OMEGA

OTEC™

HYBRID INVERTER Split

Service Manual

eco FRIENDLY R410A REFRIGERANT

DC INVERTER

AHRI CERTIFIED

ETL LISTED

ENERGY STAR

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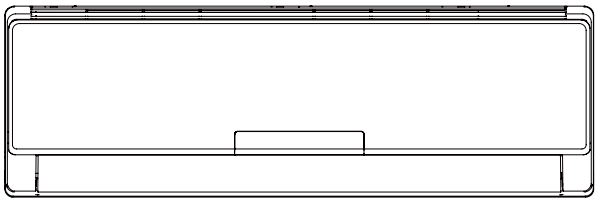
Summary and Features

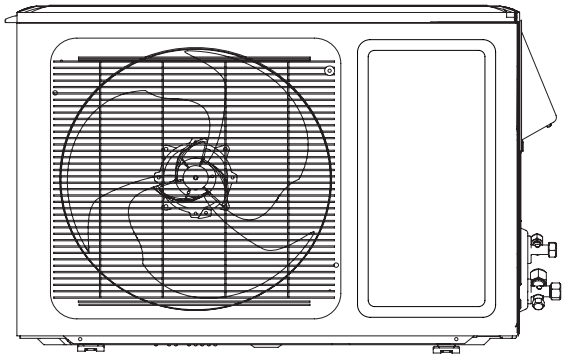
Indoor Unit

HWSS012J2A-RWK035
HWSS018J2A-RWI053

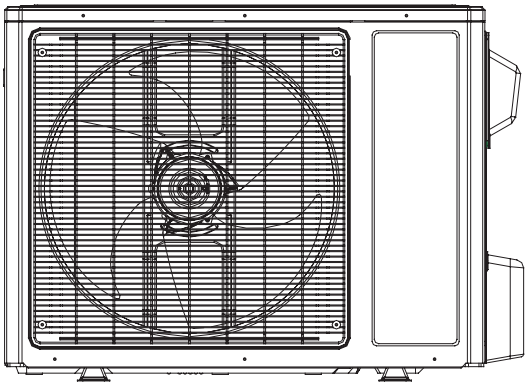


Outdoor Unit

HCSS012J2A-RSK035



HCSS018J2A-RSI053



Remote Controller

1.Safety Precautions

Installing, starting up, and servicing air conditioner can be hazardous due to system pressure, electrical components, and equipment location, etc.
Only trained, qualified installers and service personnel are allowed to install, start-up, and service this equipment.
Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained service personnel.
When handling the equipment, observe precautions in the manual and on tags, stickers, and labels attached to the equipment. Follow all safety codes. Wear safety glasses and work gloves. Keep quenching cloth and fire extinguisher nearby when brazing.
Read the instructions thoroughly and follow all warnings or cautions in literature and attached to the unit. Consult local building codes and current editions of national as well as local electrical codes.
Recognize the following safety information:

Warning Incorrect handling could result in personal injury or death.

Caution Incorrect handling may result in minor injury, or damage to product or property.

Warning

All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.

●Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.
●Never supply power to the unit unless all wiring and tubing are completed, reconnected and checked.
●This system adopts highly dangerous electrical voltage. Incorrect connection or inadequate grounding can cause personal injury or death. Stick to the wiring diagram and all the instructions when wiring.
●Have the unit adequately grounded in accordance with local electrical codes.
●Have all wiring connected tightly. Loose connection may lead to overheating and a possible fire hazard.

All installation or repair work shall be performed by your dealer or a specialized subcontractor as there is the risk of fire, electric shock, explosion or injury.

●Make sure the outdoor unit is installed on a stable, level surface with no accumulation of snow, leaves, or trash beside.
●Make sure the ceiling/wall is strong enough to bear the weight of the unit.
●Make sure the noise of the outdoor unit does not disturb neighbors.
●Follow all the installation instructions to minimize the risk of damage from earthquakes, typhoons or strong winds.
●Avoid contact between refrigerant and fire as it generates poisonous gas.
●Apply specified refrigerant only. Never have it mixed with any other refrigerant. Never have air remain in the refrigerant line as it may lead to rupture and other hazards.
●Make sure no refrigerant gas is leaking out when installation is completed.
●Should there be refrigerant leakage, the density of refrigerant in the air shall in no way exceed its limited value, or it may lead to explosion.
●Keep your fingers and clothing away from any moving parts.
●Clear the site after installation. Make sure no foreign objects are left in the unit.
●Always ensure effective grounding for the unit.

Caution

●Never install the unit in a place where a combustible gas might leak, or it may lead to fire or explosion.
●Make a proper provision against noise when the unit is installed at a telecommunication center or hospital.
●Provide an electric leak breaker when it is installed in a watery place.
●Never wash the unit with water.
●Handle unit transportation with care. The unit should not be carried by only one person if it is more than 20kg.
●Never touch the heat exchanger fins with bare hands.
●Never touch the compressor or refrigerant piping without wearing glove.
●Do not have the unit operate without air filter.
●Should any emergency occur, stop the unit and disconnect the power immediately.
●Properly insulate any tubing running inside the room to prevent the water from damaging the wall.

2. Specifications

2.1 Unit Specifications

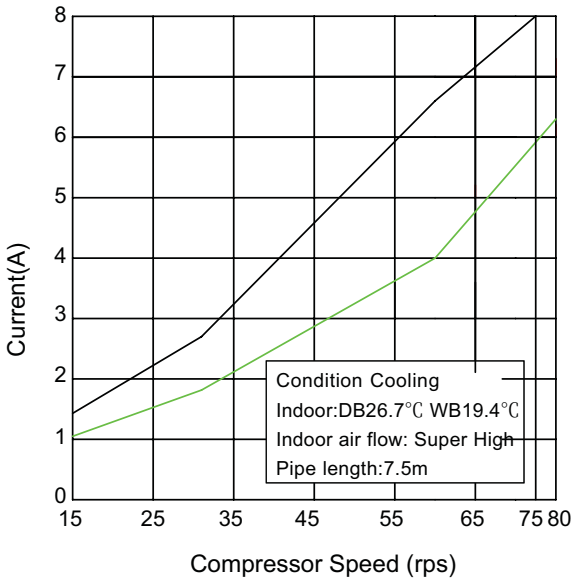
Parameter		Unit	Value	
Model			**HWSS012J2A-RWK035**	**HWSS018J2A-RWI053**
Product Code			CB161002800	CB161002700
Power Supply	Rated Voltage	V ~	208/230	208/230
	Rated Frequency	Hz	60	60
	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
Cooling Capacity (Min ~ Max)		Btu/h	12000(4500~14000)	18000(6000~22350)
Heating Capacity (Min ~ Max)		Btu/h	13000(3250~14500)	25000(4100~25000)
Cooling Power Input (Min ~ Max)		W	1000(120~1450)	1500(300~2650)
Heating Power Input (Min ~ Max)		W	1200(220~1500)	2750(335~2750)
Cooling Power Current		A	5.2	7.5
Heating Power Current		A	6.0	13.5
Rated Input		W	1500	2750
Rated Current		A	7.50	13.50
Air Flow Volume(SH/H/M/L/SL)		m^3/h	510/470/430/370/-	850/780/650/550/-
Dehumidifying Volume		L/h	1.4	1.8
EER		Btu/w.h	12.0	14.7
COP		Btu/w.h	10.9	9.1
SEER		Btu/w.h	20.00	18.00
HSPF		Btu/w.h	9.60	10.20
Application Area		m^2	16-24	23-34
Indoor Unit	Model of indoor unit		**HWSS012J2A-RWK035**	**HWSS018J2A-RWI053**
	Fan Type		Cross-flow	Cross-flow
	Diameter Length(DXL)	mm	Φ92X645	Φ98X710
	Fan Motor Cooling Speed (SH/H/M/L/SL)	r/min	1300/1080/900/740/-	1350/1200/1050/900/-
	Fan Motor Heating Speed (SH/H/M/L/SL)	r/min	1300/1160/1040/920/-	1420/1250/1150/1050/-
	Output of Fan Motor	W	20	20
	Fan Motor RLA	A	0.20	0.25
	Fan Motor Capacitor	μF	1	1.5
	Input of Heater	W	/	/
	Evaporator Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Pipe Diameter	mm	Φ7	Φ7
	Row-fin Gap	mm	2-1.4	2-1.4
	Coil Length (LXDXW)	mm	645X25.4X267	715X25.4X304.8
	Swing Motor Model		MP24AA	MP28VB
	Output of Swing Motor	W	2.4	2.5
	Fuse	A	3.15	3.15
	Sound Pressure Level (SH/H/M/L/SL)	dB (A)	40/36/32/26/-	46/44/40/35/-
	Sound Power Level (SH/H/M/L)	dB (A)	50/46/42/36/-	56/54/50/45/-
	Dimension (WXHXD)	mm	845X275X180	940X298X200
	Dimension of Carton Box (L/W/H)	mm	915X255X355	1010X285X380
	Dimension of Package (L/W/H)	mm	918X258X370	1013X288X395
	Net Weight	kg	11	13
	Gross Weight	kg	14	17

Outdoor Unit	Model of Outdoor Unit		**HCSS012J2A-RSK035**	**HCSS018J2A-RSI053**
	Compressor Manufacturer/Trademark		China Resources (Shenyang) Sanyo CO.,LTD/SANYO	China Resources (Shenyang) Sanyo CO.,LTD/SANYO
	Compressor Model		C-6RZ110H1A	C-6RZ146H1A
	Compressor Oil		FV50S	FV50S
	Compressor Type		Rotary	Rotary
	L.R.A.	A	33.00	41.00
	Compressor RLA	A	4.6	8.4
	Compressor Power Input	W	800	1640
	Overload Protector		1NT11L-3979	1NT11L-3979
	Throttling Method		Electron expansion valve	Electron expansion valve
	Operation temp	ºC	16~30	16~30
	Ambient temp (cooling)	ºC	18~43	18~43
	Ambient temp (heating)	ºC	-7~24	-7~24
	Condenser Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube Φ7
	Pipe Diameter	mm	Φ9.52	2-1.4
	Rows-fin Gap	mm	2-1.4	837X38.1X660
	Coil Length (LXDXW)	mm	747X44X508	690/500
	Fan Motor Speed	rpm	900/680	60
	Output of Fan Motor	W	40	0.62
	Fan Motor RLA	A	0.17	3.5
	Fan Motor Capacitor	μF	/	3200
	Air Flow Volume of Outdoor Unit	m^3/h	1800	Axial-flow
	Fan Type		Axial-flow	Φ520
	Fan Diameter	mm	Φ398.5 Automatic Defrosting	Automatic Defrosting
	Defrosting Method		T1	T1
	Climate Type		I	I
	Isolation		IP24	IP24
	Moisture Protection			
	Permissible Excessive Operating Pressure for the Discharge Side	MPa	3.8	3.8
	Permissible Excessive Operating Pressure for the Suction Side	MPa	1.2	1.2
	Sound Pressure Level (H/M/L)	dB (A)	55/-/-	54/-/-
	Sound Power Level (H/M/L)	dB (A)	65/-/-	64/-/-
	Dimension (WXHXD)	mm	848X540X320	963X700X396
	Dimension of Carton Box (L/W/H)	mm	878X360X580	1026X455X735
	Dimension of Package (L/W/H)	mm	881X363X595	1029X458X750
	Net Weight	kg	40	50
	Gross Weight	kg	44	55
	Refrigerant		R410A	R410A
	Refrigerant Charge	kg	1.30	1.45
Connection Pipe	Length	m	7.5	7.5
	Gas Additional Charge	g/m	20	20
	Outer Diameter Liquid Pipe	mm	Φ6	Φ6
	Outer Diameter Gas Pipe	mm	Φ9.52	Φ12
	Max Distance Height	m	10	15
	Max Distance Length	m	20	30

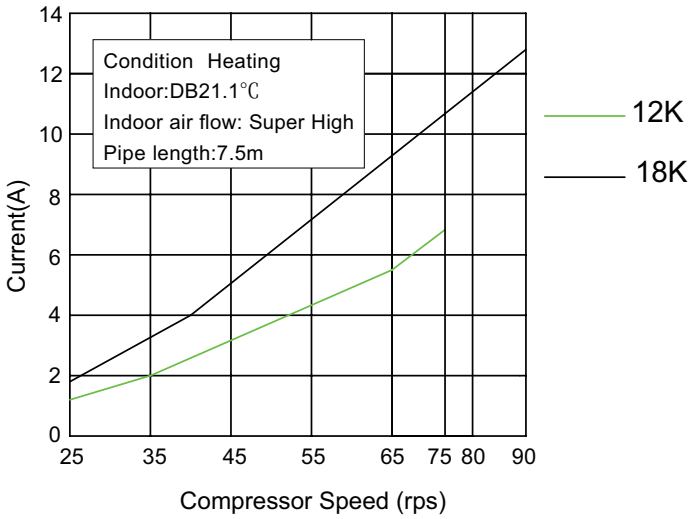
The above data is subject to change without notice. Please refer to the nameplate of the unit.

2.2 Operation Characteristic Curve

Cooling

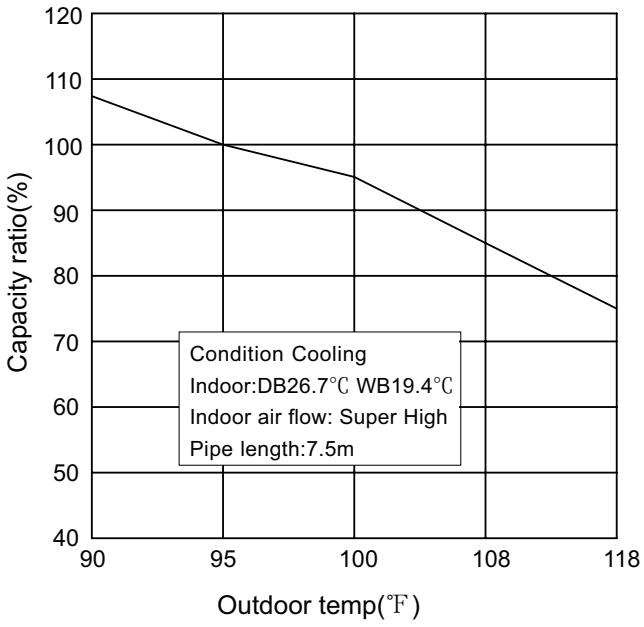


Heating

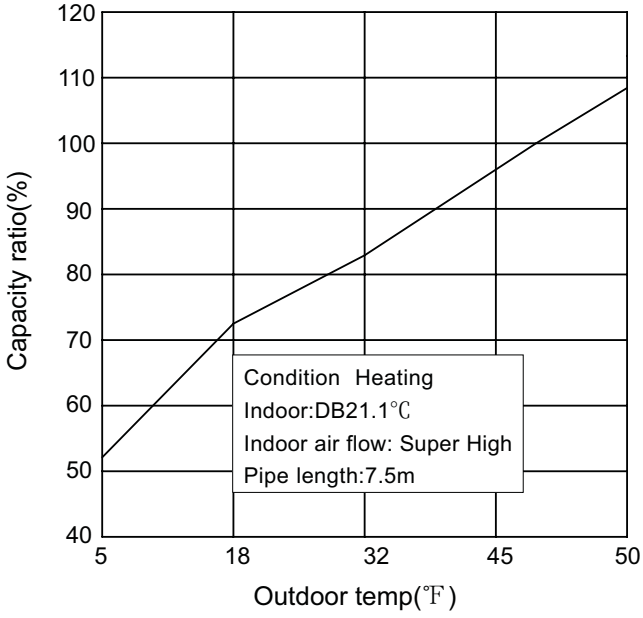


2.3 Capacity Variation Ratio according to Temperature

Cooling



Heating



2.4 Operation Data

Cooling

Temperature condition (℃)		Model name	Standard pressure	Heat exchanger pipe temp		Indoor fan mode	Outdoor fan mode(rpm)	Compressor revolution
Indoor	Outdoor		P (MPa)	T1 (°C)	T2 (°C)			
26.9/19.4	35/23.9	12K	0.8 to 1.1	11 to 14	38 to 70	Super High	900/680	rated
		18K	0.9 to 1.3	9 to 12	38 to 65	Super High	690/500	rated

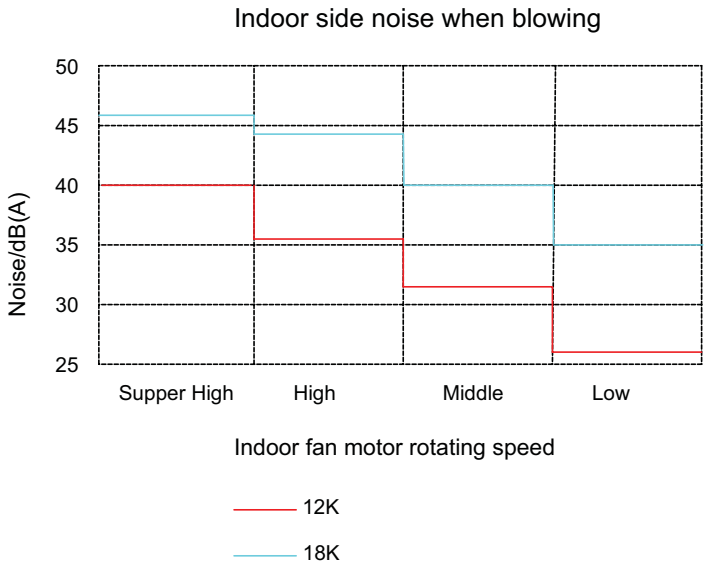
Heating

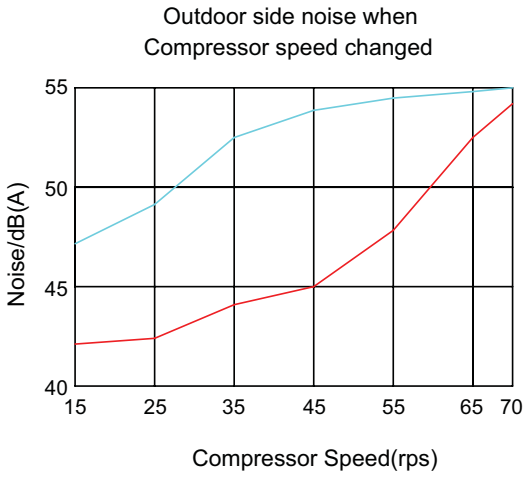
Temperature condition (℃)		Model name	Standard pressure	Heat exchanger pipe temp		Indoor fan mode	Outdoor fan mode(rpm)	Compressor revolution
Indoor	Outdoor		P (MPa)	T1 (°C)	T2 (°C)			
21.1/15.6	8.33/6.11	12K	2.8 to 3.2	42 to 70	0 to 3	Super High	900/680	rated
		18K	2.8 to 3.5	46 to 80	0 to 3	Super High	690/500	rated

T1: Inlet and outlet pipe temperature of evaporator
T2: Inlet and outlet pipe temperature of condenser
P: Pressure of air pipe connecting indoor and outdoor units

NOTES :
(1) Measure surface temperature of heat exchanger pipe around center of heat exchanger path U bent. (Thermistor themometer)
(2) Connecting piping condition : 7.5m

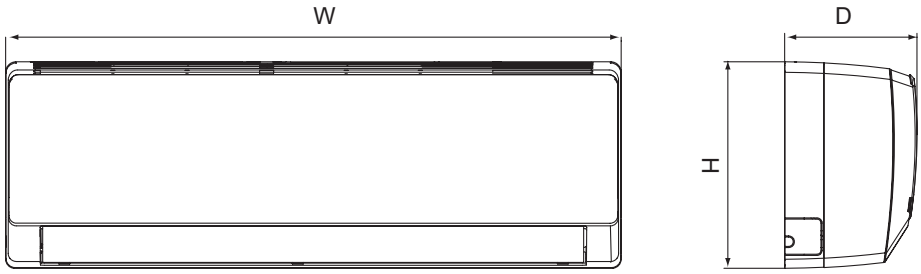
2.5 Noise Criteria Curve Tables for both Models



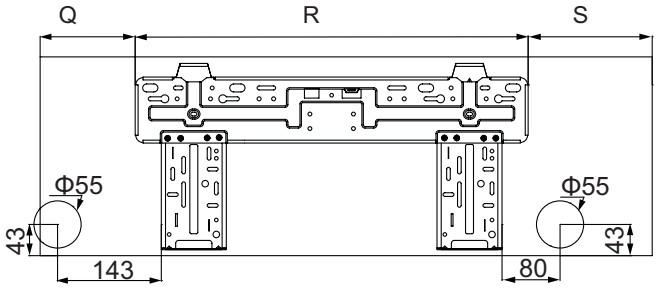


3. Construction Views

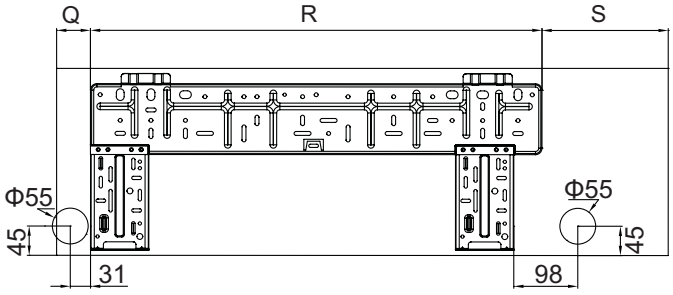
3.1 Indoor Unit



12K Unit



18K Unit

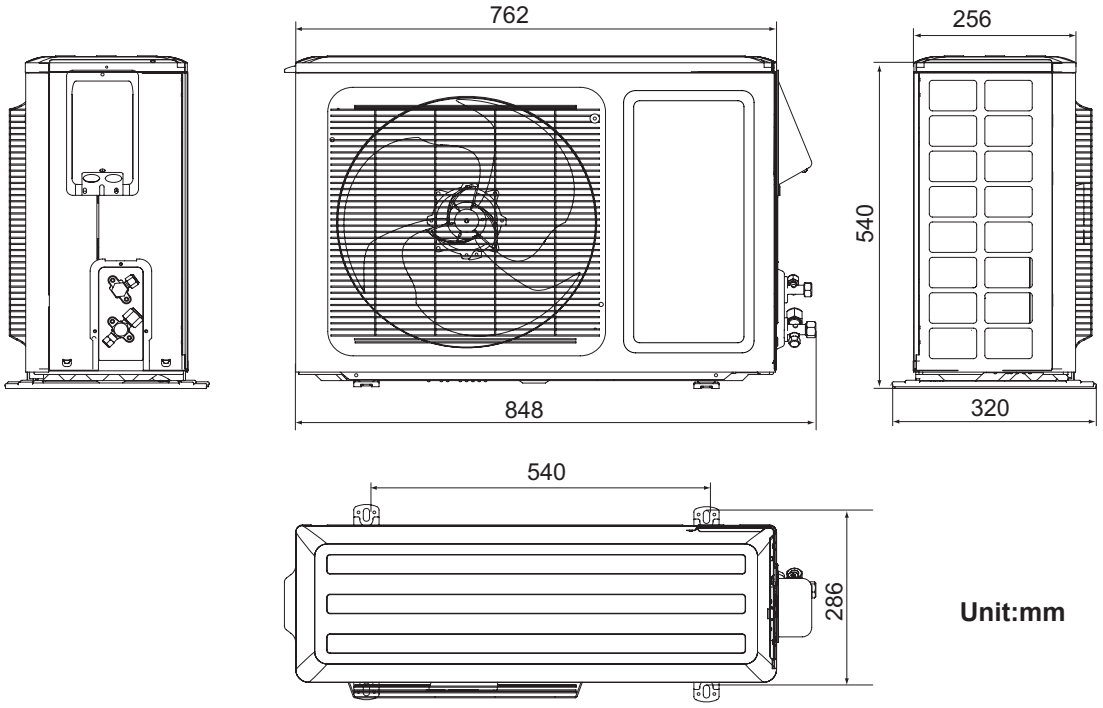


Unit:mm

Model	W	H	D	Q	R	S
HWSS012J2A-RWK035	845	275	180	131	542	172
HWSS018J2A-RWI053	940	298	200	52	694	194

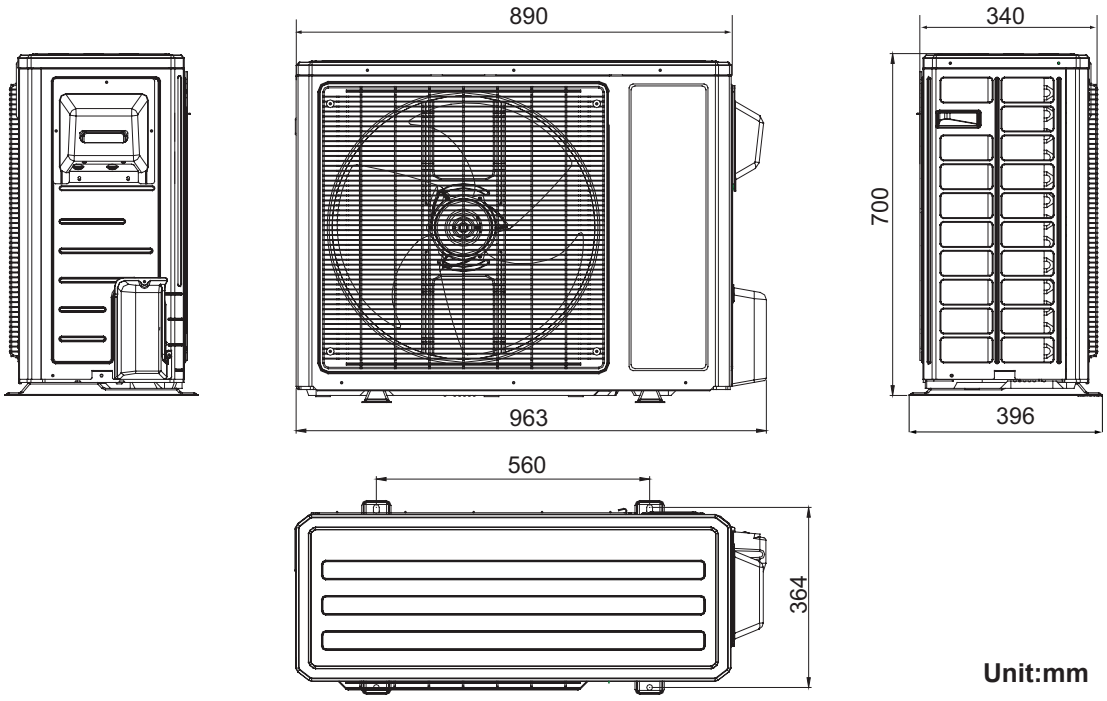
3.2 Outdoor Unit

HCSS012J2A-RSK035



Unit:mm

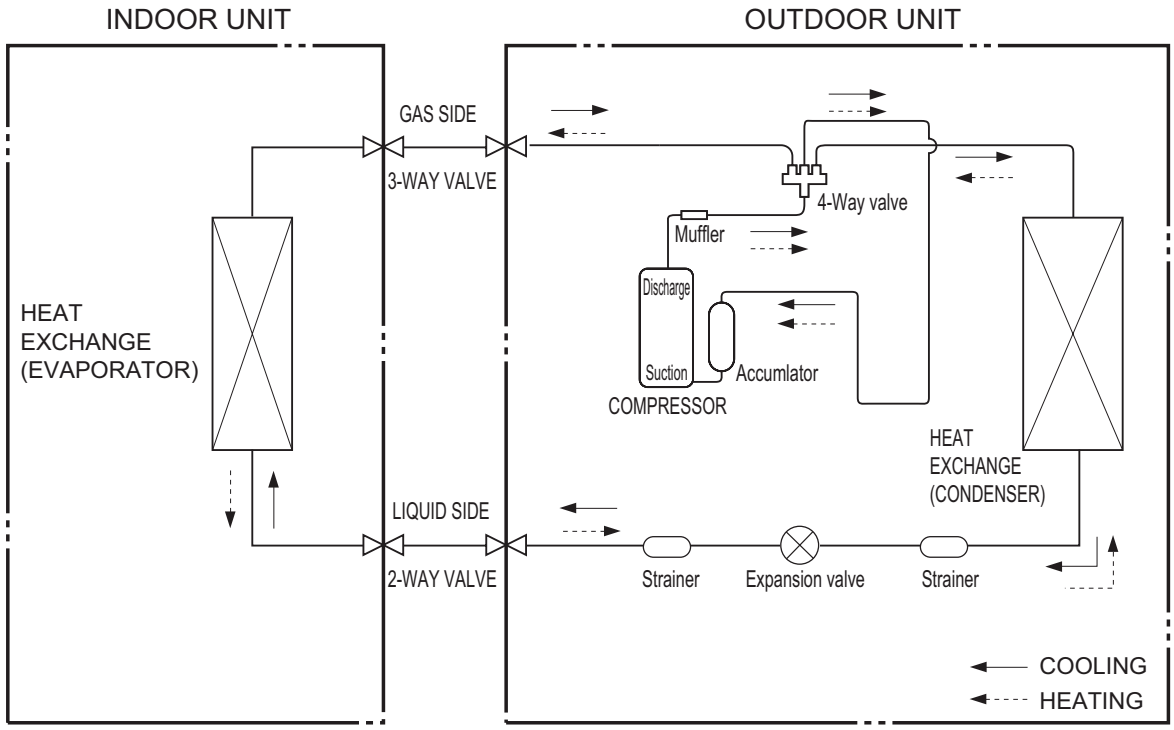
HCSS018J2A-RSI053



Unit:mm

4. Refrigerant System Diagram

(1)Cooling&Heating Models



Refrigerant pipe diameter
Liquid : 1/4" (6 mm) Gas : 3/8" (9.52 mm)(12K)
Liquid : 1/4" (6 mm) Gas : 1/2" (12 mm)(18K)

5. Schematic Diagram

5.1 Electrical Data

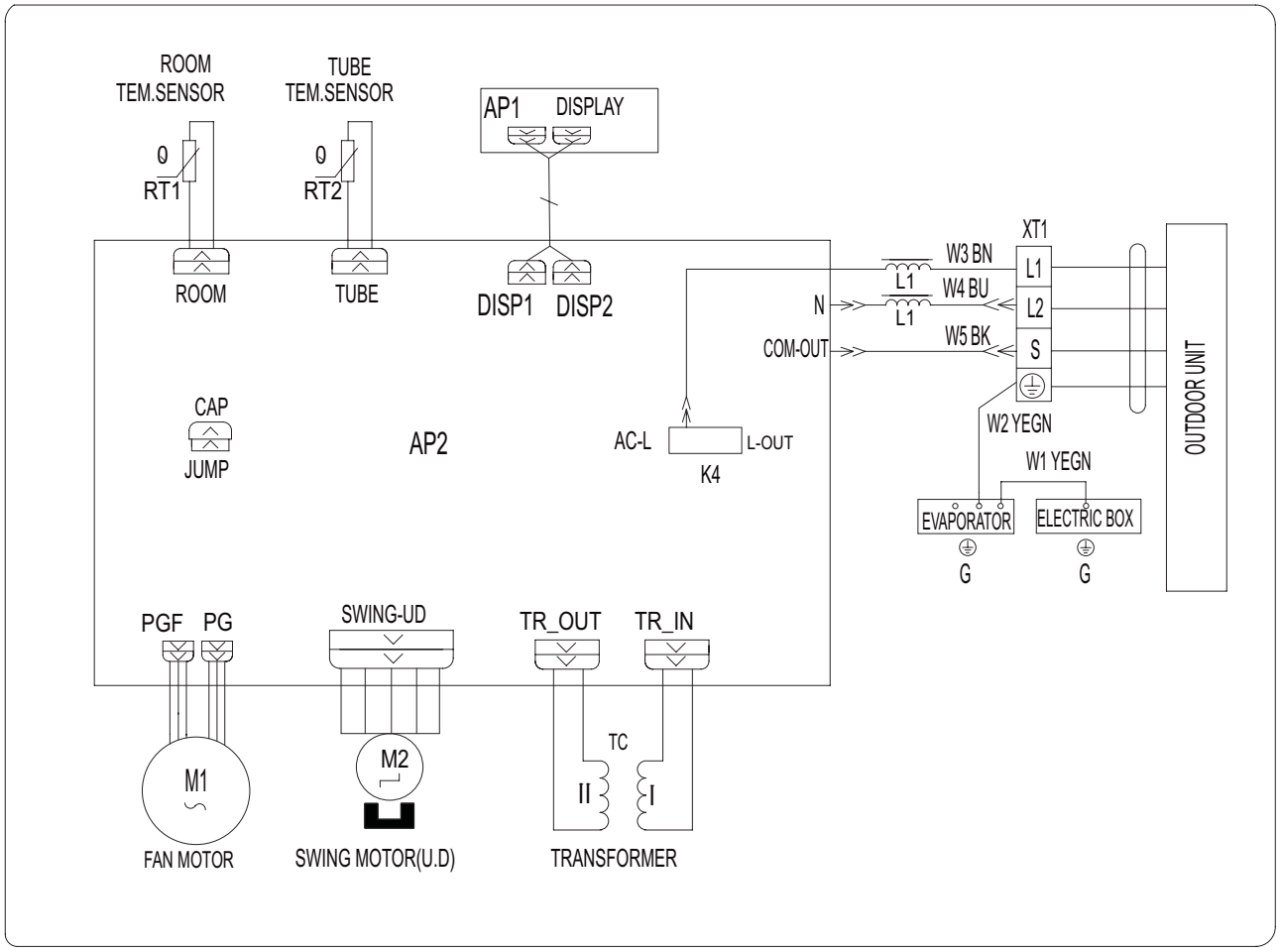
Meaning of marks

Symbol	Color symbol	Symbol	Parts name
OG	ORANGE	⏚	PROTECTIVE EARTH
WH	WHITE	COMP	COMPRESSOR
YE	YELLOW	CT1,2	OVERLOAD
RD	RED	4V	4-WAY VALVE
YEGN	YELLOW GREEN	XT	TERMINAL BLOCK
BN	BROWN		
BU	BLUE		
BK	BLACK		

5.2 Electrical Wiring

●Indoor Unit

HWSS012J2A-RWK035



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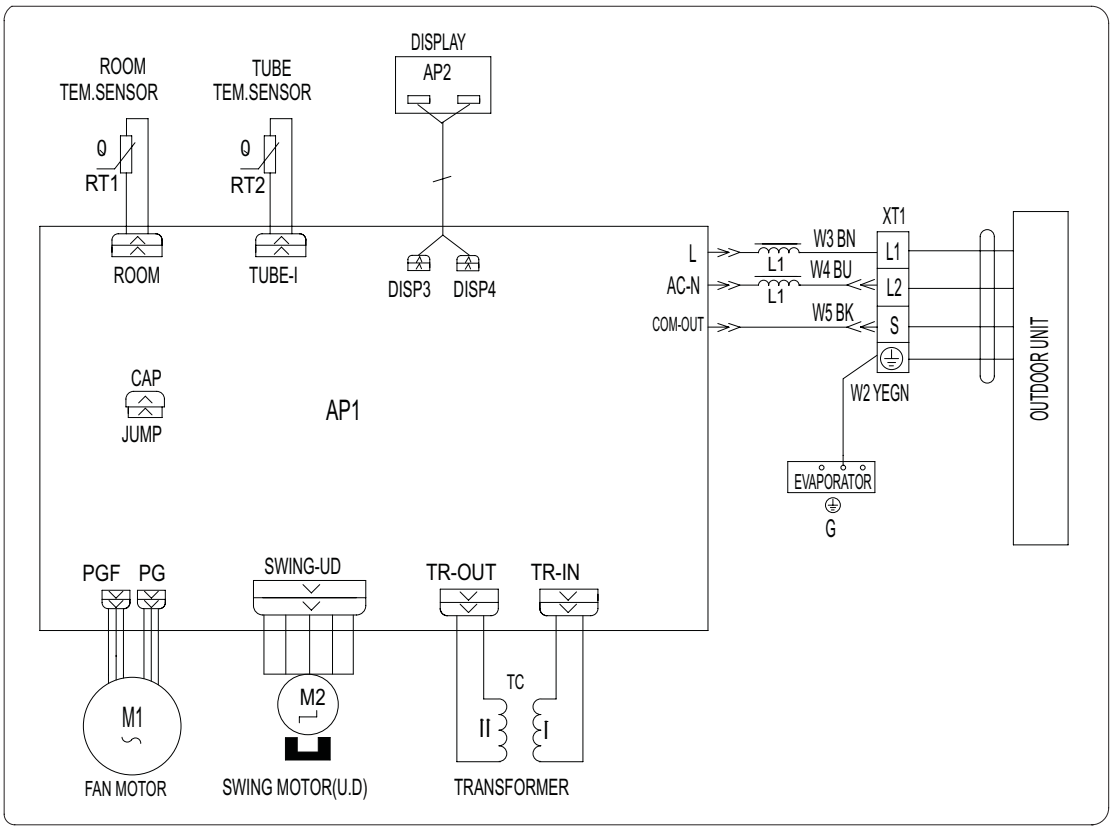
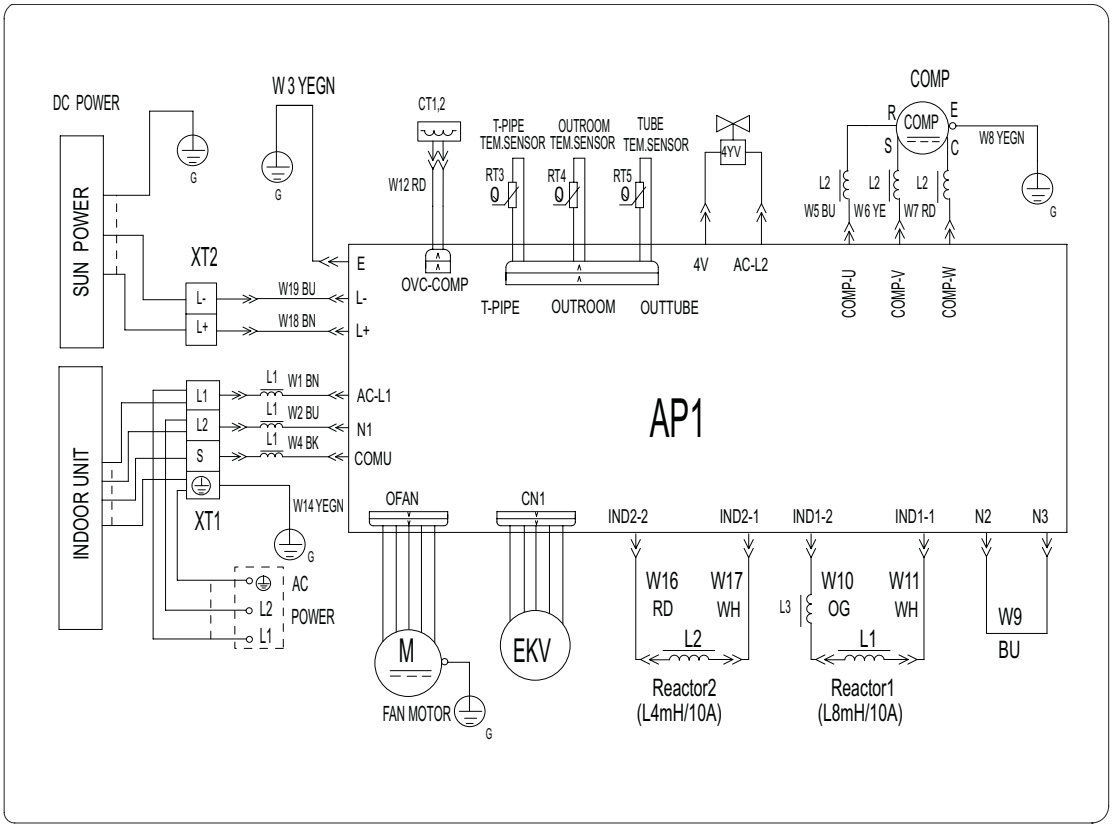


●**Outdoor Unit**

HCSS012J2A-RSK035



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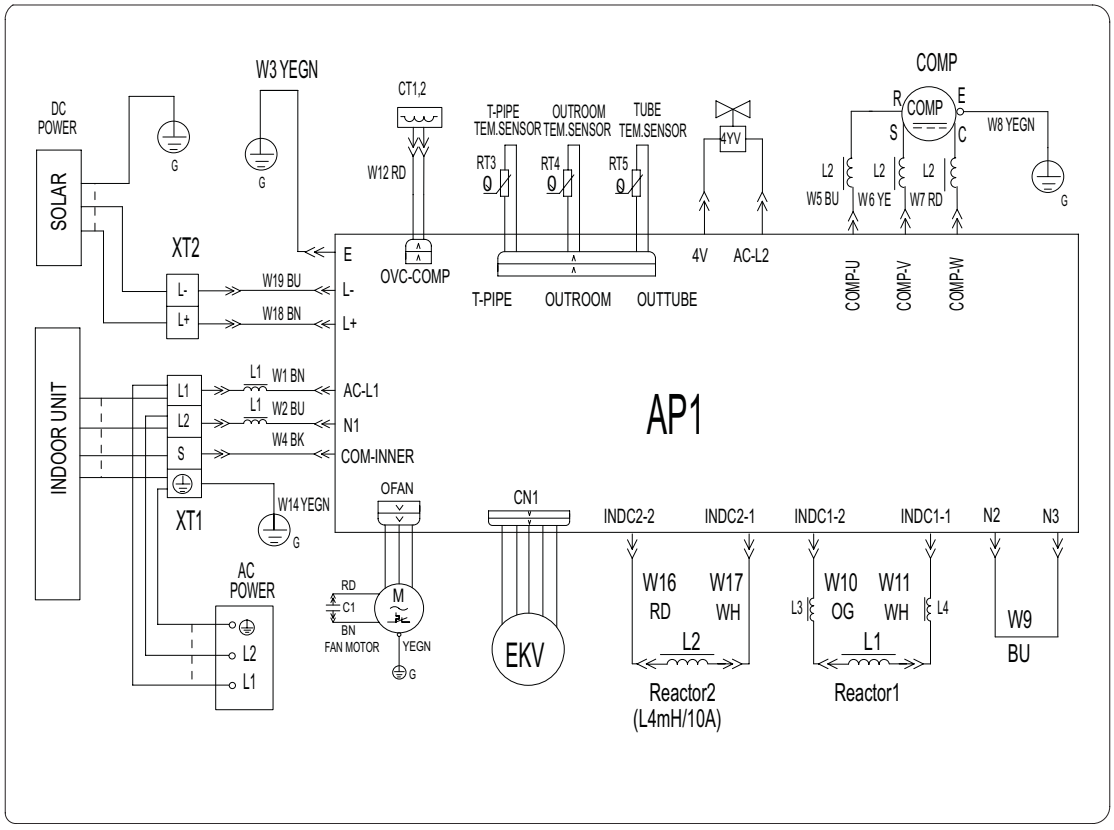


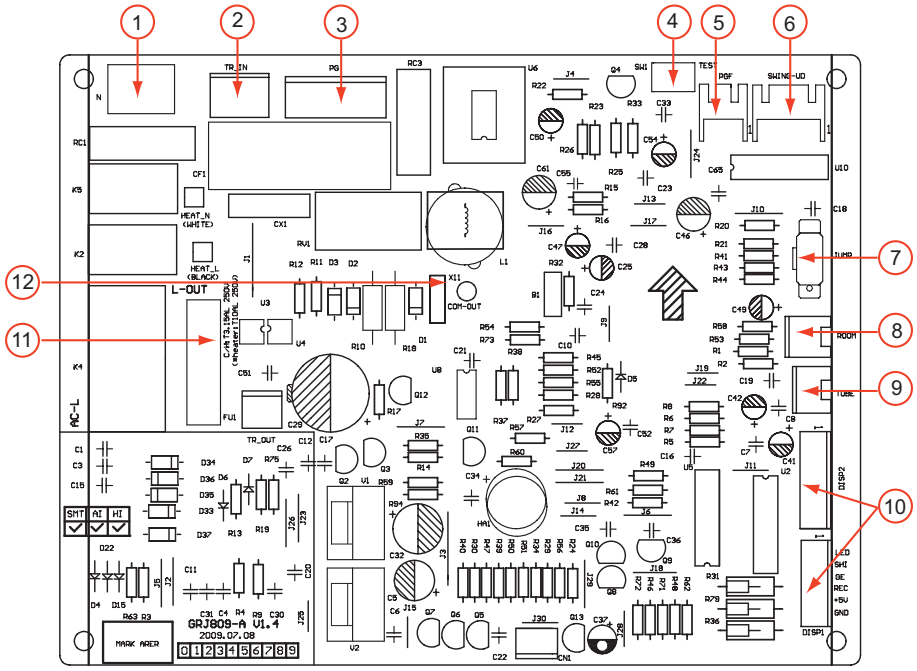
These circuit diagrams are subject to change without notice. Please refer to the one supplied with the unit.

5.3 Printed Circuit Board

(1)Indoor Unit

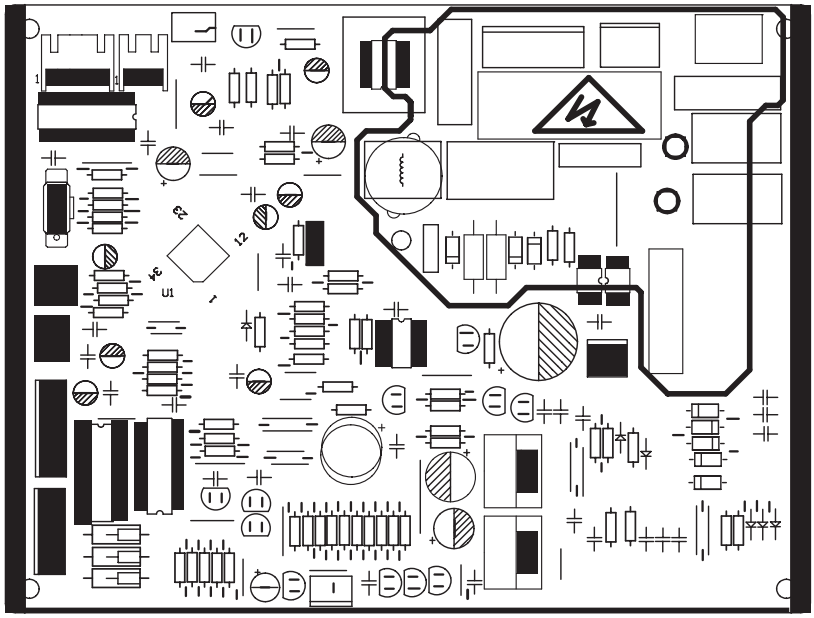
HWSS012J2A-RWK035

●TOP VIEW



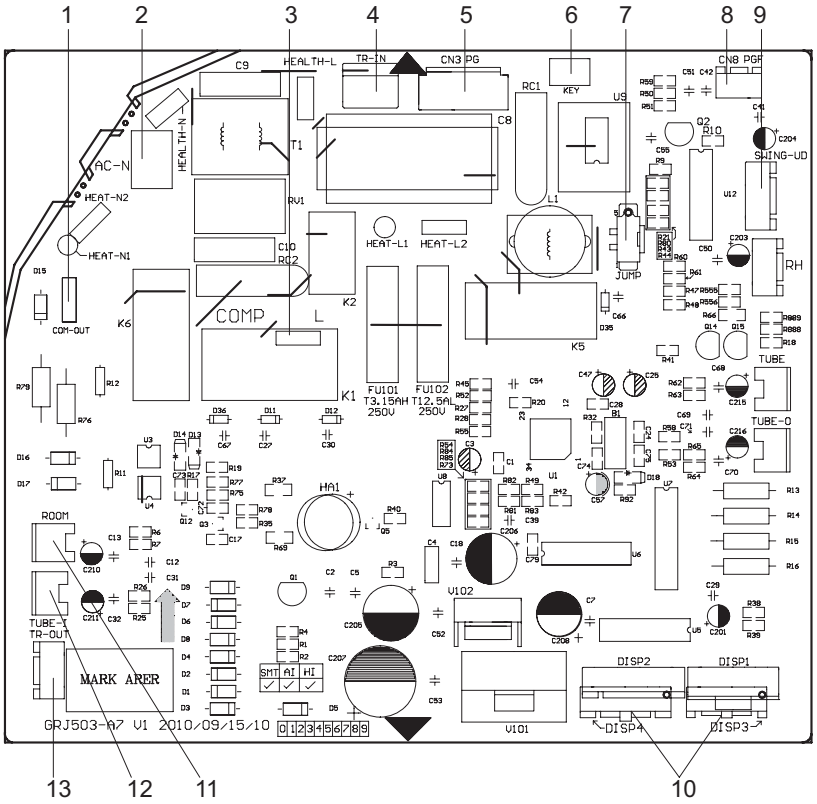
1	Interface of neutral wire
2	Transformer input
3	Interface of PG motor
4	Auto button
5	Feedback from PG motor
6	Up&down swing
7	Jump cap
8	Room temperature sensor
9	Pipe temperature sensor
10	Display interface of DISP-1, DISP-2
11	Protective tube
12	Communication interface

●BOTTOM VIEW



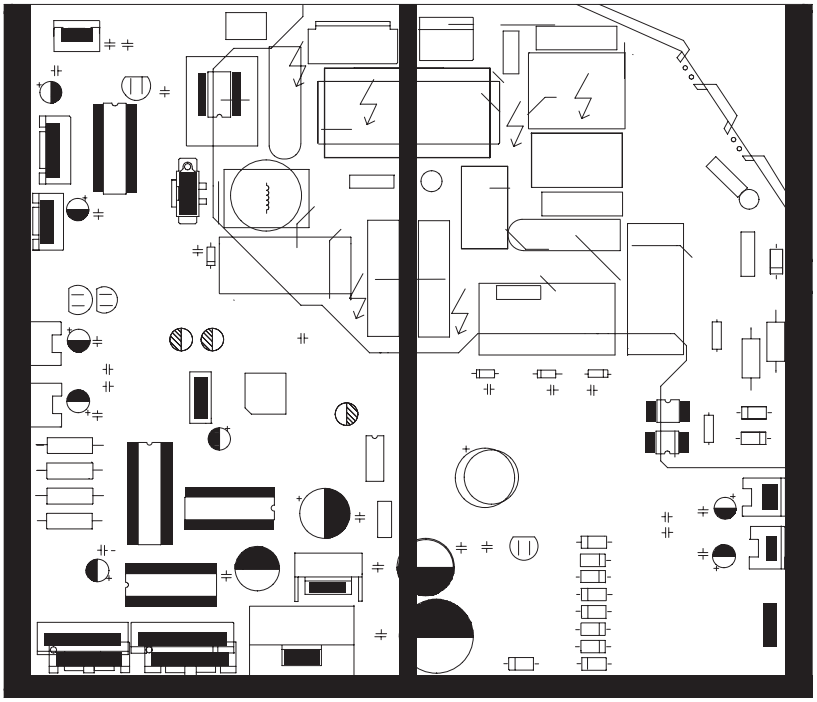
HWSS018J2A-RWI053

●TOP VIEW



1	Communication interface
2	Interface of neutral wire
3	Interface of live wire
4	Input terminal of transformer
5	Strong current terminal of PG motor
6	Auto button
7	Jumper cap
8	Feedback terminal of PG motor
9	Swing terminal
10	Terminals DISP3 and DISP4 of display
11	Ambient temp sensor terminal
12	Pipe temperature sensor terminal
13	Output terminal of transformer

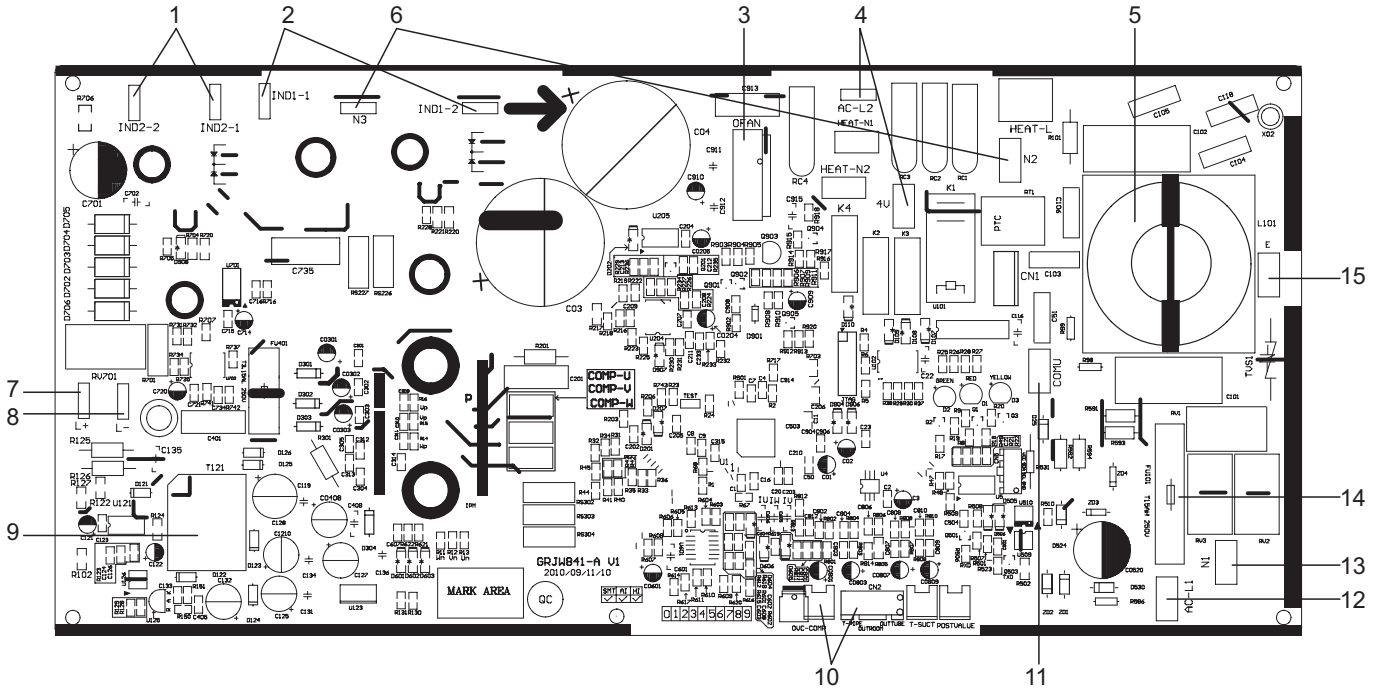
●BOTTOM VIEW



(2)Outdoor Unit

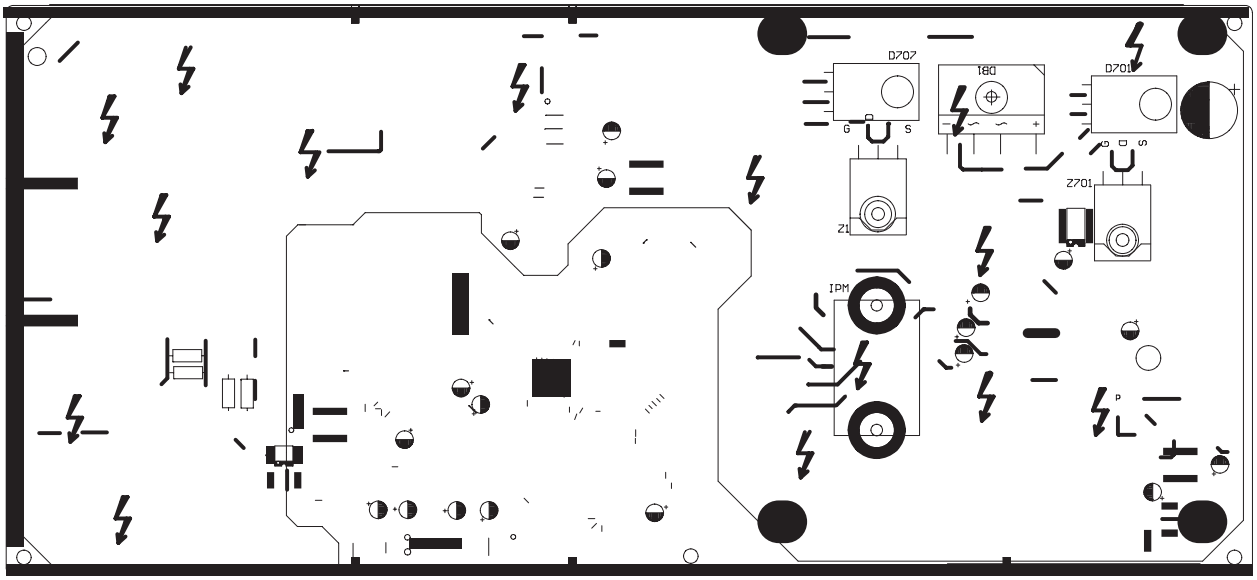
HCSS012J2A-RSK035

●TOP VIEW



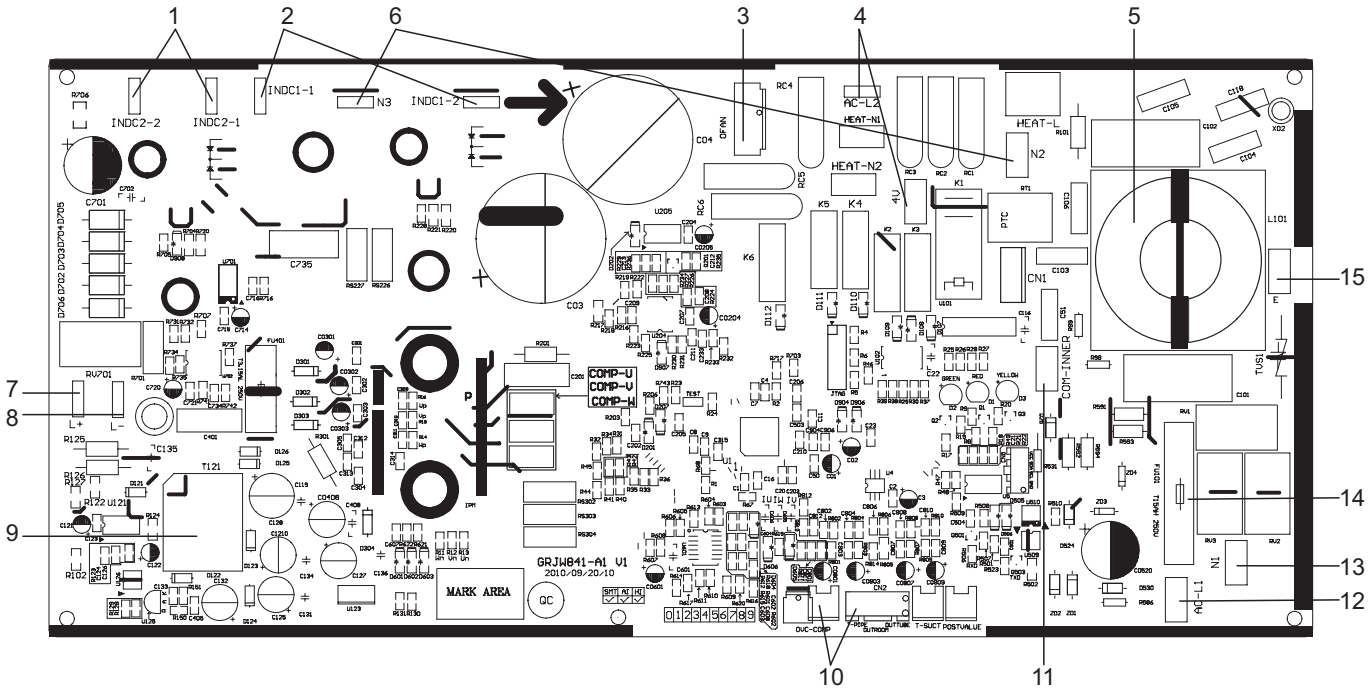
1	Terminal of small electric reactor	2	Terminal of big electric reactor	3	Outdoor fan terminal	4	4-way valve terminal	5	Choke L101
6	Terminal of neutral wire jumper	7	Solar power terminal(+)	8	Solar power terminal (-)	9	High-frequency transformer	10	Terminal of temp sensor
11	Communication wire terminal	12	Live wire terminal	13	Neutral wire terminal	14	Protective tube FU101	15	Terminal of ground wire

●BOTTOM VIEW



HCSS018J2A-RSI053

●TOP VIEW



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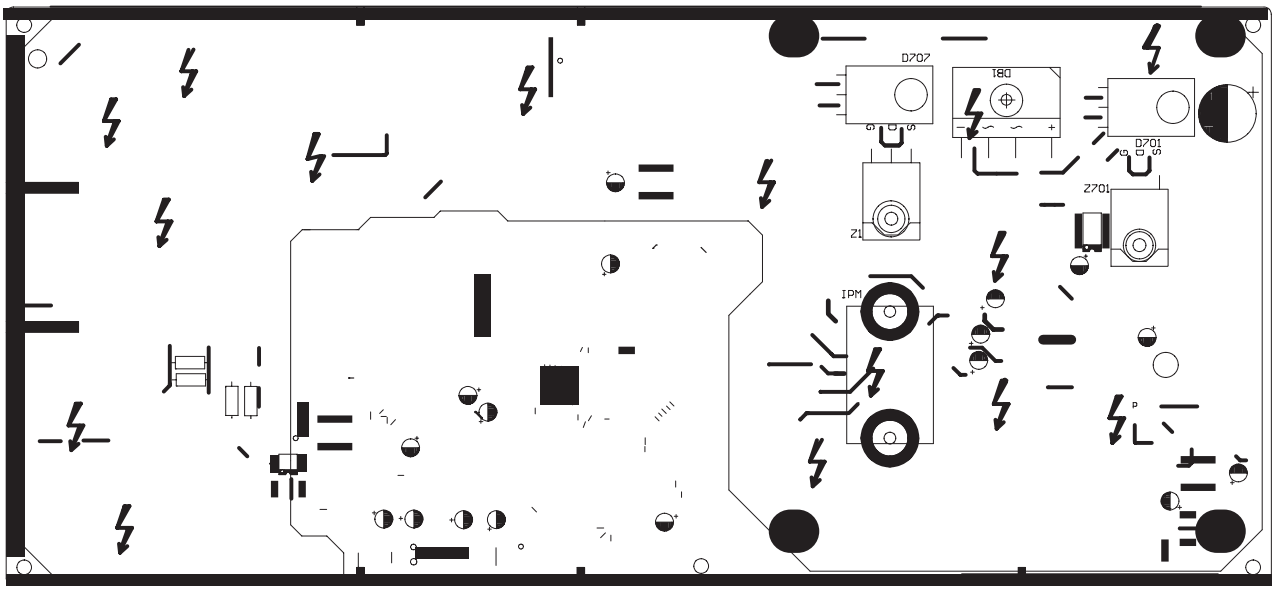
●BOTTOM VIEW



6. Function and Control

6.1 Remote Control Operations

1 ON/OFF

Press it to start or stop operation.

2 MODE

Press it to select operation mode (AUTO/COOL/DRY/FAN/HEAT).

3 +

Press it to increase temperature setting.

4 -

Press it to decrease temperature setting.

5 FAN

Press it to set fan speed.

6

Press it to set swing angle.

7 TIMER ON

Press it to set auto-on timer.

8 TIMER OFF

Press it to set auto-off timer.

9 CLOCK

Press it to set clock.

10 X-FAN (X-FAN is the alternative expression of BLOW for the purpose of understanding.)

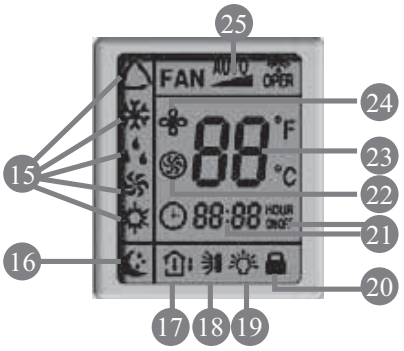
11 TEMP

12 TURBO

13 SLEEP

14 LIGHT

Press it to turn on/off the light.



15 MODE icon:

If MODE button is pressed, current operation mode icon (AUTO), (COOL), (DRY), (FAN) or (HEAT is only for heat pump models) will show.

16 SLEEP icon :

is displayed by pressing the SLEEP button. Press this button again to clear the display.

17 TEMP icon:

Pressing TEMP button, (set temperature), (indoor ambient temperature), (outdoor ambient temperature) and blank is displayed circularly.

18 Up & down swing icon:

is displayed when pressing the up & down swing button. Press this button again to clear the display.

19 LIGHT icon:

is displayed by pressing the LIGHT button.Press LIGHT button again to clear the display.

20 LOCK icon:

is displayed by pressing "+" and “-” buttons simultaneously.Press them again to clear the display.

21 SET TIME display:

After pressing TIMER button, ON or OFF will blink.This area will show the set time.

22 TURBO icon:

is displayed when pressing theTURBO button.Press this button again to clear the display.

23 DIGITAL display:

This area will show the set temperature. In SAVE mode,"SE" will be displayed. During defrosting operation, “H1” will be displayed.

24 X-FAN icon:

is displayed when pressing the X-FAN button. Press this button again to clear the display.

25 FAN SPEED display:

Press FAN button to select the desired fan speed setting(AUTO Low-Med-High).Your selection will be displayed in the LCD windows, except the AUTO fan speed.

1 ON/OFF:

Press this button to turn on the unit. Press this button again to turn off the unit.

2 MODE:

Each time you press this button,a mode is selected in a sequence that goes from AUTO, COOL,DRY, FAN, and HEAT *, as the following:

AUTO ▶ COOL ▶ DRY ▶ FAN ▶ HEAT*

*Note: Only for models with heating function.

After energization, AUTO mode is defaulted. In AUTO mode, the set temperature will not be displayed on the LCD, and the unit will automatically select the suitable operation mode in accordance with the room temperature to make indoor room comfortable.

3 + :

Press this button to increase set temperature. Hold it down for above 2 seconds to rapidly increase set temperature. In AUTO mode, set temperature is not adjustable.

4 -:

Press this button to decrease set temperature. Hold it down for above . 2 seconds to rapidly decrease set temperature. In AUTO mode, set temperature is not adjustable.

5 FAN :

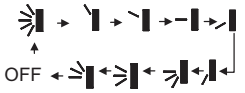
This button is used for setting fan speed in the sequence that goes from AUTO, , , to then back to Auto.

AUTO → → → →

Low speed Medium speed High speed

6

Press this button to set up & down swing angle, which circularly changes as below:



This remote controller is universal. If any command , or is sent out, the unit will carry out the command as

indicates the guide louver swings as:

7 TIMER ON:

Press this button to initiate the auto-ON timer. To cancel the auto-timer program, simply press this button again. After pressing this button, ⏲ disappears and "ON" blinks . 0 0:00 is displayed for ON time setting. Within 5 seconds, press + or - button to adjust the time value. Every press of either button changes the time setting by 1 minute. Holding down either button rapidly changes the time setting by 1 minute and then 10 minutes. Within 5 seconds after setting, press TIMER ON button to confirm.

8 TIMER OFF:

Press this button to initiate the auto-off timer. To cancel the auto-timer program, simply press the button again.TIMER OFF setting is the same as TIMER ON.

9 CLOCK :

Pressing CLOCK button, ⏲ blinks. Within 5 seconds, pressing + or - button adjusts the present time. Holding down either button above 2 seconds increases or decreases the time by 1 minute every 0.5 second and then by 10 minutes every 0.5 second. During blinking after setting, press CLOCK button again to confirm the setting, and then ⏲ will be constantly displayed.

10 X-FAN:

Pressing X -FAN button in COOL or DRY mode,the icon ✿ is displayed and the indoor fan will continue operation for 10 minutes in order to dry the indoor unit even though you have turned off the unit.

After energization, X-FAN OFF is defaulted. X-FAN is not available in AUTO, FAN or HEAT mode.

11 TEMP:

Press this button, could select displaying the indoor setting temperature or indoor ambient temperature.When the indoor unit firstly power on it will display the setting temperature, if the temperature's displaying status is changed from other status to" ⌂ ",displays the ambient temperature, 5s later or within 5s, it receives other remote control signal that will return to display the setting temperature. if the users haven't set up the temperature displaying status,that will display the setting temperature.

12 TURBO:

Press this button to activate / deactivate the Turbo function which enables the unit to reach the preset temperature in the shortest time. In COOL mode, the unit will blow strong cooling air at super high fan speed. In HEAT mode, the unit will blow strong heating air at super high fan speed.

13 SLEEP:

Press this button to go into the SLEEP operation mode. Press it again to cancel this function. This function is available in COOL, HEAT (Only for models with heating function) or DRY mode to maintain the most comfortable temperature for you.

14 LIGHT:

Press LIGHT button to turn on the display's light and press this button again to turn off the display's light. If the light is turned on , 💡 is displayed. If the light is tunrned off, 💡 disappears.

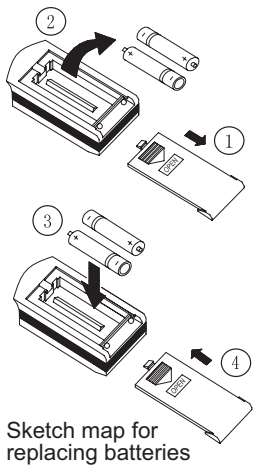
15 Combination of "+" and "-" buttons: About lock

Press "+ " and "-" buttons simultaneously to lock or unlock the keypad. If the remote controller is locked, 🔒 is displayed. In this case, pressing any button, 🔒 blinks three times.

16 Combination of "MODE" and "-" buttons:About switch between Fahrenheit and Centigrade At unit OFF, press "MODE" and "- " buttons simultaneously to switch between ℃ and ℉.

Replacement of Batteries

1.Remove the battery cover plate from the rear of the remote controller.
(As shown in the figure)
2.Take out the old batteries.
3.Insert two new AAA1.5V dry batteries, and pay attention to the polarity.
4. Reinstall the battery cover plate.



Sketch map for replacing batteries

★Notes:

●When replacing the batteries, do not use old or different types of batteries. Otherwise, it may cause malfunction.
●If the remote controller will not be used for a long time, please remove batteries to prevent batteries from leaking.
●The operation should be performed in its receiving range.
●It should be kept 1m away from the TV set or stereo sound sets.
●If the remote controller does not operate normally, please take the batteries out and reinsert them after 30 seconds. If it still can't operate properly, replace the batteries.

6.2 Description of Each Control Operation

1. Temperature Parameters

Indoor preset temperature (Tpreset)

Indoor ambient temperature (Tamb)

2. Basic Functions

Once energized, in no case should the compressor be restarted within less than 3 minutes. In the situation that memory function is available, for the first energization, if the compressor is at stop before de-energization, the compressor will be started without a 3-minute lag; if the compressor is in operation before de-energization, the compressor will be started with a 3-minute lag; and once started, the compressor will not be stopped within 6 minutes regardless of changes in room temperature;

(1) Cooling Mode

① Working conditions and process of cooling

When Tamb.≥ Tpreset, the unit will enter cooling operation, in which case the indoor fan, the outdoor fan and the compressor will work and the indoor fan will run at preset speed.

When Tamb.≤ Tpreset -2℃, the compressor will stop.Opening angle of expansion valve is detected and if it is less than 150 steps, it will be increased to 150 steps, otherwise, the opening angle will not change.The outdoor fan will stop with a time lag of 30s, and the indoor fan will run at preset speed.

When Tpreset -2℃ < Tamb.< Tpreset, the unit will remain at its previous state.

Under this mode, the four-way valve will be de-energized and temperature can be set within a range from 16 to 30℃

If the compressor is shut down for some reasons, the indoor fan and the swing device will operate at original state.

② Protection

Antifreeze protection

Under cooling and dry mode, 6 minutes after the compressor is started:

If T evap.≤ 2℃ , the compressor will operate at reduced frequency. Expansion valve is prohibited to be turned down until Tevap. ≥10 ℃, the normal operation will be resumed.

If T evap.≤ -1℃ is detected for durative 3 minutes, the compressor will stop, power solar circuit will stop working and opening angle of expansion valve is detected. If it is less than 150 steps, it will be increased to 150 steps, otherwise, it will not change. And after 30 seconds, the outdoor fan will stop;and under cooling mode, the indoor fan and the swing motor will remain at the original state.

If T evap. ≥ 10℃ and the compressor has remained at OFF for at least 3 minutes, the compressor will resume its original operation state. Power solar circuit resumes operation and value of electronic expansion valve will be cleared.

③ Total current up and frequency down protection

If I total≤ A, frequency rise will be allowed; if Itotal ≥B, frequency rise will not be allowed; ifItotal ≥ C, the compressor will run at reduced frequency; and if Itotal ≥D, the compressor will stop and the outdoor fan will stop with a time lag of 30s. Solar power circuit will stop working

(2) Dry Mode

1 Working conditions and process of dry

If Tamb. ＞ Tpreset, the unit will enter cooling and dry mode, in which case the compressor and the outdoor fan will operate and the indoor fan will run at low speed.

If Tpreset -2℃ ≤Tamb.≤ Tpreset, the compressor remains at its original operation state.

If Tamb.< Tpreset -2℃ , the compressor will stop, and opening angle of expansion valve is detected. If it is less than 150 steps, it will be increased to 150 steps, otherwise, it will not change. The outdoor fan will stop with a time lag of 30s, and the indoor fan will operate at low speed.

Protection

Protection is the same as that under the cooling mode.

(3) Heating Mode

1、Working conditions and process of heating

If Tamb.≤Tpreset +2℃, the unit enters heating mode, in which case the four-way valve, the compressor and the outdoor fan will operate simultaneously, and the indoor fan will run at preset speed in the condition of preset cold air prevention.

If T amb.≥Tpreset +5℃ , the compressor will stop, and opening angle of expansion valve is detected. If it is less than 150 steps, it will be increased to 150 steps, otherwise, it will not change. In 30s later, outdoor fan stops operation. The outdoor fan will stop with a time lag of 30s, and the indoor fan will run under the mode of residue heat blowing.

If Tpreset +2℃ <T amb.< Tpreset +5℃ , the unit will maintain its original operating status.

Under this mode, the four-way valve is energized and temperature can be set within a range of 16 - 30℃ . The operating symbol, the heating symbol and preset temperature are revealed on the display.

2、Condition and process of defrost

① When Toutdoor amb.≤5℃, and compressor has been continuously operating for 3 hours, if Toutdoor pipe ＜0℃ is detected for continuous 1min., defrosting operation will start.

② When duration of successive heating operation is more than 45 minutes, or accumulated heating time more than 90 minutes,and one of the following conditions is reached, the unit will enter the defrost mode after 3 minutes.

a. Toutdoor amb.≥5℃, Toutdoor pipe ≤-2℃

b. -2℃≤Toutdoor amb.＜5℃, Toutdoor pipe-Tcompensation ≤-6℃；

c. -5℃≤Toutdoor amb. ＜-2℃, Toutdoor pipe-Tcompensation ≤-8℃;

d. -10℃≤Toutdoor amb. ＜-5℃, Toutdoor pipe-Tcompensation ≤(Toutdoor amb.-4℃)

e. Toutdoor amb.＜-10℃, Toutdoor pipe-Tcompensation≤（Toutdoor amb.-3℃）

At that time, the indoor fan stops and the compressor stops, and after 30 seconds the outdoor fan will stop, and then after 30 seconds, the four-way valve will stop. After 30 seconds, the compressor is initiated for raising the frequency to defrost frequency.

When the compressor has operated under defrost mode for 7.5 minutes, or Touter tube ≥E , the compressor will be converted to 46Hz operation. After 30 seconds, the compressor will stop. And after another 30 seconds, the four-way valve will be opened, and after 60 seconds, the compressor and the outdoor fan will be started, the in door fan will run under preset cold air prevention conditions, and H1 will be displayed at temperature display area on the display panel. Defrost frequency is 85Hz.

3.Protection

Cold air prevention

The unit is started under heating mode (the compressor is ON):

① In the case of T indoor amb .<24℃ : if T tube≤40℃ and the indoor fan is at stop state, the indoor fan will begin to run at low speed with a time lag of 2 minutes. Within 2 minutes, if T tube>40℃ , the indoor fan also will run at low speed; and after 1-minute operation at low speed, the indoor fan will be converted to operation at preset speed. Within 1-minute low speed operation or 2-minute non-operation, if T tube >42℃ , the fan will run at present speed.

② In the case of T indoor amb.≥24℃ : if T tube ≤42℃ , the indoor fan will run at low speed, and after one minute, the indoor fan will be converted to preset speed. With in one-minute low speed operation, if T tube , the indoor fan will be converted to preset speed.

Note: T indoor amb.i ndicated in ① and ② refers to, under initially heating mode, the indoor ambient temperature before the command to start the compressor is performed according to the program, or after the unit is withdrawn from defrost, the indoor ambient temperature before the defrost symbol is cleared.

Total current up and frequency down protection

If the total current Itotal ≤W, frequency rise will be allowed; if Itotal ≥X, frequency rise will not be allowed; if Itotal ≥Y, the compressor will run at reduced frequency; and if Itotal ≥Z, the compressor will stop，solar power circuit will stop working and the outdoor fan will stop with a time lag of 30s.

(4) Fan Mode

Under the mode, the indoor fan High, medium, low and auto speed can be chosen for indoor unit. and the compressor, the outdoor fan, the four-way valve and the electric heater will stop.

Under the mode, temperature can be set within a range of 16 – 30℃

(5) AUTO Mode

Working conditions and process of AUTO mode

Under AUTO mode, standard cooling temperature Tpreset is 25℃ and standard heating temperature Tpreset is 20℃

a. Once energized, if Tamb.≤22℃ , the unit will be started under heating mode; if 22℃ < Tamb.< 25℃ , the unit will run under fan mode and the operation indicator lamp will be bright; and if Tamb.≥25℃ , the unit will be started under cooling mode.

a. Under AUTO mode, if Tamb.≥Tpreset +1℃ is detected, the unit will select to run under cooling mode, in which case implicit preset temperature is 25℃ ; if Tamb.≤Tpreset -1℃ , the compressor will stop, the outdoor fan will stop with a time lag of 30 seconds, and the indoor fan will run at preset speed; and if Tpreset -1℃)< Tamb.< Tpreset+1℃ , the unit will remain at its originalstate.

b. Under AUTO mode, if Tamb. ≤Tpreset+2℃ is detected, the unit will select to run under heating mode, in which case implicit preset temperature is 20℃ ; if Tamb.≥Tpreset+4℃ , the compressor will stop, the outdoor fan will stop with a time lag of 30seconds, and the indoor fan will run under the mode of residue heat blowing; and if Tpreset +2 ℃ < Tamb.< Tpreset +5℃ , the unit will remain at its original state.

c. Under AUTO mode, if 20℃ < Tamb.< 25℃ , the unit will remain at its original state.

2.Protection

a. In cooling operation, protection is the same as that under the cooling mode;

b. In heating operation, protection is the same as that under the heating mode;

c. When ambient temperature changes, operation mode will be converted preferentially. Once started, the compressor will remain unchanged for at least 6 minutes.

(6) Common Protection Functions and Fault Display under COOL, HEAT, DRY and AUTO Modes

1 Overload protection

T tube : measured temperature of outdoor heat exchanger under cooling mode; and measured temperature of indoor heat exchanger under heating mode.

(1) Cooling overload

a. If T tube ≤T1℃ , the unit will return to its original operation state.

b. If T tube ≥T2℃ , frequency rise is not allowed.

c. If T tube ≥T3℃ , the compressor will run at reduced frequency.

d. If T tube≥T4℃ , the compressor will stop, solar power circuit will stop working and the indoor fan will run at preset speed.

12K During cooling and drying ：T1=52℃，T2=55℃，T3=57℃，T4=60℃；

18K During cooling and drying ：T1=52℃，T2=55℃，T3=58℃，T4=62℃；

(2) Heating overload

a. If T tube≤T1℃ , the unit will return to its original operation state.

b. If T tube ≥T2℃ , frequency rise is not allowed.

c. If T tube ≥T3℃ , the compressor will run at reduced frequency.

d. If T tube≥T4℃ , the compressor will stop solar power circuit will stop working and the indoor fan will blow residue heat and the n stop.

12K During heating. T1=50℃，T2=53℃，T3=55℃，T4=60℃；

18K During heating T1=52℃，T2=55℃，T3=58℃，T4=62℃；

(3)Exhaust temperature protection of compressor

If exhaust temperature ≥98℃ , frequency is not allowed to rise.

If exhaust temperature ≥103℃ , the compressor will run at reduced frequency.

If exhaust temperature ≥110℃ , the compressor will stop. solar power circuit will stop working

If exhaust temperature ≤90℃ and the compressor has stayed at stop for at least 3 minutes, the compressor will resume its operation.

Value of electronic expansion valve will be cleared and solar power circuit will resume operation.

(4) Communication fault

If the unit fails to receive correct signals for durative 3 minutes, communication fault can be justified and the whole system will stop.

(5) Module protection

Under module protection mode, the compressor will stop. solar power circuit will stop working When the compressor remains at stop for at least 3 minutes, the compressor will resume its operation，and solar power circuit will resume operation. If module protection occurs six times in succession, the compressor will not be started again.

(6)If overload malfunction occurs, compressor will stop operation and outdoor fan will stop operation in 30s later. Solar power circuit will stop working. After malfunction is eliminated and the unit has stopped operation for 3min, the unit will resume normal operation, value of electronic expansion valve will be cleared and solar power circuit will resume working.

(7) If voltage on the DC bus is below 150V or over 420V, the compressor will stop and the outdoor fan will stop with a time lag of 30 seconds. When voltage on the DC bus returns to its normal value and the compressor has stayed at stop for at least 3 minutes, the compressor will resume its opera tion.

(8)Module temperature protection:

When Tipm ≥90℃，the frequency is prohibited to increase;

When Tipm ≥95℃，the frequency decreases;

When Tipm ≥100℃, Compressor stops operation and solar power circuit stops working;

When Tipm ≤85℃，after compressor has stopped operation for 3min, compressor will resume operation, value of electronic expansion valve will be cleared and solar power circuit will resume working.

(9)Compression power protection:

When Pc ≥P1, the frequency is prohibited to increase and expansion valve is prohibited to be turned down until Pc ≤1400W for continuous 3min, normal operation will be resumed;

When Pc ≥ P2, frequency will be decreased;

When Pc ≥P3, compressor stops operation and solar power circuit will stop working;

When Pc ≤P4, when compressor has stopped operation for 3min, compressor will resume operation, value of electronic expansion valve will be cleared and solar power circuit will resume working.

(10) Faults of temperature sensors

Designation of sensors	Faults
Indoor ambient temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds
Indoor tube temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds
Outdoor ambient temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds
Outdoor tube temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds, and no detection is performed within 10 minutes after defrost begins.
Exhaust	After the compressor has operated for 3 minutes, the sensor is detected to be open-circuited or short-circuited for successive 30 seconds.
Overload	After the compressor has operated for 3 minutes, the sensor is detected to be open-circuited or short-circuited for successive 30 seconds.

(11) Solar power circuit protection

a. Detection for connection of solar power: after the unit is energized, the connection of solar power will be detected immediately. If the voltage of input terminal of solar power is not detected, indoor unit will display malfunction code for 5 seconds and the unit will be started up normally. In 5s later, indoor unit will not display the malfunction code.

b. Overhigh voltage protection for solar power supply: when voltage of input terminal of solar power is over 180V, the solar power supply will be cut-off, indoor unit will display malfunction code and the unit will normally operate.

c. Overcurrent protection for solar power: when current of input terminal of solar power is over 9A, the solar power supply will be cut-off, indoor unit will display malfunction code and the unit will normally operate.

7. Installation Manual

7.1 Notices for Installation

Caution

1.The unit should be installed only by authorized service center according to local or government regulations and in compliance with this manual.

2.Before installing, please contact with local authorized maintenance center. If the unit is not installed by the authorized service center, the malfunction may not be solved due to incovenient contact between the user and the service personnel.

3.When removing the unit to the other place, please firstly contact with the local authorized service center.

4.Warning: Before obtaining access to terminals, all supply circuits must be disconnected.

5.For appliances with type Y attachment, the instructions shall contain the substance of the following. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

6.The appliance must be positioned so that the plug is accessible.

7.The temperature of refrigerant line will be high; please keep the interconnection cable away from the copper tube.

8.The instructions shall state the substance of the following:

This appliance is not intended for use by persons(including children)with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

7.1.1 Installation Site Instructions

Proper installation site is vital for correct and efficient operation of the unit. Avoid the following sites where:

●strong heat sources, vapours, flammable gas or volatile liquids are emitted.

●high-frequency electro-magnetic waves are generated by radio equipment, welders and medical equipment.

●salt-laden air prevails (such as close to coastal areas).

●the air is contaminated with industrial vapours and oils.

●the air contains sulphures gas such as in hot spring zones.

●corrosion or poor air quality exists.

7.1.2 Installation Site of Indoor Unit

1.The air inlet and outlet should be away from the obstructions. Ensure the air can be blown through the whole room.

2.Select a site where the condensate can be easily drained out, and where it is easily connected to outdoor unit.

3.Select a place where it is out of reach of children.

4.Select a place where the wall is strong enough to withstand the full weight and vibration of the unit.

5.Be sure to leave enough space to allow access for routine maintenance. The installation site should be 250cm or more above the floor.

6.Select a place about 1m or more away from TV set or any other electric appliance.

7.Select a place where the filter can be easily taken out.

8.Make sure that the indoor unit is installed in accordance with installation dimension instructions.

9.Do not use the unit in the laundry or by swimming pool etc.

7.1.3 Installation Site of Outdoor Unit

1.Select a site where noise and outflow air emitted by the unit will not annoy neighbors.

2.S elect a site where there is sufficient ventilation.

3.Select a site where there is no obstruction blocking the inlet and outlet.

4.The site should be able to withstand the full weight and vibration.

5.Select a dry place, but do not expose the unit to direct sunlight or strong wind.

6.Make sure that the outdoor unit is installed in accordance with the installation instructions,and is convenient for maintenance and repair.

7.The height difference between indoor and outdoor units is within A m, and the length of the connecting tubing does not exceed B m.

Model	A	B
12K	10	20
18K	15	30

8.Select a place where it is out of reach of children.

9.Select a place where the unit does not have negative impact on pedestrians or on the city.

7.1.4 Safety Precautions for Electric Appliances

1.A dedicated power supply circuit should be used in accordance with local electrical safety regulations.

2.Don't drag the power cord with excessive force.

3.The unit should be reliably earthed and connected to an exclusive earth device by the professionals.

4.The air switch must have the functions of magnetic tripping and heat tripping to prevent short circuit and overload.

5.The minimum distance between the unit and combustive surface is 1.5m.

6.The appliance shall be installed in accordance with national wiring regulations.

7.An all-pole disconnection switch with a contact separation of at least 3mm in all poles should be connected in fixed wiring.

Note:

●Make sure the live wire, neutral wire and earth wire in the family power socket are properly connected. There should be reliable circuit in the diagram.

●Inadequate or incorrect electrical connections may cause electric shock or fire.

7.1.5 Earthing Requirements

1.Air conditioner is type I electric appliance. Please ensure that the unit is reliably earthed.

2.The yellow-green wire in air conditioner is the earthing wire which can not be used for other purposes. Improper earthing may cause electric shock.

3.The earth resistance should accord to the national criterion.

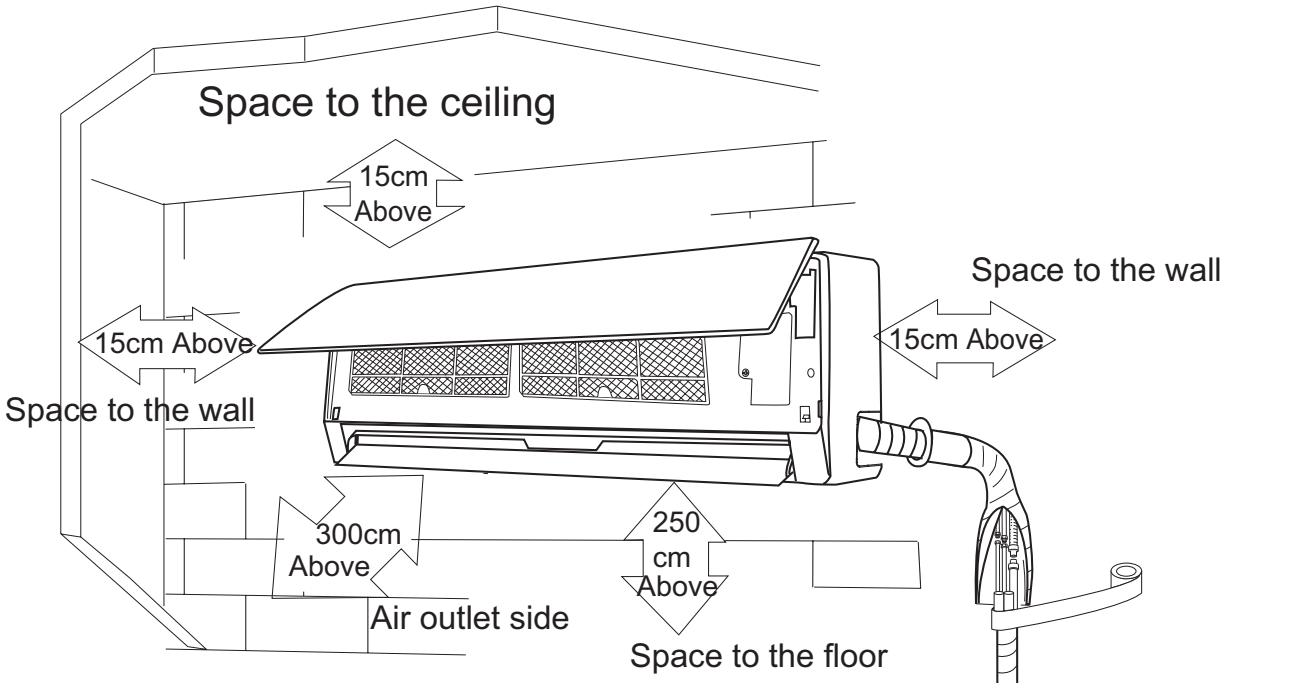
4.The power must have reliable earthing terminal. Please do not connect the earthing wire with the following:

① Water pipe ② Gas pipe ③ Contamination pipe

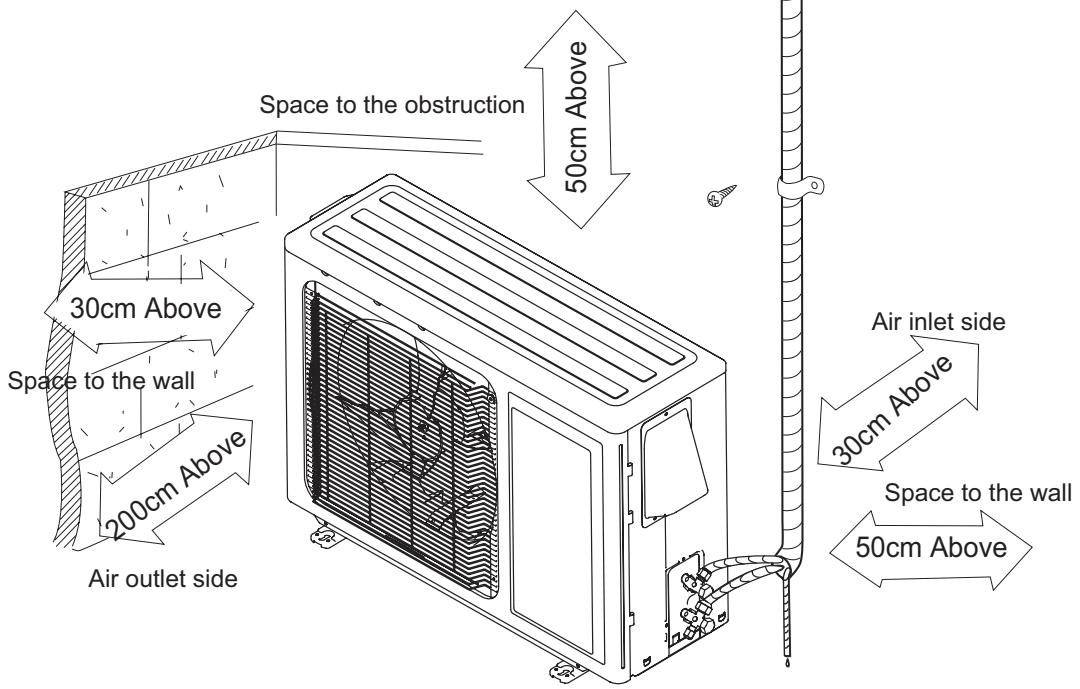
④ Other place that professional personnel consider is unreliable

5. The model and rated values of fuses should accord with the silk print on fuse cover or related PCB.

7.2 Installation Drawing



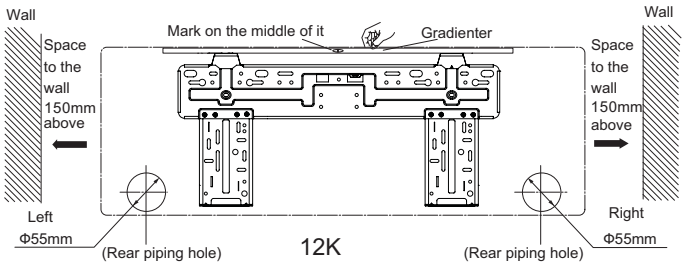
- The dimensions of the space necessary for correct installation of the appliance including the minimum permissible distances to adjacent structures

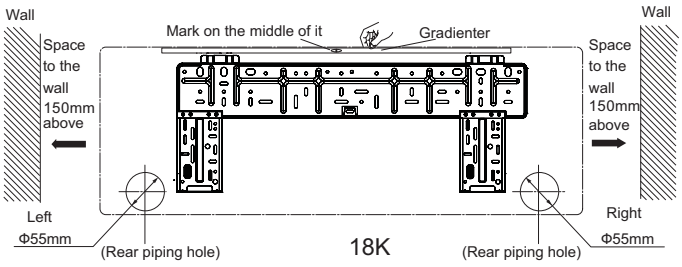


7.3 Install Indoor Unit

7.3.1 Installation of Mounting Plate

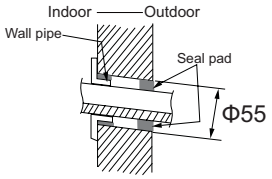
1. Mounting plate should be installed horizontally. As the water tray's outlet for the indoor unit is two-way type, during installation, the indoor unit should slightly slant to water tray's outlet for smooth drainage of condensate.
2.Fix the mounting plate on the wall with screws.
3.Be sure that the mounting plate has been fixed firmly enough to withstand about 60 kg. Meanwhile, the weight should be evenly shared by each screw.





7.3.2 Drill Piping Hole

1.Slant the piping hole (Φ55) on the wall slightly downward to the outdoor side.
2.Insert the piping-hole sleeve into the hole to prevent the connection piping and wiring from being damaged when passing through the hole.



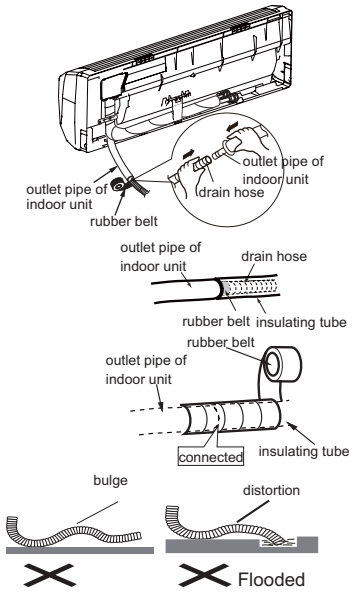
7.3.3 Installation of Drain Hose

1.Connect the drain hose to the outlet pipe of the indoor unit. Bind the joint with rubber belt.

2.Put the drain hose into insulating tube.

3.Wrap the insulating tube with wide rubber belt to prevent the shift of insulating tube. Slant the drain hose downward slightly for smooth drainage of condensate.

Note: The insulating tube should be connected reliably with the sleeve outside the outlet pipe. The drain hose should be slanted downward slightly, without distortion, bulge or fluctuation. Do not put the outlet in the water.



7.3.4 Connecting Indoor and Outdoor Electric Wires

1.Open the front panel.
2.Remove the wiring cover .Connect and fix the power connection cord to the terminal board. as shown in Fig 2.
3.Make the power connection cord pass through the hole at the back of indoor unit.
4.Reinstall the cord anchorage and wiring cover.
5.Reinstall the front panel.

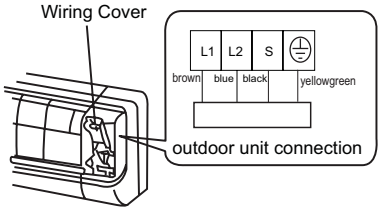


Fig.2

NOTE:

All wires between indoor and outdoor units must be connected by the qualified electric contractor.

- Electric wires must be connected correctly. Improper connection may cause malfunction.
- Tighten the terminal screws securely.
- After tightening the screws, pull the wire slightly to confirm whether it's firm or not.
- Make sure that the electric connections are earthed properly to prevent electric shock.
- Make sure that all wiring connections are secure and the cover plates are reinstalled properly. Poor installation may cause fire or electric shock.

7.3.5 Installation of Indoor Unit

●The piping can be output from right, right rear, left or left rear.

1.When routing the piping and wiring from the left or right side of indoor unit, cut off the tailings from the chassis when necessary(As shown in Fig.3)

(1) Cut off tailing 1 when routing the wiring only;

(2) Cut off tailing 1 and tailing 2 when routing both the wiring and piping.

2.Take out the piping from body case; wrap the piping, power cords, drain hose with the tape and then make them pass through the piping hole. (As shown in Fig.4)

3.Hang the mounting slots of the indoor unit on the upper hooks of the mounting plate and check if it is firm enough. (As shown in Fig.5)

4.The installation site should be 250cm or more above the floor.

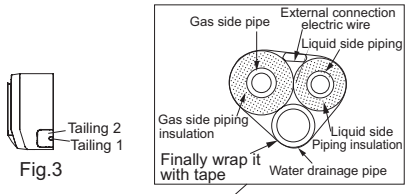


Fig.3

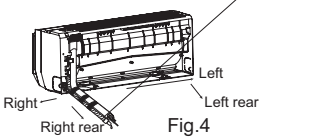


Fig.4

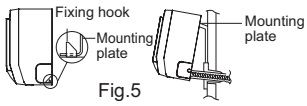


Fig.5

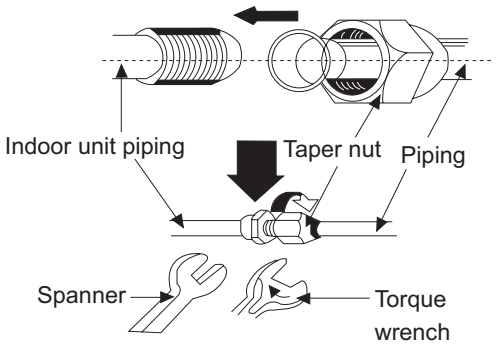
7.3.6 Installation of Connection Pipe

1.Align the center of the pipe flare with the related valve.

2.Screw in the flare nut by hand and then tighten the nut with spanner and torque wrench by referring to the following:

Hex nut diameter	Tightening torque(N·m)
Φ 6	15～20
Φ 9.52	31～35
Φ 12	50～55
Φ 16	60～65
Φ 19	70～75

NOTE: Connect the connection pipe to indoor unit at first and then to outdoor unit. Handle piping bending with care. Do not damage the connection pipe. Ensure that the joint nut is tightened firmly, otherwise, it may cause leakage.



7.4 Install Outdoor Unit

7.4.1 Electric Wiring

1.Disassemble the cable cross plate sub-assy on the outdoor unit right side plate.

2.Take off wire cord anchorage. Connect and fix the power connection cord to the terminal board. Wiring should fit that of indoor unit.

3.Fix the power connection cord with wire clamps and then connect the corresponding connector.

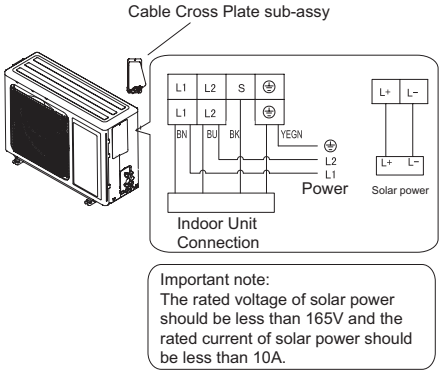
4.Ensure wire has been fixed well.

5.Install the cable cross plate sub-assy.

NOTE:

●Wrong wiring may cause spare parts malfunction.

●After the cable fixed, make sure there should be a free space between the connection and connection and fixing place on the lead wire.



Important note:
The rated voltage of solar power should be less than 165V and the rated current of solar power should be less than 10A.

7.4.2 Air Purging and Leakage Test

1.Connect charging hose of manifold valve to charge end of low pressure valve (both high/low pressure valves must be tightly shut).
Connect joint of charging hose to vacuum pump.
3. Fully open the handle of Lo manifold valve.
4. Open the vacuum pump for vacuumization. At the beginning, slightly loosen joint nut of low pressure valve to check if there is air coming inside (If noise of vacuum pump has been changed, the reading of multimeter is 0). Then tighten the nut.
5.Keep vacuuming for more than 15mins and make sure the reading of multi-meter is $-1.0X10^5$ pa(-76cmHg).
6. Fully open high/low pressure valves.
7. Remove charging hose from charging end of low pressure valve.
8. Tighten lid of low pressure valve. (As shown in Fig.6)

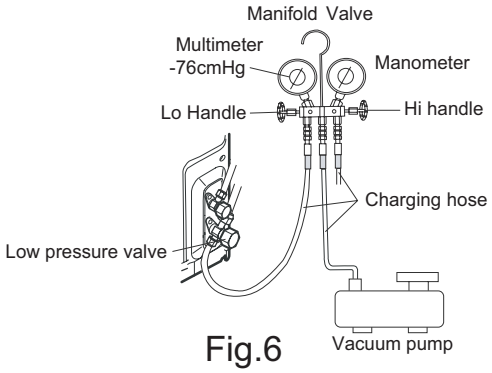
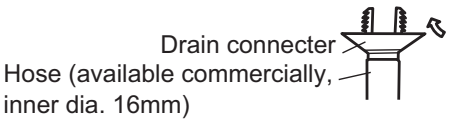


Fig.6

7.4.3 Outdoor Condensate Drainage (only for Heat pump unit)

During heating operation, the condensate and defrosting water should be drained out reliably through the drain hose.
Install the outdoor drain connector in a Φ25 hole on the base plate and attach the drain hose to the connector so that the waste water formed in the outdoor unit can be drained out .The hole diameter 25 must be plugged.
Whether to plug other holes will be determined by the dealers according to actual conditions.

Bottom frame



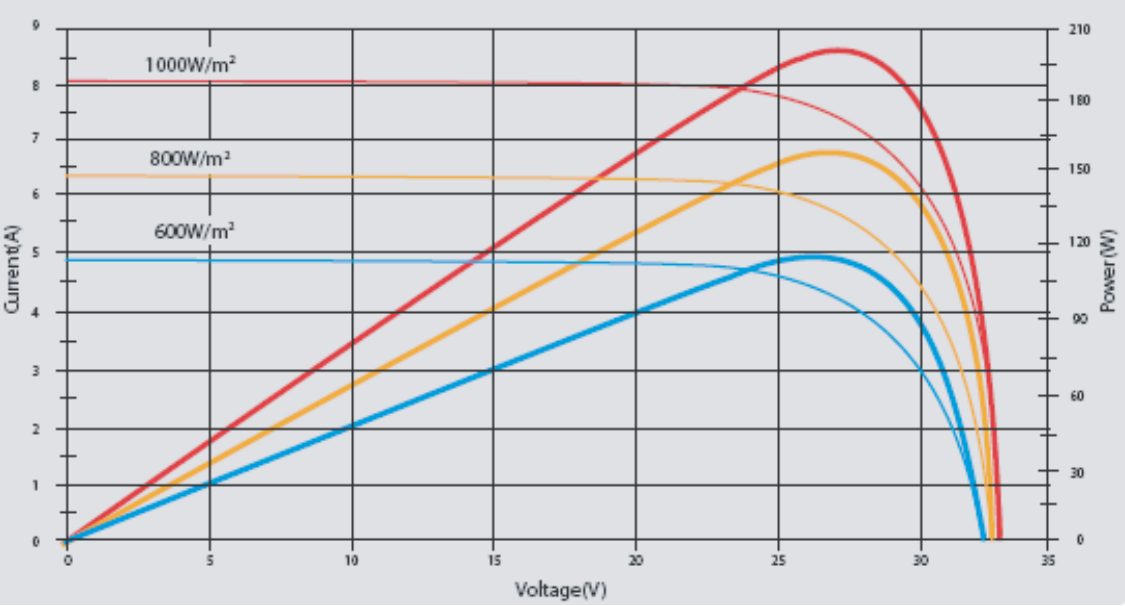
7.5 Install PV-Module

7.5.1 PV-Module Characteristics

Electrical Characteristics	
Open - Circuit Voltage (Voc)	33.4V
Optimum Operating Voltage (Vmp)	26.2V
Short - Circuit Current (Isc)	8.12A
Optimum Operating Current (Imp)	7.63A
Maximum Power at STC (Pmax)	200Wp
Operating Temperature	-40ºC to +85ºC
Maximum System Voltage	600V DC
Maximum Series Fuse Rating	20AMPS
Power Tolerance	±3 %
Mechanical Characteristics	
Solar Cell	Poly-crystalline 156×156mm (6inch)
No. of Cells	54 (6×9)
Dimensions	1482×992×35mm (58.3×39.1×1.4inch)
Weight	16.8kg (37.0lbs.)
Front Glass	3.2 mm (0.13inch) tempered glass
Frame	Anodized aluminium alloy
Junction Box	IP65 rated
Output Cables	LAPP (4.0mm2), asymmetrical lengths (-) 1200mm(47.2inch) and (+) 800mm (31.5inch), MC Plug Type IV connectors

STC: Irradiance 1000W/m2, Module temperature 25ºC, AM=1.5

Current-Voltage & Power-Voltage Curve

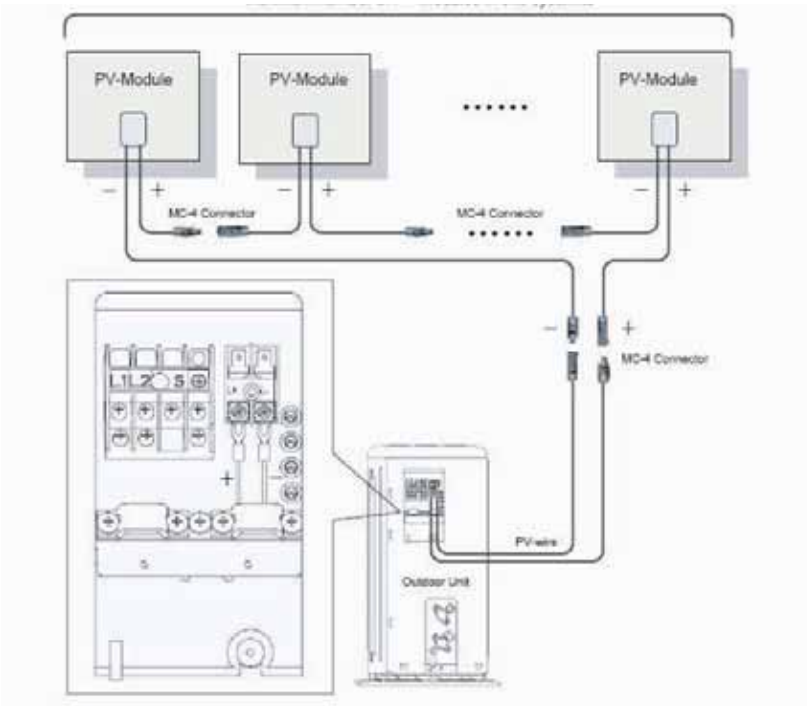


7.5.2 Mechanical Installation

1. Mechanical Installation of PV-modules should be operated by professional solar photovoltaic installation guides or reputable solar installer or systems integrator.
2. Omega do not provide any mechanical installation guide of PV-modules, as a result, Omega will not provide any instructor or after ser vice for the problems of mechanical installation of PV-modules.

7.5.3 Electrical Installation

1. General Installation
   • Any hardware used must be compatible with the mounting structure material to avoid galvanic corrosion
   • It is not recommended to use modules with different configurations in the same system.
   • Several modules should be connected in series to form a string of modules if needed.The maximum number of series connected modules is 5.
   • MC-4 connector is the recommended connector and the recommended system wires size is AWG12 .
2. Installation Sketch



7.5.4 Assembly of PV-wire

1.The PV-wire should be single-pole, double insulated solar cable, the length of which is due to the distance from PV-modules to outdoor unit of AC, the recommended conductor cross section is AWG12, and it should accord with UL4703.
2. The MC-4 Connectors should be assembled to the PV-wires , and the other side of the PV-wires should be assembled with spade terminals.

MC-4connectors,

connected with PV-modules

PV-wires

spade terminals,commected

with outdoor unit

7.5.5 Assembly of MC-4 Connector

1. Introduction of MC-4 Connector
The MC-4 Connector contains three Parts, male PV cable coupler(PV-KST4/6II-UR), female PV cable coupler(PV-KBT4/6II-UR) and a safty lock clip(PV-SSH4).

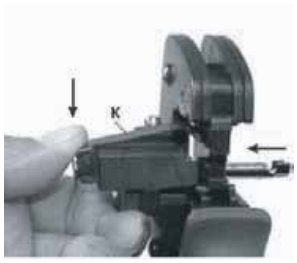
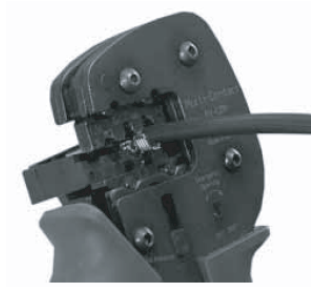
Male PV cable coupler (PV-KST4/6II-UR)

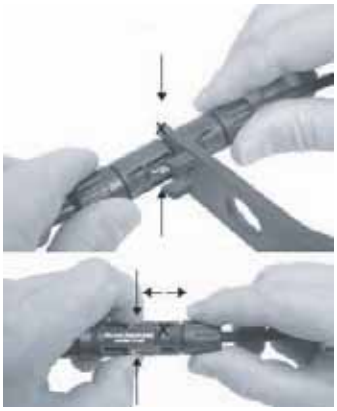
Female PV cable coupler (PV-KBT4/6II-UR)

Safty lock clip (PV-SSH4)

2.Assembly Method

	Introduction	Photo	Recommended tool
Step1	Strip cable insulation. L = 6-7,5 mm. Take care not to cut individual strands.		Stripping pliers:PV-AZM-1.5/6  Interchangeable blade: PV-M-AZM-156 

Step2	Open and hold clamping clip (K).Insert contact in the appropriate cross-section range of the crimping tool. Turn contact till crimping tabs face the top. Release clamping clip (K). The contact is secured.		Crimping pliers: PV-CZM-19100  Insert: PV-ES-CZM-19100  Locator: PV-LOC 
Step3	Lightly press the pliers together so that the crimping tabs lie securely within the crimping die.		
Step4	Insert the stripped cable until the insulation comes into contact with the crimping insert. Close crimping tool completely. Check crimp.		
Step5	Push the crimped contact into the socket resp. plug insulator until it engages. Pull lightly on the lead to check that the metal part has engaged.		
Step6	Insert the test pin with the corresponding side into the socket or plug to the end position. If the contact is correctly assembled, the white marking on the test pin must be still visible.		Test plug PV-PST 

Step7	Screw on the cable gland, hand-tight, with the tools PV-MS. The tightening torque must be adapted to the solar cables used in each specific case. Typical values lie in a range between 2,5Nm to 3Nm.		Open-end spanner PV-MS 1 set = 2 pieces 
Step8	Plug the coupling together until they engage. Check correct engagement by pulling on the coupling.		
Step9	Compress the two snapin springs (X) by hand or with the PV-MS tool and separate the coupling.		
Step10	Plugging: Mount the plug connection until it engages. Check correct engagement by pulling on the coupling. Unplugging: The plug connection can only be unlocked with the tool PV-MS.		PV-SSH4 

7.6 Check after Installation and Operation Test

7.6.1 Check after Installation

Items to be checked	Possible malfunction
Has it been fixed firmly?	The unit may drop, shake or emit noise.
Have you done the refrigerant leakage test?	It may cause insufficient cooling(heating) capacity
Is heat insulation sufficient?	It may cause condensation and dripping.
Is water drainage satisfactory?	It may cause condensation and dripping.
Is the voltage in accordance with the rated voltage marked on the nameplate?	It may cause electric malfunctionor damage the product.
Is the electric wiring and piping connection installed correctly and securely?	It may cause electric malfunction or damage the part.
Has the unit been connected to a secure earth connection?	It may cause electrical leakage.
Is the power cord specified?	It may cause electric malfunctionor damage the part.
Are the inlet and outlet openings blocked?	It may cause insufficient cooling(heating) capacity.
Is the length of connection pipes and refrigerant capacity been recorded?	The refrigerant capacity is not accurate.

7.6.2 Operation Test

1.Before Operation Test

(1)Do not switch on power before installation is finished completely.

(2)Electric wiring must be connected correctly and securely.

(3)Cut-off valves of the connection pipes should be opened.

(4)All the impurities such as scraps and thrums must be cleared from the unit.

2.Operation Test Method

(1)Switch on power and press "ON/OFF"?button on the remote controller to start operation.

(2)Press MODE button to select the COOL, HEAT (Not available for cooling only unit), FAN to check whether the operation is normal or not.

7.7 Installation and Maintenance of Healthy Filter

7.7.1 Installation of Healthy Filter

1.Lift up the front panel from its two ends, as shown by the arrow direction, and then remove the air filter. (As shown in fig a)

2.Attach the healthy filter onto the air filter. (as shown in fig b)

3.Install the air filter properly along the arrow direction in Fig.c, and then close the panel .

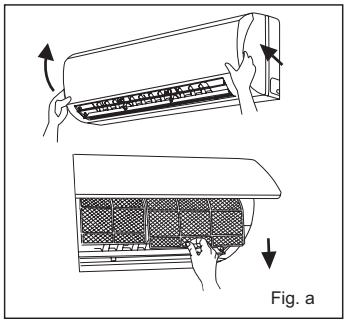


Fig. a

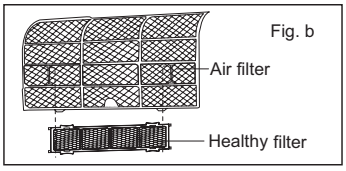


Fig. b

7.7.2 Cleaning and Maintenance

Remove the healthy filter and reinstall it after cleaning according to the installation instruction. Don't use brush or hard things to clean the filter. After cleaning, be sure to dry it in the shade.

7.7.3 Service Life

The general serive life for the healthy filter is about one year under normal condition. As for silver ion filter, it is invalid when its surface becomes black (green).

●This supplementary instruction is provided for reference to the unit with healthy filter. If the graphics provided herein is different from the actual product, please refer to the atual product. The quantity of healthy filters is based on the actual delivery.

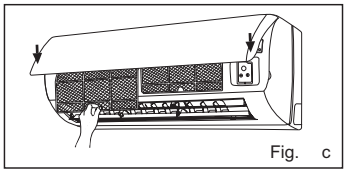
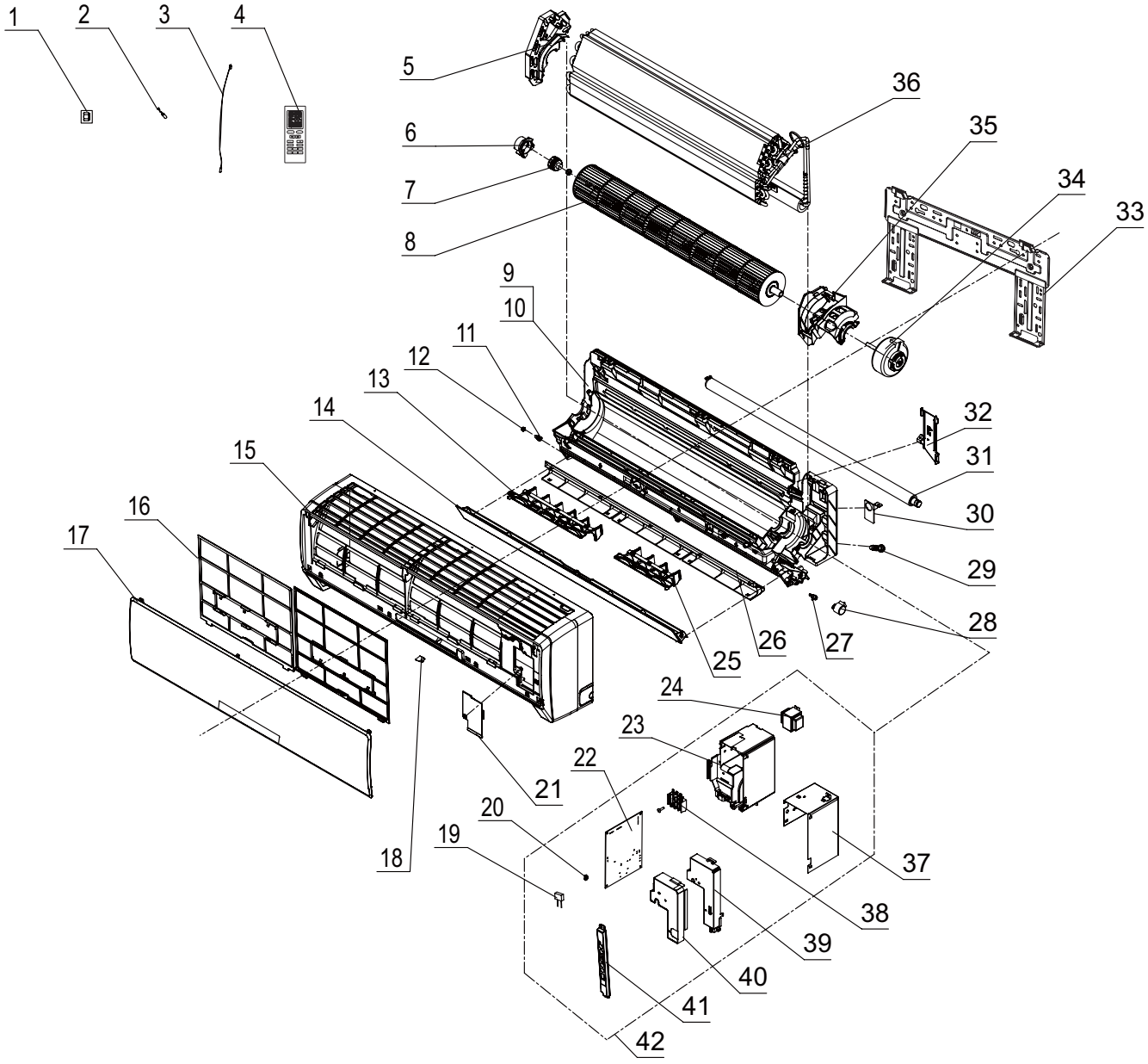


Fig. c

8. Exploded Views and Parts List

8.1 Indoor Unit

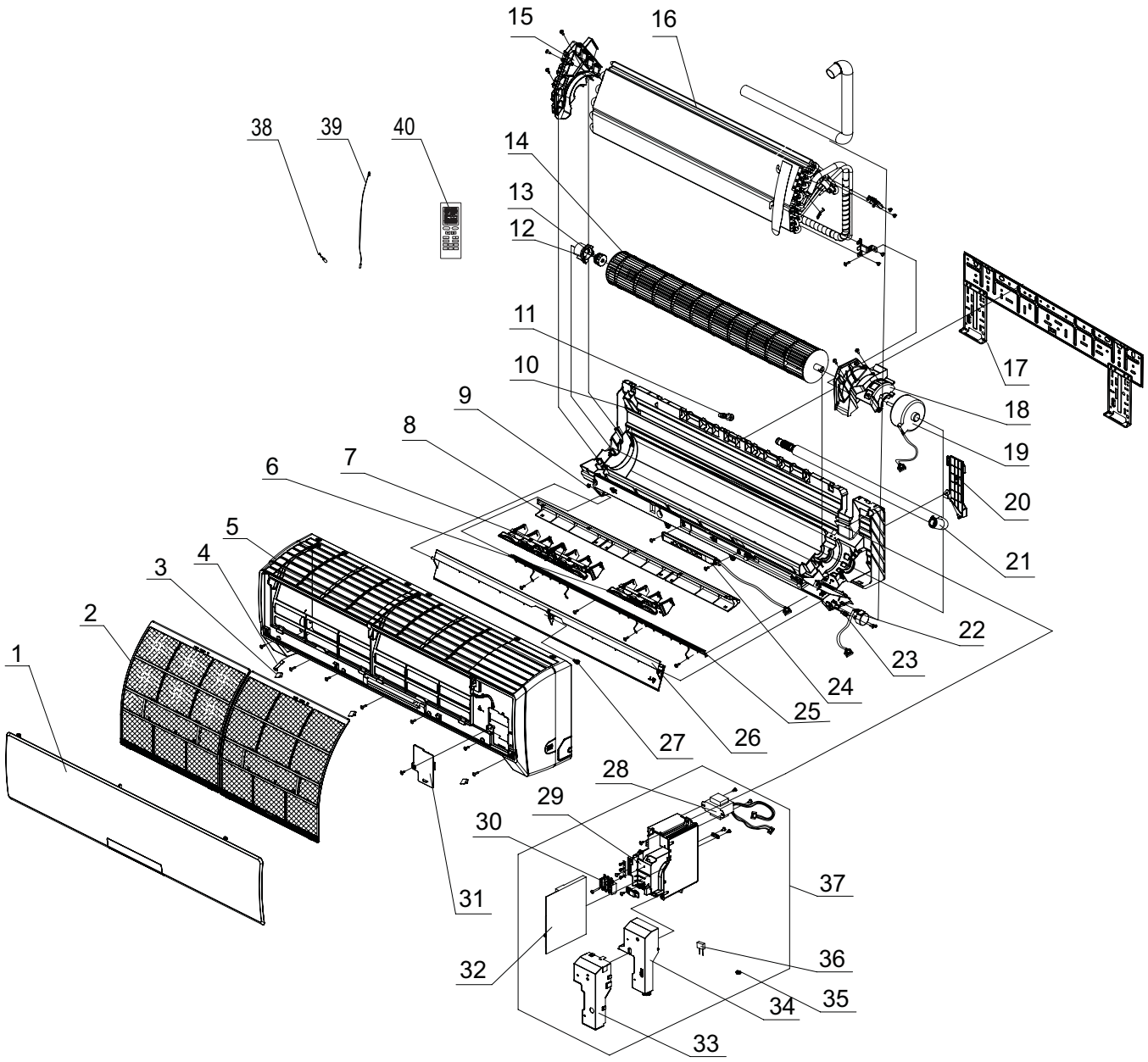
HWSS012J2A-RWK035



NO.	Description	Part Code	Qty
		HWSS012J2A-RWK035	
	Product Code	CB161N02800	
1	Pipe Connection Nut Accessories	06320020	1
2	Tube Sensor	390000591G	1
3	Ambient Temperature Sensor	390000451	1
4	Remote Controller	305100482	1
5	Evaporator Support	24212091	1
6	Ring of Bearing	26152022	1
7	O-Gasket sub-assy of Bearing	76512051	1
8	Cross Flow Fan	10352017	1
9	Rear Case assy	2220210309	1
10	Rear Case	2220245405	1
11	Axile Bush	10542008	1
12	Left Axile Bush	10512037	1
13	Air Louver1	10512164	1
14	Guide Louver	10512157	1
15	Front Case Sub-assy	2001213914	1
16	Filter Sub-Assy	1112220403	2
17	Front Panel Sub-Assy	20012557	1
18	Screw Cover	24252016	1
19	Capacitor	33010002	1
20	Jumper	4202300108	1
21	Electric Box Cover2	20122075	1
22	Main Board	30138476	1
23	Electric Box	20112082	1
24	Transformer	43110293	1
25	Air Louver2	10512165	1
26	Helicoid Tongue	26112163	1
27	Crank	10582070	1
28	Step Motor	1521212901	1
29	Rubber Plug(Water Tray)	76712012	1
30	Cable Cross Plate	02122019	1
31	Drainage Hose	0523001401	1
32	Pipe Clamp	26112164	1
33	Wall Mounting Frame	01252021	1
34	Fan Motor	15012089	1
35	Motor Press Plate	26112161	1
36	Evaporator Assy	01002321	1
37	Lower Shield Sub-assy of Electric Box	01592072	1
38	Terminal Board	4201123301	1
39	Electric Box Cover1	20122103	1
40	Shield Cover of Electric Box Sub-assy	01592073	1
41	Display Board	30565012	1
42	Electric Box Assy	2020212897	1

The data above are subject to change without notice.

HWSS018J2A-RWI053

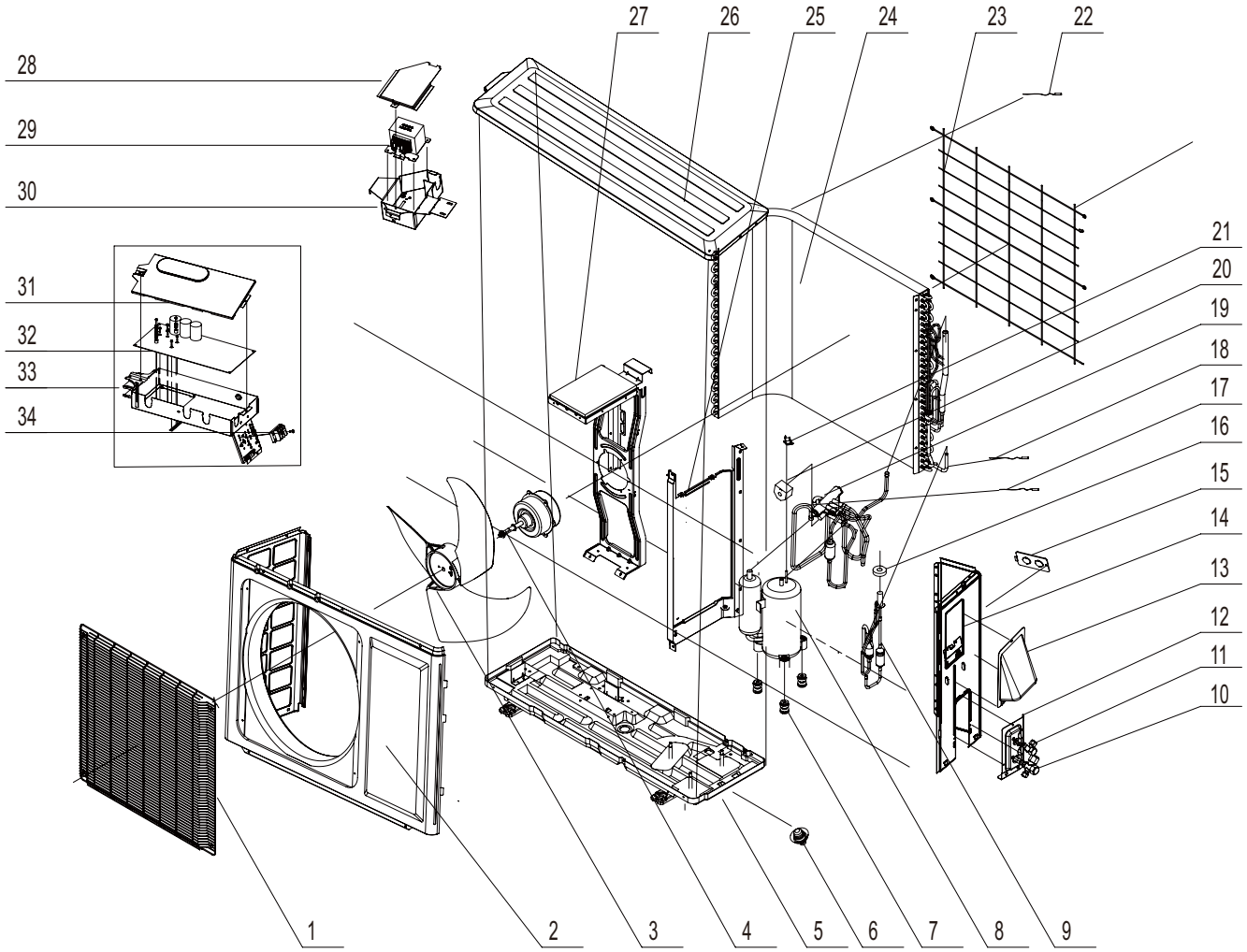


NO.	Description	Part Code	Qty
		HWSS018J2A-RWI053	
	Product Code	CB161N02700	
1	Front Panel Assy	20012280	1
2	Filter Sub-Assy	1112208901	2
3	Screw Cover	24252016	3
4	Baffle Plate	26112228	1
5	Front Case Sub-Assy	20012288	1
6	Air Louver 1	10512708	1
7	Air Louver 2	10512709	1
8	Helicoid tongue	26112238	1
9	Left Axile Bush	10512037	1
10	Rear Case Assy	22202128	1
11	Rubber Plug (Water Tray)	76712012	1
12	Ring of Bearing	26152022	1
13	O-Gasket sub-assy of Bearing	76512051	1
14	Cross Flow Fan	10352019	1
15	Evaporator Support	24212100	1
16	Evaporator Assy	01002575	1
17	Wall Mounting Frame	01252218	1
18	Motor Press Plate	26112178	1
19	Fan Motor	1501211601	1
20	Pipe Clamp	26112164	1
21	Drainage hose	05230014	1
22	Step Motor	15012086	1
23	Crank	10582070	1
24	Display Board	30565039	1
25	Mesh enclosure (air outlet)	01472015	1
26	Guide Louver	10512115	1
27	Axile Bush	10542008	1
28	Transformer	43110257	1
29	Electric Box	20112108	1
30	Terminal Board	4201123301	1
31	Electric Box Cover 2	20112081	1
32	Main Board	30138856	1
33	Shield cover of Electric Box	01592092	1
34	Electric Box Cover 1	20122128	1
35	Jumper	4202300110	1
36	Capacitor CBB611A	33010043	1
37	Electric Box Assy	2020211485	1
38	Ambient Temperature Sensor	390000451	1
39	Tube Sensor	390000591G	1
40	Remote Controller	305100482	1

The data above are subject to change without notice.

8.2 Outdoor Unit

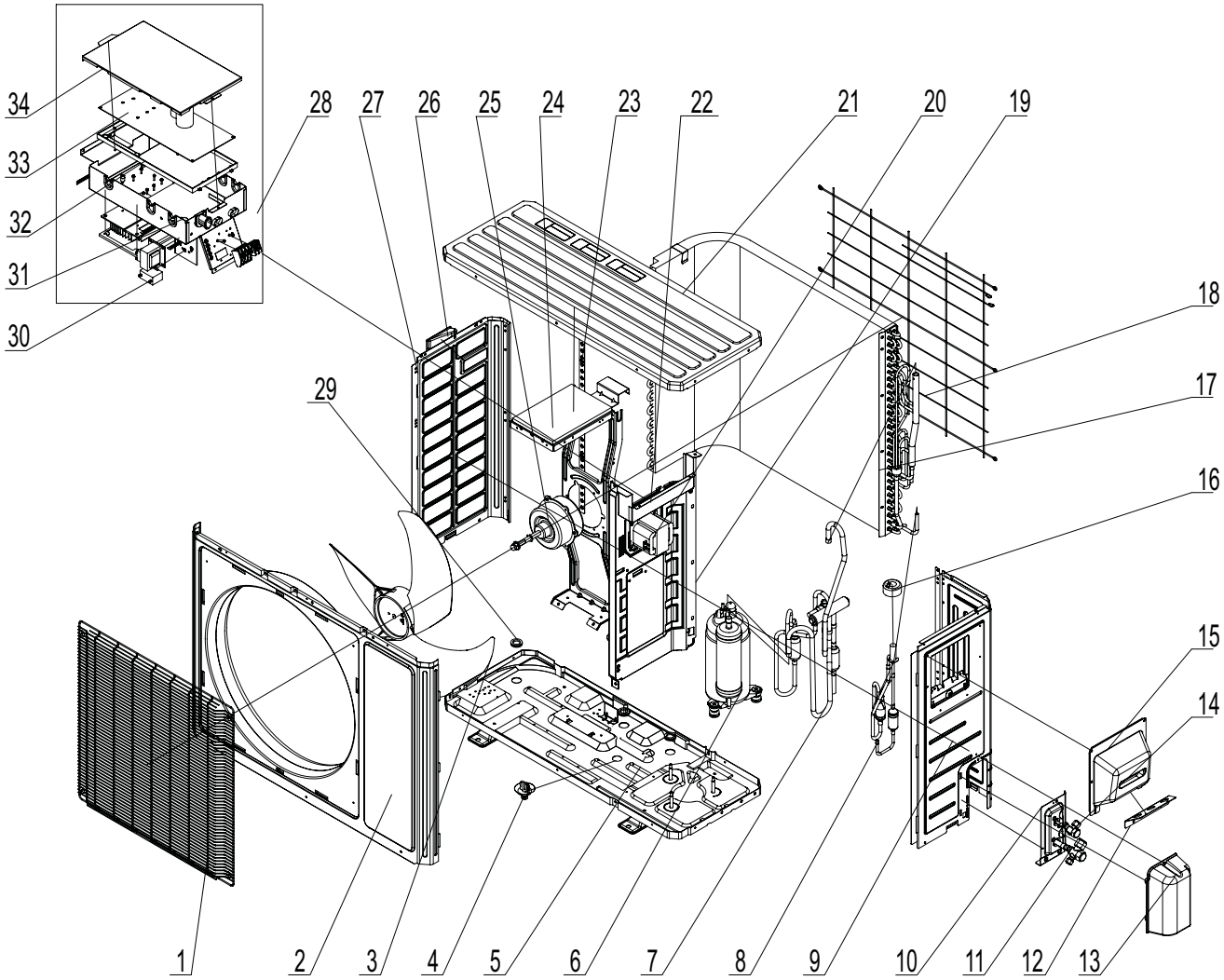
HCSS012J2A-RSK035



NO.	Description	Part Code	Qty
		HCSS012J2A-RSK035	
	Product Code	CB161W02800	
1	Rear Grill (Front)	01473012	1
2	Cabinet	0143304601P	1
3	Axial Flow Fan	10333502	1
4	Fan Motor	15013069	1
5	Chassis Sub-assy	01203939P	1
6	Drainage Connecter	06123401	1
7	Compressor Gasket	76815203	3
8	Compressor and fittings	00205212	1
9	Electric Expansion Valve Sub-Assy	07133631	1
10	Valve	071302391	1
11	Valve	07100003	1
12	Valve Support	01713041	1
13	Cable Cross Plate sub-assy	02123015	1
14	Right Side Plate Assy	013030712	1
15	Cover of pass wire	01413069	1
16	Magnet Coil	4300876701	1
17	Discharge sensor	39000310G	1
18	Tube Sensor	39000310G	1
19	4-way Valve Assy	03123574	1
20	Magnet Coil	430004002	1
21	Overload Protector	00180002	1
22	Temperature Sensor	39000310G	1
23	Rear Grill(Back)	01473014	1
24	Condenser Assy	01113941	1
25	Clapboard Sub-Assy	01233034	1
26	Top Cover Plate	01253443	1
27	Motor suport spot welding sub-assy	01703007	1
28	Cover of Reactor box	01413029	1
29	Reactor	43130178	1
30	Reactor sub-assy	01403616	1
31	Electric Box Cover Sub-Assy	02603485	1
32	Main Board	30138705	1
33	Electric Box Assy	0140398678	1
34	Terminal Board	42010273/4201115402	1

The data above are subject to change without notice.

HCSS018J2A-RSI053



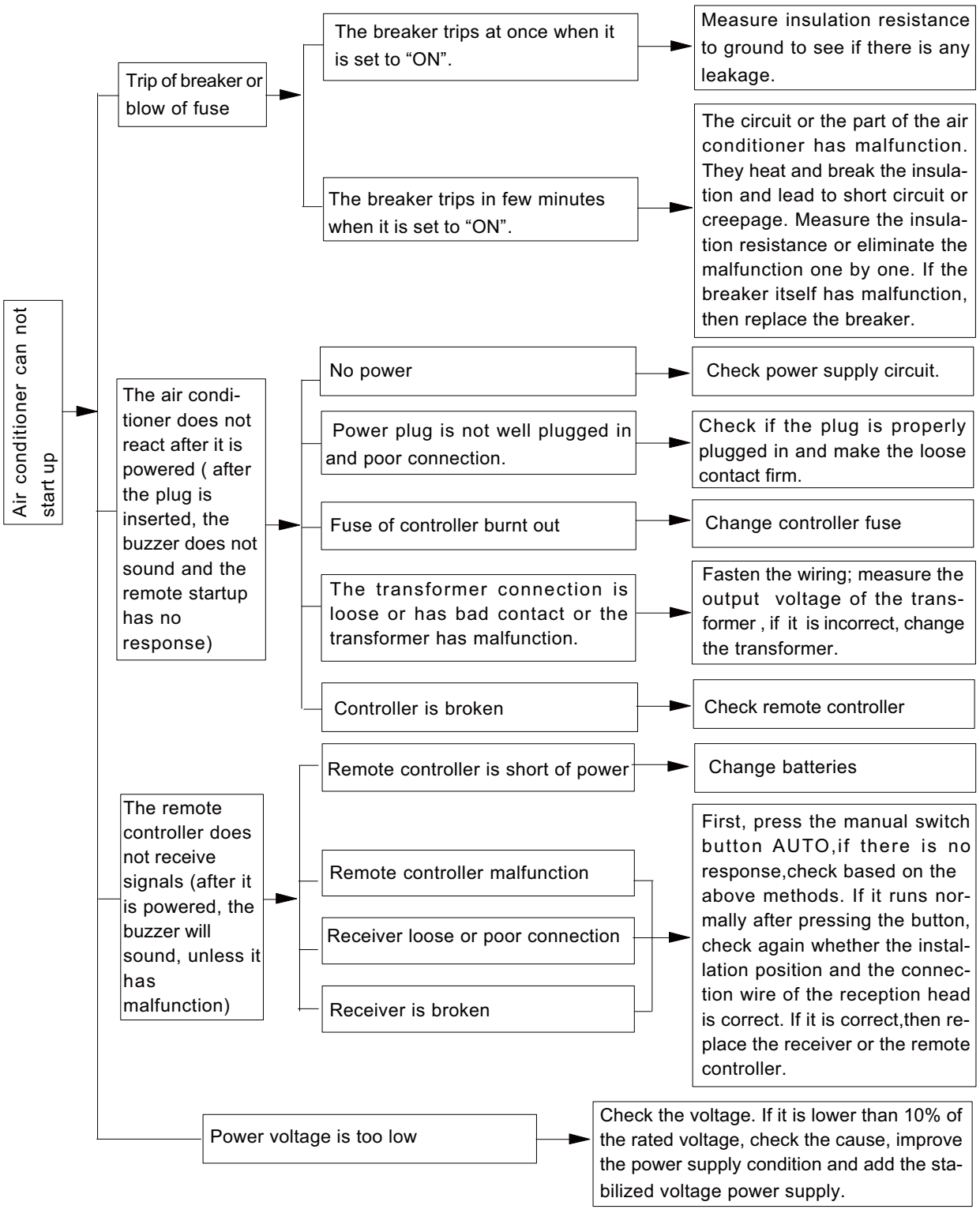
NO.	Description	Part Code	Qty
		HCSS018J2A-RSI053	
	Product Code	CB161W02700	
1	Front Grill	01473049	1
2	Cabinet	01433047P	1
3	Axial Flow Fan	10335008	1
4	Drainage Connecter	06123401	1
5	Chassis Sub-assy	0120371401P	1
6	Compressor and fittings	00103501	1
7	4-Way Valve Assy	03123723	1
8	Electronic Expansion Valve	07133556	1
9	Right Side Plate	0130505303P	1
10	Valve support assy	01715010P	1
11	Cut-off valve Sub-Assy	07133649	1
12	Retaining Plate	02113035P	1
13	Valve cover	22245002	1
14	Cut off Valve Sub-Assy	07133058	1
15	handle Assy	02113109	1
16	Electric expand valve fitting	43008767	1
17	Condenser Assy	01113386	1
18	Rear Grill	01473043	1
19	Clapboard Sub-Assy	01232902	1
20	Reactor	43130192	1
21	Top Cover	01255005P	1
22	Supporting Strip	01793030	1
23	Supporting Board(Condenser)	01795010	1
24	Motor Support Sub-Assy	01705020	1
25	Fan Motor	1501506302	1
26	left handle	26235401	1
27	Left Side Plate	01305041P	1
28	Electric Box Assy	02603545	1
29	Drainage Plug	06813401	3
30	Capacitor CBB61	33010010	1
31	Magnetic Ring	49010109	1
32	Electric Box 1	20113005	1
33	Main Board	30138855	1
34	Electric Box Cover	01413171	1

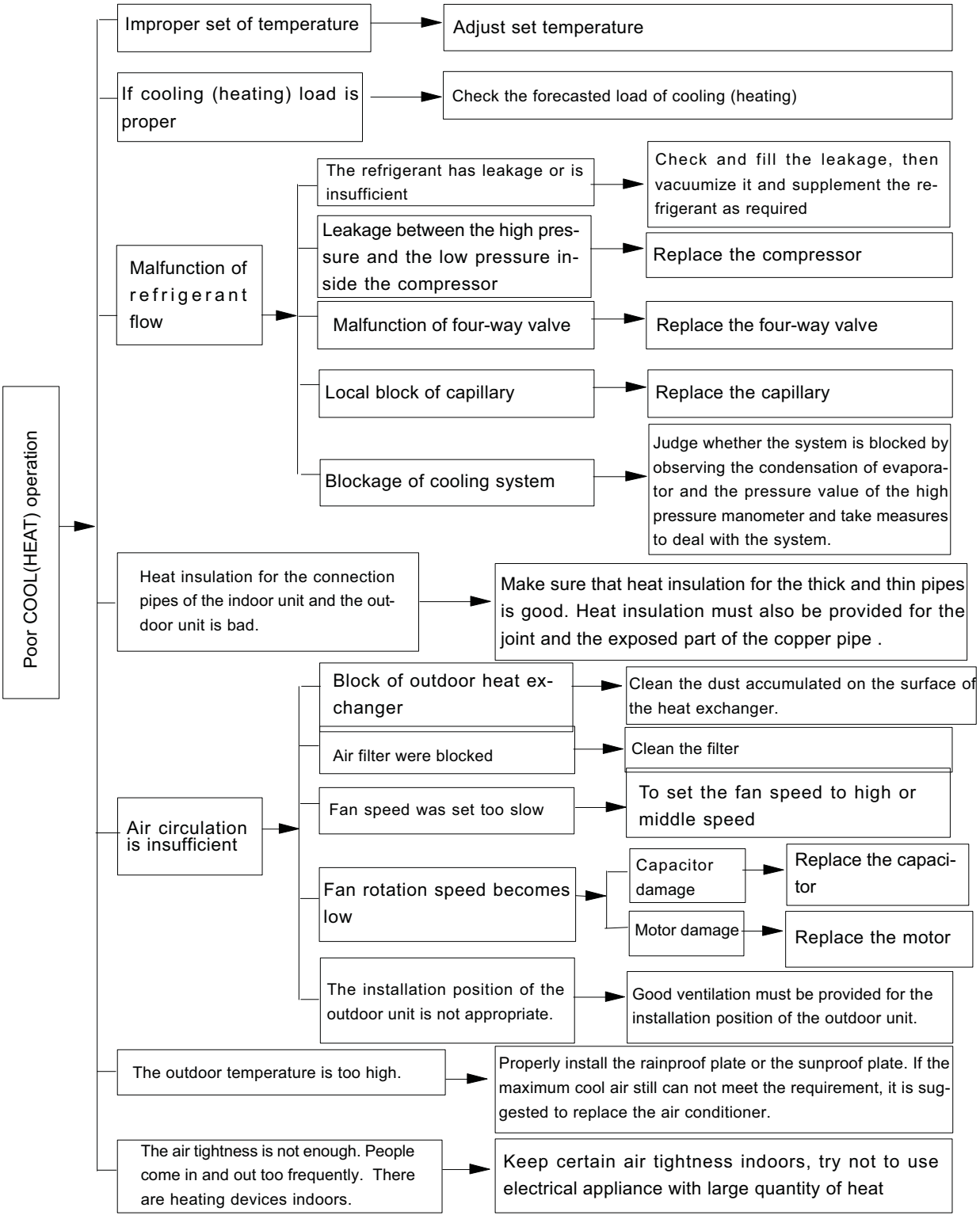
The data above are subject to change without notice.

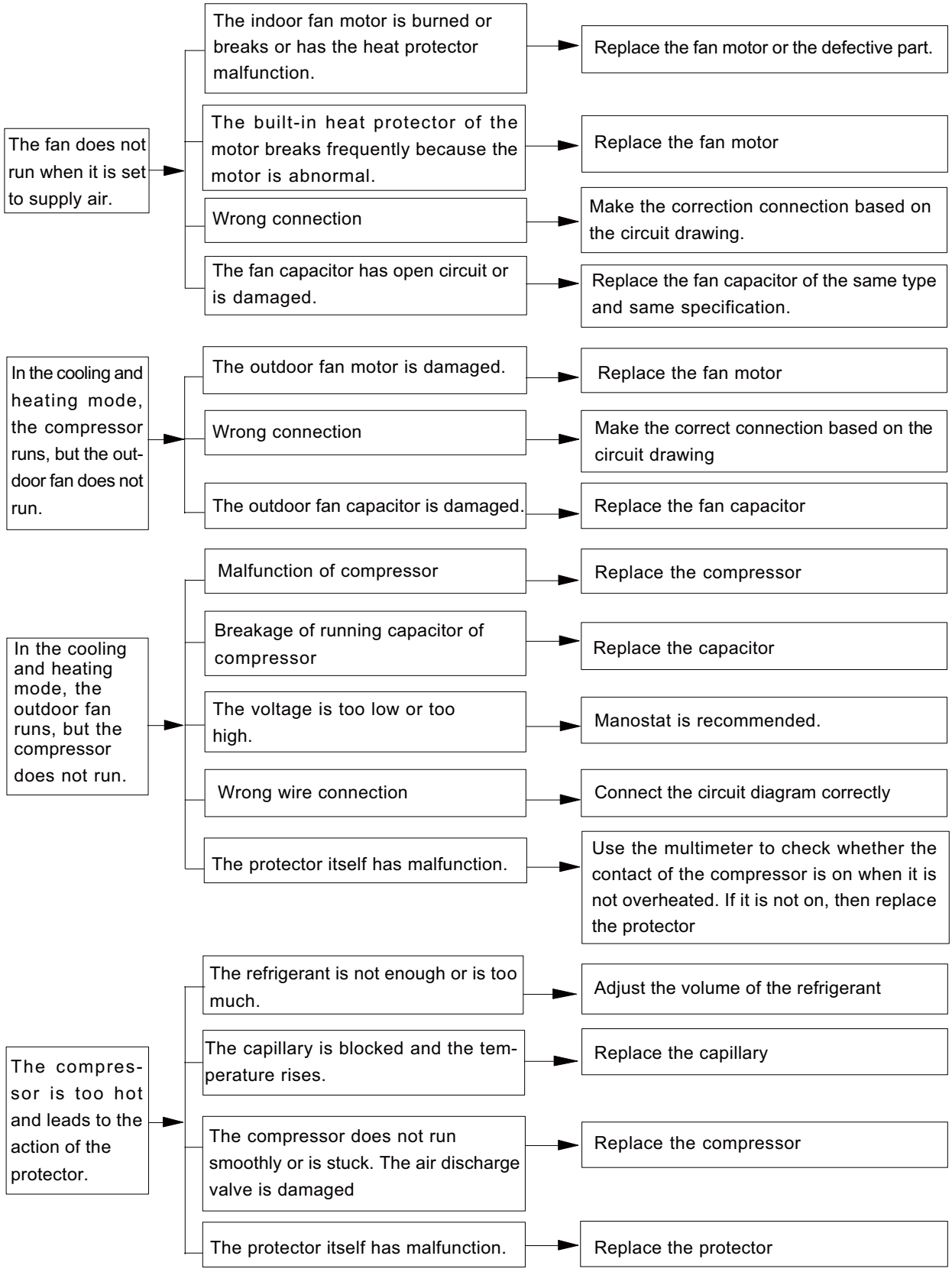
9. Troubleshooting

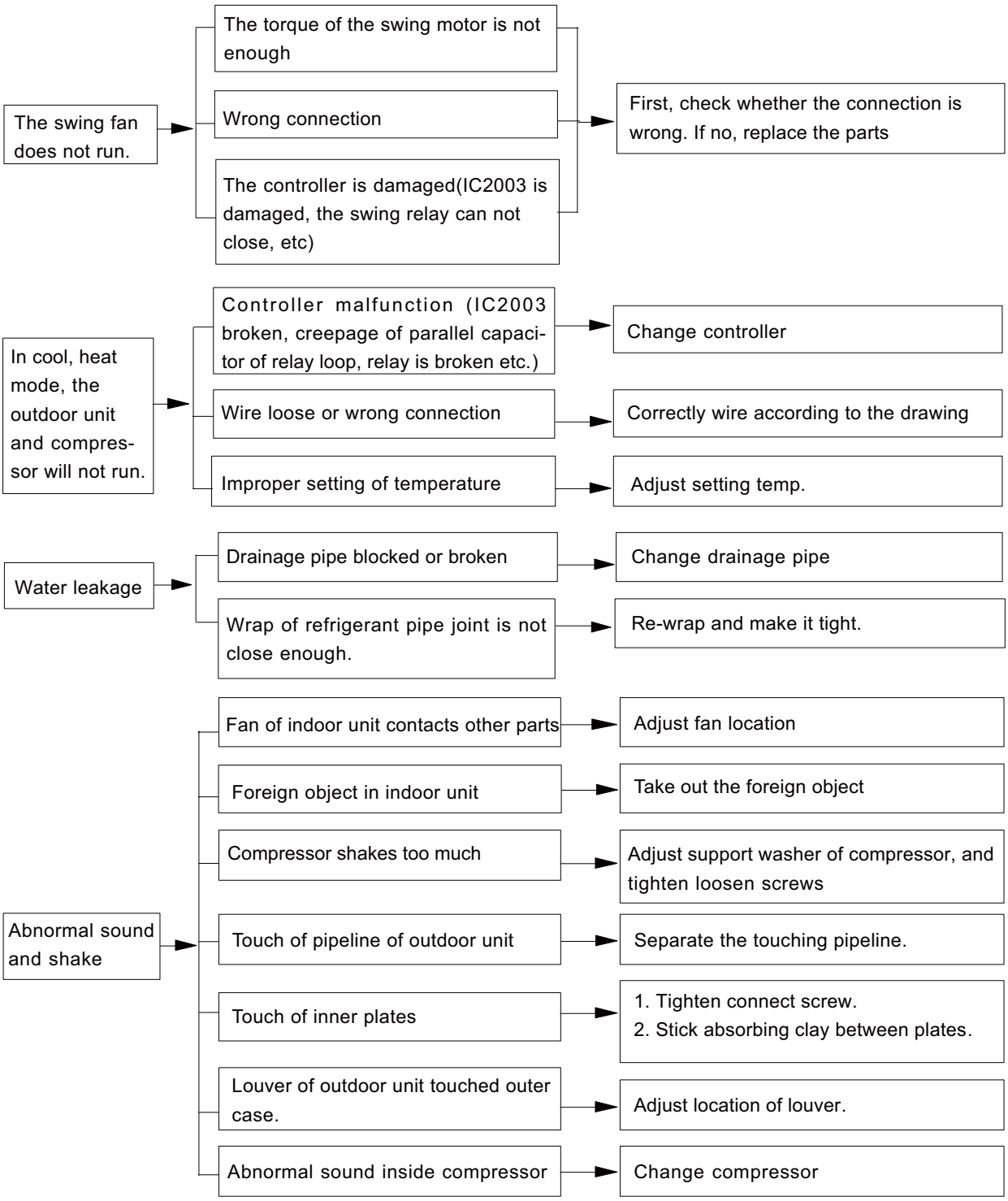
9.1 Malfunction Analysis

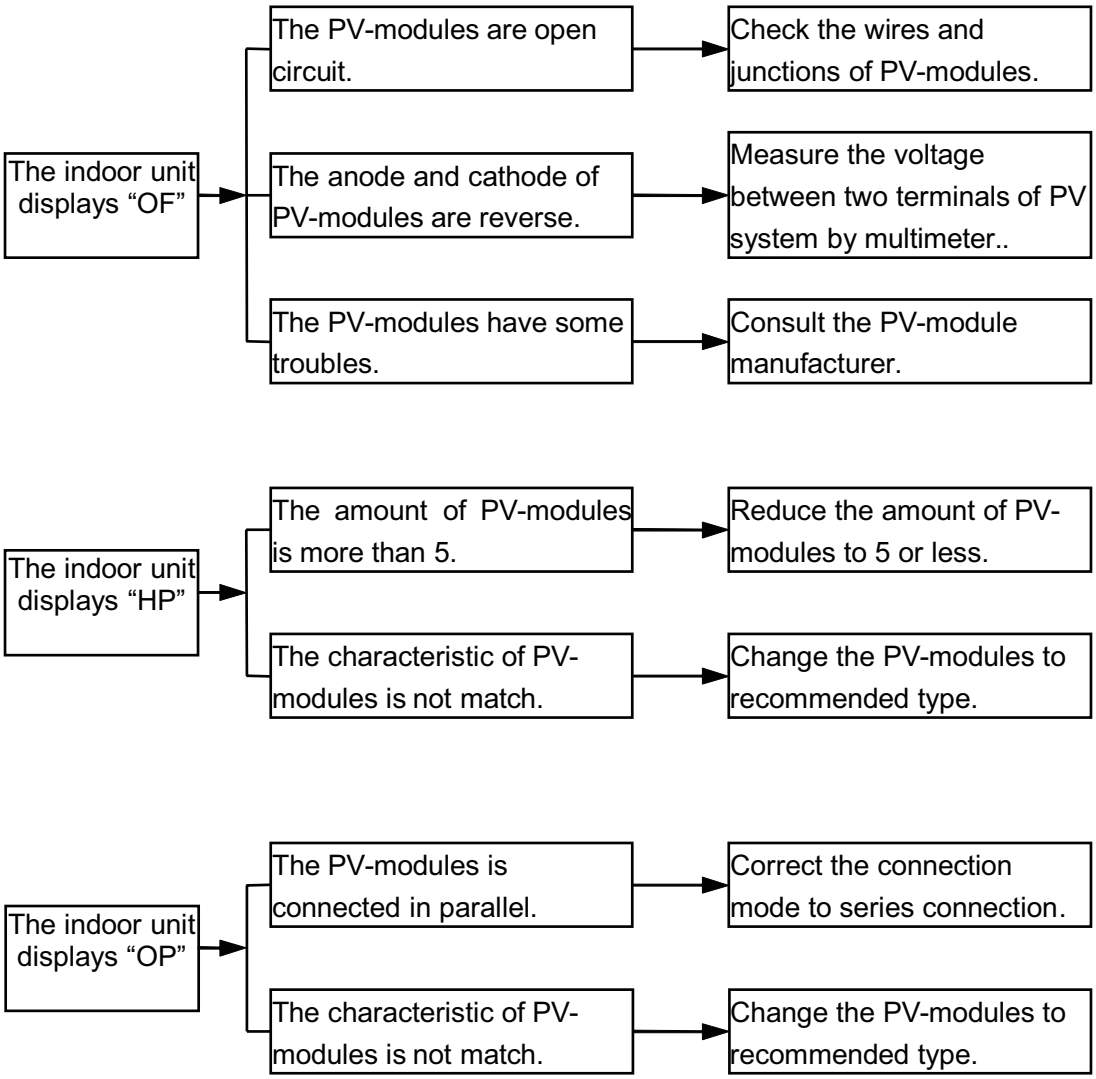
Note: When replacing the controller, make sure insert the wire jumper into the new controller, otherwise the unit will display C5




Poor COOL(HEAT) operation
Improper set of temperature
Adjust set temperature
If cooling (heating) load is proper
Check the forecasted load of cooling (heating)
Malfunction of refrigerant flow
The refrigerant has leakage or is insufficient
Check and fill the leakage, then vacuumize it and supplement the refrigerant as required
Leakage between the high pressure and the low pressure inside the compressor
Replace the compressor
Malfunction of four-way valve
Replace the four-way valve
Local block of capillary
Replace the capillary
Blockage of cooling system
Judge whether the system is blocked by observing the condensation of evaporator and the pressure value of the high pressure manometer and take measures to deal with the system.
Heat insulation for the connection pipes of the indoor unit and the outdoor unit is bad.
Make sure that heat insulation for the thick and thin pipes is good. Heat insulation must also be provided for the joint and the exposed part of the copper pipe .
Air circulation is insufficient
Block of outdoor heat exchanger
Clean the dust accumulated on the surface of the heat exchanger.
Air filter were blocked
Clean the filter
Fan speed was set too slow
To set the fan speed to high or middle speed
Fan rotation speed becomes low
Capacitor damage
Replace the capacitor
Motor damage
Replace the motor
The installation position of the outdoor unit is not appropriate.
Good ventilation must be provided for the installation position of the outdoor unit.
The outdoor temperature is too high.
Properly install the rainproof plate or the sunproof plate. If the maximum cool air still can not meet the requirement, it is suggested to replace the air conditioner.
The air tightness is not enough. People come in and out too frequently. There are heating devices indoors.
Keep certain air tightness indoors, try not to use electrical appliance with large quantity of heat


The fan does not run when it is set to supply air.
The indoor fan motor is burned or breaks or has the heat protector malfunction.
Replace the fan motor or the defective part.
The built-in heat protector of the motor breaks frequently because the motor is abnormal.
Replace the fan motor
Wrong connection
Make the correction connection based on the circuit drawing.
The fan capacitor has open circuit or is damaged.
Replace the fan capacitor of the same type and same specification.
In the cooling and heating mode, the compressor runs, but the outdoor fan does not run.
The outdoor fan motor is damaged.
Replace the fan motor
Wrong connection
Make the correct connection based on the circuit drawing
The outdoor fan capacitor is damaged.
Replace the fan capacitor
In the cooling and heating mode, the outdoor fan runs, but the compressor does not run.
Malfunction of compressor
Replace the compressor
Breakage of running capacitor of compressor
Replace the capacitor
The voltage is too low or too high.
Manostat is recommended.
Wrong wire connection
Connect the circuit diagram correctly
The protector itself has malfunction.
Use the multimeter to check whether the contact of the compressor is on when it is not overheated. If it is not on, then replace the protector
The compressor is too hot and leads to the action of the protector.
The refrigerant is not enough or is too much.
Adjust the volume of the refrigerant
The capillary is blocked and the temperature rises.
Replace the capillary
The compressor does not run smoothly or is stuck. The air discharge valve is damaged
Replace the compressor
The protector itself has malfunction.
Replace the protector


The swing fan does not run.
The torque of the swing motor is not enough
Wrong connection
The controller is damaged(IC2003 is damaged, the swing relay can not close, etc)
First, check whether the connection is wrong. If no, replace the parts
In cool, heat mode, the outdoor unit and compressor will not run.
Controller malfunction (IC2003 broken, creepage of parallel capacitor of relay loop, relay is broken etc.)
Change controller
Wire loose or wrong connection
Correctly wire according to the drawing
Improper setting of temperature
Adjust setting temp.
Water leakage
Drainage pipe blocked or broken
Change drainage pipe
Wrap of refrigerant pipe joint is not close enough.
Re-wrap and make it tight.
Abnormal sound and shake
Fan of indoor unit contacts other parts
Adjust fan location
Foreign object in indoor unit
Take out the foreign object
Compressor shakes too much
Adjust support washer of compressor, and tighten loosen screws
Touch of pipeline of outdoor unit
Separate the touching pipeline.
Touch of inner plates
1. Tighten connect screw.
2. Stick absorbing clay between plates.
Louver of outdoor unit touched outer case.
Adjust location of louver.
Abnormal sound inside compressor
Change compressor

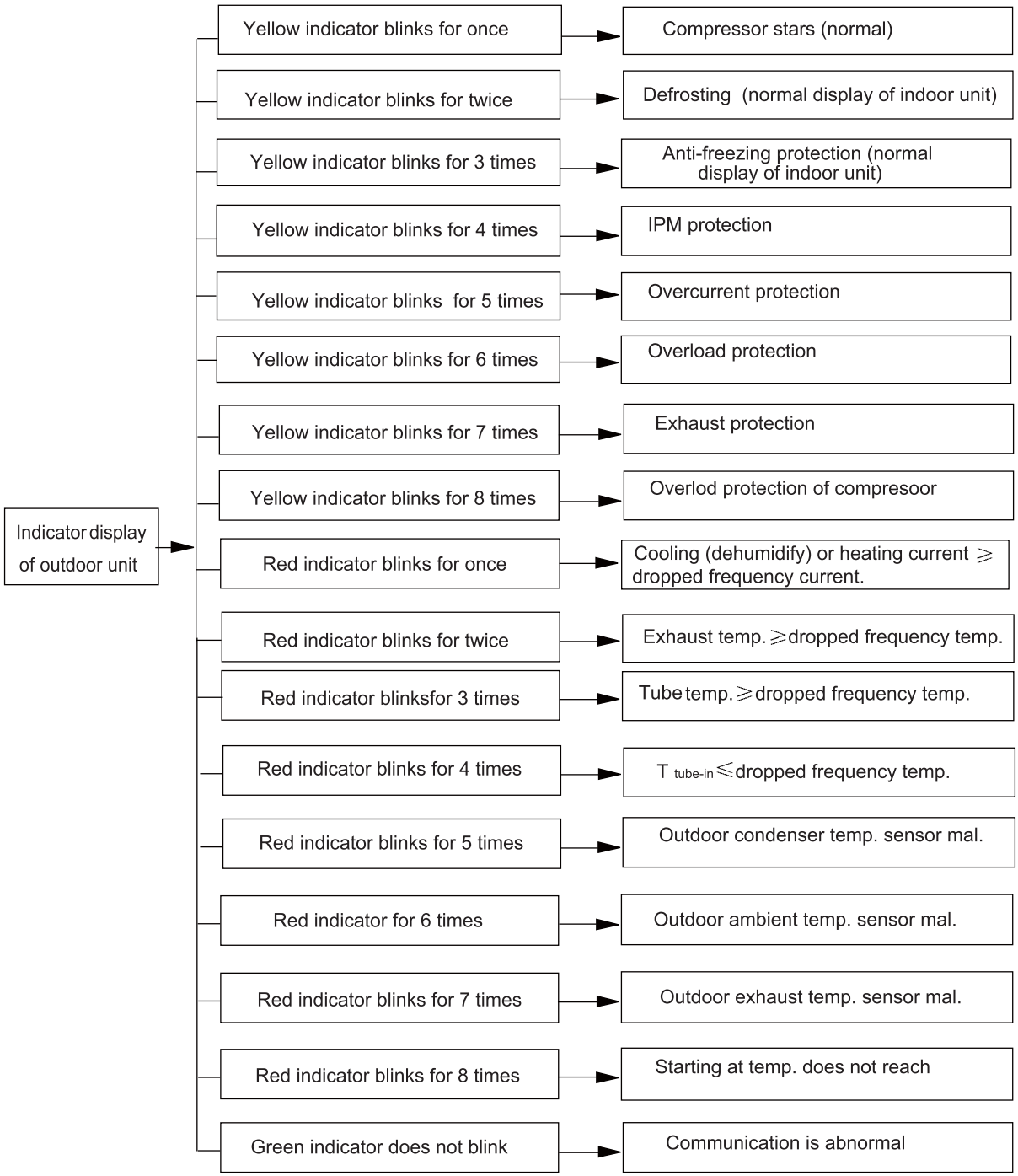

The indoor unit displays “OF”
The PV-modules are open circuit.
Check the wires and junctions of PV-modules.
The anode and cathode of PV-modules are reverse.
Measure the voltage between two terminals of PV system by multimeter..
The PV-modules have some troubles.
Consult the PV-module manufacturer.
The indoor unit displays “HP”
The amount of PV-modules is more than 5.
Reduce the amount of PV-modules to 5 or less.
The characteristic of PV-modules is not match.
Change the PV-modules to recommended type.
The indoor unit displays “OP”
The PV-modules is connected in parallel.
Correct the connection mode to series connection.
The characteristic of PV-modules is not match.
Change the PV-modules to recommended type.

9.2 Flashing LED of Indoor/Outdoor Unit and Primary Judgement

Operation status		Yellow LED lamp	Red LED lamp	Green LED lamp	Display of IDU
1	Compressor operates	Blinks once			
2	Defrosting	Blinks twice			
3	Freeze protection	Blinks for 3 times			
4	IPM protection	Blinks for 4 times			
5	Overcurrent protection	Blinks for 5 times			
6	Overload protection	Blinks for 6 times			
7	Discharge protection	Blinks for 7 times			
8	Overload protection	Blinks for 8 times			
9	Frequency limit （current）		Blinks once		
10	Frequency limit (discharge)		Blinks twice		
11	Frequency limit (overload)		Blinks for 3 times		
12	Frequency decrease(freeze protection)		Blinks for 4 times		
13	Malfunction of outdoor ambient temp sensor		Blinks for 6 times		
14	Malfunction of outdoor pipe temp sensor		Blinks for 5 times		
15	Malfunction of outdoor discharge temp sensor		Blinks for 7 times		
16	Reaching the temperature which activates operation of the unit		Blinks for 8 times		
17	Communication is normal			Blinks continuously	
18	Communication malfunction			Off	
19	Low voltage protection	Blinks for 12 times			
20	High voltage protection	Blinks for 13 times			
21	Malfunction of indoor ambient temp sensor				F1
22	Malfunction of indoor pipe temp sensor				F2
23	Nominal cooling or nominal heating				P1
24	Max. cooling or max. heating				P2
25	Solar power supply is not correctly connected				OF
26	Overvoltage protection of solar power supply				HP
27	Overcurrent protection of solar power supply				OP

9.3 Malfunction Display

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



Analysis or processing of some of the malfunction display:
1. Compressor discharge protection
Possible reasons: shortage of refrigerant; blockage of air filter; poor ventilation or air flow short pass for condenser; the system has noncondensing gas (such as air, water etc.); blockage of capillary assy (including filter); leakage inside four-way valve causes incorrect operation; malfunction of compressor; malfunction of protection relay; malfunction of discharge sensor; outdoor temperature too high.
Processing method: refer to the malfunction analysis in the above section.
2. Low voltage overcurrent protection
Possi ble reason: Sudden drop of supply voltage.
3. Communic ation malfun ction
Processin g method: Check if communic ation signal cable is connected reliably.
4. Senso r open or shor t circuit
Processin g method: Check whether s ensor is normal, c onnected with the corre sponding po sition on the controller and if damage of lead wire is found.
5. Compressor over load protection
Possi ble rea sons: insufficient or too much refrigrant; blockage of capillary an d increas e of suct ion temp.; improp er running of compressor, burning in or stuck of bearing, damage of discharge valve; malfunc tion of pro tector.
Processi ng method: adjust refrige rant amount; replace the capillary; replace the compressor; use univers al meter to check if the cont actor of compress or is fine when it is not overh eated, if not replace the prote ctor.
6. System malfun ction
i.e.overloadprotection.Whentubetemperature(Check thetemperatureof outdoor heat exchanger when cooling and check the temperatur e of indoor heat exchanger when heating) is too high, protectionwill beactivated.
Possi ble reasons: Outdoor tempera ture is too high when cooling; insufficient outdoor air circulation; refrigerant flow malfunction.
please refer to the malfunction analysis in the previous section for handling method .
7. IPM module protection
Processing method:Once the module malfunction happens,if it persists for a long time and can not be self- canceled, cut off the power and turn off the unit,and then re-energize the unit again after about 10 min.After repeating the procedure for sever times, if the malfunction still exists,replace the module.

9.4 How to Simply Check the Main Part

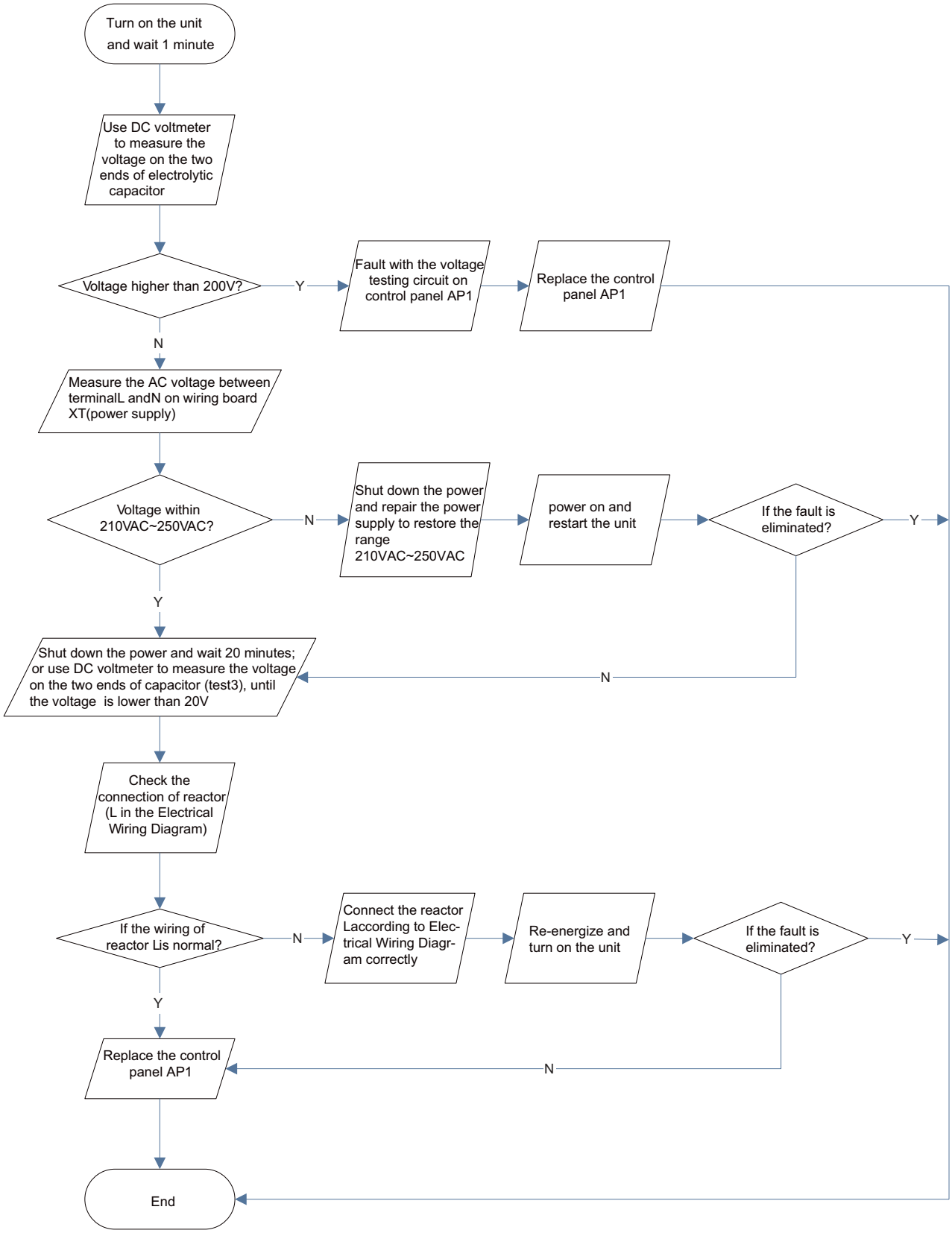
(1) Capacitor charge fault (Fault with outdoor unit) (AP1 below refers to the outdoor control panel)

Main Check Points:

●Use AC voltmeter to check if the voltage between terminal L and N on the wiring board is within 210VAC~240VAC.

●Is the reactor (L) correctly connected? Is the connection loose or fallen? Is the reactor (L) damaged?

Fault diagnosis process:



(2) IPM Protection, Out-of-step Fault, Compressor Phase Overcurrent (AP1 below refers to the outdoor control panel)

Main check points:

●Is the connection between control panel AP1 and compressor COMP secure? Loose? Is the connection in correct order?

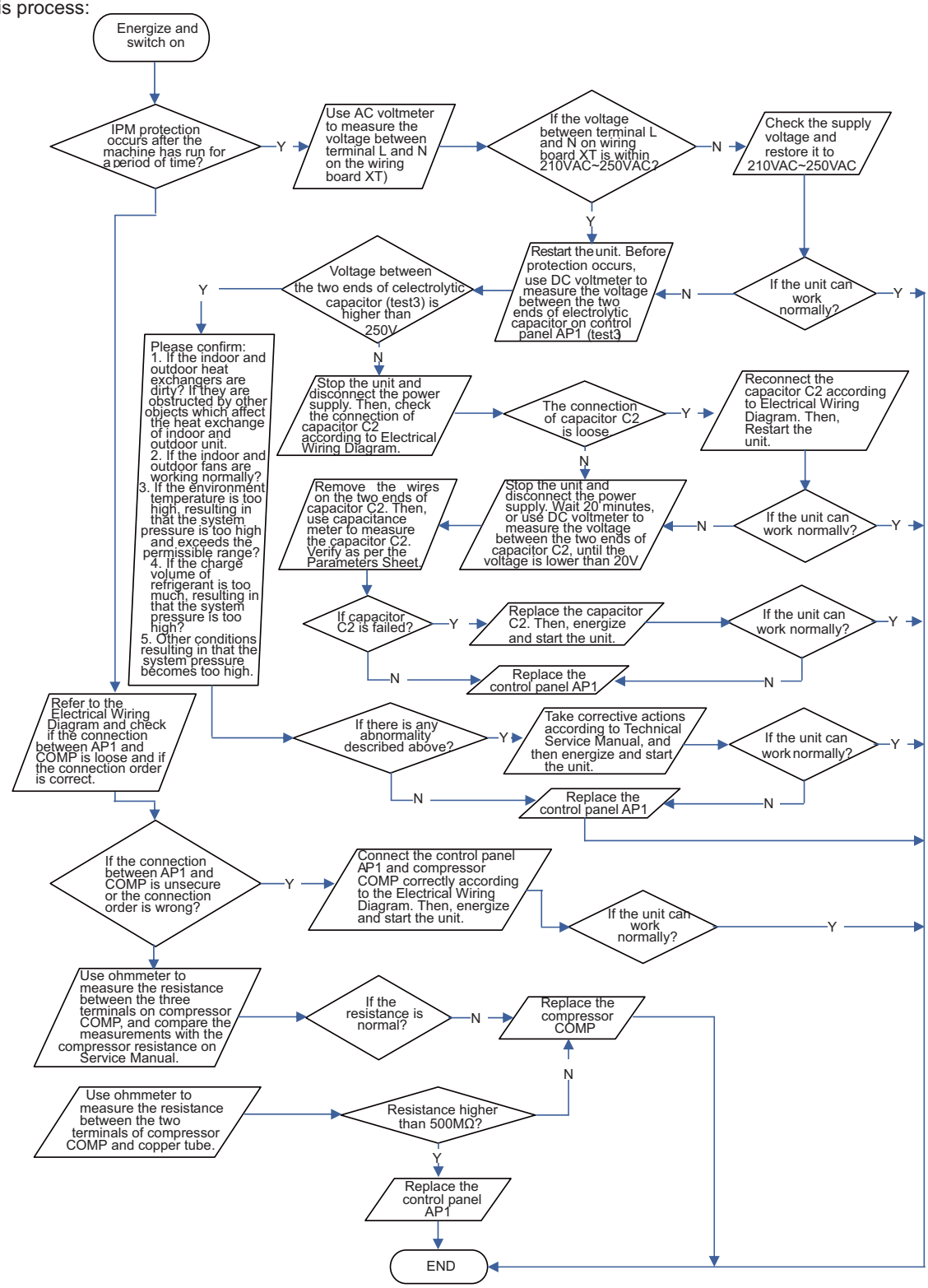
●Is the voltage input of the machine within normal range? (Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)

●Is the compressor coil resistance normal? Is the insulation of compressor coil against the copper tube in good condition?

●Is the working load of the machine too high? Is the radiation good?

l●s the charge volume of refrigerant correct?

Fault diagnosis process:



(3)High temperature and overload protection diagnosis (AP1 hereinafter refers to the control board of the outdoor unit)

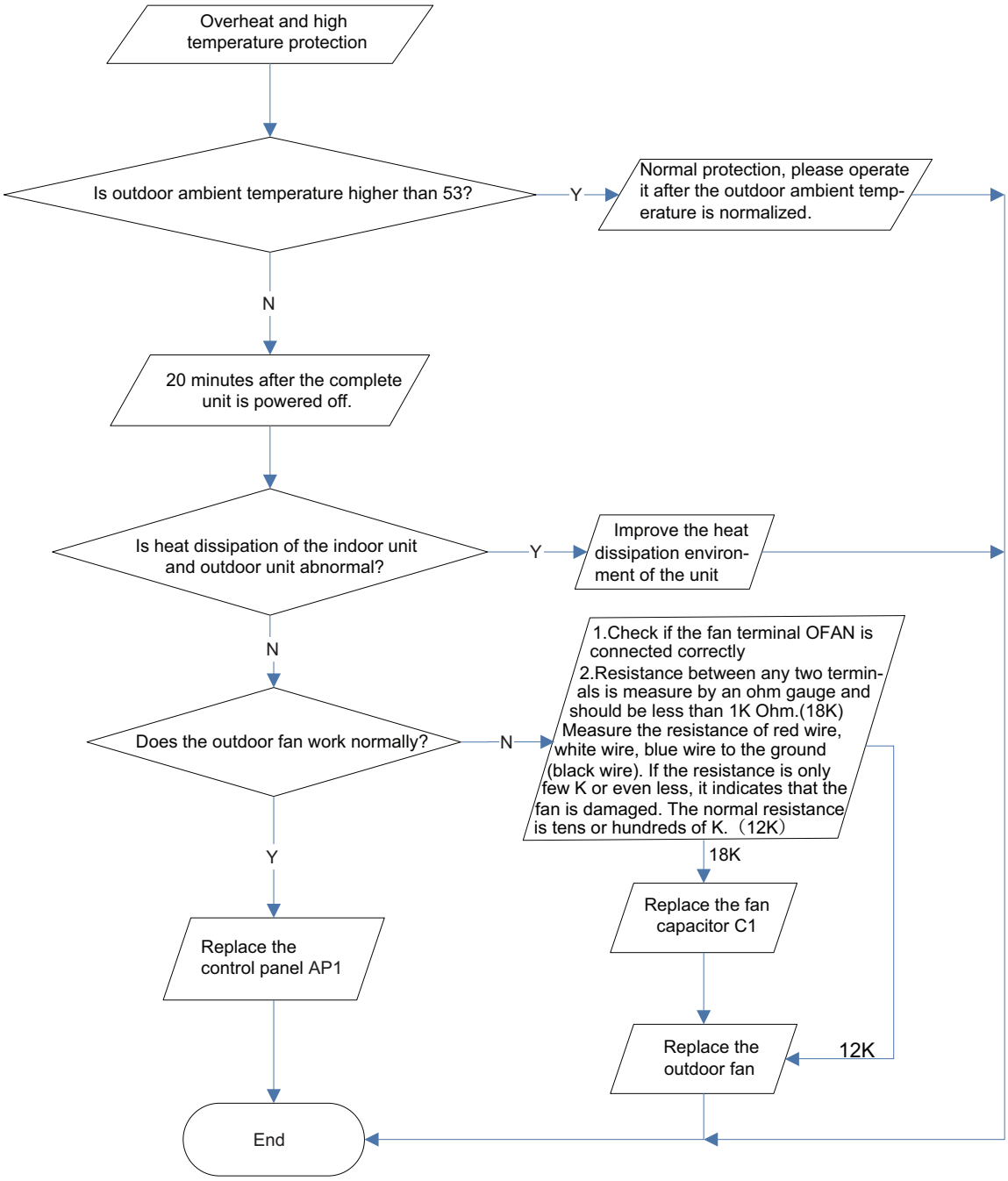
Mainly detect:

●Is outdoor ambient temperature in normal range?

●Are the outdoor and indoor fans operating normally?

●Is the heat dissipation environment inside and outside the unit good?

Fault diagnosis process:



(4) Start-up failure (following AP1 for outdoor unit control board)

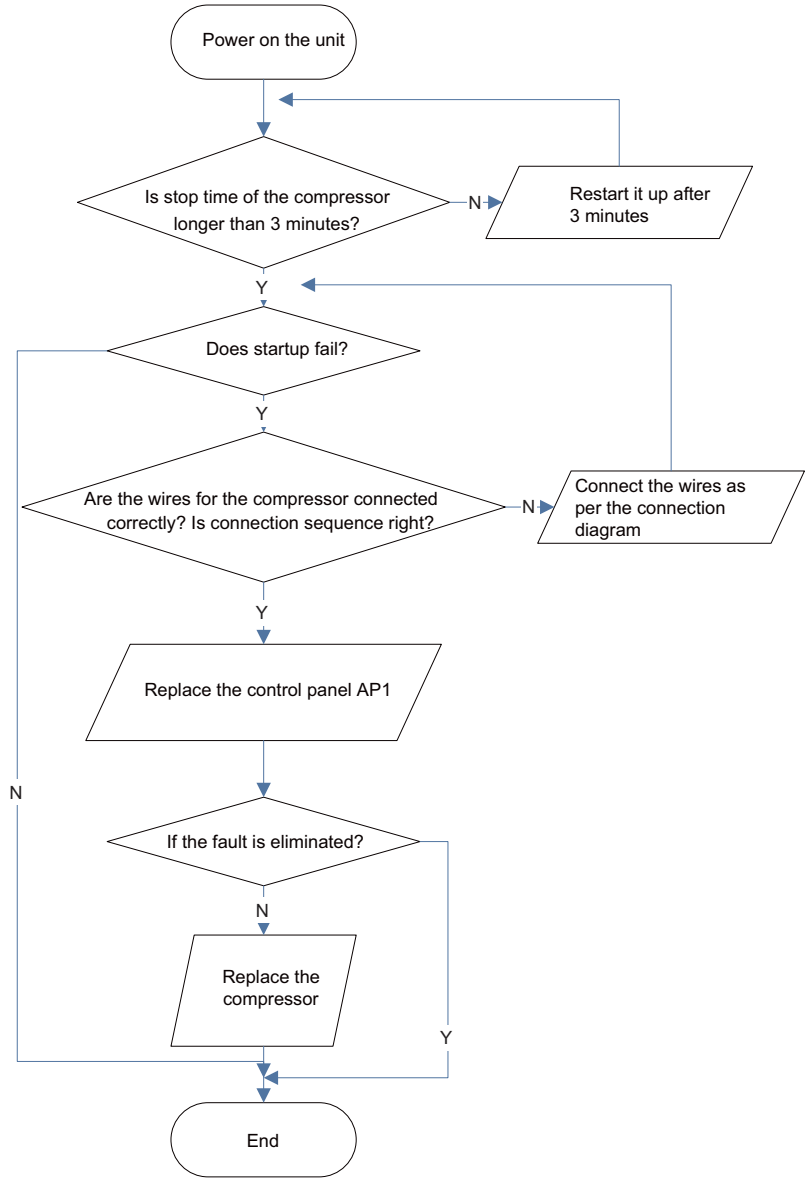
Mainly detect:

●Whether the compressor wiring is connected correct?

●Is compressor broken?

●Is time for compressor stopping enough?

Fault diagnosis process:



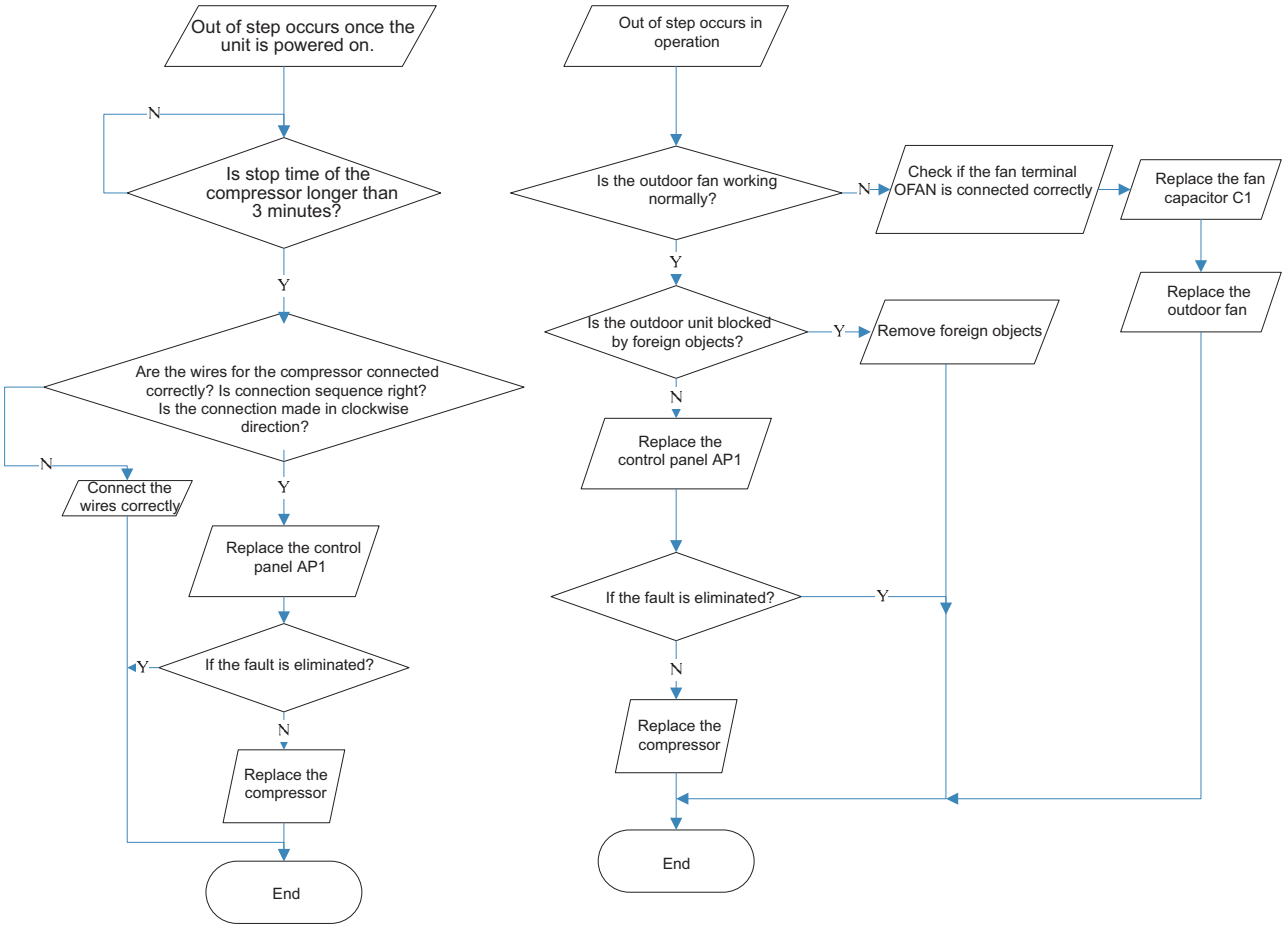
(5) Out of step diagnosis for the compressor (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

●Is the system pressure too high?

●Is the input voltage too low?

Fault diagnosis process:



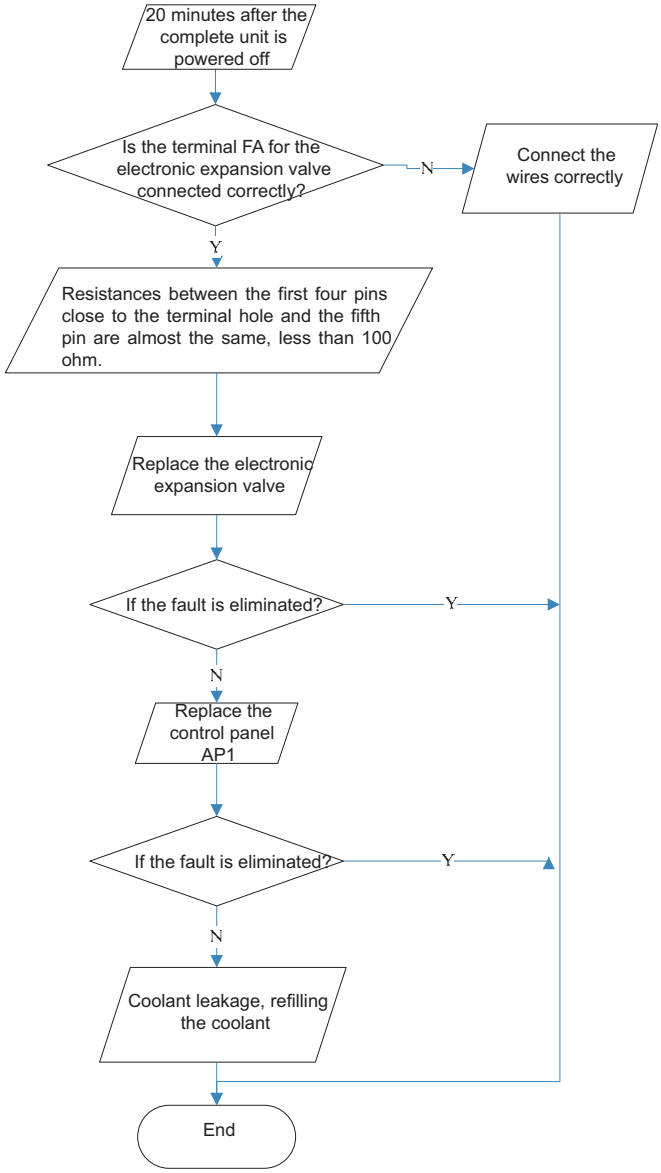
(6)Overload and air exhaust malfunction diagnosis (following AP1 for outdoor unit control board)

Mainly detect:

●Is the PMV connected well or not? Is PMV damaged?

●Is refrigerant leaked?

Fault diagnosis process:

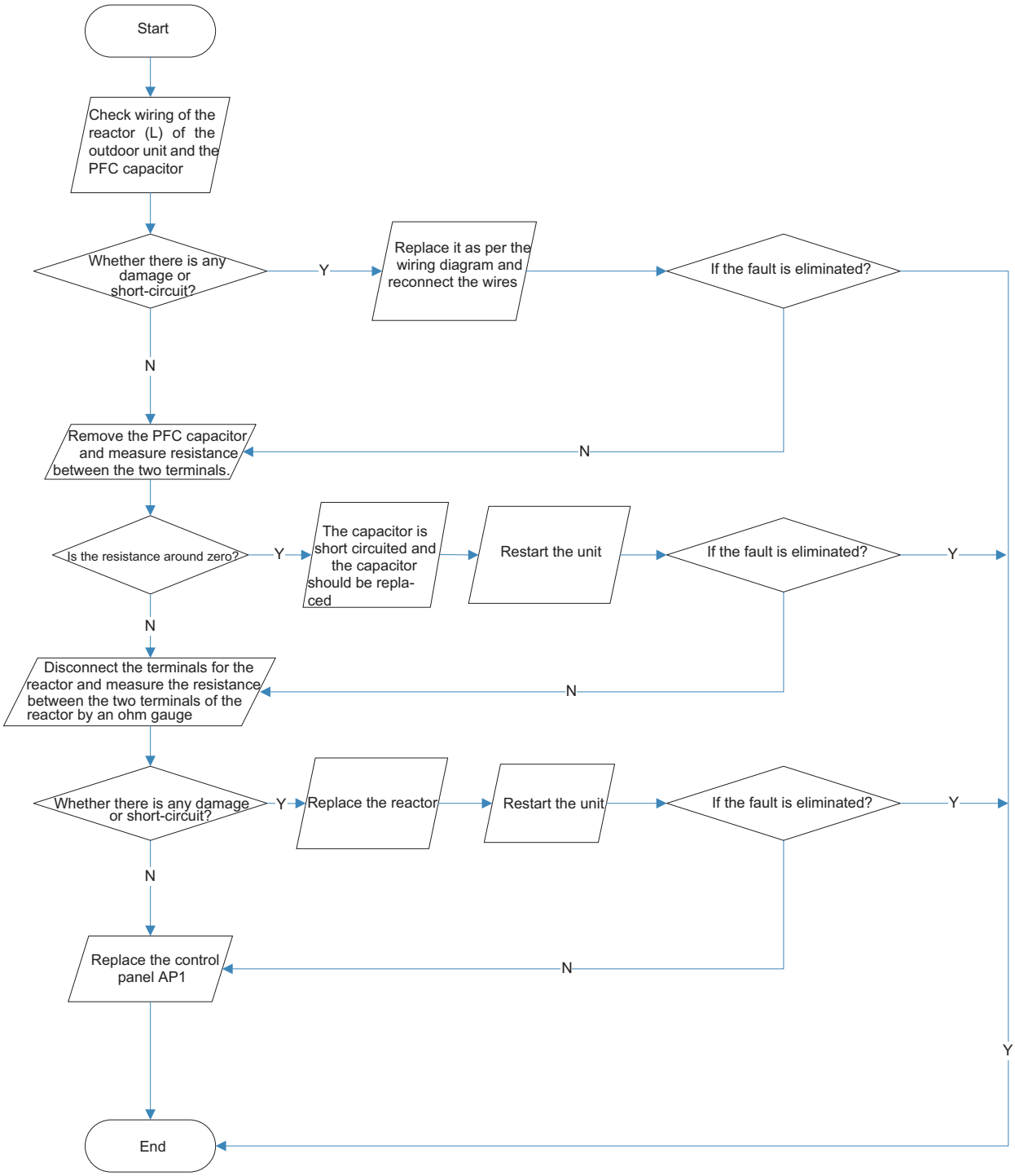


(7)Power factor correct or (PFC) fault (a fault of outdoor unit) (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

●Check if the reactor (L) of the outdoor unit and the PFC capacitor are broken

Fault diagnosis process:



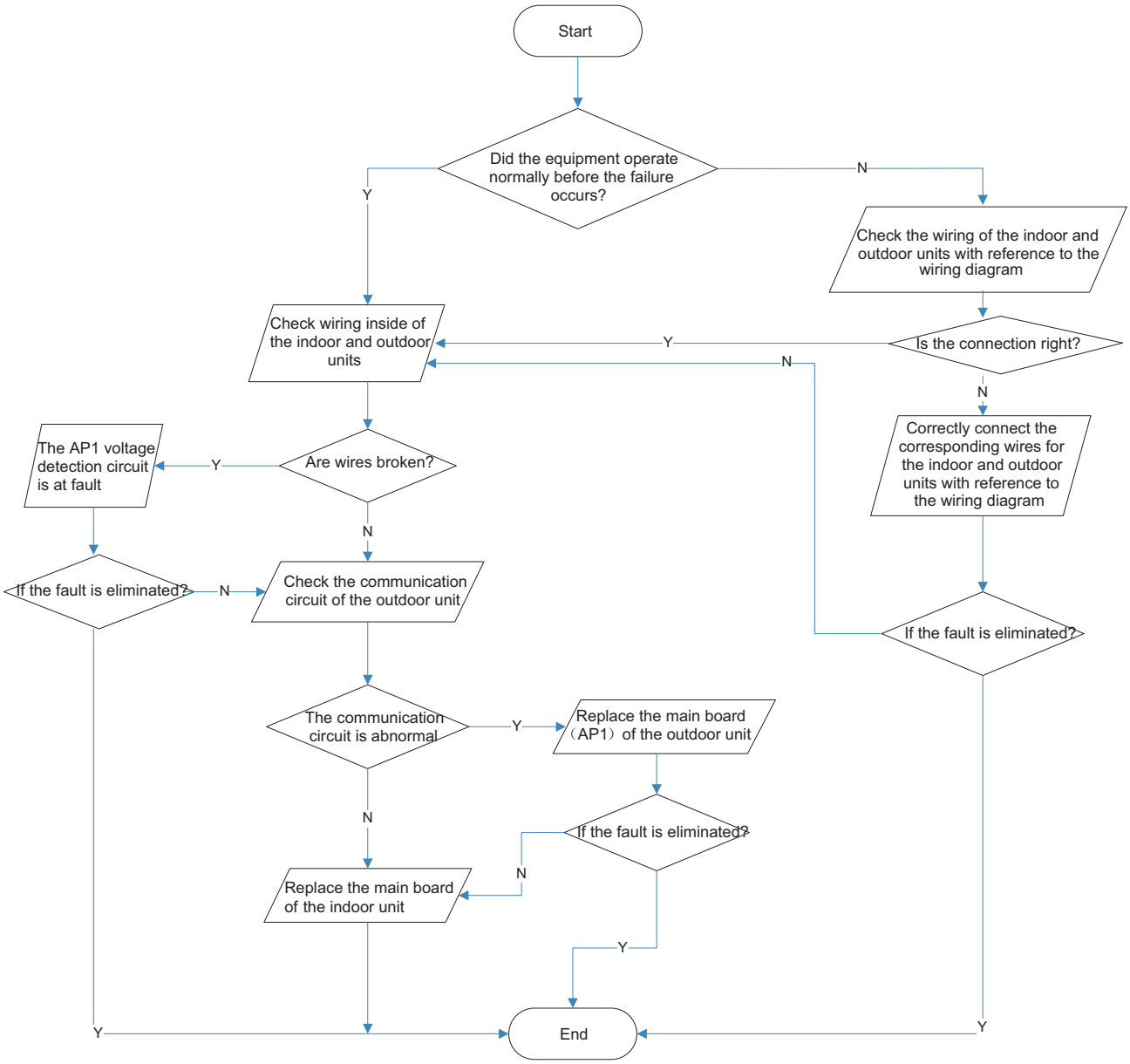
(8) Communication malfunction: (following AP1 for outdoor unit control board)

Mainly detect:

●Is there any damage for the indoor unit mainboard communication circuit? Is communication circuit damaged?

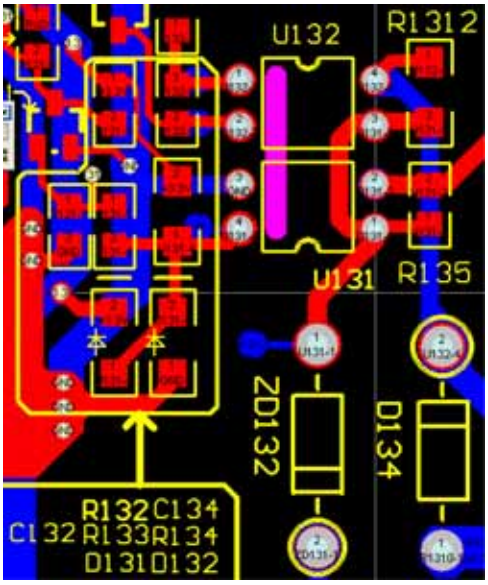
●Detect the indoor and outdoor units connection wire and indoor and outdoor units inside wiring is connect well or not, if is there any damage?

Fault diagnosis process:

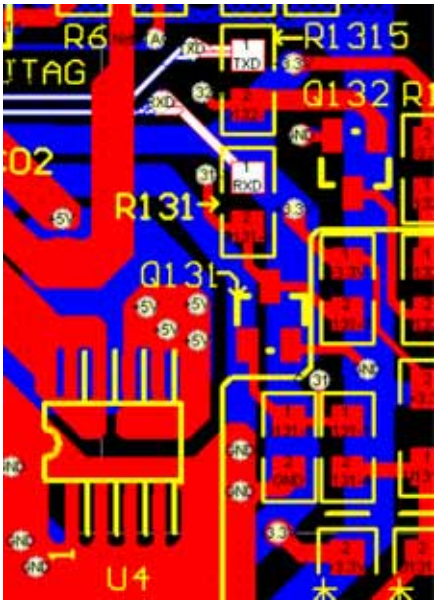


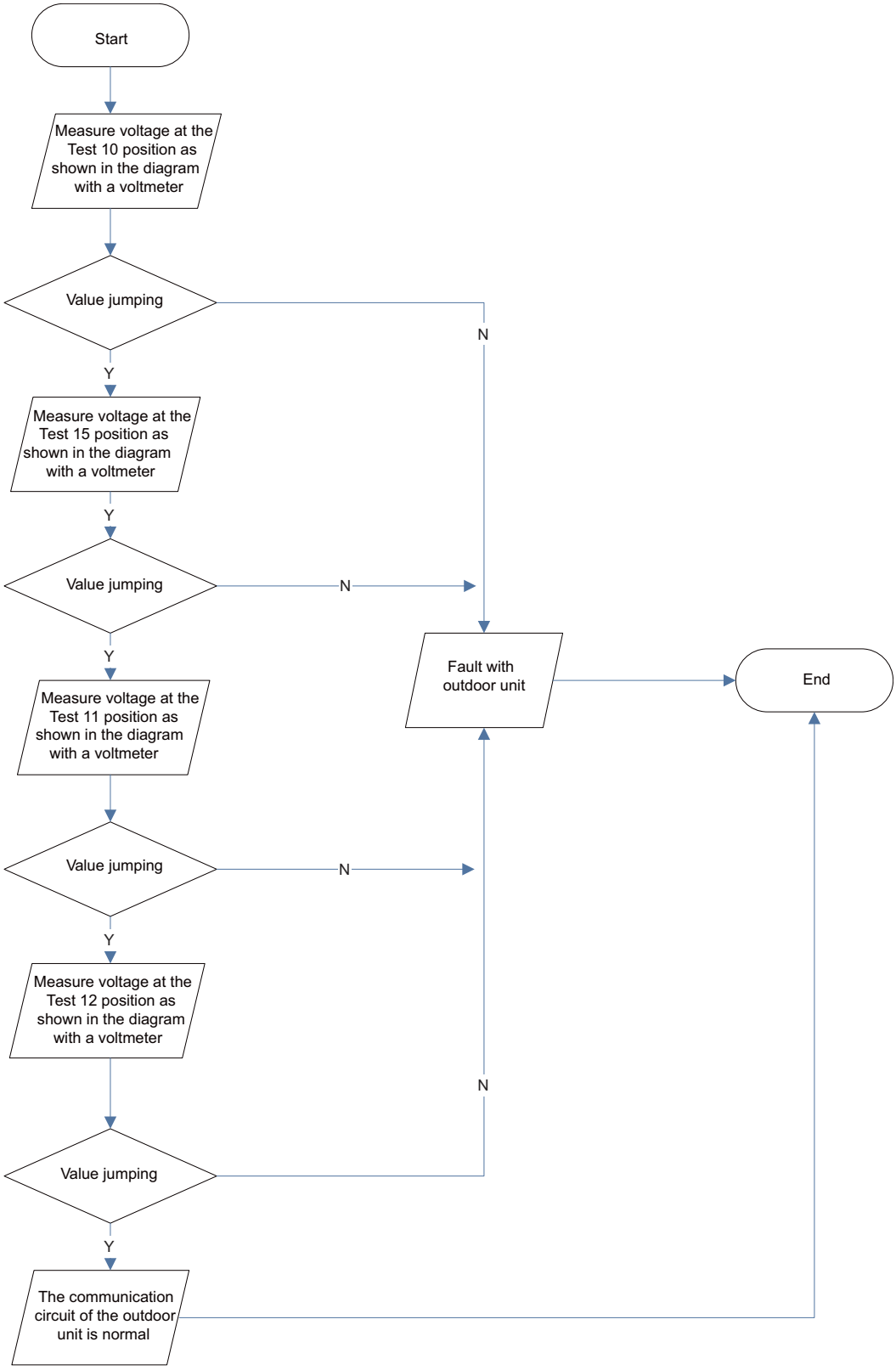
(9) Flow chart for outdoor communitcation circuit detecting:

(1) Test the voltage between N point of wiring board and communication cable with universal meter. The voltage shall be variable. Otherwise, it might be malfunction of mainboard of indoor unit, or malfunction of mainboard of outdoor unit, or wrong wire connection of indoor and outdoor unit. Please ensure that there is no malfunction of mainboard of indoor unit, or wrong wire connection of indoor and outdoor unit. After removing the malfunction of indoor unit, remove the malfunction of outdoor unit.
(2) Test the voltage of pin 1 and pin 2 of U132 with universal meter (voltage of both sides of R135). The voltage should be variable. (Test 10) Test the voltage of pin 3 and pin 4 of U132 with universal meter (voltage of both sides of R1312). The voltage should be variable. (Test 15) Otherwise, there is malfunction of mainboard of outdoor unit.



(3) Test the voltage of pin 3 and pin 4 of U131 with universal meter (voltage of both sides of R134). The voltage should be variable. (test 11) Test the voltage of pin 1 and pin 2 of U132 with universal meter (voltage of both sides of C134). The voltage should be variable. (test 12) Otherwise, there is malfunction of mainboard of outdoor unit.
(4) Test the voltage between pin 1 of R135 (white) and pin 1 of U4. The voltage should be variable. Test voltage between pin1 of R131 (white) and pin 1 of U4 with universal meter. The voltage should be variable. Otherwise, there is malfunction of mainboard of outdoor unit.




Start
Measure voltage at the Test 10 position as shown in the diagram with a voltmeter
Value jumping
N
Y
Measure voltage at the Test 15 position as shown in the diagram with a voltmeter
Y
Value jumping
N
Y
Measure voltage at the Test 11 position as shown in the diagram with a voltmeter
Value jumping
N
Y
Measure voltage at the Test 12 position as shown in the diagram with a voltmeter
N
Value jumping
Y
The communication circuit of the outdoor unit is normal
Fault with outdoor unit
End

Appendix

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

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

Appendix 3: Resistance Table of Outdoor Discharge Temperature Sensor(50K)									
Temp. （℃）	Resistance(kΩ)		Temp.（℃）	Resistance(kΩ)		Temp. （℃）	Resistance(kΩ)		Temp.（℃）	Resistance(kΩ)
-29	853.5		10	98		49	18.34		88	4.754
-28	799.8		11	93.42		50	17.65		89	4.609
-27	750		12	89.07		51	16.99		90	4.469
-26	703.8		13	84.95		52	16.36		91	4.334
-25	660.8		14	81.05		53	15.75		92	4.204
-24	620.8		15	77.35		54	15.17		93	4.079
-23	580.6		16	73.83		55	14.62		94	3.958
-22	548.9		17	70.5		56	14.09		95	3.841
-21	516.6		18	67.34		57	13.58		96	3.728
-20	486.5		19	64.33		58	13.09		97	3.619
-19	458.3		20	61.48		59	12.62		98	3.514
-18	432		21	58.77		60	12.17		99	3.413
-17	407.4		22	56.19		61	11.74		100	3.315
-16	384.5		23	53.74		62	11.32		101	3.22
-15	362.9		24	51.41		63	10.93		102	3.129
-14	342.8		25	49.19		64	10.54		103	3.04
-13	323.9		26	47.08		65	10.18		104	2.955
-12	306.2		27	45.07		66	9.827		105	2.872
-11	289.6		28	43.16		67	9.489		106	2.792
-10	274		29	41.34		68	9.165		107	2.715
-9	259.3		30	39.61		69	8.854		108	2.64
-8	245.6		31	37.96		70	8.555		109	2.568
-7	232.6		32	36.38		71	8.268		110	2.498
-6	220.5		33	34.88		72	7.991		111	2.431
-5	209		34	33.45		73	7.726		112	2.365
-4	198.3		35	32.09		74	7.47		113	2.302
-3	199.1		36	30.79		75	7.224		114	2.241
-2	178.5		37	29.54		76	6.998		115	2.182
-1	169.5		38	28.36		77	6.761		116	2.124
0	161		39	27.23		78	6.542		117	2.069
1	153		40	26.15		79	6.331		118	2.015
2	145.4		41	25.11		80	6.129		119	1.963
3	138.3		42	24.13		81	5.933		120	1.912
4	131.5		43	23.19		82	5.746		121	1.863
5	125.1		44	22.29		83	5.565		122	1.816
6	119.1		45	21.43		84	5.39		123	1.77
7	113.4		46	20.6		85	5.222		124	1.725
8	108		47	19.81		86	5.06		125	1.682
9	102.8		48	19.06		87	4.904		126	1.64

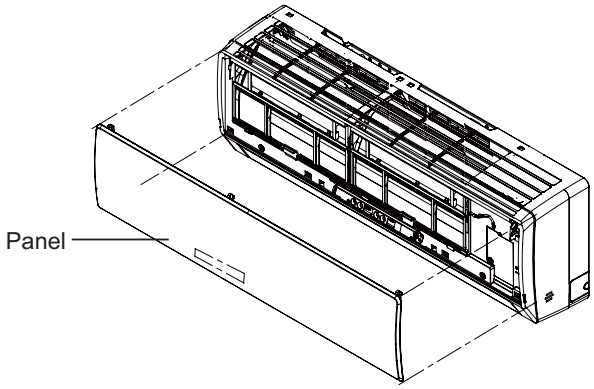
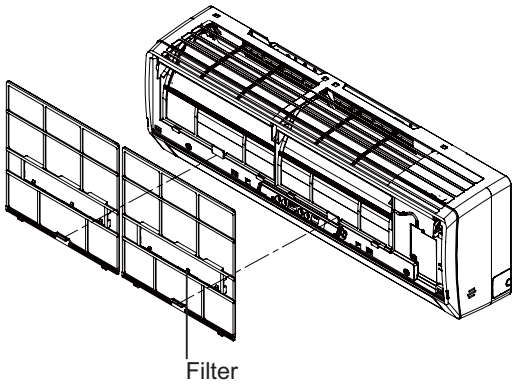
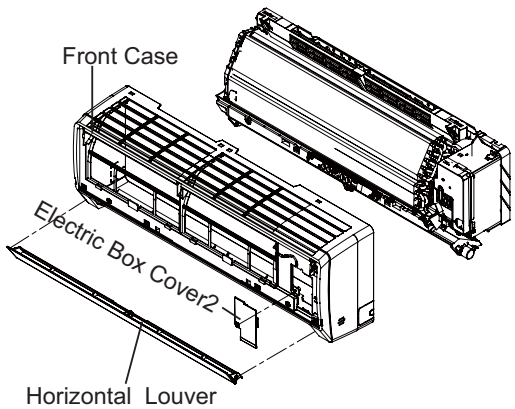
Note: The information above is for reference only.

10. Removal Procedure

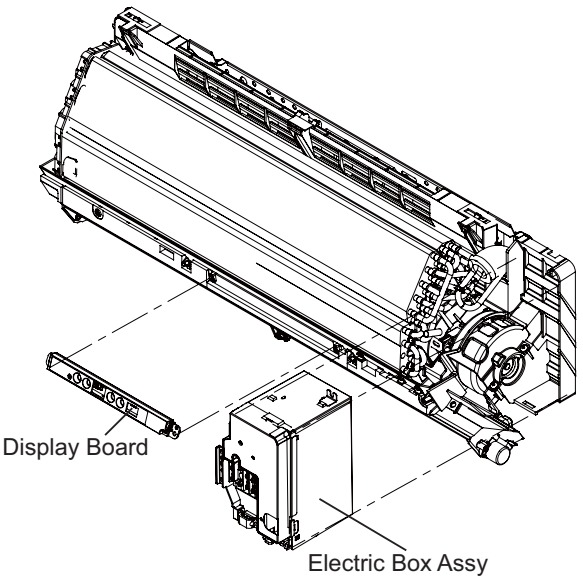
10.1 Removal Procedure of Indoor Unit

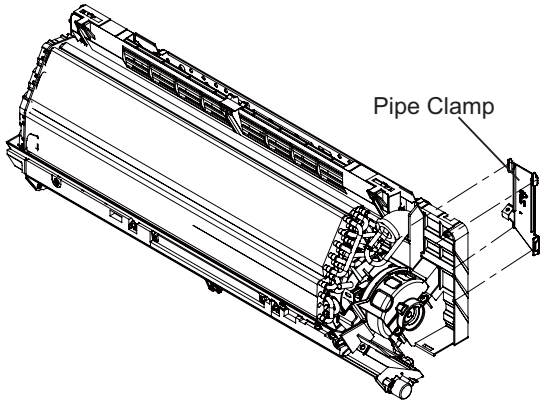
Warning **Be sure to wait for a minimum of 10 minutes after turning off all power supplies before disassembly.**

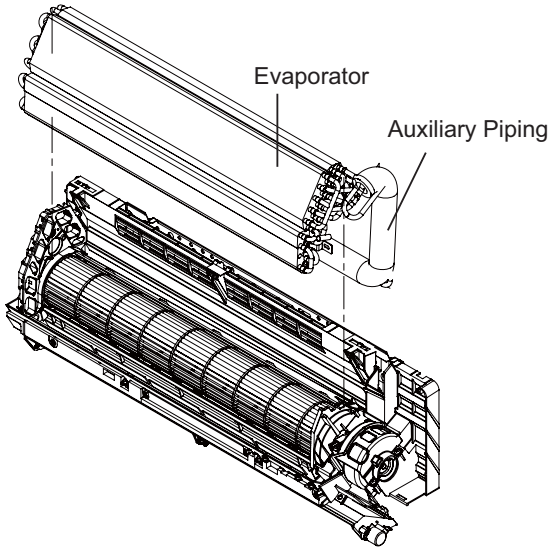
NOTE:Take A3 front panel for example.

Steps	Procedure	
	1.Remove panel	
	Open the front panel.Push the rotor shaft on both sides of the panel to make it separate from the groove .Remove the panel.	
	2.Remove filter	
	Loosen the clasp of the filter.Push the filter inward and then draw it upward to remove it.	
	3.Remove horizontal louver and front case	
	Remove axial sleeve of horizontal louver. Bend the louver outwards and then remove the louver. Loosen the screws of the electric box cover2 with screwdriver.Remove the electric box cover2. Open the screw cap on the front case. Remove the screws fixing the front case. Loosen the six clasps of the front case. Remove the front case.	

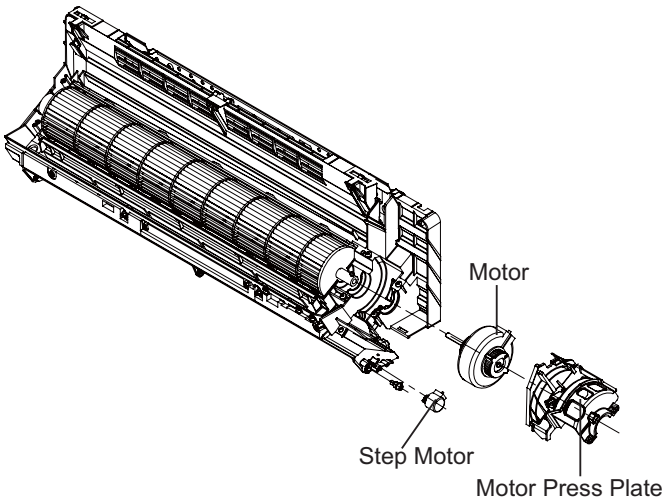
Steps	Procedure
4.Remove electric box assy	
	Remove the screws of the electric box assy.Remove the screws at the joint of the earthing wire and evaporator.Loosen the clasp at the joint of the electric box cover and the electric box.Remove the 2 screws of the display.Remove the electric box assy.
5.Remove evaporator	
1	Remove the screws of the press plate of connecting pipe.Remove press plate of connecting pipe.
2	Remove the 3 screws at the joint of the evaporator and rear case.Adjust slightly the pipe on the evaporator.Remove the evaporator.

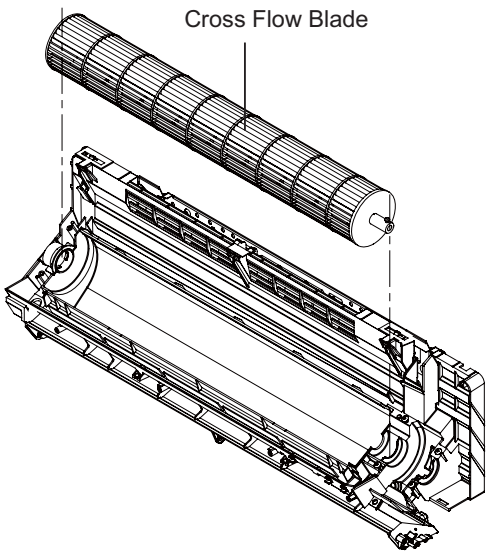






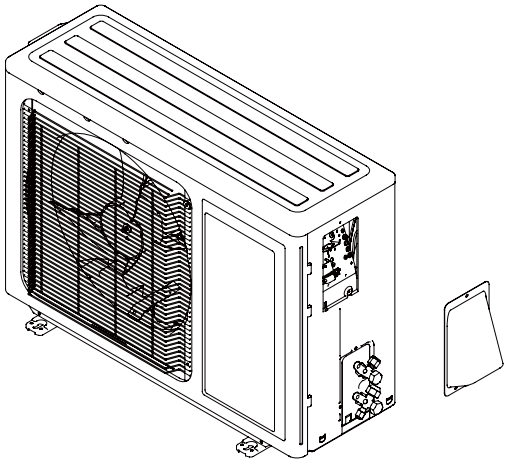
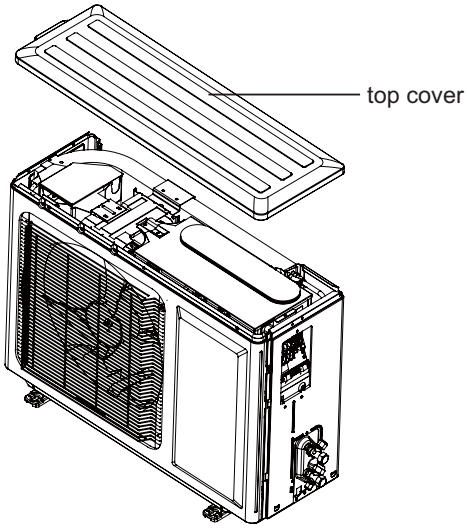
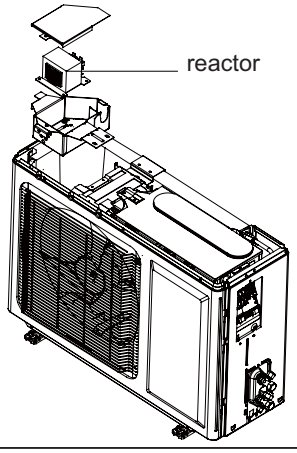
Steps	Procedure
6.Remove motor and axial flow blade	
1	Remove screws of step motor and then remove the motor. Remove the screw of the motor press plate and then remove the press plate. Remove the screws at the joint of the cross flow blade and the motor. Take down the motor.
2	Remove the cross flow blade.

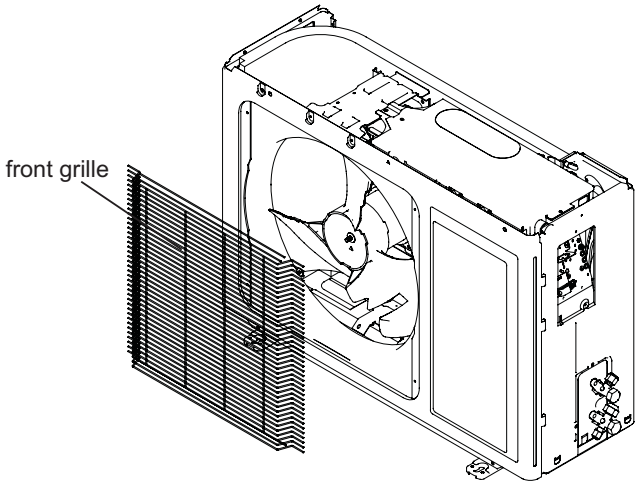
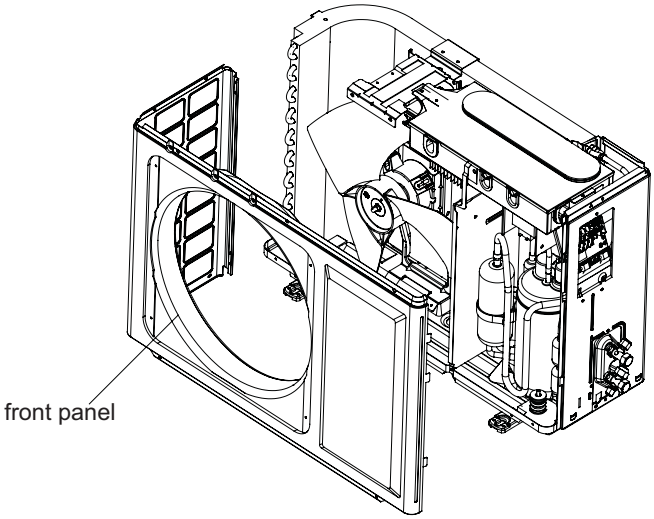
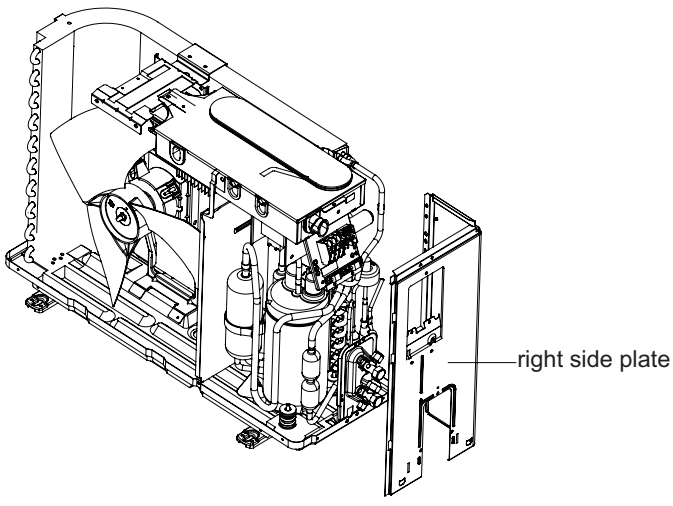


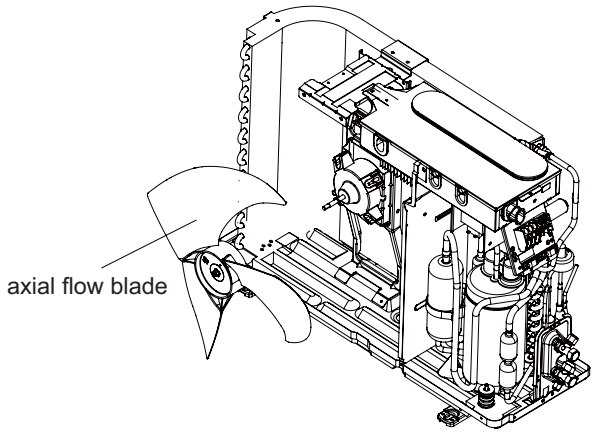
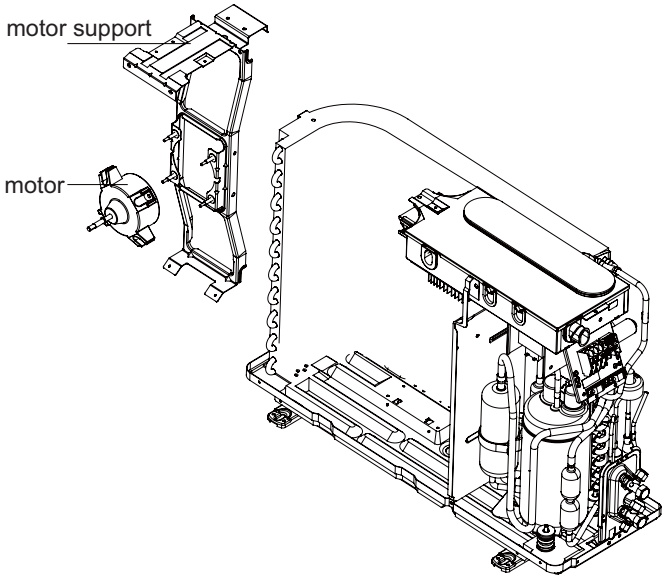
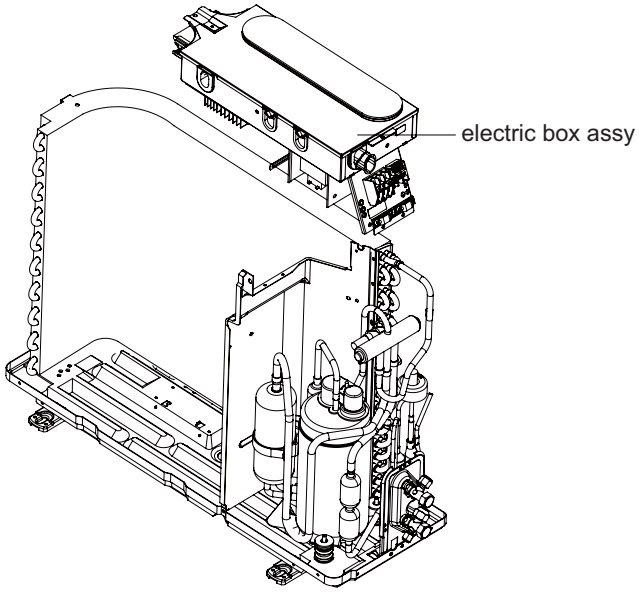


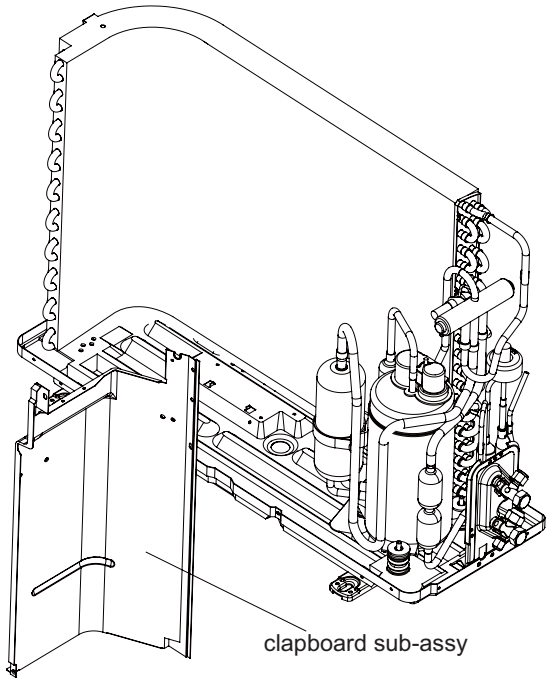
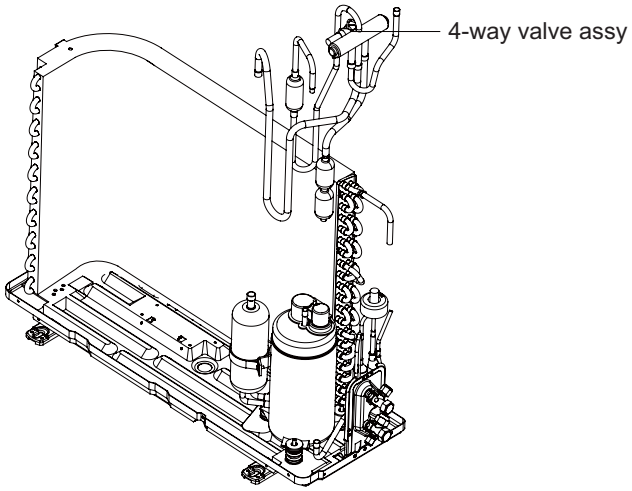
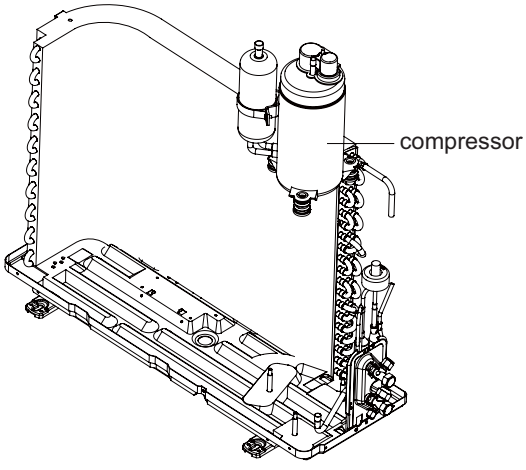
10.2 Removal Procedure of Outdoor Unit(12K)

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

Steps	Procedure	
1.Remove panel		
	Open the front panel Push the rotor shaft on both sides of the panel to make it separate from the groove. Remove the panel.	
2.Remove top cover		
	Remove connection screws connecting the top cover plate with the front panel and the right side plate,and then remove the top cover.	
3.Remove reactor sub-assy		
	Remove screws fixing reactor sub-assy, and then pull the reactor sub-assy upwards to remove it. Remove screws on reactor sub-assy cover, and then remove the reactor.	

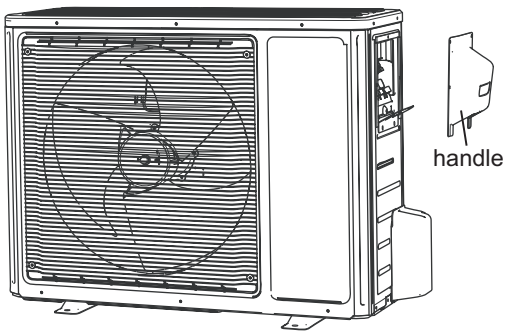
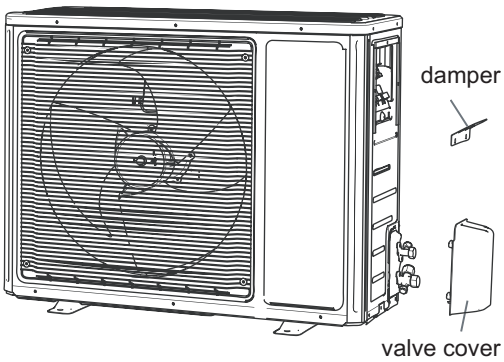
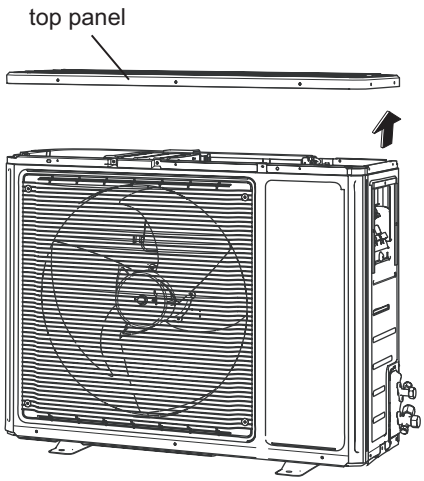
Steps	Procedure
4.Remove front grille	
Remove connection screws between the front grille and the front panel. Then remove the front grille.	
5.Remove front panel	
Remove connection screws connecting the front panel with the chassis and the motor support, and then remove the front panel.	
6.Remove right side plate	
Remove connection screws connecting the right side plate with the valve support and the electric box. Then remove the right side plate.	

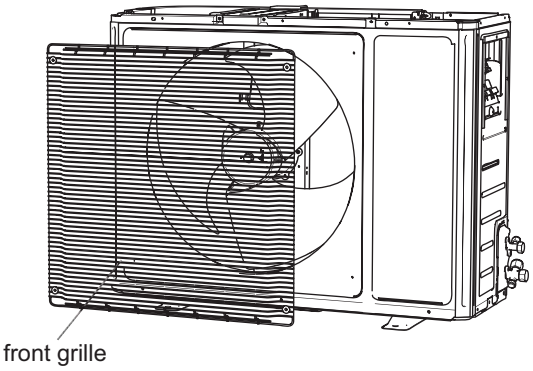
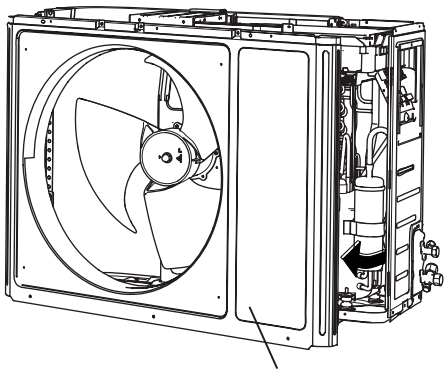
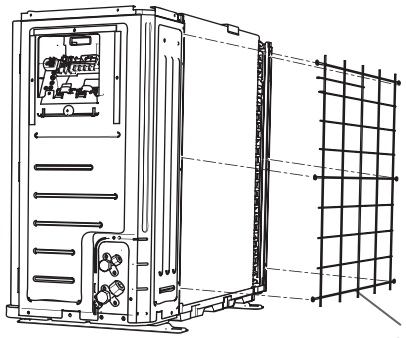
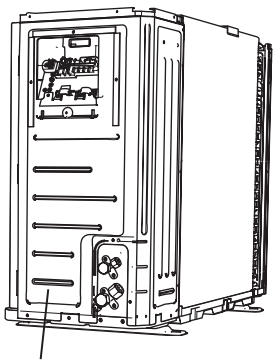
Steps	Procedure
7.Remove axial flow blade	
Remove the nut fixing the blade and thenremove the axial flow blade.	
8.Remove motor and motor support	
Remove the 4 tapping screws fixing the motor Pull out the lead-out wire and remove themotor. Remove the 2 tapping screws fixingthe motor support. Lift motor support to re-move it.	
9.Remove electric box assy	
Remove the 2 screws fixing the cover of elec-tric box. Lift to remove the cover. Loosen thewire and disconnect the terminal. Lift to re-move the electric box assy.	

Steps	Procedure
10.Remove clapboard sub-assy	
Loosen the screws of the clapboard sub-assy .The clapboard sub-assy has a hook on thelower side. Lift and pull the clapboard sub-assy to remove.	
11.Remove 4-way valve assy	
Unscrew the fastening nut of the 4-way Valve Assy coil and remove the coil. Wrap the 4-way Valve Assy with wet cotton and unsolderthe 4 weld spots connecting the 4-way Valve Assy to take it out(Note: Refrigerant shouldbe discharged firstly.) Welding processshould be as quickly as possible and keepwrapping cotton wet all the time. Be sure notto burn out the lead-out wire of compressor.	
12.Remove compressor	
Remove the 3 footing screws of the compressorand remove the compressor.	

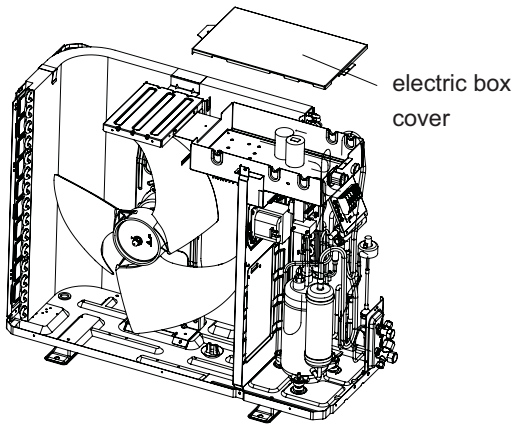
10.3 Removal Procedure of Outdoor Unit(18K)

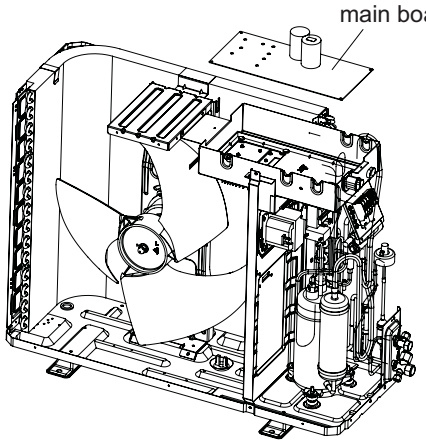
Warning **Be sure to wait for a minimum of 10 minutes after turning off all power supplies before disassembly.**

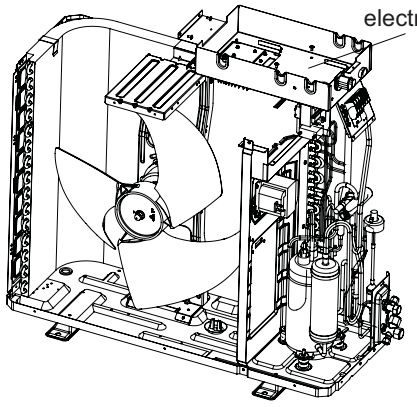
Steps	Procedure	Points
1. Remove top cover and handle		
1 Twist off the screws used for fixing the handle, pull the handle upward to remove it.		
2 Twist off the 2 screws fixing the damper, and then remove the damper. Twist off the 2 screws fixing thevalve cover, push it downward and then remove the valve cover.		
3 Twist off the screws used for fixing the top cover, pull the top cover upward to remove it.		

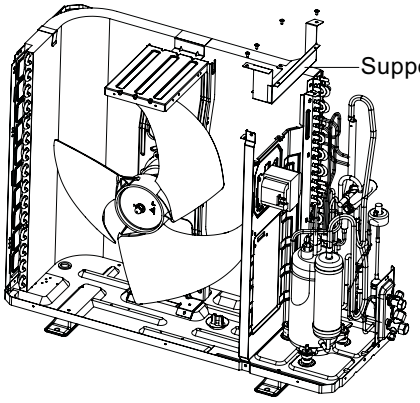
Steps		Procedure	Points
2.Remove front grille and front panel			
1	Twist off the screws fixing the front grille and then remove the front grille.	 front grille	
2	Twist off the screws fixing the panel, pull it upward, loosen the clasp on the right side, rotate it to the left and then remove the panel.	 front panel	■ Lift the front panel and remove it while pushing the right side panel inwards. Step Procedure Points
3.Remove right side plate			
1	Remove screws fixing grille,and then remove it.	 reat Grill	
2	Twist off the screws fixing the right side plate and end plate of condenser and valve support, pull it upward and then remove the right side plate sub-assy.	 right Side Plate	

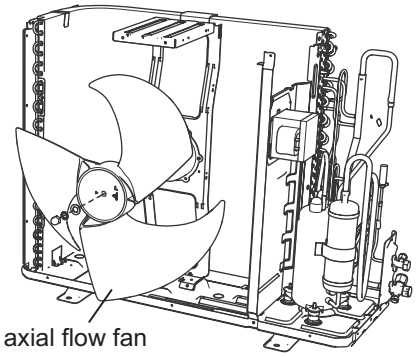
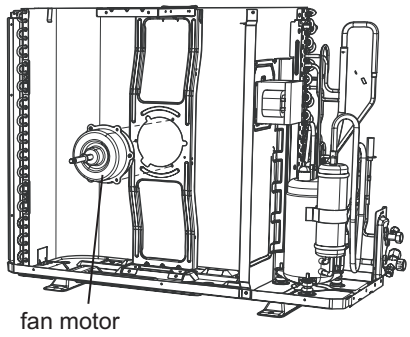
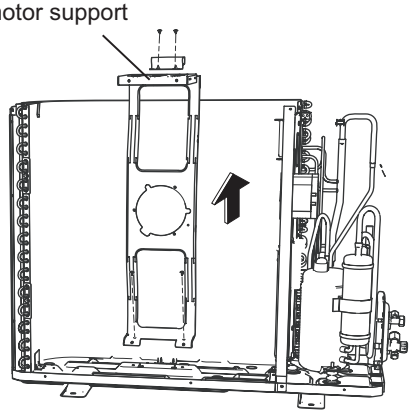
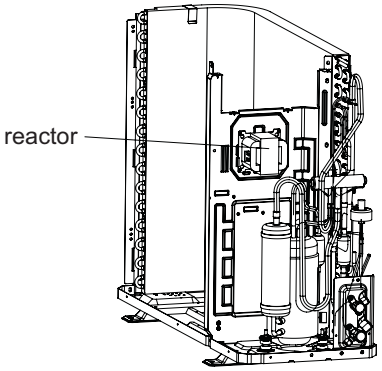
Steps	Procedure	Points
4.Remove Electric Box Assy		
1	Twist the 2 screws fixing the electric box cover and then remove the electric box cover.	
2	Pull out the wiring of motor, compressor,temperature sensor, reactor; twist off the earthing screws on the side wiring terminal ,and the screws fixing the main board, and then remove the main board.	
3	Twist off the screws fixing the electric box cover and then pull the electric box upward to remove it.	
4	Twist off the screws on Supporting Strip and then remove the Supporting Strip.	

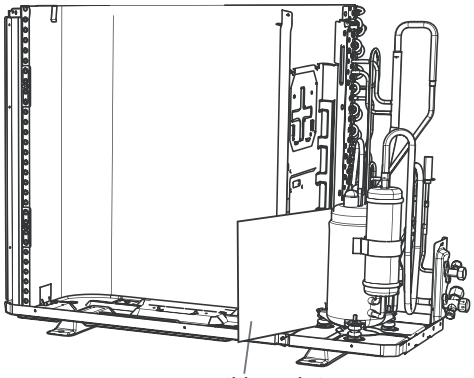
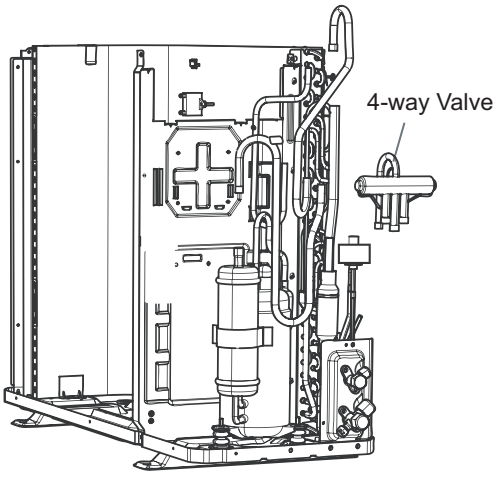


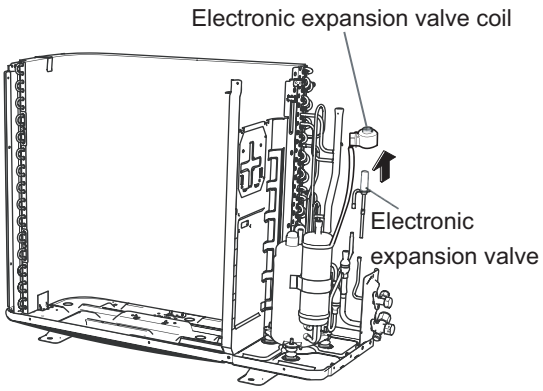
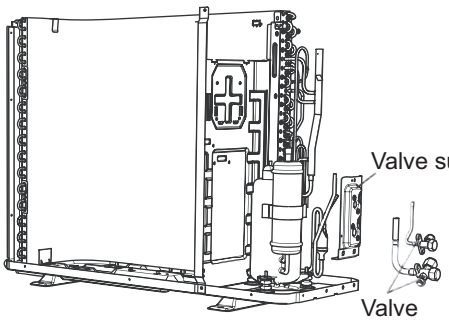
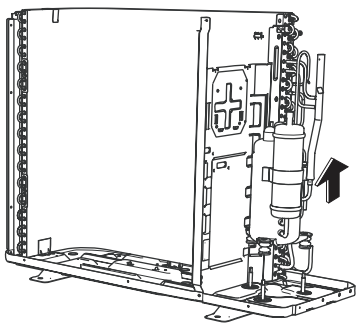






Steps	Procedure	Points
5.Remove the axial flow fan Twist off the nut fixing the blade with wrench and the draw out the axial flow fan.		■ The screw has reverse winding.
6. Remove the Fan Motor and the Motor Support. 1 Twist off the 4 screws fixing themotor and then remove the motor. 2 Twist off the 4 screws fixing the motor support and then remove the motor support.	 motor support 	
7. Remove the reactor Twist off the screws fixing thereactor and then remove the reactor;		

Steps	Procedure		Points
8.Remove suction pipe and discharge pipe of compressor			
1	Remove the sound blanket.		■ Since the piping ports on the sound blanket are torn easily, remove the blanket carefully.
2	Loosen the screw of the four way valve coil; Heat up the brazed part and withdraw the piping with pliers.		■ Be careful so as not to burn the compressor terminals or the name plate. ■ Before working, make sure that the refrigerant is empty in the circuit. ■ Provide a protective sheet or a steel plate so that the brazing flame cannot influence peripheries. **Caution** Be careful about the four way valve, pipes and so on, which were heated up by a gas brazing machine, so as not to get burnt your hands.

Steps	Procedure	Points
9.Remove electric expan- sion valve		
	Remove the electronic expansion valve coil. Heat up the two brazed parts of the electronic expansion valve and disconnect.	
10. Remove the compressor		
1	Twist off the screws fixing the valve and valve support and then remove the valve support.	
2	Twist off the three foot nuts on compressor and then remove the compressor.	

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