Service Manual

MODEL:GWH09AB-A3DNA1B
GWH12AB-A3DNA1B
GWH12AB-D3DNA1B
(Refrigerant R410A)

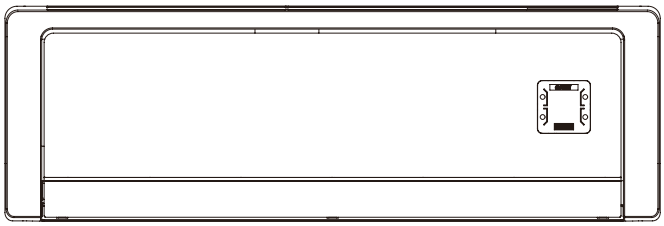
GREE ELECTRIC APPLIANCES, INC.OF ZHUHAI

The pic. below is the actual panel and the vectorgraph in the manual is for reference only.

Summary and features

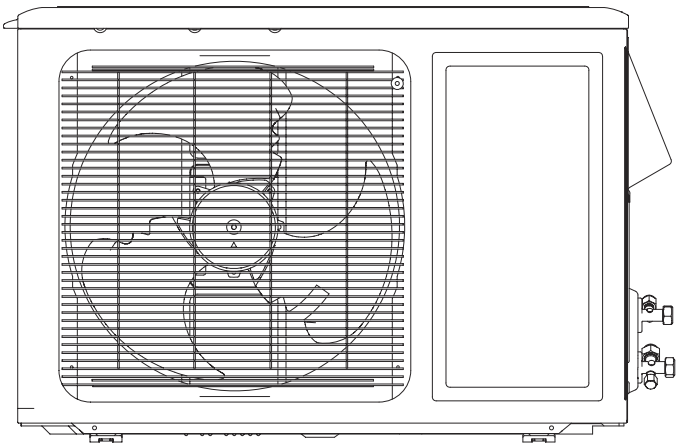
Indoor Unit

GWH09AB-A3DNA1B/I
GWH12AB-A3DNA1B/I
GWH12AB-D3DNA1B/I



Outdoor Unit

GWH09AB-A3DNA1B/O
GWH12AB-A3DNA1B/O
GWH12AB-D3DNA1B/O



Remote control window

YT1FF

1.Safety Precautions

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location (roofs, elevated structures, etc.).

Only trained, qualified installers and service mechanics should 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 working on the equipment, observe precautions in the literature 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. Use care in handling, rigging, and setting bulky equipment.

Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and current editions of the National Electrical Code (NEC).

Recognize safety information. This is the safety-alert symbol ⚠ . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.Understand these signal words: DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

- **The unit should be installed according to the instructions in order to minimize the risk of damage from earthquakes, hurricanes or strong winds.**
- **Contact of refrigerant and fire generates poisonous gas.**
- **Use specified refrigerant only.**

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Never use the system compressor as a vacuum pump.

Refrigerant lines and indoor coil should be evacuated using the recommended deep vacuum method of 500 microns. The alternate triple evacuation method may be used if the procedure outlined below is followed. Always break a vacuum with dry nitrogen.

- **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.**

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

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.

- **Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections or inadequate grounding can cause accidental injury or death.**
- **Ground the unit according to local electrical codes.**
- **Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.**
- **Make sure the ceiling/wall is strong enough to hold the unit's weight. The outdoor unit should be installed in a location where air and noise emitted by the unit will not disturb the neighbors.**
- **Properly insulate any refrigerant or condensate line running inside a room to prevent "sweating" that can cause dripping water and damage to walls and floors.**
- **The outdoor unit must be installed on stable, level surface, where there is no accumulation of snow, leaves or rubbish.**

⚠ Caution

- **Never install on the place where a combustible gas might leak, or it may lead to fire or explosion.**
- **When the unit is installed at telecommunication centers or hospitals, take a proper provision against noise.**
- **When installing at a watery place, provide an electric leak ground fault breaker.**
- **Do not wash the unit with water.**
- **Be very careful about unit transportation.The unit should not be carried by only one person if it is more than 45lb.**
- **Do not touch the heat exchanger fins with bare hands.**
- **Do not touch the compressor or refrigerant piping whithout wearing glove.**
- **Do not operate the air conditioner without air filter.**
- **Should any emergency occur, stop the unit and disconnect the power immediately.**

2.Specifications

Parameter		Unit	Value	
Model			GWH09AB-A3DNA1B	GWH12AB-A3DNA1B
Product Code			CB11500550	CB11500570
Power Supply	Rated Voltage	V～	115	115
	Rated Frequency	Hz	60	60
	Phases		1	1
Power Supply Model			Outdoor	Outdoor
Cooling Capacity (Min～Max)		Btu/h	9000(4000～11950)	12000(4500～13000)
Heating Capacity (Min～Max)		Btu/h	9500(3412～12500)	11700(3200～14000)
Cooling Power Input (Min～Max)		W	630(166～1180)	960(160～1180)
Heating Power Input (Min～Max)		W	680(200～1230)	1140(400～1250)
Cooling Power Current		A	8	13
Heating Power Current		A	8.5	14.5
Rated Input		W	1100	1300
Rated Current		A	10	12
Air Flow Volume		CFM	300	300
Moisture Removal		gal./hr	0.32	0.37
EER		BTU/W	14.3	12.5
COP		W/W	4.04	3.34
SEER		W/W	23	22
HSPF		W/W	9.8	8.9
Application Area		sq.ft.	129-194	172-258
Indoor Unit	Model of indoor unit		GWH09AB-A3DNA1B/I	GWH12AB-A3DNA1B/I
	Fan Type		Cross-flow	Cross-flow
	Diameter Length(DXL)	inch	Φ(3-3/8)X(26-3/10)	Φ(3-3/8)X(26-3/10)
	Fan Motor Cooling Speed (SH/H/M/L/SL)	r/min	1400/1150/1050/900/-	1500/1150/1050/900/-
	Fan Motor Heating Speed (SH/H/M/L/SL)	r/min	1450/1250/1150/1050/400	1450/1250/1150/1050/400
	Output of Fan Motor	W	10	10
	Fan Motor RLA	A	/	/
	Fan Motor Capacitor	μF	/	/
	Input of Heater	W	/	/
	Evaporator Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Pipe Diameter	inch	Φ11/40	Φ11/40
	Row-fin Gap	inch	2-1/17	2-1/17
	Coil Length (LXDXW)	inch	(25-7/8)X1X(11-2/9)	(25-7/8)X1X(11-2/9)
	Swing Motor Model		MP28VB	MP28VB
	Output of Swing Motor	W	2	2
	Fuse	A	3.15	3.15
	Sound Pressure Level (SH/H/M/L/SL)	dB (A)	42/38/30/28/-	42/38/30/28/-
	Sound Power Level (SH/H/M/L/SL)	dB (A)	52/48/40/38/-	52/48/40/38/-
	Dimension (WXHXD)	inch	34.3X11.1X7	34.3X11.1X7
	Dimension of Carton Box (W/H/D)	inch	36.8X14.7X10.2	36.8X14.7X10.2
	Dimension of Package (W/H/D)	inch	36.8X14.7X10.2	36.8X14.7X10.2
	Net Weight	lb.	26	26
	Gross Weight	lb.	33	33

Outdoor Unit	Model of Outdoor Unit		GWH09AB-A3DNA1B/O	GWH12AB-A3DNA1B/O
	Compressor Manufacturer/Trademark		CHINA RESOURCES(SHENYANG) SANYO COMPRESSOR CO. LTD./SANYO	CHINA RESOURCES(SHENYANG) SANYO COMPRESSOR CO. LTD./SANYO
	Compressor Model		C-6RZ110H1A	C-6RZ110H1A
	Compressor Oil		FV50S	FV50S
	Compressor Type		Rotary	Rotary
	L.R.A.	A	33.00	33
	Compressor RLA	A	4.59	4.59
	Compressor Power Input	W	800	800
	Overload Protector		Int11I-3979	Int11I-3979
	Throttling Method		Electron expansion valve	Electron expansion valve
	Operation temp	ºF	61～86	61～86
	Ambient temp (cooling)	ºF	41～115	41～115
	Ambient temp (heating)	ºF	5～86	5～86
	Condenser Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Pipe Diameter	inch	Φ3/8	Φ3/8
	Rows-fin Gap	inch	2-1/18	2-1/18
	Coil Length (LXDXW)	inch	(29-2/5)X(1-3/4)X20	(29-2/5)X(1-3/4)X20
	Fan Motor Speed	rpm	830	830
	Output of Fan Motor	W	30	30
	Fan Motor RLA	A	/	/
	Fan Motor Capacitor	μF	/	/
	Air Flow Volume of Outdoor Unit	CFM	1059	1177
	Fan Type		Axial-flow	Axial-flow
	Fan Diameter	inch	Φ(15-3/4)	Φ(15-3/4)
	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	3.8	3.8
	Permissible Excessive Operating Pressure for the Suction Side	MPa	1.2	1.2
	Sound Pressure Level (H/M/L)	dB (A)	52/-/-	55/-/-
	Sound Power Level (H/M/L)	dB (A)	62/-/-	65/-/-
	Dimension (WXHXD)	inch	33.3X21.3X12.6	33.3X23.2X12.6
	Dimension of Carton Box (W/H/D)	inch	34.5X22.8X14.2	34.5X24.8X14.2
	Dimension of Package (W/H/D)	inch	34.5X22.8X14.2	34.5X24.8X14.2
	Net Weight	lb.	88	90
	Gross Weight	lb.	96	99
	Refrigerant		R410A	R410A
	Refrigerant Charge	oz.	47.6	47.6
Connection Pipe	Precharge line length	ft.	16	16
	Gas Additional Charge	lb./ft.	0.14	0.14
	Outer Diameter Liquid Pipe	inch	Φ1/4	Φ1/4
	Outer Diameter Gas Pipe	inch	Φ3/8	Φ1/2
	Max Distance Height	ft.	33	33
	Max Distance Length	ft.	66	66

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

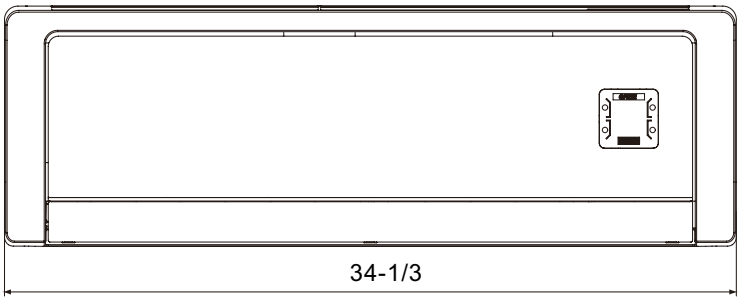
Parameter		Unit	Value
Model			GWH12AB-D3DNA1B
Product Code			CB11500380
Power Supply	Rated Voltage	V～	208/230
	Rated Frequency	Hz	60
	Phases		1
Power Supply Model			Outdoor
Cooling Capacity (Min～Max)		Btu/h	12000(4500～13000)
Heating Capacity (Min～Max)		Btu/h	13000(3200～14000)
Cooling Power Input (Min～Max)		W	960(160～1180)
Heating Power Input (Min～Max)		W	1140(400～1250)
Cooling Power Current		A	5
Heating Power Current		A	5.5
Rated Input		W	1200
Rated Current		A	6
Air Flow Volume		CFM	330
Moisture Removal		gal./hr.	0.37
EER		BTU/W	12.5
COP		W/W	3.34
SEER		W/W	22
HSPF		W/W	10.5
Application Area		sq.ft.	172-258
Indoor Unit	Model of indoor unit		GWH12AB-D3DNA1B/I
	Fan Type		Cross-flow
	Diameter Length(DXL)	inch	Φ(3-3/8)X(26-3/10)
	Fan Motor Cooling Speed (SH/H/M/L/SL)	r/min	1500/1150/1050/900/-
	Fan Motor Heating Speed (SH/H/M/L/SL)	r/min	1450/1250/1150/1050/400
	Output of Fan Motor	W	10
	Fan Motor RLA	A	/
	Fan Motor Capacitor	μF	/
	Input of Heater	W	/
	Evaporator Form		Aluminum Fin-copper Tube
	Pipe Diameter	inch	Φ11/40
	Row-fin Gap	inch	2-1/17
	Coil Length (LXDXW)	inch	(25-7/8)X1X(11-2/9)
	Swing Motor Model		MP28VB
	Output of Swing Motor	W	2
	Fuse	A	3.15
	Sound Pressure Level (SH/H/M/L/SL)	dB (A)	47/38/30/28/-
	Sound Power Level (SH/H/M/L/SL)	dB (A)	57/48/40/38/-
	Dimension (WXHXD)	inch	34.3X11.1X7
	Dimension of Carton Box (W/H/D)	inch	36.8X14.7X10.2
	Dimension of Package (W/H/D)	inch	36.8X14.7X10.2
	Net Weight	lb.	26
	Gross Weight	lb.	33

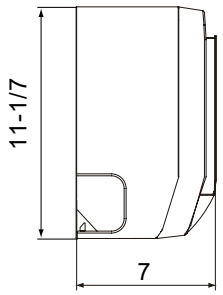
Outdoor Unit	Model of Outdoor Unit		GWH12AB-D3DNA1B/O
	Compressor Manufacturer/Trademark		CHINA RESOURCES(SHENYANG) SANYO COMPRESSOR CO. LTD./SANYO
	Compressor Model		C-6RZ110H1A
	Compressor Oil		FV50S
	Compressor Type		Rotary
	L.R.A.	A	33.00
	Compressor RLA	A	4.59
	Compressor Power Input	W	800
	Overload Protector		Int11l-3979
	Throttling Method		Electron expansion valve
	Operation temp	ºF	61～86
	Ambient temp (cooling)	ºF	41～115
	Ambient temp (heating)	ºF	5～86
	Condenser Form		Aluminum Fin-copper Tube
	Pipe Diameter	inch	Φ3/8
	Rows-fin Gap	inch	2-1/18
	Coil Length (LXDXW)	inch	(29-2/5)X(1-3/4)X22
	Fan Motor Speed	rpm	830
	Output of Fan Motor	W	30
	Fan Motor RLA	A	/
	Fan Motor Capacitor	μF	/
	Air Flow Volume of Outdoor Unit	CFM	1177
	Fan Type		Axial-flow
	Fan Diameter	inch	Φ(15-3/4)
	Defrosting Method		Automatic Defrosting
	Climate Type		T1
	Isolation		I
	Moisture Protection		IP24
	Permissible Excessive Operating Pressure for the Discharge Side	PSI	551
	Permissible Excessive Operating Pressure for the Suction Side	PSI	174
	Sound Pressure Level (H/M/L)	dB (A)	55/-/-
	Sound Power Level (H/M/L)	dB (A)	65/-/-
	Dimension (WXHXD)	inch	33.3X23.2X12.6
	Dimension of Carton Box (W/H/D)	inch	34.5X24.8X14.2
	Dimension of Package (W/H/D)	inch	34.5X24.8X14.2
	Net Weight	lb.	90
	Gross Weight	lb.	99
	Refrigerant		R410A
	Refrigerant Charge	oz.	45.8
Connection Pipe	Precharge line length	ft.	16
	Gas Additional Charge	lb./ft.	0.14
	Outer Diameter Liquid Pipe	inch	Φ1/4
	Outer Diameter Gas Pipe	inch	Φ1/2
	Max Distance Height	ft.	33
	Max Distance Length	ft.	66

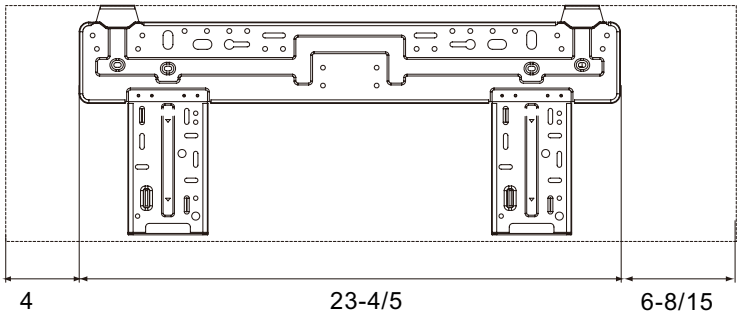
The above data is subject to change without notice. Please refer to the nameplate of the unit.

3. Construction Views

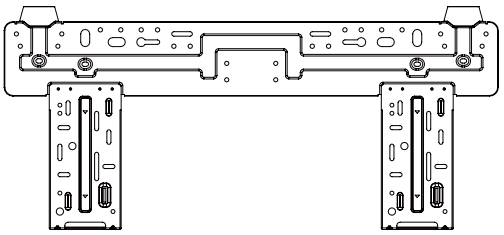
3.1 Indoor Unit (THE SAME DIMS FOR 9k12k)



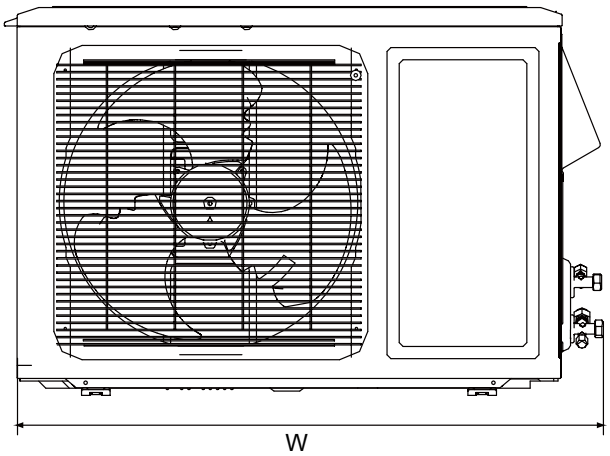


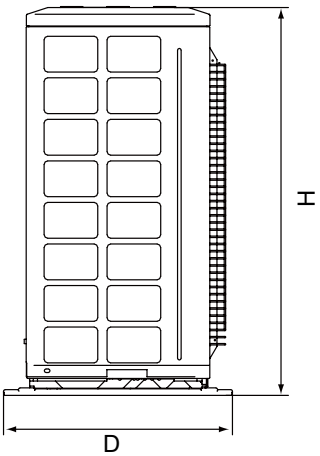


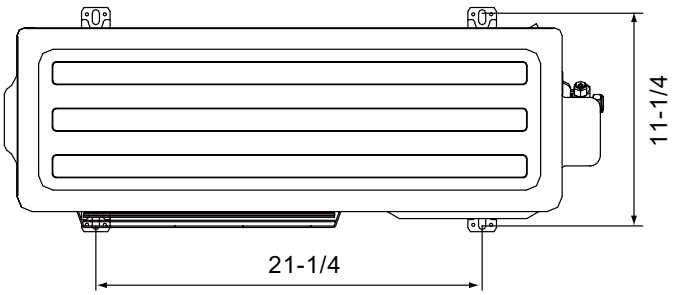
12K Unit:



3.2 Outdoor Unit



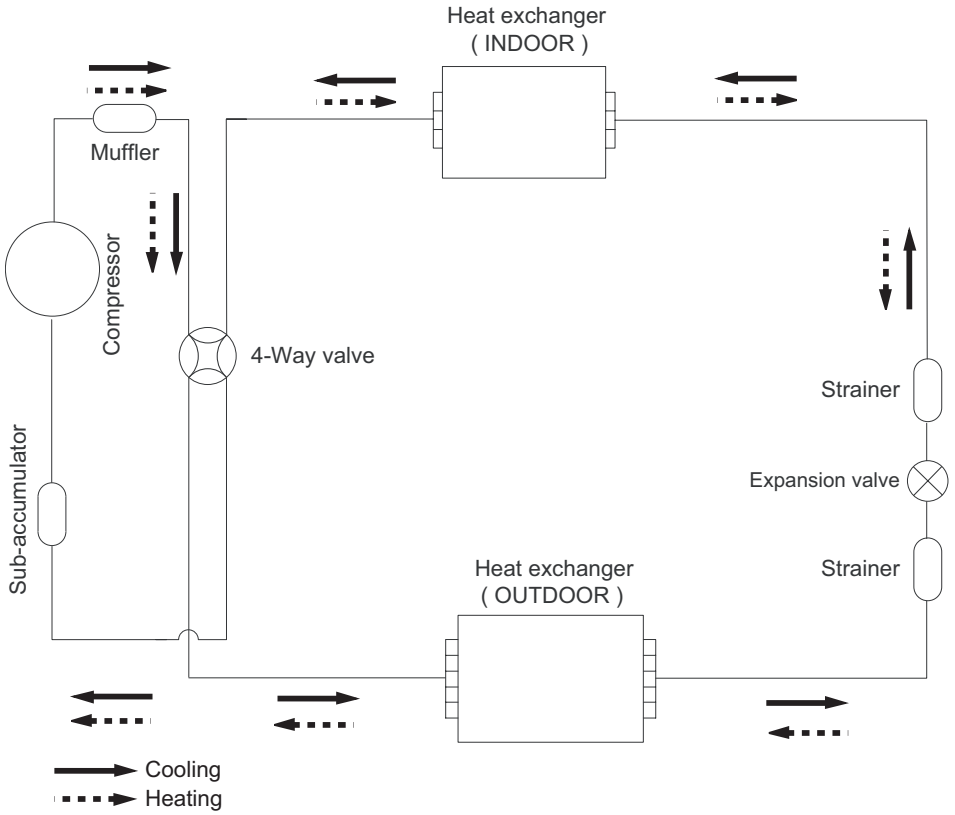




Unit:inch

Model	W	H	D
09K	33-3/8	21-1/4	12-3/5
12K	33-3/8	23-2/9	12-3/5

4. Refrigerant System Diagram



Refrigerant Pipe Diameter		
	Liquid	Gas
09K	1/4″	3/8″
12K	1/4″	1/2″

5. Schematic Diagram

5.1 Electrical Date

Meaning of marks

- **Indoor Unit**

Symbol	Color symbol	Symbol	Color symbol
WH	WHITE	**BN**	BROWN
YE	YELLOW	**BU**	BLUE
RD	RED	**BK**	BLACK
YEGN	YELLOW GREEN	⏚	Ground

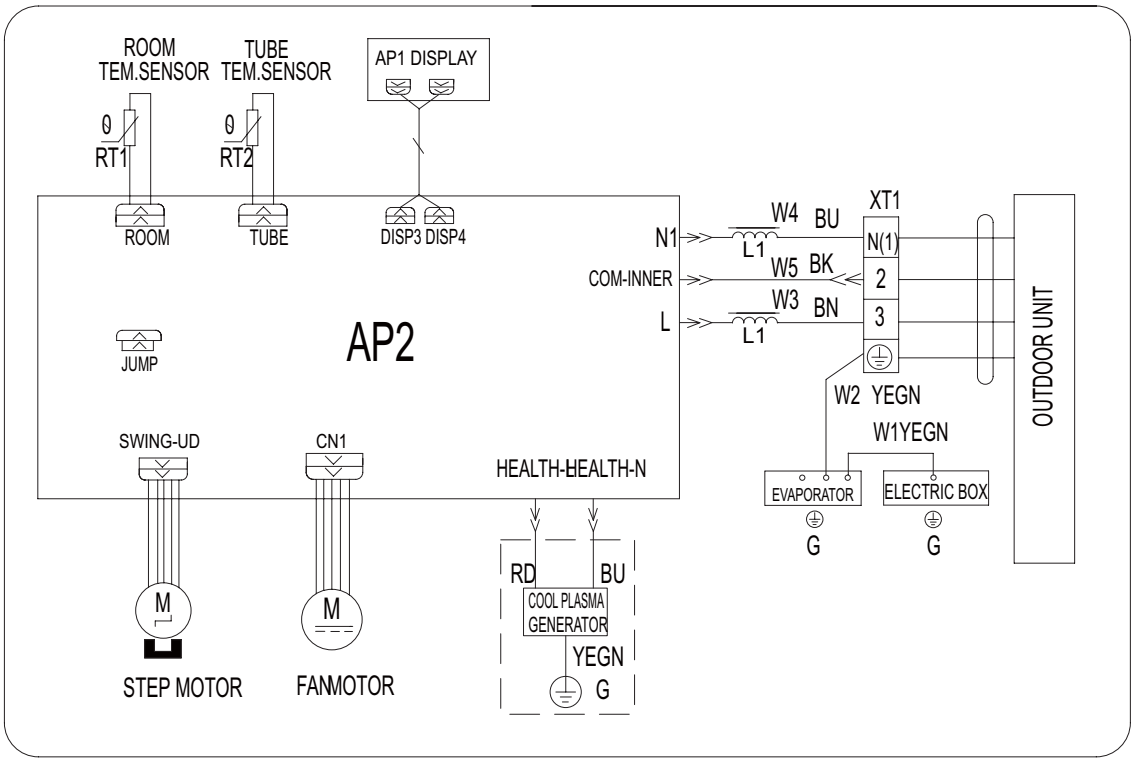
- **Outdoor Unit**

Symbol	Parts name	Symbol	Color symbol
L1 L2	N line Front line	**WH**	WHITE
4YV	4-way valv	**YE**	YELLOW
EKV	electric expansion valv	**RD**	RED
L	reactor	**BN**	SAT OVERLOAD BN BROWN
COMP	COMPRESSOR	**BU**	BLUE
⏚	Ground	**BK**	BLACK
		YEGN	YELLOW GREEN

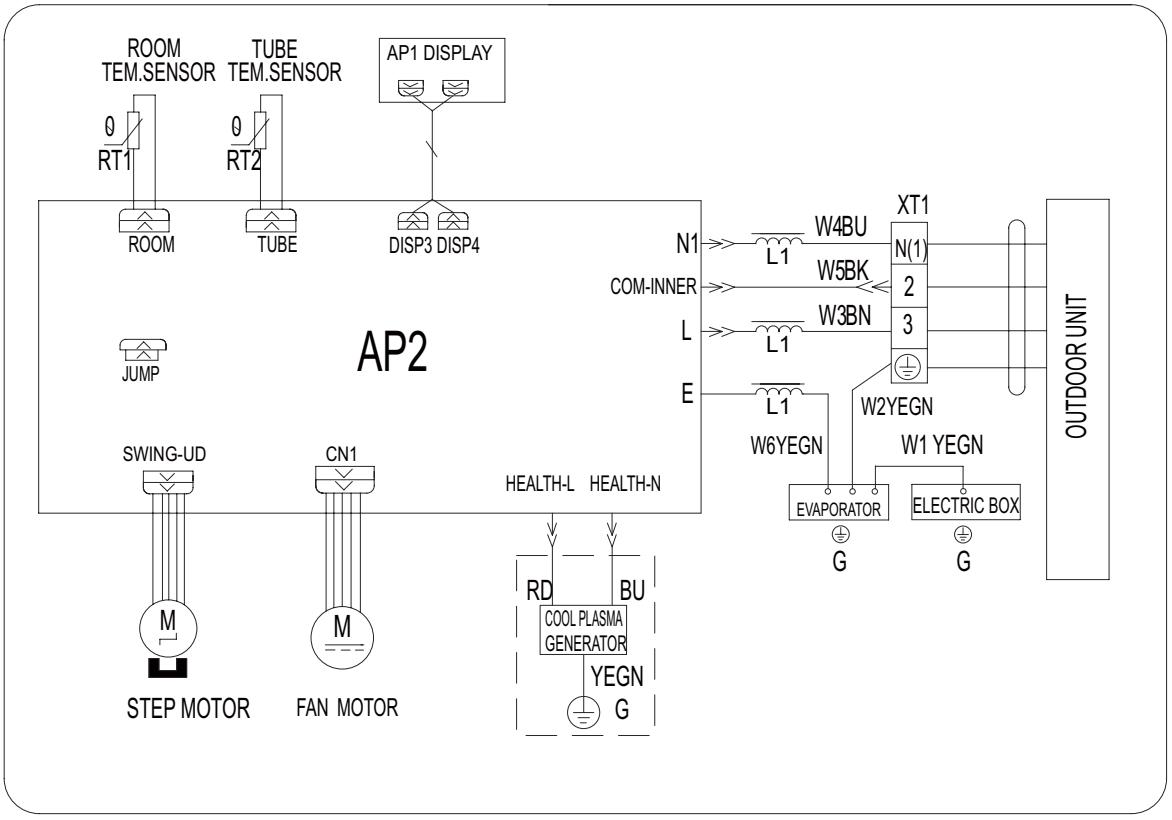
5.2 Electrical wiring

- **Indoor Unit**

(1) Models GWH09AB-A3DNA1B/I ,GWH12AB-A3DNA1B/I

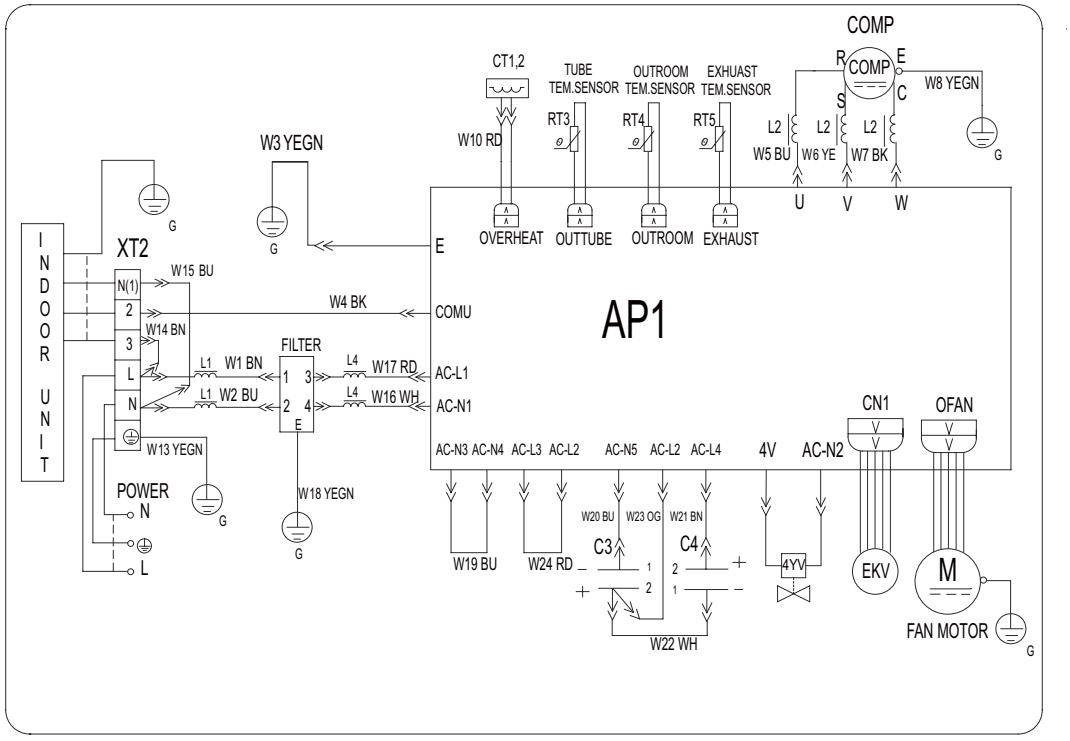


(2) Model GWH12AB-D3DNA1B/I

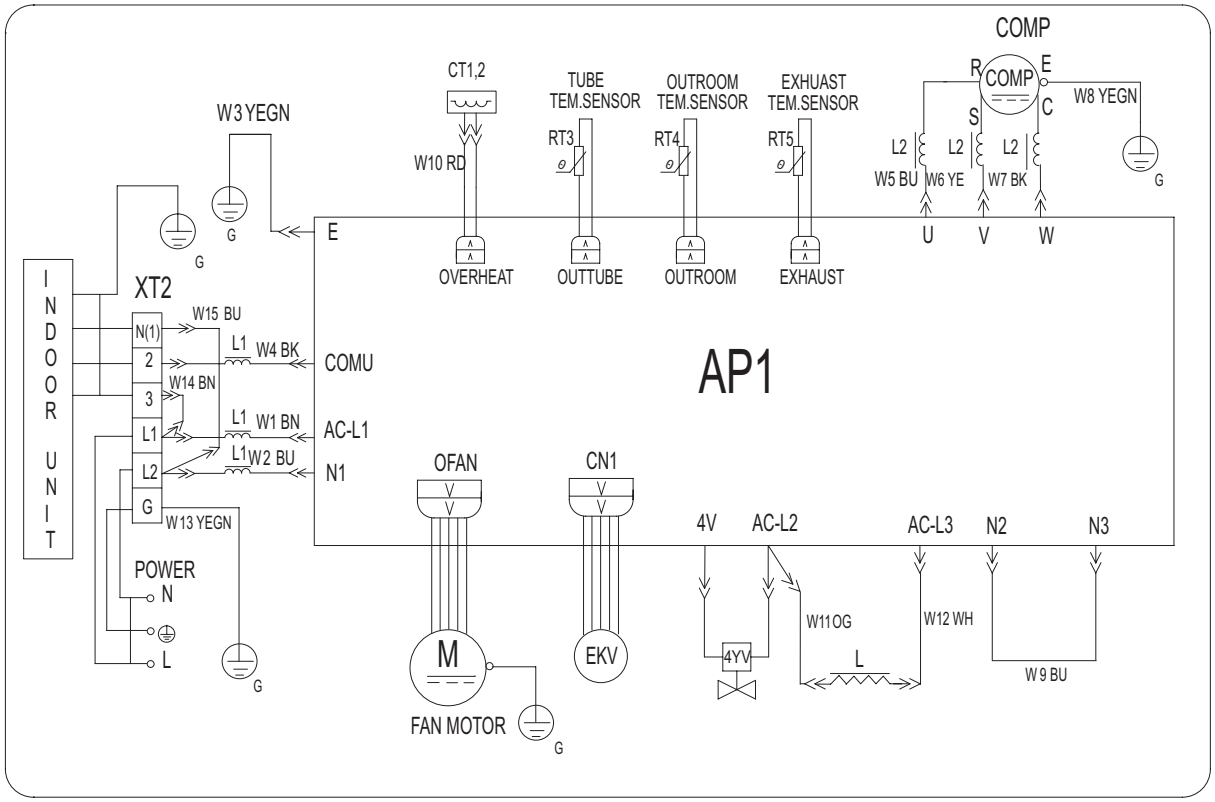


- **Outdoor Unit**

(1) Models GWH09AB-A3DNA1B/O,GWH12AB-A3DNA1B/O



(2) Models GWH09AB-A3DNA1B/O,GWH12AB-A3DNA1B/O

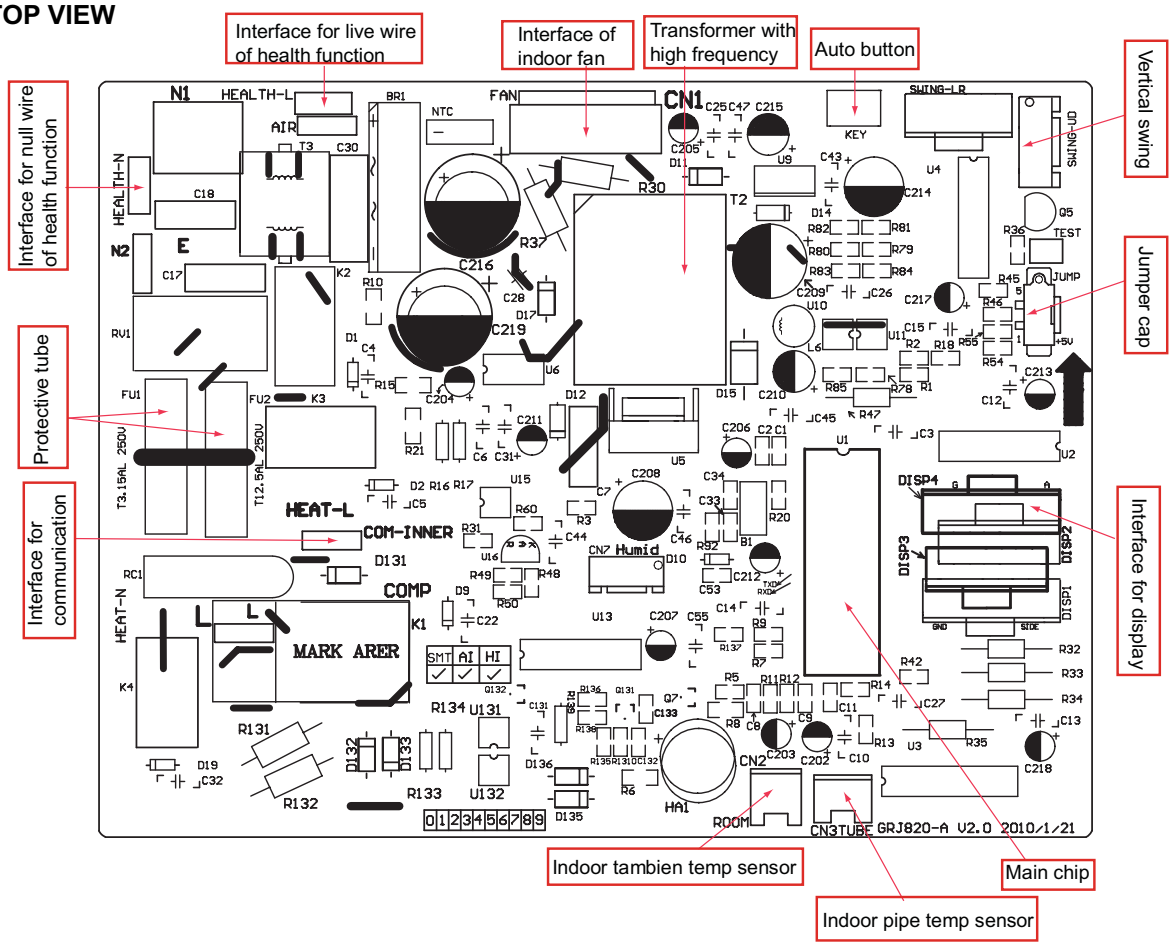


These circuit diagrams are subject to change without notice, please refer to the one supplied with the unit.

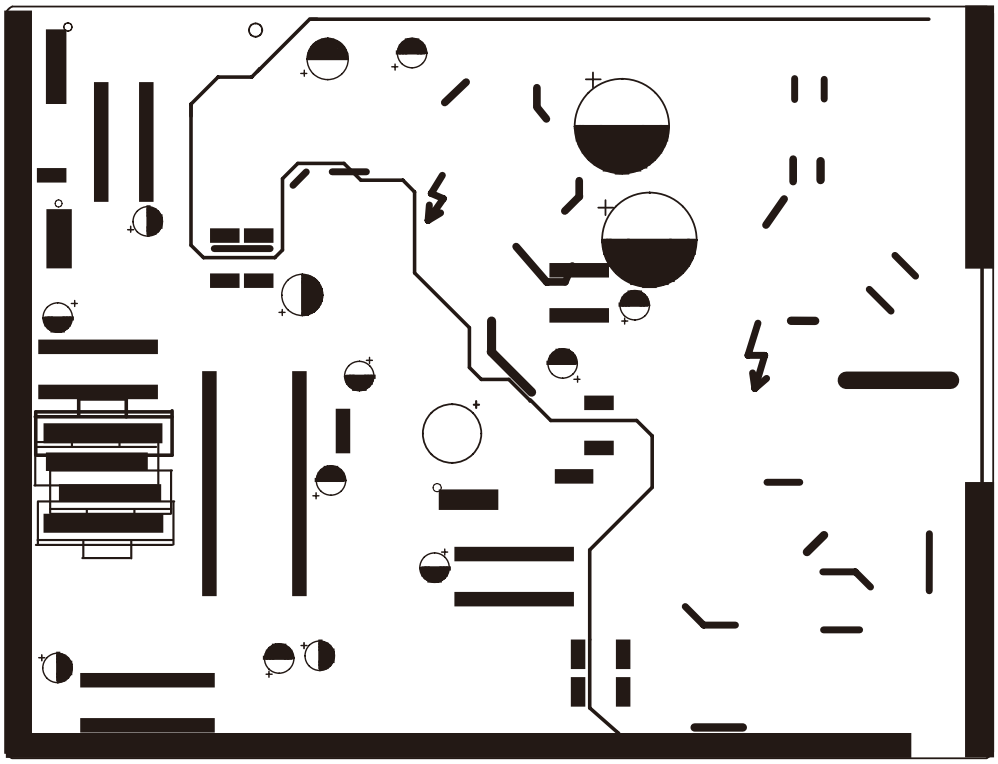
5.3 Printed Circuit Board

Indoor Unit

- **TOP VIEW**



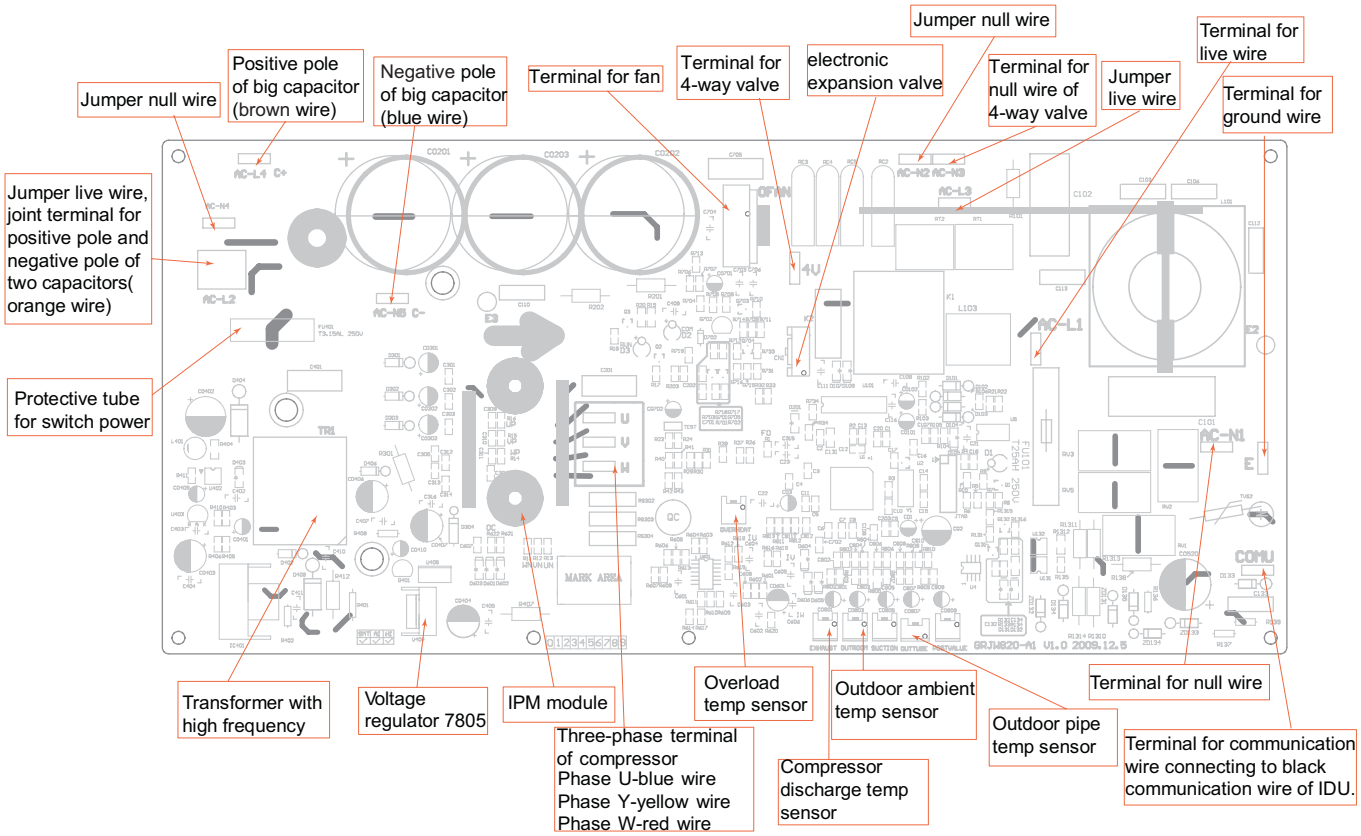
- **BOTTOM VIEW**



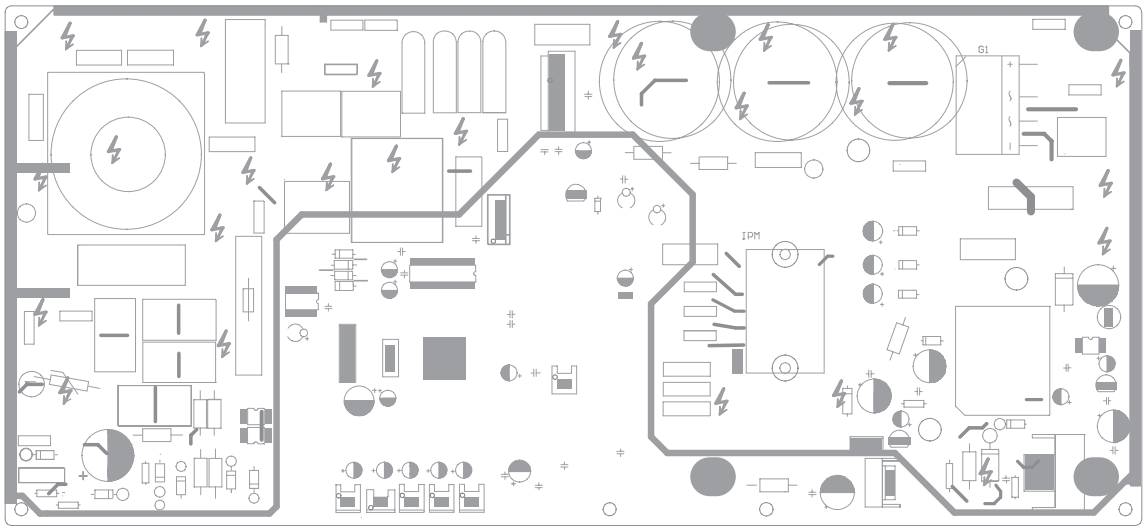
Outdoor Unit

(1) Models GWH09AB-A3DNA1B/O , GWH12AB-A3DNA1B/O

● **TOP VIEW**

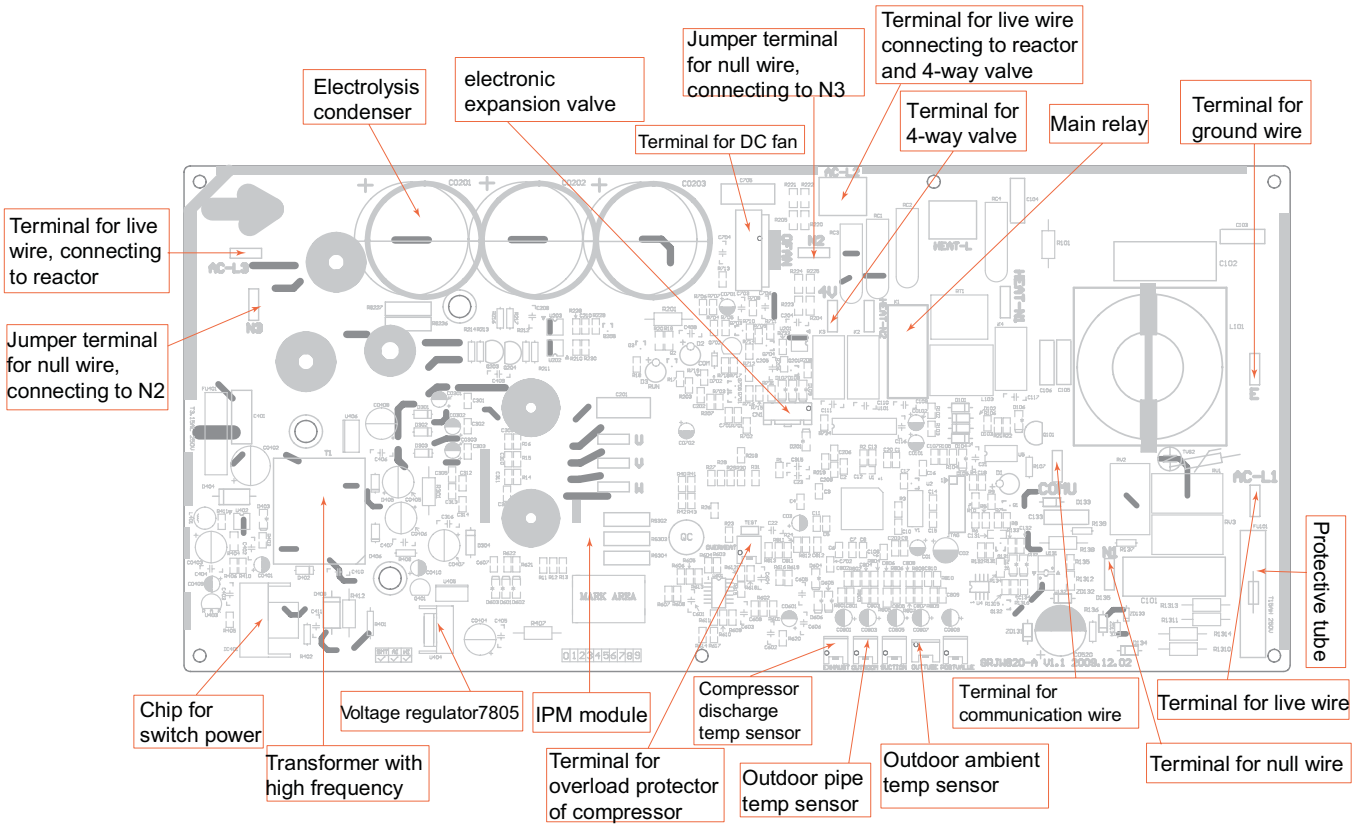


● **BOTTOM VIEW**

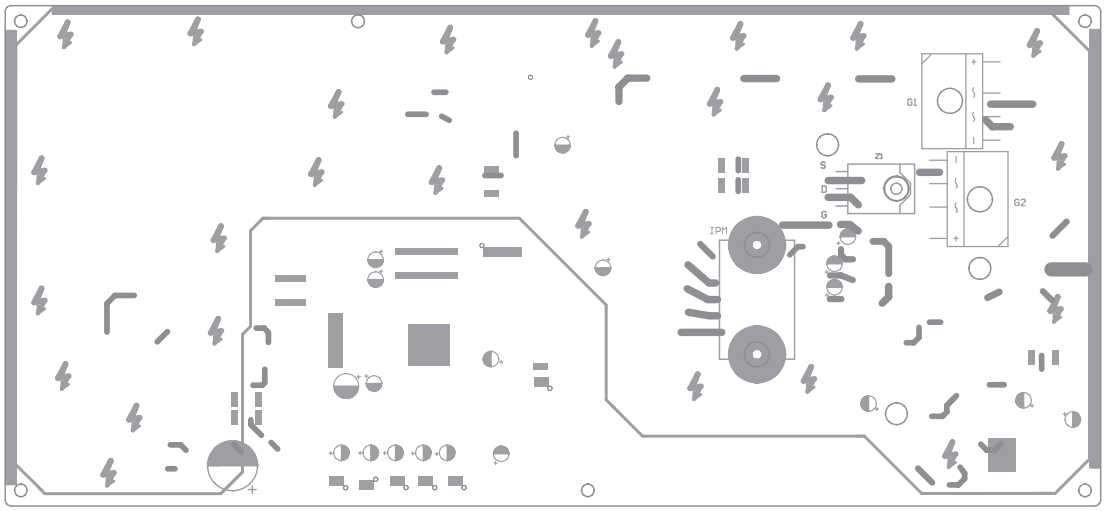


(2) Model GWH12AB-D3DNA1B/O

- **TOP VIEW**



- **BOTTOM VIEW**



6. Function and Control

6.1 Remote Control Operations

1 ON/OFF Button

2 Setpoint Temperature DOWN Button

3 Setpoint Temperature UP Button

4 FAN Speed Button

5 MODE Button

6 I FEEL Button

7 HEALTH function Button

8 AIR function Button

9 Clock Button

10 Timer ON Button

11

12 X-FAN Button

13 Temperature Displaye Button

14 TIMER OFF Button

15 TURBO Button

16 Sleep Mode Button

17 Light Mode Button

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

1

Press this button, the unit will be turned on, press it once more, the unit will be turned off.

2 —:

To lower temperature set point. Press this button, sets temperature,when unit is on . Continuously press and hold this button for more than 2 seconds,the corresponding contents will be changed rapidly， but in AUTO mode, set temperature is not adjustable.

3 + :

To increase temperature set point. Press this button, the temperature can be set up, continuously press this button and hold for two seconds, the relative contents can quickly change, but in AUTO mode, set temperature is not adjustable.

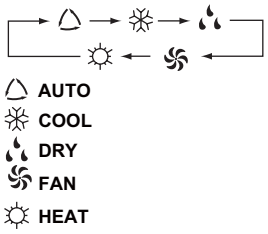
4 FAN :

Press this button, Auto, Low, Middle, High speed can be circularly selected. After powered on, Auto fan speed is default. Under Dehumidify mode, Low fan speed only can be set up.

Low speed Medium speed High speed

5 MODE :

Press this button, Auto, Cool,Dry, Fan, Heat mode can be selected circularly. Auto mode is default while power on. Under Auto mode, the temperature will not be displayed; In this mode, the unit will automatically select the suitable operation mode in accordance with the room temperature to make the room more comfortable for you.



AUTO
COOL
DRY
FAN
HEAT

Note:Only for models with heating function.

6 I FEEL :

Press this button, I FEEL On and I FEEL Off can be selected.In the I FEEL function.
The unit will adjust temperature automatically according to the sensed temperature.

7 (The function is not for the models mentioned in the manual.)

Press this button to set HEALTH function ON or OFF. After the unit is turned on, it defaults to HEALTH function ON.

8 (The function is not for the models mentioned in the manual.)

Press this button to select AIR function ON or OFF.

9 CLOCK :

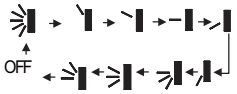
Press this button, the clock can be set up,signal ㊐ blink and display.Within 5 seconds, the value can be adjusted by pressing + or - button, if continuously press this button for 2 seconds above,in every 0.5 seconds, the value on ten place of Minute will be increased 1. During blinking, repress the Clock button, signal ㊐ will be constantly displayed and it denotes the setting succeeded. After powered on, 12:00 is defaulted to display and signal ㊐ will be displayed. If there is signal ㊐ be displayed that denotes the current time value is Clock value, otherwise is Timer value.

10 TIMER ON :

Timer On setting: Signal “ON” will blink and display, signal㊐ will conceal, the numerical section will become the timer on setting status. During 5 seconds blink,by pressing ＋ or － button to adjust the time value of numerical section, every press of that button, the value will be increased or decreased 1 minute. Hold pressing ＋ or －button, 2 seconds later, it quickly change, the way of change is:During the initial 2.5 seconds, ten numbers change in the one place of minute, thenthe one place is constant, ten numbers change in the tens place of minute at 2.5 seconds speed and carry. During 5s blink, press the Timer button, the timer setting succeeds. The Timer On has been set up, repress the timer On button, the Timer On will be canceled. Before setting the Timer, please adjust the Clock to the current actual time.

11 :

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



This is an universal use remote controller. If remote controller sends the following three kinds of status , or , the swing status of main unit will be which indicates the guide louver swings up and down between that all five positions:

When the guide louver start to swing up and down, if turn off the Swing, the air guide louver will stop at current position.

12 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 you have turned off the unit.After energization, X-FAN OFF is defaulted. X-FAN is not available in AUTO,FAN or HEAT mode.

13 TEMP :

Press this button, could select displaying (the indoor setting temperature) , (indoor ambient temperature)or (outdoor am-bient temperature) .The unit defaults not to display the icon. During operation of TEMP button, the set temperature is always displayed

14 TIMER OFF :

Once press this key to enter into TIMER OFF setup, in which case the TIMER OFF icon will blink.The method of setting is the same as TIMER ON.

15 TURBO:

Press this button to activate / deactivate the Turbo function which enables the unit to reach the preset temperature in shortest time. Such as 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.
(This function is not applicable for some models)

16 SLEEP:

Press this button, Sleep On and Sleep Off can be selected. After Sleep function set up, the unit will automatically select the suitable operation mode to maintain the most comfortable temperature for you. This function is available in COOL , HEAT or DRY mode

17 LIGHT:

Press this button to select LIGHT on or off in the displayer. When the LIGHT on is set,the icon will be displayed and the indicator light in the displayer will be on. When the LIGHT off is set, the icon will be displayed and the indicator light in thedisplayer will be off.

18 "+" and "–"button 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.

19 "MODE" and " - " buttons About switch between fahrenheit and celsius:

At unit OFF, press "MODE" and " - " buttons simultaneously to switch between ℉ and ℃.

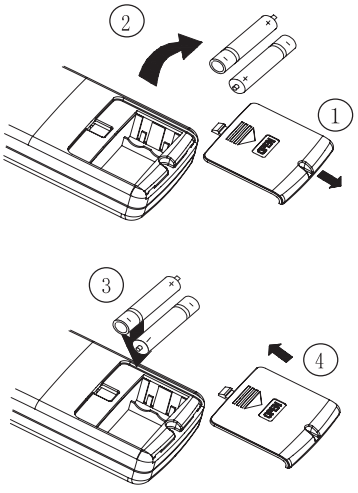
6.2 Changing batteries and notices

1. Slightly to press the place with , along the arrowhead direction to push the back cover of wireless remote control. (As show in figure)

2. Take out the old batteries. (As show in figure)

3. Insert two new AAA1.5V dry batteries, and pay attention to the polarity.
(As show in figure)

4 .Attach the back cover of wireless remote control. (As show in figure)



Sketch map for replacing batteries

★ Notes:

- When replacing the batteries, do not use old or different types of batteries,otheerwise, 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 replace them after 30 seconds.If still not operating properly, replace the batteries.

6.3 Description of Each Control Operation

1. Temperature Parameters

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

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) Cooling Mode

①Working conditions and process of cooling

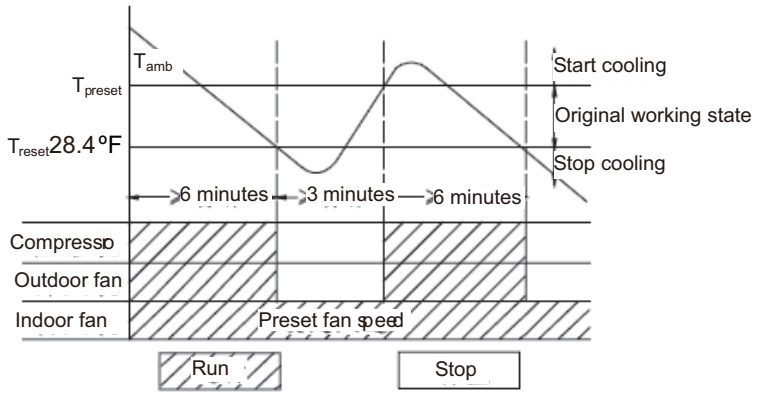
When $T_{amb} \geqslant T_{preset}$, the unit will enter cooling operation, in which case the indoor fan, the outdoor fan and the compressor will work and the indoor fan will run at preset speed.

When $T_{amb} \leqslant T_{preset}$ -28.4 ºF , the compressor will stop, the outdoor fan will stop with a time lag of 30s, and the indoor fan will run at preset speed.

When T_{preset} -28.4 ºF < $T_{amb.}$< T_{preset} +33.8 ºF , the unit will remain at its previous state.

➢ Under this mode, the four-way valve will be de-energized and temperature can be set within a range from 61 to 86ºF

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



② Protection

◆ Antifreeze protection

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

If $T_{evap} \leqslant$ 35.6 ºF, the compressor will operate at reduced frequency.

If $T_{evap} \leqslant$ 30.2ºF is detected for durative 3 minutes, the compressor will stop, and after 30 seconds, the outdoor fan will stop; and under cooling mode, the indoor fan and the swing motor will remain at the original state.

If $T_{evap.} \geqslant$ 42.8 ºF and the compressor has remained at OFF for at least 3 minutes, the compressor will resume its original operation state.

◆ Total current up and frequency down protection

If Itotal ⩽ A, frequency rise will be allowed; if Itotal ⩾ B, frequency rise will not be allowed; ifItotal ⩾ C, the compressor will run at reduced frequency; and if Itotal ⩾ D, the compressor will stop and the outdoor fan will stop with a time lag of 30s.

(2) Dehumidifying Mode

①Working conditions and process of dehumidifying

If T_{amb}>T_{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_{preset} 28.4 ºF $\leqslant T_{amb} \leqslant T_{preset}$, the compressor remains at its original operation state.

If $T_{amb.}$< T_{preset} 28.4ºF, 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) Heating Mode

①Working conditions and process of heating

If $T_{amb.} \leqslant$ Tpreset +35.6ºF, 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 $T_{amb.} \geqslant T_{preset}$ +41 ºF , 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} +35.6ºF <$T_{amb.}$< T_{preset} +41ºF, 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 61 - 86ºF. The operating symbol, the heating symbol and preset temperature are revealed on the display.

②Condition 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.

a. $T_{outdoor\ amb.} \geqslant$AºF, $T_{outdoor\ tube} \leqslant$WºF;

b. AºF$\leqslant T_{outdoor\ amb.}$ <BºF, $T_{outdoor\ tube} \leqslant$XºF ;

c. BºF$\leqslant T_{outdoor\ amb.}$ <CºF, $T_{outdoor\ tube} \leqslant$YºF;

d. $T_{outdoor\ amb.}$<CºF, $T_{outdoor\ tube} \leqslant$ZºF

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 $T_{outer\ tube} \geqslant$E, the compressor will be converted to 53Hz 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 70Hz.

3.Protection

◆ Cold air prevention

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

①In the case of $T_{indoor\ amb.}$ <75ºF : if $T_{tube} \leqslant$104ºFand 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}>104ºF, 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}>108ºF , the fan will run at present speed.

②In the case of $T_{indoor\ amb.} \geqslant$75ºF : if $T_{tube} \leqslant$108ºF, 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}>104ºF , the indoor fan will be converted to preset speed.

Note: $T_{indoor\ amb.}$ indicated in ①and ②refers 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 $I_{total} \leqslant$W, frequency rise will be allowed; if $I_{total} \geqslant$X, frequency rise will not be allowed; if $I_{total} \geqslant$Y, the compressor will run at reduced frequency; and if $I_{total} \geqslant$Z, 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 61 - 86ºF .

(5) AUTO Mode

①Working conditions and process of AUTO mode

Under AUTO mode, standard cooling temperature T_{preset} is 77ºF and standard heating temperature T_{preset} is 64ºF.

a. Once energized, if $T_{amb} \leqslant$68ºF , the unit will be started under heating mode; if 68ºF < $T_{amb.}$< 77ºF, the unit will run under fanmode and the run indicator will be bright; and if $T_{amb} \geqslant$77ºF , the unit will be started under cooling mode.

b.Under AUTO mode, if $T_{amb.} \geq T_{preset}$ is detected, the unit will select to run under cooling mode, in which case implicit preset temperature is 77ºF ; if $T_{amb.} \leq T_{preset}$ 28.4ºF, the compressor will stop, the outdoor fan will stop with a time lag of 1 minute, and the indoor fan will run at preset speed; and if T_{preset} -(28.4ºF)< $T_{amb.}$< T_{preset} , the unit will remain at its original state.
c. Under AUTO mode, if $T_{amb.} \leq T_{preset}$ + 35.6 ºF is detected, the unit will select to run under heating mode, in which case implicit preset temperature is 64ºF; if $T_{amb.} \geq T_{preset}$ +41ºF , the compressor will stop, the outdoor fan will stop with a time lag of 1 minute, and the indoor fan will run under the mode of residue heat blowing; and if T_{preset} +35.2ºF < $T_{amb.}$< T_{preset} +41ºF , the unit will remain atits original state. The cooling-only unit will run under fan mode.
d. Under AUTO mode, if 68ºF < Tamb.< 77 ºF , the unit will remain at its original state.

② **Protection**

a. In cooling operation, protection is the same as that under the cooling mode;
b. In heating operation, protection is the same as that under the heating mode;
c. When ambient temperature changes, operation mode will be converted preferentially. Once started, the compressor will remain unchanged for at least 6 minutes.

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

① **Overload protection**

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

1) Cooling overload

a. If $T_{tube} \leq$ 126ºF, the unit will return to its original operation state.
b. If $T_{tube} \geq$ 131ºF , frequency rise is not allowed.
c. If $T_{tube} \geq$ 136ºF , the compressor will run at reduced frequency.
d. If $T_{tube} \geq$ 144ºF , the compressor will stop and the indoor fan will run at preset speed.

2) Heating overload

a. If $T_{tube} \leq$ 126ºF , the unit will return to its original operation state.
b. If $T_{tube} \geq$ 131ºF , frequency rise is not allowed.
c. If $T_{tube} \geq$ 136ºF , the compressor will run at reduced frequency.
d. If $T_{tube} \geq$ 144ºF , the compressor will stop and the indoor fan will blow residue heat and then stop.

② **Exhaust temperature protection of compressor**

If exhaust temperature $\geq$ 208ºF , frequency is not allowed to rise.
If exhaust temperature $\geq$ 217ºF , the compressor will run at reduced frequency.
If exhaust temperature $\geq$ 230ºF , the compressor will stop.
If exhaust temperature $\leq$ 194ºF 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 239 ºF, the compressor will stop and the outdoor fan will stop with a time lag of 30 seconds. If temperature is below 203ºF , the overload protection will be relieved .
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.

⑥ **Faults of temperature sensors**

Designation of sensors	Faults
Indoor ambient temperature	The sensor is detected to be open-circuited or short-circuited for successive 20 seconds
Indoor tube temperature	The sensor is detected to be open-circuited or short-circuited for successive 20 seconds
Outdoor ambient temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds
Outdoor tube temperature	The sensor is detected to be open-circuited or short-circuited for successive 30 seconds, and no detection is performed within 10 minutes after defrost begins.
Exhaust	After the compressor has operated for 3 minutes, the sensor is detected to be open-circuited or short-circuited for successive 30 seconds.
Overload	After the compressor has operated for 3 minutes, the sensor is detected to be open-circuited or short-circuited for successive 30 seconds.

4. 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 1.8 ºF . Regulating Range: 61~86ºF, 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

a. When the air conditioner is under the mode of COOL, DRY, and the SLEEP mode has been set well, after the SLEEP state keeps about 1 hour, the pre-setting T will raise 1.8 ºF, and it will raise 1.8 ºF again after 2 hours, so it raise 3.6 ºF in 2 hours, then it will run on at the setting temperature and wind speed.

b. When the air conditioner is under the mode of HEAT, and the Timer has been set well, after the SLEEP state keeps about 1 hour, the pre-setting T will reduce 1.8 ºF , and it will reduce 1.8 ºF again after 2 hours, so it reduce 3.6 ºF in 2 hours, then it will run on at the setting temperature and wind speed.

c. The setting temperature keeps the same under the FAN mode and AUTO mode.

(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.

Cooling mode: $T_{ring} \geq T_{setting} + 3.6$, high speed; $T_{setting} - 3.6 < T_{ring} < T_{setting} + 3.6$, medium speed; $T_{ring} \leq T_{setting} - 3.6$, low speed.

Sending wind mode: : $T_{ring} > T_{setting} + 7.2$, high speed; $T_{setting} + 3.6 \leq T_{ring} \leq T_{setting} + 7.2$, medium speed; $T_{ring} < T_{setting} + 3.6$, low speed. Moisture removal mode: force to be set as the low speed

Heating mode: $T_{ring} \leq T_{setting} + 1.8$ high speed; $T_{setting} + 1.8 < T_{ring} < T_{setting} + 9$, medium speed; $T_{ring} \geq T_{setting} + 3.6$, low speed.

(7) Buzzer Control

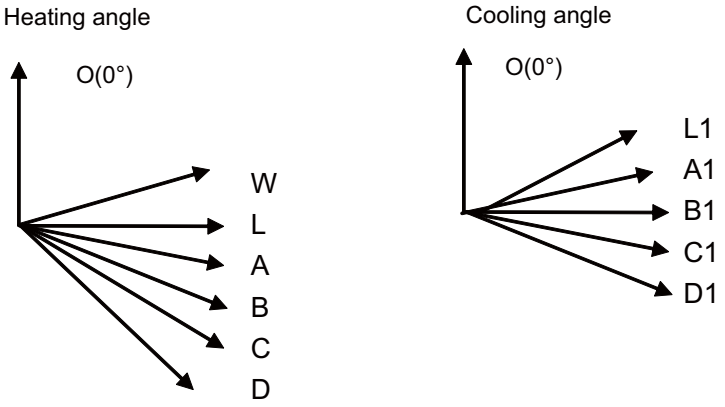
The buzzer will send a "Di" sound when the air conditioner is powered up or received the information sent by the remote control or there is a button input, the single tube cooler doesn't receive the remote control ON signal under the mode of heating mode.

(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 o 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

①Operation 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 61 to 86℉) and indoor ambient temperature. The heating and air supply temperature will display 77℉ under auto-mode, the temperature will display 18℃ under the heating mode, and the temperature will display H1 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 E8: Overload protection

F1: Indoor ambient sensor start and short circuit (continuously measured failure in 20S)

F2: Indoor evaporator sensor start and short circuit (continuously measured failure in 20S)

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 don't 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 10 minutes under low air damper (The swing will operate as the former status within 10 minutes, 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.

7. Installation Manual

7.1 Notices for Installation

7.1.1 Caution

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

2.Before installating, 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 discommodious contacts.

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 circuit 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.

7.1.2 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.

7.1.3 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 condensing water can be easily drained out, and where it is easily connected for outdoor unit.

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

4.Select the 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.

7.1.4 Installation Site of Outdoor Unit

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

2.Select 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 10m, and the length of the connecting tubing does not exceed 15 (09k)or20(12K)m.

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

9.Select a place which will not block pedestrian passage and influence the city appearance.

7.1.5 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 emphatically.
3.The unit should be reliably earthed and connected to the special 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:

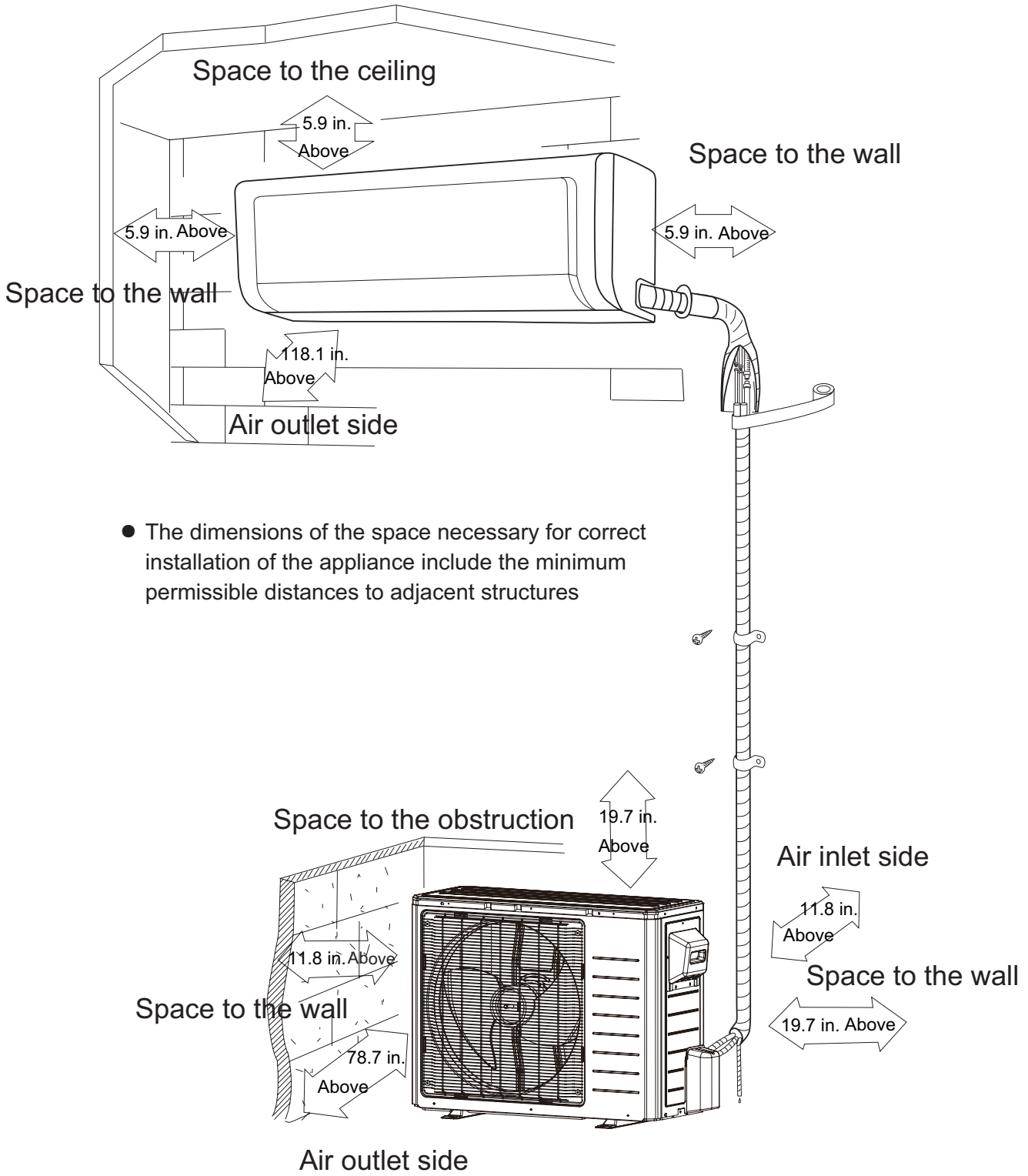
● **Make sure the live wire, neutral wire and earth wire in the family power socket are properlly connected. There should be reliable circuit in the diagram.**

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

7.1.6 Earthing Requirements

1. Air conditioner is type I electric appliance. Please ensure the 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 user's power must have reliable earthing terminal. Please don't 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 rating values for fuses accord with the silk print on fuse cover or related PCB.

7.2 Installation Drawing



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

This is just the schematic plan, please refer to the actual product.

7.3 Install Indoor Unit

7.3.1 Installation of Mounting Plate

1.Make the mounting plate completely level . As the water tray's oulet of the indoor unit is two-way type, the indoor unit during installation should slightly slant to watert tray's outlet for smooth drainage of condensing water.

2.Fix the mounting plate on the wall with screws.(Where is pre-covered with plastic granula)

3.Be sure that the mounting plate has been fixed firmly enough to withstand the weight of an adult of 132.3 lb.; further more, the weight should be evenly shared by each screw.

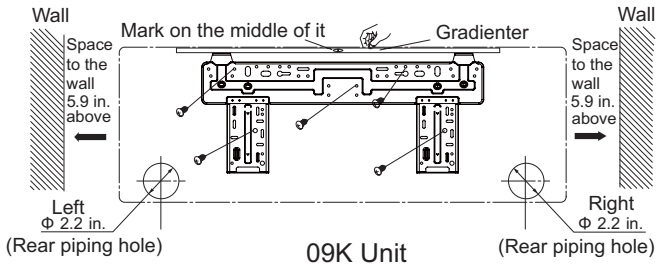
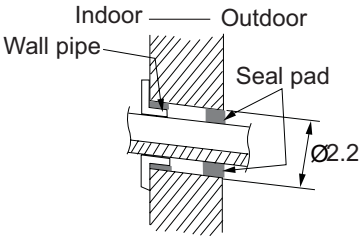


Fig.5

7.3.2 Drill Piping Hole

1.Slant the piping hole (Φ 5.9) 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.



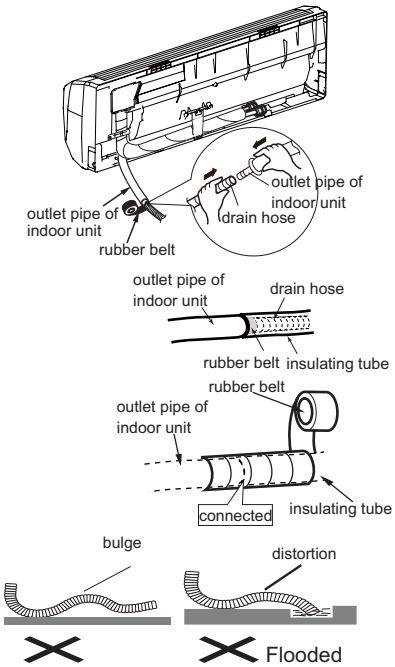
7.3.3 Installation of Drain Hose

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.

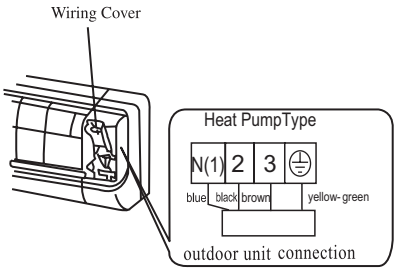
3.Wrap the insulating tube with wide rubber belt to prevent the shift of insulating tube. Slant the drain hose downward slightly for smooth drainage of condensing water.

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.
3.Make the power connection cord and signal control wire (only for heat pump unit) pass through.
4.Reinstall the cord anchorage and wiring cover.
5.Reinstall the front panel.the hole at the back of indoor unit.



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 tightly.
- After tightening the screws, pull the wire sligltly to confirm whether it's firm or not.
- Make sure that the electric connections are earthed properly to prevent electric shock.
- Make sure that the electric connections are earthed properly to prevent electric shock.

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.7)
(1) Cut off the tailings 1 when routing the wiring only;
(2) Cut off the tailings 1 and tailings 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 hem pass through the piping hole. (As shown in Fig.8)
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.9)
4.The installation site should be 98.4 in. or more above the floor.

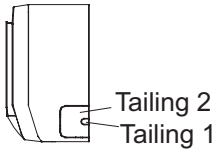
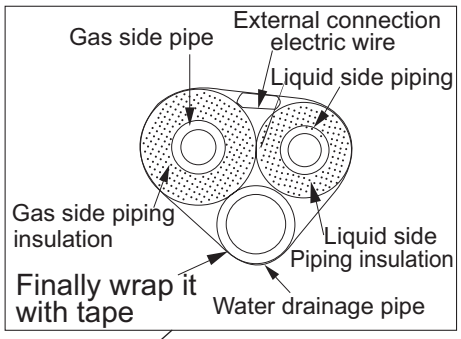


Fig.7



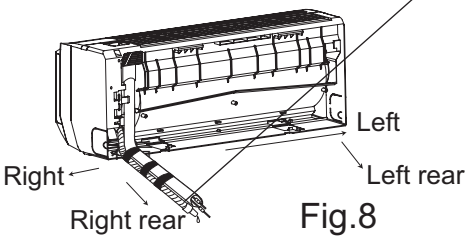


Fig.8

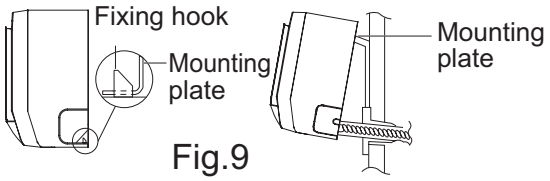


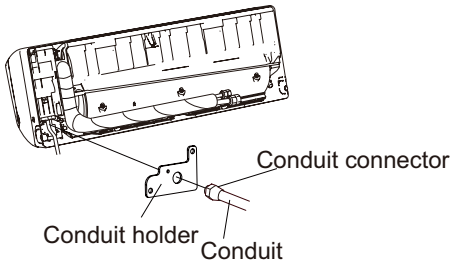
Fig.9

7.3.6 Install the Conduit assy

1) Pass the connection wires of indoor and outdoor units throught the wire-passing pipe.
2) Fix the wire-passing pipe at the chassis with 2 screws.

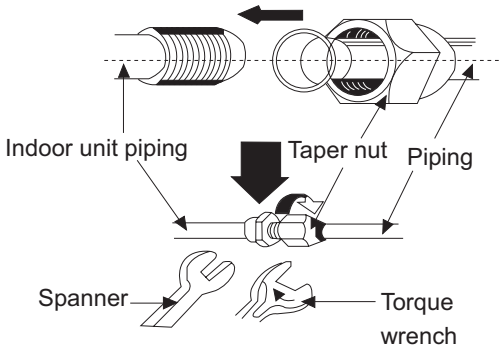
●Conduit assy consists of conduit, conduit holder and conduit connector.

The length of the wire-passing pipe can be calculated according tothe length of connection wire



7.3.7 Installation of Connection Pipe

1.Align the center of the piping 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:



Tube diameter	Tightening torque,approximate(N·m)
Φ6.35(1/4")	14～18N·m(140-180kgf.cm)
Φ9.52(3/8")	34～42N·m(340-420kgf.cm)
Φ12.7(1/2")	49～61N·m(490-610kgf.cm)
Φ15.88(5/8")	68～82N·m(680-820kgf.cm)

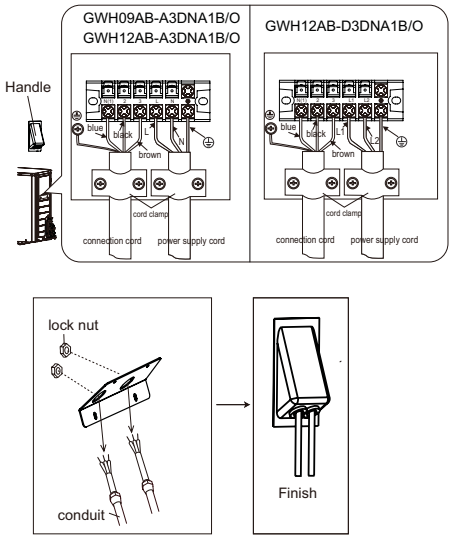
NOTE: Connect the connection pipe to indoor unit at first and then to outdoor unit. Handle piping bending with care. Do not damage the connection pipe. Ensure that the joint nut is tightened firmly, otherwise, it may cause leakage.

7.4 Install Outdoor Unit

7.4.1 Electric Wiring

1.Remove the handle from the outdoor unit.
2. Fasten the power supply cord and the connection cord to the retaining plate using the lock nut.(open the knock out holes if necessary)
3.Connect the power supply cord and the connection cord to terminal.
4.Fasten the power supply cord and connection cord with cord clamp.
5. Install the handle.

The screws are packed with the terminal board.



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

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Never use the system compressor as a vacuum pump.

Refrigerant tubes and indoor coil should be evacuated using the recommended deep vacuum method of 500 microns. The alternate triple evacuation method may be used if the procedure outlined below is followed. Always break a vacuum with dry nitrogen.

SYSTEM VACUUM AND CHARGE

Using Vacuum Pump

1. Completely tighten flare nuts A, B, C, D, connect manifold gage charge hose to a charge port of the low side service valve. (See Fig. 10.)
2. Connect charge hose to vacuum pump.
3. Fully open the low side of manifold gage. (See Fig.11)
4. Start vacuum pump
5. Evacuate using either deep vacuum or triple evacuation method.
6. After evacuation is complete, fully close the low side of manifold gage and stop operation of vacuum pump.
7. The factory charge contained in the outdoor unit is good for up to 25 ft. (8 m) of line length. For refrigerant lines longer than 25 ft (8 m), add 0.1 oz. per foot of extra piping up to the maximum allowable length.
8. Disconnect charge hose from charge connection of the low side service valve.
9. Fully open service valves B and A.
10. Securely tighten caps of service valves.

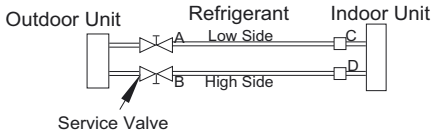


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Fig.10 – Service Valve

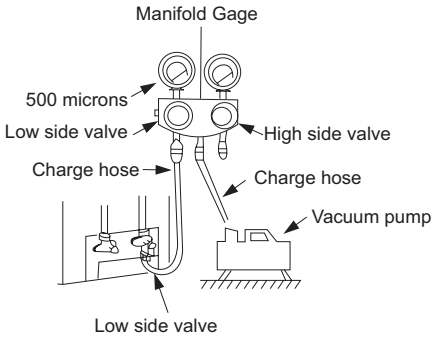

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Fig.11 – Manifold

Deep Vacuum Method

The deep vacuum method requires a vacuum pump capable of pulling a vacuum of 500 microns and a vacuum gage capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of assuring a system is free of air and liquid water. (See Fig. 12)

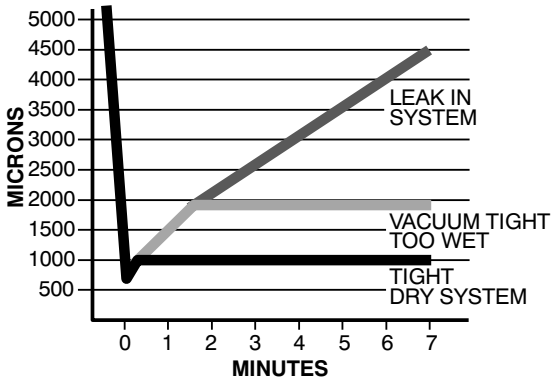

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Fig.12 – Deep Vacuum Graph

Triple Evacuation Method

The triple evacuation method should only be used when vacuum pump is only capable of pumping down to 28 in. of mercury vacuum and system does not contain any liquid water.
Refer to Fig. 18 and proceed as follows:

1. Pump system down to 28 in. of mercury and allow pump to continue operating for an additional 15 minutes.
2. Close service valves and shut off vacuum pump.
3. Connect a nitrogen cylinder and regulator to system and open until system pressure is 2 psig.
4. Close service valve and allow system to stand for 1 hr. During this time, dry nitrogen will be able to diffuse throughout the system absorbing moisture.
5. Repeat this procedure as indicated in Fig.13. System will then be free of any contaminants and water vapor.

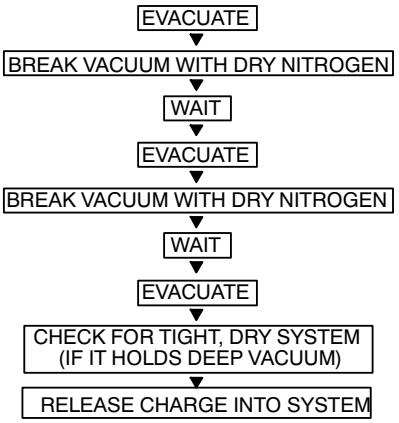

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Fig.13 – Triple Evacuation Method

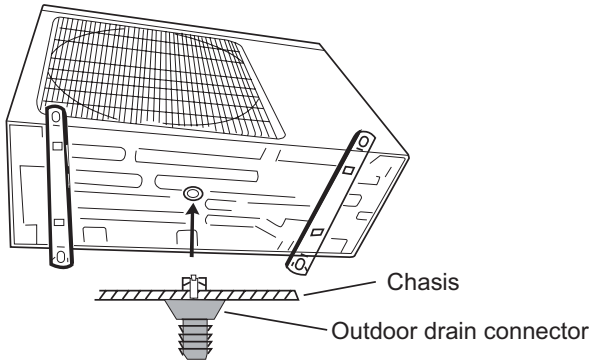
Final Tubing Check

IMPORTANT: Check to be certain factory tubing on both indoor and outdoor unit has not shifted during shipment. Ensure tubes are not rubbing against each other or any sheet metal. Pay close attention to feeder tubes, making sure wire ties on feeder tubes are secure and tight.

7.4.3 Outdoor Condensation Drainage (only for Heat pump unit)

During heating operation, the condensing water and defrosting water should be drained out reliably through the drain hose. Install the outdoor drain connector in a 25 hole on the 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.

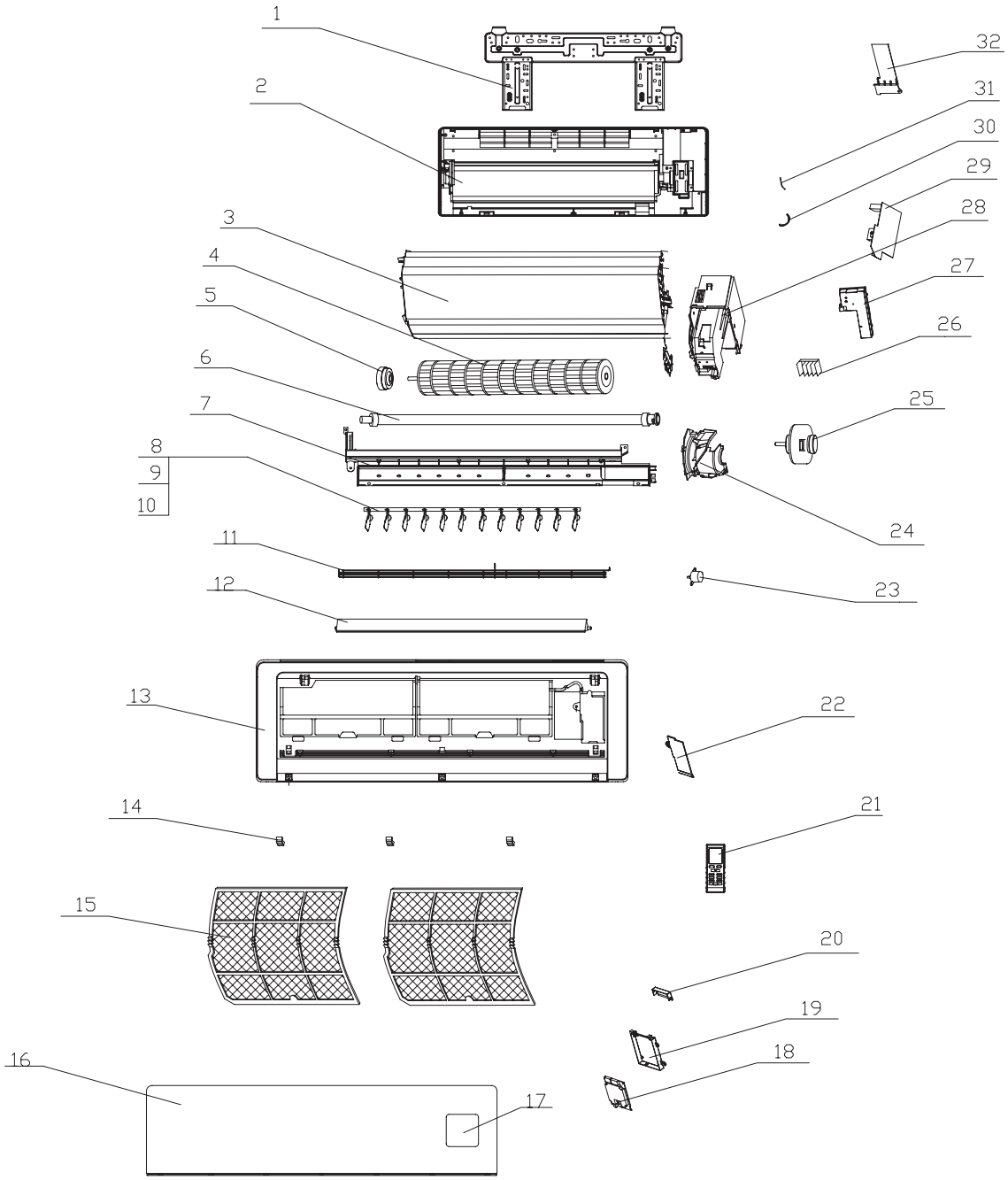
2.Operation Test Method

(1)Switch on power and press “ON/OFF” button on the wireless remote controllerto start the operation.

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

8. Exploded Views and Parts List

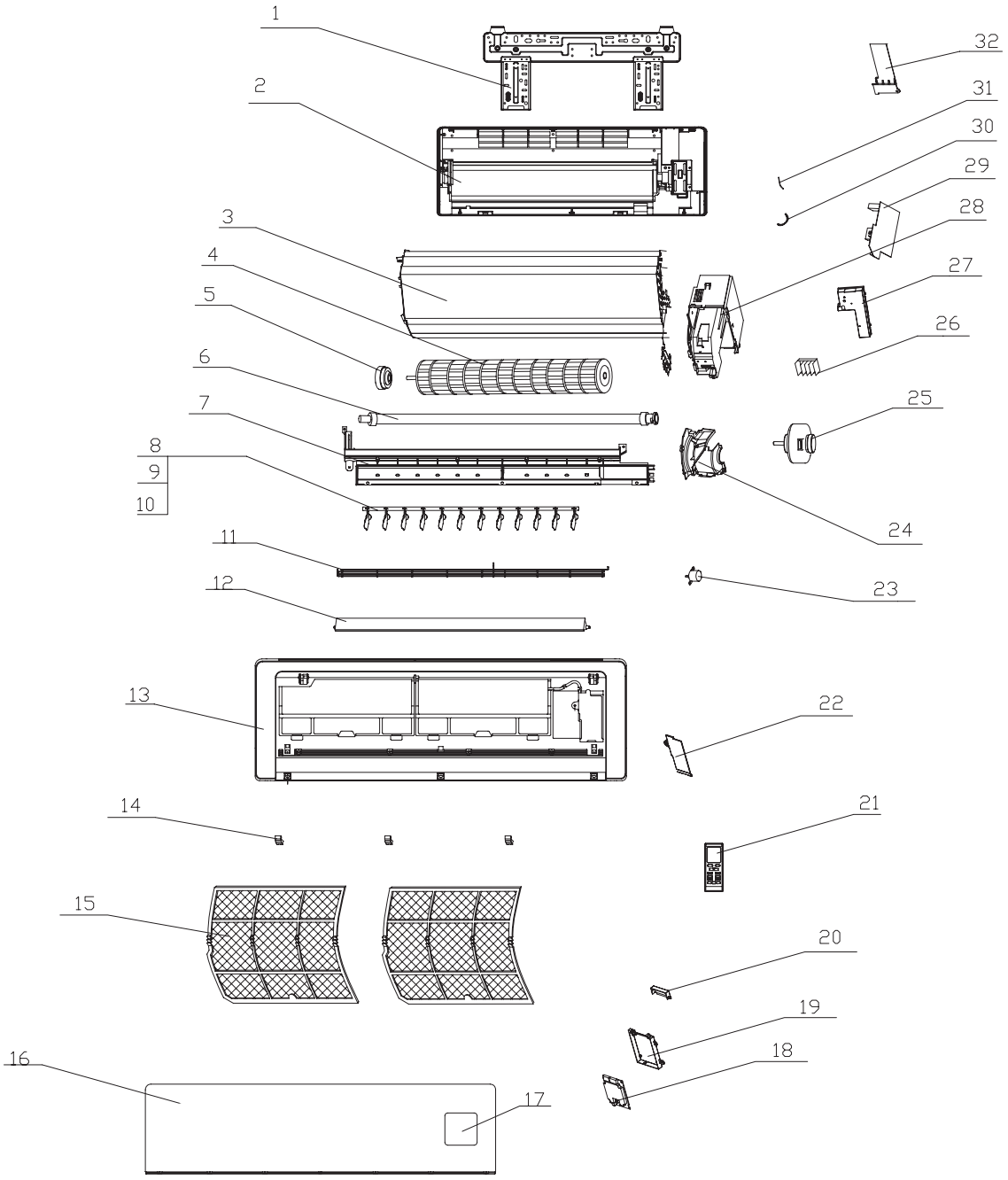
8.1 Indoor Unit



Exploded Views and Parts List

NO.	Description	Part Code	Qty
		GWH09AB-A3DNA1B/I	
	Product Code	CB115N0554_K54715	
1	Wall-Mounting Frame	01252008	1
1	Filter	111220081	2
2	Rear Case assy	2220208402	1
3	Evaporator Assy	01002089	1
4	Cross Flow Fan	10352023	1
5	O-Gasket sub-assy of Bearing	76512051	1
6	Drainage Pipe	0523001401	1
7	Water Tray Assy	20182146	1
8	Louver	10512099	8
9	Louver	10512097	2
10	Swing Linkage	10582450	1
11	Front grill	01472011	1
12	Guide Louver	1051210205P	1
13	Front Case	20002760	1
14	Screw Cover	24252019P	3
15	Filter	11122059	2
16	Front Panel Assy	2001206703	1
17	Decorative Strip	20192203D	1
18	Receiver Board D5005	30545052	1
19	Display Box	none	0
20	Display Box Cover2	20122058	1
21	Remote Controller	305100502	1
22	Electric Box Cover	20122074P	1
23	Step Motor	15012086	1
24	Motor Clamp	26112132	1
25	Motor	1501306801	1
26	4-bit Terminal Board	42011233	1
27	Electric Box Cover1	20122103	1
28	Electric Box Assy	2010256214	1
29	Main Board	30138202	1
30	Ambient Temperature Sensor	390000451	1
31	Tube Sensor (20K black)	390000591	1
32	Press Plate of Connecting Pipe	26112124	1

The above data are subject to be changed without notice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Exploded Views and Parts List

NO.	Description	Part Code	Qty
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	Product Code	CB115N0574_K54715	
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2	Rear Case assy	2220208402	1
3	Evaporator Assy	0100252402	1
4	Cross Flow Fan	10352023	1
5	O-Gasket sub-assy of Bearing	76512051	1
6	Drainage Pipe	0523001401	1
7	Water Tray Assy	20182146	1
8	Louver	10512099	8
9	Louver	10512097	2
10	Swing Linkage	10582450	1
11	Front grill	01472011	1
12	Guide Louver	1051210205P	1
13	Front Case	20002760	1
14	Screw Cover	24252019P	3
15	Filter	11122059	2
16	Front Panel Assy	2001206703	1
17	Decorative Strip	20192203D	1
18	Receiver Board D5005	30545052	1
19	Display Box	none	0
20	Display Box Cover2	20122058	1
21	Remote Controller	305100502	1
22	Electric Box Cover	20122074P	1
23	Step Motor	15012086	1
24	Motor Clamp	26112132	1
25	Motor	1501306801	1
26	4-bit Terminal Board	42011233	1
27	Electric Box Cover1	20122103	1
28	Electric Box Assy	2010256214	1
29	Main Board	30138202	1
30	Ambient Temperature Sensor	390000451	1
31	Tube Sensor (20K black)	390000591	1
32	Press Plate of Connecting Pipe	26112124	1

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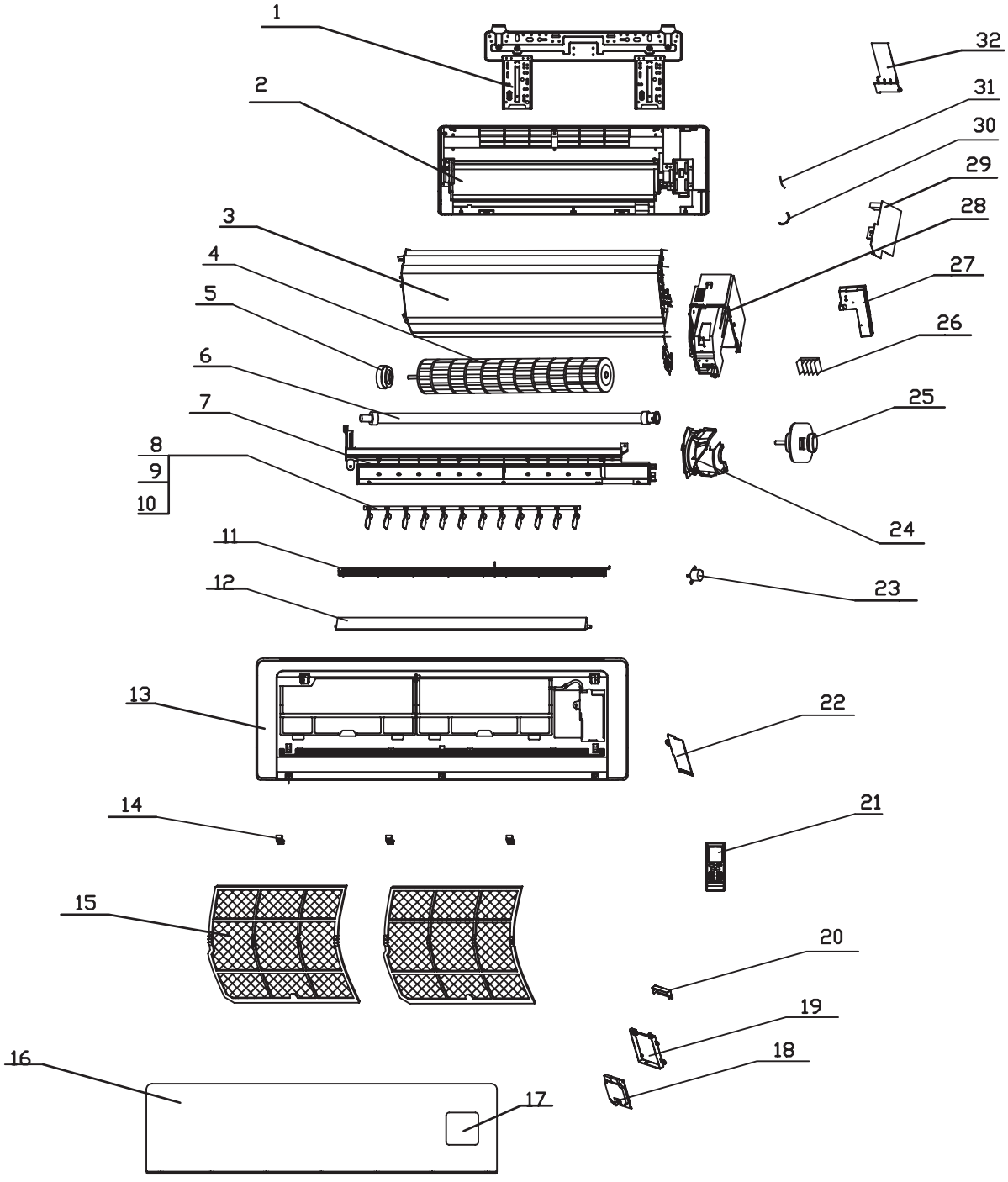
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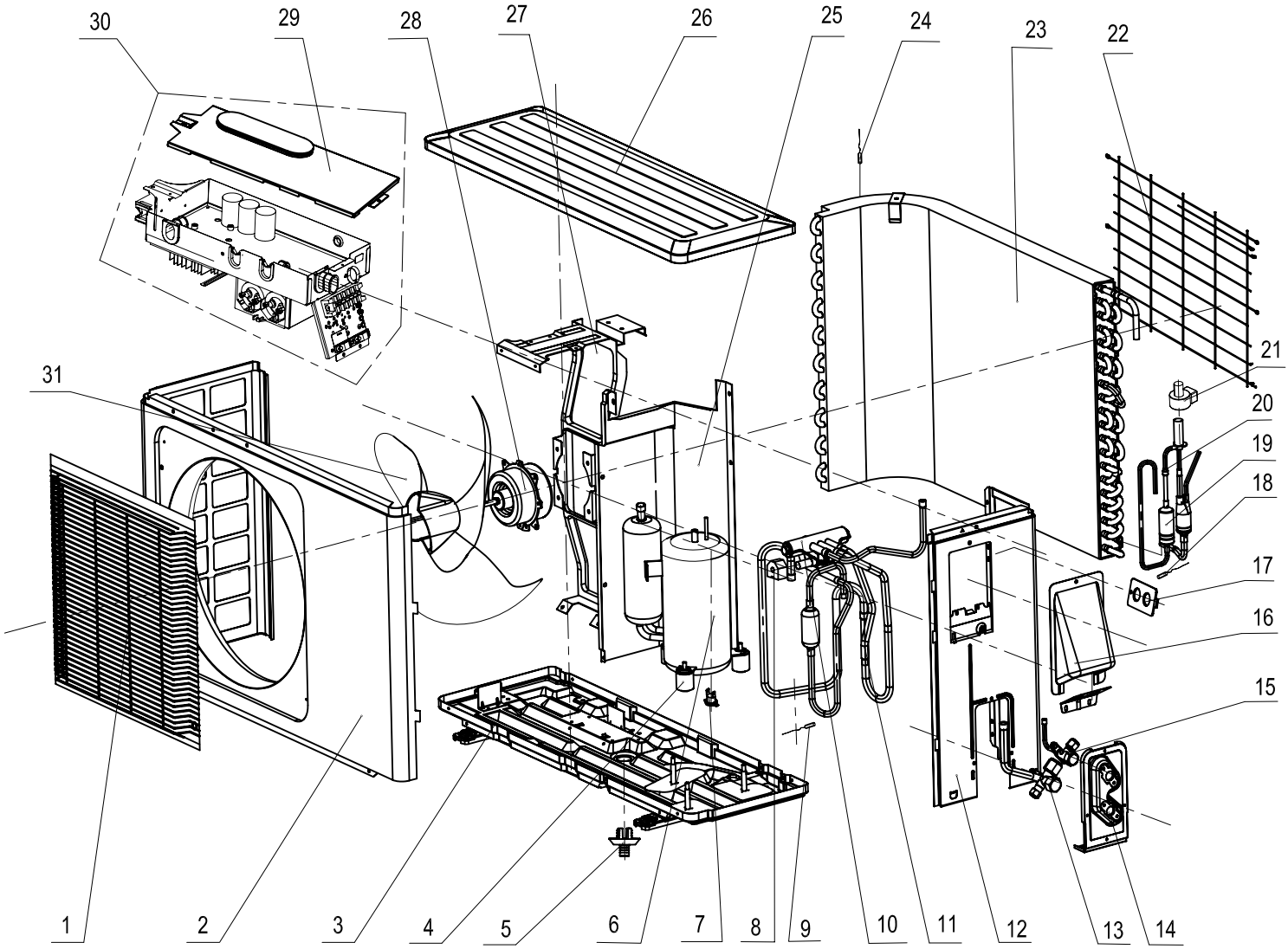
Exploded Views and Parts List

NO.	Description	Part Code	Qty
		GWH12AB-D3DNA1B/I	
	Product Code	CB115N0388_K54715	
1	Wall-Mounting Frame	01252008	1
2	Rear Case assy	2220208402	1
3	Evaporator Assy	0100252402	1
4	Cross Flow Fan	10352023	1
5	O-Gasket sub-assy of Bearing	76512051	1
6	Drainage Pipe	0523001401	1
7	Water Tray Assy	20182146	1
8	Louver	10512099	8
9	Louver	10512097	2
10	Swing Linkage	10582450	1
11	Front grill	01472011	1
12	Guide Louver	1051210205P	1
13	Front Case	20002760	1
14	Screw Cover	24252019P	3
15	Filter	11122059	2
16	Front Panel Assy	2001206703	1
17	Decorative Strip	20192203D	1
18	Receiver Board D5005	30545052	1
19	Display box	20122070	1
20	Display Box Cover2	20122058	1
21	Remote Controller	305100502	1
22	Electric Box Cover	20122074P	1
23	Step Motor	15012086	1
24	Motor Clamp	26112132	1
25	Motor FN10D-ZL	15013068	1
26	4-bit Terminal Board	42011233	1
27	Electric Box Cover1	20122103	1
28	Electric Box Assy	2010256211	1
29	Main Board	30138201	1
30	Ambient Temperature Sensor	390000451	1
31	Tube Sensor (20K black)	390000591	1
32	Press Plate of Connecting Pipe	26112124	1
	Crank	10582070	1
	Shield cover of Electric Box sub-assy	01592073	1
	Filter	111220081	2
	Louver Clamp	26112158	5
	Evaporator Support	24212076	1
	Axile Bush	10542704	1
	Axile Bush (guide louver)	10542008	1
	Jumper Cap	4202300105	1
	Water Tray Glue Plug	76712012	1

The above data are subject to be changed without notice

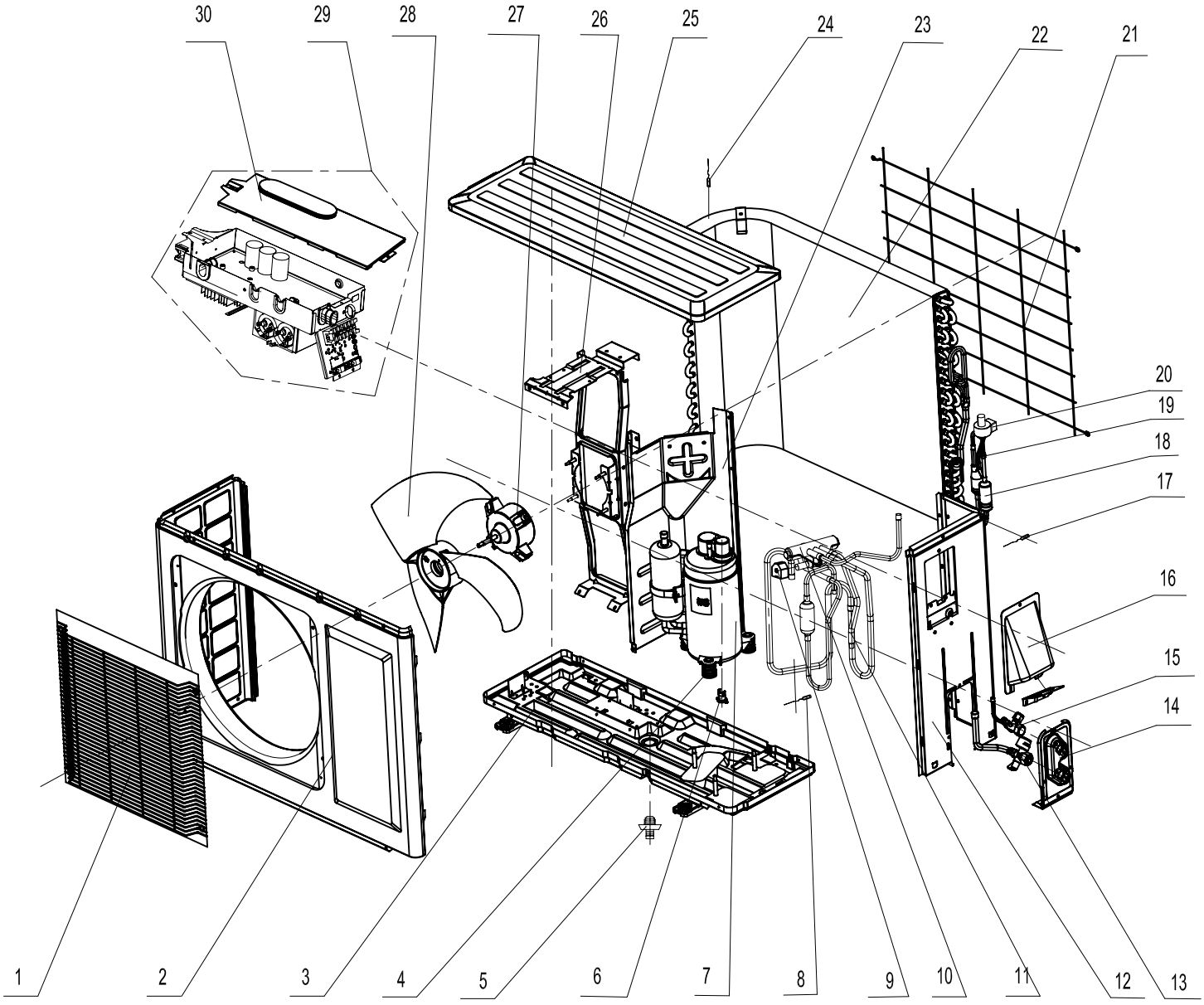
8.2 Outdoor Unit



Exploded Views and Parts List

NO.	Description	Part Code	Qty
		GWH09AB-A3DNA1B/O	
	Product Code	CB115W0551_K54715	
1	Mesh Enclosure	01473012	1
2	Cabinet	0143304601P	1
3	Underpan Sub-Assy	01203524	1
4	Compressor Gasket	76815203	3
5	Drainage Connecter	06123401	1
6	Compressor C-6RZ110H1A	00205212	1
7	Overload Protector	00180002	1
8	4-way Valve Accessary	4300040021	1
9	Temperature Sensor for Discharge Gas	39000016	1
10	4-way Valve	430004032	1
11	4-way Valve Assy	03123315	1
12	Right Side Plate Assy	013030712	1
13	Cut-off Valve	07100135	1
14	Valve Support	01713041	1
15	Cut-off Valve (1/4)	07100003	1
16	Cable Cross Plate Assy	02123015	1
17	Wire cover	01413069	1
18	Magnet Coil	4300876701	1
19	Tube Sensor (20K black)	390001921	1
20	Filter	07220019	1
21	Electric Expansion Valve Sub-Assy	07133554	1
22	Rear Grill	01473014	1
23	Condenser Assy	01113298_K54715	1
24	Sensor	3900020801	1
25	Clapboard Sub-Assy	01233034	1
26	Top Cover Plate	01253443	1
27	Motor suport spot welding sub-assy	01703007	1
28	Motor FW30G-ZL	15013069	1
29	Electric box cover sub-assy	0260309601	1
30	Electric Box Assy	0140398685	1
31	Axial-flow Fan	10333502	1
	Mian board	30138211	1

The above data are subject to be changed without notice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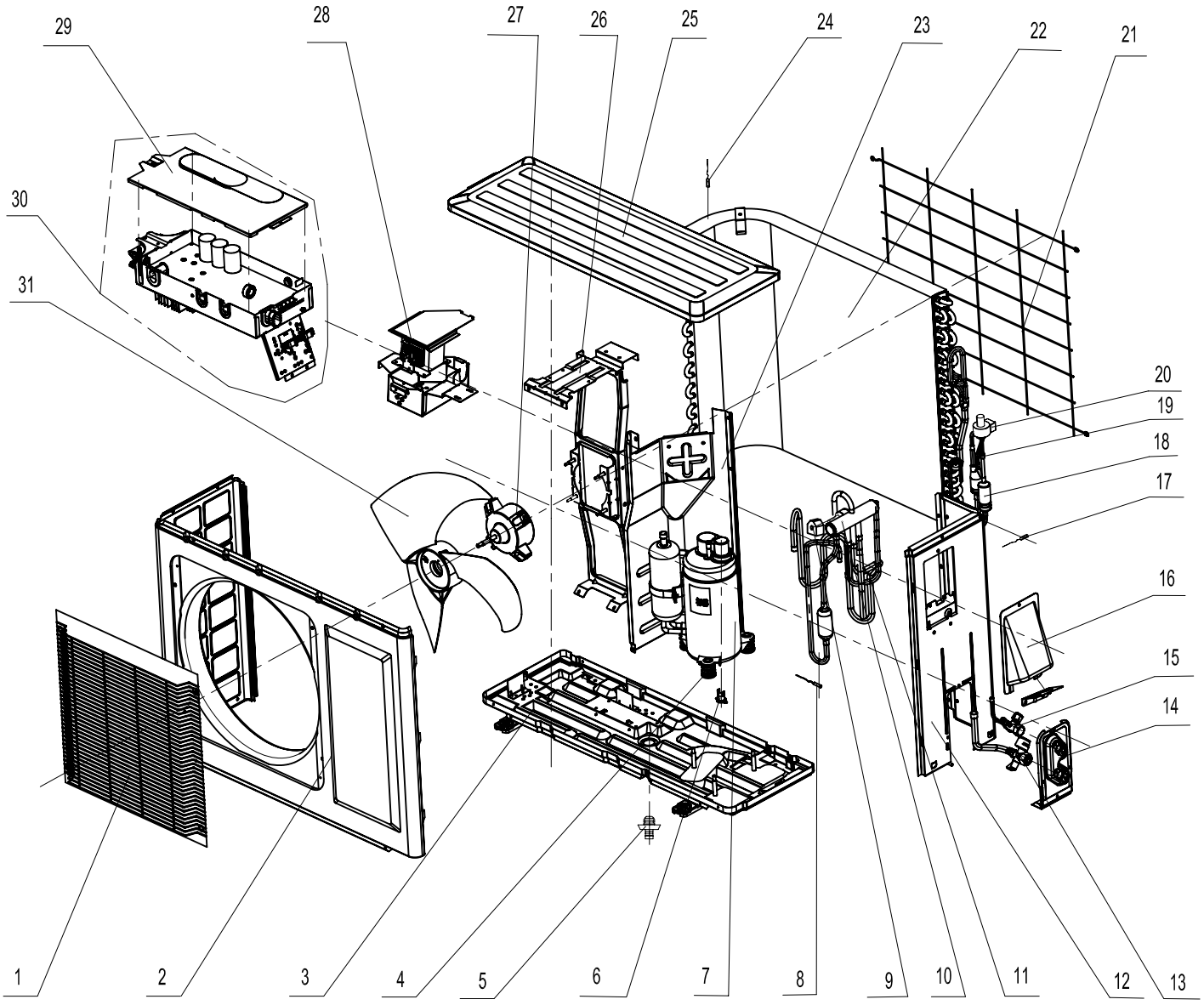
Exploded Views and Parts List

NO.	Description	Part Code	Qty
		GWH12AB-A3DNA1B/O	
	Product Code	CB115W0571_K54715	
1	Front Grill	01473012	1
2	Front Panel	0153500201	1
3	Chassis Sub-assy	01203524	1
4	Compressor Gasket	76815203	3
5	Drainage Connecter	06123401	1
6	Overload Protector	00180002	1
7	Compressor and fittings	00205212	1
8	Discharge Sensor	39000016	1
9	Magnet Coil	4300040021	1
10	4-Way Valve	430004032	1
11	4-Way Valve Assy	03123316	1
12	Right Side Plate	0130508701P	1
13	Valve	07100003	1
14	Valve Support	01713041	1
15	Cut off Valve	07130838	1
16	Cable Cross Plate Sub-assy	02123015	1
17	Tube Sensor	390001921	1
18	Strainer	07220019	1
19	Electric Expansion Valve S	07133458	1
20	Magnet Coil	4300876701	1
21	Rear Grill	01475014	1
22	Condenser Assy	01113520_K54715	1
23	Clapboard Sub-Assy	01233090	1
24	Temperature Sensor	3900020801	1
25	Top Cover Plate	01253443	1
26	Motor Suport Spot Weldin	0170301002	1
27	Fan Motor	15013069	1
28	Axial Flow Fan	10333502	1
29	Electric Box Assy	0140398685	1
30	Electric Box Cover Sub-As	0260309601	1
	Main Board	30138211	1

The above data are subject to be changed without notice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Exploded Views and Parts List

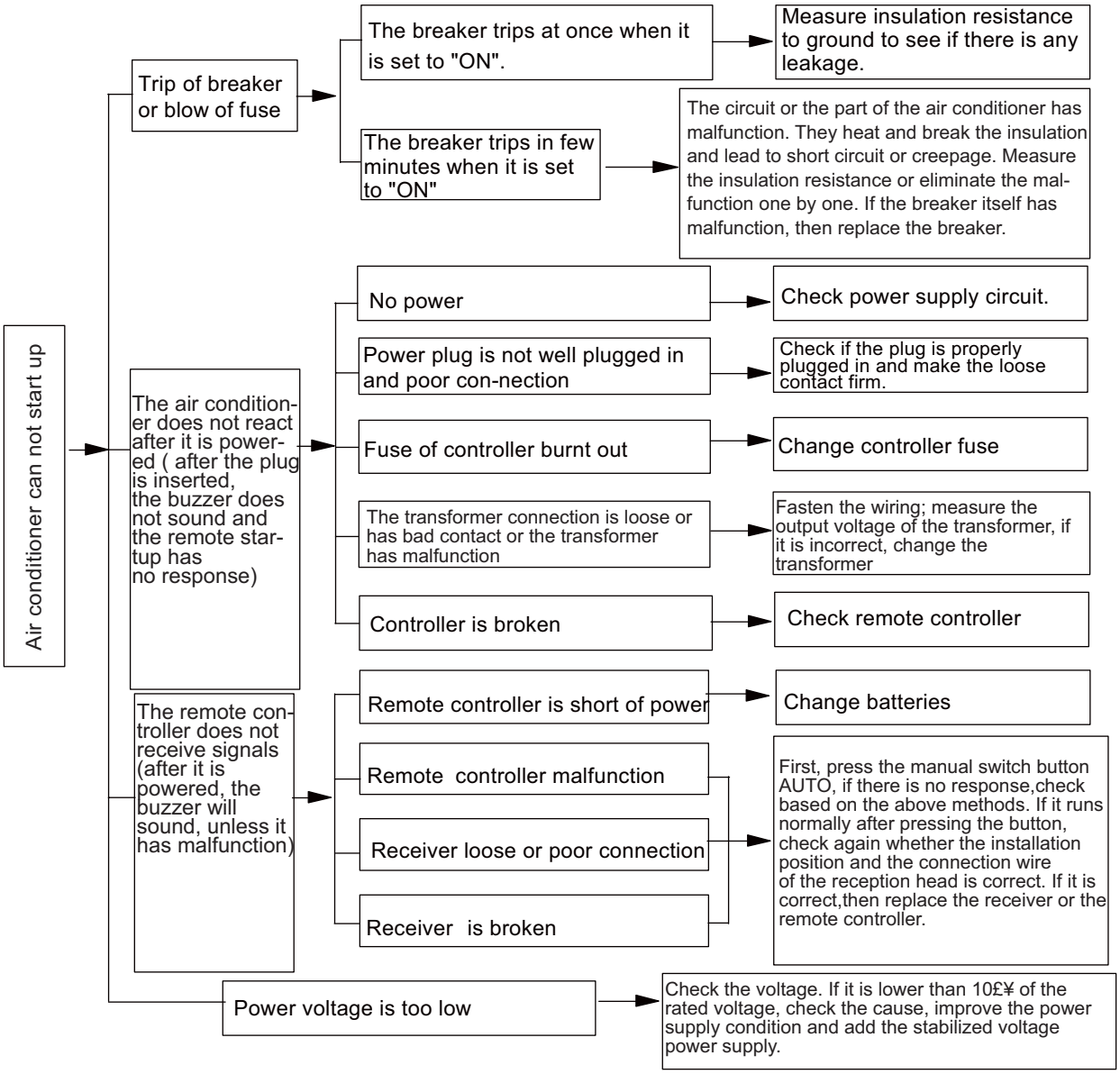
NO.	Description	Part Code	Qty
		GWH12AB-D3DNA1B/O	
	Product Code	CB115W0382_K54715	
1	Front Grill	01473012	1
2	Front Panel	0153500201	1
3	Chassis Sub-assy	01203524	1
4	Compressor Gasket	76815203	3
5	Drainage Connecter	06123401	1
6	Overload Protector	00180002	1
7	Compressor and fittings	00205212	1
8	Discharge sensor	39000016	1
9	Magnet Coil	4300040036	1
10	4-way Valve	430004032	1
11	4-way Valve Assy	03123207	1
12	Right Side Plate	0130508701P	1
13	Valve	07100003	1
14	Valve Support	01713041	1
15	Cut off Valve	07130838	1
16	Cable Cross Plate sub-assy	02123015	1
17	Tube Sensor	390001921	1
18	Strainer	07220019	1
19	Electric Expansion Valve S	07133069	1
20	Magnet Coil	4300876701	1
21	Rear Grill	01475014	1
22	Condenser Assy	01113321_K54715	1
23	Clapboard Sub-Assy	01233090	1
24	Temperature Sensor	3900020801	1
25	Top Cover Plate	01253443	1
26	Motor suport spot welding	0170301002	1
27	Fan Motor	15013069	1
28	Reactor	43130178	1
29	Electric Box Cover Sub-As	0260309601	1
30	Electric Box Assy	0140398683	1
31	Axial Flow Fan	10333502	1
	Main Board	30138209	1

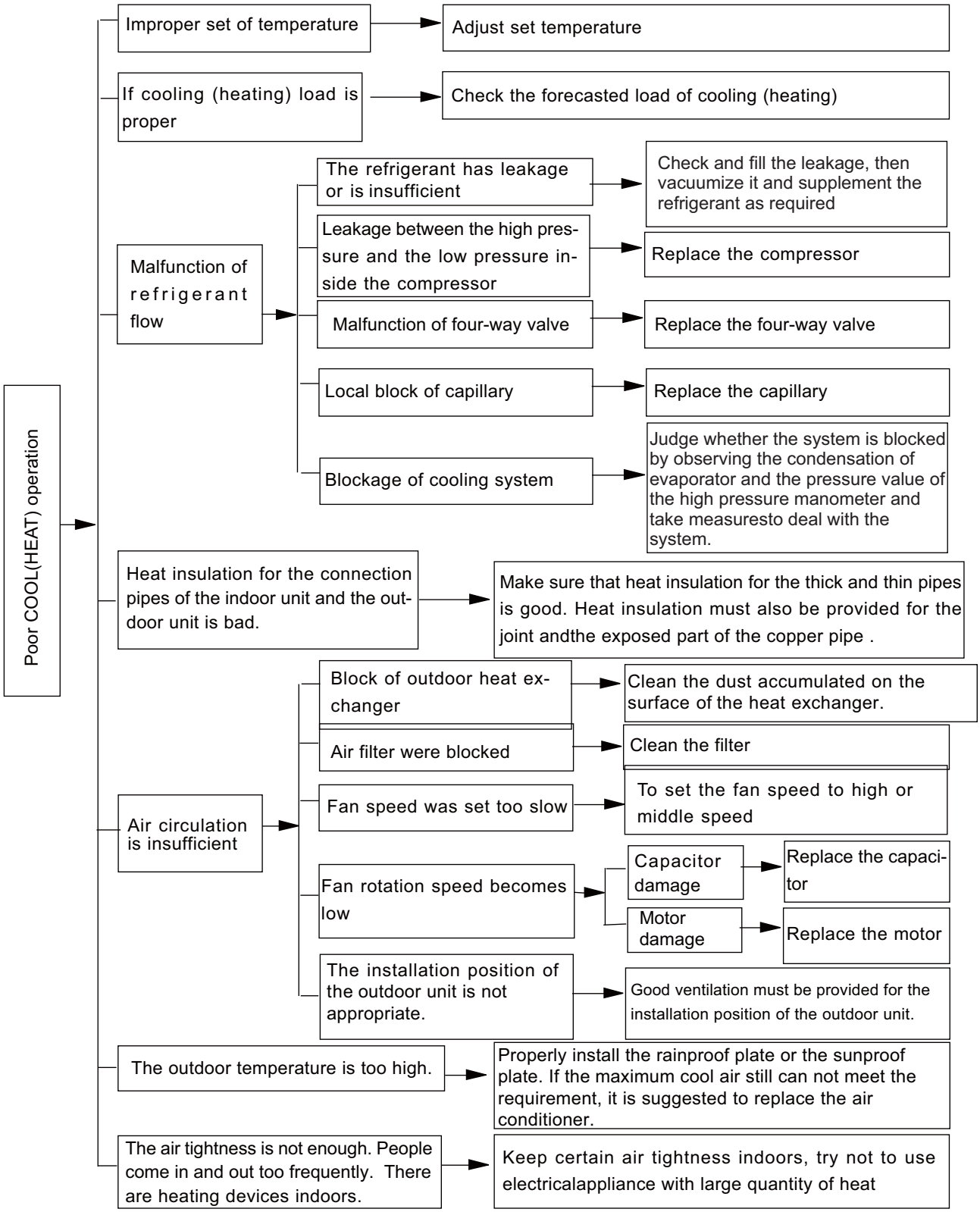
The above data are subject to be changed without notice

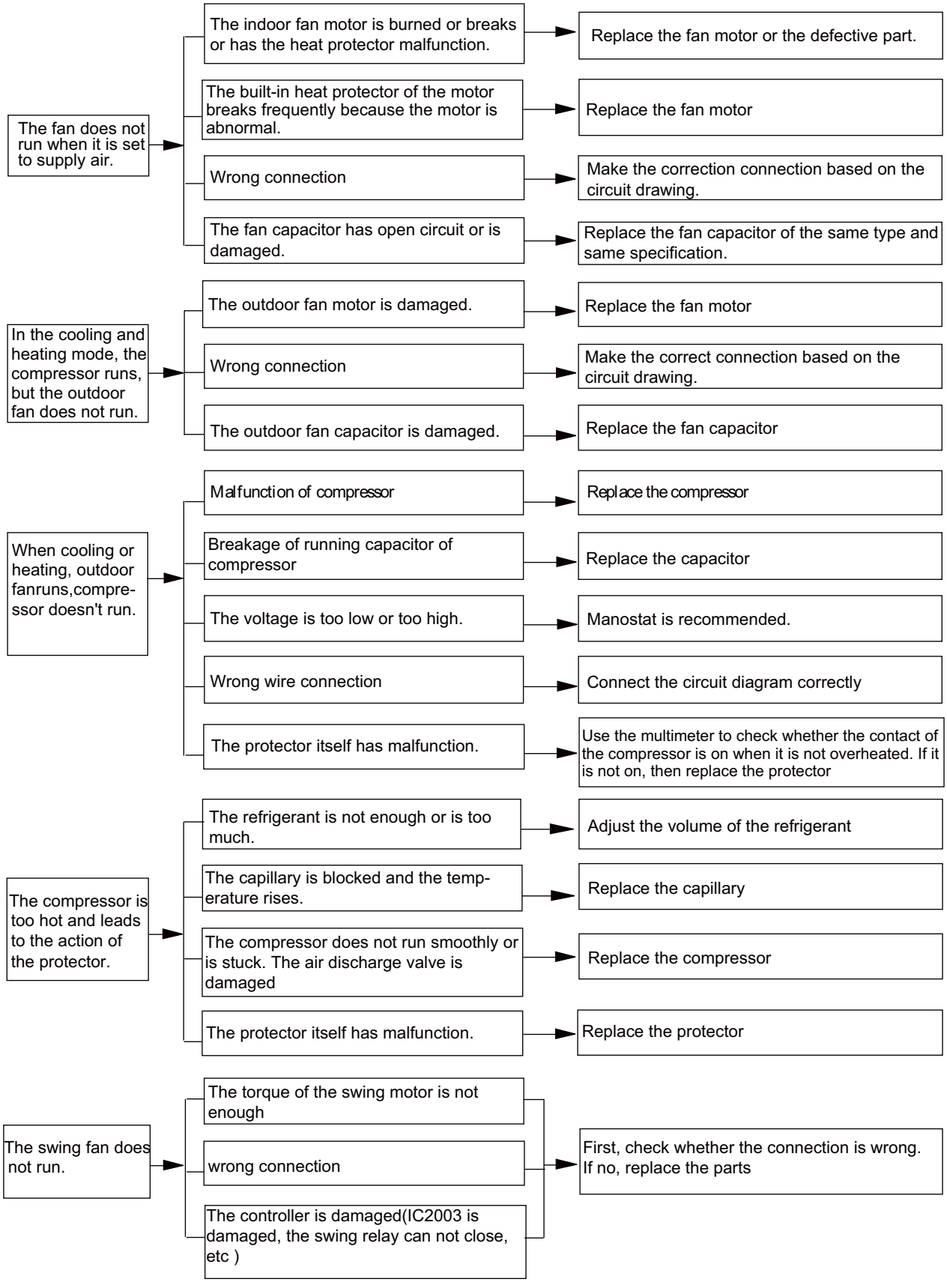
9. Troubleshooting

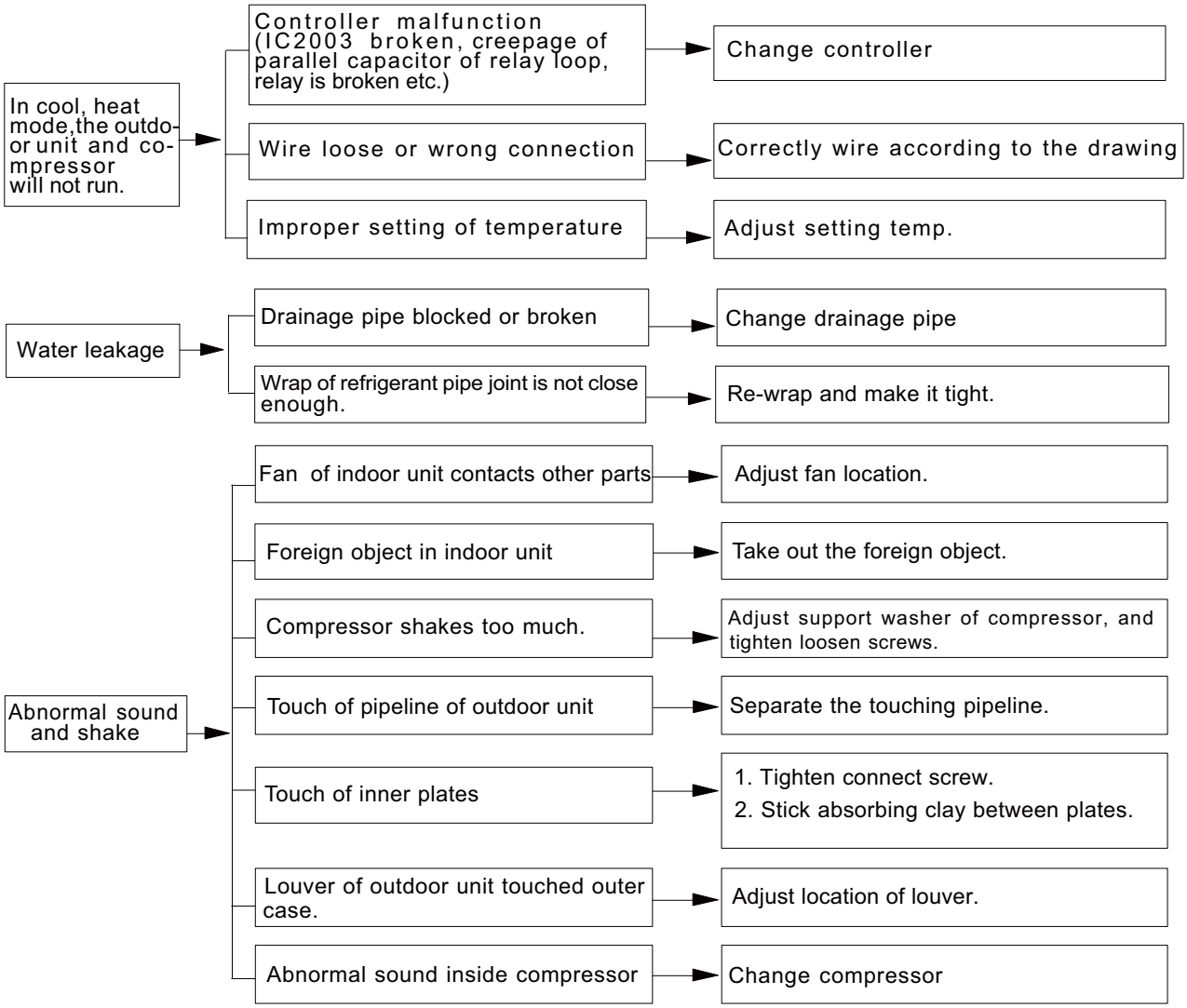
9.1 Malfunction Analysis

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




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


The fan does not run when it is set to supply air.
The indoor fan motor is burned or breaks or has the heat protector malfunction.
Replace the fan motor or the defective part.
The built-in heat protector of the motor breaks frequently because the motor is abnormal.
Replace the fan motor
Wrong connection
Make the correction connection based on the circuit drawing.
The fan capacitor has open circuit or is damaged.
Replace the fan capacitor of the same type and same specification.
In the cooling and heating mode, the compressor runs, but the outdoor fan does not run.
The outdoor fan motor is damaged.
Replace the fan motor
Wrong connection
Make the correct connection based on the circuit drawing.
The outdoor fan capacitor is damaged.
Replace the fan capacitor
When cooling or heating, outdoor fanruns,compre-ssor doesn't run.
Malfunction of compressor
Replace the compressor
Breakage of running capacitor of compressor
Replace the capacitor
The voltage is too low or too high.
Manostat is recommended.
Wrong wire connection
Connect the circuit diagram correctly
The protector itself has malfunction.
Use the multimeter to check whether the contact of the compressor is on when it is not overheated. If it is not on, then replace the protector
The compressor is too hot and leads to the action of the protector.
The refrigerant is not enough or is too much.
Adjust the volume of the refrigerant
The capillary is blocked and the temp-erature rises.
Replace the capillary
The compressor does not run smoothly or is stuck. The air discharge valve is damaged
Replace the compressor
The protector itself has malfunction.
Replace the protector
The swing fan does not run.
The torque of the swing motor is not enough
wrong connection
The controller is damaged(IC2003 is damaged, the swing relay can not close, etc)
First, check whether the connection is wrong. If no, replace the parts

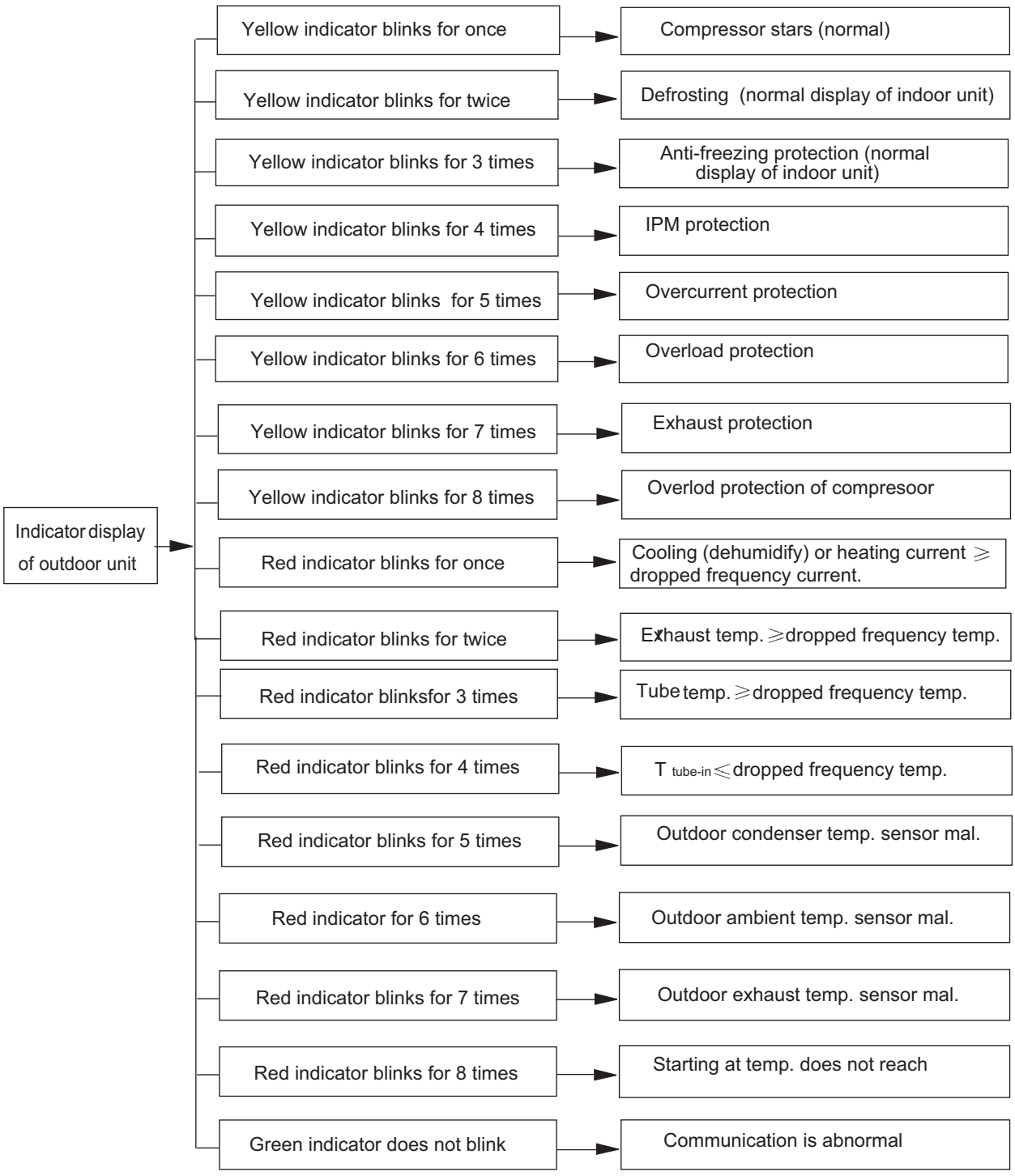

In cool, heat mode,the outdoor unit and compressor will not run.
Controller malfunction (IC2003 broken, creepage of parallel capacitor of relay loop, relay is broken etc.)
Change controller
Wire loose or wrong connection
Correctly wire according to the drawing
Improper setting of temperature
Adjust setting temp.
Water leakage
Drainage pipe blocked or broken
Change drainage pipe
Wrap of refrigerant pipe joint is not close enough.
Re-wrap and make it tight.
Abnormal sound and shake
Fan of indoor unit contacts other parts
Adjust fan location.
Foreign object in indoor unit
Take out the foreign object.
Compressor shakes too much.
Adjust support washer of compressor, and tighten loosen screws.
Touch of pipeline of outdoor unit
Separate the touching pipeline.
Touch of inner plates
1. Tighten connect screw.
2. Stick absorbing clay between plates.
Louver of outdoor unit touched outer case.
Adjust location of louver.
Abnormal sound inside compressor
Change compressor

9.2 Flashing LED of Indoor/Outdoor Unit and Primary Judgement

Name of malfunction	Display of indoor unit	State of the lamps on the outdoor unit PCB			State of the lamps on the indoor unit PCB			Reasons
	ERROR CODE	YELLOW	RED	GREEN	RUNNING	COOLING	HEATING	
Compressor running (normal)		blink-1 times					blink-1 times	Normal
Automatic defrosting (normal)	H1	blink-2 times			blink-2 times			Normal
Anti-freezing protection	E2	blink-3 times						Refrigerant leakage、indoor unit air flow blocked up、filter duty
Stop for IPM module protection (over current)	H5	blink-4 times					blink-5 times	IPM moudel over current、outdoor unit air flow blocked up
Stop for over current protection	E5	blink-5 times			blink-5 times			Outdoor unit over current、ambient temperature is abominable
Overload protection	H4	blink-6 times						Ambient temperature is abominable、heat exchanger blocked up
Stop for exhaust protection	E4	blink-7 times			blink-4 times			Less refrigerant、capillary blocked up、ambient temperature is abominable
Stop for compressor overload protection	H3	blink-8 times					blink-3 times	Compressor shell over heat、less refrigerant、capillary blocked up
Stop for over power protection	L9	blink-9 times						Ambient temperature is abominable
Stop for IPM module protection (over heat)	H5	blink-10 times					blink-5 times	IPM moudel over heat、outdoor unit air flow blocked up
Stop for EEPROM read-write malfunction	EE	blink-11 times						The EEPROM on the outdoor PCB mainboard can not read or write
Stop for low voltage protection	PL	blink-12 times					blink-21 times	DC voltage is too low.
Stop for high voltage protection	PH	blink-13 times				blink-11 times		DC voltage is too high.
Stop for PFC circuit over current protection	HC	blink-14 times						The PFC circuit over current
No feedback of indoor fan motor	H6				blink-11 times			indoor fan is abnormal
Stop for ID and OD doesn't match	LP	blink-16 times						The indoor unit and outdoor unit doesn't match
Refrigerant or Capillary abnormity	F0	blink-17 times						Less refrigerant、capillary blocked up
Compressor frequence limit by over current protection	F8		blink-1 times			blink-8 times		Outdoor unit over current、ambient temperature is abominable
Compressor frequence limit by exhaust protection	F9		blink-2 times			blink-9 times		Less refrigerant、capillary blocked up、ambient temperature is abominable
Compressor frequence limit by over load protection			blink-3 times					Ambient temperature is abominable、heat exchanger blocked up
Compressor frequence limit by anti-freezing protection			blink-4 times			blink-4 times		Refrigerant leakage、indoor unit air flow blocked up、filter duty
Outdoor pipe temperature sensor malfunction	F4		blink-5 times					Circuit-open or circuit-short for outdoor condenser pipe temp. sensor
Outdoor ambient temperature sensor malfunction	F3		blink-6 times			blink-3 times		Circuit-open or circuit-short for outdoor environment temp. sensor
Outdoor exhaust temperature sensor malfunction	F5		blink-7 times			blink-5 times		Circuit-open or circuit-short for outdoor gas-discharge pipe temp. sensor
The indoor temp. reach to operate compressor (nomal)			blink-8 times					Nomal,compressor prepare to running
Compressor frequence limit by IPM protection			blink-11 times					IPM moudel over heat、outdoor unit air flow blocked up
Compressor frequence limit by over power protection			blink-13 times					Ambient temperature is abominable
Indoor ambient temperature sensor malfunction	F1					blink-1 times		Circuit-open or circuit-short for indoor environment temp. sensor
Indoor tube temperature sensor malfunction	F2					blink-2 times		Circuit-open or circuit-short for indoor evaporator pipe temp. sensor
Stop for communication malfunction	E6			off	blink-6 times			Communication line failure、main PCB failure、interfere source、connect line wrong
Communication normal				on				Communication is normal
Jumper cap malfunction protection	C5				blink-15 times			The jumper misfit the main board
Heating anti-high temperature drop frequency	H0						blink-10 times	Indoor tube temperature is too high

Remark: The lamps blink 0.5s on, 0.5s off,between two error cycle,it will be 2s off interval .

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



Analysis or processing of some of the malfunction display:

1. Compressor discharge protection

   Possible reasons: shortage of refrigerant; blockage of air filter; poor ventilation or air flow short pass for condenser; the system has noncondensing gas (such as air, water etc.); blockage of capillary assy (including filter); leakage inside four-way valve causes incorrect operation; malfunction of compressor; malfunction of protection relay; malfunction of discharge sensor; outdoor temperature too high.
   Processing method: refer to the malfunction analysis in the above section.

2. Low voltage overcurrent protection

   Possible reason: Sudden drop of supply voltage.

3. Communication malfunction

   Processing method: Check if communication signal cable is connected reliably.

4. Sensor open or short circuit

   Processing method: Check whether sensor is normal, connected with the corresponding position on the controller and if damage of lead wire is found.

5. Compressor overload protection

   Possible reasons: insufficient or too much refrigrant; blockage of capillary and increase of suction temp.; improper running of compressor, burning in or stuck of bearing, damage of discharge valve; malfunction of protector.

   Processing method: adjust refrigerant amount; replace the capillary; replace the compressor; use universal meter to check if the contactor of compressor is fine when it is not overheated, if not replace the protector.

6. System malfunction

   i.e.overloadprotection.Whentubetemperature(Check thetemperatureof outdoor heat exchanger when cooling and check the temperature of indoor heat exchanger when heating) is too high, protectionwill beactivated.

   Possible reasons: Outdoor temperature is too high when cooling; insufficient outdoor air circulation; refrigerant flow malfunction.
   please refer to the malfunction analysis in the previous section for handling method .

7. IPM module protection

   Processing method:Once the module malfunction happens,if it persists for a long time and can not be self- canceled, cut off the power and turn off the unit,and then re-energize the unit again after about 10 min.After repeating the procedure for sever times, if the malfunction still exists,replace the module.

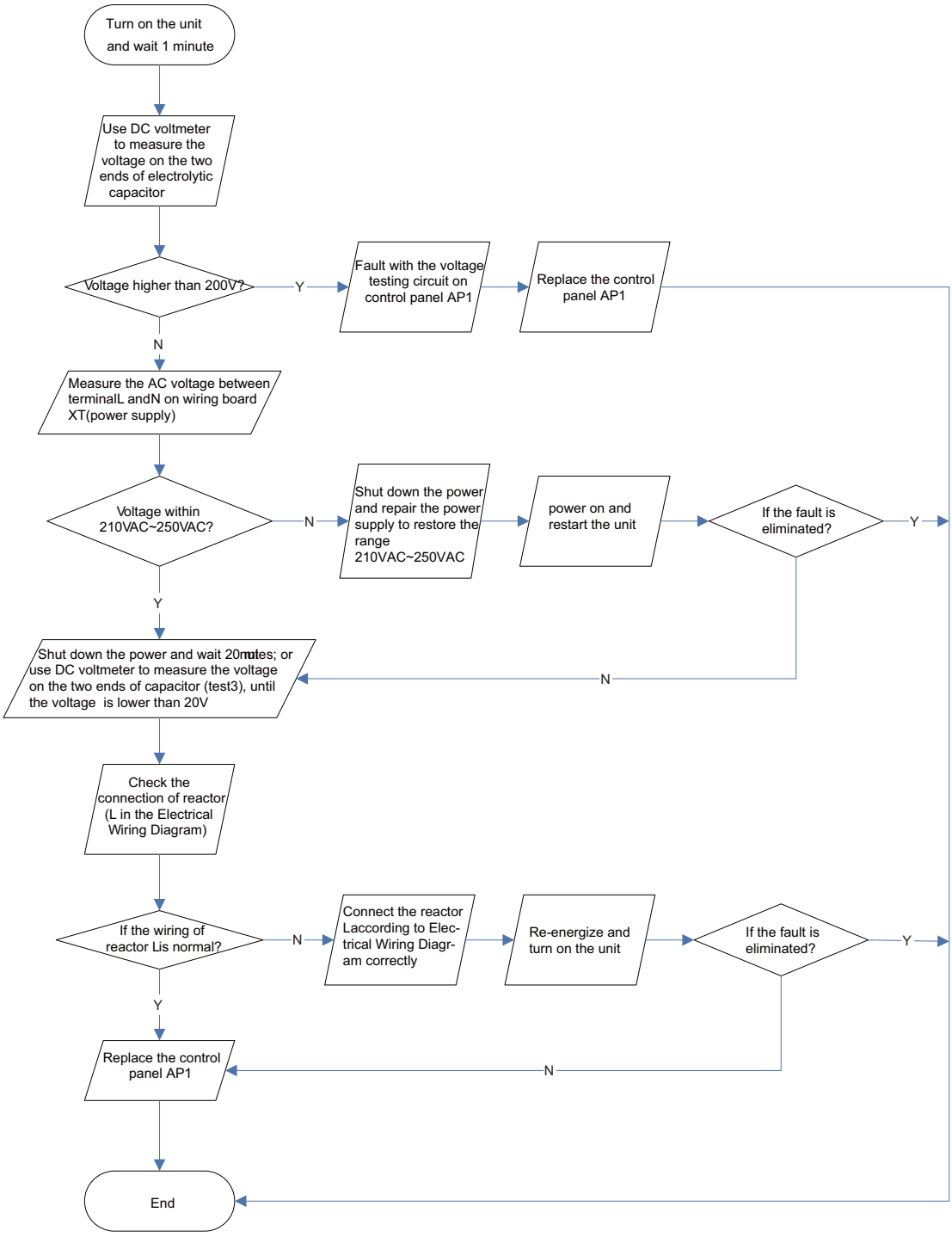
9.3 How to Check simply the main part

(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.
- If the reactor (L) is correctly connected? If the connection is loose or fallen? If the reactor (L) is damaged?

Fault diagnosis process:

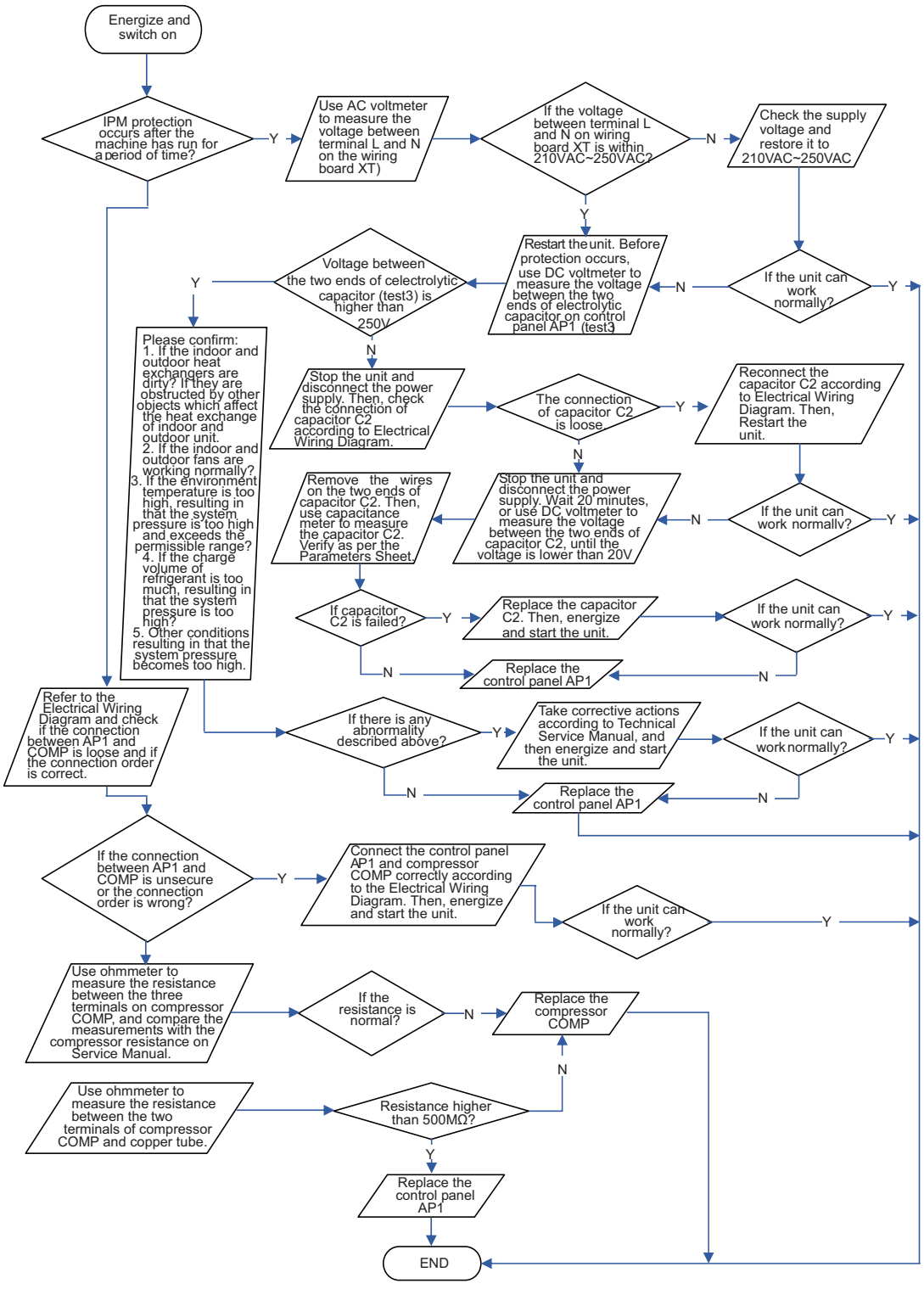


(2) IPM Protection, Out-of-step Fault, Compressor Phase Overcurrent (AP1 below refers to the outdoor control panel)

Main check points:

- If the connection between control panel AP1 and compressor COMP is secure? If loose? If the connection is in correct order?
- If the voltage input of the machine is within normal range? (Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
- If the compressor coil resistance is normal? If the insulation of compressor coil against the copper tube is in good condition?
- If the working load of the machine are too high? If the radiation is good?
- If the charge volume of refrigerant is correct?

Fault diagnosis process:

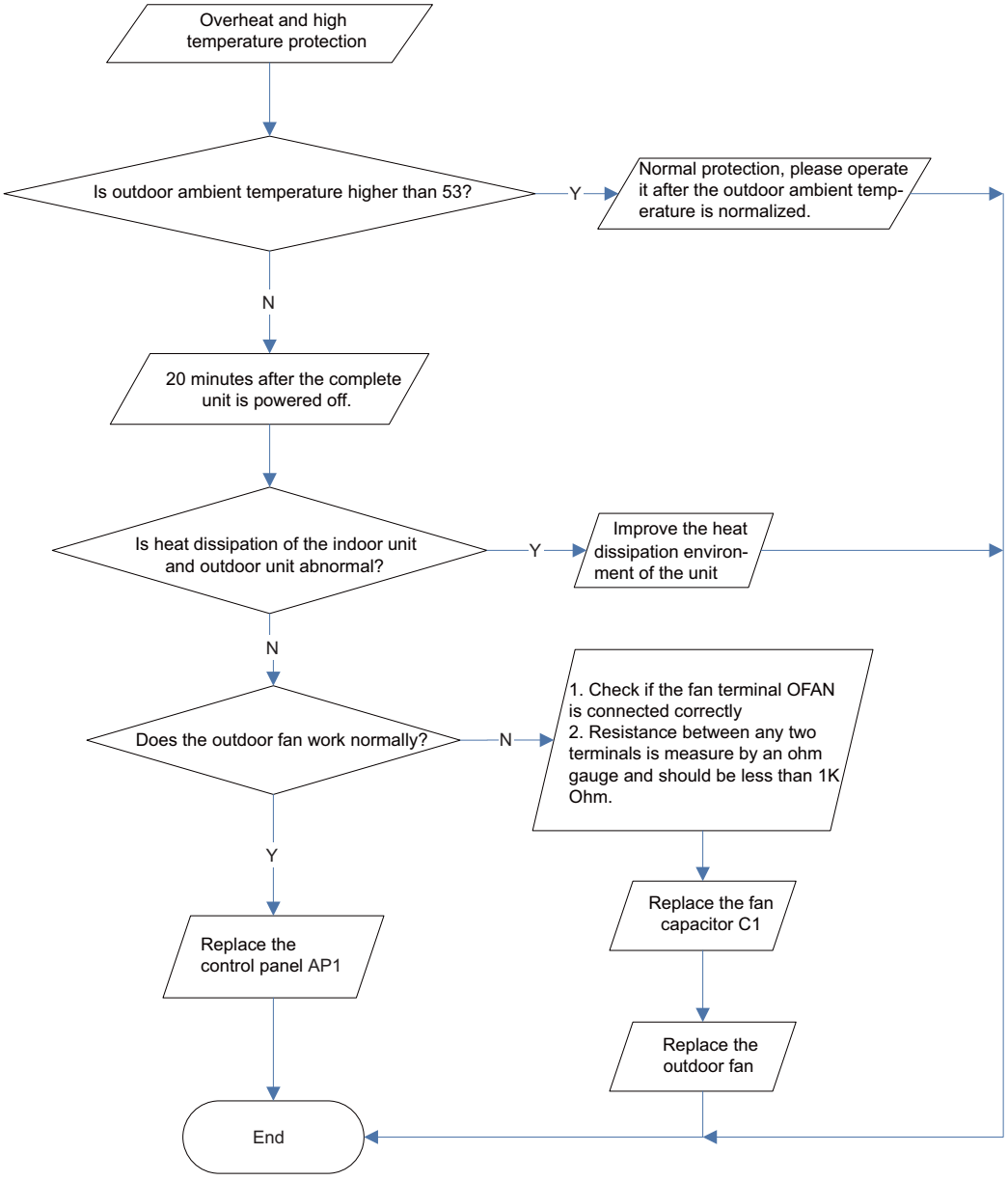


(3)High temperature and overload protection diagnosis (AP1 hereinafter refers to the control board of the outdoor unit)

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 is good?

Fault diagnosis process:

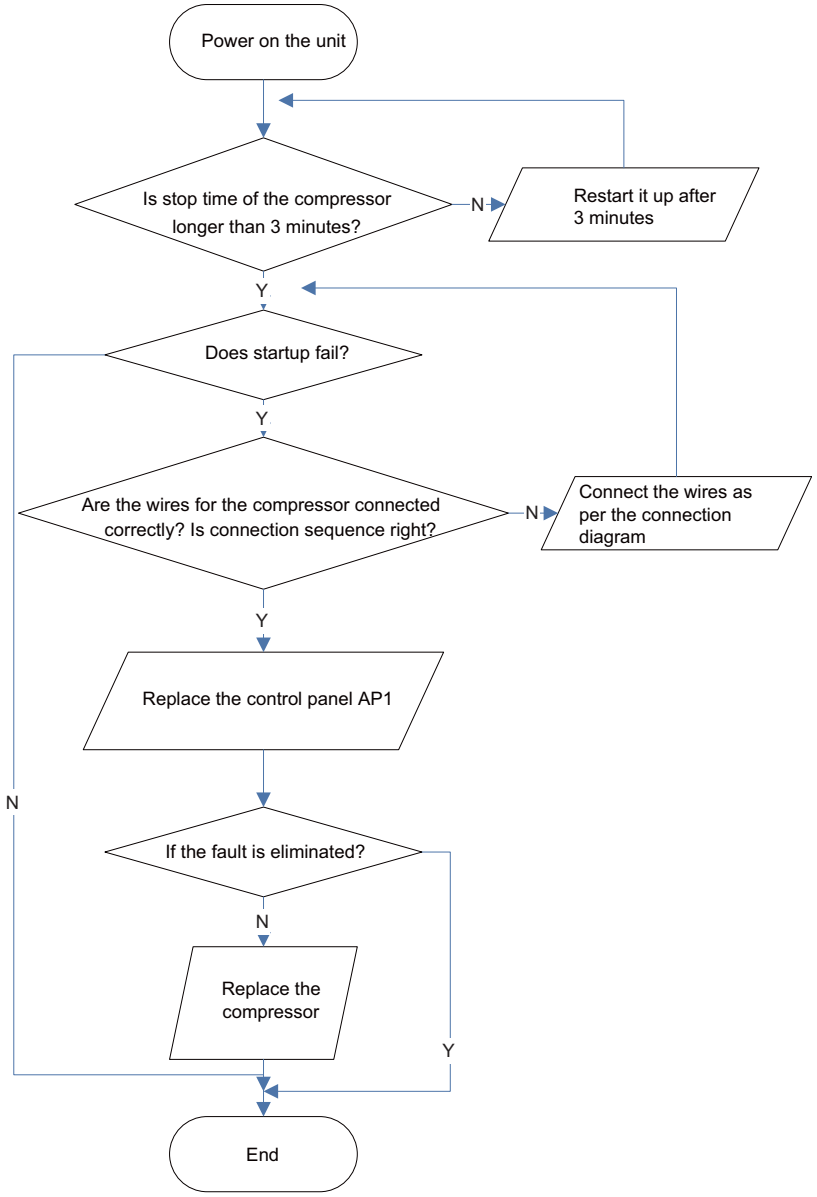


(4) Start-up failure (following AP1 for outdoor unit control board)

Mainly detect:

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

Fault diagnosis process:

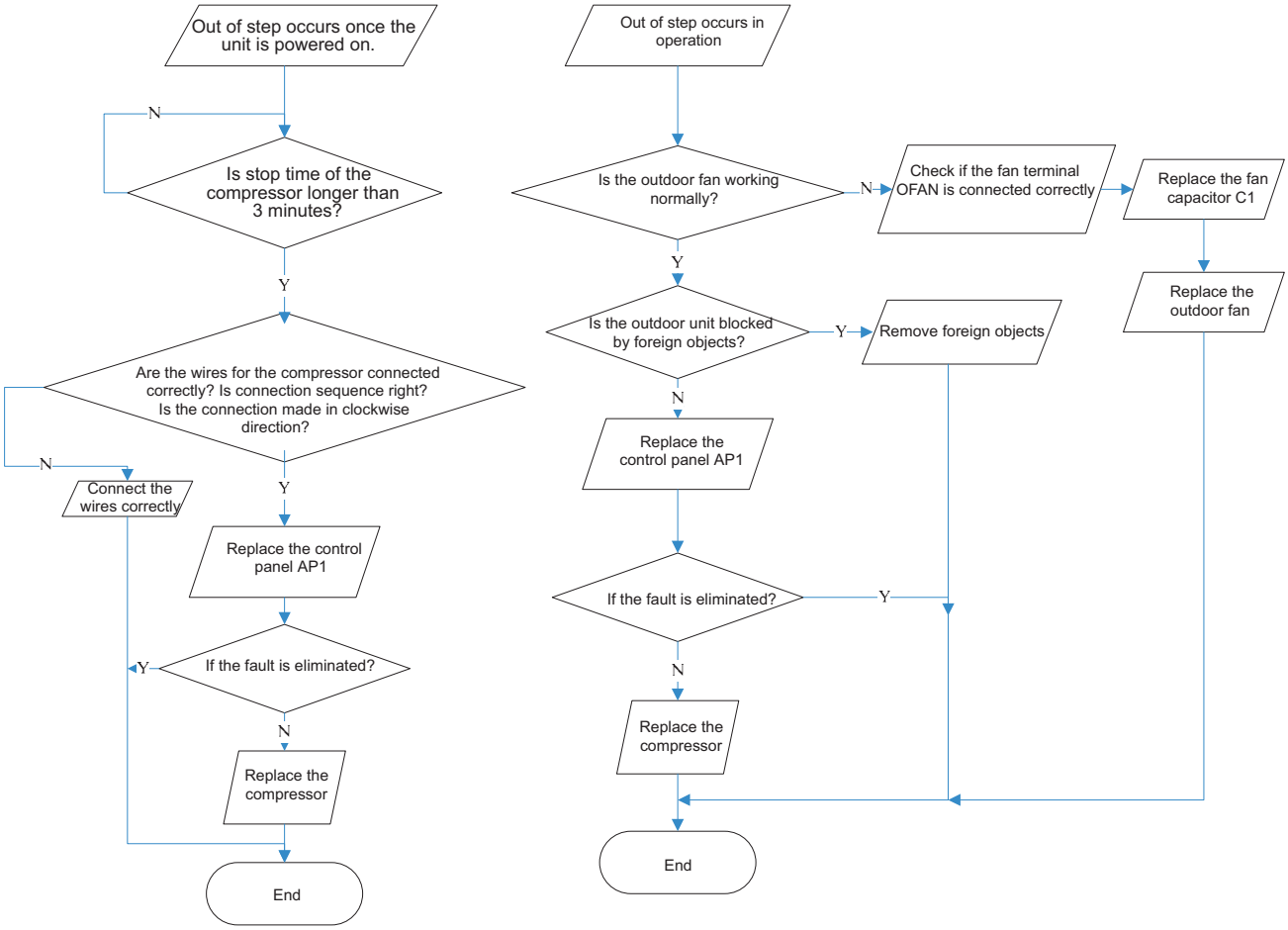


(5) Out of step diagnosis for the compressor (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

- Whether the system pressure is too high?
- Whether the input voltage is too low?

Fault diagnosis process:

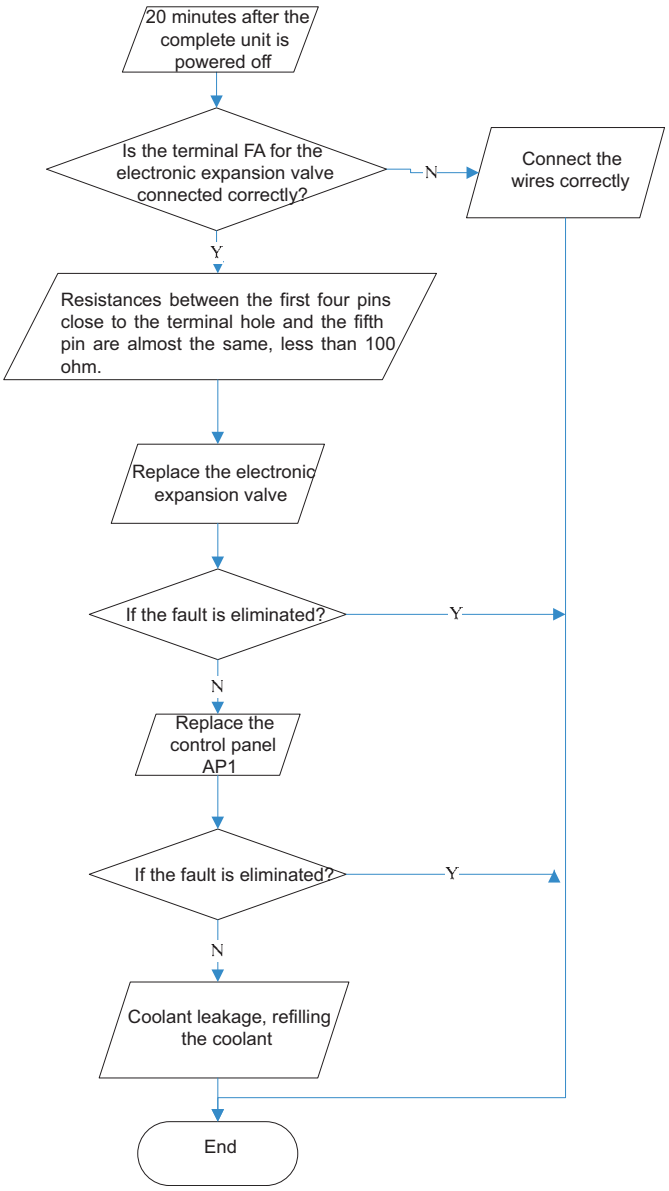


(6)Overload and air exhaust malfunction diagnosis (following AP1 for outdoor unit control board)

Mainly detect:

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

Fault diagnosis process:

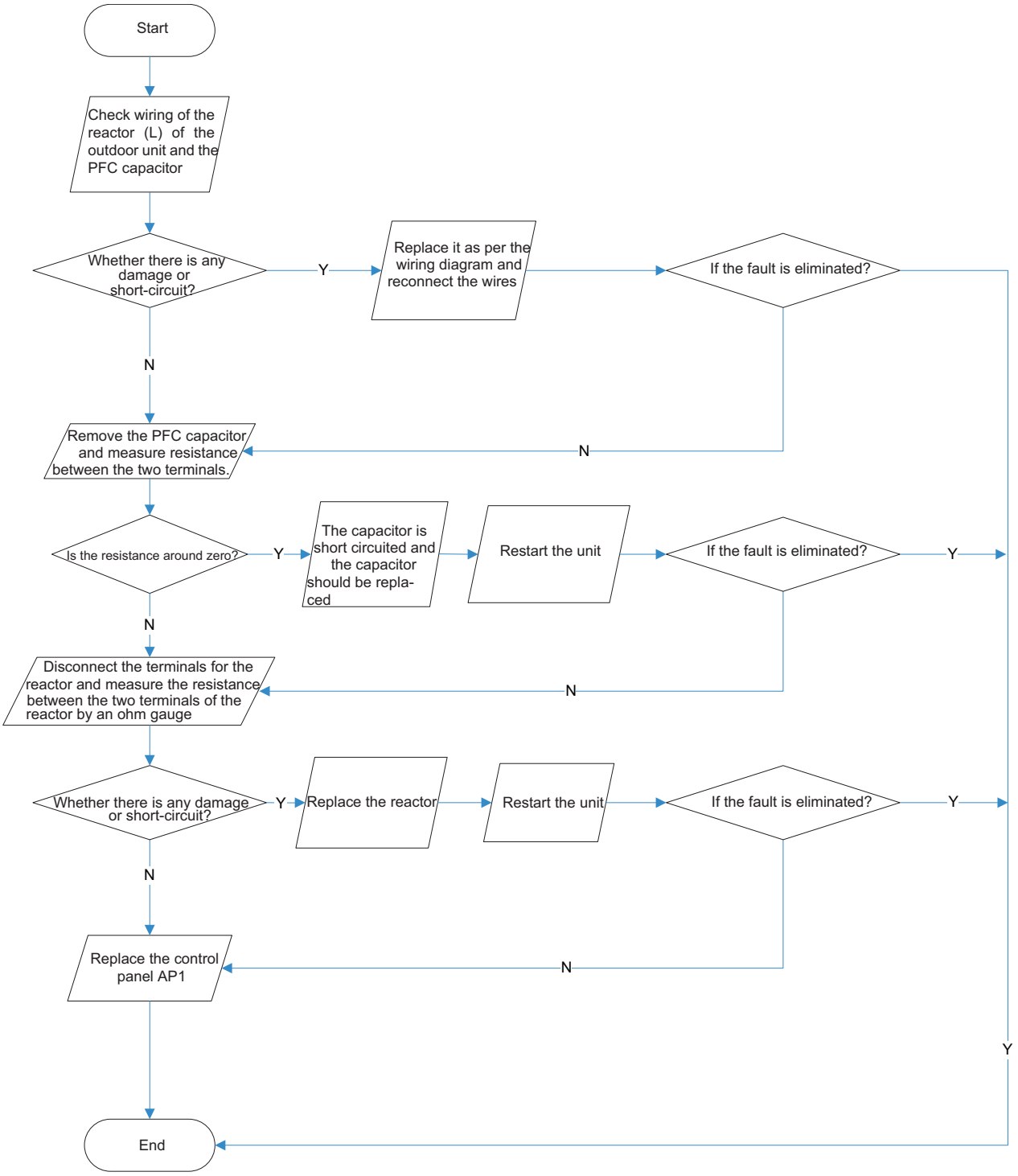


(7)Power factor correct or (PFC) fault (a fault of outdoor unit) (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

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

Fault diagnosis process:



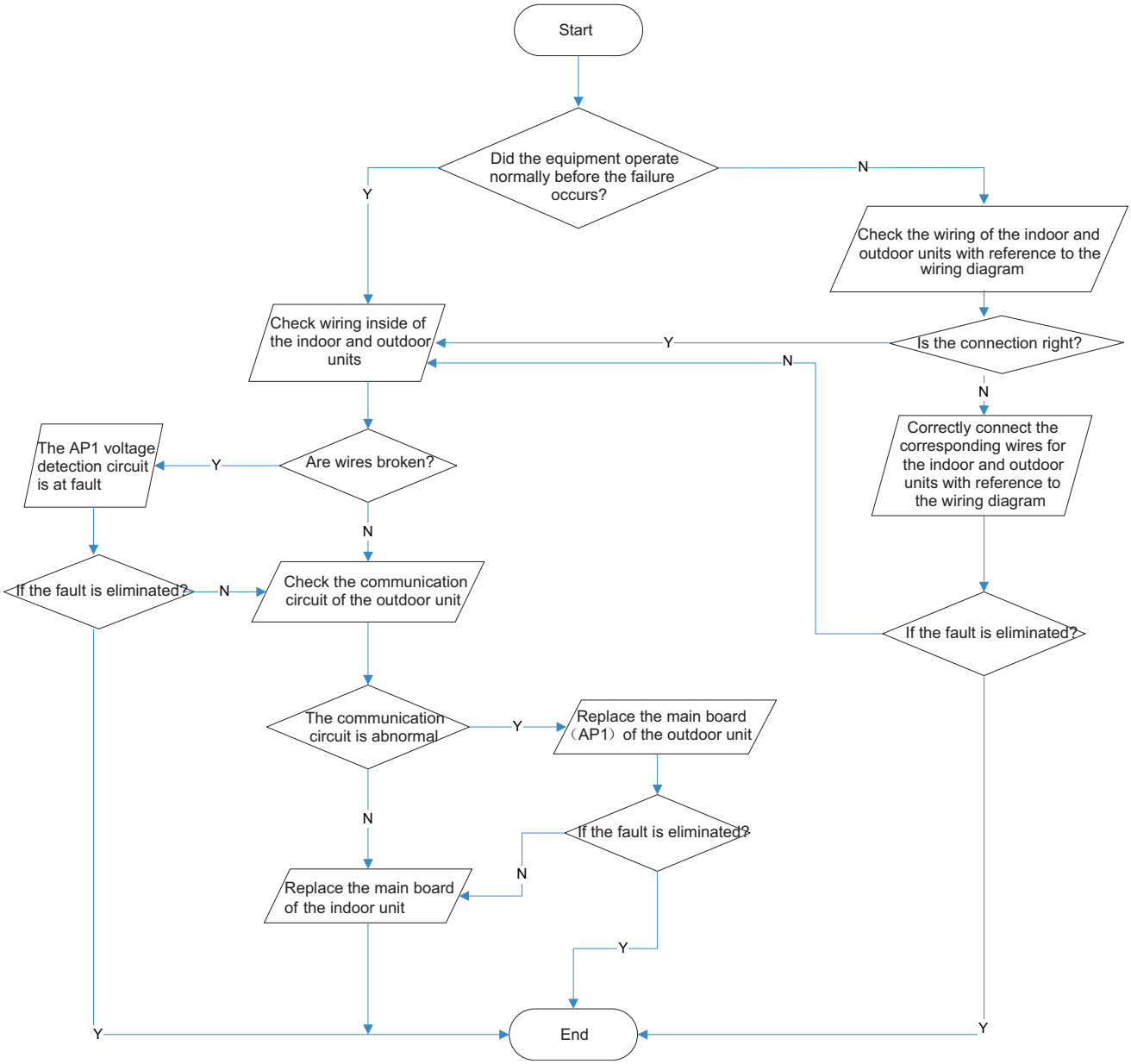
(8) Communication malfunction: (following AP1 for outdoor unit control board)

Mainly detect:

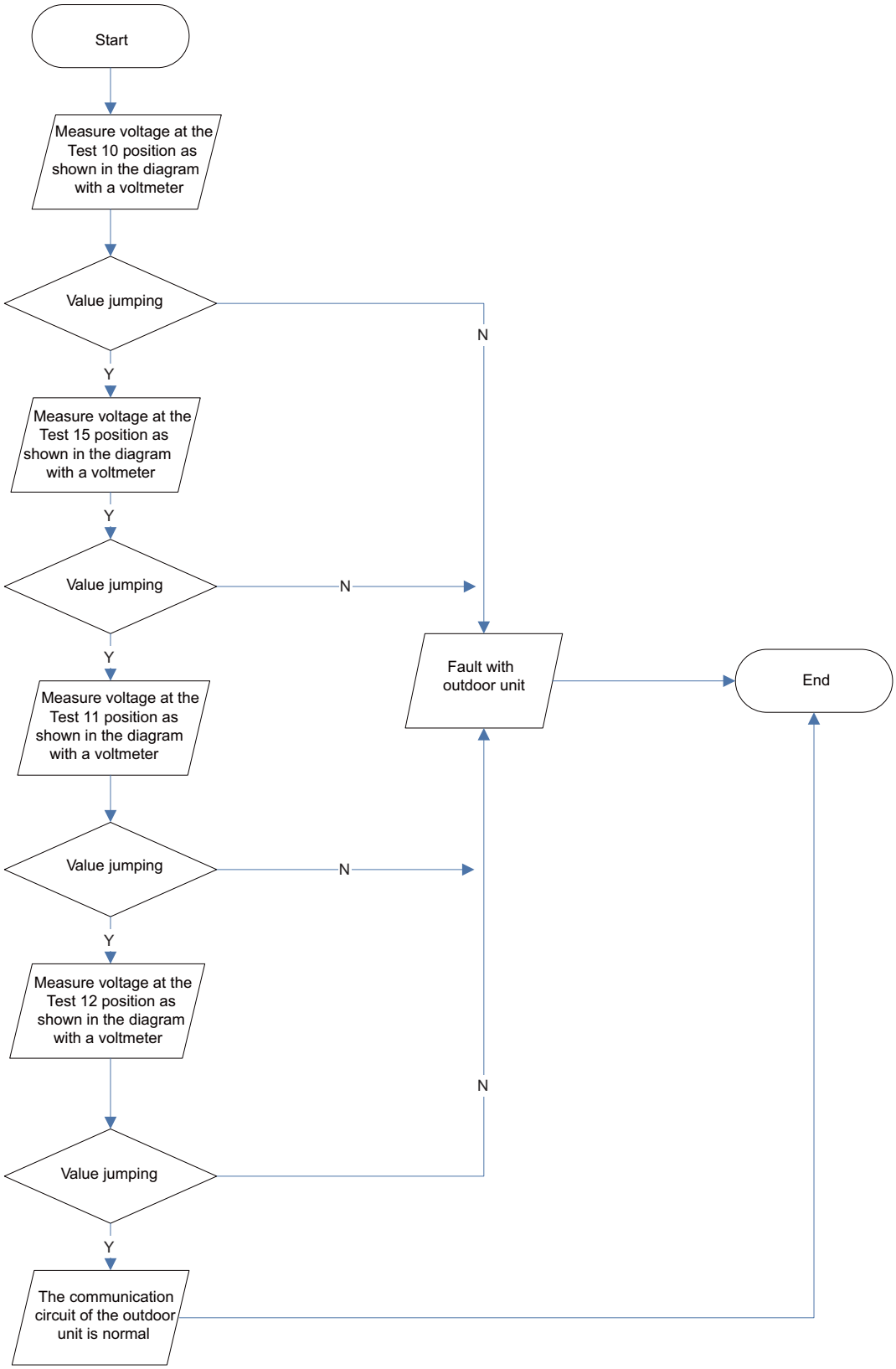
● Is there any damage for the indoor unit mainboard communication circuit? Is communication circuit damaged?

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

Fault diagnosis process:



(9) Flow chart for outdoor communitcation circuit detecting:

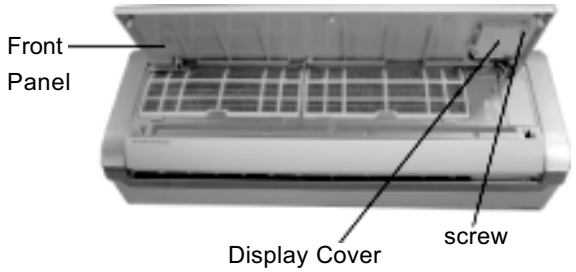
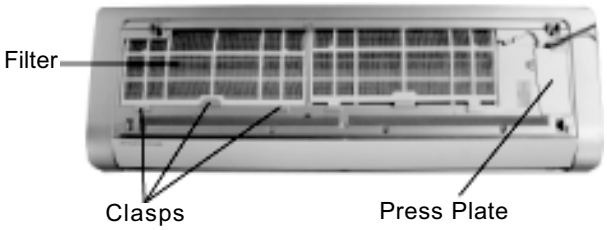
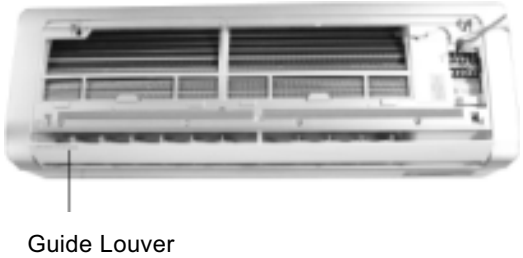
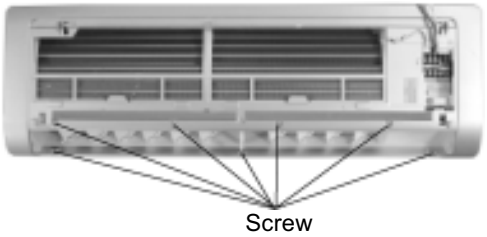


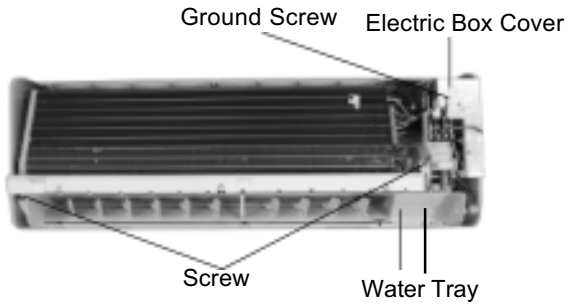
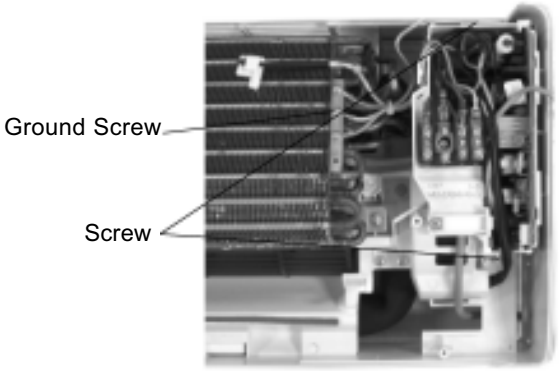
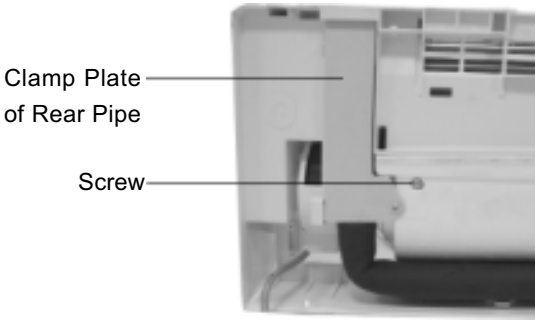
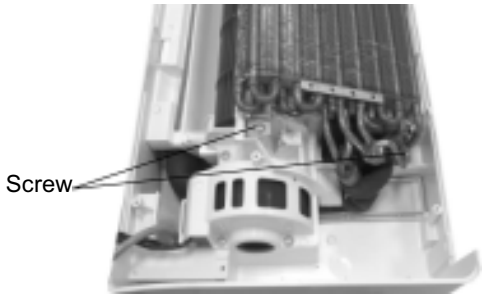
Note: Below information only for reference.

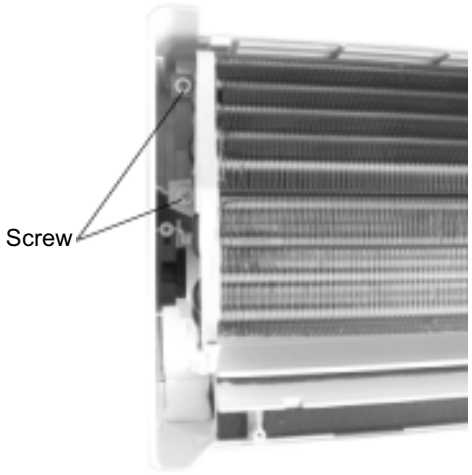
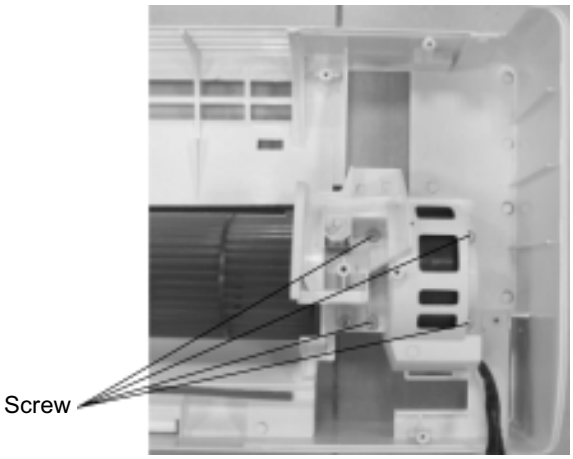
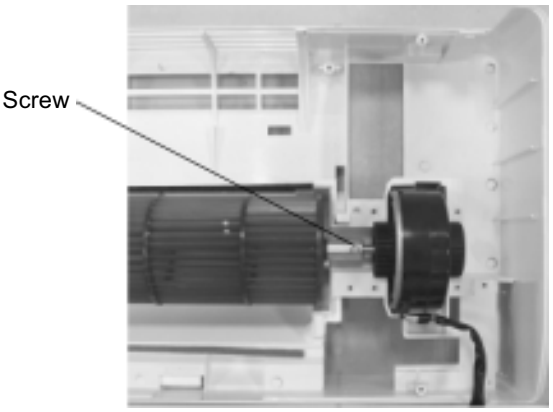
10. Removal Procedure

10.1 Removal Procedure of Indoor Unit

⚠ Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

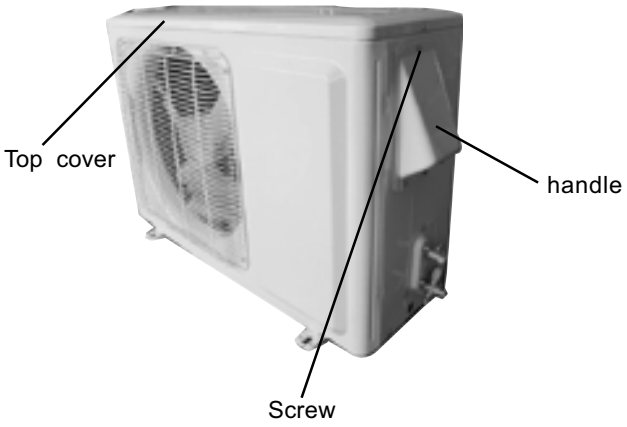
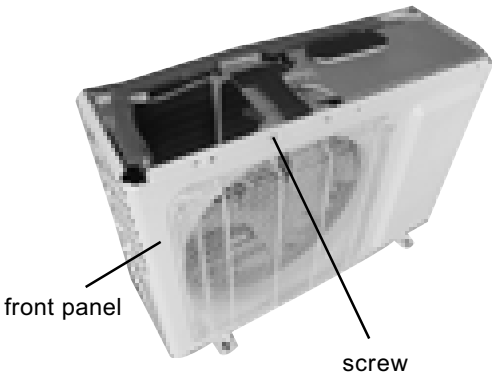
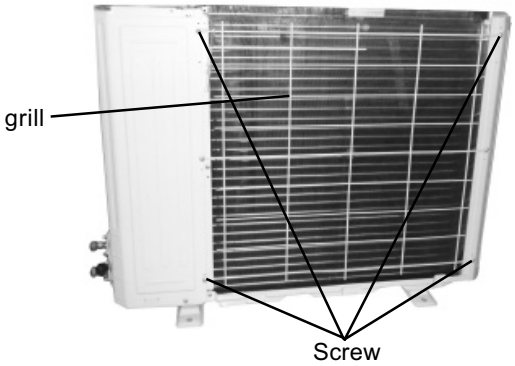
Step	Procedure	
1.Disassemble Front Panel		
	Push the convex parts in the left and right sides of the front panel, and then lift the front panel. Unscrew the screws fixing the display cover and pull out the plug.Forcibly lift the front panel upwards from the clasps to take it out.	
2.Disassemble Filter and Press Plate		
	Top the middle section of air filter from the clasps at both sides.Pull the air filter forward to remove it. Unscrew the 1 screw on press plate to open the press plate.	
3.Disassemble Guide Louver		
	Push out the axile bush in the middle of guide louver .Then slightly bend the guide louver to remove it.	
4.Disassemble Front Case		
	Unscrew the 7 tapping screws fixing the front case, and turn the front case backwards to remove it.	

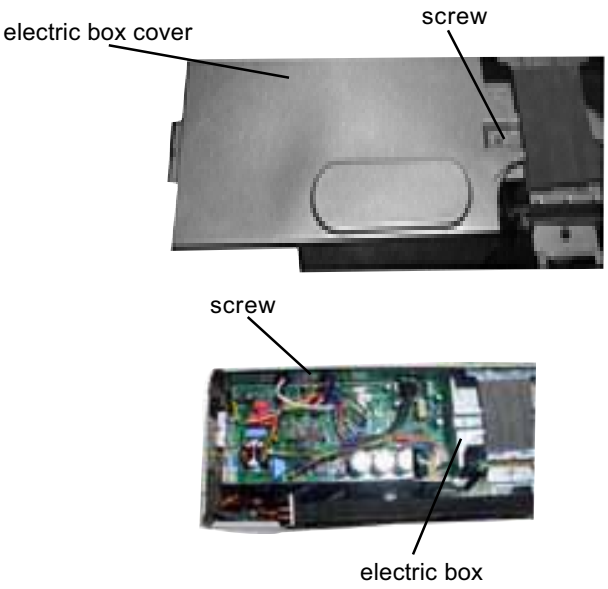
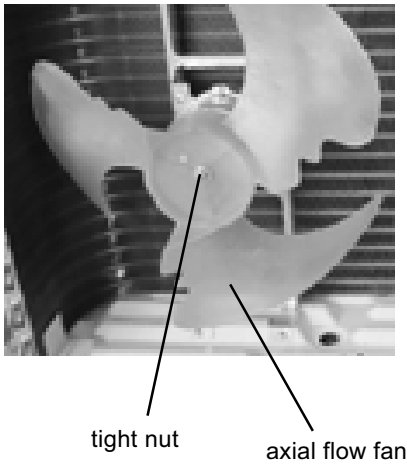
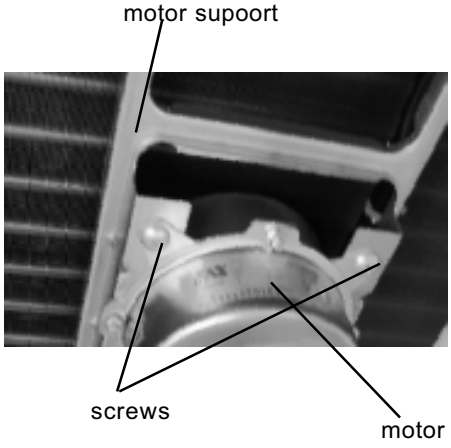
Step	Procedure	
5.Disassemble Water Tray		
	Unscrew the ground screw on the electric box cover and loose the clasps to remove electric box cover.Pulll out the wiring terminal.Unscrew the 2 screws fixing the water tray to remove the water tray.	
6.Disassemble Electric Box		
	Unscrew the 2 screws fixing the electric box. Unplug the motor terminal.Unscrew the three ground screws.Lift the electric box upwards to remove it.	
7.Disassemble Evaporator		
	Unscrew the screws fixing the clamp plate of rear pipe at the back of evaporator to remove the plate.	
	Unscrew the 2 screws in the right of evaporator.	

Step	Procedure	
	Unscrew the 2 screws in the left of evaporator Turn the evaporator at certain angle to remove it.	
8.Disassemble Motor and Cross Flow Fan		
	Unscrew the screws fixing the press plate of motor and connecting motor and cross flow fan to remove the motor and cross flow fan.	 

10.2 Removal Procedure of Outdoor Unit

⚠ Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	
1.Disassemble Big Handleand Top cover		
	Unscrew the screw fixing the big handle,and then remove it downwards to take it out. Unscrew the screws of top cover, then lift it upwards toremove the top cover.	
2.Disassemble Front Panel		
	Unscrew the screws of front panel with screwdriver to remove the front panel.	
3.Disassemble Grill and Right Side Plate		
	Unscrew the screws of grill to remove the grill. Unscrew the screws of right side plate, condenser sideplate and valve support, lift it upwards to remove theright side plate.	

Step	Procedure	
4. Disassemble electric box subassembly		
	Unscrew the screws fixing electric box cover, lift it upward to remove the electric box cover. Unscrew the screws fixing electric box, pull out theconnection wire of compressor motor, fan motor andelectric box, lift them upward to remove the electricbox.	
5.Disassemble Axial Flow Fan		
	Loosen the tight nut fixing the axial flowfan witha spanner ,and then take out the nut,spring gasketand flap gasket in turn.	
6.Disassemble Motor and Motor Support		
	Unscrew tight screw to take motor out, unscrew thescrews fixing motor support, lift it upward to removethe motor supoort.	

Step	Procedure
7.Disassemble 4-way valve subassembly	
	Weld out the 4 spot weld connect 4-way valve sub-assembly and condenser, inlet and outlet port ofcompressor, gas valve to remove the 4-way valve subassembly. Be sure weld it as soon as possible toavoid burn out the leading wire of compressor (Note:Confirm the refrigerant is out completely be-fore weldout the 4-way valve subassembly.).
8.Disassemble Gas and Liquid Valves	
	Unscrew the two bolts fixing gas valve and liquidvalve.Unsolder weld spots between gas valve and(Note:During unsoldering ,wrap the valves withwet cloth to avoid damage for high temperature.) and air-return pipe to remove the gas valve.Unscrew the two bolts fixing liquid valve. Unsolderweld spots between liquid valve and capillary toremove the liq-uid valve.
9.Disassemble Compressor	
	Unscrew the three foot-nuts at the foot of the compressortake out the compressor.compressor, and then carefully remove the pipes to,unsolder the suction and the discharge pipes.