

SERVICE MANUAL

# TOWER SERIES

AST-24AI



“Original instructions”

**IMPORTANT NOTE:**

Read this manual carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.

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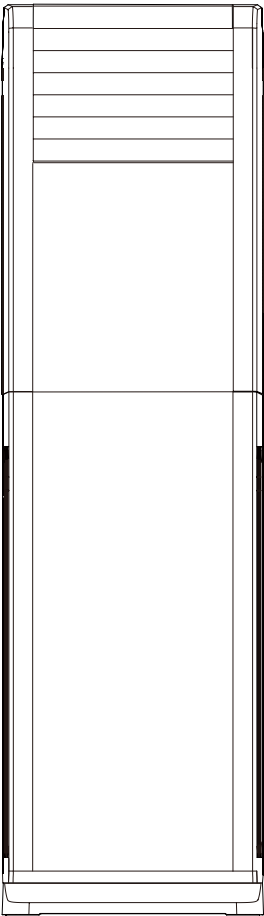
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# Part I : Technical Information

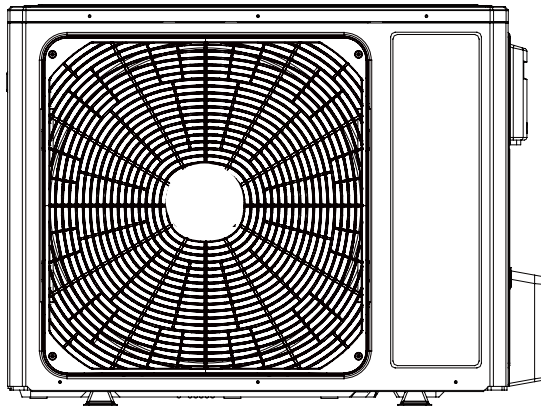
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## 1. Summary

**Indoor Unit:**



**Outdoor Unit:**



**Remote Controller:**

YAP1F4(WiFi)





## 2. Specifications

### 2.1 Specification Sheet

Parameter	Unit	Value	
Model		AST-24AI	
Product Code		CH156000800	
Power Supply	Rated Voltage	V~ 220-240	
	Rated Frequency	Hz 50.0	
	Phases	1.0	
Power Supply Mode		Outdoor	
Cooling Capacity	W	7200	
Heating Capacity	W	7500	
Cooling Power Input	W	2250	
Heating Power Input	W	2080	
Cooling Power Current	A	10.4	
Heating Power Current	A	9.32	
Rated Input	W	3800	
Rated Current	A	18	
Air Flow Volume(SH/H/M/L/SL)	m <sup>3</sup> /h	1400/1150/1050/900/-	
Dehumidifying Volume	L/h	2.0	
EER	(Btu/h)/W	3.2	
COP	W/W	3.6	
SEER	W/W	/	
HSPF	W/W	/	
Application Area	m <sup>2</sup>	27-42	
Indoor Unit	Model of indoor unit		AST-24AI
	Product Code		CH156N00800
	Fan Type		Centrifugal
	Diameter Length(DXL)	mm	Φ350X130.5
	Fan Motor Cooling Speed(SH/H/M/L/SL)	r/min	600/500/450/400/-
	Fan Motor Heating Speed(SH/H/M/L/SL)	r/min	600/500/450/400/-
	Output of Fan Motor	W	65
	Fan Motor RLA	A	/
	Fan Motor Capacitor	μF	/
	Evaporator Form		Aluminum Fin-copper Tube
	Pipe Diameter	mm	Φ7
	Row-fin Gap	mm	2-1.3
	Coil Length (LXDXW)	mm	724X25.4X392
	Swing Motor Model		MP35AA/MP24TA
	Output of Swing Motor	W	2.5/1.5
	Fuse	A	5
	Sound Pressure Level (SH/H/M/L/SL)	dB (A)	49/45/42/39/-
	Sound Power Level (SH/H/M/L/SL)	dB (A)	63/57/53/50/-
	Dimension (WXHXD)	mm	507X1770X320
	Dimension of Carton Box (LXWXH)	mm	1985X620X425
Dimension of Package(LXWXH)	mm	1988X623X440	
Net Weight	kg	40	
Gross Weight	kg	53.5	

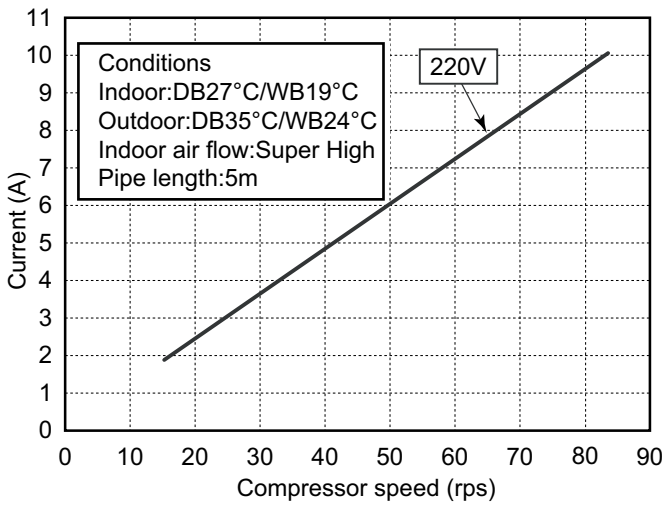
Outdoor Unit	Model of Outdoor Unit		AST-24AI
	Product Code		CH156W00800
	Compressor Manufacturer/Trademark		ZHUHAI LANDA COMPRESSOR CO,LTD.
	Compressor Model		QXFS-D25zX090H
	Compressor Oil		R68EP
	Compressor Type		Rotary
	L.R.A.	A	24A
	Compressor RLA	A	11.0
	Compressor Power Input	W	2420.0
	Overload Protector		"HPC115/95U1 KSD115°C "
	Throttling Method		Electron expansion valve
	Operation Temp	°C	-15~43
	Ambient Temp (Cooling)	°C	-15~43
	Ambient Temp (Heating)	°C	-15~24
	Condenser Form		Aluminum Fin-copper Tube
	Pipe Diameter	mm	Φ7
	Rows-fin Gap	mm	2-1.4
	Coil Length (LXDXW)	mm	935X38.1X660
	Fan Motor Speed	rpm	800
	Output of Fan Motor	W	60.0
	Fan Motor RLA	A	0.6
	Fan Motor Capacitor	μF	/
	Air Flow Volume of Outdoor Unit	m <sup>3</sup> /h	3200
	Fan Type		Axial-flow
	Fan Diameter	mm	Φ520
	Defrosting Method		Automatic Defrosting
	Climate Type		T1
	Isolation		I
	Moisture Protection		IPX4
	Permissible Excessive Operating Pressure for the Discharge Side	MPa	4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa	2.5
	Sound Pressure Level (H/M/L)	dB (A)	60/-/-
Sound Power Level (H/M/L)	dB (A)	68/-/-	
Dimension (WXHXD)	mm	963X700X396	
Dimension of Carton Box (LXWXH)	mm	1026X455X735	
Dimension of Package(LXWXH)	mm	1029X458X750	
Net Weight	kg	53.32	
Gross Weight	kg	58	
Refrigerant		R410A	
Refrigerant Charge	kg	2	
Connection Pipe	Length	m	5
	Gas Additional Charge	g/m	50
	Outer Diameter Liquid Pipe	mm	Φ6
	Outer Diameter Gas Pipe	mm	Φ16
	Max Distance Height	m	10.0
	Max Distance Length	m	25.0
	Note: The connection pipe applies metric diameter.		

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

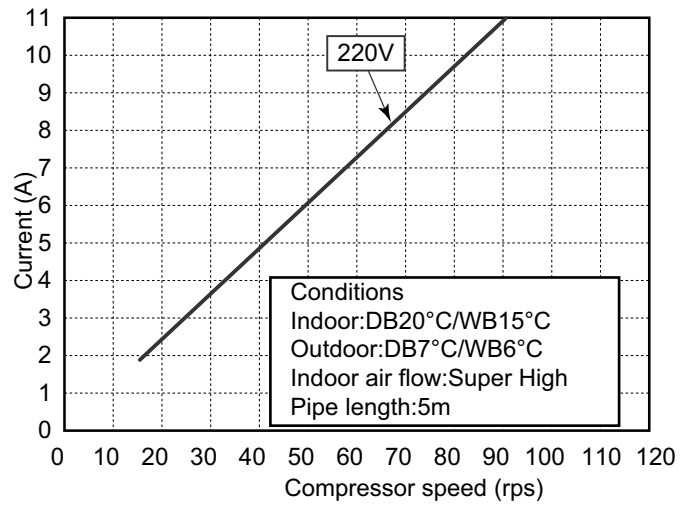


## 2.2 Operation Characteristic Curve

Cooling

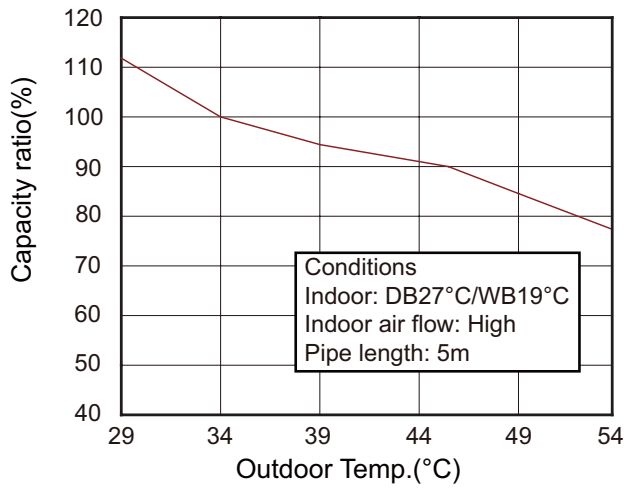


Heating

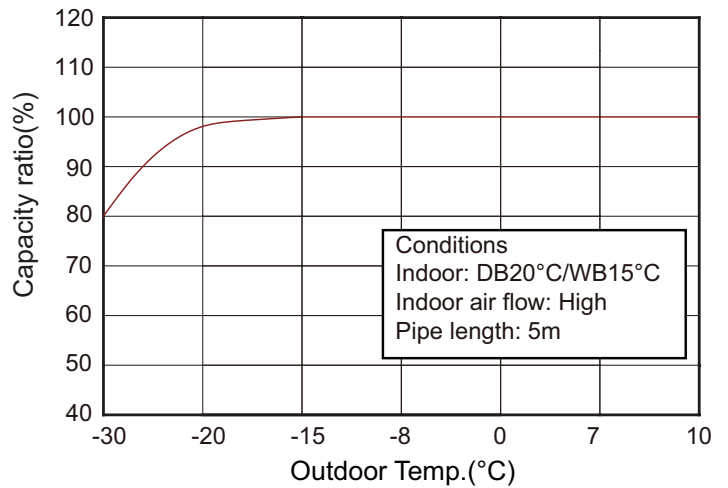


## 2.3 Capacity Curve in Different Outdoor Temperature

Cooling



Heating



## 2.4 Cooling 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	AST-24AI	0.9 to 1.1	in:8~11 out:11~14	in:65~75 out:37~43	Super High	High	48

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/-	7/6	AST-24AI	2.0 to 2.3	in:75~8 out:33~38	in:1~3 out:4~8	Super High	High	56

**Instruction:**

T1: Inlet and outlet pipe temperature of evaporator

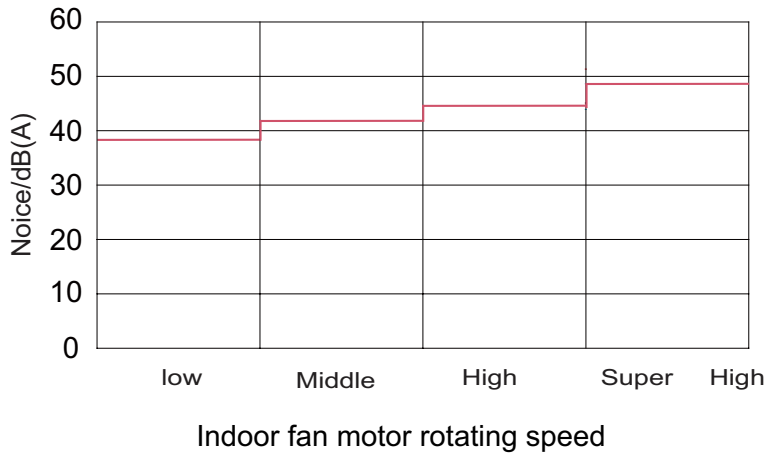
T2: Inlet and outlet pipe temperature of condenser

P: Pressure at the side of big valve

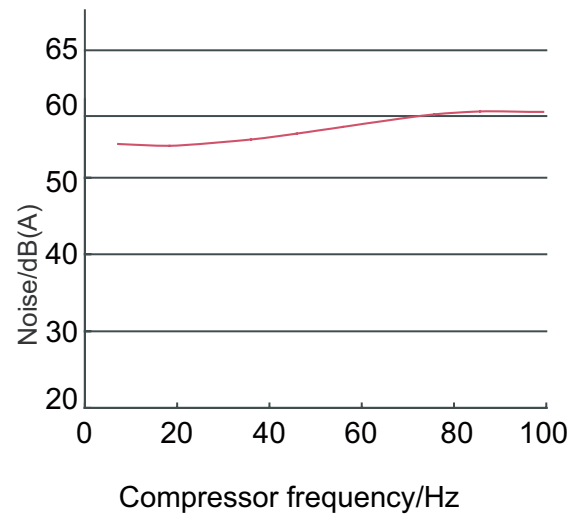
Connection pipe length: 5 m.

## 2.5 Noise Curve

Indoor side noise when blowing

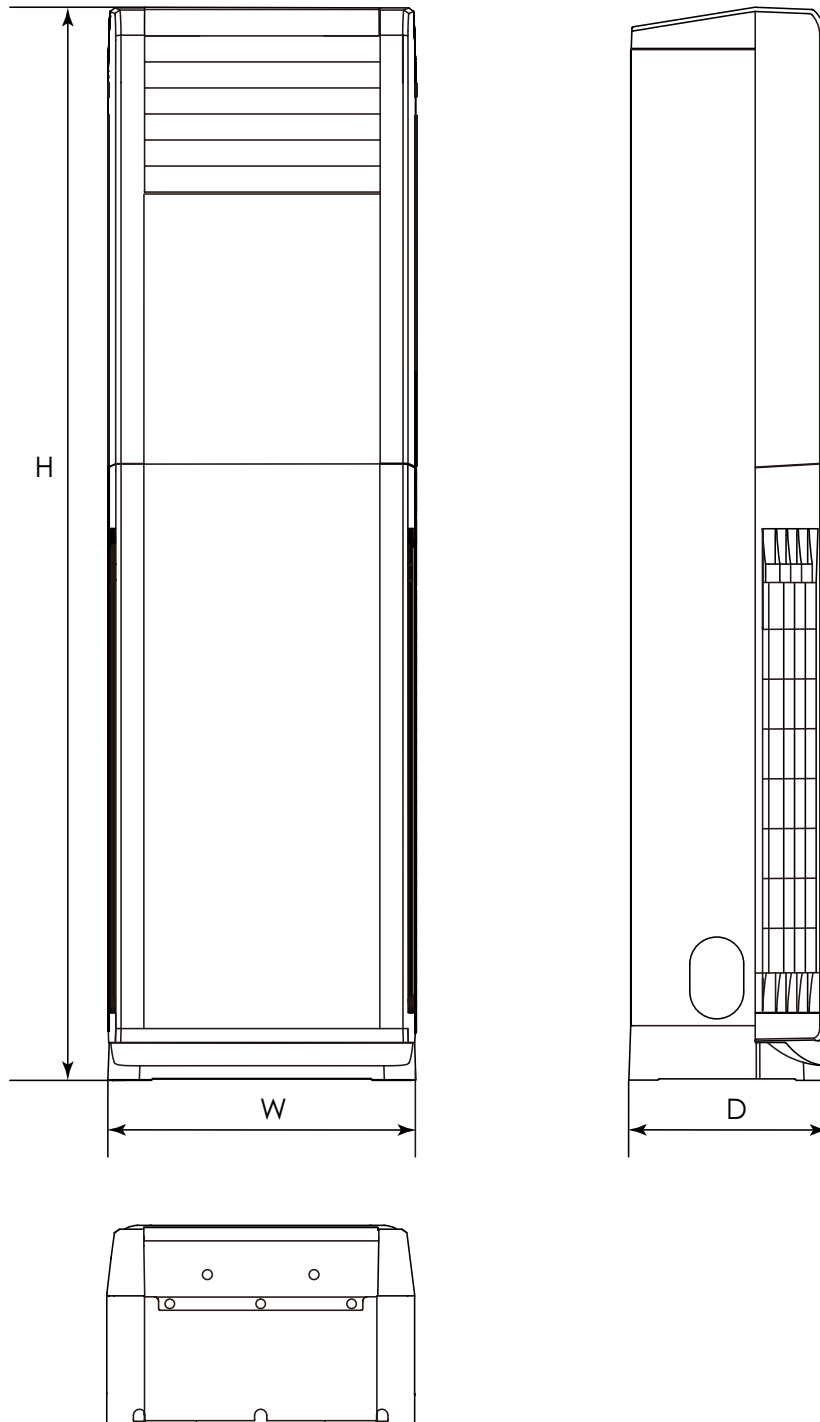


Outdoor side noise when blowing



### 3. Outline Dimension Diagram

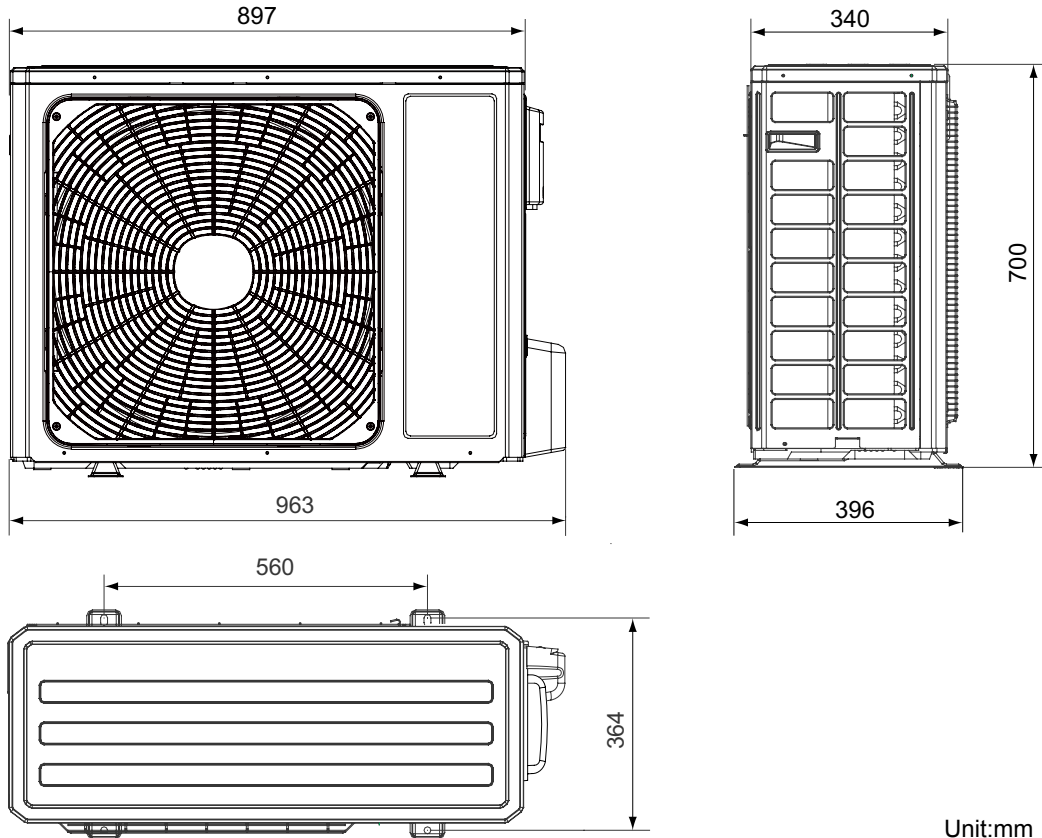
#### 3.1 Indoor Unit



Unit:mm

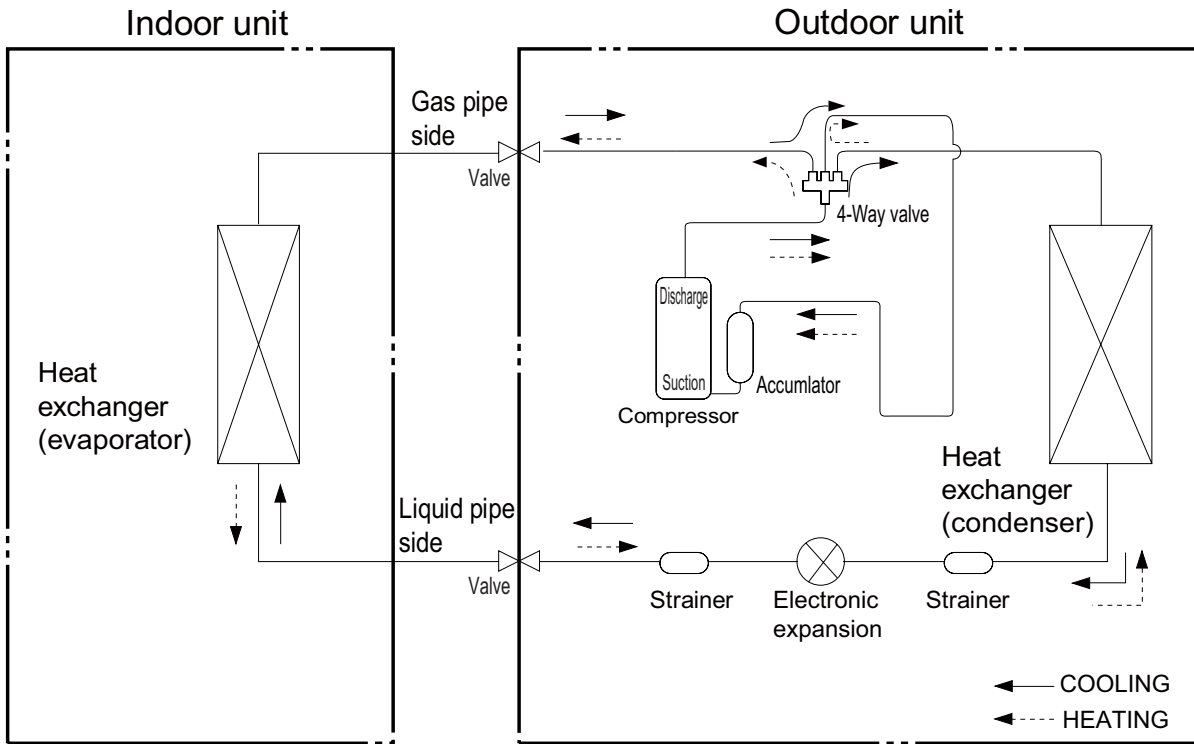
Model	W	H	D
AST-24AI	507	1770	320

### 3.2 Outdoor Unit



Unit:mm

# 4. Refrigerant System Diagram



Connection pipe specification:  
 Liquid : 1/4" (6 mm)  
 Gas : 5/8" (16mm)

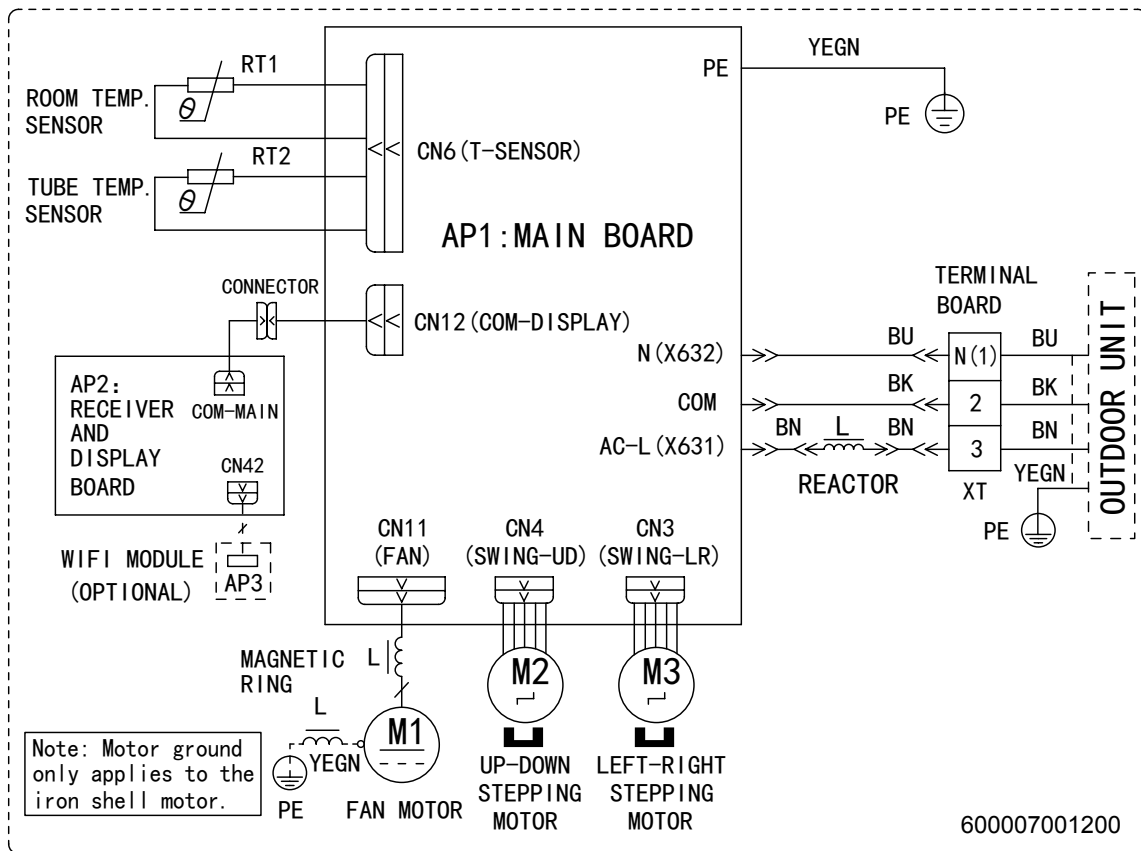
## 5. Electrical Part

### 5.1 Wiring Diagram

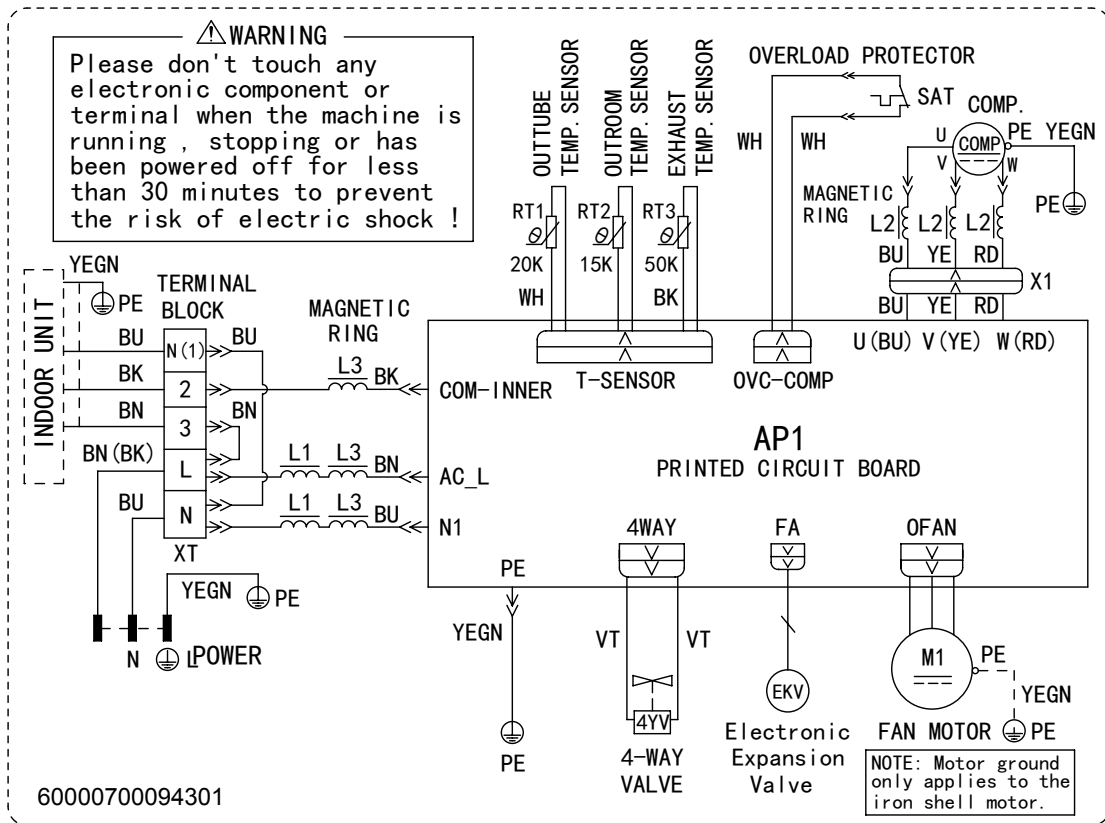
- Instruction

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
YE	Yellow	BN	Brown	COMP	Compressor
RD	Red	BU	Blue	⊕	Grounding wire
YEGN	Yellow/Green	BK	Black	/	/

- Indoor Unit



• Outdoor Unit

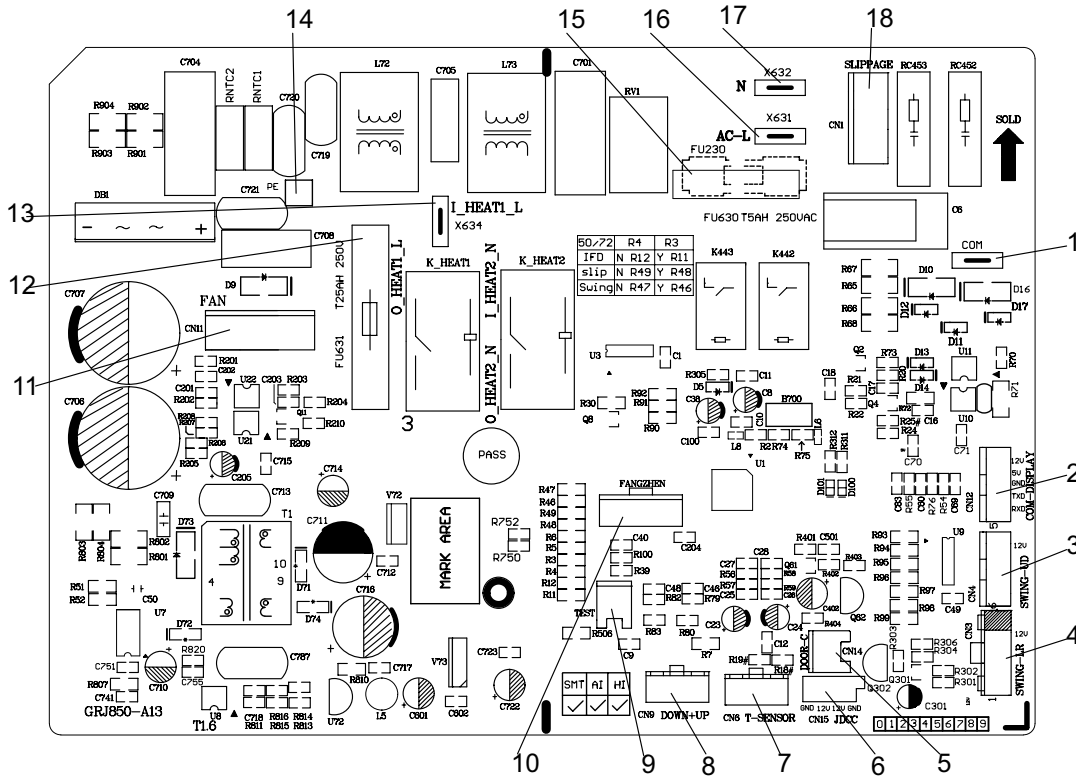


These wiring diagrams are subject to change without notice; please refer to the one supplied with the unit.

## 5.2 PCB Printed Diagram

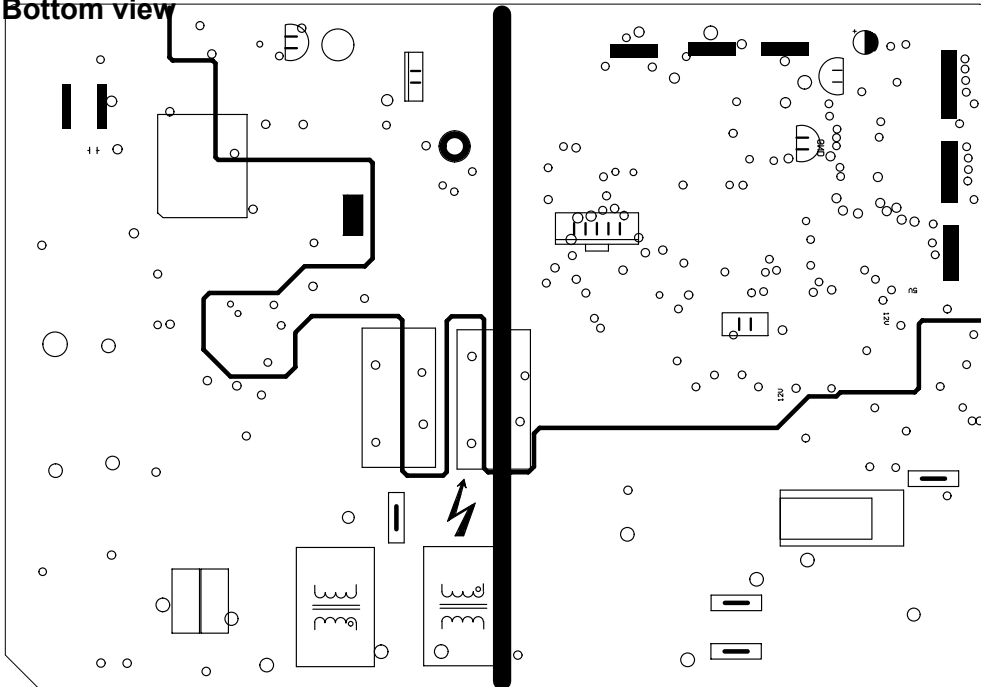
### Indoor unit

#### • Top view



1	Copper pin terminal of communication wire
2	Needle stand of display board
3	Needle stand of up&right swing
4	Needle stand of left&right swing
5	Door switch terminal
6	Electrostatic dedusting terminal
7	Needle stand of temperature sensor
8	Inspection needle stand for up&down position of sliding door
9	Test needle stand
10	Simulation burning needle stand
11	Needle stand of DC fan
12	Fuse of E-heater
13	Copper pin of live wire of E-heater
14	Earthing wire terminal
15	Fuse
16	Copper pin terminal of live wire
17	Copper pin terminal of neutral wire
18	Motor terminal of sliding door

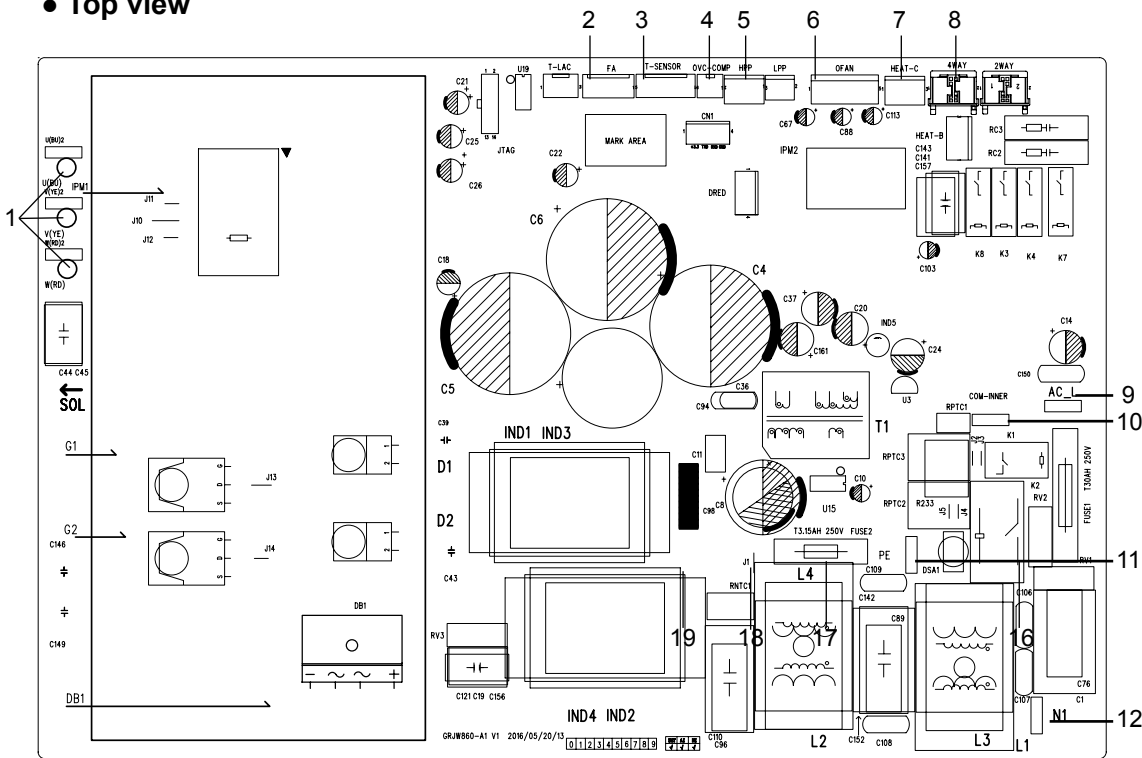
#### • Bottom view





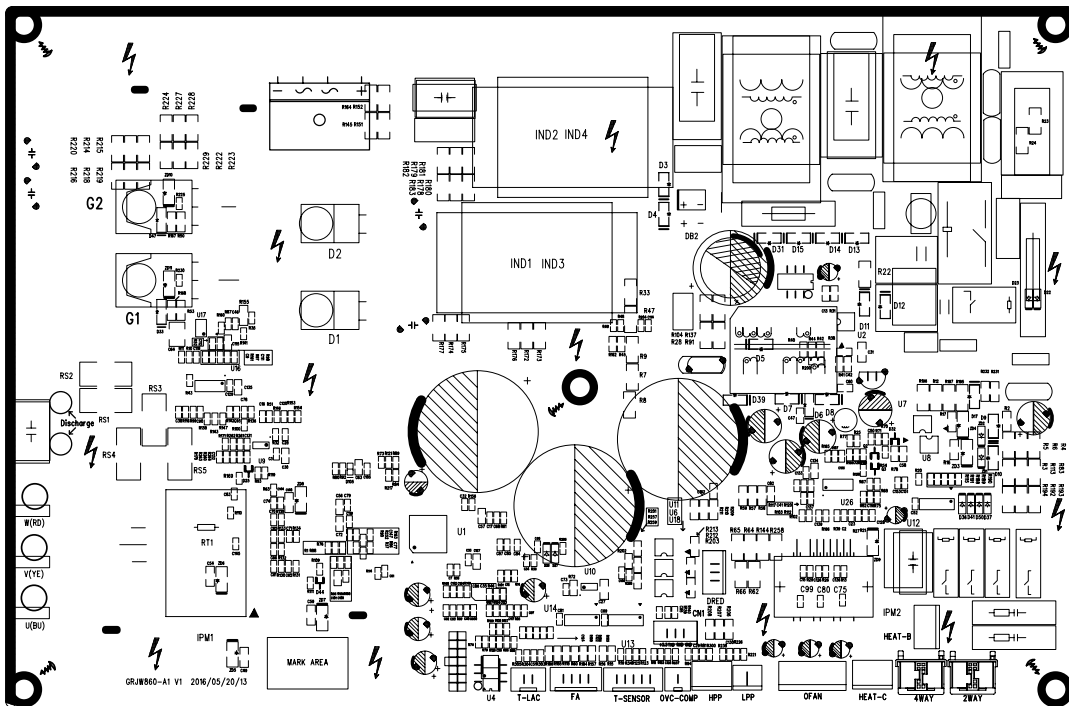
Outdoor unit

• Top view



1	Terminal of compressor wire
2	Terminal of electronic expansion valve
3	Terminal of sensor
4	Terminal of compressor overload protection
5	Terminal of high pressure protection
6	Terminal of outdoor fan
7	Terminal of compressor electric heating
8	Terminal of 4-way valve
9	Power supply live wire
10	Communication wire with indoor unit
11	Earthing wire
12	Power supply neutral wire

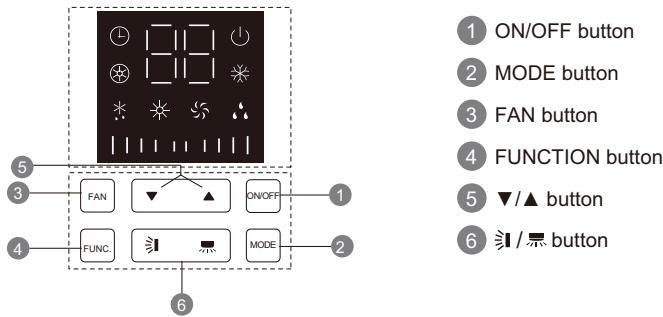
• Bottom view



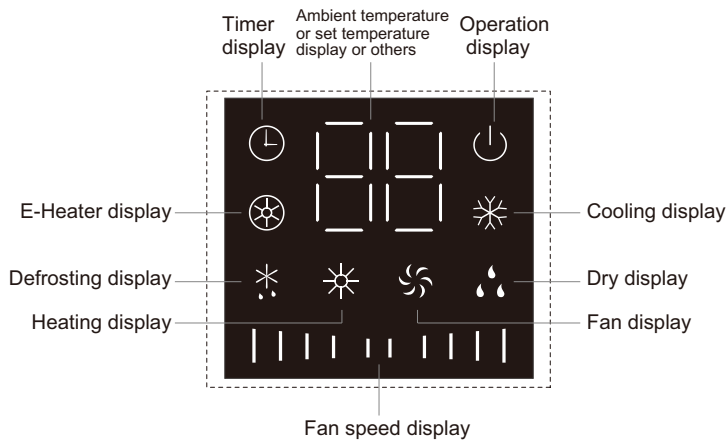
# 6. Function and Control

## 6.1 Function Buttons of Air Conditioner

### Button's Name and Function



### Introduction for icons on display screen of air conditioner



**Note:**

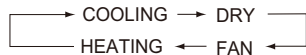
This series unit adopts touch buttons. You only need to touch the buttons slightly.

**1** ON/OFF button

- Press this button to turn on or turn off the unit. (Note: Under X-FAN mode, press this button to turn on the unit directly.)

**2** MODE button

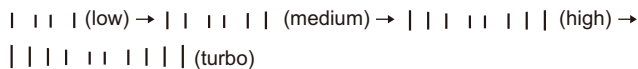
- Every time press this button, the mode will switchover in cycle among.



(Note: Cooling only unit won't accept heating operation signal. For cooling only unit, pressing MODE button under FAN mode will skip heating mode and enter cooling mode.)

**3** FAN button

- Press this button and then fan speed can be selected and displayed in the sequence as below:



(Note: Only low fan speed is available for dry mode. Fan speed can't be adjusted under dry mode. Turbo cannot be set in FAN mode.)

**4** FUNCTION button

- Under on status, press Function button to switch between timer and auxiliary heating function setting (auxiliary heating can be set only in heating mode). When timer or auxiliary heating icon is blinking, it means this function can be set. Press "▲" or "▼" button to set function. If there's no operation change within 5s after setting is finished, the function setting will be confirmed. Or press Function button again to exit or confirm the function. When the function is selected through Function button, if the unit is not turned off and no remote control signal is received within 2min, pressing Function button again to circulate from the previous set function. After 2min or the unit is turned off or remote control signal is received, pressing Function button again to circulate from timer icon. (Note: Only when the unit is under heating mode and with auxiliary heating function, auxiliary heating function can be turned on or off through Function button.)
- Under off status, if the unit is in X-FAN status, press Function button to turn off the unit directly; if the unit is not in X-FAN status, press Function button to set timer ON.

## Button's introduction

### 5 ▼/▲ button

- After each pressing of "▲" or "▼" button, set temperature will increase or decrease 1°C. Temperature adjustment range is 16°C~30°C. This button is invalid under auto mode. Timer setting can be set in 1h increment among 0~24h. When it is adjusted to auxiliary heating function setting through Function button, press this button to turn on or turn off auxiliary heating. (Note: auxiliary heating is valid only for the model with this function.)
- Hold "▲" and "▼" buttons for 3s and the air conditioner will display "LC", which indicates buttons are locked. Any button under on status or ON/OFF button and function buttons under off status are all invalid. Hold these two button for 3s again to release the lock.

### 6 ↻/⏸ button

- Left and right swing: this button controls the left and right swing motor, single pressit to switchover between ON and OFF.
- Up and down swing: this button controls the up and down swing motor, single pressit to switchover between ON and OFF.

## Icon function introduction

### Operation display

- It indicates the air conditioner is put through the power. Under on status, this indicator is on; under off status, this indicator is off.

### Timer display

- When this indicator is on, it indicates the timer function is turned on.

### Heating display

- When this indicator is on, it indicates the heating mode is turned on.

### Defrosting display

- When this indicator is on, it indicates the defrosting function is turned on.

### Dry display

- When this indicator is on, it indicates the dry mode is turned on.

### E-Heater display

- When this indicator is on, it indicates the E-heater function is turned on.

### Cooling display

- When this indicator is on, it indicates the cooling mode is turned on.

### Fan display

- When this indicator is on, it indicates the fan mode is turned on.

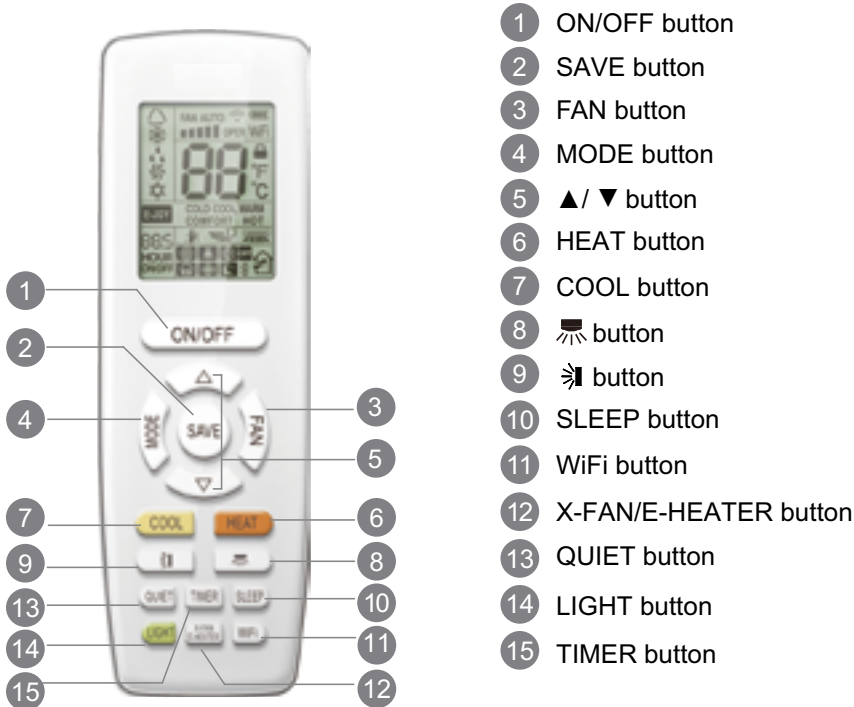
### Fan speed display

- Displays the fan speed. The fan speed is displayed as below:

| | | | (low) → | | | | | (medium) → | | | | | | | |  
 (high) → | | | | | | | | | (turbo)

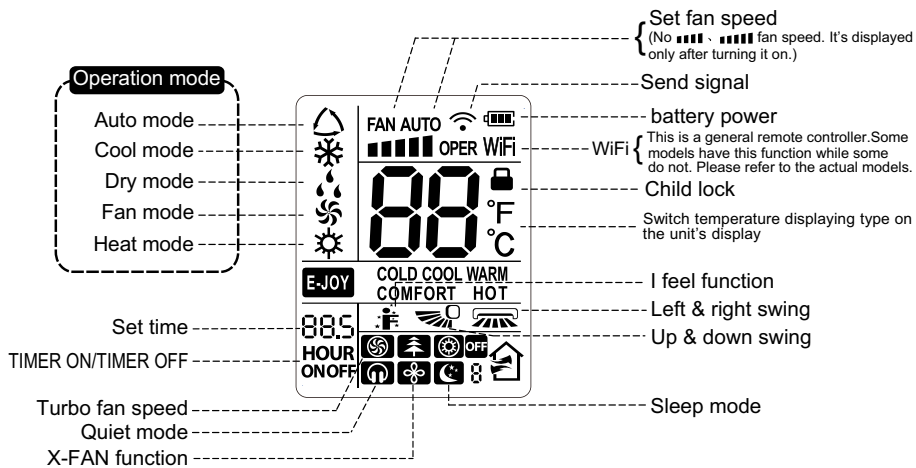
## 6.2 Remote Control Operations

### Buttons on remote controller



- 1 ON/OFF button
- 2 SAVE button
- 3 FAN button
- 4 MODE button
- 5 ▲/ ▼ button
- 6 HEAT button
- 7 COOL button
- 8 button
- 9 button
- 10 SLEEP button
- 11 WiFi button
- 12 X-FAN/E-HEATER button
- 13 QUIET button
- 14 LIGHT button
- 15 TIMER button

### Introduction for icons on display screen



### Introduction for buttons on remote controller

**Note:**

- This is a general use remote controller, it could be used for the air conditioners with multifunction; For some function, which the model doesn't have, if press the corresponding button on the remote controller that the unit will keep the original running status.
- After putting through the power, the air conditioner will give out a sound. Operation indicator "⏻" is ON. After that, you can operate the air conditioner by using remote controller.
- Under on status, pressing the button on the remote controller, the signal icon "📶" on the display of remote controller will blink once and the air conditioner will give out a "di" sound, which means the signal has been sent to the air conditioner.

**1** ON/OFF button

Press this button can turn on or turn off the air conditioner. After turning on the air conditioner, indoor unit will give out a sound.

**2** SAVE button

Under cooling mode, press this button to start up or turn off energy-saving function. When energy-saving function is started up, "SE" will be shown on remote controller, and air conditioner will adjust the set temperature automatically according to ex-factory setting to reach to the best energy-saving effect. Press this button again to exit energy-saving function.

**3** FAN button

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

**Note:**

- Under AUTO speed, air conditioner will select proper fan speed automatically according to ex-factory setting.
- It's Low fan speed under Dry mode.
- Turbo cannot be set in FAN mode.

**4** MODE button

Press this button to select your required operation mode.



- When selecting auto mode, air conditioner will operate automatically according to the sensed temperature. Set temperature can't be adjusted and will not be displayed as well. Press "FAN" button can adjust fan speed. Press "🌀" / "🌀" button can adjust fan blowing angle.
- After selecting cool mode, air conditioner will operate under cool mode. Cool indicator "❄️" on indoor unit is ON. Press "▲" or "▼" button to adjust set temperature. Press "FAN" button to adjust fan speed. Press "🌀" / "🌀" button to adjust fan blowing angle.
- When selecting dry mode, the air conditioner operates at low speed under dry mode. Dry indicator "💧" on indoor unit is ON. Under dry mode, fan speed can't be adjusted. Press "🌀" / "🌀" button to adjust fan blowing angle.
- When selecting fan mode, the air conditioner will only blow fan, no cooling and no heating. Fan indicator "🌀" on indoor unit is ON. Press "FAN" button to adjust fan speed. Press "🌀" / "🌀" button to adjust fan blowing angle.
- When selecting heating mode, the air conditioner operates under heat mode. Heat indicator "☀️" on indoor unit is ON. Press "▲" or "▼" button to adjust set temperature. Press "FAN" button to adjust fan speed. Press "🌀" / "🌀" button to adjust fan blowing angle. (Cooling only unit won't receive heating mode signal. If setting heat mode with remote controller, press ON/OFF button can't start up the unit).

**Note:**

- For preventing cold air, after starting up heating mode, indoor unit will delay 1~5 minutes to blow air (actual delay time is depend on indoor ambient temperature).
- Set temperature range from remote controller: 16~30°C (61-86°F); Fan speed: auto, low speed, medium speed, high speed, turbo speed.

**5** ▲/ ▼ button

- Press "▲" or "▼" button once increase or decrease set temperature 1°C (°F). Holding "▲" or "▼" button, 2s later, set temperature on remote controller will change quickly. On releasing button after setting is finished, temperature indicator on indoor unit will change accordingly. (Temperature can't be adjusted under auto mode)
- When setting TIMER ON, TIMER OFF, press "▲" or "▼" button to adjust time. (Refer to TIMER button for details)





**6** Cool button

- Press this button, unit will operate in cool mode.

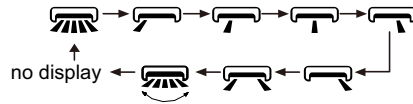
**7** Heat button




- Press this button, unit will operate in heat mode.

### 8 button





- Under simple swing mode, pres this button can turn on ("" icon is displayed) or turn off ("" icon is not displayed) the left&right swing function.
- When the unit is turned off by remote controller, press "▲" button and "" button can switch between single swing mode and fixed-angle swing mode. "" on the remote controller will flash twice.

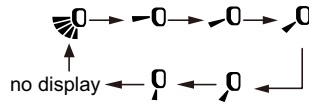
Under fixed-angle swing mode, press this button and then left&right swing status will circulate as shown in the right figure:



- This remote controller is the general type remote controller. When remote controller receives the signal of "", swing status is same as ""; when remote controller receives "", swing status is same as left&right swing OFF.

### 9 button

- Under simple swing mode, pres this button can turn on ("" icon is displayed) lor turn off ("" icon is not displayed) the up&down swing function.
- When the unit is turned off by remote controller, press "▲" button and "" button can switch between single swing mode and fixed-angle swing mode. "" on the remote controller will flash twice. Under fixed-angle swing mode, press this button and the up&down swing status will circulate as shown in the right figure:



### 10 SLEEP button


Under COOL, or HEAT mode, press this button to start up sleep function. "☾" icon is displayed on remote controller. Press this button again to cancel sleep function and "☾" icon will disappear. After powered on, Sleep Off is defaulted. After the unit is turned off, the Sleep function is canceled. In this mode, the time of time can be adjusted. Under Fan , DRY and Auto modes, this function is not available.

### 11 WiFi button

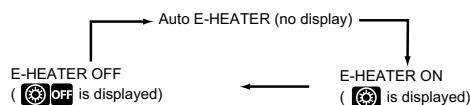
Press "WiFi" button to turn on or turn off WiFi function. When WiFi function is turned on, the "WiFi" icon will be displayed on remote controller; Under status of remote controller off, press "MODE" and "WiFi" buttons simultaneously for 1s, WiFi module will restore to factory default setting.

- This function is only available for some models.

### 12 X-FAN/E-HEATER button

Pressing this button in COOL or DRY mode, the icon "" is displayed and the indoor fan will continue operation for a few minutes in order to dry the indoor unit even though you have turned off the unit. After energization, X-FAN OFF is defaulted. X-FAN is not available in AUTO, FAN or HEAT mode. This function indicates that moisture on evaporator of indoor unit will be blown after the unit is stopped to avoid mould.

- Having set X FAN function on: After turning off the unit by pressing ON/OFF button indoor fan will continue running for about a few minutes. at low speed. In this period, press X-FAN button to stop indoor fan directly.
- Having set X FAN function off: After turning off the unit by pressing ON/OFF button, the complete unit will be off directly.
- Only under cooling mode and dry mode, press this button can turn on (characters of "X-FAN" are displayed) or turn off (characters of "X-FAN" are not displayed) X-FAN function.
- Under heating mode, press this button and the E-HEATER status will changed circularly as below:



**13** QUIET button

Press this button can turn on or turn off QUIET function.

- This function is not available for this unit.

**14** LIGHT button

Press this button to turn off display light on indoor unit. Press this button again to turn on display light.

**15** TIMER button

- At ON status, press this button once can set TIMER OFF. The character of HOUR and OFF will flash. Press "▲" or "▼" button within 5s can adjust the time of TIMER ON. After each pressing of "▲" or "▼" button, time will increase or decrease half an hour. When holding "▲" or "▼" button, 2s later, the time will change quickly until to reach to your required time. After that, press "TIMER" button to confirm it. The character of HOUR and OFF won't flash again. Cancel TIMER OFF: Press "TIMER" button again under TIMER OFF status.
- 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.

**Function introduction for combination buttons****Child lock function**

Press "▲" and "▼" simultaneously to turn on or turn off child lock function. When child lock function is on, "🔒" icon is displayed on remote controller. If you operate the remote controller, the "🔒" icon will blink three times without sending signal to the unit.

**Temperature display switchover function**

Under OFF status, press "▼" and "MODE" buttons simultaneously to switch temperature display 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 speed, medium speed, high speed, turbo speed.
5. Press "↻" button to select fan blowing angle.

**Replacement of batteries in remote controller**

1. Lift the cover along the direction of arrow (as shown in Fig 1 ①).
2. Take out the original batteries (as shown in Fig 1 ②).
3. Place two 7# (AAA 1.5V) dry batteries, and make sure the position of "+" polar and "-" polar is correct (as shown in Fig 2 ③).
4. Reinstall the cover (as shown in Fig 2 ④).



Fig.1

Fig.2

**NOTICE**

- 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.

## 6.3 Description of Each Control Operation

### 1. Basic Functions

#### 1.1 Cooling Mode

When  $T_{amb} \geq T_{preset} + 1^{\circ}\text{C}$ , the unit will run in cooling mode. Meanwhile, compressor and outdoor fan will run. Indoor fan will run at setting fan speed;

When  $T_{amb} \leq T_{preset} - 1^{\circ}\text{C}$ , the unit will stop running in cooling mode. Compressor and outdoor fan will stop running, while indoor fan is still running at setting fan speed;

When  $T_{preset} - 1^{\circ}\text{C} < T_{amb} < T_{preset} + 1^{\circ}\text{C}$ , the unit will keep previous running status;

#### 1.2 Dry Mode

When  $T_{amb} > T_{preset} + 2^{\circ}\text{C}$ , the unit will run at cooling mode. Meanwhile, compressor and outdoor fan will run. Indoor fan will run at low fan speed.

When  $T_{preset} - 2^{\circ}\text{C} \leq T_{amb} \leq T_{preset} + 2^{\circ}\text{C}$ , compressor and outdoor fan will run for 6mins and then stop running for 4mins and they will run like that circularly. Indoor fan will run at low fan speed;

When  $T_{amb} < T_{preset} - 2^{\circ}\text{C}$ , compressor and outdoor fan will stop running. Indoor fan will run at low fan speed.

#### 1.3 Heating Mode

When  $T_{amb} \leq T_{preset} - 1^{\circ}\text{C}$ , the unit will run in heating mode and the corresponding load will start running. Indoor fan will run at the condition of anti cold wind.

When  $T_{amb} \geq T_{preset} + 1^{\circ}\text{C}$ , the corresponding load will be stopped. Indoor fan will run at setting fan speed and the condition of blowing residual heat.

When  $T_{preset} < T_{amb} < T_{preset} + 1^{\circ}\text{C}$ , the unit will keep previous running status.

#### 1.4 Fan Mode

Indoor fan will run at setting fan speed. Compressor, outdoor fan and reversing valve will stop running.

#### 1.5 Auto Mode

In this mode, the unit will decide its running mode according to the ambient temperature.

When  $T_{amb} > 26^{\circ}\text{C}$ , the unit will run in cooling mode. Internal setting temperature is  $26^{\circ}\text{C}$ ;

When  $20^{\circ}\text{C} \leq T_{amb} \leq 26^{\circ}\text{C}$ , the unit will run in dry mode. Internal setting temperature is  $24^{\circ}\text{C}$ ;

When  $T_{amb} < 20^{\circ}\text{C}$ , the unit will run in heating mode. Internal setting temperature is  $20^{\circ}\text{C}$ . When  $T_{amb} \geq 24^{\circ}\text{C}$ , the unit will quit from the heating mode. As for the cooling only unit, when  $T_{amb} < 20^{\circ}\text{C}$ , the unit will run at fan mode and the internal setting temperature is  $20^{\circ}\text{C}$ . When  $T_{amb} \geq 24^{\circ}\text{C}$ , the unit will quit from the fan mode.

### 2. Protection Function

#### 2.1 Indoor Antifreezing Protection

When antifreezing protection is detected, the corresponding load will be stopped. After the antifreezing protection is released, controller will run at setting mode. Buttons won't be shielded during the antifreezing protection.

#### 2.2 High Pressure Protection of System

When high pressure protection is detected, the corresponding load will be stopped. All button and remote control signal will be shielded and E1 will be displayed; after high pressure protection of compressor is released, all buttons and remote control signal will become normal.

#### 2.3 Low Pressure Protection of System

When low pressure protection is detected for the first time, the corresponding load will be stopped and the indicator will blink. If the low pressure protection is detected for twice successively, the corresponding load will be stopped and E3 will be displayed. They can't resume automatically.

#### 2.4 High Temperature Protection for Discharge Pipe

When high temperature protection for discharge pipe is detected, the corresponding load will be stopped. E4 will be displayed.

#### 2.5 Indoor High Temperature Resistant Protection

When high temperature resistant protection is detected, the corresponding load will be stopped.

#### 2.6 Overcurrent Protection

When overcurrent protection is detected, the corresponding load will be stopped and E5 will be displayed.

### 3. Other Function

#### 3.1 Defrosting

The unit will judge according to the tube temperature and ambient temperature, when it's detected that the outdoor condenser is frosting, the unit will start defrosting. Indoor fan and four-way valve will stop running. After defrosting is finished, the unit will start heating normally. During the time of defrosting, Defrosting indicator is on.

#### 3.2 Swing Function

Users can start up or stop the function of up&down swing, right&left swing.



### 3.3 Sleep

- ① If the controller is in cooling or dry mode, after the sleep function is started, Tpreset will be increased but it won't increase over 3°C. Then the unit will run at the increased temperature.
- ② If the controller is in heating mode, after the sleep function is started, Tpreset will be decreased and it won't decrease over 3°C. Then the unit will run at the decreased temperature.

### 3.4 Timer

Timer ON and timer OFF can be set by remote controller or buttons and the setting range is 0.5~24hrs.

### 3.5 Buzzer

Upon energization and operation, the buzzer will give out a beep.

### 3.6 Power-off Memory Function

Memory content: mode, up&dwon swing (7 statuses), right&left swing (ON/OFF), setting temperature, setting fan speed, health, light, timer. After power failure, the unit will run according to the memory content automatically when power recovered. If energize the unit after power failure and the unit is turned on before power failure, the compressor will be delayed for 3mins for protection; if the unit is turned off before power failure, the compressor won't be delayed for 3mins for protection. If the timer is reached before power failure, the unit will run according to the mode before power failure after power recovered; if the timer isn't reached, the timer will be continued and time will be recalculated.

### 3.7 LED Display Module Control

#### 1. Indicator control

Indicator will be displayed according to current operation function.

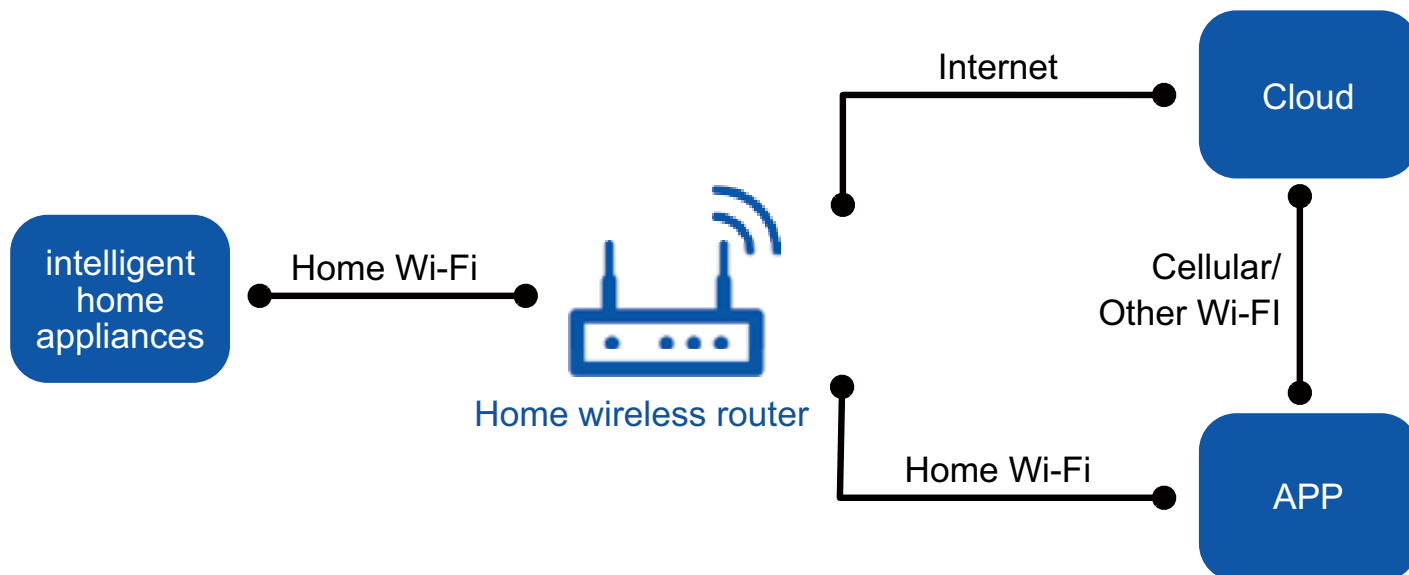
2. Use the light button on remote controller to turn off the LED display: When cancel the "light" by remote controller, the complete display screen will go out except the running indicator.

### 3.8 Buttons

- ① ON/OFF button: This button is used for control the on/off of controller. After each pressing of this button, the on/off status will be changes for once.
- ② Mode button: After pressing the mode button, it will be selected and display as: auto—cooling—drying—fan—heating (not available for cooling only unit).
- ③ +and – buttons: This two buttons are used for adjusting temperature and timer;
- ④ Up&down button: This button is used for control the up&dwon swing motor and it will be selected and displayed as: angle 1→angle 2→angle 3 →angle 4→angle 5→to-and-fro swing →stop swing.
- ⑤ Fan speed button: fan speed will be selected as: auto—low—medium—high—super-high;
- ⑥ Right&left swing button: This button is used for control the on/off of right&left swing motor. After each pressing this button, the on/off status of the right&left swing motor will be changed for once.

## 6.4 Ewpe Smart App Operation Manual

### Control Flow Chart



### Operating Systems

Requirement for User's smart phone:



iOS system  
Support iOS7.0 and  
above version



Android system  
Support Android 4.4 and  
above version

### Download and installation



App Download Linkage

Scan the QR code or search "Ewpe Smart" in the application market to download and install it. When "Ewpe Smart" App is installed, register the account and add the device to achieve long-distance control and LAN control of smart home appliances. For more information, please refer to "Help" in App.

# Part II : Installation and Maintenance

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## 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 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

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#### 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 .

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.

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

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

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

●When installing or moving this unit, do not charge the refrigerant which is not comply with that on the nameplate or unqualified refrigerant. Otherwise, it may cause abnormal operation, wrong action, mechanical malfunction or even series safety accident.

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

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

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

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

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

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

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

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

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

Poor connections may lead to electric shock or fire.

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

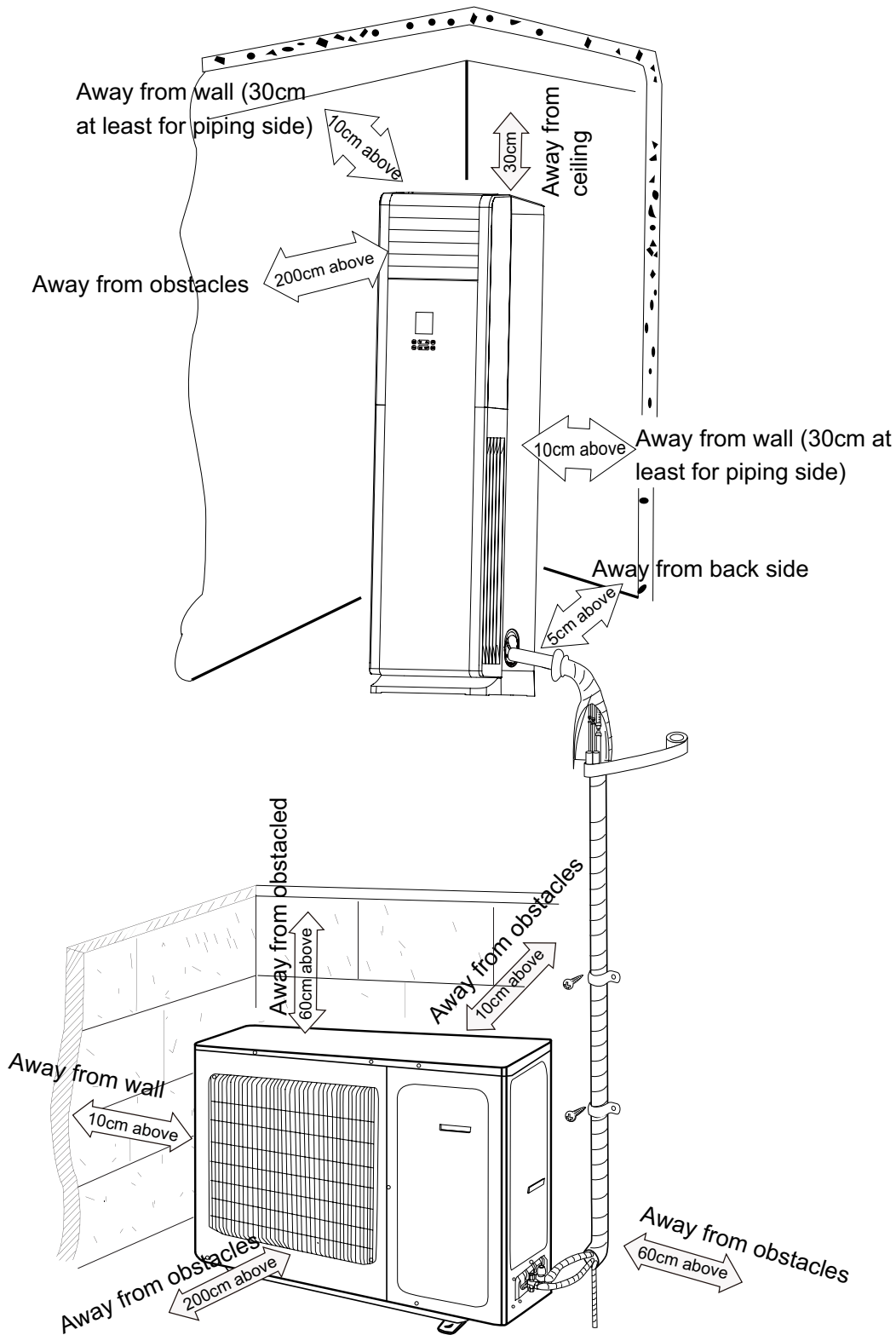
Electric wires with insufficient capacity, wrong wire connections and insecure wire terminals may cause electric shock or fire.

## Main Tools for Installation and Maintenance

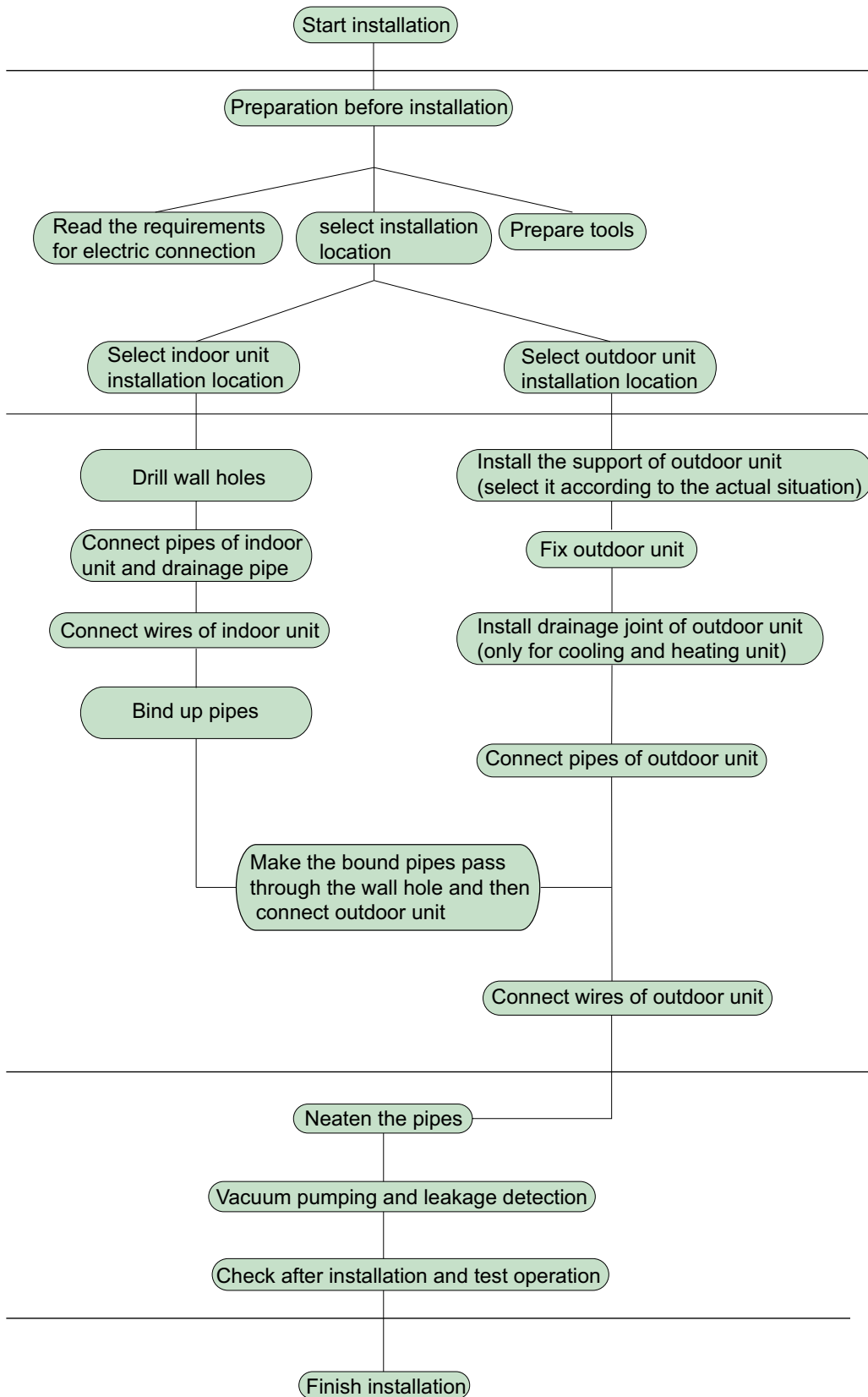
<p>1. Measuring tape</p> 	<p>2. Screw driver</p> 	<p>3. Impact drill, drill head, electric drill</p> 
<p>4. Electroprobe</p> 	<p>5. Universal meter</p> 	<p>6. Torque wrench, open-end wrench, inner hexagon spanner</p> 
<p>7. Electronic leakage detector</p> 	<p>8. Vacuum pump</p> 	<p>9. Pressure meter</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	7	Sealing gum
2	Outdoor unit	8	Wrapping tape
3	Connection pipe	9	Support of outdoor unit
4	Drainage pipe	10	Fixing screw
5	Connecting cable(power cord)	11	Drainage plug(cooling and heating unit)
6	Wall pipe	12	Owner's manual, remote controller

### ⚠ Note:

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

## 8.3 Selection of Installation Location

### 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.

### Indoor Unit:

1. Avoid installing the indoor unit in a place where generated or leaked inflammable gas will stay.
2. Avoid installing the indoor unit in a moist place or in a place where oil may be splashed on the unit.
3. Select a location where outlet air may reach each corner of the room.
4. Select a location where connection pipe can be led to outdoor conveniently.
5. Select a location where air inlet and outlet won't be blocked.
6. Select a location with least affection of outdoor air.
7. Select a location with firm and flat floor.
8. Retain sufficient space for maintenance and installation.
9. Ensure the installation meets the requirement of installation dimension diagram.
- 10.Keep it away from fluorescent lamp.

### 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.
6. The height difference between indoor unit and outdoor unit should be within 5m. The length of connection pipe should be within 10m.

## 8.4 Requirements for electric connection

### ⚠ Safety Precaution:

- 1.Must follow the electric safety regulations when installing the unit.
- 2.If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.
- 3.According to the local safety regulations, use qualified power supply circuit and air switch
- 4.A air switch having a contact separation of at least 3mm in all poles should be fixed in fixed wiring.
- 5.The appliance shall be installed in accordance with national wiring regulation.
- 6.The air switch must have the functions of magnetic tripping and heat tripping in order to prevent short circuit or overload. Please install the air switch with suitable capacity according to the sheet below.
- 7.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.
- 8.Properly connect the live wire, neutral wire and grounding wire of power socket.
- 9.Be sure to cut off the power supply before proceeding any work related to electric safety.
- 10.Do not put through the power before finishing installation.

### ⚠ Grounding Requirement:

1. The air conditioner is first class electric appliance. It must be properly grounded 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.

Model	Capacity of air switch
AST-24AI	25A

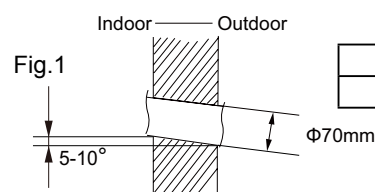
## 8.5 Installation of Indoor Unit

### Step one: choosing installation location

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

### Step two: open piping hole

- 1.Choose the position of piping hole according to the direction of outlet pipe.
- 2.Open a piping hole with the diameter of  $\Phi 70\text{mm}$  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  $5-10^\circ$ . (As show in Fig.1)



Model	Piping hole
AST-24AI	$\Phi 70\text{mm}$

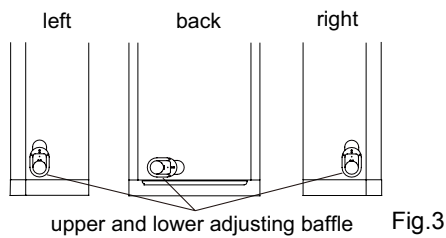
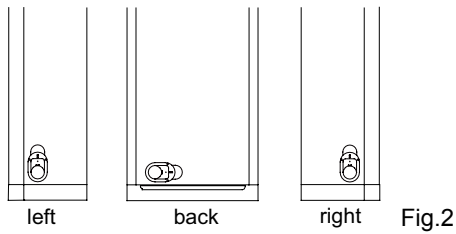


**⚠ Note:**

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.

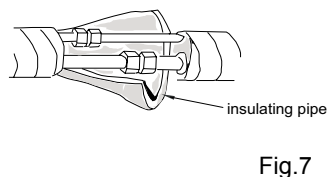
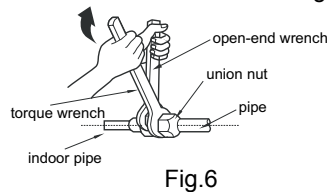
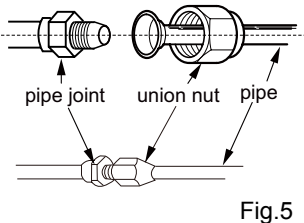
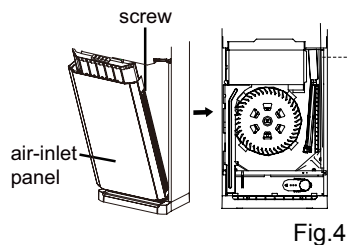
**Step three: outlet pipe**

1. The pipe can be led out in the direction of left, right or rear. (As show in Fig.2)
2. After confirming the direction of outlet pipe, loosen the screws at the upper and lower adjusting baffle to let the connection pipe/drain pipe connects the indoor unit. (As show in Fig.3)



**Step four: connect the pipe of indoor unit**

1. Take out the left and right screw cover and then remove the screws on air-inlet panel to remove the panel. (As show in Fig.4)
2. Aim the pipe joint at the corresponding bellmouth. (As show in Fig.5)
3. Pretightening the union nut with hand.
4. 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)
5. Wrap the indoor pipe and joint of connection pipe with insulating pipe, and then wrap it with tape. (As show in Fig.7)

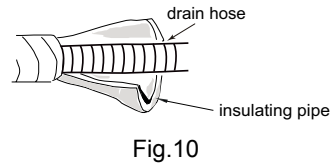
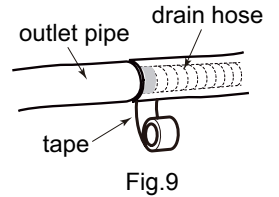
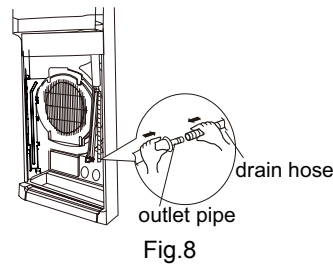


Refer to the following table for wrench moment of force :

Hex nut diameter(mm)	Tightening torque(N·m)
Φ6(1/4")	15~20
Φ9.52(3/8")	30~40
Φ12(1/2")	45~55
Φ16(5/8")	60~65
Φ19(3/4")	70~75

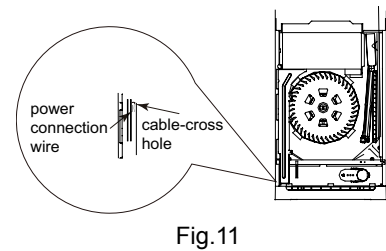
**Step five: install drain hose**

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.8)
3. Add insulating pipe in the indoor drain hose in order to prevent condensation. (As show in Fig.10)

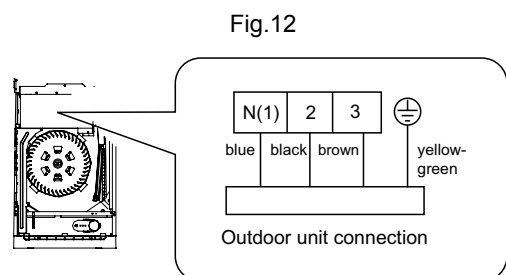


**Step six: connect wire of indoor unit**

1. Make the power connection wire go through the cable-cross hole of indoor unit. (As show in Fig.11)



2. 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 supply wire, power connection wire with wire clip. (As show in Fig.12)



3. Adjust the position of upper and lower adjusting baffle; clamp the connection pipe and drain pipe as firm as possible.
4. Tighten the screws.

**⚠ Note:**

All wires of indoor unit and outdoor unit should be connected by a professional.

- 1.If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.
- 2.For the air conditioner with plug, the plug should be reachable after finishing installation.
- 3.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.

**Step seven: bind up pipe**

1. Bind up the connection pipe, power cord and drain hose with the band.(As show in Fig.13)
- 2.Reserve a certain length of drain hose and power cord for installation when binding to a certain degree, separate the indoor power and then separate the drain hose.(As show in Fig.14)
3. Bind them evenly.
4. The liquid pipe and gas pipe should be bound separately at the end.

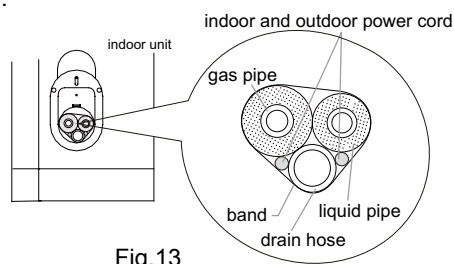


Fig.13

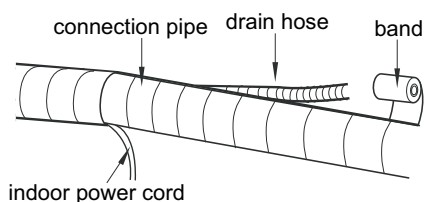


Fig.14

**⚠ Note:**

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

**Step Eight: place the indoor unit**

- 1.Put the bound pipes in the wall pipe and then make them pass through the wall hole.
2. Stuff the gap between pipes and wall hole with sealing gum. (As show in Fig.15)
3. Fix the wall pipe.
- 4.Check if the indoor unit is installed firmly.

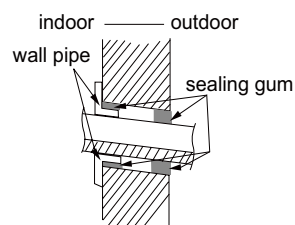


Fig.15

**⚠ Note:**

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

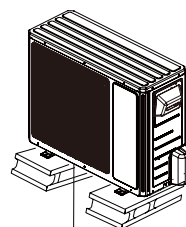
## 8.6 Installation of Outdoor Unit

**Step one: 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.16)
- 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.

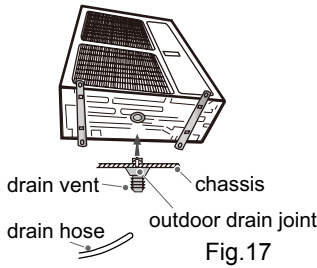


At least 3mm above the floor

Fig.16

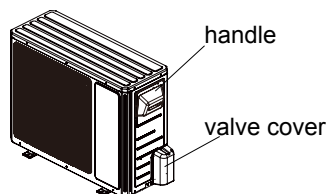
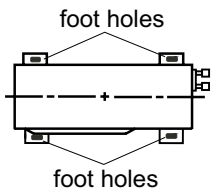
**Step two: install drain joint (only for cooling and heating unit)**

1. Connect the outdoor drain joint into the hole on the chassis, as shown in the picture below.
2. Connect the drain hose into the drain vent.(As show in Fig.17)



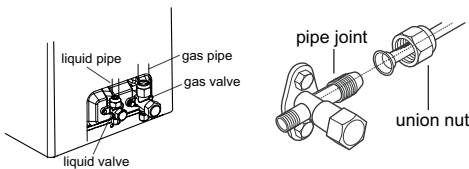
**Step three: fix outdoor unit**

1. Place the outdoor unit on the support.
2. Fix the foot holes of outdoor unit with bolts.(As show in Fig.18)



**Step four: connect indoor and outdoor pipes**

1. Remove the screw on the right handle of outdoor unit and then remove the handle.(As show in Fig.19)
2. Remove the screw cap of valve and aim the pipe joint at the bellmouth of pipe.(As show in Fig.20)

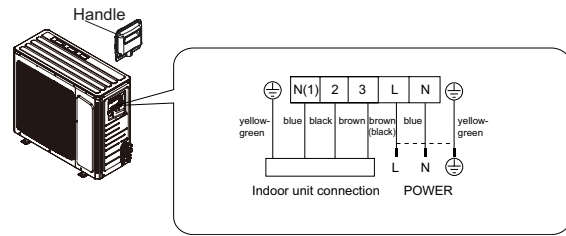


3. Pretightening the union nut with hand.
4. Tighten the union nut with torque wrench by referring to the sheet below.

Hex nut diameter(mm)	Tightening torque(N·m)
Φ6(1/4")	15~20
Φ9.52(3/8")	30~40
Φ12(1/2")	45~55
Φ16(5/8")	60~65
Φ19(3/4")	70~75

**Step five: connect outdoor electric wire**

1. Remove the wire clip; connect the power connection wire to the wiring terminal according to the color; fix them with screws. (As show in Fig.21)



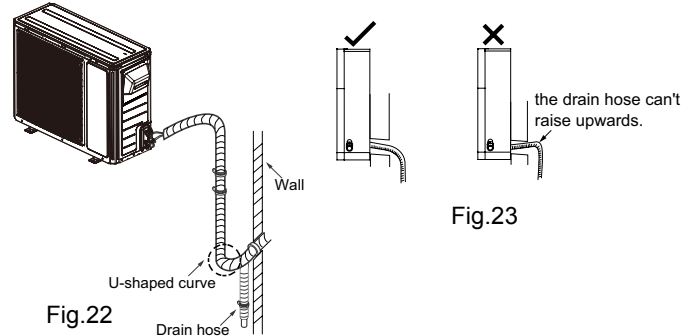
2. Fix the power connection wire with wire clip (only for cooling and heating unit).

**Note:**

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

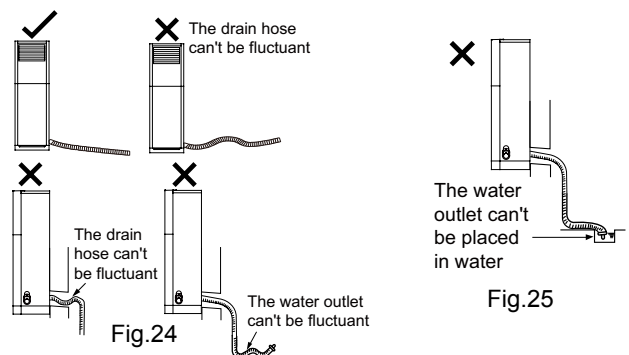
**Step six: neaten the pipes**

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.23)



**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.23)
- 2.Slant the drain hose slightly downwards. The drain hose can't be curved, raised and fluctuant, etc. (As show in Fig.24)
- 3.The water outlet can't be placed in water in order to drain smoothly.(As show in Fig.25)



## 8.7 Vacuum Pumping and Leak Detection

### 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  $-0.1\text{MPa}$ .
4. Close the vacuum pump and maintain this status for 1-2min to check if the pressure of piezometer remains in  $-0.1\text{MPa}$ . 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.26)

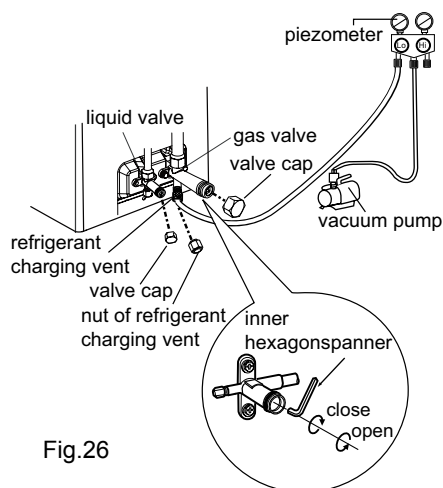


Fig.26

### Leakage Detection

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

## 8.8 Check after Installation and Test Operation

### 1. Check After Installation

Check according to the following requirement after finishing installation.

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

### 2. Test Operation

#### (1) Preparation of test operation

The client approves the air conditioner installation. Specify the important notes for air conditioner to the client.

#### (2) Method of test operation

Put through the power, press ON/OFF button on the remote controller to start operation. Press MODE button to select AUTO, COOL, DRY, FAN and HEAT to check whether the operation is normal or not. If the ambient temperature is lower than  $16\text{ }^{\circ}\text{C}$ , the air conditioner can't start cooling.

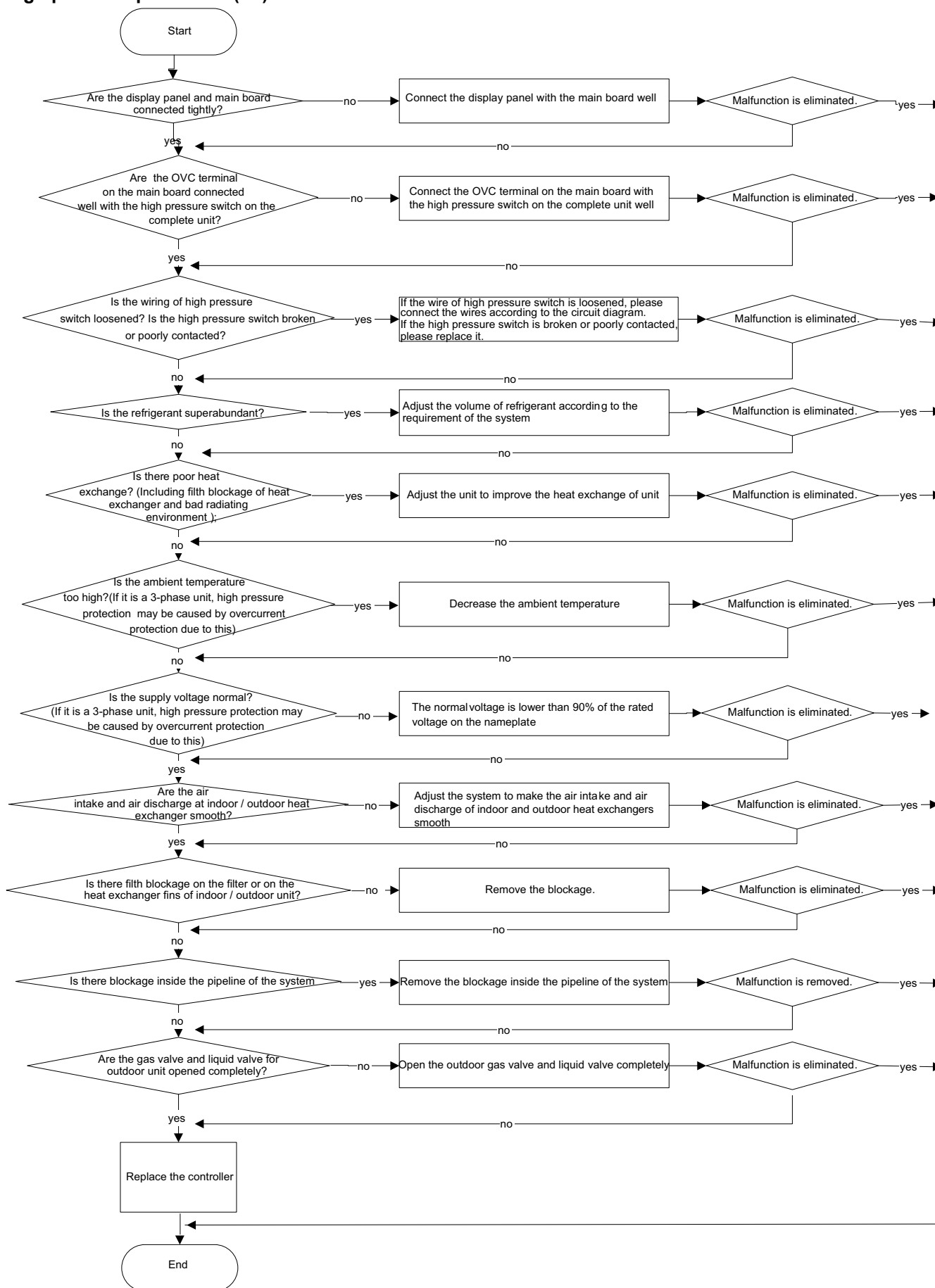
## 9.Troubleshooting

### 9.1 Judgement by Flashing LED of Indoor

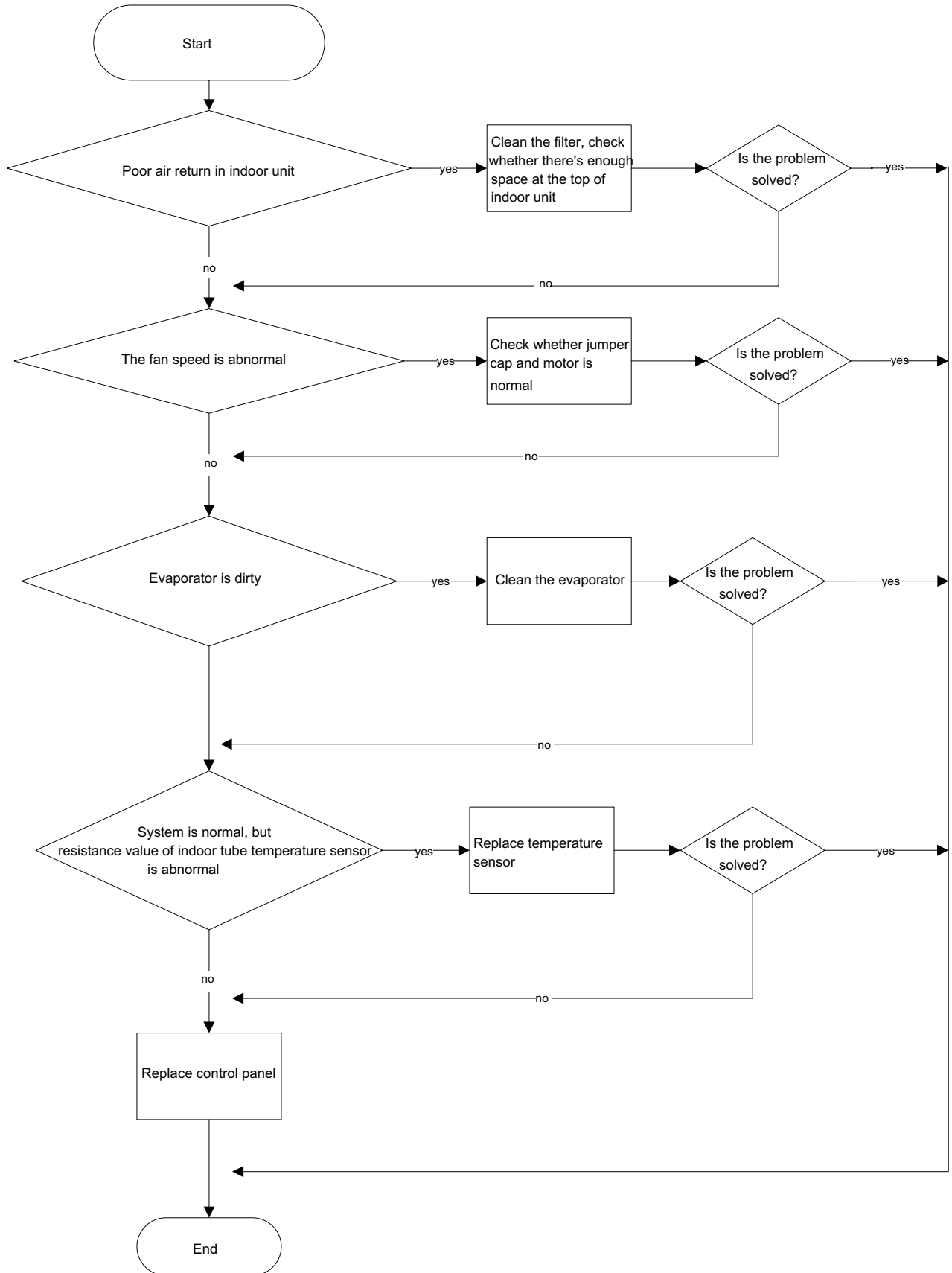
No.	Malfunction Name	Error Code	A/C Status	Possible Causes
1	High pressure protection	E1	During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, if it is inverter unit, the complete unit stops; if it is floor standing unit, the complete unit stops and operation of remote controller or controller is unavailable.	<ol style="list-style-type: none"> <li>1. The main board and the display panel are not connected well.</li> <li>2. The OVC terminal on main board is not connected well with the high pressure switch on the complete unit.</li> <li>3. The wiring of high pressure switch is loosened.</li> <li>4. Refrigerant is superabundant.</li> <li>5. Poor heat exchange (including blocked heat exchanger and bad radiating environment ).</li> <li>6. Ambient temperature is too high.(if it is 3-phase unit, the high pressure protection may be caused by overcurrent protection due to this reason)</li> <li>7. The supply voltage is abnormal.(if it is 3-phase unit, the high pressure protection may be caused by overcurrent protection due to this reason)</li> <li>8. The air intake and air discharge at indoor / outdoor heat exchanger are not smooth. The air cycle is short circuited.</li> <li>9. Filter and heat exchange fins of indoor/outdoor units are blocked.</li> <li>10. The system pipeline is blocked.</li> <li>11. The gas valve and liquid valve for outdoor unit are not completely opened.</li> <li>12. The OVC input is at high level.</li> </ol>
2	Freeze protection	E2	During cooling and drying operation,compressor and outdoor fan stop while indoor fan operates.	<ol style="list-style-type: none"> <li>1. Poor air-return in indoor unit.</li> <li>2. Abnormal fan speed.</li> <li>3. Dirty evaporator.</li> <li>4. System is normal, but the indoor tube temperature sensor is abnormal, or the tube temperature sensor is not connected well.</li> </ol>
3	Low pressure protection of compressor	E3	The complete unit stops	<ol style="list-style-type: none"> <li>1. The main board and display panel are not connected well.</li> <li>2. The LPP terminal on the main board is not connected well with the high pressure switch on the complete unit.</li> <li>3. The wiring of the high pressure switch is loosened. High pressure switch is damaged or poorly contacted.</li> <li>4. Insufficient or leaking out refrigerant.</li> <li>5. The LPP input is at high level.</li> </ol>
4	High discharge temperature protection of compressor	E4	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation,all loads stop.	<ol style="list-style-type: none"> <li>1. Abnormal system (e.g.: blockage, etc)</li> <li>2. Abnormal rotation speed of outdoor motor (cooling )</li> <li>3. Abnormal air intake (cooling)</li> <li>4. System is normal, but the compressor discharge temperature sensor is abnormal or poorly contacted.</li> </ol>
5	Overcurrent protection	E5	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	<ol style="list-style-type: none"> <li>1. Unstable supply voltage. Normal fluctuation shall be within 10% of the rated voltage on the nameplate.</li> <li>2. Supply voltage is too low and load is too high.</li> <li>3. Measure the current of live wire on main board. If the current isn't higher than the overcurrent protection value, please check the controller.</li> <li>4. The indoor and outdoor heat exchangers are too dirty, or the air inlet and air outlet are blocked.</li> <li>5. The fan motor is not running. Abnormal fan speed: fan speed is too low or the fan doesn't run.</li> <li>6. The compressor is not running normally. There is abnormal sound, oil leakage or the temperature of the shell is too high, etc.</li> <li>7. There's blockage in the system. (filth blockage, ice plug, greasy blockage, Y-valve hasn't beenopened completely)</li> </ol>

## 9.2 How to Check Simply the Main Part of Indoor

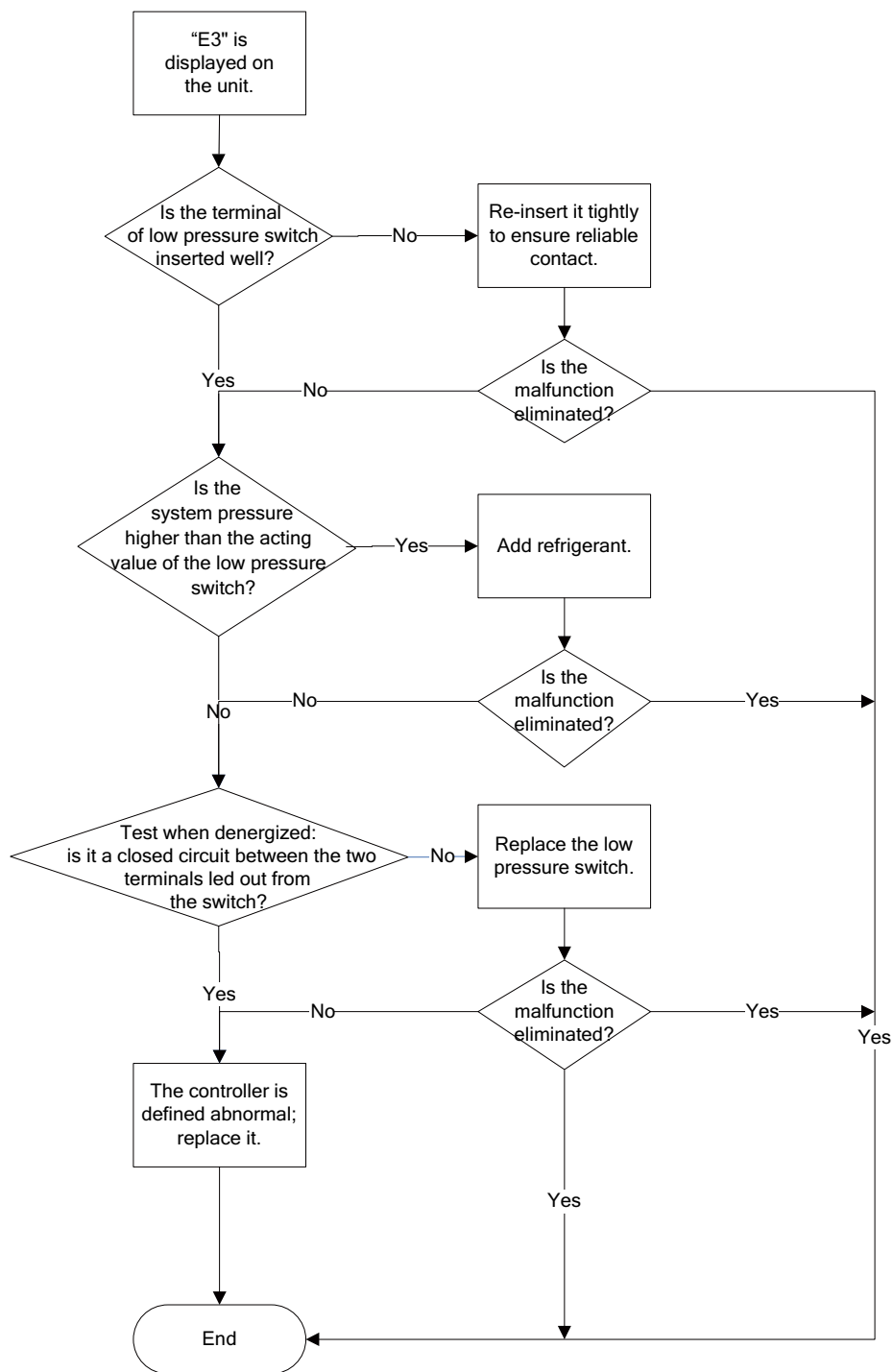
### (1) High pressure protection (E1)



(2) Freeze protection(E2)

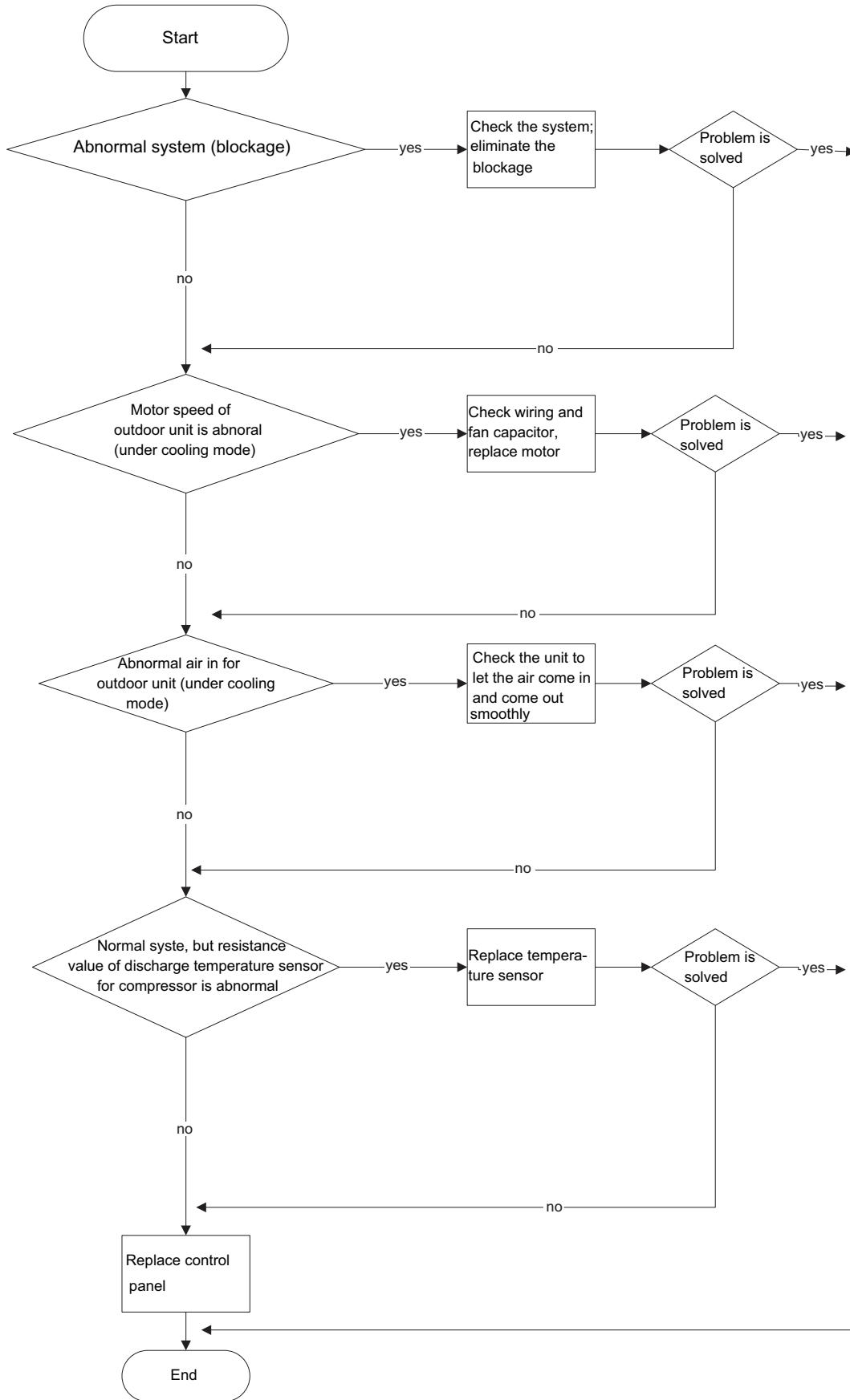


(3) Low pressure protection of compressor (E3)

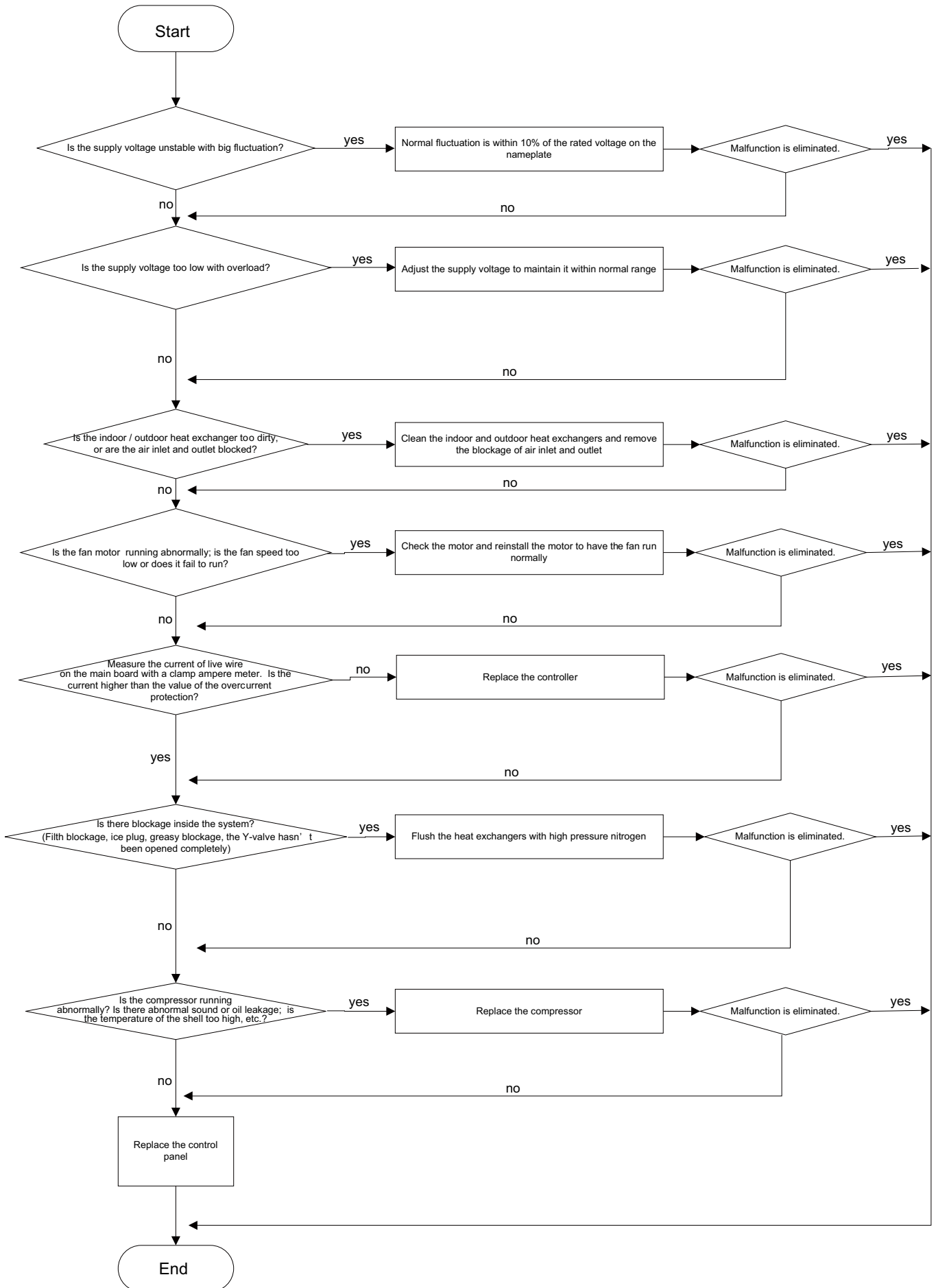




(4) High discharge temperature protection of compressor (E4)



(5) Overcurrent protection (E5)



### 9.3 Judgement by Flashing LED of Outdoor

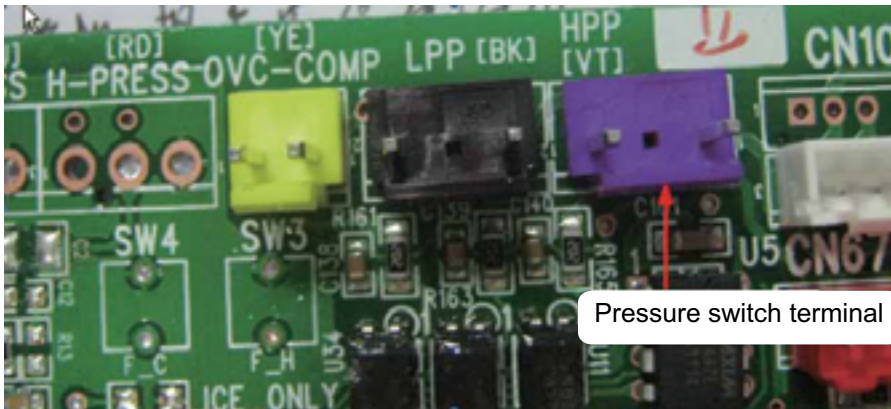
NO.	Name of malfunction	Outdoor Display Error Code
1	System high pressure protection	E1
2	Anti-freezing protection	E2
3	System low pressure protection	E3
4	Compressor exhaust high temperature protection	E4
5	Communication failure between indoor unit and outdoor unit	E6
6	Outdoor tube sensor open or short circuit	F2
7	Outdoor ambient sensor open or short circuit	F3
8	Exhaust sensor open or short circuit	F4
9	Outdoor DC fan motor malfunction	H6
10	Over compressor phase current protection	P5
11	Compressor overload protection	H3
12	IPM protection	H5
13	PFC protection	HC
14	Compressor loss step protection	H7
15	Startup failure	Lc
16	Capacitor charge malfunction	PU
17	IPM sensor circuit malfunction	P7
18	IPM high temperature protection	P8
19	Over voltage protection for PN	PH
20	Low PN voltage protection	PL
21	Current Detect Sensor malfunction	Pc
22	IPM Module Reset	P0
23	Phase Loss	Ld
24	Driver Module Communication Fail	P6
25	Charging Circuit Malfunction	PU

1. E1: High pressure protection

Malfunction description: The pressure of ODU high pressure side is too high.

Main check points:

- a. Is the system pressure is normal;
- b. Is the pressure switch is normal;
- c. If above two issues are normal, the mainboard circuit is with malfunction, please replace mainboard.



Pressure switch terminal of high Pressure

2. E2: Freeze protection

Malfunction description: Too low tube temperature of IDU under cooling mode.

Main check point:

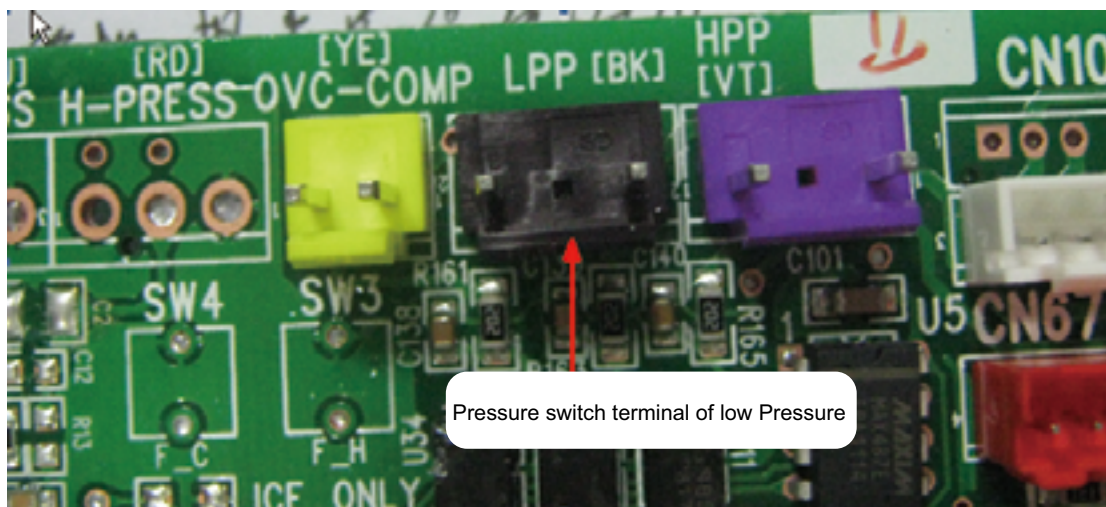
- a. Check if the IDU fan speed is normal, if the air inlet/outlet is smooth;
- b. Check if the IDU, ODU heat exchanger is too dirty that affect the heat exchanging effect.

3. E3: Low pressure protection

Malfunction description: The pressure of ODU low pressure side is too low

Main check points:

- a. Is the system pressure is normal;
- b. Is the pressure switch is normal;
- c. If above two issues are normal, the mainboard circuit is with malfunction, please replace mainboard.



4. E4: The air discharging temperature is too high

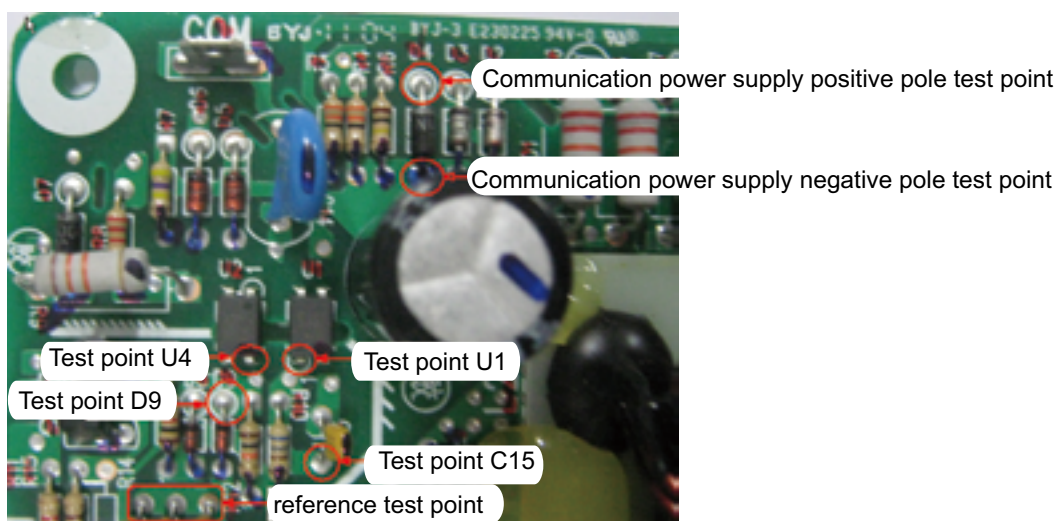
Main check points:

- a. Pull off the ODU air discharging temp. sensor, check if the temp. sensor resistance value match with present temperature;
- b. Check if the refrigerant is too much or too little;
- c. Check if the IDU, ODU heat exchanger is too dirty that affect the heat exchanging effect.

5. E6: IDU, ODU communication malfunction

Main check points:

- a. Check if the wiring connection if IDU and ODU is correct;
- b. Check if the filter communication power supply voltage is normal, if the DC voltage is more than  $54 \pm 15\%$ , please replace the ODU filter;
- c. Measure the voltage between D9/U2/C15/U1 and the reference point, if the voltage between D9/U2 and reference point is not within 0~5V, please replace the IDU mainboard; if the voltage between U1 and reference point is not within 0~1.1V, while the voltage between C15 and reference point is not within 0~5V, please replace ODU mainboard.



6. F2: ODU tube temp. sensor open/short circuit

Malfunction description: The ODU tube temp. sensor temperature value is too high or too low that out of the normal range.

Main check points:

- a. Pull off the ODU tube temp. sensor, check if the temp. sensor resistance value match with present temperature;
- b. If the temp. sensor resistance is normal, please replace ODU mainboard;

7. F3: ODU ambient temp. sensor open/short circuit

Malfunction description: The ODU ambient temp. sensor temperature value is too high or too low that out of the normal range.

Main check points:

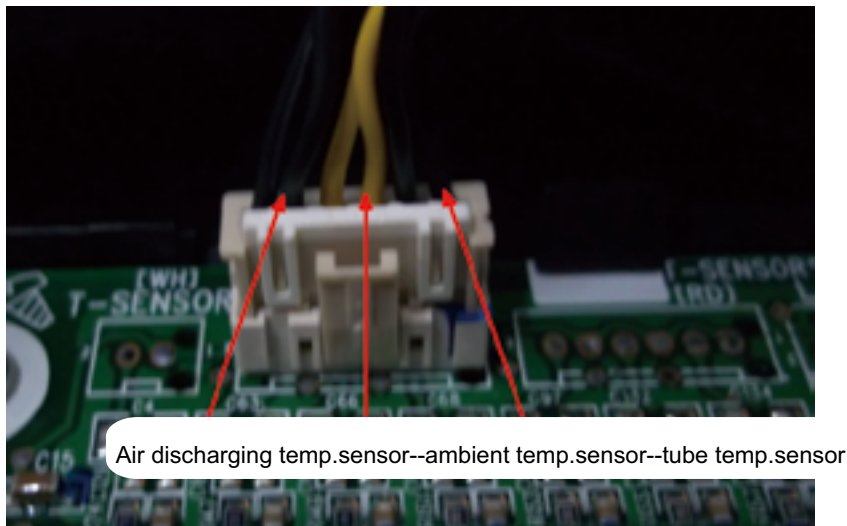
- a. Pull off the ODU ambient temp. sensor, check if the temp. sensor resistance value match with present temperature;
- b. If the temp. sensor resistance is normal, please replace ODU mainboard;

8. F4: ODU air discharging temp. sensor open, short circuit

Malfunction description: The ODU air discharging temp. sensor temperature value is too high or too low that out of the normal range.

Main check points:

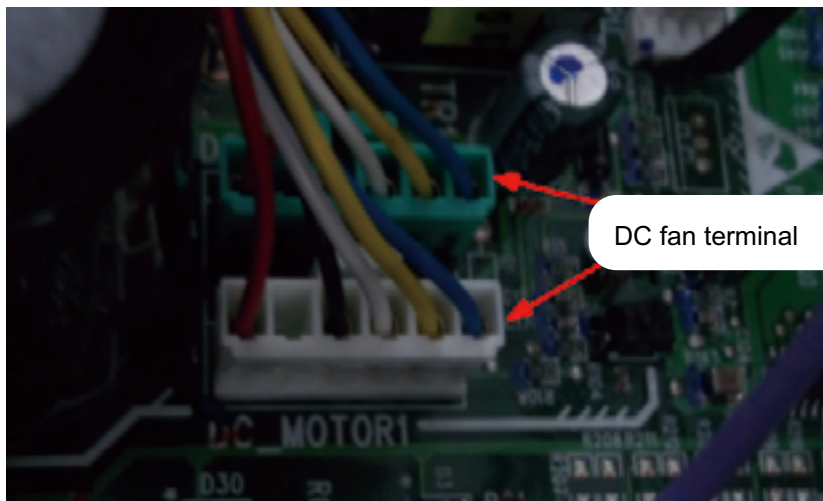
- a. Pull off the ODU air discharging temp. sensor, check if the temp. sensor resistance value match with present temperature;
- b. If the temp. sensor resistance is normal, please replace ODU mainboard;



9. H6: ODU DC fan malfunction

Main check points:

- a. Check if the DC fan connection terminal is well contacted.
  - b. If only one fan is with malfunction, please interchange the two fan terminal to see if the malfunction is eliminated. If so, the DC fan is with malfunction, please replace the DC fan, otherwise, please replace the ODU mainboard.
- If all above is normal, please replace the ODU mainboard.



## 10. P5: Compressor phase current overcurrent protection

Malfunction description: Compressor operation current is over than the setting protection value.

Main check points:

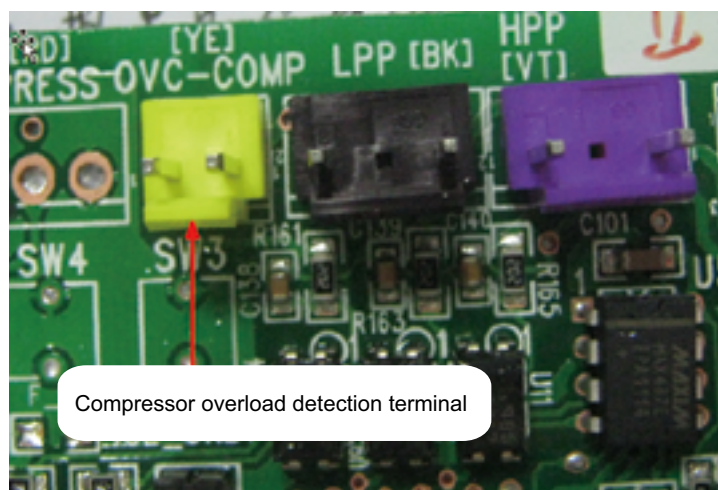
- Check if the indoor and outdoor ambient temperature is over than normal cooling, heating temperature range;
- Check if the evaporator is too dirty that affect the heat exchanging effect.

## 11. H3: Compressor overload protection

Malfunction description: Temperature of top compressor is over than the limit value

Main check points:

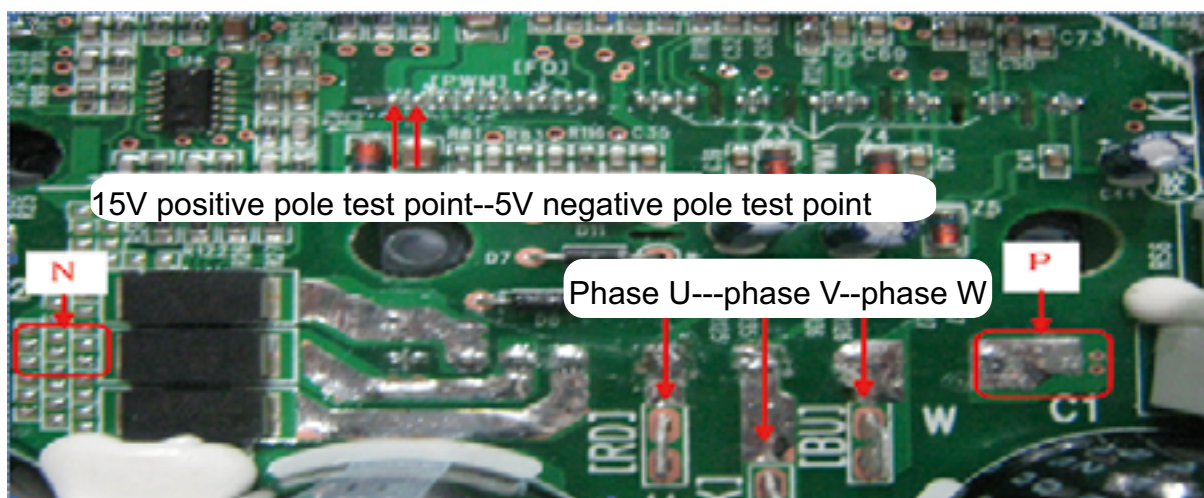
- Normally the compressor overload protection switch is always on, check if the switch is normal.



## 12. H5: IPM module protection

Main check points:

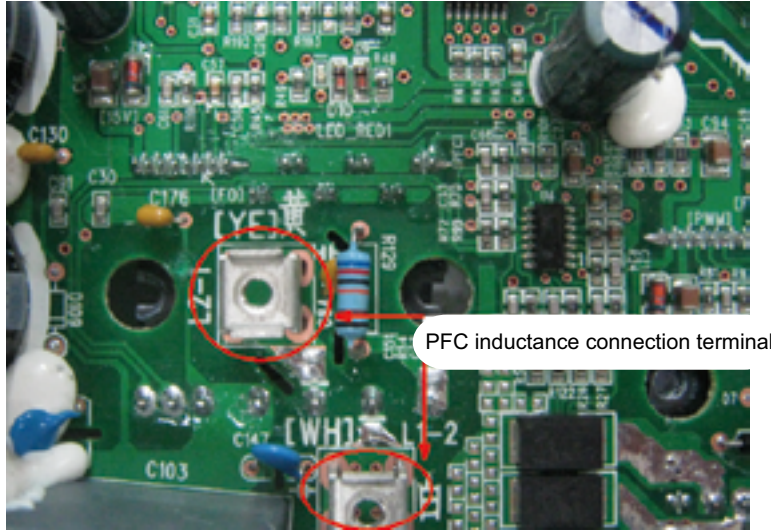
- Check if the compressor wiring connection is well connected, if the compressor wiring sequence is correct. The correct wiring sequence is yellow, blue, red in anticlockwise direction.
- Measure if the DC voltage between D10 is around 15V, if it is less than 13.5V or more than 18V, please replace ODU mainboard.
- Pull off the compressor connection wire, measure the impedance between phase U/V/W and P/N, if any of them is short circuit, please replace the ODU mainboard;
- Check if the compressor is damaged, measure the resistance between any two phases of the compressor three phases. They should be almost the same, if they're with big difference, the compressor is damaged, please check the insulation condition of three phases to the case.



13. HC: PFC protection

Main check points:

- a. Check if the unit voltage input is normal;
- b. Check if the inductance wire is well connected;
- c. If the above two issues are normal, please replace the ODU mainboard.



14. H7: Compressor out-of-step malfunction

Main check points:

- a. Check if the system pressure is too high?
- b. Check if the working voltage is too low?

15. Lc; Compressor startup failure

Main check points:

- a. Check if the compressor wiring connection is well connected;
- b. Check if the compressor startup interval is over 3 minutes, if not, please water for 3 minutes than turn on the unit;
- c. Check if there's too much refrigerant.
- d. Check if the compressor is damaged, measure the resistance between any two phase of the three phases, they should be almost the same, if they're with big difference, the compressor is damaged, please check the insulation condition of three phases to the case.

16. PU: ODU capacitor charging malfunction

Malfunction description: after the unit is energized, before the compressor starting operation, the electrolytic capacitor on mainboard should be charging. After the charging command is received, if it is detected by chip that the voltage of electrolytic capacitor is low, it is ODU capacitor charging malfunction.

Main check points:

- a. Check if the unit voltage input is within normal range.
- b. Check if the electric reactor connection wiring and capacitor connection wiring is well connected, if the electric reactor is open circuit.
- c. If above two issues are normal, please replace ODU mainboard.

17. P7: Module temp. sensor circuit malfunction

Malfunction description: There's a thermal resistance on top of IPM module, for detecting the module surface temperature, if it is detected by chip that the temperature is over the normal range.

Main check points:

- a. The circuit on mainboard is damaged, please replace the ODU mainboard.

18. P8: Module temperature too high protection

Main check points:

- a. After daubing radiating glue on IPM module, fix it with screw, if the glue is aging or the fixing screw is loosened, please daub the glue again or fix the screw and test again, if the malfunction still exist, please replace the mainboard.

19. PH: ODU DC bus bar voltage too high

Malfunction description: When it is detected the voltage of DC bus bar on electrolytic capacitor is over 400V.

Main check points:

- a. Check if the input voltage is too high that out of normal power supply voltage range.

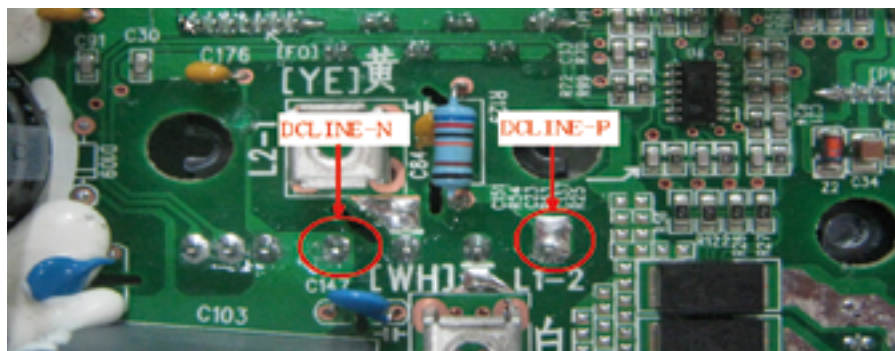
## 20. PL: ODU DC bus bar voltage too low

Malfunction description: When it is detected the voltage of DC bus bar on electrolytic capacitor is less than 200V.

Main check points:

a. Check if the input voltage is too low that out of normal power supply voltage range.

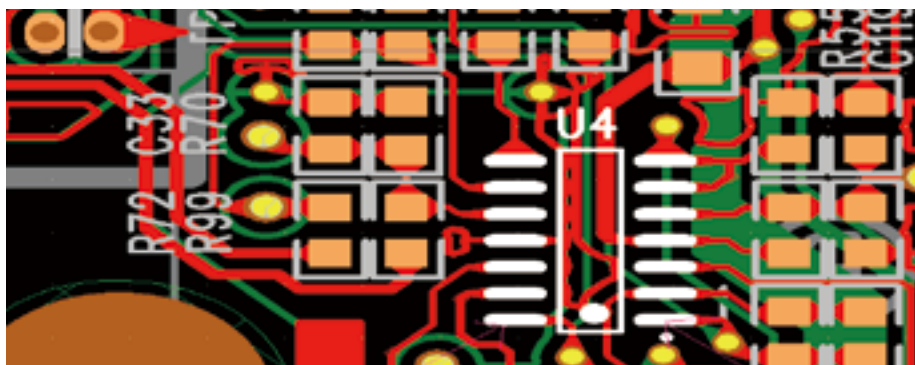
ODU DC bus bar voltage test point is showed as following picture, please measure the voltage of DCLINE-P and DCLINE-N with multimeter DC grade.



## 21. Pc: Current detection circuit malfunction/current sensor malfunction

Malfunction description: Check if IU and IV is more than  $1.65V \times 12.5\%$  before powering on the unit.

Main check points: Measure if the IU, IV us abnormal when power off the unit, if the voltage value is not around 1.65V, please replace the mainboard.



## 22. P0: IPM module reset

Malfunction description: DSP chip reset and initialize.

Main check points: Check if the wiring distribution in electric box is regular, tidy the wire and test again, if the problem still exist, please replace the mainboard.

## 23. Ld: Lack phase

Malfunction description: Compressor current is detected less than a certain value during operation.

Main check points: Check if the CPU mainboard is loosened or incorrect inserted. Well insert and test again, if the problem still exist, please replace the mainboard/

## 24. PU: Charging circuit malfunction

Malfunction description: The DC bus bar voltage is less than 100V during charging.

Main check points: Check if the circuit wiring connection is loosened or correct as wiring diagram, well connect the wire, if the malfunction still exist, please replace the mainboard.



## 9.4 Maintenance Method for Normal Malfunction

### 1. Air Conditioner Can't be Started Up

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

### 2. Poor Cooling (Heating) for Air Conditioner

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

### 3. Horizontal Louver Can't Swing

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

#### 4. ODU Fan Motor Can't Operate

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

#### 5. Compressor Can't Operate

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

#### 6. Air Conditioner is Leaking

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

#### 7. Abnormal Sound and Vibration

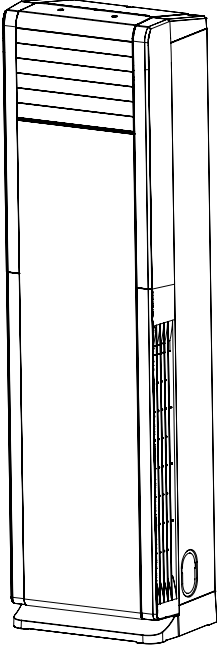
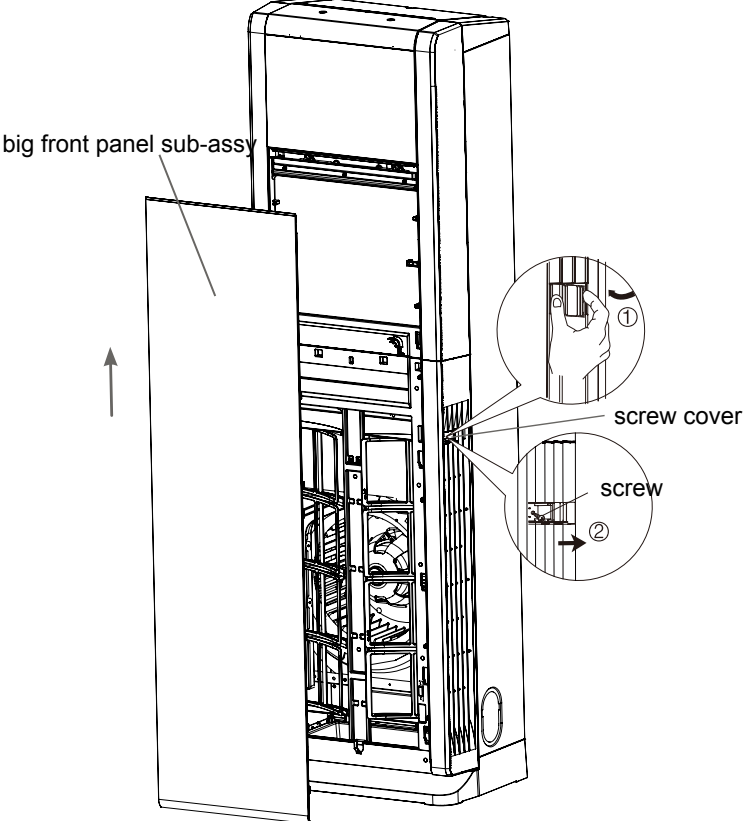
Possible causes	Discriminating method (air conditioner status)	Troubleshooting
When turn on or turn off the unit, the panel and other parts will expand and there's abnormal sound	There's the sound of "PAPA"	Normal phenomenon. Abnormal sound will disappear after a few minutes.
When turn on or turn off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

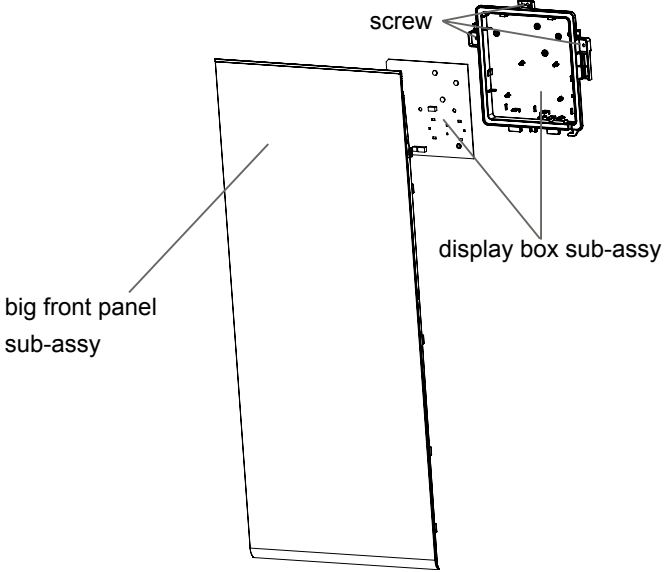
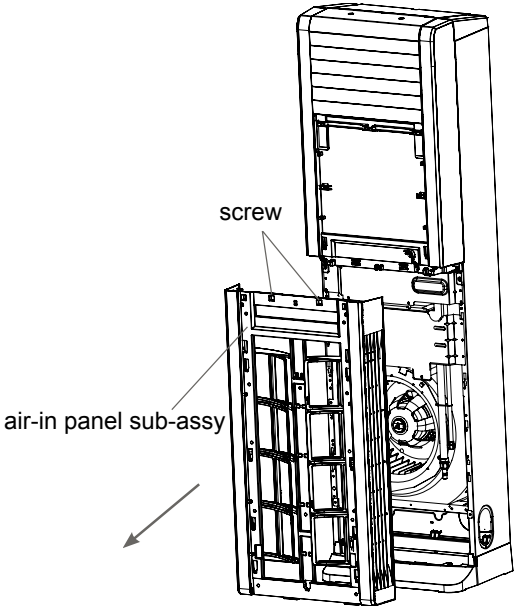
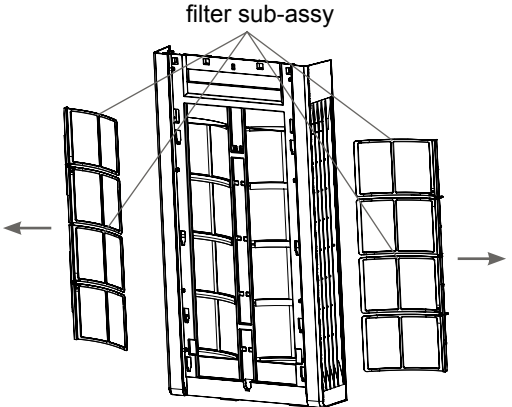
# 10. Removal Procedure

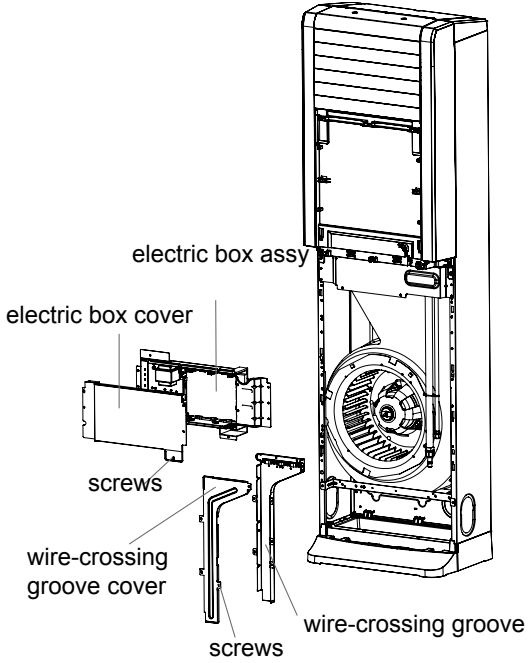
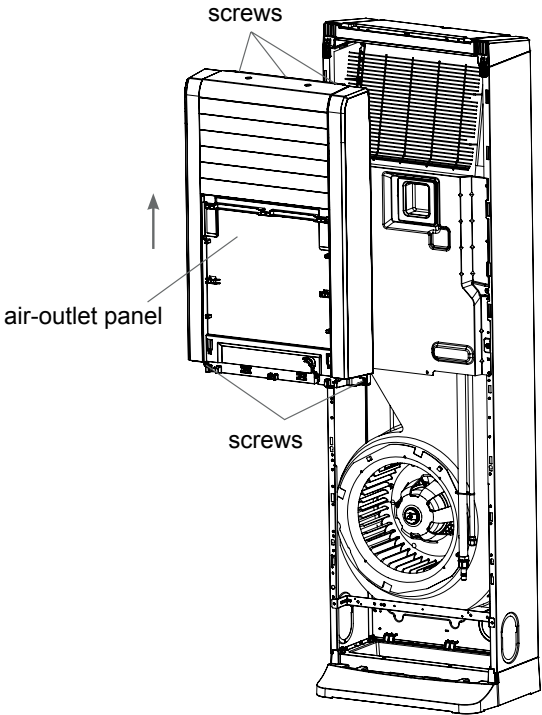


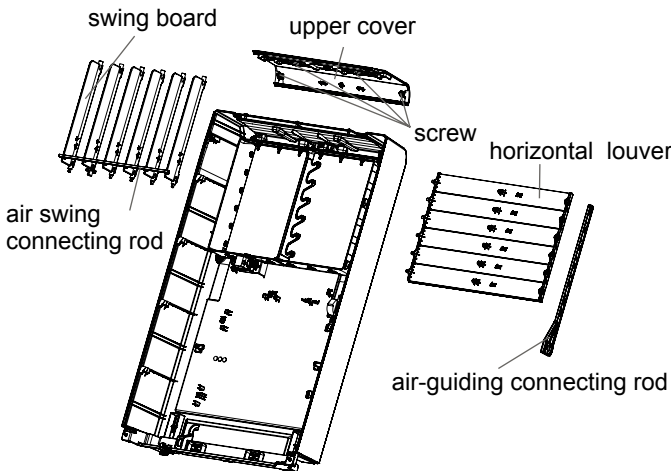
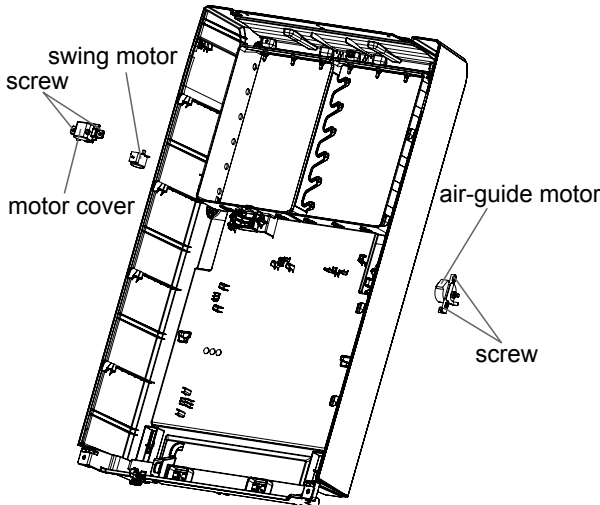
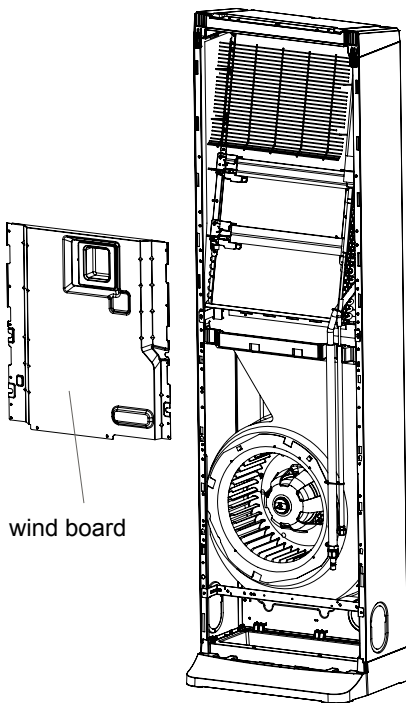
**Caution: discharge the refrigerant completely before removal.**

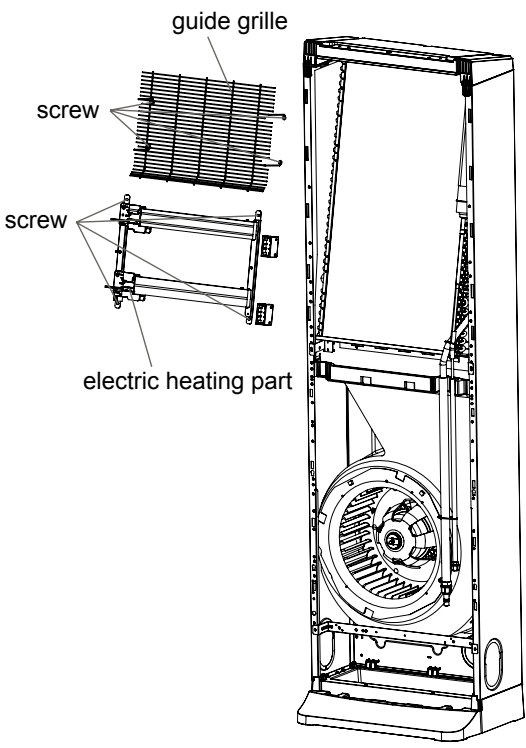
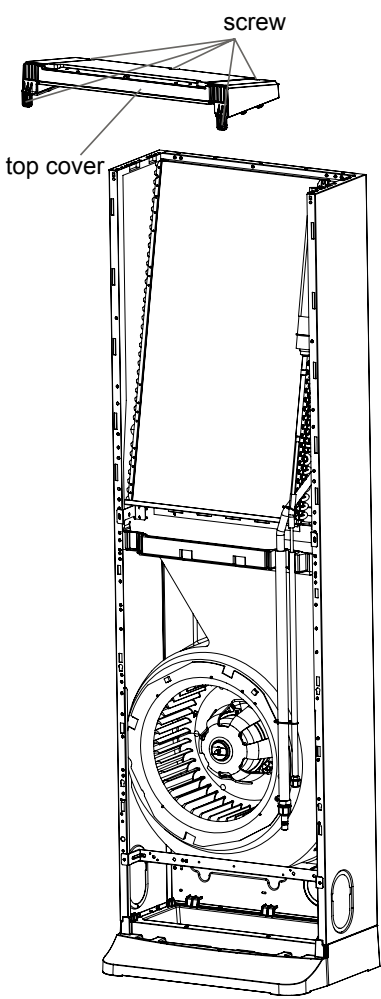
## 10.1 Removal Procedure of Indoor Unit

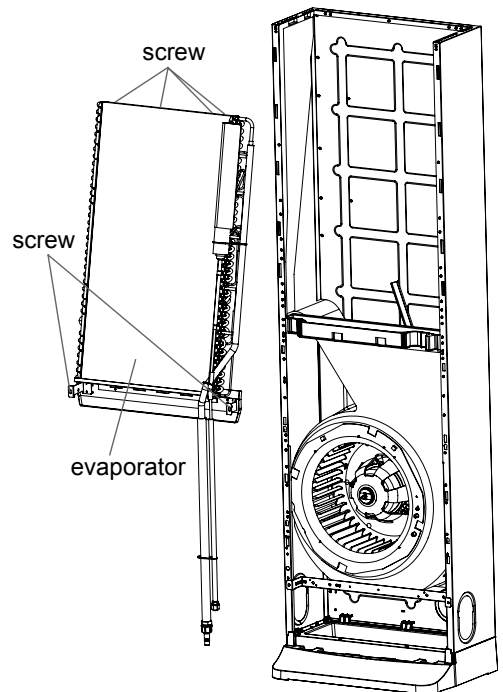
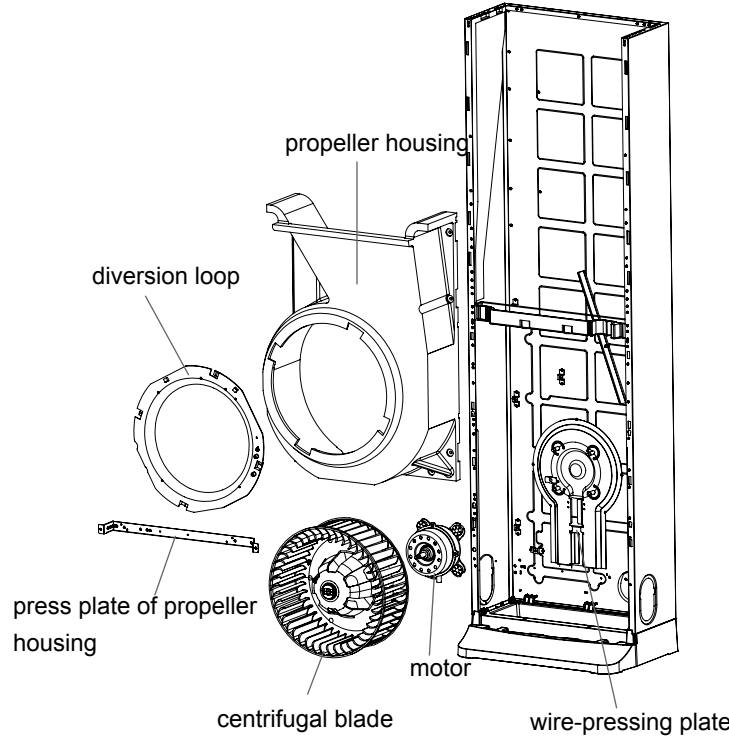
Step	Procedure
1. Outside view of indoor unit	
2. Remove the big front panel sub-assy	<p data-bbox="279 1240 740 1489">Open the screw cover, use screwdriver to remove the screws at both side of air-in panel, push the big front panel upwards and then separate the connector connected to the connection wire of display and then remove the big front panel.</p> 

Step	Procedure
<p>3.Remove display box sub-assy</p>	<p>Take out the connection wire of display from the wire groove, remove the fixing screws of display box sub-assy, and then remove the display box sub-assy.</p> 
<p>4. Remove air-in panel sub-assy</p>	<p>Remove two screws on the air-in panel sub-assy. Open the air-in panel along the arrow direction and then remove the air-in panel.</p> 
<p>5.Remove filter sub-assy</p>	<p>Extend your hands into grooves at both sides, pull it outwards and then draw out 4 filters.</p> 

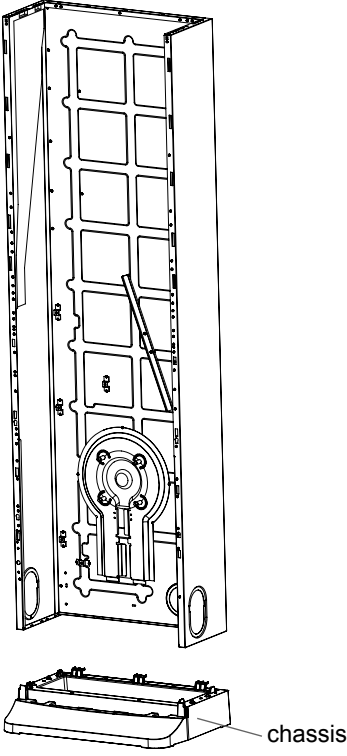
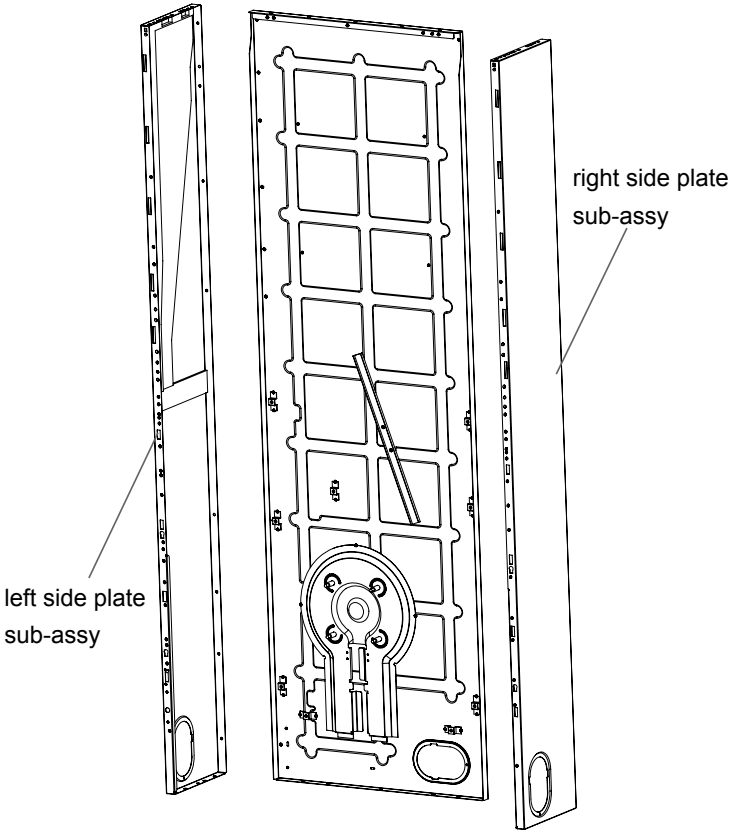
Step	Procedure
<p>6.Remove electric box and wire-passing groove sub-assy</p>	<p>Remove the four screws fixing the electric box cover and then remove the electric box cover; disconnect the wiring terminal of each electronic components and then remove related electronic components according to your requirements;</p> <ol style="list-style-type: none"> <li>1.Remove the two screws fixing the electric box assy and then lift the electric box assy outwards to remove it;</li> <li>2.Remove the four screws fixing the cover of wire-crossing groove and then remove the cover of wire-crossing groove;</li> <li>3.Remove the four screws fixing the wire-crossing groove and then remove the wire-crossing groove sub-assy.</li> </ol> 
<p>7.Remove air-outlet panel</p>	<p>Remove the three screws at the top and two screws at the lower part of air outlet panel and screws in the screw covers at two sides; push the air outlet panel upwards slightly to remove the air outlet panel assy.</p> 

Step	Procedure
<p>8.Remove upper cover, horizontal louver, swing board</p>	<p>a.Remove 2 screws at the upper part of the upper cover and two screws at the back side of the air-outlet panel.                      b.After removing the air-guiding connecting robe, and then pull the horizontal louver outwards to remove it.                      c.After removing the air swing connection rod, pull the swing board inwards to remove it.</p> 
<p>9.Remove swing motor and air-guide motor</p>	<p>a.Remove screws used for fixing the air-guide motor and the remove the air-guide motor.                      b.Remove screws used for fixing the motor cover, remove the motor cover and then remove the swing motor.</p> 
<p>10.Remove wind board</p>	<p>Remove 11 screws used for fixing the wind board and then remove the wind board.</p> 

Step	Procedure
<p>11.Remove electric heating part</p>	<p>Remove 4 screws used for fixing the guide grille and then remove the guide grille. Remove 4 screws fixing the electric heating part, and then remove the electric heating parts.</p> 
<p>12.Remove top cover</p>	<p>Remove 5 screws used for fixing the top cover, pull it upwards and then remove the top cover.</p> 

Step	Procedure
<p>13.Remove evaporator</p>	<p>Remove 4 screws used for fixing the top connection board and lower connection board of evaporator and 2 screws used for fixing the side plate, pull left and right side plates outwards slightly and take out evaporator, baffle board and water tray. After the evaporator is removed, remove left and right wind boards on the evaporator and the baffle board.</p> 
<p>14.Remove propeller housing, centrifugal blade and motor</p>	<p>a.Remove 3 screws used for fixing the press plate of propeller housing, and then take out the pressure plate of propeller housing.</p> <p>b.Rotate the diversion loop to a certain position in the clockwise direction and then take out the diversion loop,</p> <p>c.Remove 9 screws used for fixing the propeller housing and then take out the propeller housing.</p> <p>d.Use wrench to remove the nuts used for fixing the centrifugal blade and then pull the centrifugal blade outwards.</p> <p>e.Take out the centrifugal blade.</p> <p>f.Remove 4 screws fixing the motor and 2 screws fixing the wire-pressing late, and then remove the motor.</p> 



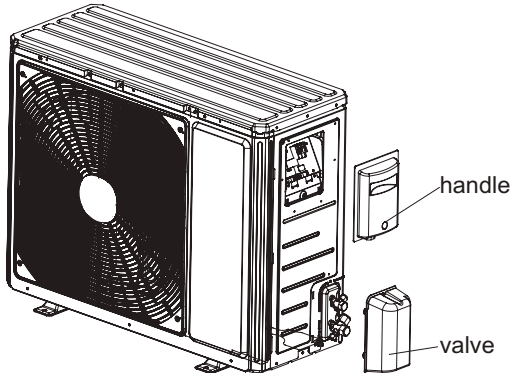
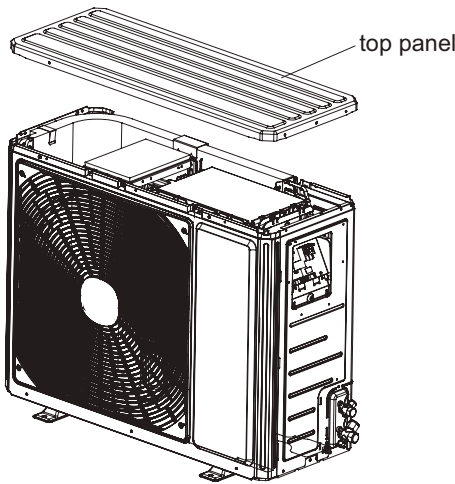
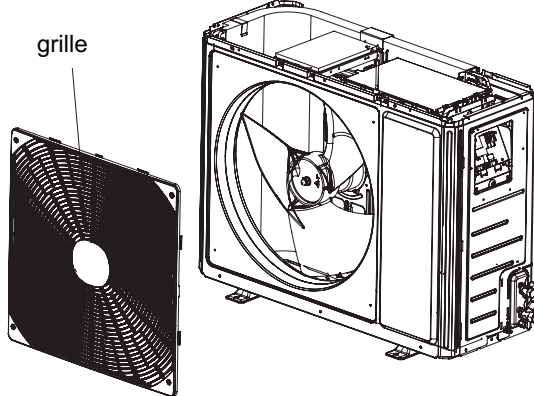
Step	Procedure
15.Remove chassis	<p data-bbox="224 301 685 366">Remove 9 screws, pull it downwards and then remove the chassis.</p> 
16.Remove left and right side plates sub-assy	<p data-bbox="224 1118 685 1227">Remove screws on both plates, pull it to both sides respectively and then remove left and right side plates sub-assy.</p> 

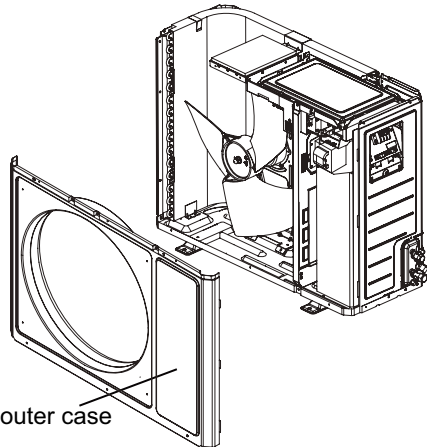
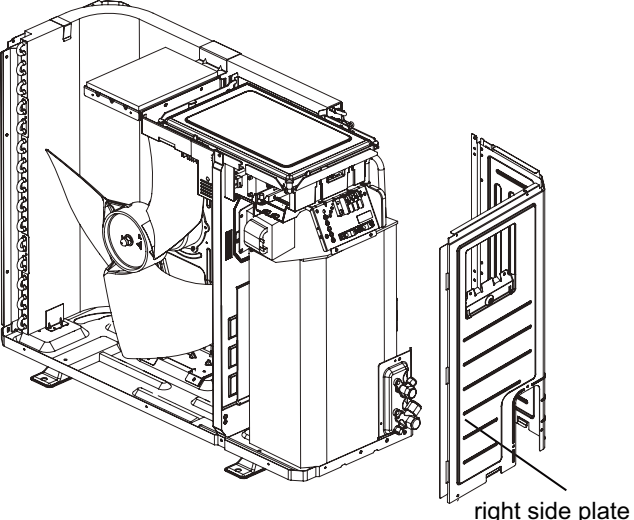
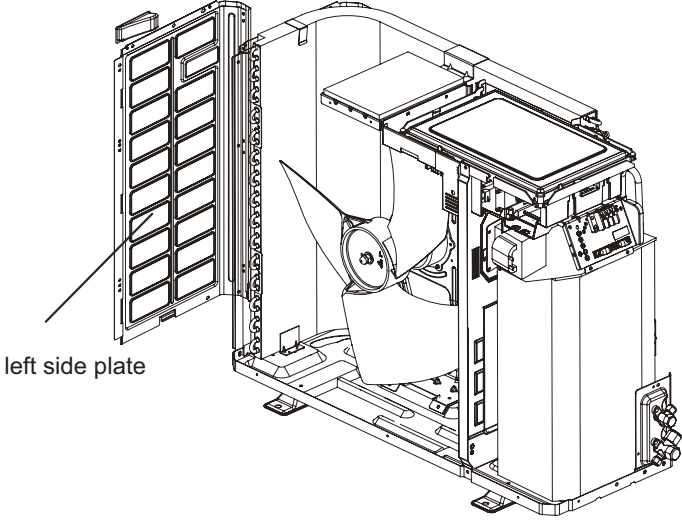
## 10.2 Removal Procedure of Outdoor Unit

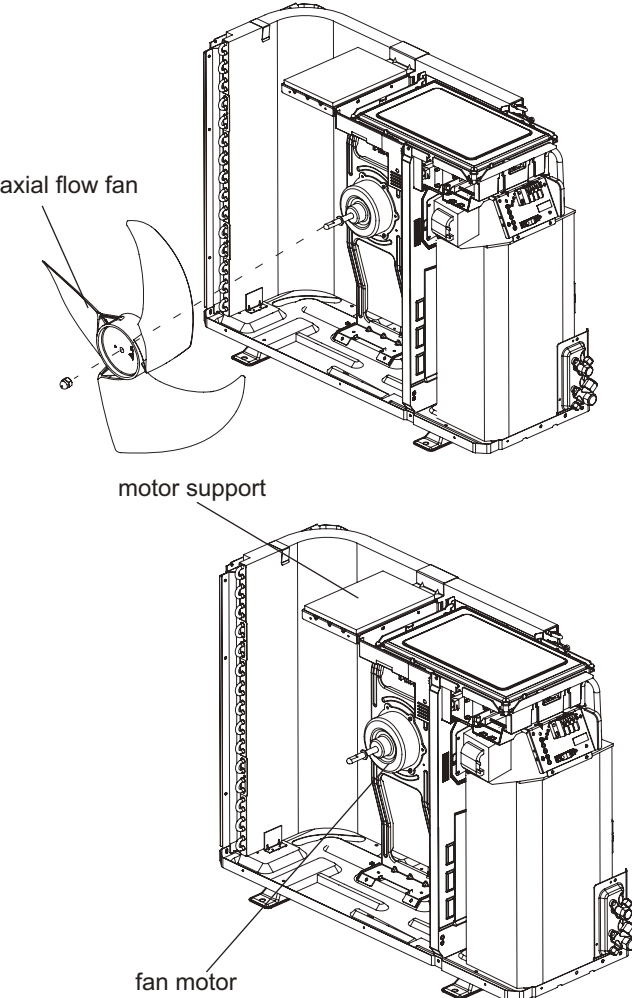
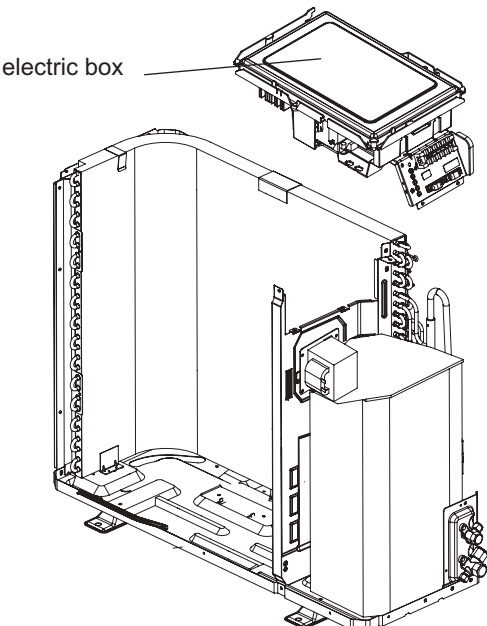


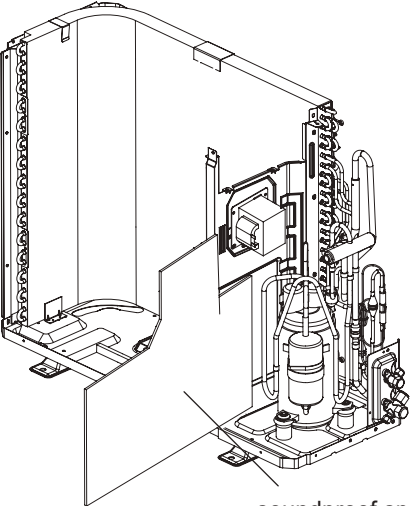
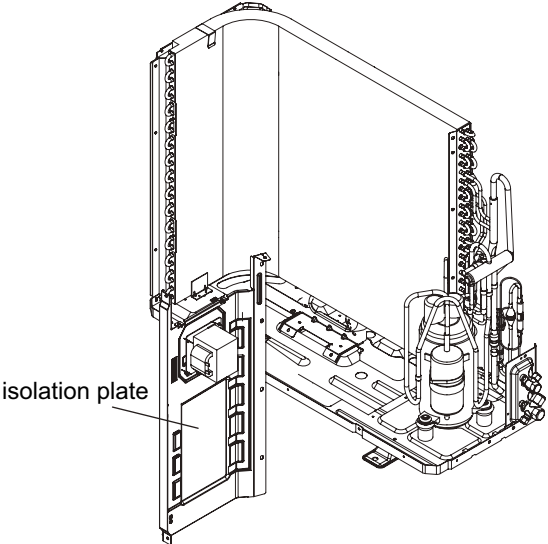
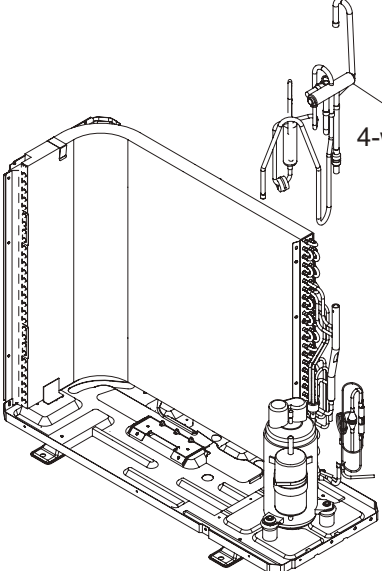
### Warning

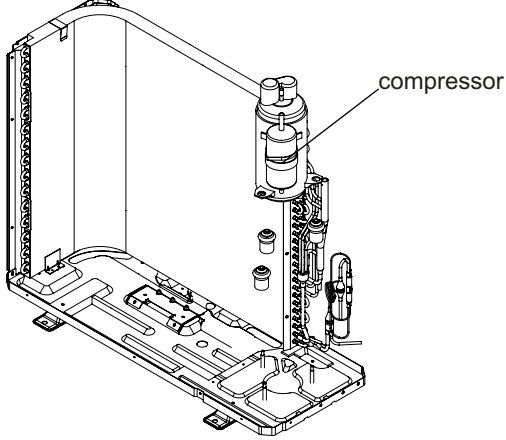
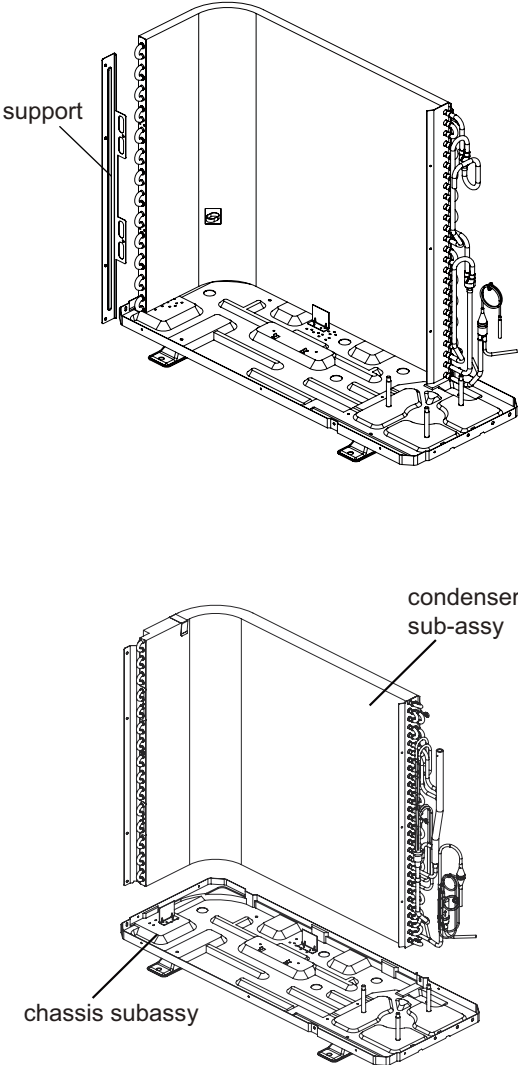
Be sure to wait for a minimum of 10 minutes after turning off all power supplies before disassembly.

Steps	Procedure
<p>1. Remove big handle, valve cover and top cover</p>	<p>Remove the screw connecting the big handle and right side plate, and then remove the big handle. Remove the screw connecting the valve cover and right side plate, and then remove the valve cover.</p>  <p>Remove the screws connecting the top cover with outer case, right side plate and left side plate; lift the top cover upwards to remove it.</p> 
<p>2. Remove grille and outer case</p>	<p>Remove the 4 screws connecting the grille and outer case, and then remove the panel grille.</p> 

Steps	Procedure
	<p data-bbox="207 373 755 528">Remove the screws connecting the outer case with motor support, isolation plate and chassis; lift the outer case upwards; loosen the clasps of outer case with right side plate and left side plate, and then remove the outer case.</p>  <p data-bbox="933 659 1047 683">outer case</p>
<p data-bbox="103 725 431 753">3. Remove right&amp;left side plate</p>	<p data-bbox="207 897 755 1022">Remove the screws connecting the right side plate with electric box assy, valve support, chassis and condenser side plate, and then remove the right side plate.</p>  <p data-bbox="1313 1247 1474 1271">right side plate</p> <p data-bbox="207 1539 755 1598">Remove the screws connecting the left side plate with chassis, and then remove the left side plate.</p>  <p data-bbox="818 1793 964 1817">left side plate</p>

Steps	Procedure	
4. Remove axial flow blade	<p>Remove the nut fixing axial flow blade and then remove the blade.</p> <p>Remove the 6 screws fixing the motor and then remove the motor. Remove the 2 screws connecting the motor support and chassis, and then loosen the stopper to remove the motor support.</p>	 <p>The diagram illustrates the removal of the axial flow fan and motor support. The top part shows the axial flow fan being detached from the motor support. The bottom part shows the fan motor and motor support being removed from the chassis. Labels include 'axial flow fan', 'motor support', and 'fan motor'.</p>
5. Remove electric box	<p>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>The diagram illustrates the removal of the electric box sub-assembly. The top part shows the electric box sub-assembly being lifted out of the chassis. The bottom part shows the chassis with the electric box sub-assembly removed. Label includes 'electric box'.</p>

Steps	Procedure	
6. Remove the soundproof sponge	<p>Tear off the sticking stripe and then remove the soundproof sponge.</p>	 <p>soundproof sponge</p>
7. Remove isolation plate	<p>Remove the 2 screws connecting the isolation plate and condenser side plate; remove the 3 screws connecting the isolation plate and chassis, and then remove the isolation plate.</p>	 <p>isolation plate</p>
8. Remove 4-way valve assy	<p>Unsolder the welding joints connecting the 4-way valve assy with capillary sub-assy, compressor and condenser; remove the 4-way valve.                      Note:                      Before unsoldering the welding joint, wrap the 4-way valve with a wet cloth completely to avoid damage to the valve caused by high temperature.</p>	 <p>4-way valve assy</p>

Steps	Procedure
<p>9. Remove compressor</p>	<p>Remove the 3 foot nuts fixing compressor and then lift the compressor upwards to remove the compressor and damping cushion.            Note:            Keep the ports of discharge pipe and suction pipe from foreign objects.</p> 
<p>10. Remove condenser sub-assy</p>	<p>Remove the screws connecting the support (condenser) and condenser assy, and then remove the support (condenser).</p> <p>Remove the 2 screws fixing the condenser and chassis, and then lift the condenser upwards to remove it.</p> 

# Appendix:

## Appendix 1: Reference Sheet of Celsius and Fahrenheit

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

### Set temperature

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

### Ambient temperature

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

## Appendix 2: Configuration of Connection Pipe

### 1. Standard length of connection pipe

- 5m, 7.5m, 8m.

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

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

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

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

Additional refrigerant charging amount for R22, R407C, R410A and R134a			
Diameter of connection pipe		Outdoor unit throttle	
Liquid pipe(mm)	Gas pipe(mm)	Cooling only(g/m)	Cooling and heating(g/m)
Φ6	Φ9.5 or Φ12	15	20
Φ6 or Φ9.5	Φ16 or Φ19	15	50
Φ12	Φ19 or Φ22.2	30	120
Φ16	Φ25.4 or Φ31.8	60	120
Φ19	/	250	250
Φ22.2	/	350	350

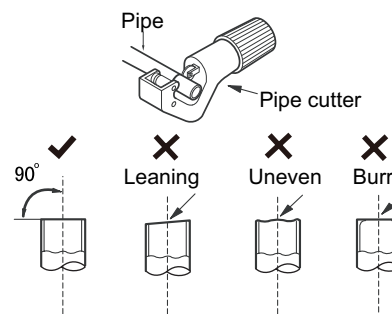
## Appendix 3: Pipe Expanding Method

**⚠ Note:**

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

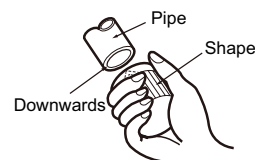
**A: Cut the pip**

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



**B: Remove the burrs**

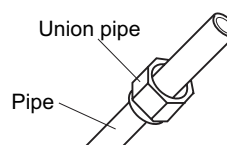
- Remove the burrs with shaper and prevent the burrs from getting into the pipe.



**C: Put on suitable insulating pipe**

**D: Put on the union nut**

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



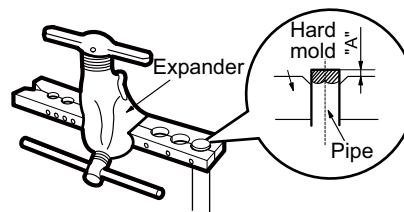
**E: Expand the port**

- Expand the port with expander.

**⚠ Note:**

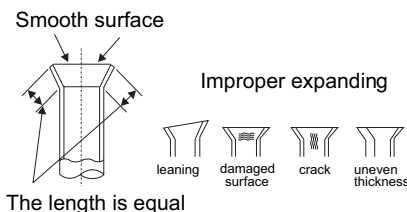
- "A" is different according to the diameter, please refer to the sheet below:

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



**F: Inspection**

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





## Appendix 4: List of Resistance for Temperature Sensor

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

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

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

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

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

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

# NOTE CONCERNING PROTECTION OF ENVIRONMENT

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This product must not be disposed of via normal household waste after its service life, but must be taken to a collection station for the recycling of electrical and electronic devices. The symbol on the product, the operating instructions or the packaging indicate such disposal procedures. The materials are recyclable in accordance with their respective symbols. By means of re-use, material recycling or any other form of recycling old appliances you are making an important contribution to the protection of our environment. Please ask your local council where your nearest disposal station is located.

## INFORMATION CONCERNING USED REFRIGERANT MEDIUM

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This unit is containing fluorinated gases included in the Kyoto protocol. The maintenance and the liquidation must be carried out by qualified personnel.

Type of refrigerant: R410A

The composition of the cooling medium R410A: (50% HFC-32, 50% HFC-125)

The quantity of the refrigerant: please see the unit label.

The value GWP: 2088 (1 kg R410A = 2,088 t CO<sub>2</sub> eq)

GWP = Global Warming Potential

In case of quality problem or other please contact your local supplier or authorized service center.

**Emergency number: 112**

## PRODUCER

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Great Britain

[www.sinclair-world.com](http://www.sinclair-world.com)

This product was manufactured in China (Made in China).

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