9. Maintenance

9.1 Troubleshooting for Normal Malfunction

Note: When replacing the controller, make sure insert the wire jumper into the new controller, otherwise the unit will display C5.

Air conditioner can not start up

- The remote controller does not receive signals (after it is powered, the buzzer will sound, unless it has malfunction)
  - Trip of breaker or blow of fuse
  - The air conditioner does not react after it is powered (after the plug is inserted, the buzzer does not sound and the remote startup has no response)
  - Power plug is not well plugged in and poor connection.
  - The transformer connection is loose or has bad contact or the transformer has malfunction.
  - Controller is broken
  - Remote controller is short of power
  - Receiver loose or poor connection
  - Remote controller malfunction
  - Receiver is broken
  - Power voltage is too low

The breaker trips at once when it is set to "ON".

The breaker trips in few minutes when it is set to "ON".

No power

Fuse of controller burnt out

The circuit or the part of the air conditioner has malfunction. They heat and break the insulation and lead to short circuit or creepage. Measure the insulation resistance or eliminate the malfunction one by one. If the breaker itself has malfunction, then replace the breaker.

Measure insulation resistance to ground to see if there is any leakage.

Check power supply circuit.

Check if the plug is properly plugged in and make the loose contact firm.

Change controller fuse

Fasten the wiring; measure the output voltage of the transformer, if it is incorrect, change the transformer.

Check remote controller

Change batteries

Check the voltage. If it is lower than 10% of the rated voltage, check the cause, improve the power supply condition and add the stabilized voltage power supply.
Improper set of temperature → Adjust set temperature

If cooling (heating) load is proper → Check the forecasted load of cooling (heating)

Malfunction of refrigerant flow →
- The refrigerant has leakage or is insufficient → Check and fill the leakage, then vacuumize it and supplement the refrigerant as required
- Leakage between the high pressure and the low pressure inside the compressor → Replace the compressor
- Malfunction of four-way valve → Replace the four-way valve
- Local block of capillary → Replace the capillary
- Blockage of cooling system → 
  - Judge whether the system is blocked by observing the condensation of evaporator and the pressure value of the high pressure manometer and take measures to deal with the system.

Heat insulation for the connection pipes of the indoor unit and the outdoor unit is bad. → Make sure that heat insulation for the thick and thin pipes is good. Heat insulation must also be provided for the joint and the exposed part of the copper pipe.

Block of outdoor heat exchanger → Clean the dust accumulated on the surface of the heat exchanger.

Air filter were blocked → Clean the filter

Fan speed was set too slow → To set the fan speed to high or middle speed

Fan rotation speed becomes low →
- Capacitor damage → Replace the capacitor
- Motor damage → Replace the motor

The installation position of the outdoor unit is not appropriate. → Good ventilation must be provided for the installation position of the outdoor unit.

The outdoor temperature is too high. → Properly install the rainproof plate or the sunproof plate. If the maximum cool air still can not meet the requirement, it is suggested to replace the air conditioner.

The air tightness is not enough. People come in and out too frequently. There are heating devices indoors. → Keep certain air tightness indoors, try not to use electrical appliance with large quantity of heat.
The indoor fan motor is burned or breaks or has the heat protector malfunction.
Replace the fan motor or the defective part.

The built-in heat protector of the motor breaks frequently because the motor is abnormal.
Replace the fan motor

Wrong connection
Make the correct connection based on the circuit drawing.

The fan capacitor has open circuit or is damaged.
Replace the fan capacitor of the same type and same specification.

Wrong connection

The fan does not run when it is set to supply air.

In the cooling and heating mode, the compressor runs, but the outdoor fan does not run.

The outdoor fan motor is damaged.
Replace the fan motor

Wrong connection
Make the correct connection based on the circuit drawing.

The outdoor fan capacitor is damaged.
Replace the fan capacitor

Malfunction of compressor
Replace the compressor

Breakage of running capacitor of compressor
Replace the capacitor

The voltage is too low or too high.
Manostat is recommended.

Wrong wire connection
Connect the circuit diagram correctly

Use the multimeter to check whether the contact of the compressor is on when it is not overheated. If it is not on, then replace the protector

The protector itself has malfunction.

In the cooling and heating mode, the outdoor fan runs, but the compressor does not run.

The voltage is too low or too high.

Wrong wire connection

The protector itself has malfunction.

The compressor is too hot and leads to the action of the protector.

The refrigerant is not enough or is too much.
Adjust the volume of the refrigerant

The capillary is blocked and the temperature rises.
Replace the capillary

The compressor does not run smoothly or is stuck. The air discharge valve is damaged.
Replace the compressor

The protector itself has malfunction.
Replace the protector
The swing fan does not run.

- The torque of the swing motor is not enough
- Wrong connection
- The controller is damaged (IC2003 is damaged, the swing relay can not close, etc.)
- First, check whether the connection is wrong. If no, replace the parts

In cool, heat mode, the outdoor unit and compressor will not run.

- Controller malfunction (IC2003 broken, creepage of parallel capacitor of relay loop, relay is broken etc.)
- Wire loose or wrong connection
- Improper setting of temperature
- Change controller
- Correctly wire according to the drawing
- Adjust setting temp.

Water leakage

- Drainage pipe blocked or broken
- Wrap of refrigerant pipe joint is not close enough.
- Change drainage pipe
- Re-wrap and make it tight.

- Fan of indoor unit contacts other parts
- Foreign object in indoor unit
- Compressor shakes too much
- Adjust fan location
- Take out the foreign object
- Adjust support washer of compressor, and tighten loosen screws

Abnormal sound and shake

- Touch of pipeline of outdoor unit
- Touch of inner plates
- Louver of outdoor unit touched outer case.
- Abnormal sound inside compressor
- Separate the touching pipeline.
- 1. Tighten connect screw.
   2. Stick absorbing clay between plates.
- Adjust location of louver.
- Change compressor
## 9.2 Error Code List

<table>
<thead>
<tr>
<th>NO.</th>
<th>Malfunction Name</th>
<th>Dual-8 Code Display</th>
<th>Display Method of Outdoor Unit</th>
<th>A/C status</th>
<th>Possible Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>High pressure protection of system</td>
<td>E1</td>
<td>Indicator Display (during blinking, ON 0.5s and OFF 0.5s)</td>
<td></td>
<td>Possible reasons: 1. Refrigerant was superabundant; 2. Poor heat exchange (including filter blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.</td>
</tr>
<tr>
<td>2</td>
<td>Antifreezing protection</td>
<td>E2</td>
<td>Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s</td>
<td></td>
<td>During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops. Possible reasons: 1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty.</td>
</tr>
<tr>
<td>3</td>
<td>System block or refrigerant leakage</td>
<td>E3</td>
<td>Operation Indicator</td>
<td>Cool Indicator</td>
<td>Heating Indicator</td>
</tr>
<tr>
<td>4</td>
<td>High discharge temperature protection of compressor</td>
<td>E4</td>
<td>OFF 3S and blink 4 times</td>
<td>OFF 3S and blink 7 times</td>
<td>OFF 3S and blink 9 times</td>
</tr>
<tr>
<td>5</td>
<td>Overcurrent protection</td>
<td>E5</td>
<td>OFF 3S and blink 5 times</td>
<td>OFF 3S and blink 6 times</td>
<td>OFF 3S and blink 8 times</td>
</tr>
<tr>
<td>6</td>
<td>Communication Malfunction</td>
<td>E6</td>
<td>OFF 3S and blink 6 times</td>
<td>OFF 3S and blink 8 times</td>
<td>OFF 3S and blink 9 times</td>
</tr>
<tr>
<td>7</td>
<td>High temperature resistant protection</td>
<td>E8</td>
<td>OFF 3S and blink 8 times</td>
<td>OFF 3S and blink 10 times</td>
<td>OFF 3S and blink 11 times</td>
</tr>
<tr>
<td>8</td>
<td>EEPROM malfunction</td>
<td>EE</td>
<td>OFF 3S and blink 12 times</td>
<td>OFF 3S and blink 13 times</td>
<td>OFF 3S and blink 14 times</td>
</tr>
<tr>
<td>9</td>
<td>Limit/ decrease frequency due to high temperature of module</td>
<td>EU</td>
<td>OFF 3S and blink 15 times</td>
<td>OFF 3S and blink 16 times</td>
<td>OFF 3S and blink 17 times</td>
</tr>
<tr>
<td>10</td>
<td>Malfunction protection of jumper cap</td>
<td>C5</td>
<td>OFF 3S and blink 15 times</td>
<td>OFF 3S and blink 16 times</td>
<td>OFF 3S and blink 17 times</td>
</tr>
<tr>
<td>NO.</td>
<td>Malfunction Name</td>
<td>Display Method of Indoor Unit</td>
<td>Display Method of Outdoor Unit</td>
<td>A/C status</td>
<td>Possible Causes</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------------</td>
<td>-------------------------------</td>
<td>--------------------------------</td>
<td>------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11</td>
<td>Gathering refrigerant</td>
<td>F0</td>
<td>OFF 3S and blink 1 times</td>
<td></td>
<td>When the outdoor unit receive signal of Gathering refrigerant, the system will be forced to run under cooling mode for gathering refrigerant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OFF 3S and blink 1 times</td>
<td></td>
<td>Nominal cooling</td>
</tr>
<tr>
<td>12</td>
<td>Indoor ambient temperature sensor is open/short circuited</td>
<td>F1</td>
<td>OFF 3S and blink once</td>
<td></td>
<td>During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Loosening or bad contact of indoor ambient temp. sensor and mainboard terminal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Components in mainboard fell down leads short circuit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3. Indoor ambient temp. sensor damaged. (check with sensor resistance value chart)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4. Mainboard damaged.</td>
</tr>
<tr>
<td>13</td>
<td>Indoor evaporator temperature sensor is open/short circuited</td>
<td>F2</td>
<td>OFF 3S and blink twice</td>
<td></td>
<td>AC stops operation once reaches the setting temperature. Cooling, drying; internal fan motor stops operation while other loads stop operation; heating: AC stop operation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Loosening or bad contact of Indoor evaporator temp. sensor and mainboard terminal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Components on the mainboard fall down leads short circuit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3. Indoor evaporator temp. sensor damaged. (check temp. sensor value chart for testing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4. Mainboard damaged.</td>
</tr>
<tr>
<td>14</td>
<td>Outdoor ambient temperature sensor is open/short circuited</td>
<td>F3</td>
<td>OFF 3S and blink 3 times</td>
<td>OFF 3S and blink 6 times</td>
<td>During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor</td>
</tr>
<tr>
<td>15</td>
<td>Outdoor condenser temperature sensor is open/short circuited</td>
<td>F4</td>
<td>OFF 3S and blink 4 times</td>
<td>OFF 3S and blink 5 times</td>
<td>During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation, the complete unit will stop operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. The head of temperature sensor hasnt been inserted into the copper tube</td>
</tr>
<tr>
<td>16</td>
<td>Outdoor discharge temperature sensor is open/short circuited</td>
<td>F5</td>
<td>OFF 3S and blink 5 times</td>
<td>OFF 3S and blink 7 times</td>
<td>During cooling and drying operation, compressor will sop after operating for about 3 mins, while indoor fan will operate; During heating operation, the complete unit will stop after operating for about 3 mins.</td>
</tr>
<tr>
<td>17</td>
<td>Limit/ decrease frequency due to overload</td>
<td>F6</td>
<td>OFF 3S and blink for 6 times</td>
<td>OFF 3S and blink 3 times</td>
<td>All loads operate normally, while operation frequency for compressor is decreased. Refers to the malfunction analysis (overload, high temperature resistant)</td>
</tr>
<tr>
<td>18</td>
<td>Decrease frequency due to overcurrent</td>
<td>F8</td>
<td>OFF 3S and blink 8 times</td>
<td>OFF 3S and blink once</td>
<td>All loads operate normally, while operation frequency for compressor is decreased. The input supply voltage is too low; System pressure is too high and overload</td>
</tr>
<tr>
<td>NO.</td>
<td>Malfunction Name</td>
<td>Display Method of Indoor Unit</td>
<td>Display Method of Outdoor Unit</td>
<td>A/C status</td>
<td>Possible Causes</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------</td>
<td>-------------------------------</td>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dual-8 Code Display</td>
<td></td>
<td>Indicator Display (during blinking, ON 0.5s and OFF 0.5s)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operation Ind.</td>
<td>Cool Indicator</td>
<td>Heating Indicator</td>
<td>Yellow Indicator</td>
</tr>
<tr>
<td>19</td>
<td>Decrease frequency due to high air discharge</td>
<td>F9</td>
<td>OFF 3S and blink 9 times</td>
<td></td>
<td>OFF 3S and blink twice</td>
</tr>
<tr>
<td>20</td>
<td>Limit/ decrease frequency due to antifreezing</td>
<td>FH</td>
<td>OFF 3S and blink 2 times</td>
<td>OFF 3S and blink 4 times</td>
<td>All loads operate normally, while operation frequency for compressor is decreased</td>
</tr>
<tr>
<td>21</td>
<td>Voltage for DC bus-bar is too high</td>
<td>PH</td>
<td>OFF 3S and blink 11 times</td>
<td>OFF 3S and blink 13 times</td>
<td>During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.</td>
</tr>
<tr>
<td>22</td>
<td>Voltage of DC bus-bar is too low</td>
<td>PL</td>
<td>OFF 3S and blink 21 times</td>
<td>OFF 3S and blink 12 times</td>
<td>During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop</td>
</tr>
<tr>
<td>23</td>
<td>Compressor Min frequency in test state</td>
<td>P0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Compressor rated frequency in test state</td>
<td>P1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Compressor maximum frequency in test state</td>
<td>P2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO.</td>
<td>Malfunction Name</td>
<td>Display Method of Indoor Unit</td>
<td>Display Method of Outdoor Unit</td>
<td>A/C status</td>
<td>Possible Causes</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------</td>
<td>------------------------------</td>
<td>--------------------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dual-8 Code Display</td>
<td>Indicator Display (during blinking, ON 0.5s and OFF 0.5s)</td>
<td>Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operation Indicator</td>
<td>Cool Indicator</td>
<td>Heating Indicator</td>
<td>Yellow Indicator</td>
</tr>
<tr>
<td>26</td>
<td>Compressor intermediate frequency in test state</td>
<td>P3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Overcurrent protection of phase current for compressor</td>
<td>P5</td>
<td>OFF 3S and blink 15 times</td>
<td>OFF 3S and blink 15 times</td>
<td>OFF 3S and blink 17 times</td>
</tr>
<tr>
<td>28</td>
<td>Charging malfunction of capacitor</td>
<td>PU</td>
<td>OFF 3S and blink 17 times</td>
<td>OFF 3S and blink 17 times</td>
<td>OFF 3S and blink 18 times</td>
</tr>
<tr>
<td>29</td>
<td>Malfunction of module temperature sensor circuit</td>
<td>P7</td>
<td>OFF 3S and blink 17 times</td>
<td>OFF 3S and blink 17 times</td>
<td>OFF 3S and blink 18 times</td>
</tr>
<tr>
<td>30</td>
<td>Module high temperature protection</td>
<td>P8</td>
<td>OFF 3S and blink 17 times</td>
<td>OFF 3S and blink 17 times</td>
<td>OFF 3S and blink 18 times</td>
</tr>
<tr>
<td>31</td>
<td>Overload protection for compressor</td>
<td>H3</td>
<td>OFF 3S and blink 3 times</td>
<td>OFF 3S and blink 3 times</td>
<td>OFF 3S and blink 5 times</td>
</tr>
<tr>
<td>32</td>
<td>IPM protection</td>
<td>H5</td>
<td>OFF 3S and blink 5 times</td>
<td>OFF 3S and blink 5 times</td>
<td>OFF 3S and blink 5 times</td>
</tr>
<tr>
<td>33</td>
<td>Module temperature is too high</td>
<td>H5</td>
<td>OFF 3S and blink 5 times</td>
<td>OFF 3S and blink 5 times</td>
<td>OFF 3S and blink 10 times</td>
</tr>
<tr>
<td>NO.</td>
<td>Malfunction Name</td>
<td>Display Method of Indoor Unit</td>
<td>Display Method of Outdoor Unit</td>
<td>A/C status</td>
<td>Possible Causes</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------</td>
<td>------------------------------</td>
<td>--------------------------------</td>
<td>------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indicator Display (during blinking, ON 0.5s and OFF 0.5s)</td>
<td>Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operation Indicator</td>
<td>Cool Indicator</td>
<td>Heating Indicator</td>
<td>Yellow Indicator</td>
<td>Red Indicator</td>
</tr>
<tr>
<td>34</td>
<td>Internal motor (fan motor) do not operate</td>
<td>H6</td>
<td>OFF 3S and blink 11 times</td>
<td>Internal fan motor, external fan motor, compressor and electric heater stop operation, guide louver stops at present location.</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Desynchronizing of compressor</td>
<td>H7</td>
<td>OFF 3S and blink 7 times</td>
<td>During cooling and drying operation, the complete unit will stop operation.</td>
<td>Refer to the malfunction analysis (IPM protection, loss of synchronism, protection and overcurrent protection of phase current for compressor.)</td>
</tr>
<tr>
<td>36</td>
<td>PFC protection</td>
<td>HC</td>
<td>OFF 3S and blink 6 times</td>
<td>During cooling and drying operation, the complete unit will stop operation.</td>
<td>Refer to the malfunction analysis</td>
</tr>
<tr>
<td>37</td>
<td>Outdoor DC fan motor malfunction</td>
<td>L3</td>
<td>OFF 3S and blink 23 times</td>
<td>Outdoor DC fan motor malfunction lead to compressor stop operation,</td>
<td>DC fan motor malfunction or system blocked or the connector loosed</td>
</tr>
<tr>
<td>38</td>
<td>power protection</td>
<td>L9</td>
<td>OFF 3S and blink 20 times</td>
<td>compressor stop operation and Outdoor fan motor will stop 30s latter, 3 minutes latter fan motor and compressor will restart</td>
<td>To protect the electronic components when detect high power</td>
</tr>
<tr>
<td>39</td>
<td>Indoor unit and outdoor unit doesn't match</td>
<td>LP</td>
<td>OFF 3S and blink 19 times</td>
<td>compressor and Outdoor fan motor can't work</td>
<td>Indoor unit and outdoor unit doesn't match</td>
</tr>
<tr>
<td>40</td>
<td>Failure start-up</td>
<td>LC</td>
<td>OFF 3S and blink 11 times</td>
<td>During cooling and drying operation, the complete unit will stop operation.</td>
<td>Refer to the malfunction analysis</td>
</tr>
<tr>
<td>41</td>
<td>Malfunction of phase current detection circuit for compressor</td>
<td>U1</td>
<td>OFF 3S and blink 13 times</td>
<td>During cooling and drying operation, the complete unit will stop operation.</td>
<td>Replace outdoor control panel AP1</td>
</tr>
<tr>
<td>42</td>
<td>Malfunction of voltage dropping for DC bus-bar</td>
<td>U3</td>
<td>OFF 3S and blink 20 times</td>
<td>During cooling and drying operation, the complete unit will stop operation.</td>
<td>Supply voltage is unstable</td>
</tr>
<tr>
<td>NO.</td>
<td>Malfunction Name</td>
<td>Display Method of Indoor Unit</td>
<td>Display Method of Outdoor Unit</td>
<td>A/C status</td>
<td>Possible Causes</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------</td>
<td>-------------------------------</td>
<td>-----------------------------</td>
<td>------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dual-Code Display</td>
<td>Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operation Indicator</td>
<td>Cool Indicator</td>
<td>Heating Indicator</td>
<td>Yellow Indicator</td>
</tr>
<tr>
<td>43</td>
<td>Malfunction of complete units current detection</td>
<td>U5</td>
<td>OFF 3S and blink 13 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>The four-way valve is abnormal</td>
<td>U7</td>
<td>OFF 3S and blink 20 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Frequency limiting (power)</td>
<td></td>
<td>OFF 3S and blink 13 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Compressor is open-circuited</td>
<td></td>
<td>OFF 3S and blink once</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>The temperature for turning on the unit is reached</td>
<td></td>
<td>OFF 3S and blink 8 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Frequency limiting (module temperature)</td>
<td></td>
<td>OFF 3S and blink 11 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Normal communication</td>
<td></td>
<td>continuously</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Defrosting</td>
<td>H1</td>
<td>OFF 3S and blink once</td>
<td>OFF 1S and blink twice</td>
<td></td>
</tr>
</tbody>
</table>
9.3 Troubleshooting for Main Malfunction

- Indoor unit:

1. Malfunction of Temperature Sensor F1, F2

Troubleshooting for F1,F2 malfunction

- Is the wiring terminal between the temperature sensor and the controller loosened or poorly contacted?
  - yes: Insert the temperature sensor tightly
  - no: Is malfunction eliminated

- Is there short circuit due to trip'over of the parts?
  - yes: Make the parts upright
  - no: Is malfunction eliminated

- Is the temperature sensor normal according to the Resistance Table?
  - no: Replace it with a temperature sensor with the same model
  - yes: Is malfunction removed

Replace the mainboard with the same model.

End
2. Troubleshooting for Malfunction H6—Indoor Fan Stops Operation

Start

Disconnect power and move the fan blades by hand.

Fan moves smoothly or not?

No

Adjust the motor and fan assembly. Make sure the motor can run smoothly.

Yes

Connect power and check if the malfunction is eliminated.

When power is off, check if the connection terminal of indoor fan motor and main board is loosened or not.

Yes

R-Connect the connection terminator of indoor fan motor.

No

No

Connect power and check if the malfunction is eliminated.

Yes

Connect power again.

Check the voltage between motor interface terminal 1 and terminal 2 if it's within 280~310VDC.

No

Main board malfunction. Replace a main board with the same model.

Yes

Then check the voltage between motor interface terminal 2 and terminal 3 if it's 15VDC.

No

Main board malfunction. Replace a main board with the same model.

Yes

Then check if there's voltage between motor interface terminal 2 and terminal 4.

No

Main board malfunction. Replace a main board with the same model.

Yes

Motor malfunction. Replace a motor with the same model.

End
Start

Disconnect power and check the wire of IDU and ODU and the wire within the electric box are correctly connected.

Correctly connected? No

Connect according to wiring diagram.

Malfunction is eliminated?

No

Does the main board match with the display board?

Does the IDU main board match with the ODU main board?

No

Match according to product requirements.

Malfunction is eliminated?

No

Communication cord is damaged?

Yes

Replace the connection cord.

Malfunction is eliminated?

No

Replace the IDU main board.

Yes

Replace the ODU main board.

Malfunction is eliminated?

Yes

End

Correctly connected?

Yes

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?

No

Correctly connected?
4. Malfunction of Protection of Jumper Cap C5

Troubleshooting for C5 malfunction

Is there jumper cap on the mainboard?

- Yes
  - Is the jumper cap inserted correctly and tightly?
    - Yes
      - Is malfunction eliminated?
        - Yes
          - End
        - No
          - Replace the jumper cap with the same model
            - Is malfunction eliminated?
              - Yes
                - End
              - No
                - Replace the mainboard with the same model

- No
  - Assemble the jumper cap with the same model
    - Is malfunction eliminated?
      - Yes
        - End
      - No
        - Insert the jumper cap tightly
          - Is malfunction eliminated?
            - Yes
              - End
            - No
              - Replace the jumper cap with the same model
                - Is malfunction eliminated?
                  - Yes
                    - End
                  - No
                    - Replace the mainboard with the same model
● Outdoor unit:

(1) Capacitor charge fault (Fault with outdoor unit) (AP1 below refers to the outdoor control panel)

Main Check Points:
- Use AC voltmeter to check if the voltage between terminal L and N on the wiring board is within 210VAC–240VAC.
- Is the reactor (L) correctly connected? Is the connection loose or fallen? Is the reactor (L) damaged?

Fault diagnosis process:

1. **Turn on the unit and wait 1 minute**
2. Use DC voltmeter to measure the voltage on the two ends of electrolytic capacitor
3. **Voltage higher than 200V?**
   - **Y:** Fault with the voltage testing circuit on control panel AP1
   - **N:** Replace the control panel AP1
4. **Measure the AC voltage between terminal L and N on wiring board XT (power supply)**
5. **Voltage within 210VAC–250VAC?**
   - **N:** Shut down the power and repair the power supply to restore the range 210VAC–250VAC
   - **Y:** Shut down the power and wait 20 minutes; or use DC voltmeter to measure the voltage on the two ends of capacitor, until the voltage is lower than 20V
6. **Check the connection of reactor (L in the Electrical Wiring Diagram)**
7. **If the wiring of reactor L is normal?**
   - **N:** Replace the control panel AP1
   - **Y:** Connect the reactor L according to Electrical Wiring Diagram correctly
8. **Re-energize and turn on the unit**
9. **If the fault is eliminated?**
   - **Y:** End
   - **N:** If the fault is not eliminated, repeat the process from step 1.

---

*Installation and Maintenance*
(2) IPM Protection, Out-of-step Fault, Compressor Phase Overcurrent (AP1 below refers to the outdoor control panel)

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

Fault diagnosis process:

1. **Energize and switch on**
   - IPM protection occurs after the machine has run for a period of time?
     - **Y**
       - Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
       - **N**
         - If the voltage between terminal L and N on wiring board XT is within 210VAC~250VAC?
           - **N**
             - Use AC voltmeter to measure the voltage between terminal L and N on wiring board XT.
             - **Y**
               - Check the supply voltage and restore it to 210VAC~250VAC
               - **N**
                 - Restart the unit. Before protection occurs, use DC voltmeter to measure the voltage between the two ends of electrolytic capacitor on control panel AP1.
                 - **N**
                   - If the unit can work normally?
                     - **Y**
                       - Reconnect the capacitor C2 according to Electrical Wiring Diagram. Then, Restart the unit.
                     - **N**
                       - If capacitor C2 is failed?
                         - **Y**
                           - Replace the capacitor C2. Then, energize and start the unit.
                         - **N**
                           - Replace the control panel AP1.
                 - **N**
                   - If there is any abnormality described above?
                     - **Y**
                       - Take corrective actions according to Technical Service Manual, and then energize and start the unit.
                     - **N**
                       - If the unit can work normally?
                         - **Y**
                           - Replace the control panel AP1.
                         - **N**
                           - If the unit can work normally?
                             - **Y**
                               - Replace the compressor COMP and start the unit.
                             - **N**
                               - If the resistance is normal?
                                 - **Y**
                                   - Replace the compressor COMP.
                                 - **N**
                                   - Replace the control panel AP1.
1. **N**
   - Use ohmmeter to measure the resistance between the two terminals of compressor COMP and copper tube.
   - Resistance higher than 500MΩ?
     - **Y**
       - Replace the control panel AP1.
     - **N**
       - Replace the compressor COMP.

Please confirm:
1. If the indoor and outdoor heat exchangers are dirty? They are obstructed by other objects which affect the heat exchange of indoor and outdoor unit.
2. If the indoor and outdoor fans are blocked or not covered with filters?
3. If the environment temperature is too high, resulting in that the system pressure is too high and exceeds the pressure range?
4. If the charge of refrigerant is too high, resulting in that the system pressure is too high?
5. Other conditions resulting in that the system pressure becomes too high?
(3) High temperature and overload protection diagnosis (AP1 hereinafter refers to the control board of the outdoor unit)

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

Fault diagnosis process:

1. Overheat and high temperature protection
   - Is outdoor ambient temperature higher than 53?
     - Y: Normal protection, please operate it after the outdoor ambient temperature is normalized.
     - N: 20 minutes after the complete unit is powered off.
2. Is heat dissipation of the indoor unit and outdoor unit abnormal?
   - Y: Improve the heat dissipation environment of the unit.
   - N: Does the outdoor fan work normally?
     - Y: Replace the control panel AP1.
     - N:
       - 1. Check if the fan terminal OFAN is connected correctly.
       - 2. Resistance between any two terminals is measured by an ohm gauge and should be less than 1K Ohm.
       - Replace the fan capacitor C1.
       - Replace the outdoor fan.
3. End
(4) Start-up failure (following AP1 for outdoor unit control board)
Mainly detect:
● Whether the compressor wiring is connected correctly?
● Is compressor broken?
● Is time for compressor stopping enough?
Fault diagnosis process:

- Power on the unit
- Is stop time of the compressor longer than 3 minutes?
  - Yes: Does startup fail?
    - Yes: Are the wires for the compressor connected correctly? Is connection sequence right?
      - Yes: Replace the control panel AP1
      - No: Connect the wires as per the connection diagram
    - No: Restart it up after 3 minutes
  - No: Replace the compressor
- If the fault is eliminated?
  - No: Replace the compressor
  - Yes: End
(5) Out of step diagnosis for the compressor (AP1 hereinafter refers to the control board of the outdoor unit)
Mainly detect:
- Is the system pressure too high?
- Is the input voltage too low?
Fault diagnosis process:

Out of step occurs once the unit is powered on.

- Is stop time of the compressor longer than 3 minutes?
  - Y: Check if the fan terminal OFAN is connected correctly
  - N: Connect the wires correctly

Are the wires for the compressor connected correctly? Is connection sequence right? Is the connection made in clockwise direction?

Replace the control panel AP1

If the fault is eliminated?

- Y: Replace the compressor

N: Replace the control panel AP1

Out of step occurs in operation

- Is the outdoor fan working normally?
  - Y: Replace the fan capacitor C1
  - N: Replace the outdoor fan

Is the outdoor unit blocked by foreign objects?

Remove foreign objects

If the fault is eliminated?

- Y: Replace the compressor

N: Replace the control panel AP1

Check if the fan terminal OFAN is connected correctly

Replace the control panel AP1

End
(6) Overload and air exhaust malfunction diagnosis (following AP1 for outdoor unit control board)

Mainly detect:

- Is the PMV connected well or not? Is PMV damaged?
- Is refrigerant leaked?

Fault diagnosis process:
(7) Power factor correct or (PFC) fault (a fault of outdoor unit) (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:
- Check if the reactor (L) of the outdoor unit and the PFC capacitor are broken

Fault diagnosis process:

```
Start
  └── Check wiring of the reactor (L) of the outdoor unit and the PFC capacitor
      ├── Whether there is any damage or short-circuit?
      │    └── Y → Replace it as per the wiring diagram and reconnect the wires
      │    └── N → Remove the PFC capacitor and measure resistance between the two terminals
      │          └── N → Disconnect the terminals for the reactor and measure the resistance between the two terminals of the reactor by an ohm gauge
      │          └── Y → The capacitor is short circuited and the capacitor should be replaced
      │                └── N → Replace the reactor
      │                        └── Y → Restart the unit
      │                                └── N → If the fault is eliminated?
      ├── Replace the control panel AP1
      │    └── N → If the fault is eliminated?
      │           └── Y → End
```
(8) Communication malfunction: (following AP1 for outdoor unit control board)

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

Fault diagnosis process:

Start

Did the equipment operate normally before the failure occurs?

Y

Check wiring inside of the indoor and outdoor units

Are wires broken?

Y

The AP1 voltage detection circuit is at fault

N

Are wires broken?

Y

The communication circuit is abnormal

N

Replace the main board (AP1) of the outdoor unit

N

If the fault is eliminated?

Y

Replace the main board of the indoor unit

N

End

N

Check the wiring of the indoor and outdoor units with reference to the wiring diagram

Is the connection right?

Y

Correctly connect the corresponding wires for the indoor and outdoor units with reference to the wiring diagram

N

If the fault is eliminated?

Y

End

N

If the fault is eliminated?
### Detection Points

<table>
<thead>
<tr>
<th>No. of Detection point</th>
<th>Detection point</th>
<th>Corresponding parameter</th>
<th>Test value under normal conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point 1</td>
<td>Between AC-L1,N1</td>
<td>Neutral and live wire</td>
<td>165 V ~ 253 V</td>
</tr>
<tr>
<td>Point 2</td>
<td>Right side of R201;U404 heat sink</td>
<td>DC bus bar</td>
<td>230 V ~ 380 V</td>
</tr>
<tr>
<td>Point 3</td>
<td>Top of D304;bottom of D304</td>
<td>IPM drive voltage+15V</td>
<td>13.5 V ~15.5 V</td>
</tr>
<tr>
<td>Point 4</td>
<td>Top of C116; bottom of C116</td>
<td>Relay drive voltage+12V</td>
<td>11 V ~13 V</td>
</tr>
<tr>
<td>Point 5</td>
<td>Right side of R228; left side of R228</td>
<td>PFC drive voltage+15V</td>
<td>13.5 V ~15.5 V</td>
</tr>
<tr>
<td>Point 6</td>
<td>Two pins on upper left of U4; bottom of U4 (the top is close to &quot;U4&quot;silk screen)</td>
<td>Chip+3.3V</td>
<td>3.1 V ~3.3 V</td>
</tr>
<tr>
<td>Point 7</td>
<td>Two pins on upper left of U4; Bottom of U4</td>
<td>+5V</td>
<td>4.8 V ~5.1 V</td>
</tr>
<tr>
<td>Point 8</td>
<td>Bottom of R506; bottom of U4</td>
<td>Signal is received by outdoor unit</td>
<td>Between 0 and 3.3V</td>
</tr>
<tr>
<td>Point 9</td>
<td>Bottom of R523; bottom of U4</td>
<td>Signal is sent by outdoor unit</td>
<td>Between 0 and 3.3V</td>
</tr>
<tr>
<td>Point 10</td>
<td>Between AC-L2.4V</td>
<td>Neutral and live wire</td>
<td>165 V ~ 253 V</td>
</tr>
</tbody>
</table>

### Circuit Diagram

- **Rectifier and filter circuit**: Detection point: rectified voltage
- **Control circuit of DC fan**: Detection point: output voltage
- **Control circuit of 4-way valve**: Detection point: output voltage
- **High voltage filter circuit**: Detection point: voltage after filter
- **PFC circuit**: Detection point: voltage of bus bar
- **Circuit for switch power supply**: Detection point: chip: 5V, PFC and IPM: 15V, Relay: 12V
- **Circuit for compressor drive**: Detection point: Up/Un,Vp/Vn,Wp/Wn, voltage waveform and three-phase current waveform
- **Temperature input circuit**: Detection point: voltage of IC pin
- **Communication circuit**: Detection point: communication

---

**Notes**: The table above lists various detection points along with their corresponding parameters and test values under normal conditions. Each point is associated with a specific circuit or feature of the system, as indicated in the diagram. The detection points include various key areas such as rectifier circuits, control circuits, high voltage filters, PFC circuits, and more, each serving a specific function in the overall system operation.
2. Troubleshooting of Outdoor Unit

2.1 Firstly, check if power supply is normal
Check if power switch is turned on and the voltage is between 165V~253V.

2.2 Malfunction Code Table of Outdoor Unit
### 2.3 Each Malfunction and Diagram

#### (1) LED Lamp Status Description

Different status of green, red and yellow indicators indicate different operation status and protection of the unit.

**Note:** The LED's flash at a 1 second rate for the required number of flashes, and then a 2 second pause before repeating the 1 second rate sequence.

**Note:** Two or more faults can appear in the one LED fault sequence.

**Example of LED sequence:**

<table>
<thead>
<tr>
<th>Malfunction Name</th>
<th>Nixie Tube</th>
<th>LED Lamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freeze Protection</td>
<td>E2</td>
<td>Blinks for 3 times</td>
</tr>
<tr>
<td>IPM protection</td>
<td>H5</td>
<td>Blinks for 4 times</td>
</tr>
<tr>
<td>Overcurrent protection</td>
<td>E5</td>
<td>Blinks for 5 times</td>
</tr>
<tr>
<td>EEPROM reading and writing malfunction</td>
<td>EE</td>
<td>Blinks for 11 times</td>
</tr>
<tr>
<td>Low voltage protection</td>
<td>PL</td>
<td>Blinks for 12 times</td>
</tr>
<tr>
<td>High voltage protection</td>
<td>PH</td>
<td>Blinks for 13 times</td>
</tr>
<tr>
<td>PFC overcurrent protection</td>
<td>HC</td>
<td>Blinks for 14 times</td>
</tr>
<tr>
<td>Mismatching of models of indoor and outdoor units</td>
<td>LP</td>
<td>Blinks for 16 times</td>
</tr>
<tr>
<td>Malfunction of outdoor ambient temperature sensor</td>
<td>F3</td>
<td>Blinks for 6 times</td>
</tr>
<tr>
<td>Malfunction of outdoor pipe temperature sensor</td>
<td>F4</td>
<td>Blinks for 5 times</td>
</tr>
<tr>
<td>Malfunction of outdoor discharge temperature sensor</td>
<td>F5</td>
<td>Blinks for 7 times</td>
</tr>
<tr>
<td>Communication malfunction</td>
<td>E6</td>
<td>Off</td>
</tr>
<tr>
<td>Low pressure protection (refrigerant leak)</td>
<td>E3</td>
<td>Blinks for 9 times</td>
</tr>
<tr>
<td>Abnormality of 4-way valve</td>
<td>U7</td>
<td></td>
</tr>
<tr>
<td>Over-load protection</td>
<td>E8</td>
<td>Blinks for 6 times</td>
</tr>
<tr>
<td>Discharge temperature protection</td>
<td>E4</td>
<td>Blinks for 7 times</td>
</tr>
<tr>
<td>Overload protection</td>
<td>H3</td>
<td>Blinks for 8 times</td>
</tr>
<tr>
<td>Over power protection</td>
<td>L9</td>
<td>Blinks for 9 times</td>
</tr>
</tbody>
</table>

![LED (Yellow) 3 Flash (Freezing Prevention)](image)
Mutable fault code sequence.

(2) Low Voltage protection
PL is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 12 times
Check voltage of power supply.

(3) High voltage protection
PH is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 13 times.
Check voltage of power supply.

(4) Communication Malfunction
E6 is displayed on indoor unit
Green LED lamp of outdoor unit doesn’t blink.
If there is no LED lamp blinking,
1. Measure voltage between N1 (neutral wire) and 3 (live wire) on patching board of outdoor electric box by AC voltage grade of universal meter. If it is found that there is voltage, check if there is electricity for patching board of indoor unit. If there is no electricity, check if wiring of indoor unit is correct. Otherwise replace controller of indoor unit.
2. If power supply of indoor unit is normal, check if wiring of outdoor unit is correct and if there is any wrong or loose wiring.
3. If the above two conditions don’t exist, outdoor controller can be replaced directly.
Any or a few of indicators are normally on.
Such circumstance usually indicates that IC on outdoor controller doesn’t work. Outdoor controller can be replaced directly.

There is only red indicator blinking
1. Set universal meter to DC voltage grade to measure voltage of detection point 8. If voltage is between 0~3.3V, the signal has been sent by indoor unit but not received by outdoor unit yet. In that case, replace outdoor controller directly.
2. If voltage of detection point 8 is always around 3.3V or around 0V, set universal meter to AC voltage to measure voltage between communication wire and neutral wire (N1) on patching board. If voltage swings between 0V and 20V, the signal
has been sent by indoor unit but not received by outdoor unit yet. In that case, replace outdoor controller directly. If voltage
doesn’t change, indoor unit has not sent signal or the communication wire is damaged. Check communication wire or replace
indoor controller.

(5) Freeze Protection
E2 is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 3 times
It indicates that the temperature of indoor evaporator is too low so it is easily frozen. Check if indoor fan is operating.

(6) Over current protection
E5 is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 5 times
It indicates that the current of the complete unit is too large. Check if voltage of power supply is normal.

(7) EEPROM Reading and Writing Malfunction
EE is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 11 times
Check if EEPRPM is assembled correctly.
H5 is displayed on indoor unit.
Yellow LED lamp of outdoor unit blinks for 4 times
Check compressor module is normal: check there is short circuit between bus bar (left side of R201, refer to detection point 2 for more details) and phase U, V, W. Then check that between ground wire (heat sink of U404, refer to detection point 2 for more details) and phase U, V, W. If there is short circuit, the module has been burnt out. If not, the module is ok and the following steps shall be done.

---

**Flowchart: IPM Module Protection Occurs**

1. **H5 is displayed on indoor unit**
   - **Recoverable**
     - Wait over 3min and check if the unit can resume normal operation.
     - If yes, go to **Y**. If no, go to **N**.
   - **Unrecoverable**
     - De-energize the unit and wait for over 5min and then energize it again (set COOL or HEAT mode). Observe if IPM protection occurs within 1min after turning on the unit.
     - If yes, go to **N**. If no, go to **Y**.

---

**Recoverable Flow: Normal IPM Protection**

1. **Y**: Check if over current protection occurs for power supply module incurs IPM module protection.
   - **Y**: After turning on the unit, observe if outdoor fan is operating (keep operating for about 1min and then stops operation).
     - **Y**: Check if power supply (15V, detection point 3) for IPM module is normal.
       - **Y**: Replace D304 or switch power board.
       - **N**: Replace IPM module or mainboard.
     - **N**: Replace IPM module or mainboard.
   - **N**: Because there are over 6 times of over current protection for IPM module, refer to recoverable conditions.

---

**Recoverable Flow: Normal IPM Protection**

1. **N**: Normal IPM protection which may be incurred by abnormal power supply or other reasons.
   - **Y**: Check if voltage of power supply is lower than 165V; if condenser is blocked; De-energize the unit and wait for at least 5min. Then open outdoor electric box to check if screws of IPM module are screwed up. And check if thermal grease is spread evenly.
     - **Y**: Clean condenser of outdoor unit; spread thermal grease on the bottom of IPM module; reassemble IPM module.
     - **N**: Check if voltage of power supply is lower than 40V. Unplug U, V, W terminals connecting to compressor and check if IGBT on IPM is damaged by universal meter.
   - **N**: De-energize the unit and wait for at least 5min (when voltage between P and N is lower than 40 V). Unplug U, V, W terminals connecting to compressor and check if IGBT on IPM is damaged by universal meter.
     - **Y**: Replace IPM module or mainboard.
     - **N**: Check if compressor is damaged or blocked.
Check if outdoor ambient temperature sensor is well connected.
Check if outdoor ambient temperature sensor is open or short circuit.

(8) Malfunction of Outdoor Pipe Temperature Sensor
F4 is displayed on indoor unit
Red LED lamp of outdoor unit blinks for 5 times
Check if outdoor pipe temperature sensor is correctly connected
Check if resistor of outdoor pipe temp sensor is short or open circuit.

(9) Malfunction of Outdoor Discharge Temperature Sensor
F5 is displayed on indoor unit
Red LED lamp of outdoor unit blinks for 7 times.
Check if discharge temperature sensor is correctly connected
Check if resistor of discharge temp sensor is short or open circuit.

(10) PFC Over Current Protection
HC is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 14 times
Check if voltage of power supply is normal
Check if there is short circuit between any two pins. If so, IGBT is damaged. Replace the IGBT and turn on the unit again. If IGBT is still burnt out, the PFC drive circuit is damaged, replace the mainboard.
Check if voltage of PFC is normal (15V). If not, check switch power module.

(11) Mismatching of Models of Indoor and Outdoor Units
LP is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 16 times
Check if jumper cap of indoor unit is applicable.

(12) Low Pressure Protection (refrigerant leak) (not applicable to this model)
E3 is displayed on indoor unit
Red LED lamp of outdoor unit blinks for 9 time
Check if refrigerant leaks and if connecting pipe is correctly connected.
(13) Abnormality of 4-way valve
U7 is displayed on indoor unit
If 4-way valve is abnormally working, check 4-way valve is damaged; cut-off power and unplug 2 wire of 4-way valve. Then measure resistance between two wire. If the resistance is not between 1~2K, the electromagnetic valve is open circuit. In that case, replace coil of 4-way valve.

(14) Over-load Protection Function
E8 is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 6 times.
Measure temperature of outdoor heat exchanger during COOL operation; measuring temperature of indoor heat exchanger during HEAT operation.
When T_{pipe}\leq T_1{}^\degree {}C, the previous operation status will be resumed.
When T_{pipe}\geq T_2{}^\degree {}C, if T_{pipe}<T_1{}^\degree {}C for continuous 3min, normal operation will be resumed;
When T_{pipe}\geq T_3{}^\degree {}C, compressor will operate at decreased frequency;
When T_{pipe}\geq T_4{}^\degree {}C, compressor will stop operation;
During COOL and DRY operations: T_1=52, T_2=55, T_3=58, T_4=62;
During HEAT operation: T_1=50, T_2=53, T=56, T_4=60;
Check if temperature of pipe meets the above conditions of over-load protection.

(15) Discharge Temperature Protection
E4 is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 7 times
When TB_{discharge}\geq 98{}^\degree {}C, the frequency is prohibited to increase;
When TB_{discharge}\geq 103{}^\degree {}C, the compressor operates at decreased frequency;
When TB_{discharge}\geq 110{}^\degree {}C, the compressor stops operation;
When TB_{discharge}<90, when compressor has stopped operation for 3min, it will resume operation.
Check if discharge temperature meets the above conditions of protection.

(16) Overload Protection
H3 is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 8 times.
Check the following points:
• Refrigerant charge.
• Restrictions within the capillary tube.
• Poor air flow across the indoor & outdoor coils.
• Correct operation of the four way reversing valve.
Check the Compressor Over Temperature connector plug located on the outdoor PCB for correct termination & continuity to the over temperature protector.
Check the over temperature protector located next to the three compressor terminals.
Note: This over temperature protector is “normally closed”.
(17) Power Protection
L9 is displayed on indoor unit
Yellow LED lamp of outdoor unit blinks for 9 times
When $P_c \geq 1500\text{w}$, if $P_c \leq 1400\text{w}$ for continuous 3min, the unit will resume normal operation;
When $P_c \leq 1600\text{w}$, the unit will operate at decreased frequency;
When $P_c \geq 1700\text{w}$, compressor stops operation.

# Check if power of compressor meets the conditions mentioned above. Decrease the frequency so as to reduce the power to less than 1400w for 3min. Then check if the compressor resumes operation.
(18) Other Normal Malfunction

COOL operation is normal but HEAT operation is unavailable.

- COOL operation is normal but HEAT operation is unavailable.

  - In HEAT mode, measure voltage between two wire of 4-way-valve by AC voltage grade of universal meter.

    - Voltage between 4V and AC-L2(detection point 10) is not around AC220V
      - Replace outdoor controller
    - If it is AC220V
      - Cut-off power supply and unplug two wire of 4-way-valve. Then measure if resistance between the two wire is 1-2K
        - Resistance is too large
          - Replace 4-way valve
        - 4-way valve is normal
          - The system of the unit is abnormal

HEAT operation is normal but COOL operation is unavailable.

It is usually due to K3 contact adhesion of outdoor controller, which can be judged by universal meter.

After replacing outdoor controller, the malfunction still exists:

In that case, check if communication wire, temp sensor, fan, compressor or 4-way valve is normal.

Communication wire: Check if communication wire, live wire and neutral wire are incorrectly connected, or wiring terminal is poorly connected. If the communication wire is prolonged, check if the joint is well connected.

Temperature sensor: measure resistances to ground of the 3.3V(detection point 6) and IPM15V(detection point 3). If there is short circuit to ground, check if each temp sensor is damaged.

Electric reactor: If communication malfunction still occurs after replacing electric box, unplug 2 wiring terminals of electric reactor and measure resistance between these two terminals by universal meter.

Fan: unplug wiring terminal of fan and measure resistance between any two wire among red, yellow, white wire by universal meter. Usually, the resistance will be hundreds of ohm, otherwise, there is open circuit and the fan is damaged.

Compressor: If operation environment is good, wiring is correct and system is in normal conditions, the H5 protection still frequently occurs after replacing controller, probably because compressor has malfunction.

4-way valve: unplug two purple wire of 4-way valve and then measure if resistance between these two wire is 1~2K. If the resistance is too large, there is open circuit of electromagnetic valve and coil of 4-way valve shall be replaced.

If malfunctions above don’t exist, inspect indoor unit.
(19) Cautions:

1. Before replacing mainboard of inverter outdoor unit, check if the substituted mainboard is qualified. The following tests shall be done:
   a. Check if there is short circuit between any two pins. If so, this mainboard of outdoor unit can’t be used.
   b. Check if there is short circuit between P,N of DC bus bar. If so, this mainboard of outdoor unit can’t be used.
   c. Check if there is short circuit between P and U,V,W and between N and U,V,W. If there is any short circuit, this mainboard can’t be used.

2. Each kind of compressor is applicable to one kind of mainboard. There is one-to-one relationship between mainboard and compressor. Before replacement, check the model of the mainboard which has malfunction and then use the mainboard with the same model for replacement. Don’t judge model of mainboard according to model of the unit, or else, mismatching between mainboard and compressor may be incurred.

3. Before replacing compressor, choose a compressor which has the same model for replacement. Don’t judge model of compressor according to model of the unit, or else, mismatching between compressor and pipeline or controller may be incurred.

4. Wire can’t contact each other, 4-way valve, compressor and sharp edge. Ground wire of compressor, fan and electric box shall be separately fixed.