



Service Manual

Model: GVH24AK-K3DNC6A
(Refrigerant R410A)

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2. Specifications

2.1 Specification Sheet

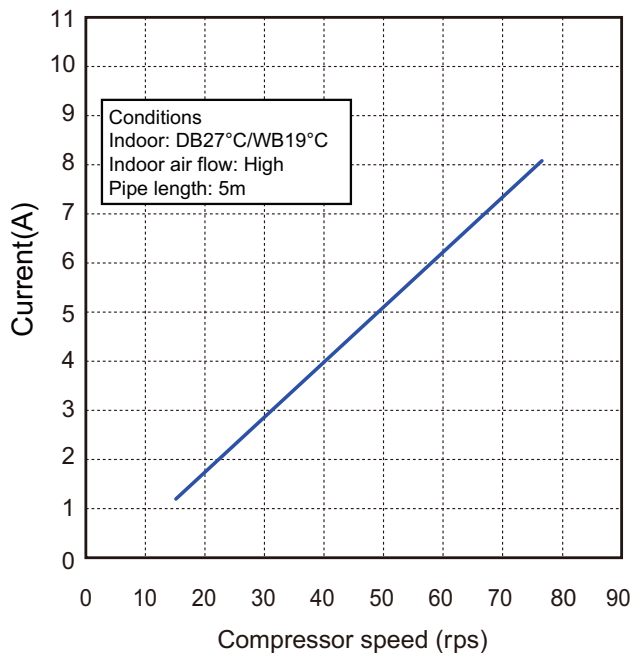
| Parameter | Unit | Value | |
|-------------------------------------|---|--------------------------------|-------------------------------|
| Model | | GVH24AK-K3DNC6A | |
| Product Code | | CH074000100 | |
| Power Supply | Rated Voltage | V~ 220-240 | |
| | Rated Frequency | Hz 50 | |
| | Phases | 1 | |
| Power Supply Mode | | Indoor | |
| Cooling Capacity(Min~Max) | W | 7200(1500~8800) | |
| Heating Capacity(Min~Max) | W | 9500(100~10020) | |
| Cooling Power Input(Min~Max) | W | 2140(340~3250) | |
| Heating Power Input(Min~Max) | W | 3060(270~4000) | |
| Cooling Current Input | A | 9.5 | |
| Heating Current Input | A | 13.5 | |
| Rated Input | W | 4000 | |
| Rated Current | A | 17.4 | |
| Air Flow Volume (SH/H/MH/M/ML/L/SL) | m ³ /h | 1200/1100/1000/900/800/700/550 | |
| Dehumidifying Volume | L/h | 2 | |
| EER | W/W | 3.36 | |
| COP | W/W | 3.10 | |
| SEER | W/W | 6.10 | |
| SCOP | W/W | 4.00 | |
| Application Area | m ² | 27-42 | |
| Indoor Unit | Indoor Unit Model | GVH24AK-K3DNC6A/I | |
| | Indoor Unit Product Code | CH074N00100 | |
| | Fan Type | Cross-flow | |
| | Fan Diameter Length(DXL) | mm | Φ106X961 |
| | Cooling Speed (SH/H/MH/M/ML/L/SL) | r/min | 1140/1050/950/850/750/650/500 |
| | Heating Speed (SH/H/MH/M/ML/L/SL) | r/min | 1140/1050/950/850/750/650/500 |
| | Fan Motor Power Output | W | 30 |
| | Fan Motor RLA | A | 0.22 |
| | Fan Motor Capacitor | μF | / |
| | Heater Power Input | W | 2100 |
| | Evaporator Form | | Aluminum Fin-copper Tube |
| | Evaporator Pipe Diameter | mm | Φ7 |
| | Evaporator Row-fin Gap | mm | 2-1.5 |
| | Evaporator Coil Length (LXD _X W) | mm | 440X25.4X952.5 |
| | Swing Motor Model | | MP35GT |
| | Swing Motor Power Output | W | 2.5 |
| | Fuse Current | A | 3.15 |
| | Sound Pressure Level (SH/H/MH/M/ML/L/SL) | dB (A) | 48/45/43/40/37/35/30 |
| | Sound Power Level (SH/H/MH/M/ML/L/SL) | dB (A) | 58/55/53/50/47/45/40 |
| | Dimension (WXHXD) | mm | 395X1844X462 |
| | Dimension of Carton Box (LXWXH) | mm | 575X498X2020 |
| | Dimension of Package(LXWXH) | mm | 578X501X2035 |
| | Net Weight | kg | 46 |
| Gross Weight | kg | 64 | |

| | | | | |
|--|---|-------------------|----------------------------------|--------------------------------|
| Outdoor Unit | Outdoor Unit Model | | GVH24AK-K3DNC6A/O | |
| | Outdoor Unit Product Code | | CH074W00100 | |
| | Compressor Manufacturer | | ZHUHAI LANDA COMPRESSOR CO.,LTD. | |
| | Compressor Model | | QXAT-D20zF030 | |
| | Compressor Oil | | RB68EP | |
| | Compressor Type | | Rotary | |
| | Compressor LRA. | A | | 30 |
| | Compressor RLA | A | | 15 |
| | Compressor Power Input | W | | 2300 |
| | Compressor Overload Protector | | | 1NT11L-6233/HPC 115/95 /KSD115 |
| | Throttling Method | | | Electron expansion valve |
| | Set Temperature Range | °C | | 16~30 |
| | Cooling Operation Ambient Temperature Range | °C | | 18~54 |
| | Heating Operation Ambient Temperature Range | °C | | -30~24 |
| | Condenser Form | | | Aluminum Fin-copper Tube |
| | Condenser Pipe Diameter | mm | | Φ7 |
| | Condenser Rows-fin Gap | mm | | 2-1.4 |
| | Condenser Coil Length (LXDXW) | mm | | 985X38.1X748 |
| | Fan Motor Speed | rpm | | 780/740/710/680 |
| | Fan Motor Power Output | W | | 90 |
| | Fan Motor RLA | A | | 0.39 |
| | Fan Motor Capacitor | μF | | / |
| | Outdoor Unit Air Flow Volume | m ³ /h | | 4000 |
| | Fan Type | | | Axial-flow |
| | Fan Diameter | mm | | Φ550 |
| | 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) | | 58/-/- |
| | Sound Power Level (H/M/L) | dB (A) | | 68/-/- |
| Dimension(WXHXD) | mm | | 1000X790X427 | |
| Dimension of Carton Box (LXWXH) | mm | | 1080X485X840 | |
| Dimension of Package(LXWXH) | mm | | 1083X488X855 | |
| Net Weight | kg | | 63 | |
| Gross Weight | kg | | 68 | |
| Refrigerant | | | R410A | |
| Refrigerant Charge | kg | | 2.0 | |
| Connection Pipe | Connection Pipe Length | m | 5 | |
| | Connection Pipe Gas Additional Charge | g/m | 50 | |
| | Outer Diameter Liquid Pipe | mm | Φ6 | |
| | Outer Diameter Gas Pipe | mm | Φ16 | |
| | Max Distance Height | m | 10 | |
| | Max Distance Length | m | 25 | |
| Note: The connection pipe applies metric diameter. | | | | |

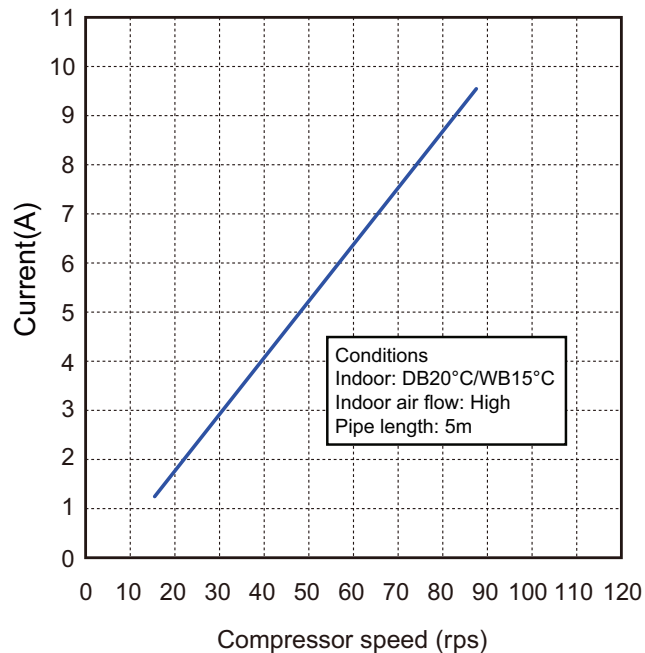
The above data is subject to change without notice. Please refer to the nameplate of the unit.

2.2 Operation Characteristic Curve

Cooling

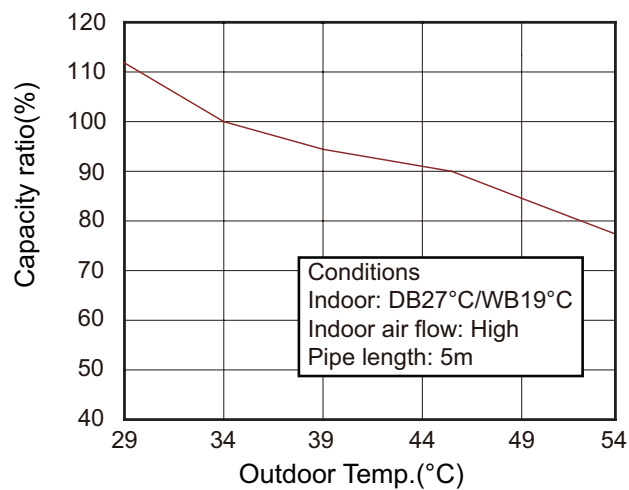


Heating

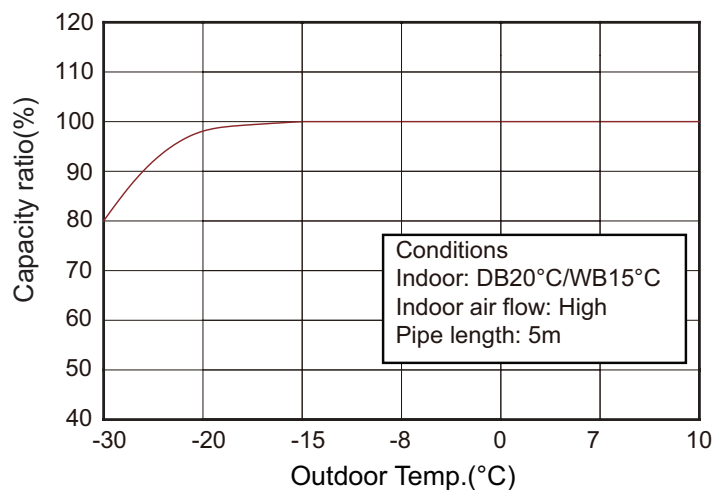


2.3 Capacity Variation Ratio According to Temperature

Cooling

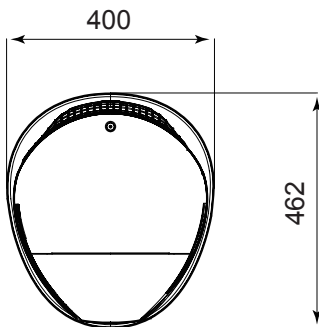
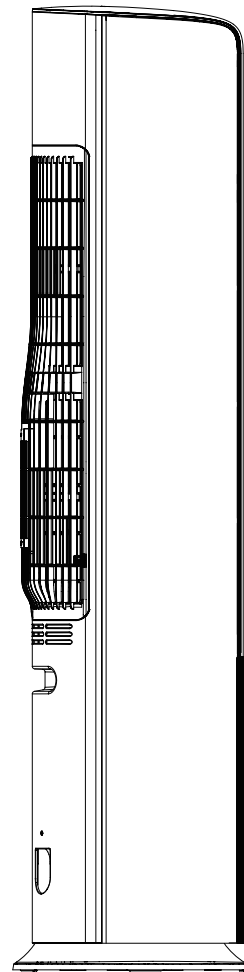
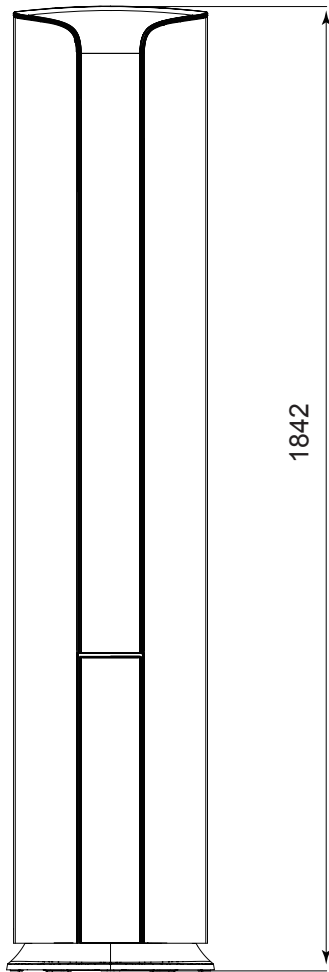


Heating



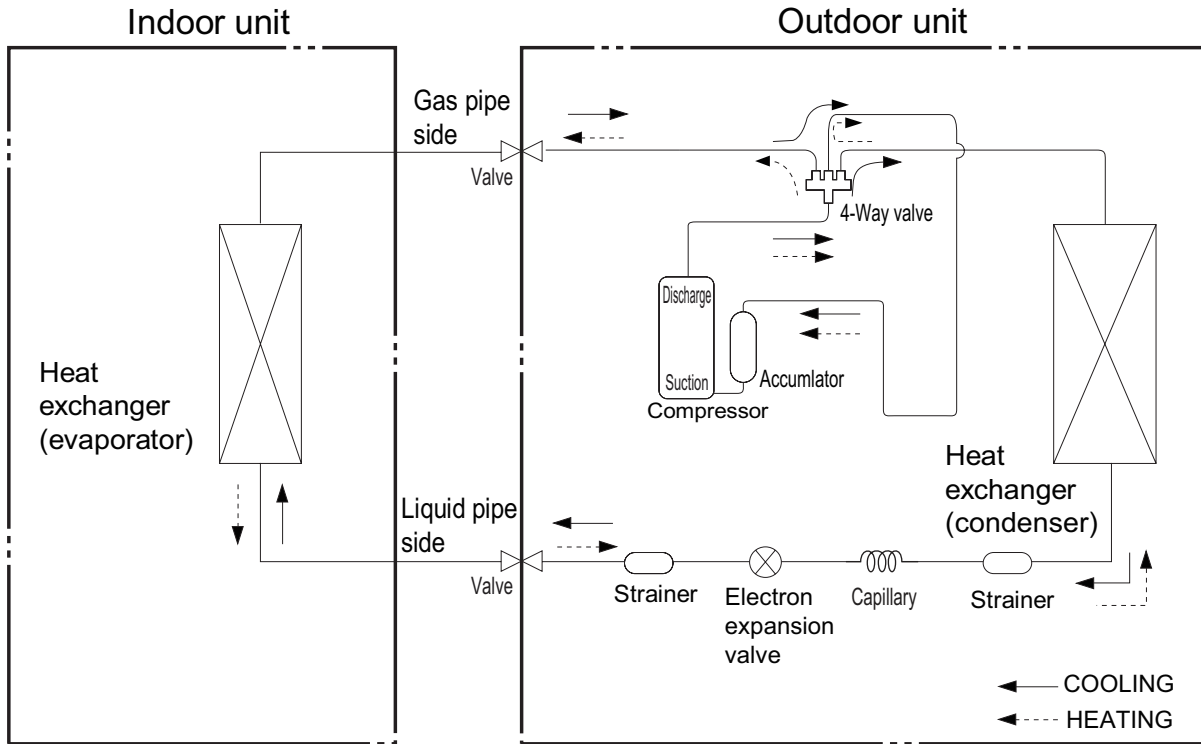
3. Outline Dimension Diagram

3.1 Indoor Unit



Unit:mm

4. Refrigerant System Diagram



Connection pipe specification:

Liquid pipe: 1/4" (6mm)

Gas pipe: 5/8" (16mm)

5. Electrical Part

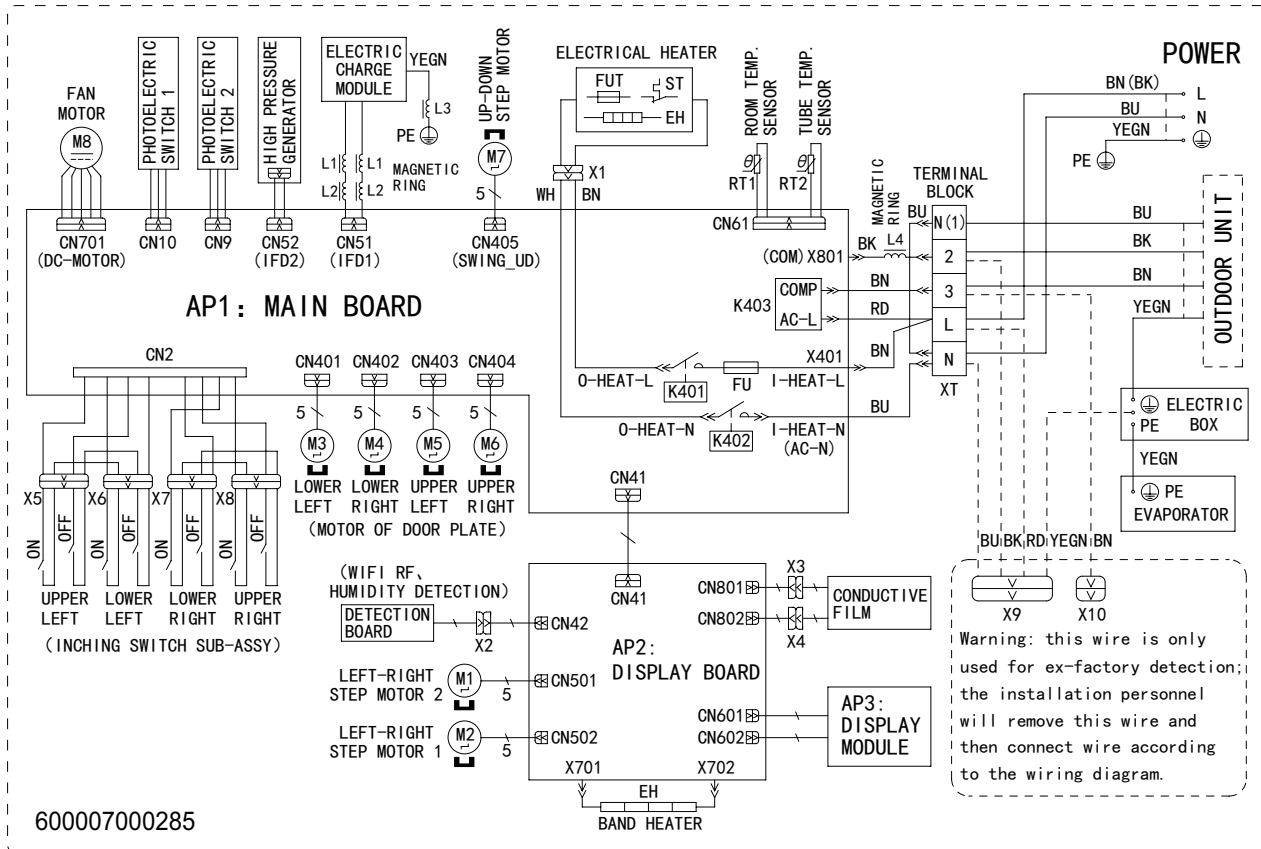
5.1 Wiring Diagram

• Instruction

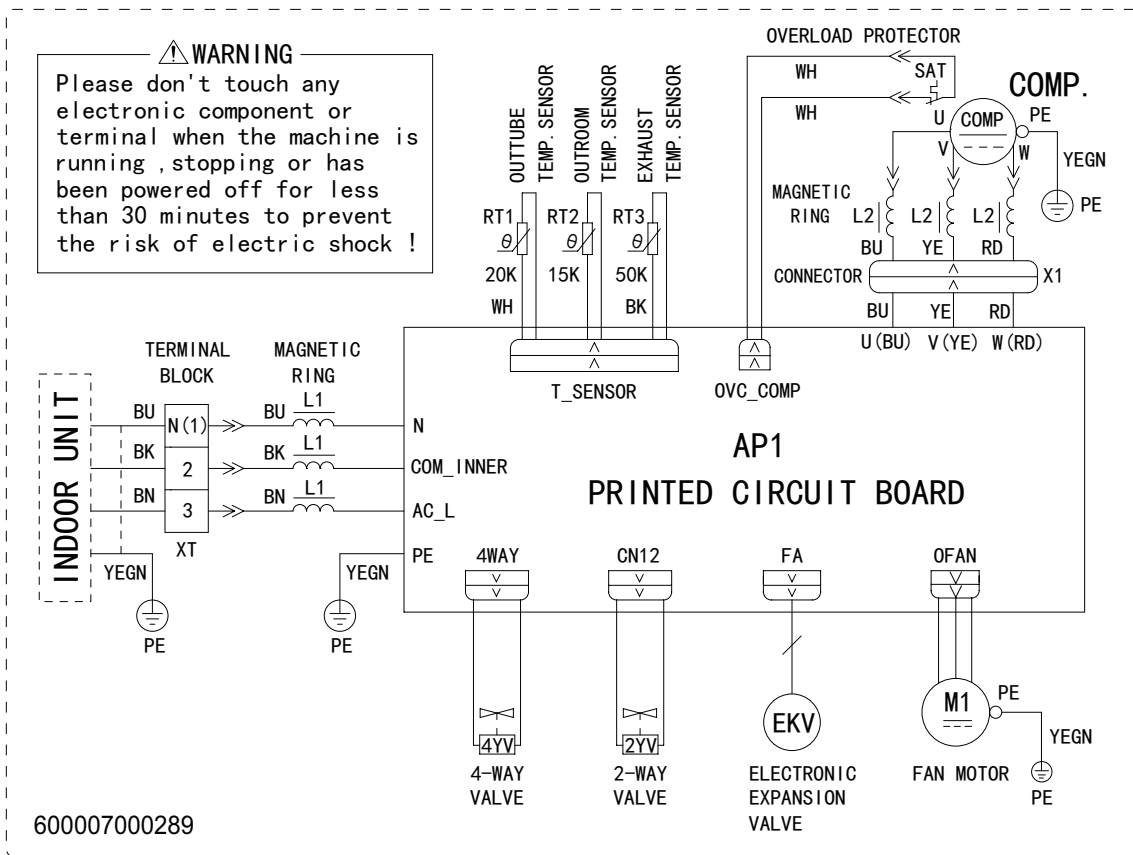
| Symbol | Symbol Color | Symbol | Symbol Color | Symbol | Name |
|--------|--------------|--------|--------------|--------|----------------|
| WH | White | GN | Green | CAP | Jumper cap |
| YE | Yellow | BN | Brown | COMP | Compressor |
| RD | Red | BU | Blue | | Grounding wire |
| YEGN | Yellow/Green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

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

• Indoor Unit



• Outdoor Unit

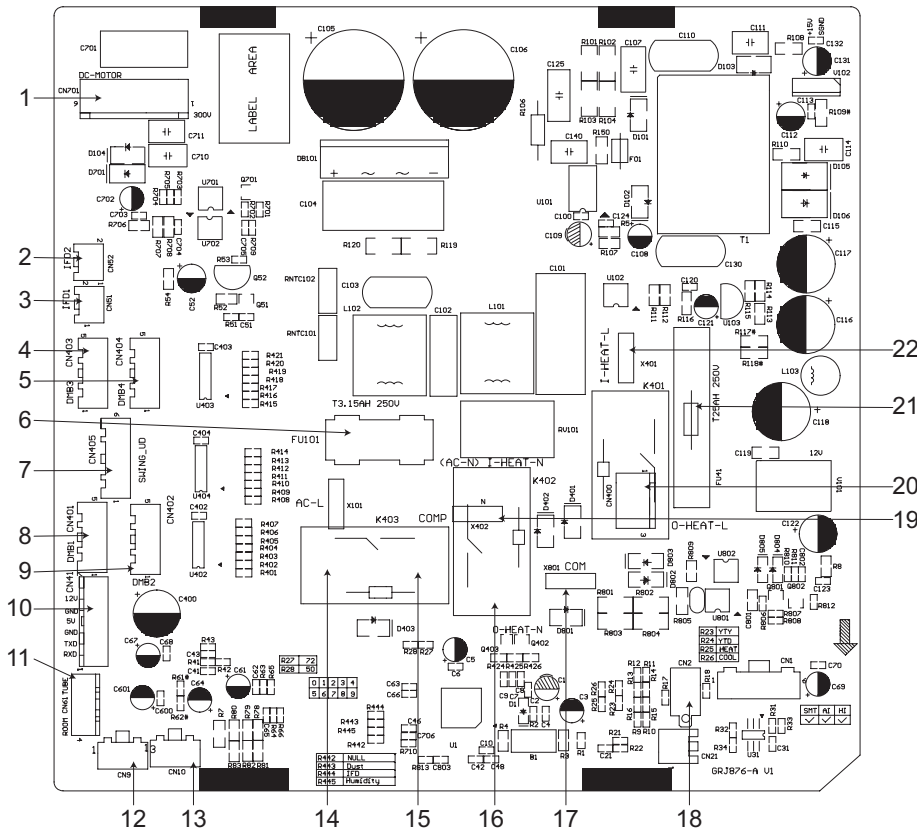


These circuit diagrams are subject to change without notice, please refer to the one supplied with the unit.

5.2 PCB Printed Diagram

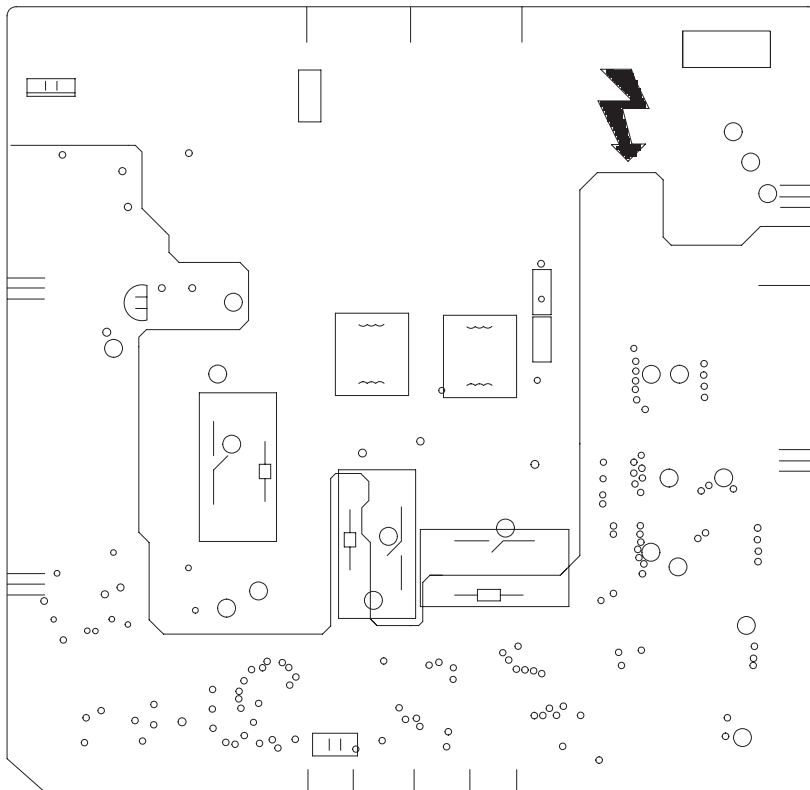
Main Board for Indoor Unit

• Top view



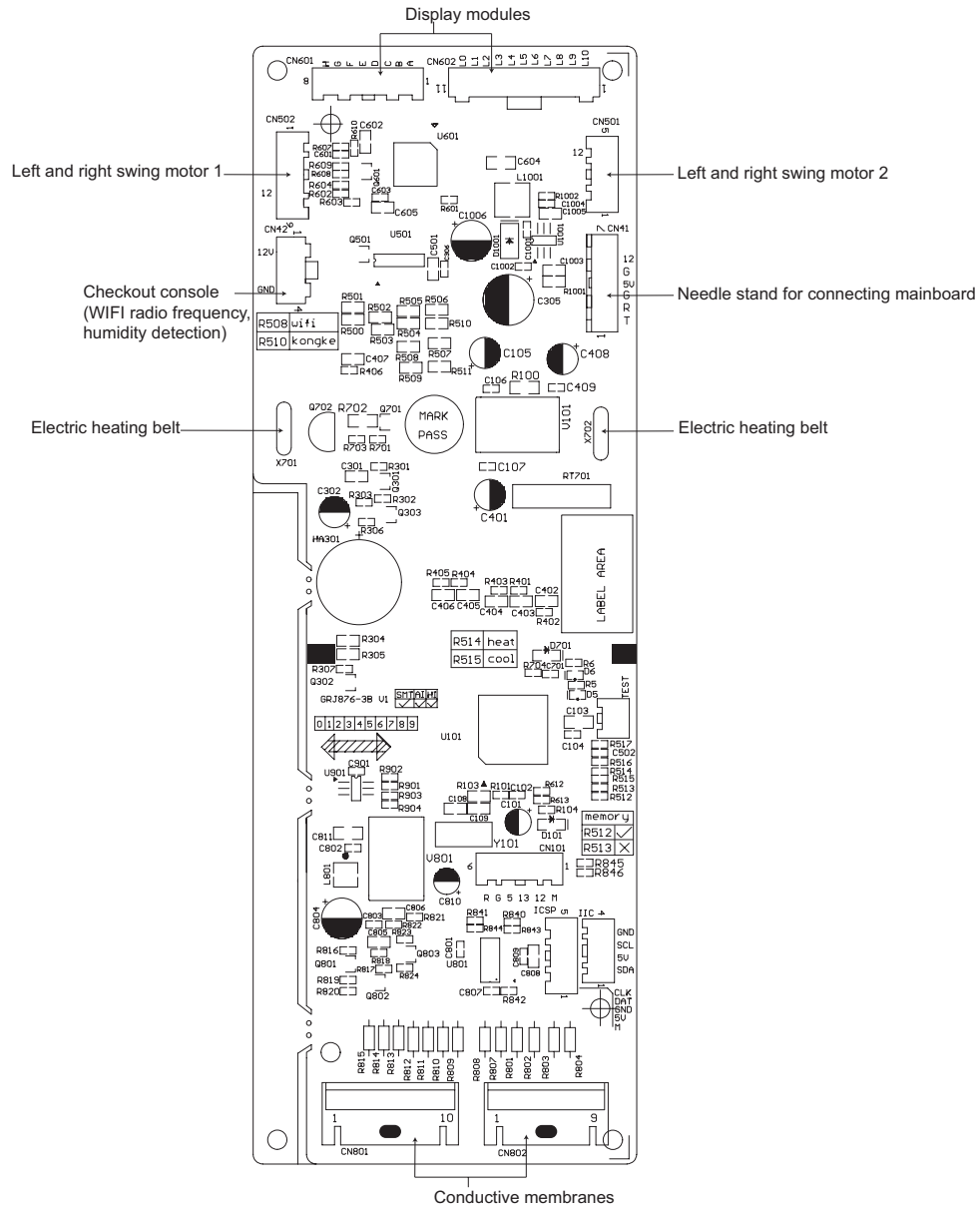
| NO | Name |
|----|--|
| 1 | DC motor |
| 2 | High-pressure generator |
| 3 | Charged module |
| 4 | Left upper gate plate motor |
| 5 | Right upper gate plate motor |
| 6 | Protective tube |
| 7 | Up and down swing motor |
| 8 | Left lower gate plate motor |
| 9 | Right lower gate plate motor |
| 10 | Needle stand for connecting display board |
| 11 | Needle stand of temperature sensor |
| 12 | Photoelectric switch 2 |
| 13 | Photoelectric switch 1 |
| 14 | Terminal of live wire |
| 15 | Terminal of live wire for ODU |
| 16 | Zero line control terminal for electric heater |
| 17 | Terminal for communication with ODU |
| 18 | Needle stand for inching switch |
| 19 | Zero line input terminal for electric heater |
| 20 | Live wire control terminal for electric heater |
| 21 | Protective tube for electric heater |
| 22 | Live wire input terminal for electric heater |

• Bottom view



Display Board

• Top view



Slide Bar

●When the unit is not in function setting while in unit on status, touch the slide bar to make it slide from left to right to increase set temperature; touch the slide bar to make it slide from right to left to decrease set temperature; temperature setting range is 16°C~ 30°C (The slide bar is not available for setting temperature under auto and E-joy modes).



●Under function setting status, press function button to select the function. That function's character will flash and then confirm or cancel it.

- (1) Timer: Set timer and adjust the time within 0.5~25h. When set timer through control panel, the time will change every 0.5h.
- (2) Eco-wind: turn on or turn off eco-wind function.
- (3) Set: Set temperature display on or off.
- (4) Room temp.: Room temperature display on or off.

●Pressing "🔒" and "🔒" button at the same time for 3s, all button functions on the display are shielded. When pressing any button, the buzzer will give out a sound and "LC" will blink on the nixitube for three times to remind user that the buttons are locked and then resume normal display. Press these two buttons at the same time for 3s again to cancel shielding function and then the display resumes normal status.

Function Buttons and Displayer (Display)



1. Set

Display set temperature.

2. Room Temp

Display indoor ambient temperature.

3. Defrost

When defrost icon is bright, it means the unit is in defrosting.

4. Fan

Display fan speed with fan speed icon in dynamic display. When the arrow icon is in setting fan speed, the arrows corresponding to the fan speed is all bright. When fan speed has been set, the arrows display dynamically and circularly with increasing one arrow every 0.5 second.

| | | | |
|-------------|--|--------------|--|
| Auto: | | Medium: | |
| Quiet: | | Medium high: | |
| Low: | | High: | |
| Medium low: | | Turbo: | |

5. Up&down Swing

Display up and down swing status.

6. Display left and right swing status.

Display indoor ambient temperature.

7. E-heater Function

When this icon is bright, it means E-heater function is activated.

8. Timer Function

When this icon is bright, it means timer function is activated.

9. Eco-wind Function

When this icon is bright, it means eco-wind function is activated.

10. Purify Function

When this icon is bright, it means purify function is set.

11. Auto Function

When this icon is bright, it means auto mode is set.

12. Fan Function

When this icon is bright, it means fan mode is set.

13. Dry Function

When this icon is bright, it means dry mode is set.

14. Heat Function

When this icon is bright, it means heat mode is set.

15. Cool Function

When this icon is bright, it means cool mode is set.

16. WiFi Function

When this icon is bright, it means WiFi function is activated.

1. ON/OFF Button

- Press this button to turn on or turn off the air conditioner.
- Turn on or turn off the air conditioner can cancel previous timer, sleep functions.

2. +/- Button

- After each pressing of "-" or "+" button can decrease or increase set temperature 0.5°C. If press "-" or "+" button for more than 2s, temperature will change quickly.
- The temperature setting range is 16~30°C. Note: Temperature can't be adjusted under auto mode.

3. Cool Button

Press this button turn on the cooling mode.

4. Heat Button

Press this button can turn on the heating mode.

5. E-joy Button



- Press this button to enter into E-joy mode. "EY" is displayed and it defaulted at "Comfort" mode. Press "+" button and then the mode will change as below:

Cold →Cool→Comfort→Warm→Hot





(The mode will change in reverse direction if press "-" button)

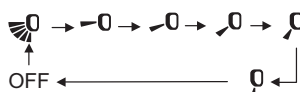
- Under E-joy mode, press E-joy, Mode, Cool or Heat button to exit E-joy mode.
- Under E-joy mode, X-FAN/E-heater, Sleep, Turbo and Quiet buttons are invalid.

6. Eco-wind Button





- Press this button to enter into Eco-wind mode: Auto swing and purify functions are turned on.
- Under Eco-wind mode, press Eco-wind, Mode, Cool, Heat or E-joy button to exit Eco-wind mode.
- Under Eco-wind mode, those buttons as below are invalid:  button,  button, Quiet button, Fan button, Purify button and Turbo button.
- Under Auto or Dry mode, Eco-wind button is invalid.

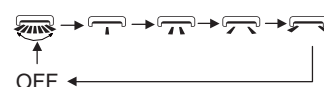
7. Button

- Under simple swing mode, press this button can turn on (display " " icon) or turn off (not display " " icon) up&down swing function.
- Under OFF status, press "+" button and " " button simultaneously can switch between simple swing mode and fixed swing mode. During switching time " " icon on remote controller will flash twice.
- Under fixed seing mode, press this button and the up&down swing status will change in the sequence as below:



8. Button

- Under simple swing mode, press this button can turn on (display " " icon) or turn off (not display " " icon) left&right swing function.
- Under OFF status, press "+" button and " " button simultaneously can switch between simple swing mode and fixed swing mode. During switching time " " icon on remote controller will flash twice.
- Under fixed-angle swing mode, press this button and the left and right swing status will change in the sequence as below:



9. Mode Button

Press this button and the mode will change in the sequence as below:



Note:

- Heating mode is invalid for cooling only unit.
- After selecting auto mode, remote controller won't display set temperature. Air conditioner will select proper operation method according to indoor temperature to comfortable environment.

10. Turbo Button

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

11. Fan Button

Press this button can select the fan speed in the sequence as below:

Note:

The unit can only operate at low speed () under dry mode.



12. Quiet Button

Press this button can turn on (display the character of "Quiet") or turn off (not display the character of "Quiet") quiet function.

Note:

- Quiet function is defaulted to be turned off after energization.
- Quiet function is only applied for cooling mode.

13. Purity Button

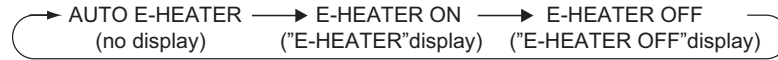
- When the unit is turned on, press this button to set purify function.
- If turn off the unit with remote controller, the purify function is defaulted OFF. Under Eco-wind mode, if turn on the unit again after turning off the unit with remote controller, the previous purify function will be kept.
- This function can't be set when the unit is turned off. If switching modes, the previous purify status will be kept.

14. Sleep Button

- Press this button once can enter into or quit from sleep status.
- Sleep function will be cancelled after turning off the unit. Sleep function can't be set under fan, auto, E-joy or dry mode.

15. X-Fan E-heater Button

- Only in Cool or Dry mode, Press this button can set X-FAN function on of off The character of " X-FAN " is displayed or no displayed.
- In Heat mode, Press this button can select the E-HEATER in the sequence as below:



16. Light Button

Press this button can turn on the turn off the light on the display.

17. WIFI Button

- Press this button 3s can set wifi function on or OFF.
- At OFF status, press mode button and wifi button, can reset wifi mode parameter and open wifi function.

18. Timer Button

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

Special Function Introduction

1. Child Lock Function

Press "-" and "+" buttons simultaneously for 6s can lock or unlock the keyboard. After locking keyboard, remote controller displays the icon of "🔒". Meanwhile, locking icon will flash 3 times when pressing any buttons, while the status has no change. After unlocking the keyboard, the locking icon will disappear.

2. Residual Heat-blowing Function

If turn off the unit when the unit is operating under heating or auto heating mode, compressor and outdoor fan stops operation, while indoor fan will still operate at low speed for 30s before stop operation.

3. X-fan Function


X-fan function is used to dry the evaporator of indoor unit after turning off the unit to prevent mildew.

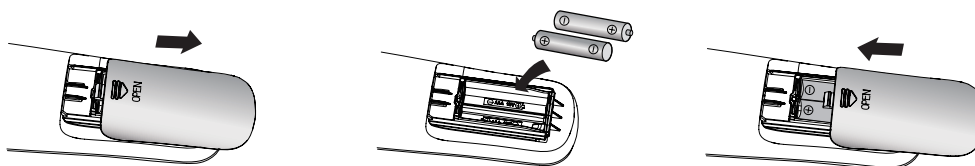
X-fan function is turned on: When pressing ON/OFF button to turn off the unit, the indoor fan will still operate at low fan speed for a while. During this process, you can press X-fan/E-heater button again to turn off the indoor fan directly.


4. About AUTO RUN

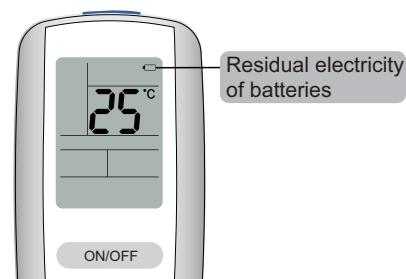
When AUTO RUN mode is selected, the setting temperature will not be displayed on the LCD, the unit will be in accordance with the room temp. automatically to select the suitable running method and to make ambient comfortable.

Replacement of batteries in remote controller

1. Press the back side of remote controller marked with  slightly and then push out the cover of battery box along the arrow direction.
2. Replace two 7# (AAA 1.5V) dry batteries, and make sure the position of "+" polar and "-" polar are correct. Do not mix to use new and old batteries or different type batteries. Otherwise, it may cause the remote controller invalid.
3. Reinstall the cover of battery box.



This remote controller can display the residual electricity of batteries. When the icon of  on remote controller is flashing, please replace batteries in time. Otherwise, the remote controller can't operate normally.



6.3 Operation Method

Basic Operation

1. Turn ON/OFF unit

After putting through the power, press "ON/OFF" on control panel or "ON/OFF" on remote controller.

2. Selection of operation mode

Press "Cool" button or "Heat" button on control panel to select cooling mode or heating mode. Press "Function" button on control panel can select auto, dry or fan mode, or press "Mode" button on remote controller to select the mode in the sequence of auto, cool, dry, fan or heating (not available for cooling only unit). Set temperature won't be displayed under auto mode and then temperature is defaulted at 25°C (77°F).

3. Selection of fan speed

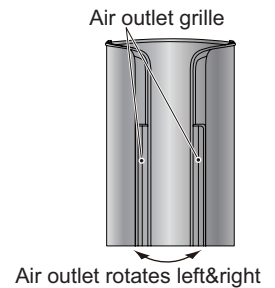
Press "Fan" button on control panel or press "Fan" button on remote controller to select, auto, low, medium or high fan speed. Only low fan speed can be set under dry mode (including auto dry mode). Fan speed can be adjusted by press this button.

4. Set temperature

Press "+/-" button on control panel or "+/-" button on remote controller to adjust set temperature. Press those two buttons for 3s can shield all buttons on control panel or remote controller. Temperature setting range is 16°C(61°F)~30°C(86°F). Temperature can't be adjusted under auto mode.

left&right Wind Direction Adjustment

- Press " " button on remote controller or " (LEFT/RIGHT) " on control panel can select up&down swing method, and control the operation and stop of left&right swing motor to let swing blade rotate left&right or stop at a certain angle to blow wind.
- If indoor fan is operating, as for each pressing of " " button on remote controller, please refer to the part of instruction of remote controller for swing method for details.
- Press " " button on remote controller can turn on or turn off left&right swing. Press this button once to turn on swing function and press it again to turn off swing function.
- When swing function is turned off, the characters and icon of left&right swing on remote controller or display will disappear; When selecting other status, swing characters and icon will display.

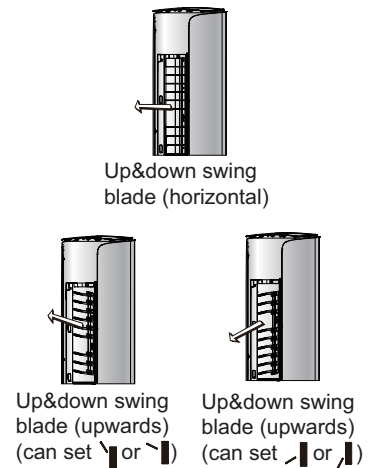


Up&down Wind Direction Adjustment

- Press " " button on remote controller or " " on control panel can select up&down swing method, and control the operation and stop of up&down swing motor to let swing blade rotate up&down or stop at a certain angle to blow wind.
- If indoor fan is operating, as for each pressing of " " button on remote controller, please refer to the part of instruction of remote controller for swing method for details.
- Press " " button on remote controller can turn on or turn off up&down swing. Press this button once to turn on swing function and press it again to turn off swing function.
- When swing function is turned off, the characters and icon of up&down swing on remote controller or display will disappear; when selecting other status, swing characters and icon will display.
- Cooling, drying — Set to blow wind at front side or blow wind upwards in general.

When turning on the unit, you can select to blow wind downwards to decrease temperature around people quickly. However, it can't keep blowing wind downwards for a long time to make sure good air ventilation of indoor air.

- Heating — Set to blow wind downwards in general.



6.4 Brief Description of Modes and Functions

● Indoor Unit

Basic Functions

1. Cooling mode

Under this mode, the fan motor and swing mode will operate according to the setting status; temperature setting range is 16~30°C , and the initial value is 25°C .

When there is malfunction for outdoor unit or protection, the indoor unit will keep the original operating status and error code is displayed.

2. Drying mode

Under this mode, the fan motor operates at low speed and swing operates at set status. Temperature setting range is 16~30°C , and the initial value is 25°C .

When there is malfunction for outdoor unit or protection, the indoor unit will keep the original operating status and error code is displayed.

3. Heating mode

Under this mode, temperature setting range is 16~30°C , and the initial value is 25°C .

Operation condition and process for heating:

When the operation status of compressor sent by outdoor unit is ON under heating, indoor unit operates at cold air prevention condition.

When the operation status of compressor sent by outdoor unit is OFF, indoor fan operates at residential heat-blowing condition.

4. Fan mode

Under this mode, IDU fan motor can operate at high, medium, low or auto speed.

5. Auto mode

Under this mode, operation mode is conducted according to the ambient temperature and the following conditions:

When $T_{amb} > 26^{\circ}\text{C}$, the unit operates under cooling mode. Indoor set temperature is 26°C ;

When $20^{\circ}\text{C} \leq T_{amb} \leq 26^{\circ}\text{C}$, the unit operates under drying mode. Indoor set temperature is 24°C ;

When $T_{amb} < 20^{\circ}\text{C}$, the unit operates under heating mode. Indoor set temperature is 20°C ; When $T_{amb} \geq 24^{\circ}\text{C}$, the unit exits heating mode.

If the unit is cooling only type, when $T_{amb} < 20^{\circ}\text{C}$, the unit operate at fan mode. Indoor set temperature is 20°C . When $T_{amb} \geq 24^{\circ}\text{C}$, the unit exits fan mode.

Other functions

1. E-heater

When e-heater is set by remote controller or button:

When IDU fan motor operates and e-heater operation status is satisfied, e-heater starts operation;

When it reached to certain condition, e-heater stops operation.

2. Swing function

Swing function is different for different models. As for up & down swing and left & right swing, the swing angle will be different for different structure and motor.

3. Turbo

Under heating or cooling mode, turbo function can be turned on or turned off by remote controller or button (turbo function is not available for auto, dry and fan mode). After setting turbo mode, IDU fan motor operates at super-high speed.

4. X-fan

X-fan can be turned on or turned off under cooling or drying mode (x-fan mode is not available for auto, heating and fan mode). After turning on the x-fan mode and turning off the unit, IDU fan motor operates at low speed for 10 minutes (within these 10min, swing operates at original status, while other loads all stop operation) and then stop operation. After turning off x-fan mode, press on/off button to turn off the unit.

5. Timer

Timer can be turned on or turned off by remote controller or buttons. Timer setting range is 0.5~24hours. .

6. Sleep

① Under cooling or drying mode, when the unit starts operating under sleeping mode, the set temperature will increase but no more than 3°C , and then the unit operates at that temperature.

② Under heating mode, when the unit starts operating under sleeping mode, set temperature will decrease but no more than 3°C , and then the unit operates at that temperature.

7. Buzzer

Upon energization or receiving available signal of remote control, the buzzer will give out a beep.

8. Compulsory operation function of IDU

Enter into compulsory operation control: within 5min after energizing the unit, press light button on remote controller for 3 times successively within 3 seconds to enter into Freon recovery mode. Fo is displayed and send Freon recovery mode successively for 25min, and all loads will operate under cooling mode (set fan speed as high speed and set temperature as 16°C).

Exit compulsory operation control: Freon recovery mode will be exited when receiving any remote control signal or button signal. Or Freon recovery mode will be exited after operating for 25min, and then the unit will be turned off automatically.

9. Display

9.1. Function: when selecting auto, drying, swing, timer, purity, e-heater, set, room temperature, or clean function, the corresponding

icons on display modular will flicker. After the function is turned on or turned off, icon won't flicker anymore and the startup function will be displayed. (air and health functions are not available for low speed).

9.2. Digit in the middle:

9.2.1 When there's malfunction protection, only error code is displayed;

9.2.2 During normal operation, if temperature or timer function is set, corresponding timer setting will be displayed for 5 seconds and then display the set temperature (set or room temperature).

9.3. Mode:

As for auto, cooling, drying, fan and heating mode, only the selected one will be bright. Character and icon will be displayed at the same time. Under auto mode, auto and actual operation modes will be displayed simultaneously.

9.4. Indicator control:

Operation indicator is on when turning on the unit.

9.5 Button display

Under energization and standby status, only ON/OFF indicator is bright. Press touch switch to turn on the unit directly. When touching any other buttons, all buttons are bright. After turning on the unit, except ON/OFF button, all other buttons and display icons are controlled by light button on remote controller. When turning off the light, touch any buttons except ON/OFF button to display all buttons. If buttons are concealed, touch button area slightly and then all buttons will be displayed. You can perform operation during button display period. If there's no any button operation, button display will be concealed after 10s.

10.Button

Buttons on the control panel: ON/OFF button, cooling button, heating button, function button, scroll bar, fan speed button, left & right swing button, up & down swing button.

10.1 ON/OFF button

Press this button to turn on or turn off the controller.

Note: under x-fan mode, press ON/OFF button can turn on the unit directly.

10.2 Cooling button

Press this button under power-on status to enter into cooling mode.

10.3 Heating button

Press this button under power-on status to enter into heating mode.

10.4 Scroll bar

10.4.1 If not setting the function, when sliding the scroll bar from left to right under power-on status, the temperature will increase; when sliding the scroll bar from right to left, the temperature will decrease; the adjusting range is 16 °C ~30 °C (under auto mode, the scroll bar cannot adjust the temperature).

10.4.2 Under function setting condition, the scroll bar can be used to set timer at the range of 0-24 hours.

10.4.3 When setting other functions other than timer setting, slide the scroll bar to the right, corresponding function will be turned on; slide the scroll bar to the left, corresponding function will be turned off.

10.5 Function button

10.5.1 Under power-on status, each time press the function button for once, the setting can switch in turns among auto, dry, swing, air, setting, room temperature, and timer function. When certain character flickers, it means such function can be set, you can set with touching the scroll bar, and if there is no operation after setting for 5 seconds, it means confirmation. Or press the function button again can also confirm the setting.

10.5.2 Under power-off status and with x-fan mode status, press the function button will directly turn off the unit; Under power-off status and without x-fan status, press function button for each time can set timer function. When certain character flickers, it means such function can be set with touching the scroll bar, and if there is no operation after setting for 5 seconds, it means confirmation. Or press the function button again can also confirm the setting.

10.6 Fan speed button

The fan speed button is invalid under dry and auto dry mode. When pressing fan speed button, the fan speed will display and select according to the following ways: auto=» quiet (only in cooling mode)=» low=» low and medium=» medium=» medium and high=» high=» turbo.

| No | Fan speed | Display |
|----|-----------------|---------|
| 1 | Quiet | |
| 2 | Low | |
| 3 | Low and medium | |
| 4 | Medium | |
| 5 | Medium and high | |
| 6 | High | |
| 7 | Turbo | |

● Outdoor Unit

1. Input parameters compensation function

Under cooling mode, indoor ambient temperature that involved in control operation = (T indoor amb. - Δ T0°C indoor amb. compensation of cooling).

Under heating mode, indoor ambient temperature that involved in control operation = (T indoor amb. - Δ T3°C indoor amb. compensation of heating).

2. Valid judgment control of parameter

For stable operation of the complete unit, please insert outdoor discharge temperature sensor into the corresponding temperature sensor bushing of discharge pipe to let the control system can detect discharge temperature of system accurately. Otherwise, the unit will stop operation and the unit will display that outdoor discharge temperature sensor is invalid (hasn't inserted tightly). Press ON/OFF button on remote controller can resume the operation.

3. Cooling mode

3.1 Working conditions and process of cooling

3.1.1: (T indoor amb. - Δ T indoor amb. compensation of cooling) - T set \geq 0.5°C, the unit operates under cooling mode;

3.1.2: (T indoor amb. - Δ T indoor amb. compensation of cooling) - T set \leq -2°C, or (T indoor ambient temperature - Δ T indoor amb. compensation of cooling) - T set $<$ -1°C and last for 6 minutes and the frequency has dropped to the lower limit, that means the unit will stop operation at the designated temperature;

3.1.3 Otherwise, keep the original operating status.

3.2 Temperature setting range:

3.2.1: If T outdoor amb. \geq 【T low-temperature cooling temperature】, the temperature setting range is 16~30 °C (cooling under normal temperature);

3.2.2: If T outdoor amb. $<$ 【T low-temperature cooling temperature】, the temperature setting range is 25~30 °C (cooling under low temperature), that is, the estimated lowest setting temperature of outdoor unit is 25°C.

4. Dry mode

4.1 Working condition and process for drying: the same as cooling mode;

4.2 The temperature setting range is the same as cooling mode;

5. Fan mode

5.1 Compressor, ODU fan motor and 4-way valve are all be turned off;

5.2 The temperature setting range is 16~30°C.

6. Heating mode

6.1 Working condition and process for heating: (T indoor amb. is the actual temperature detected by indoor ambient temperature sensor; Δ T indoor amb. compensation of heating is indoor ambient temperature compensation during heating process)

6.1.1: T set - (T indoor amb. - Δ T indoor amb. compensation of heating) \geq 0.5°C, the unit operated under heating mode;

6.1.2: T set - (T indoor amb. - Δ T indoor amb. compensation of heating) \leq -2°C, or T set - (T indoor amb. - Δ T indoor amb. compensation of heating) $<$ -1°C and last for 6 minutes, and the frequency has decreased to the lower limit, the unit will stop operation when reaching to temperature point;

6.1.3: Otherwise, the unit operates at the original operating status.

7. Defrosting control (heating mode)

7.1 After entering the defrosting time condition, if it is detected that it satisfies the condition of entering into defrosting temperature condition for 3 minutes successively, the unit will enter into defrosting.

7.2 Defrosting-starting: the compressor stops operation and is restarted up after being delayed for 55s;

7.3 Defrosting-ending: the compressor stops operation and is restarted up after being delayed for 55s.

7.4 When defrosting-ending condition satisfied any one of conditions as below, defrosting operation will be exited:

7.4.1: T outdoor tube \geq 【T defrosting exit temp. 1】;

7.4.2: T outdoor amb. $<$ -5°C, and T outdoor tube \geq 【T defrosting exit temp. 2】 continuous time exceeds 80 seconds;

7.4.3: Defrosting time reaches 【T the longest defrosting time】.

8. Compressor control

8.1 Frequency of compressor is fuzzy controlled according to the relationship between ambient temperature and set temperature, and the change speed of ambient temperature;

8.2 Turn on the unit under cooling, heating or drying mode, compressor will be started up after ODU fan motor is started up for 15s;

8.3 When turn off the unit, stop operation due to protection of mode switchover, compressor will stop operation immediately.

8.4 Under every mode: once compressor is started, it can be allowed to stop operation after operating for 7 minutes (Notes: including the closedown condition at temperature point; not including the error protection, closedown by remote controller, mode switch and related conditions that require the compressor to stop operation).

8.5 Under every mode: once compressor is stopped, compressor can be restarted up after delayed for 3 minutes (Notes: for the indoor unit with power-off memory function, after closing down and re-energizing, it can be restarted without time delay).

9. ODU fan motor control

9.1 When turn off the unit with remote controller, stop operation due to protection or stop operation when reaching to temperature point, ODU fan motor stops operation after compressor is stopped for 1 minutes;

9.2 Under fan moor: ODU stops operation.

9.3 Defrosting-starting: enter into defrosting condition. ODU stops operation after compressor stops for 50s;

9.4 Defrosting-ending: exit defrosting condition. Compressor starts to heat again, and ODU will start operation 15s in advance.

10. 4-way valve control

10.1 4-way valve is close under cooling, drying and fan mode.

10.2 When the unit is started up under heating mode, 4-way valve is energized immediately.

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10.3 When turn off unit under heating, or switch to other mode from heating mode, 4-way valve is de-energized after compressor stops for 2min;

10.4 When the unit is stopped due to protection, 4-way valve will be de-energized after delaying for 4min.

10.5 Defrosting-starting: enter into defrosting condition. After the unit stops for 50s. 4-way valve will be de-energized;

10.6 Defrosting-ending: exit defrosting condition. After compressor stops operation for 50s, 4-way valve will be energized.

11. Freeze prevention protection

11.1 Under cooling or drying mode, if it is detected that T indoor tube < cooling, heating, drying for 3 minutes, the compressor will start up after the outdoor fan motor starts for 15 seconds;

11.2 Under power-off status, stop operation for protection, or switch to swing mode, the compressor stops operation immediately.

11.3 Under every mode: once the compressor is started, it is allowed to stop operation after operation for 7 minutes (Notes: including the closedown condition at temperature point; not including the error protection, closedown by remote controller, mode switch and related conditions that require the compressor to stop operation);

11.4 Under every mode: once the compressor stops, it is allowed to restart after delaying for 3 minutes (Notes: for the indoor unit with power-off memory function, after closing down and re-energizing, it can be restarted without time delay).

12. Compressor discharge temperature protection function

12.1 If $【T \text{ discharge closedown temperature}】 \leq T \text{ air discharge}$, then the unit stops operation for air discharge protection; if $T \text{ air discharge} < 【T \text{ discharge frequency limit temperature}】$, and the compressor has stopped for 3 minutes, the unit resume to operate;

12.2 If $【T \text{ discharge frequency limit temperature}】 \leq T \text{ air discharge}$, then the operating frequency of compressor will decrease or stop increasing;

12.3 If the compressor stops operation due to air discharge temperature protection for 6 times, it will not resume to operate until pressing ON/OFF button. During the operation, if operating time for compressor is over 10 minutes, then times for air discharge protection record will be reset. Under closedown or switch to swing mode, times for air discharge protection record will be reset immediately (if the malfunction cannot be eliminated, the switch mode cannot solve the error).

13. Current protection function

13.1 If $【I \text{ overcurrent limit}】 \leq I \text{ AC}$, then the operating frequency of compressor will decrease or stop increasing.

13.2 If $【I \text{ overcurrent closedown}】 \leq I \text{ AC}$, the unit will conduct overcurrent protection and close down; the unit will resume to operate after the compressor stops for 3 minutes;

13.3 If the unit stops operation due to overcurrent protection for 6 times, it will not resume to operate until pressing ON/OFF button. During the operation, if operating time of compressor is over 10 minutes, then times for overcurrent closedown will be reset.

14. Voltage drop protection

During operation of compressor, if the voltage drop fast, the unit will close down and give out an alarm of voltage drop error, and it will restart automatically after 3 minutes.

15. Communication error

If the unit has not received the correct signal of indoor unit for 3 minutes, it will close down for communication error protection; the unit will resume to operate only after the communication error is solved and the compressor stops for 3 minutes.

16. IPM module protection

After the compressor is started up, if the IPM module has overcurrent error or voltage is too low due to abnormality, the IPM will give out a module protection signal. After the unit is started, the main chip will immediately detect the module protection signal, once the module protection signal is detected, it will close down due to protection; if the module protection is eliminated, and compressor has stopped for 3 minutes, the unit will resume to operate. If the module protection closedown occurs for 3 times, the unit cannot resume to operate until pressing ON/OFF button; if the operating time for compressor is over 10 minutes, the times for module protection closedown will be reset.

17. Module overheat protection

17.1 If $【T \text{ module frequency limit temperature}】 \leq T \text{ module}$, then the operating frequency of compressor will decrease or stop increasing;

17.2 If $【T \text{ module closedown temperature}】 \leq T \text{ module}$, then the unit will close down due to protection; if $T \text{ module} < 【T \text{ module frequency limit temperature}】$, and the compressor has shut down for 3 minutes, the unit will resume to operate;

17.3 If the unit stops operation due to overheat protection for 6 times, it will not resume to operate until pressing ON/OFF button. During the operation, if operating time of compressor is over 10 minutes, then times for overcurrent closedown will be reset (if the malfunction cannot be eliminated, the switch mode cannot solve the error).

18. Compressor overload protection

18.1 If the overload switch of compressor is detected to be disconnected for 3 seconds, the unit will stop operation due to protection;

18.2 If the overload protection is detected to be resumed, and the compressor stops operation for 3 minutes, the unit will resume to operate;

18.3 If the compressor closes down for 3 times due to overload protection, and it cannot automatically resume to operate, the press ON/OFF button can resume the operation; after the compressor operates for 30 minutes, times for overload protection of compressor is eliminated.

Part II : Installation and Maintenance

7. Notes for Installation and Maintenance

Safety Precautions: Important!

Please read the safety precautions carefully before installation and maintenance.

The following contents are very important for installation and maintenance.

Please follow the instructions below.

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



Warnings

Electrical Safety Precautions:

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

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

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

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

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

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

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

Installation Safety Precautions:

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

Refrigerant Safety Precautions:

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

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

Main Tools for Installation and Maintenance

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

8. Installation

8.1 Important Notes

1. All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.
2. If the air conditioner is to be moved to other place, please contact appointed maintenance center in advance.

8.2 Basic Requirements of Installation Location

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

1. The place near strong heat sources, vapors, flammable or explosive 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.

8.3 Selection of installation location

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. Retain sufficient space for maintenance and installation.
7. Select a location with least affection of outdoor air.
8. Select a location with firm and flat floor.
9. Ensure the installation meets the requirement of installation dimension diagram.
10. The appliance shall not be installed in the laundry.

Outdoor Unit

1. Select a location where the noise and outflow air emitted by the outdoor unit will not affect neighborhood, animals or plants.
2. The ventilation of outdoor unit is good.
3. There should be no obstruction near outdoor unit, which may affect air inlet and air outlet of unit.
4. The location should be able to withstand the weight and vibration of outdoor unit and ensure the safety during installation.
5. The location should be dry, in which the outdoor unit won't be exposed directly to sunlight or strong wind.
6. Ensure the installation meets the requirement of installation dimension diagram and is convenient for maintenance.
7. The height difference between indoor unit and outdoor unit should be within 5m. The length of connection pipe should be within 10m.
8. Select a location which is out of reach for people.
9. Select a location which will not affect the passersby and city appearance.

8.4 Precautions of Connecting Pipe

The connection pipe and drainage pipe should be insulated to avoid water drop-ping due to condensation.

1. Both the indoor side and outdoor side adopt connection of expanding port. The connection pipe is as shown in the figure, used for connecting indoor unit and outdoor unit. (As show in Fig.1)
2. When connecting the big connection pipe and small connection pipe with the indoor unit, the big connection pipe and small connection pipe should be misaligned and the small connection pipe should be 100mm longer than big connection pipe.

Note:

Do not bend the flexible pipe for more than three times. Do insulation to all connection part of port-expanded pipe and connection pipe. (As show in Fig.2)

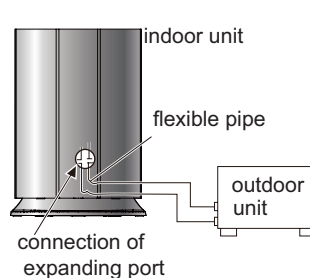


Fig.1

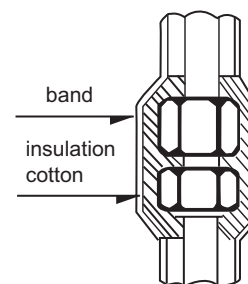


Fig.2

3. The cut-off valve of outdoor unit shall be closed completely. For each connection, screw off the screw cap at the cut-off valve and then connect the port-expanded pipe immediately (in 5min). If the screw cap at the cutoff valve has been placed for a long time, dust, moisture and other sundries may get into the pipe, which will cause malfunction.

Notic of flexible pipe

1. The flexible pipe should be applied in the indoor side.
2. The bended angel shall not exceed 90°.
3. The bended part shall be located in the pipe center. Bigger bended radius will be better.
4. Do not bend the flexible pipe for more than three times. (As show in Fig.3)

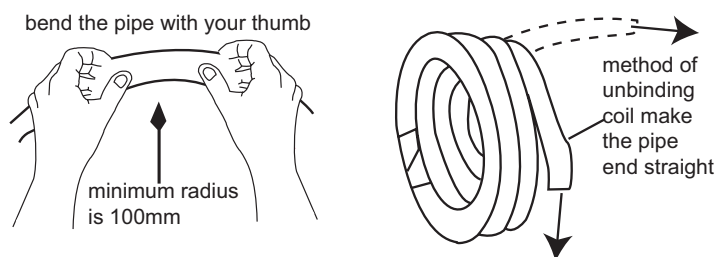


Fig.3

Notic of flexible pipe

1. The flexible pipe should be applied in the indoor side.
2. The bended angel shall not exceed 90°.
3. The bended part shall be located in the pipe center. Bigger bended radius will be better.
4. Do not bend the flexible pipe for more than three times.

Situation of bending thinwalled pipe

1. When bending the pipe, cut off the needed recess at the bended part of insulation pipe and then expose the pipe (wrap it with sealing tape after bending).
2. The pipe bended radius should be big in order to avoid damage.
3. Use pipe bender for the compact pipe bending.

Adopt cooper pipe sold in the market

The cut-off valve of outdoor unit shall be closed completely. After the connection is connected with the indoor unit and outdoor unit, perform discharge from the maintenance port of low pressure cut-off valve at outdoor unit. After discharging, screw up the nut at maintenance port.

After finishing the three points mentioned above

The valve rod of outdoor cut-off valve should be opened completely to ensure smoothness of connection pipe between indoor unit and outdoor unit.

Note:

When the outdoor unit is installed higher than the indoor unit, an oil return bend must be adopted.(As show in Fig.4)

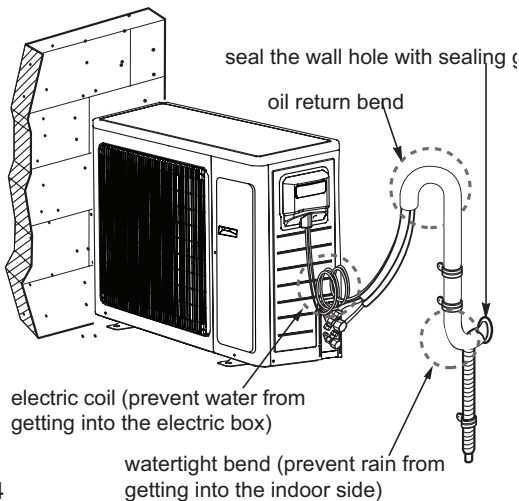


Fig.4

8.5 Requirement of Electric Safety

Disposal of electric wire

1. Grounding must be performed by the qualified person on the specialized grounding device of building. An electricity leakage protection switch and air switch with sufficient capacity must be included in the fixed circuit.
2. The power must adopt rated voltage and specialized circuit of air conditioner.
3. The diameter of power cord must accord with related requirement.
4. Perform installation according to national wiring rules.
5. Proper grounding measure must be applied.
6. Do not pull the power cord forcibly.
7. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Basic Requirements

As the power of air conditioner is relatively big, the circuit for power supply of air conditioner must meet the following requirements:

1. It must be a specialized brand circuit included the electric leakage protector with sufficient capacity.
2. Including an air switch with suitable capacity, please note the following table. Air switch should be included magnet buckle and heating buckle function, which can protect the circuit-short and overload. (Caution: please do not use the fuse only for protecting the circuit.)
3. The capacity of wire diameter shall be 1.5 times bigger than the maximum current of air conditioner.
4. The minimum distance between the air conditioner and flammable surface should be 1.5m.
5. A circuit breaker switch must be installed in the fixed circuit. The circuit breaker should be all-pole parting and the contact parting distance should be more than 3mm.

| Air-conditioner | Air switch capacity |
|-----------------|---------------------|
| 24K | 25A |

Note:

1. During electric connection, arrange sufficient protection according to the surrounding conditions (ambient temperature, direct sunlight, rain, etc.).
2. The power cord and power connection wire shall apply cooper core cable which accords with national standards.
3. Indoor unit and outdoor unit shall be grounded reliably.

Pay attention to the following items when connecting wires

1. Please do the wiring according to the wiring diagram. The screws must be tightly fastened, the slippery screws must be changed, the tapping screw cannot be used for electric wiring.
2. Use the cables provided with the unit. Do not replace the cables or change the length or terminal of cable. If a change is needed, please contact appointed maintenance center.
3. After the electric installation completed, make sure to use wire clamp to fix the power cord, power supply connection wire and signal wire tightly, and ensure that there is enough space in the fix position and each connection terminals of the lead wires.
4. Please use about a half kilogram of force to check whether each lead wire is installed well. When checking the air connector, please enclasp it, and check each lead wire of which is connecting with the connector.
5. ⊕ is the symbol of grounding; it denotes that the yellow-green wire only can be connected with the place with the symbol.
6. For the power cord which is without the plug, you cannot connect the plug for using.
7. The electric connection of indoor and outdoor should not be affected by the stretch and bending.
8. Specialized circuit must be used for power supply.
9. Please do the wiring according to the wiring diagram sticking on the unit.
10. The primary coil of control circuit transformer shall be connected to the power supply of 220V. Detail satiation please refer to the wiring diagram.(As show in Fig.5)
11. For the floor standing type air conditioner using three phase power supply, the phases shall be connected properly. If the phases are connected wrongly or phase reverse occurs, the protector in the control circuit will take protection and the compressor can't start up. In this case, please cut off the power

supply and exchange the connection of any two phase wires, then the unit will operate normally.

Simple installation diagram, please refer to the wiring diagram for details.

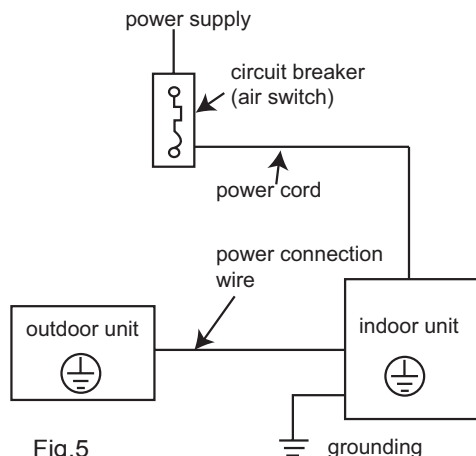


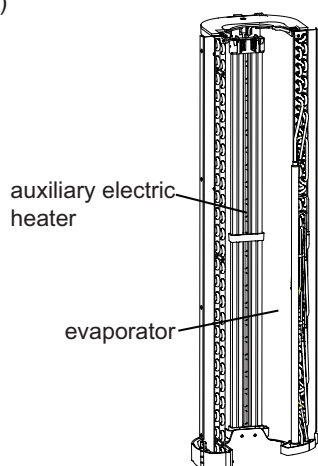
Fig.5

Grounding Requirements

1. The air conditioner is first class electric appliance. Please take reliable grounding measure.
2. The yellow-green wire in the air conditioner is grounding wire. Do not use it for other purposes or cut it off. Do not fix it by the tapping screw. Otherwise, it may cause the electric shock.
3. The grounding resistance should comply with national electric safety regulations.
4. The power supply must be reliably grounded. Please do not connect the grounding wire to the following places:
 - a. Water pipe;
 - b. Gas pipe;
 - c. Drainage pipe;
 - d. The place where is unreliable suggested by the professional.

Others

1. All electric work must be performed by the qualified person according to local regulations and the instructions given in this manual.
2. The connection way between air conditioner and power cord, and the connection way among independent elements, please refer to the wiring diagram on the unit.
3. The model and rated value of fuse, please refer to the printing on corresponding controller or fuse sleeve.
4. The auxiliary electric heater is assembled in the indoor evaporator. It belongs to ceramic PTC electric heating elements, whose power is as shown in the rating label on the unit. (As show in Fig.6)



(Please refer to the actual product) Fig.6

8.6 Installation of Indoor Unit

Installation dimension diagram of indoor unit (As show in Fig.7)

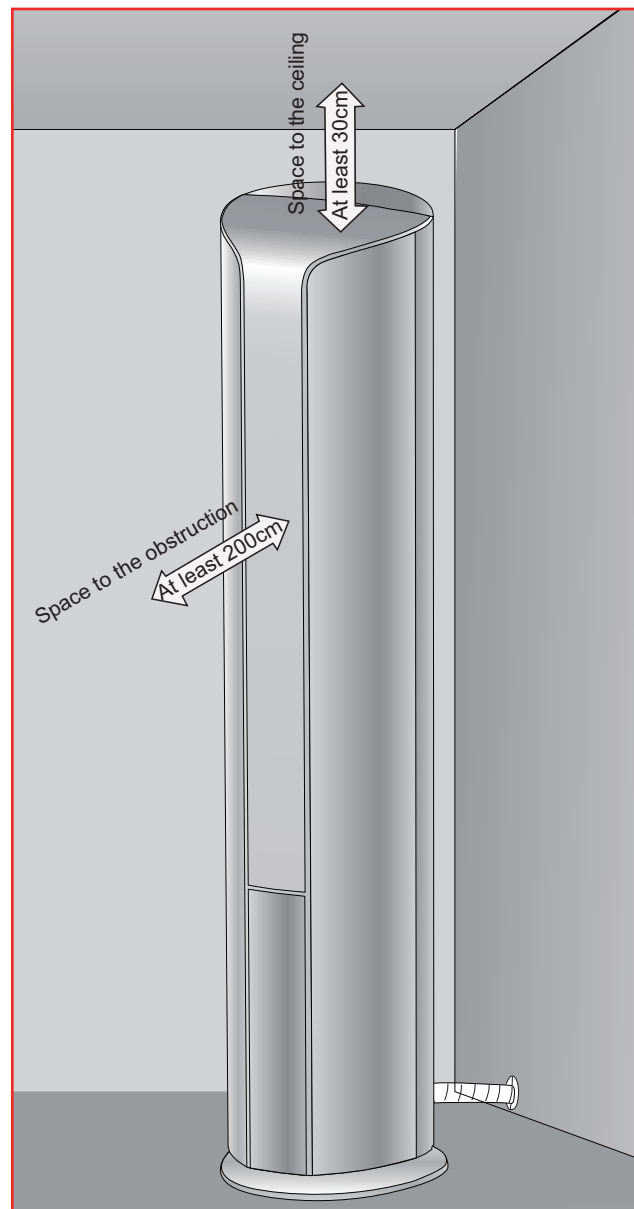


Fig.7

Step one: Install drainage hose and connection pipe

When connecting pipeline and wires, please remove top cover and left&right side plates.

1. Remove the fixing screws (three screws) on the top cover and then draw out the top cover. (As show in Fig.8)



Fig.8

- Before removing left & right side plates, please loose four screws under the top cover. Please see the procedure as below:
 (1)When the side plate is closed, loose #3 and #8 screws in the screw holes at both sides.(As show in Fig.9)
 (2)Push left and right side plates to open status, and then loosen #11 screw and #12 screw in the screw holes.(As show in Fig.10)

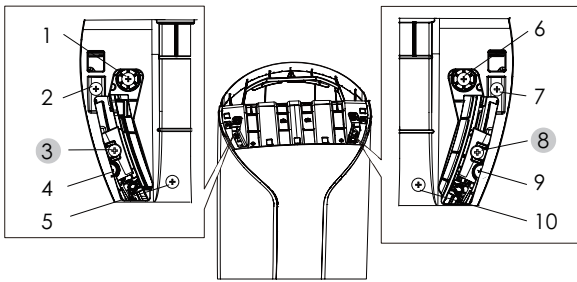


Fig.9

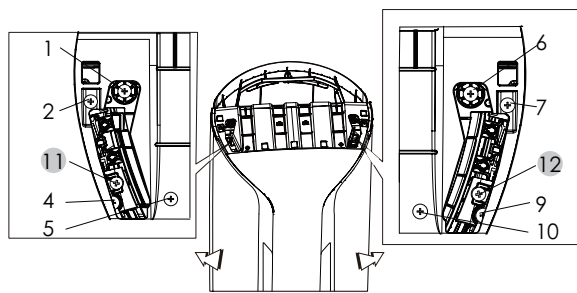


Fig.10

- After loosening the screws, pull the upper part of left and right side plates outwards by referring to fig.11 ① and lift the door plate upwards by referring fig.11 ②, and then left&right side plates can be removed.

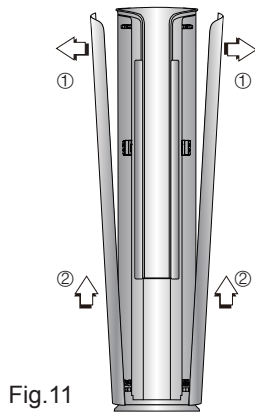


Fig.11

- When connecting pipes and wires, please use the equipped accessories.
- Install the connection pipe at the right side of the unit body. Before installation, please remove one screw used for fixing the cover plate of connection and then you can remove the cover plate of connection pipe.(As show in Fig.12)
- By referring the relative position between wall hole and unit body, please select left elbow pipe or right elbow pipe. (As show in Fig.13)

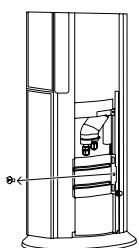


Fig.12

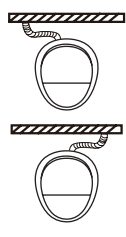


Fig.13

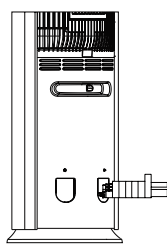


Fig.14

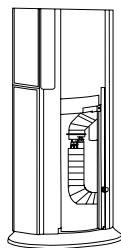


Fig.15

- You can select to cut off the baiting of exit pipe hole according to the elbow pipe direction, and then put the connection pipe through the exit pipe hole and then connect the connection pipe. (As show in Fig.14 and Fig.15)
- The indoor part of drainage pipe should be wrapped with heat insulating materials (thickness should be 9mm as least). The drainage pipe should tilt outwards so that the condensate water can be drained smoothly.
- After connecting indoor unit and connection pipe and wrapping them, move the indoor unit next to the wall or to the corner. You are suggested to install the indoor unit next to the wall.

Note:

Use adhesive plaster at drainage pipe and leave an inclined angle during installation of drainage pipe. Do not bind the black rubber tube with connection pipe and drainage pipe.(As show in Fig.16 and Fig.17)

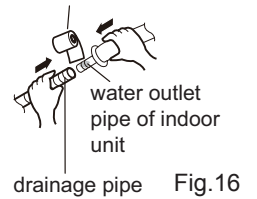


Fig.16

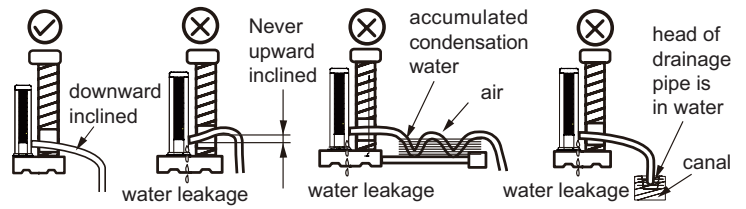


Fig.17

- Unfold the connection pipe, bend it according to the length needed, remove the screw cap on indoor unit pipe, match the connection pipe with the center of indoor unit pipe and then screw up the nut.(As show in Fig.18)

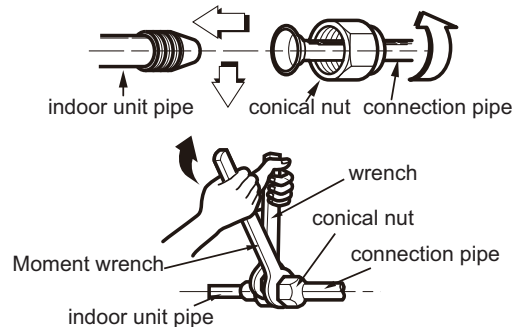


Fig.18

Moment of screwing up:

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

Note:

Connect the connection pipe with indoor unit and then connection with the outdoor unit; well distribute the bending pipes; properly screw up the joint nuts.

Step two: Wiring of indoor unit

1. Remove the left and right support plate. electric box is in the left of the unit, press the screw at the electric box cover, take off the electric box cover.
2. Take out the electric box cover, screw down the test wire of screw, take out the test wire from the cable cross hole. (As show in Fig.19)

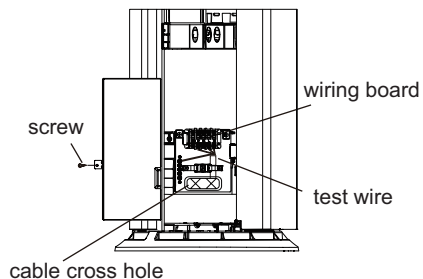


Fig.19

3. Thread the power connection wire through the cable cross hole from the cable cross hole.
4. Well connect the wire according to wiring diagram.(As show in Fig.20)
5. Fix the protecting cover section of power connection wire at the groove of wire clamp and then screw up the fixing screw to fix the connection wire firmly.

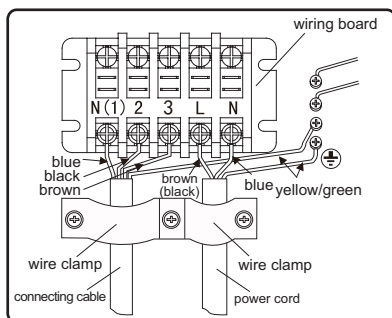


Fig.20

Note:

Please contact the maintenance center for another connection wire with adequate length if the present one is not long enough.

1. Correctly connect the wires.
2. Well screw up the screws fixing terminals and connection wirings.
3. The wirings should be properly fixed.
4. Incorrect wiring connection of grounding wire may lead to electric shock.
5. Well fix the electric box cover with sufficient screw. Improper assembly of electric box cover may cause fire hazard or electric shock.
6. For the air conditioner without plug, an circuit break must be installed in the line. The circuit break should be all-pole parting and the contact parting distance should be more than 3mm.
7. All wires of indoor unit and outdoor unit should be connected by a professional.
8. If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.
9. For the air conditioner with plug, the plug should be reachable after finishing installation.

Step three: Installation of rear cover

1. Bind the connection pipe, connection wire and drainage pipe together with binder.(As show in Fig.21)
 - Fix some positions for convenient binding
 - Do not bind too tightly.
 - Leave the joint of connection pipe for leakage test.
 - Knock down the sub-small hole for 24 unit when cutting the baiting.
2. According to installation position, cut one of the baitings, thread the packed pipe and wire through the baiting hole.(As show in Fig.22)
3. Assemble the rear case.

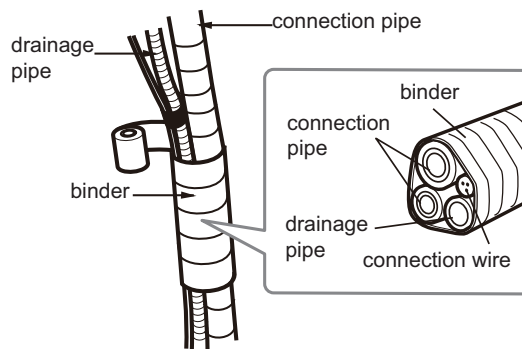


Fig.21

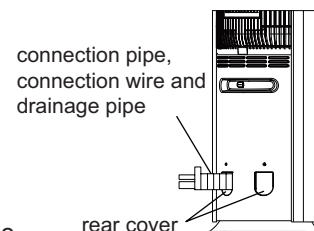


Fig.22

8.7 Installation of Outdoor Unit

Installation dimension diagram of outdoor unit

(As show in Fig.23)

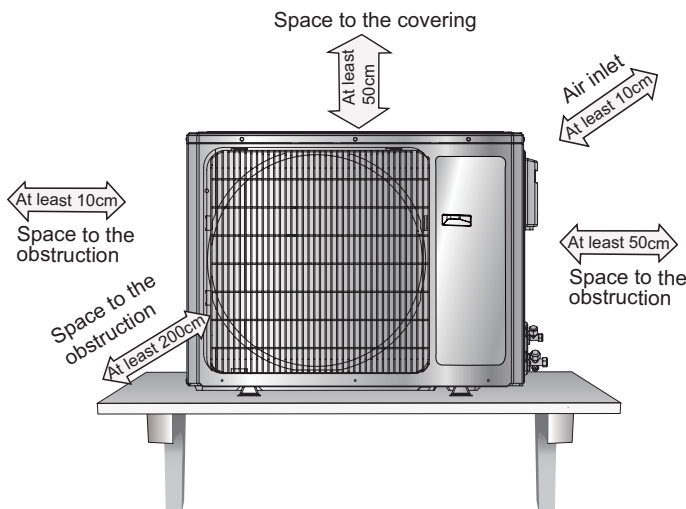


Fig.23

Step one: open piping hole

1. Confirm the position of pipe hole and drill a hole inclined to outside.(As show in Fig.24)
2. Assemble wall pipe to protect the piping and cable.
3. The distance between the highest position of wall hole and the bottom of air conditioner should be no more than 50cm (If the height of wall hole doesn't meet the requirement, please drill hole again to avoid water leakage.)

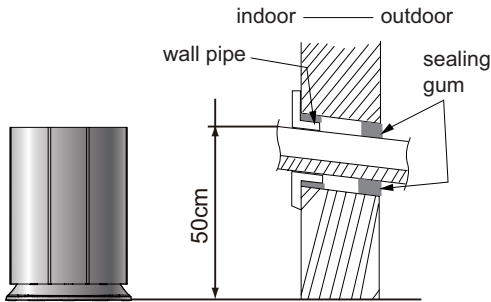


Fig.24

Step two: Pipe connection of outdoor unit

Fix the outdoor unit on the selected position (As show in Fig.25)

1. Match the flared port of connection pipe to the valve, and then tighten them with hand.
2. Tighten them with torque wrench.

Note:

welding the pipes when lengthening the connection pipe.

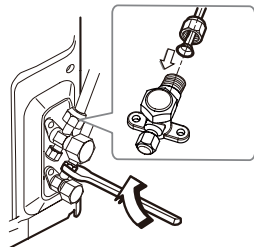


Fig.25

Step three: connect outdoor electric wire

1. Remove the handle of outdoor unit.
2. Remove the wire clamp; connect the power connection to the wiring terminal and then fix it. The wire distribution must be in accordance with the indoor unit.
3. Fix the power connection wire with wire binder.
4. Make sure the wire is fixed properly.
5. Assemble the handle of outdoor unit. (As show in Fig.26)

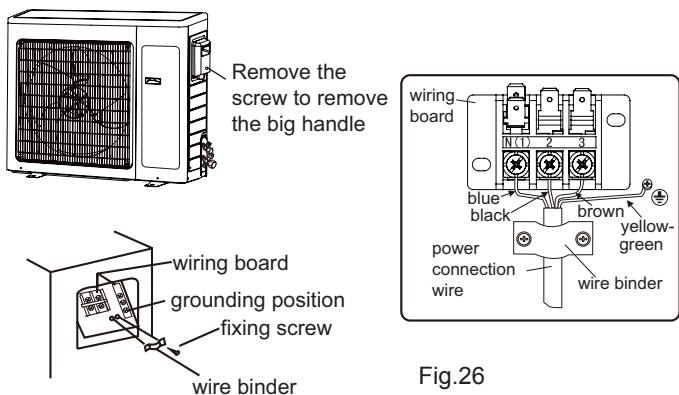


Fig.26

Step four: Drainage of outdoor unit condensation water (not applicable for cooling only unit)

When the unit is heating, the condensation water formed in the outdoor unit can be drained out properly through the drainage hose. Installation: Install the outdoor drainage joint in the $\Phi 25$ hole on the chassis as shown in the figure. Then connect the drainage pipe to the drainage port, so that the condensation water formed in the outdoor unit can be drained out to a proper place. (As show in Fig.27)

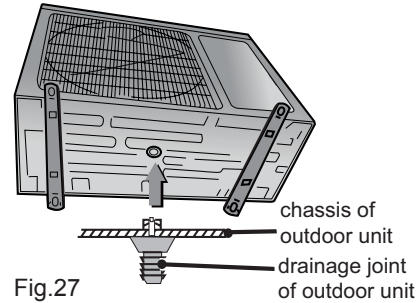


Fig.27

Step five: Vacuum pumping

Use vacuum pump (As show in Fig.28)

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

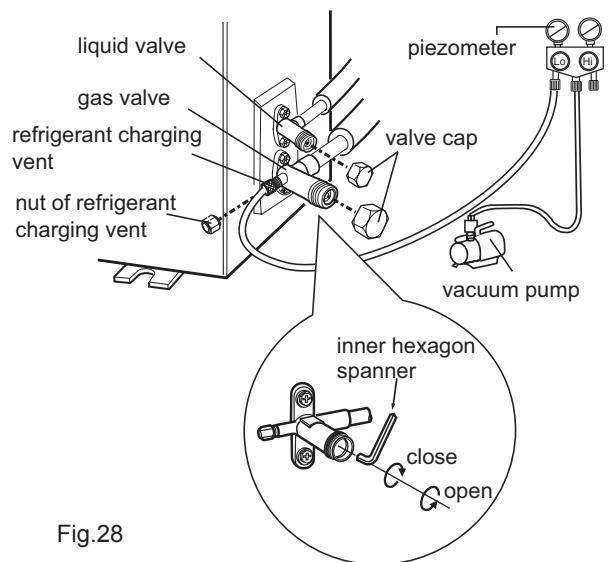


Fig.28

Step six: 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.(As show in Fig.29)

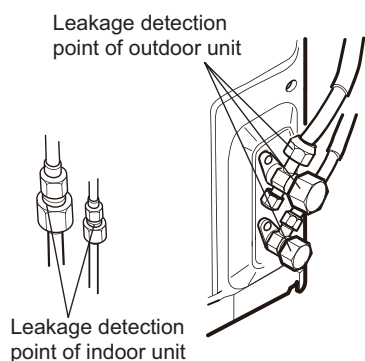


Fig.29

8.8 Check after Installation and Test Operation

Check after installation

Check according to the following requirement after finishing installation.

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

Test operation

1. Preparation of test operation

- Do not switch on power before installation is finished completely.
- Electric wiring must be connected correctly and securely.
- Gas vale and liquid valve should be opened.

2. Test operation method

- Switch on power, press ON/OFF button on the remote controller to start operation.
- Press MODE button to select COOL, HEAT and FAN to check whether the operation is normal or not.

8.9 Installation of Anti-tilting Chain

In order to prevent tilting due to an accident, please install the anti-tilting chain.(As show in Fig.30)

Installation steps:

1. Remove the screw in the anti-tilting hole at the top cover of indoor unit.
2. Take out the anti-tilting chain from the accessories; put it into the anti-tilting hole and then fix it with screw.
3. Fix the other end of anti-tilting chain on the wall with screw(ST4.2X38).

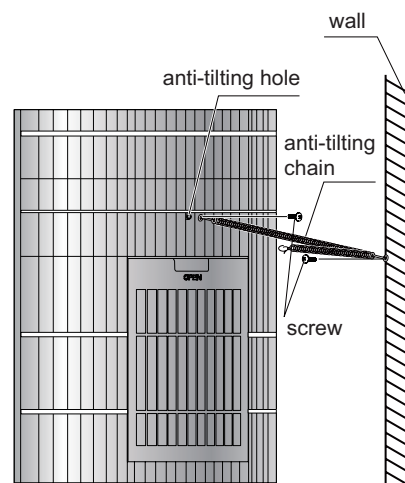


Fig.30

| Test Point No. | Test Point | Corresponding Component | Test value under normal condition |
|----------------|--|---|-----------------------------------|
| Test1 | Between A and C | Neutral wire wire and live wire | 160V~265V |
| Test2 | Between B and C | Neutral wire wire and live wire | 160V~265V |
| Test3 | Between D and E | Electrolytic capacitor of DC bus bar | DC 180V~380V |
| Test4 | Between F and G | Electrolytic capacitor of switch power supply | DC 180V~380V |
| Test5 | Two ends of diode D10 in H | D10 (IPM module bootstrap + 15V power supply) | DC 14.5V~15.6V |
| Test6 | Two ends of electrolytic capacitor C708 in I | C708 (+15V power supply) | DC 14.5V~15.6V |
| Test7 | Two ends of electrolytic capacitor C715 in J | C715 (+12V power supply) | DC 12V~13V |
| Test8 | Two ends of electrolytic capacitor C710 in K | C710 (+5V power supply) | DC 5V |
| Test9 | Two ends of electrolytic capacitor C226 in L | C226 (+3.3V power supply) | DC 3.3V |
| Test10 | Two ends of electrolytic capacitor C24 in M | C24 | DC 56V |
| Test11 | Between N point and GND | N end of R78 grounding (signal receiving terminal of ODU) | Fluctuate between 0~3.3V |
| Test12 | U12 in P | Between 1 and 2 of U12 pin | Fluctuate between 0~3.3V |
| Test13 | Between O point and GND | O end of R75 grounding (signal receiving terminal of ODU) | Fluctuate between 0~3.3V |
| Test14 | U15 in Q | Between 3 and 4 of U15 pin | Fluctuate between 0~3.3V |

9.2 Procedure of Troubleshooting

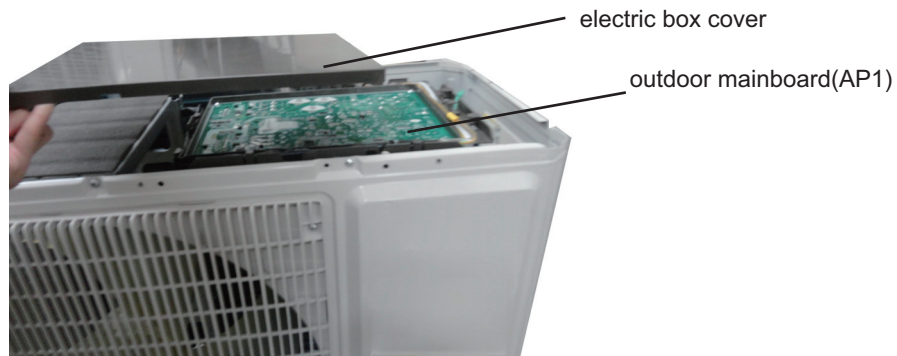
1. For malfunction diagnosis please conduct according to the following flowchart

| Step | Malfunction diagnosis procedure |
|------|--|
| 1 | Confirm malfunction |
| 2 | Read error code of indoor/outdoor unit and find out the malfunction name |
| 3 | Troubleshooting and maintenance (see the contents hereinafter) |

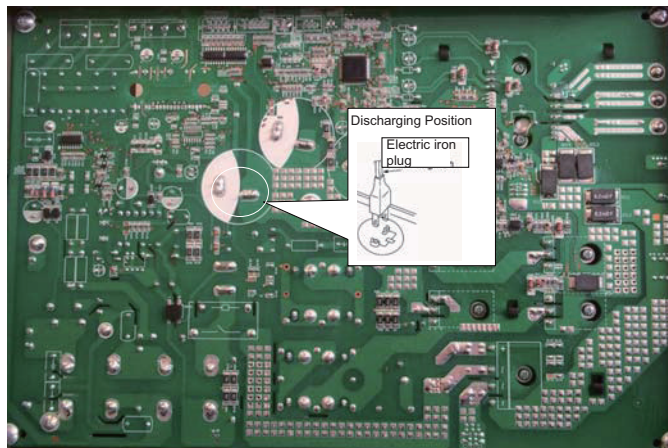
Notes:

There's electrolytic capacitor with big capacity on main board of outdoor unit. Even the power is cut off, there's still high voltage in the capacitor (DC 280V-380V; it's related to input voltage). It takes more than 20mins for the voltage to decrease to safety range. If touch the electrolytic capacitor within 20min after cutting off the power, it will cause electric shock. If it needs to maintain the unit after de-energization, please discharge the electrolytic capacitor by the method as below:

1. Open the electric box cover of outdoor unit



2. As shown in below fig. Insert the plug of discharging resistance (about 100 ohm, 20W) or electric soldering iron into the two points of discharging positions (it will cause spark at the begging of contacting), keep about 30s, and then discharge the electrolytic capacitor. After discharging and before maintenance, please use DC notch of universal meter to check whether discharge is finished to prevent electric shock. If the voltage is less than 20V, you can maintain the unit safely. Prohibit discharging the electrolytic capacitor with current-conducting object directly.



Malfunction confirmation

1. First check if the power source is normal.

Make sure that the power switch is closed and in supplying status;

2. Confirm the supply voltage

Make sure that the supply voltage is within the range of AC 200V~250V. If not, the unit may not operate normally.

2. Summary sheet for malfunction of ODU

| No | Name of Malfunction | Display of Outdoor Unit | | | | AC Status | Possible Causes |
|----|--|--|----|-----|-----|---|--|
| | | Indicator has 3 kinds of display status and they will be displayed circularly every 5s | | | | | |
| | | □ OFF ■ ON ☆ Blink | | | | | |
| | | D5 | D6 | D16 | D30 | | |
| 1 | High pressure protection of system | □ | ☆ | ☆ | ☆ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | 1. Refrigerant is superabundant;; 2. Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); 3. Ambient temperature is too high; 4. High pressure switch is damaged. |
| 2 | Freeze prevention protection | ■ | □ | ■ | □ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | 1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty; 4. Indoor tube temperature sensor is abnormal |
| 3 | High discharge temperature protection of compressor | ■ | □ | ■ | ☆ | During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating: all loads stop operation. | Please refer to the malfunction analysis (discharge protection, overload) |
| 4 | AC overcurrent protection | □ | ■ | ☆ | □ | During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating: all loads stop operation. | 1. Supply voltage is unstable; 2. Supply voltage is too low and load is too high; 3. Current is too high due to overload |
| 5 | Current detection malfunction of the whole unit | □ | ■ | ☆ | ■ | During cooling and drying operation, compressor and indoor fan operate. During heating operation, all loads stop operation. | The circuit on control board of outdoor unit has malfunction. Replace the control board of outdoor unit. |
| 6 | Communication malfunction between IDU and ODU | □ | □ | □ | ☆ | During cooling operation, compressor stops while indoor fan operates. During heating: all loads stop operation. | Refer to the malfunction analysis. |
| 7 | High temperature resistant protection | ■ | □ | ■ | ■ | During cooling operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Refer to the malfunction analysis (overload, high temperature resistant). |
| 8 | Outdoor ambient temperature sensor is open/short circuited | □ | □ | ☆ | ■ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | 1. Outdoor ambient temperature sensor is poorly connected (refer to the wiring diagram of indoor unit); 2. Outdoor ambient temperature sensor is damaged (please refer to the resistance table of temperature sensor) |
| 9 | Outdoor condenser temperature sensor is open/short circuited | □ | □ | ☆ | □ | During cooling and drying operation, compressor stops while indoor fan operates. During heating, all loads stop operation. | 1. Outdoor pipe temperature sensor is poorly connected (refer to the wiring diagram of indoor unit); 2. Outdoor pipe temperature sensor is damaged (please refer to the resistance table of temperature sensor) |
| 10 | Outdoor discharge temperature sensor is open/short circuited | □ | □ | ☆ | ☆ | During cooling and drying operation, compressor stops after running for 3 minutes, and indoor fan operates. During heating: all loads stop operation after running for 3 minutes. | 1. Outdoor air discharge temperature sensor is poorly connected (refer to the wiring diagram of indoor unit); 2. Outdoor air discharge temperature sensor is damaged (please refer to the resistance table of temperature sensor) |

| | | | | | | | |
|----|--|---|---|---|---|--|--|
| 11 | Outdoor discharge temperature sensor hasn't been inserted tightly | □ | ■ | □ | □ | During cooling and drying operation, compressor stops operation while indoor fan operates. During heating operation, all loads stop operation. | Outdoor discharge temperature sensor hasn't been inserted into the copper pipe. |
| 12 | Limit/decrease frequency due to overload | ■ | □ | ☆ | ☆ | All loads operate normally, and operating frequency of compressor decreases. | Refer to the malfunction analysis (overload, high temperature resistant) |
| 13 | Decrease frequency due to overcurrent | ■ | ■ | □ | ■ | All loads operate normally, and operating frequency of compressor decreases. | 1. The input supply voltage is too low; 2. System pressure is too high and overload |
| 14 | Decrease frequency due to high air discharge | ■ | ■ | □ | □ | All loads operate normally, and operating frequency of compressor decreases. | 1. Overload or temperature is too high; 2. Refrigerant is insufficient; 3. Malfunction of electric expansion valve (EKV) (for the model with electronic expansion valve); 4. Poor heat exchange of outdoor unit. |
| 15 | Limit/decrease frequency due to freeze protection | ■ | ■ | ■ | □ | All loads operate normally, and operating frequency of compressor decreases. | 1. Poor air return inside indoor unit or speed is too low; 2. Indoor tube temperature sensor is abnormal (please refer to the resistance table of 20K temperature sensor). |
| 16 | Decrease frequency due to high temperature resistant under heating | ■ | □ | ☆ | ☆ | All loads operate normally, and operating frequency of compressor decreases. | Refer to malfunction analysis (overload, high temperature resistant). |
| 17 | Defrosting | | | | | It operates under heating mode. Compressor operates while indoor fan stops operation. | Normal |
| 18 | Overload protection of compressor | □ | ☆ | ☆ | □ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | 1. Wiring terminal OVC-COMP of control board for outdoor fan is loosened; 2. Overload protector is damaged; 3. Refer to malfunction analysis (discharge protection, overload) |
| 19 | System is abnormal | ■ | □ | ■ | ■ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Refer to malfunction analysis (overload, high temperature resistant). |
| 20 | IPM protection | □ | ☆ | □ | ■ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Refer to malfunction analysis (IPM protection, desynchronizing of compressor, overcurrent protection of phase-current of compressor). |
| 21 | Module high temperature protection | ■ | □ | ☆ | ■ | During cooling operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation | 1. Check whether the ventilation of radiator is abnormal; 2. After the whole unit is de-energized for 20min, check whether the thermal grease on IPM modular of outdoor unit's control board is dry; check whether the radiator is tightened; 3. Otherwise please replace the control board of outdoor unit. |
| 22 | Circuit failure of module temperature sensor | □ | □ | ■ | ☆ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Replace control board of outdoor unit. |

| | | | | | | | |
|----|---|---|---|---|---|--|---|
| 23 | Compressor is desynchronizing | □ | ☆ | ■ | ☆ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Refer to malfunction analysis (IPM protection, desynchronizing of compressor, overcurrent protection of phase-current of compressor). |
| 24 | Overcurrent protection of phase current for compressor | □ | ☆ | □ | □ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Refer to malfunction analysis (IPM protection, desynchronizing of compressor, overcurrent protection of phase-current of compressor). |
| 25 | Malfunction of phase current detection circuit for compressor | □ | ☆ | ■ | □ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Replace control board of outdoor unit. |
| 26 | Startup failure | □ | ☆ | □ | ☆ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Refer to malfunction analysis. |
| 27 | PFC protection | □ | ■ | ☆ | ☆ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Refer to malfunction analysis. |
| 28 | EEPROM malfunction | □ | □ | ■ | ■ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Replace control board of outdoor unit. |
| 29 | Charging malfunction of capacitor | □ | ■ | □ | ■ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | Refer to malfunction analysis for charging of capacitor. |
| 30 | Malfunction of voltage dropping for DC bus-bar | □ | ■ | ■ | ■ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | The supply voltage is not stable. |
| 31 | Voltage of DC bus-bar is too low | | | | | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | 1. Measure the voltage between L and N on wiring board (XT), if the voltage is lower than 150 VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor on control board after energizing the unit (TEST3 in the fig.), if it's the DC voltage is more than 180V, there's malfunction in the circuit, please replace the control panel; if the voltage is less than 180V, please check wiring of the unit. |
| 32 | | | | | | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | 1. Measure the voltage between L and N on wiring board, if the voltage is over 265 VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control board after energizing the unit, if the voltage is less than 400V, it means the circuit for measuring DC voltage is faulted, please replace the control board. |

| | | | | | | | |
|----|---|---|---|---|---|--|--|
| 33 | DC power source is short circuited | □ | ■ | □ | ■ | During cooling and drying operation, compressor stops while indoor fan operates. During heating operation, all loads stop operation. | |
| 34 | Limit/decrease frequency due to high module temperature | ■ | ■ | ■ | ☆ | All loads operate normally, and operating frequency of compressor decreases. | 1. Check whether the ventilation of radiator is abnormal; 2. After the whole unit is de-energized for 20min, check whether the thermal grease on IPM modular of outdoor unit's control board is dry; check whether the radiator is tightened; 3. Otherwise please replace the control board of outdoor unit. |
| 35 | Switch error of 4-way valve | ■ | □ | ☆ | □ | If this error occurs under heating mode: all loads stop operation. | 1. Power voltage is less than AC175V 2. Wiring terminal 4V is loosen or broken 3. 4V is damaged; replace 4V |
| 36 | Zero-crossing malfunction of outdoor unit | ■ | ■ | ☆ | □ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | Replace control board of outdoor unit |
| 37 | Malfunction of DC fan motor of outdoor fan motor | ■ | □ | □ | □ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | Connection wires of DC fan and outdoor unit is loose; If there's no malfunction, replace the control board |
| 38 | Electric level is abnormal | ■ | ■ | ☆ | ■ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | The resistance is damaged or short-circuited, otherwise please replace the control board. |
| 39 | Offset voltage of PFC current is wrong | ■ | ☆ | □ | □ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | Replace control board of outdoor unit. |
| 40 | Malfunction of middle temperature sensor for outdoor unit | ■ | ■ | ☆ | ☆ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | Middle temperature sensor is poor connected or damaged. |
| 41 | Overvoltage | □ | ■ | ■ | ☆ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | After commutation, the DC voltage of supply power is too high. |
| 42 | Phase-lacking of outdoor fan motor | ■ | □ | □ | ■ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | Phase-lacking of power supply of outdoor fan motor. |

| | | | | | | | |
|----|--|---|---|---|---|--|---|
| 43 | Outdoor fan motor is desynchronizing | ■ | □ | □ | ☆ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | Outdoor fan motor is desynchronizing. |
| 44 | Limit/decrease frequency due to phase current protection | ■ | ■ | □ | ☆ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | Phase-current of compressor is too high. |
| 45 | Outdoor ambient temperature is abnormal | ■ | ☆ | □ | ■ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | Outdoor ambient temperature is too high or too low. |
| 46 | Current detecting circuit of fan motor is faulted | ■ | ☆ | □ | ☆ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | Current detecting circuit of fan motor is abnormal. |
| 47 | Freon-lacking protection, refrigerant circulation cut-off protection | ■ | ☆ | ■ | ■ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | The air conditioner lacks of refrigerant/the valve has not been opened/the system is blocked. |
| 48 | Limit/decrease frequency due to peak current | ■ | ☆ | ☆ | ■ | During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, all loads stop operation. | PFC peak current is too high. |

3. Malfunction Checkup Flow

First define the malfunction according to the indicator of IDU/ODU and list for malfunctions (always stuck on the electric box or top cover of unit).

Once there is malfunction, the indicator of outdoor control board will directly display corresponding malfunction.

Some malfunctions can be directly displayed on the monitor of indoor unit, while some should be checked by using remote controller (press the light button for 4 times in 3 seconds).

In the following diagnosis flow, "Y" means "Yes", "N" means "No".

In the following diagnosis flow, control board AP1 means control board of outdoor unit.

Notes: Before conducting malfunction maintenance, please conduct electric discharge for electrolytic capacitor according to the above methods and make sure that the voltage has dropped to 20V or below, otherwise it may cause electric shock or damage of control board.

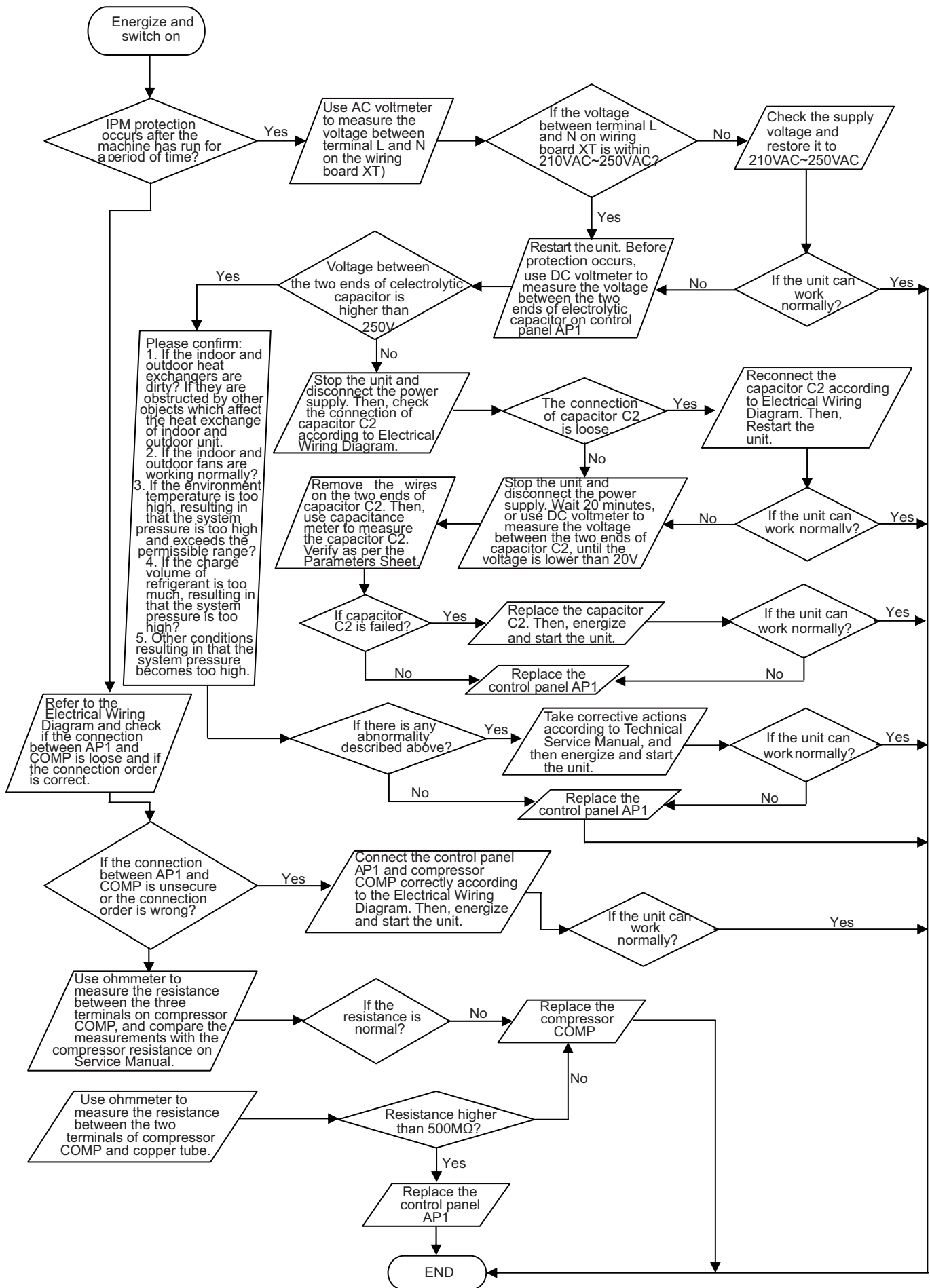
3.1. IPM Protection, Out-of-step Fault, Compressor Phase Overcurrent (AP1 below refers to the outdoor control panel)

| Possible | D5 | D6 | D16 | D30 |
|------------------------------|----|----|-----|-----|
| IPM Protection | □ | ☆ | □ | ■ |
| Out-of-step Fault | □ | ☆ | ■ | ☆ |
| Compressor Phase Overcurrent | □ | ☆ | □ | □ |

Main check points:

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

Fault diagnosis process:



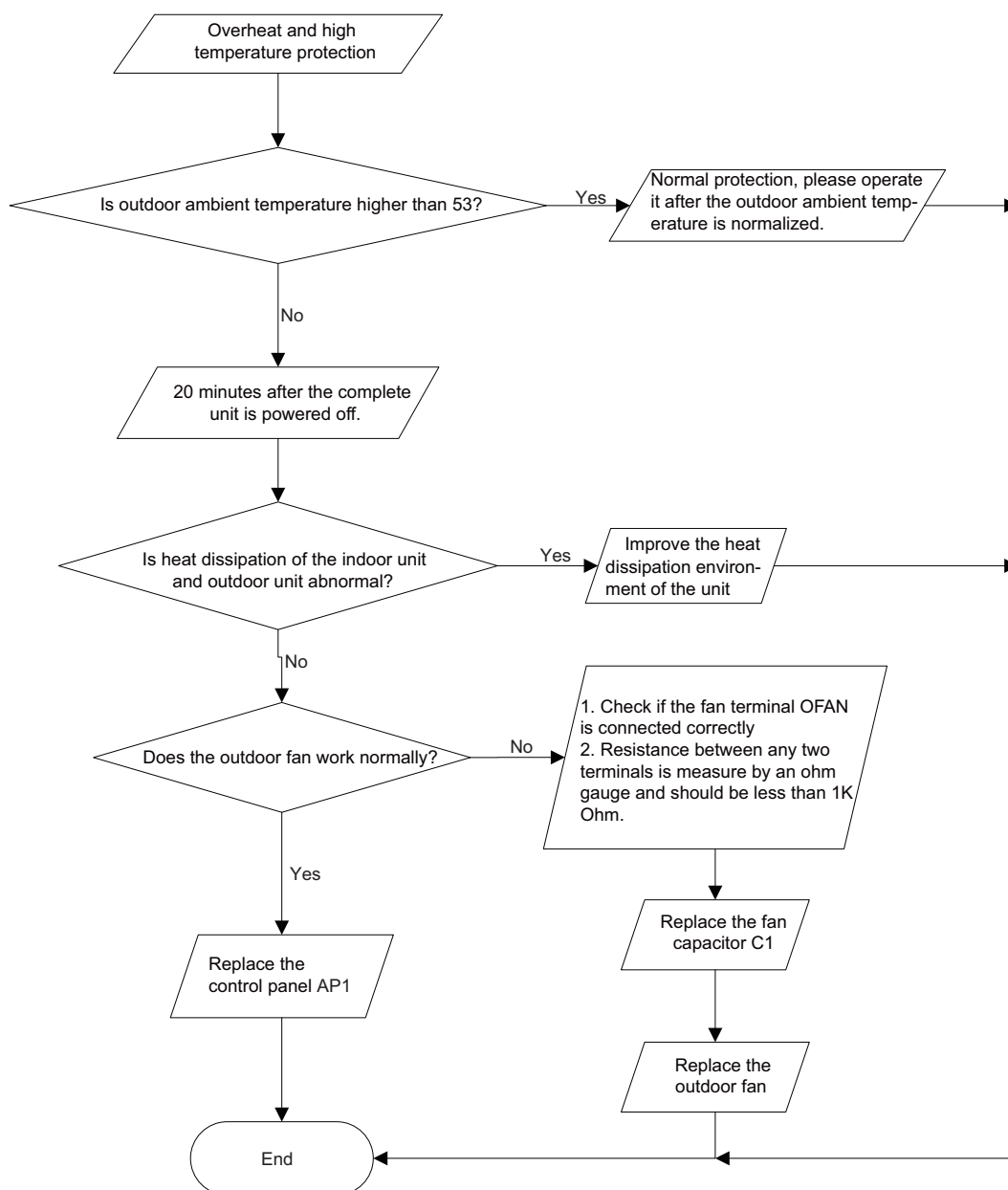
3.2 High temperature and overload protection diagnosis (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

- Is outdoor ambient temperature in normal range?
- Are the outdoor and indoor fans operating normally?
- Is the heat dissipation environment inside and outside the unit good?

Fault diagnosis process:

| D5 | D6 | D16 | D30 |
|----|----|-----|-----|
| ■ | □ | ■ | ■ |



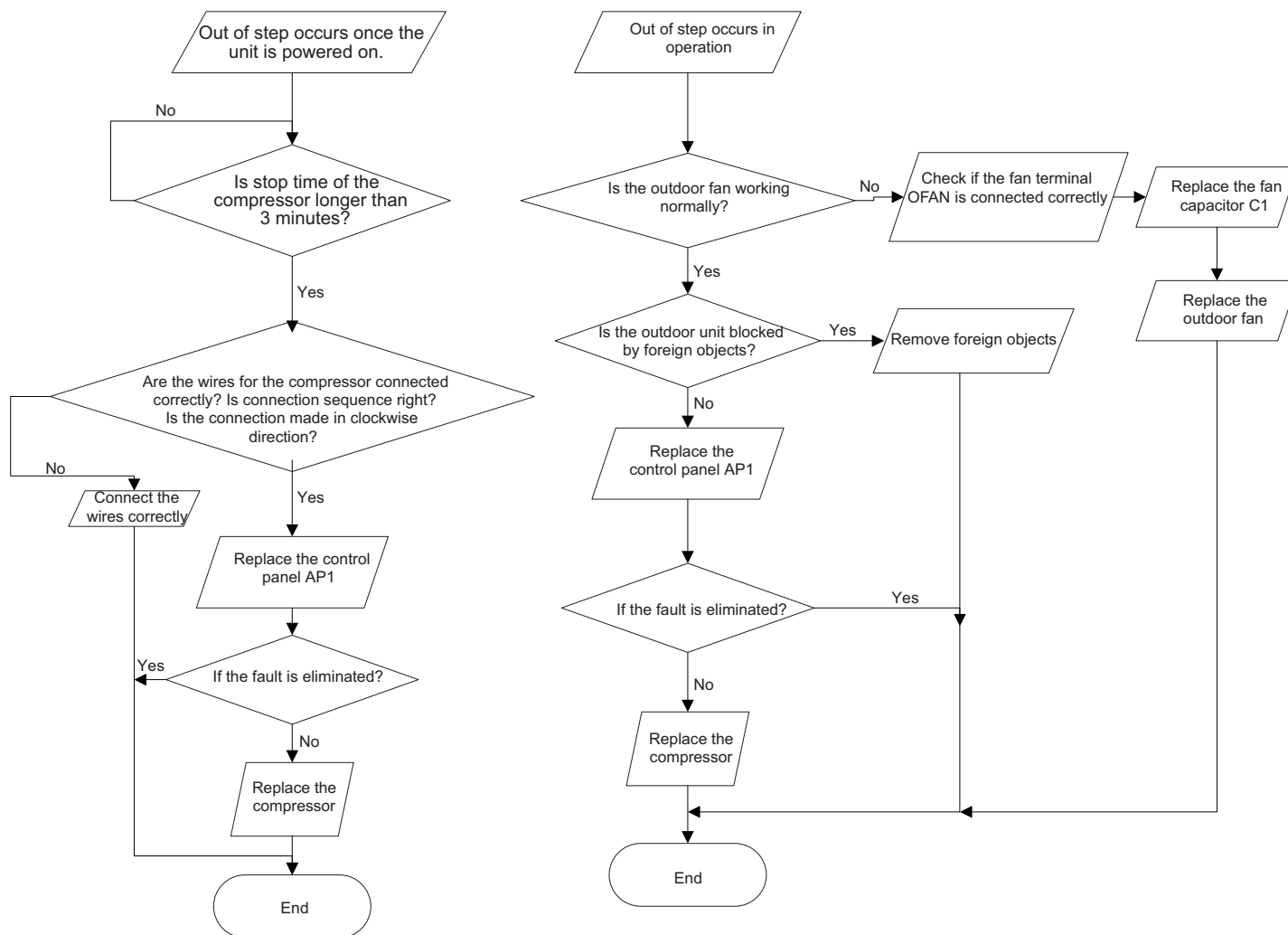
3.4. Out of step diagnosis for the compressor (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

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

Fault diagnosis process:

| D5 | D6 | D16 | D30 |
|----|----|-----|-----|
| □ | ☆ | ■ | ☆ |



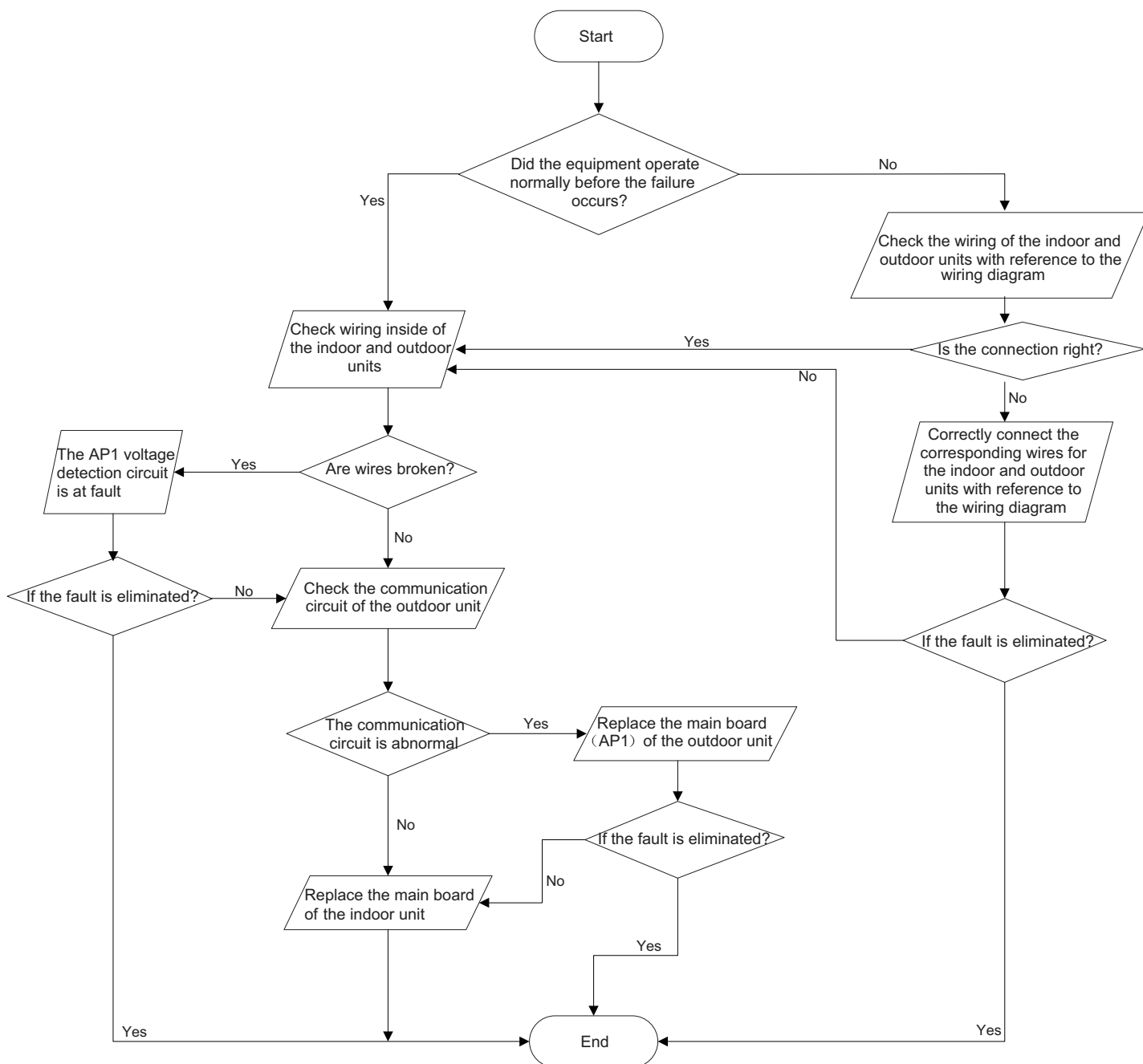
3.6. Communication malfunction: (following AP1 for outdoor unit control board)

Mainly detect:

| D5 | D6 | D16 | D30 |
|----|----|-----|-----|
| □ | □ | □ | ☆ |

- Is there any damage for the indoor unit mainboard communication circuit? Is communication circuit damaged?
- Detect the indoor and outdoor units connection wire and indoor and outdoor units inside wiring is connect well or not, if is there any damage?

Fault diagnosis process:

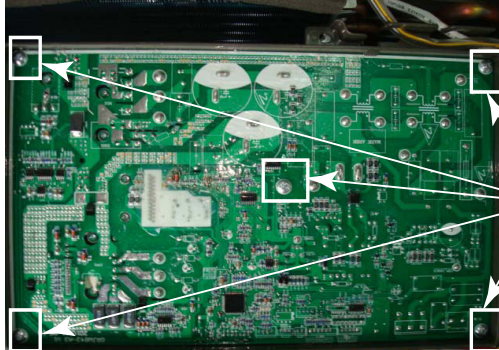


4. Installation and Maintenance Diagram for Controller

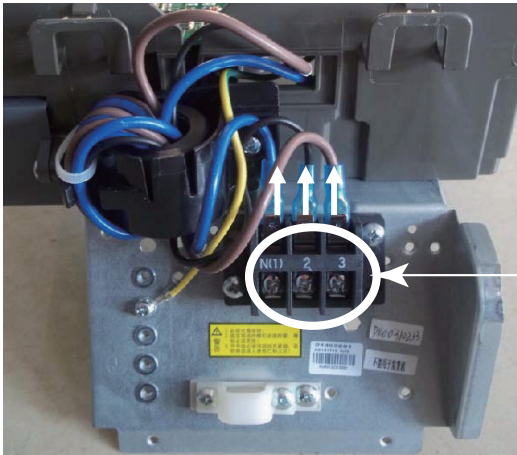
(The following are process for disassembly. For installation please conduct back to front.)

(a) After opening the top cover of ODU.

(Planform of electric box)



Unscrew the screws at the five positions

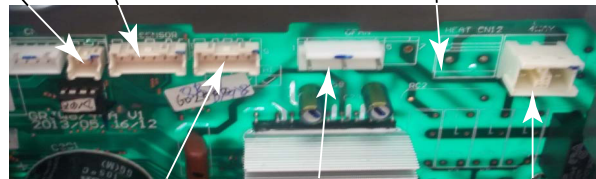


Pull out these three wiring terminals. Do not pull the electric wire when pulling out the terminals. You can pull it out by pressing the lock catch on the pin.

Overload of compressor (OVC-COMP)

Temperature sensor (T-SENSOR)

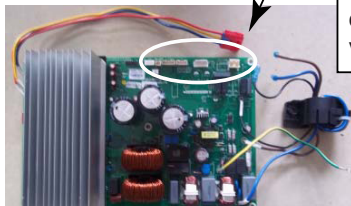
2-way valve (CN12) (depend on the model)



Electronic expansion valve (FA)

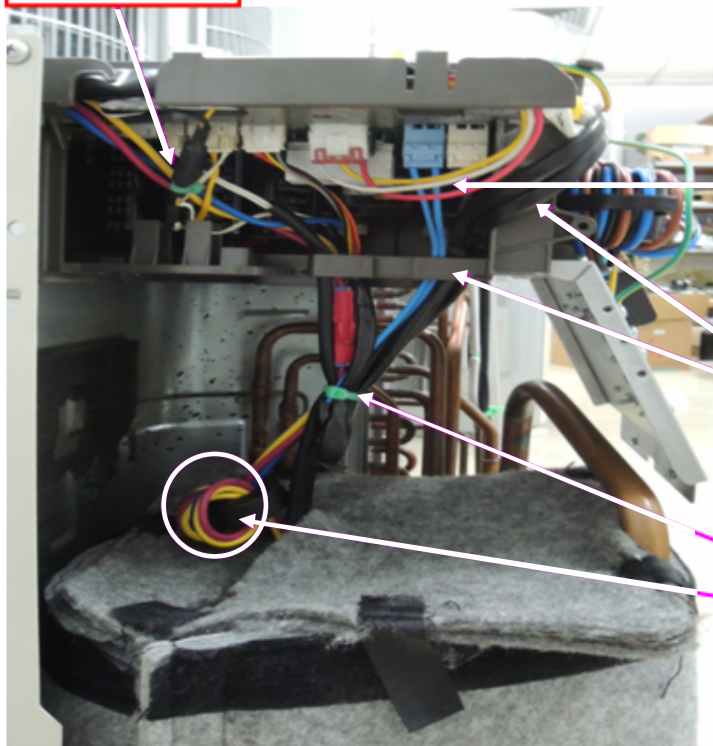
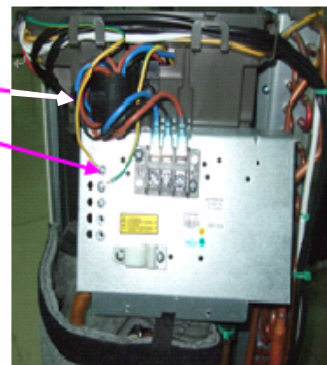
Fan motor (OFAN)

4-way valve (4V) (not for cooling only unit)



Ambient temperature sensor and tube temperature sensor should through this position and then connect to the mainboard

Wiring connection in wiring board is shown as the figure. Ground lead of motor and mainboard are fixed beside the wiring board, as shown in the figure.



The motor wire should through from the wire slots shown in the picture and then connect to the mainboard.

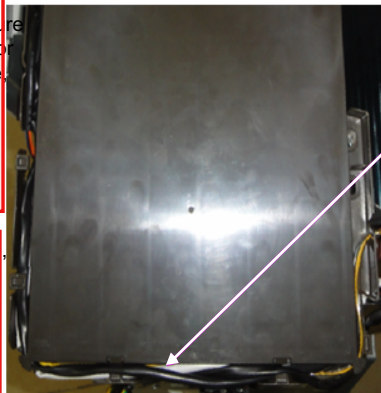
The 2-way valve and electronic expansion valve should be arranged as shown in the picture, the wires should be clicked into the buckles in the bottom of electric box.

All the wires in this position should be fixed with tieline, (truss the excess part of wires of 2-way valve and electronic expansion valve), and then arrange the wires from the lower buckle of electric box to enter into the electric box.

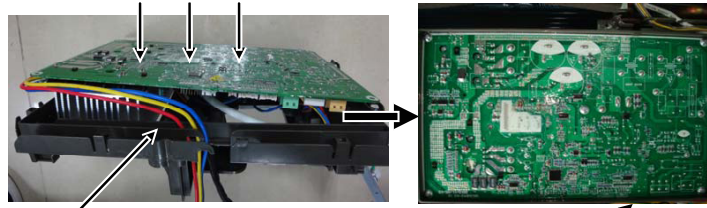


In the lower position of sound insulation cotton, use high-temperature tieline to truss the temperature sensor wire, compressor wire, overload wire, 4-way valve wire, etc. to prevent them from touching the inhalation tube. (Notes: all the wires should thread through the wire hole of inner side of sound insulation cotton)

Air discharge wire, 4-way valve wire, compressor wire and overload wire are all belonging to motion wires. When fixing the wires, keep a clearance of 20~30 mm to prevent them from being dragged.

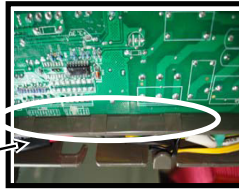


Wire arrangement inside the electric box for wires of ambient temperature sensor and tube temperature sensor, electronic expansion valve, 2-way valve is shown in the picture.



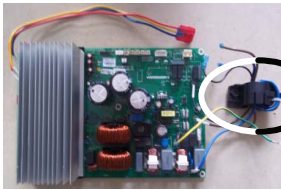
Notes: the compressor wire of controller threads through the wire slot.

Make sure that the PCB board has clicked into this buckle.

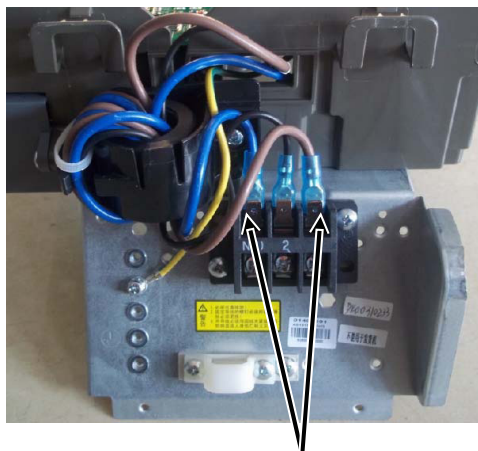
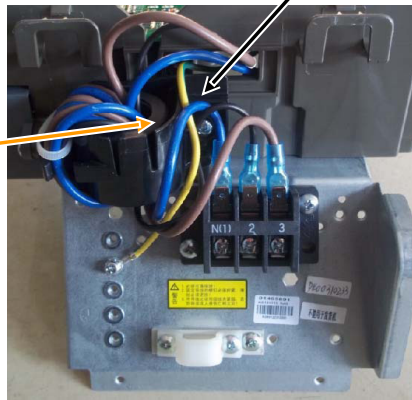


Notes:

put the mainboard (AP1) of controller into the electric box along the shown direction in the picture. Make sure that the mainboard of controller is horizontally placed in the corresponding slot in the electric box, and the mainboard has no distortion.

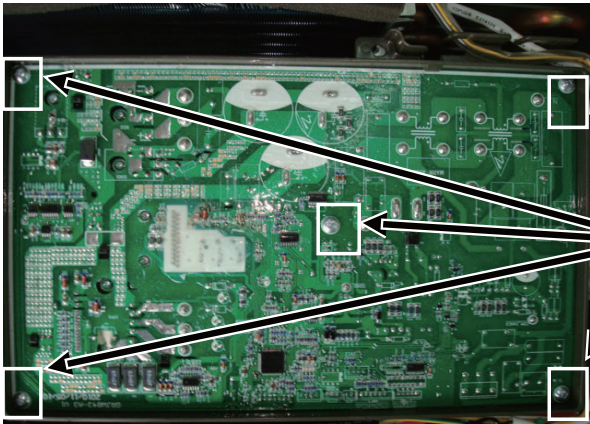


Use screw to fix the magnetic ring

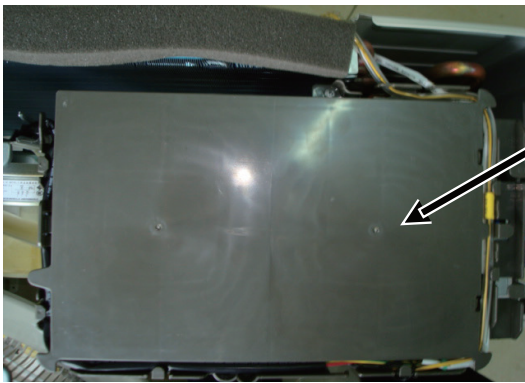


Connect the terminals of zero wire, live wire, and communication wire according to the circuit diagram. Pay attention to the connecting order (wiring board 1 (N), 2, 3 correspond to the zero wire, communication wire, live wire), please operate according to the "Methods for connecting terminals" (see the following chapter); use screw to fix the ground lead onto the sheet metal.

Wires and terminals on the mainboard AP1 of controller (please refer to the connecting method of terminals in the previous chapter)



Fix the screws in these five positions



Cover the electric box cover, make sure that the electric box cover match to the slot of electric cover.

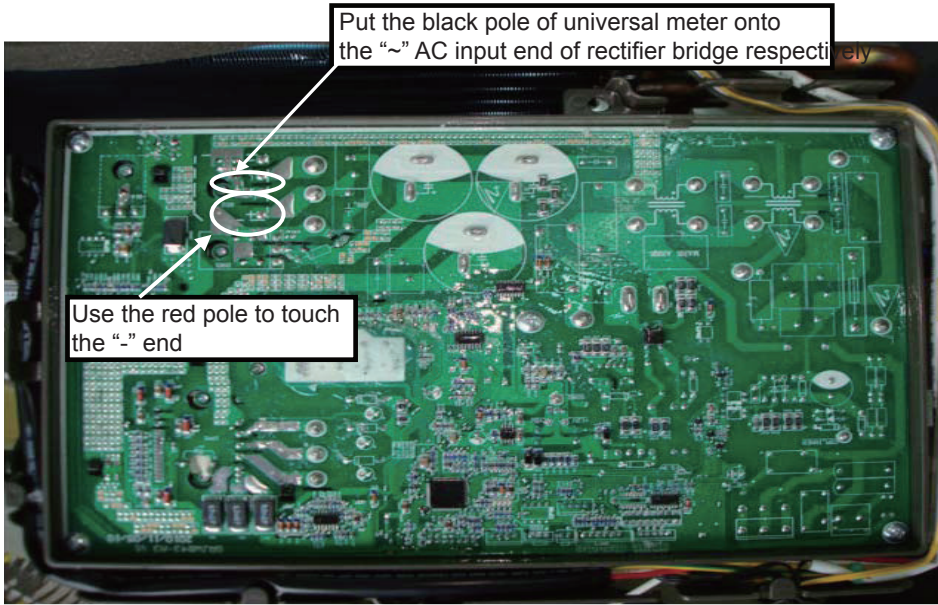
Finish assembling the controller.

Checking method:

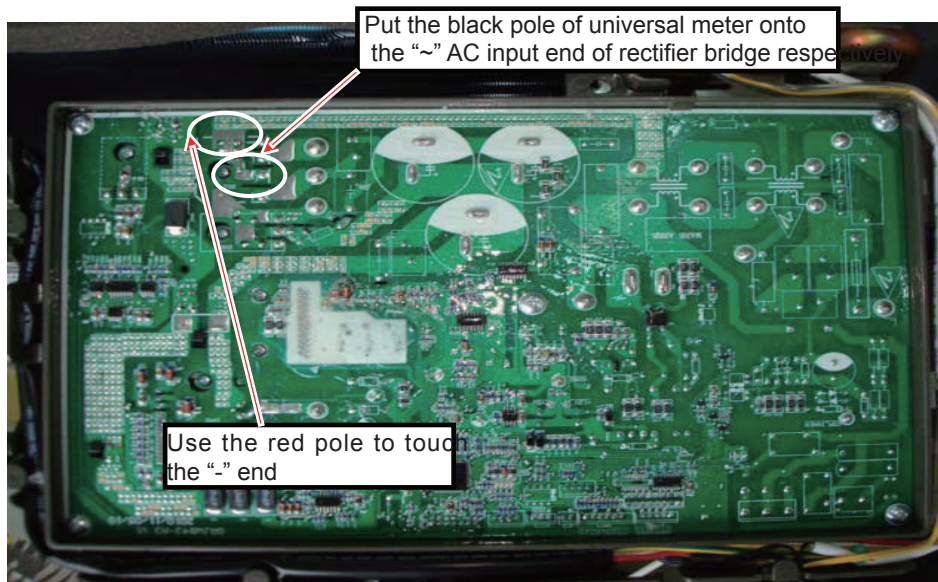
Use diode notch of universal meter to measure:

Process:

- a. Put the black pole of universal meter onto the “+” end of rectifier bridge, as shown in the 1 end of the above picture, use the red pole to touch the 2 and 3 ends of rectifier bridge respectively, that is, the AC input end with “~”, read the value respectively, if it is within the range of 0.3V~0.8V, it means the two diodes of rectifier bridge are normal;
- b.



- c. Put the red pole of universal meter onto the “-” end of rectifier bridge, as shown in the 4 end of the above picture, and then use black pole to touch the 2 and 3 end respectively, that is, the AC input end with “~”, read the value on the universal meter respectively, if it is between 0.3V~0.8V, it means the two diodes are normal.

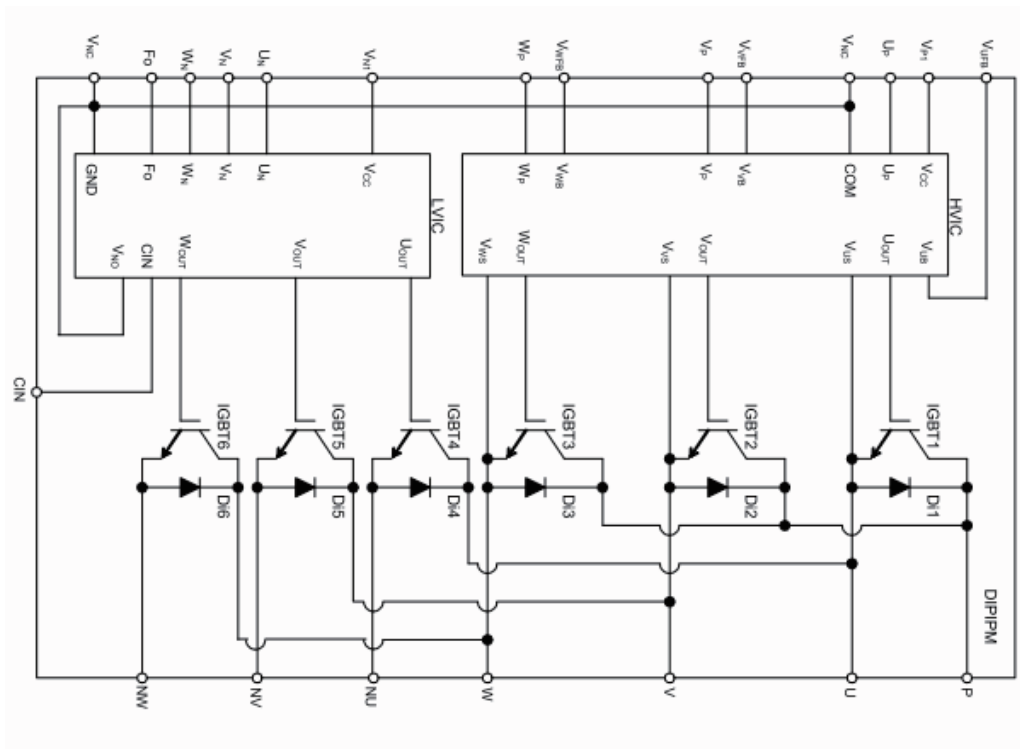
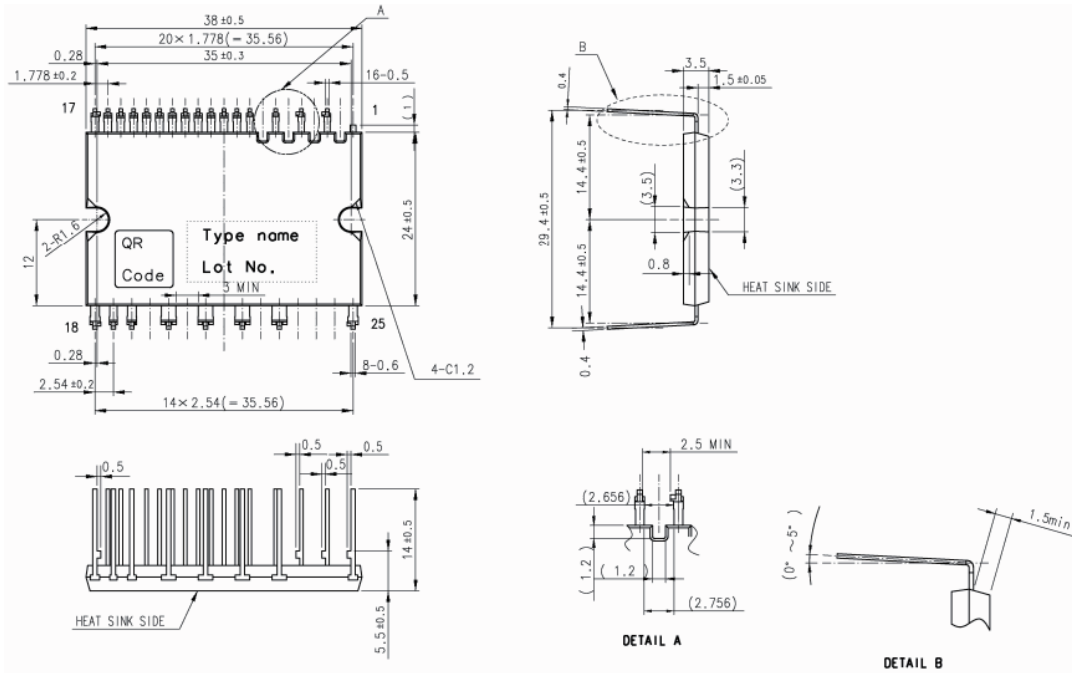


d. After the above measurement, you will get 4 numerical values, if any one of them is not within the range of 0.3V~0.7V, it means the rectifier bridge is damaged.

Notices: during the measurement, please make sure that the battery of universal meter is sufficient and the pole has touched the end (there may be glue in the surface of mainboard for damp proofing, which may cause invalid touch of the pole).

6.2 IPM module

Appearance and inner diagram (the following diagrams are only for reference. It depends on different models and manufacturers.)

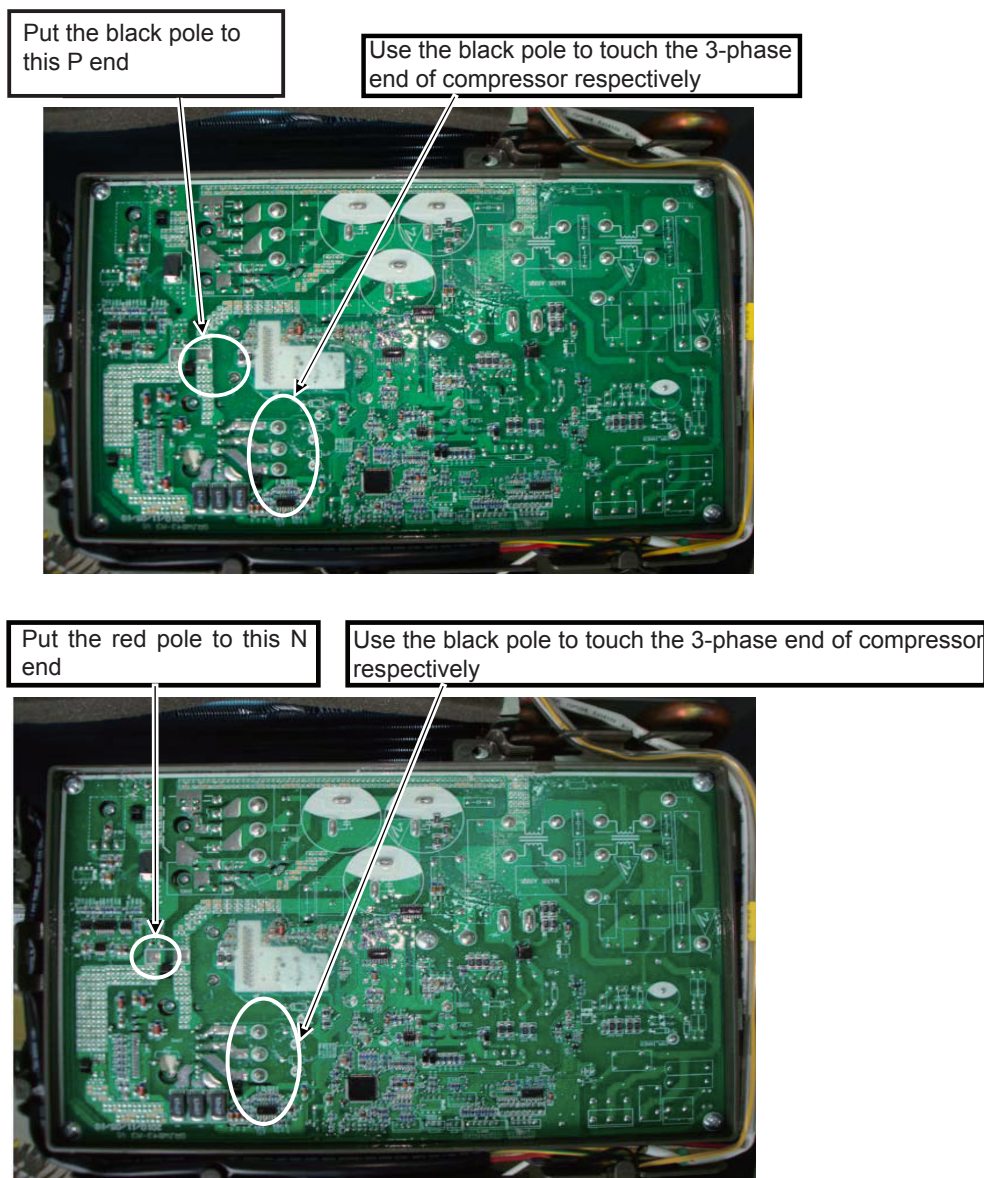


Checking method

Use the diode notch of universal meter to check the power (this is only for checking if the IGBT1~IGBT6 and continuous-flow Di1~Di6 inside the module are damaged)

Process

- a. Disconnect the connecting wire of compressor;
- b. Put the black pole of universal meter onto "P" end of IPM module (this end connects to the positive pole of high-pressure electrolytic capacitor); use the red pole to touch the 3-phase end of compressor, and read the value of universal meter respectively, if the value is within 0.3V~0.8V, it means this part is normal.



d. After the above measurement, you will get 4 numerical values, if any one of them is not within the range of 0.3V~0.7V, it means the IPM module is damaged.

Notices: during the measurement, please make sure that the battery of universal meter is sufficient and the pole has touched the end (there may be glue in the surface of mainboard for damp proofing, which may cause invalid touch of the pole).

9.3 Troubleshooting for Normal Malfunction

1. Air Conditioner Can't be Started Up

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

2. Poor Cooling (Heating) for Air Conditioner

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

3. Horizontal Louver Can't Swing

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

4. 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

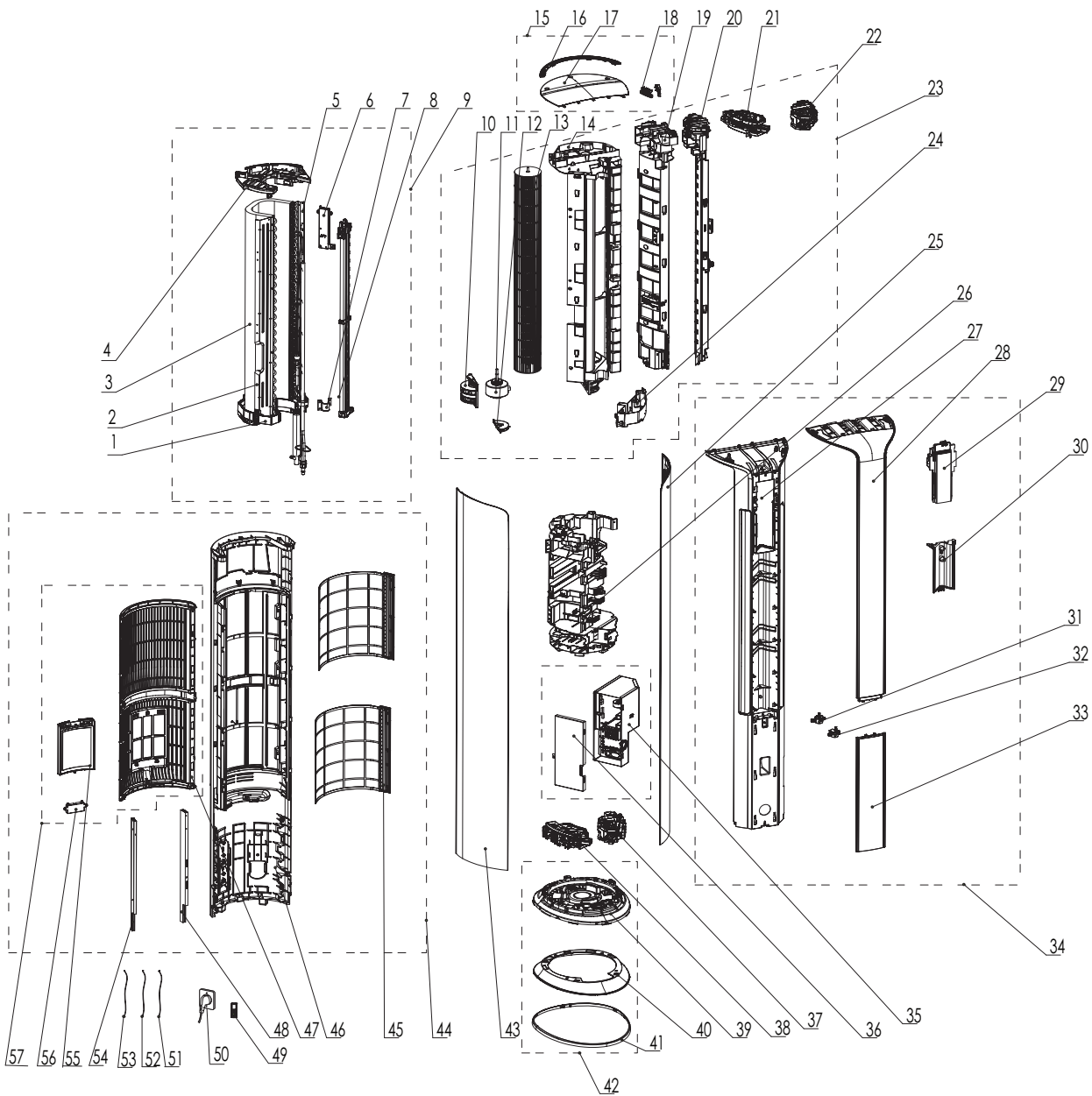
| Possible causes | Discriminating method (air conditioner status) | Troubleshooting |
|-----------------------|---|---|
| Drain pipe is blocked | Water leaking from indoor unit | Eliminate the foreign objects inside the drain pipe |
| Drain pipe is broken | Water leaking from drain pipe | Replace drain 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. Exploded View and Parts List

10.1 Indoor Unit



The component is only for reference; please refer to the actual product.

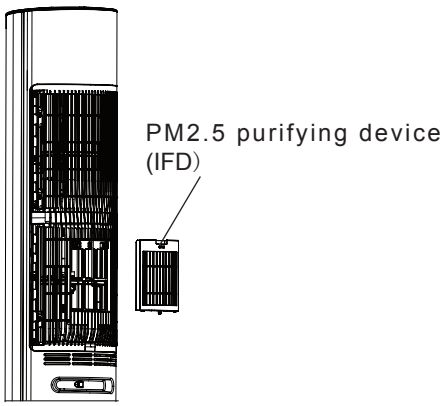
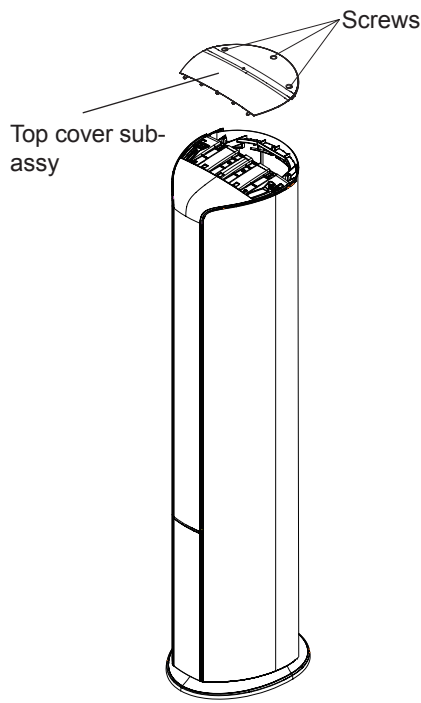
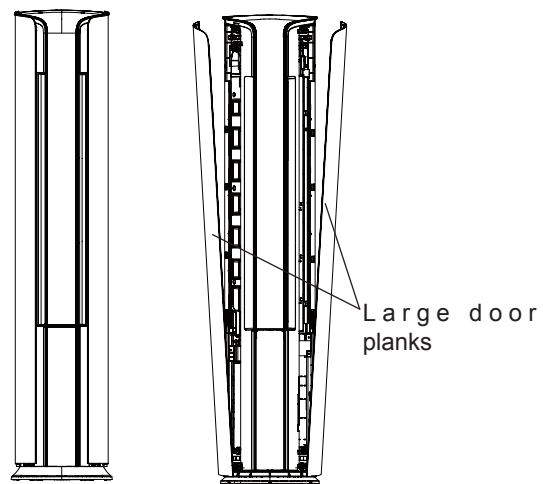
| NO. | Description | Part Code | Qty |
|-----|------------------------------------|-------------------|-----|
| | | GVH24AK-K3DNC6A/I | |
| | Product Code | CH074N00100 | |
| 1 | Water Tray 1 | 20184026 | 1 |
| 2 | Baffle Plate | 01364350 | 1 |
| 3 | Evaporator Assy | 01004571 | 1 |
| 4 | Evaporator Support Assy | 24214058 | 1 |
| 5 | Baffle plate | 01364351 | 1 |
| 6 | Examine Plank CS552E | 30110097 | 1 |
| 7 | Support Plate | 01794045 | 1 |
| 8 | Electrical Heater | 320000901 | 1 |
| 9 | Evaporator Assy | 0100457201 | 1 |
| 10 | Motor Cover 2 | 22242152 | 1 |
| 11 | Fan Motor | 15012143 | 1 |
| 12 | Motor Press Plate | 26114395 | 1 |
| 13 | Cross Flow Fan | 10354005 | 1 |
| 14 | Air Duct Assy | 10104095 | 1 |
| 15 | Top Cover Sub-Assy | 22244477 | 1 |
| 16 | Decorate(crest cover) | 20194246 | 1 |
| 17 | Coping | 20124441 | 1 |
| 18 | Press to Press a Piece | 26114511 | 2 |
| 19 | Connection Plate | 26114397 | 1 |
| 20 | Lead Breeze Module | 10104088 | 1 |
| 21 | Rotating Device Assy | 10544052 | 1 |
| 22 | Rotating Device Assy | 10544051 | 1 |
| 23 | The Breeze Way Parts | 10104087 | 1 |
| 24 | Water Tray 2 | 20184027 | 1 |
| 25 | The Front Door Plank Module(right) | 26114495 | 1 |
| 26 | Base | 26154105 | 1 |
| 27 | Air Outlet Panel | 20014206P | 1 |
| 28 | Decorate the Plank Module(up) | 20194247 | 1 |
| 29 | Display Board | 30568194 | 1 |
| 30 | Press Plate | 26114486 | 1 |
| 31 | Motor Assy | 15004002 | 1 |
| 32 | Motor Assy | 15004003 | 1 |
| 33 | Decorate the Plank Module(descend) | 20194248 | 1 |
| 34 | Ago Door Plank Parts | 26114499 | 1 |
| 35 | Electric Box Assy | 02604092 | 1 |
| 36 | Electric Box Cover | 01254069 | 1 |
| 37 | Rotating Device Assy | 10544050 | 1 |
| 38 | Rotating Device Assy | 10544049 | 1 |
| 39 | Chassis Sub | 22224072 | 1 |
| 40 | Decorative Board | 20194105P | 1 |
| 41 | Decorative Board | 20194249D | 1 |
| 42 | Chassis Sub-assy | 22224071 | 1 |
| 43 | The Front Door Plank Module(left) | 26114494 | 1 |

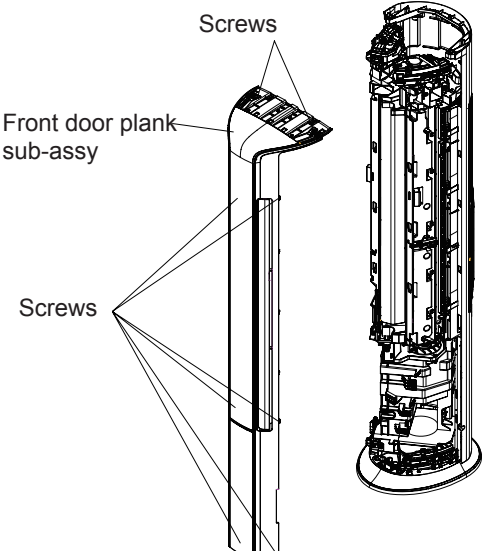
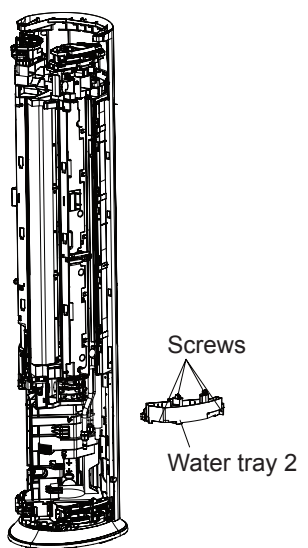
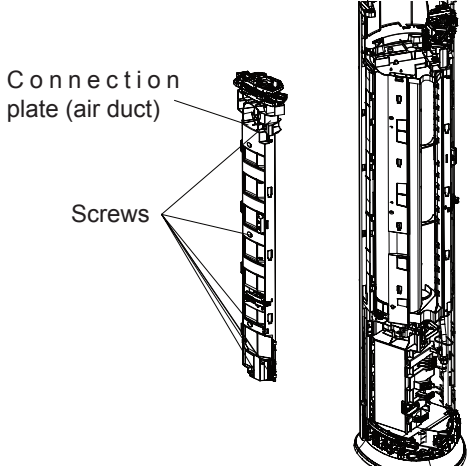
| | | | |
|----|--------------------------------------|------------|---|
| 44 | Air Intake Panel Assy | 20014212 | 1 |
| 45 | Filter Sub-Assy | 11124033P | 2 |
| 46 | Air Intake Panel | 20014207P | 1 |
| 47 | Air Intake Front Grill | 22414009P | 1 |
| 48 | Support Plate | 01794036 | 1 |
| 49 | Remote Controller | 30510512 | 1 |
| 50 | Socket | / | / |
| 51 | 4-Temperature Sensor | 3900013714 | 1 |
| 52 | Connecting Cable | 40020317 | 1 |
| 53 | Connecting Cable | 40020789 | 1 |
| 54 | Support Plate | 01794037 | 1 |
| 55 | Filter Sub-Assy | 11124224 | 1 |
| 56 | The High Pressure Occurrence Machine | 11140029 | 1 |
| 57 | Front Grill Assy | 22414010 | 1 |

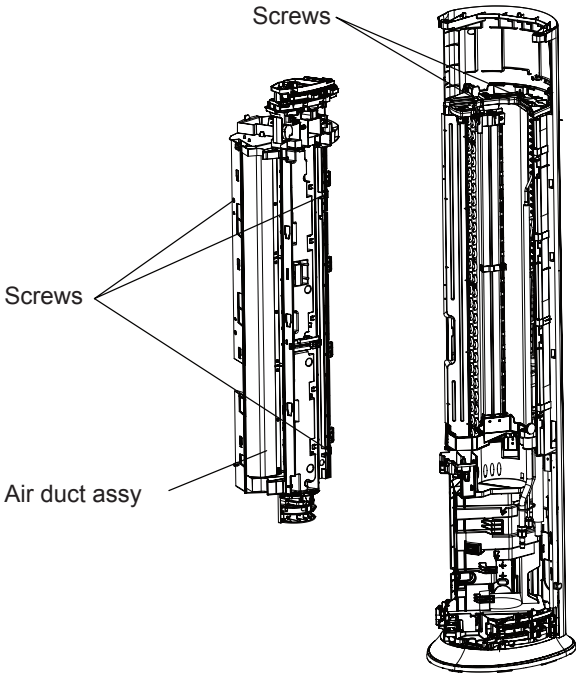
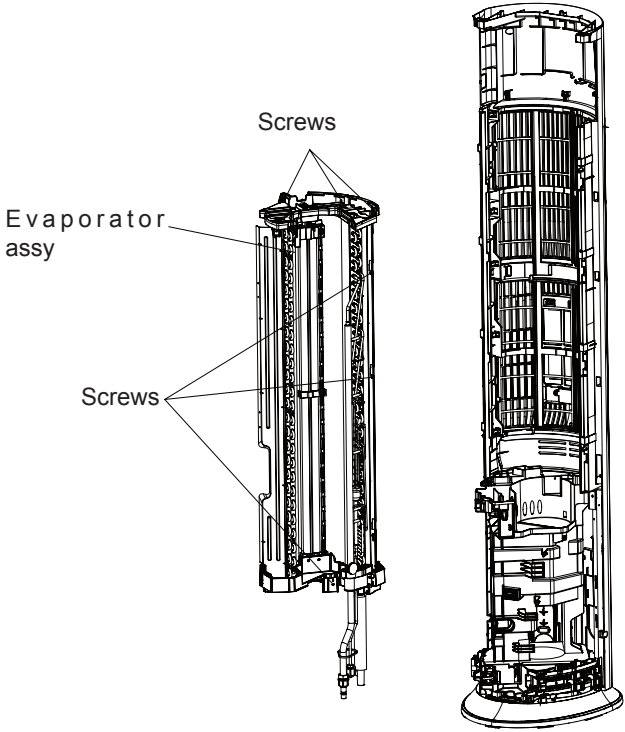
Above data is subject to change without notice.

| No. | Description | Part Code | Qty |
|-----|-----------------------------|-------------------|-----|
| | | GVH24AK-K3DNC6A/O | |
| | | Product Code | |
| | | CH074W00100 | |
| 1 | Front Grill | 22415011 | 1 |
| 2 | Handle | 26235401 | 1 |
| 3 | Cabinet | 01435004P | 1 |
| 4 | Front Side Plate | 01305086P | 1 |
| 5 | Axial Flow Fan | 10335014 | 1 |
| 6 | Fan Motor | 1501403402 | 1 |
| 7 | Electric Box Assy | 10000204840 | 1 |
| 8 | Main Board | 30138000204 | 1 |
| 9 | Terminal Board | 420111041 | 1 |
| 10 | Handle | 26235401 | 1 |
| 11 | Left Side Plate | 01305043P | 1 |
| 12 | Coping | 01255006P | 1 |
| 13 | Motor Support Sub-Assy | 01705025 | 1 |
| 14 | Condenser Support Plate | 01175092 | 1 |
| 15 | Condenser Assy | 01103000252 | 1 |
| 16 | Rear Grill | 01475013 | 1 |
| 17 | Wiring Clamp | 26115004 | 1 |
| 18 | Temperature Sensor | 3900030901 | 1 |
| 19 | Electronic Expansion Valve | 07135176 | 1 |
| 20 | Big Handle | 26235001 | 1 |
| 21 | Valve Cover | 22245003 | 1 |
| 22 | Cut off Valve | 07130239 | 1 |
| 23 | Valve Support Sub-Assy | 0170506101P | 1 |
| 24 | Right Side Plate | 0130504401P | 1 |
| 25 | 4-way Valve Assy | 03025497 | 1 |
| 26 | Compressor and fittings | 00105251 | 1 |
| 27 | Clapboard Sub-Assy | 01235091 | 1 |
| 28 | Drainage Hole Cap | 06813401 | 3 |
| 29 | Drainage Connector | 06123401 | 1 |
| 30 | Electrical Heater (Chassis) | / | / |
| 31 | Chassis Sub-assy | 01205223P | 1 |

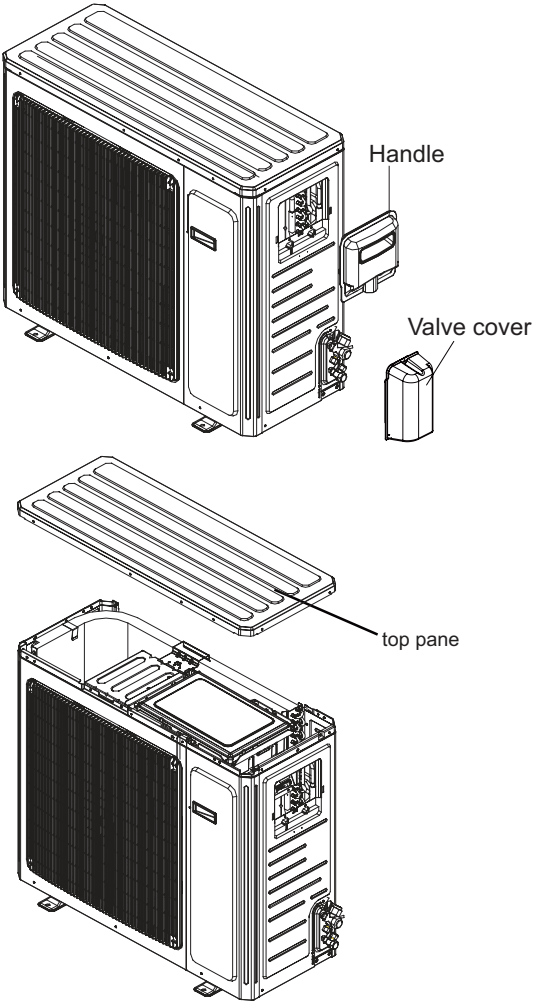
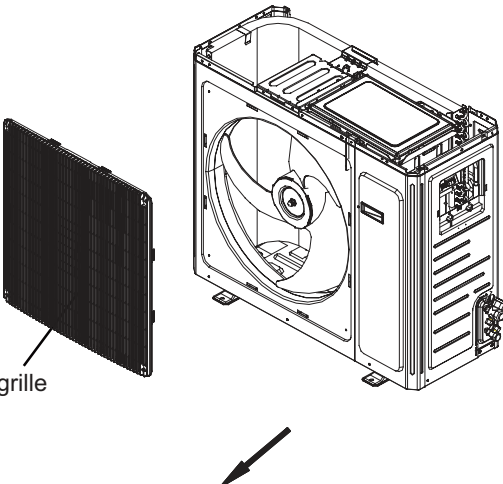
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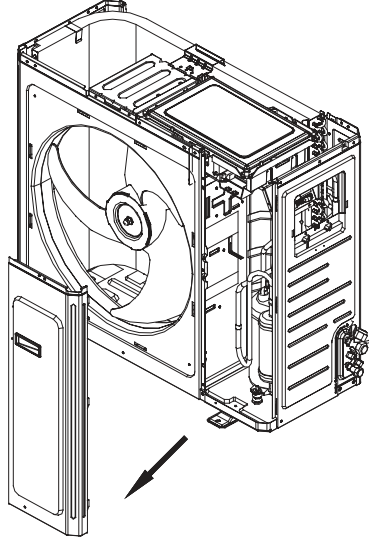
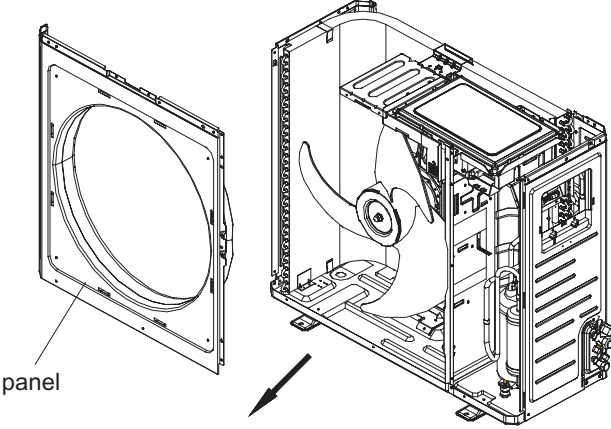
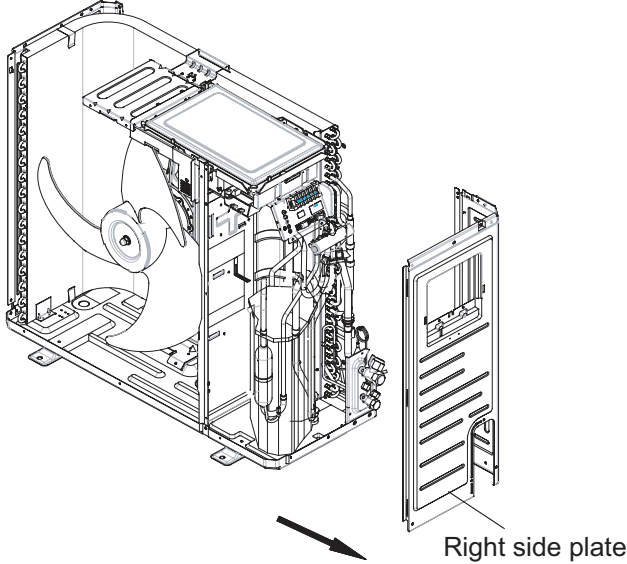
| Step | Procedure |
|--|---|
| 3. Remove the PM2.5 purifying device (IFD) | <p>a. Take apart the PM2.5 purifying device in the back of indoor unit along the direction of arrow;</p> <p>b. Press the buckle in upper position of “purifier module”, and then draw out the purifier module and filter.</p>  |
| 4. Remove the top cover sub-assy | <p>Unscrew the 3 screws for fixing the top cover, and then hold the top cover and draw it backward to take it apart.</p>  |
| 5. Remove the large door plank | <p>a. Under closing status of large door plank, first unscrew the 2 spring screws, and then under open status of large door plank, unscrew the 2 spring screws.</p> <p>b. And then take apart the large door planks.</p>  |

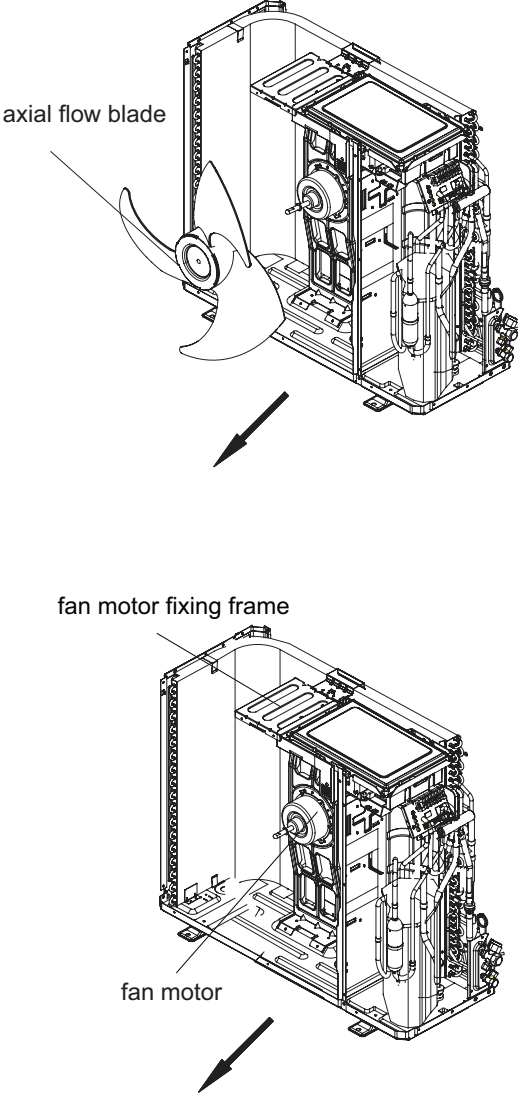
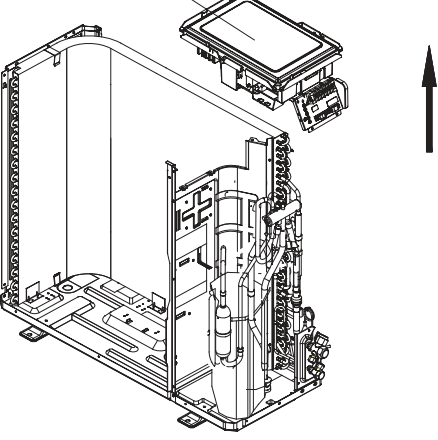
| Step | Procedure |
|---|--|
| <p>8. Remove the front door plank assy</p> | <p>Unscrew the 8 screws which are for fixing the front door plank, and then lift the front door plank assy to remove them out. Screws</p>  |
| <p>9. Remove the water tray 2</p> | <p>Unscrew the 4 screws which are for fixing the water tray 2, and then remove the water tray 2.</p>  |
| <p>10. Remove the connection plate (air duct)</p> | <p>Unscrew the 7 screws which are for fixing the connection plate (air duct) 1, and then lift the connection plate (air duct) to remove them out.</p>  |

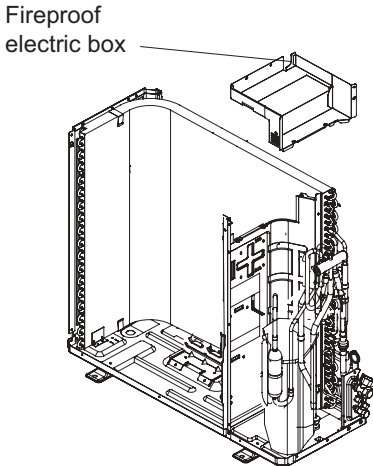
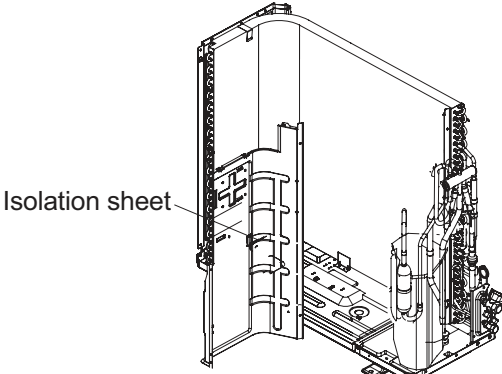
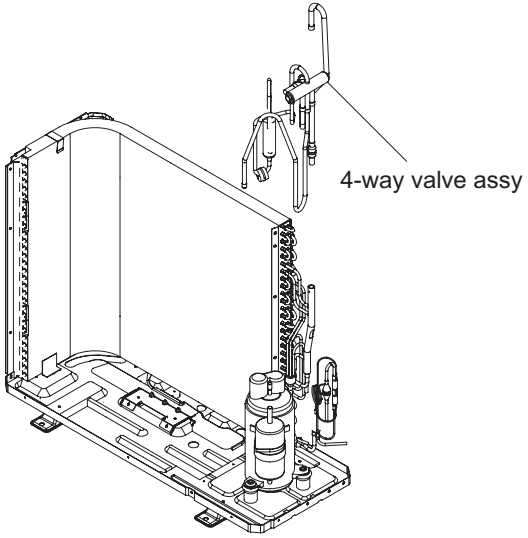
| Step | Procedure |
|---------------------------------------|---|
| <p>11. Remove the air duct assy</p> | <p>First unscrew the 6 screws which are for fixing the air duct, and then lift the air duct up to separate the buckle from the slot, and then remove it out.</p>  <p>The diagram for Step 11 consists of two parts. On the left is a side view of the air duct assembly, which is a cylindrical component with a top cap. Six screws are shown being removed from the top cap. On the right is a top-down view of the main unit, showing the air duct assembly being lifted out of its housing. Labels include 'Screws' pointing to the top cap screws, and 'Air duct assy' pointing to the main cylindrical component.</p> |
| <p>12. Remove the evaporator assy</p> | <p>Unscrew the 6 screws which are for fixing the evaporator assy, slightly lift the evaporator up, and then draw it out.</p>  <p>The diagram for Step 12 consists of two parts. On the left is a side view of the evaporator assembly, which is a cylindrical component with a top cap. Six screws are shown being removed from the top cap. On the right is a top-down view of the main unit, showing the evaporator assembly being lifted out of its housing. Labels include 'Screws' pointing to the top cap screws, and 'Evaporator assy' pointing to the main cylindrical component.</p> |

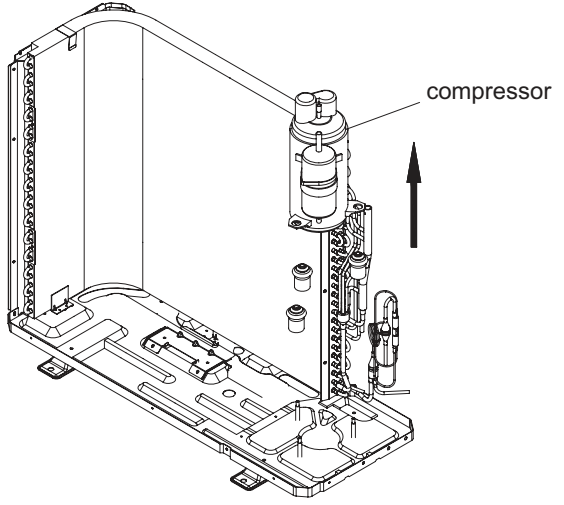
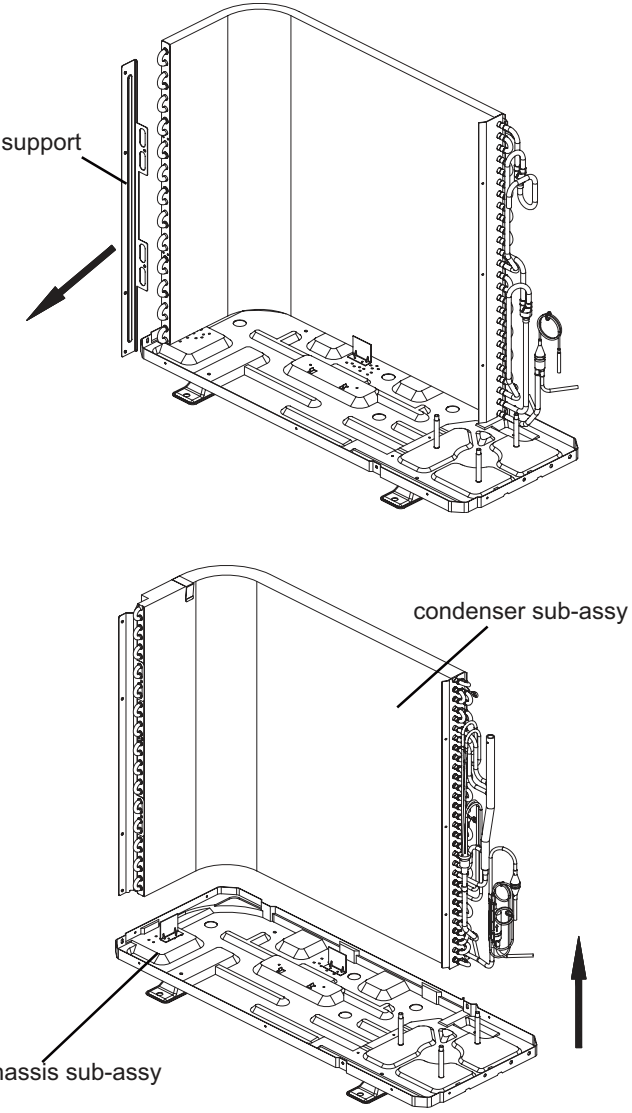
11.2 Removal Procedure of Outdoor Unit

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

| Step | Procedure | |
|--------------------------------|--|--|
| b | Remove the screws connecting the front side plate and then remove the front side panel. |  |
| c | Remove the screws connecting the panel with the chassis and the motor support, and then remove the panel. |  |
| 3. Remove and right side plate | | |
| | Remove the screws connecting the right side plate with the chassis, the valve support and the electric box, and then remove the right side plate assy. |  |

| Step | Procedure | |
|--|--|--|
| <p>4. Remove fan motor</p> <p>a</p> <p>b</p> | <p>Remove the nuts fixing the blade and then remove the axial flow blade.</p> <p>Remove the 4 tapping screws fixing the motor; disconnect the leading wire insert of the motor and then remove the motor. Remove the 2 tapping screws fixing the motor support and then pull the motor support upwards to remove it.</p> |  <p>axial flow blade</p> <p>fan motor fixing frame</p> <p>fan motor</p> |
| <p>5. Remove electric box</p> | <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>electric box</p> |

| Step | Procedure |
|---|--|
| <p>6.Remove Fireproof electric box</p> | <p>Twist off the screws on fireproof electric box and then remove the fireproof electric box.</p>  |
| <p>7. Remove chassis sub-assy and Isolation sheet</p> | <p>Remove the 3 screws fixing the isolation sheet and then remove the Isolation sheet.</p>  |
| <p>8. Remove 4-way valve assy</p> | <p>Discharge the refrigerant completely;unsolder the pipelines connecting the compressor and the condenser assy,and then remove the 4-way valve assy.</p>  |

| Step | Procedure | |
|-------------------------------|---|--|
| 9. Remove compressor | Remove the 3 foot nuts fixing the compressor and then remove the compressor. |  <p>compressor</p> |
| 10. Remove condenser sub-assy | <p>a Remove the screws connecting the support (condenser) and condenser assy, and then remove the support(condenser).</p> <p>b Disassemble the chassis sub-assy and condenser sub-assy.</p> |  <p>support</p> <p>condenser sub-assy</p> <p>chassis sub-assy</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

- Standard length of connection pipe
 - 5m, 7.5m, 8m.
- Min. length of connection pipe is 3m.
- Max. length of connection pipe and max. high difference.
- 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):

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

Additional refrigerant charging amount = prolonged length of liquid pipe × additional refrigerant charging amount per meter

- 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 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 |

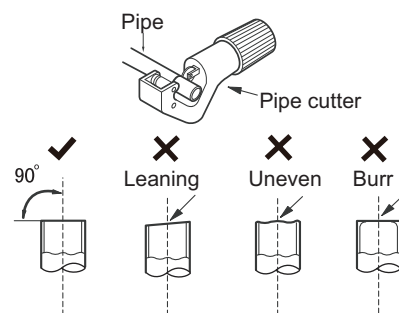
Appendix 3: Pipe Expanding Method

⚠ Note:

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

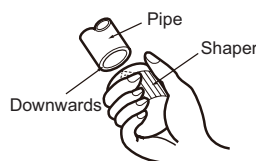
A: Cut the pip

- 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

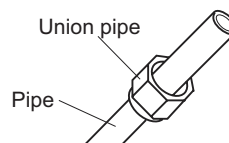
- Remove the burrs with shaper and prevent the burrs from getting into the pipe.



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.



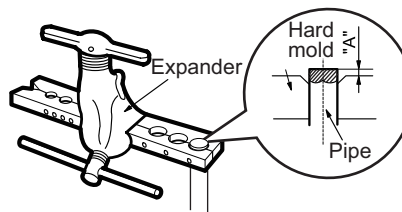
E: Expand the port

- Expand the port with expander.

⚠ Note:

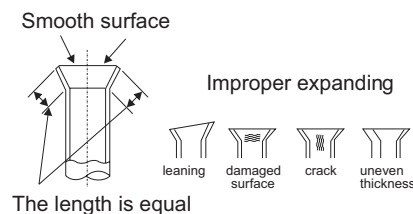
- "A" is different according to the diameter, please refer to the sheet below:

| 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 |

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