



Service Manual

Models: GWH28AFE-K3NNA1A
GWH28AFE-K3NNA1B
GWH28AFE-K3NNA2A
GWH28AFE-K3NNA2B
GWH28AFE-K3NNA3A
GWH28AFE-K3NNA5A
(Refrigerant:R410A)

GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI

The background features a network of thin grey lines connecting various circular nodes, some of which are shaded in light grey. There are also several semi-transparent geometric shapes in shades of blue and teal. At the bottom right, there is a detailed image of a complex industrial or mechanical structure, possibly a refrigeration system, rendered in a blue-tinted style.

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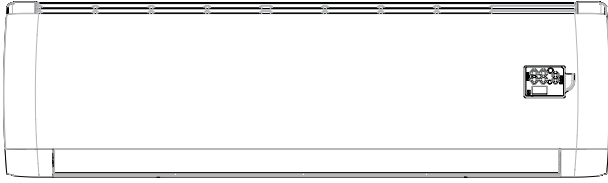
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Part I : Technical Information

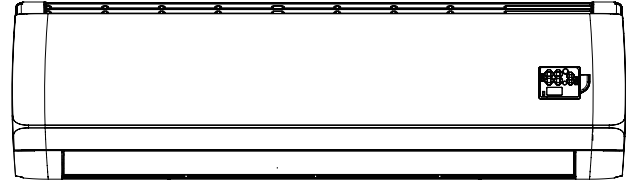
1. Summary

Indoor Unit:

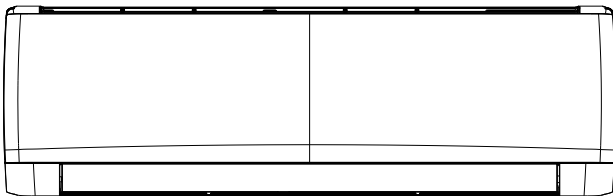
GWH28AFE-K3NNA1A/I
GWH28AFE-K3NNA1B/I



GWH28AFE-K3NNA2A/I
GWH28AFE-K3NNA2B/I



GWH28AFE-K3NNA3A/I

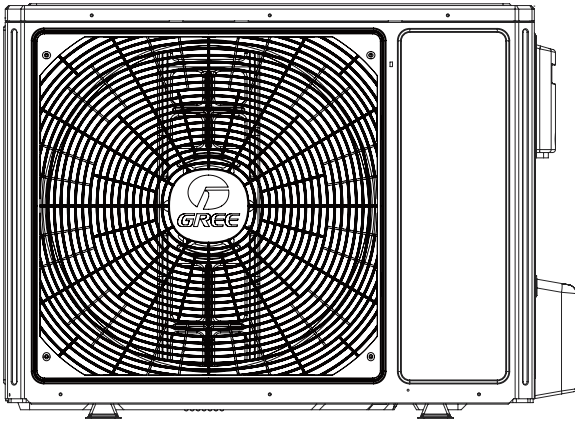


GWH28AFE-K3NNA5A/I

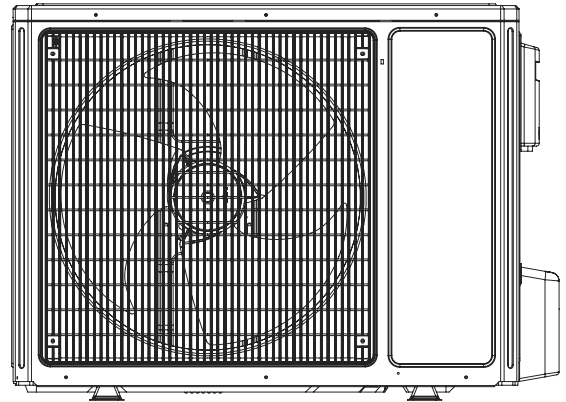


Outdoor Unit:

GWH28ACE-K3NNA5A/O



GWH28AAE-K3NNA1A/O
GWH28AAE-K3NNA1C/O



Remote Controller:

YAW1F



Model list:

No.	Model	Product Code	Indoor Unit Model	Indoor Unit Product Code	Outdoor Unit Model	Outdoor Unit Product Code	Remote Controller:
1	GWH28AFE-K3NNA1A	CA348000200	GWH28AFE-K3NNA1A/I	CA348N00200	GWH28ACE-K3NNA5A/O	CA341W00300	YAW1F
2	GWH28AFE-K3NNA1B	CA348000901	GWH28AFE-K3NNA1B/I	CA348N00900	GWH28AAE-K3NNA1A/O	CA476W02101	
3	GWH28AFE-K3NNA2B	CA363001000	GWH28AFE-K3NNA2B/I	CA363N01000		CA476W02100	
4	GWH28AFE-K3NNA2A	CA363000100	GWH28AFE-K3NNA2A/I	CA363N00100	GWH28AAE-K3NNA1C/O	CA476W05600	
5	GWH28AFE-K3NNA3A	CA362000100	GWH28AFE-K3NNA3A/I	CA362N00100			
6		CA362000101		CA362N00101			
7		GWH28AFE-K3NNA5A		CA368000500			

2. Specifications

2.1 Specification Sheet

Model			GWH28AFE-K3NNA1A	GWH28AFE-K3NNA1B
Product Code			CA348000200	CA348000901
Power Supply	Rated Voltage	V~	220-240	220-240
	Rated Frequency	Hz	50	50
	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
Cooling Capacity		W	8000	8000
Heating Capacity		W	8500	8500
Cooling Power Input		W	2846	2846
Heating Power Input		W	2647	2647
Cooling Current Input		A	12.3	12.3
Heating Current Input		A	12	12
Rated Input		W	3650	3650
Rated Current		A	20	20
Air Flow Volume(SH/H/M/L/SL)		m ³ /h	1200/1100/1000/850/-	1200/1100/1000/850/-
Dehumidifying Volume		L/h	3.0	3.0
EER		W/W	2.81	2.81
COP		W/W	3.21	3.21
SEER		W/W	/	/
HSPF		W/W	/	/
Application Area		m ²	46-70	46-70
Indoor Unit	Fan Type		GWH28AFE-K3NNA1A/I	GWH28AFE-K3NNA1B/I
	Product Code of Indoor Unit		CA348N00200	CA348N00900
	Fan Type		Cross-flow	Cross-flow
	Diameter Length(DXL)	mm	Φ108X830	Φ108X830
	Fan Motor Cooling Speed(SH/H/M/L/SL)	r/min	1330/1200/1000/900/-	1330/1200/1000/900/-
	Fan Motor Heating Speed(SH/H/M/L/SL)	r/min	1330/1200/1000/900/-	1330/1200/1000/900/-
	Output of Fan Motor	W	35	35
	Fan Motor RLA	A	0.35	0.35
	Fan Motor Capacitor	μF	3	3
	Evaporator Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Pipe Diameter	mm	Φ7	Φ7
	Row-fin Gap	mm	2.5-1.5	2.5-1.5
	Coil Length (LXD _X W)	mm	845X25.4X342.9	845X25.4X342.9
	Swing Motor Model		MP35CP	MP35CP
	Output of Swing Motor	W	2.5	2.5
	Fuse	A	3.15	3.15
	Sound Pressure Level (SH/H/M/L/SL)	dB (A)	51/48/42/39/-	51/48/42/39/-
	Sound Power Level (SH/H/M/L/SL)	dB (A)	61/58/52/49/-	61/58/52/49/-
	Dimension (WXHXD)	mm	1135X328X247	1135X328X247
	Dimension of Carton Box (LXWXH)	mm	1190X407X335	1190X407X335
Dimension of Package (LXWXH)	mm	1193X410X350	1193X410X350	
Net Weight	kg	17.5	16.5	
Gross Weight	kg	21	20	

Model			GWH28AFE-K3NNA2A	GWH28AFE-K3NNA3A GWH28AFE-K3NNA5A
Product Code			CA363000100	CA362000100/CA362000101 CA368000500
Power Supply	Rated Voltage	V~	220-240	220-240
	Rated Frequency	Hz	50	50
	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
Cooling Capacity		W	8500	8500
Heating Capacity		W	9200	9200
Cooling Power Input		W	2647	2647
Heating Power Input		W	2548	2548
Cooling Current Input		A	12.3	12.3
Heating Current Input		A	12	12
Rated Input		W	3500	3500
Rated Current		A	20	20
Air Flow Volume(SH/H/M/L/SL)		m ³ /h	1200/1100/1000/850/-	1200/1100/1000/850/-
Dehumidifying Volume		L/h	3.0	3.0
EER		W/W	3.21	3.21
COP		W/W	3.61	3.61
SEER		W/W	/	/
HSPF		W/W	/	/
Application Area		m ²	46-70	46-70
Indoor Unit	Fan Type		GWH28AFE-K3NNA2A/I	GWH28AFE-K3NNA3A/I GWH28AFE-K3NNA5A/I
	Product Code of Indoor Unit		CA363N00100	CA362N00100/CA362N00101 CA368N00500
	Fan Type		Cross-flow	Cross-flow
	Diameter Length(DXL)	mm	Φ108X830	Φ108X830
	Fan Motor Cooling Speed(SH/H/M/L/SL)	r/min	1330/1200/1000/900/-	1330/1200/1000/900/-
	Fan Motor Heating Speed(SH/H/M/L/SL)	r/min	1330/1200/1000/900/-	1330/1200/1000/900/-
	Output of Fan Motor	W	35	35
	Fan Motor RLA	A	0.45	0.45
	Fan Motor Capacitor	μF	3	3
	Evaporator Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Pipe Diameter	mm	Φ7	Φ7
	Row-fin Gap	mm	2.5-1.5	2-1.5
	Coil Length (LXDXW)	mm	845X25.4X342.9	845X25.4X342.9
	Swing Motor Model		MP35CP	MP35CP
	Output of Swing Motor	W	2.5	2.5
	Fuse	A	3.15	3.15
	Sound Pressure Level (SH/H/M/L/SL)	dB (A)	50/48/42/39/-	51/48/42/39/-
	Sound Power Level (SH/H/M/L/SL)	dB (A)	60/58/52/49/-	61/58/52/49/-
	Dimension (WXHXD)	mm	1135X328X247	1135X328X247
	Dimension of Carton Box (LXWXH)	mm	1190X407X335	1190X407X335
	Dimension of Package (LXWXH)	mm	1193X410X350	1193X410X350
Net Weight	kg	17	17	
Gross Weight	kg	20.5	20.5	

Outdoor Unit	Model of Outdoor Unit		GWH28AAE-K3NNA1C/O	
	Outdoor Unit Product Code		CA476W05600	
	Compressor Manufacturer/Trademark		ZHUHAI LANDA COMPRESSOR CO., LTD	
	Compressor Model		QXAS-F305N450	
	Compressor Oil		ATMOS-RB68EP or equivalent	
	Compressor Type		Rotary	
	L.R.A.	A		60
	Compressor RLA	A		11.6
	Compressor Power Input	W		2525
	Overload Protector			/
	Throttling Method			Capillary
	Operation Temp	°C		16~30
	Ambient Temp (Cooling)	°C		18~43
	Ambient Temp (Heating)	°C		-7~24
	Condenser Form			Aluminum Fin-copper Tube
	Pipe Diameter	mm		Φ7
	Rows-fin Gap	mm		2.5-1.5
	Coil Length (LXDXW)	mm		820X38.1X660
	Fan Motor Speed	rpm		850
	Output of Fan Motor	W		35
	Fan Motor RLA	A		0.8
	Fan Motor Capacitor	μF		4.5
	Air Flow Volume of Outdoor Unit	m ³ /h		3200
	Fan Type			Axial-flow
	Fan Diameter	mm		Φ520
	Defrosting Method			Automatic Defrosting
	Climate Type			T1
	Isolation			I
	Moisture Protection			IPX4
	Permissible Excessive Operating Pressure for the Discharge Side	MPa		4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa		2.5
	Sound Pressure Level (H/M/L)	dB (A)		57/-/-
Sound Power Level (H/M/L)	dB (A)		67/-/-	
Dimension (WXHXD)	mm		965X700X396	
Dimension of Carton Box (LXWXH)	mm		1026X455X735	
Dimension of Package (LXWXH)	mm		1029X458X750	
Net Weight	kg		61	
Gross Weight	kg		65.5	
Refrigerant			R410A	
Refrigerant Charge	kg		1.9	
Connection Pipe	Length	m	5	
	Gas Additional Charge	g/m	50	
	Outer Diameter Liquid Pipe	mm	Φ6	
	Outer Diameter Gas Pipe	mm	Φ16	
	Max Distance Height	m	10	
	Max Distance Length	m	30	
Note: The connection pipe applies metric diameter.				

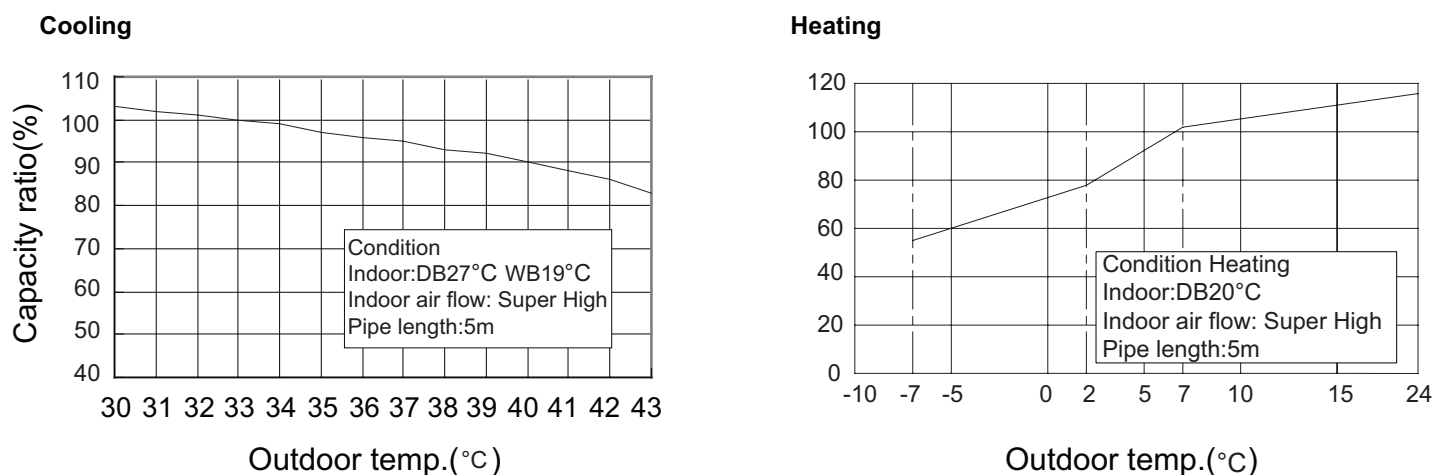
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Model			GWH28AFE-K3NNA2B
Product Code			CA363001000
Power Supply	Rated Voltage	V~	220-240
	Rated Frequency	Hz	50
	Phases		1
Power Supply Mode			Outdoor
Cooling Capacity		W	8000
Heating Capacity		W	8500
Cooling Power Input		W	2846
Heating Power Input		W	2647
Cooling Current Input		A	12.3
Heating Current Input		A	12
Rated Input		W	3500
Rated Current		A	20
Air Flow Volume(SH/H/M/L/SL)		m ³ /h	1200/1100/1000/850/-
Dehumidifying Volume		L/h	3.0
EER		W/W	2.81
COP		W/W	3.21
SEER		W/W	/
HSPF		W/W	/
Application Area		m ²	46-70
Indoor Unit	Fan Type		GWH28AFE-K3NNA2B/I
	Product Code of Indoor Unit		CA363N01000
	Fan Type		Cross-flow
	Diameter Length(DXL)	mm	Φ108X830
	Fan Motor Cooling Speed(SH/H/M/L/SL)	r/min	1330/1200/1000/900/-
	Fan Motor Heating Speed(SH/H/M/L/SL)	r/min	1330/1200/1000/900/-
	Output of Fan Motor	W	35
	Fan Motor RLA	A	0.35
	Fan Motor Capacitor	μF	3
	Evaporator Form		Aluminum Fin-copper Tube
	Pipe Diameter	mm	Φ7
	Row-fin Gap	mm	2.5-1.5
	Coil Length (LXDXW)	mm	845X25.4X342.9
	Swing Motor Model		MP35CP
	Output of Swing Motor	W	2.5
	Fuse	A	3.15
	Sound Pressure Level (SH/H/M/L/SL)	dB (A)	51/48/42/39/-
	Sound Power Level (SH/H/M/L/SL)	dB (A)	61/58/52/49/-
	Dimension (WXHDX)	mm	1135X328X247
	Dimension of Carton Box (LXWXH)	mm	1190X407X335
Dimension of Package (LXWXH)	mm	1193X410X350	
Net Weight	kg	16.5	
Gross Weight	kg	20	

Outdoor Unit	Model of Outdoor Unit		GWH28AAE-K3NNA1A/O	
	Outdoor Unit Product Code		CA476W02100	
	Compressor Manufacturer/Trademark		ZHUHAI LANDA COMPRESSOR CO., LTD	
	Compressor Model		QXAS-F305N450	
	Compressor Oil		ATMOS-RB68EP or equivalent	
	Compressor Type		Rotary	
	L.R.A.	A		60
	Compressor RLA	A		11.6
	Compressor Power Input	W		2525
	Overload Protector			/
	Throttling Method			Capillary
	Operation Temp	°C		16~30
	Ambient Temp (Cooling)	°C		18~43
	Ambient Temp (Heating)	°C		-7~24
	Condenser Form			Aluminum Fin-copper Tube
	Pipe Diameter	mm		Φ7
	Rows-fin Gap	mm		2.5-1.4
	Coil Length (LXDXW)	mm		820X38.1X660
	Fan Motor Speed	rpm		850
	Output of Fan Motor	W		85
	Fan Motor RLA	A		0.8
	Fan Motor Capacitor	μF		4.5
	Air Flow Volume of Outdoor Unit	m ³ /h		1800
	Fan Type			Axial-flow
	Fan Diameter	mm		Φ520
	Defrosting Method			Automatic Defrosting
	Climate Type			T1
	Isolation			I
	Moisture Protection			IPX4
	Permissible Excessive Operating Pressure for the Discharge Side	MPa		4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa		2.5
	Sound Pressure Level (H/M/L)	dB (A)		59/-/-
Sound Power Level (H/M/L)	dB (A)		69/-/-	
Dimension (WXHXD)	mm		965X700X396	
Dimension of Carton Box (LXWXH)	mm		1026X455X735	
Dimension of Package (LXWXH)	mm		1029X458X750	
Net Weight	kg		61	
Gross Weight	kg		65.5	
Refrigerant			R410A	
Refrigerant Charge	kg		1.9	
Connection Pipe	Length	m	5	
	Gas Additional Charge	g/m	50	
	Outer Diameter Liquid Pipe	mm	Φ6	
	Outer Diameter Gas Pipe	mm	Φ16	
	Max Distance Height	m	10	
	Max Distance Length	m	30	
Note: The connection pipe applies metric diameter.				

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

2.2 Capacity Curve in Different Outdoor Temperature



2.3 Cooling and Heating Data Sheet in Rated Frequency

Cooling:

Rated cooling condition(°C) (DB/WB)		Model	Pressure of gas pipe connecting indoor and outdoor unit	Inlet and outlet pipe temperature of heat exchanger		Fan speed of indoor unit	Fan speed of outdoor unit
Indoor	Outdoor			T1 (°C)	T2 (°C)		
27/19	35/24	28K	0.9~1.1	in:6~8 out:10~12	in:75~85 out:37~43	Super High	High

Heating:

Rated heating condition(°C) (DB/WB)		Model	Pressure of gas pipe connecting indoor and outdoor unit	Inlet and outlet pipe temperature of heat exchanger		Fan speed of indoor unit	Fan speed of outdoor unit
Indoor	Outdoor			T1 (°C)	T2 (°C)		
20/-	7/6	28K	2.8~3.0	in:75~85 out:37~43	in:1~3 out:2-5	Super High	High

Instruction:

T1: Inlet and outlet pipe temperature of evaporator

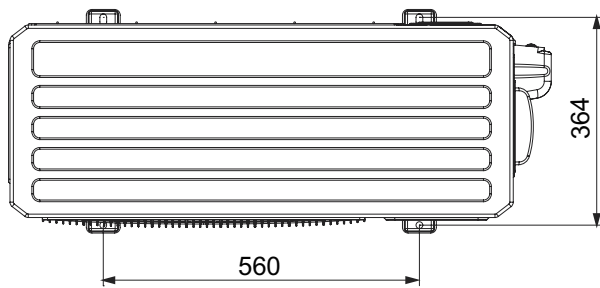
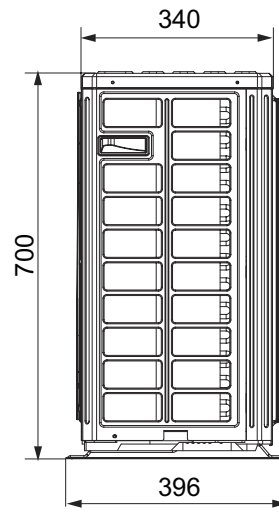
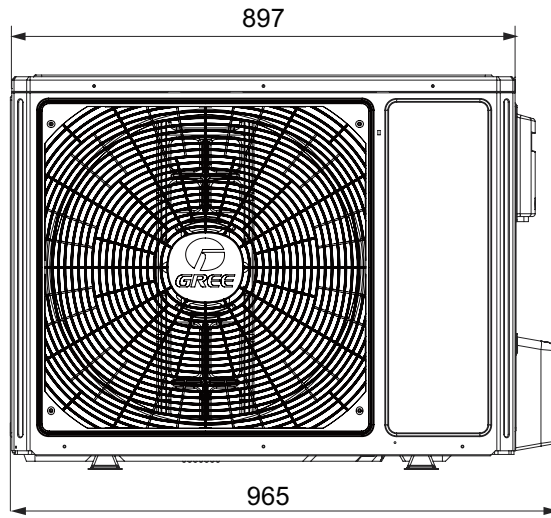
T2: Inlet and outlet pipe temperature of condenser

P: Pressure at the side of big valve

Connection pipe length: 5 m.

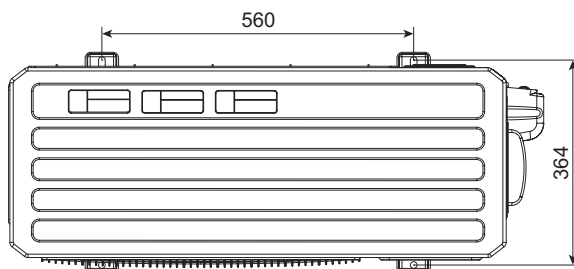
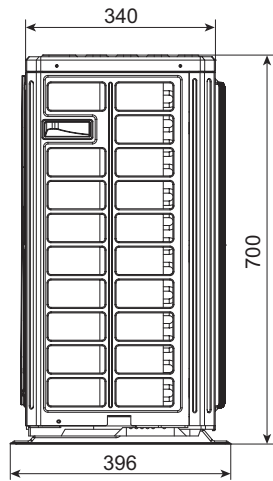
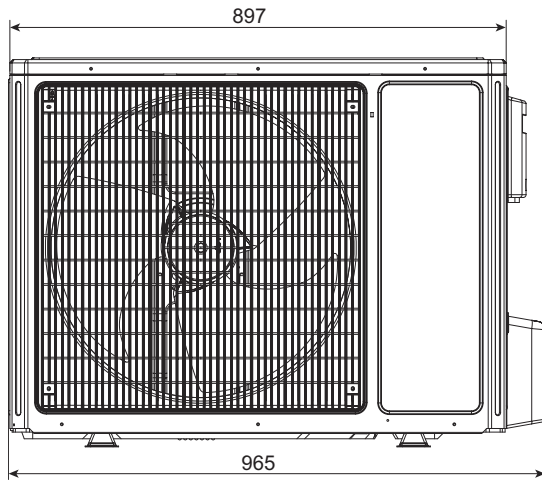
3.2 Outdoor Unit

GWH28ACE-K3NNA5A/O



Unit:mm

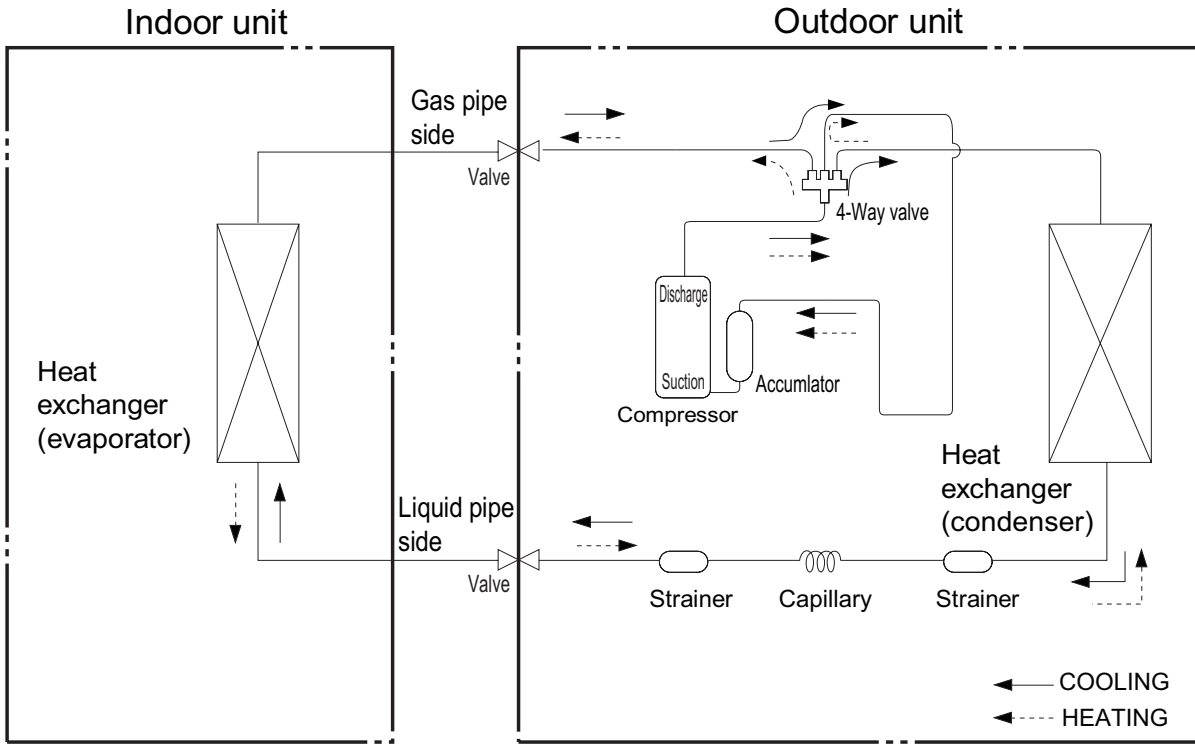
GWH28AAE-K3NNA1A/O GWH28AAE-K3NNA1C/O



Unit:mm

4. Refrigerant System Diagram

Cooling and heating models



Connection pipe specification:

Liquid pipe: 1/4" (6mm)

Gas pipe: 5/8" (16mm)

5. Electrical Part

5.1 Wiring Diagram

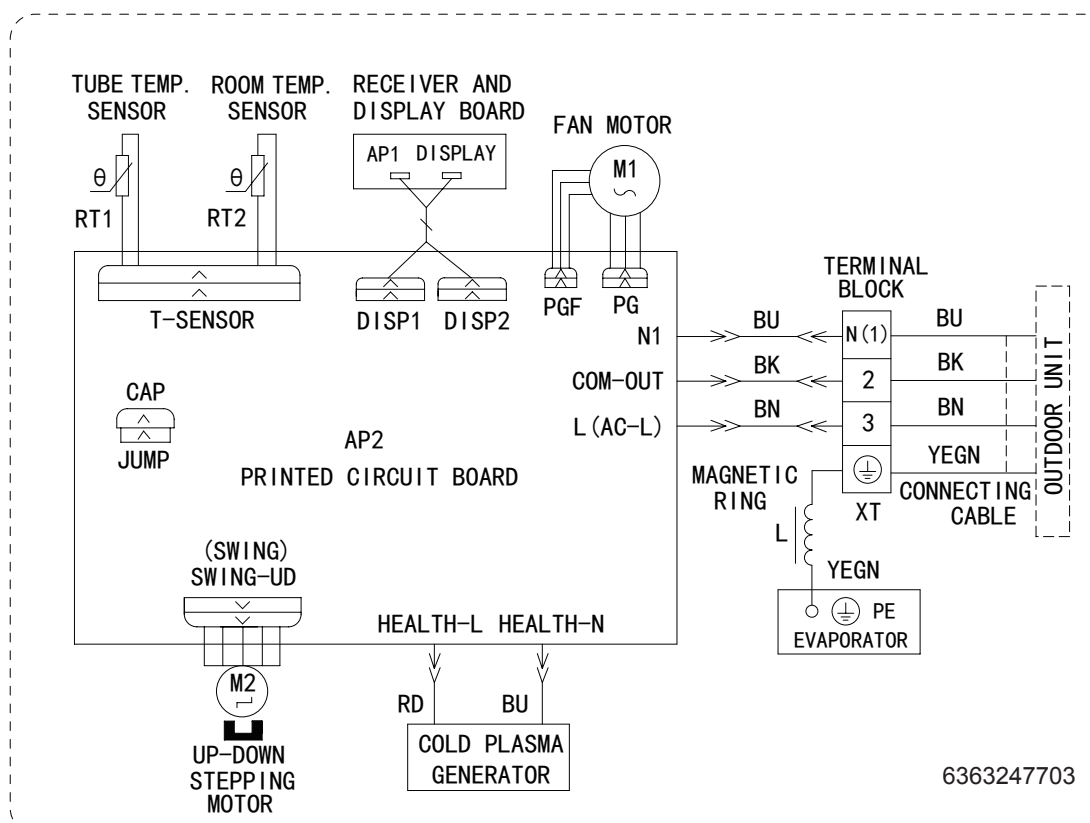
• Instruction

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
WH	White	GN	Green	CAP	Jumper cap
YE	Yellow	BN	Brown	COMP	Compressor
RD	Red	BU	Blue		Grounding wire
YEGN	Yellow/Green	BK	Black	/	/
VT	Violet	OG	Orange	/	/

Note: Jumper cap is used to determine fan speed and the swing angle of horizontal lover for this model.

• Indoor Unit

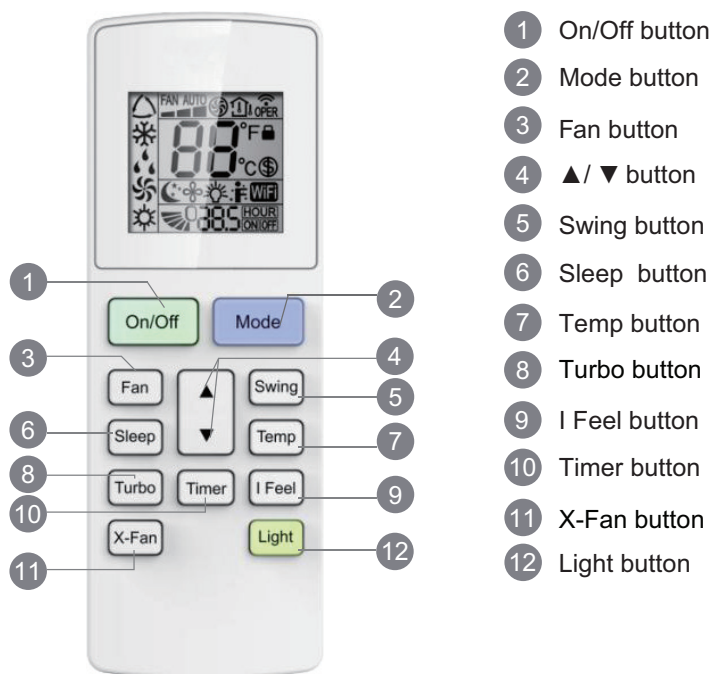
GWH28AFE-K3NNA1A/I GWH28AFE-K3NNA2A/I GWH28AFE-K3NNA3A/I(CA362N00100) GWH28AFE-K3NNA5A/I



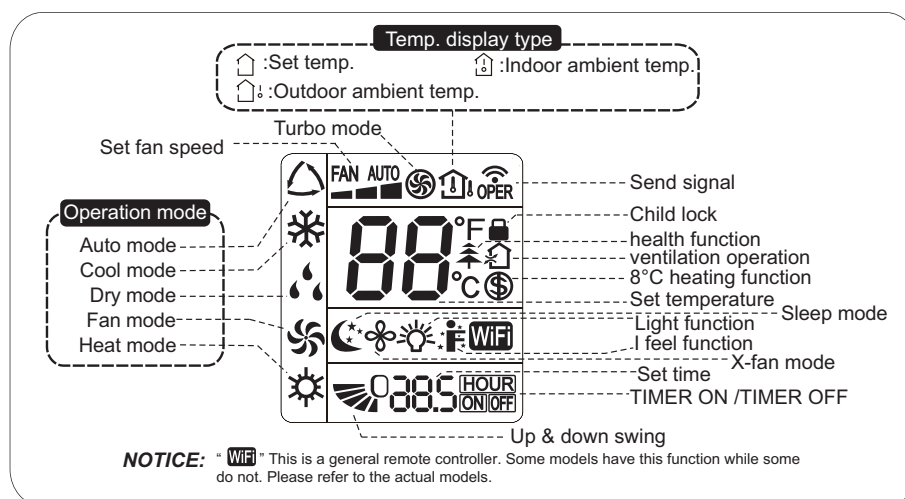
6. Function and Control

6.1 Remote Controller Introduction

Buttons on Remote Controller



Icon Display on Remote Controller



Note:

- This is a general use remote controller, it could be used for the air conditioners with multifunction; For some function, which the model doesn't have, if you press the corresponding button on the remote controller that the unit will keep the original running status.
- After putting through the power, the air conditioner will give out a sound. Operation indicator "🔌" is ON (red indicator, the colour is different for different). After that, you can operate the air conditioner by using remote controller.
- When power is connected (stand by condition), you can operate the air conditioner through the remote controller.
- Under on status, pressing the button on the remote controller, the signal icon "📶" on the display of remote controller will blink once and the air conditioner will give out a "de" sound, which means the signal has been sent to the air conditioner.
- Under off status, set temperature and clock icon will be displayed on the display of remote controller (If timer on, timer off and light functions are set, the corresponding icons will be displayed on the display of remote controller at the same time); Under on status, the display will show the corresponding set function icons.

1. ON/OFF button

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

2. MODE button

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



3. FAN Button

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

* Note: Fan speed under dry mode is low speed.

4. ▲ / ▼ button

Press ▲ / ▼ button to increase/decrease set temperature. In AUTO mode, set temperature is not adjustable.

When setting Timer On or Timer Off, press "▲" or "▼" button to adjust the time.

5. SWING button

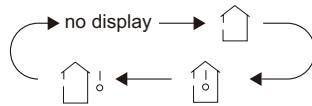
Press this button to turn on up&down air swing.

6. SLEEP Button

Under Cool mode, press this button to turn on Sleep function. Press this button to cancel Sleep function. Under Fan and Dry mode, this function is unavailable.

7. TIMER Button

Press this button, you can see indoor set temperature, indoor ambient temperature on indoor unit's display. The setting on remote controller is selected circularly as below:



Note:

Outdoor temperature display is not available for some models. At that time, indoor unit receives " " signal, while it displays indoor set temperature.

8. Turbo button

Under COOL or HEAT mode, press this button to activate / deactivate the Turbo function.

Note:

Not applicable for this unit.

9. I FEEL button

Press this button to start I FEEL function and " " will be displayed on the remote controller. After this function is set, the remote controller will send the detected ambient temperature to the controller and the unit will automatically adjust the indoor temperature according to the detected temperature. Press this button again to close I FEEL function and " " will disappear. When I FEEL function is turned on, the remote controller should be put within the area where indoor unit can receive the signal sent by the remote controller.

10. Timer button

- Under ON status, press this button to set timer OFF; Under OFF status, press this button to set timer ON.
- Press this button once and the characters of HOUR ON (OFF) will flash to be displayed. Meanwhile, press " ▲ " button or " ▼ " button to adjust timer setting (time will change quickly if holding " ▲ " or " ▼ " button). Time setting range is 0.5~24hours. Press this button again to confirm timer setting and the characters of HOUR ON (OFF) will stop flashing. If the characters are flashing but you haven't press timer button, timer setting status will be quit after 5s. If timer is confirmed, press this button again to cancel timer.

11.X-Fan button

- Press this button in COOL or DRY mode to turn on X-fan function.

When this function is started up, indoor fan will still operate at low fan speed for a while after turning off the unit by remote controller.

12.Light button



Press this button to turn on the display's light and press this button again to turn off the display's light.

If "H1" is displayed on the remote controller while it's not operated by the professional person/after-sales person, it belongs to the misoperation. Please operate it as below to cancel it. Under the OFF status of remote controller, hold the "MODE" button and "X-FAN" buttons simultaneously for 5s to cancel "H1" display.

Note:

- If remote controller displays "H1", it belongs to the normal function reminder. If the unit is defrosting under heating mode, it operates according to H1 defrosting mode. "H1" won't be displayed on the panel of indoor unit;
- Once you set H1 mode, if you turn off unit by remote controller, H1 will display 3 times on the remote controller and then disappear;
- Also, when you set H1 mode, when you change to heating mode, H1 will display 3 times on the remote controller and then disappear.

Combination of "▲" and "▼" buttons: About lock

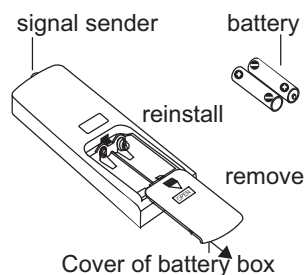
Press "▲" and "▼" buttons simultaneously 3s to lock or unlock the keypad. If the remote controller is locked,  is displayed. In this case, pressing any button,  blinks three times.

Combination of "MODE" and "▼" buttons: About switch between Fahrenheit and centigrade

At unit OFF, press "MODE" and "▼" buttons simultaneously to switch between $^{\circ}\text{C}$ and $^{\circ}\text{F}$.

Replacement of Batteries in Remote Controller

1. Press the back side of remote controller marked with "🔍", as shown in the fig, and then push out the cover of battery box along the arrow direction.
2. Replace two 7# (AAA 1.5V) dry batteries, and make sure the position of "+" polar and "-" polar are correct.
3. Reinstall the cover of battery box.



Note:

- During operation, point the remote control signal sender at the receiving window on indoor unit.
- The distance between signal sender and receiving window should be no more than 6m, and there should be no obstacles between them.
- Signal may be interfered easily in the room where there is fluorescent lamp or wireless telephone; remote controller should be close to indoor unit during operation.
- Replace new batteries of the same model when replacement is required.
- When you don't use remote controller for a long time, please take out the batteries.
- If the display on remote controller is fuzzy or there's no display, please replace batteries.

6.2 Brief Description of Modes and Functions

1. Summary

(1) Buzzer

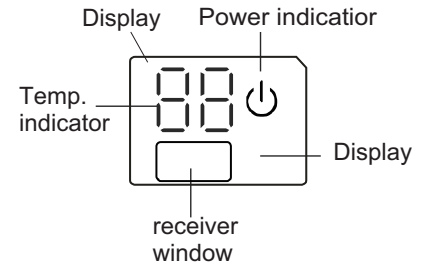
When the controller is energized or receives signal from button (emergency operation switch on air conditioner) or remote controller, the buzzer will give out a beep.

(2) Display

◆ After putting through the power, all indicators will be displayed once. Power indicator is in red under standby status. After turning on the unit by remote controller, operation indicator and mode indicator will be displayed(mode indicator icons include cooling, heating and drying icons).

Note:

- ◆ The color of operation indicator and mode indicator is different for different models.
- ◆ Operation indicator and mode indicator are not available for some models.
- ◆ Display content or position may be different, please refer to the current products.



(3) Temperature parameter

- ◆ Indoor set temperature (T_{preset})
- ◆ Indoor ambient temperature (T_{amb}.)
- ◆ Inner tube temperature of indoor evaporator (T_{tube})

2. Introduction of Basic Mode Function

- ◆ Once the compressor is energized, there should be a minimum interval of 3 mins between two start-ups.
- ◆ If the unit is with memory function and is off before power failure, the compressor can be restarted without an interval of 3 mins; if the unit is on before power failure, the compressor will be restarted with an interval of 3 mins.

Once compressor is started, it won't stop within 6 mins according to the change of room temp.

(1) Auto mode

① Operation condition and process for auto mode

Under auto mode, the system will automatically select operation mode (cooling, heating, and fan) according to indoor ambient temperature. There will be 30s delayed for protection between mode switchover.

- ◆ When $T_{amb} \geq 26$, unit will be in cooling mode. Ex-factory set temperature is 20°C
- ◆ Cooling and heating unit: When $T_{amb} \leq (19^\circ\text{C} + T_{compensation})$, unit will be in heating mode. T_{preset}=20°C.
- ◆ Cooling only unit: When $T_{amb} \leq 22^\circ\text{C}$ (or 72 °F), unit will be in fan mode. T_{preset}=25°C.
- ◆ For cooling and heating unit under condition that $(19^\circ\text{C} + T_{compensation}) < T_{amb} < 26^\circ\text{C}$ (For cooling only unit under condition that $22^\circ\text{C} < T_{amb} < 26^\circ\text{C}$), when unit is initially turned on in auto mode, it will operate according to auto fan mode. When unit is changed to auto mode from other modes, it will maintain its previous working status (If auto mode is turned on from drying mode, unit will operate according to auto fan mode).

② Display: Operation icon, actual operation mode icon, set temperature (that's the display content of dual-8 nixie tube)

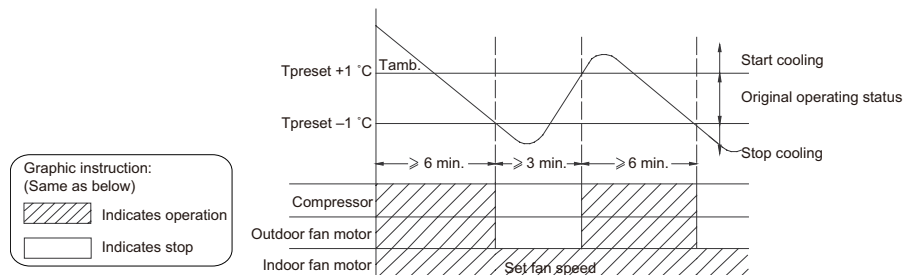
③ Protection function is same as that under each mode.

(2) Cooling mode

① Operation condition and process for cooling mode

- ◆ When $T_{amb} \geq T_{set} + 1^\circ\text{C}$, the system operates under cooling mode. In this case, the compressor, the ODU fan motor and the IDU fan motor operates at set speed.
- ◆ When $T_{amb} \leq T_{set} - 1^\circ\text{C}$, the compressor and the ODU fan motor stop, while the IDU fan motor operates at set speed.
- ◆ When $T_{set} - 1^\circ\text{C} < T_{amb} < T_{set} + 1^\circ\text{C}$, the system will maintain its previous operation status.

In cooling mode, the 4-way valve is de-energized (4-way valve is not available for cooling only unit). Temperature setting range is 16~30°C.

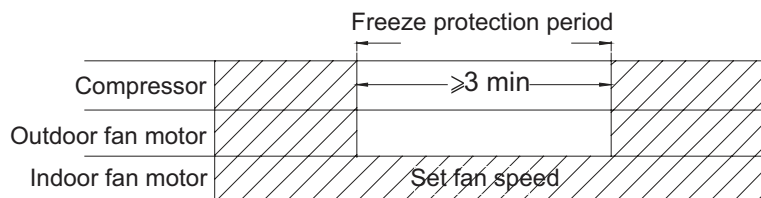


② Display: Operation icon, cooling icon, set temperature.

③ Protection function

◆ Freeze protection

During operation, when controller detected that $T_{tube} \leq 0^{\circ}\text{C}$ for a consecutive period of time, the system enters into freeze protection. In that case, the compressor and the ODU fan stop operation, while the IDU operates at set fan speed. If freeze protection is released and the compressor has been out of operation for 3 mins, the unit will resume its previous operation status.



◆ Overcurrent protection (this protection function is not available for those models whose cooling capacity $\leq 12000\text{Btu/h}$)

During operation process, if controller detected that system current exceeds the limit value for 3s consecutively (overcurrent), only the fan operates. About 3 mins later, if overcurrent is released, the system will resume original operation.

If overcurrent protection occurs for 6 times consecutively, and resume operation time won't exceed 6min every time, overcurrent protection information will be displayed. After turning off the unit, display won't be displayed.

If turn on the unit again, the system will be restated up again. Overcurrent protection information will be eliminated.

Please refer to maintenance part for display information and disposal method for details.

◆ Locked protection to IDU fan motor

During operation of IDU fan motor, if controller detected that the rotation speed of IDU fan motor less than 300/min or stop rotation, the motor operates abnormally. In order to prevent damage to motor, controller will protect automatically, the system stops operation and blocked information of IDU fan motor will be displayed. After turning off the unit, display won't be displayed.

If turn on the unit again, the system will be restated up again. Blocked information of IDU fan motor will be eliminated. (For some models, they can only be restated up after re-energized)

Please refer to maintenance part for display information and disposal method for details.

(3) Drying mode

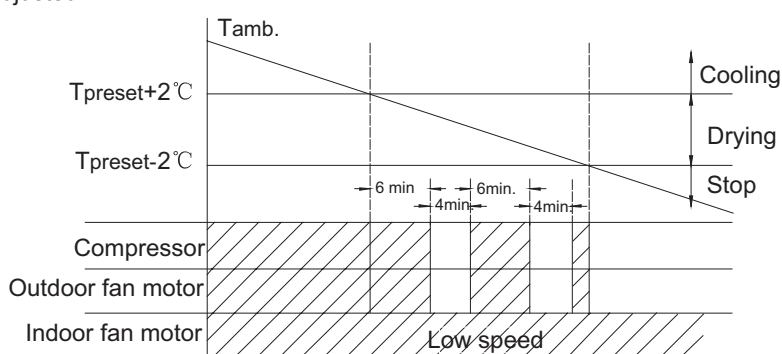
① Operation condition and process for drying mode

◆ When $T_{amb.} > T_{set} + 2^{\circ}\text{C}$, the system starts drying and cooling. In this case, the compressor and the ODU fan motor operate, and the IDU fan motor operates at low speed.

◆ When $T_{set} - 2^{\circ}\text{C} \leq T_{amb.} \leq T_{set} + 2^{\circ}\text{C}$, the system will start drying. In this case, the IDU fan motor operates at low speed; the compressor and the ODU fan motor operate for 6 minutes and stop for 4 minutes in cycle.

◆ When $T_{amb.} < T_{set} - 2^{\circ}\text{C}$, the compressor and the ODU fan motor stop, while the IDU fan motor runs at low speed.

In drying mode, the 4-way valve is de-energized (4-way valve is not available for cooling only unit); Temperature setting range is $16 \sim 30^{\circ}\text{C}$. Fan speed can't be adjusted.



② Display: Operation icon, drying icon, set temperature.

③ Protection function

◆ Freeze protection

During drying and cooling operation, when the controller detected that $T_{tube} \leq 0^{\circ}\text{C}$ for a period of time consecutively, the system will enter into freeze protection. In that case, the compressor and the ODU fan motor stops operation, while the IDU fan motor operates at low speed. When freeze protection is release and the compressor has stopped for 3min, the system will resume original operation.

During drying operation, when the controller detected that $T_{tube} \leq 0^{\circ}\text{C}$ for a period of time consecutively, the system enters into freeze protection. In that case, the compressor, the ODU fan motor stops operation, while the IDU fan motor operates at low speed. When freeze protection is release and the compressor has stopped for 4min, the system will resume original operation.

◆ Other protection is same as that under cooling mode.

(4) Fan mode

① Operation condition and process for fan mode

In fan mode, the IDU fan motor operates at set speed, while the compressor and the ODU fan motor stop. 4-way valve is de-energized (4-way valve is not available for cooling only unit). Temperature setting range is 16~30°C .

② Display: Operation icon, set temperature.

③ Protection function

In fan mode, there are overcurrent protection and blocked protection of IDU fan motor. Please refer to corresponding protection function under cooling mode for details.

(5) Heating mode(no heating mode is not available for cooling only unit)

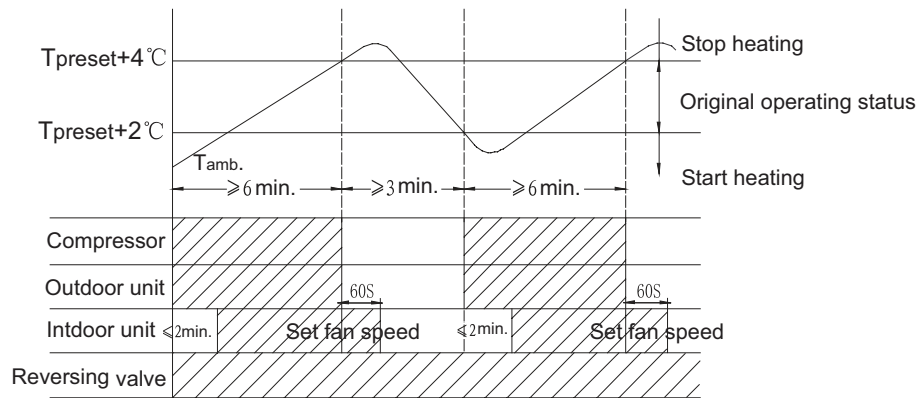
① Operation conditioner and process for heating mode

◆ When $T_{amb}-T_{compensation} \leq T_{preset}-1^{\circ}C$, unit will operate in heating mode. 4-way valve will be energized while compressor and outdoor fan starts operation at the same time. Indoor fan will start some time later so that air condition won't blow out cold air.

◆ When $T_{amb}-T_{compensation} \geq T_{preset}+1^{\circ}C$, compressor and outdoor fan will stop operation while 4-way valve is still power on. Indoor fan will continue operation for a while at set fan speed to blow out the residual heat so that temperature within the air conditioner won't be too high.

◆ When $T_{preset}-1^{\circ}C < T_{amb}-T_{compensation} < T_{preset}+1^{\circ}C$, system will maintain its previous working status.

In heating mode, 4-way valve is energized. Temperature setting range is 16~30°C .



② Display: Operation icon, heating icon, set temperature.

③ Defrosting condition and process

For ensuring heating effect, air conditioner will defrost automatically according to defrosting status on outdoor unit. During defrosting, heating icon will be on and off.

④ Protection function

◆ Overheating prevention protection

During operation, when controller detects that $T_{tube} \geq 55^{\circ}C$,the ODU fan motor stops operation; When T_{tube} is resumed normally, the ODU fan motor resumes operation.

◆ Noise silencing protection

When turning off the unit or during mode switchover, the 4-way valve is closed. In order to decrease noise, the 4-way valve will delay 2mins to be closed.

◆ Overcurrent protection (this protection function is not available for those models whose cooling capacity $\leq 12000Btu/h$)

During operation process, if controller detected that system current exceeds the limit value for 3s consecutively(overcurrent), the system stops operation. About 3mins later, if overcurrent is released, the system will resume original operation. If overcurrent protection occurs for 6 times consecutively, and resume operation time won't exceed 6min every time, overcurrent protection information will be displayed. After turning off the unit, display won't be displayed.

If turn on the unit again, the system will be restated up again. Overcurrent protection information will be eliminated.

Please refer to maintenance part for display information and disposal method for details.

◆ Locked protection to IDU fan motor

During operation of IDU fan motor, if controller detected that the rotation speed of IDU fan motor less than 300/min or stop rotation, the motor operates abnormally. In order to prevent damage to motor, controller will protect automatically, the system stops operation and blocked information of IDU fan motor will be displayed. After turning off the unit, display won't be displayed.

If turn on the unit again, the system will be restated up again. Blocked information of IDU fan motor will be eliminated. (For some models, they can only be restated up after re-energized)

Please refer to maintenance part for display information and disposal method for details.

3. Other Control Function Introduction

(1)Timer function

Clock timer: The precision of clock timer is 1minute. 24hours circulated timer can be set.

◆ **Timer ON:** If timer ON is set during operation of the unit, the unit will continue to operate. If timer ON is set at unit OFF, upon ON time reaches, the unit will start to run according to previous setting status.

◆ **Timer OFF:** If timer OFF is set at unit OFF, the system will keep standby status. If timer OFF is set at unit ON, upon OFF time reaches, the unit will stop operation.

◆ **Timer change:**

Although timer has been set, the unit still can be turned on/off by pressing ON/OFF button on the remote controller. You can also reset the timer.

If timer ON and timer OFF are set at the same time during operation of the unit, the unit will keep running at current status till OFF time reaches. Upon ON time reached, the system will be turned on automatically. The unit will operate circularly like that every 24hours.

If timer ON and timer OFF are set at unit OFF status, the system keep OFF status till ON time reaches. Upon OFF time reaches, the system will be turned OFF automatically. The unit will operate circularly like that every 24hours.

(2) Emergency operation switch

After pressing this button, the system will operate according under auto mode and the IDU fan motor operates at auto speed. Swing motor operates when the IDU fan motor operates. Press this button again to turn off the unit.



(3) Sleep function

In this mode, the system will select proper sleep curve to operate according to different set temperature.

① If start up sleep function under cooling or drying mode, the system will increase set temperature automatically within a certain range to operate.

② If start up sleep function under heating mode, the system will decrease set temperature automatically within a certain range to operate.

(4) Turbo function

Turbo function can be set under cooling and heating modes. During operation of turbo function, the system operates at the maximum fan speed.

(5) Dry function

Dry function can be set under cooling and drying modes. During operation of drying function, the fan will stop operation after operating for a period of time when turning off the unit.

(6) Auto fan speed control

Auto fan speed control can be set under cooling, heating and fan mode. During operation of auto fan speed control, the IDU fan motor will adjust the fan speed (high, medium or low speed) according to ambient temperature.


(7) Up&down swing control

① After energization, up & down swing motor will firstly have the horizontal louver rotate anticlockwise to position O to close air outlet. If swing function has not been set after start-up of the unit, horizontal louver will turn clockwise to position D in heating mode, or turn clockwise to level position L in other modes.

② If swing function is set when turning on the unit, the horizontal louver will swing between L and D.

Horizontal louver has 7 swing statuses:


◆ Stay at position L: control by remote controller: 

◆ Stay at position A: control by remote controller: 

◆ Stay at position B: control by remote controller: 

◆ Stay at position C: control by remote controller: 

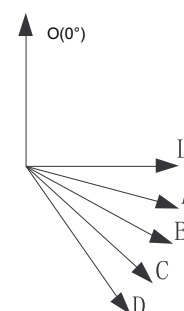
◆ Stay at position D: control by remote controller: 

◆ Swing between L and D: control by remote controller: 

◆ Stop at any position between L and D (angles between L and D are equiangular) and no display on remote controller.

③ When turning off the unit, horizontal louver will close at position O.

④ Swing action is valid only when set swing command and the IDU fan motor is operating.



(9) Dual-8 nixie tube display

◆ When the air conditioner is turned on for the first time, dual-8 nixie tube defaulted to display current set temperature.

◆ When controller receives signal of display set temperature, dual-8 nixie tube displays set temperature. When received remote control signal is switched to indoor ambient temperature display status signal from other display status, dual-8 nixie tube will display indoor ambient temperature for 3-5s, and then turn back to display set temperature. If remote control to set other status, the display keeps the same.

- ◆ When air conditioner has a malfunction, dual-8 nixie tube will show relevant error code.

F1	Indoor ambient temperature sensor is open/short-circuited
F2	Indoor evaporator temperature sensor is open/short-circuited
H6	Blocked protection of IDU fan motor
C5	Malfunction protection of jumper cap
U8	Zero-crossing inspection circuit malfunction of the IDU fan motor
F3	Outdoor ambient temperature sensor is open/short-circuited
F4	Outdoor condenser temperature sensor is open/short-circuited
F5	Outdoor discharge temperature sensor is open/ short-circuited
E1	High pressure protection
E3	Low pressure protection of compressor
E4	High discharge temperature protection of compressor
E5	Overcurrent protection
E6	Communication malfunction
H3	Overload protection compressor
E8	Overload malfunction
F0	Lack of refrigerant or block protection for the system
Defrosting	Heating indicator off for 0.5s and then blinks for 10s

- ◆ When air conditioner is in auto defrosting, heating icon will be on and off.
- ◆ If turn off light button, all display will be turned off.

(10) Memory function

① Power failure when turning on the unit

- ◆ Memory content: ON status, mode, up&down swing, light, set temperature, set fan speed, general timer, Fahrenheit/ Celsius
- ◆ General timer can be memorized. Time of timer is calculated again from energization.
- ◆ Clock timer can't be memorized.

② Power failure when turning off the unit

- ◆ Memory content: OFF status, mode, up&down swing, light, set temperature, set fan speed, general timer, Fahrenheit/ Celsius
- ◆ General timer can be memorized. Time of timer is calculated again from energization.
- ◆ Clock timer can't be memorized.

4. Special Function

(1) Health function (for the model with health function)

During operation of the IDU fan motor, press health button on the remote controller to start health function (If there is not health button on the remote controller, the unit defaults health function ON).

(2) I Feel function (for all models, but it needs the remote controller which can set this function)

When I FEEL command is received, the controller will operate according to the ambient temperature sent by the remote controller (For defrosting and cold air prevention, the unit operates according to the ambient temperature sensed by the air conditioner). The remote controller will regularly send ambient temperature data to the controller. When the data has not been received for a long time, the unit will operate according to the temperature sensed by the air conditioner. If I FEEL function is not set, the ambient temperature will be that sensed by the air conditioner.

Part II : Installation and Maintenance

7. Notes for Installation and Maintenance

Safety Precautions: Important!

Please read the safety precautions carefully before installation and maintenance.

The following contents are very important for installation and maintenance.

Please follow the instructions below.

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



Warnings

Electrical Safety Precautions:

1. Cut off the power supply of air conditioner before checking and maintenance.
2. The air condition must apply specialized circuit and prohibit share the same circuit with other appliances.
3. The air conditioner should be installed in suitable location and ensure the power plug is touchable.
4. Make sure each wiring terminal is connected firmly during installation and maintenance.
5. Have the unit adequately grounded. The grounding wire can't be used for other purposes.
6. Must apply protective accessories such as protective boards, cable-cross loop and wire clip.
7. The live wire, neutral wire and grounding wire of power supply must be corresponding to the live wire, neutral wire and grounding wire of the air conditioner.
8. The power cord and power connection wires can't be pressed by hard objects.
9. If power cord or connection wire is broken, it must be replaced by a qualified person.

10. If the power cord or connection wire is not long enough, please get the specialized power cord or connection wire from the manufacture or distributor. Prohibit prolong the wire by yourself.

11. For the air conditioner without plug, an air switch must be installed in the circuit. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.

12. Make sure all wires and pipes are connected properly and the valves are opened before energizing.

13. Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.

14. Replace the fuse with a new one of the same specification if it is burnt down; don't replace it with a cooper wire or conducting wire.

15. If the unit is to be installed in a humid place, the circuit breaker must be installed.

Installation Safety Precautions:

1. Select the installation location according to the requirement of this manual.(See the requirements in installation part)
2. Handle unit transportation with care; the unit should not be carried by only one person if it is more than 20kg.
3. When installing the indoor unit and outdoor unit, a sufficient fixing bolt must be installed; make sure the installation support is firm.
4. Ware safety belt if the height of working is above 2m.
5. Use equipped components or appointed components during installation.
6. Make sure no foreign objects are left in the unit after finishing installation.

Refrigerant Safety Precautions:

1. Avoid contact between refrigerant and fire as it generates poisonous gas; Prohibit prolong the connection pipe by welding.
2. Apply specified refrigerant only. Never have it mixed with any other refrigerant. Never have air remain in the refrigerant line as it may lead to rupture or other hazards.
3. Make sure no refrigerant gas is leaking out when installation is completed.
4. If there is refrigerant leakage, please take sufficient measure to minimize the density of refrigerant.
5. Never touch the refrigerant piping or compressor without wearing glove to avoid scald or frostbite.

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

Safety Precautions for Installing and Relocating the Unit:

To ensure safety, please be mindful of the following precautions.



Warnings

1. When installing or relocating the unit, be sure to keep the refrigerant circuit free from air or substances other than the specified refrigerant.

Any presence of air or other foreign substance in the refrigerant circuit will cause system pressure rise or compressor rupture, resulting in injury.

2. When installing or moving this unit, do not charge the refrigerant which is not comply with that on the nameplate or unqualified refrigerant.

Otherwise, it may cause abnormal operation, wrong action, mechanical malfunction or even series safety accident.

3. When refrigerant needs to be recovered during relocating or repairing the unit, be sure that the unit is running in cooling mode. Then, fully close the valve at high pressure side (liquid valve). About 30-40 seconds later, fully close the valve at low pressure side (gas valve), immediately stop the unit and disconnect power. Please note that the time for refrigerant recovery should not exceed 1 minute.

If refrigerant recovery takes too much time, air may be sucked in and cause pressure rise or compressor rupture, resulting in injury.

4. During refrigerant recovery, make sure that liquid valve and gas valve are fully closed and power is disconnected before detaching the connection pipe.

If compressor starts running when stop valve is open and connection pipe is not yet connected, air will be sucked in and cause pressure rise or compressor rupture, resulting in injury.

5. When installing the unit, make sure that connection pipe is securely connected before the compressor starts running.

If compressor starts running when stop valve is open and connection pipe is not yet connected, air will be sucked in and cause pressure rise or compressor rupture, resulting in injury.

6. Prohibit installing the unit at the place where there may be leaked corrosive gas or flammable gas.

If there leaked gas around the unit, it may cause explosion and other accidents.

7. Do not use extension cords for electrical connections. If the electric wire is not long enough, please contact a local service center authorized and ask for a proper electric wire.

Poor connections may lead to electric shock or fire.

8. Use the specified types of wires for electrical connections between the indoor and outdoor units. Firmly clamp the wires so that their terminals receive no external stresses.

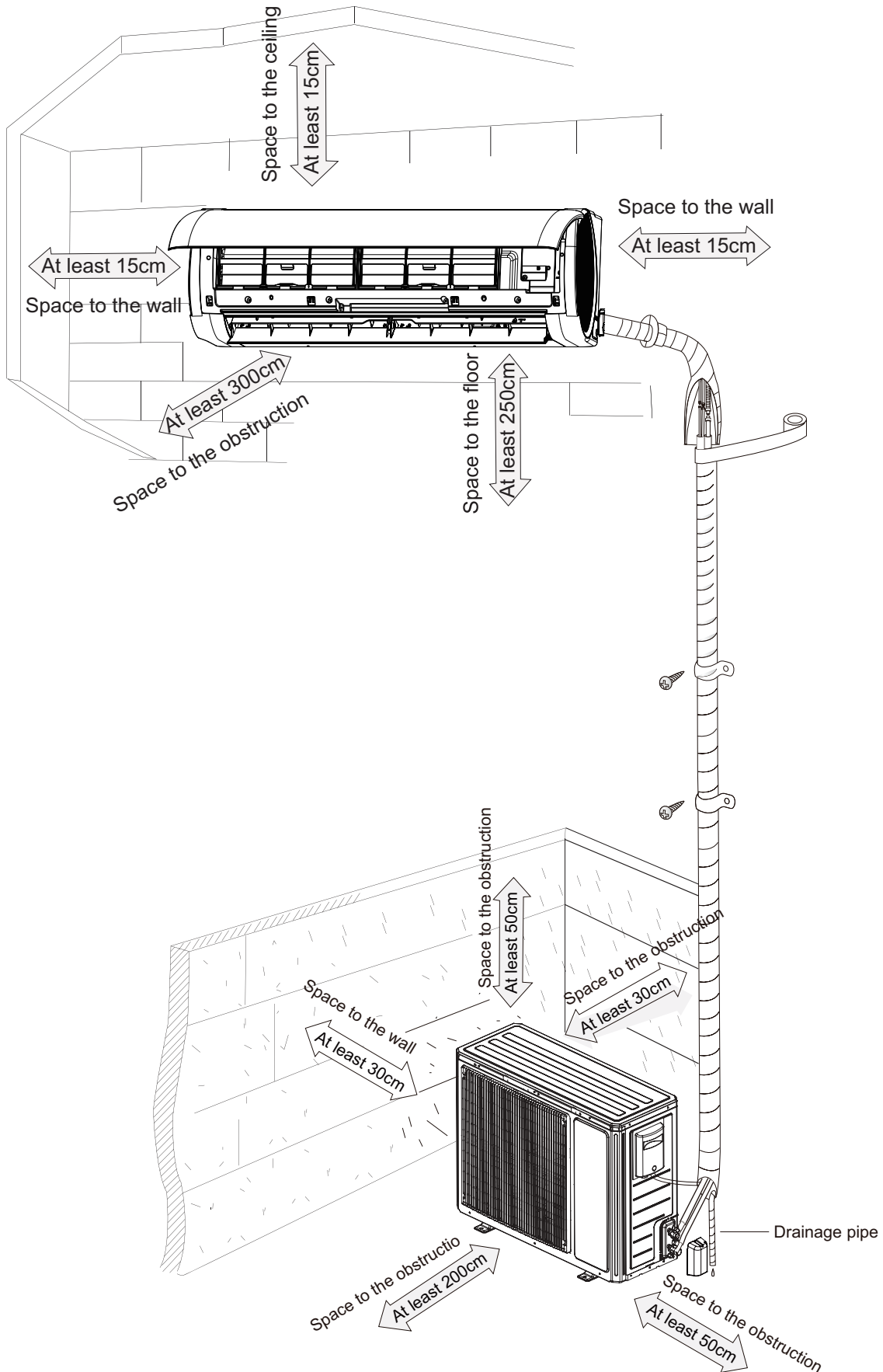
Electric wires with insufficient capacity, wrong wire connections and insecure wire terminals may cause electric shock or fire.

Main Tools for Installation and Maintenance

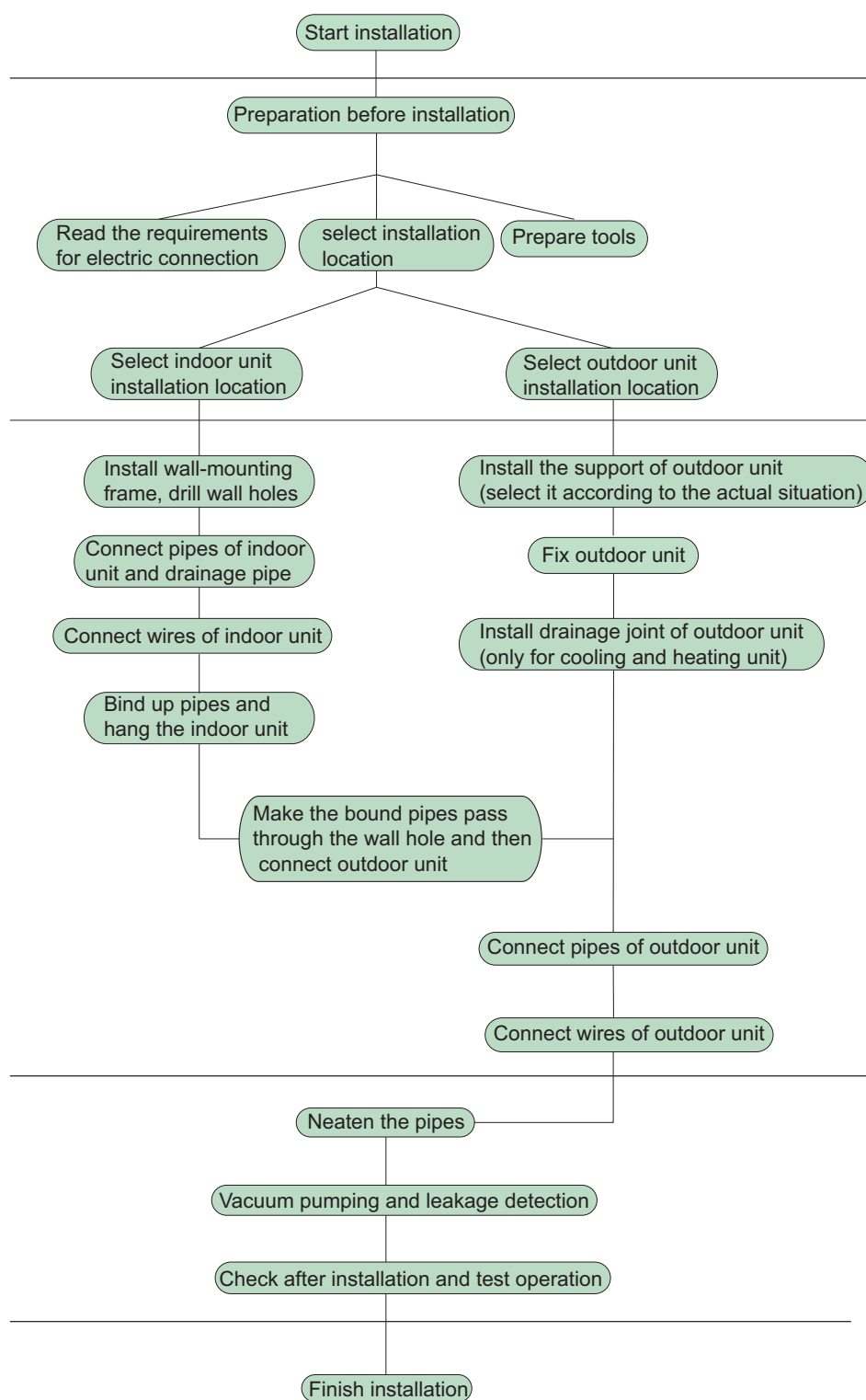
<p>1. Level meter, measuring tape</p> 	<p>2. Screw driver</p> 	<p>3. Impact drill, drill head, electric drill</p> 
<p>4. Electroprobe</p> 	<p>5. Universal meter</p> 	<p>6. Torque wrench, open-end wrench, inner hexagon spanner</p> 
<p>7. Electronic leakage detector</p> 	<p>8. Vacuum pump</p> 	<p>9. Pressure meter</p> 
<p>10. Pipe pliers, pipe cutter</p> 	<p>11. Pipe expander, pipe bender</p> 	<p>12. Soldering appliance, refrigerant container</p> 

8. Installation

8.1 Installation Dimension Diagram



Installation procedures



Note: this flow is only for reference; please find the more detailed installation steps in this section.

8.2 Installation Parts-checking

No.	Name	No.	Name
1	Indoor unit	8	Sealing gum
2	Outdoor unit	9	Wrapping tape
3	Connection pipe	10	Support of outdoor unit
4	Drainage pipe	11	Fixing screw
5	Wall-mounting frame	12	Drainage plug(cooling and heating unit)
6	Connecting cable(power cord)	13	Owner's manual, remote controller
7	Wall pipe		

⚠ Note:

- 1.Please contact the local agent for installation.
- 2.Don't use unqualified power cord.

8.3 Selection of Installation Location

1. Basic Requirement:

Installing the unit in the following places may cause malfunction. If it is unavoidable, please consult the local dealer:

- (1) The place with strong heat sources, vapors, flammable or explosive gas, or volatile objects spread in the air.
- (2) The place with high-frequency devices (such as welding machine, medical equipment).
- (3) The place near coast area.
- (4) The place with oil or fumes in the air.
- (5) The place with sulfureted gas.
- (6) Other places with special circumstances.
- (7) The appliance shall not be installed in the laundry.
- (8) It's not allowed to be installed on the unstable or motive base structure (such as truck) or in the corrosive environment (such as chemical factory).

2. Indoor Unit:

- (1) There should be no obstruction near air inlet and air outlet.
- (2) Select a location where the condensation water can be dispersed easily and won't affect other people.
- (3) Select a location which is convenient to connect the outdoor unit and near the power socket.
- (4) Select a location which is out of reach for children.
- (5) The location should be able to withstand the weight of indoor unit and won't increase noise and vibration.
- (6) The appliance must be installed 2.5m above floor.
- (7) Don't install the indoor unit right above the electric appliance.
- (8) Please try your best to keep way from fluorescent lamp.

3. Outdoor Unit:

- (1) Select a location where the noise and outflow air emitted by the outdoor unit will not affect neighborhood.
- (2) The location should be well ventilated and dry, in which the outdoor unit won't be exposed directly to sunlight or strong wind.
- (3) The location should be able to withstand the weight of outdoor unit.
- (4) Make sure that the installation follows the requirement of installation dimension diagram.
- (5) Select a location which is out of reach for children and far away from animals or plants.If it is unavoidable, please add fence for safety purpose.

8.4 Requirements for electric connection

1. Safety Precaution

- (1) Must follow the electric safety regulations when installing the unit.
- (2) According to the local safety regulations, use qualified power supply circuit and air switch.
- (3) Make sure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring may result in electric shock,fire hazard or malfunction. Please install proper power supply cables before using the air conditioner.
- (4) Properly connect the live wire, neutral wire and grounding wire of power socket.
- (5) Be sure to cut off the power supply before proceeding any work related to electricity and safety.
- (6) Do not put through the power before finishing installation.
- (7) 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.
- (8) The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.
- (9) The appliance shall be installed in accordance with national wiring regulations.

2. Grounding Requirement:

- (1) The air conditioner is first class electric appliance. It must be properly grounding with specialized grounding device by a professional. Please make sure it is always grounded effectively, otherwise it may cause electric shock.
- (2) The yellow-green wire in air conditioner is grounding wire, which can't be used for other purposes.
- (3) The grounding resistance should comply with national electric safety regulations.
- (4) The appliance must be positioned so that the plug is accessible.
- (5) An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.
- (6) Including an air switch with suitable capacity, please note the following table. Air switch should be included magnet buckle and heating buckle function, it can protect the circuit-short and overload. (Caution: please do not use the fuse only for protect the circuit)

Air-conditioner	Air switch capacity
28K	32A

8.5 Installation of Indoor Unit

1. Choosing Installation location

Recommend the installation location to the client and then confirm it with the client.

2. Install Wall-mounting Frame

- (1) Hang the wall-mounting frame on the wall; adjust it in horizontal position with the level meter and then point out the screw fixing holes on the wall.
- (2) Drill the screw fixing holes on the wall with impact drill (the specification of drill head should be the same as the plastic expansion particle) and then fill the plastic expansion particles in the holes.

(3) Fix the wall-mounting frame on the wall with tapping screws (ST4.2X25TA) and then check if the frame is firmly installed by pulling the frame. If the plastic expansion particle is loose, please drill another fixing hole nearby.

3. Install Wall-mounting Frame

(1) Choose the position of piping hole according to the direction of outlet pipe. The position of piping hole should be a little lower than the wall-mounted frame. (As show in Fig.1)

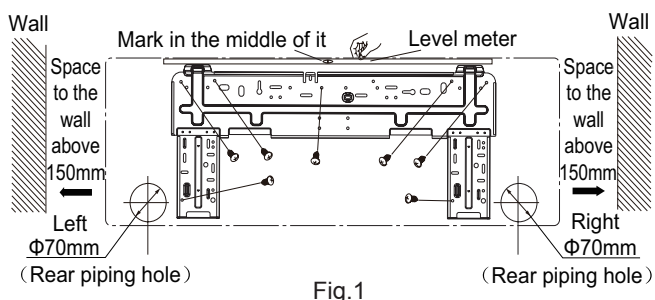


Fig.1

(2) Open a piping hole with the diameter of Φ70mm on the selected outlet pipe position. In order to drain smoothly, slant the piping hole on the wall slightly downward to the outdoor side with the gradient of 5-10°. (As show in Fig.2)

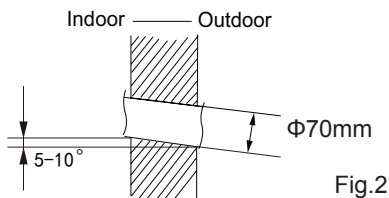


Fig.2

⚠ Note:

- (1) Pay attention to dust prevention and take relevant safety measures when opening the hole.
- (2) The plastic expansion particles are not provided and should be bought locally.

4. Outlet Pipe

(1) The pipe can be led out in the direction of right, rear right, left or rear left. (As show in Fig.3)
 (2) When selecting leading out the pipe from left or right, please cut off the corresponding hole on the bottom case. (As show in Fig.4)

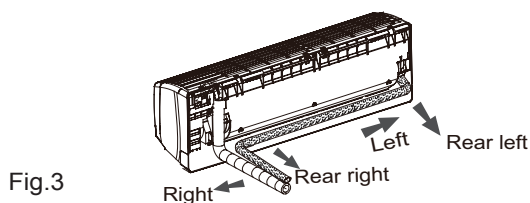


Fig.3

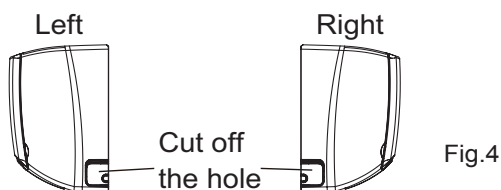


Fig.4

5. Connect the Pipe of Indoor Unit

- (1) Aim the pipe joint at the corresponding bellmouth. (As show in Fig.5)
- (2) Pretightening the union nut with hand.
- (3) Adjust the torque force by referring to the following sheet. Place the open-end wrench on the pipe joint and place the torque wrench on the union nut. Tighten the union nut with torque wrench. (As show in Fig.6)
- (4) Wrap the indoor pipe and joint of connection pipe with insulating pipe, and then wrap it with tape. (As show in Fig.7)

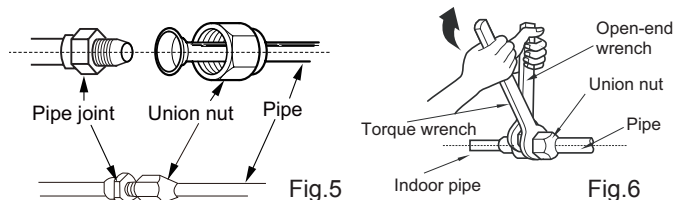


Fig.5

Fig.6

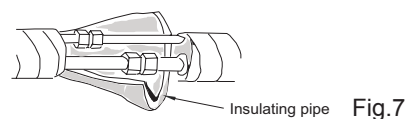


Fig.7

Refer to the following table for wrench moment of force:

Hex nut diameter	Tightening torque(N·m)
Φ6	15~20
Φ9.52	30~40
Φ12	45~55
Φ16	60~65
Φ19	70~75

6. Install Drain Hose

- (1) Connect the drain hose to the outlet pipe of indoor unit. (As show in Fig.8)
- (2) Bind the joint with tape. (As show in Fig.9)

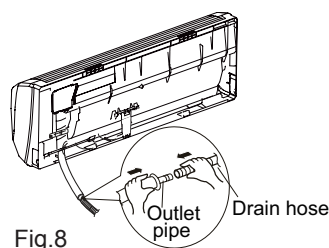


Fig.8

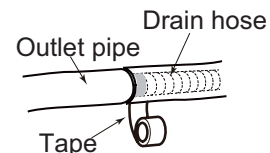
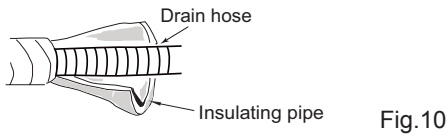


Fig.9

⚠ Note:

- (1) Add insulating pipe in the indoor drain hose in order to prevent condensation.
- (2) The plastic expansion particles are not provided. (As show in Fig.10)



7. Connect Wire of Indoor Unit

(1) Open the panel, remove the screw on the wiring cover and then take down the cover.(As show in Fig.11)

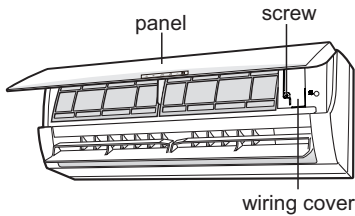


Fig.11

(2) Make the power connection wire go through the cable-cross hole at the back of indoor unit and then pull it out from the front side.(As show in Fig.12)

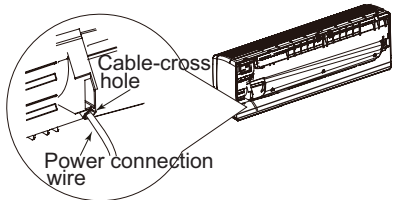
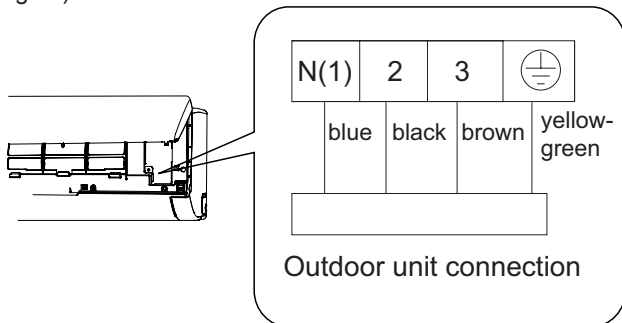


Fig.12

(3) Remove the wire clip; connect the power connection wire to the wiring terminal according to the color; tighten the screw and then fix the power connection wire with wire clip.(As show in Fig.13)



Note: the wiring connect is for reference only, please refer to the actual one.

Fig.13

(4) Put wiring cover back and then tighten the screw.
(5) Close the panel.

⚠ Note:

- (1) All wires of indoor unit and outdoor unit should be connected by a professional.
- (2) If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.
- (3) For the air conditioner with plug, the plug should be

reachable after finishing installation.

(4) For the air conditioner without plug, an air switch must be installed in the line. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.

8. Bind Up Pipe

(1) Bind up the connection pipe, power cord and drain hose with the band.(As show in Fig.14)

(2) Reserve a certain length of drain hose and power cord for installation when binding to a certain degree, separate the indoor power and then separate the drain hose.(As show in Fig.15)

(3) Bind them evenly.

(4) The liquid pipe and gas pipe should be bound separately at the end.

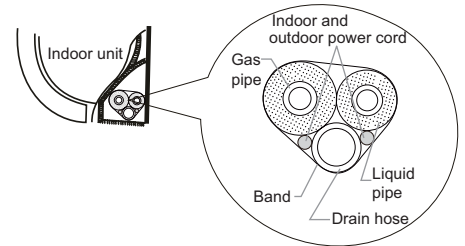


Fig.14

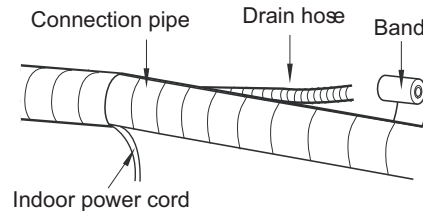


Fig.15

⚠ Note:

- (1) The power cord and control wire can't be crossed or winding.
- (2) The drain hose should be bound at the bottom.

9. Hang the Indoor Unit

(1) Put the bound pipes in the wall pipe and then make them pass through the wall hole.

(2) Hang the indoor unit on the wall-mounting frame.

(3) Stuff the gap between pipes and wall hole with sealing gum.

(4) Fix the wall pipe.(As show in Fig.16)

(5) Check if the indoor unit is installed firmly and closed to the wall.(As show in Fig.17)

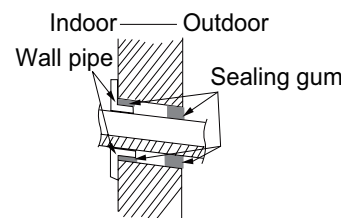


Fig.16

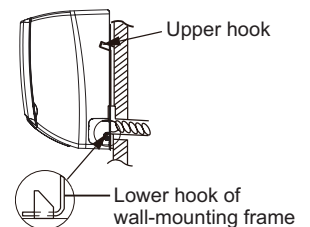


Fig.17

⚠ Note:

Do not bend the drain hose too excessively in order to prevent blocking.

8.6 Installation of Outdoor Unit

1. Fix the Support of Outdoor Unit(select it according to the actual installation situation)

- (1) Select installation location according to the house structure.
- (2) Fix the support of outdoor unit on the selected location with expansion screws.

⚠ Note:

- (1) Take sufficient protective measures when installing the outdoor unit.
- (2) Make sure the support can withstand at least four times the unit weight.
- (3) The outdoor unit should be installed at least 3cm above the floor in order to install drain joint.(As show in Fig.18)
- (4) For the unit with cooling capacity of 2300W~5000W, 6 expansion screws are needed; for the unit with cooling capacity of 6000W~8000W, 8 expansion screws are needed; for the unit with cooling capacity of 10000W~16000W, 10 expansion screws are needed.

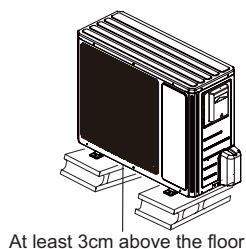


Fig.18

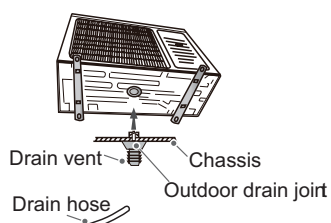


Fig.19

2. Install Drain Joint(Only for cooling and heating unit)

- (1) Connect the outdoor drain joint into the hole on the chassis.
 - (2) Connect the drain hose into the drain vent.
- (As show in Fig.19)

3. Fix Outdoor Unit

- (1) Place the outdoor unit on the support.
 - (2) Fix the foot holes of outdoor unit with bolts.
- (As show in Fig.20)

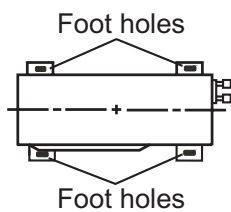


Fig.20

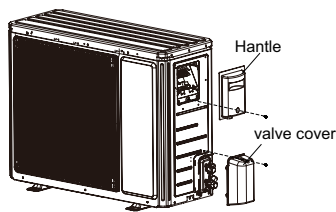


Fig.21

4. Connect Indoor and Outdoor Pipes

- (1) Remove the screw fixing the junction box cover of outdoor unit and then remove the cover.(As show in Fig.21)
- (2) Remove the screw cap of valve and aim the pipe joint at the bellmouth of pipe.(As show in Fig.22)

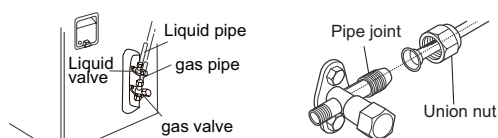


Fig.22

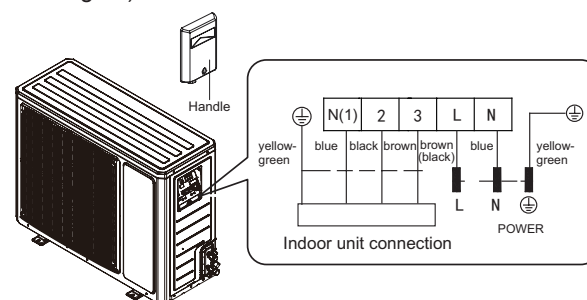
- (3) Pretightening the union nut with hand.
- (4) Tighten the union nut with torque wrench.

Refer to the following table for wrench moment of force:

Hex nut diameter	Tightening torque(N·m)
Φ6	15~20
Φ9.52	30~40
Φ12	45~55
Φ16	60~65
Φ19	70~75

5. Connect Outdoor Electric Wire

- (1) Remove the wire clip; connect the power connection wire and signal control wire (only for cooling and heating unit) to the wiring terminal according to the color; fix them with screws.(As show in Fig.23)



Note: the wiring connect is for reference only, please refer to the actual one.

Fig.23

- (2) Fix the power connection wire and signal control wire with wire clip (only for cooling and heating unit).

⚠ Note:

- (1) After tightening the screw, pull the power cord slightly to check if it is firm.
- (2) Never cut the power connection wire to prolong or shorten the distance.

6. Neaten the Pipes

- (1) The pipes should be placed along the wall, bent reasonably and hidden possibly. Min. semidiameter of bending the pipe is 10cm.
- (2) If the outdoor unit is higher than the wall hole, you must set a U-shaped curve in the pipe before pipe goes into the room, in order to prevent rain from getting into the room.(As show in Fig.24)

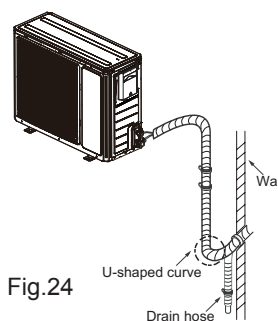


Fig.24

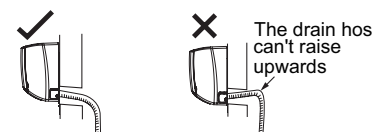
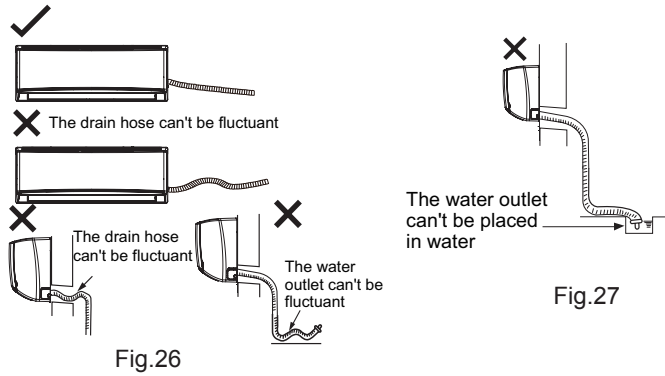


Fig.25

Note:

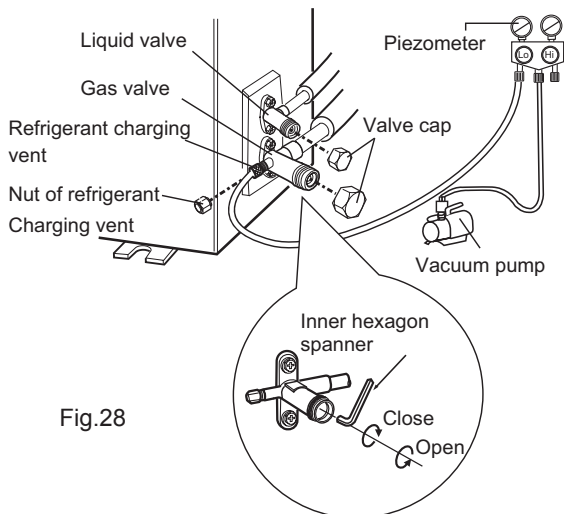
- (1) The through-wall height of drain hose shouldn't be higher than the outlet pipe hole of indoor unit.(As show in Fig.25)
- (2) Slant the drain hose slightly downwards. The drain hose can't be curved, raised and fluctuant, etc.(As show in Fig.26)
- (3) The water outlet can't be placed in water in order to drain smoothly.(As show in Fig.27)



8.7 Vacuum Pumping and Leak Detection

1. Use Vacuum Pump

- (1) Remove the valve caps on the liquid valve and gas valve and the nut of refrigerant charging vent.
- (2) Connect the charging hose of piezometer to the refrigerant charging vent of gas valve and then connect the other charging hose to the vacuum pump.
- (3) Open the piezometer completely and operate for 10-15min to check if the pressure of piezometer remains in -0.1MPa.
- (4) Close the vacuum pump and maintain this status for 1-2min to check if the pressure of piezometer remains in -0.1MPa. If the pressure decreases, there may be leakage.
- (5) Remove the piezometer, open the valve core of liquid valve and gas valve completely with inner hexagon spanner.
- (6) Tighten the screw caps of valves and refrigerant charging vent.(As show in Fig.28)



2. Leakage Detection

- (1) With leakage detector:
Check if there is leakage with leakage detector.
- (2) With soap water:
If leakage detector is not available, please use soap water for leakage detection. Apply soap water at the suspected position and keep the soap water for more than 3min. If there are air bubbles coming out of this position, there's a leakage.

8.8 Check after Installation and Test Operation

1. Check after Installation

Check according to the following requirement after finishing installation.

NO.	Items to be checked	Possible malfunction
1	Has the unit been installed firmly?	The unit may drop, shake or emit noise.
2	Have you done the refrigerant leakage test?	It may cause insufficient cooling (heating) capacity.
3	Is heat insulation of pipeline sufficient?	It may cause condensation and water dripping.
4	Is water drained well?	It may cause condensation and water dripping.
5	Is the voltage of power supply according to the voltage marked on the nameplate?	It may cause malfunction or damage the parts.
6	Is electric wiring and pipeline installed correctly?	It may cause malfunction or damage the parts.
7	Is the unit grounded securely?	It may cause electric leakage.
8	Does the power cord follow the specification?	It may cause malfunction or damage the parts.
9	Is there any obstruction in air inlet and air outlet?	It may cause insufficient cooling (heating) capacity.
10	The dust and sundries caused during installation are removed?	It may cause malfunction or damaging the parts.
11	The gas valve and liquid valve of connection pipe are open completely?	It may cause insufficient cooling (heating) capacity.
12	Is the inlet and outlet of piping hole been covered?	It may cause insufficient cooling (heating) capacity or waster eletricity.

2. Test Operation

- (1) Preparation of test operation
 - The client approves the air conditioner installation.
 - Specify the important notes for air conditioner to the client.
- (2) Method of test operation
 - Put through the power, press ON/OFF button on the remote controller to start operation.
 - Press MODE button to select AUTO, COOL, DRY, FAN and HEAT to check whether the operation is normal or not.
 - If the ambient temperature is lower than 16°C , the air conditioner can't start cooling.

9. Maintenance

9.1 Error Code

No.	Malfunction Name	Display Method of Indoor Unit (Error Code)	A/C Status	Possible Causes(For specific maintenance method, please refer to the following procedure of troubleshooting)
1	Indoor ambient temperature sensor is open/short-circuited	F1	The unit will stop operation as it reaches the temperature point. During cooling and drying operation, except indoor fan operates, other loads (such as compressor, outdoor fan, 4-way valve) stop operation; During heating operation, the complete unit stops operation.	<ol style="list-style-type: none"> 1. The wiring terminal between indoor ambient temperature sensor and controller is loosened or poorly contacted; 2. There's short circuit due to trip-over of the parts on controller; 3. Indoor ambient temperature sensor is damaged (Please check it by referring to the resistance table for temperature sensor) 4. Main board is broken.
2	Indoor evaporator temperature sensor is open/short-circuited	F2	The unit will stop operation as it reaches the temperature point. During cooling and drying operation, except indoor fan operates, other loads stop operation; During heating operation, the complete unit stops operation.	<ol style="list-style-type: none"> 1. The wiring terminal between indoor evaporator temperature sensor and controller is loosened or poorly contacted; 2. There's short circuit due to the trip-over of the parts on controller; 3. Indoor evaporator temperature sensor is damaged (Please check it by referring to the resistance table for temperature sensor) 4. Main board is broken.
3	Blocked protection of IDU fan motor	H6	IDU fan, ODU fan, compressor and electric heat tube stop operation. Horizontal louver stops at the current position.	<ol style="list-style-type: none"> 1. The feedback terminal of PG motor is not connected tightly. 2. The control terminal of PG motor is not connected tightly. 3. Fan blade rotates unsmoothly. 4. Malfunction of motor 5. Main board is broken.
4	Malfunction protection of jumper cap	C5	Operation of remote controller or control panel is available, but the unit won't act.	<ol style="list-style-type: none"> 1. There's not jumper cap on the main board. 2. Jumper cap is not inserted properly and tightly. 3. Jumper cap is damaged. 4. Controller is damaged.
5	Zero-crossing inspection circuit malfunction of the IDU fan motor	U8	Operation of remote controller or control panel is available, but the unit won't act.	<ol style="list-style-type: none"> 1. Quick de-energization and energization. Wrong judgement by the controller because the electric-discharging of capacitor is slow. 2. Zero-crossing inspection circuit of main board for controller is abnormal.
6	Outdoor ambient temperature sensor is open/short-circuited	F3	The unit will stop operation as it reaches the temperature point. During cooling and drying operation, compressor stops and indoor fan operates; During heating operation, the complete unit stops operation.	<ol style="list-style-type: none"> 1. The wiring terminal between outdoor ambient temperature sensor and controller is loosened or poorly contacted; 2. There's short circuit due to the trip-over of the parts on controller; 3. Outdoor ambient temperature sensor is damaged (Please check it by referring to the resistance table for temperature sensor) 4. Main board is broken.
7	Outdoor condenser temperature sensor is open/short-circuited	F4	The unit will stop operation as it reaches the temperature point. During cooling and drying operation, compressor stops and indoor fan operates; During heating operation, the complete unit stops operation.	<ol style="list-style-type: none"> 1. The wiring terminal between outdoor condenser temperature sensor and controller is loosened or poorly contacted; 2. There's short circuit due to the trip-over of the parts on controller; 3. Outdoor condenser temperature sensor is damaged (Please check it by referring to the resistance table for temperature sensor) 4. Main board is broken.

8	Outdoor discharge temperature sensor is open/short-circuited	F5	The unit will stop operation as it reaches the temperature point. During cooling and drying operation, the compressor stops operation while IDU fan motor operates; During heating operation, the heating fan motor operates according to the conditions of blowing residual heat.	<ol style="list-style-type: none"> 1. The wiring terminal between outdoor condenser temperature sensor and maiboard is loosened or poorly contacted. 2. There's short circuit due to trip-over of the parts on maiboard. 3. Outdoor condenser temperature sensor is damaged (Please check it by referring to the resistance table for temperature sensor). 4. Mainboard is broken.
9	High pressure protection	E1	During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, if it is inverter unit, the complete unit stops; if it is floor standing unit, the complete unit stops and operation of remote controller or controller is unavailable.	<ol style="list-style-type: none"> 1. The main board and the display panel are not connected well. 2. The OVC terminal on main board is not connected well with the high pressure switch on the complete unit. 3. The wiring of high pressure switch is loosened. 4. Refrigerant is superabundant; 5. Poor heat exchange (including blocked heat exchanger and bad radiating environment); 6. Ambient temperature is too high; (if it is 3-phase unit, the high pressure protection may be caused by overcurrent protection due to this reason) 7. The supply voltage is abnormal (if it is 3-phase unit, the high pressure protection may be caused by overcurrent protection due to this reason) 8. The air intake and air discharge at indoor / outdoor heat exchanger are not smooth. The air cycle is short circuited. 9. Filter and heat exchange fins of indoor/outdoor units are blocked. 10. The system pipeline is blocked. 11. The gas valve and liquid valve for outdoor unit are not completely opened. 12. The OVC input is at high level.
10	Low pressure protection of compressor	E3	The complete unit stops	<ol style="list-style-type: none"> 1. The main board and display panel are not connected well. 2. The LPP terminal on the main board is not connected well with the high pressure switch on the complete unit. 3. The wiring of the high pressure switch is loosened. High pressure switch is damaged or poorly contacted. 4. Insufficient or leaking out refrigerant. 5. The LPP input is at high level.
11	High discharge temperature protection of compressor	E4	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	<ol style="list-style-type: none"> 1. Abnormal system (e.g.: blockage, etc) 2. Abnormal rotation speed of outdoor motor (cooling) 3. Abnormal air intake (cooling) 4. System is normal, but the compressor discharge temperature sensor is abnormal or poorly contacted.
12	Overcurrent protection	E5	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	<ol style="list-style-type: none"> 1. Unstable supply voltage. Normal fluctuation shall be within 10% of the rated voltage on the nameplate. 2. Supply voltage is too low and load is too high. 3. Measure the current of live wire on main board. If the current isn't higher than the overcurrent protection value, please check the controller. 4. The indoor and outdoor heat exchangers are too dirty, or the air inlet and air outlet are blocked. 5. The fan motor is not running. Abnormal fan speed: fan speed is too low or the fan doesn't run 6. The compressor is not running normally. There is abnormal sound, oil leakage or the temperature of the shell is too high, etc. 7. There's blockage in the system (filth blockage, ice plug, greasy blockage, Y-valve hasn't been opened completely)

13	Communication malfunction	E6	During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	<ol style="list-style-type: none"> 1. The communication line is not connected tightly or poorly contacted. 2. The match between main board and display panel is incorrect. Indoor and outdoor unit boards are matched incorrectly. 3. Incorrect wire connection. 4. Controller is damaged.
14	Overload malfunction	E8	The entire unit stops.	<ol style="list-style-type: none"> 1. Indoor and outdoor heat exchanger is too dirty? Or air inlet/outlet is blocked? 2. Fan motor doesn't work at a normal fan speed; fan speed is too low or the fan doesn't run. 3. Compressor operates normally or not? Is there any abnormal noise or oil leak? Casing is too hot? 4. System is blocked inside? (Dirt blockage? Ice blockage? Oil blockage? Y-valve is not fully open?) 5. Main board temperature sensor detects wrongly.
15	Overload protection for compressor	H3	The entire unit stops.	<ol style="list-style-type: none"> 1. Outdoor and indoor heat exchangers are too dirty or the air inlet/outlet is blocked. 2. Fan motor doesn't work at a normal fan speed; fan speed is too low or the fan doesn't run. 3. Compressor doesn't work normally. Strange noise or leakage occurs. Temperature of the shell is too high. 4. System is blocked inside(dirt block, ice block, oil block, Y-valve not fully open). 5. High pressure switch is abnormal 6. The refrigerant is leaking and cause overheating protection to compressor
16	Lack of refrigerant or block protection for the system or Overload protection compressor	F0	The Dual-8 Code Display will show F0 and the complete unit stops.	<ol style="list-style-type: none"> 1. Refrigerant leakage; 2. Indoor evaporator temperature sensor works abnormally; 3. The unit has been plugged up somewhere; 4. The compressor can't be started up normally. Because the power voltage for the complete unit is too low, and the outdoor working condition is too high.
17	Defrosting	Heating indicator off for 0.5s and then blinks for 10s	Not the error code. It's the status code for the operation.	

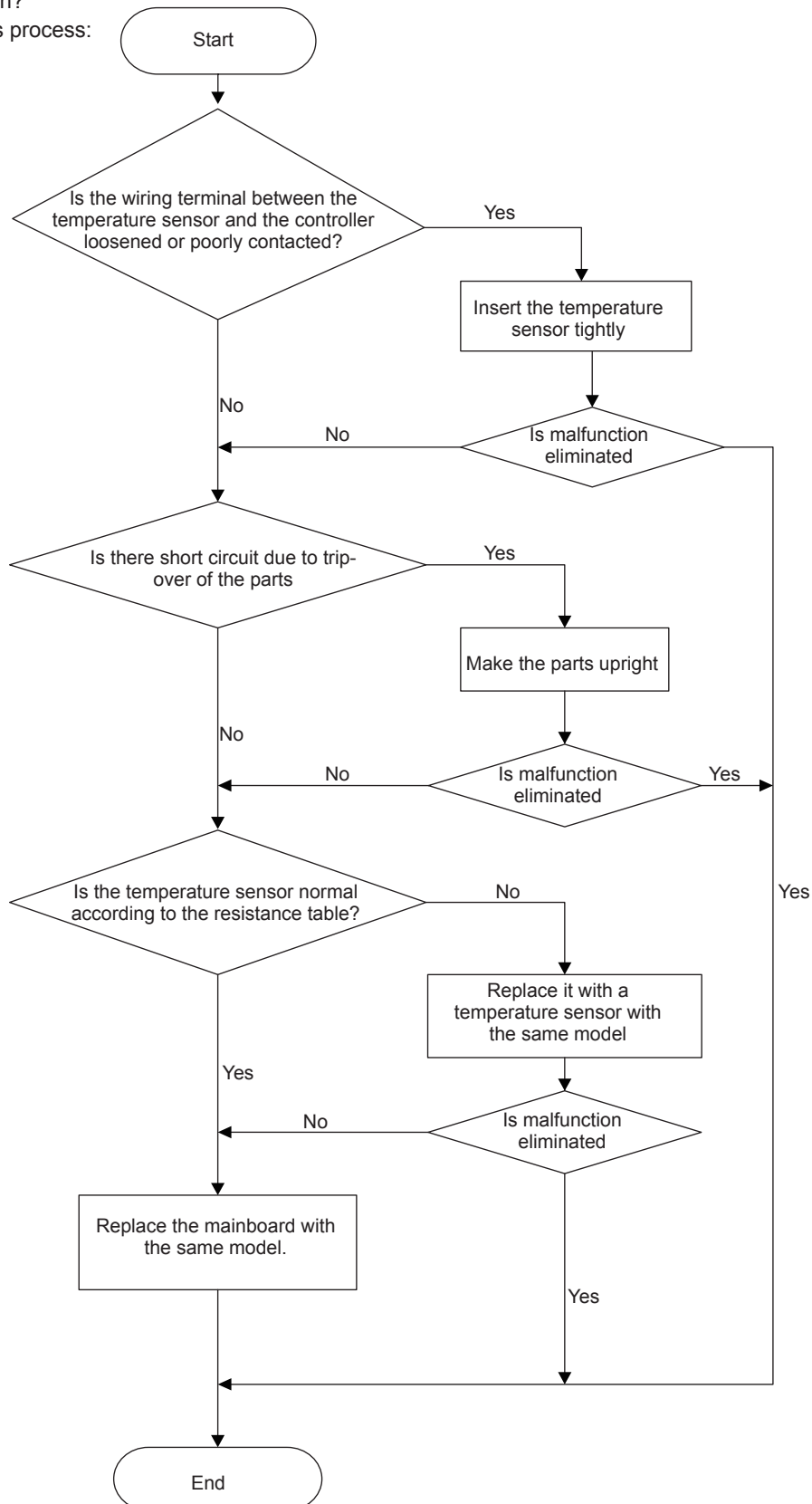
9.2 Procedure of Troubleshooting

1. Malfunction of Temperature Sensor F1, F2

Main detection points:

- Is the wiring terminal between the temperature sensor and the controller loosened or poorly contacted?
- Is there short circuit due to trip-over of the parts?
- Is the temperature sensor broken?
- Is mainboard broken?

Malfunction diagnosis process:

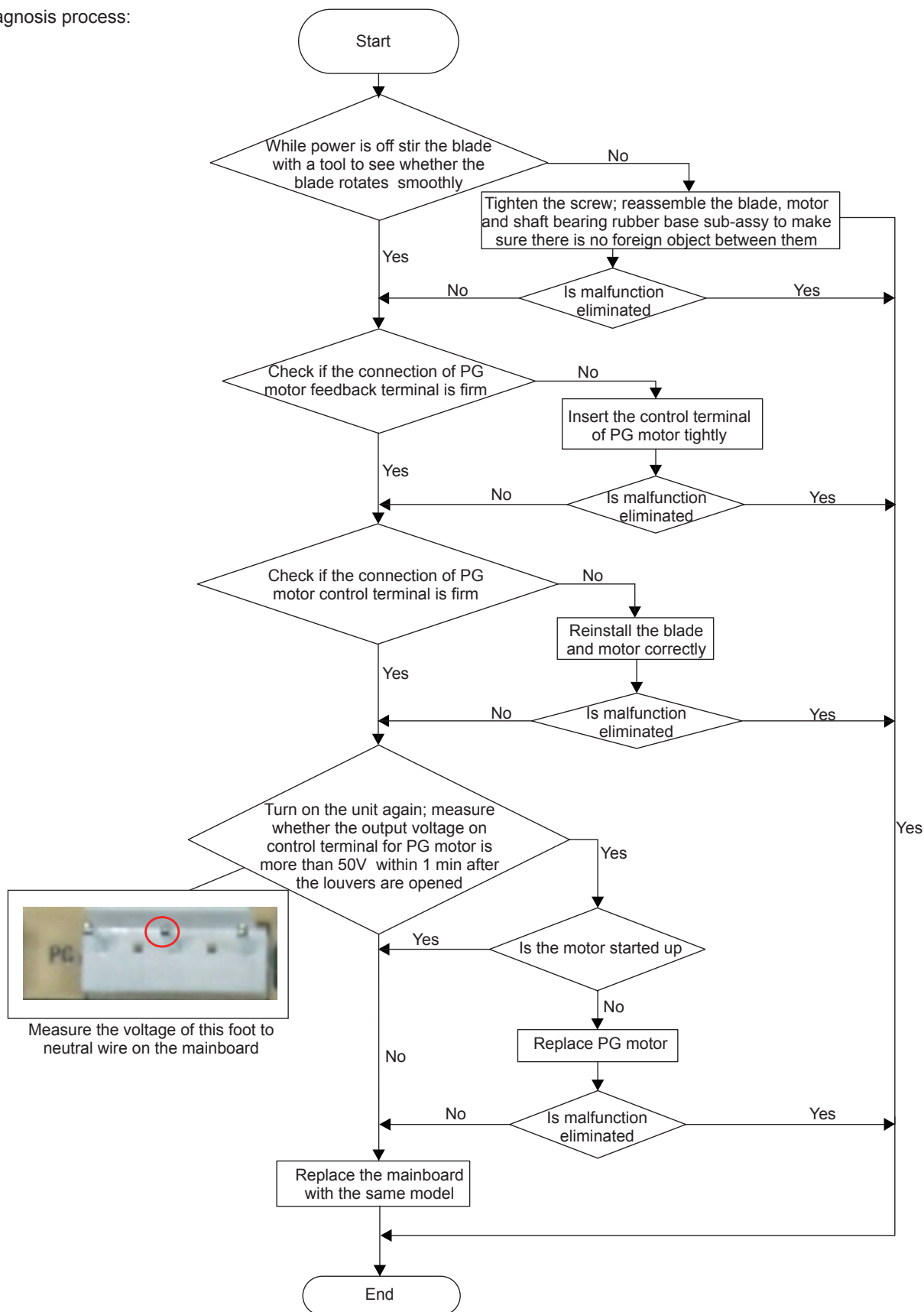


2. Malfunction of Blocked Protection of IDU Fan Motor H6

Main detection points:

- Smoothly the control terminal of PG motor connected tightly?
- Smoothly the feedback interface of PG motor connected tightly?
- The fan motor can't operate?
- The motor is broken?
- Detection circuit of the mainboard is defined abnormal?

Malfunction diagnosis process:

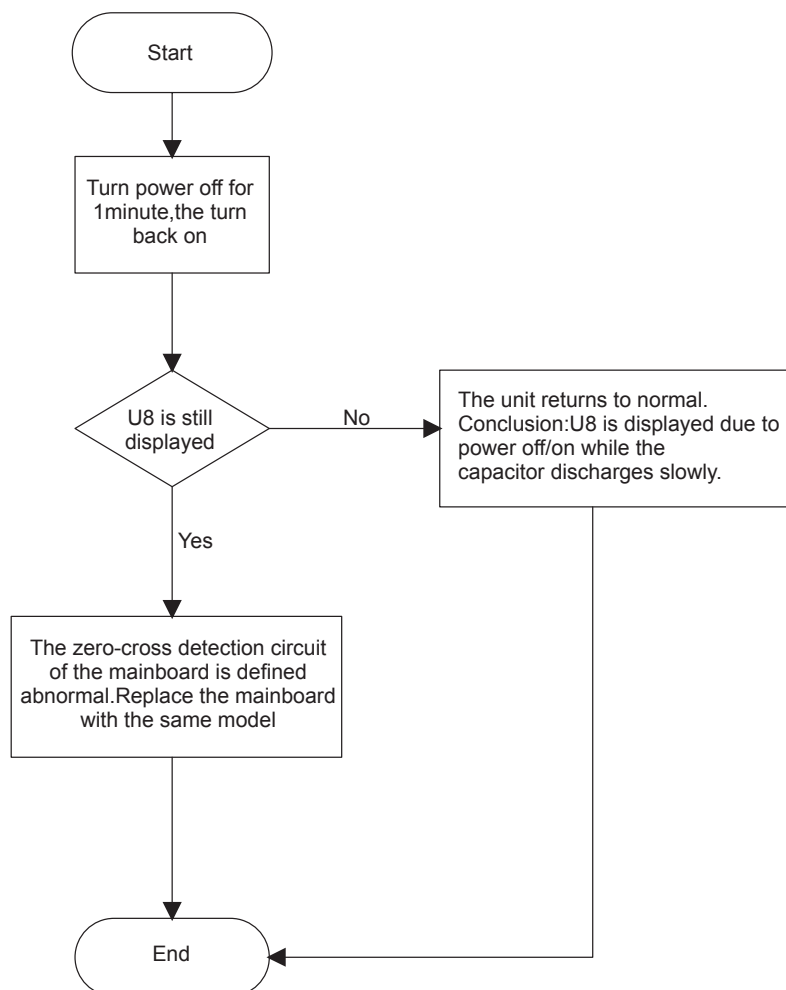


4. Malfunction of Zero-crossing Inspection Circuit Malfunction of the IDU Fan Motor U8

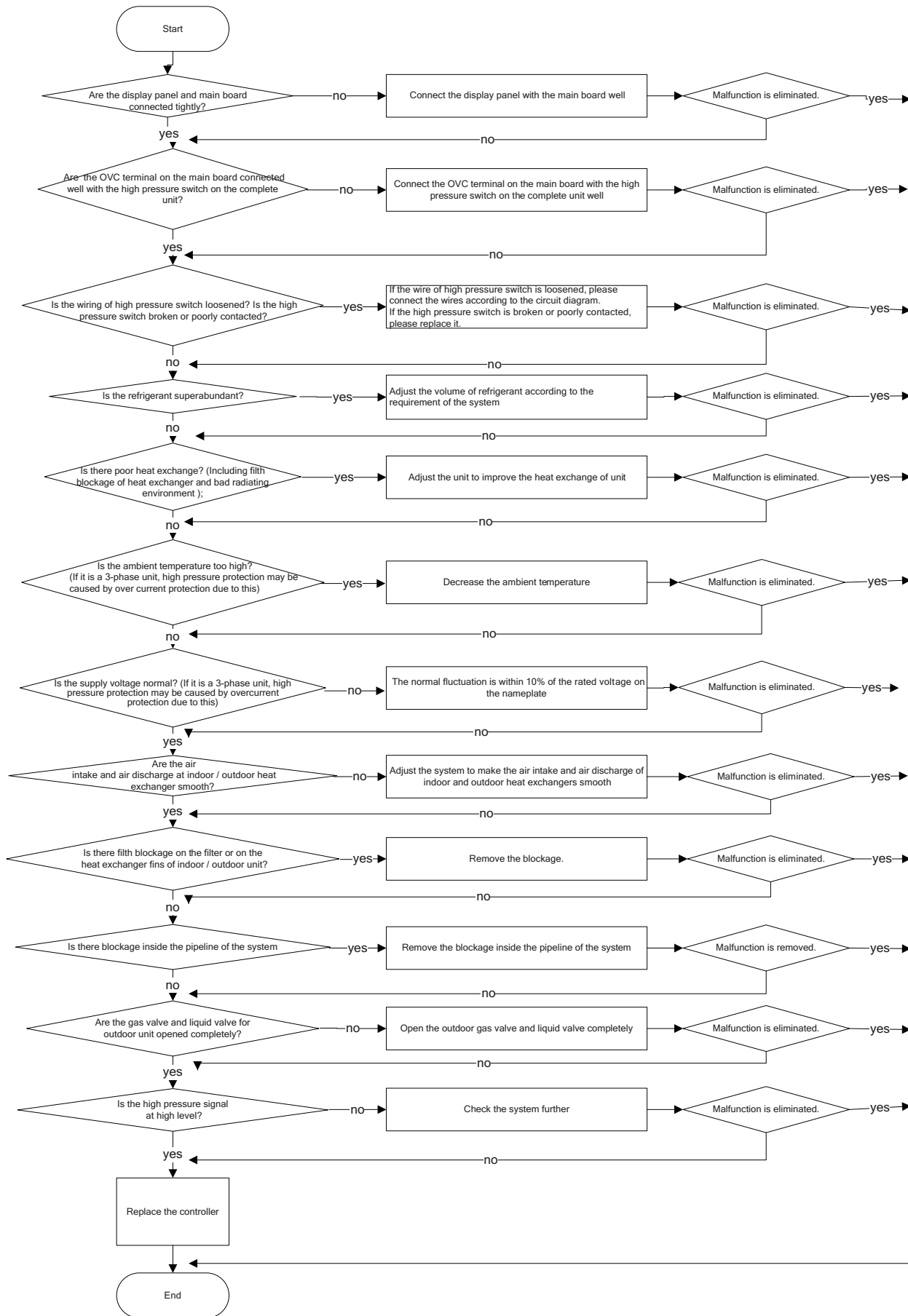
Main detection points:

- Instant energization after de-energization while the capacitor discharges slowly?
- The zero-cross detection circuit of the mainboard is defined abnormal?

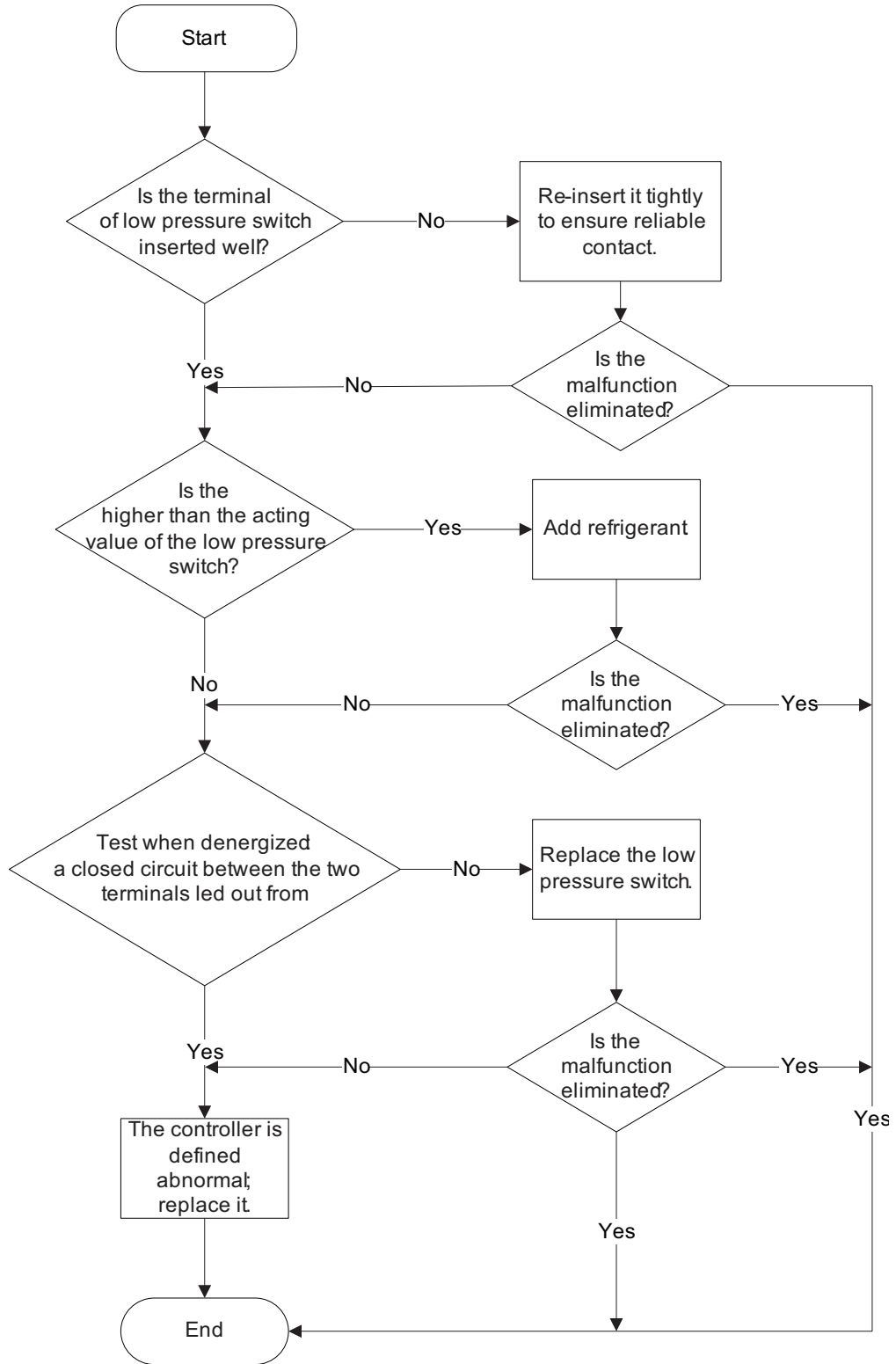
Malfunction diagnosis process:



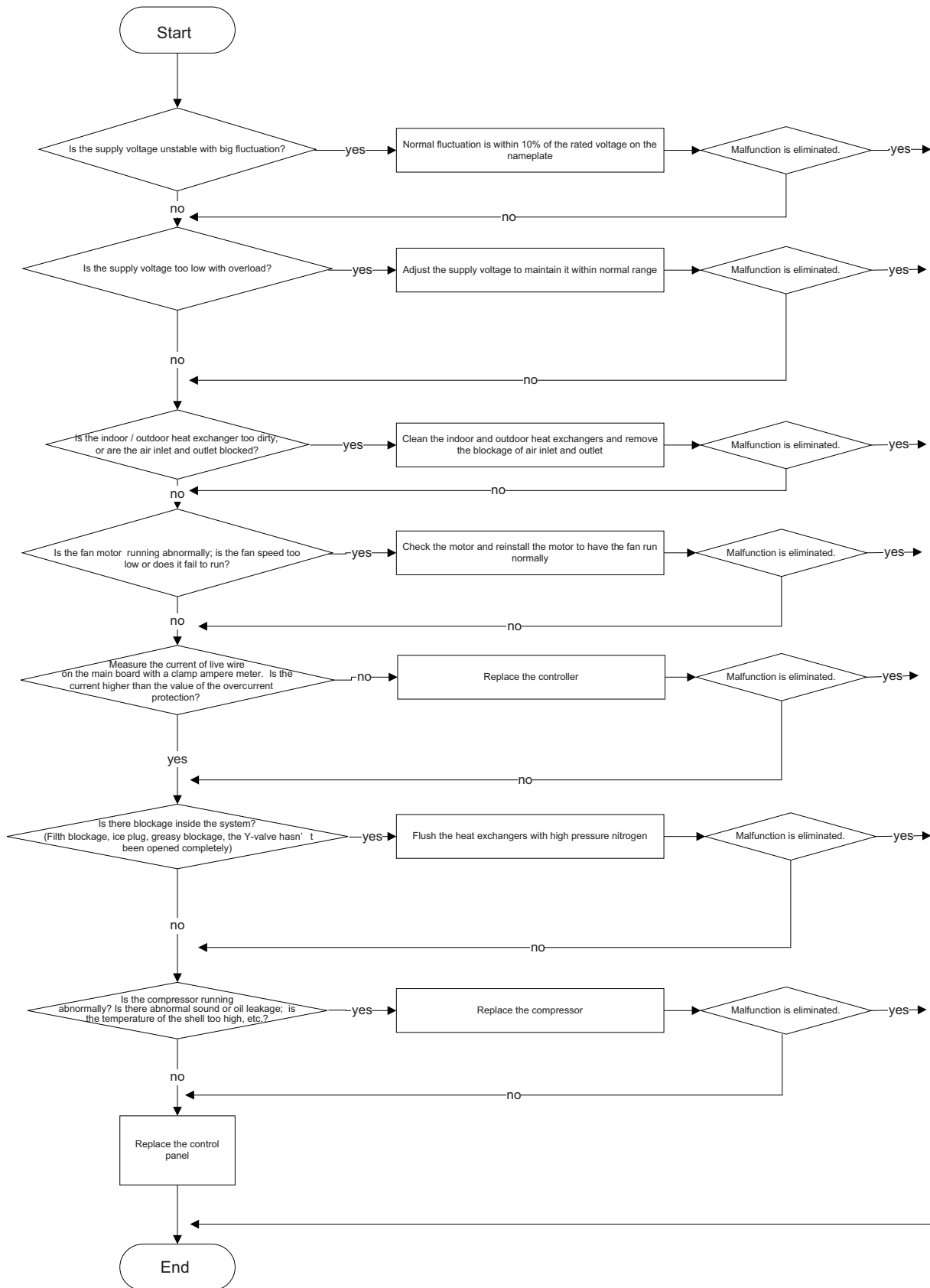
5. High pressure protection (E1)



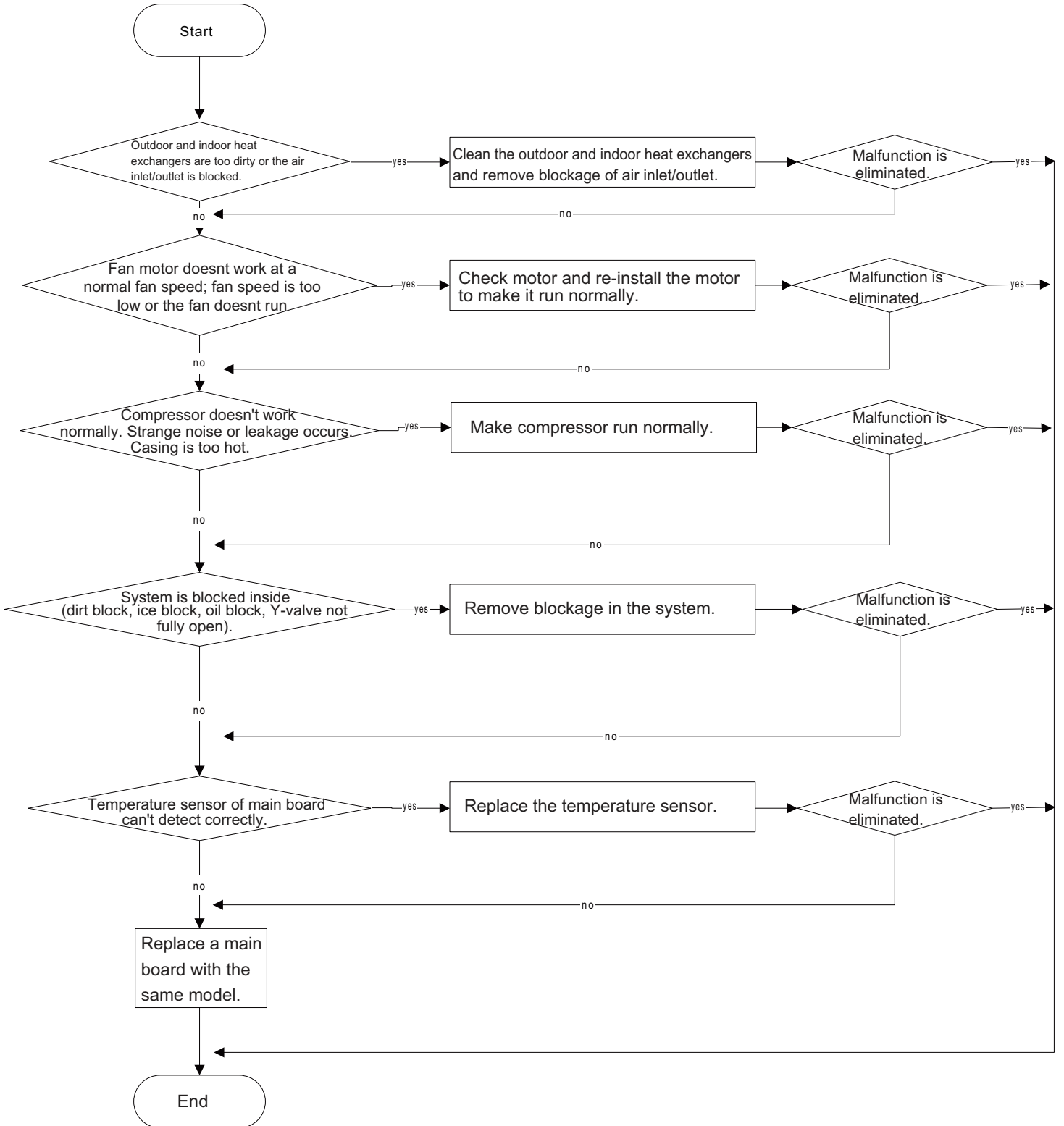
6. Low pressure protection of compressor (E3)



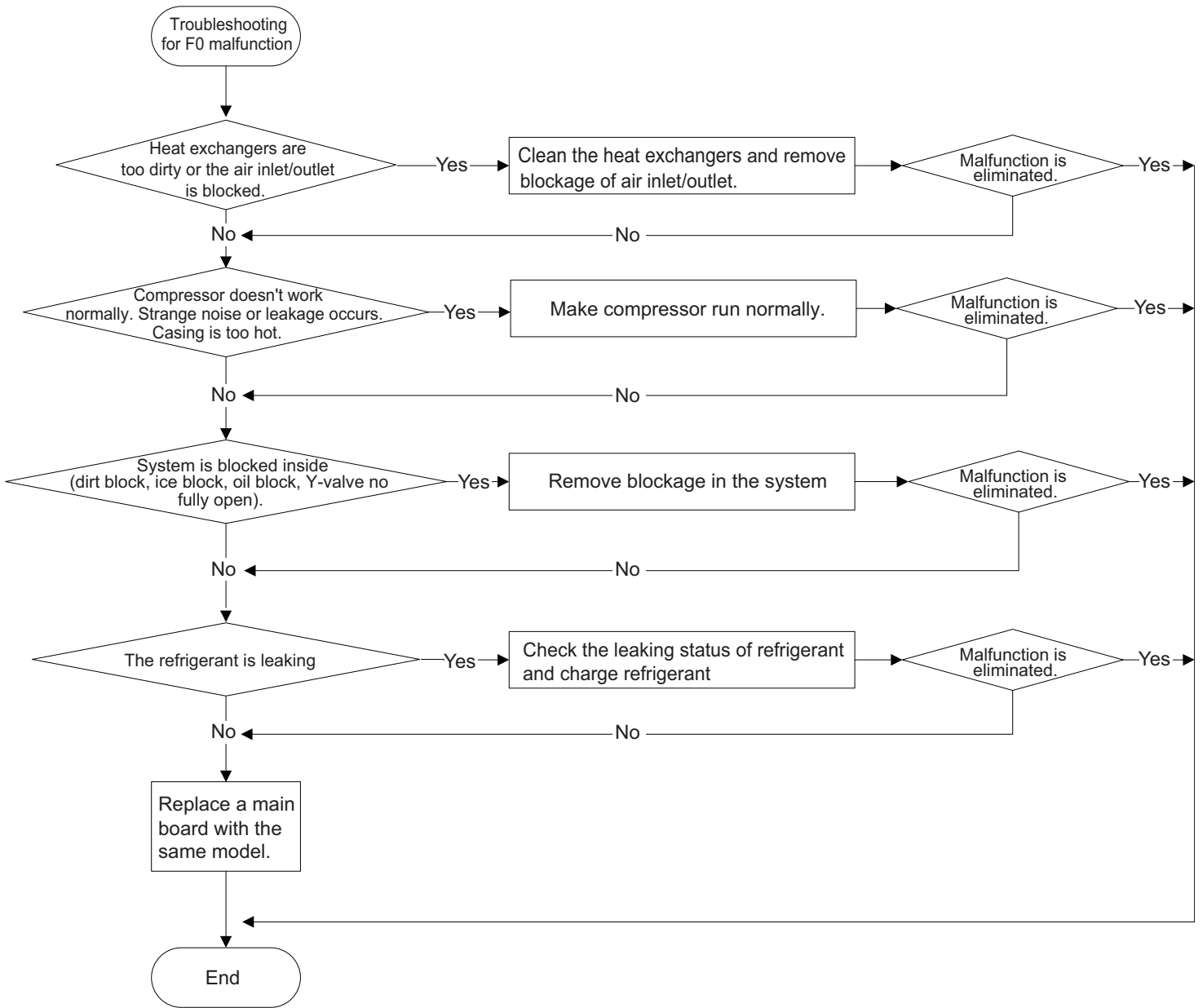
8. Overcurrent protection (E5)



10. Overload malfunction (E8)



12. Malfunction of Insufficient fluorine protection F0



9.3 Maintenance Method for Normal Malfunction

1. Air Conditioner Can't be Started Up

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
No power supply, or poor connection for power plug	After energization, operation indicator isn't bright and the buzzer can't give out sound	Confirm whether it's due to power failure. If yes, wait for power recovery. If not, check power supply circuit and make sure the power plug is connected well.
Wrong wire connection between indoor unit and outdoor unit, or poor connection for wiring terminals	Under normal power supply circumstances, operation indicator isn't bright after energization	Check the circuit according to circuit diagram and connect wires correctly. Make sure all wiring terminals are connected firmly
Electric leakage for air conditioner	After energization, room circuit breaker trips off at once	Make sure the air conditioner is grounded reliably Make sure wires of air conditioner is connected correctly Check the wiring inside air conditioner. Check whether the insulation layer of power cord is damaged; if yes, place the power cord.
Model selection for air switch is improper	After energization, air switch trips off	Select proper air switch
Malfunction of remote controller	After energization, operation indicator is bright, while no display on remote controller or buttons have no action.	Replace batteries for remote controller Repair or replace remote controller

2. Poor Cooling (Heating) for Air Conditioner

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
Set temperature is improper	Observe the set temperature on remote controller	Adjust the set temperature
Rotation speed of the IDU fan motor is set too low	Small wind blow	Set the fan speed at high or medium
Filter of indoor unit is blocked	Check the filter to see it's blocked	Clean the filter
Installation position for indoor unit and outdoor unit is improper	Check whether the installation position is proper according to installation requirement for air conditioner	Adjust the installation position, and install the rainproof and sunproof for outdoor unit
Refrigerant is leaking	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unit's pressure is much lower than regulated range	Find out the leakage causes and deal with it. Add refrigerant.
Malfunction of 4-way valve	Blow cold wind during heating	Replace the 4-way valve
Malfunction of capillary	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unit's pressure is much lower than regulated range. If refrigerant isn't leaking, part of capillary is blocked	Replace the capillary
Flow volume of valve is insufficient	The pressure of valves is much lower than that stated in the specification	Open the valve completely
Malfunction of horizontal louver	Horizontal louver can't swing	Refer to point 3 of maintenance method for details
Malfunction of the IDU fan motor	The IDU fan motor can't operate	Refer to troubleshooting for H6 for maintenance method in details
Malfunction of the ODU fan motor	The ODU fan motor can't operate	Refer to point 4 of maintenance method for details
Malfunction of compressor	Compressor can't operate	Refer to point 5 of maintenance method for details

3. Horizontal Louver Can't Swing

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Stepping motor is damaged	Stepping motor can't operate	Repair or replace stepping motor
Main board is damaged	Others are all normal, while horizontal louver can't operate	Replace the main board with the same model

4. ODU Fan Motor Can't Operate

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Capacity of the ODU fan motor is damaged	Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor.	Replace the capacity of fan
Power voltage is a little low or high	Use universal meter to measure the power supply voltage. The voltage is a little high or low	Suggest to equip with voltage regulator
Motor of outdoor unit is damaged	When unit is on, cooling/heating performance is bad and ODU compressor generates a lot of noise and heat.	Change compressor oil and refrigerant. If no better, replace the compressor with a new one

5. Compressor Can't Operate

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Capacity of compressor is damaged	Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor.	Replace the compressor capacitor
Power voltage is a little low or high	Use universal meter to measure the power supply voltage. The voltage is a little high or low	Suggest to equip with voltage regulator
Coil of compressor is burnt out	Use universal meter to measure the resistance between compressor terminals and it's 0	Repair or replace compressor
Cylinder of compressor is blocked	Compressor can't operate	Repair or replace compressor

6. Air Conditioner is Leaking

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Drain pipe is blocked	Water leaking from indoor unit	Eliminate the foreign objects inside the drain pipe
Drain pipe is broken	Water leaking from drain pipe	Replace drain pipe
Wrapping is not tight	Water leaking from the pipe connection place of indoor unit	Wrap it again and bundle it tightly

7. Abnormal Sound and Vibration

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
When turn on or turn off the unit, the panel and other parts will expand and there's abnormal sound	There's the sound of "PAPA"	Normal phenomenon. Abnormal sound will disappear after a few minutes.
When turn on or turn off the unit, there's abnormal sound due to flow of refrigerant inside air conditioner	Water-running sound can be heard	Normal phenomenon. Abnormal sound will disappear after a few minutes.
Foreign objects inside the indoor unit or there're parts touching together inside the indoor unit	There's abnormal sound fro indoor unit	Remove foreign objects. Adjust all parts' position of indoor unit, tighten screws and stick damping plaster between connected parts
Foreign objects inside the outdoor unit or there're parts touching together inside the outdoor unit	There's abnormal sound fro outdoor unit	Remove foreign objects. Adjust all parts' position of outdoor unit, tighten screws and stick damping plaster between connected parts
Short circuit inside the magnetic coil	During heating, the way valve has abnormal electromagnetic sound	Replace magnetic coil
Abnormal shake of compressor	Outdoor unit gives out abnormal sound	Adjust the support foot mat of compressor, tighten the bolts
Abnormal sound inside the compressor	Abnormal sound inside the compressor	If add too much refrigerant during maintenance, please reduce refrigerant properly. Replace compressor for other circumstances.

NO.	Description	Part Code			Qty
		GWH28AFE-K3NNA1A/I	GWC24AFE-K6NNA1B/I	GWH28AFE-K3NNA5A/I	
	Product Code	CA348N00200	CA348N01200	CA368N00500	
1	Front Panel	200003060036T	200003060036T	200003060099T	1
2	Filter Sub-Assy	1101200703	1101200703	1101200703	2
3	Screw Cover	2425201906	2425201906	2425201906	3
4	Left Side Plate	200085060008	200085060008	200085060008	1
5	Decorative Strip(Left)	230001060039D	230001060039D	230001060039D	1
6	Front Case	20000200003004	20000200003004	20000200003004	1
7	Air Louver(Manual)	10512737	10512744	10512737	3
8	Helicoid Tongue	26112513	26112513	26112513	1
9	Left Axile Bush	10512037	10512037	10512037	1
10	Rear Case assy	000001000069	000001000075	000001000069	1
11	Rubber Plug (Water Tray)	76712012	76712012	76712012	1
12	Ring of Bearing	26152025	26152025	26152025	1
13	O-Gasket sub-assy of Bearing	76512051	76512051	76512051	1
14	Cross Flow Fan	10352057	10352057	10352057	1
15	Evaporator Support	24212178	24212178	24212178	1
16	Evaporator Assy	011001000073	011001000052	011001000095	1
17	Cold Plasma Generator	1114001602	1114001602	1114001602	1
18	Wall Mounting Frame	01252229	01252229	01252229	1
19	Motor Press Plate	26112515	26112515	26112515	1
20	Fan Motor	15012145	15012145	15012145	1
21	Connecting pipe clamp	26112514	26112514	26112514	1
22	Drainage Hose	0523001405	0523001405	0523001405	1
23	Stepping Motor	1521240210	1521240210	1521240210	1
24	Crank	73012005	73012005	73012005	1
25	Guide Louver	200004060018	200004060018	200004060018	1
26	Axile Bush	10542036	10542036	10542036	2
27	Right Side Plate	200086060007	200086060007	200086060007	1
28	Decorative Strip(Right)	230001060040D	230001060040D	230001060040D	1
29	Shield Cover of Electric Box Cover 2	01202000099	01202000099	01202000099	1
30	Electric Box Cover2	20112210	20112210	20112210	1
31	Electric Box	20112211	20112211	20112211	1
32	Side plate (electric box)	01302002	01302002	01302002	1
33	Terminal Board	42011233	42011233	42011233	1
34	Display Board	300001000202	300001000202	300001060400	1
35	Main Board	300002000792	300002060127	300002000792	1
36	Shield Cover of Electric Box Cover	01592176	01592176	01592176	1
37	Electric Box Cover	20112209	20112209	20112209	1
38	Jumper	4202300106	4202300127	4202300106	1
39	Lower Shield of Electric Box	01592139	01592139	01592139	1
40	Electric Box Assy	100002003704	100002060912	100002064412	1
41	Connecting Cable	4002054026	400205382	4002054026	0
42	Connecting Cable	4002052318	/	4002052318	0
43	Temperature Sensor	3900031302	3900031302	3900031302	1
44	Remote Controller	305001000009	305100611	305001000009	1

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NO.	Description	Part Code			Qty
		GWH28AFE-K3NNA2A/I	GWH28AFE-K3NNA3A/I	GWH28AFE-K3NNA2B/I	
	Product Code	CA363N00100	CA362N00100	CA363N01000	
1	Front Panel	200003060089T	200003060084T	200003060089	1
2	Filter Sub-Assy	1101200703	1101200703	1101200703	2
3	Screw Cover	2425201906	2425201906	2425201906	3
4	Left Side Plate	200085060008	200085060008	200085060008	1
5	Decorative Strip(Left)	230001060039D	230001060039D	230001060039D	1
6	Front Case	20000200003004	20000200003004	20000200003004	1
7	Air Louver(Manual)	10512737	10512737	10512737	3
8	Helicoid Tongue	26112513	26112513	26112513	1
9	Left Axile Bush	10512037	10512037	10512037	1
10	Rear Case assy	000001000069	000001000069	000001000069	1
11	Rubber Plug (Water Tray)	76712012	76712012	76712012	1
12	Ring of Bearing	26152025	26152025	26152025	1
13	O-Gasket sub-assy of Bearing	76512051	76512051	76512051	1
14	Cross Flow Fan	10352057	10352057	10352057	1
15	Evaporator Support	24212178	24212178	24212178	1
16	Evaporator Assy	011001000095	011001000095	011001000073	1
17	Cold Plasma Generator	1114001602	1114001602	/	1
18	Wall Mounting Frame	01252229	01252229	01252229	1
19	Motor Press Plate	26112515	26112515	26112515	1
20	Fan Motor	15012145	15012145	15012145	1
21	Connecting pipe clamp	26112514	26112514	26112514	1
22	Drainage Hose	0523001405	0523001405	0523001405	1
23	Stepping Motor	1521240210	1521240210	1521240210	1
24	Crank	73012005	73012005	73012005	1
25	Guide Louver	200004060018	200004060018	200004060018	1
26	Axile Bush	10542036	10542036	10542036	2
27	Right Side Plate	200086060007	200086060007	200086060007	1
28	Decorative Strip(Right)	230001060040D	230001060040D	230001060040D	1
29	Shield Cover of Electric Box Cover 2	01202000099	01202000099	01202000099	1
30	Electric Box Cover2	20112210	20112210	20112210	1
31	Electric Box	20112211	20112211	20112211	1
32	Side plate (electric box)	01302002	01302002	01302002	1
33	Terminal Board	42011233	42011233	42011233	1
34	Display Board	300001000202	300001000202	300001000202	1
35	Main Board	300002000792	300002000792	300002000790	1
36	Shield Cover of Electric Box Cover	01592176	01592176	01592176	1
37	Electric Box Cover	20112209	20112209	20112209	1
38	Jumper	4202300106	4202300106	4202300106	1
39	Lower Shield of Electric Box	01592139	01592139	01592139	1
40	Electric Box Assy	100002003704	100002003704	100002061624	1
41	Connecting Cable	4002054026	4002054026	4002054026	0
42	Connecting Cable	4002052318	4002052318	4002052318	0
43	Temperature Sensor	3900031302	3900031302	3900031302	1
44	Remote Controller	305001000009	305001000009	305001000009	1

Above data is subject to change without notice.

NO.	Description	Part Code	Qty
		GWH28AFE-K3NNA3A/I	
Product Code		CA362N00101	
1	Front Panel	200003060084T	1
2	Filter Sub-Assy	1101200703	2
3	Screw Cover	2425201906	3
4	Left Side Plate	200085060008	1
5	Decorative Strip(Left)	230001060039D	1
6	Front Case	20000200003004	1
7	Air Louver(Manual)	10512737	3
8	Helicoid Tongue	26112513	1
9	Left Axile Bush	10512037	1
10	Rear Case assy	000001000069	1
11	Rubber Plug (Water Tray)	76712012	1
12	Ring of Bearing	26152025	1
13	O-Gasket sub-assy of Bearing	76512051	1
14	Cross Flow Fan	10352057	1
15	Evaporator Support	24212178	1
16	Evaporator Assy	011001000095	1
17	Cold Plasma Generator	/	/
18	Wall Mounting Frame	01252229	1
19	Motor Press Plate	26112515	1
20	Fan Motor	15012145	1
21	Connecting pipe clamp	26112514	1
22	Drainage Hose	0523001405	1
23	Stepping Motor	1521240210	1
24	Crank	73012005	1
25	Guide Louver	200004060018	1
26	Axile Bush	10542036	2
27	Right Side Plate	200086060007	1
28	Decorative Strip(Right)	230001060040D	1
29	Shield Cover of Electric Box Cover 2	01202000099	1
30	Electric Box Cover2	20112210	1
31	Electric Box	20112211	1
32	Side plate (electric box)	01302002	1
33	Terminal Board	42011233	1
34	Display Board	300001060400	1
35	Main Board	300002000790	1
36	Shield Cover of Electric Box Cover	01592176	1
37	Electric Box Cover	20112209	1
38	Jumper	4202300106	1
39	Lower Shield of Electric Box	01592139	1
40	Electric Box Assy	100002064998	1
41	Connecting Cable	4002054026	0
42	Connecting Cable	4002052318	0
43	Temperature Sensor	3900031302	1
44	Remote Controller	305001000009	1

Above data is subject to change without notice.

NO.	Description	Part Code		Qty
		GWH28ACE-K3NNA5A/O	GWH28AAE-K3NNA1C/O	
		Product Code	CA341W00300	
1	Front Grill	22413025	22415002	1
2	Front Panel	01535013P	01535013P	1
3	Axial Flow Fan	10335008	10335008	1
4	Drainage Connector	06123401	06123401	1
5	Drainage hole Cap	06813401	06813401	3
6	Chassis Sub-assy	017000000171P	017000000171P	1
7	Compressor and Fittings	009001000104	009001000104	1
8	Right Side Plate Assy	0130329201	000130060033	1
9	Valve Support Sub-Assy	01713098P	01713098P	1
10	Cut off Valve	07130239	07130239	1
11	Cut off Valve	07133157	07133157	1
12	Valve Cover	22245002	22245002	1
13	Handle	26233053	26233053	1
14	Condenser Assy	011002000339	011002060292	1
15	4-Way Valve Assy	030152000221	030152060143	1
16	Magnet Coil	4300040047	4300040047	1
17	Clapboard	01245200018	01245200018	1
18	Motor Support Sub-Assy	01705036	01705036	1
19	Rear Grill	01473062	01473062	1
20	Coping	012049000007P	012049000007P	1
21	Electric Box Cover	01425200102	01425200102	1
22	Fan Motor	1501506310	1501506310	1
23	Left Side Plate	01305093P	01305093P	1
24	Handle	26233053	26233053	1
25	Capacitor CBB61S	3301074706	3301074706	1
26	Transformer	4311023601	4311023601	1
27	Electric Box	0142520004001	0142520004001	1
28	Main Board	30135819	30135819	1
29	AC Contactor	44010256	44010256	1
30	Capacitor CBB65	3300008107	3300008107	1
31	Electric Box Assy	100002060820	100002000946	1
32	Terminal Board	422000060009	422000060009	1
33	Insulation GasketC	70410523	70410523	1
34	Wire Clamp	71010102	71010102	1
35	Supporting Board(Condenser)	01795010	01795010	1

Above data is subject to change without notice.

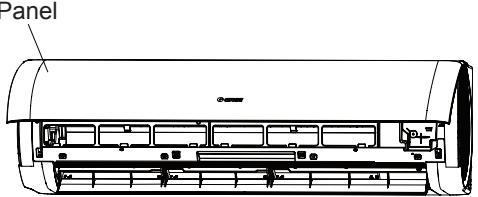
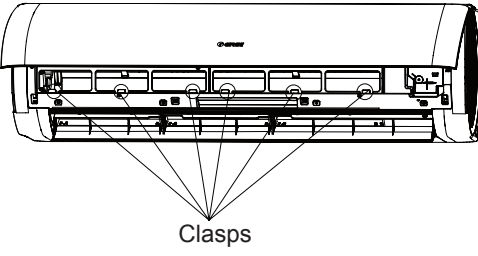
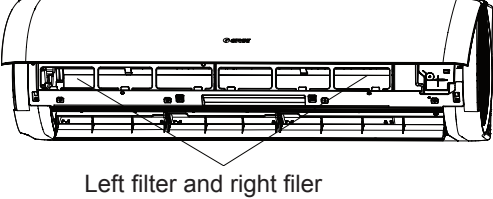
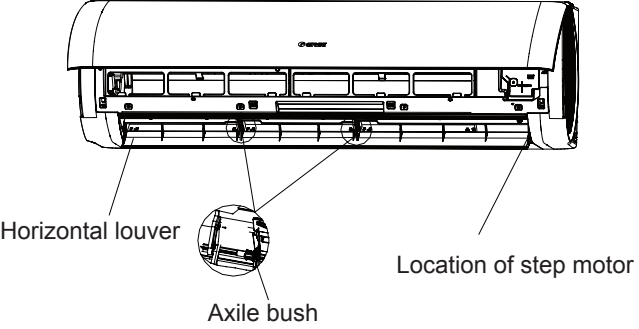
NO.	Description	Part Code		Qty
		GWH28AAE-K3NNA1A/O		
		CA476W02100	OCA476W02101	
1	Front Grill	22415002	22415002	1
2	Front Panel	01535013P	01535013P	1
3	Axial Flow Fan	10335008	10335008	1
4	Drainage Connector	06123401	06123401	1
5	Drainage hole Cap	06813401	06813401	3
6	Chassis Sub-assy	017000000171P	017000000171P	1
7	Compressor and Fittings	009001000104	009001000104	1
8	Right Side Plate Assy	0130329201	0130329201	1
9	Valve Support Sub-Assy	01713098P	01713098P	1
10	Cut off Valve	07130239	07130239	1
11	Cut off Valve	07133157	07133157	1
12	Valve Cover	22245002	22245002	1
13	Handle	26233053	26233053	1
14	Condenser Assy	011002000339	011002000339	1
15	4-Way Valve Assy	030152000221	030152000221	1
16	Magnet Coil	4300040047	4300040047	1
17	Clapboard	01245200018	01245200018	1
18	Motor Support Sub-Assy	01705036	01705036	1
19	Rear Grill	01473062	01473062	1
20	Coping	012049000007P	012049000007P	1
21	Electric Box Cover	01425200102	01425200102	1
22	Fan Motor	1501506310	1501506310	1
23	Left Side Plate	01305093P	01305093P	1
24	Handle	26233053	26233053	1
25	Capacitor CBB61S	3301074706	3301074706	1
26	Transformer	4311023601	4311023601	1
27	Electric Box	0142520010301	0142520010301	1
28	Main Board	30135819	30135819	1
29	AC Contactor	44010256	44010256	1
30	Capacitor CBB65	3300008107	3300008107	1
31	Electric Box Assy	100002000946	100002000946	1
32	Terminal Board	420101943	420101943	1
33	Insulation GasketC	70410523	70410523	1
34	Wire Clamp	71010102	71010102	1
35	Supporting Board(Condenser)	01795010	01795010	1

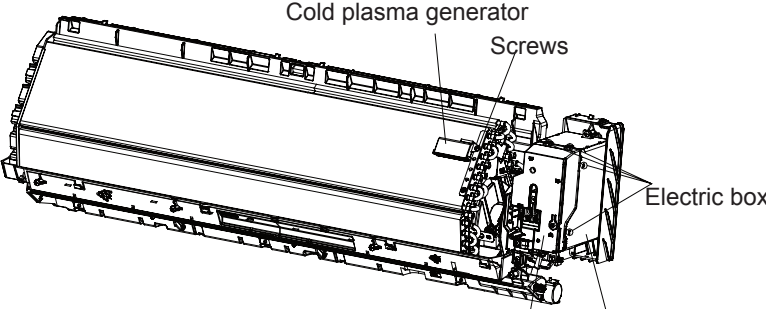
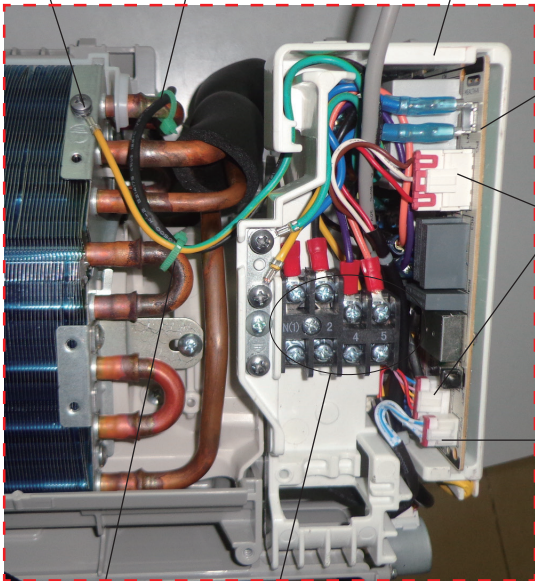
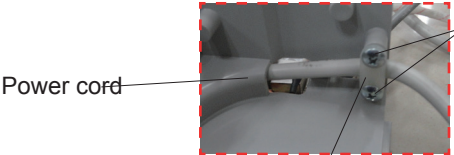
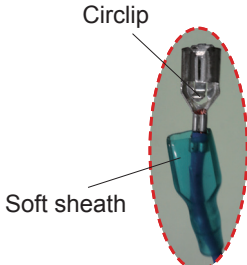
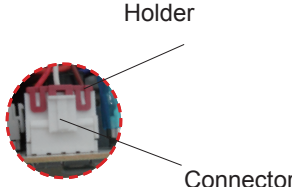
Above data is subject to change without notice.

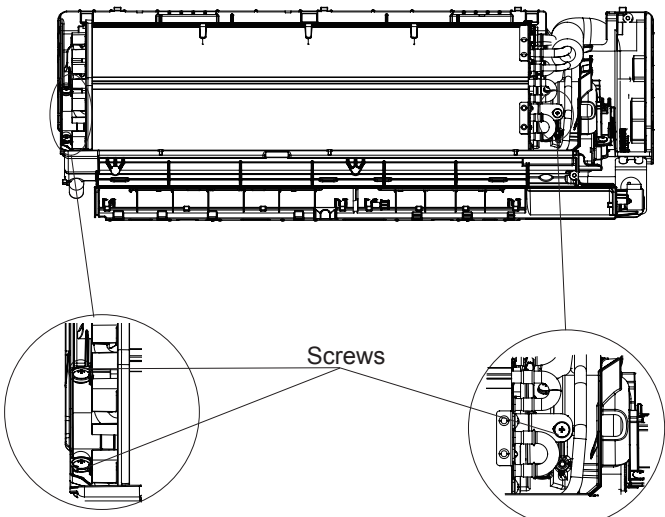
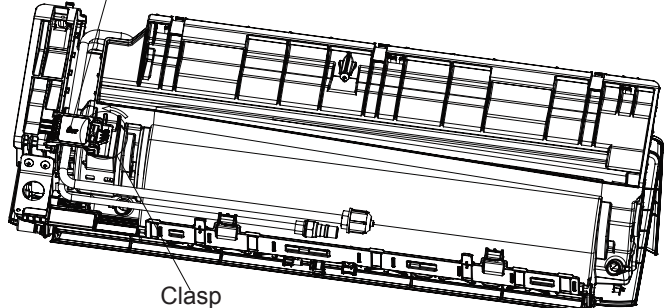
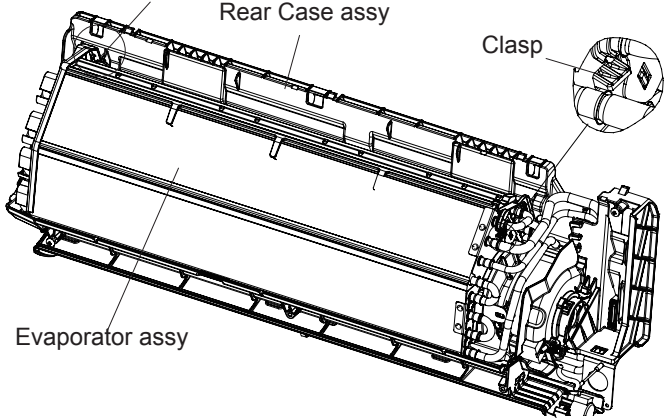
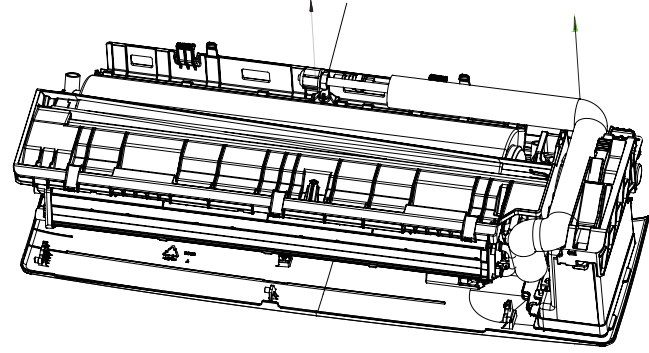
11. Removal Procedure

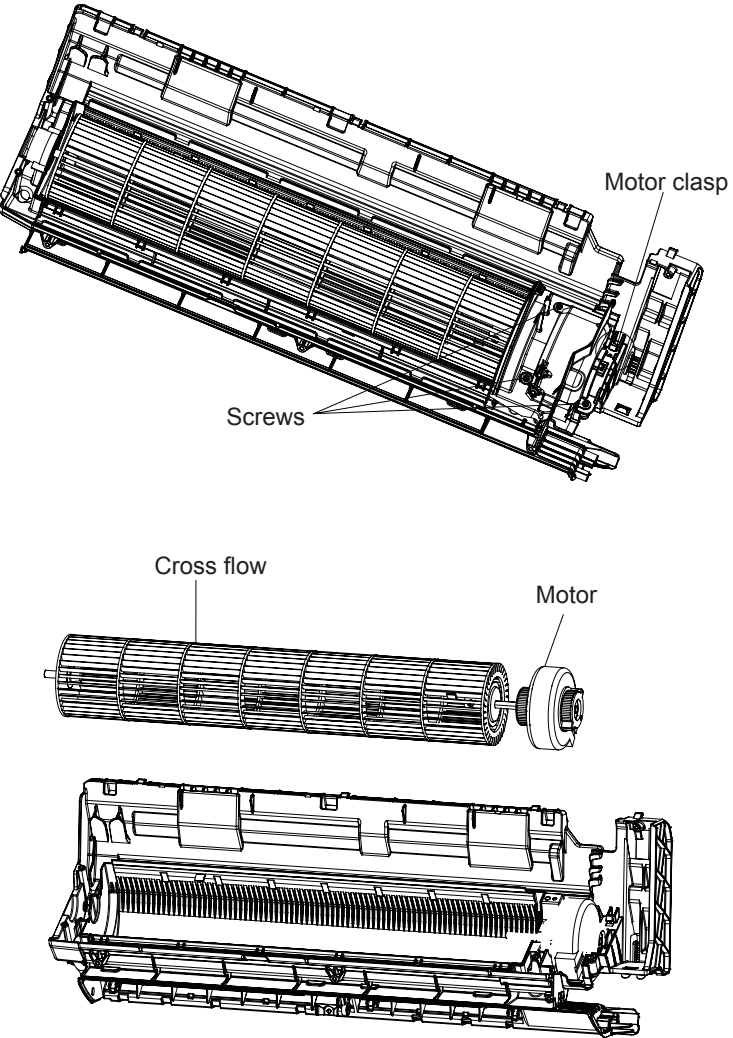
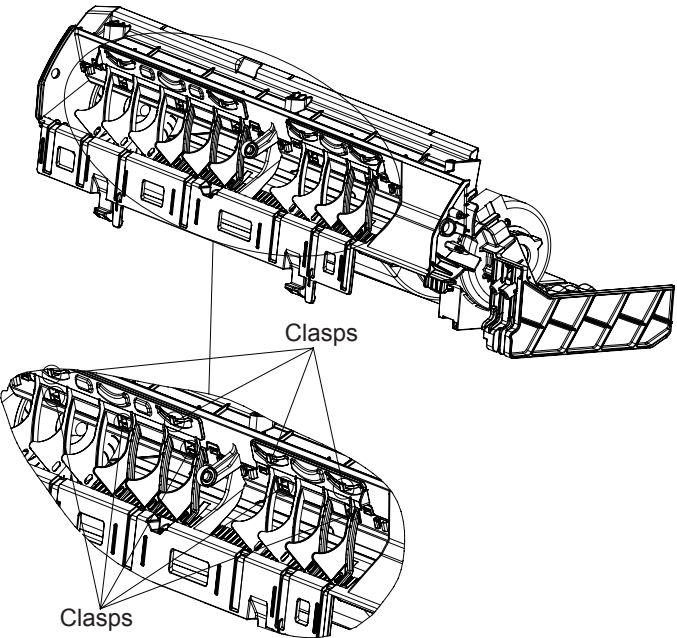
! Caution: discharge the refrigerant completely before removal.

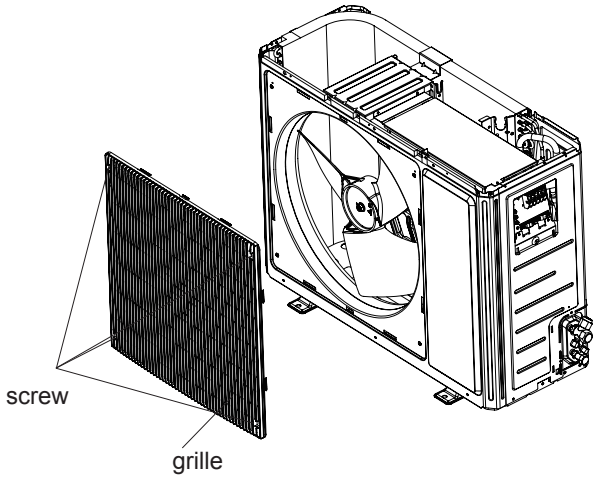
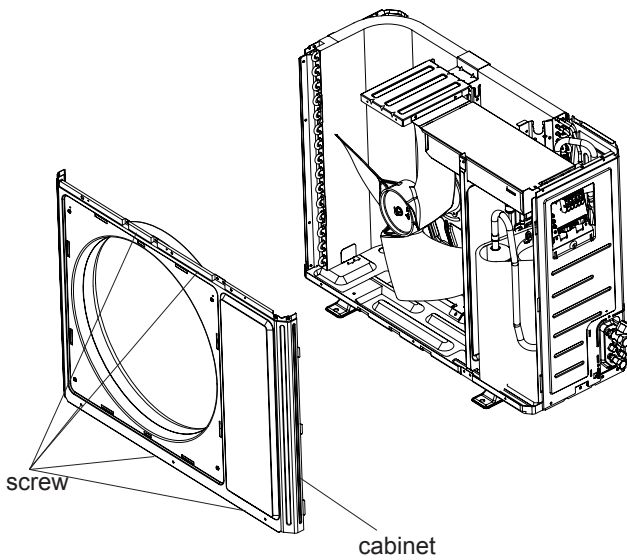
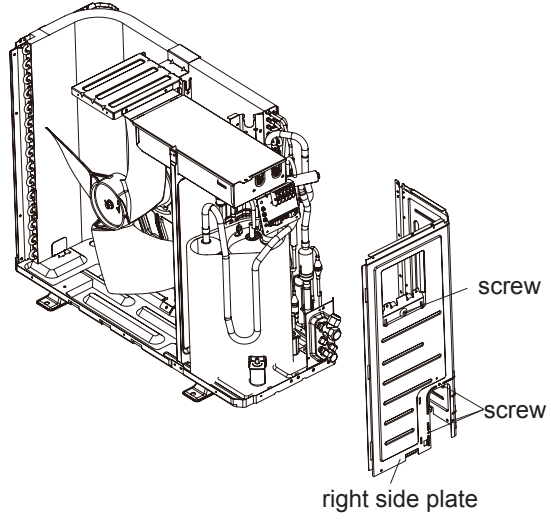
11.1 Removal Procedure of Indoor Unit

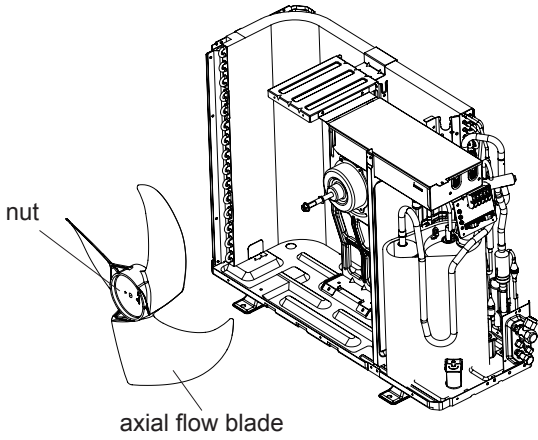
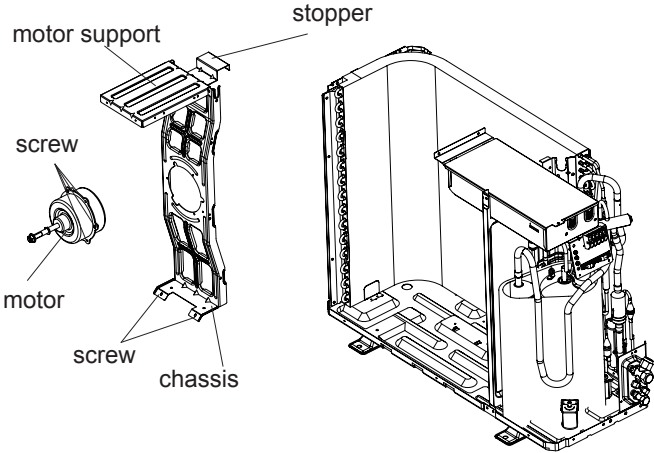
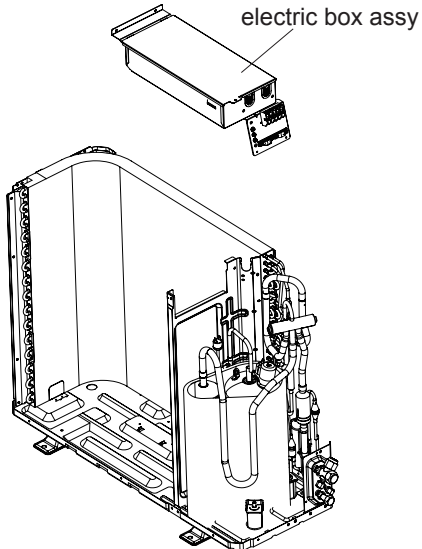
Step	Procedure	
1. Remove filter		
a	Open the panel.	
b	Loosen the clasp shown in the fig and then pull the left filter and right filter outwards to remove them.	
		
2. Remove horizontal louver		
	Push out the axle bush on horizontal louver. Bend the horizontal louver with hand and then separate the horizontal louver from the crankshaft of step motor to remove it.	

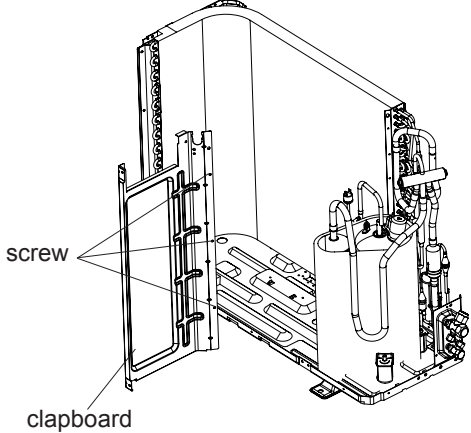
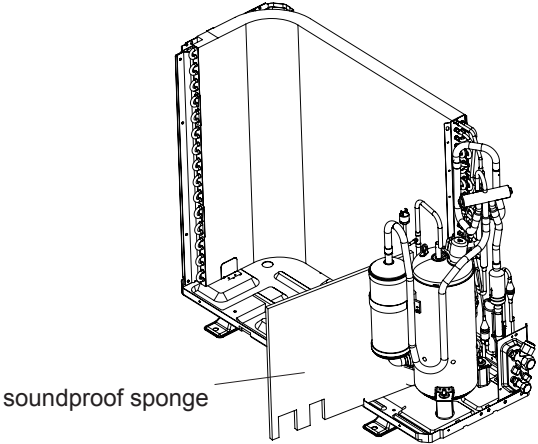
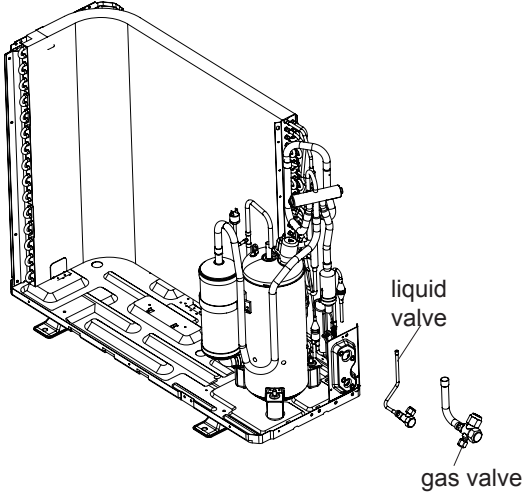
Step	Procedure
6. Remove electric box assy	
<p>a</p> <p>Loosen the connection clasps between Cold plasma generator and electric box, and then remove the cold plasma generator.</p> <p>b</p> <ol style="list-style-type: none"> ① Cut off the wire binder and pull out the indoor tube temperature sensor. ② Screw off one grounding screw. ③ Remove the wiring terminals of motor andstepping motor. ④ Remove the electric box assy. ⑤ Screw off the screws that are locking each. 	
<p>c</p> <p>Rotate the electric box assy. Twist off the screws that are locking the wire clip and loosen the power cord. Remove the wiring terminal of power cord. Lift up the main board and take it off.</p> <p>Instruction: Some wiring terminal of this product is with lock catch and other devices. The pulling method is as below:</p> <ol style="list-style-type: none"> 1.Remove the soft sheath for some terminals at first, hold the circlip and then pull out the terminals. 2.Pull out the holder for some terminals at first (holder is not available for some wiring terminal), hold the connector and then pull the terminal. 	  

Step	Procedure
7. Remove evaporator assy	
a	<p>Remove 3 screws fixing evaporator assy.</p> 
b	<p>At the back of the unit, Loosen the clasp, connection pipe clamp and then remove the connection pipe clamp.</p> 
c	<p>First remove the left side of evaporator from the groove of bottom shell and then remove the right side from the clasp on the bottom shell.</p> 
d	<p>Adjust the position of connection pipe on evaporator slightly and then lift the evaporator upwards to remove it.</p> 

Step	Procedure
<p>8. Remove motor and cross flow blade</p> <p>a Remove 3 screws fixing motor clamp and then remove the motor clamp.</p> <p>b Remove the at the connection place of cross flow blade and motor; lift the motor and cross flow blade upwards to remove them.</p>	
<p>9. Remove vertical louver</p> <p>Loosen the connection clasps between vertical louver and bottom case to remove vertical louver.</p>	

Steps	Procedure	
2. Remove grille and cabinet		
a	<p>Remove the 4 screws connecting the grille and outer case, and then remove the panel grille.</p>	 <p>screw</p> <p>grille</p>
b	<p>Remove the screws connecting the outer case with motor support, isolation plate and chassis; lift the outer case upwards; loosen the clasps of outer case with right side plate and left side plate, and then remove the outer case.</p>	 <p>screw</p> <p>cabinet</p>
3. Remove right side plate		
	<p>Remove the screws connecting the right side plate with electric box assy, valve support, chassis and condenser side plate, and then remove the right side plate.</p>	 <p>screw</p> <p>screw</p> <p>right side plate</p>

Steps	Procedure
<p>4. Remove axial flow blade</p>	<p>Remove the nut fixing axial flow blade and then remove the blade.</p>  <p>nut</p> <p>axial flow blade</p>
<p>5. Remove motor support sub-assy and motor</p>	<p>Remove the 2 screws connecting the motor support and chassis, and then loosen the stopper to remove the motor support.</p> <p>Remove the 6 screws fixing the motor and then remove the motor.</p>  <p>motor support</p> <p>stopper</p> <p>screw</p> <p>motor</p> <p>screw</p> <p>chassis</p>
<p>6. Remove electric box assy</p>	<p>Remove the screws fixing electric box assy ; pull out each wiring terminal; lift the electric box assy upwards to remove it.</p> <p>Note: When pulling out the wiring terminal, pay attention to loose the clasp and dont pull it so hard.</p>  <p>electric box assy</p>

Steps	Procedure	
7. Remove clapboard	<p>Remove the screws fixing clapboard and then remove the clapboard.</p>	
8. Remove soundproof sponge	<p>Remove the soundproof sponge wrapping the compressor.</p>	
9. Valve liquid valve and gas valve	<p>Unsolder the welding joint connecting the valve with capillary and condenser; unsolder the welding joint connecting the gas valve and air-return pipe; remove the 2 bolts fixing the gas valve to remove the gas valve.</p> <p>Unsolder the welding joint connecting the liquid valve and Y-shaped pipe; remove the 2 bolts fixing the liquid valve to remove the liquid valve.</p> <p>Note: Before unsoldering the welding joint, wrap the gas valve with a wet cloth completely to avoid damage to the valve caused by high temperature.</p>	

Appendix:

Appendix 1: Reference Sheet of Celsius and Fahrenheit

Conversion formula for Fahrenheit degree and Celsius degree: $T_f = T_c \times 1.8 + 32$

Set temperature

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

Ambient temperature

Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius (°C)
32/33	32	0	55/56	55.4	13	79/80	78.8	26
34/35	33.8	1	57/58	57.2	14	81	80.6	27
36	35.6	2	59/60	59	15	82/83	82.4	28
37/38	37.4	3	61/62	60.8	16	84/85	84.2	29
39/40	39.2	4	63	62.6	17	86/87	86	30
41/42	41	5	64/65	64.4	18	88/89	87.8	31
43/44	42.8	6	66/67	66.2	19	90	89.6	32
45	44.6	7	68/69	68	20	91/92	91.4	33
46/47	46.4	8	70/71	69.8	21	93/94	93.2	34
48/49	48.2	9	72	71.6	22	95/96	95	35
50/51	50	10	73/74	73.4	23	97/98	96.8	36
52/53	51.8	11	75/76	75.2	24	99	98.6	37
54	53.6	12	77/78	77	25			

Appendix 2: Configuration of Connection Pipe

1. Standard length of connection pipe

- 5m, 7.5m, 8m.

2. Min. length of connection pipe is 3m.

3. Max. length of connection pipe and max. high difference. (More details please refer to the specifications.)

4. The additional refrigerant oil and refrigerant charging required after prolonging connection pipe

- After the length of connection pipe is prolonged for 10m at the basis of standard length, you should add 5ml of refrigerant oil for each additional 5m of connection pipe.
- The calculation method of additional refrigerant charging amount (on the basis of liquid pipe):
- Basing on the length of standard pipe, add refrigerant according to the requirement as shown in the table. The additional refrigerant charging amount per meter is different according to the diameter of liquid pipe. See the following sheet.
- Additional refrigerant charging amount = prolonged length of liquid pipe X additional refrigerant charging amount per meter

Additional refrigerant charging amount for R22, R407C, R410A and R134a			
Diameter of connection pipe		Outdoor unit throttle	
Liquid pipe(mm)	Gas pipe(mm)	Cooling only(g/m)	Cooling and heating(g/m)
Φ6	Φ9.52 or Φ12	15	20
Φ6 or Φ9.52	Φ16 or Φ19	15	50
Φ12	Φ19 or Φ22.2	30	120
Φ16	Φ25.4 or Φ31.8	60	120
Φ19	/	250	250
Φ22.2	/	350	350

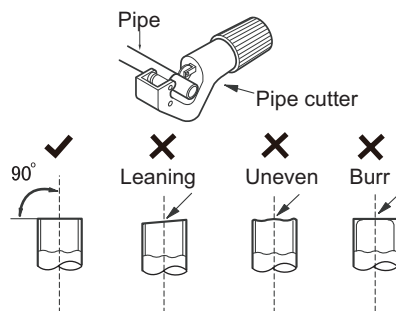
Appendix 3: Pipe Expanding Method

⚠ Note:

Improper pipe expanding is the main cause of refrigerant leakage. Please expand the pipe according to the following steps:

A: Cut the pipe

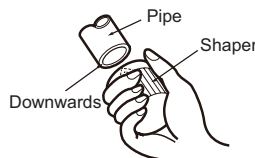
- Confirm the pipe length according to the distance of indoor unit and outdoor unit.
- Cut the required pipe with pipe cutter.



B: Remove the burrs

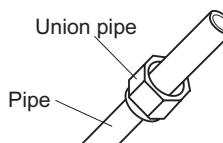
- Remove the burrs with shaper and prevent the burrs from getting into the pipe.

C: Put on suitable insulating pipe



D: Put on the union nut

- Remove the union nut on the indoor connection pipe and outdoor valve; install the union nut on the pipe.



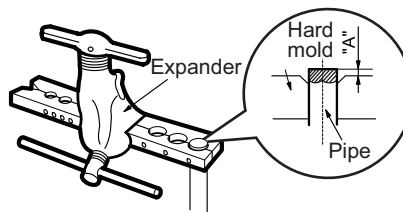
E: Expand the port

- Expand the port with expander.

⚠ Note:

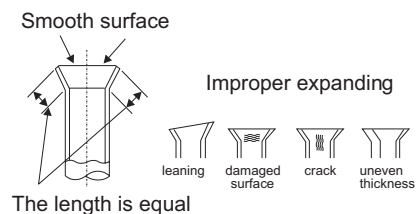
- "A" is different according to the diameter, please refer to the sheet below:

Outer diameter(mm)	A(mm)	
	Max	Min
Φ6 - 6.35 (1/4")	1.3	0.7
Φ9.52 (3/8")	1.6	1.0
Φ12 - 12.70 (1/2")	1.8	1.0
Φ16 - 15.88 (5/8")	2.4	2.2



F: Inspection

- Check the quality of expanding port. If there is any blemish, expand the port again according to the steps above.



Appendix 4: List of Resistance for Temperature Sensor

Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(15K)

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

Resistance Table of Tube Temperature Sensors for Outdoor and Indoor(20K)

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

Resistance Table of Discharge Temperature Sensor for Outdoor(50K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)
-29	853.5	10	98	49	18.34	88	4.75
-28	799.8	11	93.42	50	17.65	89	4.61
-27	750	12	89.07	51	16.99	90	4.47
-26	703.8	13	84.95	52	16.36	91	4.33
-25	660.8	14	81.05	53	15.75	92	4.20
-24	620.8	15	77.35	54	15.17	93	4.08
-23	580.6	16	73.83	55	14.62	94	3.96
-22	548.9	17	70.5	56	14.09	95	3.84
-21	516.6	18	67.34	57	13.58	96	3.73
-20	486.5	19	64.33	58	13.09	97	3.62
-19	458.3	20	61.48	59	12.62	98	3.51
-18	432	21	58.77	60	12.17	99	3.41
-17	407.4	22	56.19	61	11.74	100	3.32
-16	384.5	23	53.74	62	11.32	101	3.22
-15	362.9	24	51.41	63	10.93	102	3.13
-14	342.8	25	49.19	64	10.54	103	3.04
-13	323.9	26	47.08	65	10.18	104	2.96
-12	306.2	27	45.07	66	9.83	105	2.87
-11	289.6	28	43.16	67	9.49	106	2.79
-10	274	29	41.34	68	9.17	107	2.72
-9	259.3	30	39.61	69	8.85	108	2.64
-8	245.6	31	37.96	70	8.56	109	2.57
-7	232.6	32	36.38	71	8.27	110	2.50
-6	220.5	33	34.88	72	7.99	111	2.43
-5	209	34	33.45	73	7.73	112	2.37
-4	198.3	35	32.09	74	7.47	113	2.30
-3	199.1	36	30.79	75	7.22	114	2.24
-2	178.5	37	29.54	76	7.00	115	2.18
-1	169.5	38	28.36	77	6.76	116	2.12
0	161	39	27.23	78	6.54	117	2.07
1	153	40	26.15	79	6.33	118	2.02
2	145.4	41	25.11	80	6.13	119	1.96
3	138.3	42	24.13	81	5.93	120	1.91
4	131.5	43	23.19	82	5.75	121	1.86
5	125.1	44	22.29	83	5.57	122	1.82
6	119.1	45	21.43	84	5.39	123	1.77
7	113.4	46	20.6	85	5.22	124	1.73
8	108	47	19.81	86	5.06	125	1.68
9	102.8	48	19.06	87	4.90	126	1.64

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For product improvement, specifications and appearance in this manual are subject to change without prior notice.