Service Manual

Models:

GWH18QD-K3DNA1G   GWH24QE-K3DNA1G
GWH18QD-K3DNA2G   GWH24QE-K3DNA2G
GWH18QD-K3DNA5G   GWH24QE-K3DNA5G
GWH18QD-K3DNA6G   GWH24QE-K3DNA6G
GWH18QD-K3DNB2G   GWH24QE-K3DNB2G
GWH18QD-K3DNB4G   GWH24QE-K3DNB4G
GWH18QD-K3DNB6G   GWH24QE-K3DNB6G
GWH18QD-K3DNB8G   GWH24QE-K3DNB8G
GWH18QD-K3DNC2G   GWH24QE-K3DNC2G

(Refrigerant R410A)

GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI
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Part Ⅰ: Technical Information

1. Summary

**Indoor Unit**

- **A1 panel**
- **A2 panel**
- **A5 panel**
  - GWH18QD-K3DNA5G/I(CB425N03402/CB425N03400)
  - GWH24QE-K3DNA5G/I(CB425N03302)
- **A5 panel**
  - GWH18QD-K3DNA5G/I(CB425N03403)
  - GWH24QE-K3DNA5G/I(CB425N03303)
- **A6 panel**
- **B2 panel**
- **B4 panel**
Outdoor Unit

GWH18QD-K3DNA1G/O
GWH24QE-K3DNA1G/O

Remote Controller

YAN1F1
# 2. Specifications

## 2.1 Specification Sheet

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Note: The connection pipe applies metric diameter.

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<td>Outer Diameter Gas Pipe</td>
<td>mm Φ12</td>
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<td>Max Distance Length</td>
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Note: The connection pipe applies metric diameter.

The above data is subject to change without notice. Please refer to the nameplate of the unit.
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<td>5.CB434002202  6.CB435000303</td>
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<td>V~</td>
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<td><strong>Cooling Operation Ambient Temperature Range</strong></td>
<td>°C -15~43</td>
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<td>A /</td>
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<td>μF /</td>
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<td><strong>Connection Pipe Gas Additional Charge</strong></td>
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Note: The connection pipe applies metric diameter.

The above data is subject to change without notice. Please refer to the nameplate of the unit.
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<th>Unit</th>
<th>Value</th>
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<td>Rated Voltage</td>
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<td>7250(2000~8500)</td>
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<td>23-34</td>
</tr>
<tr>
<td>Indoor Unit Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fan Type</td>
<td></td>
<td>Cross-flow</td>
</tr>
<tr>
<td>Fan Diameter Length(DXL)</td>
<td>mm</td>
<td>Φ108X830</td>
</tr>
<tr>
<td>Cooling Speed(SH/H/M/L/SL)</td>
<td>r/min</td>
<td>1250/1000/900/800/-</td>
</tr>
<tr>
<td>Heating Speed(SH/H/M/L/SL)</td>
<td>r/min</td>
<td>1250/1000/900/850/-</td>
</tr>
<tr>
<td>Fan Motor Power Output</td>
<td>W</td>
<td>35</td>
</tr>
<tr>
<td>Fan Motor RLA</td>
<td>A</td>
<td>0.35</td>
</tr>
<tr>
<td>Fan Motor Capacitor</td>
<td>μF</td>
<td>3</td>
</tr>
<tr>
<td>Evaporator Form</td>
<td></td>
<td>Aluminum Fin-copper Tube</td>
</tr>
<tr>
<td>Evaporator Pipe Diameter</td>
<td>mm</td>
<td>Φ7</td>
</tr>
<tr>
<td>Evaporator Row-fin Gap</td>
<td>mm</td>
<td>2.1.4</td>
</tr>
<tr>
<td>Evaporator Coil Length (LXDXW)</td>
<td>mm</td>
<td>845X25.4X342.9</td>
</tr>
<tr>
<td>Swing Motor Model</td>
<td></td>
<td>MP35CJ</td>
</tr>
<tr>
<td>Swing Motor Power Output</td>
<td>W</td>
<td>2.5</td>
</tr>
<tr>
<td>Fuse Current</td>
<td>A</td>
<td>3.15</td>
</tr>
<tr>
<td>Sound Pressure Level(SH/H/M/L/SL)</td>
<td>dB (A)</td>
<td>48/45/42/39/-</td>
</tr>
<tr>
<td>Sound Power Level(SH/H/M/L/SL)</td>
<td>dB (A)</td>
<td>64/59/56/53/-</td>
</tr>
<tr>
<td>Dimension (WXHXD)</td>
<td>mm</td>
<td>1078X325X246</td>
</tr>
<tr>
<td>Dimension of Carton Box (LXWXH)</td>
<td>mm</td>
<td>1145X410X335</td>
</tr>
<tr>
<td>Dimension of Package(LXWXH)</td>
<td>mm</td>
<td>1148X413X350</td>
</tr>
<tr>
<td>Net Weight</td>
<td>kg</td>
<td>17</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>kg</td>
<td>20.5</td>
</tr>
<tr>
<td>Outdoor Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Outdoor Unit Model</td>
<td>GWH24QE-K3DNA1G/O</td>
<td></td>
</tr>
<tr>
<td>Outdoor Unit Product Code</td>
<td>CB419W05301</td>
<td></td>
</tr>
<tr>
<td>Compressor Manufacturer</td>
<td>ZHUHAI LANDA COMPRESSOR CO., LTD.</td>
<td></td>
</tr>
<tr>
<td>Compressor Model</td>
<td>QXAS-D23zX090A</td>
<td></td>
</tr>
<tr>
<td>Compressor Oil</td>
<td>FV50S</td>
<td></td>
</tr>
<tr>
<td>Compressor Type</td>
<td>Rotary</td>
<td></td>
</tr>
<tr>
<td>Compressor LRA</td>
<td>A 25</td>
<td></td>
</tr>
<tr>
<td>Compressor RL A</td>
<td>A 11.50</td>
<td></td>
</tr>
<tr>
<td>Compressor Power Input</td>
<td>W 2550</td>
<td></td>
</tr>
<tr>
<td>Compressor Overload Protector</td>
<td>1NT11L-6233 or HPC115/95/ or KSD115°C</td>
<td></td>
</tr>
<tr>
<td>Throttling Method</td>
<td>Electron expansion valve+Capillary</td>
<td></td>
</tr>
<tr>
<td>Set Temperature Range</td>
<td>°C 16~30</td>
<td></td>
</tr>
<tr>
<td>Cooling Operation Ambient Temperature Range</td>
<td>°C -15~43</td>
<td></td>
</tr>
<tr>
<td>Heating Operation Ambient Temperature Range</td>
<td>°C -20~24</td>
<td></td>
</tr>
<tr>
<td>Condenser Form</td>
<td>Aluminum Fin-copper Tube</td>
<td></td>
</tr>
<tr>
<td>Condenser Pipe Diameter</td>
<td>mm Φ7</td>
<td></td>
</tr>
<tr>
<td>Condenser Rows-fin Gap</td>
<td>mm 2-1.4</td>
<td></td>
</tr>
<tr>
<td>Condenser Coil Length (LXDXW)</td>
<td>mm 935X38.1X660</td>
<td></td>
</tr>
<tr>
<td>Fan Motor Speed</td>
<td>rpm 800/300</td>
<td></td>
</tr>
<tr>
<td>Fan Motor Power Output</td>
<td>W 60</td>
<td></td>
</tr>
<tr>
<td>Fan Motor RL A</td>
<td>A /</td>
<td></td>
</tr>
<tr>
<td>Fan Motor Capacitor</td>
<td>μF /</td>
<td></td>
</tr>
<tr>
<td>Outdoor Unit Air Flow Volume</td>
<td>m³/h 3200</td>
<td></td>
</tr>
<tr>
<td>Fan Type</td>
<td>Axial-flow</td>
<td></td>
</tr>
<tr>
<td>Fan Diameter</td>
<td>mm Φ520</td>
<td></td>
</tr>
<tr>
<td>Defrosting Method</td>
<td>Automatic Defrosting</td>
<td></td>
</tr>
<tr>
<td>Climate Type</td>
<td>T1</td>
<td></td>
</tr>
<tr>
<td>Isolation</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>Moisture Protection</td>
<td>IP24</td>
<td></td>
</tr>
<tr>
<td>Permissible Excessive Operating Pressure for the Discharge Side</td>
<td>MPa 4.3</td>
<td></td>
</tr>
<tr>
<td>Permissible Excessive Operating Pressure for the Suction Side</td>
<td>MPa 2.5</td>
<td></td>
</tr>
<tr>
<td>Sound Pressure Level (H/M/L)</td>
<td>dB (A) 60/-/-</td>
<td></td>
</tr>
<tr>
<td>Sound Power Level (H/M/L)</td>
<td>dB (A) 68/-/-</td>
<td></td>
</tr>
<tr>
<td>Dimension(WXHXD)</td>
<td>mm 963X700X396</td>
<td></td>
</tr>
<tr>
<td>Dimension of Carton Box (LXWXH)</td>
<td>mm 1026X455X735</td>
<td></td>
</tr>
<tr>
<td>Dimension of Package(LXWXH)</td>
<td>mm 1029X458X750</td>
<td></td>
</tr>
<tr>
<td>Net Weight</td>
<td>kg 53</td>
<td></td>
</tr>
<tr>
<td>Gross Weight</td>
<td>kg 57.5</td>
<td></td>
</tr>
<tr>
<td>Refrigerant</td>
<td>R410A</td>
<td></td>
</tr>
<tr>
<td>Refrigerant Charge</td>
<td>kg 1.9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connection Pipe</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection Pipe Length</td>
<td>m 5</td>
</tr>
<tr>
<td>Connection Pipe Gas Additional Charge</td>
<td>g/m 50</td>
</tr>
<tr>
<td>Outer Diameter Liquid Pipe</td>
<td>mm Φ6</td>
</tr>
<tr>
<td>Outer Diameter Gas Pipe</td>
<td>mm Φ16</td>
</tr>
<tr>
<td>Max Distance Height</td>
<td>m 10</td>
</tr>
<tr>
<td>Max Distance Length</td>
<td>m 25</td>
</tr>
</tbody>
</table>

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

[Graph showing current (A) against compressor speed (rps) for cooling and heating.]

2.3 Capacity Variation Ratio According to Temperature

Heating operation ambient temperature range is -15°C~24°C

Cooling

- Capacity ratio (%)
- Outdoor temp.(°C)
- Conditions
  - Indoor: DB27°C/WB19°C
  - Outdoor: DB35°C/WB24°C
  - Indoor air flow: High
  - Pipe length: 5m

Heating

- Capacity ratio (%)
- Outdoor temp.(°C)
- Conditions
  - Indoor: DB20°C/WB15°C
  - Outdoor: DB7°C/WB6°C
  - Indoor air flow: High
  - Pipe length: 5m

Heating operation ambient temperature range is -20°C~24°C

Cooling

- Capacity ratio (%)
- Outdoor temp.(°C)
- Conditions
  - Indoor: DB27°C/WB19°C
  - Outdoor: DB35°C/WB24°C
  - Indoor air flow: High
  - Pipe length: 5m

Heating

- Capacity ratio (%)
- Outdoor temp.(°C)
- Conditions
  - Indoor: DB20°C/WB15°C
  - Outdoor: DB7°C/WB6°C
  - Indoor air flow: High
  - Pipe length: 5m
2.4 Cooling and Heating Data Sheet in Rated Frequency

Cooling:

<table>
<thead>
<tr>
<th>Rated cooling condition(°C) (DB/WB)</th>
<th>Model</th>
<th>Pressure of gas pipe connecting indoor and outdoor unit</th>
<th>Inlet and outlet pipe temperature of heat exchanger</th>
<th>Fan speed of indoor unit</th>
<th>Fan speed of outdoor unit</th>
<th>Compressor frequency (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor</td>
<td>Outdoor</td>
<td></td>
<td>P (MPa)</td>
<td>T1 (°C)</td>
<td>T2 (°C)</td>
<td></td>
</tr>
<tr>
<td>27/19</td>
<td>35/24</td>
<td>18K</td>
<td>0.9 to 1.1</td>
<td>12 to 14</td>
<td>75 to 37</td>
<td>Super High</td>
</tr>
<tr>
<td>24K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heating:

<table>
<thead>
<tr>
<th>Rated heating condition(°C) (DB/WB)</th>
<th>Model</th>
<th>Pressure of gas pipe connecting indoor and outdoor unit</th>
<th>Inlet and outlet pipe temperature of heat exchanger</th>
<th>Fan speed of indoor unit</th>
<th>Fan speed of outdoor unit</th>
<th>Compressor frequency (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor</td>
<td>Outdoor</td>
<td></td>
<td>P (MPa)</td>
<td>T1 (°C)</td>
<td>T2 (°C)</td>
<td></td>
</tr>
<tr>
<td>20/-</td>
<td>7/6</td>
<td>18K</td>
<td>2.2 to 2.4</td>
<td>70 to 35</td>
<td>2 to 4</td>
<td>Super High</td>
</tr>
<tr>
<td>24K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Instruction:**

T1: Inlet and outlet pipe temperature of evaporator
T2: Inlet and outlet pipe temperature of condenser
P: Pressure at the side of big valve
Connection pipe length: 5 m.

2.5 Noise Curve

![Indoor side noise when blowing](image1)

![Outdoor side noise when blowing](image2)

![Outdoor side noise when blowing](image3)

<table>
<thead>
<tr>
<th>Indoor fan motor rotating speed</th>
<th>Noise (dB(A))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compressor frequency (Hz)</th>
<th>Noise (dB(A))</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>50</td>
</tr>
</tbody>
</table>
3. Outline Dimension Diagram

3.1 Indoor Unit

<table>
<thead>
<tr>
<th>Model</th>
<th>W</th>
<th>H</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>18K</td>
<td>970</td>
<td>300</td>
<td>224</td>
</tr>
<tr>
<td>24K</td>
<td>1078</td>
<td>325</td>
<td>246</td>
</tr>
</tbody>
</table>
3.2 Outdoor Unit

Unit:mm
4. Refrigerant System Diagram

Connection pipe specification:
Liquid pipe: 1/4" (6mm)
Gas pipe: 1/2" (12mm)

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

5.1 Wiring Diagram

- **Instruction**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Symbol Color</th>
<th>Symbol</th>
<th>Symbol Color</th>
<th>Symbol</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>WH</td>
<td>White</td>
<td>GN</td>
<td>Green</td>
<td>CAP</td>
<td>Jumper cap</td>
</tr>
<tr>
<td>YE</td>
<td>Yellow</td>
<td>BN</td>
<td>Brown</td>
<td>COMP</td>
<td>Compressor</td>
</tr>
<tr>
<td>RD</td>
<td>Red</td>
<td>BU</td>
<td>Blue</td>
<td></td>
<td>Grounding wire</td>
</tr>
<tr>
<td>YEGN</td>
<td>Yellow/Green</td>
<td>BK</td>
<td>Black</td>
<td></td>
<td>/</td>
</tr>
<tr>
<td>VT</td>
<td>Violet</td>
<td>OG</td>
<td>Orange</td>
<td></td>
<td>/</td>
</tr>
</tbody>
</table>

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

- **Indoor Unit**

GWH18QD-K3DNA1G/I(CB419N05600) GWH18QD-K3DNA5G/I(CB425N03400/CB425N03403) GWH18QD-K3DNA6G/I(CB427N04400)
● Outdoor Unit
GWH18QD-K3DNA1G/O(CB419W05600)
**WARNING**

Please don't touch any terminal when the voltage of terminal (DC+) and (DC-) at AP1 is higher than 30V to prevent the risk of electric shock!

---

Please don't touch any electronic component or terminal when the machine is running, stopping or has been powered off for less than 30 minutes to prevent the risk of electric shock!
Please don't touch any electronic component or terminal when the machine is running, stopping or has been powered off for less than 30 minutes to prevent the risk of electric shock!

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

Indoor Unit

- Top view

- Bottom view
Outdoor Unit
18K

● Top view

```
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Terminal of compressor overload protection</td>
</tr>
<tr>
<td>2</td>
<td>Terminal of temperature sensor</td>
</tr>
<tr>
<td>3</td>
<td>Terminal of electronic expansion valve</td>
</tr>
<tr>
<td>4</td>
<td>Terminal of outdoor fan</td>
</tr>
<tr>
<td>5</td>
<td>Terminal of 4-way valve</td>
</tr>
<tr>
<td>6</td>
<td>Terminal of compressor electric heating</td>
</tr>
<tr>
<td>7</td>
<td>Terminal of chassis electric heating</td>
</tr>
<tr>
<td>8</td>
<td>Terminal of indoor unit and outdoor unit communication</td>
</tr>
<tr>
<td>9</td>
<td>Power supply live wire</td>
</tr>
<tr>
<td>10</td>
<td>Earthing wire</td>
</tr>
<tr>
<td>11</td>
<td>Power supply neutral wire</td>
</tr>
</tbody>
</table>
```

● Bottom view
24K

- Top view

- Bottom view

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power supply neutral wire</td>
</tr>
<tr>
<td>2</td>
<td>Power supply live wire</td>
</tr>
<tr>
<td>3</td>
<td>Communication wire with indoor unit</td>
</tr>
<tr>
<td>4</td>
<td>Terminal of outdoor temperature sensor</td>
</tr>
<tr>
<td>5</td>
<td>Terminal of compressor overload protection</td>
</tr>
<tr>
<td>6</td>
<td>Terminal of electronic expansion valve</td>
</tr>
<tr>
<td>7</td>
<td>Terminal of outdoor fan</td>
</tr>
<tr>
<td>8</td>
<td>Terminal of compressor electric heating</td>
</tr>
<tr>
<td>9</td>
<td>Terminal of 4-way valve</td>
</tr>
<tr>
<td>10</td>
<td>Terminal of compressor wire</td>
</tr>
<tr>
<td>11</td>
<td>Terminal of chassis electric heating</td>
</tr>
<tr>
<td>12</td>
<td>Terminal of low ambient temperature cooling temperature sensor</td>
</tr>
<tr>
<td>13</td>
<td>Terminal of high pressure protection</td>
</tr>
<tr>
<td>14</td>
<td>Terminal of low pressure protection</td>
</tr>
<tr>
<td>15</td>
<td>Terminal of 2-way valve</td>
</tr>
<tr>
<td>16</td>
<td>Earthing wire</td>
</tr>
</tbody>
</table>
6. Function and Control

6.1 Remote Controller Introduction

Introduction for icons on display screen

<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ON/OFF button</td>
</tr>
<tr>
<td>2</td>
<td>MODE button</td>
</tr>
<tr>
<td>3</td>
<td>FAN button</td>
</tr>
<tr>
<td>4</td>
<td>SWING button</td>
</tr>
<tr>
<td>5</td>
<td>TURBO button</td>
</tr>
<tr>
<td>6</td>
<td>▲/▼ button</td>
</tr>
<tr>
<td>7</td>
<td>SLEEP button</td>
</tr>
<tr>
<td>8</td>
<td>TEMP button</td>
</tr>
<tr>
<td>9</td>
<td>I FEEL button</td>
</tr>
<tr>
<td>10</td>
<td>LIGHT button</td>
</tr>
<tr>
<td>11</td>
<td>CLOCK button</td>
</tr>
<tr>
<td>12</td>
<td>TIMER ON / TIMER OFF button</td>
</tr>
</tbody>
</table>

Introduction for buttons on remote controller

Note:
- After putting through the power, the air conditioner will give out a sound. Operation indicator "" is ON (red indicator). After that, you can operate the air conditioner by using remote controller.
- Under on status, pressing the button on the remote controller, the signal icon "" on the display of remote controller will blink once and the air conditioner will give out a "de" sound, which means the signal has been sent to the air conditioner.
- Under off status, set temperature and clock icon will be displayed on the display of remote controller (if timer on, timer off and light functions are set, the corresponding icons will be displayed on the display of remote controller at the same time); Under on status, the display will show the corresponding set function icons.
1. **ON/OFF button**

Press this button can turn on or turn off the air conditioner. After turning on the air conditioner, operation indicator "(on indoor unit’s display is ON (green indicator. The colour is different for different models), and indoor unit will give out a sound.

2. **MODE button**

Press this button to select your required operation mode.

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

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

3. **FAN button**

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

**Caution:**
- Under AUTO speed, air conditioner will select proper fan speed automatically according to ex-factory setting.
- Fan speed under dry mode is low speed.

4. **SWING button**

Press this button can select up&down swing angle. Fan blow angle can be selected circularly as below:

- When selecting "", air conditioner is blowing fan automatically. Horizontal louver will automatically swing up & down at maximum angle.
- When selecting "", air conditioner is blowing fan at fixed position. Horizontal louver will stop at the fixed position.
- Hold "button above 2s to set your required swing angle. When reaching your required angle, release the button.

**Note:**
- "" may not be available. When air conditioner receives this signal, the air conditioner will blow fan automatically.

5. **TURBO button**

Under COOL or HEAT mode, press this button to turn to quick COOL or quick HEAT mode. " icon is displayed on remote controller. Press this button again to exit turbo function and " icon will disappear.

6. **▲ / ▼ button**

- When setting TIMER ON, TIMER OFF or CLOCK, press "▲" or "▼" button to adjust time. (Refer to CLOCK, TIMER ON, TIMER OFF buttons) When setting TIMER ON, TIMER OFF or CLOCK, press "▲" or "▼" button to adjust time. (Refer to CLOCK, TIMER ON, TIMER OFF buttons)
7. SLEEP button
Under COOL, HEAT or DRY mode, press this button to start up sleep function. "" icon is displayed on remote controller. Press this button again to cancel sleep function and "" icon will disappear.

8. TEMP button
By pressing this button, you can see indoor set temperature, indoor ambient temperature or outdoor ambient temperature on indoor unit’s display. The setting on remote controller is selected circularly as below:

- When selecting "" or no display with remote controller, temperature indicator on indoor unit displays set temperature.
- When selecting "" with remote controller, temperature indicator on indoor unit displays indoor ambient temperature.
- When selecting "" with remote controller, temperature indicator on indoor unit displays outdoor ambient temperature.

Note:
- Outdoor temperature display is not available for some models. At that time, indoor unit receives "" signal, while it displays indoor set temperature.
- It’s defaulted to display set temperature when turning on the unit. There is no display in the remote controller.
- Only for the models whose indoor unit has dual-8 display.
- When selecting displaying of indoor or outdoor ambient temperature, indoor temperature indicator displays corresponding temperature and automatically turn to display set temperature after three or five seconds.

9. I FEEL button
Press this button to start I FEEL function and "" will be displayed on the remote controller. After this function is set, the remote controller will send the detected ambient temperature to the controller and the unit will automatically adjust the indoor temperature according to the detected temperature. Press this button again to close I FEEL function and "" will disappear.

- Please put the remote controller near user when this function is set. Do not put the remote controller near the object of high temperature or low temperature in order to avoid detecting inaccurate ambient temperature.

10. LIGHT button
Press this button to turn off display light on indoor unit. "" icon on remote controller disappears. Press this button again to turn on display light. "" icon is displayed.

11. CLOCK button
Press this button to set clock time. "" icon on remote controller will blink. Press "" or "" button within 5s to set clock time. Each pressing of "" or "" button, clock time will increase or decrease 1 minute. If hold "" or "" button, 2s later, time will change quickly. Release this button when reaching your required time. Press "" button to confirm the time. "" icon stops blinking.

Note:
- Clock time adopts 24-hour mode.
- The interval between two operation can’t exceeds 5s. Otherwise, remote controller will quit setting status. Operation for TIMER ON/TIMER OFF is the same.

12. TIMER ON / TIMER OFF button
- TIMER ON button
"TIMER ON" button can set the time for timer on. After pressing this button, "" icon disappears and the word "ON" on remote controller blinks. Press "" or "" button to adjust TIMER ON setting. After each pressing "" or "" button, TIMER ON setting will increase or decrease 1min. Hold "" or "" button, 2s later, the time will change quickly until reaching your required time. Press "" to confirm it. The word "ON" will stop blinking. "" icon resumes displaying. Cancel TIMER ON: Under the condition that TIMER ON is started up, press "" button to cancel it.

- TIMER OFF button
"TIMER OFF" button can set the time for timer off. After pressing this button,"" icon disappears and the word "OFF" on remote controller blinks. Press "" or "" button to adjust TIMER OFF setting. After each pressing "" or "" button, TIMER OFF setting will increase or decrease 1min. Hold "" or "" button, 2s later, the time will change quickly until reaching your required time. Press "" word "OFF" will stop blinking. "" icon resumes displaying. Cancel TIMER OFF. Under the condition that TIMER OFF is started up, press "" button to cancel it.

Note:
- Under on and off status, you can set TIMER OFF or TIMER ON simultaneously.
- Before setting TIMER ON or TIMER OFF, please adjust the clock time.
- After starting up TIMER ON or TIMER OFF, set the constant circulating valid. After that, air conditioner will be turned on or turned off according to setting time. ON/OFF button has no effect on setting. If you don’t need this function, please use remote controller to cancel it.
Function introduction for combination buttons

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

Note:
● Under energy-saving function, fan speed is defaulted at auto speed and it can’t be adjusted.
● Under energy-saving function, set temperature can’t be adjusted. Press "TURBO" button and the remote controller won’t send signal.
● Sleep function and energy-saving function can’t operate at the same time. If energy-saving function has been set under cooling mode, press sleep button will cancel energy-saving function. If sleep function has been set under cooling mode, start up the energy-saving function will cancel sleep function.

2. 8 ℃ heating function
Under heating mode, press "TEMP" and "CLOCK" buttons simultaneously to start up or turn off 8 ℃ heating function. When this function is started up, "8 ℃" will be shown on remote controller, and the air conditioner keep the heating status at 8 ℃. Press "TEMP" and "CLOCK" buttons simultaneously again to exit 8 ℃ heating function.

Note:
● Under 8 ℃ heating function, fan speed is defaulted at auto speed and it can’t be adjusted.
● Under 8 ℃ heating function, set temperature can’t be adjusted. Press "TURBO" button and the remote controller won’t send signal.
● Sleep function and 8 ℃ heating function can’t operate at the same time. If 8 ℃ heating function has been set under cooling mode, press sleep button will cancel 8 ℃ heating function. If sleep function has been set under cooling mode, start up the 8 ℃ heating function will cancel sleep function.
● Under ℉ temperature display, the remote controller will display 46 ℉ heating.

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

4. Temperature display switchover function
Under OFF status, press "▼" and "MODE" buttons simultaneously to switch temperature display between ℃ and ℉.

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

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

Note:
● During operation, point the remote control signal sender at the receiving window on indoor unit.
● The distance between signal sender and receiving window should be no more than 8m, and there should be no obstacles between them.
● Signal may be interfered easily in the room where there is fluorescent lamp or wireless telephone; remote controller should be close to indoor unit during operation.
● Replace new batteries of the same model when replacement is required.
● When you don’t use remote controller for a long time, please take out the batteries.
● If the display on remote controller is fuzzy or there’s no display, please replace batteries.
6.2 Brief Description of Modes and Functions

1. Basic function of system

(1) Cooling mode
   (1) Under this mode, fan and swing operates at setting status. Temperature setting range is 16~30°C.
   (2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.

(2) Drying mode
   (1) Under this mode, fan operates at low speed and swing operates at setting status. Temperature setting range is 16~30°C.
   (2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.
   (3) Protection status is same as that under cooling mode.
   (4) Sleep function is not available for drying mode.

(3) Heating mode
   (1) Under this mode, Temperature setting range is 16~30°C.
   (2) Working condition and process for heating mode:
      When turn on the unit under heating mode, indoor unit enters into cold air prevention status. When the unit is stopped or at OFF status, and indoor unit has been started up just now, the unit enters into residual heat-blowing status.
   (4) Working method for AUTO mode:
      1. Working condition and process for AUTO mode:
         a. Under AUTO mode, standard heating Tpreset=20°C and standard cooling Tpreset=25°C. The unit will switch mode automatically according to ambient temperature.
      2. Protection function:
         a. During cooling operation, protection function is same as that under cooling mode.
         b. During heating operation, protection function is same as that under heating mode.
      3. Display: Set temperature is the set value under each condition. Ambient temperature is (Tamb.-Tcompensation) for heat pump unit and Tamb. for cooling only unit.
      4. If there’s I feel function, Tcompensation is 0. Others are same as above.

(5) Fan mode
   Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 16~30°C.

2. Other control

(1) Buzzer
   Upon energization or available operating the unit or remote controller, the buzzer will give out a beep.

(2) Auto button
   If press this auto button when turning off the unit, the complete unit will operate at auto mode. Indoor fan operates at auto fan speed and swing function is turned on. Press this auto button at ON status to turn off the unit.

(3) Auto fan
   Heating mode: During auto heating mode or normal heating mode, auto fan speed will adjust the fan speed automatically according to ambient temperature and set temperature.

(4) Sleep
   After setting sleep function for a period of time, system will adjust set temperature automatically.

(5) Timer function:
   General timer and clock timer functions are compatible by equipping remote controller with different functions.

(6) Memory function
   Memorize compensation temperature, off-peak energization value.
   Memory content: mode, up&down swing, light, set temperature, set fan speed, general timer (clock timer can’t be memorized).
   After power recovery, the unit will be turned on automatically according to memory content.

(7) Health function
   During operation of indoor fan, set health function by remote controller. Turn off the unit will also turn off health function.
   Turn on the unit by pressing auto button, and the health is defaulted ON.
(8) I feel control mode
After controller received I feel control signal and ambient temperature sent by remote controller, controller will work according to the ambient temperature sent by remote controller.

(9) Compulsory defrosting function
(1) Start up compulsory defrosting function
Under ON status, set heating mode with remote controller and adjust the temperature to 16°C. Press “+, -, +, -, +, -” button successively within 5s and the complete unit will enter into compulsory defrosting status. Meanwhile, heating indicator on indoor unit will ON 10s and OFF 0.5s successively. (Note: If complete unit has malfunction or stops operation due to protection, compulsory defrosting function can be started up after malfunction or protection is resumed.
(2) Exit compulsory defrosting mode
After compulsory defrosting is started up, the complete unit will exit defrosting operation according to the actual defrosting result, and the complete unit will resume normal heating operation.

(10) Refrigerant recovery function:
(1) Enter refrigerant recycling function
Within 5min after energizing (unit ON or OFF status is ok), continuously press LIGHT button for 3 times within 3s to enter refrigerant recycling mode; “Fo” is displayed and refrigerant recycling function is started. At this moment, the maintenance people closes liquid valve. After 5min, stick the thimble of maintenance valve with a tool. If there is no refrigerant spraying out, close the gas valve immediately and then turn off the unit to remove the connection pipe.
(2) Exit refrigerant recycling function
After entering refrigerant recycling mode, when receive any remote control signal or enter refrigerant recycling mode for 25min, the unit will exit refrigerant recycling mode automatically If the unit is in standby mode before refrigerant recycling, it will be still in standby mode after finishing refrigerant recycling; if the unit is in ON status before refrigerant recycling, it will still run in original operation mode.

(11) Ambient temperature display control mode
1. When user set the remote controller to display set temperature (corresponding remote control code: 01), current set temperature will be displayed.
2. Only when remote control signal is switched to indoor ambient temperature display status (corresponding remote control code: 10) from other display status (corresponding remote control code: 00, 01, 11), controller will display indoor ambient temperature for 3s and then turn back to display set temperature.
Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 16~30°C.

(12) Off-peak energization function:
Adjust compressor’s minimum stop time. The original minimum stop time is 180s and then we change to:
The time interval between two start-ups of compressor can’t be less than 180+T s(0≤T≤15). T is the variable of controller. That’s to say the minimum stop time of compressor is 180s~195s. Read-in T into memory chip when refurbish the memory chip each time. After power recovery, compressor can only be started up after 180+T s at least.

(13) SE control mode
The unit operates at SE status.

(14) X-fan mode
When X-fan function is turned on, after turn off the unit, indoor fan will still operate at low speed for 2min and then the complete unit will be turned off. When x-fan function is turned off, after turn off the unit, the complete unit will be turned off directly.

(15) 8°C heating function
Under heating mode, you can set 8°C heating function by remote controller. The system will operate at 8°C set temperature.

(16) Turbo fan control function
Set turbo function under cooling or heating mode to enter into turbo fan speed. Press fan speed button to cancel turbo wind. No turbo function under auto, dry or fan mode.
Outdoor Units

1. Input Parameter Compensation and Calibration

(1) Check the ambient temperature compensation function

Indoor ambient temperature compensation function.

a. In cooling mode, the indoor ambient temperature participating in computing control = (T_{\text{indoor ambient temperature}} - \Delta T_{\text{cooling indoor ambient temperature compensation}})

b. In heating mode, the indoor ambient temperature participating in computing control = (T_{\text{indoor ambient temperature}} - \Delta T_{\text{heating indoor ambient temperature compensation}})

(2) Check effective judgment controls of parameters

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

a. Judgment of exhaust detection temperature change:

After the compressor starts up and runs for 10 minutes, if the compressor frequency f ≥ 40Hz, and the rising value T_{\text{exhaust}} (T_{\text{exhaust (after start-up for 10 minutes)}} - T_{\text{exhaust (before start-up)}}) < 2ºC , the outdoor exhaust temperature thermo-bulb can be judged not to be connected into place (judging once when the power is on the first time).

b. Comparative judgment of exhaust detection temperature and condenser detection temperature (T_{\text{pipe temperature}} = T_{\text{outdoor pipe temperature in cooling mode}}, T_{\text{pipe temperature}} = T_{\text{indoor pipe temperature in heating mode}}):

After the compressor starts up and runs for 10 minutes, if the compressor frequency f ≥ 40Hz, and T_{\text{pipe temperature}} ≥ (T_{\text{exhaust}} + 3ºC), the outdoor exhaust temperature thermobulb can be judged not to be connected into place (judging once when power is on the first time).

2. Basic Functions

(1) Cooling Mode

1. Conditions and processes of cooling operation:

a. If the compressor is shut down, and \[T_{\text{set up}} - (T_{\text{indoor ambient temperature}} - \Delta T_{\text{cooling indoor ambient temperature compensation}}) \leq 0.5ºC, \] start up the machine for cooling, the cooling operation will start;

b. During operations of cooling, if 0ºC ≤ \[T_{\text{set up}} - (T_{\text{indoor ambient temperature}} - \Delta T_{\text{cooling indoor ambient temperature compensation}}) < 2ºC, \] the cooling operation will be still running;

c. During operations of cooling, if 2ºC ≤ \[T_{\text{set up}} - (T_{\text{indoor ambient temperature}} - \Delta T_{\text{cooling indoor ambient temperature compensation}}), \] the cooling operation will stop after reaching the temperature point.

2. Temperature setting range

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

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

(2) Dehumidifying Mode

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

2. The temperature setting range is: 16~30ºC;

(3) Air-supplying Mode

1. The compressor, outdoor fans and four-way valves are switched off;

2. The temperature setting range is: 16~30ºC.

(4) Heating Mode

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

a. If the compressor is shut down, and \[(T_{\text{indoor ambient temperature}} - \Delta T_{\text{heating indoor ambient temperature compensation}}) - T_{\text{set up}} \leq 0.5ºC, \] start the machine to enter into heating operations for heating;

b. During operations of heating, if 0ºC ≤ \[(T_{\text{indoor ambient temperature}} - \Delta T_{\text{heating indoor ambient temperature compensation}}) - T_{\text{set up}} < 2ºC, \] the heating operation will be still running;

c. During operations of heating, if 2ºC ≤ \[(T_{\text{indoor ambient temperature}} - \Delta T_{\text{heating indoor ambient temperature compensation}}) - T_{\text{set up}}], \] the heating operation will stop after reaching the temperature point.

2. The temperature setting range in this mode is: 16~30ºC.
3. Special Functions

Defrosting Control

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

② Conditions of finishing defrosting
The defrosting operation can exit when any of the conditions below is satisfied:

③ \( T_{\text{outdoor pipe temperature}} \geq (T_{\text{outdoor ambient temperature}} - [T_{\text{temperature 1 of finishing defrosting}}]) \);

④ The continuous running time of defrosting reaches \([t_{\text{max. defrosting time}}]\).

4. Control Logic

(1) Compressor Control
Start the compressor after starting cooling, heating, dehumidifying operations, and the outer fans start for 5s; When the machine is shutdown, in safety stops and when switching to air-supplying mode, the compressor will stop immediately. In all modes: once the compressor starts up, it will not be allowed to stop until having run for the \([t_{\text{min. compressor running time}}]\) (Note: including cases of shutdown when the temperature point is reached; except the cases requiring stopping the compressor such as fault protection, remote shutdown, mode switching etc.); In all modes: once the compressor stops, it will be allowed be restart after 3-minute delay (Note: The indoor units have a function of power memory, the machine can be restarted after remote shutdown and powering up again without delay).

1. Cooling mode
Start the machine to enter into cooling operation for cooling, the compressor is switched on.

2. Dehumidifying mode
Same as the cooling mode.

3. Air-supplying mode
The compressor is switched off.

4. Heating mode
(1) Start the machine to enter into heating operation for heating, the compressor is switched on.

(2) Defrosting:
   a. Defrosting starts: the compressor is shut down, and restarts it after 55-second delay.
   b. Defrosting ends: the compressor stops, then starts it after 55-second delay.

(2) Outer Fans Control
Notes:
Only the outer fans run for at least 80s in each air flow speed can the air flow be switched;

After the outer fans run compulsively in high speed for 80s when the machine starts up, control the air flow according to the logic.

After remote shutdown, safety stops, and when the machine stops after reaching the temperature point, as well as after the compressor stops, extend 1 minute, the outer fans will stop (During the period in the 1 minute, the air flow of outer fans can be changed according to the outdoor ambient temperature changes); When running with force, the outdoor fans shall run in the highest air flow.

(3) 4-way valve control
1. The 4-way valve control under the modes of Cooling, dehumidification and supplying air: closing;

2. The status of 4-way valve control under the heating mode: getting power;
   (1) 4-way valve power control under heating mode
   Starts the machine under heating mode, the 4-way valve will get power immediately.
   (2) 4-way valve power turn-off control under heating mode
   a. When you should turn off the power or switch to other mode under heating mode, the power of 4-way valve will be cut after 2 minutes of the compressor stopped.
   b. When all kinds of protection stops, the power of 4-way valve will be cut after delaying 4 minutes.

(3) Defrosting control under heating mode:
   a. Defrosting begins: The power of 4-way valve will be cut after 50s of entering into the defrosting compressor.
   b. Defrosting stops: The 4-way valve will get power after 50s of exiting the defrosting compressor.

(4) Evaporator frozen-preventing protection function
At the mode of Cooling, dehumidifying:
Evaporator frozen-preventing protection function is allowed to begin after 6 min of starting the compressor.
1. Starting estimation:
After the compressor stopped working for 180s, if $T_{\text{inner pipe}} > [T_{\text{frozen-preventing frequency-limited temperature}}]$ (the temperature of hysteresis is 2ºC), the machine is only allowed to start for operating, otherwise it should not be started, and should be stopped to treat according to the frozen-preventing protection: Clear the trouble under the mode of power turn-off / heating, and the protection times are not counted.

2. Frequency limited

If $T_{\text{frozen-preventing normal speed frequency-reducing temperature}} \leq T_{\text{inner pipe}}$, then you should limit the frequency raising of the compressor.

3. Reducing frequency at normal speed:
   If $T_{\text{frozen-preventing high speed frequency-reducing temperature}} \leq T_{\text{inner pipe}}$, you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit;

4. Reducing frequency at high speed:
   If $T_{\text{frozen-preventing power turn-off temperature}} \leq T_{\text{inner pipe}}$, you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit;

5. Power turn-off:
   If the $T_{\text{inner pipe}} < [T_{\text{frozen-preventing power turn-off temperature}}]$, then frozen-preventing protect to stop the machine; If $T_{\text{frozen-preventing normal speed frequency-reducing temperature}} < T_{\text{inner pipe}}$, and the compressor has already stopped working for 3 minutes, the whole machine should be allowed to operate.

6. If the frozen-preventing protection power turn-off continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume if the fault keeps on. During the process of running, if the running time of the compressor exceeds the evaporator frozen-preventing protection times zero clearing time, the times of frozen-preventing power turn-off should be cleared to recount. The mode of stopping the machine or transferring to supply air will clear the trouble times immediately (if the trouble can not be resumed, mode transferring will not clear it).

(5) Overload protection function

Overload protection function at the mode of cooling and dehumidifying

1. Starting estimation:
After the compressor stopped working for 180s, if $T_{\text{outer pipe}} < [T_{\text{cooling overload frequency-limited temperature}}]$ (the temperature of hysteresis is 2ºC), the machine is allowed to start, otherwise it should not be started, and should be stopped to treat according to the overload protection: Clear the trouble at the mode of power turn-off / heating, and the protection times are not counted.

2. Frequency limited
   If $T_{\text{cooling overload frequency-limited temperature}} \leq T_{\text{outer pipe}}$, you should limit the frequency raising of the compressor.

3. Reducing frequency at normal speed and power turn-off:
   If $T_{\text{cooling overload frequency-reducing temperature at high speed}} \leq T_{\text{outer pipe}}$, you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if $T_{\text{cooling overload frequency-reducing temperature at normal speed}} \leq T_{\text{outer pipe}}$, then cooling overload protects machine stopping;

4. Reducing frequency at high speed and stop machine:
   If $T_{\text{cooling overload frequency-reducing temperature at high speed}} \leq T_{\text{outer pipe}}$, you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if $T_{\text{cooling overload frequency-reducing temperature at normal speed}} \leq T_{\text{outer pipe}}$, then cooling overload protects machine stopping;

5. Power turn-off:
   If $T_{\text{cooling overload power turn-off temperature}} \leq T_{\text{outer pipe}}$, then cooling overload protects machine stopping; If $T_{\text{outer pipe}} > [T_{\text{cooling overload frequency-limited temperature}}]$ and the compressor has already stopped working for 3 minutes, the machine should be allowed to operate.

6. If the cooling overload protection power turn-off continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume if the fault keeps on. During the process of running, if the running time of the compressor exceeds the overload protection times zero clearing time, the times of overload protection power turn-off should be cleared to recount. The mode of stopping the machine or transferring to supply air will clear the trouble times immediately (if the trouble can not be resumed, transferring mode will not clear it).

Overload protection function at the mode of heating

Starting estimation:
After the compressor stopped working for 180s, if $T_{\text{inner pipe}} > [T_{\text{heating overload frequency-limited temperature}}]$ (the temperature of hysteresis is 2ºC), the machine is only allowed to start for operating, otherwise it should not be started, and should be stopped to treat according to the overload protection:
Clear the trouble at the mode of power turn-off / heating, and the protection times are not counted.
1. Frequency limited
If \( T_{\text{heating overload frequency-limited temperature}} \leq T_{\text{inner pipe}} \), you should limit the frequency raising of compressor.

2. Reducing frequency at normal speed and stopping machine:
If \( T_{\text{heating overload frequency reducing temperature at high speed}} \leq T_{\text{inner pipe}} \leq T_{\text{heating overload frequency reducing temperature at normal speed}} \), you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if \( T_{\text{heating overload frequency reducing temperature at normal speed}} \leq T_{\text{inner pipe}} \), then overload protects machine stopping.

3. Reducing frequency at high speed and power turn-off:
If \( T_{\text{heating overload frequency reducing temperature at high speed}} \leq T_{\text{inner pipe}} \leq T_{\text{heating overload power turn-off temperature}} \), you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if \( T_{\text{heating overload frequency reducing temperature at normal speed}} \leq T_{\text{outer pipe}} \), then Cooling overload protects machine stopping.

4. Power turn-off:
If the \( T_{\text{heating overload power turn-off temperature}} \leq T_{\text{inner pipe}} \), then overload protects machine stopping; If \( T_{\text{inner pipe}} \) \( T_{\text{heating overload frequency-limited temperature}} \) and the compressor has been stopped working for 3 minutes, the machine should be allowed to operate.

5. If the overload protection power turn-off continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the t overload protection times zero clearing time, the times of overload protection power turn-off should be cleared to recount. The mode of stopping the machine or transferring to supply air will clear the trouble times immediately (if the trouble can not be resumed, transferring mode will not clear it). Protective function for discharge temperature of compressor

1. Starting estimation:
After the compressor stopped working for 180s, if \( T_{\text{Discharge}} \leq T_{\text{Discharge limited temperature}} \) (the temperature of hysteresis is 2ºC), the machine is allowed to start, otherwise it should not be started, and should be stopped to treat according to the discharge temperature: The machine should be stopped or transferred to supply air, the trouble should be cleared immediately, and the protection times are not counted.

2. Frequency limited
If \( T_{\text{Limited frequency during discharging}} \leq T_{\text{Discharge}} \leq T_{\text{frequency reducing temperature at normal speed during discharging}} \), you should limit the frequency raising of compressor.

3. Reducing frequency at normal speed and stopping machine:
If \( T_{\text{frequency reducing temperature at normal speed during discharging}} \leq T_{\text{Discharge}} \leq T_{\text{frequency reducing temperature at high speed during discharging}} \), you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if \( T_{\text{frequency reducing temperature at normal speed during discharging}} \leq T_{\text{Discharge}} \), you should discharge to protect machine stopping.

4. Reducing frequency at high speed and power turn-off:
If \( T_{\text{frequency reducing temperature at high speed during discharging}} \leq T_{\text{Discharge}} \leq T_{\text{Stop temperature during discharging}} \), you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if \( T_{\text{frequency reducing temperature at normal speed during discharging}} \leq T_{\text{Discharge}} \), you should discharge to protect machine stopping.

5. Power turn-off:
If the \( T_{\text{Power turn-off temperature during discharging}} \leq T_{\text{Discharge}} \), you should discharge to protect machine stopping; If \( T_{\text{Discharge}} \leq T_{\text{Limited frequency during discharging}} \) and the compressor has been stopped for 3 minutes, the machine should be allowed to operate.

6. If the discharging temperature protection of compressor continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the t Protection times clearing of over current, the discharge protection is cleared to recount. Stopped or transferred to supply air mode will clear the trouble times immediately (if the trouble can not be resumed, mode transferring also will not clear it).

7. Frequency limited
If \( I_{\text{Limited frequency when overcurrent}} \leq I_{\text{AC Electric current}} \leq I_{\text{frequency reducing when overcurrent}} \), you should limit the frequency raising of compressor.

8. Reducing frequency:
If \( I_{\text{Frequency reducing when overcurrent}} \leq I_{\text{AC Electric current}} \leq I_{\text{Power turn-off when overcurrent}} \), you should reduce the compressor frequency till the lower limit or exit the frequency reducing condition.

9. Power turn-off:
If \( I_{\text{Power turn-off machine when overcurrent}} \leq I_{\text{AC Electric current}} \), you should carry out the overcurrent stopping protection; If \( I_{\text{AC Electric current}} \leq I_{\text{Limited frequency when overcurrent}} \) and the compressor has been stopped for 3 minutes, the machine should be allowed to operate.

10. If the overcurrent protection continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the t Protection times clearing of over current, the discharge protection is cleared to recount.
(6) Voltage sag protection
After start the compressor, if the time of DC link Voltage sag \(U_{\text{ sagging protection voltage}}\) is measured to be less than \(t\) Voltage sag protection time \(T\), the machine should be stop at once, hand on the voltage sag trouble, reboot automatically after 30 minutes.

(7) Communication fault
When you have not received any correct signal from the inner machine in three minutes, the machine will stop for communication fault. When you have not received any correct signal from driver IC (aim to the controller for the separating of main control IC and driver IC), and the machine will stop for communication fault. If the communication is resumed, the machine will be allowed to operate.

(8) Module protection
Testing the module protective signal immediately after started, once the module protective signal is measured, stop the machine with module protection immediately. If the module protection is resumed, the machine will be allowed to operate. If the module protection continuously occurs for three times, it should not be resumed automatically, and you should press the ON/OFF button to resume. If the running time of compressor exceeds the \(t\) Protection times clearing of module \(T\), the module protection is cleared to recount.

(9) Module over heating protection
1. Starting estimation:
   After the compressor stopped working for 180s, if \(T_{\text{Module}} < T_{\text{Limited frequency temperature of module}}\) (the temperature of hysteresis is 2), the machine is allowed to start, otherwise it should not be started, and should be stopped to treat according to the module overheating protection: The machine should be stopped or transferred to supply air, the trouble should be cleared immediately, and the protection times are not counted.

2. Frequency limited
   If \(T_{\text{Limited frequency temperature of module}} \leq T_{\text{Module}} < T_{\text{Frequency reducing temperature at normal speed of module}}\), you should limit the frequency raising of compressor.

3. Reducing frequency at normal speed and power turn-off:
   If \(T_{\text{Frequency reducing temperature at normal speed of module}} \leq T_{\text{Module}} < T_{\text{Frequency reducing temperature at high speed of module}}\), you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if \(T_{\text{Frequency reducing temperature at normal speed of module}} \leq T_{\text{Module}}\) you should stop the machine for module overheating protection;

4. Reducing frequency at high speed and power turn-off:
   If \(T_{\text{Frequency reducing temperature at high speed of module}} \leq T_{\text{Module}} < T_{\text{Power turn-off temperature of module}}\), you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if \(T_{\text{Frequency reducing temperature at normal speed of module}} \leq T_{\text{Module}}\) you should stop the machine for module overheating protection;

5. Power turn-off:
   If the \(T_{\text{Power turn-off temperature of module}} \leq T_{\text{Module}}\) you should stop the machine for module overheating protection; If \(T_{\text{Module}} < T_{\text{Limited frequency temperature of module}}\) and the compressor has been stopped for 3 minutes, the machine should be allowed to operate.

6. If protection continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the \(t\) Protection times clearing of compressor \(T\), the discharge protection is cleared to recount. Stopped or transferred to supply air mode will clear the trouble times immediately (if the trouble can not be resumed, mode transferring also will not clear it).

(10) Compressor overloads protection
If you measure the compressor overload switch action in 3s, the compressor should be stopped for overloading. The machine should be allowed to operate after overload protection was measured to resume. If the overloading protection continuously occurs for three times, it should not be resumed automatically, and you should press the ON/OFF button to resume. The protection times of compressor is allowed to clear after the compressor run \(t\) Protection times clearing of compressor overloading \(30\) minutes.

(11) Phase current over current protection of compressor
During the running process of compressor, you could measure the phase current of the compressor, and control it according to the following steps:

1. Frequency limited
   If \(I_{\text{Limited frequency phase current}} \leq I_{\text{Phase current}} < I_{\text{Frequency reducing phase current}}\), you should limit the frequency raising of compressor.

2. Reducing Frequency
   If \(I_{\text{Frequency Reducing Phase Current}} \leq I_{\text{Phase Current}} < I_{\text{Power Turn-Off Phase Current}}\), the compressor shall continue to reduce frequency till the lowest frequency limit or out of the condition of reducing frequency;

3. Power turn-off
   If \(I_{\text{Phase Current}} \geq I_{\text{Power Turn-Off Phase Current}}\), the compressor phase current shall stop working for overcurrent protection; if \(I_{\text{Phase Current}} \leq I_{\text{Frequency Reducing Phase Current}}\), and the compressor have stopped working for 3 min, the machine shall be allowed to operate;

4. If the overcurrent protection of compressor phase current continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the \(t\) Clearing Time of Compressor Phase Current Times \(30\) minutes, the overcurrent protection is cleared to recount.
(12) Starting-up Failure Protection for Compressor
Stop the compressor after its starting-up fails, restart it after 20s if the fault doesn’t shows, and if they are all failing for the successive start 3 times, it shall be reported as Starting-up Failure, and then restart up it after 3 min. When it still not be able to operate through carry out the above process for 5 times, it is available if press ON/OFF. And the compressor should be cleared the times after it run 2 min.

(13) Out-of-Step Protection for Compressor
The out-of-step protection signal should be detected immediately after starting-up compressor, and once find the out-of-step protection signal, the out-of-step protection shall be stopped; if it can run for lasting power turn-off 3 min, the machine shall be allowed to operate. If it still can’t run automatically when the out-of-step protection for compressor happens to stop working for 6 times in succession, it needs to press ON/OFF to operate. And if the running time is more than 10 min, the power turn-off times for out-of-step protection shall be cleared and recounted.

(14) Voltage Abnormity Protection for DC Bus
To detect voltage abnormity protection for dc bus after completing the pre-charge:
1. Over-High Voltage Protection for DC Bus:
   If it found the DCbus voltage $U_{DC} > [U_{DC Jiekuangchun Protection}]$, turn off PFC and stop the compressor at once, and it shall show the DC over-high voltage failure; it should clear out the failure when the voltage dropped to $U_{DC} < [U_{DC Jiekuangchun Recovery}]$ and the compressor stopped for 3 min.
2. Over-Low Voltage Protection for DC Bus:
   If it found the DC bus voltage $U_{DC} < [U_{DC Wantuochun Protection}]$, turn off PFC and stop the compressor at once, and it shall show the DC over-low voltage; and it should clear out the failure when the voltage raised to $U_{DC} > [U_{DC Wantuochun Recovery}]$ and the compressor stopped for 3 min.
3. To detect voltage abnormity protect for DC bus when getting electricity:
   If it found the DC bus voltage $U_{DC} > [U_{DC—Over-High Voltage}]$, turn off the relay at once, and shows voltage abnormity failure for DC Bus. And the failure can’t recover except to break off and get the electricity.

(15) Abnormality Protection for Four-way Valve
Under the model of heating operation in good condition: the compressor is detected $[T_{Inner Tube} < (T_{Inner Ring} - T_{Abnormality Temperature Difference For Four-Way Valve Reversion})]$, during the running, it should be regarded as four-way valve reversion abnormality. And then it can run if stop the reversion abnormality protection for four-way valve 3 min; and if it still can’t run when the reversion abnormality protection for four-way valve happens to stop working for 3 times in succession, it is available if presses ON/OFF.

Attention: the protection shall be shielded during the testing mode and defrosting process, and it shall be cleared out the failure and its times immediately when turning off or delivering wind / cooling / dehumidifying mode converted (the inverted mode don’t clear out the failure when it can’t recover to operate).

(16) PFC Protection
1. After start up the PFC, it should detect the protection signal of PFC immediately; under the condition of PFC protection, it should turn off the PFC and compressor at one time;
2. It shows the failure is cleared out if PFC Protection stopped working 3 min and recovers to run automatically;
3. If it still can’t run when it occurs PFC protection for 3 times in succession, it is available if presses ON/OFF; and clear the PFC Protection times when start up PFC for 10min.

(17) Failure Detection for Sensor
1. Outdoor Ambient Sensor: detect the failure of sensor at all times.
2. Outdoor Tube Sensor: You should not detect the failure of outdoor tube sensor within 10 minutes heating operation compressor except the defrosting, and you could detect it at other time.
3. Outdoor Exhaust Sensor:
   (a) The compressor only detect the sensor failure after it start up 3 min in normal mode;
   (b) It should detect the exhaust sensor failure immediately in the testing mode.
4. Module Temperature Sensor:
   (a) Short-Circuit Detection: the compressor should be detected immediately when the module temperature sensor occurs short-circuits;
   (b) Open-Circuit Detection: the compressor should be detected on open-circuit when it runs 3min (it needn’t 30s avoiding the module over-heated).
   (c) Detect the sensor failure at all times in the testing mode.
5. Disposal for Sensor Protection
   (1) When the short-circuit of sensor is detected within 30s, It is regarded as the temperature of sensor over-high (or infinitely high), and now according to the over-high sensor, the machine should carry out the corresponding protection to stop working, and show the corresponding temperature shutdown protection and sensor failure at the same time (for example: the compressor stops immediately when the outdoor tube sensor short-circuit, and the machine shall show the overload protection and outdoor tube sensor failure).
   (2) When the open-circuit of sensor is detected within 30s, The protection shall be stopped and it shall show the corresponding sensor failure.
6. Electric Heating Function of Chassis
(1) When $T_{\text{outdoor amb.}} \leq 0^\circ\text{C}$, the electric heating of chassis will operate;
(2) When $T_{\text{outdoor amb.}} > 2^\circ\text{C}$, the electric heating of chassis will stop operation;
(3) When $0^\circ\text{C} < T_{\text{outdoor amb.}} \leq 2^\circ\text{C}$, the electric heating of chassis will keep original status.

7. Electric Heating Function of Compressor
(1) When $T_{\text{outdoor amb.}} \leq -5^\circ\text{C}$, compressor stops operation, while the electric heating of compressor starts operation;
(2) When $T_{\text{outdoor amb.}} > -2^\circ\text{C}$, the electric heating of compressor stops operation;
(3) When $-5^\circ\text{C} < T_{\text{outdoor amb.}} \leq -2^\circ\text{C}$, the electric heating of compressor will keep original status.
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 conditioner 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.

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

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

8.1 Installation Dimension Diagram

Space to the ceiling
At least 15cm

Space to the wall
At least 15cm

Space to the obstruction
At least 200cm

Space to the wall
At least 30cm

Space to the obstruction
At least 50cm

Space to the floor
At least 250cm

Drainage pipe

Space to the wall
At least 15cm

Space to the obstruction
At least 30cm

Space to the wall
At least 50cm

Space to the obstruction
At least 50cm
Installation and Maintenance Service Manual

Installation procedures

Start installation

Preparation before installation

Read the requirements for electric connection

select installation location

Prepare tools

Select indoor unit installation location

Select outdoor unit installation location

Install wall-mounting frame, drill wall holes

Install the support of outdoor unit (select it according to the actual situation)

Connect pipes of indoor unit and drainage pipe

Fix outdoor unit

Connect wires of indoor unit

Install drainage joint of outdoor unit (only for cooling and heating unit)

Bind up pipes and hang the indoor unit

Make the bound pipes pass through the wall hole and then connect outdoor unit

Connect pipes of outdoor unit

Connect wires of outdoor unit

Neaten the pipes

Vacuum pumping and leakage detection

Check after installation and test operation

Finish installation

Note: this flow is only for reference; please find the more detailed installation steps in this section.
### 8.2 Installation Parts-checking

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

⚠️ **Note:**
1. Please contact the local agent for installation.
2. Don’t use unqualified power cord.

### 8.3 Selection of Installation Location

#### 1. Basic Requirement:
Installing the unit in the following places may cause malfunction. If it is unavoidable, please consult the local dealer:
1. The place with strong heat sources, vapors, flammable or explosive gas, or volatile objects spread in the air.
2. The place with high-frequency devices (such as welding machine, medical equipment).
3. The place near coast area.
4. The place with oil or fumes in the air.
5. The place with sulfureted gas.
6. Other places with special circumstances.
7. The appliance shall not be installed in the laundry.

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

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

### 8.4 Electric Connection Requirement

#### 1. Safety Precaution
1. Must follow the electric safety regulations when installing the unit.
2. According to the local safety regulations, use qualified power supply circuit and air switch.
3. Make sure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring may result in electric shock, fire hazard or malfunction. Please install proper power supply cables before using the air conditioner.

<table>
<thead>
<tr>
<th>Air-conditioner</th>
<th>Air switch capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>18K</td>
<td>16A</td>
</tr>
<tr>
<td>24K</td>
<td>25A</td>
</tr>
</tbody>
</table>

4. Properly connect the live wire, neutral wire and grounding wire of power socket.
5. Be sure to cut off the power supply before proceeding any work related to electricity and safety.
6. Do not put through the power before finishing installation.
7. For appliances with type Y attachment, the instructions shall contain the substance of the following. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
8. The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.
9. The appliance shall be installed in accordance with national wiring regulations.

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

#### 8.5 Installation of Indoor Unit

#### 1. Choosing Installation location
Recommend the installation location to the client and then confirm it with the client.

#### 2. Install Wall-mounting Frame
1. Hang the wall-mounting frame on the wall; adjust it in horizontal position with the level meter and then point out the screw fixing holes on the wall.
2. Drill the screw fixing holes on the wall with impact drill (the specification of drill head should be the same as the plastic expansion particle) and then fill the plastic expansion particles.
in the holes.
(3) Fix the wall-mounting frame on the wall with tapping screws (ST4.2X25TA) and then check if the frame is firmly installed by pulling the frame. If the plastic expansion particle is loose, please drill another fixing hole nearby.

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

![Fig.1](image1.png)

(2) Open a piping hole with the diameter of Φ55(70)mm on the selected outlet pipe position. In order to drain smoothly, slant the piping hole on the wall slightly downward to the outdoor side with the gradient of 5-10°.(As show in Fig.2)

![Fig.2](image2.png)

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

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

![Fig.3](image3.png)

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

![Fig.5](image5.png)

Refer to the following table for wrench moment of force:

<table>
<thead>
<tr>
<th>Hex nut diameter(mm)</th>
<th>Tightening torque(N-m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Φ6</td>
<td>15~20</td>
</tr>
<tr>
<td>Φ9.52</td>
<td>30~40</td>
</tr>
<tr>
<td>Φ12</td>
<td>45~55</td>
</tr>
<tr>
<td>Φ16</td>
<td>60~65</td>
</tr>
<tr>
<td>Φ19</td>
<td>70~75</td>
</tr>
</tbody>
</table>

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

![Fig.6](image6.png)

![Fig.7](image7.png)
7. Connect Wire of Indoor Unit

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

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

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

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

8. Bind up Pipe

(1) All wires of indoor unit and outdoor unit should be connected by a professional.
(2) If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.
(3) For the air conditioner with plug, the plug should be reachable after finishing installation.
(4) For the air conditioner without plug, an air switch must be installed in the line. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.

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

9. Hang the Indoor Unit

(1) Put the bound pipes in the wall pipe and then make them pass through the wall hole.
(2) Hang the indoor unit on the wall-mounting frame.
(3) Stuff the gap between pipes and wall hole with sealing gum.
(4) Fix the wall pipe. (As show in Fig.16)
(5) Check if the indoor unit is installed firmly and closed to the wall. (As show in Fig.17)
Installation and Maintenance

Service Manual

8.6 Installation of Outdoor Unit

1. Fix the Support of Outdoor Unit (Select it according to the actual installation situation)
   (1) Select installation location according to the house structure.
   (2) Fix the support of outdoor unit on the selected location with expansion screws.

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

2. Install Drain Joint (Only for cooling and heating unit)
   (1) Connect the outdoor drain joint into the hole on the chassis. (As show in Fig.19)
   (2) Connect the drain hose into the drain vent.

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

4. Connect Indoor and Outdoor Pipes
   (1) Remove the screw on the handle and valve cover of outdoor unit and then remove the handle and valve cover. (As show in Fig.21)
   (2) Remove the screw cap of valve and aim the pipe joint at the bellmouth of pipe. (As show in Fig.22)
   (3) Pretightening the union nut with hand.
   (4) Tighten the union nut with torque wrench.

Refer to the following table for wrench moment of force:

<table>
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<td>60~65</td>
</tr>
<tr>
<td>Φ19</td>
<td>70~75</td>
</tr>
</tbody>
</table>

5. Connect Outdoor Electric Wire
   (1) Remove the wire clip; connect the power connection wire and power card to the wiring terminal according to the color; fix them with screws. (As show in Fig.23)

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

6. Neaten the Pipes
   (1) The pipes should be placed along the wall, bent reasonably and hidden possibly. Min. semidiameter of bending the pipe is 10 cm.
   (2) If the outdoor unit is higher than the wall hole, you must set a U-shaped curve in the pipe before pipe goes into the room, in order to prevent rain from getting into the room. (As show in Fig.24)
2. Leakage Detection
(1) With leakage detector:
Check if there is leakage with leakage detector.
(2) With soap water:
If leakage detector is not available, please use soap water for leakage detection. Apply soap water at the suspected position and keep the soap water for more than 3min. If there are air bubbles coming out of this position, there's a leakage.

8.8 Check after Installation and Test Operation

1. Check after Installation
Check according to the following requirement after finishing installation.

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

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

9.1 Malfunction Display of Indoor Unit

1. Malfunction display requirement
When there are several malfunctions, they will be displayed circularly.

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

Note: when the compressor is restarted, the malfunction display delay time (200s) is cleared.
(4) When the unit is under limit frequency or frequency drop state, the display can be controlled via remote controller.

3. Display control via remote controller
Enter display control: press light button successively for 6 times within 3s to display the corresponding malfunction code;
Exit display control: pressing light button successively for 6 times within 3s or after display is shown for 5min, the display will terminate.

Display under test state
Dual 8 nixie tube display: minimum cooling (heating)-P0; middle cooling (heating)-P3
Nominal cooling (heating) –P1; maximum cooling (heating) –P2;

● Error Code List

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

Note: Please refer to service manual for the troubleshooting procedure for outdoor unit.
● Discharging method
(1) remove the inverter cover (Outdoor Unit)

(2) As shown below, connect the discharge resistance (approx. 100Ω 20W) or plug of the soldering iron to voltage between + - terminals of the electrolytic capacitor on PC Board for 30s, and then perform discharging.

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

Indoor unit
(1) Malfunction of Temperature Sensor F1, F2

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

Malfunction diagnosis process:

Start

Is the wiring terminal between the temperature sensor and the controller loosened or poorly contacted?

- Yes
  - Insert the temperature sensor tightly
  - Is malfunction eliminated

- No
  - Is there short circuit due to trip-over of the parts

- Yes
  - Make the parts upright
  - Is malfunction eliminated

- No
  - Is the temperature sensor normal according to the resistance table?

- No
  - Replace it with a temperature sensor with the same model
  - Is malfunction eliminated

- Yes
  - Replace the mainboard with the same model.
  - Is malfunction eliminated

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

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

Malfunction diagnosis process:

1. **Start**

2. While power is off stir the blade with a tool to see whether the blade rotates smoothly:
   - No → Tighten the screw; reassemble the blade, motor and shaft bearing rubber base sub-assy to make sure there is no foreign object between them.
   - Yes → Check if the connection of PG motor feedback terminal is firm.

3. Check if the connection of PG motor feedback terminal is firm:
   - Yes → Is malfunction eliminated? Yes → Replace PG motor. No → Insert the control terminal of PG motor tightly.
   - No → Is malfunction eliminated? Yes → Reinstall the blade and motor correctly. No → Is malfunction eliminated?

4. Turn on the unit again; measure whether the output voltage on control terminal for PG motor is more than 50V within 1 min after the louvers are opened:
   - Yes → Is the motor started up? Yes → Measure the voltage of this foot to neutral wire on the mainboard. No → Replace the mainboard with the same model.
   - No → Replace PG motor.

5. **End**
(3) Malfunction of Protection of Jumper Cap C5

Main detection points:
- Is there jumper cap on the mainboard?
- Is the jumper cap inserted correctly and tightly?
- The jumper is broken?
- The motor is broken?
- Detection circuit of the mainboard is defined abnormal?

Malfunction diagnosis process:

Start

Is there jumper cap on the mainboard?

Yes

No

Is the jumper cap inserted correctly and tightly?

Yes

No

Insert the jumper cap tightly

Is malfunction eliminated

Yes

No

Replace the jumper cap with the same model

Is malfunction eliminated

Yes

No

Replace the mainboard with the same model

End
(4) Malfunction of Zero-crossing Inspection Circuit Malfunction of the IDU Fan Motor U8
Main detection points:
- Instant energization after de-energization while the capacitor discharges slowly?
- The zero-cross detection circuit of the mainboard is defined abnormal?

Malfunction diagnosis process:

```
Start

Turn power off for 1 minute, the turn back on

U8 is still displayed

Yes
The zero-cross detection circuit of the mainboard is defined abnormal. Replace the mainboard with the same model.

No
The unit returns to normal. Conclusion: U8 is displayed due to power off/on while the capacitor discharges slowly.

End
```

Click Start to continue.
(5) Communication malfunction (E6)

Troubleshooting for E6 malfunction

Disconnect power and check if the connection wire of indoor and outdoor units and the built-in wire of electric box are correctly connected.

Correct connection? No Connect the wire properly according to the wiring diagram. Is malfunction eliminated? Yes

Main board matches with display board? Main board of IDU matches with that of ODU? No Match correctly according to product specification. Is malfunction eliminated? Yes

Connection of communication wire is damaged or not? Yes Replace the connection wire. Is malfunction eliminated? Yes

No

Replace the main board of IDU. Is malfunction eliminated? No Replace the main board of ODU. Yes

End
Outdoot Unit

(1) Malfunction of Desynchronizing of Compressor (H7)
Main check point:
Whether the system pressure is too high?
Whether the electronic expansion valve can work normally?
Whether the radiation for the unit is in good condition?
Malfunction diagnosis process:

Desynchronizing malfunction occurs after de-energizing and turning on the unit

Yes

Whether stop time for compressor is more than 3min?

No

Yes

Whether valve of outdoor unit is opened?

No

Open the valve

Yes

Is malfunction eliminated?

No

Is malfunction eliminated?

Yes

Whether wire connection for compressor is correct?

No

Connect wire correctly

Yes

Is malfunction eliminated?

No

Is malfunction eliminated?

Yes

Whether electronic expansion valve is damaged?

No

Replace electronic expansion valve

Yes

Is malfunction eliminated?

No

Replace main board of outdoor unit

Yes

Is malfunction eliminated?

No

Replace compressor

End
Desynchronizing malfunction occurs during operation process

Whether the outdoor fan can operate normally?
  Yes
  No

  Whether the radiation for the unit is in good condition?
    Yes
    No

      Whether the input voltage is normal?
        Yes
        No

          Whether refrigerant is superfluous?
            Yes
            No

              Replace main board of outdoor unit
              Replace compressor

            Is malfunction eliminated?
              Yes
              No

              Replace compressor

          Charge refrigerant according to service manual

        Turn on the unit again after the power voltage is resumed

      Improve the radiation circumstances for the unit (such as clean heat exchanger, improve ventilation, etc)

    Replace outdoor fan

  Check whether the fan terminal is connected well

  Replace fan capacitor

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

Main check point:
- Whether the temperature sensor is damaged?
- Whether the terminal of temperature sensor is loose or not connected?
- Whether the main board is damaged?

Malfunction diagnosis process:

Start the troubleshooting for temperature sensor

Check the connection between temperature sensor and wiring terminal is loose or in poor connection

- Yes: Insert the temperature sensor well
- No: Is malfunction eliminated?

Check whether the temperature sensor is normal according to the Resistance Value Table for Temperature Sensor?

- Yes: Replace the temperature sensor
- No: Is malfunction eliminated?

Replace the controller

Is malfunction eliminated?

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

Main check point:
- Whether the electronic expansion valve is connected well and whether it’s damaged?
- Whether the refrigerant is leaking?
- Whether the overload protector is damaged?
- Malfunction diagnosis process:

**Start**

- Whether the overload protector is connected?
  - Yes
  - No

  - Measure the resistance between both ends of overload protector under ambient temperature. Whether the resistance <1KΩ?
    - Yes
    - No

    - Whether wire connection wire electronic expansion valve is in good condition?
      - Yes
      - No

      - Replace overload protector

      - Check the coil of electronic expansion valve. If it’s damaged, please replace it.

      - Is malfunction eliminated?
        - Yes
        - No

        - If the refrigerant is leaking, please add refrigerant according to Service Manual.

        - Is malfunction eliminated?
          - Yes
          - No

        - Replace main board of outdoor unit

End

**Remark:**
Detection method for electronic expansion valve: There are 5 wires for the coil of electronic expansion valve and one of them are common port (the left or the right wire). The resistance for other terminals are all most the same (about 100Ω). You can measure those resistance values to judge whether the electronic expansion valve is damaged or not.
(4) Charging Malfunction of Capacitor (PU)
Main check point:
Whether input power is normal?
Main board is damaged.
Malfunction diagnosis process:

1. Energize and turn on the unit; wait for 1 min
2. Measure the voltage at both ends of big electrolytic capacitor with the DC notch of universal meter
3. Is the voltage more than 100V?
   - Yes: There is malfunction for the detection circuit on main board of outdoor unit
   - No: Check whether the input voltage is within the normal range?
5. If No: Check the input power and resume the power supply normal
6. Is malfunction eliminated?
   - Yes: End
   - No: Replace main board of outdoor unit

Replace main board of outdoor unit
(5) Malfunction of Overload Protection (E8)

Main check point:
Whether the tube temperature sensor is normal?
Whether the outdoor ambient temperature is within the normal range?
Whether indoor fan and outdoor fan can operate normally?
Whether radiation environment inside or outside the unit is good?

Malfunction diagnosis process:

Start

Check whether outdoor and indoor tube temperature sensors are normal?  
Flow:
- Yes
  - Whether outdoor ambient temperature is more than 53°C?
    - Yes
      - Normal protection. Please improve the ambient temperature
    - No
      - Whether radiation inside or outdoor the unit is good?
        - Yes
          - Improve the radiation environment for the unit
        - No
          - Whether outdoor fan operates normally?
            - Yes
              - Replace main board of outdoor unit
            - No
              - Flow:
                - Whether outdoor ambient temperature is more than 53°C?
                  - Yes
                    - Improve the radiation environment for the unit
                  - No
                    - Replace the tube temperature sensor

End

Remark:
When overload protection occurs under cooling mode, it's because the main board detected the outdoor tube temperature sensor exceeds limited temperature and then the unit stops operation. Please check outdoor tube temperature sensor;
When overload protection occurs under heating mode, it's because the main board detected the indoor tube temperature sensor exceeds limited temperature and then the unit stops operation. Please check indoor tube temperature sensor;
(6) Malfunction of IPM Protection (H5)

Main check point:
- Whether input voltage is within the normal range?
- Whether wires of compressor are connected reliably, tightly or correctly?
- Whether the resistance of compressor coil is normal? Whether the insulation between compressor coil and copper pipe is in good condition?
- Whether the unit is overloading? Whether the radiation for the unit is in good condition?
- Whether the volume of charged refrigerant is proper?

Malfunction diagnosis process:

1. Whether the heat exchangers for indoor unit and outdoor unit are dirty? Whether the heat exchangers are covered by other objects?
2. Whether indoor fan and outdoor fan operate normally?
3. Whether system pressure is too high?
4. Whether voltage is too high due to superfluous refrigerant?

Please check:

- Whether there’re above circumstances?

If Yes, modify it according to Service Manual and then energize and turn on the unit.

If No:
- Connect compressor wires according to correct wiring method
- Measure the resistance between two phases of three phases of compressor
- Is resistance value normal?
  - If Yes, proceed
  - If No, measure the resistance between three-phase of compressor and copper pipe
  - Is resistance value more than 500MΩ?
    - If No, replace compressor
    - If Yes, replace main board of outdoor unit

Is malfunction eliminated?
- If Yes, end
- If No, repeat the process.
(7) Malfunction of PFC Protection (HC)
Main check point:
Whether power supply is normal?
Malfunction diagnosis process:

Start

Check whether power supply is normal

Is power abnormal?

Yes

Turn on the unit again after the power is resumed

No

Replace main board of outdoor unit

End
(8) Malfunction of Communication (E6)

Main check point:
Check whether connection wires between indoor unit and outdoor unit and wiring inside the unit are connected well?
Check the main board of indoor unit or main board of outdoor unit is damaged?

Malfunction diagnosis process:

Communication malfunction

De-energize the unit and then check whether connection wires between indoor unit and outdoor unit and wiring inside the electric box are correct.

Are wires are connected correctly?

No

Connect wire correctly according to circuit diagram

Is malfunction eliminated?

Yes

End

No

Replace main board of indoor unit

Is malfunction eliminated?

No

Replace main board of outdoor unit

Yes
(9) Malfunction of Failure Start-up of Compressor (LC)
Main check point:
Whether the compressor wires are connected correctly?
Whether the stop time for compressor is enough?
Whether compressor is damaged?
Whether the refrigerant-charging volume is superfluous?
Malfunction diagnosis process:

1. Energize and turn on the unit
2. Whether the stop time for compressor is more than 3min?
   - Yes
   - No
3. Whether compressor wires are connected correctly?
   - Yes
   - No
4. Whether the refrigerant volume is superfluous?
   - Yes
   - No
5. Please charge the refrigerant according to Service Manual
   - Is malfunction eliminated?
     - Yes
     - No
6. The stop time for unit is not enough; high pressure and low pressure of system are unbalanced; please wait for 3min and then restart up the unit
   - Replace main board of outdoor unit
     - Is malfunction eliminated?
       - Yes
       - No
8. Replace compressor
   - End
(10) Malfunction of Overcurrent Protection E5

Main detection points:
- Is the supply voltage unstable with big fluctuation?
- Is the supply voltage too low with overload?
- Hardware trouble?

Malfunction diagnosis process:

1. **Start**
2. **Is the supply voltage unstable with big fluctuation?**
   - **Yes**: Normal fluctuation should be within 10% of the rated voltage on the nameplate.
   - **No**
3. **Is the supply voltage too low with overload?**
   - **Yes**: Adjust the supply voltage to maintain it within normal range.
   - **No**
4. **Is the indoor/outdoor heat exchanger dirty or are the air inlet and outlet blocked?**
   - **Yes**: Clean the indoor and outdoor heat exchangers and remove the blockage of air inlet and outlet.
   - **No**
5. **The fan is abnormal? Fan speed is too low or fan doesn’t rotate**
   - **Yes**: Check the motor and reinstall the motor to have the fan run normally.
   - **No**
6. **Measure the current of live wire on the main board with a clamp ampere meter. Is the current higher than the value of the overcurrent protection?**
   - **Yes**: Replace the mainboard with the same model.
   - **No**
7. **Is there blockage inside the system? (Filth blockage, ice plug, greasy blockage, the cut off valve hasn’t been opened completely)**
   - **Yes**: Flush the heat exchangers with high pressure nitrogen.
   - **No**
8. **Is the compressor running abnormally? Is there abnormal sound or oil leakage; is the temperature of the shell too high, etc.?**
   - **Yes**: Replace the compressor.
   - **No**
9. **Replace the mainboard with the same model**
10. **End**
(9) Other Malfunction

1. IPM module temperature sensor is open-circuited (P7)
Hardware of main board is damaged. Please replace main board.

2. Overheating protection of IPM module (P8)
   ① Poor radiation because the module radiator is dirty;
   ② IPM module is damaged;
   ③ Malfunction of outdoor fan, etc;

3. Detection circuit malfunctions of phase-current of compressor (U1)
Hardware of main board is damaged. Please replace main board.

4. DC busbar voltage is too high (PH)
   ① Input voltage is too high or unstable;
   ② Hardware of main board is damaged;

5. DC busbar voltage is too low (PL)
   ① Input voltage is too low or unstable;
   ② Hardware of main board is damaged;

6. Malfunction of ODU DC fan (L3)
   ① The wire terminal of outdoor fan motor is loosed, fix the terminal.
   ② Motor damaged, replace the motor.
   ③ Fan motor module on mainboard is damaged, replace the main board AP1
## 9.3 Troubleshooting for Normal Malfunction

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

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Discriminating Method (Air conditioner Status)</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>No power supply, or poor connection for power plug</td>
<td>After energization, operation indicator isn’t bright and the buzzer can’t give out sound</td>
<td>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.</td>
</tr>
<tr>
<td>Wrong wire connection between indoor unit and outdoor unit, or poor connection for wiring terminals</td>
<td>Under normal power supply circumstances, operation indicator isn’t bright after energization</td>
<td>Check the circuit according to circuit diagram and connect wires correctly. Make sure all wiring terminals are connected firmly.</td>
</tr>
<tr>
<td>Electric leakage for air conditioner</td>
<td>After energization, room circuit breaker trips off at once</td>
<td>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.</td>
</tr>
<tr>
<td>Model selection for air switch is improper</td>
<td>After energization, air switch trips off</td>
<td>Select proper air switch</td>
</tr>
<tr>
<td>Malfunction of remote controller</td>
<td>After energization, operation indicator is bright, while no display on remote controller or buttons have no action.</td>
<td>Replace batteries for remote controller. Repair or replace remote controller.</td>
</tr>
</tbody>
</table>

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

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

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<th>Possible Causes</th>
<th>Discriminating Method (Air conditioner Status)</th>
<th>Troubleshooting</th>
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<tr>
<td>Wrong wire connection, or poor connection</td>
<td>Check the wiring status according to circuit diagram</td>
<td>Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly</td>
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<tr>
<td>Stepping motor is damaged</td>
<td>Stepping motor can't operate</td>
<td>Repair or replace stepping motor</td>
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<tr>
<td>Main board is damaged</td>
<td>Others are all normal, while horizontal louver can't operate</td>
<td>Replace the main board with the same model</td>
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<tr>
<td>Malfunction of horizontal louver</td>
<td>Horizontal louver can’t swing</td>
<td>Refer to point 3 of maintenance method for details</td>
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<tr>
<td>Malfunction of the IDU fan motor</td>
<td>The IDU fan motor can’t operate</td>
<td>Refer to troubleshooting for H6 for maintenance method in details</td>
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<tr>
<td>Malfunction of the ODU fan motor</td>
<td>The ODU fan motor can’t operate</td>
<td>Refer to point 4 of maintenance method for details</td>
</tr>
<tr>
<td>Malfunction of compressor</td>
<td>Compressor can’t operate</td>
<td>Refer to point 5 of maintenance method for details</td>
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### 4. ODU Fan Motor Can't Operate

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<td>Wrong wire connection, or poor connection</td>
<td>Check the wiring status according to circuit diagram</td>
<td>Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly</td>
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<td>Capacity of the ODU fan motor is damaged</td>
<td>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.</td>
<td>Replace the capacity of fan</td>
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<tr>
<td>Power voltage is a little low or high</td>
<td>Use universal meter to measure the power supply voltage. The voltage is a little high or low</td>
<td>Suggest to equip with voltage regulator</td>
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<tr>
<td>Motor of outdoor unit is damaged</td>
<td>When unit is on, cooling/heating performance is bad and ODU compressor generates a lot of noise and heat.</td>
<td>Change compressor oil and refrigerant. If no better, replace the compressor with a new one</td>
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### 5. Compressor Can't Operate

<table>
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<th>Possible causes</th>
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<th>Troubleshooting</th>
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<td>Wrong wire connection, or poor connection</td>
<td>Check the wiring status according to circuit diagram</td>
<td>Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly</td>
</tr>
<tr>
<td>Capacity of compressor is damaged</td>
<td>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.</td>
<td>Replace the compressor capacitor</td>
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<tr>
<td>Power voltage is a little low or high</td>
<td>Use universal meter to measure the power supply voltage. The voltage is a little high or low</td>
<td>Suggest to equip with voltage regulator</td>
</tr>
<tr>
<td>Coil of compressor is burnt out</td>
<td>Use universal meter to measure the resistance between compressor terminals and it's 0</td>
<td>Repair or replace compressor</td>
</tr>
<tr>
<td>Cylinder of compressor is blocked</td>
<td>Compressor can't operate</td>
<td>Repair or replace compressor</td>
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### 6. Air Conditioner is Leaking

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<th>Possible causes</th>
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<td>Drain pipe is blocked</td>
<td>Water leaking from indoor unit</td>
<td>Eliminate the foreign objects inside the drain pipe</td>
</tr>
<tr>
<td>Drain pipe is broken</td>
<td>Water leaking from drain pipe</td>
<td>Replace drain pipe</td>
</tr>
<tr>
<td>Wrapping is not tight</td>
<td>Water leaking from the pipe connection place of indoor unit</td>
<td>Wrap it again and bundle it tightly</td>
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### 7. Abnormal Sound and Vibration

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

10.1 Indoor Unit

GWH18QD-K3DNB6G/I GWH18QD-K3DNC2G/I
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# 11. Removal Procedure

## 11.1 Removal Procedure of Indoor Unit

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<td>1. Remove filter assy</td>
<td>Open the front panel. Push the left and right filters to make them break away from the groove on the front case. Then remove the left and right filters one by one.</td>
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<tr>
<td>2. Remove horizontal louver</td>
<td>Push out the axle bush on horizontal louver, Bend the horizontal louver with hand and then separate the horizontal louver from the crank shaft of step motor to remove it.</td>
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<tr>
<td>3. Remove panel and display</td>
<td>Separate the panel rotation shaft from the groove fixing the front panel and then removes the front panel. Screw off the 2 screws that are locking the display board. <strong>Note:</strong> Applicable for A1/A5/B2/B4/B6/B8/C2 panel.</td>
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Caution: discharge the refrigerant completely before removal.
4. Remove electric box cover 2

Remove the screw on the electric box cover 2 to remove the electric box cover 2.

---

5. Remove front case sub-assy

**a** Remove the screws fixing front case.

Note:

① Open the screw caps before removing the screws around the air outlet.

② The quantity of screws fixing the front case sub-assy is different for different models.

**b** Loosen the connection clasps between front case sub-assy and bottom case. Lift up the front case sub-assy and take it out.

---

6. Remove display

Screw off the 2 screws that are locking the display board.

**Note:**
Applicable for A2/A6 panel.
<table>
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<tr>
<th>Step</th>
<th>Procedure</th>
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</thead>
</table>
| 7. Remove vertical louver | a. Loosen the connection clasps between vertical louver and bottom case to remove vertical louver.  
   b. Screw off the screws that are locking the swing motor and take the motor off. |

| 8. Remove electric box assy | a. Loosen the connection clasps between shield cover of electric box sub-assy and electric box, and then remove the shield cover of electric box sub-assy. Remove the screw fixing electric box assy. |

b. ① Cut off the wire binder and pull out the indoor tube temperature sensor.  
   ② Screw off one grounding screw.  
   ③ Remove the wiring terminals of motor and stepping motor.  
   ④ Remove the electric box assy.  
   ⑤ Screw off the screws that are locking each lead wire.
<table>
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<th>Step</th>
<th>Procedure</th>
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<tr>
<td>c</td>
<td>Rotate the electric box assy. Twist off the screws that are locking the wire clip and loosen the power cord. Remove the wiring terminal of power cord. Lift up the main board and take it off. Instruction: Some wiring terminal of this products is with lock catch and other devices. The pulling method is as below: ① Remove the soft sheath for some terminals at first, hold the circlip and then pull out the terminals. ② Pull out the holder for some terminals at first (holder is not available for some wiring terminal). hold the connector and then pull the terminal.</td>
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9. Remove evaporator assy

| a    | Remove 3 screws fixing evaporator assy. |
| b    | At the back of the unit, remove the screw fixing connection pipe clamp and then remove the connection pipe clamp. |
| c    | First remove the left side of evaporator from the groove on the rear case assy. Then remove the right side from the clasp on the rear case assy. |
### Step d

Adjust the position of connection pipe on evaporator upwards to remove it.

#### Procedure
![Connection pipe](image1)

### 10. Remove motor and cross flow blade

**a**  Remove the screws fixing motor clamp and then remove the motor clamp.

**b**  
1. Remove the screws at the connection place of cross flow blade and motor; lift the motor and cross flow blade upwards to remove them.
2. Remove the bearing holder sub-assy.
3. Remove the screw fixing step motor and then remove the step motor.

![Component parts](image2)
### 11.2 Removal Procedure of Outdoor Unit

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

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<tbody>
<tr>
<td>1.</td>
<td>Remove big handle, valve cover and top cover</td>
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</table>

a. Remove the screw connecting the big handle and right side plate, and then remove the big handle. Remove the screw connecting the valve cover and right side plate, and then remove the valve cover.

b. Remove the screws connecting the top cover with outer case, right side plate and left side plate; lift the top cover upwards to remove it.
### 2. Remove grille and cabinet

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<td>Remove the 4 screws connecting the grille and outer case, and then remove the panel grille.</td>
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<tr>
<td>b</td>
<td>Remove the screws connecting the outer case with motor support, isolation plate and chassis; lift the outer case upwards; loosen the clasps of outer case with right side plate and left side plate, and then remove the outer case.</td>
</tr>
</tbody>
</table>

### 3. Remove rear guard grille and right side plate

<table>
<thead>
<tr>
<th>Step</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Remove the 3 screws connecting the grille with right side plate and left side plate, and then remove the rear guard grille.</td>
</tr>
<tr>
<td>b</td>
<td>Remove the screws connecting the right side plate with electric box assy, valve support, chassis and condenser side plate, and then remove the right side plate.</td>
</tr>
<tr>
<td>Step</td>
<td>Procedure</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>4. Remove axial flow blade</td>
<td>Remove the nut fixing axial flow blade and then remove the blade.</td>
</tr>
<tr>
<td>5. Remove electric box assy</td>
<td>a. Remove the grounding wire screw on the electric box assy and then remove the grounding wire. (See fig 1) b. Disconnect the wiring terminals of reactor, compressor, high and low pressure switch, compressor overload protector, temperature sensor, outdoor fan motor and 4-way valve. (See fig 2) Note: keep pressing the circlip when disconnecting the wiring terminal of reactor; keep pressing the retainer when disconnecting other wiring terminals. c. Remove the wire inside the wiring groove.</td>
</tr>
<tr>
<td>Step</td>
<td>Procedure</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>d</td>
<td>Remove the 2 screws fixing the electric box assy and then lift the electric box assy upwards to remove it.</td>
</tr>
<tr>
<td>e</td>
<td>Push the electric box cover in the direction of arrow to make the clasp at the right side separate from the groove; then pull it in the opposite direction to make the clasp at the lift side separate from the groove and then remove the electric box cover.</td>
</tr>
<tr>
<td>f</td>
<td>Remove the 5 screws connecting the mainboard and then remove the mainboard.</td>
</tr>
<tr>
<td>g</td>
<td>Remove the 9 screws fixing the radiator and then remove the radiator.</td>
</tr>
</tbody>
</table>
## Step 6
### Procedure
Remove the isolation plate and reactor.

- **a** Remove the 2 screws connecting the isolation plate and condenser side plate; remove the 3 screws connecting the isolation plate and chassis, and then remove the isolation plate.

- **b** Remove the 4 screws connecting the reactor and isolation plate, and then remove the reactor.

## Step 7
### Procedure

Tear off the sticking stripe and then remove the soundproof sponge.

- **Remove the 2 screws connecting the isolation plate and condenser side plate; remove the 3 screws connecting the isolation plate and chassis, and then remove the isolation plate.**

- **Remove the 4 screws connecting the reactor and isolation plate, and then remove the reactor.**
<table>
<thead>
<tr>
<th>Step</th>
<th>Procedure</th>
</tr>
</thead>
</table>
| 8. Valve Support Sub-Assy| Un solder the welding joint connecting the valve with capillary and condenser; unsolder the welding joint connecting the gas valve and air-return pipe; remove the 2 bolts fixing the gas valve to remove the gas valve.  
Un solder the welding joint connecting the liquid valve and Y-shaped pipe; remove the 2 bolts fixing the liquid valve to remove the liquid valve.  
Note: Before unsoldering the welding joint, wrap the gas valve with a wet cloth completely to avoid damage to the valve caused by high temperature. |
| 9. Remove 4-way valve assy| Un solder the welding joints connecting the 4-way valve assy with capillary sub-assy, compressor and condenser; remove the 4-way valve.  
Note: Before unsoldering the welding joint, wrap the 4-way valve with a wet cloth completely to avoid damage to the valve caused by high temperature. |
| 10. Motor Support Sub-Assy and motor | a  
Remove the 2 screws connecting the motor support and chassis, and then loosen the stopper to remove the motor support. |
<table>
<thead>
<tr>
<th>Step</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>Remove the 6 screws fixing the motor and then remove the motor.</td>
</tr>
<tr>
<td>11. Remove condenser</td>
<td>Remove the 2 screws fixing the condenser and chassis, and then lift the condenser upwards to remove it.</td>
</tr>
<tr>
<td>12. Remove compressor</td>
<td>Remove the 3 foot nuts fixing compressor and then lift the compressor upwards to remove the compressor and damping cushion. Note: Keep the ports of discharge pipe and suction pipe from foreign objects.</td>
</tr>
</tbody>
</table>
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

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

Ambient temperature

<table>
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<th>Fahrenheit (°F)</th>
<th>Celsius (°C)</th>
<th>Fahrenheit display temperature (°F)</th>
<th>Fahrenheit (°F)</th>
<th>Celsius (°C)</th>
<th>Fahrenheit display temperature (°F)</th>
<th>Fahrenheit (°F)</th>
<th>Celsius (°C)</th>
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</thead>
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<td>79/80</td>
<td>78.8</td>
<td>26</td>
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<tr>
<td>34/35</td>
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<td>1</td>
<td>57/58</td>
<td>57.2</td>
<td>14</td>
<td>81</td>
<td>80.6</td>
<td>27</td>
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<tr>
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<td>2</td>
<td>59/60</td>
<td>59</td>
<td>15</td>
<td>82/83</td>
<td>82.4</td>
<td>28</td>
</tr>
<tr>
<td>37/38</td>
<td>37.4</td>
<td>3</td>
<td>61/62</td>
<td>60.8</td>
<td>16</td>
<td>84/85</td>
<td>84.2</td>
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</tr>
<tr>
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<td>4</td>
<td>63</td>
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<td>86/87</td>
<td>86</td>
<td>30</td>
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<tr>
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<td>64/65</td>
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<td>88/89</td>
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<td>66/67</td>
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<td>89.6</td>
<td>32</td>
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<td>68</td>
<td>20</td>
<td>91/92</td>
<td>91.4</td>
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</tr>
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<td>8</td>
<td>70/71</td>
<td>69.8</td>
<td>21</td>
<td>93/94</td>
<td>93.2</td>
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<td>9</td>
<td>72</td>
<td>71.6</td>
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<td>95/96</td>
<td>95</td>
<td>35</td>
</tr>
<tr>
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<td>50</td>
<td>10</td>
<td>73/74</td>
<td>73.4</td>
<td>23</td>
<td>97/98</td>
<td>96.8</td>
<td>36</td>
</tr>
<tr>
<td>52/53</td>
<td>51.8</td>
<td>11</td>
<td>75/76</td>
<td>75.2</td>
<td>24</td>
<td>99</td>
<td>98.6</td>
<td>37</td>
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<tr>
<td>54</td>
<td>53.6</td>
<td>12</td>
<td>77/78</td>
<td>77</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Appendix 2: Configuration of Connection Pipe

1. Standard length of connection pipe
   - 5m, 7.5m, 8m.
2. Min. length of connection pipe is 3m.
3. Max. length of connection pipe and max. high difference.
4. The additional refrigerant oil and refrigerant charging required after prolonging connection pipe
   - After the length of connection pipe is prolonged for 10m at the basis of standard length, you should add 5ml of refrigerant oil for each additional 5m of connection pipe.
   - The calculation method of additional refrigerant charging amount (on the basis of liquid pipe):
     
     - When the length of connection pipe is above 5m, add refrigerant according to the prolonged length of liquid pipe. The additional refrigerant charging amount per meter is different according to the diameter of liquid pipe. See the following sheet.
     - Additional refrigerant charging amount = prolonged length of liquid pipe \times \text{additional refrigerant charging amount per meter}

<table>
<thead>
<tr>
<th>Diameter of connection pipe</th>
<th>Outdoor unit throttle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid pipe(mm)</td>
<td>Gas pipe(mm)</td>
</tr>
<tr>
<td>Φ6</td>
<td>Φ9.5 or Φ12</td>
</tr>
<tr>
<td>Φ6 or Φ9.5</td>
<td>Φ16 or Φ19</td>
</tr>
<tr>
<td>Φ12</td>
<td>Φ19 or Φ22.2</td>
</tr>
<tr>
<td>Φ16</td>
<td>Φ25.4 or Φ31.8</td>
</tr>
<tr>
<td>Φ19</td>
<td>/</td>
</tr>
<tr>
<td>Φ22.2</td>
<td>/</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cooling capacity</th>
<th>Max length of connection pipe</th>
<th>Max height difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000 Btu/h(1465 W)</td>
<td>15 m</td>
<td>5 m</td>
</tr>
<tr>
<td>7000 Btu/h(2051 W)</td>
<td>15 m</td>
<td>5 m</td>
</tr>
<tr>
<td>9000 Btu/h(2637 W)</td>
<td>15 m</td>
<td>10 m</td>
</tr>
<tr>
<td>12000 Btu/h(3516 W)</td>
<td>20 m</td>
<td>10 m</td>
</tr>
<tr>
<td>18000 Btu/h(5274 W)</td>
<td>25 m</td>
<td>10 m</td>
</tr>
<tr>
<td>24000 Btu/h(7032 W)</td>
<td>25 m</td>
<td>10 m</td>
</tr>
<tr>
<td>28000 Btu/h(8204 W)</td>
<td>30 m</td>
<td>10 m</td>
</tr>
<tr>
<td>36000 Btu/h(10548 W)</td>
<td>30 m</td>
<td>20 m</td>
</tr>
<tr>
<td>42000 Btu/h(12306 W)</td>
<td>30 m</td>
<td>20 m</td>
</tr>
<tr>
<td>48000 Btu/h(14064 W)</td>
<td>30 m</td>
<td>20 m</td>
</tr>
</tbody>
</table>
Appendix 3: Pipe Expanding Method

⚠️ Note:

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

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

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

C: Put on suitable insulating pipe

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

E: Expand the port
- Expand the port with expander.

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

<table>
<thead>
<tr>
<th>Outer diameter (mm)</th>
<th>A (mm)</th>
<th>Max</th>
<th>Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ф6 - 6.35 (1/4&quot;)</td>
<td>1.3</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Ф9.52 (3/8&quot;)</td>
<td>1.6</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Ф12 - 12.70 (1/2&quot;)</td>
<td>1.8</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Ф16 - 15.88 (5/8&quot;)</td>
<td>2.4</td>
<td>2.2</td>
<td></td>
</tr>
</tbody>
</table>

F: Inspection
- Check the quality of expanding port. If there is any blemish, expand the port again according to the steps above.
Appendix 4: List of Resistance for Temperature Sensor

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

<table>
<thead>
<tr>
<th>Temp(°C)</th>
<th>Resistance(kΩ)</th>
<th>Temp(°C)</th>
<th>Resistance(kΩ)</th>
<th>Temp(°C)</th>
<th>Resistance(kΩ)</th>
<th>Temp(°C)</th>
<th>Resistance(kΩ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-19</td>
<td>138.1</td>
<td>20</td>
<td>18.75</td>
<td>59</td>
<td>3.848</td>
<td>98</td>
<td>1.071</td>
</tr>
<tr>
<td>-18</td>
<td>128.6</td>
<td>21</td>
<td>17.93</td>
<td>60</td>
<td>3.711</td>
<td>99</td>
<td>1.039</td>
</tr>
<tr>
<td>-17</td>
<td>121.6</td>
<td>22</td>
<td>17.14</td>
<td>61</td>
<td>3.579</td>
<td>100</td>
<td>1.009</td>
</tr>
<tr>
<td>-16</td>
<td>115</td>
<td>23</td>
<td>16.39</td>
<td>62</td>
<td>3.454</td>
<td>101</td>
<td>0.98</td>
</tr>
<tr>
<td>-15</td>
<td>108.7</td>
<td>24</td>
<td>15.68</td>
<td>63</td>
<td>3.333</td>
<td>102</td>
<td>0.952</td>
</tr>
<tr>
<td>-14</td>
<td>102.9</td>
<td>25</td>
<td>15</td>
<td>64</td>
<td>3.217</td>
<td>103</td>
<td>0.925</td>
</tr>
<tr>
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<td>97.4</td>
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<td>14.36</td>
<td>65</td>
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<td>104</td>
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<td>13.74</td>
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<td>105</td>
<td>0.873</td>
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<td>28</td>
<td>13.16</td>
<td>67</td>
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<td>106</td>
<td>0.848</td>
</tr>
<tr>
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<td>82.75</td>
<td>29</td>
<td>12.6</td>
<td>68</td>
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<tr>
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<td>30</td>
<td>12.07</td>
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<td>0.802</td>
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<tr>
<td>-8</td>
<td>74.35</td>
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<td>11.57</td>
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<td>109</td>
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<tr>
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<td>11.09</td>
<td>71</td>
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<td>110</td>
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<tr>
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<td>123</td>
<td>0.532</td>
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<td>88</td>
<td>1.451</td>
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GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI
Add: West Jinji Rd, Qianshan, Zhuhai, Guangdong, China 519070
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For product improvement, specifications and appearance in this manual are subject to change without prior notice.