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1 Trial Run

1.1 Check for Wiring

WARNING!
Do not check for the power supply unless proper checkout equipment has prepared and preventive measures have been taken, otherwise it would lead to severe injury.

- Are sizes of connection lines and the air switch proper?
- Does wiring comply with relative standards and electric codes?
- Is there any incorrect wiring?
- Does each contact work properly?
- Is the power supply and insulation proper?
- Are initial set points of control and protective elements satisfied?

1.2 Check for the Water System

- Are water inlet and outlet directions correct?
- Is the water piping cleaned? Are there foreign matters at the pipe joints? Is the water quality satisfied?
- Is insulation of water pipes in good condition?
- Does exhaust valve of the water system work properly?

1.3 Check for the Communication System

When the unit is powered on, check for the communication system, including: communication between AP1 and AP2, between the wired controller and the main board. When there is unusual communication, this error will be displayed at the wired controller. Then, check out the cause according to the displayed error. See the figure below for wiring of the communication system.

1.4 Trial Run

Start the unit when there is no any problem for wiring and piping. After startup, check for the electrostatic expansion valve, water pump, fan, and compressor to see if they work normally. When there is any error, solve it according to the troubleshooting flowchart covered in this manual. However, if the troubleshooting flowchart is still unhelpful, please contact GREE sales agent.

2 Error Code List

<table>
<thead>
<tr>
<th>No.</th>
<th>Full Name</th>
<th>Displayed Name</th>
<th>Error Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ambient temperature sensor error</td>
<td>Ambient sensor</td>
<td>F4</td>
</tr>
<tr>
<td>2</td>
<td>Defrost temperature sensor error</td>
<td>Defro. sensor</td>
<td>d6</td>
</tr>
<tr>
<td>3</td>
<td>Discharge temperature sensor error</td>
<td>Disch. sensor</td>
<td>F7</td>
</tr>
<tr>
<td>4</td>
<td>Suction temperature sensor error</td>
<td>Suction sensor</td>
<td>F5</td>
</tr>
<tr>
<td>5</td>
<td>Outdoor fan error</td>
<td>Outdoor fan</td>
<td>EF</td>
</tr>
<tr>
<td>6</td>
<td>Compressor internal overload protection</td>
<td>Comp. overload</td>
<td>H3</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Code</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>High pressure protection</td>
<td>E1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Low pressure protection</td>
<td>E3</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>High discharge protection</td>
<td>E4</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Refrigerant loss protection</td>
<td>P2</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Heat pump-water pump protection</td>
<td>E0</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Solar kit-water pump protection</td>
<td>EL</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Swimming pool-water pump protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Incorrect capacity DIP switch setting</td>
<td>c5</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Communication error between indoor and outdoor unit</td>
<td>E6</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Drive communication error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>High pressure sensor error</td>
<td>Fc</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Enthalpy-enhancing sensor error</td>
<td>F8</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Low pressure sensor error</td>
<td>dL</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Heat exchanger-leaving water temperature sensor error</td>
<td>F9</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Auxiliary heater-leaving water temperature sensor error</td>
<td>dH</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Heat exchanger-entering water temperature sensor error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Water tank water temperature sensor 1 error</td>
<td>FE</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Water tank water temperature sensor 2 error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Solar kit-entering water temp sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Solar kit-leaving water temp sensor</td>
<td>FH</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Solar kit-temp sensor</td>
<td>FF</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Swimming pool-entering water temp sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Swimming pool-leaving water temp sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Swimming pool-water temp sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Remote room sensor 1</td>
<td>F3</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Remote room sensor 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Heat pump-water flow switch</td>
<td>Ec</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Solar kit-water flow switch</td>
<td>F2</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Swimming pool-water flow switch</td>
<td>F1</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Welding protection of the auxiliary heater</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Welding protection of the auxiliary heater</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Welding protection of the water tank heater</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Under-voltage DC bus or voltage drop error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Over-voltage DC bus</td>
<td>PH</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>AC current protection (input side)</td>
<td>PA</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>IPM defective</td>
<td>H5</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>PFC defective</td>
<td>Hc</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Start failure</td>
<td>Lc</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Phase loss</td>
<td>LD</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Drive module resetting</td>
<td>P6</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Compressor over-current</td>
<td>P0</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Overspeed</td>
<td>P5</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Sensing circuit error or current sensor error</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LF</td>
<td></td>
</tr>
</tbody>
</table>
3 Flow Chart Of Troubleshooting

3.1 Comp High-pressure Protection E1

- Comp High-pressure protection E1
  - Check if the High-pressure switch is broken
    - yes: Replace the High-pressure switch
    - no: Check if the High-pressure switch wiring is loose.
      - yes: Replace the wiring
      - no: Check if the water in the tank is enough
        - yes: Install rightly the tank temp sensor
        - no: Check if the gas valve and liquid valve are fully open
          - yes: Fully open the valve
          - no: Check if the electric expansion valve can work normally
            - yes: Replace the electronic expansion valve
3.2 Comp Low-pressure Protection E3

- Check if comp low-pressure switch is broken or the wiring is loose.
  - yes: Replace comp low-pressure or rewire
  - no:
    - yes: Check the fans
    - no: Repair the leakage of system pipe and add refrigerant according to the required volume

3.3 Comp Discharge Temp Protection E4

- Measure if the exhaust temperature of compressor reaches 120℃
  - yes: Replace the mainboard of AP2
  - no:
    - yes: Replace the electronic expansion valve
    - no:
      - yes: The refrigerant of the system is not enough and add refrigerant according to the required volume
      - no: Repair the leakage of system pipe and add refrigerant according to the required volume

- Check if the fans stop running or reverse
  - yes: Check the fans
  - no:
    - yes: Repair the leakage of system pipe and add refrigerant according to the required volume
    - no: Repair the leakage of system pipe and add refrigerant according to the required volume

- Check if the system has leaked
  - yes:
  - no:
    - yes:
    - no:

3.4 Overload Protection of Compressor or Driver Error

- **Comp Overload Protection**
  - Check if the AC contactor is damaged
    - yes: Replace the AC contactor
    - no: Check if the compressor wiring is correct
      - yes: Adjust the compressor wiring
      - no: Check if the voltage is normal
        - yes: Recharge suitable amount of the refrigerant
        - no: Contact the power supply company
  - no: Check if the refrigerant of the system is excessive
    - yes: Recharge suitable amount of the refrigerant
    - no: yes

3.5 DC Fan Error EF

- **EF is displayed on the wired controller**
  - Is the motor wire phase sequence right?
    - yes: Work Normally
    - no: Adjust the motor wire
      - yes: Tighten the fan wiring terminal
      - no: Replace the mainboard AP2. Does it work normally?
        - yes: Work Normally
        - no: Replace the outdoor fan
3.6 Temperature Sensor Error

Temperature Sensor Error

- Check if the plug on temperature sensor is correctly connected to the socket.
  - Yes
  - No: Check the orientation of plug and socket

- Check if the resistance of temperature sensor is correct.
  - Yes
  - No: Replace the temperature sensor

(Replace the mainboard of the AP1 or AP2)

3.7 Communication Malfunction E6

Communication Malfunction E6

- Check if the communication line of the unit is connected.
  - Yes
  - No: Check the orientation of plug and socket

- Measure if the Communication line is through.
  - Yes
  - No: Replace the communication line

- Check if the communication line of the unit is connected correctly.
  - Yes
  - No: Check the orientation of plug and socket

- Check if the monobloc unit is electrically powered.
  - Yes
  - No: Please supply power to the monobloc unit
3.8 Capacity Switch Error (Code:"C5")

Communication Malfunction E6

Check if the communication line of the unit is connected

no

Communication Malfunction E6

yes

Measure if the Communication line is through

no

Communication Malfunction E6

yes

Check if the communication line of the unit is connected correctly

yes

Communication Malfunction E6

no

Communication Malfunction E6

Communication Malfunction E6

4 Diagnosis of Driving

4.1 Diagnosis Flowchart of Driving of Single-phase Unit and Three-phase Unit

4.1.1 Drive Module Reset(Code:"P0") ; IPM or PFC Temperature Sensor Error(Code:"P7") ; AC Current Protection (Input Side)(Code:"PA"); Current Sense Circuit Error(code:"PC"); PFC Protection(Code:"HC")
“Driver reset”, “T-mod. sensor”, “AC curr. pro.”, “FPC defective” or “Current sen.” is displayed on the wired controller.

P0, P7, PA, HC or PC is displayed in the mainboard. 88 indicating lamp.

Replace the driver board AP4.

Work Normally.

4.1.2 IPM or PFC Over-temperature Protection (Code: “P8”)

“Overtemp.-mod.” is displayed on the wired controller.

P8 is displayed in the mainboard. 88 indicating lamp.

Is the IPM or PFC module of the driver board AP4 tightened?

Replace the driver board AP4.

Tighten the IPM or PFC module.

Work Normally.
4.1.3 DC Busbar Over-voltage Protection(Code:"PH") ; DC Busbar Under-voltage Protection(Code:"PL")

- "DC over-vol." or "DC under-vol." is displayed on the wired controller
- PH or PL is displayed in the mainboard 88 Indicating Lamp
- Is input voltage ranged from 185VAC to 264VAC?
  - Replace the mainboard.
  - Does it work normally?
  - Replace the mainboard
  - Work Normally
  - Please cut off the power and notify the power company.

Note: three-phase input voltage is in the range from 320VAC to 475VAC.

4.1.4 Drive-to-main-control Communication Error(Code:"P6")

- "Drive-main com." is displayed on the wired controller
- P6 is displayed in the mainboard 88 Indicating Lamp
- Is the CPU tightened?
  - Is the CPU tightened?
  - Work Normally
4.1.5 Compressor Startup Failure (code:"LC")

- "Start failure" is displayed on the wired controller
- LC is displayed in the mainboard 88 indicating lamp
- Replace the driver board AP4. Does it work Normally?
- Replace the compressor
- Work Normally

4.1.6 Compressor Current Protection (Code:"P5"); Compressor Motor Desynchronizing (Code:"H7"); IPM Protection (Code:"H5"); Phase Loss (Code:"LD")

- "Start failure" is displayed on the wired controller
- LC is displayed in the mainboard 88 indicating lamp
- Replace the mainboard. Does it work Normally?
- Replace the mainboard. Does it work Normally?
- Replace the mainboard. Does it work Normally?
- Replace the mainboard. Does it work Normally?
4.1.7 Charging Circuit Error (Code: "PU")

- "Charge circuit" is displayed on the wired controller.
- PU is displayed in the mainboard 88 indicating lamp.
- Is the PFC wire tightened or is the sequence right?
  - Replace the mainboard
  - Tighten the PFC wire or adjust the sequence

Work Normally

5 Daily Maintenance and Repair
5.1 Daily Maintenance

In order to avoid damage of unit, all protecting devices in the unit had been set before outgoing, so the user can never adjust or remove them.

For the first startup of the unit or next startup of unit after long-period stop (above 1 day) by cutting off the power, please electrify the unit in advance to preheat the unit for more than 8hr.

Never put sundries on the unit and accessories. Keep dry, clean and ventilated around the unit.

Remove the dust accumulated on the condenser fin timely to ensure performance of unit and to avoid stop of unit for protection.

In order to avoid protection or damage of unit caused by blockage of water system, clean the filter in water system periodically and frequently check water replenishing device.

In order to ensure anti-freezing protection, never cut off the power if ambient temp. is below zero in winter.

In order to avoid frost crack of the unit, water in the unit and pipeline system not used for a long period should be drained. In addition, open the end cap of water tank for drainage.

Never frequently make the unit on/off and close manual valve of water system during operation of unit by users.

Ensure frequently check the working condition of each part to see if there is oil stain at pipeline joint and charge valve to avoid leakage of refrigerant.

If malfunction of the unit is out of control of users, please timely contact with authorized service center of company.

Note: the water pressure gage is installed in returning water line in the indoor unit, Please adjust the hydraulics system pressure according to next item:

1. If the pressure is less than 0.5 bar, please recharge the water immediately;
2. When recharging, the hydraulics system pressure should be not more than 2.5 Bar.
### 5.2 Troubleshooting

<table>
<thead>
<tr>
<th>Malfunctions</th>
<th>Reasons</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| Compressor does not start up             | ① Power supply has problem.  
  ② Connection wire is loose.  
  ③ Malfunction of mainboard.  
  ④ Malfunction of compressor. | ① Phase sequence is reverse.  
  ② Check out and re-fix.  
  ③ Find out the reasons and repair.  
  ④ Replace compressor. |
| Heavy noise of fan                        | ① Fixing bolt of fan is loose.  
  ② Fan blade touches shell or grill.  
  ③ Operation of fan is unreliable. | ① Re-fix fixing bolt of fan.  
  ② Find out the reasons and adjust.  
  ③ Replace fan. |
| Heavy noise of compressor                 | ① Liquid slugging happens when liquid refrigerant enters into compressor.  
  ② Internal parts in compressor are broken. | ① Check if expansion valve is failure and temp. sensor is loose. If that, repair it.  
  ② Replace compressor. |
| Water pump does not run or runs abnormally | ① Malfunction of power supply or terminal.  
  ② Malfunction of relay.  
  ③ There is air in water pipe. | ① Find out the reasons and repair.  
  ② Replace relay.  
  ③ Evacuate. |
| Compressor starts or stops frequently     | ① Poor or excess refrigerant.  
  ② Poor circulation of water system.  
  ③ Low load. | ① Discharge or add part of refrigerant.  
  ② Water system is blocked or there is air in it. Check water pump, valve and pipeline. Clean water filter or evacuate.  
  ③ Adjust the load or add accumulating devices. |
| The unit does not heat although compressor is running | ① Leakage of refrigerant.  
  ② Malfunction of compressor. | ① Repair by leakage detection and add refrigerant.  
  ② Replace compressor. |
| Poor efficiency of hot water heating      | ① Poor heat insulation of water system.  
  ② Poor heat exchange of evaporator.  
  ③ Poor refrigerant of unit.  
  ④ Blockage of heat exchanger at water side. | ① Enhance heat insulation efficiency of the system.  
  ② Check if air in or out of unit is normal and clean evaporator of the unit.  
  ③ Check if refrigerant of unit leaks.  
  ④ Clean or replace heat exchanger. |

### 5.3 Repair

#### 5.3.1 Key Components

<table>
<thead>
<tr>
<th>Picture</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Compressor" /></td>
<td>Compressor</td>
<td>It is the heart of the cooling system, mainly used to turn the low-temperature, low-pressure refrigerant vapor to high-temperature high-pressure vapor and then discharge it to the evaporator. The two-stage enthalpy-adding compressor is adopted herein, which can improve the heating performance of the unit largely.</td>
</tr>
<tr>
<td><img src="image" alt="Electrostatic Expansion Valve" /></td>
<td>Electrostatic Expansion Valve</td>
<td>It is one of four main components and used to turn the hi-pressure liquid refrigerant to low-temperature, low-pressure vapor-liquid mixture and adjust the refrigerant flow rate entering the evaporator.</td>
</tr>
<tr>
<td>Component</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Vapor Liquid Separator</td>
<td>It is installed at the side of the suction line, and used to prevent liquid refrigerant entering the compressor, which if not avoided will lead to wet compression or even liquid slugging.</td>
<td></td>
</tr>
<tr>
<td>4-way Valve</td>
<td>It is used the switch flow direction of refrigerant and then realize switchover between cooling and heating. It also can be used for defrosting through the counterflow.</td>
<td></td>
</tr>
<tr>
<td>Plate Heat Exchanger</td>
<td>It is the water-refrigerant plate type heat exchanger, used to liquefy the high-temperature high-pressure vapor refrigerant or evaporate the low-temperature low pressure liquid refrigerant. Heat of condensation is taken away by circulation water and heat for evaporation is supplied also by circulation water.</td>
<td></td>
</tr>
<tr>
<td>Water Pump</td>
<td>It is the power equipment for water circulation.</td>
<td></td>
</tr>
<tr>
<td>Expansion Tank</td>
<td>It is used to keep stable pressure of the water system. The tank is charged with a certain volume of nitrogen which is separated from the water side with a gasbag. When pressure of the water side exceeds the nitrogen pressure, the gasbag will expand and water enters into the tank so as to lower the pressure of the water system. In contract, when pressure of the water system goes down, nitrogen in the tank will expel water out to the water system.</td>
<td></td>
</tr>
<tr>
<td><strong>Flow Switch</strong></td>
<td>It is used to prevent the heat exchanger from being frozen owing to reduced water flow rate. When the flow rate goes down to the point at which the flow switch will act, the switch will trip off and the unit will raise an alarm and shut down.</td>
<td></td>
</tr>
<tr>
<td><strong>Three-pipe Liquid Receiver</strong></td>
<td>Three pipes are connected to two electrostatic expansion valves and the enthalpy-adding port of the compressor respectively. It is mainly used to further reduce pressure of the refrigerant which has gone through the first-stage throttling and then vaporize some refrigerant. The vaporized refrigerant will be sucked in the compressor again so as to enhance the heating performance of the system.</td>
<td></td>
</tr>
<tr>
<td><strong>Safety Valve</strong></td>
<td>It is used to prevent the pressure of circulation water from increasing unusually. When the pressure is larger than the set point (0.6MPa), this valve will open to relieve water pressure.</td>
<td></td>
</tr>
<tr>
<td><strong>Exhaust Valve</strong></td>
<td>It is used to expel air trapped inside the water system to make sure normal operation of the system. It is usually installed at the highest point of the system.</td>
<td></td>
</tr>
</tbody>
</table>

### 5.3.2 Charging and Discharging of Refrigerant

The unit has been charged with refrigerant before delivery. Overcharging or undercharging will cause the compressor to run improperly or be damaged. When refrigerant is required to be charged or discharged for installation, maintenance and other reasons, please follow steps below and nominal charged volume on the nameplate.

1. **Discharging**: remove metal sheets of the outer casing, connect a hose to the charging valve and then discharge refrigerant.
Test Operation & Troubleshooting & Maintenance

Notes
① Discharge is allowed unless the unit has been stopped. (Cut off the power and repower it 1 minutes later)
② Protective measures should be taken during discharging to avoid frost bites.
③ When discharging is finished, if vacuuming cannot be done immediately, remove the hose to avoid air or foreign matters entering the unit.

(2) Vacuuming: When discharging is finished, use hoses to connect the charging valve, manometer and vacuum pump to vacuum the unit.

Note: when vacuuming is finished, pressure inside the unit should be kept lower than 80Pa for at least 30 minutes to make sure there is no leak. Either charging valve 1 or charging valve 2 can be used for vacuuming.

(3) Charging: when vacuuming is finished and it is certain that there is no leak, charging can be done.

- Be sure to charge the specified amount of refrigerant in liquid state.
- Since this refrigerant is a mixed refrigerant, adding it in gas form may cause the refrigerant composition to change, preventing normal operation.
- Before charging, check whether the refrigerant cylinder is equipped with a siphon tube or not.
For continuous improvement in the products, Gree reserves the right to modify the product specification and appearance in this manual without notice and without incurring any obligations.