



# Service Manual

Models: WGC18IT/GC18IT  
WGC24IT/GC24IT

R410A



## Table of Contents

<b>Part I : Technical Information</b>	<b>1</b>
<b>1. Summary</b>	<b>1</b>
<b>2. Specifications</b>	<b>2</b>
2.1 Specification Sheet	2
2.2 Operation Characteristic Curve	6
2.3 Capacity Variation Ratio According to Temperature	6
2.4 Cooling and Heating Data Sheet in Rated Frequency	7
2.5 Noise Curve	7
<b>3. Outline Dimension Diagram</b>	<b>8</b>
3.1 Indoor Unit	8
3.2 Outdoor Unit	9
<b>4. Refrigerant System Diagram</b>	<b>10</b>
<b>5. Electrical Part</b>	<b>11</b>
5.1 Wiring Diagram	11
5.2 PCB Printed Diagram	13
<b>6. Function and Control</b>	<b>15</b>
6.1 Remote Controller Introduction	15
6.2 Brief Description of Modes and Functions	19
 <b>Part II : Installation and Maintenance</b>	 <b>25</b>
<b>7. Notes for Installation and Maintenance</b>	<b>25</b>
<b>8. Installation</b>	<b>27</b>
8.1 Installation Dimension Diagram	27
8.2 Installation Parts-checking	29
8.3 Selection of Installation Location	29
8.4 Electric Connection Requirement	29
8.5 Installation of Indoor Unit	29
8.6 Installation of Outdoor Unit	32
8.7 Vacuum Pumping and Leak Detection	33
8.8 Check after Installation and Test Operation	33



<b>9. Maintenance</b>	34
9.1 Malfunction Display of Indoor Unit	34
9.2 Troubleshooting for Main Malfunction	36
9.3 Troubleshooting for Normal Malfunction	53
<b>10. Exploded View and Parts List</b>	55
10.1 Indoor Unit	55
10.2 Outdoor Unit	59
<b>11. Removal Procedure</b>	63
11.1 Removal Procedure of Indoor Unit	63
11.2 Removal Procedure of Outdoor Unit	69
<b>Appendix:</b>	81
Appendix 1: Reference Sheet of Celsius and Fahrenheit	81
Appendix 2: Configuration of Connection Pipe	81
Appendix 3: Pipe Expanding Method	82
Appendix 4: List of Resistance for Temperature Sensor	83

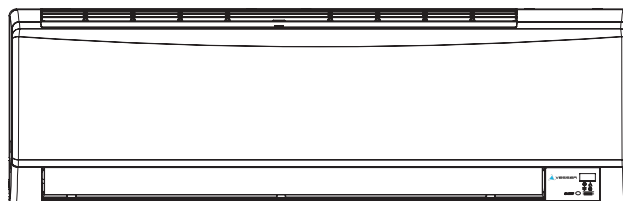


# Part I : Technical Information

## 1. Summary

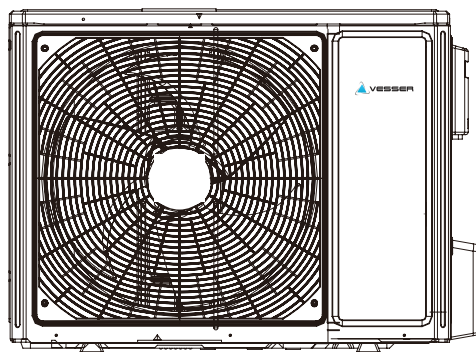
### Indoor Unit

WGC 18 IT  
WGC 24 IT

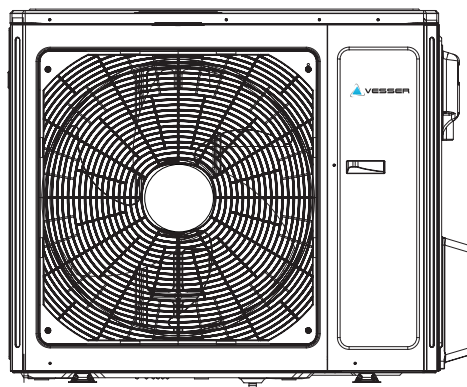


### Outdoor Unit

GC 18 IT



GC 24 IT



### Remote Controller

YB1F2(XFAN)





## 2. Specifications

### 2.1 Specification Sheet

Parameter		Unit	Value	Value
Model			WGC18IT-GC24IT	WGC24IT-GC24IT
Product Code			CB146036000	CB146035900
Power Supply	Rated Voltage	V~	220-240	220-240
	Rated Frequency	Hz	50	50
	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
Cooling Capacity(Min~Max)		W	5275(1200~6200)	6450(2530~6550)
Heating Capacity(Min~Max)		W	5570(1100~6000)	7000(2530~7600)
Cooling Power Input(Min~Max)		W	1675(380~2450)	2180(600~2650)
Heating Power Input(Min~Max)		W	1750(350~2600)	2220(600~2800)
Cooling Current Input		A	7.43	9.7
Heating Current Input		A	7.80	10.5
Rated Input		W	2650	2800
Rated Current		A	11.80	12.5
Air Flow Volume(SH/H/M//L/SL)		m <sup>3</sup> /h	800/680/560/460/-	1000/800/700/550/-
Dehumidifying Volume		L/h	1.8	2.1
EER		W/W	3.15	2.96
COP		W/W	3.18	3.15
SEER		W/W	5.60	5.60
HSPF		W/W	/	/
Application Area		m <sup>2</sup>	23-34	23-34
Indoor Unit	Indoor Unit Model		WGC18IT	WGC24IT
	Indoor Unit Product Code		CB146N36000	CB146N35900
	Fan Type		Cross-flow	Cross-flow
	Fan Diameter Length(DXL)	mm	Φ98X650	Φ98X765
	Cooling Speed(SH/H/M//L/SL)	r/min	1350/1100/950/800/-	1350/1150/1000/850/-
	Heating Speed(SH/H/M//L/SL)	r/min	1400/1200/1050/900/-	1400/1200/1000/900/-
	Fan Motor Power Output	W	20	35
	Fan Motor RLA	A	0.31	0.31
	Fan Motor Capacitor	μF	1.5	2.5
	Evaporator Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Evaporator Pipe Diameter	mm	Φ7	Φ7
	Evaporator Row-fin Gap	mm	2-1.4	2-1.5
	Evaporator Coil Length (LXDXW)	mm	657X25.4X304.8	765X25.4X342.9
	Swing Motor Model		MP28VB	MP35XX
	Swing Motor Power Output	W	2	2.5
	Fuse Current	A	3.15	3.15
	Sound Pressure Level(SH/H/M//L/SL)	dB (A)	49/44/40/35/-	51/47/42/39/-
	Sound Power Level(SH/H/M//L/SL)	dB (A)	60/55/51/46/-	61/57/52/49/-
	Dimension (WXHXD)	mm	867X305X215	1007X315X219
	Dimension of Carton Box (LXWXH)	mm	945X380X295	1073X395X313
	Dimension of Package(LXWXH)	mm	948X383X310	1076X398X328
	Net Weight	kg	12	14
	Gross Weight	kg	15	17



Outdoor Unit	Outdoor Unit Model		GC18IT	GC24IT
	Outdoor Unit Product Code		CB146W36000	CB146W35900
	Compressor Manufacturer		ZHUHAI LANDA COMPRESSOR CO.,LTD	ZHUHAI LANDA COMPRESSOR CO.,LTD
	Compressor Model		QXA-B141zF030A	QXA-B141zF030A
	Compressor Oil		68EP	68EP
	Compressor Type		Rotary	Rotary
	Compressor LRA	A	25	25
	Compressor RLA	A	7.2	7.2
	Compressor Power Input	W	1440	1440
	Compressor Overload Protector		1NT11L-6233 or KSD115°C or HPC115/95U1	1NT11L-6233 or KSD115°C or HPC115/95U1
	Throttling Method		Capillary	Capillary
	Set Temperature Range	°C	16~30	16~30
	Cooling Operation Ambient Temperature Range	°C	-15~43	-15~43
	Heating Operation Ambient Temperature Range	°C	-15~24	-15~24
	Condenser Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Condenser Pipe Diameter	mm	Φ7	Φ7
	Condenser Rows-fin Gap	mm	2-1.4	2-1.4
	Condenser Coil Length (LXDXW)	mm	851X38.1X660	984X38.1X748
	Fan Motor Speed	rpm	750	800
	Fan Motor Power Output	W	60	90
	Fan Motor RLA	A	/	/
	Fan Motor Capacitor	μF	/	/
	Outdoor Unit Air Flow Volume	m <sup>3</sup> /h	3200	4000
	Fan Type		Axial-flow	Axial-flow
	Fan Diameter	mm	Φ520	Φ552
	Defrosting Method		Automatic Defrosting	Automatic Defrosting
	Climate Type		T1	T1
	Isolation		I	I
	Moisture Protection		IP24	IP24
	Permissible Excessive Operating Pressure for the Discharge Side	MPa	4.3	4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa	2.5	2.5
	Sound Pressure Level (H/M/L)	dB (A)	55/-/-	58/-/-
	Sound Power Level (H/M/L)	dB (A)	65/-/-	68/-/-
	Dimension(WXHXD)	mm	963X700X396	1000X790X427
	Dimension of Carton Box (LXWXH)	mm	1026X455X735	1080X485X840
	Dimension of Package(LXWXH)	mm	1029X458X750	1083X488X855
	Net Weight	kg	46	55.5
	Gross Weight	kg	50.5	60.5
	Refrigerant		R410A	R410A
	Refrigerant Charge	kg	1.3	1.80
Connection Pipe	Connection Pipe Length	m	5	5
	Connection Pipe Gas Additional Charge	g/m	20	50
	Outer Diameter Liquid Pipe	mm	Φ6	Φ6
	Outer Diameter Gas Pipe	mm	Φ12	Φ16
	Max Distance Height	m	10	10
	Max Distance Length	m	25	25
Note: The connection pipe applies metric diameter.				

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



Parameter		Unit	Value	Value
Model			WGC18IT-GC18IT	WGC24IT-GC24IT
Product Code			CB146036000	CB146035900
Power Supply	Rated Voltage	V~	220-240	220-240
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	Phases		1	1
Power Supply Mode			Outdoor	Outdoor
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Heating Current Input		A	7.80	10.5
Rated Input		W	2650	2800
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	Heating Speed(SH/H/M//L/SL)	r/min	1400/1200/1050/900/-	1400/1200/1000/900/-
	Fan Motor Power Output	W	20	35
	Fan Motor RLA	A	0.31	0.31
	Fan Motor Capacitor	μF	1.5	2.5
	Evaporator Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Evaporator Pipe Diameter	mm	Φ7	Φ7
	Evaporator Row-fin Gap	mm	2-1.4	2-1.5
	Evaporator Coil Length (LXDXW)	mm	657X25.4X304.8	765X25.4X342.9
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	Swing Motor Power Output	W	2	2.5
	Fuse Current	A	3.15	3.15
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	Dimension (WXHXD)	mm	867X305X215	1007X315X219
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	Dimension of Package(LXWXH)	mm	948X383X310	1076X398X328
	Net Weight	kg	12	14
	Gross Weight	kg	15	17



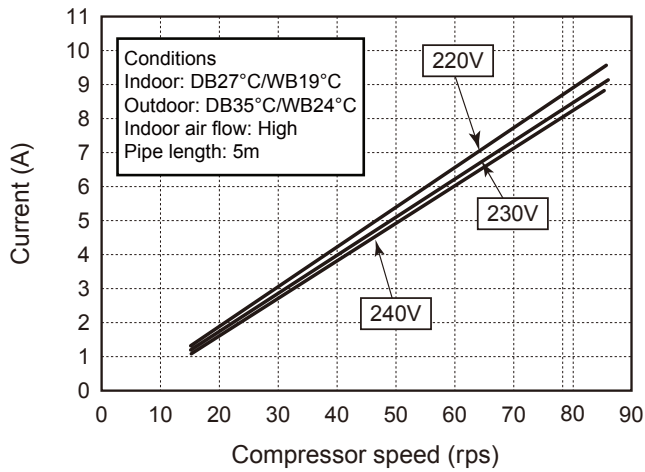
Outdoor Unit	Outdoor Unit Model		GC18IT	GC24IT
	Outdoor Unit Product Code		CB146W36000	CB146W35900
	Compressor Manufacturer		ZHUHAI LANDA COMPRESSOR CO.,LTD	ZHUHAI LANDA COMPRESSOR CO.,LTD
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	Compressor Oil		68EP	68EP
	Compressor Type		Rotary	Rotary
	Compressor LRA	A	25	25
	Compressor RLA	A	7.2	7.2
	Compressor Power Input	W	1440	1440
	Compressor Overload Protector		1NT11L-6233 or KSD115°C or HPC115/95U1	1NT11L-6233 or KSD115°C or HPC115/95U1
	Throttling Method		Capillary	Capillary
	Set Temperature Range	°C	16~30	16~30
	Cooling Operation Ambient Temperature Range	°C	-15~43	-15~43
	Heating Operation Ambient Temperature Range	°C	-15~24	-15~24
	Condenser Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Condenser Pipe Diameter	mm	Φ7	Φ7
	Condenser Rows-fin Gap	mm	2-1.4	2-1.4
	Condenser Coil Length (LXDXW)	mm	851X38.1X660	984X38.1X748
	Fan Motor Speed	rpm	750	800
	Fan Motor Power Output	W	60	90
	Fan Motor RLA	A	/	/
	Fan Motor Capacitor	μF	/	/
	Outdoor Unit Air Flow Volume	m³/h	3200	4000
	Fan Type		Axial-flow	Axial-flow
	Fan Diameter	mm	Φ520	Φ552
	Defrosting Method		Automatic Defrosting	Automatic Defrosting
	Climate Type		T1	T1
	Isolation		I	I
	Moisture Protection		IP24	IP24
	Permissible Excessive Operating Pressure for the Discharge Side	MPa	4.3	4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa	2.5	2.5
	Sound Pressure Level (H/M/L)	dB (A)	55/-/-	58/-/-
	Sound Power Level (H/M/L)	dB (A)	65/-/-	68/-/-
	Dimension(WXHXD)	mm	963X700X396	1000X790X427
	Dimension of Carton Box (LXWXH)	mm	1026X455X735	1080X485X840
	Dimension of Package(LXWXH)	mm	1029X458X750	1083X488X855
	Net Weight	kg	46	55.5
	Gross Weight	kg	50.5	60.5
	Refrigerant		R410A	R410A
	Refrigerant Charge	kg	1.3	1.80
Connection Pipe	Connection Pipe Length	m	5	5
	Connection Pipe Gas Additional Charge	g/m	20	50
	Outer Diameter Liquid Pipe	mm	Φ6	Φ6
	Outer Diameter Gas Pipe	mm	Φ12	Φ16
	Max Distance Height	m	10	10
	Max Distance Length	m	25	25
Note: The connection pipe applies metric diameter.				

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

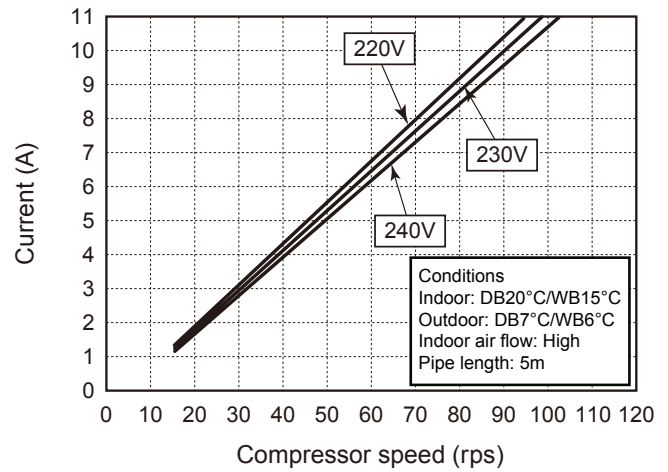


## 2.2 Operation Characteristic Curve

Cooling

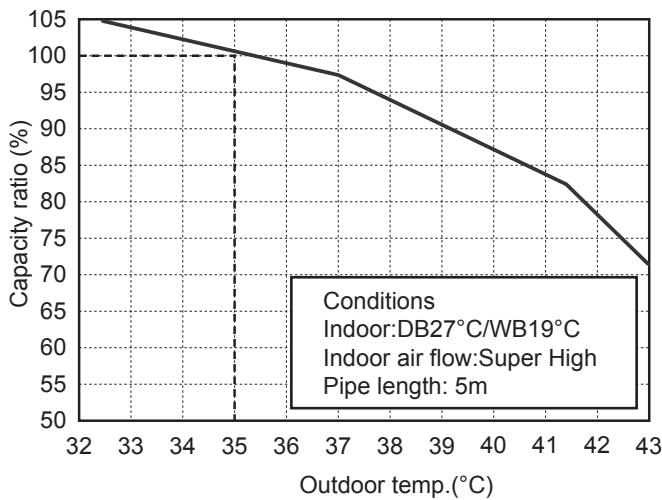


Heating

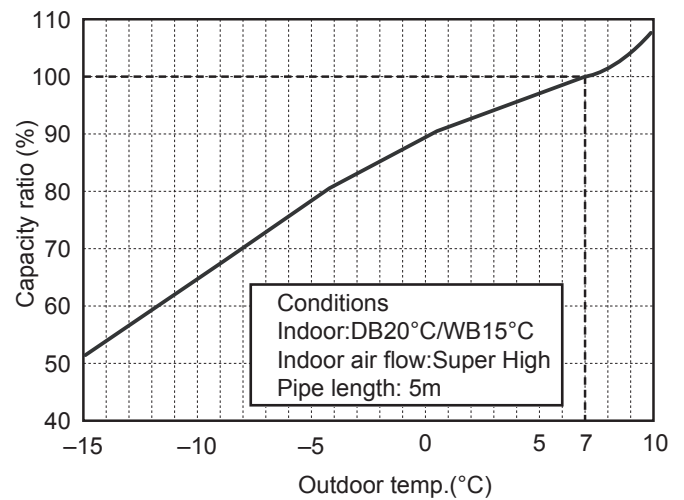


## 2.3 Capacity Variation Ratio According to Temperature

WGC18 IT

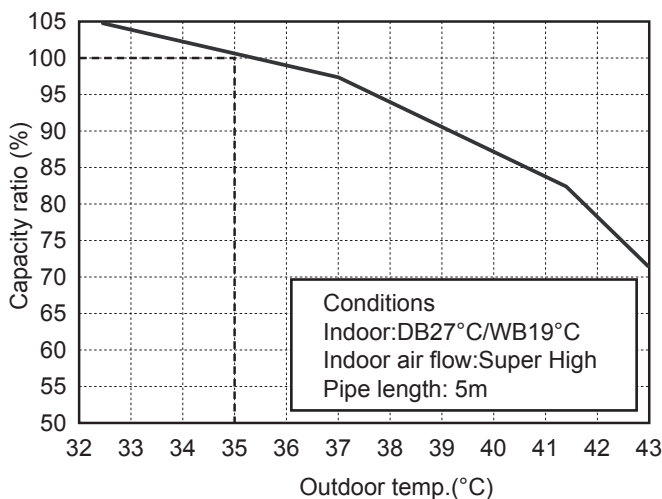


Heating

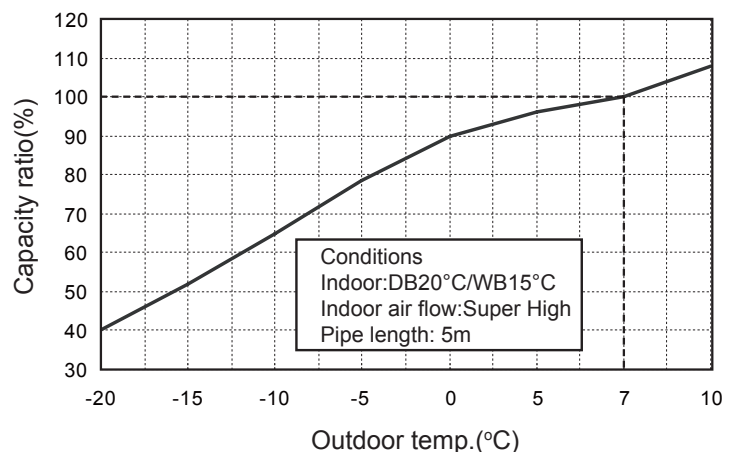


WGC 24 IT

Cooling



Heating





## 2.4 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	Compressor frequency (Hz)
Indoor	Outdoor			T1 (°C)	T2 (°C)			
27/19	35/24	18K	0.9 to 1.1	12 to 14	75 to 37	Super High	High	73
		24K						80

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	Compressor frequency (Hz)
Indoor	Outdoor			T1 (°C)	T2 (°C)			
20/15	7/6	18K	2.2 to 2.4	70 to 35	2 to 4	Super High	High	75
		24K						78

### Instruction:

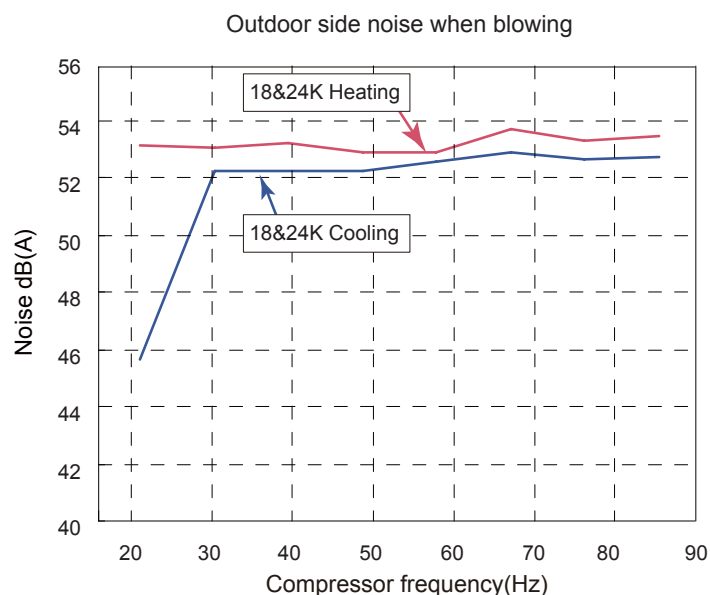
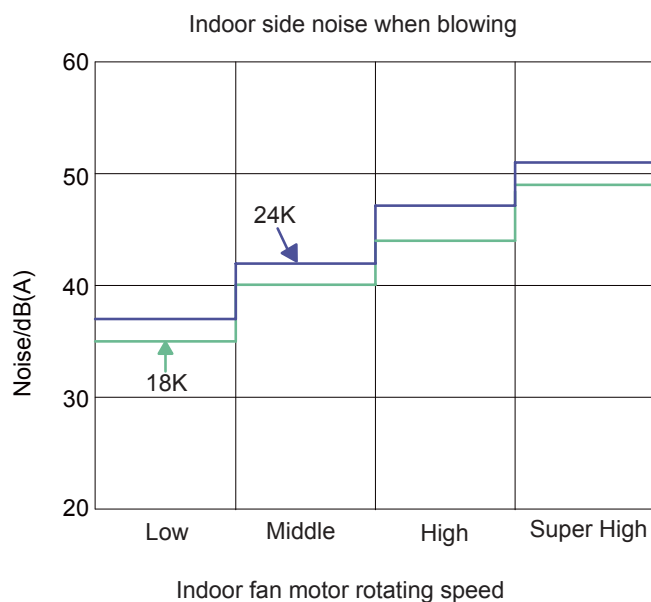
T1: Inlet and outlet pipe temperature of evaporator

T2: Inlet and outlet pipe temperature of condenser

P: Pressure at the side of big valve

Connection pipe length: 5 m.

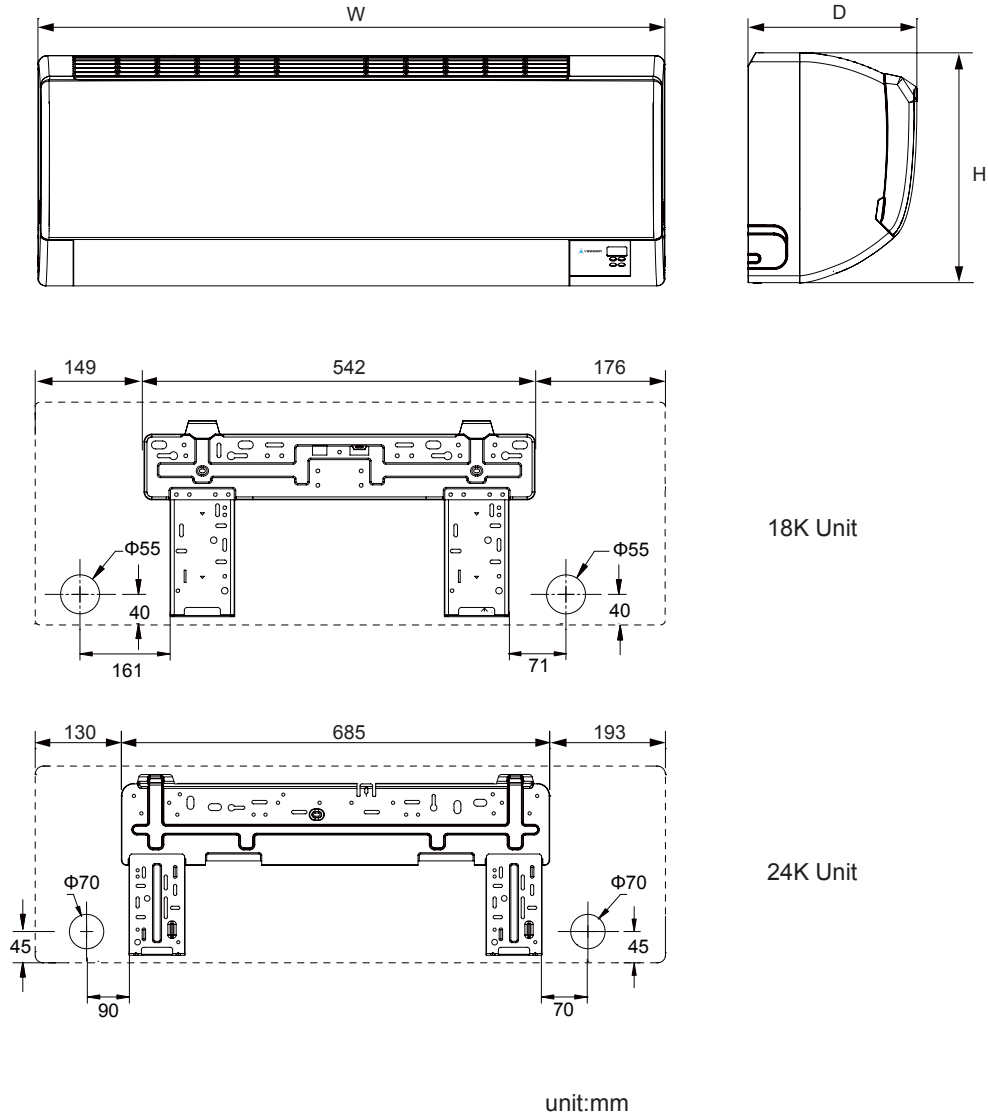
## 2.5 Noise Curve





## 3. Outline Dimension Diagram

### 3.1 Indoor Unit

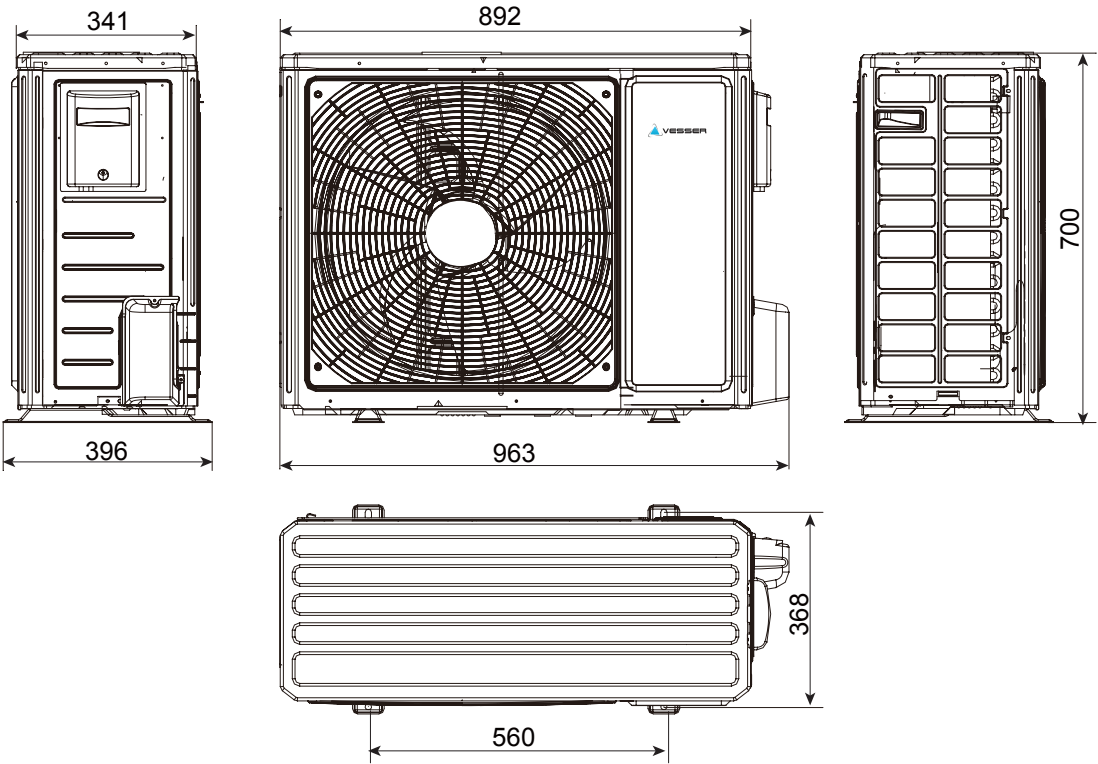


Models	W	H	D
18K	867	305	215
24K	1008	319	221

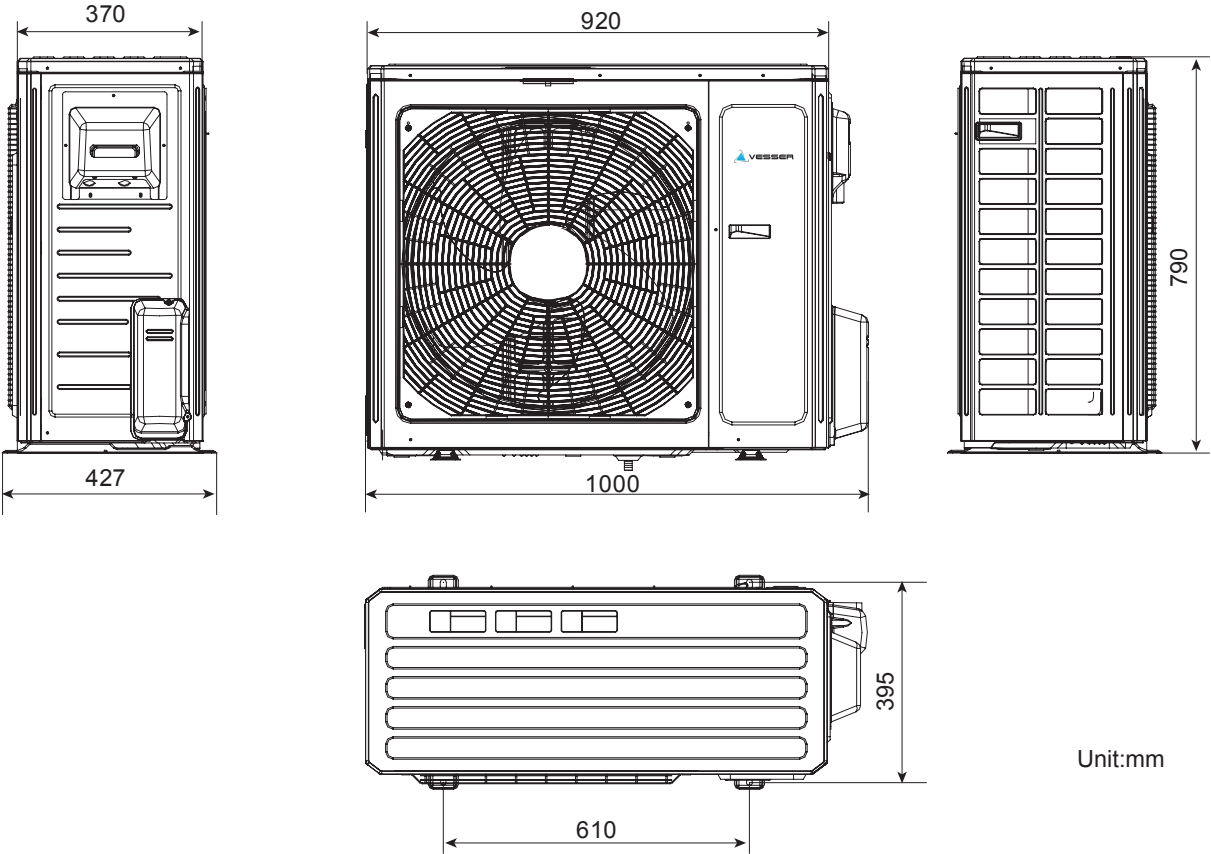


3.2 Outdoor Unit

18K Unit



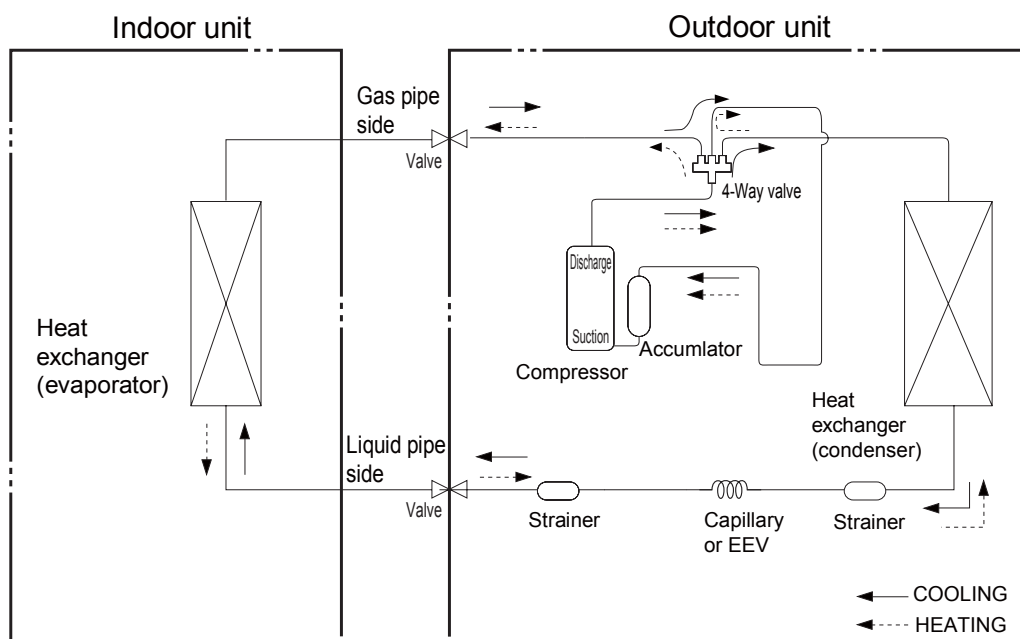
24K Unit



Unit:mm



## 4. Refrigerant System Diagram



Connection pipe specification:

Liquid pipe: 1/4" (6mm)

Gas pipe: 1/2" (12mm)(18K)

Gas pipe: 5/8" (16mm)(24K)



## 5. Electrical Part

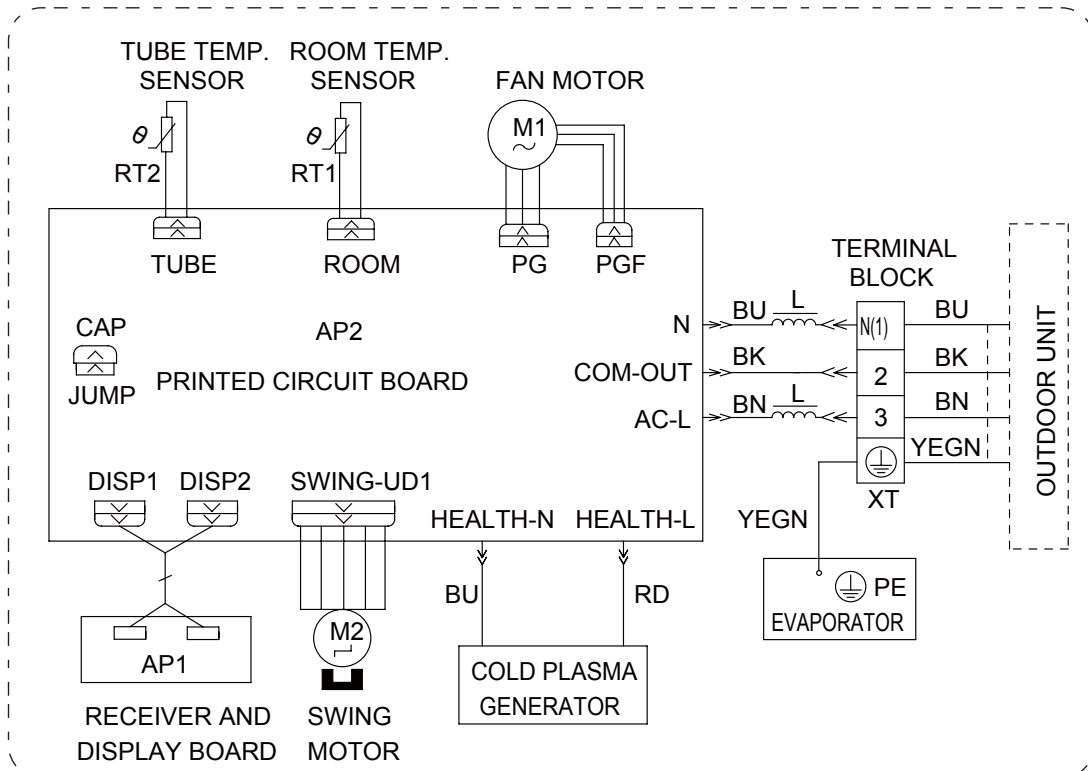
### 5.1 Wiring Diagram

#### • 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.

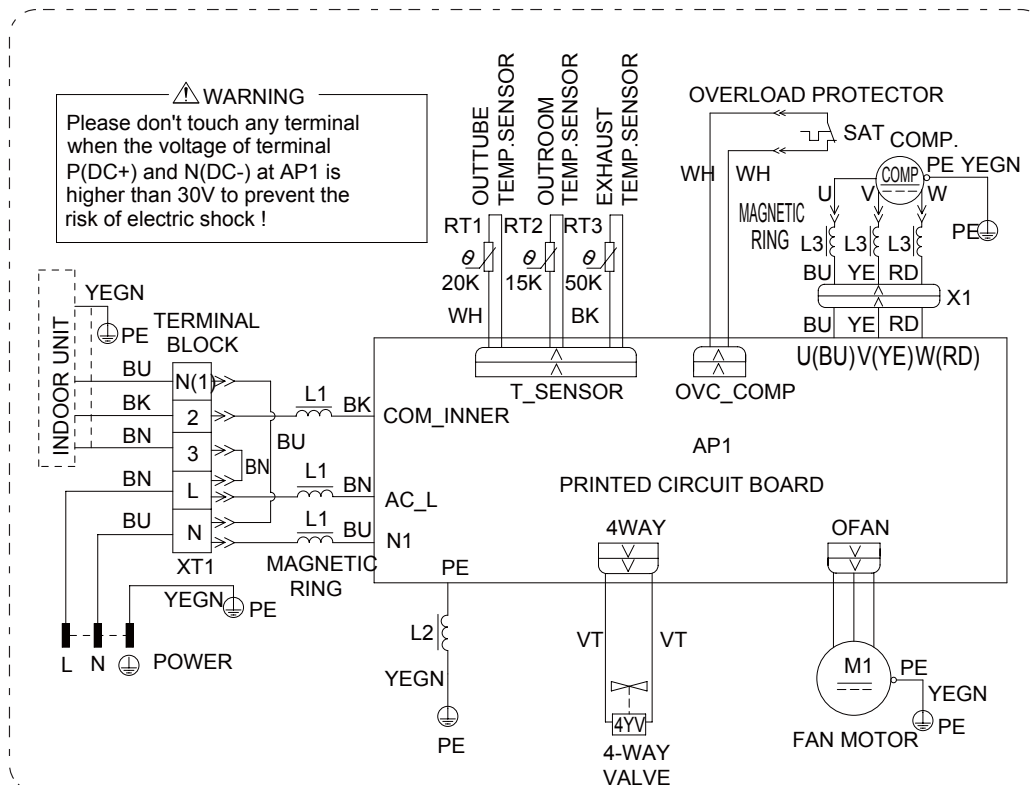
#### • Indoor Unit



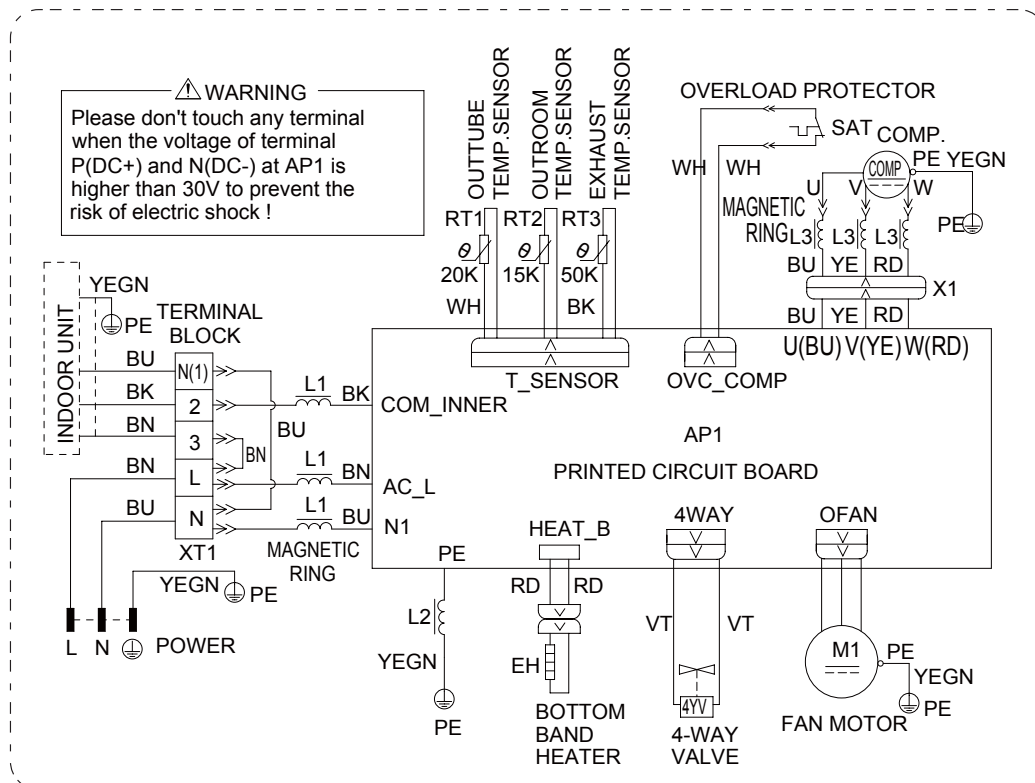


## Outdoor Unit

### GC18 IT , GC 24 IT standard



### GC 18 IT, GC 24 IT additional bottom band heater



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

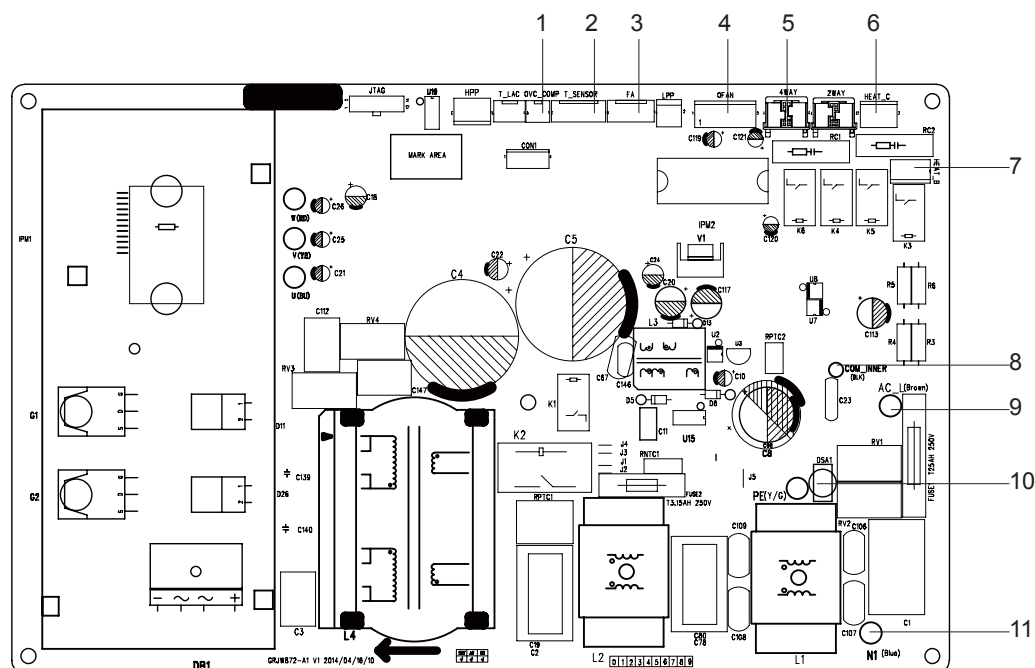






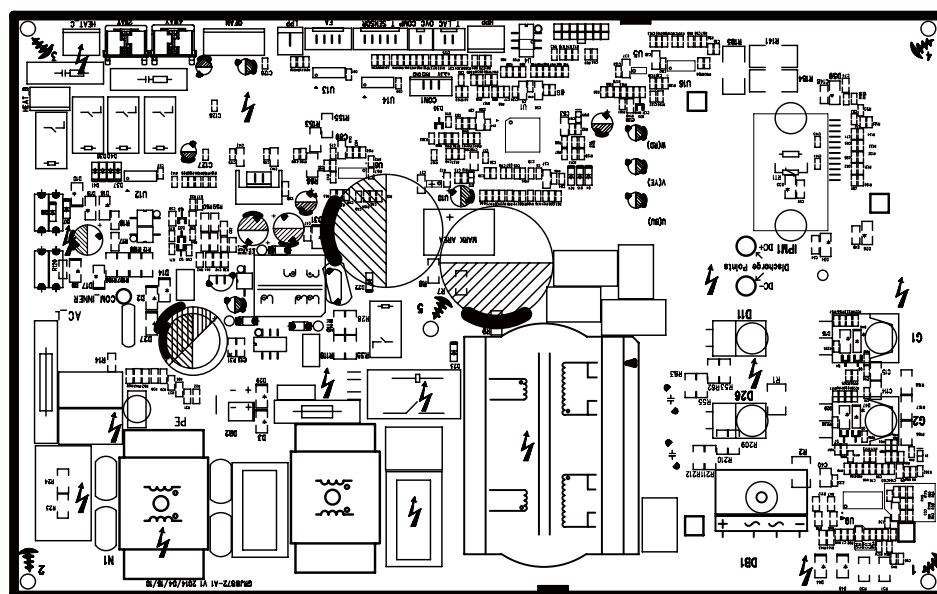
## Outdoor Unit

- **Top view**



No.	Name
1	Terminal of compressor overload protection
2	Terminal of temperature sensor
3	Terminal of electronic expansion valve
4	Terminal of outdoor fan
5	Terminal of 4-way valve
6	Terminal of compressorelectric heating
7	Terminal of chassis electric heating
8	Terminal of indoor unit and outdoor unit communication
9	Power supply live wire
10	Earthing wire
11	Power supply neutral wire

- **Bottom view**

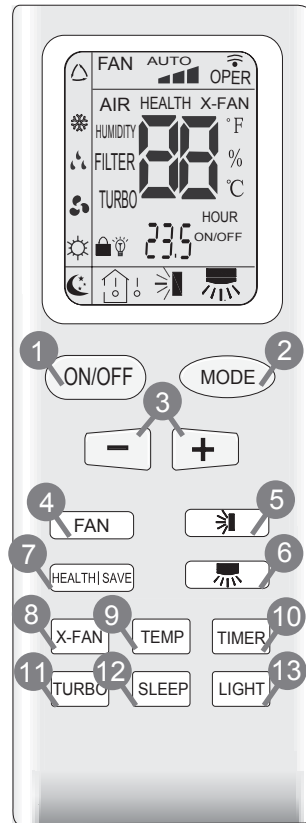






## 6. Function and Control

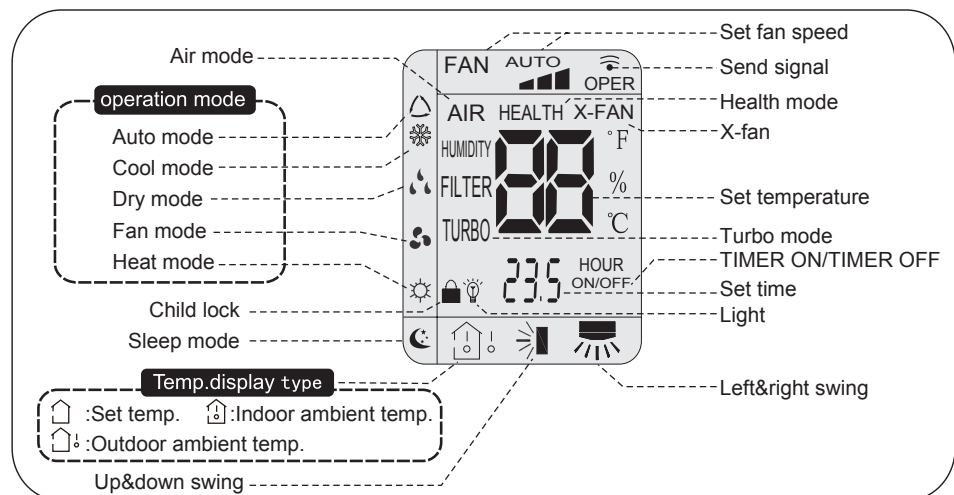
### 6.1 Remote Controller Introduction

#### Buttons on Remote Controller





- 1 ON/OFF Button
- 2 MODE Button
- 3 +/- Button
- 4 FAN Button
- 5  Button
- 6  Button
- 7 HEALTH|SAVE Button
- 8 X-FAN Button
- 9 TEMP Button
- 10 TIMER Button
- 11 TURBO Button
- 12 SLEEP Button
- 13 LIGHT Button

#### Introduction for Icons on Display Screen




#### Introduction for Buttons on Remote Controller

##### Note:

- After putting through the power, the air conditioner will give out a sound. Operation indicator "  " is ON (red indicator). After that, you can operate the air conditioner by using remote controller.
  - At ON status, after each pressing button on remote controller, the signal icon "  " on remote controller will flash once. Air conditioner will give out a sound, which indicates the signal has been sent to air conditioner.
  - At OFF status, display screen on remote controller displays set temperature.
- At on status, display screen on remote controller displays the corresponding startup function's icon.
















### 1. ON/OFF Button

Press this button can turn on or turn off the air conditioner. After turning on the unit, operation indicator “” on indoor unit is ON (green indicator. Color may be different for different models) and indoor unit gives out a sound.

### 2. MODE Button

Press this button to select your required operation mode.



- After selecting auto mode, air conditioner will operate automatically according to ambient temperature. Set temperature can't be adjusted and also can't be displayed. Press “FAN” button can adjust fan speed. Press “” button and “” button can adjust swing angle
- After selecting cool mode, air conditioner operates under cool mode. Cool indicator “” on indoor unit is ON. You can press “+” or “-” button to adjust set temperature. Press “FAN” button can adjust fan speed. Press “” button and “” button can adjust swing angle.
- After selecting dry mode, air conditioner operates under dry mode at low speed. Dry indicator “” on indoor unit is ON. Under dry mode, fan speed can't be adjusted. Press “” button and “” button to adjust swing angle.
- After selecting fan mode, air conditioner operates only under fan mode, All mode indicators on indoor unit is OFF. Operation indicator is ON. Press “FAN” button can adjust fan speed. Press “” button and “” button to adjust swing angle.
- After selecting heat mode, air conditioner operates under heat mode. Heat indicator “” on indoor unit is ON. You can press “+” or “-” button to adjust set temperature. Press “FAN” button to adjust fan speed. Press “” button and “” button to adjust swing angle. (Cooling only unit can't receive the signal for heating mode.)




**Note:**For preventing cold wind, after starting up heating mode, indoor fan will blow fan after delaying 1-5min. (Details time is decided by indoor ambient temperature)

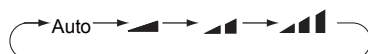
Temperature setting range on remote controller: 16℃ -30℃ . Fan speed setting range: auto, low speed, medium speed and high speed.

### 3. “+” or “-” button

- After each pressing of “+” or “-” button, it can increase or decrease set temperature 1℃ . Hold “+” or “-” button, 2s later, set temperature on remote controller will change quickly. After reaching to your required time, loosen the button. Temperature indicator on indoor unit will also change accordingly. (Temperature can't be adjusted under auto mode)
- Under TIMER ON, TIMER OFF or Clock setting, you can press “+” or “-” button to adjust time. (Refer to TIMER button for details)

### 4. FAN button

Pressing this button can set fan speed circularly as: auto (AUTO), low(  ), medium(  ), high(  ).

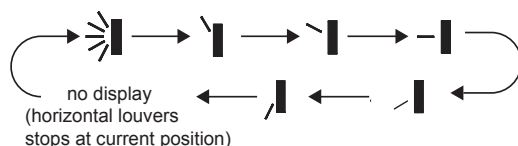



#### Note:






- Under AUTO Speed, IDU fan motor will adjust the fan speed (high, medium or low speed) according to ambient temperature.
- Fan speed under dry mode is low speed.

### 5. button

Press this button can select up&down swing. Swing angle can be selected in sequence as below:



When selecting “” with remote controller, it's auto swing. Horizontal louver of air conditioner will swing up&down automatically at the maximum angle.

When selecting “”, “”, “”, “”, “” with remote controller, it's the fixed position swing. Horizontal louver of air conditioner will stop at that position as shown by the icon to swing.







- At OFF status, press this button once can set TIMER ON. Please refer to TIMER off for detailed operation.

Cancel TIMER ON: Press "TIMER" button again under TIMER ON status.

**Note:**

- Time setting range: 0.5-24 hours.
- Time interval between two operations can't exceed 5s. Otherwise, remote controller will exit the setting status automatically.

**11. TURBO button**

When pressing this button under cooling or heating mode, air conditioner will enter into quick cooling or quick heating mode. The character of "TURBO" is displayed on remote controller. Press this button again to exit turbo function and the character of "TURBO" will be disappeared on remote controller.

**12. SLEEP button**

Press this button under cooling, heating or drying mode can start up sleep function "☾" icon will be displayed on remote controller. Press this button again to cancel sleep function "☾" icon on remote controller will be displayed.

**13. LIGHT button**

Press this button can turn off the light for indoor unit's display "💡" icon on remote controller will disappear. Press this button again to turn on the light for indoor unit's display "💡" icon on remote controller will be displayed.

## Function Introduction for Combination Buttons

**Child lock function:**

Press "+" and "-" buttons simultaneously can turn on or turn off child lock function. When child lock function is started up "🔒" icon will be displayed on remote controller. If operate remote controller "🔒" icon will flash three times, while remote controller won't send signal.

**Switchover function for temperature display:**

After turning off the unit by remote controller, press "-" button and "MODE" button simultaneously to switch between °C and °F .

## Operation Guide

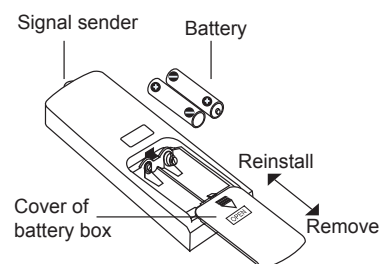
1. After putting through the power, press "ON/OFF" button on remote controller to turn on the air conditioner.
2. Press "MODE" button to select your required mode: AUTO, COOL, DRY, FAN, HEAT.
3. Press "+" or "-" button to set your required temperature. (Temperature can't be adjusted under auto mode).
4. Press 'FAN' button to set your required fan speed: auto, low, medium and high speed.
5. Press "🌀" button and "🌀" button to select fan blowing angle.

## Replacement of Batteries in Remote Controller

1. Press the back side of remote controller marked with "OPEN" 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 8m, 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

### Indoor Part

#### Temperature Parameter

- ◆ Room setting temperature (T<sub>preset</sub>)
- ◆ Room ambient temperature (T<sub>amb</sub>) (temperature sensor :15K, partial pressure resistance:15K)
- ◆ Surface temperature of copper pipe for indoor heat exchanger (T<sub>indoor tube</sub>) (temperature sensor: 20K, partial pressure resistance: 20K)

#### 1. Basic Functions of System

##### (1) Cooling Mode

- ① In this mode, indoor fan and swing will operate according to the setting status. The temperature setting range is 16~30°C.
- ② When the unit stop operation due to malfunction of outdoor unit or protection, indoor unit will keep original operating status. Malfunction code will be displayed.
- ③ When  $0 \leq (T_{\text{preset}} - T_{\text{amb}})$ , if the indoor unit is operating at high fan speed, the speed of fan will change to medium fan speed; if the indoor unit is operating at medium or low fan speed, the speed of fan will keep the same; (This condition can only be carried out after the compressor is started up); There's no change for super-high fan speed; when  $(T_{\text{amb}} - T_{\text{preset}}) \geq 1^\circ\text{C}$ , the fan speed will resume setting fan speed;

##### (2) Dry Mode

- ① In this mode, fan will operate at low fan speed and swing will operate at setting status. The temperature setting range is 16~30°C.
- ② When the unit stop operation due to malfunction of outdoor unit or protection, indoor unit will keep original operating status. Malfunction code will be displayed.

##### (3) Fan Mode

- ① In this mode, indoor fan will operate at high, medium, low or auto fan speed. Compressor, indoor fan and the four-way valve will all stop operation.
- ② In this mode, the temperature setting range is 16~30°C.

##### (4) Heating Mode

- ① In this mode, the temperature setting range is 16~30°C.
- ② Working condition and process of heating: when the unit is turned on in heating mode, indoor unit enters into anti-cold air condition; when the unit is turned off, the unit will enter into the condition of blowing residual heat.
- ③ Protection function: in heating mode, when the compressor is stopped due to malfunction, indoor fan will operate at the condition of blowing residual heat.
- ④ Defrosting control: after receiving the defrosting signal from outdoor unit, heating indicator on indoor unit OFF 0.5s and ON 10s.
- ⑤ Anti-cold function
- ⑥ Blowing residual heat function;
  - a) During heating operation, when the stopping condition for the compressor is reached, the compressor and the outdoor fan motor stop operation. The upper & down horizontal louver will rotate to the horizontal position L. The indoor fan will be stopped after operating for 60s at setting speed.
  - b) Due to the blockage of PG motor, horizontal louver will keep the stop position when the unit is turned off. (In other modes) When the unit is stopped due to other malfunctions, up & down horizontal louver will rotate to horizontal position L. The indoor fan will be stopped after operating for 60s at setting speed.
  - c) If the unit is turned off when the compressor is operating in heating mode or auto heating mode, up & down horizontal louver will rotate to horizontal position L. The indoor fan will be stopped after operating for 60s at setting speed.

##### (5) Auto Mode

- ① When  $T_{\text{amb}} \geq 26^\circ\text{C}$ , the unit will operate in cooling mode. The implied setting temperature is 25°C.
- ② Heat pump type: when  $T_{\text{amb}} \leq 22^\circ\text{C}$ , the unit will operate in heating mode. The implied setting temperature is 20°C.
- ③ Cooling only unit: when  $T_{\text{amb}} \leq 25^\circ\text{C}$ , the unit will operate in auto mode. The implied setting temperature is 25°C.
- ④ When  $23^\circ\text{C} \leq T_{\text{indoor amb}} \leq 25^\circ\text{C}$ , the unit will operate in auto fan mode if the unit is turned on and enters into the auto mode for the first time. If the unit is switched to auto mode from other mode, it will keep the previous operation mode (if the unit is switched to auto mode from dry mode, the unit will operate at auto fan mode).

#### 2. Display Status of Indoor Indicator (NOTE: Nixie tube is not available for A8 panel.)

##### (1) Status of Indoor Display Board

- ① After energization, all the icons will be displayed and then only the power indicator is bright. When the unit is turned on by remote controller, the operation indicator will be bright. Meanwhile, the current setting operation mode will be displayed.
- ② During defrosting, heating indicator on indoor unit OFF 0.5s and ON 10s.
- ③ "Dual-8" displays setting temperature.

##### • Display of operation icon and mode icon

After energization, all the icons will be displayed for once. In standby status, the operation indicator will be in red. If turn on the unit by remote controller, the operating indication icon will be bright. Meanwhile, the current setting operation mode will be displayed (mode indicator: cooling indicator, heating indicator, dry indicator). If turn off the light button, all displays will be turned off.

##### • Temperature display control mode for split type unit

- ① When user set the remote controller as the setting temperature display status, the current setting temperature will be displayed on



remote controller.

② Only when the remote control signal is switched to indoor ambient temperature display status from other display status, controller will display the indoor ambient temperature for 3s and then turn back to display the setting temperature.

③ When user hasn't set the temperature displaying status, it will be displayed according to the setting temperature.

## **(2) Malfunction Display of Indoor Unit**

When multiple malfunctions occurred simultaneously, malfunction protection codes will be displayed in cycle.

### **3. Other Control Target**

#### **(1) Up&down swing function**

After energization, up & down swing motor will firstly let the horizontal louver anticlockwise rotate to position 0 to close air outlet.

If swing function has not been set after startup of the unit, up & down horizontal louver will clockwise turn to position D in HEAT mode, or clockwise turn to level position L in other modes.

If setting swing function while starting up the unit, the horizontal louver will swing between L and D.

There are 7 kinds of swing status of horizontal louver: Positions L, A, B, C and D, swing between L and D and stop at any position between L and D.

Upon turning off the unit, the horizontal louver will close at position 0. Swing function is available only when swing function set and indoor fan is operating.

Note: If the position is set between L and B, A and C or B and D by remote controller, the horizontal louver will swing between L and D.  
L----A----B----C----D

#### **(2) Buzzer**

Upon energization and operation, the buzzer will give out sound.

#### **(3) Auto Button**

After pressing this button, the unit will operate in auto mode. Indoor fan will operate at auto fan speed and swing motor will operate.

Press this button again to turn off the unit. The complete unit is energized when pressing the button and the complete unit will enter into fast testing status. After energization, if it's detected that the auto button is pressed down and the complete unit is at fast testing status, the fast testing status will be exited.

#### **(4) Sleep Function**

This mode is only valid in cooling and heating mode. The unit will select the appropriate sleeping curve to operate according to the different setting temperature.

##### **During cooling mode:**

① When the initial temperature is set as 16~23°C, after starting up the sleep function, the temperature will increase by 1°C every one hour. After the temperature has increased by 3°C, the unit will keep this temperature. When the unit has operated for 7 hours, the temperature will decrease by 1°C and then the unit will operate at this temperature all the time;

② When the initial temperature is set as 24~27°C, after starting up the sleep function, the temperature will increase by 1°C every one hour. After the temperature has increased by 2°C, the unit will keep this temperature. When the unit has operated for 7 hours, the temperature will decrease by 1°C and then the unit will operate at this temperature all the time;

③ When the initial temperature is set as 28~29°C, after starting up the sleep function, the temperature will increase by 1°C every one hour. After the temperature has increased by 1°C, the unit will keep this temperature. When the unit has operated for 7 hours, the temperature will decrease by 1°C and then the unit will operate at this temperature all the time;

④ When the initial temperature is set as 30°C, the unit will operate at this temperature. After the unit has operated for 7 hours, the temperature will decrease by 1°C and then the unit will operate at this temperature all the time.

##### **During Heating Mode:**

① When the initial temperature is set at 16°C, the unit will operate at this temperature all the time;

② When the initial temperature is set as 17~20°C, after starting up the sleep function, the temperature will decrease by 1°C every one hour. After the temperature is decreased by 1°C, the unit will operate at this temperature;

③ When the initial temperature is set as 21~27°C, after starting up the sleep function, the temperature will decrease by 1°C every one hour. After the temperature is decreased by 2°C, the unit will operate at this temperature;

④ When the initial temperature is set as 28~30°C, after starting up the sleep function, the temperature will decrease by 1°C every one hour.

After the temperature is decreased by 3°C, the unit will operate at this temperature;

General timer and clock timer functions are compatible by equipping different functions of remote controller.

#### **(5) Timer Function**

General timer and clock timer functions are compatible by equipping different functions of remote controller.

##### **General timer:**

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 operate 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.

#### (6) Blow Function

Blow function can be set in cooling and dry mode.

#### (7) Indoor Fan Control

Indoor fan can be set at super-high, high, medium or low. Meanwhile, the fan will operate at super-high, high, medium and low fan speed respectively and it can also set at auto fan speed.

#### (8) Memory Function

Memory content includes mode, up & down swing, light, set temperature and set fan speed, general timer (clock timer can't be memorized). Upon power failure, the unit after power recovery will automatically start operation according to memorized content. The unit, without timer setting before power failure, will operate according to the last setting after power recovery. The unit, with general timer setting which has not been fulfilled before power failure, will memorize the time setting and re-calculate the time after power recovery. If there is timer function in the last remote controller command but setting time has reached, the system will act as timer on/off setting before power failure. After power failure, the system memorizes the operation states before power failure without timer action. Clock timer can not be memorized.

#### (9) Locked protection to PG motor

If the indoor fan motors rotational speed after startup keeps slow for a continuous period of time, the unit will stop operation and display "H6".

#### (10) Turbo Function

This function can be set in cooling or heating mode to quickly cool or heat the room (Turbo function is not available in auto, dry and fan mode). After pressing the turbo button, indoor fan will operate at super-high fan speed.

### 4. Malfunction Detection for Temperature sensor

#### (1) Indoor ambient temperature sensor:

Malfunction of temperature sensor will be detected at any time;

#### (2) Indoor tube temperature sensor

Malfunction of temperature sensor won't be detected during defrosting period. It starts detecting the malfunction of temperature sensor after defrosting is finished for 5 mins. Malfunction of temperature sensor will be detected at any other time.

#### (3) Protection of temperature sensor

1. When the temperature sensor is detected short circuit for 5s successively:

The detected temperature by the temperature sensor is too high and the complete unit will stop operation, meanwhile, the protection and malfunction of temperature sensor will be displayed accordingly.

2. When the temperature sensor is detected open circuit for 5s successively: The unit will stop operation due to protection and the corresponding malfunction of temperature sensor will be displayed directly.

### 5. Refrigerant Recovery Function (applicable when changing installation location or in maintenance)

#### (1) Enter refrigerant recovery function

Within 5min after energizing (unit ON or OFF status is ok), continuously press LIGHT button for 3 times within 3s to enter refrigerant recycling mode; Fo is displayed and refrigerant recycling function is started. At this moment, the maintenance people close liquid valve. After 5min, stick the thimble of maintenance valve with a tool. If there is no refrigerant spraying out, close the gas valve immediately and then turn off the unit to remove the connection pipe.

#### (2) Exit refrigerant recovery function

After entering refrigerant recycling mode, when receive any remote control signal or enter refrigerant recycling mode for 25min, the unit will exit refrigerant recycling mode automatically if the unit is in standby mode before refrigerant recycling, it will be still in standby mode after finishing refrigerant recycling; if the unit is in ON status before refrigerant recycling, it will still run in original operation mode.

### 6. Compulsory Defrosting Function

#### (1) Start up compulsory defrosting function

Under ON status, set heating mode with remote controller and adjust the temperature to 16°C. Press "+, -, +, -, +, -" button successively within 5s and the complete unit will enter into compulsory defrosting status. Meanwhile, heating indicator on indoor unit will ON 10s and OFF 0.5s successively. (Note: If complete unit has malfunction or stops operation due to protection, compulsory defrosting function can be started up after malfunction or protection is resumed.)

#### (2) Exit compulsory defrosting mode

After compulsory defrosting is started up, the complete unit will exit defrosting operation according to the actual defrosting result, and the complete unit will resume normal heating operation.



## Outdoor Part

### 1. Input Parameter Compensation and Calibration

#### ① Check the input parameter compensation function

As the instruction feature of split unit, concerning the comfortable, in heating mode, the indoor ambient temperature of compressor stopping time is higher than preset temperature.

#### ② Check effective judgment controls of parameters

Effective judgment function of the outdoor exhaust temperature thermo-bulb

When conditions a and b are satisfied, the outdoor exhaust temperature thermo-bulb is judged not to be connected into place, the mainboard of outer units will display failure of the outdoor exhaust temperature thermo-bulb (not connected into place), stop the unit for repairing, and resume it by remote controls of ON/OFF.

### 2. Basic Functions

#### (1) Cooling Mode

① Conditions and processes of cooling operation:

a) If the compressor is stop, and  $[T_{\text{preset}} - (T_{\text{indoor ambient}} - \Delta T_{\text{cooling indoor ambient temperature compensation}})] \leq 0.5^{\circ}\text{C}$ , start up the unit for cooling, and start to cooling operation;

b) During operations of cooling, if  $0^{\circ}\text{C} \leq [T_{\text{preset}} - (T_{\text{indoor ambient}} - \Delta T_{\text{cooling indoor ambient temperature compensation}})] < 2^{\circ}\text{C}$ , the cooling operation will be still running;

c) During operations of cooling, if  $2^{\circ}\text{C} \leq [T_{\text{preset}} - (T_{\text{indoor ambient}} - \Delta T_{\text{cooling indoor ambient temperature compensation}})]$ , the cooling operation will stop after reaching to the temperature point.

② Temperature setting range

a) If  $T_{\text{outdoor ambient}} \geq [T_{\text{low-temperature cooling}}]$ , the temperature can be set at: 16~30°C (Cooling at room temperature);

b) If  $T_{\text{outdoor ambient}} < [T_{\text{low-temperature cooling}}]$ , the temperature can be set at: 25~30°C (Cooling at low temperature), that is, the minimum setting temperature for outdoor unit judgment is 25°C.

#### (2) Dry Mode

① Conditions and processes of dry operations: Same as the cooling mode;

② The temperature setting range is: 16~30°C;

#### (3) Fan Mode

1. The compressor, outdoor fan and four-way valve are switched off;

② The temperature setting range is: 16~30°C.

#### (4) Heating Mode

① Conditions and processes of heating operations: ( $T_{\text{indoor ambient}}$  is the actual detection temperature of indoor environment thermo-bulb,  $\Delta T_{\text{heating indoor ambient temperature compensation}}$  is the indoor ambient temperature compensation during heating operations)

a) If the compressor is stop, and  $[(T_{\text{indoor ambient}} - \Delta T_{\text{heating indoor ambient temperature compensation}}) - T_{\text{preset}}] \leq 0.5^{\circ}\text{C}$ , start the machine to enter into heating operations for heating;

b) During operations of heating, if  $0^{\circ}\text{C} \leq [(T_{\text{indoor ambient}} - \Delta T_{\text{heating indoor ambient temperature compensation}}) - T_{\text{preset}}] < 2^{\circ}\text{C}$ , the heating operation will be still running;

c) During operations of heating, if  $2^{\circ}\text{C} \leq [(T_{\text{indoor ambient}} - \Delta T_{\text{heating indoor ambient temperature compensation}}) - T_{\text{preset}}]$ , the heating operation will stop after reaching the temperature point.

② The temperature setting range in this mode is: 16~30°C.

#### (5) Defrosting Control

① After the time for defrosting is judged to be satisfied, if the temperature for defrosting is satisfied after detections for continuous 3minutes, the defrosting operation will start.

② Start to defrost: Compressor stops and starts up 55S later;

③ Defrosting finish: Compressor stops and starts up 55S later;

④ Conditions of finishing defrosting

The defrosting operation can exit when any of the conditions below is satisfied:

a)  $T_{\text{outdoor pipe}} \geq 12^{\circ}\text{C}$ ;

b)  $T_{\text{outdoor ambient}} < -5^{\circ}\text{C}$ , and the  $T_{\text{outdoor pipe}} \geq 6^{\circ}\text{C}$  last more than 80S;

c) The continuous running time of defrosting reaches to 8min.

#### (6) Compressor Control



- ① The frequency of compressor will be controlled with the relationship of ambient temperature and preset temperature and changing speed of ambient temperature;
- ② Start the compressor after starting cooling, heating, dry operations, and the outdoor fan start for 5s;
- ③ When the unit is off, in safety stops and switching to fan mode, the compressor will stop immediately;
- ④ In all modes: once the compressor starts up, it will not be allowed to stop until having run for the  $[T_{\min. \text{ Compressor running time}}]$  (Note: including cases of shutdown when the temperature point is reached; except the cases requiring stopping the compressor such as fault protection, remote shutdown, mode switching etc.);
- ⑤ In all modes: once the compressor stops, it will be allowed be restart after 3-minute delay (Note: The indoor units have a function of power memory, the machine can be restarted after remote shutdown and powering up again without delay).

#### (7) Outdoor Fan Control

- ① When the unit is off by remote control, in safety stops and stop after reaching to the temperature point.
- ② In fan mode: The outdoor fan stops;
- ③ Start to defrost: Outdoor fan will stop after compressor stops for 50S;
- ④ Defrosting finish: Outdoor fan will start up when the compressor is stopping.

#### (8) 4-way valve control

- ① The 4-way valve control under the modes of Cooling, dehumidification and fan: closing;
- ② When the unit is on in heating mode, the 4-way valve is energized;
- ③ When the unit is on in heating mode and heating mode shift to other modes, the 4-way valve will be de-energized after compressor stops for 2min;
- ④ After protection stops, the 4-way valve will be de-energized after 4min;
- ⑤ Start to defrost: The power of 4-way valve will be de-energized after the compressor stops;
- ⑥ Defrosting finish: The 4-way valve will be energized after the compressor stops.

#### (9) Freeze prevention protection

- ① Under cooling or drying mode, if it detected that Tindoor tube  $< 0^{\circ}\text{C}$  for 3 min successively, the unit will stop operation due to freeze prevention protection. If  $6^{\circ}\text{C} < \text{Tindoor tube}$ , and compressor has stopped for 3min, the complete unit can be allowed to resume operation;
- ② Under cooling or drying mode, if Tindoor tube  $< 6^{\circ}\text{C}$ , the operation frequency of compressor may decrease or the operation frequency of compressor may stop increasing,
- ③ If the unit stops operation due to freeze prevention protection for 6 times successively, the unit cant resume operation automatically and error code will be displayed successively. Only press ON/OFF button can resume the operation. During operation process, if compressor operates for more than 10min, times of stop operation due to freeze prevention protection will be cleared. Malfunction and malfunction times will be cleared immediately when turning off the unit or switch to fan/heating mode.

#### (10) Overload protection function

- ① Overload protection function under cooling or drying mode, if  $65^{\circ}\text{C} \leq \text{Toutdoor tube}$ , the unit stops operation due to overload protection under cooling; if  $\text{Toutdoor tube} < 55^{\circ}\text{C}$ , and compressor has stopped for 3mins, the complete unit can then be allowed to resume operation;
- ② under cooling or drying mode, if  $55^{\circ}\text{C} \leq \text{Toutdoor tube}$ , operation frequency of compressor will decrease or operation frequency of compressor will stop increasing;
- ③ Overload protection function under heating mode, if  $64^{\circ}\text{C} \leq \text{Tindoor tube}$ , the unit will stop operation due to overload protection under heating, If  $\text{Tindoor tube} < 54^{\circ}\text{C}$ , and compressor has stopped for 3min, the complete unit can then be allowed to resume operation;
- ④ Under heating mode, if  $54^{\circ}\text{C} \leq \text{Tindoor tube}$ , operation frequency of compressor will decrease or operation frequency of compressor will stop increasing;
- ⑤ If the unit stops operation due to overload protection for 6 times successively, the unit cant resume operation automatically and error code will be displayed successively. Only press ON/OFF button can resume the operation. During operation process, if compressor operates for more than 10min, times of stop operation due to overload protection will be cleared. Malfunction and malfunction times will be cleared immediately when turning off the unit, under fan mode or switching to heating mode.

#### (11) Discharge temperature protection function of compressor

- ① If  $115^{\circ}\text{C} \leq \text{Tdischarge}$ , the unit stops operation due to discharge protection; if  $\text{Tdischarge} < 97^{\circ}\text{C}$ , and compressor has stopped for 3min, the complete unit can then be allowed to resume operation;
- ② If  $97^{\circ}\text{C} \leq \text{Tdischarge}$ , operation frequency of compressor will decrease or operation frequency of compressor will stop increasing;
- ③ If the unit stops operation due to discharge temperature protection of compressor for 6 times successively, the unit cant resume



operation automatically and error code will be displayed successively. Only press ON/OFF button can resume the operation. During operation process, if compressor operates for more than 10min, times of stop operation due to discharge protection will be cleared. Malfunction and malfunction times will be cleared immediately when turning off the unit, or switching to fan mode.

#### **(12)Current protection function**

- ① If  $12A \leq I$  AC current, operation frequency of compressor will decrease or operation frequency of compressor will stop increasing;
- ② If  $17A \leq I$  AC current, the unit stops operation due to overcurrent protection. When compressor has stopped operation for 3min, the complete unit can then be allowed to resume operation.
- ③ If the unit stops operation due to overcurrent protection for 6 times successively, the unit cant resume operation automatically. Only press ON/OFF button can resume the operation. During operation process, if compressor operates for more than 10min, times of stop operation due to overcurrent protection will be cleared.

#### **(13)Voltage-dropping protection**

During operation, if the voltage is decreasing quickly, the unit may stop operation and alarm voltage-dropping malfunction. 3 mins later, the unit will be restarted up automatically.

#### **(14)Communication malfunction**

If it hasnt received the correct signal from indoor unit for 3min successively, the unit will stop operation due to communication malfunction; If communication malfunction is resumed and compressor has stopped for 3min, the complete unit can then be allowed to resume operation.

#### **(15)IPM module protection**

After compressor is turned on, if it causes overcurrent to IPM modular, or control voltage is too low due to some abnormal causes, IP will generate modular protection signal. Main chip will detect the modular protection signal as soon as the unit is turned on. Once modular protection signal is detected, the unit will stop operation immediately due to protection. If modular protection is resumed and compressor has stopped for 3min, the complete unit can then be allowed to resume operation.

If the unit stops operation due to modular protection for 3 times successively, the unit cant resume operation automatically, except pressing ON/OFF button. If compressor has operates for more than 10 min successively, the stop operation times due to modular protection will be cleared.

#### **(16)Modular overheating protection**

- ① If  $80^{\circ}C \leq T_{\text{modular}}$ , operation frequency of compressor will decrease or operation frequency of compressor will stop increasing;
- ② If  $95^{\circ}C \leq T_{\text{modular}}$ , the unit will stop operation due to protection; if  $T_{\text{modular}} < 87^{\circ}C$ , and compressor has stopped for 3min, the complete unit can then be resume operation;
- ③ If the unit stops operation due to modular overheating protection for 6 times successively, the unit cant resume operation automatically. Only press ON/OFF button can resume the operation. During operation process, if compressor operates for more than 10min, times of stop operation due to modular overheating protection will be cleared. Malfunction times will be cleared immediately when turning off the unit, or switching to fan mode.

#### **(17)Overload protection of compressor**

- ① If it detected that overload switch of compressor breaks for 3s successively, the system will stop operation due to protection;
- ② If it detected overload protection is resumed, and compressor has stopped for 3min, the complete unit can then be allowed to resume operation;
- ③ If it detected that the unit stops operation due to overload protection of compressor for 3 times successively, the unit cant resume operation automatically, except pressing ON/OFF button. After compressor operates for 30min, overload protection times of compressor will be cleared.



# 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. Wear 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.



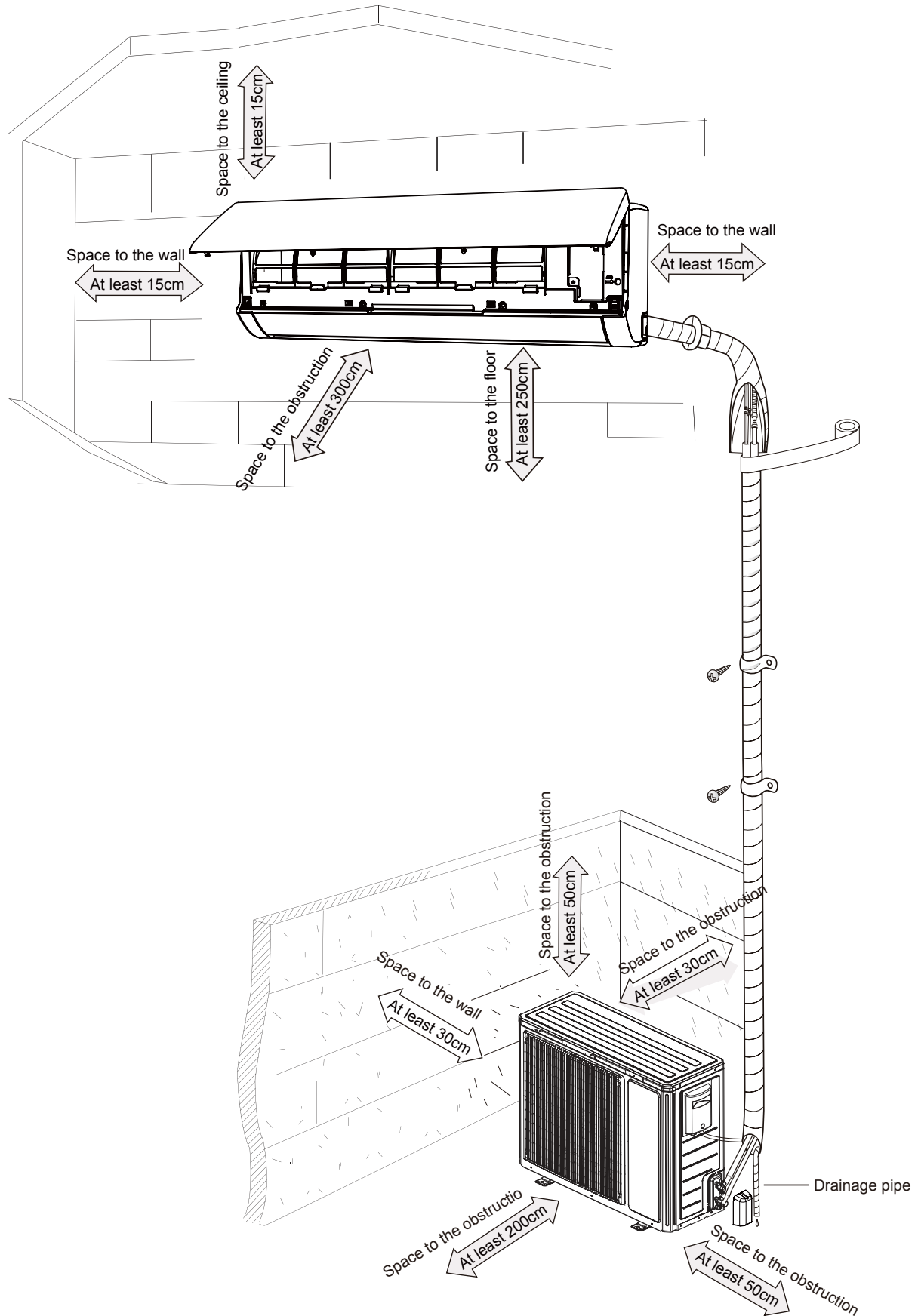
## Main Tools for Installation and Maintenance

<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> 



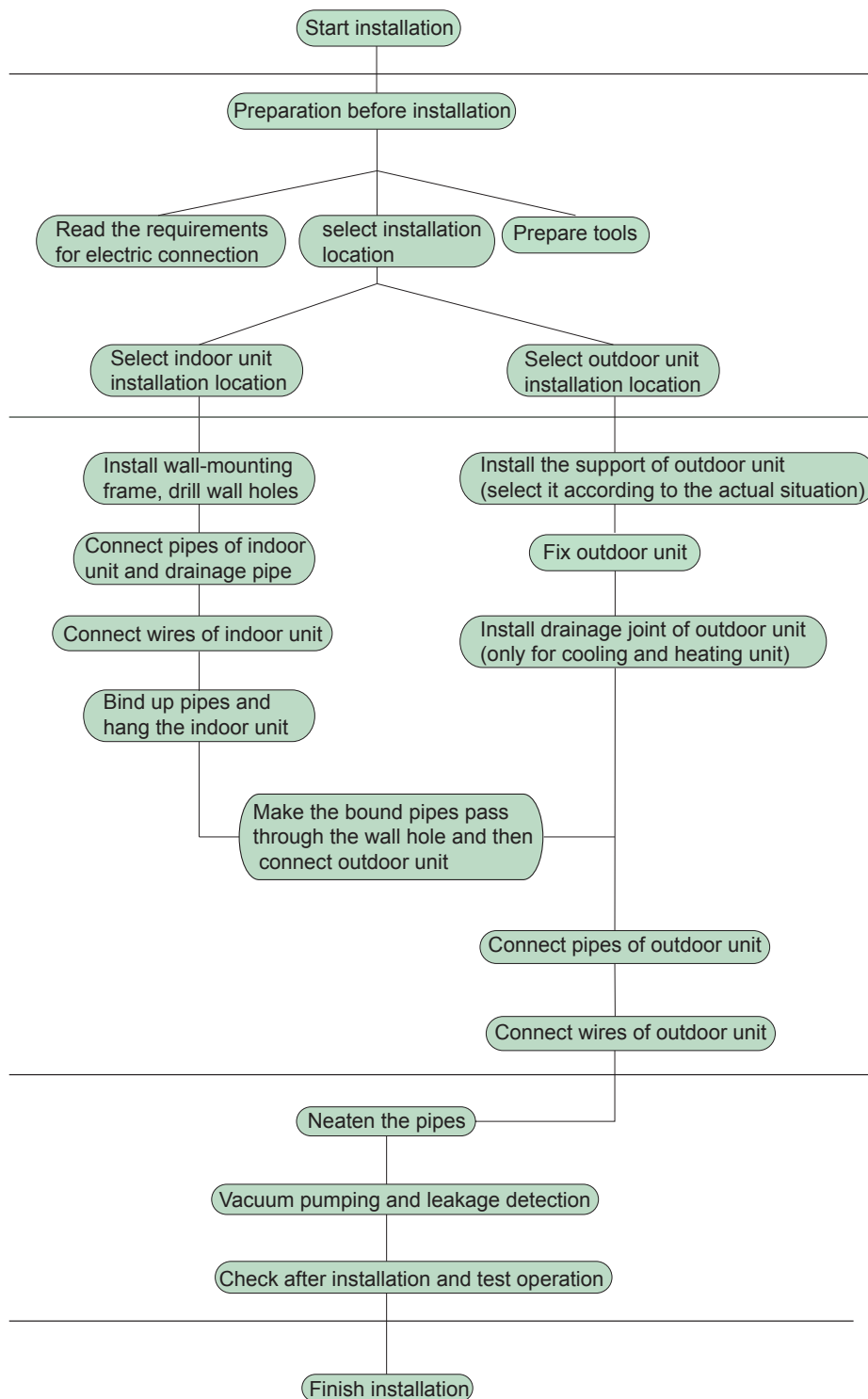
## 8. Installation

### 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.

### 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 away 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 Electric Connection Requirement

### 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.

Air-conditioner	Air switch capacity
18/24K	16A

- (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) For appliances with type Y attachment,the instructions shall contain the substance of thefollowing.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)

## 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)

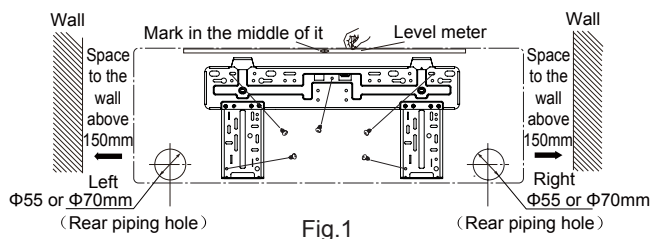


Fig.1

(2) Open a piping hole with the diameter of Φ55(70) 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)

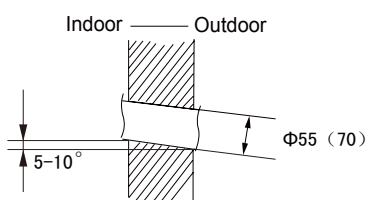


Fig.2

#### ⚠ 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)

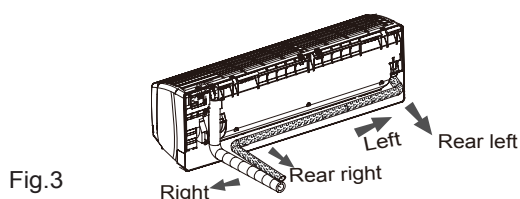


Fig.3

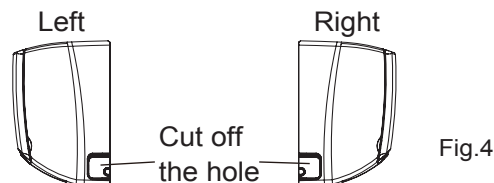


Fig.4

### 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)

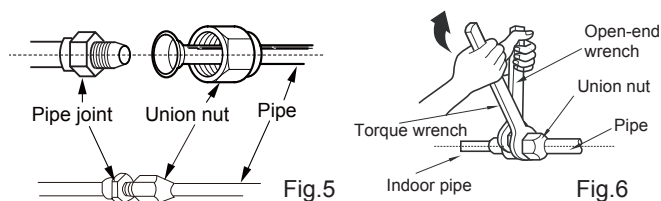


Fig.5

Fig.6

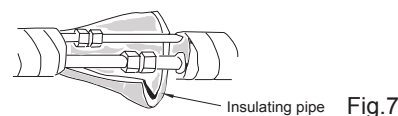


Fig.7

Refer to the following table for wrench moment of force:

Hex nut diameter(mm)	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)

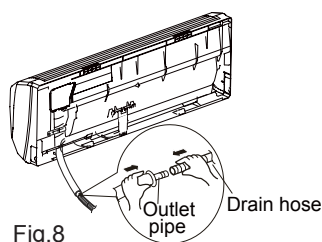


Fig.8

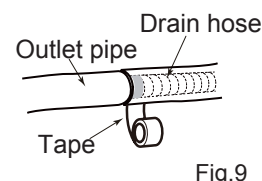


Fig.9



**⚠ 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)

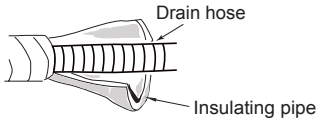


Fig.10

## 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)

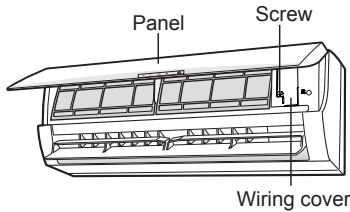


Fig.11

- (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)

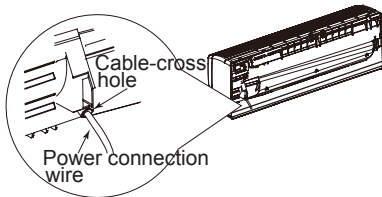


Fig.12

- (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)

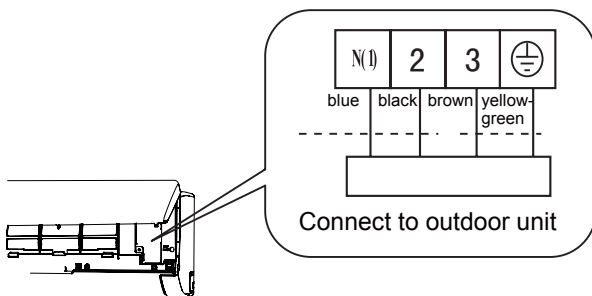


Fig.13

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

- (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 them. 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.

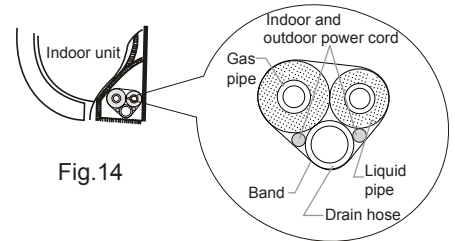


Fig.14

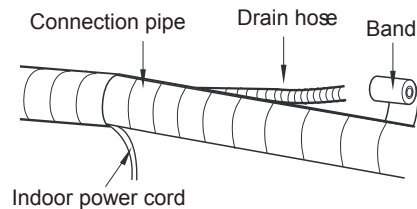


Fig.15

**⚠ 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)



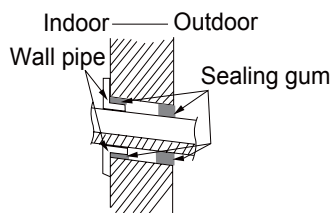


Fig.16

**⚠ Note:**

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

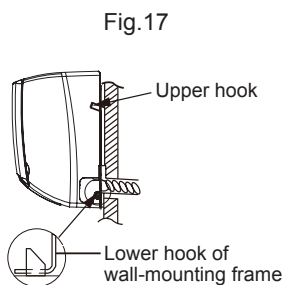


Fig.17

## 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.

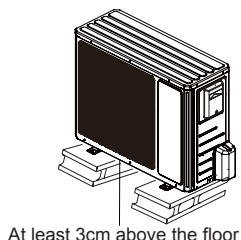


Fig.18

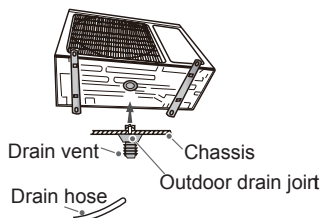


Fig.19

### 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)

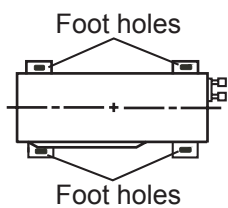


Fig.20

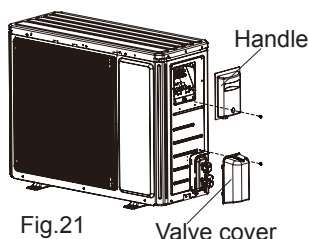


Fig.21

### 4. Connect Indoor and Outdoor Pipes

- (1) Remove the screw on the handle and valve cover of outdoor unit and then remove the handle and valve 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)

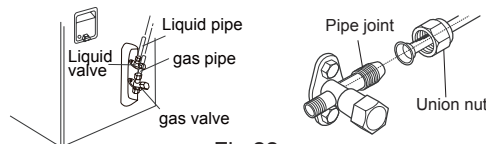


Fig.22

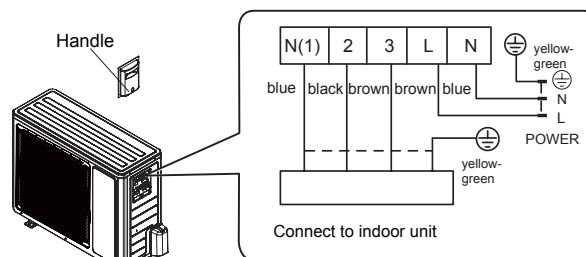
- (3) Pretightening the union nut with hand.
- (4) Tighten the union nut with torque wrench .

Refer to the following table for wrench moment of force:

Hex nut diameter(mm)	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 power card 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 with wire clip.

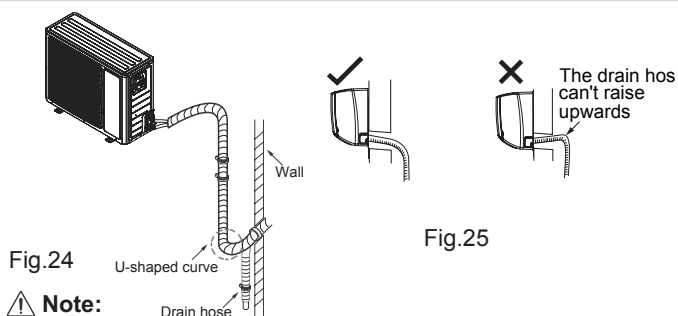
**⚠ Note:**

- (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

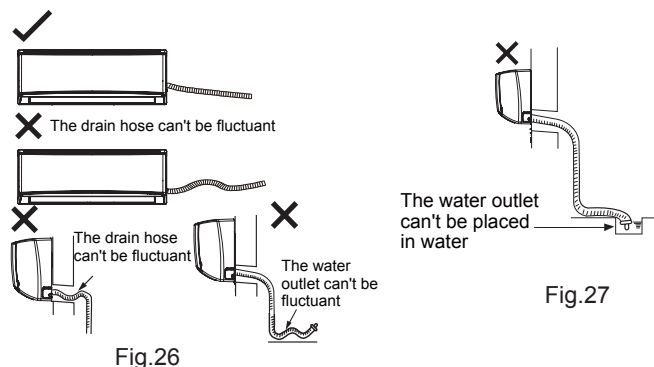
- (1) The pipes should be placed along the wall, bent reasonably and hidden possibly. Min. semidiameter of bending the pipe is 10cm.
- (2) If the outdoor unit is higher than the wall hole, you must set a U-shaped curve in the pipe before pipe goes into the room, in order to prevent rain from getting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





#### Note:

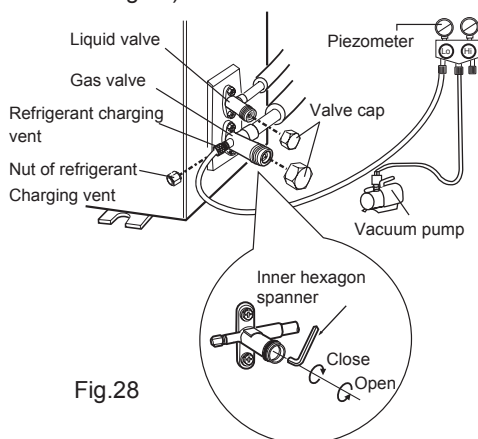
- (1) The through-wall height of drain hose shouldn't be higher than the outlet pipe hole of indoor unit.(As show in Fig.25)
- (2) Slant the drain hose slightly downwards. The drain hose can't be curved, raised and fluctuant, etc.(As show in Fig.26)
- (3) The water outlet can't be placed in water in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

### 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 Malfunction Display of Indoor Unit

#### 1. Malfunction display requirement

When there are several malfunctions, they will be displayed circularly.

#### 2. Malfunction display method

- (1) Hardware malfunction: immediate display; refer to “malfunction display table”;
- (2) Operation state: immediate display; refer to “malfunction display table”;
- (3) Other malfunctions: it is displayed after the compressor stops for 200s; refer to “malfunction display table”.

Note: when the compressor is restarted, the malfunction display delay time (200s) is cleared.

- (4) When the unit is under limit frequency or frequency drop state, the display can be controlled via remote controller.

#### 3. Display control via remote controller

Enter display control: press light button successively for 6 times within 3s to display the corresponding malfunction code;

Exit display control: pressing light button successively for 6 times within 3s or after display is shown for 5min, the display will terminate.

#### Display under test state

Dual 8 nixie tube display: minimum cooling (heating)-P0; middle cooling (heating)-P3

Nominal cooling (heating) -P1; maximum cooling (heating) -P2;

#### •Error Code List

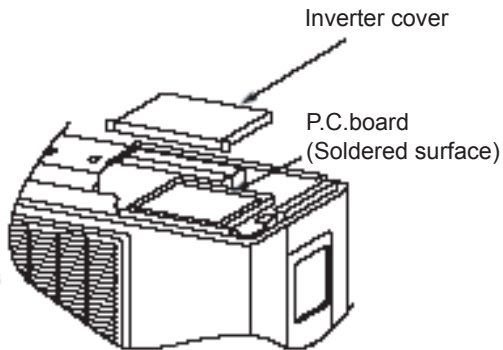
Malfunction Name	Dual-8 Nixie Tube
Malfunction of jumper cap	C5
No feedback from indoor unit's motor	H6
Circuit malfunction of zero crossing detection	U8
Indoor ambient temperature sensor is open/short-circuited	F1
Indoor evaporator temperature sensor is open/short-circuited	F2
Module temperature sensor is open/short-circuited	P7
Outdoor ambient temperature sensor is open/short-circuited	F3
Outdoor condenser tube temperature sensor is open/short-circuited	F4
Outdoor discharge temperature sensor is open/short-circuited	F5
Communication malfunction between indoor and outdoor units	E6
Malfunction of phase current circuit detection for compressor	U1
Module temperature protection	P8
Charging malfunction of capacitor	PU
Overload protection of compressor	H3
Freon recovery mode	Fo
Failure start-up of compressor	LC
Discharge high-temperature protection of compressor	E4
Overload protection	E8
Overcurrent protection of the complete unit	E5
Overcurrent protection of phase current	P5
Desynchronizing of compressor	H7
Module current protection (IPM protection)	H5
Low voltage protection of DC bus bar	PL
High voltage protection of DC bus bar	PH
PFC protection	HC
Limit/decrease frequency due to current protection of the complete unit	F8
Limit/decrease frequency due to module current protection (phase current)	En
Limit/decrease frequency due to discharge	F9
Limit/decrease frequency due to freeze protection	FH
Limit/decrease frequency due to overload	F6
Limit/decrease frequency due to module temperature protection	EU
Cold air prevention protection	E9
Freeze protection	E2
Malfunction of ODU DC fan	L3

Note: Please refer to service manual for the troubleshooting procedure for outdoor unit.



●Discharging method

(1) remove the inverter cover(Outdoor Unit)



(2)As shown below,connect the discharge resistance(approx.100Ω20W)or plug of the sold ering iron to voltage between + - terminals of the electrolytic capacitor on PC Board for 30s, and then peformedischarging.

NOTE:

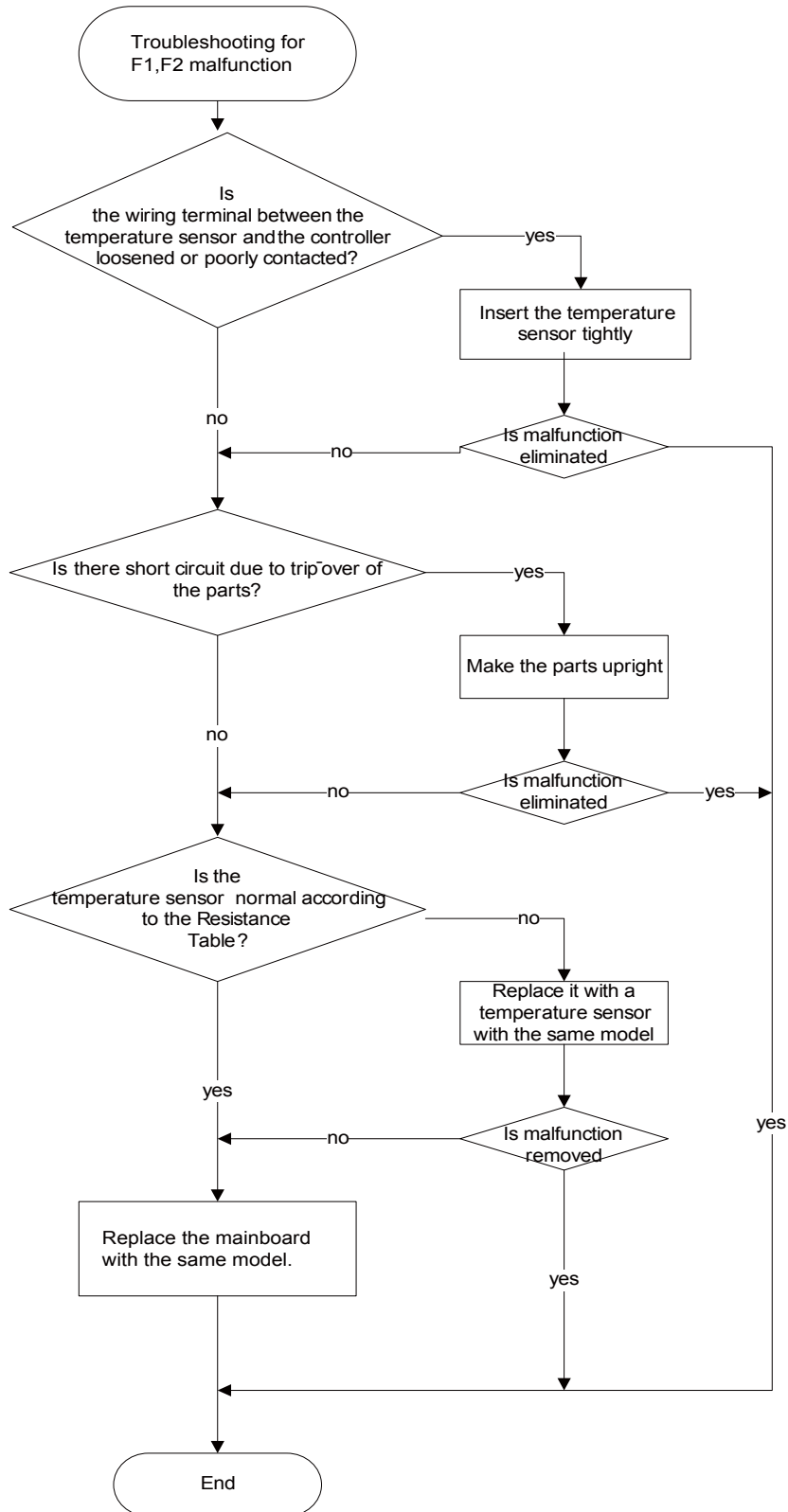
A large-capacity electrolytic capacitor is used in the outdoor unit controller(inverter).Therefore,if the power supply is turned off,charge(charging voltage DC280V to 380V)remains and disc harging takes a lot of time.. After turning off the power source,if touching the charging section before discharging, an electrical shock may be caused. Discharge the electrol ytic capacitor completely by using soldering iron,etc.



## 9.2 Troubleshooting for Main Malfunction

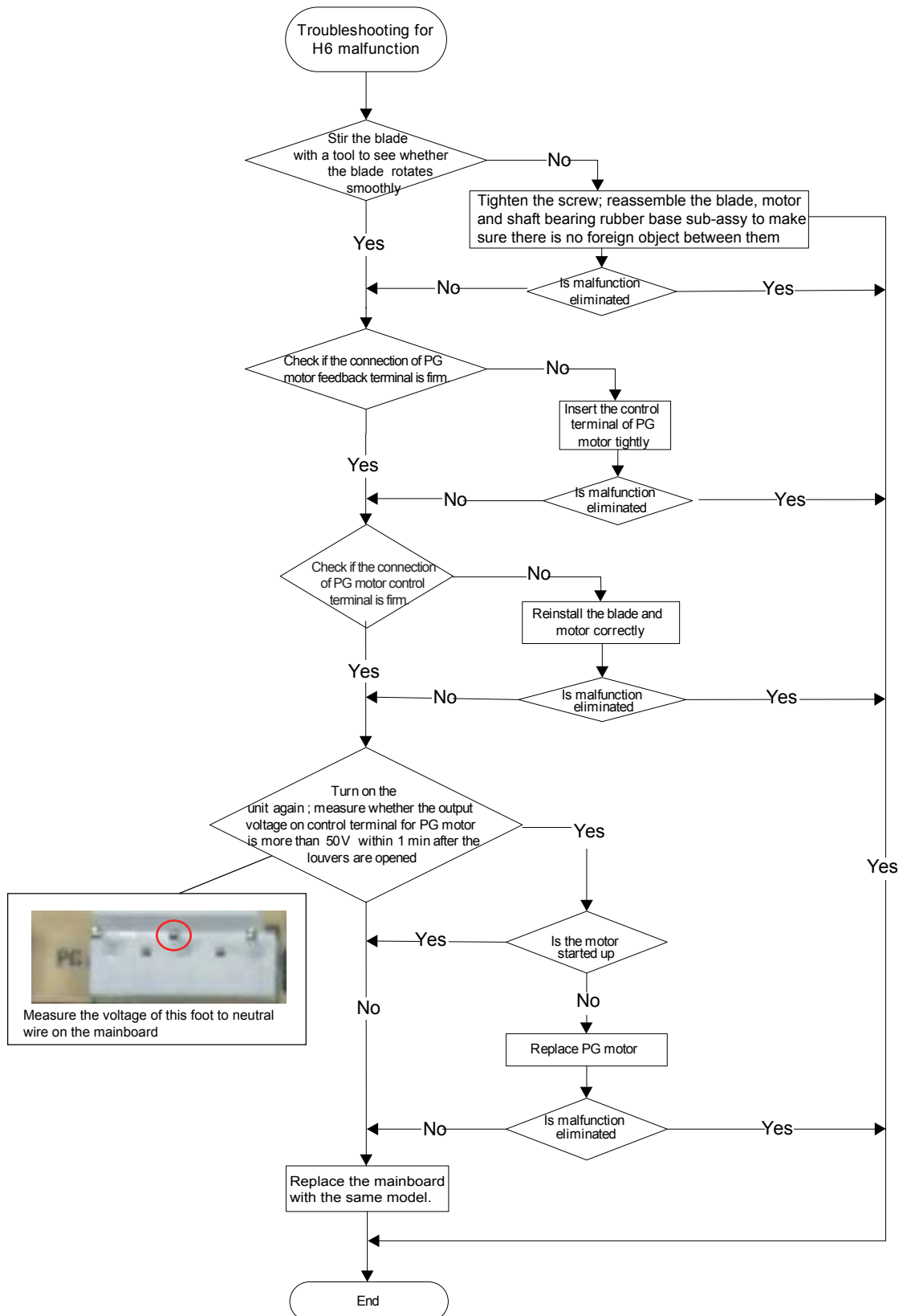
### Indoot Unit

#### (1) Malfunction of Temperature Sensor (F1/F2)



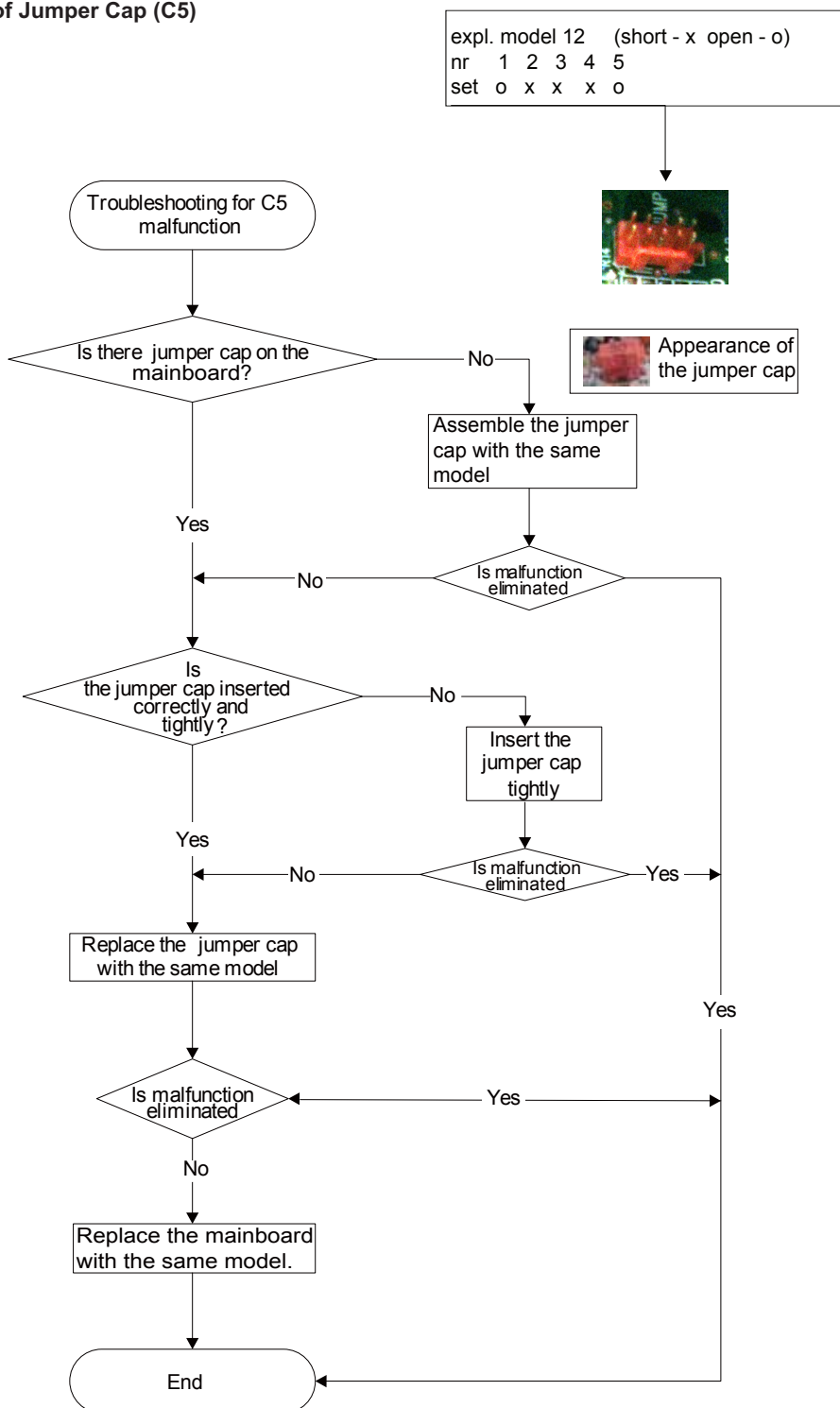


## (2) Malfunction of Blocked Protection of IDU Fan Motor (H6)



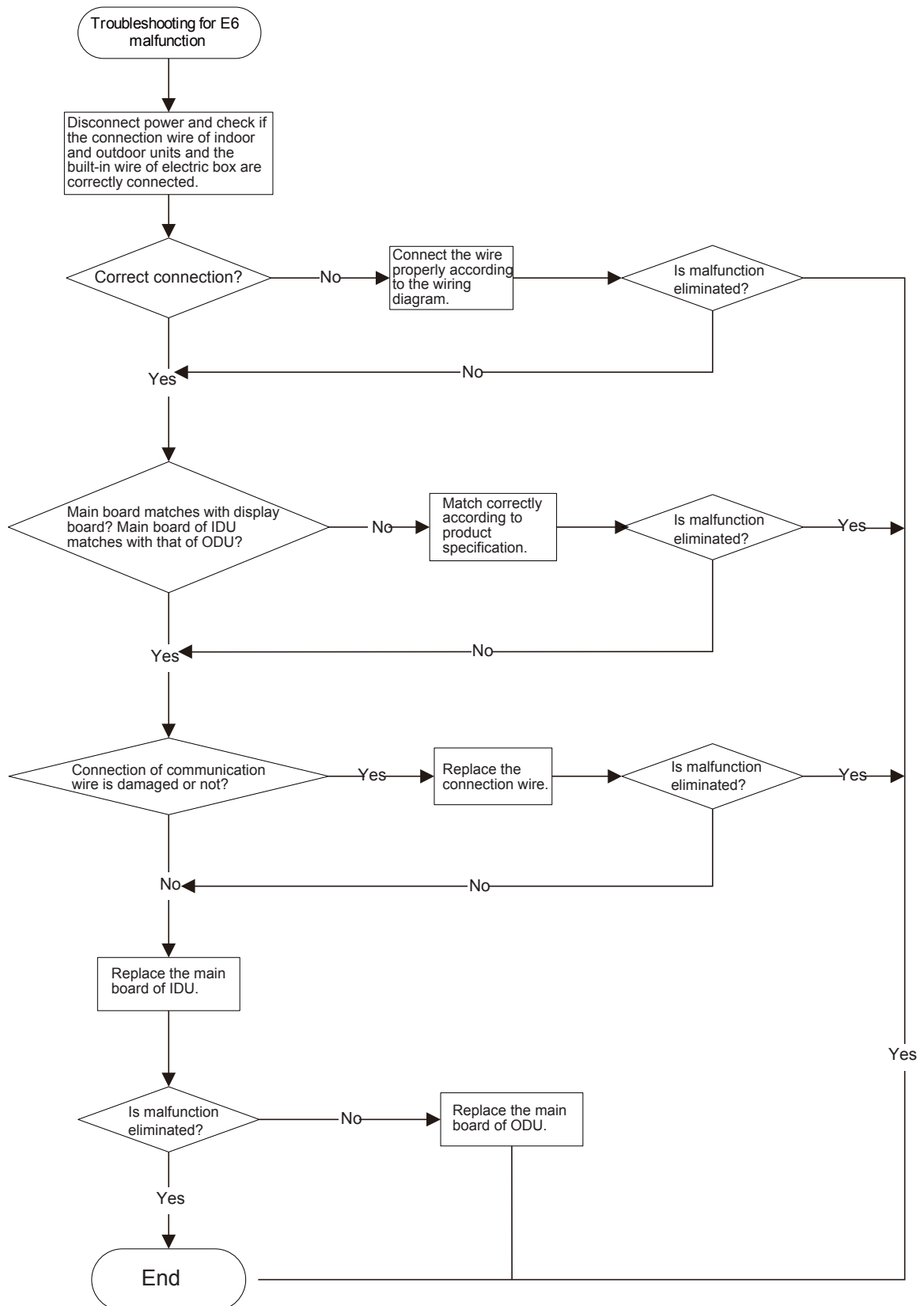


### (3) Malfunction of Protection of Jumper Cap (C5)



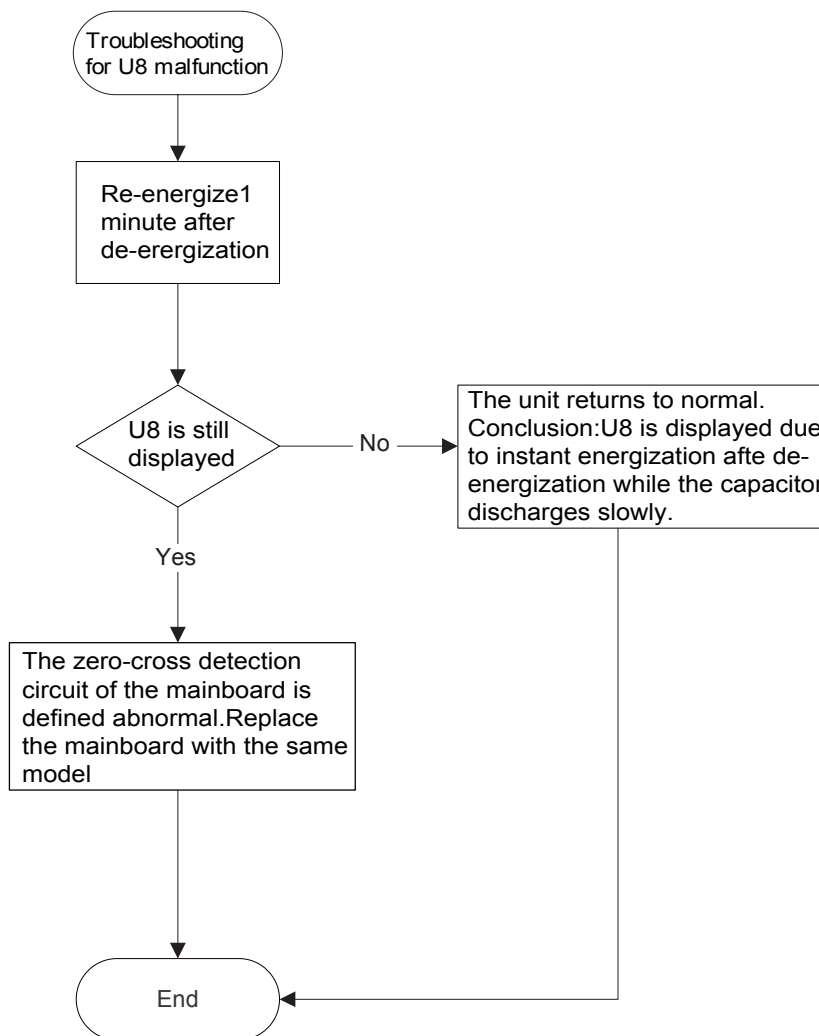


#### (4) Communication malfunction (E6)





**(5) Malfunction of Zero-crossing Inspection Circuit Malfunction of the IDU Fan Motor (U8)**



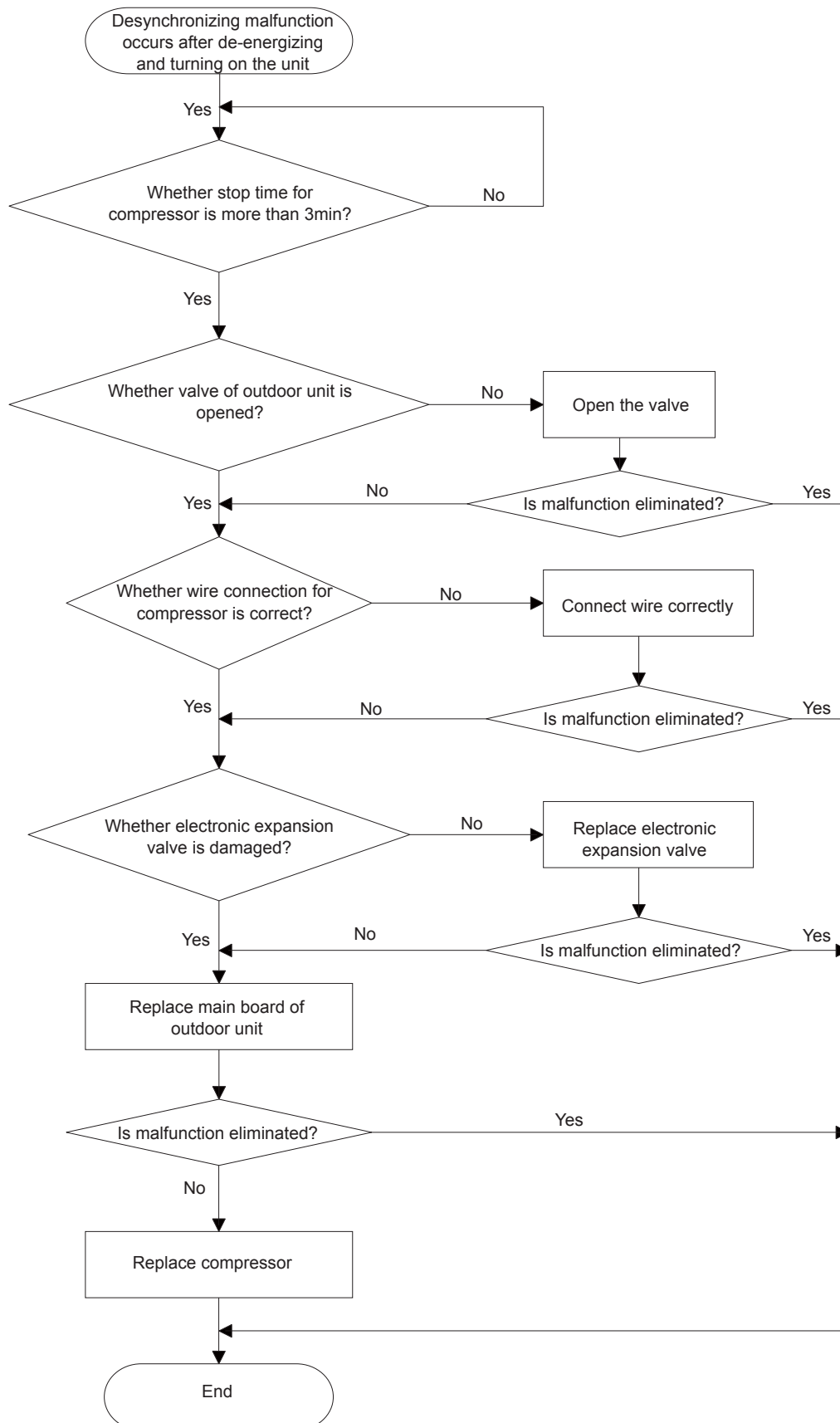


**Outdoot Unit**
**(1) Malfunction of Desynchronizing of Compressor (H7)**
**Main check point:**

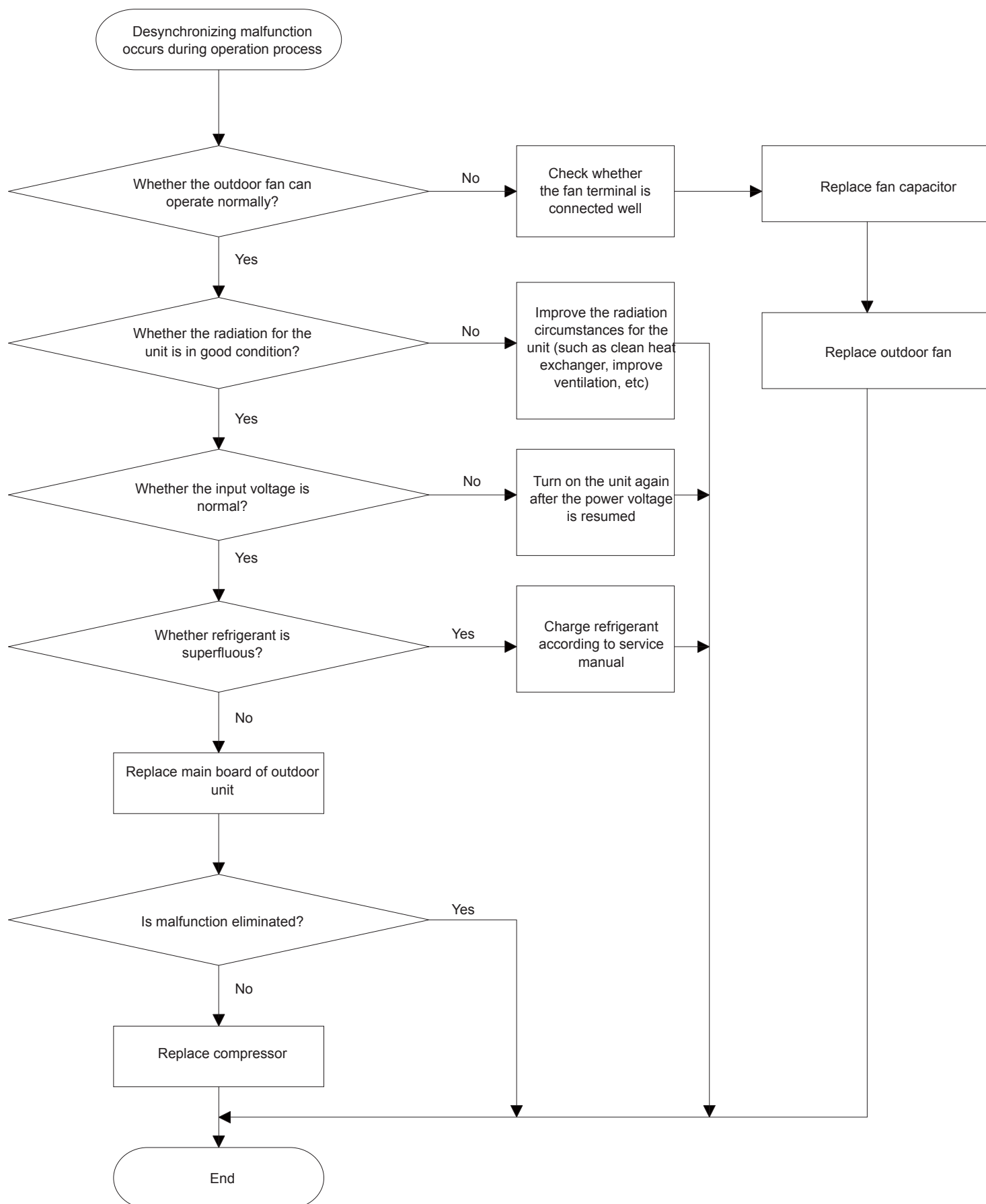
Whether the system pressure is too high?

Whether the electronic expansion valve can work normally?

Whether the radiation for the unit is in good condition?

**Check flow chart:**








## (2) Malfunction of Temperature Sensor (F3/F4/F5)

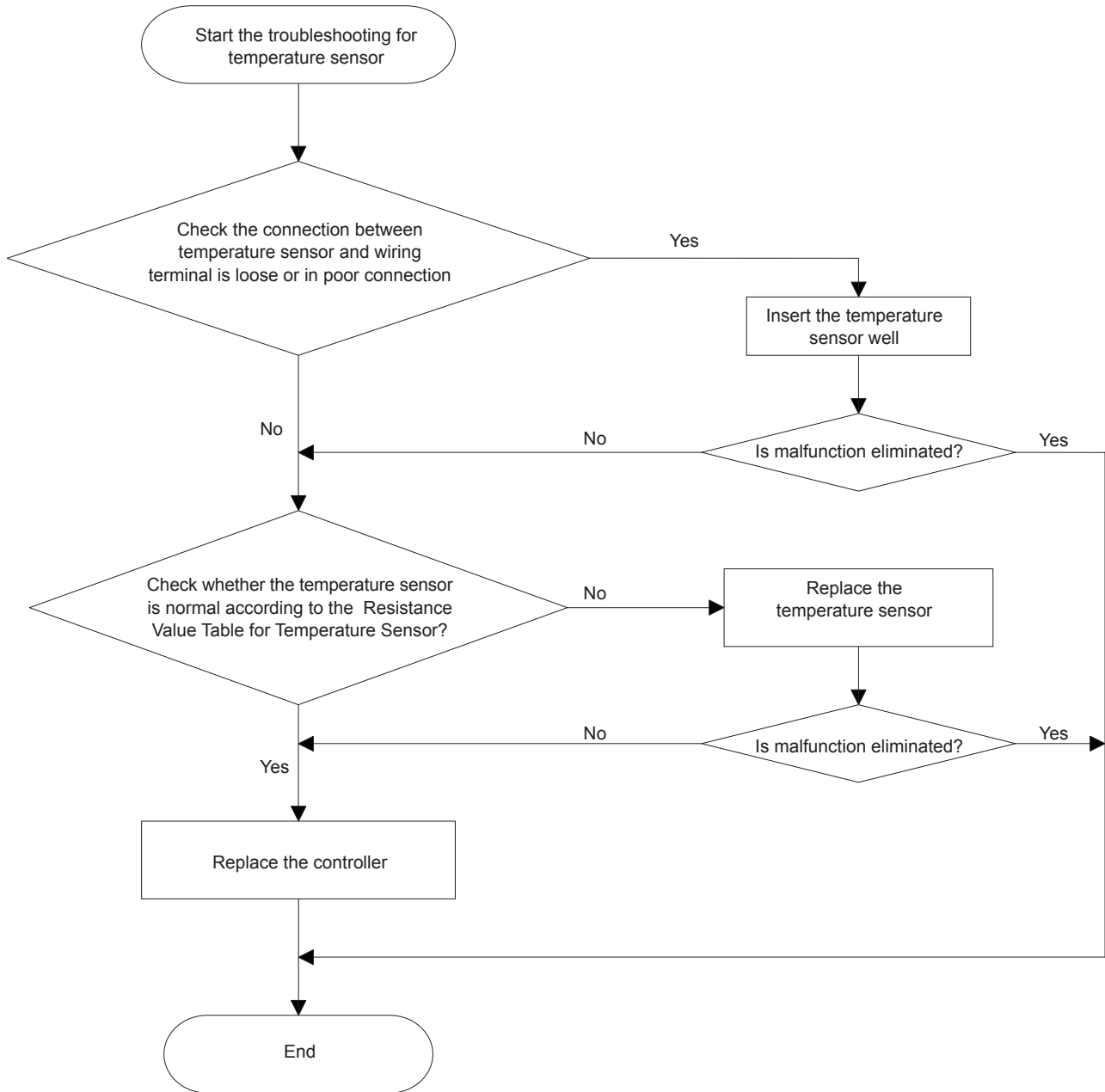
### Main check point:

Whether the temperature sensor is damaged?

Whether the terminal of temperature sensor is loose or not connected?

Whether the main board is damaged?

### Check flow chart:





### (3) Malfunction of Overload Protection of Compressor (H3) and Discharge High-temperature Protection of Compressor (E4)

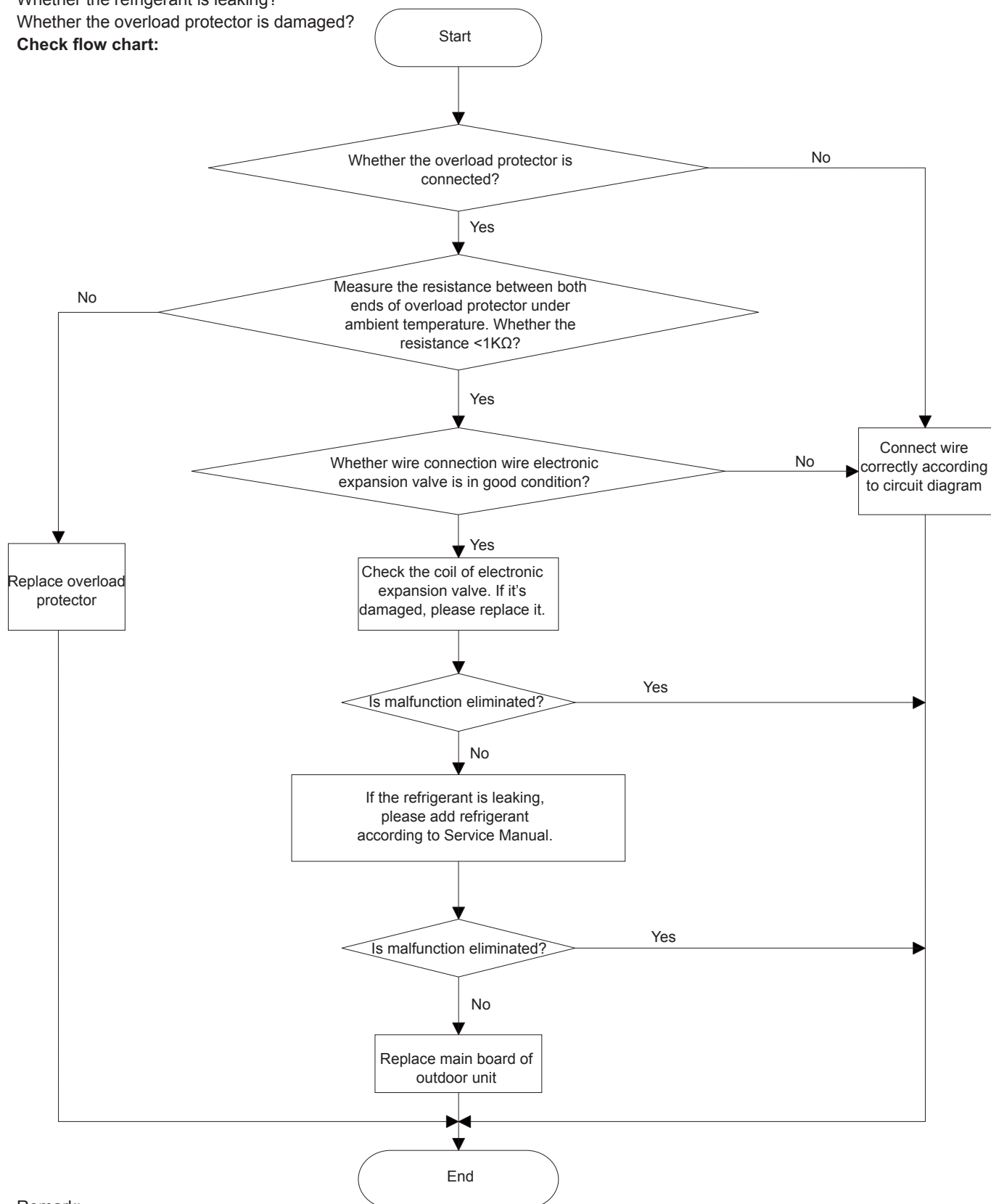
#### Main check point:

Whether the electronic expansion valve is connected well and whether it's damaged?

Whether the refrigerant is leaking?

Whether the overload protector is damaged?

#### Check flow chart:



#### Remark:

Detection method for electronic expansion valve: There are 5 wires for the coil of electronic expansion valve and one of them are common port (the left or the right wire) .The resistance for other terminals are all most the same (about 100Ω). You can measure those resistance values to judge whether the electronic expansion valve is damaged or not.



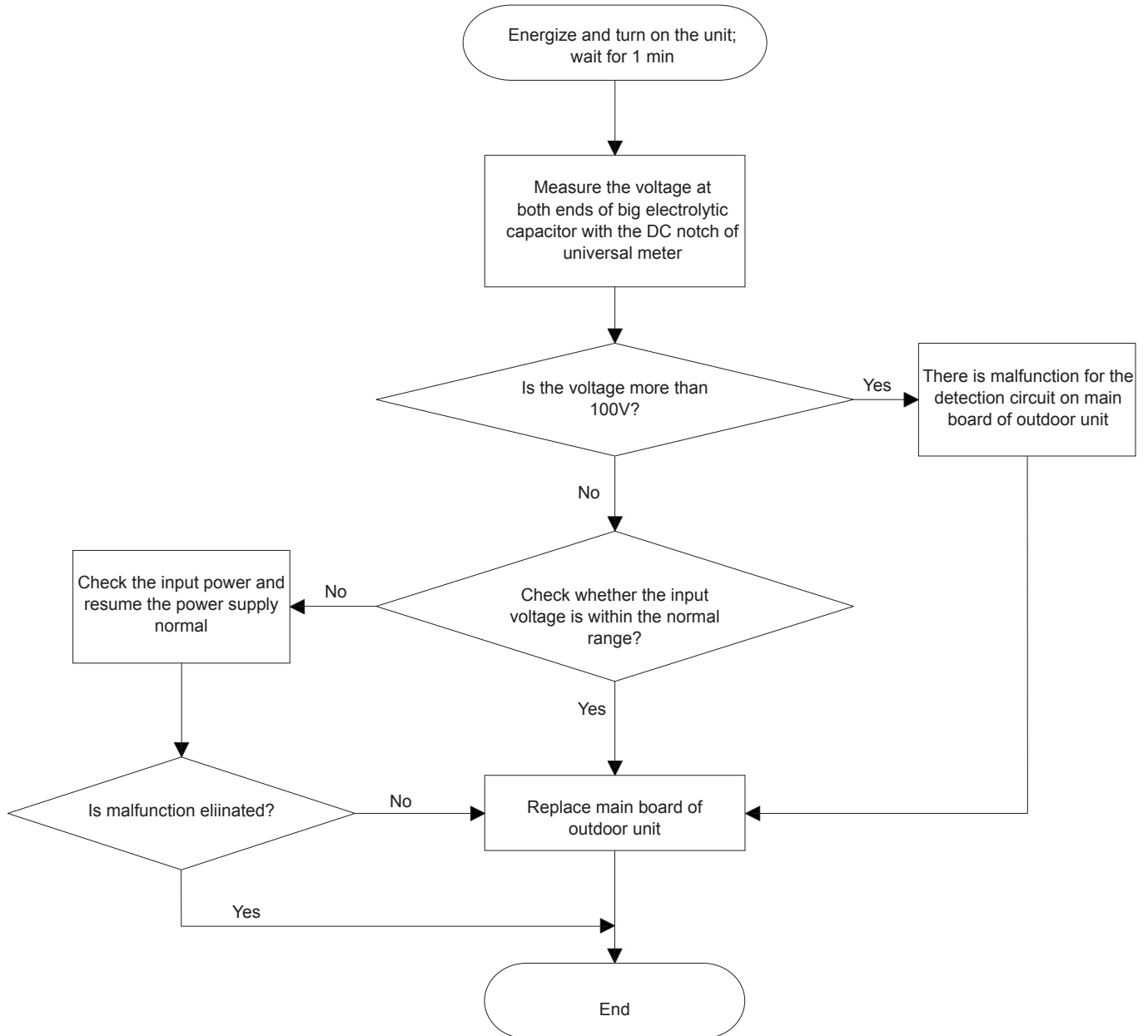
#### (4) Charging Malfunction of Capacitor (PU)

##### Main check point:

Whether input power is normal?

Main board is damaged.

##### Check flow chart:





### (5) Malfunction of Overload Protection (E8)

#### Main check point:

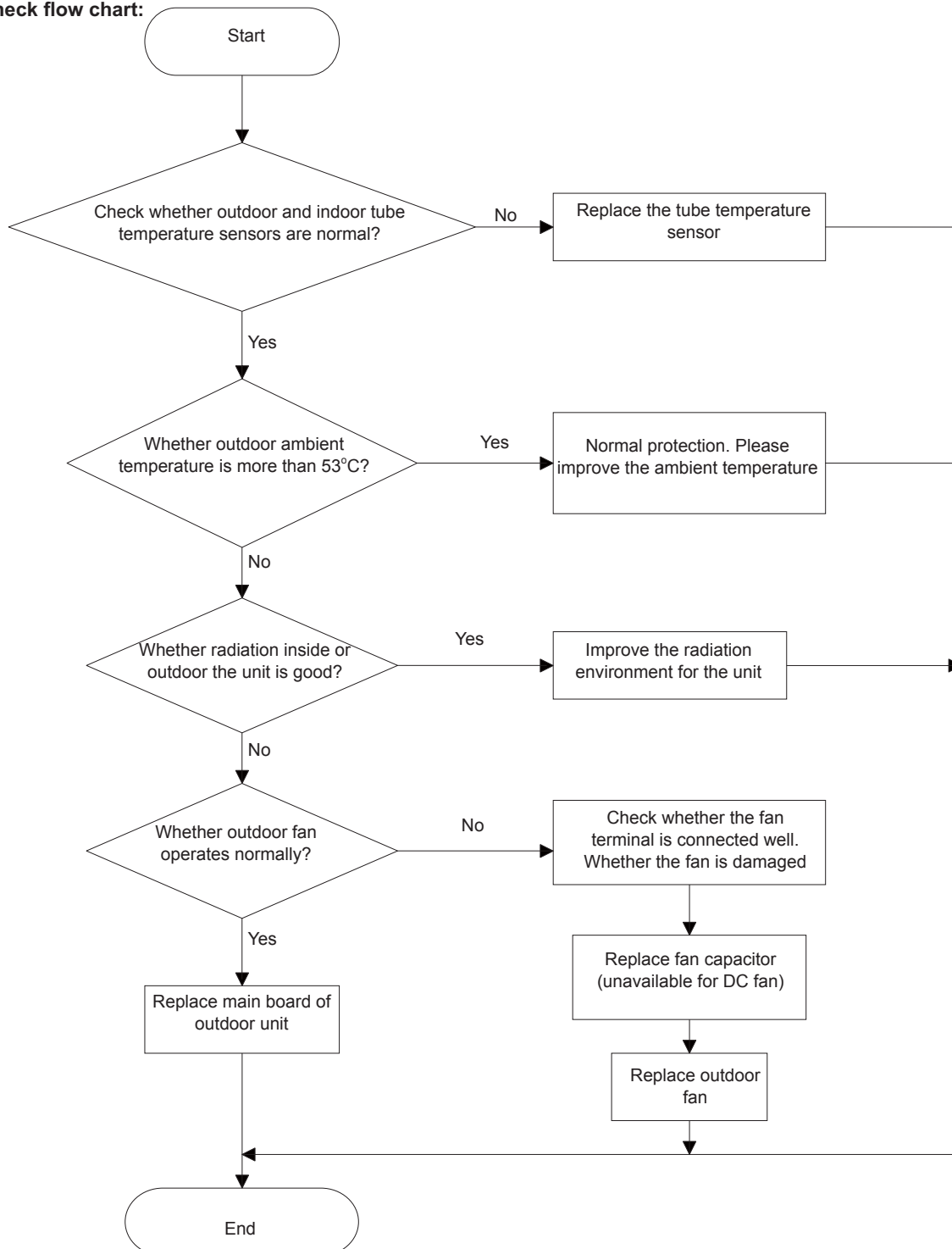
Whether the tube temperature sensor is normal?

Whether the outdoor ambient temperature is within the normal range?

Whether indoor fan and outdoor fan can operate normally?

Whether radiation environment inside or outside the unit is good?

#### Check flow chart:



#### Remark:

When overload protection occurs under cooling mode, it's because the main board detected the outdoor tube temperature sensor exceeds limited temperature and then the unit stops operation. Please check outdoor tube temperature sensor;

When overload protection occurs under heating mode, it's because the main board detected the indoor tube temperature sensor exceeds limited temperature and then the unit stops operation. Please check indoor tube temperature sensor;



## (6) Malfunction of IPM Protection (H5)

### Main check point:

Whether input voltage is within the normal range?

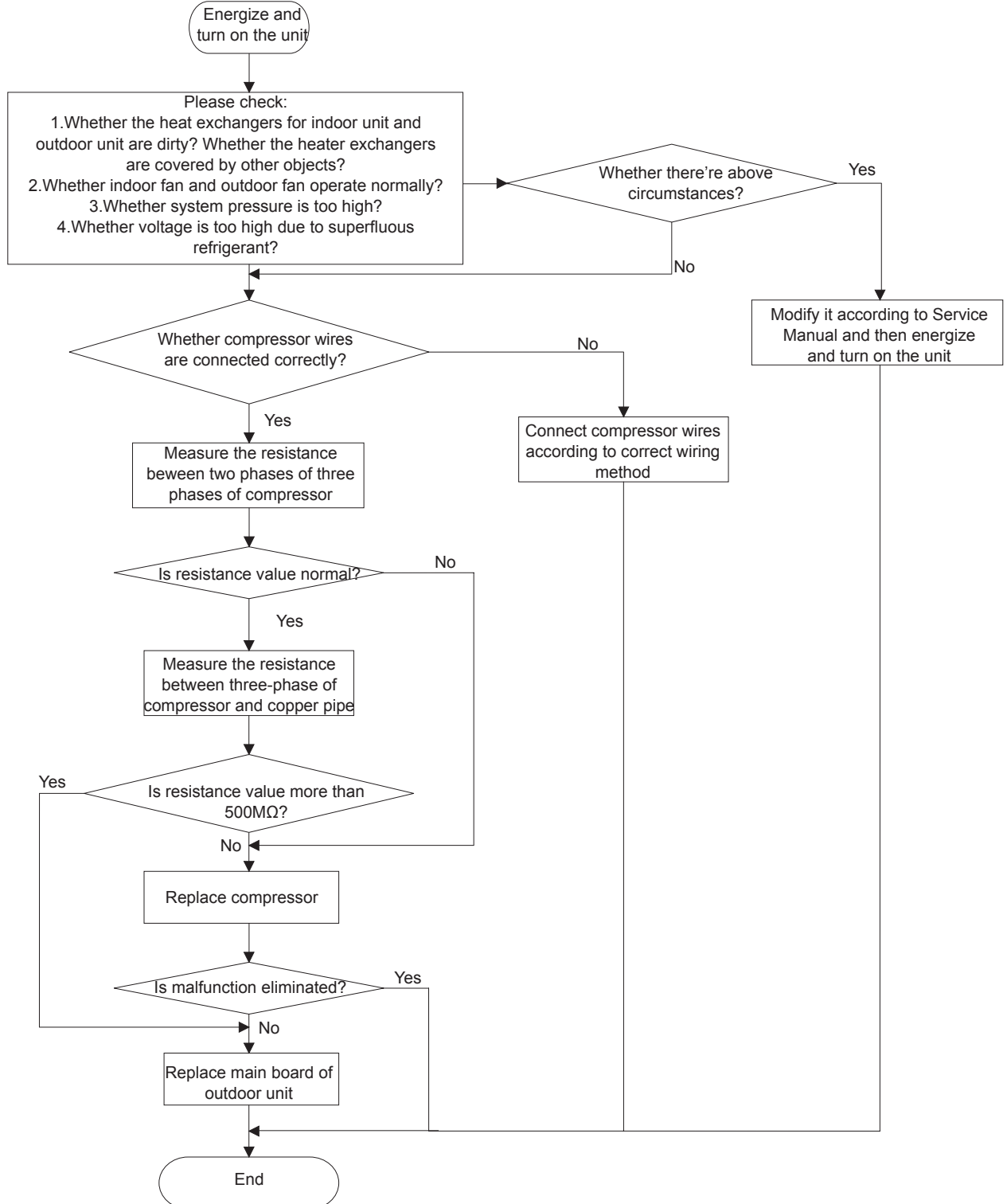
Whether wires of compressor are connected reliably, tightly or correctly?

Whether the resistance of compressor coil is normal? Whether the insulation between compressor coil and copper pipe is in good condition?

Whether the unit is overloading? Whether the radiation for the unit is in good condition?

Whether the volume of charged refrigerant is proper?

### Check flow chart:



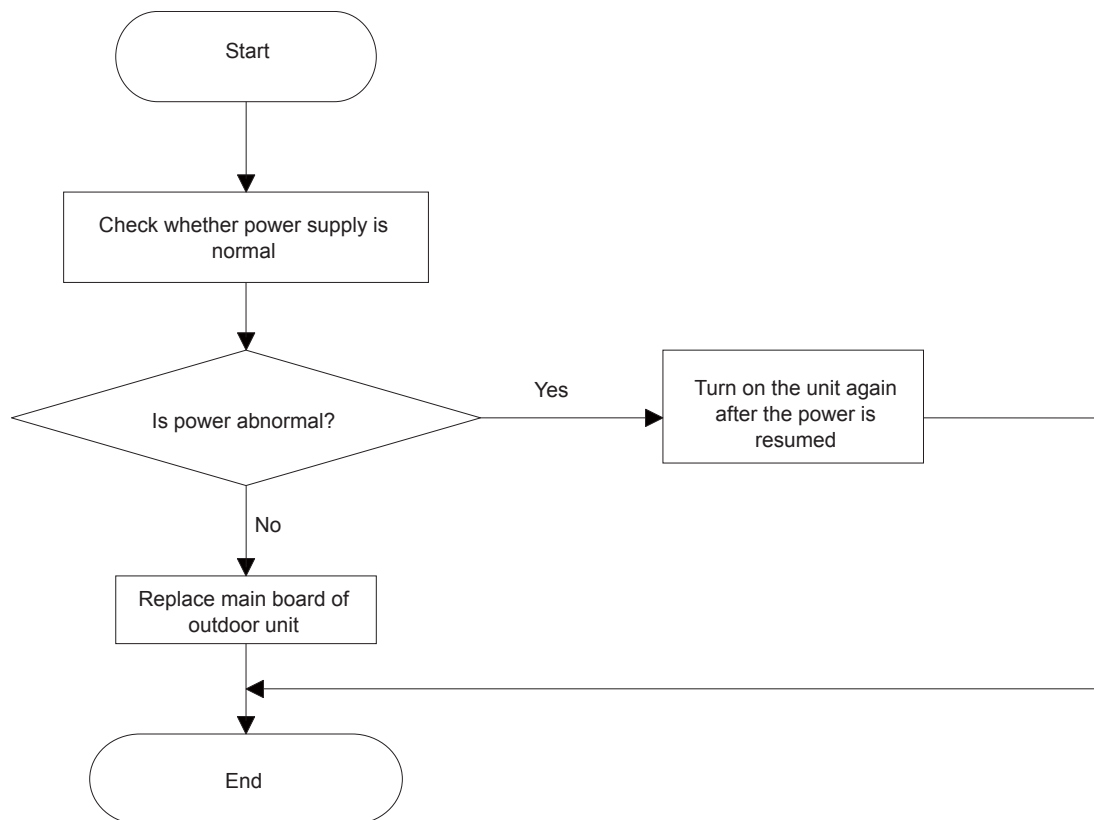


(7) Malfunction of PFC Protection (HC)

Main check point:

Whether power supply is normal?

Check flow chart:





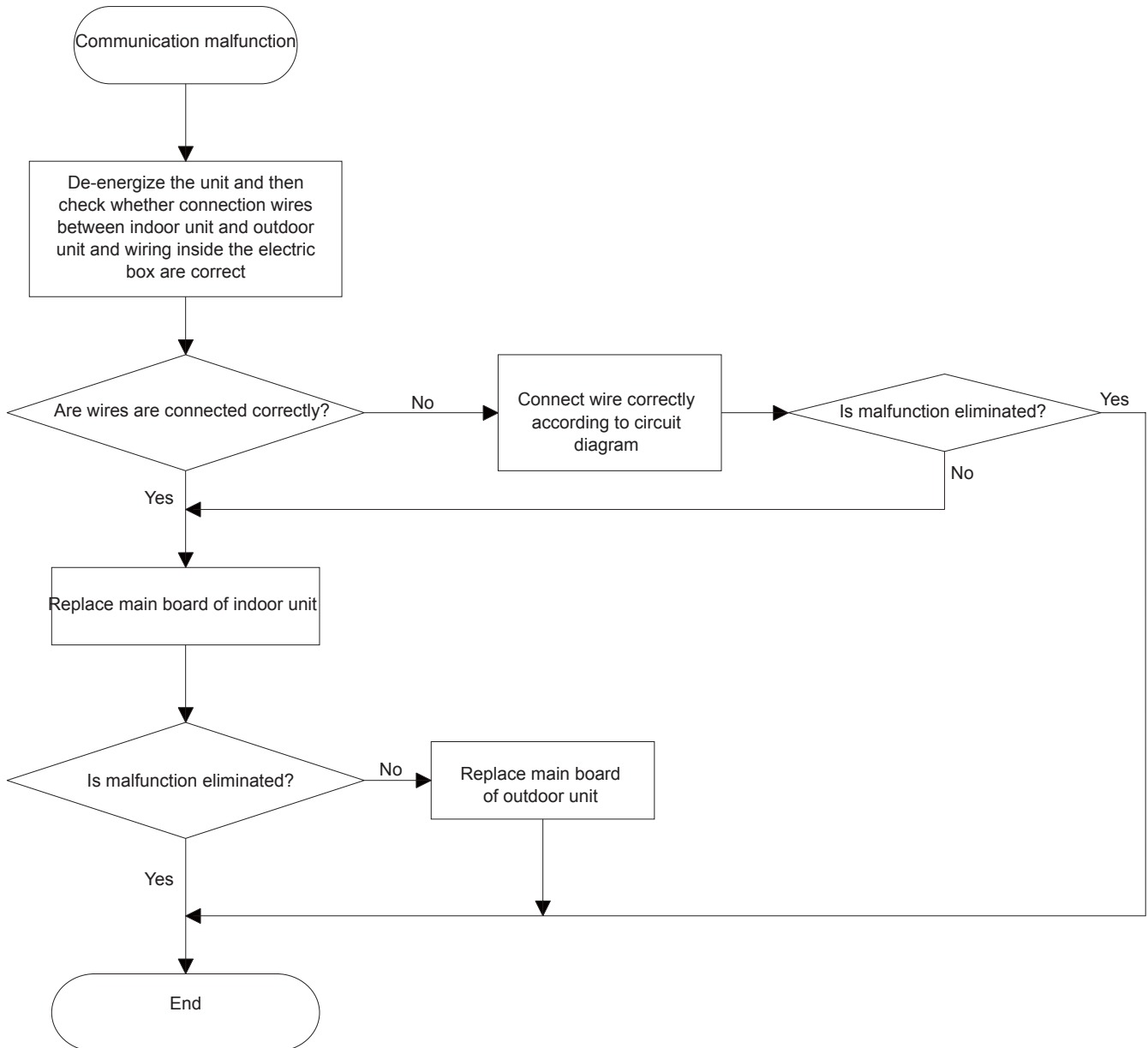
### (8) Malfunction of Communication (E6)

#### Main check point:

Check whether connection wires between indoor unit and outdoor unit and wiring inside the unit are connected well?

Check the main board of indoor unit or main board of outdoor unit is damaged?

#### Check flow chart:





### (9) Malfunction of Failure Start-up of Compressor (LC)

#### Main check point:

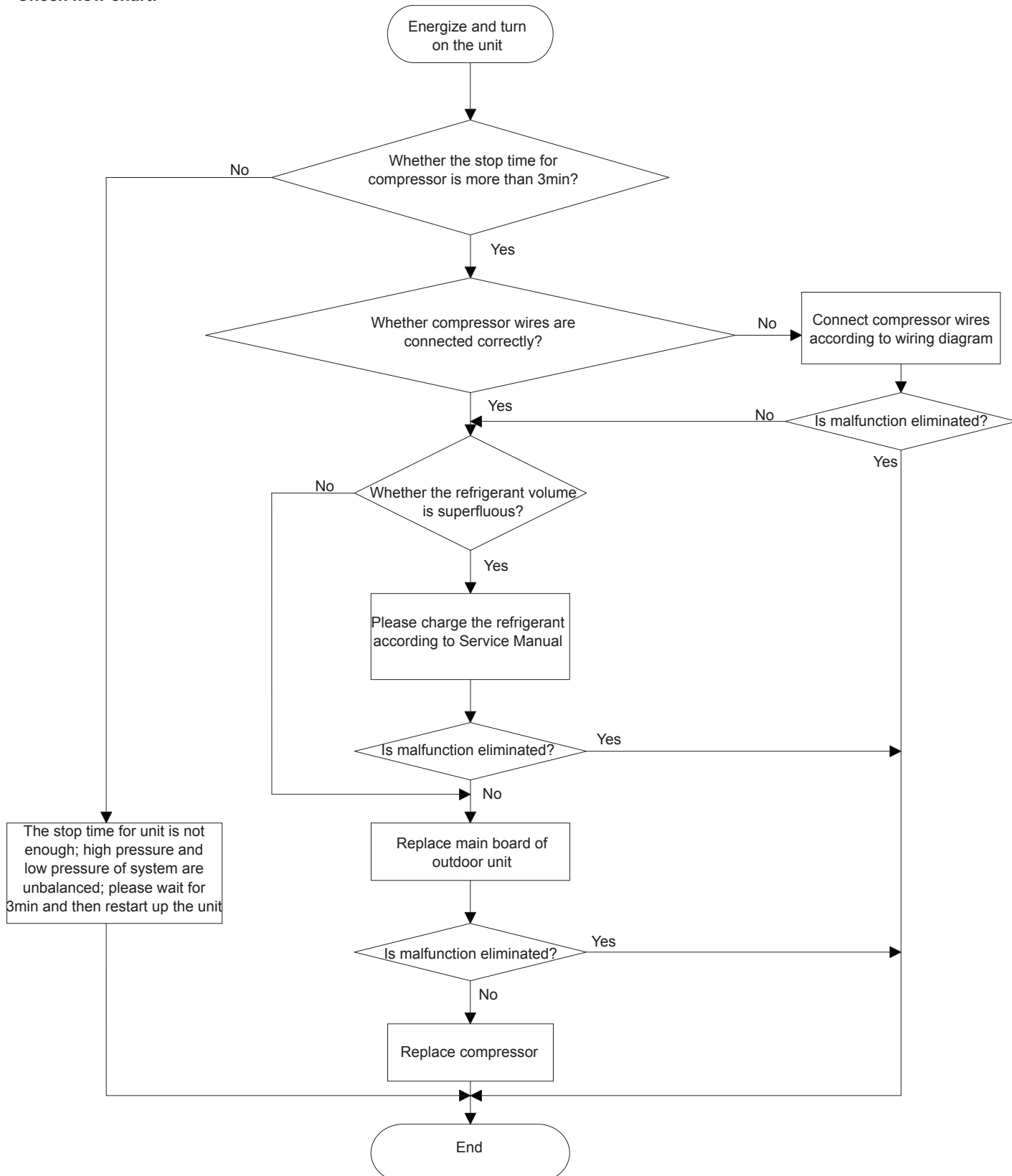
Whether the compressor wires are connected correctly?

Whether the stop time for compressor is enough?

Whether compressor is damaged?

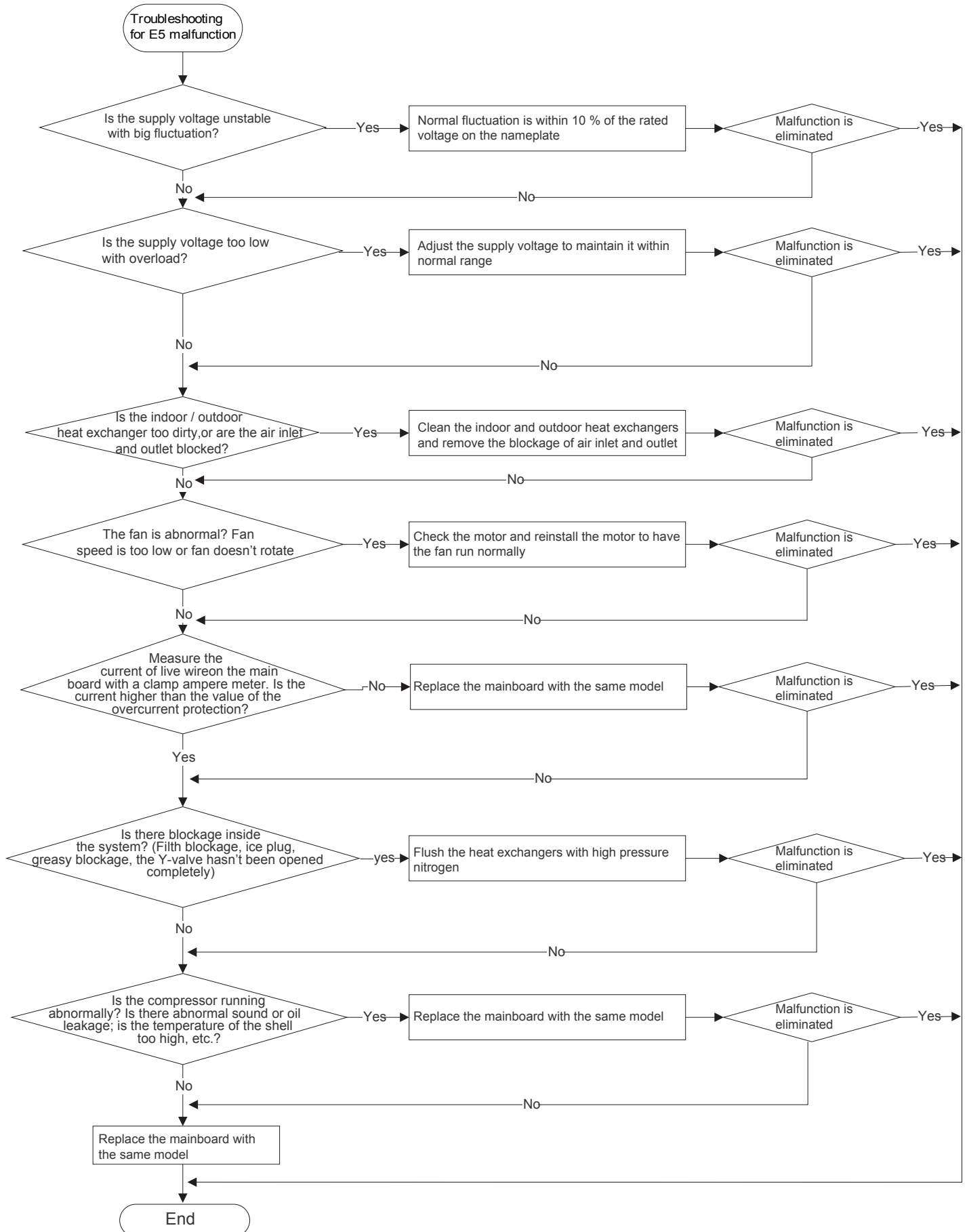
Whether the refrigerant-charging volume is superfluous?

#### Check flow chart:





## (10) Malfunction of Overcurrent Protection (E5)





## **(9) Other Malfunction**

### **1. IPM module temperature sensor is open-circuited(P7)**

Hardware of main board is damaged. Please replace main board.

### **2. Overheating protection of IPM module(P8)**

- ① Poor radiation because the module radiator is dirty;
- ② IPM module is damaged;
- ③ Malfunction of outdoor fan, etc;

### **3. Detection circuit malfunctions of phase-current of compressor (U1)**

Hardware of main board is damaged. Please replace main board.

### **4. DC busbar voltage is too high (PH)**

- ① Input voltage is too high or unstable;
- ② Hardware of main board is damaged;

### **5. DC busbar voltage is too low (PL)**

- ① Input voltage is too low or unstable;
- ② Hardware of main board is damaged;

### **6. Malfunction of ODU DC fan (L3)**

- ① The wire terminal of outdoor fan motor is loosed, fix the terminal.
- ② Motor damaged, replace the motor.
- ③ Fan motor module on mainboard is damaged, replace the main board AP1



## 9.3 Troubleshooting 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. 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

#### 5. 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.





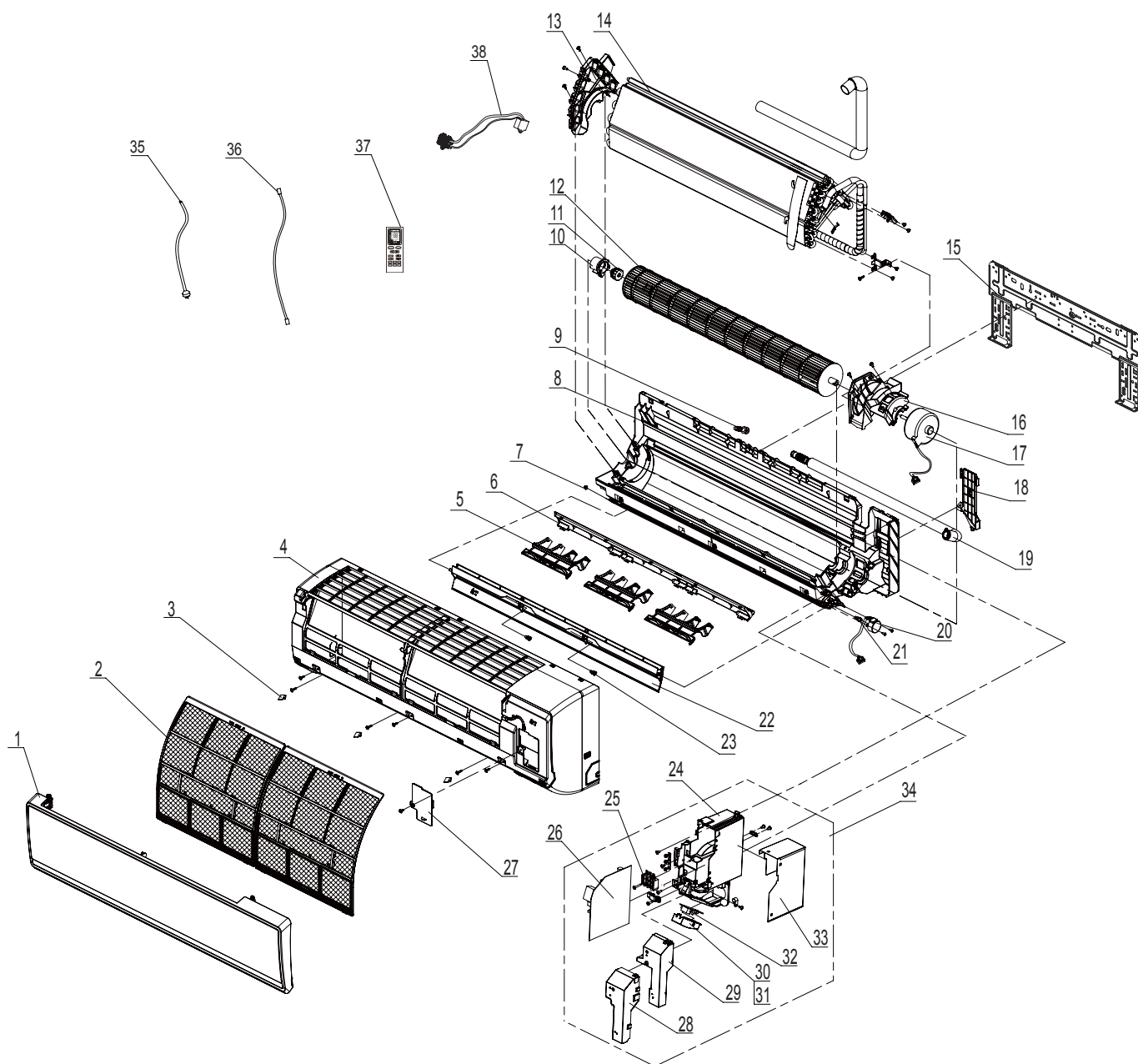


NO.	Description	Part Code	Qty
		<b>WGC 18 IT</b>	
		CB146N37301	
1	Front Panel	20012553	1
2	Filter Sub-Assy	11122104	2
3	Screw Cover	242520041	1
4	Front Case Assy	20012497	1
5	Guide Louver	10512140	1
6	Air Louver	10512160	2
7	Helicoid tongue	26112232	1
8	Left Axile Bush	10512037	1
9	Rear Case assy	22202154	1
10	Rubber Plug (Water Tray)	76712012	1
11	Ring of Bearing	26152022	1
12	O-Gasket sub-assy of Bearing	7651205102	1
13	Evaporator Support	24212119	1
14	Cold Plasma Generator	1114001602	1
15	Evaporator Assy	01002320	1
16	Wall Mounting Frame	01252484	1
17	Cross Flow Fan	10352036	1
18	Motor Press Plate	26112231	1
19	Fan Motor	15012146	1
20	Connecting pipe clamp	2611216401	1
21	Drainage hose	0523001407	1
22	SteppingMotor	15012086	1
23	Crank	10582070	1
24	Electric Box Assy	10000201021	1
25	Electric Box	20112103	1
26	Axile Bush	10542036	1
27	Indicator Light Cover	22242084	1
28	Indicator shield cover	22242083	1
29	Terminal Board	42011233	1
30	Jumper	4202300115	1
31	Electric Box Cover2	20122142	1
32	Main Board	30138000408	1
33	Display Board	30568112	1
34	Shield Cover of Electric box Cover	01592088	1
35	Electric Box Cover	20122123	1
36	Shield cover of Electric Box	01592087	1
37	Power Cord	/	/
38	Connecting Cable	4002052317	0
39	Remote Controller	305100611	1

Above data is subject to change without notice.



## WGC 24 IT





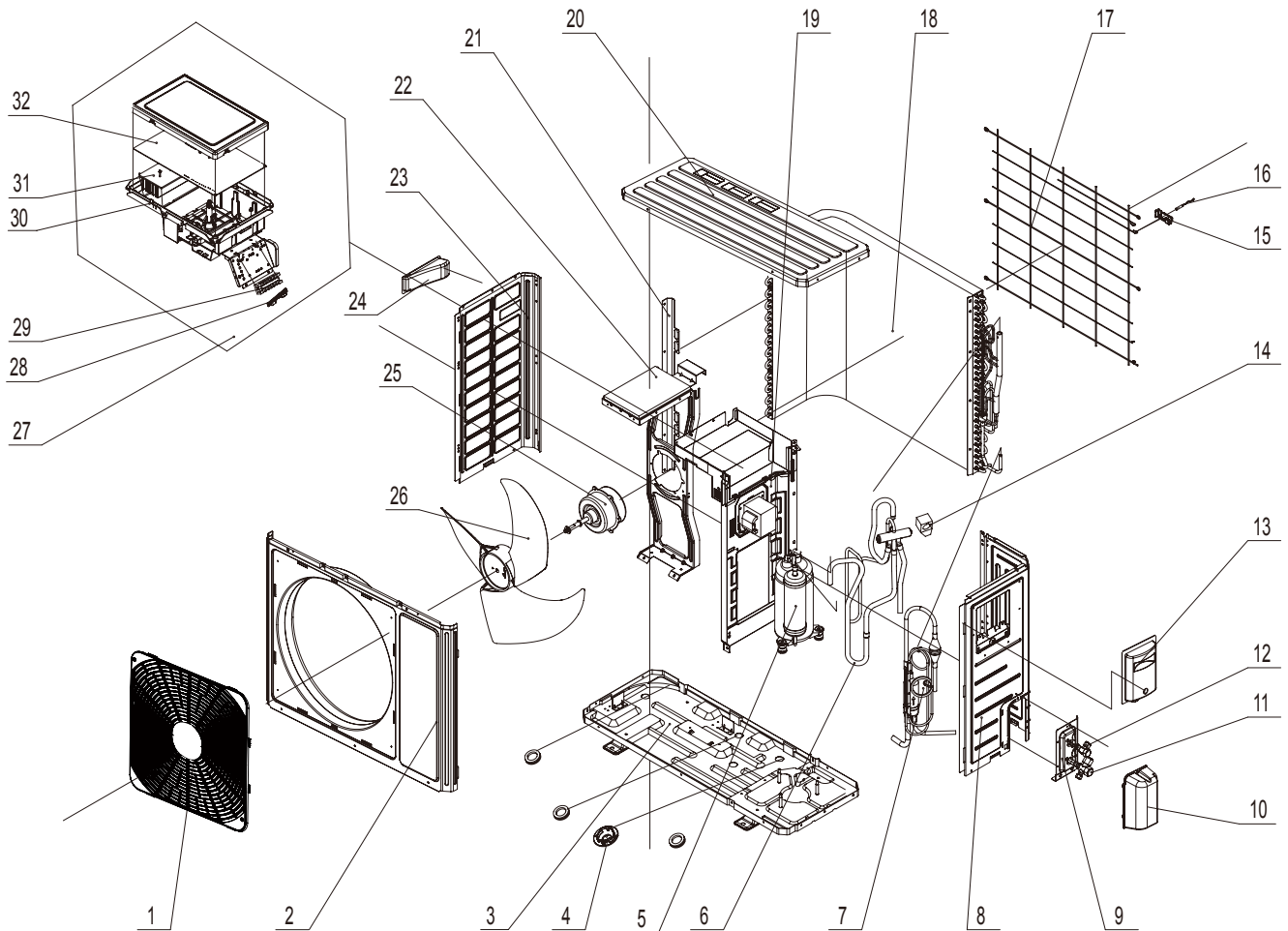
NO.	Description	Part Code	Qty
		<b>WGC24IT</b> (Cold Plasma)	
		Product Code CB146N37201	
1	Front Panel	20012546	1
2	Filter Sub-Assy	11122091	2
3	Screw Cover	24252016	3
4	Front Case Assy	20012514	1
5	Air Louver	10512139	3
6	Helicoid tongue	26112229	1
7	Left Axile Bush	10512037	1
8	Rear Case assy	00000100023	1
9	Rubber Plug (Water Tray)	76712012	1
10	Ring of Bearing	26152025	1
11	O-Gasket of Cross Fan Bearing	76512203	1
12	Cross Flow Fan	10352030	1
13	Evaporator Support	24212139	1
14	Evaporator Assy	01100100032	1
15	Wall Mounting Frame	01252032	1
16	Motor Press Plate	26112330	1
17	Fan Motor	15012098	1
18	Pipe Clamp	26112188	1
19	Drainage hose	0523001405	1
20	Step Motor	1521300101	1
21	Crank	10582070	1
22	Guide Louver	10512138	1
23	Axile Bush	10542036	2
24	Electric Box	20112103	1
25	Terminal Board	42011233	1
26	Main Board	30138000409	1
27	Electric Box Cover2	20112081	1
28	Shield Cover of Electric box Cover	01592088	1
29	Electric Box Cover	20122123	1
30	Indicator shield cover	22242083	1
31	Indicator Light Cover	22242084	1
32	Display Board	30568112	1
33	Shield cover of Electric Box	01592087	1
34	Electric Box Assy	10000200732	1
35	Power Cord	/	/
36	Connecting Cable	4002052317	0
37	Remote Controller	305100611	1
38	Cold Plasma Generator	1114001602	1

Above data is subject to change without notice.



## 10.2 Outdoor Unit

### GC 18 IT





NO.	Description	Part Code		Qty
		GC 18IT standard	GC 18IT model +	
	Product Code	CB146W36000	CB146W36001	
1	Front Grill	22413025	22413025	1
2	Front Panel	01535013P	01535013P	1
3	Chassis Sub-assy	02803207P	02803323P	1
4	Drainage Connector	06123401	06123401	1
5	Compressor and Fittings	00105249G	00105249G	1
6	4-Way Valve Assy	03073158	03073158	1
7	Capillary Sub-assy	03163307	03163307	1
8	Right Side Plate	0130509402P	0130509402P	1
9	Valve Support Assy	01715010P	01715010P	1
10	Valve Cover	22245002	22245002	1
11	Cut off Valve	0713506703	0713506703	1
12	Cut off Valve	0713506803	0713506803	1
13	Handle	26235254	26235254	1
14	Magnet Coil	4300040045	4300040045	1
15	Wiring Clamp	26115004	26115004	1
16	Temperature Sensor	3900030901	3900030901	1
17	Rear Grill	01473043	01473043	1
18	Condenser Assy	01163935	01163935	1
19	Clapboard Assy	01233153	01233153	1
20	Coping	01255005P	01255005P	1
21	Supporting Board(Condenser)	01795010	01795010	1
22	Motor Support Sub-Assy	01705036	01705036	1
23	Left Side Plate	01305093P	01305093P	1
24	Left Handle	26233053	26233053	1
25	Fan Motor	1501506402	1501506402	1
26	Axial Flow Fan	10335008	10335008	1
27	Electric Box Assy	10000100093	10000100094	1
28	Wire Clamp	71010003	71010003	1
29	Terminal Board	420101943	420101943	1
30	Electric Box	20113027	20113027	1
31	Radiator	49010252	49010252	1
32	Main Board	30138000421	30138000424	1

Above data is subject to change without notice.







NO.	Description	Part Code		Qty
		WGC 24 IT standard	WGC 24 IT +	
	Product Code	CB146W35900	CB146W35901	
1	Front Grill	22413026	22413026	1
2	Cabinet	01435004P	01435004P	1
3	Left Handle	26233053	26233053	2
4	Front Side Plate	01305086P	01305086P	1
5	Drainage Connector	06123401	06123401	1
6	Chassis Sub-assy	02803255P	0280325501P	1
7	Drainage hole Cap	06813401	06813401	3
8	Gas-liquid Separator Assy	07225017	07225017	1
9	Compressor and Fittings	00105249G	00105249G	1
10	Magnet Coil	4300040045	4300040045	1
11	4-Way Valve Assy	03073144	03073144	1
12	Valve Support Sub-Assy	0171501201P	0171501201P	1
13	Cut off Valve Sub-Assy	07135072	07135072	1
14	Cut off Valve	07133157	07133157	1
15	Baffle( alve Support)	01365435P	01365435P	1
16	Right Side Plate	0130504401P	0130504401P	1
17	Valve Cover	22245003	22245003	1
18	Big Handle	26235001	26235001	1
19	Wiring Clamp	26115004	26115004	1
20	Rear Grill	01475013	01475013	1
21	Condenser Assy	01163917	01163917	1
22	Reactor	/	/	/
23	Clapboard Assy	01233164	01233164	1
24	Condenser Support Plate	01175092	01175092	1
25	Coping	01255006P	01255006P	1
26	Motor Support Sub-Assy	01705025	01705025	1
27	Fan Motor	1501403402	1501403402	1
28	Axial Flow Fan	10335014	10335014	1
29	Left Side Plate	01305043P	01305043P	1
30	Electric Box Assy	10000100104	10000100103	1
31	Wire Clamp	71010003	71010003	1
32	Terminal Board	420101943	420101943	1
33	Electric Box	20113027	20113027	1
34	Radiator	49010252	49010252	1
35	Main Board	30138000401	30138000420	1
36	Insulated Board (Cover of Electric Box)	20113003	20113003	1
37	Temperature Sensor	3900030901	3900030901	1

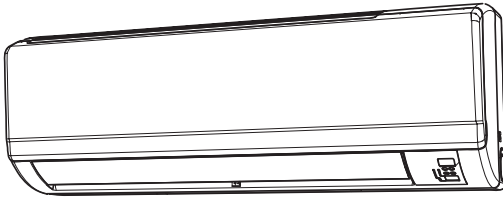
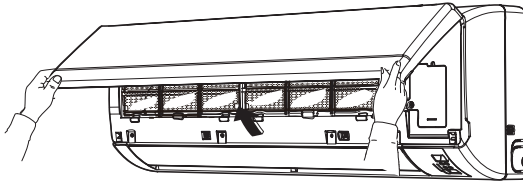
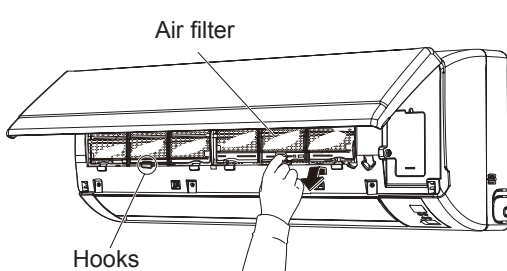
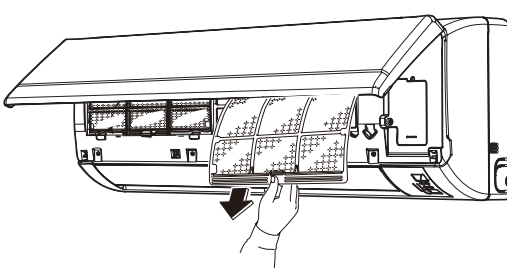
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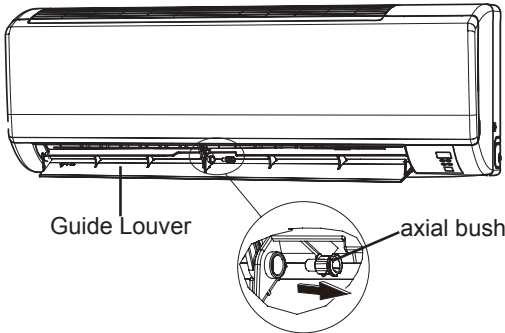
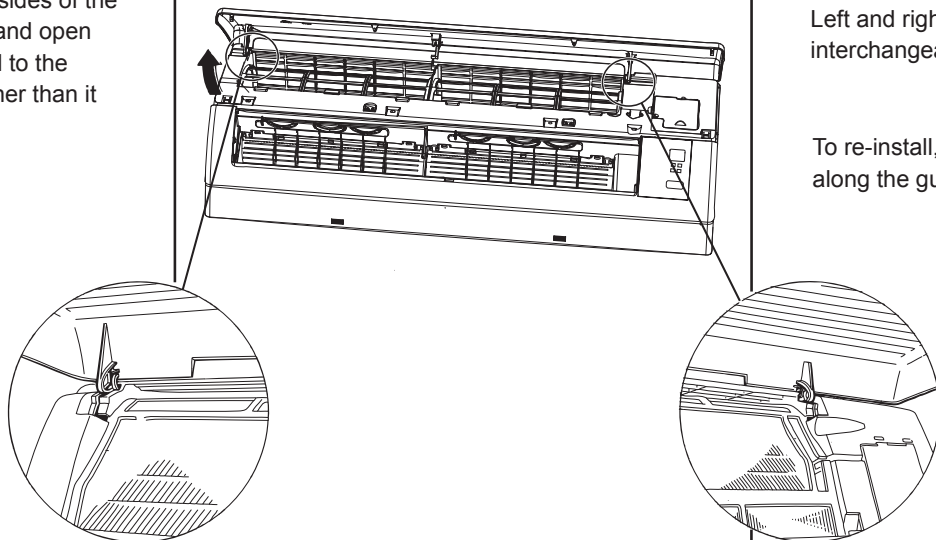
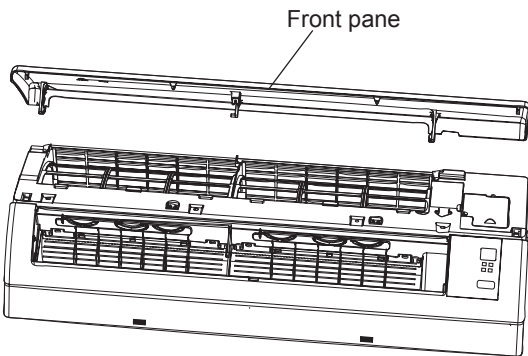
# 11. Removal Procedure

**⚠ Warning:** Be sure to wait for a minimum of 20 minutes after turning off all power supplies and discharge the refrigerant completely before removal.

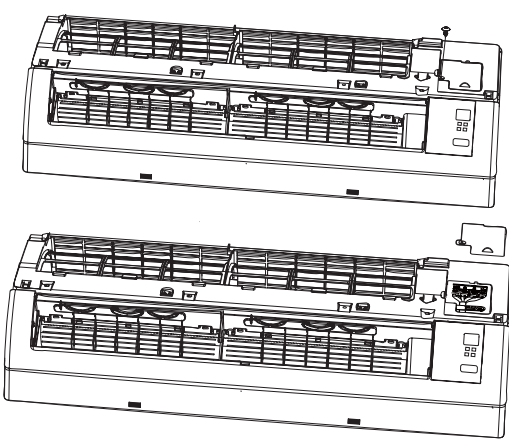
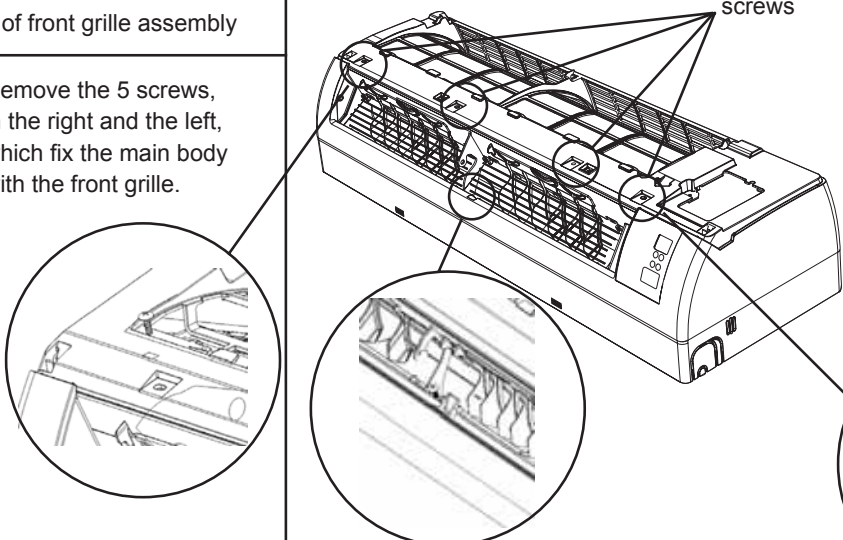
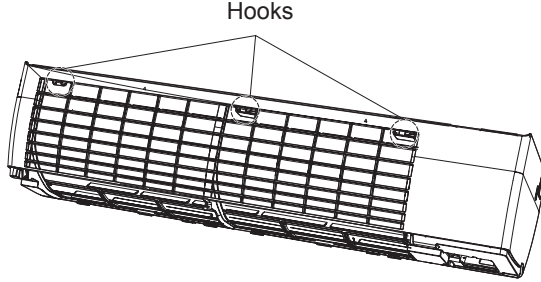
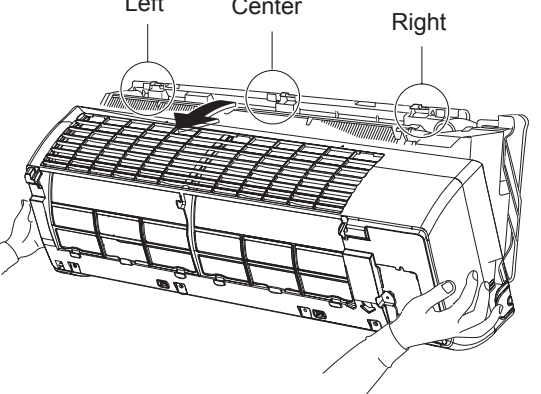
## 11.1 Removal Procedure of Indoor Unit

Steps	Procedure	Points
1. External features		If ON/OFF button is kept pushing for 5 seconds, a forced cooling operation will be carried out for approx. 15 minutes.
2. Removing air filters	<p>a Pull protrusions on left and right sides of panel with fingers and open front panel all the way.</p>  <p>b Lift center section of air filter and disengage hooks.</p>  <p>c Remove air filter by pulling forward.</p> 	<p>Left and right filters are interchangeable.</p> <p>To re-install, insert air filter along the guide.</p>

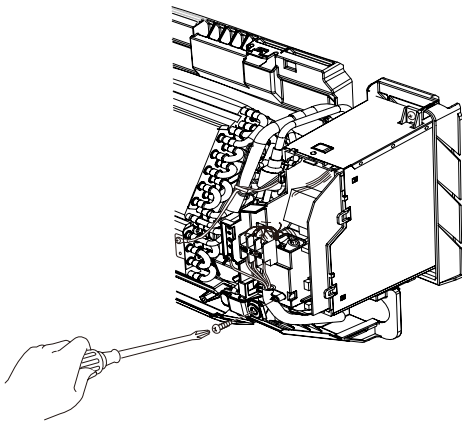
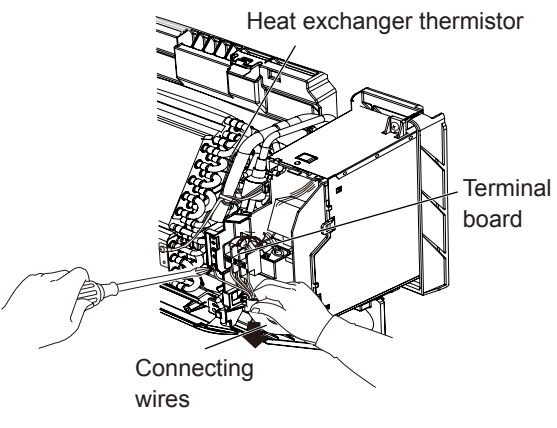
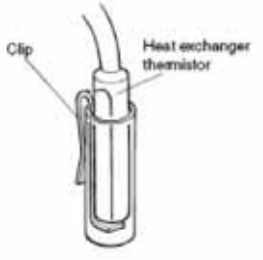
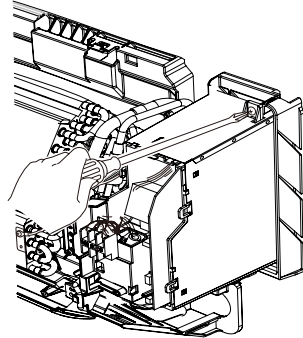


Steps	Procedure		Points
3. Opening and shutting front panel			
a	Draw out the axial bush. Bend the horizontal louver slightly and then remove it.		Support the front panel by one hand, while remove the rotation axis at the upper center by the other hand.
b	Hook a finger onto the projection part provided on the both sides of the units panel and open up the panel to the position higher than it will stop.		Left and right filters are interchangeable.  To re-install, insert air filter along the guide.
c	Remove the front panel from the unit.		



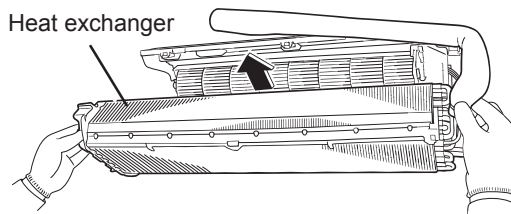
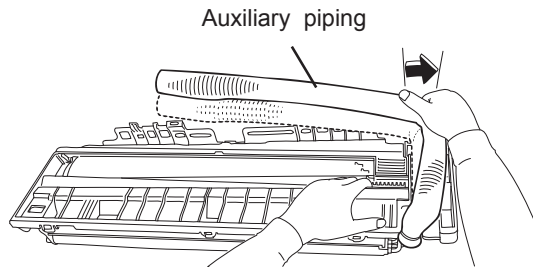
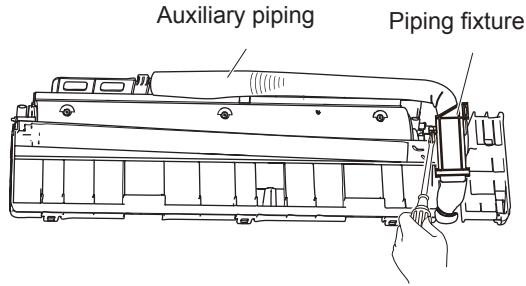
Steps	Procedure	Points
4. Opening and closing of service cover		<p>A switch for field setting is not provided in particular.</p>
5. Removal of front grille assembly	<p>a Remove the 5 screws, in the right and the left, which fix the main body with the front grille.</p>  <p>screws</p> <p>b Disengage the 3 hooks on the upper part. In case that the hooks are not pressed from above, remove the front panel and then remove the grille while pushing the hook through a clearance between the front grille and the heat exchanger.</p>  <p>Hooks</p> <p>c The front grille can be removed in a manner to pull out the upper part forward and lift up the lower part.</p>  <p>Left Center Right</p>	<p>Screw stoppers inside the flap which were equipped in the existing models are not provided.</p> <p>At the upper part there are 2 hooks in the left and the right.</p> <p>Disengage the hooks by pressing knobs with a screwdriver.</p>



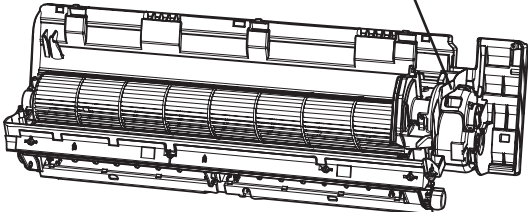
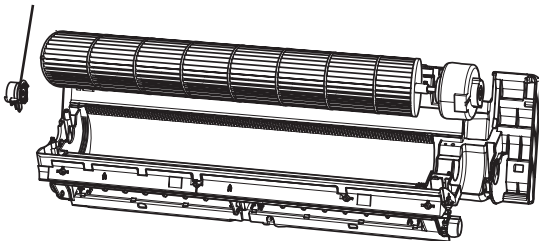
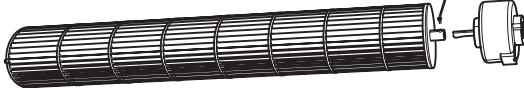
Steps	Procedure	Points
6. Remove electrical box		
a	Disconnect the cable clamp 	Pay attention to the direction of the retainer of the thermistor so that the retainer will not touch the harness (same as the existing models.)
b	Remove Temperature Sensor; Disconnect the connection wires. Twist off the earthing screw fixing the evaporator; Pull out the all the wiring terminals 	Take care not to lose the clip of thermistor. 
c	Remove a screw on the electrical box. 	



Steps	Procedure	Points
7. Remove piping fixture.		
a	Remove Pipe Clamp	
b	Adjust the pipeline slightly	
c	Loosen the screws, in the right and the left, which fix the Evaporator Assy. Remove Evaporator Assy	





Steps	Procedure	Points
8. Remove the pressure plate of motor	<div data-bbox="181 389 448 510"> <p>Remove screws of motor press plate and then remove the motor press plate.</p> </div> <div data-bbox="520 327 1050 600">  <p>Pressure plate of motor</p> </div>	
9. Remove shaft cushion rubber base	<div data-bbox="181 848 448 943"> <p>a Remove motor, blade and shaft cushion rubber base.</p> </div> <div data-bbox="520 759 1061 1032">  <p>Shaft cushion rubber base</p> </div> <div data-bbox="181 1149 448 1243"> <p>b Remove screws on cross flow blade and then remove the motor.</p> </div> <div data-bbox="520 1104 1046 1247">  <p>Screw</p> </div>	

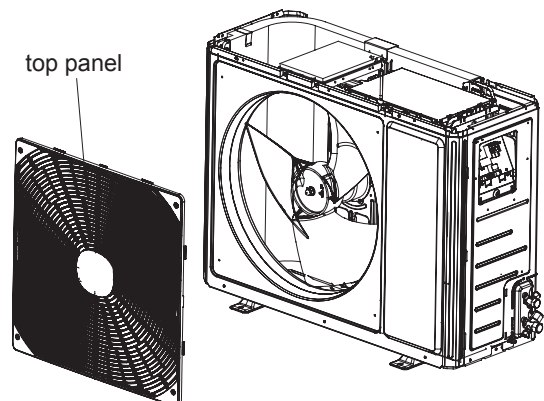
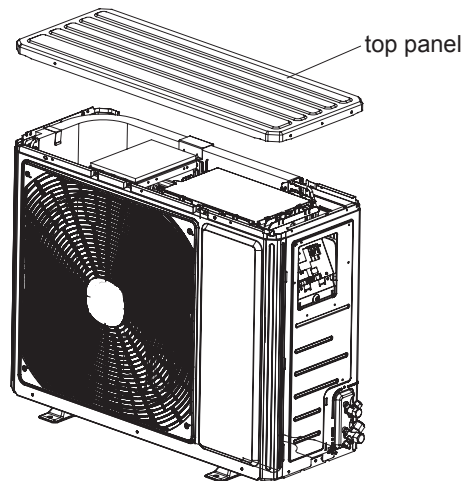
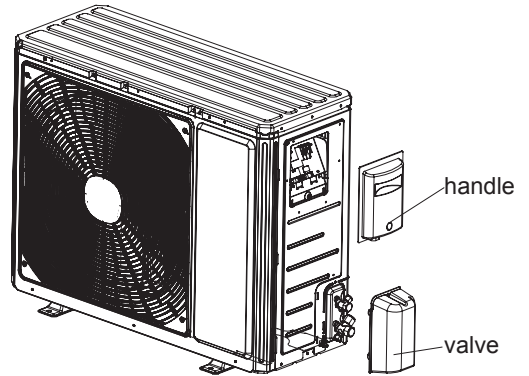


## 11.2 Removal Procedure of Outdoor Unit

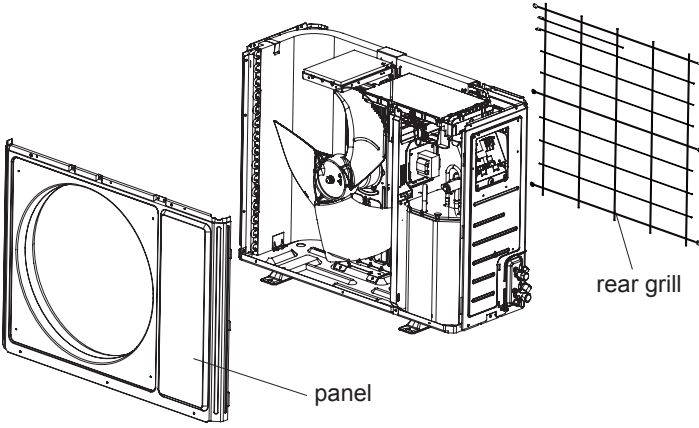
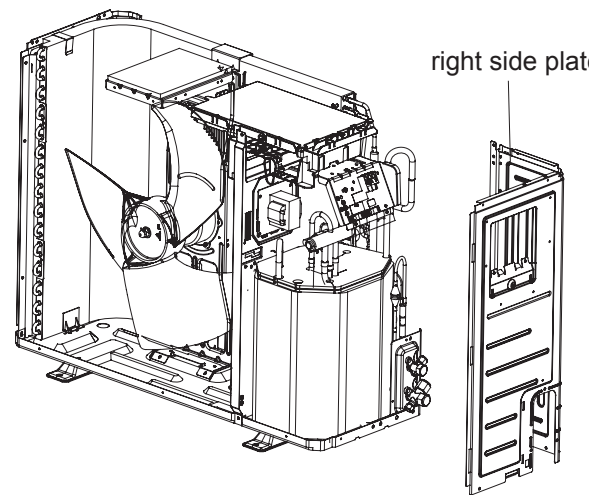
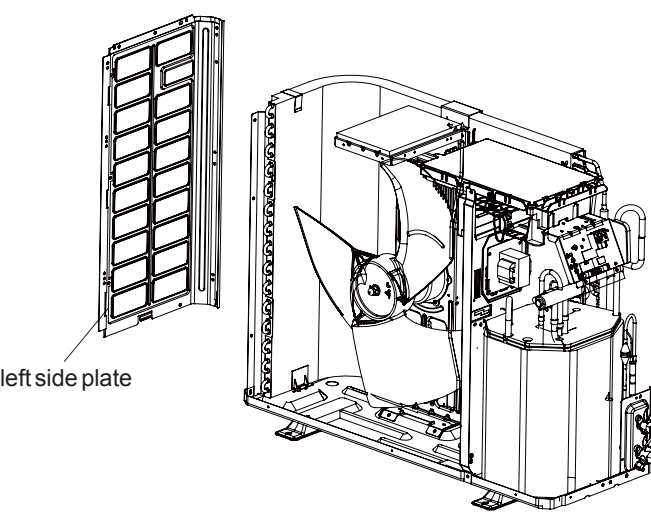
**Warning:** Be sure to wait for a minimum of 20 minutes after turning off all power supplies and discharge the refrigerant completely before removal.

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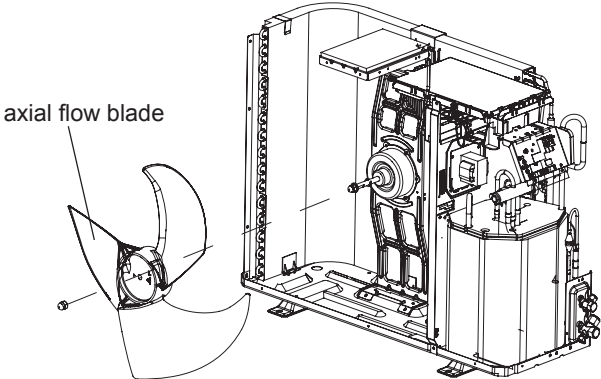
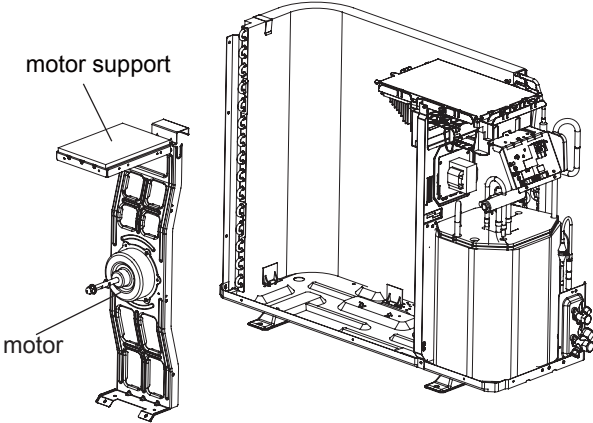
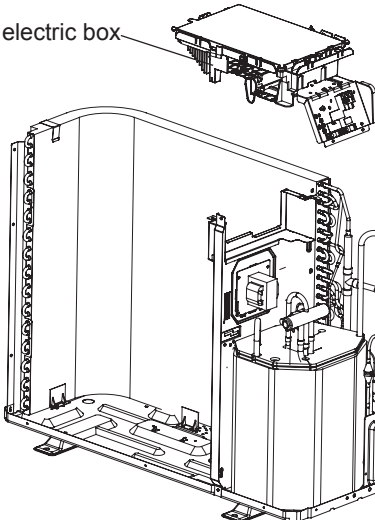
Steps	Procedure
1. Remove top panel	
1	Twist off the screws used for fixing the handle and valve cover, pull the handle and valve cover upward to remove it.
2	Remove the 3 screws connecting the top panel with the front panel and the right side plate, and then remove the top panel.
2. Remove grille , panel and rear grill	
1	Remove the 2 screws connecting the grille and the panel, and then remove the grille.



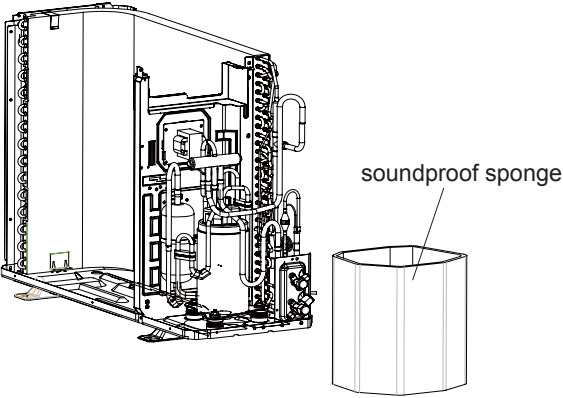
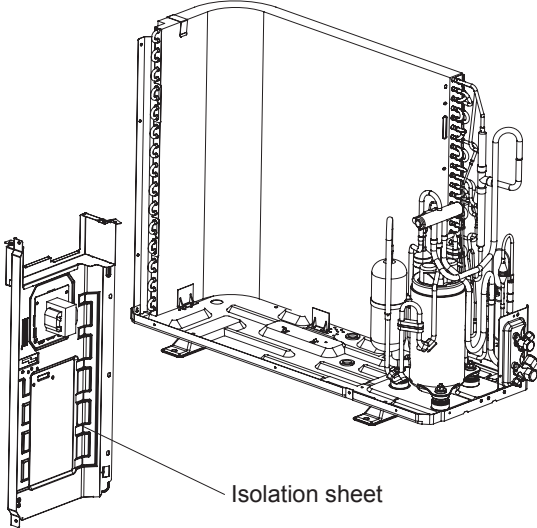
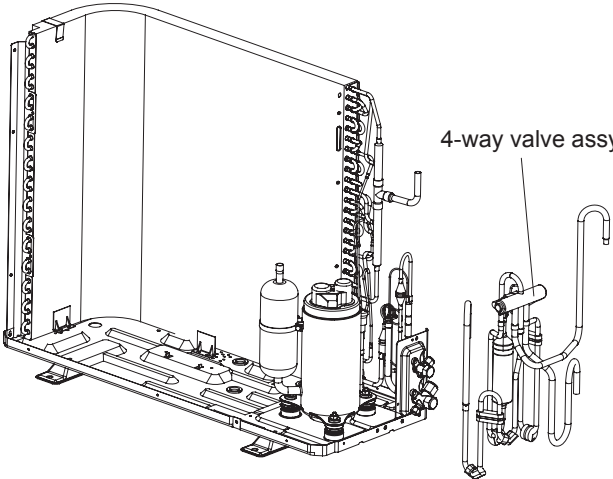


Steps		Procedure
2	<p>Remove the 5 screws connecting the panel with the chassis and the motor support, and then remove the panel.</p> <p>Remove the 6 screws connecting the left side plate and right side plate and then remove rear grill</p>	 <p>panel</p> <p>rear grill</p>
3. Remove left side plate and right side plate		
1	<p>Remove the screws connecting the right side plate with the chassis, the valve support and the electric box, and then remove the right side plate assy.</p>	 <p>right side plate</p>
2	<p>Remove the screws connecting the left side plate and the chassis, and then remove the left side plate assy.</p>	 <p>left side plate</p>

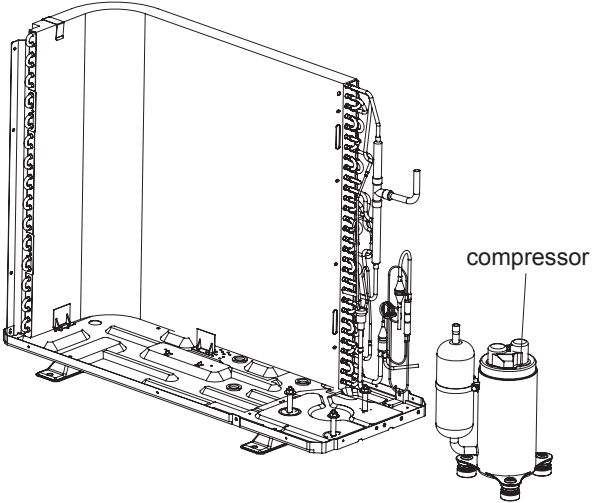
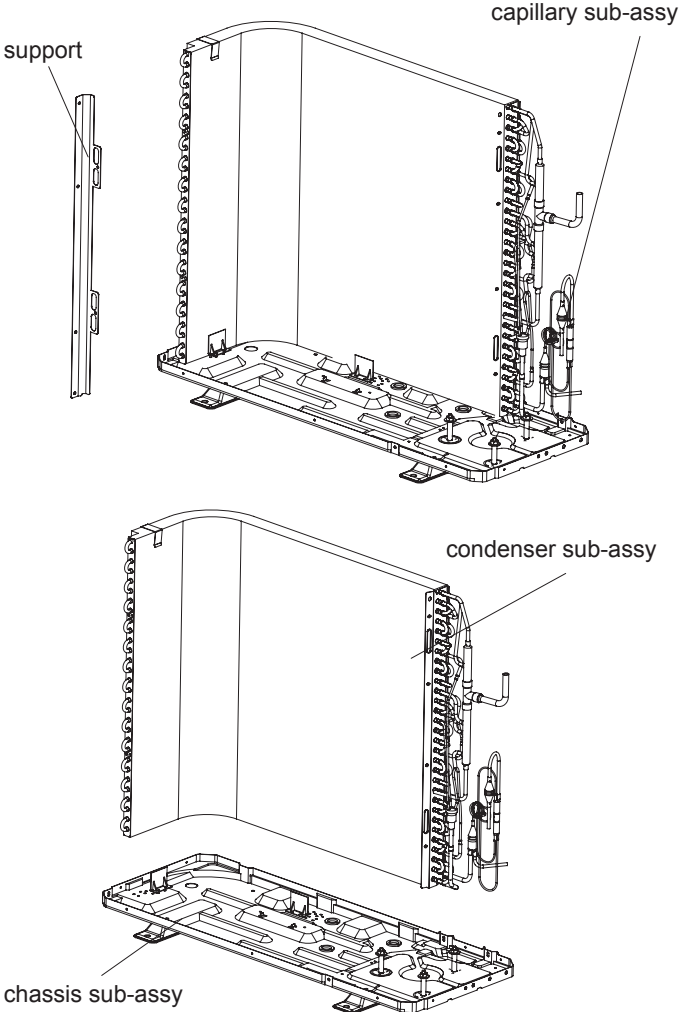


Steps	Procedure
<b>4. Remove fan motor</b>	
1	<p data-bbox="225 443 683 510">Remove the nuts fixing the blade and then remove the axial flow blade.</p>  <p data-bbox="842 443 1007 465">axial flow blade</p>
2	<p data-bbox="225 972 683 1205">Remove the 4 tapping screws fixing the motor; disconnect the leading wire insert of the motor and then remove the motor. Remove the 2 tapping screws fixing the motor support and then pull the motor support upwards to remove it.</p>  <p data-bbox="850 958 999 981">motor support</p> <p data-bbox="829 1238 890 1261">motor</p>
<b>5. Remove electric box</b>	
	<p data-bbox="225 1648 683 1796">Remove the screws fixing the electric box sub-assy; loosen the wire bundle; pull out the wiring terminals and then pull the electric box upwards to remove it.</p>  <p data-bbox="986 1496 1107 1518">electric box</p>

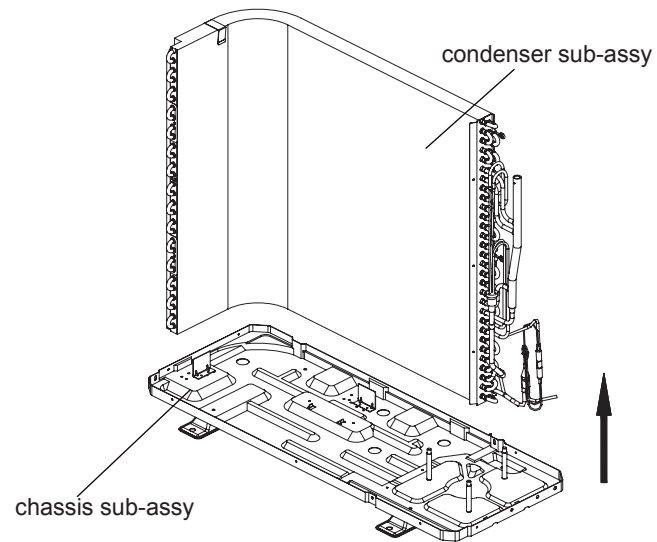


Steps	Procedure
<p>6.Remove soundproof sponge</p> <p>Since the piping ports on the soundproof sponge are torn easily, remove the soundproof sponge carefully</p>	 <p style="text-align: right;">soundproof sponge</p>
<p>7. Remove Isolation sheet</p> <p>Remove the 3 screws fixing the isolation sheet and then remove the Isolation sheet.</p>	 <p style="text-align: right;">Isolation sheet</p>
<p>8. Remove 4-way valve assy</p> <p>Discharge the refrigerant completely;unsolder the pipelines connecting the compressor and the condenser assy,and then remove the 4-way valve assy.</p>	 <p style="text-align: right;">4-way valve assy</p>



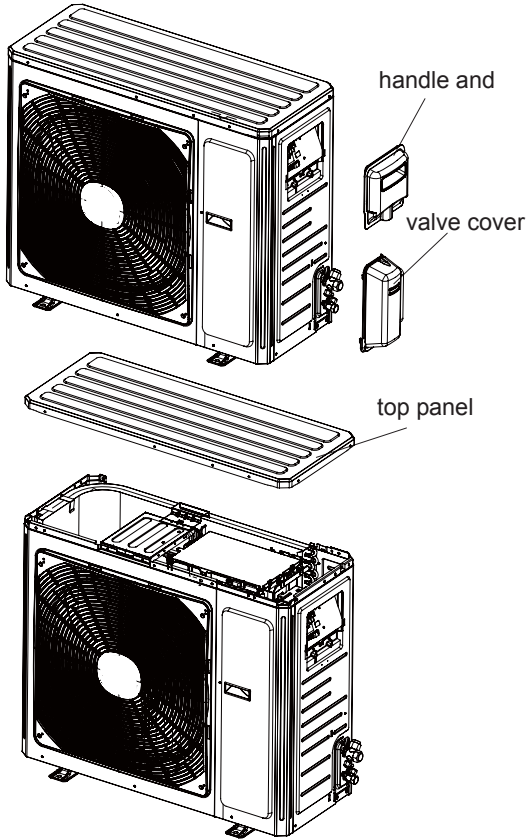
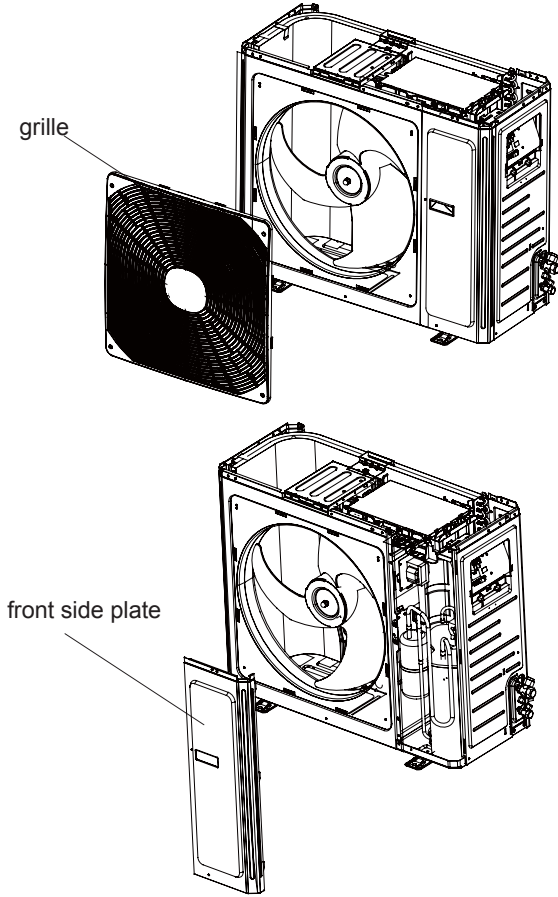
Steps	Procedure
<p>9. Remove compressor</p> <p>Remove the 3 foot nuts fixing the compressor and then remove the compressor.</p>	
<p>10.Remove condenser sub-assy</p> <p>1 Remove the screws connecting the support (condenser) and condenser assy,and then remove the support(condenser).</p> <p>2 Remove the chassis sub-assy and condenser sub-assy.</p>	



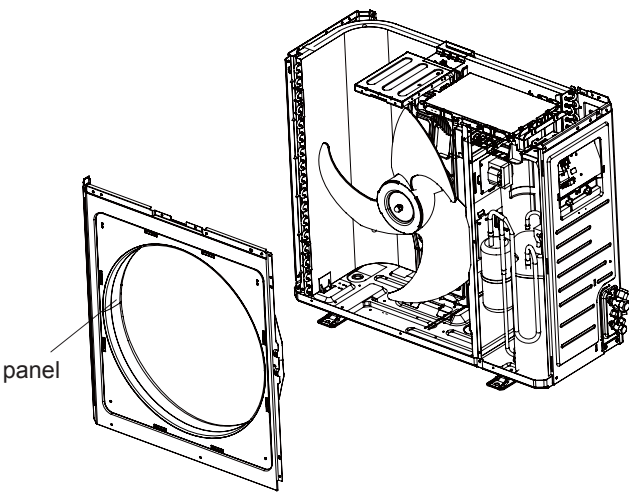
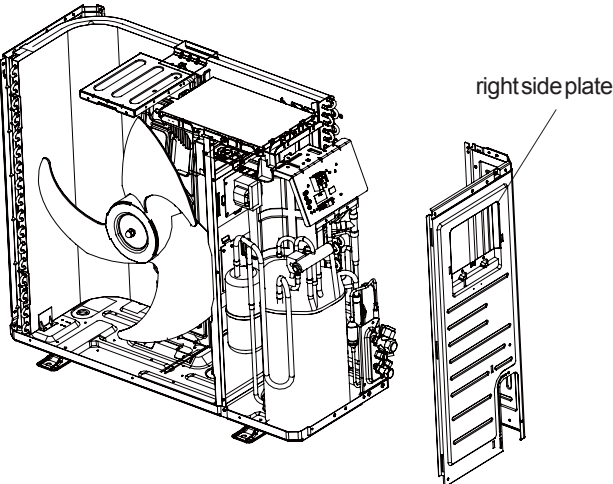
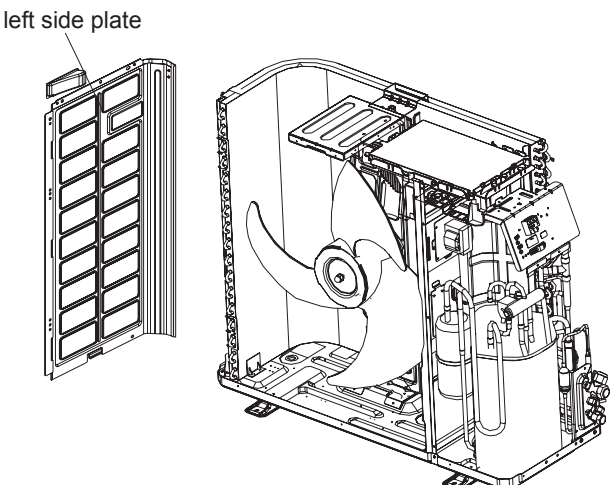
Steps	Procedure
2	<p data-bbox="226 557 750 609">Disassemble the chassis sub-assy and condenser sub-assy.</p>  <p data-bbox="1232 403 1447 427">condenser sub-assy</p> <p data-bbox="801 855 987 882">chassis sub-assy</p>



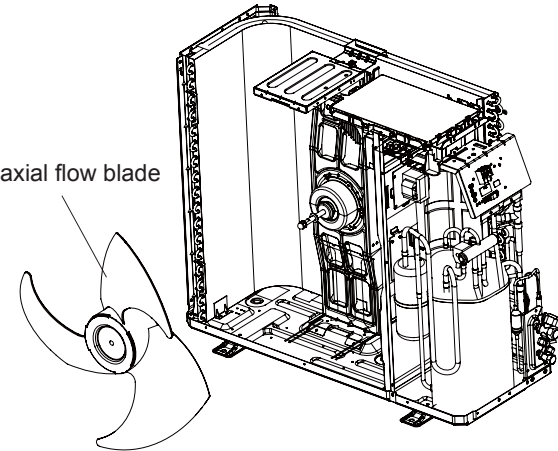
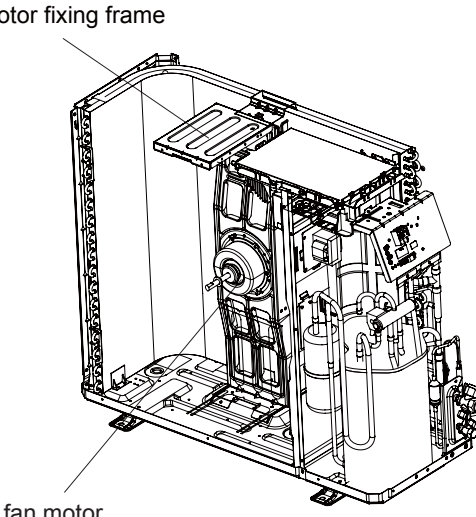
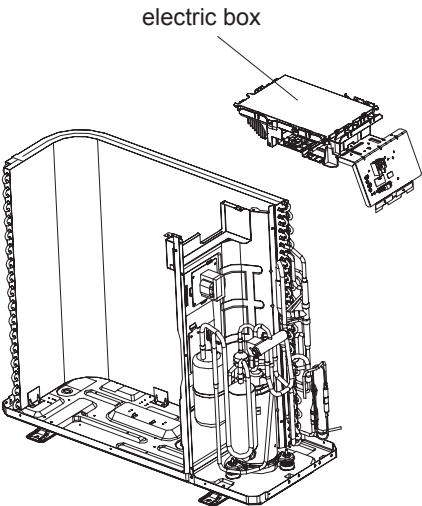
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Steps	Procedure
<p>1. Remove top panel</p> <p>1 Twist off the screws used for fixing the handle and valve cover, pull the handle and valve cover upward to remove it.</p> <p>2 Remove the 3 screws connecting the top panel with the front panel and the right side plate, and then remove the top panel.</p>	
<p>2. Remove grille, front side plate and panel.</p> <p>1 Remove the 2 screws connecting the grille and the panel, and then remove the grille.</p> <p>2 Remove the 1 screw connecting the front side plate and the panel, and then remove the front side plate.</p>	

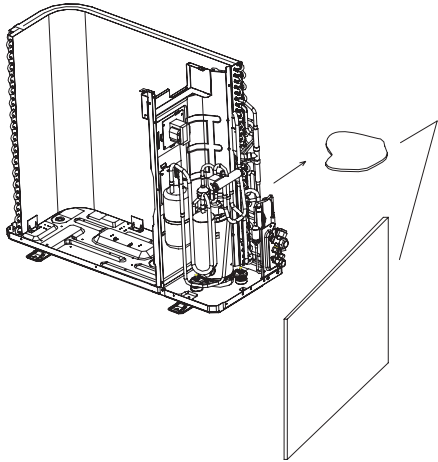
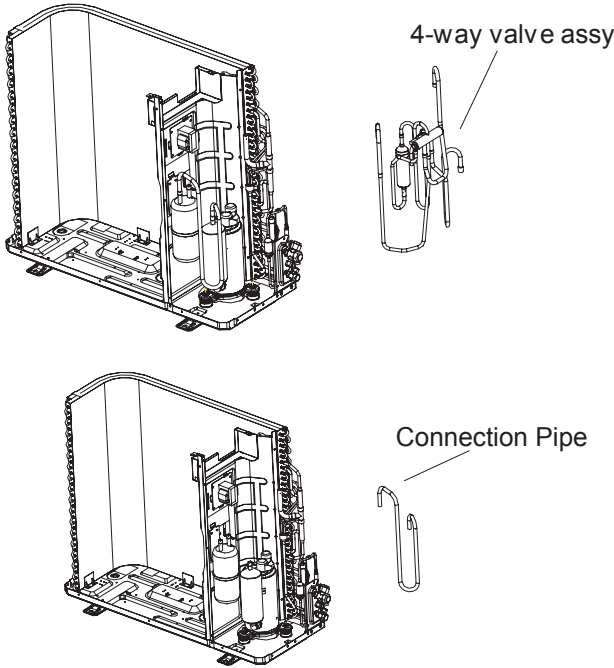
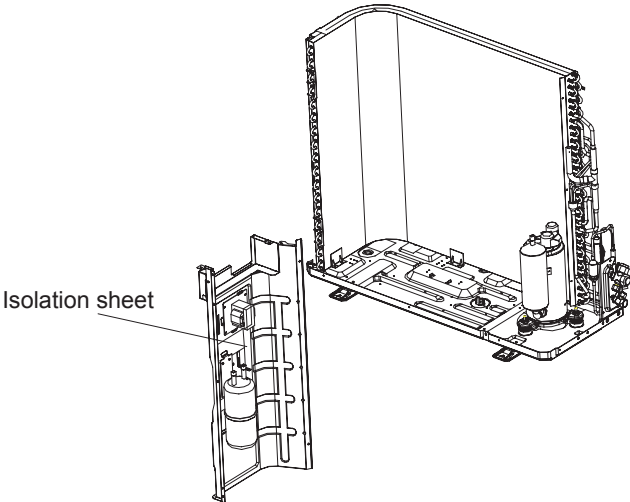


Steps	Procedure	
3	Remove the 5 screws connecting the panel with the chassis and the motor support, and then remove the panel.	 <p>panel</p>
3. Remove right side plate and left side plate		
1	Remove the screws connecting the right side plate with the chassis, the valve support and the electric box, and then remove the right side plate assy.	 <p>right side plate</p>
2	Remove the screws connecting the left side plate and the chassis, and then remove the left side plate assy.	 <p>left side plate</p>

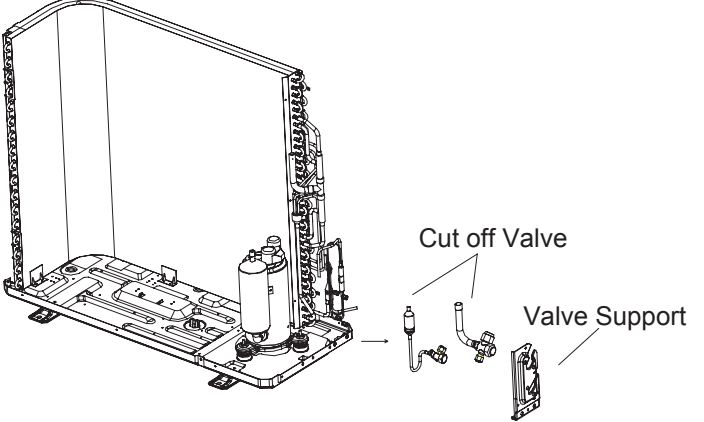
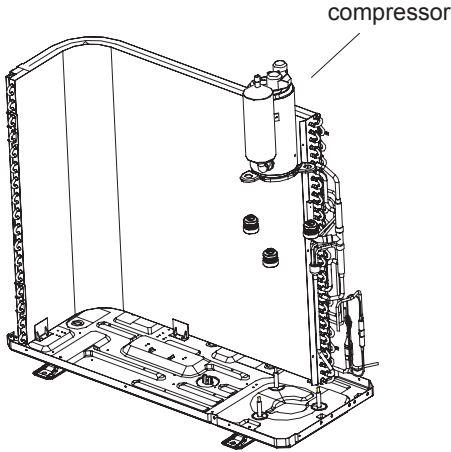
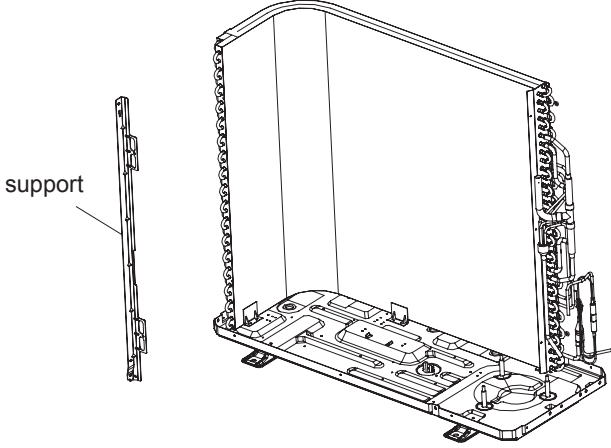


Steps	Procedure
4. Remove fan motor and axial flow blade	
1	<p data-bbox="229 465 687 533">Remove the nuts fixing the blade and then remove the axial flow blade.</p>  <p data-bbox="847 456 1007 479">axial flow blade</p>
2	<p data-bbox="229 1122 679 1352">Remove the 4 tapping screws fixing the motor; disconnect the leading wire insert of the motor and then remove the motor. Remove the 2 tapping screws fixing the motor support and then pull the motor support upwards to remove it.</p>  <p data-bbox="903 882 1134 904">fan motor fixing frame</p> <p data-bbox="967 1375 1070 1397">fan motor</p>
5. Remove electric box	
	<p data-bbox="229 1644 679 1800">Remove the screws fixing the electric box sub-assy; loosen the wire bundle; pull out the wiring terminals and then pull the electric box upwards to remove it.</p>  <p data-bbox="1046 1487 1166 1509">electric box</p>

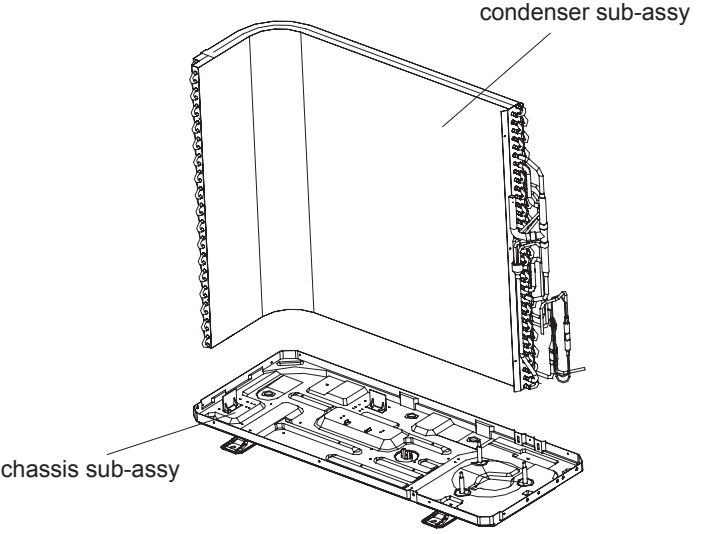


Steps		Procedure
6.Remove soundproof sponge and 4-way valve assy		
1	Since the piping ports on the soundproof sponge are torn easily, remove the soundproof sponge carefully	
2	Discharge the refrigerant completely;unsolder the pipelines connecting the compressor and the condenser assy,and then remove the 4-way valve assy.	
7. Remove Isolation sheet		
	Remove the 3 screws fixing the isolation sheet and then remove the Isolation sheet.	



Steps	Procedure
<b>8. Remove Cut off Valve and Valve Support</b>	
	<p>Remove the 2 bolts fixing the valve subassemblies. Unsolder the welding joint connecting the gas valve and the return air pipe. Remove the gas valve. (Note: When unsoldering the soldering joint, wrap the gas valve with wet cloth completely to avoid damage to the valve caused by high temperature.) Unsolder the welding joint connecting the liquid valve and the connecting pipe. Remove the liquid valve. Remove screws fixing valve support and then remove the valve support; remove the screw fixing the condenser and then pull the condenser upwards to remove it.</p>
	
<b>9. Remove compressor</b>	
	<p>Remove the 3 foot nuts fixing the compressor and then remove the compressor.</p>
	
<b>10. Remove support</b>	
1	<p>Remove the screws connecting the support and condenser assy, and then remove the support.</p>
	



Steps	Procedure
11.Remove condenser sub-assy	
<p data-bbox="197 510 686 571">Remove the chassis sub-assy and condenser sub-assy.</p>	 <p>The diagram illustrates the removal of two components from a device. The top component, labeled 'condenser sub-assy', is a rectangular unit with a grid of small circular elements on its front face and various connectors on its side. The bottom component, labeled 'chassis sub-assy', is a flat, rectangular metal plate with several mounting holes and a central circular cutout. Both components are shown being lifted away from the main body of the device, which is represented by a simple outline of a rectangular box with a curved top.</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.

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):

- When the length of connection pipe is above 5m, add refrigerant according to the prolonged length of liquid pipe. 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

Cooling capacity	Max length of connection pipe	Max height difference
5000 Btu/h(1465 W)	15 m	5 m
7000 Btu/h(2051 W)	15 m	5 m
9000 Btu/h(2637 W)	15 m	10 m
12000 Btu/h(3516 W)	20 m	10 m
18000 Btu/h(5274 W)	25 m	10 m
24000 Btu/h(7032 W)	25 m	10 m
28000 Btu/h(8204 W)	30 m	10 m
36000 Btu/h(10548 W)	30 m	20 m
42000 Btu/h(12306 W)	30 m	20 m
48000 Btu/h(14064 W)	30 m	20 m

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	Φ9.5 or Φ12	15	20
Φ6 or Φ9.5	Φ16 or Φ19	15	20
Φ12	Φ19 or Φ22.2	30	120
Φ16	Φ25.4 or Φ31.8	60	120
Φ19	/	250	250
Φ22.2	/	350	350



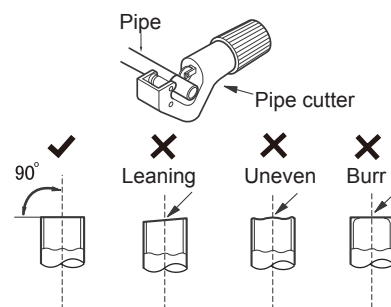
## Appendix 3: Pipe Expanding Method

### ⚠ Note:

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

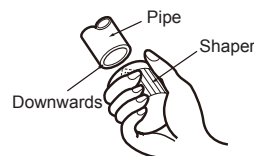
#### A: Cut the pipe

- 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

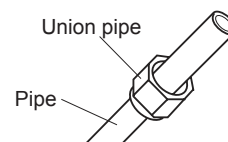
- Remove the burrs with shaper and prevent the burrs from getting into the pipe.



#### 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.



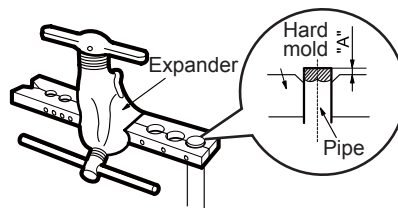
#### E: Expand the port

- Expand the port with expander.

### ⚠ Note:

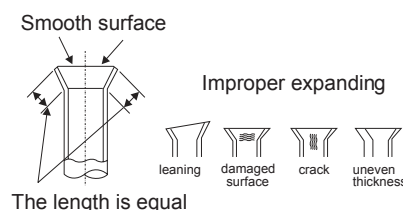
- "A" is different according to the diameter, please refer to the sheet below:

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 (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 Indoor and Outdoor (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



