



Service Manual

MODEL: GWH09MB-K3DNA3K
GWH12MB-K3DNA3K
(Refrigerant R410A)

Table of Contents

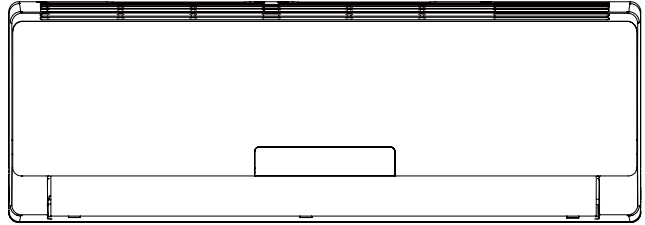
Summary and Features	1
1. Safety Precautions	2
2. Specifications	3
2.1 Unit Specifications	3
2.2 Operation Characteristic Curve	5
2.3 Capacity Variation Ratio According to Temperature	5
2.4 Noise Criteria Curve Tables for Both Models	6
2.5 Operation Data	6
3. Construction Views	7
3.1 Indoor Unit	7
3.2 Outdoor Unit	7
4. Refrigerant System Diagram	8
5. Schematic Diagram	9
5.1 Electrical Data	9
5.2 Electrical Wiring	9
5.3 Printed Circuit Board	11
6. Function and Control	13
6.1 Remote Control Operations	13
6.2 Description of Each Control Operation	16
7. Installation Manual	22
7.1 Notices for Installation	22
7.2 Installation Drawing	24
7.3 Install Indoor Unit	25
7.4 Install Outdoor Unit	26
7.5 Check after Installation and Operation Test	27
7.6 Installation and Maintenance of Healthy Filter	28

8. Exploded Views and Parts List	29
8.1 Indoor Unit.....	29
8.2 Outdoor Unit.....	31
9. Troubleshooting	35
9.1 Malfunction Analysis.....	35
9.2 Flashing LED of Indoor/Outdoor Unit and Primary Judgement.....	39
9.3 How to Check Simply the Main Part.....	46
10. Removal Procedure	59
10.1 Removal Procedure of Indoor Unit.....	59
10.2 Removal Procedure of Outdoor Unit	62

Summary and Features

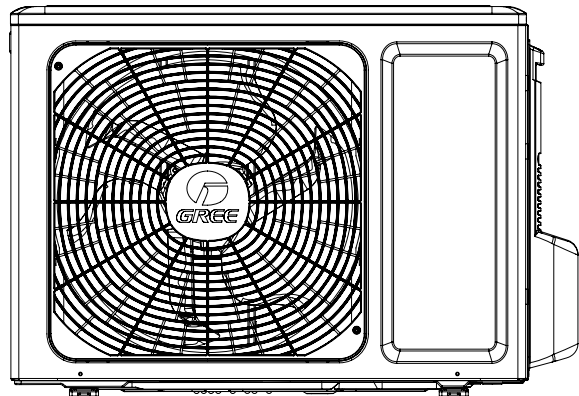
Indoor Unit

GWH09MB-K3DNA3K/I
GWH12MB-K3DNA3K/I



Outdoor Unit

GWH09MB-K3DNA3K/O
GWH12MB-K3DNA3K/O



Remote Controller

YB1FA



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

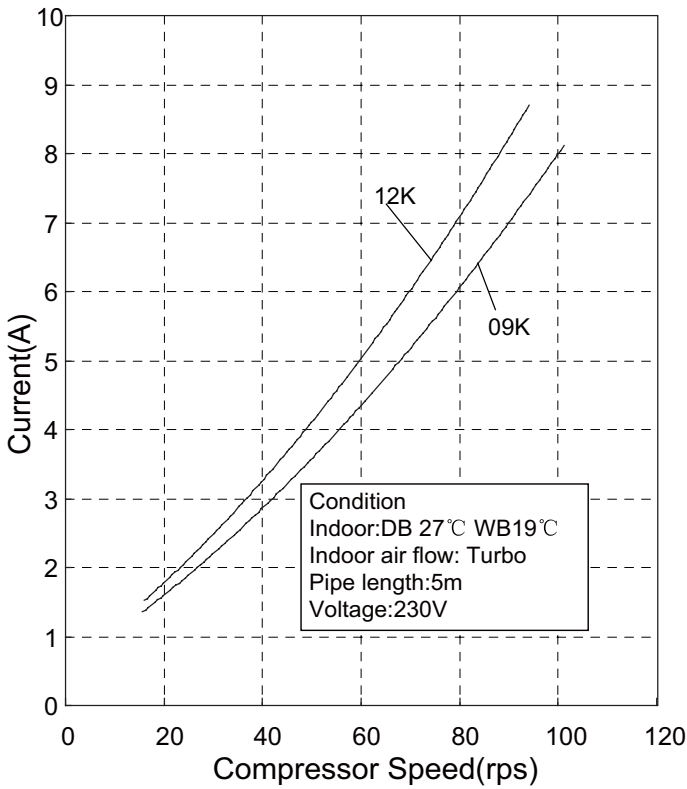
Model			GWH09MB-K3DNA3K	GWH12MB-K3DNA3K	
Product Code			CB171007600	CB171007700	
Power Supply	Rated Voltage	V~	220-240	220-240	
	Rated Frequency	Hz	50	50	
	Phases		1	1	
Power Supply Mode			Indoor	Indoor	
Cooling Capacity (Min~Max)		W	2700(550~3200)	3500(510~3900)	
Heating Capacity (Min~Max)		W	2800(800~3600)	4000(880~4400)	
Cooling Power Input (Min~Max)		W	870(250~1360)	1170(230~1400)	
Heating Power Input (Min~Max)		W	900(200~1400)	1200(250~1550)	
Cooling Power Current		A	3.8	5.1	
Heating Power Current		A	3.92	5.22	
Rated Input		W	1400	1600	
Rated Current		A	6.69	7.8	
Air Flow Volume(SH/H/M/L/SL)		m ³ /h	650/500/400/300/-	600/500/400/300/-	
Dehumidifying Volume		L/h	0.8	1.2	
EER		W/W	3.10	2.99	
COP		W/W	3.11	3.33	
SEER		W/W	-	-	
HSPF		W/W	-	-	
Application Area		m ²	12-18	16-24	
Indoor Unit	Model of Indoor Unit		GWH09MB-K3DNA3K/I	GWH12MB-K3DNA3K/I	
	Fan Type		Cross-flow	Cross-flow	
	Diameter Length(DXL)		mm	Φ92X645	Φ92X645
	Fan Motor Cooling Speed (SH/H/M/L/SL)		r/min	1260/1050/900/690/-	1290/1070/900/690/-
	Fan Motor Heating Speed (SH/H/M/L/SL)		r/min	1320/1200/1000/910/-	1280/1050/980/920/-
	Output of Fan Motor		W	20	20
	Fan Motor RLA		A	0.1	0.1
	Fan Motor Capacitor		μF	1.0	1.0
	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	636X25.4X267	636X25.4X267
	Swing Motor Model			MP24AA	MP24AA
	Output of Swing Motor		W	2	2
	Fuse		A	3.15	3.15
	Sound Pressure Level (SH/H/M/L/SL)		dB (A)	41/39/34/28/-	42/40/38/36/-
	Sound Power Level (SH/H/M/L/SL)		dB (A)	51/49/44/38/-	52/50/48/46/-
	Dimension (WXHXD)		mm	845X275X180	845X275X180
	Dimension of Carton Box (LXWXH)		mm	915X255X355	915X255X355
Dimension of Package (LXWXH)		mm	918X258X370	918X258X370	
Net Weight		kg	9	9	
Gross Weight		kg	12	12	

Outdoor Unit	Model of Outdoor Unit		GWH09MB-K3DNA3K/O	GWH12MB-K3DNA3K/O
	Compressor Manufacturer/Trademark		ZHUHAI LANDA COMPRESSOR CO., LTD.	ZHUHAI LANDA COMPRESSOR CO., LTD.
	Compressor Model		QXA-A091zE190A	QXA-A091zE190A
	Compressor Oil		FVC 68EP	FVC 68EP
	Compressor Type		Rotary	Rotary
	L.R.A.	A	16.5	16.5
	Compressor RLA	A	4.9	4.9
	Compressor Power Input	W	950	950
	Overload Protector		1NT11L-6233	1NT11L-6233
	Throttling Method		Electron expansion valve	Electron expansion valve
	Operation temp	°C	16~30	16~30
	Ambient temp (Cooling)	°C	18~43	18~43
	Ambient temp (Heating)	°C	-7~24	-7~24
	Condenser Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Pipe Diameter	mm	Φ7	Φ7
	Rows-fin Gap	mm	1-1.4	2-1.4
	Coil Length (LXDXW)	mm	710X19.05X508	695X38.1X506
	Fan Motor Speed	rpm	900/660	900/660
	Output of Fan Motor	W	30	30
	Fan Motor RLA	A	0.15	0.15
	Fan Motor Capacitor	μF	-	-
	Air Flow Volume of Outdoor Unit	m ³ /h	2000	2000
	Fan Type		Axial-flow	Axial-flow
	Fan Diameter	mm	Φ400	Φ400
	Defrosting Method		Automatic Defrosting	Automatic Defrosting
	Climate Type		T1	T1
	Isolation		I	I
	Moisture Protection		IP24	IP24
	Permissible Excessive Operating Pressure for the Discharge Side	MPa	4.3	4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa	2.5	2.5
	Sound Pressure Level (H/M/L)	dB (A)	51/-/-	53/-/-
	Sound Power Level (H/M/L)	dB (A)	61/-/-	63/-/-
Dimension (WXHXD)	mm	776X540X320	776X540X320	
Dimension of Carton Box (LXWXH)	mm	848X360X580	848X360X580	
Dimension of Package (LXWXH)	mm	851X363X595	851X363X595	
Net Weight	kg	28.0	29.0	
Gross Weight	kg	32.0	33.0	
Refrigerant		R410A	R410A	
Refrigerant Charge	kg	0.7	0.85	
Connection Pipe	Length	m	5	5
	Gas Additional Charge	g/m	20	20
	Outer Diameter Liquid Pipe	mm	Φ6	Φ6
	Outer Diameter Gas Pipe	mm	Φ9.52	Φ9.52
	Max Distance Height	m	10	10
	Max Distance Length	m	15	15

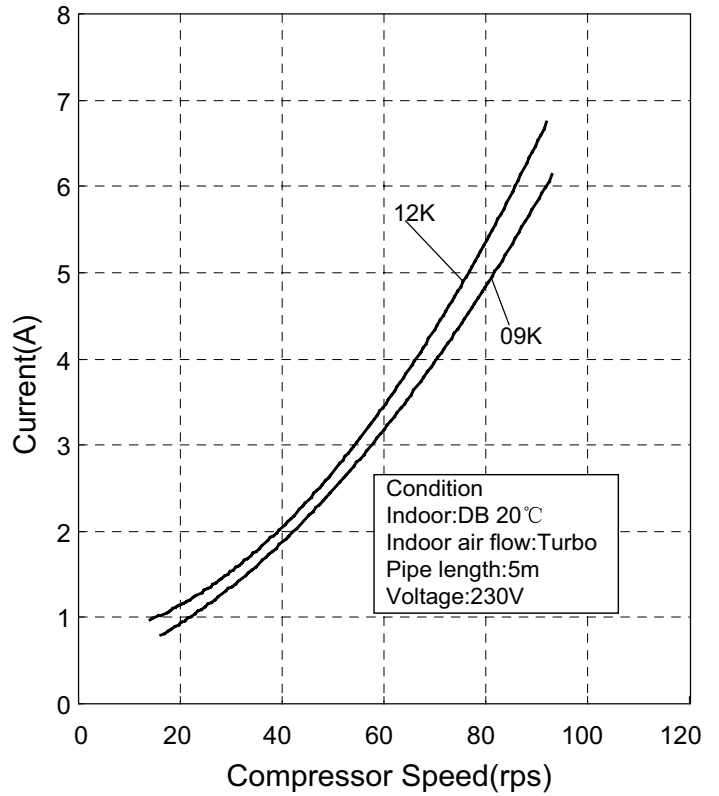
The above data is subject to change without notice. Please refer to the nameplate of the unit.

2.2 Operation Characteristic Curve

Cooling

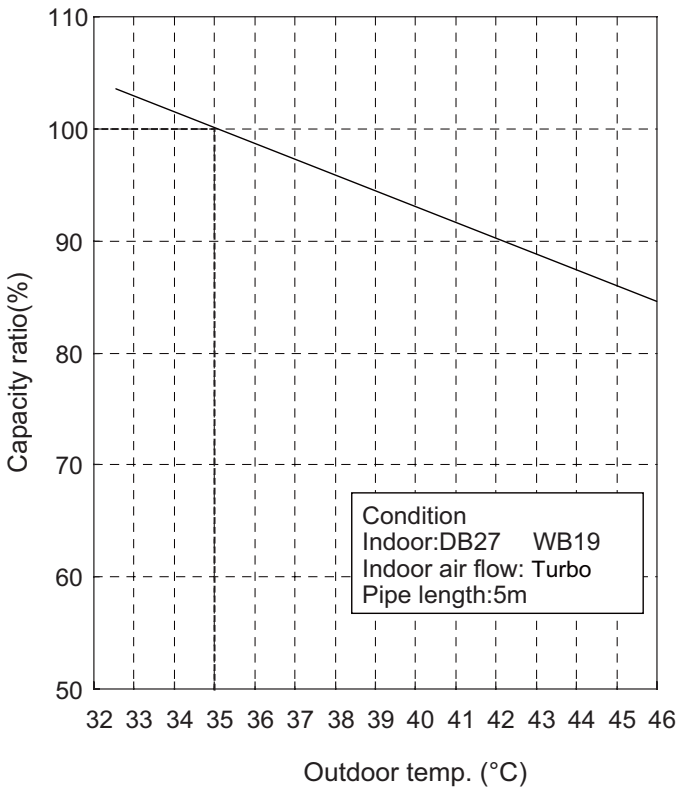


Heating

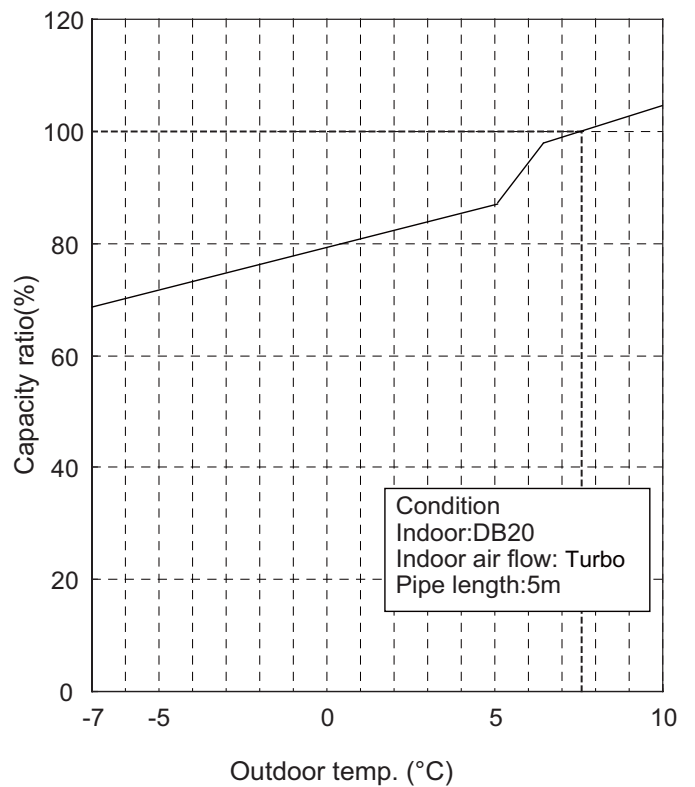


2.3 Capacity Variation Ratio According to Temperature

Cooling

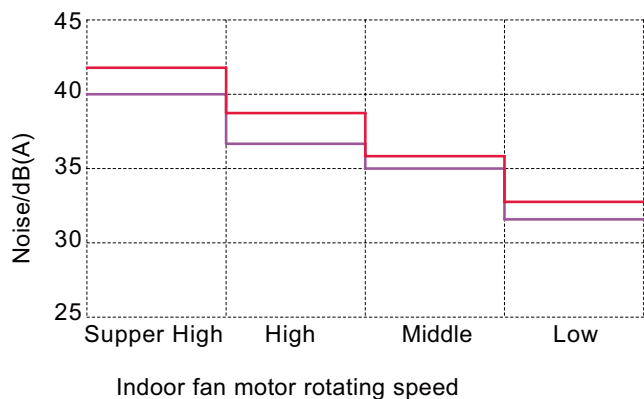


Heating

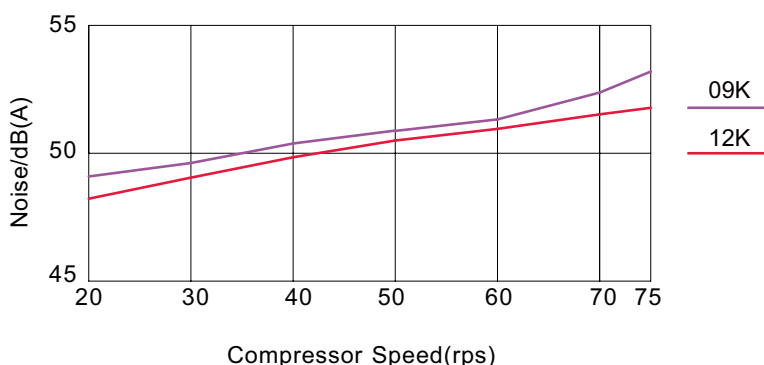


2.4 Noise Criteria Curve Tables for Both Models

Indoor side noise when blowing



Outdoor side noise when Compressor speed changed



2.5 Operation Data

Cooling

Temperature condition (°C)		Model name	Standard pressure P (MPa)	Heat exchanger pipe temp		Indoor fan mode	Outdoor fan mode (rpm)	Compressor revolution (rps)
Indoor	Outdoor			T1 (°C)	T2 (°C)			
27/19	35/24	09K	0.8 ~ 1.1	12 to 15	65 to 38	Super High	900/660	54
		12K		11 to 14	64 to 37			60

Heating

Temperature condition (°C)		Model name	Standard pressure P (MPa)	Heat exchanger pipe temp		Indoor fan mode	Outdoor fan mode (rpm)	Compressor revolution (rps)
Indoor	Outdoor			T1 (°C)	T2 (°C)			
20/-	7/6	09K	2.8 ~ 3.2	35 to 63	2 to 5	Super High	900/660	62
		12K		35 to 65	2 to 5			66

P: The air pipe pressure (gas valve side pressure) connect to indoor and outdoor unit

T1: Inlet and outlet pipe temperature of evaporator

T2: Inlet and outlet pipe temperature of condenser

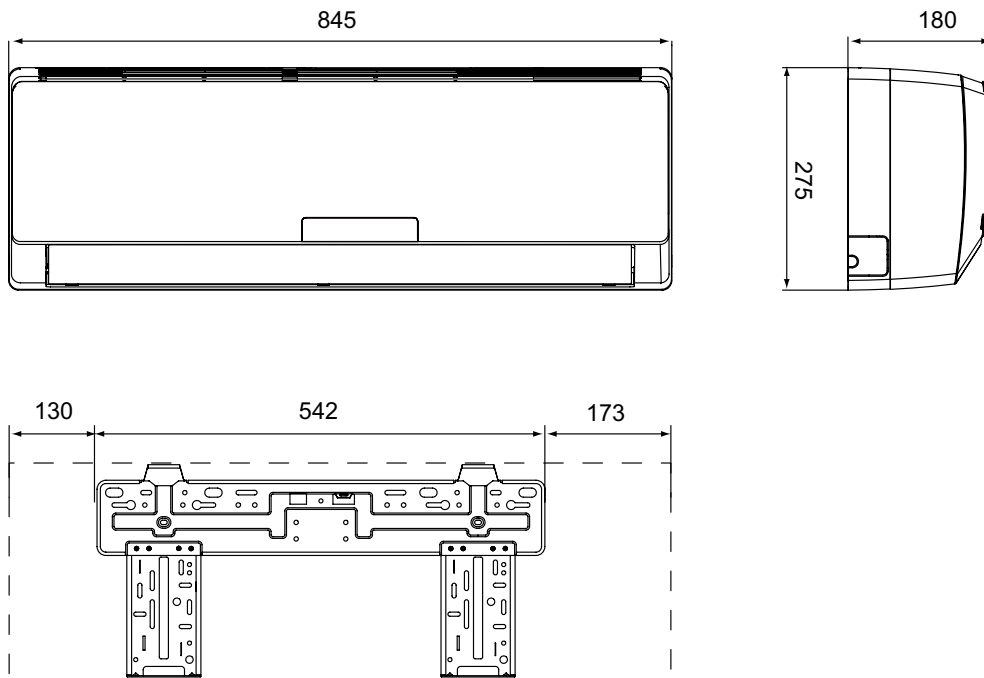
NOTES :

(1) Measure surface temperature of heat exchanger pipe around center of heat exchanger path U bent. (Thermistor thermometer)

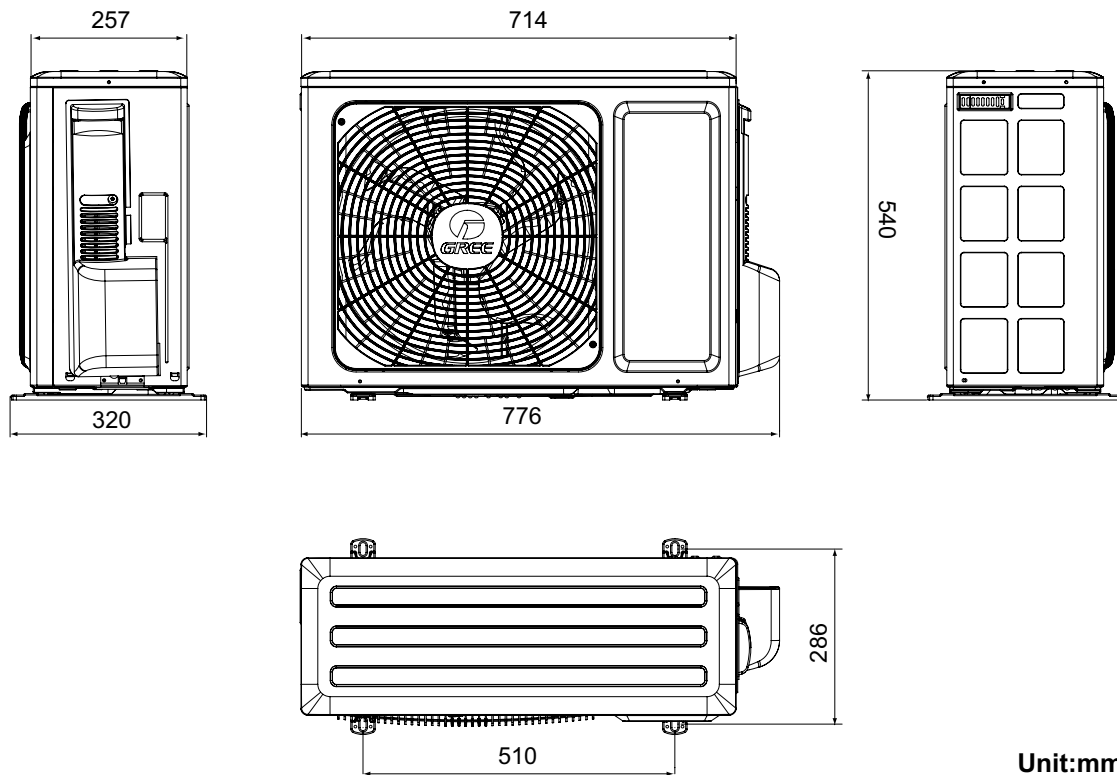
(2) Connecting piping condition : 5m

3. Construction Views

3.1 Indoor Unit

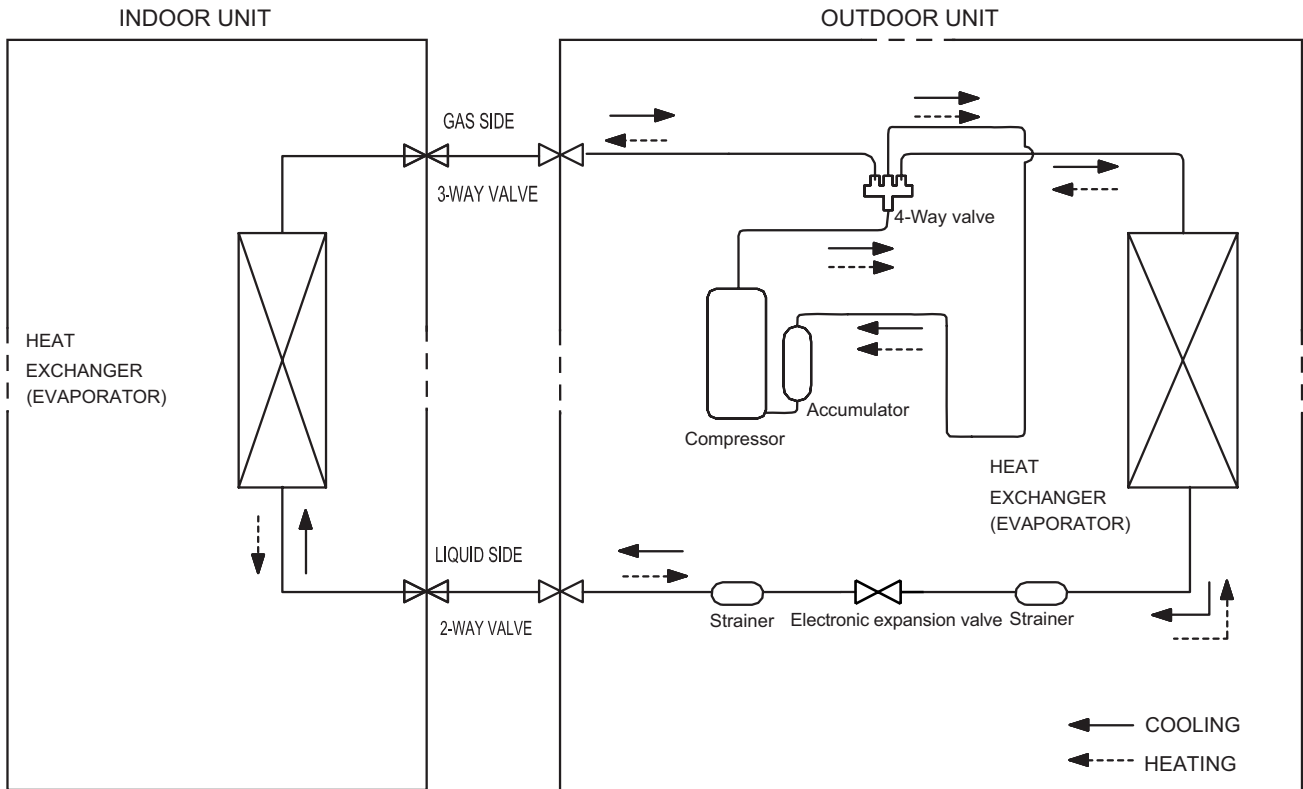


3.2 Outdoor Unit



Unit:mm

4. Refrigerant System Diagram



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

5. Schematic Diagram

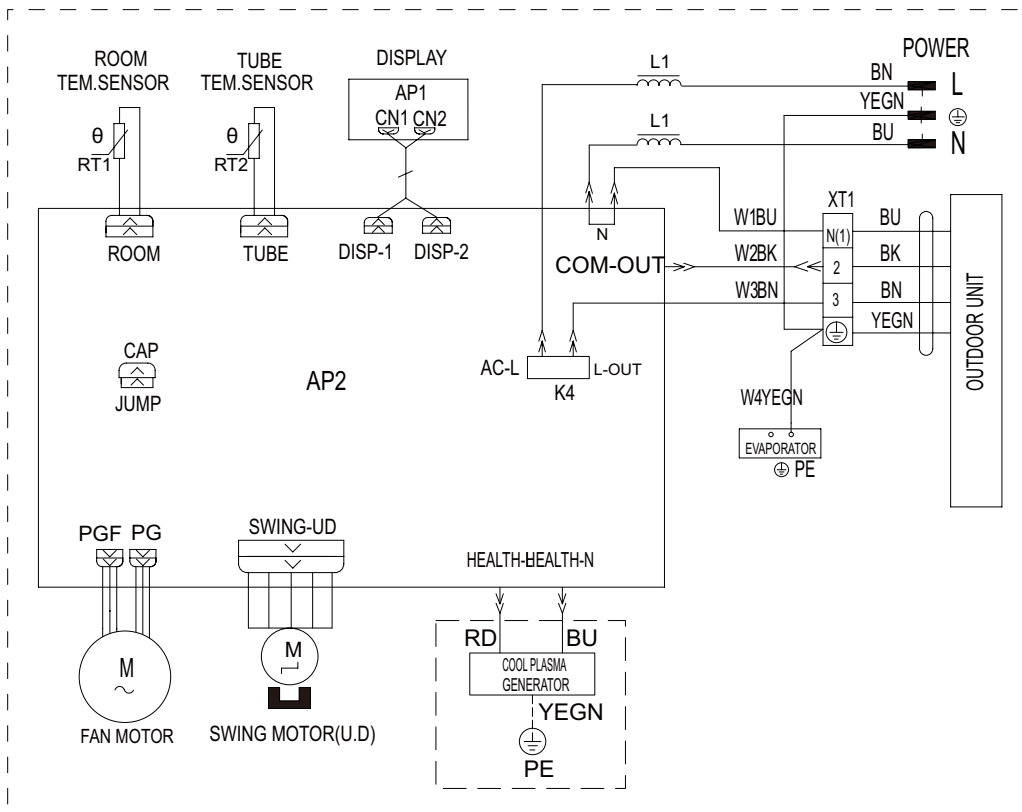
5.1 Electrical Data

Meaning of marks

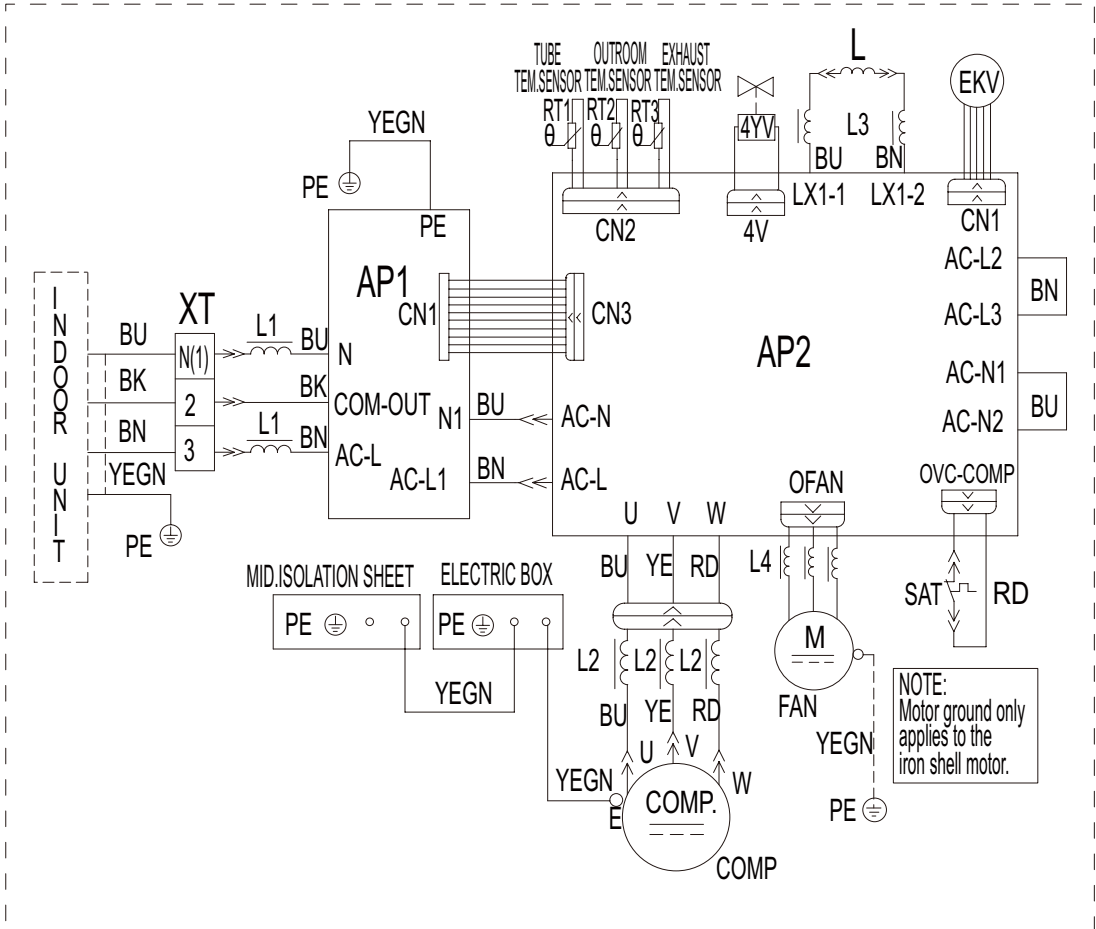
Symbol	Color Symbol	Symbol	Parts Name
OG	ORANGE		PROTECTIVE EARTH
WH	WHITE	COMP	COMPRESSOR
YE	YELLOW	SAT	OVERLOAD
RD	RED	4YV	4-WAY VALVE
YEGN	YELLOW GREEN	XT	TERMINAL BLOCK
BN	BROWN		
BU	BLUE		
BK	BLACK		

5.2 Electrical Wiring

● Indoor Unit



●Outdoor Unit

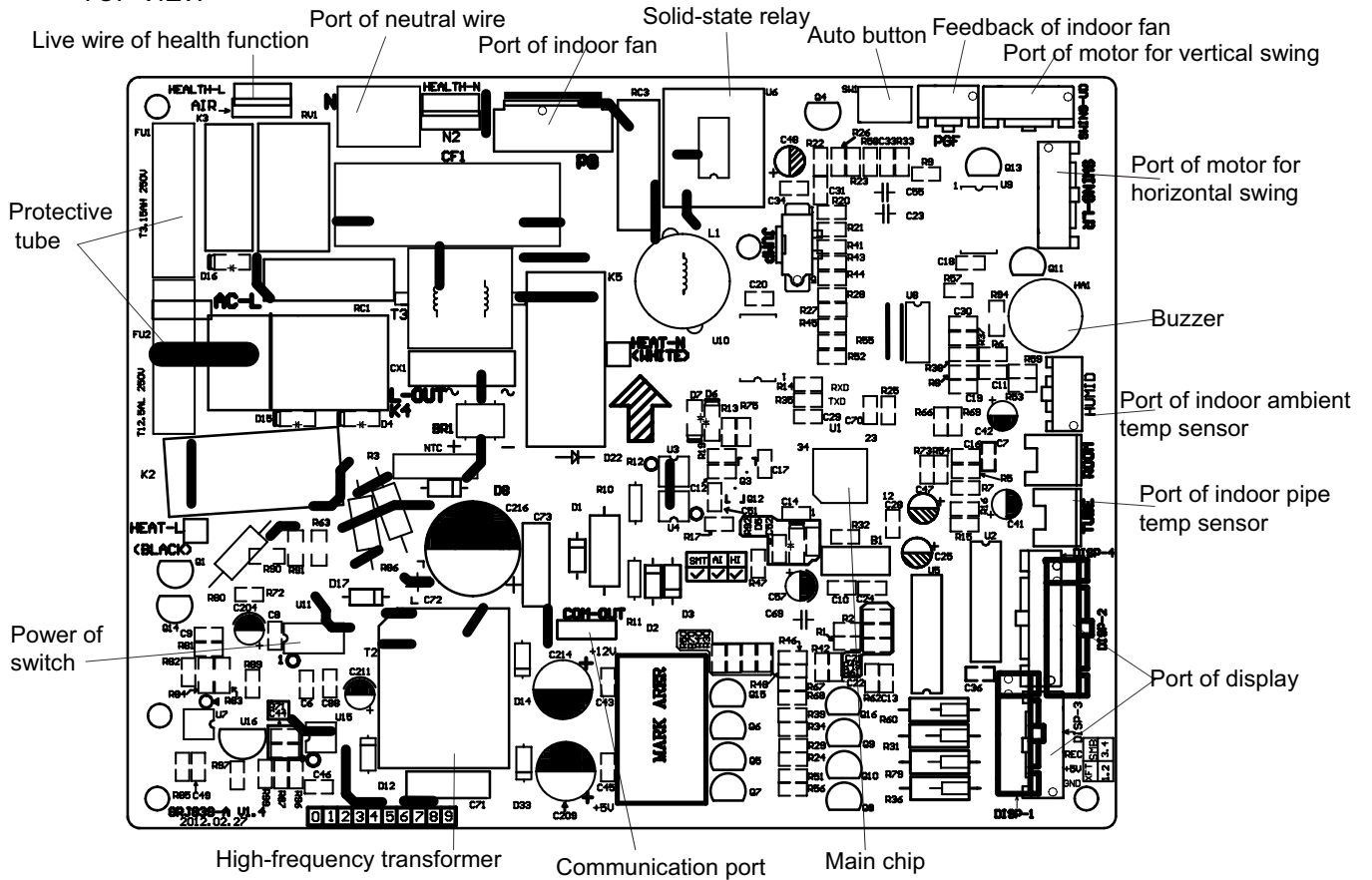


These circuit diagrams are subject to change without notice, please refer to the one supplied with the unit.

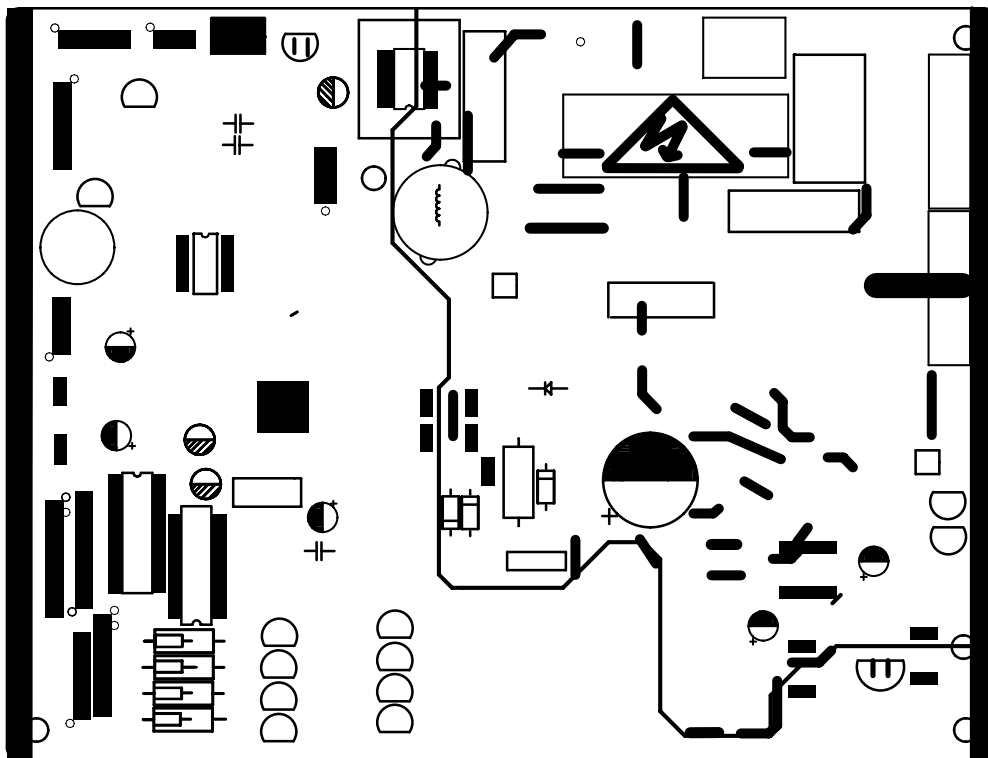
5.3 Printed Circuit Board

(1) Indoor Unit

● TOP VIEW

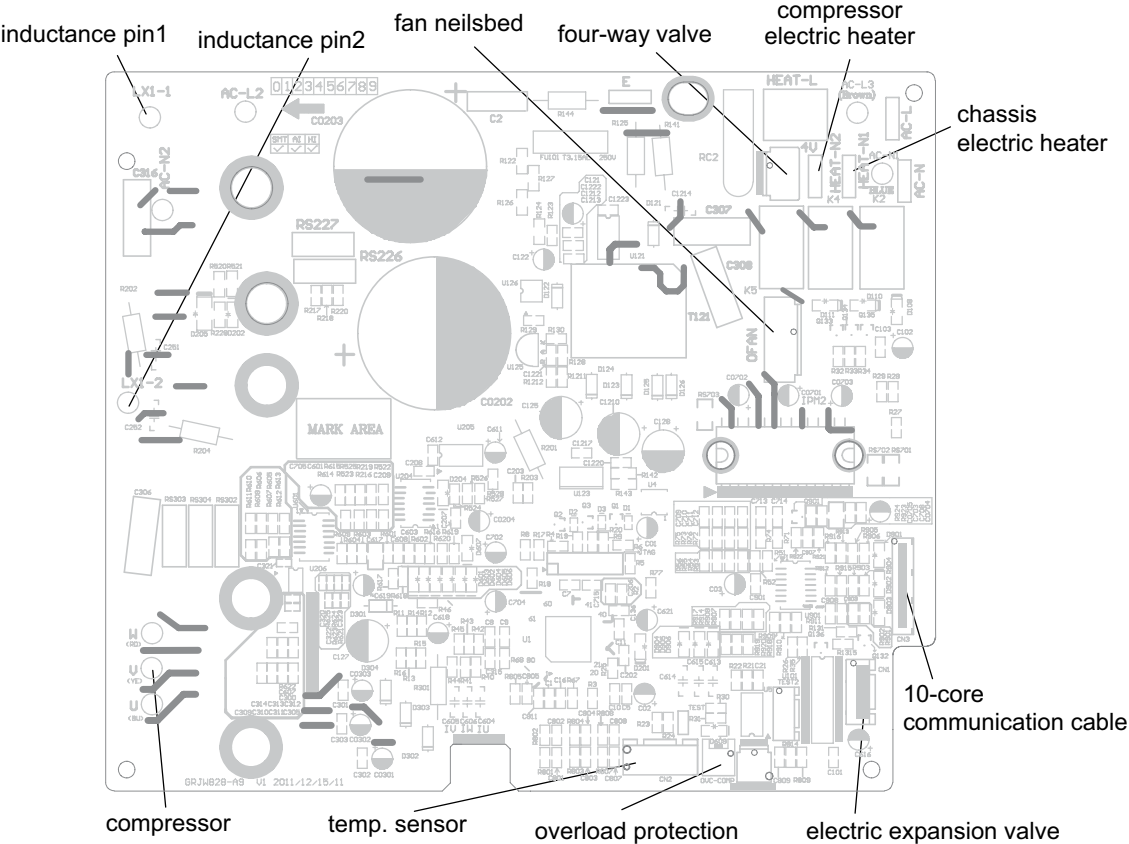


● BOTTOM VIEW

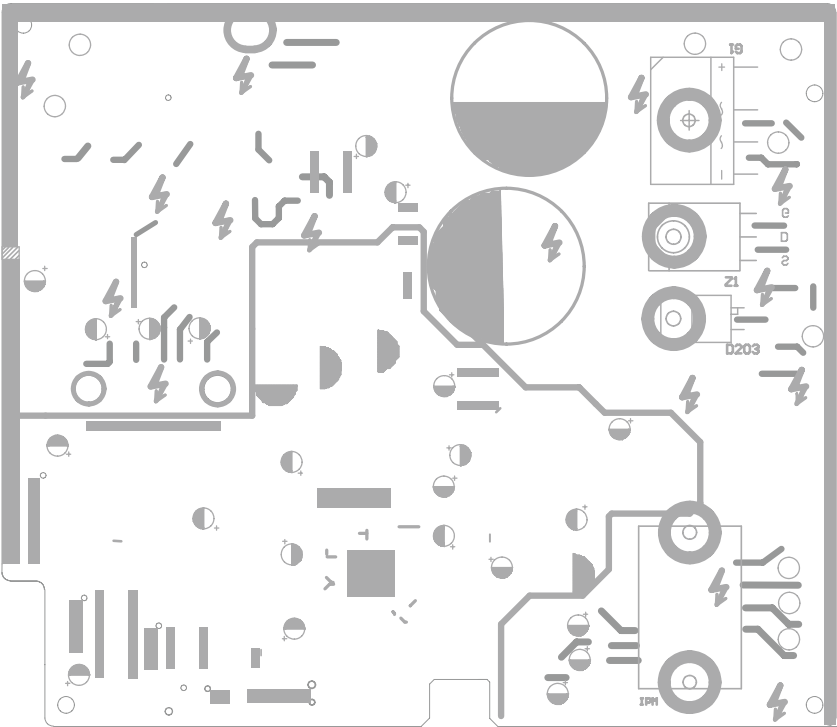


(2)Outdoor Unit

● TOP VIEW




● BOTTOM VIEW

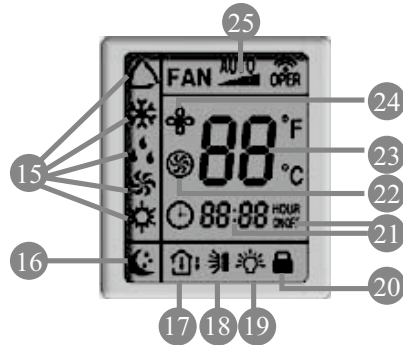


6. Function and Control






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 the TURBO 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:



*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 + :

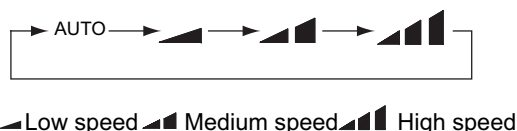
Press this button to increase set temperature. Hold it down for above 2 seconds to rapidly increase set temperature. In AUTO mode, set temperature is not adjustable.

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.



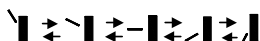
6 🌀

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 turned 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)

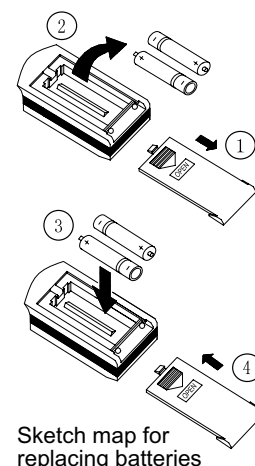
2. Take out the old batteries.

3. Insert two new AAA1.5V dry batteries, and pay attention to the polarity.

4. Reinstall the battery cover plate.

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.



Sketch map for replacing batteries

6.2 Description of Each Control Operation

1. Temperature Parameters

- ◆ Indoor preset temperature (T_{preset})
- ◆ Indoor ambient temperature ($T_{\text{amb.}}$)

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) COOL mode

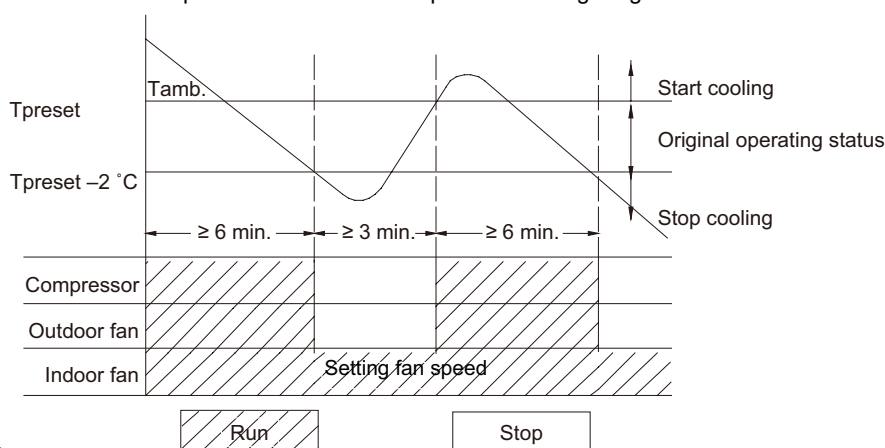
① The condition and process of cooling

If $T_{\text{amb.}} \geq T_{\text{preset}}$ COOL mode will act, the compressor and outdoor fan will run, and the indoor fan will run at the set speed.

If $T_{\text{amb.}} \leq T_{\text{preset}} - 2^\circ\text{C}$, the compressor will stop, the outdoor fan will delay 30 seconds to stop, and the indoor fan will run at the set speed.

If $T_{\text{preset}} - 2^\circ\text{C} \leq T_{\text{amb.}} \leq T_{\text{preset}}$, the unit will keep running in the previous mode.

In this mode, the reversal valve will not be powered on and the temperature setting range is $16^\circ\text{C} \sim 30^\circ\text{C}$.



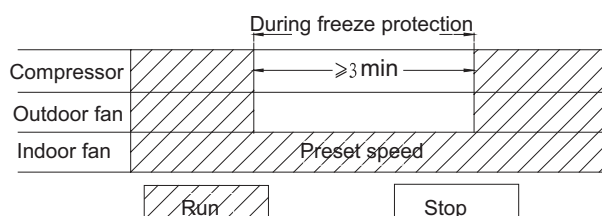
② Protection function

◆ Overcurrent protection

If total current is high, the compressor will run in limited frequency. If total current is too high, the compressor will stop, the outdoor fan will delay 30 seconds to stop, indoor unit will display E5 and outdoor yellow light will blink 5 times.

◆ Freeze protection

When the freeze protection is detected, the compressor will stop, the outdoor fan will stop after 30 seconds, and the indoor fan and swing motor will keep running in the original mode. When freeze protection is eliminated and the compressor has stopped for 3 minutes, the compressor will resume running in the original mode.



(2) Dehumidifying Mode

① Working conditions and process of dehumidifying

If $T_{\text{amb.}} > T_{\text{preset}}$ the unit will enter cooling and dehumidifying mode, in which case the compressor and the outdoor fan will operate and the indoor fan will run at low speed.

If $T_{\text{preset}} - 2^\circ\text{C} \leq T_{\text{amb.}} \leq T_{\text{preset}}$ the compressor remains at its original operation state.

If $T_{\text{amb.}} < T_{\text{preset}} - 2^\circ\text{C}$, the compressor will stop, the outdoor fan will stop with a time lag of 30s, and the indoor fan will operate at low speed.

② Protection

Protection is the same as that under the cooling mode.

(3) HEAT Mode

① Working conditions and process of heating

If $T_{amb} \leq T_{preset} + 2^{\circ}\text{C}$, 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 $T_{amb} \geq T_{preset} + 5^{\circ}\text{C}$, the compressor will stop, the outdoor fan will stop with a time lag of 30s, and the indoor fan will stop after 60-second blow at low speed

If $T_{preset} + 2^{\circ}\text{C} < T_{amb} < T_{preset} + 5^{\circ}\text{C}$, 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°C. The operating symbol, the heating symbol and preset temperature are revealed on the display.

② Condition and process of defrost

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.

(1). $T_{outdoor\ ambient} > 5^{\circ}\text{C}$, $T_{outdoor\ tube} \leq -2^{\circ}\text{C}$;

(2) $-2^{\circ}\text{C} \leq T_{outdoor\ ambient} < 5^{\circ}\text{C}$, $T_{outdoor\ tube} \leq -6^{\circ}\text{C}$;

(3) $-5^{\circ}\text{C} \leq T_{outdoor\ ambient} < -2^{\circ}\text{C}$, $T_{outdoor\ tube} \leq -8^{\circ}\text{C}$;

(4) $-10^{\circ}\text{C} \leq T_{outdoor\ ambient} < -5^{\circ}\text{C}$, $T_{outdoor\ tube} - T_{compensatory} \leq (T_{outdoor\ ambient} - 3^{\circ}\text{C})$

(5) $T_{outdoor\ ambient} < -10^{\circ}\text{C}$, $T_{outdoor\ tube} - T_{compensatory} \leq (T_{outdoor\ ambient} - 3^{\circ}\text{C})$

(after energizing, $T_{compensatory} = 0^{\circ}\text{C}$ during the first defrosting; if it is not the first defrosting, $T_{compensatory}$ is confirmed by $T_{outdoor\ tube}$ of quitting last defrosting: a. when $T_{outdoor\ tube} > 2^{\circ}\text{C}$, $T_{compensatory} = 0^{\circ}\text{C}$; b. when $T_{outdoor\ tube} \leq 2^{\circ}\text{C}$, $T_{compensatory} = 3^{\circ}\text{C}$)

At that time, the indoor fan stops and the compressor stops, and after 30 seconds the outer 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 $T_{outdoor\ ambient} \geq 10^{\circ}\text{C}$, 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 outer fan will be started, the indoor 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 $T_{indoor\ amb.} < 24^{\circ}\text{C}$: if $T_{tube} \leq 40^{\circ}\text{C}$ 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 $T_{tube} > 40^{\circ}\text{C}$, 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 $T_{tube} > 42^{\circ}\text{C}$, the fan will run at present speed.

② In the case of $T_{indoor\ amb.} \geq 24^{\circ}\text{C}$: if $T_{tube} \leq 42^{\circ}\text{C}$, the indoor fan will run at low speed, and after one minute, the indoor fan will be converted to preset speed. Within one-minute low speed operation, if $T_{tube} > 42^{\circ}\text{C}$, the indoor fan will be converted to preset speed.

Note: $T_{indoor\ amb.}$ indicated 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 $I_{total} \leq 6\text{A}$, frequency rise will be allowed; if $I_{total} \geq 7\text{A}$, frequency rise will not be allowed; if $I_{total} \geq 8\text{A}$, the compressor will run at reduced frequency; and if $I_{total} \geq 9\text{A}$, the compressor will stop and the outdoor fan will stop with a time lag of 30s.

(4) Fan Mode

Under the mode, the indoor fan will run at preset speed 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°C .

(5) AUTO Mode

① Working conditions and process of AUTO mode

a. When $T_{ambient} \geq 26^{\circ}\text{C}$, the unit will operate in Cool mode. The set temperature is 25°C.

b. When $T_{ambient} \leq 22^{\circ}\text{C}$, the heat pump unit will operate in Heat mode., set temperature be 20°C; the cooling only unit will operate in Fan mode, set temperature be 25°C.

c. When $23^{\circ}\text{C} \leq T_{ambient} \leq 25^{\circ}\text{C}$, the unit will operate in the previous state. If it is energized for the first time, it will operate in Fan mode.

d. Under auto mode, if its cooling mode, operation frequency is same as that under cooling mode; if its heating mode, operation frequency is same as that under heating mode.

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 $\leq 52^{\circ}\text{C}$, the unit will return to its original operation state.
- b. If T tube $\geq 55^{\circ}\text{C}$, frequency rise is not allowed.
- c. If T tube $\geq 58^{\circ}\text{C}$, the compressor will run at reduced frequency.
- d. If T tube $\geq 62^{\circ}\text{C}$, the compressor will stop and the indoor fan will run at preset speed.

2) Heating overload

- a. If T tube $\leq 50^{\circ}\text{C}$, the unit will return to its original operation state.
- b. If T tube $\geq 53^{\circ}\text{C}$, frequency rise is not allowed.
- c. If T tube $\geq 56^{\circ}\text{C}$, the compressor will run at reduced frequency.
- d. If T tube $\geq 60^{\circ}\text{C}$, the compressor will stop and the indoor fan will blow residue heat and then stop.

② Exhaust temperature protection of compressor

If exhaust temperature $\geq 98^{\circ}\text{C}$, frequency is not allowed to rise.

If exhaust temperature $\geq 103^{\circ}\text{C}$, the compressor will run at reduced frequency.

If exhaust temperature $\geq 110^{\circ}\text{C}$, the compressor will stop.

If exhaust temperature $\leq 90^{\circ}\text{C}$ and the compressor has stayed at stop for at least 3 minutes, the compressor will resume its operation.

③ 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.

④ Module protection

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

⑤ Overload protection

If temperature sensed by the overload sensor is over 115°C , the compressor will stop and the outdoor fan will stop with a time lag of 30 seconds. If temperature is below 95°C , the overload protection will be relieved.

⑥ DC bus voltage protection

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 operation.

⑦ Faults of temperature sensors**3. Other Controls****(1) ON/OFF**

Press the remote button ON/OFF: the on-off state will be changed once each time you press the button.

(2) Mode Selection

Press the remote button MODE, then select and show in the following ways: AUTO, COOL, DRY, FAN, HEAT, AUTO.

(3) Temperature Setting Option Button

Each time you press the remote button TEMP+ or TEMP-, the setting temperature will be up or down by 1°C . Regulating Range: $16\sim 30^{\circ}\text{C}$, the button is useless under the AUTO mode.

(4) Time Switch

You should start and stop the machine according to the setting time by remote control.

(5) SLEEP State Control

1. In cooling mode:

1.1 When the initial set temperature is $16\sim 23^{\circ}\text{C}$, the temperature will rise 1°C by every hour after sleep function is set; the temperature will not change after rising 3°C ; after running for 7 hours, the temperature will decrease 1°C and it will not change after that.

1.2 When the initial set temperature is 24-27°C, the temperature will rise 1°C by every hour after sleep function is set; the temperature will not change after rising 2°C; after running for 7 hours, the temperature will decrease 1°C and it will not change after that.

1.3 When the initial set temperature is 28-29°C, the temperature will rise 1°C by every hour after sleep function is set; the temperature will not change after rising 1°C; after running for 7 hours, the temperature will decrease 1°C and it will not change after that.

1.4 When the initial set temperature is 30°C, the unit will keep on running at this temperature; after running for 7 hours, the temperature will decrease 1°C and it will not change after that.

Relationship between set temperature and running time:

Initial Temp.	Running time(T)							
0 (start)	1	2	3	4	5	6	7	8
16	16	16	16	16	16	16	16	16
17	16	16	16	16	16	16	16	16
18	17	17	17	17	17	17	17	17
19	18	18	18	18	18	18	18	18
20	19	19	19	19	19	19	19	19
21	20	19	19	19	19	19	19	19
22	21	20	20	20	20	20	20	20
23	22	21	21	21	21	21	21	21
24	23	22	22	22	22	22	22	22
25	24	23	23	23	23	23	23	23
26	25	24	24	24	24	24	24	24
27	26	25	25	25	25	25	25	25
28	27	26	25	25	25	25	25	25
29	28	27	26	26	26	26	26	26
30	29	28	27	27	27	27	27	27

2. In heating mode:

2.1 When the initial set temperature is 16°C, the unit will keep on running at this temperature;

2.2 When the initial set temperature is 17-20°C, the temperature will decrease 1°C by every hour after sleep function is set; the temperature will not change after decreasing 1°C;

2.3 When the initial set temperature is 21-27°C, the temperature will decrease 1°C by every hour after sleep function is set; the temperature will not change after decreasing 2°C;

2.4 When the initial set temperature is 28-30°C, the temperature will decrease 1°C by every hour after sleep function is set; the temperature will not change after decreasing 3°C;

Relationship between set temperature and running time:

Initial Temp.	Running time(T)							
0 (start)	1	2	3	4	5	6	7	8
16	17	18	19	19	19	19	18	18
17	18	19	20	20	20	20	19	19
18	19	20	21	21	21	21	20	20
19	20	21	22	22	22	22	21	21
20	21	22	23	23	23	23	22	22
21	22	23	24	24	24	24	23	23
22	23	24	25	25	25	25	24	24
23	24	25	26	26	26	26	25	25
24	25	26	26	26	26	26	25	25
25	26	27	27	27	27	27	26	26
26	27	28	28	28	28	28	27	27
27	28	29	29	29	29	29	28	28
28	29	29	29	29	29	29	28	28
29	30	30	30	30	30	30	29	29
30	30	30	30	30	30	30	29	29

(6) Indoor Fan Control

The Indoor Fan can be set as HIGH, MED, LOW by remote control, and the Indoor Fan will be respectively run at high, medium, low speed. It will also be set as AUTO, and the Indoor Fan is as the followings at the automatic wind speed.

① Cooling mode: in auto cooling mode or normal cooling mode, the auto fan speed will run at below mode:

- When $T_{amb} \geq T_{preset} + 2^{\circ}\text{C}$, the indoor fan will run at high speed;
- When $T_{preset} < T_{amb} < T_{preset} + 2^{\circ}\text{C}$, the indoor fan will run at middle speed;
- $T_{amb} \leq T_{preset}$, the indoor fan will run at low speed;

Switches between high speed and middle speed, middle speed and low speed, high speed and low speed, running time of 3.5 minutes must be ensured.

② Heating mode: in auto heating mode or normal heating mode, the auto fan speed will run at below mode:

- When $T_{amb} \leq T_{preset} + 1^{\circ}\text{C}$, the indoor fan will run at high speed;
- When $T_{preset} + 1^{\circ}\text{C} < T_{amb} < T_{preset} + 3^{\circ}\text{C}$, the indoor fan will run at middle speed;
- $T_{amb} \geq T_{preset} + 3^{\circ}\text{C}$, the indoor fan will run at low speed;

Switches between high speed and middle speed, middle speed and low speed, high speed and low speed, running time of 3.5 minutes must be ensured.

Fan mode is the same as cooling mode.

(7) Buzzer Control

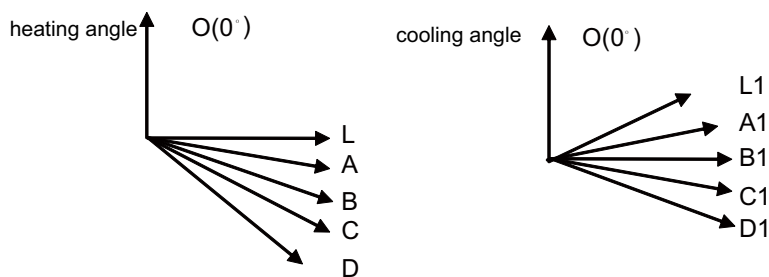
The buzzer will send a "Di" sound when the air conditioner is powered up or received the information sent by the remote control or there is a button input, the single tube cooler doesn't receive the remote control ON signal under the mode of heating mode.

(8) Auto button

If the controller is on, it will stop by pressing the button, and if the controller is off, it will be automatic running state by pressing the button, swing on and light on, and the main unit will run based on the remote control if there is remote control order.

(9) Up-and-Down Swinging Control

When power on, the up-and-down motor will firstly move the air deflector to counter-clockwise, close the air outlet. After starting the machine, if you don't set the swinging function, heating mode and auto-heating mode, the up-and-down air deflector will move to D clockwise; under other modes, the up-and-down air deflector will move to L1. If you set the swinging function when you start the machine, then the wind blade will swing between L and D. The air deflector has 7 swinging states: Location L, Location A, Location B, Location C, Location D, Location L to Location D, stop at any location between L-D (the included angle between L~D is the same). The air deflector will be closed at 0 Location, and the swinging is effectual only on condition that setting the swinging order and the inner fan is running. The indoor fan and compressor may get the power when air deflector is on the default location.



(10) Display

① Operation pattern and mode pattern display

All the display patterns will display for a time when the power on, the operation indication pattern will display in red under standby status. When the machine is start by remote control, the indication pattern will light and display the current operation mode (the mode light includes: Cooling, heating and dehumidify). If you close the light key, all the display patterns will close.

② Double-8 display

According to the different setting of remote control, the nixie light may display the current temperature (the temperature scope is from 16°C to 30°C) and indoor ambient temperature. The set temperature displayed in auto cooling and fan mode is 25°C and the set temperature displayed in auto heating mode is 20°C . Under the heating mode, and the temperature will display H1. The heating indicator is on for 0.5s and then off for 10s under the defrosting mode. (If you set the fahrenheit temperature display, the nixie light will display according to fahrenheit temperature)

(11) Protection function and failure display

E2: Freeze-proofing protection E4: Exhausting protection E5: Overcurrent protection

E6: Communication failure H4: Overload protection

F1: Indoor ambient sensor start and short circuit (continuously measured failure in 30S)

F2: Indoor evaporator sensor start and short circuit (continuously measured failure in 30S)

F3: Outdoor ambient sensor start and short circuit (continuously measured failure in 30S)

F4: Outdoor condenser sensor start and short circuit (continuously measured failure in 30S, and dont measure within 10 minutes after defrosted)

F5: Outdoor exhausting sensor start and short circuit (continuously measured failure in 30S after the compressor operated 3 minutes)

H3: Overload protection of compressor H5: Module protection

PH: High-voltage protection PL: Low-voltage protection

P1: Nominal cooling and heating P2: Maximum cooling and heating

P3: Medium cooling and heating P0: Minimum cooling and heating

(12) Drying Function

You may start or stop the drying function under the modes of cooling and dehumidify at the starting status (The modes of automatism, heating and air supply do not have drying function). When you start the drying function, after stop the machine by pressing the switch button, you should keep running the inner fans for 2 minutes under low air damper (The swing will operate as the former status within 2 minutes, cooling indicator is on for 0.5s and then off for 10s in drying and other load is stopped), then stop the entire machine; When you stop the drying function, press the switch button will stop the machine directly. When you start the drying function, operating the drying button will stop the inner fans and close the guide louver.

(13) Memory function when interrupting the power supply

Memory content: mode, swing function, light, set temperature and wind speed. After interrupted the power supply, the machine will start when recovering the power according to the memory content automatically. If the last remote control command has not set the timed function, the system will remember the last remote control command and operate according it. If the last remote control command has set timed function and the power supply is interrupted before the timed time, the system will remember the timed function of the last remote control command, the timed time will recounted form power on. If the last remote control command has set timed function, the time is out and the system is start or stop according to the set time when the power supply is interrupted, the system will remember the operation status before the power supply was interrupted, and do not carry out timed action; The timed clock will not remembered.

(14) Electric heating band control of outdoor unit

① Compressor electric heating band control:

a) Start condition: the compressor is in off status and the outdoor ambient temperature \leq -5°C.

b) Stop condition: the band is off when either of the below condition is met:

1. The compressor is in on status;

2. The compressor is in off status and the outdoor ambient temperature \geq -5°C.

c) When outdoor ambient temperature sensor is in malfunction status, the electric heating band stops operation.

② Condenser electric heating band control:

1. When Toutdoor ambient \leq 1°C, the electric heating band starts working;

2. When enter defrosting and defrosting is finished, the chassis electric heating band starts working for 3min as the compressor starts. After the compressor starts for 3min and Toutdoor ambient \geq 3°C, the electric heating band stops operation.

3. When Toutdoor ambient \geq 3°C, the condenser electric heating band doesn't work.

4. When 1°C<Toutdoor ambient<3°C, the condenser electric heating band keeps the previous status.

When outdoor ambient temperature sensor is in malfunction status, the electric heating band stops operation; the electric heating band can work again after 2min of last stop.

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 inconvenient 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 10 m, and the length of the connecting tubing does not exceed 15 m.
- 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.

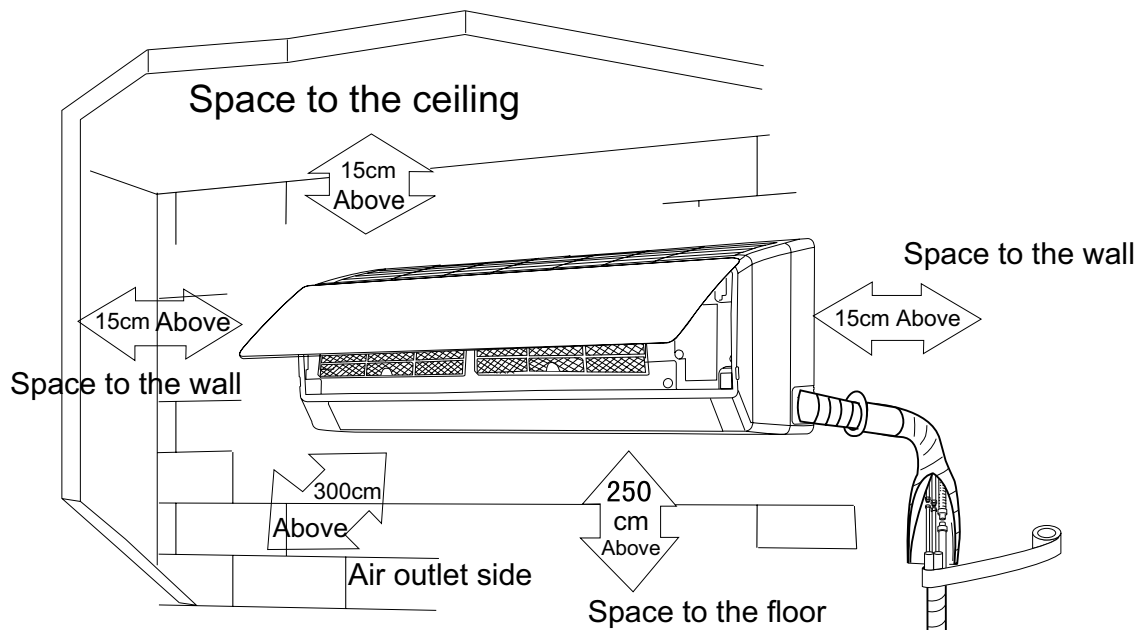
Note:

- **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.**

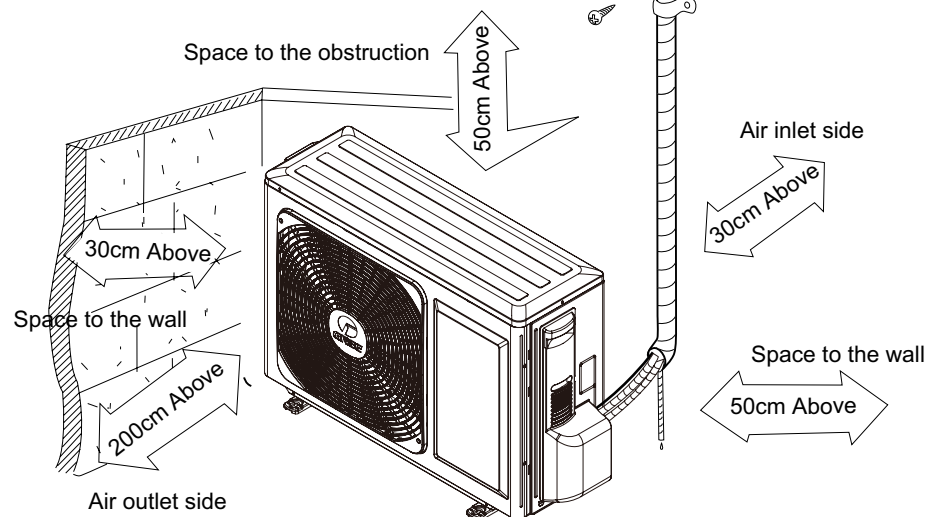
7.1.5 Earthing Requirements

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 proper installation of the unit include the minimum permissible distances to adjacent parts.

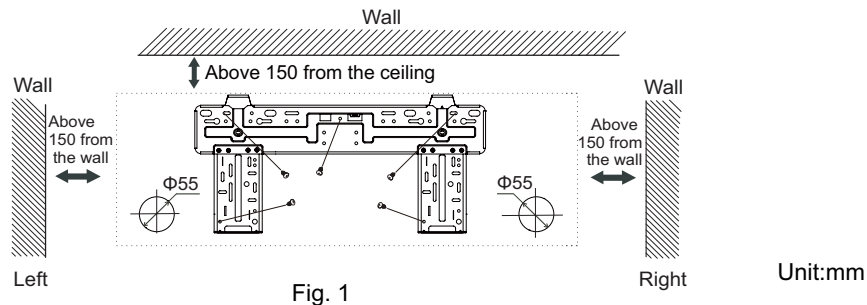


Schematic diagram being reference only (outdoor unit is with variation), please refer to real product for authentic information.

7.3 Install Indoor Unit

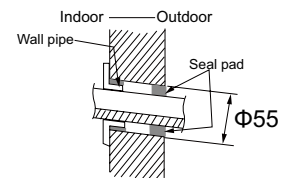
7.3.1 Installation of Mounting Plate

1. Mounting plate should be installed horizontally. As the water trays outlet for the indoor unit is two-way type, during installation, the indoor unit should slightly slant to water trays 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.



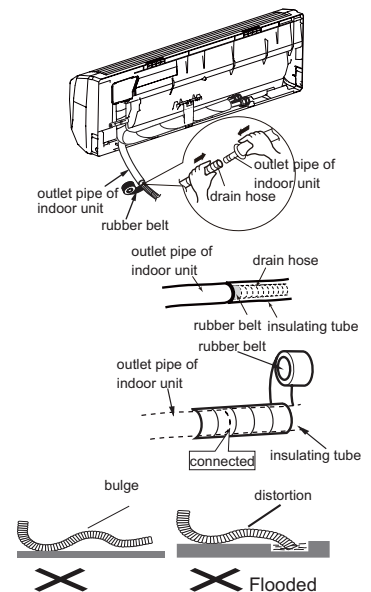
7.3.3 Installation of Drain Hose

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 and wire clamp. Make the power connection cord pass through the hole at the back of indoor unit.
3. Connect and fix the power connection cord to the terminal board. (As shown in Fig.2)
4. Fix the power connection cord with wire clamp and reinstall wiring cover.
5. Reinstall the front panel.

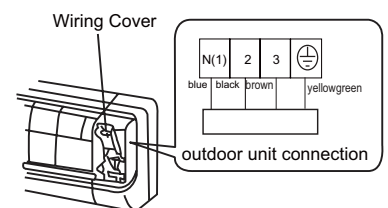


Fig.2

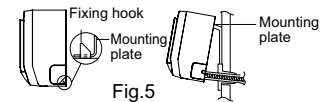
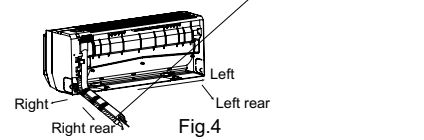
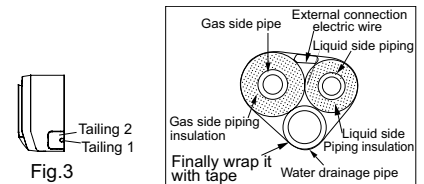
NOTE:

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 its 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.

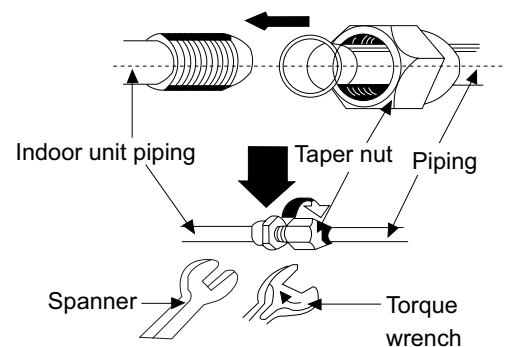


7.3.6 Installation of Connection Pipe

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)
Φ6	30 ~ 40
Φ9.52	15 ~ 20
Φ12	45 ~ 55
Φ16	60 ~ 65
Φ19	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.



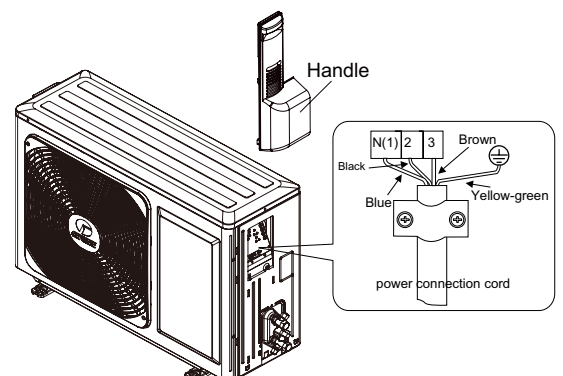
7.4 Install Outdoor Unit

7.4.1 Electric Wiring

1. Remove the handle on the right side plate of outdoor unit.
2. Take off wire clamp. 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 clamp.
4. Confirm if the wire has been fixed properly.
5. Reinstall the handle.

NOTE:

- Incorrect wiring may cause malfunction of spare part.
 - After the wire has been fixed, ensure there is free space between the connection and fixing places on the lead wire.
- Schematic diagram being reference only, please refer to real product for authentic information.



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).
2. 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 -1.0×10^5 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)

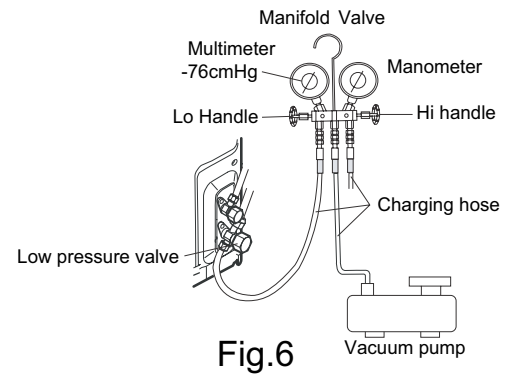


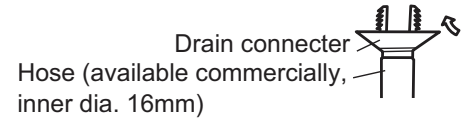
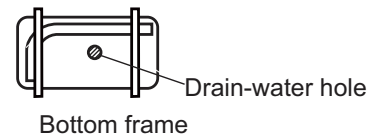
Fig.6

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 $\Phi 25$ 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.



7.5 Check after Installation and Operation Test

7.5.1 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 malfunction or 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 malfunction or 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.

7.5.2 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.

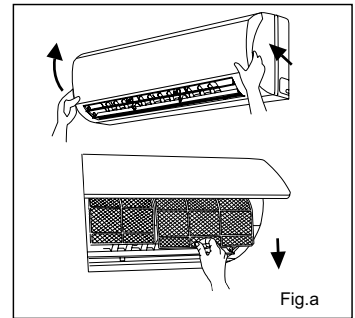
2. Operation Test Method

- (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.

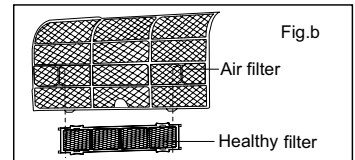
7.6 Installation and Maintenance of Healthy Filter

7.6.1 Installation of Healthy Filter

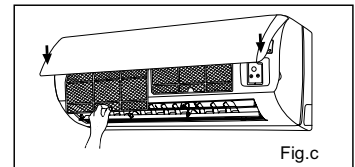
1. Lift up the front panel from its two ends, as shown by the arrow direction, and then remove the air filter. (As shown in fig. a)



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 .



7.6.2 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.

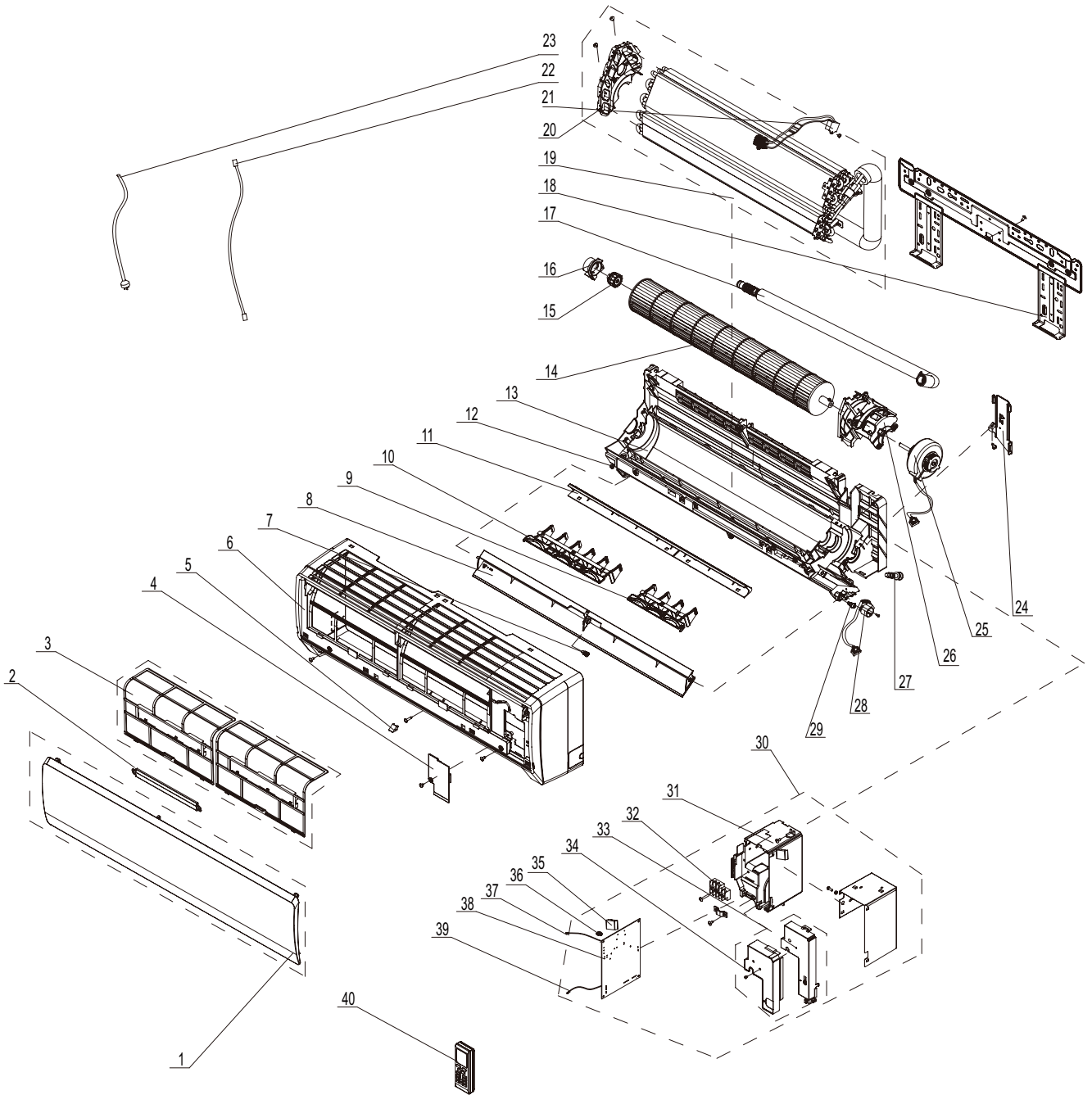
7.6.3 Service Life

The general service 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 actual product. The quantity of healthy filters is based on the actual delivery.

8. Exploded Views and Parts List

8.1 Indoor Unit

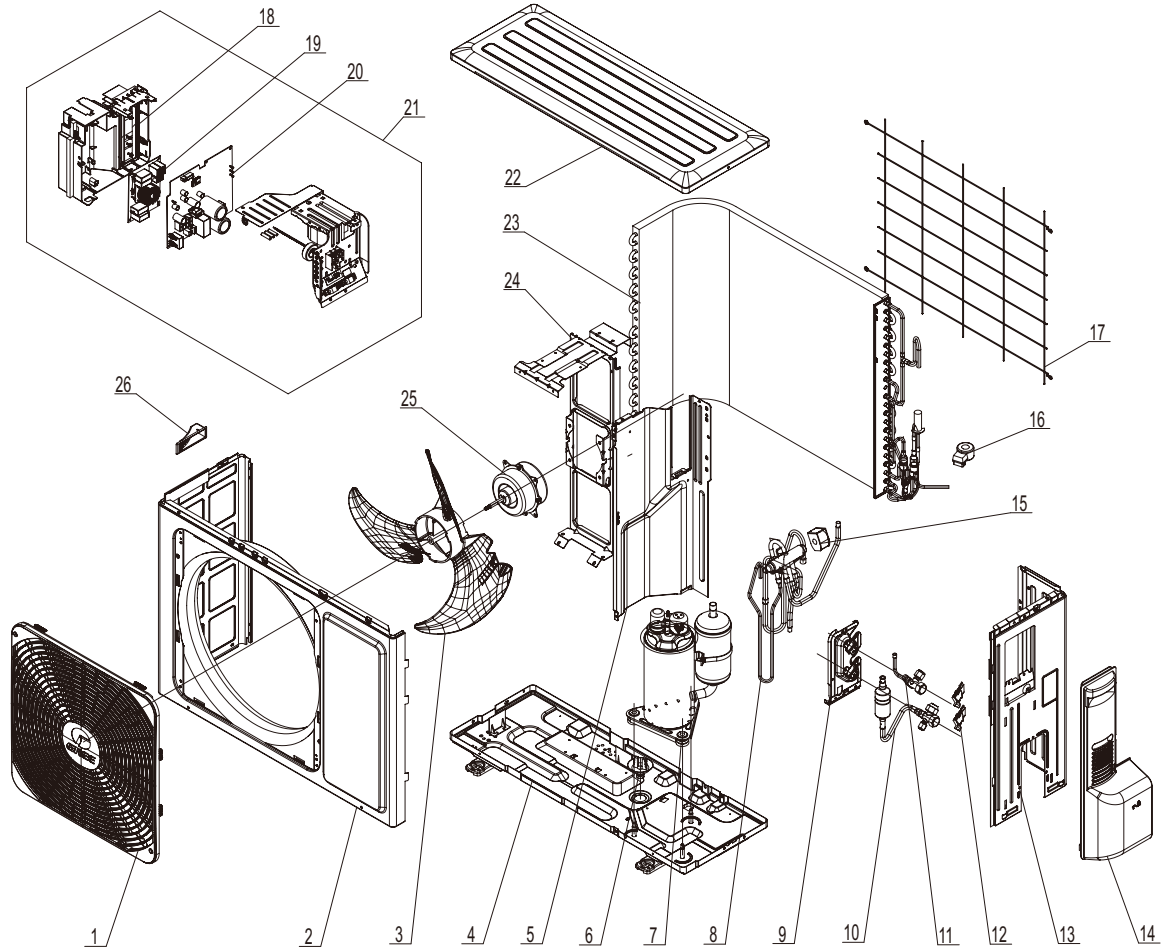


NO.	Description	Part Code		Qty
		GWH09MB-K3DNA3K/I	GWH12MB-K3DNA3K/I	
		Product Code	Product Code	
		CB171N07600	CB171N07700	
1	Front Panel	20012548	20012548	1
2	Display Board	30565007	30565007	1
3	Filter Sub-Assy	1112220403	1112220403	2
4	Electric Box Cover2	20122075	20122075	1
5	Screw Cover	24252016	24252016	1
6	Front Case Sub-Assy	20012139	20012139	1
7	Axile Bush	10542036	10542036	1
8	Guide Louver	10512157	10512157	1
9	Air Louver 1	10512156	10512156	1
10	Air Louver 2	10512155	10512155	1
11	Helicoid tongue	26112163	26112163	1
12	Left Axile Bush	10512037	10512037	1
13	Rear Case assy	2220210301	2220210301	1
14	Cross Flow Fan	10352017	10352017	1
15	O-Gasket sub-assy of Bearing	76512051	76512051	1
16	Ring of Bearing	26152022	26152022	1
17	Drainage hose	0523001401	0523001401	1
18	Wall Mounting Frame	01252021	01252021	1
19	Evaporator Assy	01002424	01002953	1
20	Evaporator Support	24212091	24212091	1
21	Cold Plasma Generator Sub-assy	/	/	/
22	Connecting Cable	400205236	400205236	0
23	Power Cord	400204643	400204643	1
24	Pipe Clamp	26112164	26112164	1
25	Fan Motor	150120874	150120874	1
26	Motor Press Plate	26112161	26112161	1
27	Rubber Plug (Water Tray)	76712012	76712012	1
28	Step Motor	1521212901	1521212901	1
29	Crank	10582070	10582070	1
30	Electric Box Assy	20402397	20402396	1
31	Electric Box	2011208201	2011208201	1
32	Terminal Board	42011233	42011233	1
33	Shield cover of Electric Box sub-assy	01592073	01592073	1
34	Electric Box Cover1	22242135	22242135	1
35	Capacitor CBB61	33010002	33010002	1
36	Jumper	4202300102	4202300104	1
37	Ambient Temperature Sensor	390000451	390000451	1
38	Main Board	30148783	30148783	1
39	Temperature Sensor	390000591	390000591	1
40	Remote Controller	305100413	305100413	1

The data above are subject to change without notice.

8.2 Outdoor Unit

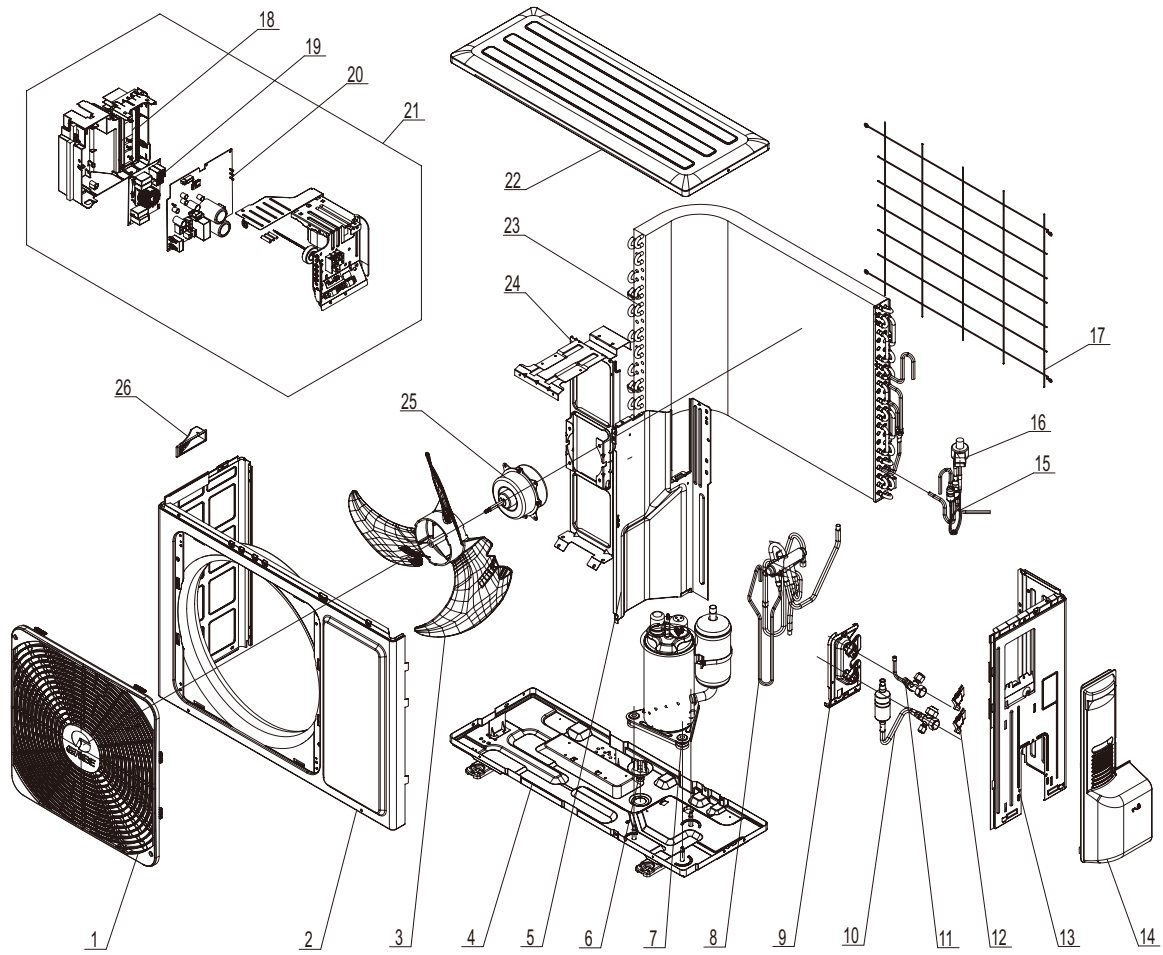
GWH09MB-K3DNA3K/O



NO.	Description	Part Code	Qty
		GWH09MB-K3DNA3K/O	
		Product Code	
		CB171W07600	
1	Front Grill	22413027	1
2	Cabinet Sub-assy	01433062	1
3	Axial Flow Fan	10333004	1
4	Chassis Sub-assy	02803037P	1
5	Clapboard Sub-Assy	01233385	1
6	Drainage Connector	06123401	1
7	Compressor and Fittings	00103896G	1
8	4-Way Valve Assy	03073151	1
9	Valve Support	0171314201P	1
10	Cut off Valve Assy	0713347401	1
11	Valve	07100003	1
12	Valve Support Block	26113017	2
13	Right Side Plate Sub-Assy	0130317801	1
14	Big Handle	26233433	1
15	Magnet Coil	4300040050	1
16	Magnet Coil	4300876701	1
17	Rear Grill	01473009	1
18	Electric Box	20113014	1
19	Filter Board	30033082	1
20	Main Board	30148803	1
21	Electric Box Assy	02613539	1
22	Top Cover Sub-Assy	01253073	1
23	Condenser Assy	01163812	1
24	Motor Support	01703104	1
25	Fan Motor	1501308502	1
26	Small Handle	26233100	1

The data above are subject to change without notice.

GWH12MB-K3DNA3K/O



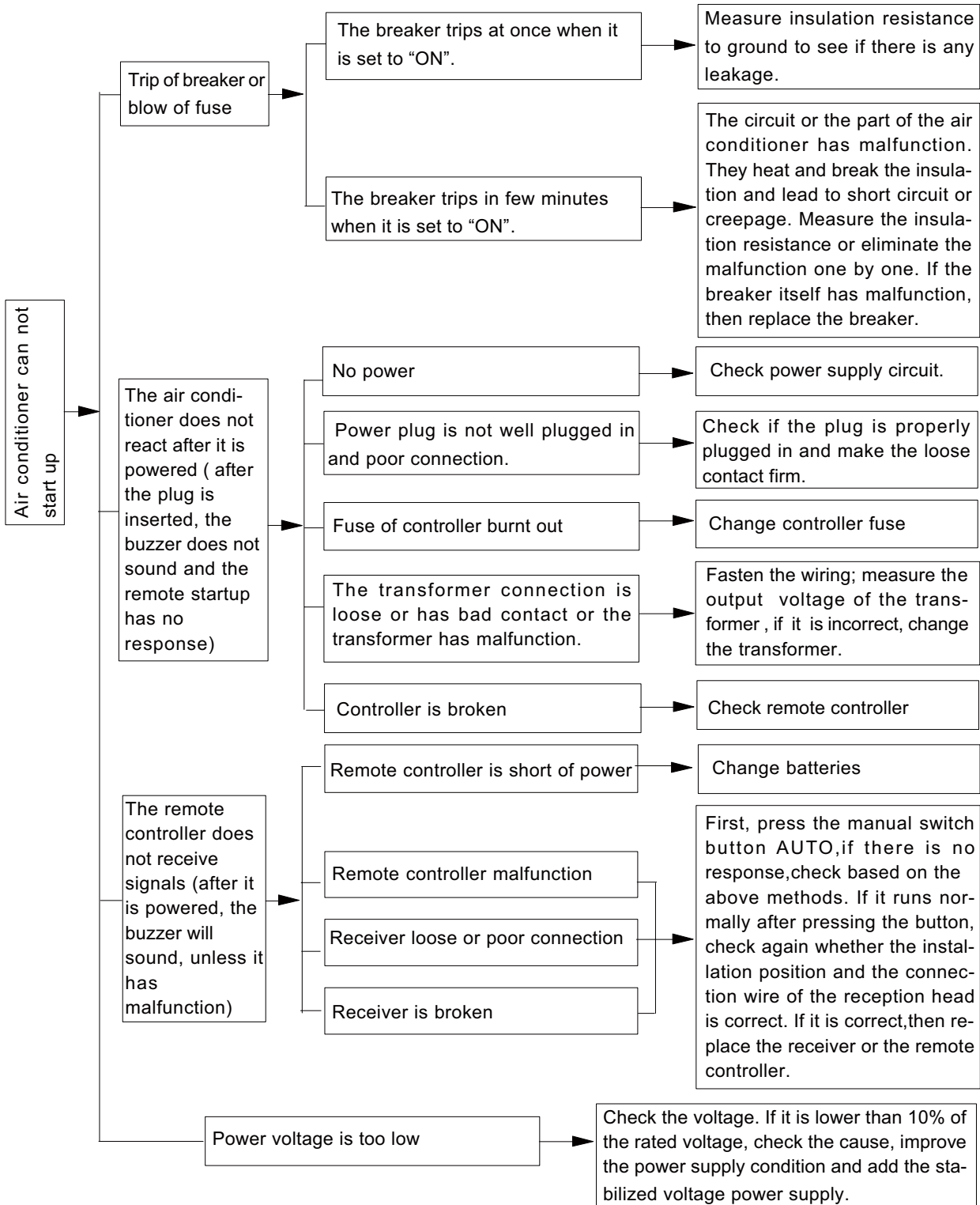
NO.	Description	Part Code		Qty
		GWH12MB-K3DNA3K/O		
		CB171W07700		
1	Front Grill	22413027		1
2	Cabinet Sub-assy	01433062		1
3	Axial Flow Fan	10333004		1
4	Chassis Sub-assy	02803151P		1
5	Clapboard Sub-Assy	01233385		1
6	Drainage Connector	06123401		1
7	Compressor and Fittings	00103896G		1
8	4-Way Valve Assy	03073151		1
9	Valve Support	0171314201P		1
10	Cut off Valve Assy	07133804		1
11	Valve	07100003		1
12	Valve Support Block	26113017		2
13	Right Side Plate Sub-Assy	0130317801		1
14	Big Handle	26233433		1
15	Electric Expansion Valve Sub-Assy	07133830		1
16	Magnet Coil	4300876701		1
17	Rear Grill	01473009		1
18	Electric Box	20113014		1
19	Filter Board	30033082		1
20	Main Board	30148803		1
21	Electric Box Assy	02613540		1
22	Top Cover Sub-Assy	01253073		1
23	Condenser Assy	01163924		1
24	Motor Support	0170310401		1
25	Fan Motor	1501308502		1
26	Small Handle	26233100		1

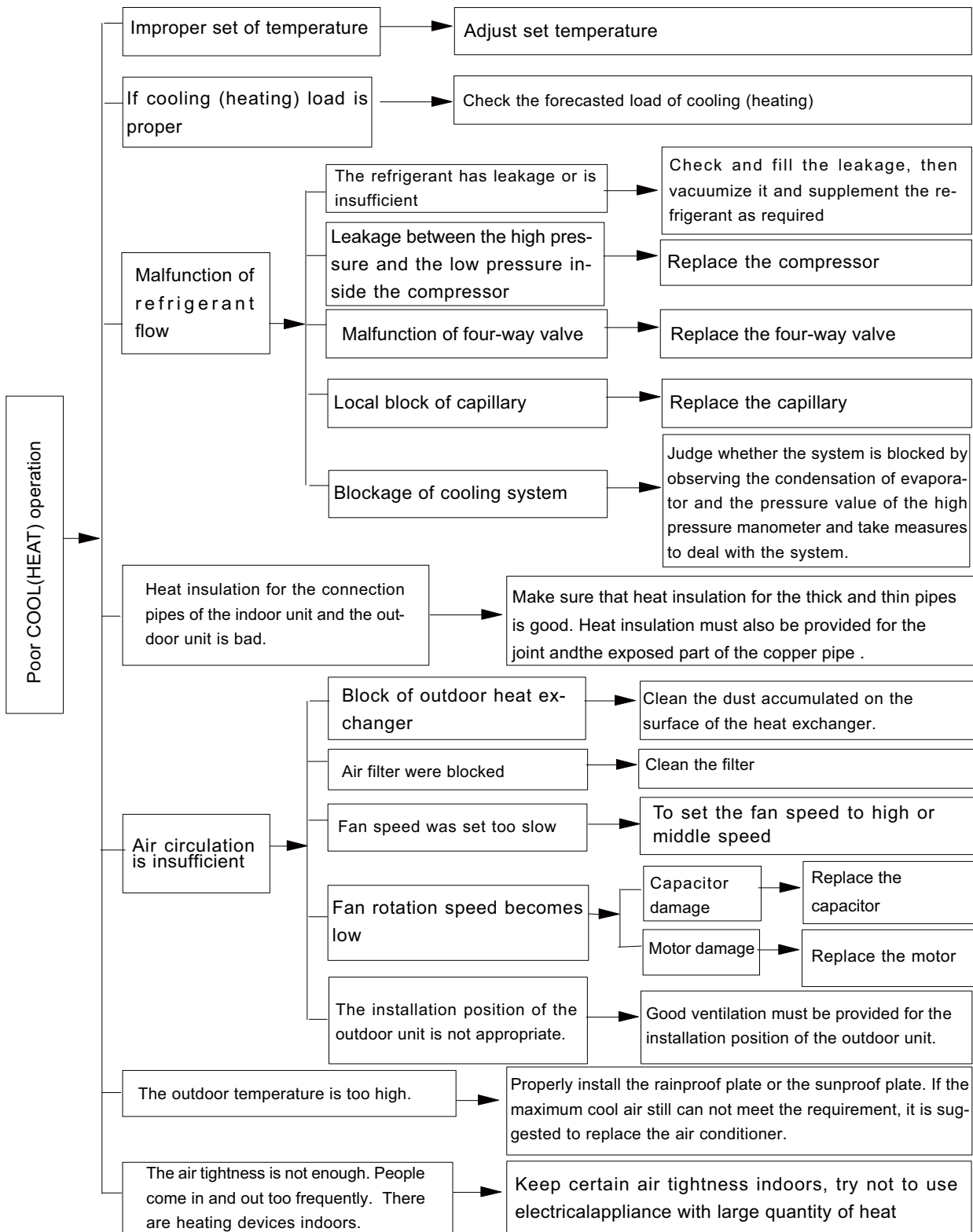
The data above are subject to change without notice.

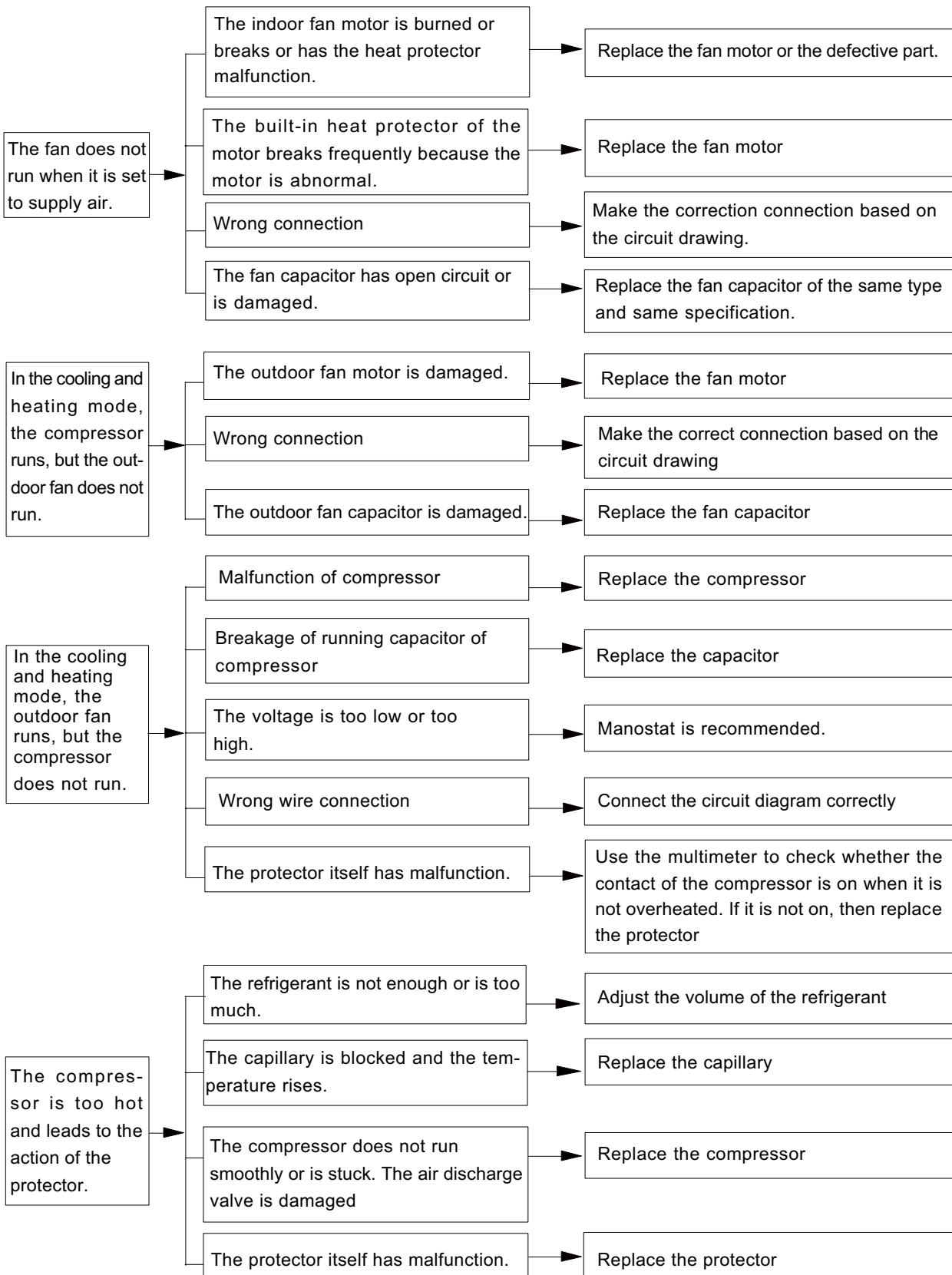
9. Troubleshooting

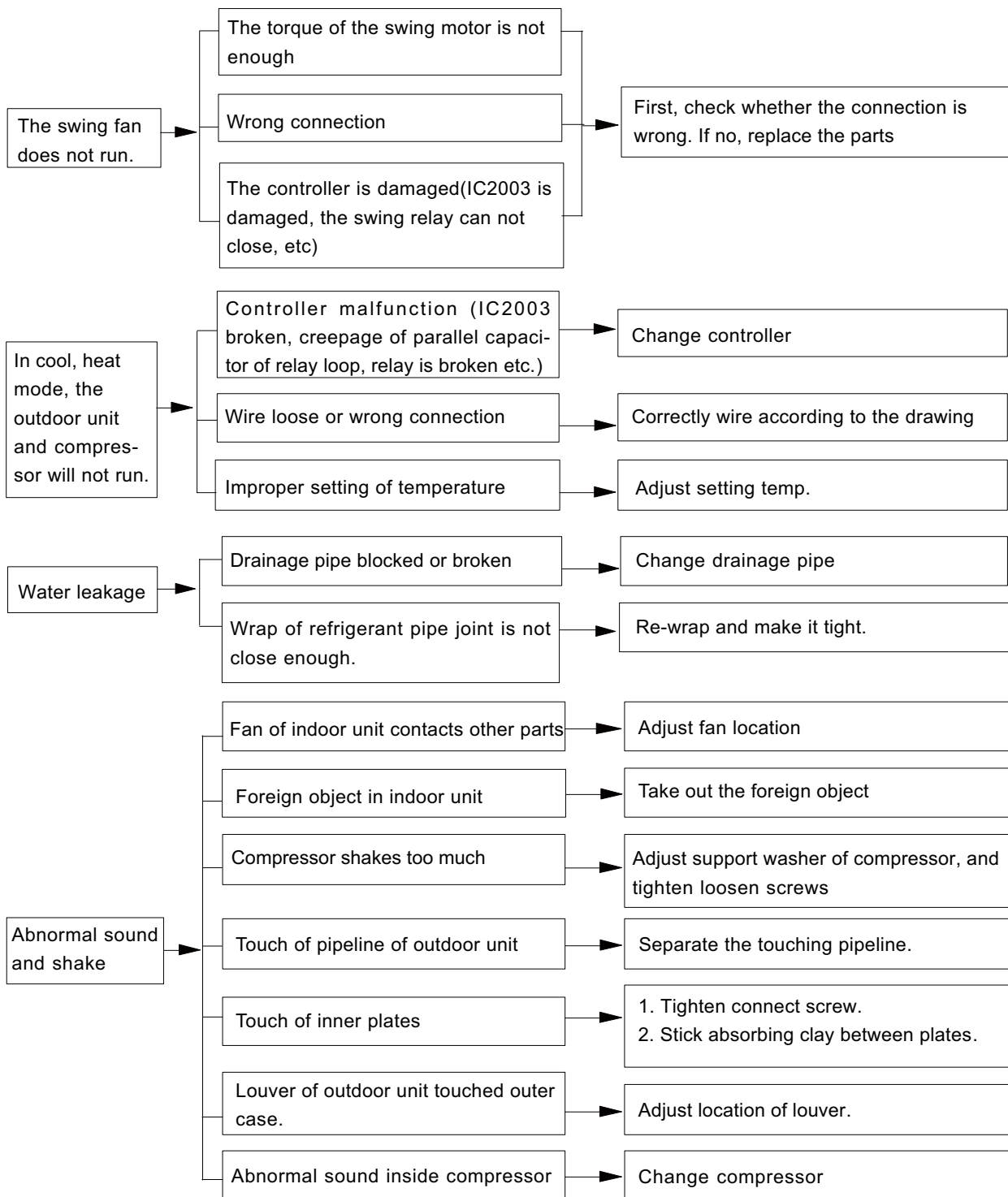
9.1 Malfunction Analysis

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









9.2 Flashing LED of Indoor/Outdoor Unit and Primary Judgement

Flashing LED of Indoor/Outdoor Unit and Primary Judgement

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
1	High pressure protection of system	E1	OFF 3s and blink once						During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops.	Possible reasons: 1. Refrigerant was superabundant; 2. Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.
2	Antifreezing protection	E2	OFF 3S and blink twice				OFF 1S and blink 3 times		During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates.	1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty.
3	System block or refrigerant leakage	E3	OFF 3S and blink 3 times					OFF 1S and blink 9 times	The Dual-8 Code Display will show E3 until the low pressure switch stop operation.	1.Low-pressure protection 2.Low-pressure protection of system 3.Low-pressure protection of compressor
4	High discharge temperature protection of compressor	E4	OFF 3S and blink 4 times				OFF 1S and blink 7 times		During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	Please refer to the malfunction analysis (discharge protection, overload).
5	Overcurrent protection	E5	OFF 3S and blink 5 times				OFF 1S and blink 5 times		During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	1. Supply voltage is unstable; 2. Supply voltage is too low and load is too high; 3. Evaporator is dirty.
6	Communication Malfunction	E6	OFF 3S and blink 6 times					OFF 1S	During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the corresponding malfunction analysis.
7	High temperature resistant protection	E8	OFF 3S and blink 8 times				OFF 1S and blink 6 times		During cooling operation: compressor will stop while indoor fan will operate. During heating operation, the complete unit stops.	Refer to the malfunction analysis (overload, high temperature resistant).
8	EEPROM malfunction	EE			OFF 3S and blink 15 times		OFF 1S and blink 11 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
9	Limit/ decrease frequency due to high temperature of module	EU		OFF 3S and blink 6 times		OFF 3S and blink 6 times			All loads operate normally, while operation frequency for compressor is decreased	Discharging after the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
10	Malfunction protection of jumper cap	C5	OFF 3S and blink 15 times						Wireless remote receiver and button are effective, but can not dispose the related command	1. No jumper cap insert on mainboard. 2. Incorrect insert of jumper cap. 3. Jumper cap damaged. 4. Abnormal detecting circuit of mainboard.

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
11	Gathering refrigerant	F0	OFF 3S and blink 1 times	OFF 3S and blink 1 times					When the outdoor unit receive signal of Gathering refrigerant ,the system will be forced to run under cooling mode for gathering refrigerant	Nominal cooling mode
12	Indoor ambient temperature sensor is open/short circuited	F1		OFF 3S and blink once					During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.	1. Loosening or bad contact of indoor ambient temp. sensor and mainboard terminal. 2. Components in mainboard fell down leads short circuit. 3. Indoor ambient temp. sensor damaged.(check with sensor resistance value chart) 4. Mainboard damaged.
13	Indoor evaporator temperature sensor is open/short circuited	F2		OFF 3S and blink twice					AC stops operation once reaches the setting temperature. Cooling, drying: internal fan motor stops operation while other loads stop operation; heating: AC stop operation	1. Loosening or bad contact of Indoor evaporator temp. sensor and mainboard terminal. 2. Components on the mainboard fall down leads short circuit. 3. Indoor evaporator temp. sensor damaged.(check temp. sensor value chart for testing) 4. Mainboard damaged.
14	Outdoor ambient temperature sensor is open/short circuited	F3		OFF 3S and blink 3 times			OFF 1S and blink 6 times		During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
15	Outdoor condenser temperature sensor is open/short circuited	F4		OFF 3S and blink 4 times			OFF 1S and blink 5 times		During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
16	Outdoor discharge temperature sensor is open/short circuited	F5		OFF 3S and blink 5 times			OFF 1S and blink 7 times		During cooling and drying operation, compressor will sop after operating for about 3 mins, while indoor fan will operate; During heating operation, the complete unit will stop after operating for about 3 mins.	1.Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor) 2.The head of temperature sensor hasnt been inserted into the copper tube
17	Limit/ decrease frequency due to overload	F6		OFF 3S and blink for 6 times			OFF 1S and blink 3 times		All loads operate normally, while operation frequency for compressor is decreased	Refer to the malfunction analysis (overload, high temperature resistant)
18	Decrease frequency due to overcurrent	F8		OFF 3S and blink 8 times			OFF 1S and blink once		All loads operate normally, while operation frequency for compressor is decreased	The input supply voltage is too low; System pressure is too high and overload

Troubleshooting

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
19	Decrease frequency due to high air discharge	F9		OFF 3S and blink 9 times				OFF 1S and blink twice	All loads operate normally, while operation frequency for compressor is decreased	Overload or temperature is too high; Refrigerant is insufficient; Malfunction of electric expansion valve (EKV)
20	Limit/ decrease frequency due to antifreezing	FH		OFF 3S and blink 2 times	OFF 3S and blink 2 times			OFF 1S and blink 4 times	All loads operate normally, while operation frequency for compressor is decreased	Poor air-return in indoor unit or fan speed is too low
21	Voltage for DC bus-bar is too high	PH		OFF 3S and blink 11 times				OFF 1S and blink 13 times	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 265VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
22	Voltage of DC bus-bar is too low	PL			OFF 3S and blink 21 times			OFF 1S and blink 12 times	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 150VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
23	Compressor Min frequency in test state	P0		(during blinking, ON 0.25s and OFF 0.25s)	(during blinking, ON 0.25s and OFF 0.25s)					Showing during min. cooling or min. heating test
24	Compressor rated frequency in test state	P1		(during blinking, ON 0.25s and OFF 0.25s)	(during blinking, ON 0.25s and OFF 0.25s)					Showing during nominal cooling or nominal heating test
25	Compressor maximum frequency in test state	P2		(during blinking, ON 0.25s and OFF 0.25s)	(during blinking, ON 0.25s and OFF 0.25s)					Showing during max. cooling or max. heating test

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
26	Compressor intermediate frequency in test state	P3		(during blinking, ON 0.25s and OFF 0.25s)	(during blinking, ON 0.25s and OFF 0.25s)				Showing during middle cooling or middle heating test	
27	Overcurrent protection of phase current for compressor	P5		OFF 3S and blink 15 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor).	
28	Charging malfunction of capacitor	PU			OFF 3S and blink 17 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Refer to the part three—charging malfunction analysis of capacitor	
29	Malfunction of module temperature sensor circuit	P7			OFF 3S and blink 18 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1	
30	Module high temperature protection	P8			OFF 3S and blink 19 times			During cooling operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	After the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.	
31	Decrease frequency due to high temperature resistant during heating operation	H0			OFF 3S and blink 10 times			All loads operate normally, while operation frequency for compressor is decreased	Refer to the malfunction analysis (overload, high temperature resistant)	
32	Static dedusting protection	H2			OFF 3S and blink twice					
33	Overload protection for compressor	H3			OFF 3S and blink 3 times	OFF 1S and blink 8 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Wiring terminal OVC-COMP is loosened. In normal state, the resistance for this terminal should be less than 1ohm. 2.Refer to the malfunction analysis (discharge protection, overload)	

Troubleshooting

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
34	System is abnormal	H4			OFF 3S and blink 4 times	OFF 1S and blink 6 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (overload, high temperature resistant)
35	IPM protection	H5			OFF 3S and blink 5 times	OFF 1S and blink 4 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
36	Module temperature is too high	H5			OFF 3S and blink 5 times	OFF 1S and blink 10 times				
37	Internal motor (fan motor) do not operate	H6	OFF 3S and blink 11 times						Internal fan motor, external fan motor, compressor and electric heater stop operation,guide louver stops at present location.	1. Bad contact of DC motor feedback terminal. 2. Bad contact of DC motor control end. 3. Fan motor is stalling. 4. Motor malfunction. 5. Malfunction of mainboard rev detecting circuit.
38	Desynchronizing of compressor	H7			OFF 3S and blink 7 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
39	PFC protection	HC			OFF 3S and blink 6 times	OFF 1S and blink 14 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
40	Outdoor DC fan motor malfunction	L3	OFF 3S and blink 23 times				OFF 1S and blink 14 times		Outdoor DC fan motor malfunction lead to compressor stop operation,	DC fan motor malfunction or system blocked or the connector loosed
41	power protection	L9	OFF 3S and blink 20 times				OFF 1S and blink 9 times		compressor stop operation and Outdoor fan motor will stop 30s latter , 3 minutes latter fan motor and compressor will restart	To protect the electrical components when detect high power
42	Indoor unit and outdoor unit doesn't match	LP	OFF 3S and blink 19 times				OFF 1S and blink 16 times		compressor and Outdoor fan motor can't work	Indoor unit and outdoor unit doesn't match
43	Failure start-up	LC			OFF 3S and blink 11 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
44	Malfunction of phase current detection circuit for compressor	U1			OFF 3S and blink 13 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
45	Malfunction of voltage dropping for DC bus-bar	U3			OFF 3S and blink 20 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Supply voltage is unstable
46	Malfunction of complete units current detection	U5		OFF 3S and blink 13 times					During cooling and drying operation, the compressor will stop while indoor fan will operate; During heating operating, the complete unit will stop operation.	Theres circuit malfunction on outdoor units control panel AP1, please replace the outdoor units control panel AP1.
47	The four-way valve is abnormal	U7		OFF 3S and blink 20 times					If this malfunction occurs during heating operation, the complete unit will stop operation.	1.Supply voltage is lower than AC175V; 2.Wiring terminal 4V is loosened or broken; 3.4V is damaged, please replace 4V.
48	Zero-crossing malfunction of outdoor unit	U9	OFF 3S and blink 18 times						During cooling operation, compressor will stop while indoor fan will operate; during heating,the complete unit will stop operation.	Replace outdoor control panel AP1
49	Frequency limiting (power)						OFF 1S and blink 13 times			
50	Compressor running					OFF 1S and blink once				
51	The temperature for turning on the unit is reached						OFF 1S and blink 8 times			
52	Frequency limiting (module temperature)						OFF 1S and blink 11 times			

Troubleshooting

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
53	Normal communication							OFF 0.5S and blink once		
54	Defrosting				OFF 3S and blink once (during blinking, ON 10s and OFF 0.5s)	OFF 1S and blink twice			Defrosting will occur in heating mode. Compressor will operate while indoor fan will stop operation.	Its the normal state

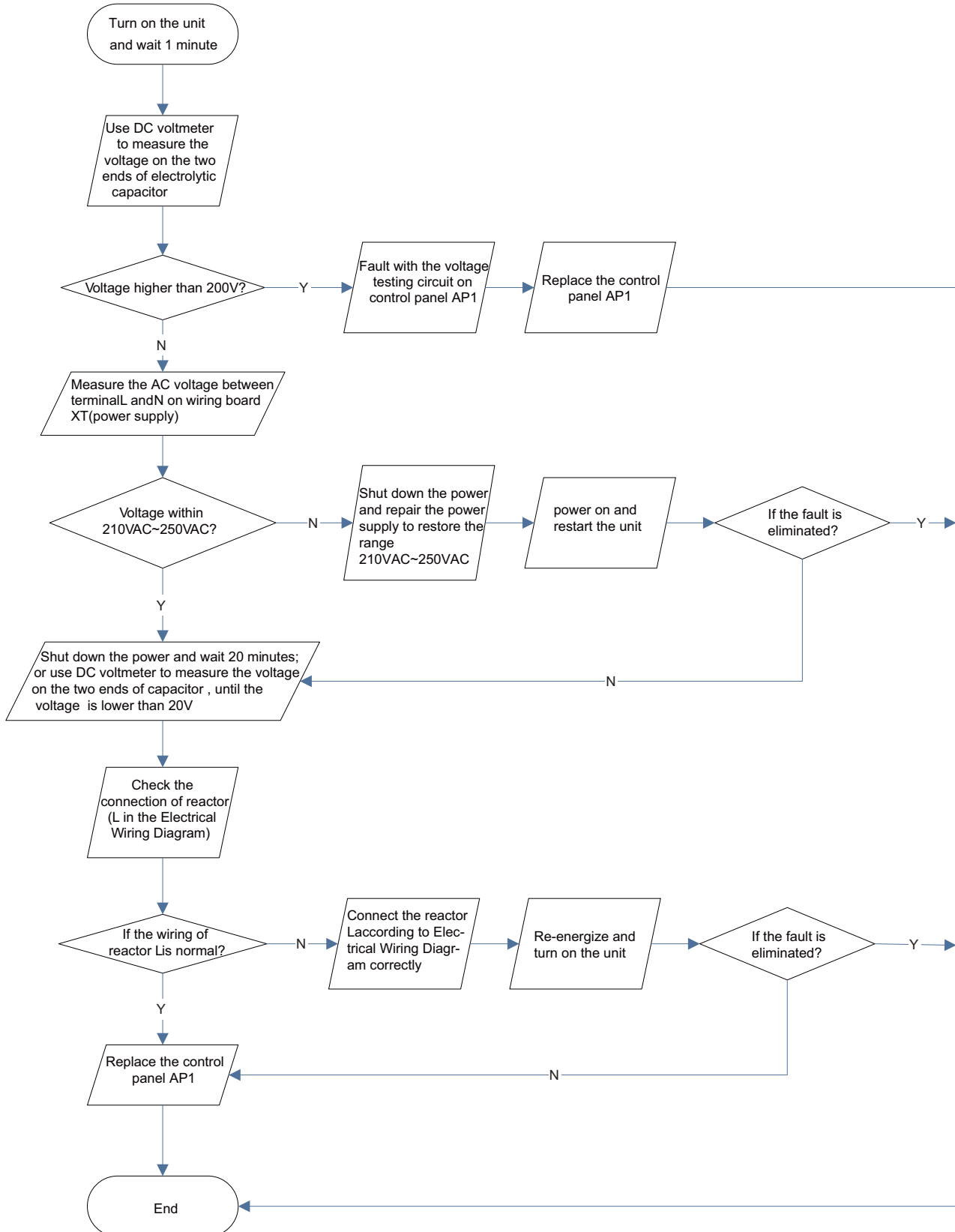
9.3 How to Check Simply the Main Part

(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:

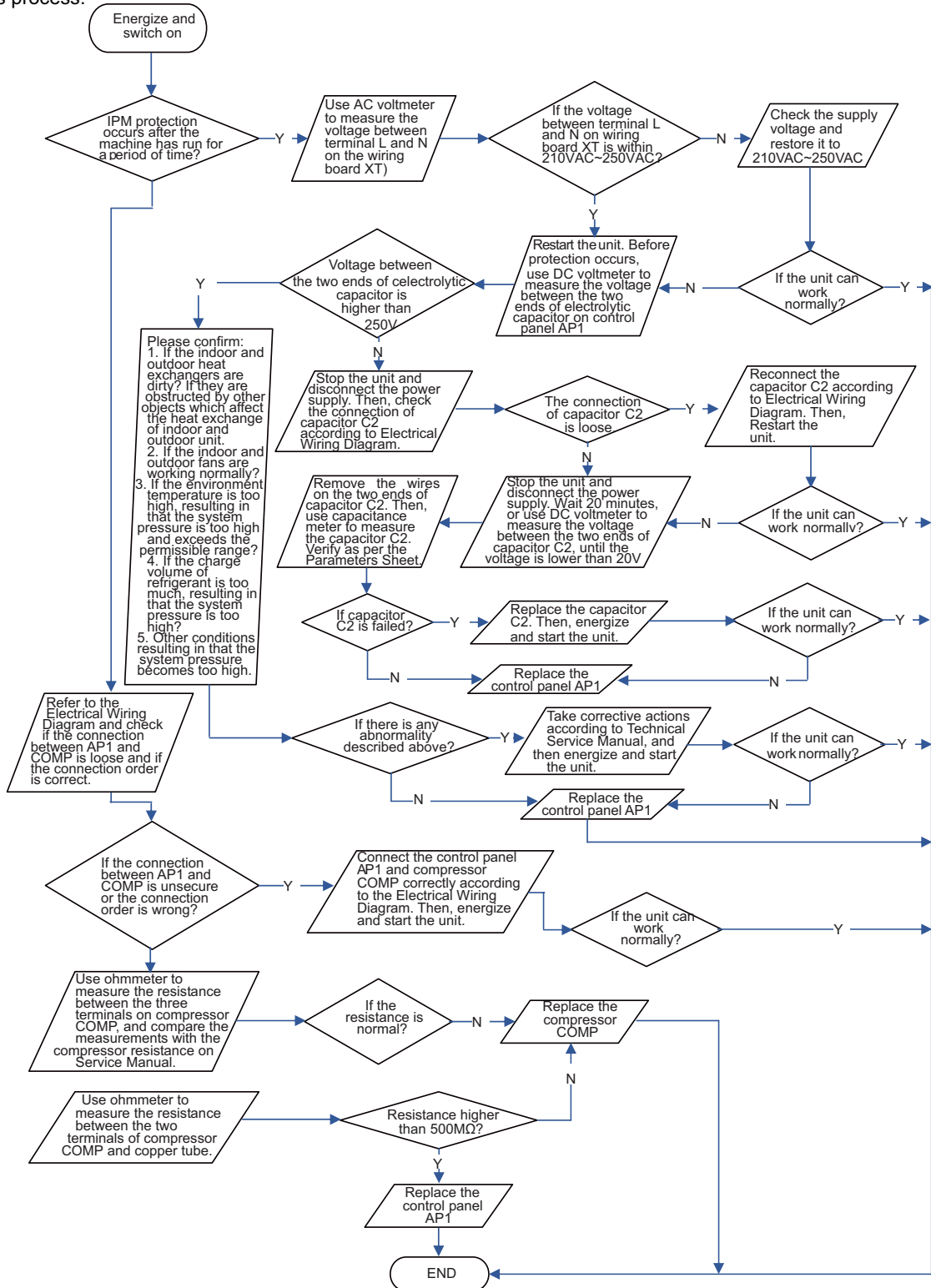


(2) IPM Protection, Out-of-step Fault, Compressor Phase Overcurrent (AP1 below refers to the outdoor control panel)

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?
- Is the charge volume of refrigerant correct?

Fault diagnosis process:

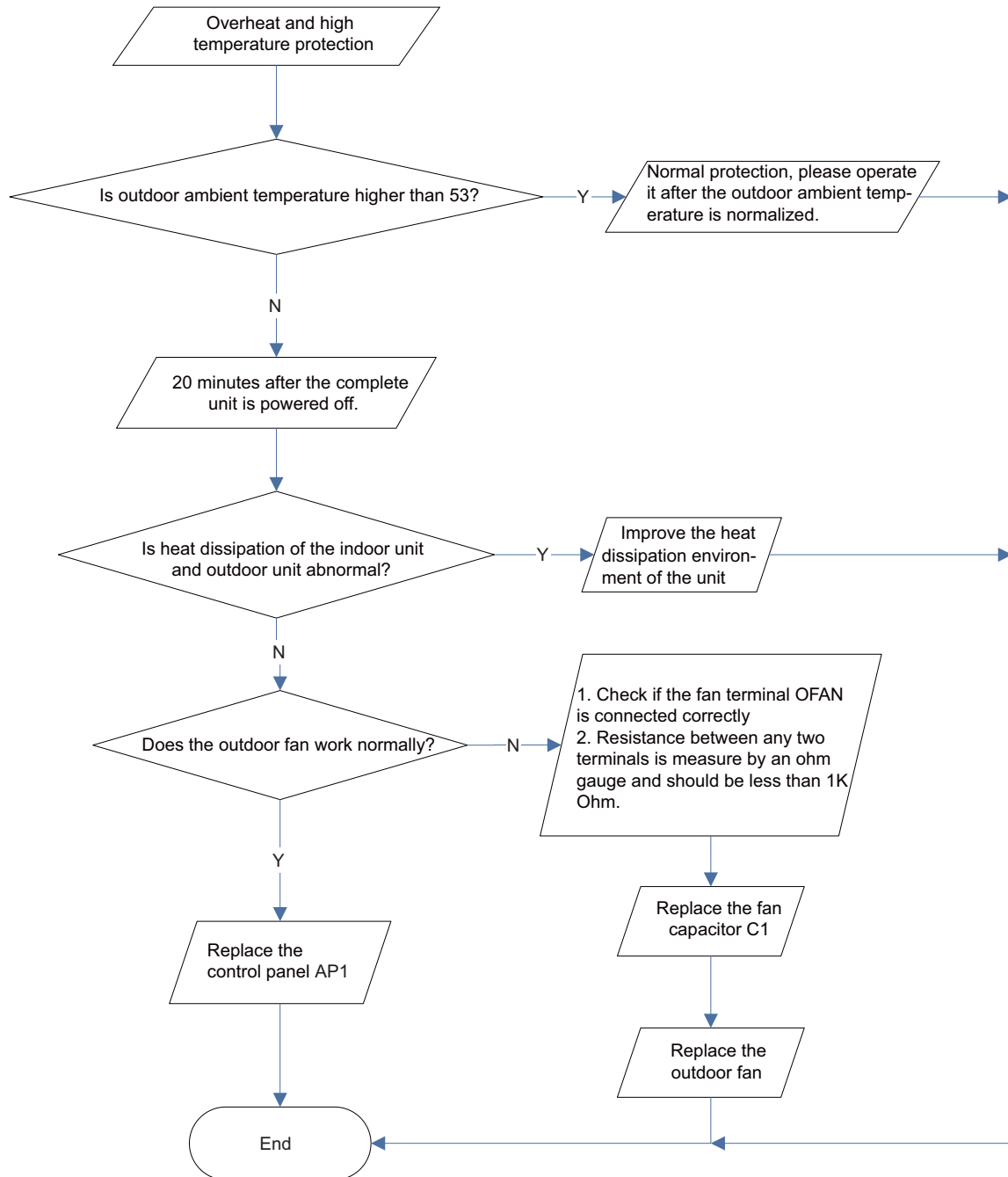


(3)High temperature and overload protection diagnosis (AP1 hereinafter refers to the control board of the outdoor unit)

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:

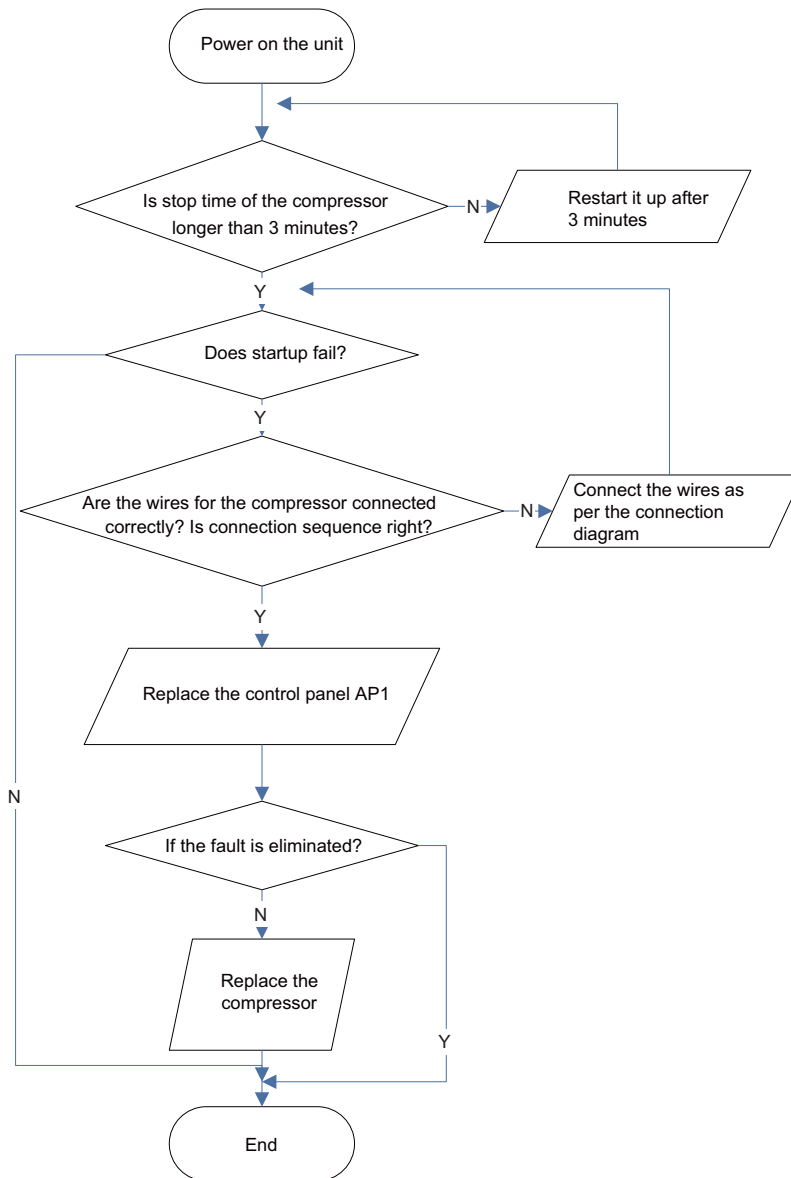


(4) Start-up failure (following AP1 for outdoor unit control board)

Mainly detect:

- Whether the compressor wiring is connected correct?
- Is compressor broken?
- Is time for compressor stopping enough?

Fault diagnosis process:

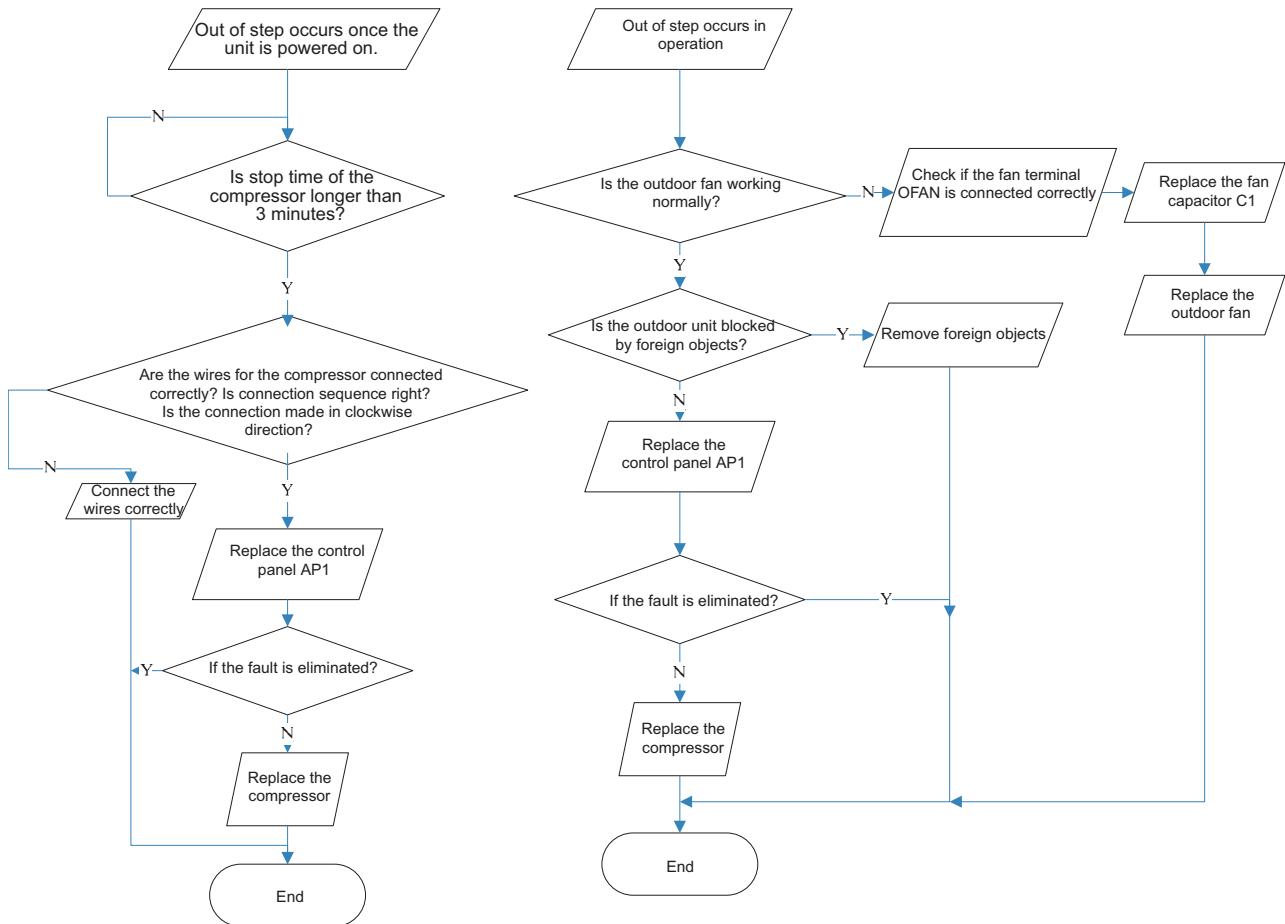


(5) Out of step diagnosis for the compressor (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

- Is the system pressure too high?
- Is the input voltage too low?

Fault diagnosis process:

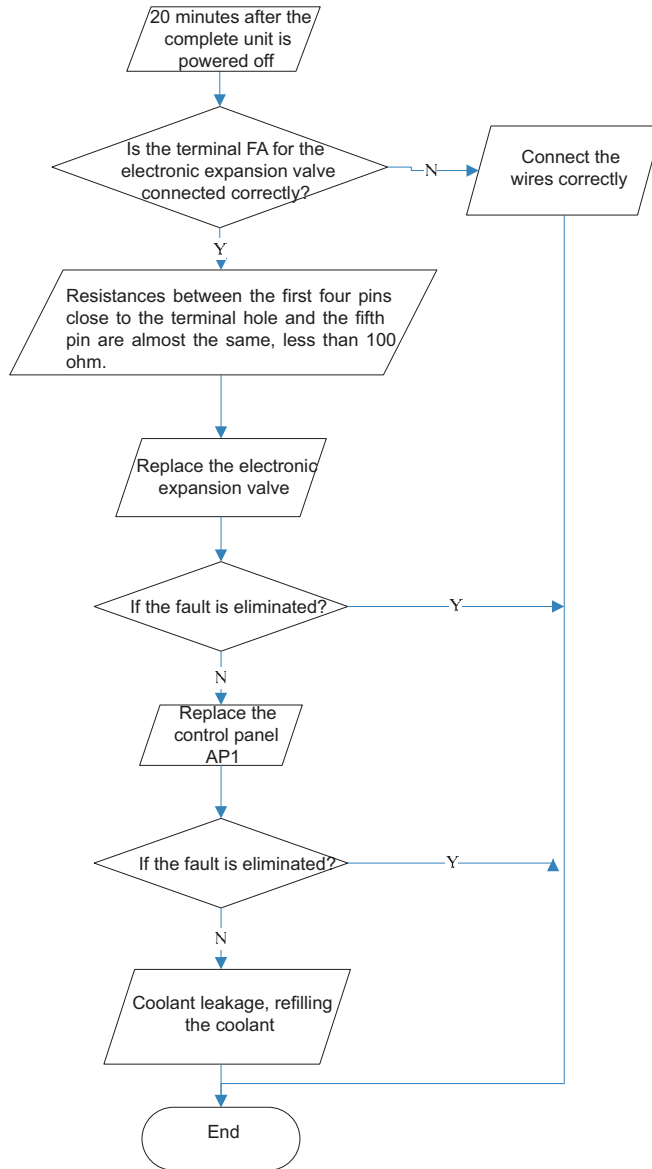


(6) Overload and air exhaust malfunction diagnosis (following AP1 for outdoor unit control board)

Mainly detect:

- Is the PMV connected well or not? Is PMV damaged?
- Is refrigerant leaked?

Fault diagnosis process:

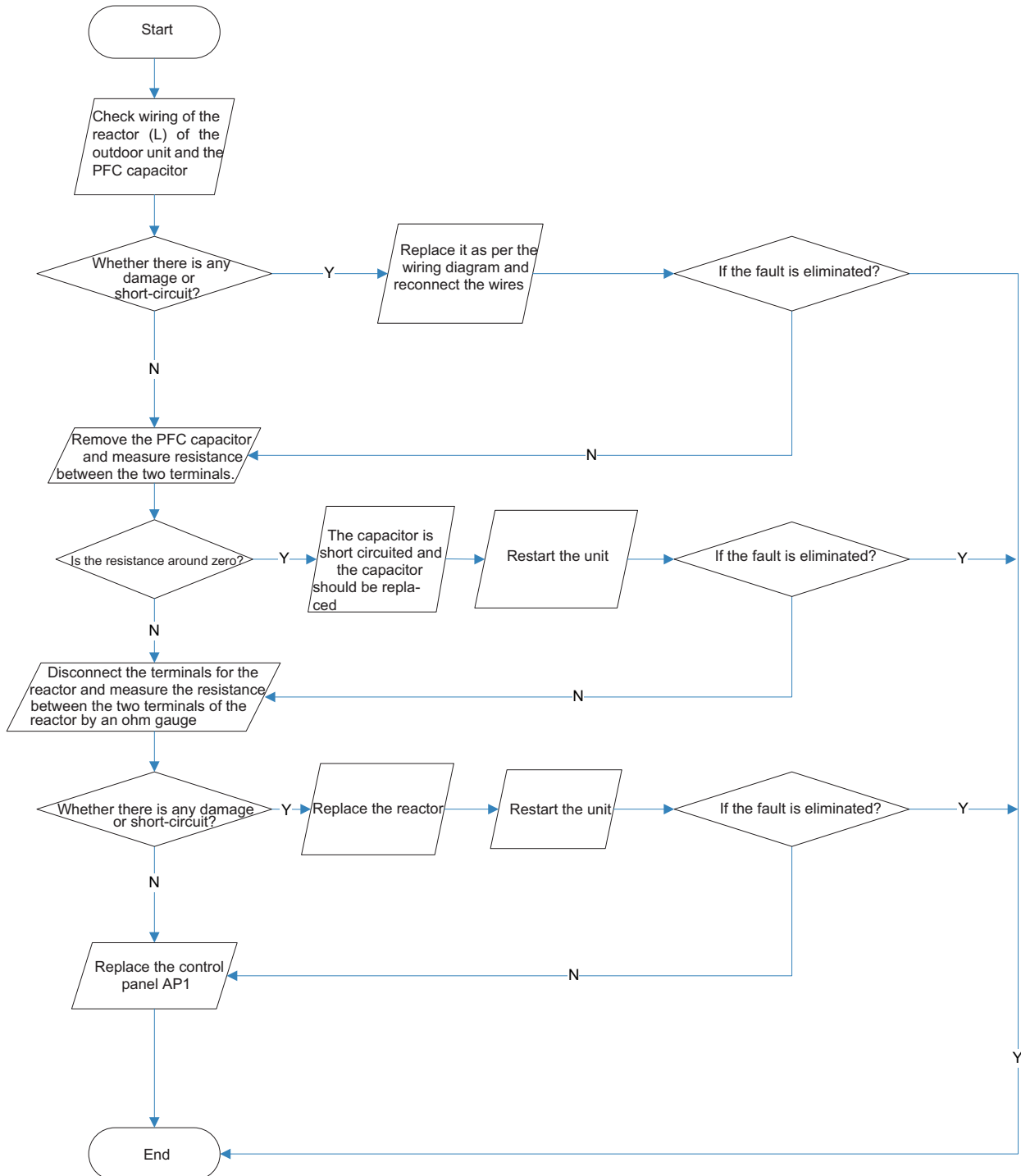


(7)Power factor correct or (PFC) fault (a fault of outdoor unit) (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

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

Fault diagnosis process:

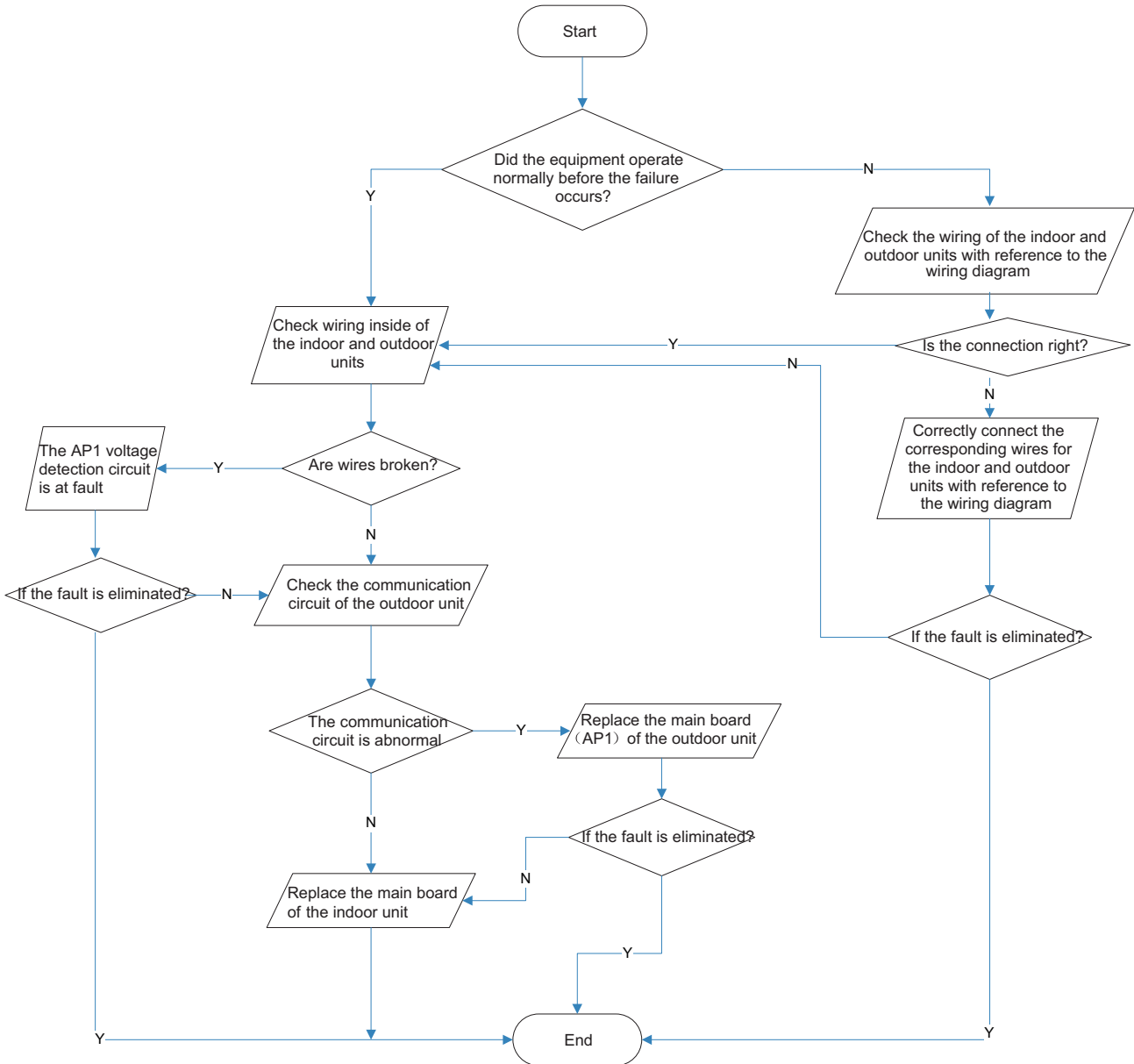


(8) Communication malfunction: (following AP1 for outdoor unit control board)

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?

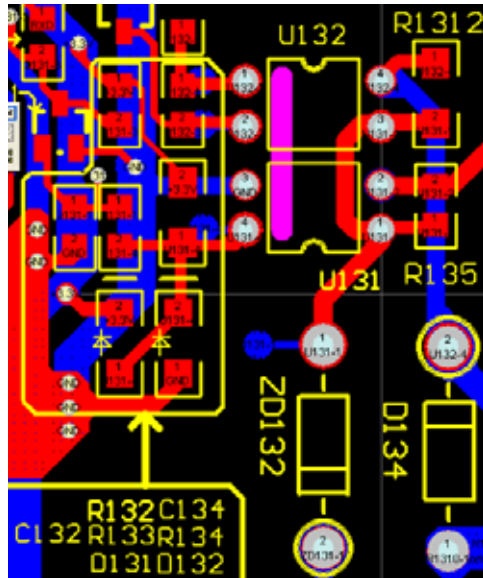
Fault diagnosis process:



(9) Flow chart for outdoor communication circuit detecting:

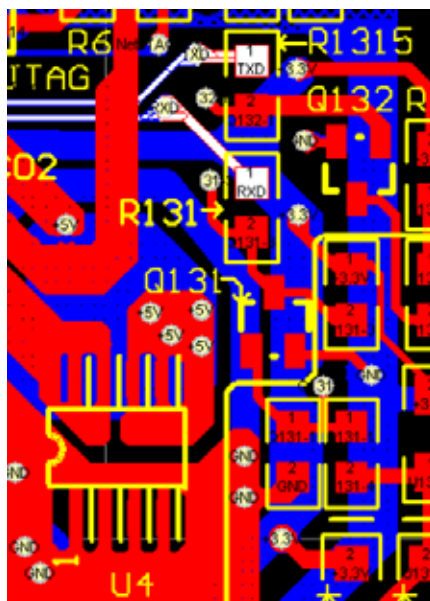
(1) Test the voltage between N point of wiring board and communication cable with universal meter. The voltage shall be variable. Otherwise, it might be malfunction of mainboard of indoor unit, or malfunction of mainboard of outdoor unit, or wrong wire connection of indoor and outdoor unit. Please ensure 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.

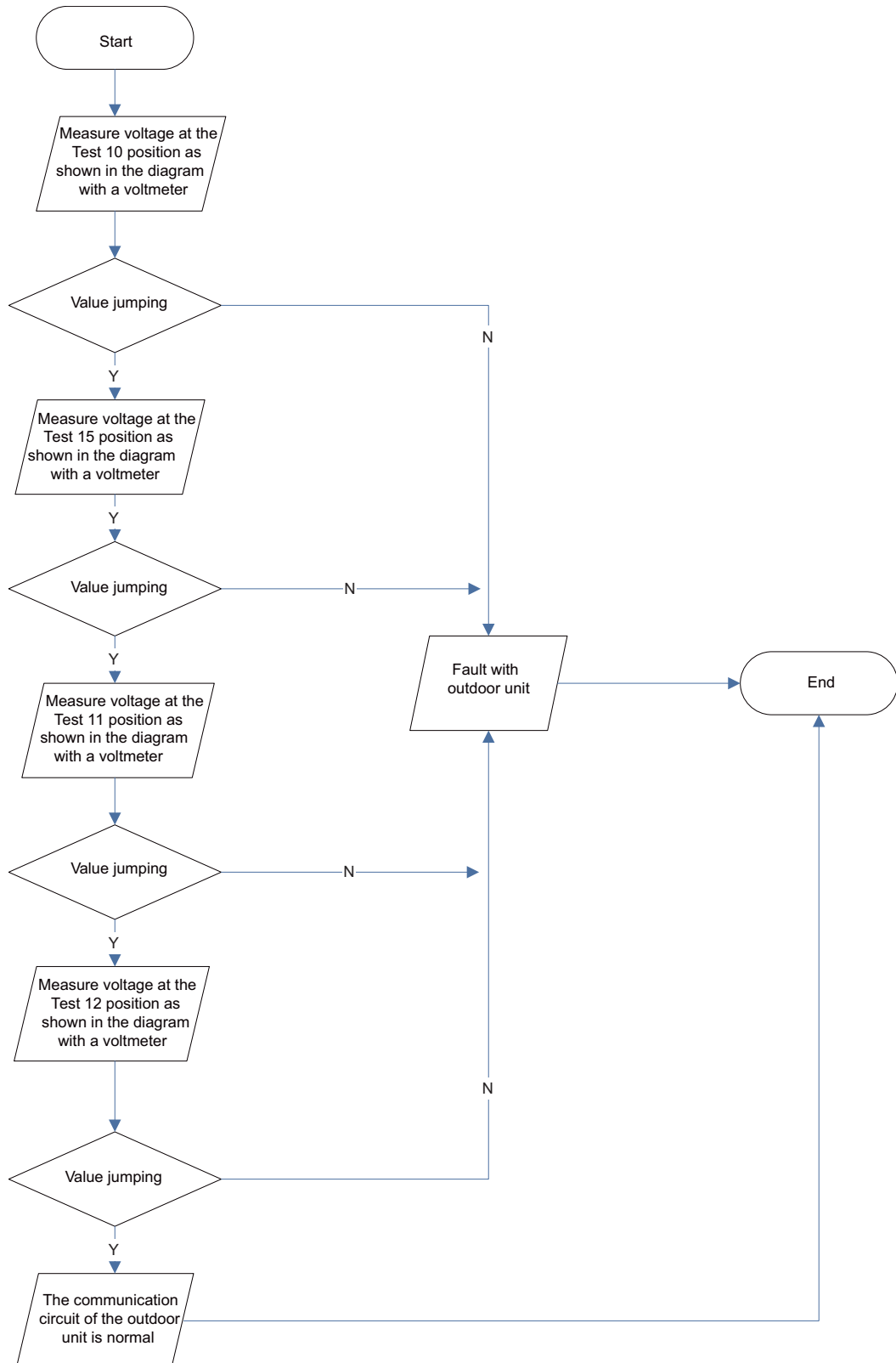
(2) Test the voltage of pin 1 and pin 2 of U132 with universal meter (voltage of both sides of R135). The voltage should be variable. (Test 10) Test the voltage of pin 3 and pin 4 of U132 with universal meter (voltage of both sides of R1312). The voltage should be variable. (Test 15) Otherwise, there 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.





Appendix

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

Appendix 2: Resistance Table of Outdoor and Indoor Tube Temperature Sensors(20K)							
Temp. (°C)	Resistance(kΩ)	Temp. (°C)	Resistance(kΩ)	Temp. (°C)	Resistance(kΩ)	Temp. (°C)	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. (°C)	Resistance(kΩ)	Temp. (°C)	Resistance(kΩ)	Temp. (°C)	Resistance(kΩ)	Temp. (°C)	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.

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