speed and vane position: as preset.
2.ODU always OFF.

5.1.6 Timer

The unit has times control, when the unit meet the timer preset, it will be switched on or off automatically.

TIMER ON

1). TIMER ON can be set only when the air conditioner is OFF.
2). Press TIMER on the remote control ONCE to enter time setting.
3). Press " ▲" or " ▼" to set the time for unit to start working.
4). Set other function as MODE, FAN SPEED, SWING etc.
5). Press TIMER ONCE AGAIN to confirm the TIME ON setting

TIMER OFF

1). TIMER OFF can be set only when the air conditioner is ON.
2). Press TIMER on the remote control ONCE to enter time setting.
3). Press " ▲" or " ▼" to set the time for unit to stop working.
4). Press TIMER ONCE AGAIN to confirm the TIME OFF setting
Note: In case of no selection for the time setting within 10s, the timer function will be OFF automatically

5.1.7 Sleeping mode

While AC works in sleeping mode, the light of Mode light always ON, and the temperature display will be OFF after 5s.
In this mode, the AC unit works according to the SLEEP CURVE as designed.
Sleeping mode the unit can work 10 hours continuously, after that it will automatic shutdown.

5.1.8 Emergency switch

When the EMERGENCY switch is pressed one time, COOLING mode is selected and if it pressed again within 3s, HEATING mode selected, while press once again, the unit will be switched off.
When the remote controller out of function, batteries lost power, for example , the EMERGENCY button in the front of indoor unit can be used for function test.
NOTE: Do not press the EMERGEMCY switch during normal operation.

5.1.9 Auto-restart function

While air conditioner is operating in one mode, all of its operation data, such as working mode, preset temperature etc. would be 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.

5.1.10 Protection

5.1.10.1 Overload protection

1. Overload protection for Cooling or Dry mode

1). if:
a. OPT≥65℃, unit stops working for overload protection.
b. OPT＜54℃, after compressor stopped for 3 min, can the unit be started to operate.
2). When OPT≥57℃ , the compressor will be frequency limited/reduced for over load protection.
3). If unit have 6 times of over load stop-working protection continuously, this protection can't be recovered unless press ON/OFF button, and unit will show failure code.
In the process of operation, once the compressor runs continuously more than 6 min, the counter of over load stop-working protection will be reset to zero and start a new counting process.
The failure and times for protection will eliminate immediately once the unit to be switched off, on fan mode or changed to be heating mode from others.
Note: If the defective failure can't be recovered, the failure can't eliminate even if operation mode changed.

2. Overload protection for Heating mode

1). If:
a. IPT≥64℃, unit stops working for overload protection.
b. IPT＜54℃ , after compressor stopped for 3 min, can the unit be started to operate.
2). When IPT≥57℃, the compressor will be frequency limited/reduced for over load protection.
3). If unit have 6 times of over load stop-working protection continuously, this protection can't be recovered unless press ON/OFF button, and unit will show failure code.
In the process of operation, once the compressor runs continuously more than 6 min, the counter of over load stop-working protection will be reset to zero and start a new counting process.
The failure and times for protection will eliminate immediately once the unit to be switched off, on fan mode or changed to be heating mode from others.
Note: If the defective failure can't be recovered, the failure can't eliminate even if operation mode changed.

5.1.10.2 The compressor discharge temperature protection

1. If ODT≥115℃, unit stops working for over temperature protection;

While ODT＜90℃, & after compressor stopped for 3 min, the unit can be started to operate.

2. If ODT≥102℃, the compressor will be frequency limited/reduced for over temperature protection.

3. If unit have 6 times of discharge over temperature stop working protection continuously, this protection can't be recovered unless press ON/OFF button, and unit will show failure code.

In the process of operation, once the compressor runs continuously more than 6 min, the counter of discharge over temperature stop working protection will be reset to zero and start a new counting process.

The failure and times for protection will eliminate immediately once the unit to be switched off, or changed to fan mode.

Note: If the defective failure can't be recovered, the failure can't eliminate even if operation mode changed.

5.1.10.3 The current protection

1. If the unit A/C working current more than Limited current (ILC), the compressor will be frequency limited / reduced for over current protection.

2. When unit A/C working current more than Stopped current (ISC), AC unit stops working. Only when the compressor stops for 3 min can the unit be recovered operation.

3. If unit have 6 times of over current stop-working protection continuously, this protection can't be recovered unless press ON/OFF button.

In the process of unit operation, once the compressor runs continuously more than 6 min, the counter of stop-working protection will be reset to zero and re-start a new counting process.

Note: For different models, ILC and ISC have different programmed value.

5.1.10.4 IPM overheating protection

1. When IPM temperature TIPM≥90℃ , the compressor will be frequency limited / reduced for IPM over temperature protection.

2. When TIPM≥100℃ , the AC unit stops working for AC system protection.

If TIPM＜85℃,and after compressor stopped for 3 min, can the unit be started to operate.

3. If unit have 6 times of IPM over temperature stop working protection continuously, this protection can't be recovered unless press ON/OFF button, and unit will show failure code.

In the process of operation, once the compressor runs continuously more than 6 min, the counter of over load stop working protection will be reset to zero and re-start a new counting process.

Note: If the defective failure can't be recovered, the failure can't eliminate even if operation mode changed.

5.1.11 Complementary

5.1.11.1 TURBO

Function effective on Cooling, Heating modes, and fan speed operates on highest.

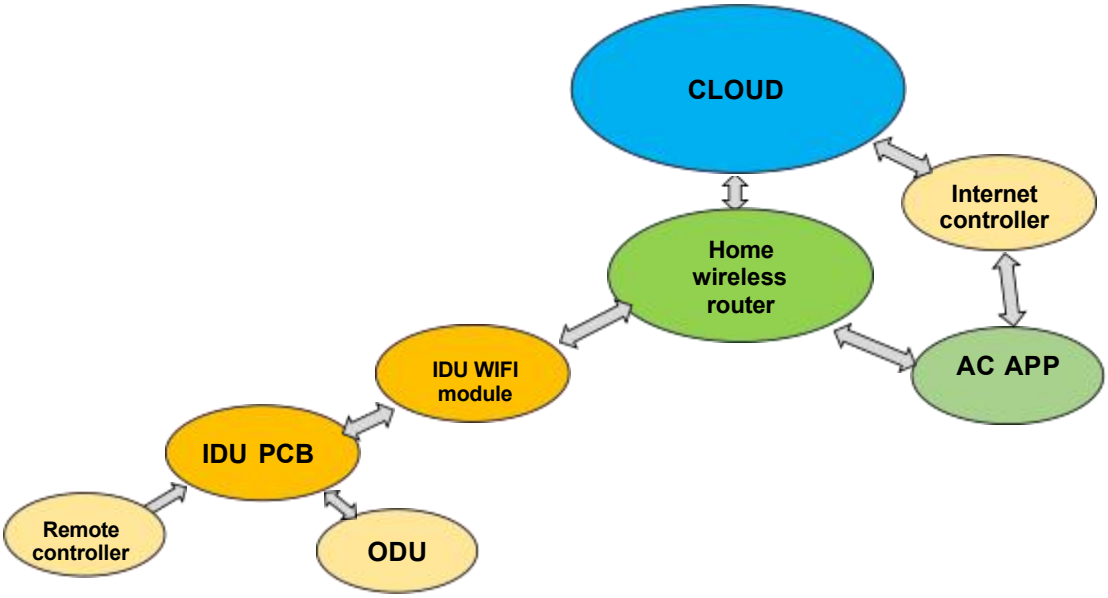
5.1.11.2 The communication control

If ODU PCB can't get signal feedback from IDU for 2 min continuously, AC unit stops working and shows E6 error code as IDU/ODU communication failure.

Once the IDU & ODU communication recovery, and also the compressor stopped for 3 min already, can the unit be recovered to operate.

5.2 WIFI OPERATION MANUAL

5.2.1 The WIFI control logic



5.2.2 Download and installation

Customer can scan the QR in the user manual or from appliance APP store to download the APP and install it in the cell phone, while installation achieved, there would be an icon as picture
created on the desktop. Register the account and add the device to system, customer can control the air conditioner by internet or LAN.

Smart Life APP



PART Ⅱ Installation and Maintenance

1. Notes for installation and maintenance

Safety Precautions

Important!

Please read the safety of precautions carefully before installation and maintenance. The following contents are very important for installation and maintenance. Please follow the instructions bellow.

● The installation or maintenance must accord with the instructions.
● Comply with all national electrical codes and local electrical codes.
● Pay attention to the warnings and cautions in this manual.
● All installation and maintenance shall be performed by distributor or qualified person.
● All electric work must be performed by licensed technician according to local regulations and instructions given in this manual.
● Be caution during installation and maintenance. Prohibit incorrect operation to prevent electric shock, casualty and other accidents.

Warnings

Electrical safety Precautions.

1) Cut off the power supply of air conditioner before checking and maintenance.
2) The air conditioner must apply specialized circuit and prohibit share the same circuit with other appliances.
3) The air conditioner should be installed in suitable location and ensure the power plug is touchable.
4) Make sure each wiring terminal is connected firmly during installation and maintenance.
5) Have the unit adequately grounded. The grounding wire can't be used for other purposes.
6) Must apply protective accessories such as protective boards, cable-cross loop and wire clip.
7) The live wire, neutral wire and grounding wire of power supply must be corresponding to the live wire, neutral wire and grounding wire of the air conditioner.
8) The power cord and power connection wires can't be pressed by hard objects.
9) If power cord or connection wire is broken, it must be replaced by qualified person.
10) If the power cord or connection wire is not long enough, please get the specialized power cord or connection wire from the manufacture or distributor. Prohibit prolong the wire by yourself.
11) For the air conditioner without plug, an air switch must be installed in the circuit. The air switch should be all-pole parting and the contact parting distance should be more then 3mm.
12) Make sure all wires and pipes are connected properly and the valves are opened before energizing.
13) Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.
14) Replace the fuse with a new one of the same specification if it is burnt down, don't replace it with a cooper wire or conducting wire.
15) If the unit is to be installed in a humid place, the circuit breaker must be installed.

Installation Safety Precaution

1) Select the installation location according to the requirement of this manual. (See the requirements in installation part).
2) Handle unit transportation with care, the unit should not be carried by only one person if it is more than 20kg.
3) When installing the indoor unit and outdoor unit, a sufficient fixing bolt must be installed, make sure the installation supporter is firm.
4) Ware safety belt if the height of working is above 2m.
5) Use equipped components or appointed components during installation.

6) Make sure no foreign objects are left in the unit after finishing installation.

Improper installation may lead to fire hazard, explosion, electric shock or injury.

Safety precautions for Installing and Relocating the unit.
To ensure safety, please be mindful of the following precautions.

Δ Warnings
When installing or relocating the unit, be sure to keep the refrigerant circuit free from air or substances other than the specified refrigerant.
Any presence of air or other foreign substance in the refrigerant circuit will cause system pressure rise or compressor rupture, resulting in injury.
When installing or moving this unit, do not charge the refrigerant which is not comply with that on the nameplate or unqualified refrigerant.
Otherwise, it may cause abnormal operation, wrong action, mechanical malfunction or even series safety accident.
When refrigerant needs to be recovered during relocating or repairing the unit, be sure that the unit is running in cooling mode. Then, fully close the valve at high pressure side (two-way valve). About 30-40 seconds later, fully close the valve at low pressure side (3-way valve), immediately stop the unit and disconnect power. Please note that the time for refrigerant recover should not exceed 1 minute.
If refrigerant recovery takes too much time, may be cause compressor overheat, resulting in injury.
During refrigerant recovery, make sure that two-way valve and 3-way valve are fully closed and power is disconnected before detaching the connecting pipe.
If compressor starts running when the valves is open and connecting pipe is not yet connected, air will be sucked in and cause pressure rise and then compressor overheat or gas leak, resulting in injury.
When installing the unit, make sure that connecting pipe is securely connected before the compressor starts running.
If compressor starts running when the valves is open and connecting pipe is not yet connected, air will be sucked in and cause pressure rise and then compressor overheat or gas leak, resulting in injury.
Prohibit installing the unit at the place where there may be leaked corrosive gas or flammable gas. If there leaked gas around the unit, it may cause explosion and other accidents.
Do not use extension cords for electrical connections. If the electric wire is not long enough, please contact a local service center authorized and ask for a proper electric wire.
Poor connection may lead to electric shock or fire.
Use the specified types of wires for electrical connections between the indoor and outdoor units. Firmly clamp the wires so that their terminals receive no external stresses.
Electric wires with insufficient capacity, wrong wire connections and insecure wire terminals may cause electric shock or fire.

Introduction R32, R290 air conditioner installation

Introduction to Refrigerants R32 & R290

The refrigerants used for air conditioners are environmentally friendly hydrocarbons R32 and R290. The two kinds of refrigerants are combustible and odorless. Moreover, they can burn and explode under certain condition. However, there will be no risk of burning and explosion if you comply with the following table to install your air conditioner in a room with an appropriate area and use it correctly.
Compared with ordinary refrigerants, Refrigerants R32 & R290 are environmentally friendly and do not destroy the ozone sphere and that their values of greenhouse effect are also very low.

R32/R290 air conditioner installation area requirement

$m1=(141.25ft^3)\times LFL$, $m2=(918.18ft^3)\times LFL$, $m3=(4590.91ft^3)\times LFL$
Where LFL is the lower flammable limit in kg/m3 , R290 LFL is $0.00237lb/ft^3$, R32 LFL is $0.0191lb/ft^3$.

For the appliances with a charge amount m1<M<m2:

The maximum charge in a room shall be in accordance with the flowing: $Mmax=2.5\times(LFL)(5/4)\times h0\times A1/2$
The required minimum floor area Amin to install an appliance with refrigerant charge M(kg) shall be in accordance with following: $Amin= (M/ (2.5 \times (LFL)(5/4) \times h0))\ 2$
Where:
Mmax is the allowable maximum charge in a room, in kg; M is the refrigerant charge amount in appliance, in lb; Amin is the required minimum room area, in ft2;

A is the room area, in ft2;
LFL is the lower flammable limit, in lb/ft3;
h0 is the installation height of the appliance, in ft for calculating Mmax or Amin, 5.9ft for wall mounted;

Table GG.1 - Maximum charge (lbs)

Category	LFL (lb/ft^3)	h0 (ft)	Floor area (ft2) Maximum charge (lb)						
			43.06	**75.35**	**107.64**	**161.46**	**215.28**	**322.92**	**538.2**
R290	0.00237	1.969	0.11	0.154	0.176	0.22	0.243	0.309	0.397
		3.281	0.176	0.243	0.066	0.132	0.198	0.441	0.661
		5.906	0.331	0.441	0.529	0.639	0.75	0.904	1.168
		7.218	0.397	0.529	0.639	0.794	0.904	1.124	1.433
R32	0.0191	1.969	1.499	1.984	2.381	2.91	3.373	4.123	5.313
		3.281	2.513	3.329	3.968	4.85	5.6	6.878	8.862
		5.906	4.519	5.974	7.143	8.752	10.097	12.368	15.992
		7.218	5.512	7.297	8.73	10.692	12.346	15.124	19.511

Table GG.2 - Minimum room area (ft2)

Category	LFL (lb/ft^3)	h0 (ft)	Charge amount (M) (lb) Minimum room area (ft2)						
R290	0.00237		0.335	0.503	0.67	1.005	1.34	1.676	2.178
		1.969	/	882.32	1570.96	3529.28	6283.84	9813.12	16290.64
		3.281	/	322.8	570.28	1269.28	2259.6	3529.8	5971.8
		5.906	/	96.84	172.16	387.36	699.4	1086.76	1836.96
		7.218	/	64.56	118.36	258.24	462.68	731.68	1237.4
R32	0.0191		2.698	4.048	5.397	8.095	10.794	13.492	17.54
		1.969	/	312.04	548.76	1248.16	2216.56	3453.96	5842.68
		3.281	/	107.6	204.44	451.92	796.24	1248.16	2108.96
		5.906	/	32.28	64.56	139.88	247.48	387.36	645.6
		7.218	/	21.52	43.04	96.84	161.4	258.24	430.4

Caution:

- Please contact the nearest after-sale service center when maintenance is necessary. At the time of maintenance, the maintenance personnel must strictly comply with the Operation Manual provided by the corresponding manufacturer and any non-professional is prohibited to maintain the air conditioner.
- It is necessary to comply with the provisions of gas-related national laws and regulations.
- It is necessary to clear away the refrigerant in the system when maintaining or scrapping an air conditioner.
- When filling the combustible refrigerant, any of your rude operations may cause serious injury or injuries to human body or bodies and object or objects.
- A leak test must be done after the installation is completed.
- It is a must to do the safety inspection before maintaining or repairing an air conditioner using combustible refrigerant in order to ensure that the fire risk is reduced to minimum.

1) Installation Safety

Installation Safety Principles

Site Safety





Open Flames Prohibited　　Ventilation Necessary

Operation Safety

Open Flames Prohibited






Mind Static Electricity　Must wear protective clothing and anti-static gloves　Don`t use mobile phone

Installation Safety

● Refrigerant Leak Detector ● Appropriate Installation Location	 The left picture is the schematic diagram of a refrigerant leak detector.

Caution:

- The installation should be in a well-ventilated condition location.
- When you installing or maintaining an air conditioner using Refrigerant R32/R290, the location should be free fire from open or any other goods temperature higher than 370 ℃ for R290/548 ℃ for R32 which easily produces open fire include welding, smoking, drying oven.
- When installing an air conditioner of R32/R290, it is necessary to take appropriate anti-static measures such as wear anti-static clothing and gloves.
- It is necessary to choose the location for installation or maintenance where in the air inlets and outlets of the indoor and outdoor units should be not surrounded by obstacles or close to any heat source or combustible and/or explosive environment.
- If the indoor unit suffers refrigerant leak during the installation, it is necessary to immediately turn off the valve of the outdoor unit and all the personnel should go out till the refrigerant leaks completely for 15 minutes. If the product is damaged, it is a must to carry such damaged product back to the maintenance station and it is prohibited to weld the refrigerant pipe or conduct other operations on the user's site.
- It is necessary to choose the place where the inlet and outlet air of the indoor unit is even.
- It is necessary to avoid the places where there are other electrical products, power switch plugs and sockets, kitchen cabinet, bed, sofa and other valuables right under the lines on two sides of the indoor unit.

Special tools:

Tool Name	Requirement(s) for Use
Mini Vacuum Pump	It should be an explosion-proof vacuum pump; can ensure certain precision and its vacuum degree should be lower than 10Pa.

Filling Device	It should be a special explosion-proof filling device; have certain precision and its filling deviation should be less than 5g.
Leak Detector	It should be calibrated regularly; and its annual leak rate should not exceed 10g.
Concentration Detector	A) The maintenance site should be equipped with a fixed-type combustible refrigerant concentration detector and connected to a safeguard alarm system; its error must be not more than 5%. B) The installation site should be equipped with a portable combustible refrigerant concentration detector which can realize two-level audible and visual alarm; its error must be not more than 10%. C) The concentration detectors should be calibrated regularly. D) It is necessary to check and confirm the functions before using the concentration detectors.
Pressure Gauge	A) The pressure gauges should be calibrated regularly. B) The pressure gauge used for Refrigerant 22 can be used for Refrigerants R290 and R161; the pressure gauge used for R410A can be used for Refrigerant 32.
Fire Extinguisher	It is necessary to carry fire extinguisher(s) when installing and maintaining an air conditioner. On the maintenance site, there should be two or more kinds of dry powder, carbon dioxide and foam fire extinguishers and that such fire extinguishers should be placed at stipulated positions, with eye-catching labels and in handy places.

Maintenance

1). Inspections before maintenance.

(1) Inspection of maintenance environment

- There should be no leaked refrigerant in the room before operation.
- It is only allowed to operate in a room which meets the area requirement on the nameplate.
- It is necessary to make the room keep a continuous ventilation state at the time of maintenance.
- The room in the maintenance should be free from fire or welding, smoking, drying oven or any other goods temperature higher than 370℃ (R290)/548℃ (R32) which easily produces fire.
- During the maintenance, it is necessary to ensure that any person's any mobile phone or any electronic product with radiation in the room is powered off.
- The maintenance area should be equipped with a drying powder or carbon dioxide fire extinguisher and that such fire extinguisher can work.

(2) Inspection of maintenance equipment

- Check the maintenance equipment is applicable to the refrigerant or not and it is only allowed to use the professional equipment recommended by the air conditioner manufacturer.
- Check the refrigerant leak detector whether has been calibrated. The set maximum alarm concentration of the refrigerant leak detector should not exceed 25% of the lower explosion limit (LEL), the refrigerant leak detector must be working during maintenance.

2) Inspection of air conditioner

- It is necessary to ensure that the air conditioner is in reliable ground connection before maintenance.
- Make sure powered supply to air conditioner is off. Before maintenance, it is necessary to cut off the power and discharge the capacitor power which used in the air conditioner. If it is a must to need the power supply during the maintenance, it is necessary to do ongoing leak detection at the most dangerous position/point in order to avoid potential danger.
- Check the warning labels on the air conditioner whether are in good condition. It is necessary to replace

the damaged or smeared warning labels.

3). Leak inspection before maintenance

Before maintenance, use the leak detector or concentration detector (pump-type) recommended by the corresponding air conditioner manufacturer to check the air conditioner leak or not.

Warning

If leak may exist, it is necessary to move all the fire out from the site or extinguish fire and then immediately shut off the air conditioner. Meanwhile, it is necessary to make sure well-ventilated.

4). Safety principles during the maintenance

- At the time of maintenance, it is necessary to ensure well-ventilation on the site.
- It is prohibited to use fire including welding, smoking or other purposes. It is prohibited to use mobile phones.
- At the time of maintenance, if the relative humidity is lower than 40%, it is necessary to wear anti-static clothing and gloves.
- If the combustible refrigerant is found leaking during the maintenance, it is a must to immediately take forced ventilation and plug up the leak source.
- If the product is damaged to the extent that it is a must to open the refrigerating system for
- maintenance, it is a must to carry the product back to the maintenance station for maintenance. (It is prohibited to weld the refrigerant pipe and do other operations on the user's site.)
- It is necessary to return the air conditioner to its initial state if it is necessary to provide visiting service again due to lacking spare part during the maintenance. Moreover, it is a must to ensure that the refrigerating system is in secure ground connection.
- If it is necessary to provide visiting service with a refrigerant cylinder, the volume of refrigerant filled in such refrigerant cylinder should not exceed the stipulated value. When such cylinder is stored in a vehicle or placed on the installation or maintenance site, it is necessary to place it vertically and securely and keep it away from any place where there is any heat source, combustion source, radiation source or electrical equipment.

5). Requirements for the site of maintenance-station

- The maintenance location should be well-ventilated, with leveled ground and not in a basement.
- The maintenance should be divided into welding and non-welding areas both of which should be labeled clearly. There should be a certain safety distance between the two areas. The maintenance location should be equipped with ventilating and air-exhausting equipment to prevent the refrigerant gas from aggregating.
- It is necessary to provide some relevant instruments such as combustible refrigerant leak detector and have a leak detecting instrument management system. It is necessary to confirm that the leak detector can work normally before maintenance.
- The main power switch should be set outside the maintenance location and equipped with protective (explosion-proof) devices.
- It is necessary to provide firefighting devices such as dry powder or carbon dioxide fire extinguisher appropriate for extinguishing the electrical fire and keep such firefighting devices in a usable condition. Temporary wires and sockets are prohibited on the maintenance location.

6). Requirements for fill the refrigerants

- It is necessary to use nitrogen to clear the cyclic system before operating the refrigerating system and vacuumize the outdoor unit for 30 minutes at least.
- It is necessary to ensure that there is no cross contamination among different refrigerants when the refrigerant filling device is used. The total length including the refrigerant pipeline should be as short

as possible in order to reduce the residual refrigerant inside such pipeline.

- It is necessary to vertically place the refrigerant storage tanks.
- It is necessary to ensure that the refrigerating system is in ground connection before the refrigerant is filled.
- When filling the refrigerant, it is necessary to fill corresponding type and volume of refrigerant as per the requirements on the product nameplate and overfilling is prohibited.
- It is necessary to seal the system in a safe sealing way after maintaining the refrigerating system.
- It is necessary to ensure that the maintenance will not damage or reduce the safety protection grade of the original system.

7). In-maintenance welding

- It is necessary to ensure that the maintenance location is well-ventilated.
- Before welding the outdoor unit, it is a must to confirm that the refrigerating system has been drained and the system has been cleaned and ensure that there has been no refrigerant in the outdoor unit.
- It is necessary to close the stop valve of the outdoor unit when using a welding gun to do the maintenance work such as cutting and welding.

8). Maintenance of electrical components

- It is necessary to use a special leak detector to check whether the maintained electrical parts location have the leak refrigerant.
- It is not allowed to refit, remove or cancel any component with the safety protection function after finishing the maintenance process.
- When maintaining the sealed parts, it is necessary to turn off the power of air conditioner before opening the sealing cover. When power supply is needed, it is necessary to do the ongoing leak detection at the most dangerous position in order to prevent potential danger.
- It is necessary to specially note that the maintenance of electrical components will not affect the replacement of protective cover.
- In order to ensure that the sealing function is not damaged after maintenance or the sealing material will not lose the effect of preventing the combustible gas leak due to ageing. So the substitute components should meet the requirements recommended by the air conditioner manufacturer.

Warning

Before doing the trial operation after finishing the maintenance, it is a must to use a practical leak detector to inspect the leakage and reliability of ground connection in order to ensure that no refrigerant leakage and reliable ground connection.

The refrigerant storage tanks should be separately placed in a well-ventilated place at the temperature ranging from -10℃ to 50℃ and label them with warning labels.

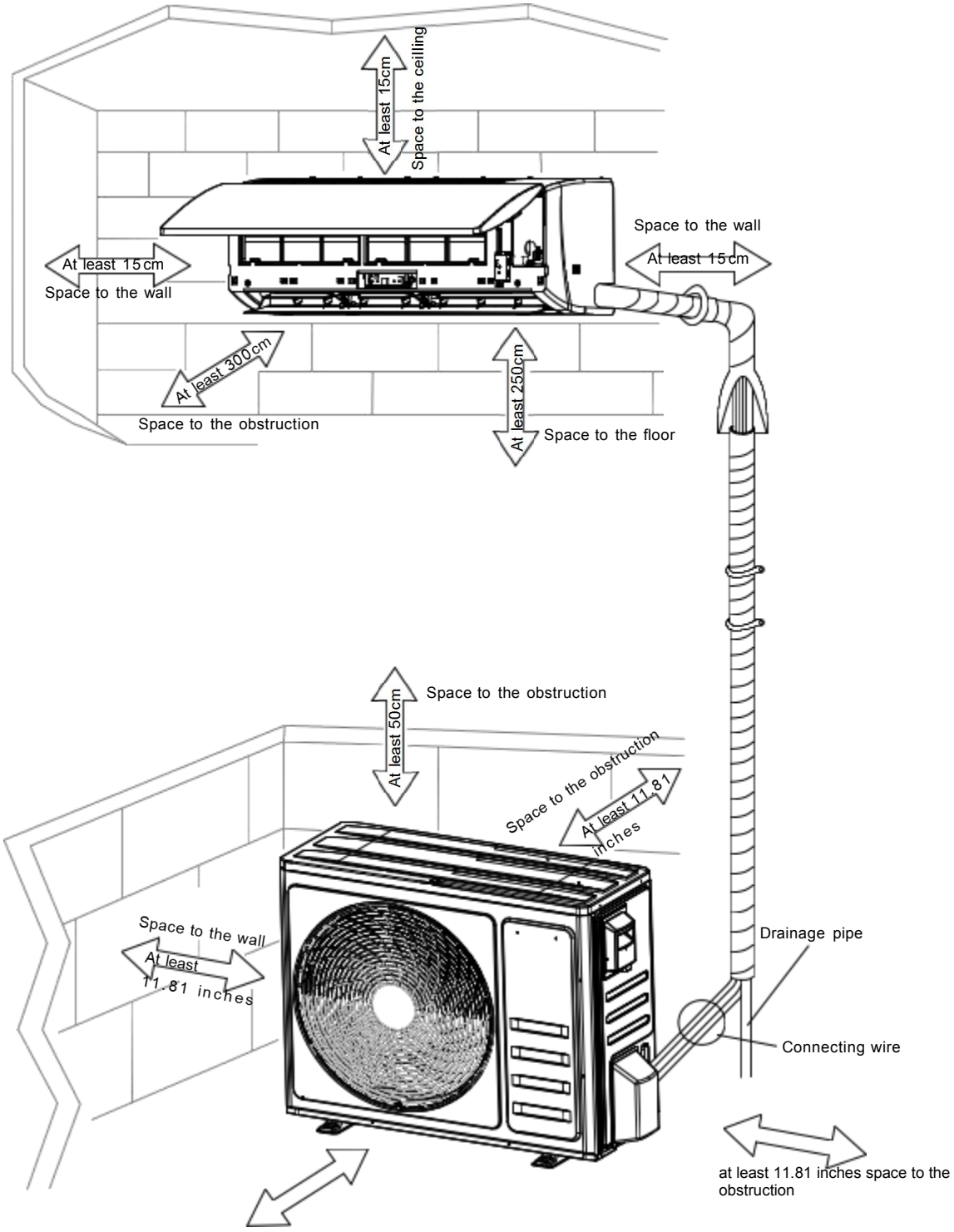
9). Emergency Accident Handling

- A maintenance station should establish emergency handling plans. It is necessary to take appropriate precautionary measures in work. For example, it is prohibited to enter the location with any kindling material and it is prohibited to wear clothing or shoes which easily produce static. Handling suggestions when a large amount of combustible refrigerant leaks:
- It is necessary to immediately operate the ventilating equipment while cutting off other power supply and evacuating the affected personnel urgently from the location.
- It is necessary to inform near residents of evacuating for over 20 meters from the location, make an alarm call, set the emergency area and prohibit irrelevant personnel and vehicles from approaching.
- The professional firefighters should wear anti-static clothing to handle the emergency on the site and cut off the source of leak.

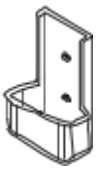
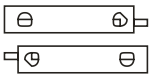
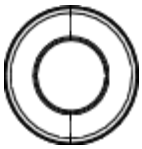
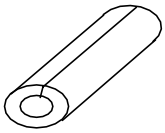
It is necessary to use nitrogen for blowing the site, especially the low-lying positions, clear away the residual combustible refrigerant gas from any area nearby and surrounding the leak point and use a handheld detector for detection and not clear the alarm until the concentration of refrigerant is zero.

2 Installation

2.1 Installation Dimension Diagram



2.2 Accessory

Remote controller 	Remote controller supporter 	Batteries 	Vinyl tape 
Drain hose 	Hole cover 	Screw 	Insulation material 

2.3 Tools

Tool name	Picture	Tool name	Picture	Tool name	Picture
Standard Wrench		Pipe Cutter		Vacuum Pump	
Adjustable/ Crescent Wrench		Screw drivers (Phillips & Flat blade)		Safety Glasses	
Torque Wrench		Manifold and Gauges		Work Gloves	
Hex Keys or Allen Wrenches		Level		Refrigerant Scale	
Drill & Drill Bits		Flaring tool		Micron Gauge	
Hole Saw		Clamp on Amp Meter			

2.4 Position

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.
- Do not install the unit in too 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 neighbors.
- 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.

OUTDOOR UNIT

- Do not install the outdoor unit near sources of heat, steam or flammable gas.
- Do not install the unit in too 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 neighbors.
- 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 room to be air conditioning, avoiding to installation in corridors or communal areas.
- Install the indoor unit at a height of at least 2.5m from the ground.

Minimum space to be left (mm) showing in the picture.

2.5 Electricity and wiring

Safety precaution

1） Must follow the electric safety regulations when installing the unit.

2） According to the local safety regulations, use qualified power supply circuit and air switch.

3） Make sure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring may result in electric shock, fire hazard or malfunction. Please install proper power supply cables before using the air conditioner.

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

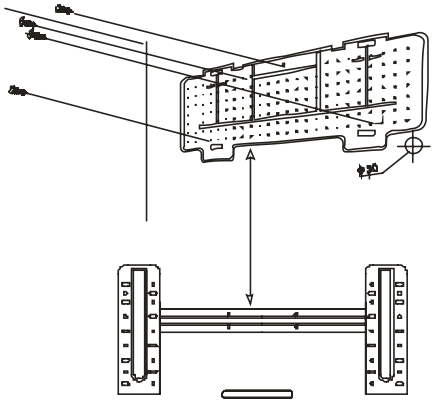
Appliance Amps(A)	Wire Size (in2)
5	0.0011625
10	0.00155
13	0.002325
18	0.00248
25	0.0031
30	0.003875

2.6 IDU Installation

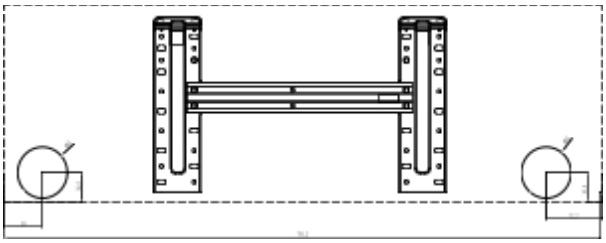
To install, proceed as follows:

2.6.1 Installation of the mounting plate.

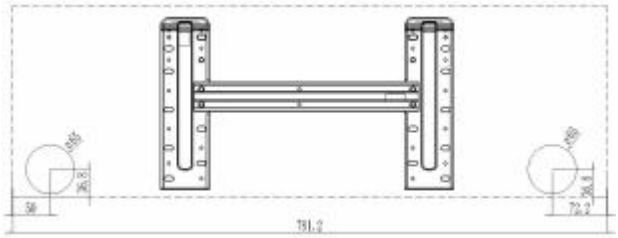
1) By using a level, put the mounting plate in a perfect square position vertically and horizontally.
2) Drill 32mm deep holes in the wall to fix the plate.
3) Insert the plastic anchors into the hole.
4) Fix the mounting plate by using the provided tapping screws.
5) Check that the mounting plate is correctly fixed.



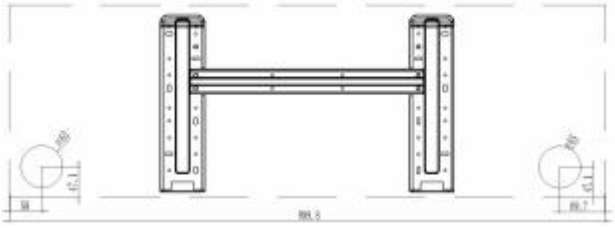
9K(698X)



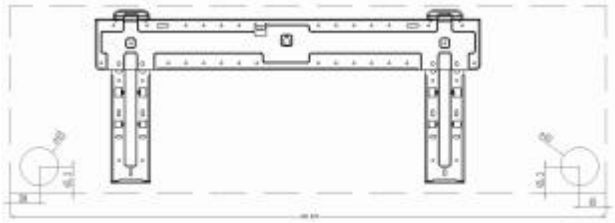
12K(770X)



18K(900X)



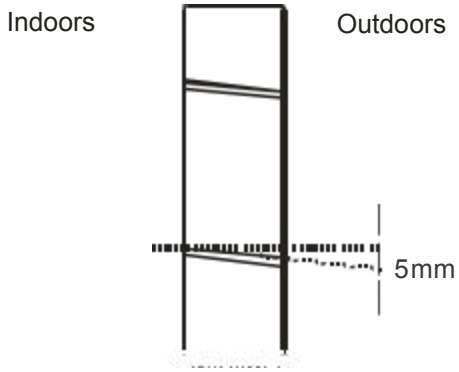
24K(1010X)



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

2.6.2 Drilling a hole in the wall for the piping

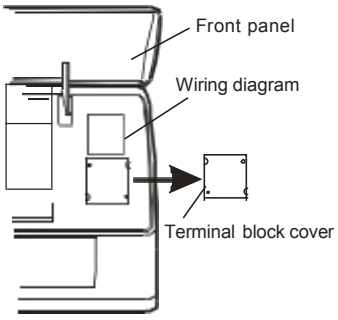
1) Decide where to drill the hole in the wall for the piping (if necessary) according to the position of the mounting plate
2) Install a flexible flange through the hole in the wall to keep the latter intact and clean.



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.

1.6.3 Electrical connections---Indoor unit

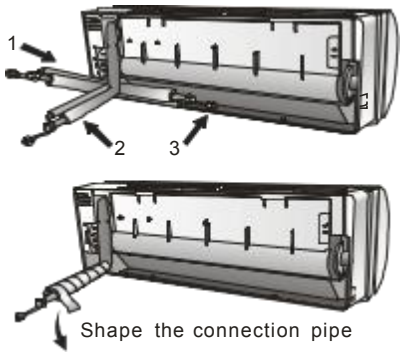
1). Lift the front panel.
2). Take off the cover as indicated in the picture (by removing a screw or by breaking the hooks).
3). For the electrical connections, see the circuit diagram on the right part of the unit under the front panel.
4). Connect the cable wires to the screw terminals by following 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.



★ **Refrigerant piping connection**

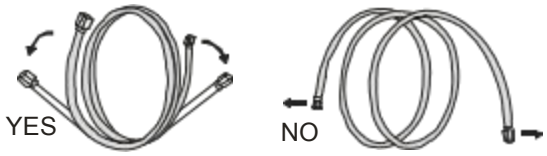
The piping can be run in the 3 directions indicated by numbers in the picture. When the piping is run in
direction 1 or 3, cut a notch along the groove on the side of the indoor unit with a cutter.

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.



1.6.4 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.

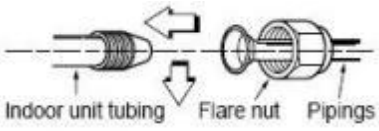


Extending the rolled pipe

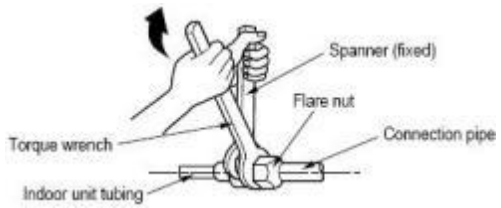
2.6.5 Connections to the indoor unit

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.

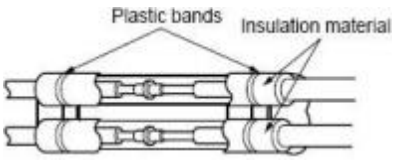


Capacity (Btu/h)	Pipe Size (Torque)	
	Gas	Liquid
7/9/12K	3/8" (31-35N.m)	1/4" (15-20N.m)
18K	1/2" (45-50N.m)	1/4" (15-20N.m)
24K	1/2" (45-50N.m)	1/4" (15-20N.m)

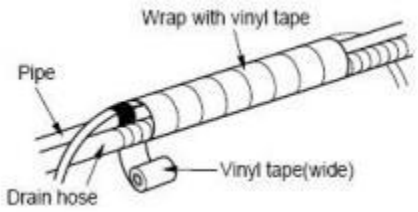
When extending the drain hose at the indoor unit, install the drain pipe.

Wrap the insulation material around the connecting portion.

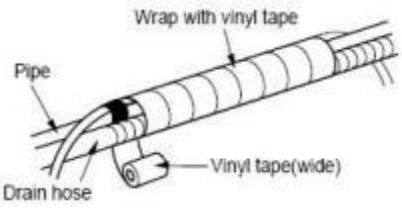
- Overlap the connection pipe insulation material and the indoor unit pipe insulation material. Bind them together with vinyl tape so that there is no gap.



Wrap the area which accommodates the rear piping housing section with vinyl tape.



- Bundle the piping and drain hose together by wrapping them with vinyl tape over the range within which they fit into the rear piping housing section.



2.6.6 Indoor unit condensed water drainage

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

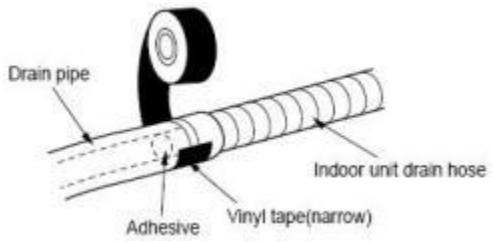
1). Place the drain hose below the piping, taking care not to create siphons.

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

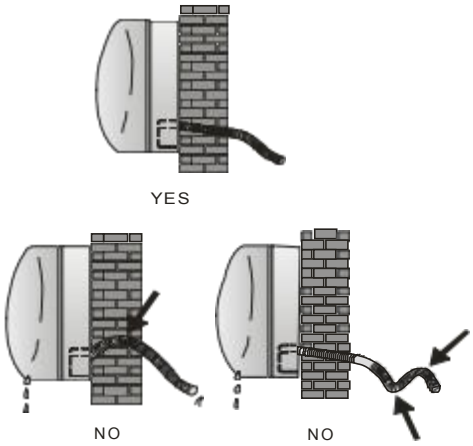
3). Do not bend the drain hose or leave it protruding or twisted and do not put the end of it in water. If an extension is connected to the drain hose, ensure that it is lagged when it passes into the indoor unit.

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.
- lPress to join the pipe connection to the base.



2.7 ODU Installation

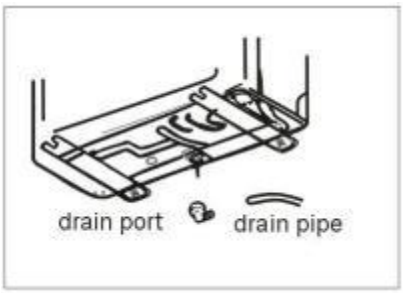
- The outdoor unit should be installed on a solid wall and fastened securely.
- The following procedure must be observed before connecting the pipes and connecting cables : decide which is the best position on the wall and leave enough space to be able to carry out maintenance easily.
- Fasten the support to the wall using screw anchors which are particularly suited to the type of wall;
- Use a larger quantity of screw anchors than normally required for the weight they have to bear to avoid vibration during operation and remain fastened in the same position for years without the screws becoming loose.
- The unit must be installed following the national regulations.

Outdoor unit condensed water drainage

(only for heat pump models)

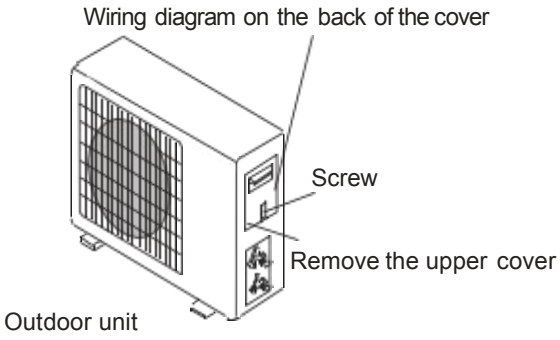
The condensed water and the ice formed in the outdoor unit during heating operation can be drained away through the drain pipe.

1) Fasten the drain port in the 25mm hole placed in the part of the unit as shown in the picture.
2) Connect the drain port and the drain pipe.
   Pay attention that water is drained in a suitable place.



Electronic connections

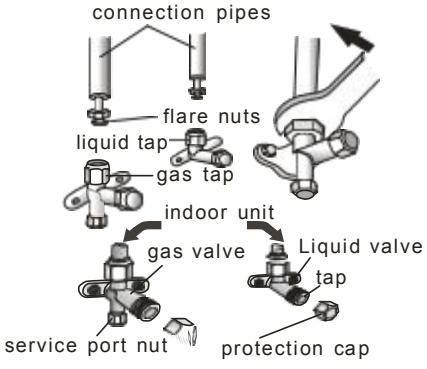
1. Take the cover away.
2. Connect the cable wires to the terminal board using the same numbering as in the indoor unit.
3. For the electrical connections, see the wiring diagram on the back of the cover
4. Fasten the cables with a cable-clamp.
5. An efficient earth connection must be ensured.
6. Replace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



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.



2.8 Vacuum and gas leakage test

1. Use vacuum Pump

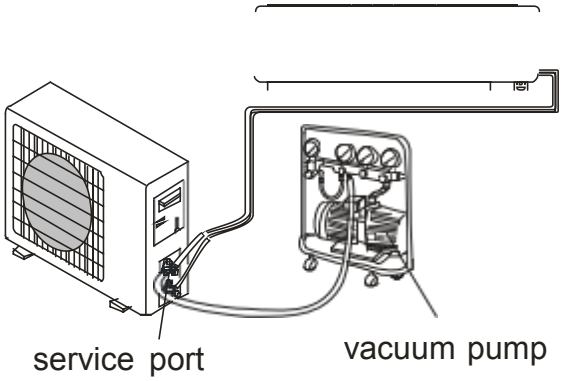
1) Air and humidity left inside the refrigerant circuit can cause compressor malfunction. After having connected the indoor and outdoor units, bleed the air and humidity from the refrigerant circuit by using a vacuum pump.

2) Open the piezometer and operation for 10-15minutes to check if the pressure of piezometer remains in -0.1Mpa.

3) Close the vacuum pump and maintain this status for 1-2min to check if the pressure of piezometer
remains in -0.1Mpa. If the pressure decrease, there may be leakage.

4) Remove the piezometer, open the valve core of liquid valve and gas valve completely.

5) Tighten the screw caps of valve and refrigerant charging vent.



2. Leakage Detection

1).With leakage detection.
Check if there is leakage with leakage detection.

2).With soap water. If leakage detection is not available, please use soap water for leakage detection. Apply soap water at the suspected position and keep the soap water for more than 3min. If there are air bubbles coming out of this position,
there a leakage.

2.9 Final test

1 Preparation of test operation.

- The client approves the air conditioner installation.
- Specify the important notes for air conditioner to the client.

2 Method of test operation

- Put through the power, press ON/OFF button on the remote controller to start operation.
- Press MODE button the select AUTO, COOL, DRY, FAN and HEAT to check whether the operation is normal or not.
- If ambient temperature is lower than 16°C, the air conditioner can't start cooling.

3. Maintenance

3.1 Failure code

Code	Fault name	Check the repair method
E1	Indoor fan failure	1.Confirm whether the indoor unit fan is well installed; 2. Confirm whether the indoor motor wiring is good; 3. Replace the main control board of the indoor unit; 4. Replace the motor of the indoor unit.
E3	Failure of the temperature sensor of the indoor coil	1. Check whether the ring temperature/tube temperature sensor is well plugged in; 2. Whether the resistance value of the measurement ring temperature/tube temperature sensor is within a reasonable range (5KΩ-20KΩ): (1) Replace the sensor with an open circuit or a resistance value outside a reasonable range; (2) If the resistance value is within a reasonable range, change the main control board of the indoor unit.
E4	Failure of the indoor ambient temperature sensor	
E0	Outdoor EE failure	Directly replace the main control board of the outdoor unit
E6	Indoor and outdoor communication failures	1. Confirm whether the wiring of the connecting cable to the terminal of the outdoor unit is correct-L (brown)/N (blue)/1 (black) 2. Replace the main control board of the outdoor unit. 3. Replace the main control board of the indoor unit. 4. Replace the connection cable of the indoor and outdoor units.
F1	The compressor starts abnormally	1. The press cannot be started normally, and the fault is reported as soon as it starts: (1) Confirm whether the compressor wiring (press end and external main control board end) is correct, U phase (white) / V phase (blue) / W phase (red); (2) Confirm whether the press coil is normal - measure the 3-phase terminal of the press, the resistance between any 2-phase terminal is generally within 1Ω-10Ω, if the open circuit/resistance value is very large, the compressor needs to be replaced (3) If there is no problem in (1)/(2), replace the main control board of the outdoor unit. 2. The press can be started normally, and the fault will be reported after running for a period of time: (1) Confirm the system status: whether the high and low pressure valves are all open; whether the system pressure is within the normal range; Confirm whether the indoor and outdoor installation environment of the air conditioner is good;

		whether the cooling and heating are normal; wait (2) If (1) confirm that there is no problem, replace the main control board of the outdoor unit.
F2	IPFCfault	Replace the main control board of the outdoor unit.
F5	Exhaust gas temperature sensor malfunction	1. Check whether the exhaust sensor is well plugged in; 2. Measure whether the resistance value of the outer ring/outer disk sensor is within a reasonable range (20KΩ-200KΩ): (1) Replace the sensor with an open circuit or a resistance value outside a reasonable range; (2) If the resistance value is within a reasonable range, change the main control board of the indoor unit.
F7	Outdoor coil temperature sensor malfunction	ODU discharge sensor and ODU PCB. ODU PCB，compressor, etc.
F8	Outdoor environment temperature sensor malfunction	
F9	Outdoor DC fan failure	1. Check whether the outdoor motor is well wired; 2. Replace the outdoor motor; 3. Replace the outdoor main control board
P1	Outdoor AC current protection	(1) Check whether there is a problem with the system status; (2) If there is no problem with the system status, directly replace the main control board of the outdoor unit.
P2	The press phase current is overcurrent	1. The press cannot be started normally, and the fault is reported as soon as it starts: - Replace the main control board of the outdoor unit. 2. The press can be started normally, and the fault will be reported after running for a period of time: (1) Confirm the system status: whether the high and low pressure valves are all open; whether the system pressure is within the normal range; Confirm whether the indoor and outdoor installation environment of the air conditioner is good; whether the cooling and heating are normal; wait (2) If (1) confirm that there is no problem, replace the main control board of the outdoor unit.
P3	AC voltage is overvoltage and undervoltage	1. Check whether the input voltage of the external unit is within the normal range of 165~265; 2. Replace the main control board of the outdoor unit.
P4	DC bus overvoltage and undervoltage	
P5	IPM Overtemperature	Normal function protection, such as continuous fault reporting, the main control board of the outdoor unit can be replaced.
P6	The exhaust temperature is too high.	Normal function protection, e.g. continuous fault reporting:
P7	The refrigeration inner coil is too low	

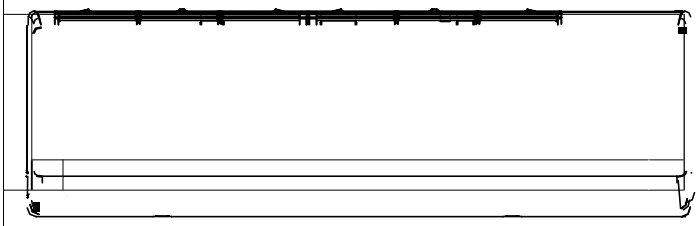
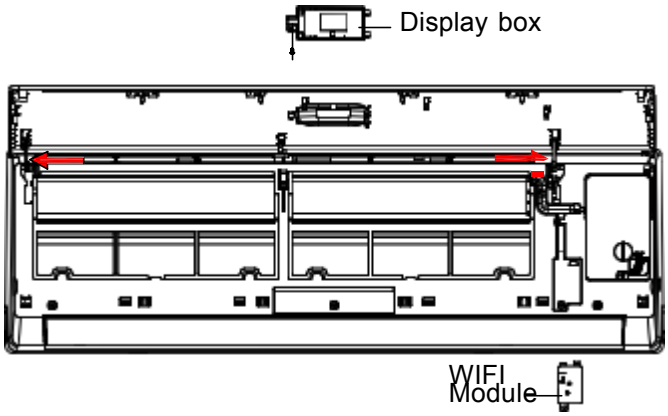
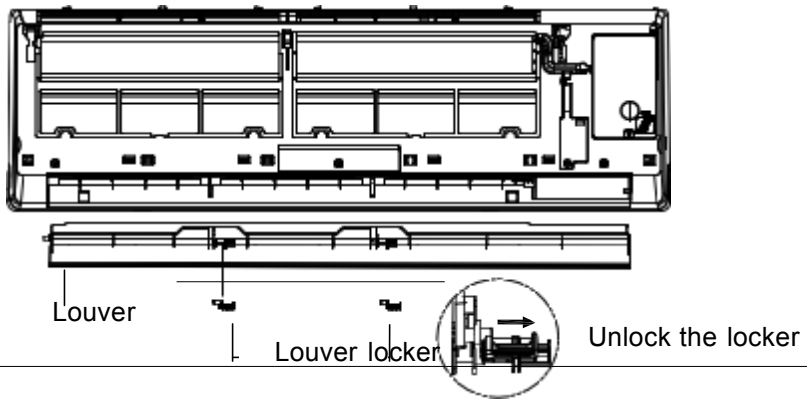
P8	The refrigeration outer coil is too high	(1) Check whether there is a problem with the system status; (2) If there is no problem with the system status, directly replace the main control board of the outdoor unit.
P9	The inner coil of heating is too high	
PA	The outdoor ambient temperature is above the normal range	Normal function protection, the temperature of the refrigeration outer ring is lower than 0 degrees, and the temperature of the heating outer ring is higher than 30 degrees, and the fault can be reset.
PC	Abnormal failure of refrigerant circulation	Check whether the high and low pressure valves are open; 2. Check whether the compressor wiring is consistent with the wiring required by the wiring diagram; 3. Check whether there is refrigerant in the machine, if there is no refrigerant, you need to take the time to refill the refrigerant.

Note: Remote controller FAILURE CODE Querying function

As shown in the failure codes, some of the codes (Fb~bj) need to press remote control for inspection.
While unit on operation, press the ECO button 8 times with 8 seconds, the buzzer BIBI 2 times, you can inspect the special failu

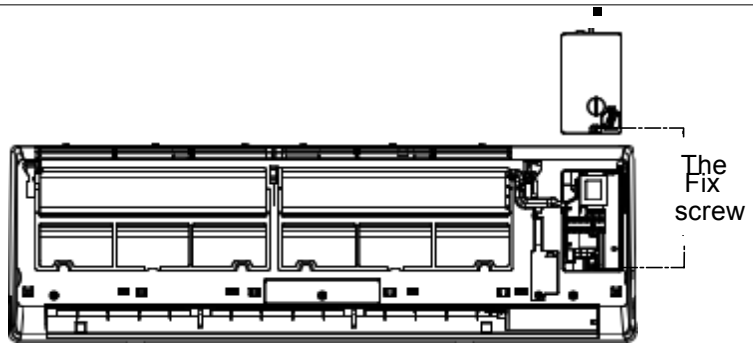
4. Disassembly IDU & ODU

4.1. IDU Disassembly

Steps	Reference photo
1. Before disassembly	
The orginal status.	
2. Disassembly front panel, display board and WIFI module.	
A. Open front panel. B. Remove one screw and take the displa box out from the panel. C. Release panel axis which shown in re arrows out from middle frame and tak the panel out. D. Unscrew and take the WIFI module ou from middle frame.	
3. Remove the louver.	
Unlock the louver lockers (clip), bend the louver slightly by hands and remove it out from middle frame and stepping motor.	

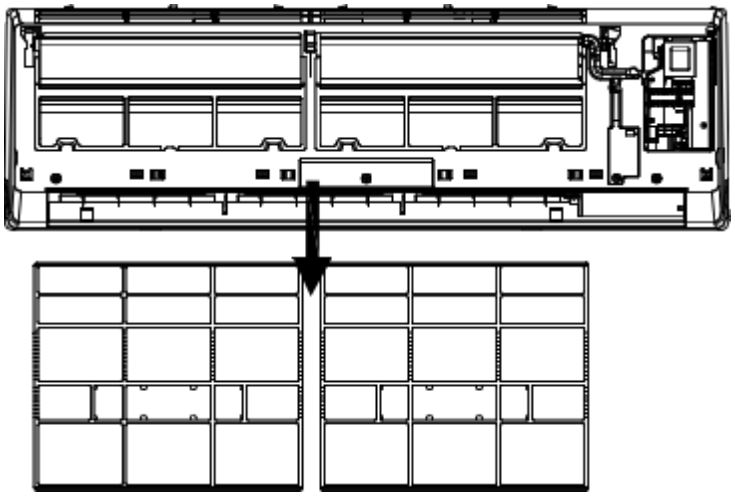
4. Remove the electric control box cover

Unfix one screw on the cover of electric box, and remove the cover.



5. Remove the filter

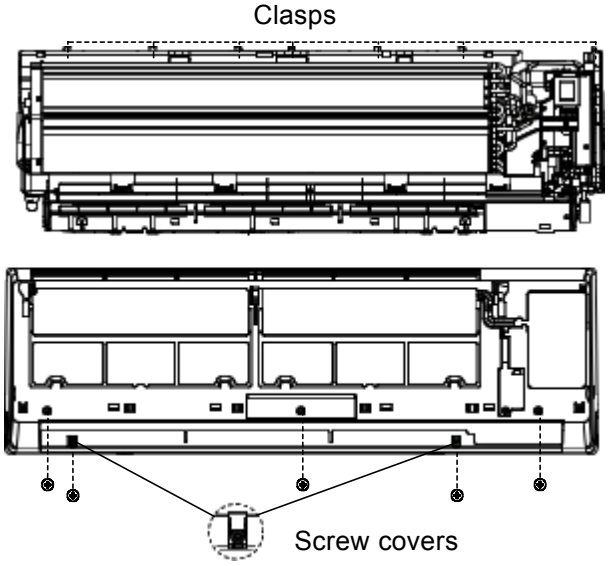
Push the filter upwards a little, you can take it out from unit.



6. Disassembly the middle frame.

A. Open the screw cover, and unfix screw with cross screwdriver.

B. Remove the middle frame by loosing the clasps with the unit base as shown in the picture and take the frame out.



7. Disassembly the electric control box.

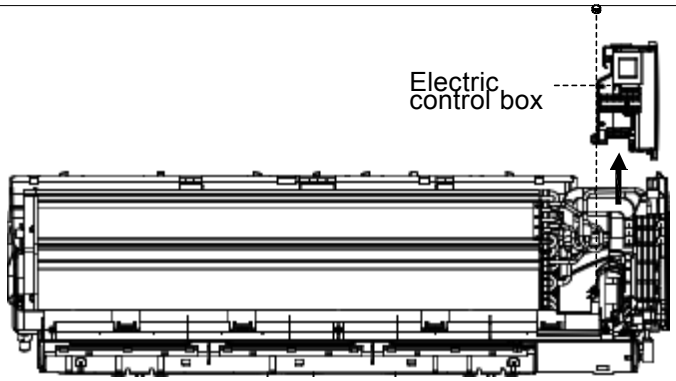
A. Remove the RT & IPT out from evaporator;

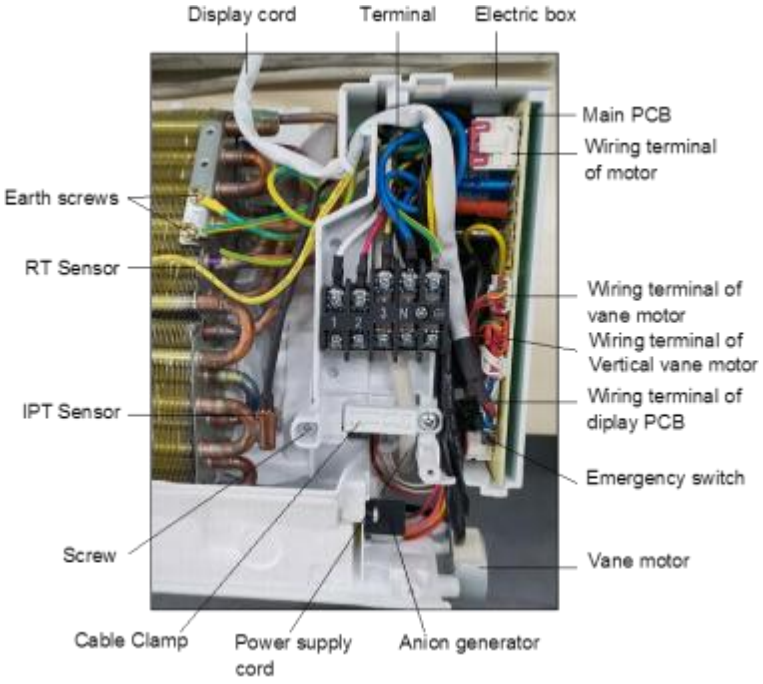
B. Unscrew all the earth ground wirings on the evaporator.

C. Take all the connectors out from PCB.

D. Unfix one screw of the control box with unit BASE FRAME, and take the control box out from unit.

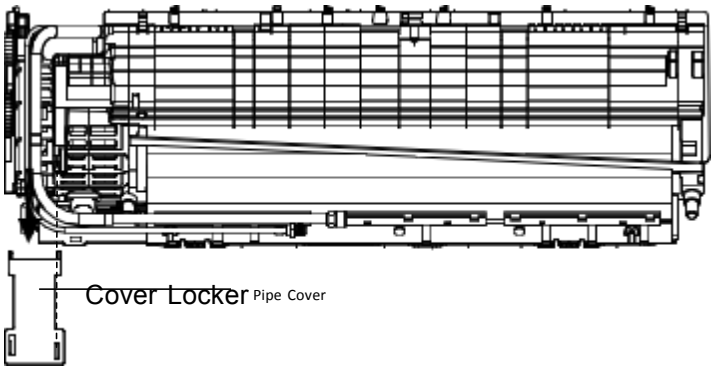
Note: The right picture for your reference only, for the exact model the wiring connection may have a little difference.





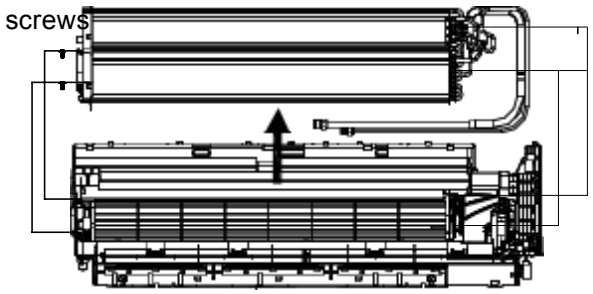
8. Remove the PIPE COVER

Loosing the lower edge of the PIPE COVER from BASE FRAME, and take the COVER out from unit.



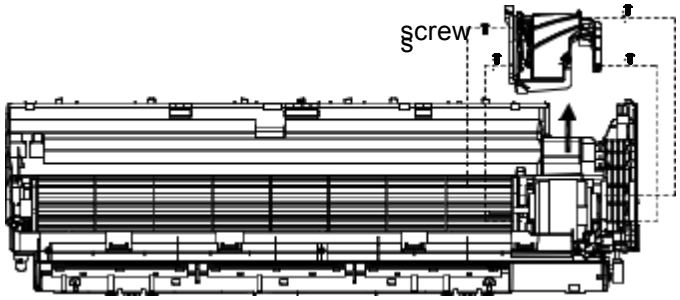
9. Disassembly the evaporator

A. Unfix 2 screws of left side shown as picture.
B. Unfix 2 screws of right side on motor cover/right support plate.
C. Take the evaporator out from unit by uplifting the IUPUT/OUTPUT pipes slightly.



10. Remove the MOTOR COVER

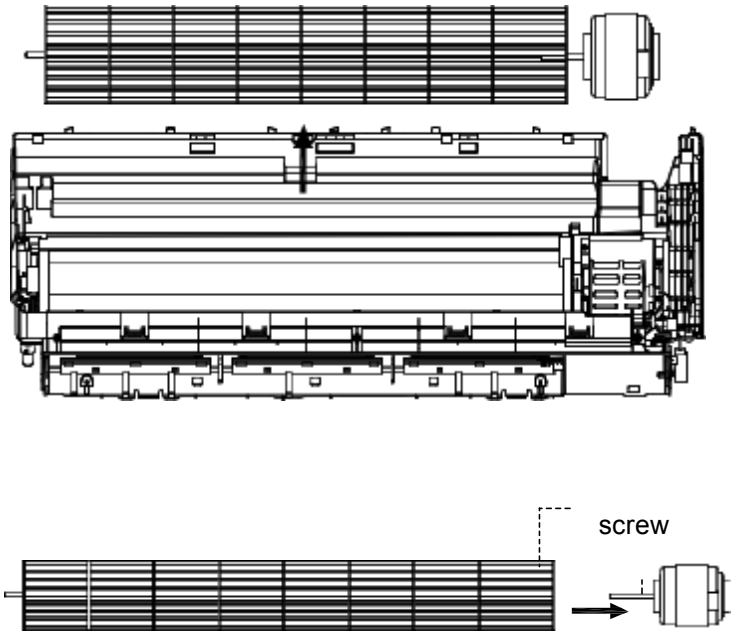
Unfix 4 screws on the motor cover with base frame.



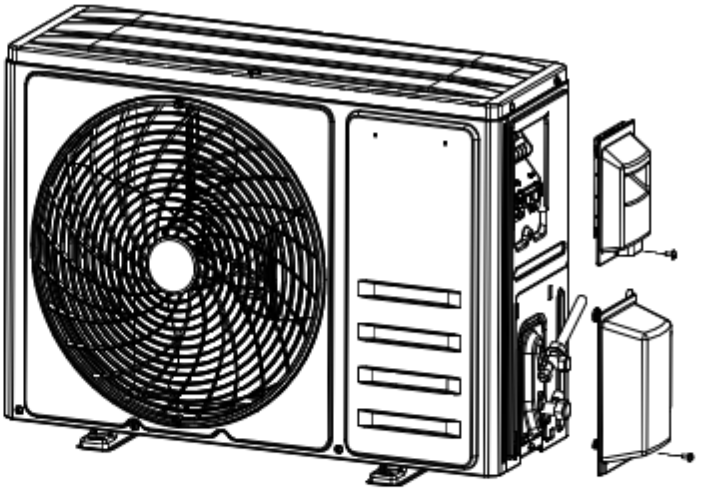
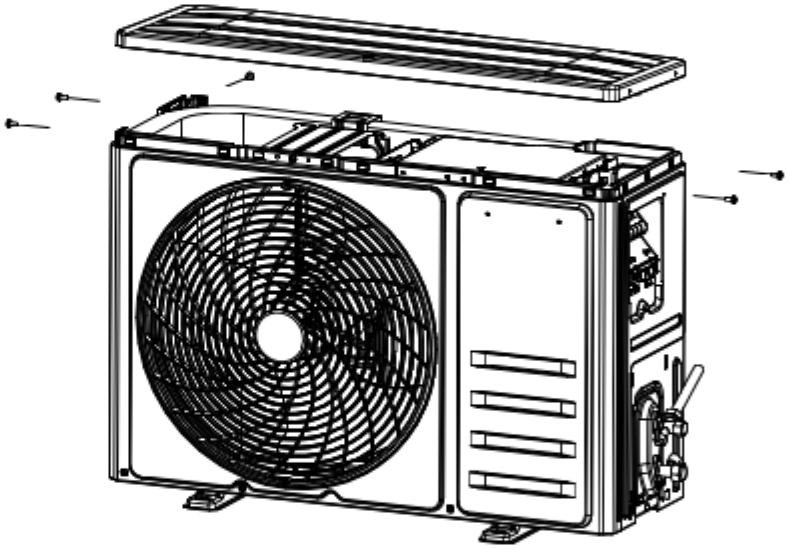
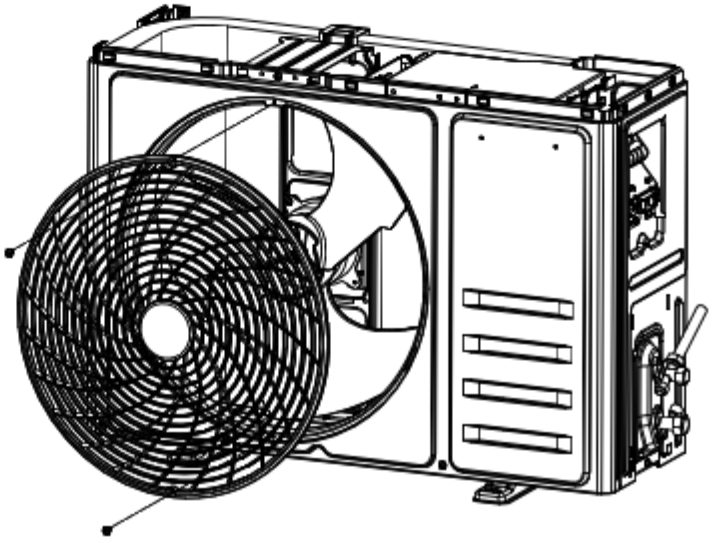
11. Disassembly fan motor and fan blade.

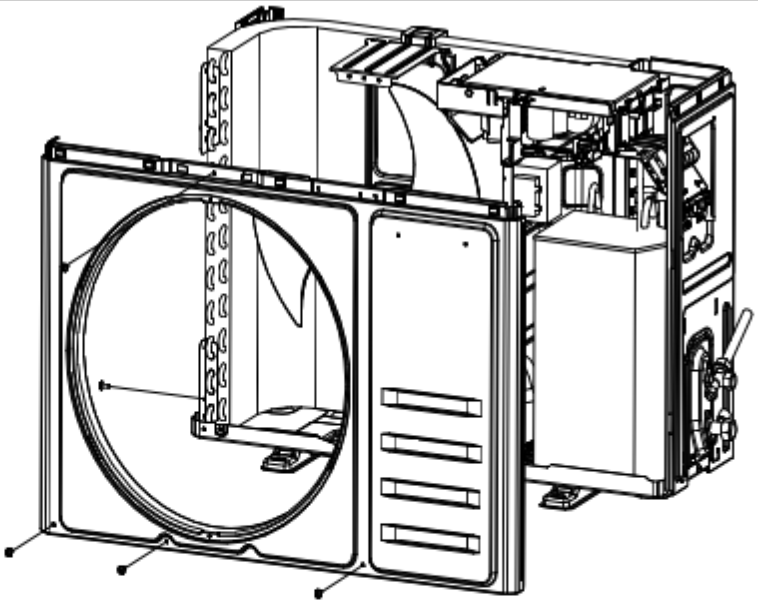
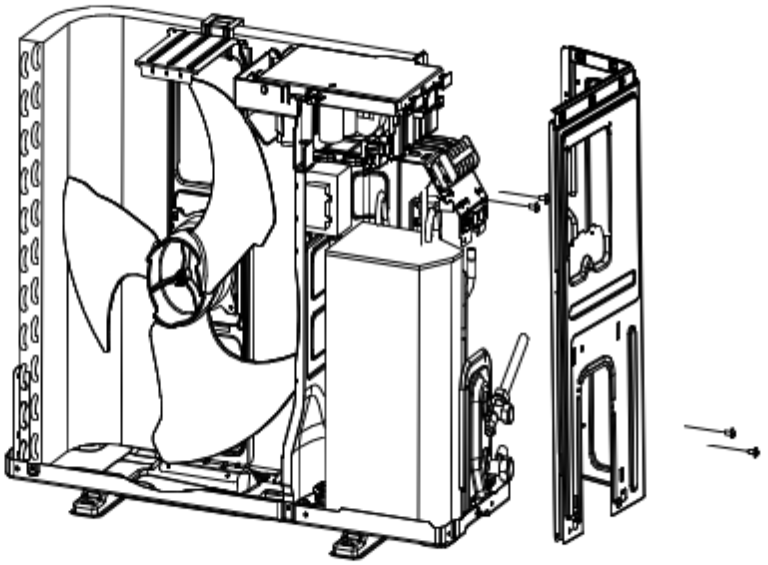
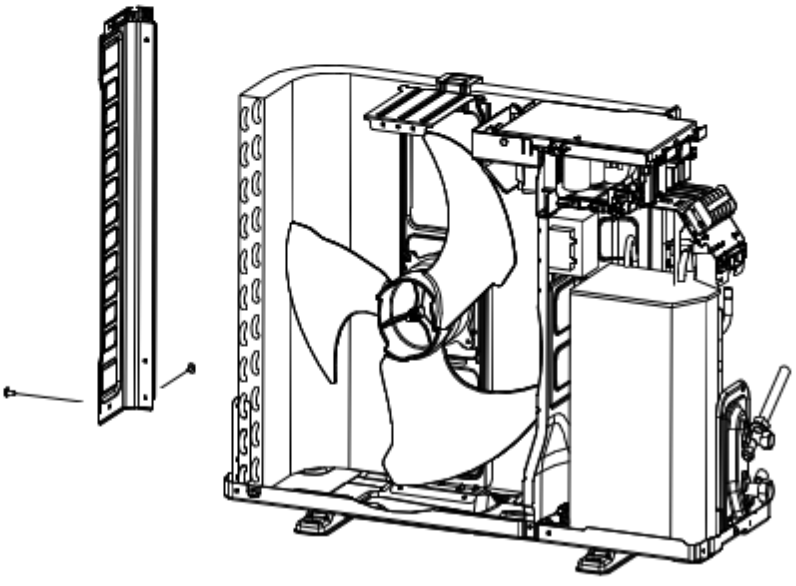
A. Uplift the fan blade and fan motor, take the base frame out.

B. Unfix one screw on the axis of fan motor, and you can get fan blade and fan motor separately.

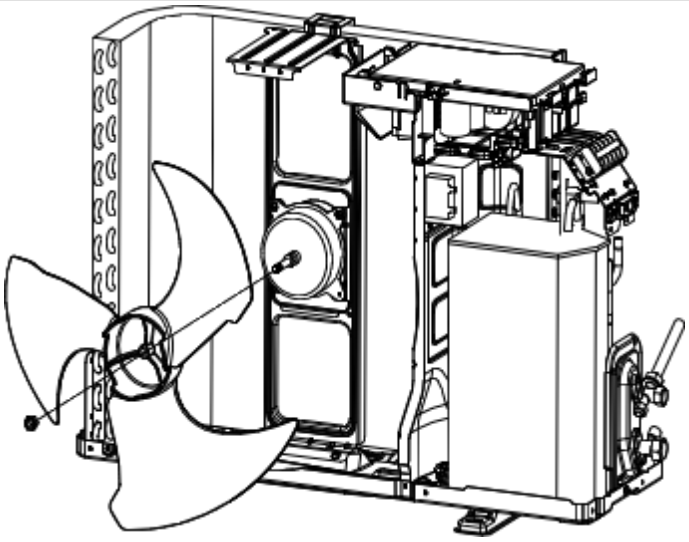


4.2 ODU Assembly

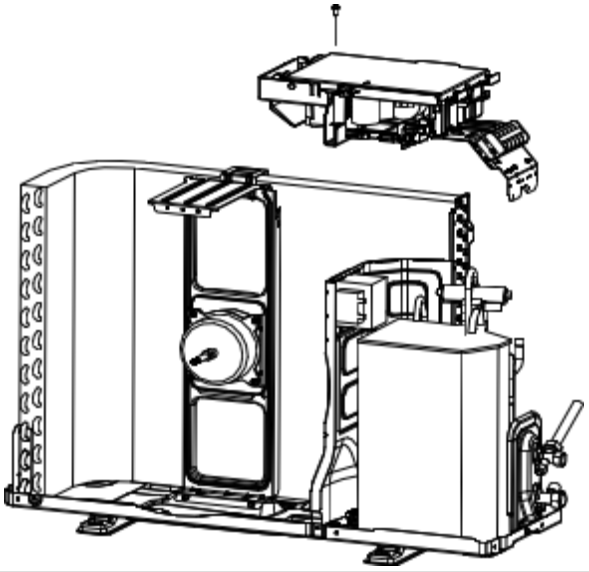
Step		Reference picture
step1：Remove the PCB Cover , valve Cover and top cover		
A	1). Unfix one screw on the PCB cover, you can take the cover out from unit. 2). Unfix one screw on the valve cover, you can take it out easily.	
B	Unfix screws btw the top cover with front panel, left and right plate, then you can take the top cover out.	
step2：Disassemble the Fan Guard and Front Panel		
A	Unfix screws on front panel with fan guard.	

B	ODU middle separate plate and base plate, uplift front panel you can take it out from unit.	
step3：Disassemble the Left and Right plate.		
A	Unfix screws btw **Right Plate** and the **Electric Box assembly**, **Valve Plate** , **Base Plate**, then you can take the Right plate out.	
B	Unfix screws btw Left Plate, Base plate and Condenser plate, you can take the left plate out.	

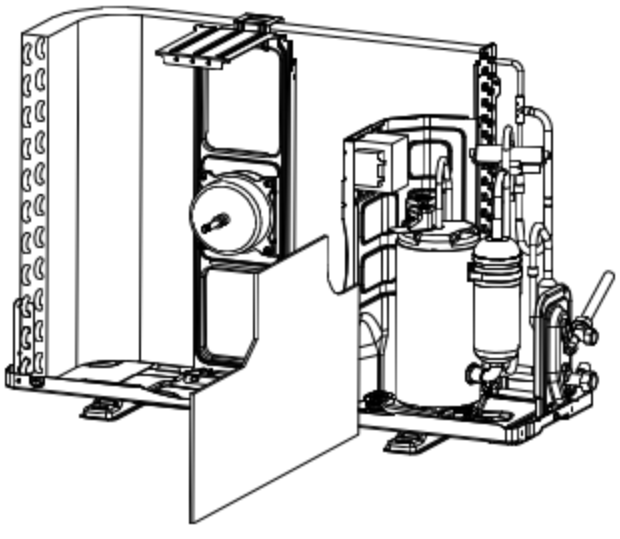
step4：Disassemble the Axis Fan Blade

A	Unscrew the fan blade nut, and take the blade out.	

step5：Disassemble the electric box

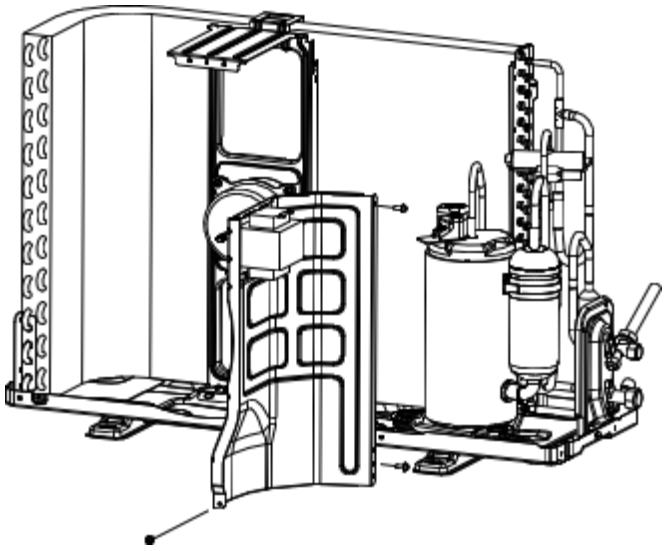
	Unfix screw btw Electric Box and motor supporter etc. loosen the wiring clamp, then you can take the control box out.	

step6： take out the noise cotton

A	Shown as picture to take the cotton out	

step7：Disassemble the separate plate

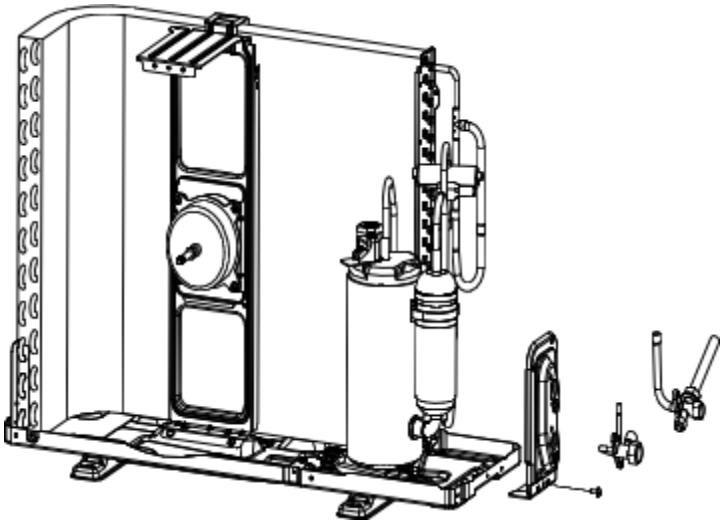
Unfix the screw btw separate plate and unit, and take it out



step8：Disassemble the 2 and 3-way valve

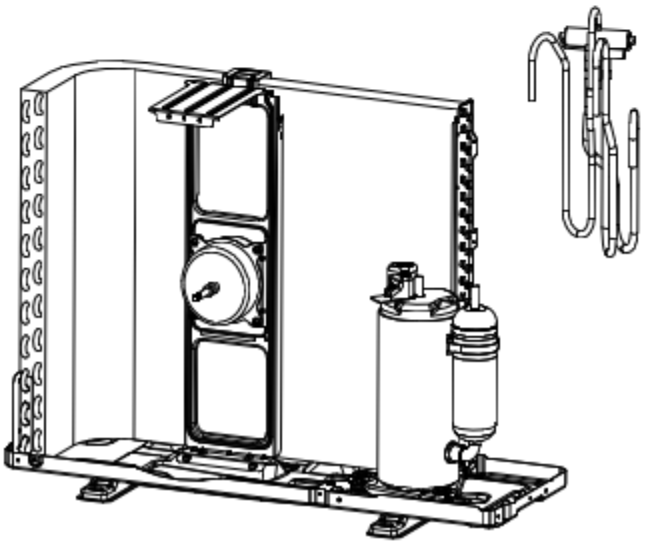
Unfix screw btw Valve plate and base, you can take the 2-way and 3-way valve out by welding.

Note:
1). The welding can only place while no gas in the unit.
2). Pay attention to the fire to prevent any injury.



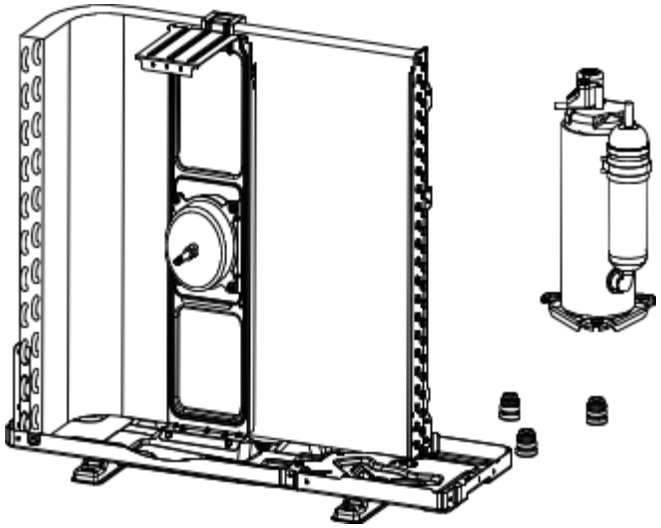
step9：Disassemble the 4-way valve assembly

Take the 4-way valve out from system by welding. Make sure no hurt to the compressor and nameplate, etc.



step10：Disassemble the compressor.

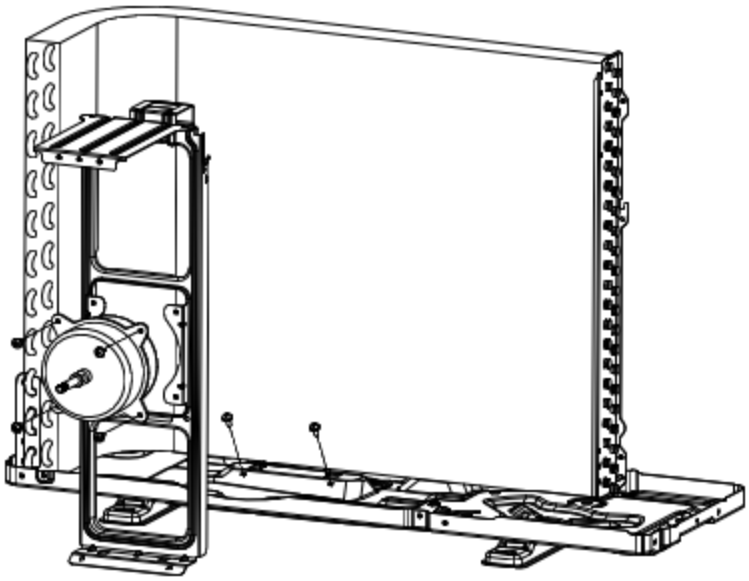
Unscrew the nuts and take the compressor out.



step11：Remove the fan motor and fan supporter.

Unfix screws btw fan motor with supporter, and supporter with base plate.

Note:
Pay attention to the motor wiring, it can't be taken out by force.

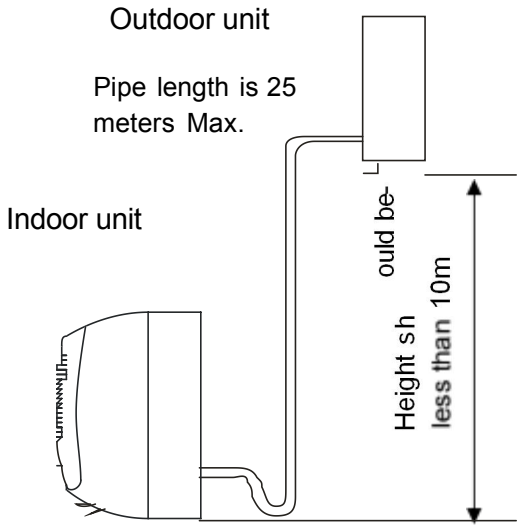


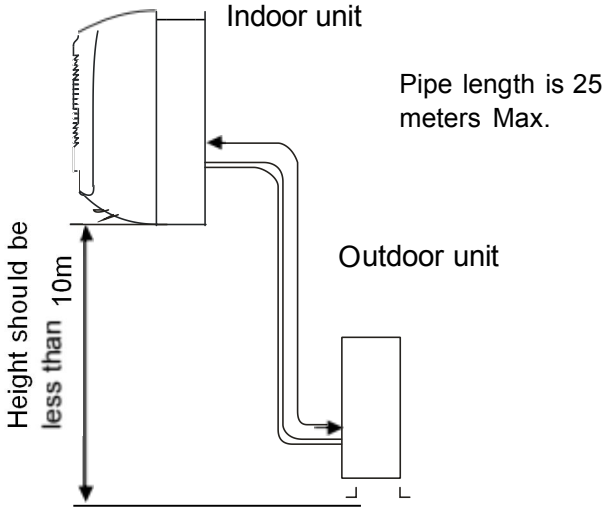
APPENDIX

Appendix 1 The comparison table of Celsius-Fahrenheit temperature

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

Appendix 2 The Pipe length and Gas charging





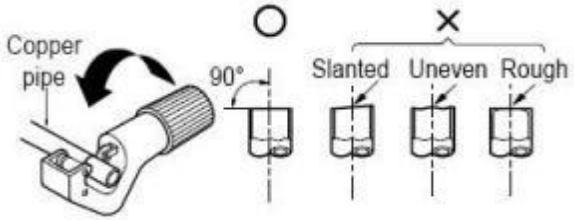
Mode	Standard length (ft)	Refrigerant piping Max. length (ft) A	Additional refrigerant charging: Xg= B * (A-5m) B
9K	9.843	82.021	0.215oz/ft
12K	9.843	82.021	0.215oz/ft
18K	9.843	82.021	0.322oz/ft
24K	9.843	82.021	0.322oz/ft
30K	9.843	82.021	0.322oz/ft
36K	9.843	82.021	0.322oz/ft

Appendix 3 Pipes Flaring

Main cause for gas leakage is due to defect in flaring work. Carry out correct flaring work in the following procedure.

A. Cut the pipes and the cable.

1) Use the piping kit accessory or the pipes purchased locally.
2) Measure the distance between the indoor and the outdoor unit.
3) Cut the pipes a little longer than measured distance.
4) Cut the cable 1.5m longer than the pipe length.



B. Burrs removal

1) Completely remove all burrs from the cut cross section of pipe/tube.
2) Put the end of the copper tube/pipe in a down ward direction as you remove burrs in order to avoid dropping burrs into the tubing.

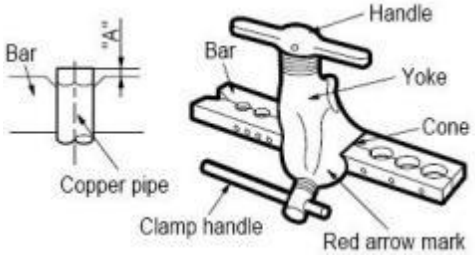


C. Flaring work

• Carry out flaring work using flaring tool as shown below.

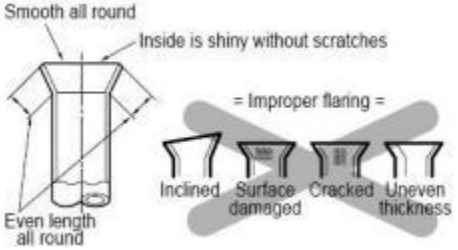
Outside diameter		A
mm	inch	mm
ø6.35	1/4	1.0~1.3
ø9.52	3/8	0.8~1.0
ø12.7	1/2	0.5~0.8
ø15.88	5/8	0.5~0.8

Firmly hold copper pipe in a die in the dimension shown in the table above.



D. Check

1) Compare the flared work with figure below.
2) If flare is noted to be defective, cut off the flared section and do flaring work again.



Appendix 4 THERMISTOR TEMPERATURE CHARACTERISTICS

1) Indoor and outdoor unit air sensor and exchange temperature charcateristics.

T(℉)	T(℃)	R(KΩ) Min	R(KΩ) Center	R(KΩ) Max	T(℉)	T(℃)	R(KΩ) Min	R(KΩ) Center	R(KΩ) Max
-40	-40.0	287.75	294.13	300.64	20	-6.7	45.823	46.408	46.999
-39	-39.4	279.06	285.20	291.46	21	-6.1	44.513	45.075	45.643
-38	-38.9	270.60	276.51	282.55	22	-5.6	43.245	43.785	44.330
-37	-38.3	262.39	268.08	273.88	23	-5.0	42.017	42.535	43.058
-36	-37.8	254.41	259.88	265.47	24	-4.4	40.827	41.324	41.827
-35	-37.2	246.66	251.93	257.31	25	-3.9	39.675	40.152	40.634
-34	-36.7	239.13	244.20	249.38	26	-3.3	38.558	39.017	39.480
-33	-36.1	231.82	236.71	241.68	27	-2.8	37.477	37.917	38.361
-32	-35.6	224.73	229.43	234.22	28	-2.2	36.429	36.852	37.278
-31	-35.0	217.85	222.37	226.97	29	-1.7	35.414	35.820	36.229
-30	-34.4	211.17	215.52	219.94	30	-1.1	34.430	34.820	35.213
-29	-33.9	204.69	208.87	213.13	31	-0.6	33.477	33.851	34.229
-28	-33.3	198.41	202.42	206.52	32	0.0	32.554	32.913	33.275
-27	-32.8	192.31	196.17	200.11	33	0.6	31.643	31.987	32.334
-26	-32.2	186.40	190.11	193.90	34	1.1	30.760	31.090	31.424
-25	-31.7	180.67	184.24	187.88	35	1.7	29.905	30.222	30.541
-24	-31.1	175.11	178.54	182.04	36	2.2	29.076	29.380	29.687
-23	-30.6	169.72	173.03	176.39	37	2.8	28.274	28.565	28.859
-22	-30.0	164.50	167.68	170.91	38	3.3	27.496	27.776	28.057
-21	-29.4	159.44	162.49	165.60	39	3.9	26.742	27.010	27.281
-20	-28.9	154.54	157.47	160.45	40	4.4	26.011	26.269	26.528
-19	-28.3	149.79	152.60	155.47	41	5.0	25.303	25.550	25.798
-18	-27.8	145.18	147.89	150.65	42	5.6	24.617	24.853	24.864
-17	-27.2	140.72	143.33	145.97	43	6.1		24.178	24.192

							23.951		
-16	-26.7	136.40	138.90	141.45	44	6.7	23.306	23.523	23.540
-15	-26.1	132.22	134.62	137.06	45	7.2	22.680	22.888	22.908
-14	-25.6	128.16	130.47	132.82	46	7.8	22.073	22.273	22.295
-13	-25.0	124.24	126.46	128.71	47	8.3	21.484	21.676	21.700
-12	-24.4	120.43	122.57	124.73	48	8.9	20.913	21.097	21.123
-11	-23.9	116.75	118.80	120.88	49	9.4	20.359	20.535	20.563
-10	-23.3	113.19	115.15	117.15	50	10.0	19.821	19.990	20.020
-9	-22.8	109.73	111.62	113.54	51	10.6	19.300	19.461	19.494
-8	-22.2	106.39	108.21	110.05	52	11.1	18.794	18.949	18.982
-7	-21.7	103.15	104.90	106.67	53	11.7	18.302	18.451	18.486
-6	-21.1	100.02	101.69	103.39	54	12.2	17.826	17.968	18.005
-5	-20.6	96.984	98.593	100.23	55	12.8	17.363	17.499	17.537
-4	-20.0	94.046	95.592	97.160	56	13.3	16.914	17.044	17.084
-3	-19.4	91.202	92.687	94.193	57	13.9	16.478	16.602	16.643
-2	-18.9	88.448	89.874	91.321	58	14.4	16.054	16.174	16.215
-1	-18.3	85.783	87.152	88.541	59	15.0	15.643	15.757	15.800
0	-17.8	83.202	84.517	85.851	60	15.6	15.244	15.353	15.397
1	-17.2	80.703	81.967	83.247	61	16.1	14.856	14.961	15.005
2	-16.7	78.285	79.498	80.728	62	16.7	14.479	14.579	14.625
3	-16.1	75.943	77.108	78.289	63	17.2	14.113	14.209	14.255
4	-15.6	73.676	74.795	75.929	64	17.8	13.758	13.849	13.896
5	-15.0	71.482	72.557	73.646	65	18.3	13.412	13.500	13.547
6	-14.4	69.358	70.390	71.435	66	18.9	13.077	13.160	13.208
7	-13.9	67.301	68.292	69.296	67	19.4	12.750	12.831	12.879
8	-13.3	65.310	66.262	67.226	68	20.0	12.434	12.510	12.558
9	-12.8	63.382	64.296	65.222	69	20.6	12.125	12.199	12.247

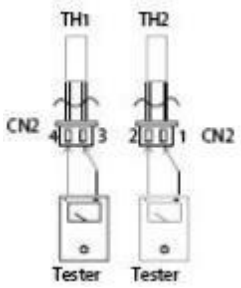
10	-12.2	61.516	62.394	63.283	70	21.1	11.826	11.896	11.945
11	-11.7	59.709	60.552	61.406	71	21.7	11.535	11.602	11.651
12	-11.1	57.960	58.770	59.589	72	22.2	11.252	11.315	11.365
13	-10.6	56.267	57.044	57.830	73	22.8	10.977	11.037	11.087
14	-10.0	54.627	55.373	56.128	74	23.3	10.709	10.767	10.817
15	-9.4	53.039	53.756	54.481	75	23.9	10.449	10.504	10.554
16	-8.9	51.501	52.190	52.886	76	24.4	10.196	10.249	10.299
17	-8.3	50.013	50.673	51.342	77	25.0	9.9500	10.000	10.050
18	-7.8	48.571	49.205	49.847	78	25.6	9.7090	9.7590	9.8090
19	-7.2	47.175	47.784	48.400	79	26.1	9.4747	9.5246	9.5745

T(℉)	T(℃)	R(KΩ) Min	R(KΩ) Center	R(KΩ) Max	T(℉)	T(℃)	R(KΩ) Min	R(KΩ) Center	R(KΩ) Max
80	26.7	9.2466	9.2965	9.3464	140	60.0	2.4470	2.4766	2.5064
81	27.2	9.0248	9.0745	9.1243	141	60.6	2.3984	2.4276	2.4570
82	27.8	8.8089	8.8585	8.9082	142	61.1	2.3509	2.3797	2.4088
83	28.3	8.5989	8.6483	8.6979	143	61.7	2.3044	2.3329	2.3617
84	28.9	8.3944	8.4438	8.4932	144	62.2	2.2591	2.2872	2.3157
85	29.4	8.1955	8.2447	8.2939	145	62.8	2.2147	2.2425	2.2707
86	30.0	8.0019	8.0508	8.0999	146	63.3	2.1714	2.1989	2.2267
87	30.6	7.8135	7.8622	7.9110	147	63.9	2.1290	2.1562	2.1836
88	31.1	7.6300	7.6785	7.7271	148	64.4	2.0876	2.1145	2.1416
89	31.7	7.4514	7.4997	7.5480	149	65.0	2.0471	2.0737	2.1005
90	32.2	7.2776	7.3255	7.3736	150	65.6	2.0076	2.0338	2.0603
91	32.8	7.1083	7.1560	7.2038	151	66.1	1.9689	1.9948	2.0210
92	33.3	6.9435	6.9909	7.0384	152	66.7	1.9311	1.9567	1.9826
93	33.9	6.7830	6.8301	6.8773	153	67.2	1.8941	1.9194	1.9450
94	34.4	6.6267	6.6735	6.7204	154	67.8	1.8580	1.8830	1.9082

95	35.0	6.4744	6.5209	6.5675	155	68.3	1.8226	1.8473	1.8723
96	35.6	6.3262	6.3723	6.4186	156	68.9	1.7881	1.8125	1.8371
97	36.1	6.1818	6.2276	6.2735	157	69.4	1.7543	1.7784	1.8028
98	36.7	6.0411	6.0865	6.1322	158	70.0	1.7212	1.7450	1.7691
99	37.2	5.9040	5.9491	5.9944	159	70.6	1.6889	1.7124	1.7362
100	37.8	5.7705	5.8153	5.8602	160	71.1	1.6572	1.6805	1.7040
101	38.3	5.6404	5.6848	5.7294	161	71.7	1.6263	1.6493	1.6725
102	38.9	5.5137	5.5577	5.6019	162	72.2	1.5960	1.6187	1.6417
103	39.4	5.3901	5.4338	5.4776	163	72.8	1.5664	1.5888	1.6115
104	40.0	5.2698	5.3130	5.3565	164	73.3	1.5374	1.5596	1.5820
105	40.6	5.1524	5.1953	5.2384	165	73.9	1.5091	1.5310	1.5531
106	41.1	5.0381	5.0806	5.1233	166	74.4	1.4814	1.5030	1.5249
107	41.7	4.9266	4.9687	5.0111	167	75.0	1.4542	1.4756	1.4972
108	42.2	4.8180	4.8597	4.9016	168	75.6	1.4277	1.4488	1.4701
109	42.8	4.7120	4.7534	4.7949	169	76.1	1.4017	1.4225	1.4436
110	43.3	4.6088	4.6497	4.6909	170	76.7	1.3762	1.3968	1.4177
111	43.9	4.5081	4.5486	4.5894	171	77.2	1.3513	1.3717	1.3923
112	44.4	4.4099	4.4500	4.4904	172	77.8	1.3269	1.3470	1.3674
113	45.0	4.3141	4.3539	4.3939	173	78.3	1.3031	1.3229	1.3431
114	45.6	4.2208	4.2601	4.2997	174	78.9	1.2797	1.2993	1.3192
115	46.1	4.1297	4.1687	4.2079	175	79.4	1.2569	1.2762	1.2959
116	46.7	4.0409	4.0795	4.1183	176	80.0	1.2345	1.2536	1.2730
117	47.2	3.9543	3.9924	4.0308	177	80.6	1.2125	1.2315	1.2507
118	47.8	3.8697	3.9075	3.9455	178	81.1	1.1911	1.2098	1.2287
119	48.3	3.7873	3.8247	3.8623	179	81.7	1.1701	1.1885	1.2073
120	48.9	3.7069	3.7438	3.7811	180	82.2	1.1495	1.1677	1.1862
121	49.4	3.6284	3.6650	3.7018	181	82.8		1.1473	1.1656

							1.1293		
122	50.0	3.5518	3.5880	3.6245	182	83.3	1.1096	1.1274	1.1454
123	50.6	3.4771	3.5129	3.5490	183	83.9	1.0902	1.1078	1.1257
124	51.1	3.4042	3.4396	3.4753	184	84.4	1.0713	1.0887	1.1063
125	51.7	3.3330	3.3680	3.4033	185	85.0	1.0527	1.0699	1.0873
126	52.2	3.2635	3.2982	3.3331	186	85.6	1.0345	1.0515	1.0687
127	52.8	3.1957	3.2300	3.2645	187	86.1	1.0167	1.0335	1.0505
128	53.3	3.1295	3.1634	3.1976	188	86.7	0.9993	1.0159	1.0327
129	53.9	3.0649	3.0984	3.1322	189	87.2	0.9822	0.9986	1.0152
130	54.4	3.0019	3.0350	3.0684	190	87.8	0.9654	0.9816	0.9980
131	55.0	2.9403	2.9730	3.0061	191	88.3	0.9490	0.9650	0.9812
132	55.6	2.8801	2.9125	2.9452	192	88.9	0.9329	0.9487	0.9648
133	56.1	2.8214	2.8534	2.8857	193	89.4	0.9172	0.9328	0.9486
134	56.7	2.7641	2.7957	2.8277	194	90.0	0.9017	0.9171	0.9328
135	57.2	2.7081	2.7394	2.7710	195	90.6	0.8866	0.9018	0.9173
136	57.8	2.6534	2.6843	2.7156	196	91.1	0.8717	0.8868	0.9021
137	58.3	2.6000	2.6306	2.6614	197	91.7	0.8572	0.8721	0.8872
138	58.9	2.5478	2.5780	2.6085	198	92.2	0.8429	0.8576	0.8726
139	59.4	2.4968	2.5267	2.5569	199	92.8	0.8289	0.8435	0.8582

R—Resistance
Resistance at 25℃:10 kΩ .



TH1: indoor room temperature sensor and outside air temperature sensor
TH2: indoor exchange temperature sensor and outside exchange temperature sensor
Before measuring resistance, disconnect connectors as shown above.

2) Outdoor unit discharge sensor temperature characteristics

R—Resistance
Resistance at 25℃:50 kΩ

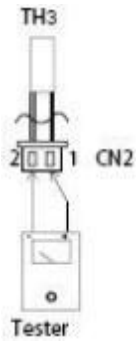
T(℉)	T(℃)	R(KΩ) Min	R(KΩ) Center	R(KΩ) Max	T(℉)	T(℃)	R(KΩ) Min	R(KΩ) Center	R(KΩ) Max
-40	-40.0	1463.3	1495.8	1529.1	20	-6.7	223.34	226.16	229.02
-39	-39.4	1423.0	1454.5	1486.6	21	-6.1	216.91	219.62	222.35
-38	-38.9	1383.3	1413.7	1444.7	22	-5.6	210.70	213.30	215.93
-37	-38.3	1344.3	1373.6	1403.5	23	-5.0	204.71	207.21	209.73
-36	-37.8	1305.9	1334.2	1363.1	24	-4.4	198.94	201.33	203.76
-35	-37.2	1268.2	1295.5	1323.4	25	-3.9	193.36	195.66	197.99
-34	-36.7	1231.3	1257.6	1284.4	26	-3.3	187.98	190.19	192.43
-33	-36.1	1195.0	1220.4	1246.2	27	-2.8	182.79	184.92	187.06
-32	-35.6	1159.5	1184.0	1208.9	28	-2.2	177.78	179.83	181.88
-31	-35.0	1124.8	1148.3	1172.3	29	-1.7	172.95	174.91	176.89
-30	-34.4	1090.9	1113.5	1136.6	30	-1.1	168.29	170.17	172.07
-29	-33.9	1057.8	1079.5	1101.7	31	-0.6	163.78	165.59	167.42
-28	-33.3	1025.4	1046.3	1067.7	32	0.0	159.44	161.18	162.94
-27	-32.8	993.85	1014.0	1034.5	33	0.6	155.11	156.78	158.47
-26	-32.2	963.09	982.45	1002.2	34	1.1	150.91	152.52	154.14
-25	-31.7	933.13	951.74	970.69	35	1.7	146.84	148.38	149.93
-24	-31.1	903.96	921.84	940.04	36	2.2	142.88	144.36	145.86
-23	-30.6	875.58	892.75	910.24	37	2.8	139.04	140.47	141.90
-22	-30.0	847.98	864.47	881.26	38	3.3	135.32	136.69	138.06
-21	-29.4	821.15	836.98	853.10	39	3.9	131.71	133.02	134.34
-20	-28.9	795.09	810.29	825.76	40	4.4	128.20	129.46	130.73
-19	-28.3	769.78	784.37	799.22	41	5.0	124.79	126.00	127.22
-18	-27.8	745.22	759.22	773.47	42	5.6	121.49	122.65	123.82
-17	-27.2	721.39	734.83	748.49	43	6.1	118.28	119.39	120.51
-16	-26.7	698.29	711.17	724.28	44	6.7	115.16	116.23	117.31

-15	-26.1	675.89	688.25	700.82	45	7.2	112.14	113.16	114.20
-14	-25.6	654.18	666.03	678.09	46	7.8	109.20	110.19	111.17
-13	-25.0	633.15	644.52	656.07	47	8.3	106.35	107.29	108.24
-12	-24.4	612.78	623.68	634.76	48	8.9	103.58	104.48	105.39
-11	-23.9	593.07	603.52	614.14	49	9.4	100.89	101.76	102.63
-10	-23.3	573.99	584.01	594.18	50	10.0	98.276	99.108	99.945
-9	-22.8	555.52	565.13	574.88	51	10.6	95.737	96.535	97.338
-8	-22.2	537.67	546.87	556.22	52	11.1	93.271	94.037	94.806
-7	-21.7	520.39	529.21	538.17	53	11.7	90.876	91.609	92.346
-6	-21.1	503.69	512.15	520.73	54	12.2	88.548	89.251	89.958
-5	-20.6	487.55	495.65	503.88	55	12.8	86.287	86.960	87.637
-4	-20.0	471.95	479.71	487.59	56	13.3	84.089	84.735	85.383
-3	-19.4	456.87	464.31	471.86	57	13.9	81.953	82.572	83.193
-2	-18.9	442.31	449.44	456.67	58	14.4	79.878	80.471	81.066
-1	-18.3	428.24	435.07	442.00	59	15.0	77.861	78.429	78.998
0	-17.8	414.65	421.19	427.84	60	15.6	75.900	76.444	76.989
1	-17.2	401.52	407.80	414.16	61	16.1	73.995	74.515	75.037
2	-16.7	388.85	394.87	400.96	62	16.7	72.142	72.640	73.140
3	-16.1	376.62	382.38	388.22	63	17.2	70.341	70.818	71.296
4	-15.6	364.81	370.33	375.93	64	17.8	68.590	69.046	69.503
5	-15.0	353.41	358.70	364.06	65	18.3	66.887	67.323	67.761
6	-14.4	342.41	347.48	352.62	66	18.9	65.232	65.649	66.067
7	-13.9	331.79	336.65	341.57	67	19.4	63.622	64.020	64.420
8	-13.3	321.54	326.20	330.92	68	20.0	62.056	62.437	62.819
9	-12.8	311.65	316.12	320.64	69	20.6	60.533	60.897	61.262
10	-12.2	302.11	306.39	310.73	70	21.1	59.052	59.400	59.748
11	-11.7	292.90	297.01	301.16	71	21.7		57.943	58.276

							57.611		
12	-11.1	284.02	287.96	291.94	72	22.2	56.209	56.527	56.844
13	-10.6	275.45	279.22	283.04	73	22.8	54.846	55.148	55.451
14	-10.0	267.18	270.80	274.46	74	23.3	53.519	53.808	54.097
15	-9.4	259.20	262.68	266.19	75	23.9	52.228	52.504	52.779
16	-8.9	251.51	254.84	258.21	76	24.4	50.972	51.235	51.497
17	-8.3	244.08	247.28	250.51	77	25.0	49.750	50.000	50.250
18	-7.8	236.92	239.98	243.08	78	25.6	48.552	48.802	49.052
19	-7.2	230.01	232.95	235.92	79	26.1	47.387	47.637	47.886

T(℉)	T(℃)	R(KΩ) Min	R(KΩ) Center	R(KΩ) Max	T(℉)	T(℃)	R(KΩ) Min	R(KΩ) Center	R(KΩ) Max
80	26.7	46.253	46.502	46.751	140	60.0	12.198	12.345	12.494
81	27.2	45.149	45.397	45.646	141	60.6	11.953	12.098	12.245
82	27.8	44.074	44.322	44.571	142	61.1	11.713	11.857	12.003
83	28.3	43.028	43.275	43.523	143	61.7	11.480	11.622	11.765
84	28.9	42.009	42.256	42.503	144	62.2	11.251	11.391	11.533
85	29.4	41.018	41.263	41.510	145	62.8	11.028	11.166	11.307
86	30.0	40.052	40.297	40.542	146	63.3	10.809	10.946	11.085
87	30.6	39.112	39.356	39.600	147	63.9	10.596	10.732	10.868
88	31.1	38.197	38.439	38.682	148	64.4	10.387	10.521	10.657
89	31.7	37.305	37.546	37.788	149	65.0	10.184	10.316	10.450
90	32.2	36.437	36.677	36.917	150	65.6	9.9844	10.115	10.247
91	32.8	35.591	35.830	36.069	151	66.1	9.7897	9.9188	10.049
92	33.3	34.768	35.005	35.243	152	66.7	9.5993	9.7268	9.8558
93	33.9	33.965	34.201	34.437	153	67.2	9.4131	9.5391	9.6665
94	34.4	33.184	33.418	33.653	154	67.8	9.2311	9.3556	9.4815
95	35.0	32.422	32.655	32.888	155	68.3	9.0531	9.1761	9.3005
96	35.6	31.680	31.911	32.143	156	68.9	8.8791	9.0006	9.1234
97	36.1	30.958	31.187	31.417	157	69.4	8.7089	8.8289	8.9503
98	36.7	30.253	30.481	30.709	158	70.0	8.5425	8.6610	8.7809
99	37.2	29.567	29.793	30.019	159	70.6	8.3797	8.4968	8.6153
100	37.8	28.898	29.122	29.347	160	71.1	8.2205	8.3361	8.4532
101	38.3	28.246	28.468	28.691	161	71.7	8.0648	8.1790	8.2946
102	38.9	27.611	27.831	28.052	162	72.2	7.9124	8.0253	8.1395
103	39.4	26.992	27.210	27.430	163	72.8	7.7634	7.8749	7.9877
104	40.0	26.388	26.605	26.822	164	73.3	7.6176	7.7277	7.8392
105	40.6	25.800	26.014	26.230	165	73.9	7.4750	7.5837	7.6939
106	41.1	25.226	25.439	25.652	166	74.4	7.3354	7.4428	7.5516
107	41.7	24.667	24.877	25.089	167	75.0	7.1989	7.3050	7.4124

108	42.2	24.122	24.330	24.540	168	75.6	7.0653	7.1701	7.2762
109	42.8	23.590	23.797	24.004	169	76.1	6.9345	7.0380	7.1429
110	43.3	23.071	23.276	23.482	170	76.7	6.8066	6.9088	7.0124
111	43.9	22.566	22.768	22.972	171	77.2	6.6813	6.7823	6.8846
112	44.4	22.073	22.273	22.475	172	77.8	6.5588	6.6585	6.7596
113	45.0	21.592	21.790	21.990	173	78.3	6.4388	6.5373	6.6372
114	45.6	21.122	21.319	21.517	174	78.9	6.3214	6.4187	6.5173
115	46.1	20.665	20.860	21.056	175	79.4	6.2064	6.3025	6.4000
116	46.7	20.218	20.411	20.605	176	80.0	6.0939	6.1888	6.2851
117	47.2	19.783	19.974	20.166	177	80.6	5.9837	6.0775	6.1726
118	47.8	19.358	19.547	19.737	178	81.1	5.8758	5.9685	6.0624
119	48.3	18.943	19.130	19.319	179	81.7	5.7702	5.8617	5.9545
120	48.9	18.539	18.724	18.910	180	82.2	5.6668	5.7572	5.8489
121	49.4	18.144	18.327	18.511	181	82.8	5.5656	5.6548	5.7454
122	50.0	17.759	17.940	18.122	182	83.3	5.4664	5.5546	5.6440
123	50.6	17.383	17.562	17.743	183	83.9	5.3693	5.4564	5.5447
124	51.1	17.016	17.193	17.372	184	84.4	5.2742	5.3602	5.4475
125	51.7	16.658	16.833	17.010	185	85.0	5.1810	5.2660	5.3522
126	52.2	16.309	16.482	16.656	186	85.6	5.0898	5.1737	5.2589
127	52.8	15.967	16.139	16.311	187	86.1	5.0004	5.0833	5.1675
128	53.3	15.634	15.804	15.974	188	86.7	4.9129	4.9948	5.0779
129	53.9	15.309	15.476	15.645	189	87.2	4.8271	4.9080	4.9901
130	54.4	14.991	15.157	15.324	190	87.8	4.7431	4.8230	4.9041
131	55.0	14.681	14.845	15.010	191	88.3	4.6608	4.7397	4.8198
132	55.6	14.379	14.541	14.704	192	88.9	4.5801	4.6581	4.7372
133	56.1	14.083	14.243	14.404	193	89.4	4.5011	4.5781	4.6563
134	56.7	13.794	13.952	14.112	194	90.0	4.4236	4.4997	4.5770
135	57.2	13.512	13.669	13.826	195	90.6	4.3477	4.4229	4.4992
136	57.8	13.237	13.391	13.547	196	91.1	4.2734	4.3476	4.4230
137	58.3	12.968	13.121	13.275	197	91.7	4.2005	4.2738	4.3483
138	58.9	12.705	12.856	13.008	198	92.2	4.1290	4.2015	4.2751
139	59.4	12.449	12.598	12.748	199	92.8	4.0590	4.1306	4.2033



TH3: Outdoor unit discharge pipe sensor
Before measuring resistance, disconnect connectors as shown above.