Bosch Split-Type Ductless Air Conditioner / Heat Pump
Climate 5000 AA Series

Service Manual
# Table of Contents

1  Key to Symbols and Safety Instructions 4
   1.1  Key to symbols 4
   1.2  Safety 4

2  Part Names and Model Numbers 6
   2.1  Model numbers 6
   2.2  Unit parts 6

3  Dimensions 7
   3.1  Indoor unit 7
   3.2  Outdoor unit 9

4  Refrigerant Cycle Diagram 10

5  Wiring Diagram 12

6  Installation Details 12
   6.1  Wrench torque sheet for installation 12
   6.2  Connecting the cables 12
   6.3  Pipe length and the elevation 12
   6.4  First time installation 12
   6.5  Adding the refrigerant to an existing system 13
   6.6  Re-installation / indoor unit needs to be repaired 13
   6.7  Re-installation while the outdoor unit needs to be repaired 14
   6.8  Operation characteristics 15

7  Electronic Functions 16
   7.1  Abbreviation 16
   7.2  Display function 16
   7.3  Main protection 16
   7.4  Operation modes and functions 17

8  Troubleshooting 22
   8.1  Indoor unit error display 23
   8.2  Outdoor unit error display 24
   8.3  Diagnosis and solution 28

9  Disassembly Guide 50
   9.1  Indoor unit 50
   9.2  Outdoor unit 55

10  Care and Maintenance 70
    10.1  Cleaning precautions 70
    10.2  Cleaning your air filter 70
    10.3  Air filter reminders (optional) 71
    10.4  Maintenance - long periods of non-use 71
    10.5  Maintenance - pre-season inspection 71

10  Care and Maintenance 70
    10.1  Cleaning precautions 70
    10.2  Cleaning your air filter 70
    10.3  Air filter reminders (optional) 71
    10.4  Maintenance - long periods of non-use 71
    10.5  Maintenance - pre-season inspection 71
1 Key to Symbols and Safety Instructions

1.1 Key to symbols

Warnings

Warnings in this document are identified by a warning triangle printed against a grey background. Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

The following keywords are defined and can be used in this document:

- **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor to moderate injury.
- **NOTICE** is used to address practices not related to personal injury.

Important information

This symbol indicates important information where there is no risk to people or property.

1.2 Safety

Please read safety precautions before installation

- **WARNING:** The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments.
- **WARNING:** Repairs made by unqualified persons can result in hazards to you and others.

- **WARNING:** Do not modify the length of the signal/power cable or use an extension cord to power the unit.
- **WARNING:** Do not share the electrical outlet with other appliances. Improper or insufficient power supply can cause fire or electrical shock.

- **WARNING:** When connecting refrigerant piping, do not let substances or gases other than the specified refrigerant enter the unit. The presence of other gases or substances will lower the unit’s capacity, and can cause abnormally high pressure in the refrigeration cycle. This can cause explosion and injury.

- **WARNING:** Installation MUST conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA70/ANSI C1-1993 or current edition and Canadian Electrical Code Part 1 CSA C.22.1.

- **WARNING:** Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.
**WARNING: ELECTRICAL**

- For all electrical work, follow all local and national wiring standards, regulations, and the Installation Manual. The power supply to the outdoor unit requires a service disconnect at the unit. Only use a dedicated circuit. Never share a power source connected to this system. Insufficient electrical capacity or defects in electrical work can cause electrical shock or fire.
- For all electrical work, use the specified cables. Connect cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock.
- All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.
- If the power supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons such as a licensed electrician in order to avoid a hazard.
- The product must be properly grounded at the time of installation, or electrical shock may occur.

**CAUTION:**

- Install condensate drainage piping according to the instructions in this manual. Improper condensate drainage may cause water damage to your home and property.

**NOTICE: FLUORINATED GASSES [REFRIGERANT]**

- This air-conditioning unit contains fluorinated gasses. For specific information on the type of gas and the amount, please refer to the relevant label on the outdoor unit itself.
- Installation, service, maintenance and repair of this unit must be performed by a certified technician.
- Product removal and recycling must be performed by a certified technician.
- If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months.
- When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

**WARNING:**

- Do not install unit in area of high heat such as kitchen, server rooms, etc.

**CAUTION:**

- For units that have an auxiliary electric heater, do not install the unit within 1 meter (3 feet) of any combustible materials.
- Do not install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it may cause fire.
- Do not operate your air conditioner in a wet room such as a bathroom or laundry room. Too much exposure to water can cause electrical components to short circuit.

**NOTICE: FLUORINATED GASSES [REFRIGERANT]**

- Air and moisture in the refrigerant system have undesirable effects as below:
  - Pressure in the system rises.
  - Operating current rises.
  - Cooling or heating efficiency drops.
  - Moisture in the refrigerant circuit may freeze and block capillary tubing.
  - Water may lead to corrosion of parts in the refrigerant system. Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.
2 Part Names and Model Numbers

2.1 Model numbers

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Voltage</th>
<th>Indoor Units</th>
<th>Outdoor Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>9k</td>
<td>115V</td>
<td>BMS500-AAU009-0AHXXA</td>
<td>BMS500-AAS009-0CSXXA</td>
</tr>
<tr>
<td>12k</td>
<td>115V</td>
<td>BMS500-AAU012-0AHXXA</td>
<td>BMS500-AAS012-0CSXXA</td>
</tr>
<tr>
<td>9k</td>
<td>208-230V</td>
<td>BMS500-AAU009-1AHXXA</td>
<td>BMS500-AAS009-1CSXXA</td>
</tr>
<tr>
<td>12k</td>
<td>208-230V</td>
<td>BMS500-AAU012-1AHXXA</td>
<td>BMS500-AAS012-1CSXXA</td>
</tr>
<tr>
<td>18k</td>
<td>208-230V</td>
<td>BMS500-AAU018-1AHXXA</td>
<td>BMS500-AAS018-1CSXXA</td>
</tr>
<tr>
<td>24k</td>
<td>208-230V</td>
<td>BMS500-AAU024-1AHXXA</td>
<td>BMS500-AAS024-1CSXXA</td>
</tr>
</tbody>
</table>

Table 1

2.2 Unit parts

![Diagram of unit parts](https://example.com/diagram.png)

Figure 1
3 Dimensions

3.1 Indoor unit

![Diagram of indoor unit dimensions](image)

<table>
<thead>
<tr>
<th>Model</th>
<th>W x D x H (mm)</th>
<th>W x D x H (inch)</th>
<th>Mounted plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMS500-AAU009-0AHXXA</td>
<td>805 x 193 x 302</td>
<td>31.69 x 7.60 x 11.89</td>
<td>B</td>
</tr>
<tr>
<td>BMS500-AAU012-0AHXXA</td>
<td>1106 x 232 x 342</td>
<td>43.54 x 9.13 x 13.46</td>
<td>D</td>
</tr>
<tr>
<td>BMS500-AAU009-1AHXXA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS500-AAU012-1AHXXA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS500-AAU018-1AHXXA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS500-AAU024-1AHXXA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2
Figure 3  For mount plate B

Figure 4  For mount plate D
3.2 Outdoor unit

Figure 5  Outdoor unit clearances

Figure 6  Outdoor unit dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>W</th>
<th>D</th>
<th>H</th>
<th>W1</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMS500-AAS009-0CSXXA</td>
<td>30.31 (770)</td>
<td>11.81 (300)</td>
<td>21.85 (555)</td>
<td>33.07 (840)</td>
<td>19.17 (487)</td>
<td>11.73 (298)</td>
</tr>
<tr>
<td>BMS500-AAS009-1CSXXA</td>
<td>31.50 (800)</td>
<td>13.11 (333)</td>
<td>21.81 (554)</td>
<td>34.25 (870)</td>
<td>20.24 (514)</td>
<td>13.39 (340)</td>
</tr>
<tr>
<td>BMS500-AAS012-0CSXXA</td>
<td>33.27 (845)</td>
<td>14.29 (363)</td>
<td>27.64 (702)</td>
<td>35.98 (914)</td>
<td>21.26 (540)</td>
<td>13.78 (350)</td>
</tr>
</tbody>
</table>

Table 3  Outdoor unit dimensions in inches (mm)
4 Refrigerant Cycle Diagram

For indoor models:
BMS500-AAU009-0AHXXA, BMS500-AAU012-0AHXXA,

For outdoor models:
BMS500-AAS009-0CSXXA, BMS500-AAS012-0CSXXA

---

**Figure 7** Refrigerant cycle diagram
For indoor models:
BMS500-AAU009-1AHXXA, BMS500-AAU012-1AHXXA,
BMS500-AAU018-1AHXXA, BMS500-AAU024-1AHXXA,

For outdoor models:
BMS500-AAS009-1CSXXA, BMS500-AAS012-1CSXXA
BMS500-AAS018-1CSXXA, BMS500-AAS024-1CSXXA
5  Wiring Diagram

Refer to wiring diagram in the installation manual (IOM) or on the unit.

6  Installation Details

6.1  Wrench torque sheet for installation

<table>
<thead>
<tr>
<th>Outside diameter</th>
<th>Torque (N.cm)</th>
<th>Additional tightening torque (N.cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ф6.35mm (1/4in)</td>
<td>1500</td>
<td>1600</td>
</tr>
<tr>
<td>Ф9.52mm (3/8in)</td>
<td>2500</td>
<td>2600</td>
</tr>
<tr>
<td>Ф12.7mm (1/2in)</td>
<td>3500</td>
<td>3600</td>
</tr>
<tr>
<td>Ф15.9mm (5/8in)</td>
<td>4500</td>
<td>4700</td>
</tr>
<tr>
<td>Ф19mm (3/4in)</td>
<td>6500</td>
<td>6700</td>
</tr>
</tbody>
</table>

Table 4

6.2  Connecting the cables

The power cord should be selected according to the following specifications sheet.

<table>
<thead>
<tr>
<th>Appliance Amps</th>
<th>AWG Wire Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td>30</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 5

The cable size and the current of the fuse or switch are determined by the maximum current indicated on the nameplate which is located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch. Recommended: A means of disconnecting the power, should be within 10 feet of the outdoor unit.

6.3  Pipe length and the elevation

<table>
<thead>
<tr>
<th>Models</th>
<th>Pipe size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gas</td>
</tr>
<tr>
<td>9K</td>
<td>3/8in (Ф9.52mm)</td>
</tr>
<tr>
<td>12K,18K</td>
<td>1/2in (Ф12.7mm)</td>
</tr>
<tr>
<td>24K</td>
<td>5/8in (Ф15.9mm)</td>
</tr>
</tbody>
</table>

Table 6

<table>
<thead>
<tr>
<th>Models</th>
<th>Standard length</th>
<th>Max. Elevation</th>
<th>Max. Length A</th>
<th>Additional refrigerant</th>
</tr>
</thead>
<tbody>
<tr>
<td>9K,12K</td>
<td>7.5m (24.6ft)</td>
<td>10m (32.8ft)</td>
<td>25m (82.0ft)</td>
<td>15g/m (0.16oz/ft)</td>
</tr>
<tr>
<td>18K</td>
<td>7.5m (24.6ft)</td>
<td>20m (65.6ft)</td>
<td>30m (98.4ft)</td>
<td>15g/m (0.16oz/ft)</td>
</tr>
<tr>
<td>24K</td>
<td>7.5m (24.6ft)</td>
<td>25m (82.0ft)</td>
<td>50m (164ft)</td>
<td>30g/m (0.32oz/ft)</td>
</tr>
</tbody>
</table>

Table 7

6.4  First time installation

Air purging with vacuum pump

Figure 9

1. Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the liquid service and gas service valves are set to the closed position.
2. Connect the refrigerant manifold, blue hose with the push pin of shut-off knob of the low side to the gas service valve port.
3. Connect the refrigerant manifold, yellow hose to the shut-off high side connection to the vacuum pump.
4. Fully open the shut-off knob low side of the manifold valve.
5. Operate the vacuum pump to evacuate.
6. Perform evacuation for 30 minutes and check whether the refrigeration low side pressure gauge indicates -0.1Mpa (14.5Psi). If the meter does not indicate -0.1Mpa (14.5Psi) after evacuating for 30 minutes, it should be evacuated 20 minutes more. If the pressure can’t achieve -0.1Mpa (14.5Psi) after evacuating 50 minutes, please check if there are some leakage points. Fully close the shut-off knob low side of the manifold and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
7. Make sure the pressure display in the pressure indicator is a little higher than the atmospheric pressure. Then remove the charge hose from the gas service valve.
8. Fully open the liquid service valve and gas service valve and securely tighten the cap of the gas service valve. System is now evacuated and charged. (Ensure that the unit is charged per the defined specifications).

Gas leak check (Use soap bubble method):
Apply soapy water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes are leaking.
### 6.5 Adding the refrigerant to an existing system

**Procedure**

1. Connect the refrigerant manifold, blue suction hose to the gas service valve’s service port, open the liquid service valve and the gas service valve. Connect the refrigerant manifold, yellow hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2. Purge the air from the refrigerant manifold, yellow hose. Open the valve at the bottom of the cylinder and press the check valve on the refrigerant manifold to purge the air.

3. Put the charging cylinder onto the electronic scale and record the weight.

4. Operate the air conditioner in cooling mode.

5. Open the valves (low side) on the refrigerant manifold and charge the system with liquid refrigerant.

6. When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), turn off the refrigerant low side valve and the refrigerant cylinder valve. Then turn off the unit to remove the hose from the gas service valve.

7. Replace valve stem caps on the service port. Use a torque wrench to tighten the service port cap to a torque of 18N.m. Be sure to check for gas leakage.

---

### 6.6 Re-installation / indoor unit needs to be repaired

#### Collecting the refrigerant into the outdoor unit (passive recovery)

**Procedure**

1. Remove the valve stem caps and confirm that both the liquid and gas service valves are set to the opened position. If not opened, use appropriate hex wrench to open the valve stems.

2. Connect refrigerant gauge low side hose (blue) to the gas service valve’s service port

3. Air purging of the refrigerant manifold, blue hose: Open the low side valve of manifold slightly to purge air from the hose for 5 seconds and then close it quickly.

4. Set the liquid service valve to the close position.

5. Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1Mpa (14.5Psi).

6. Set the gas service valve to the closed position immediately. Do this quickly so that the gauge ends up indicating 0.3Mpa (43.5Psi) to 0.5Mpa (72.5Psi). Disconnect the refrigerant manifold, and tighten the liquid and gas service valve’s stem nuts. Use a torque wrench to tighten the gas service valve's service port cap to a torque of 18N.m. Be sure to check for gas leakage.
6.7 Re-installation while the outdoor unit needs to be repaired

Evacuation for the whole system

Procedure:
1. Confirm that both the liquid and gas service valves are set to the opened position.
2. Connect the vacuum pump to gas service valve’s service port.
3. Evacuate for approximately one hour. Confirm that the refrigerant manifold low side indicates -0.1Mpa (14.5Psi).
4. Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
5. Disconnect the charge hose from the vacuum pump.

Refrigerant charging

Procedure:
1. Connect the charge hose to the charging cylinder, open the liquid and the gas service valve. Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.
2. Purge the air from the charge hose. Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
3. Put the charging cylinder onto the electronic scale and record the weight.
4. Open the valves (Low side) on the refrigerant manifold and charge the system with liquid refrigerant. If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time), operating the air conditioner in the cooling cycle. however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.
5. When the electronic scale displays the proper weight, disconnect the charge hose from the gas service valve’s service port immediately. If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.
6. Mount the valve stem caps and the service port. Use torque wrench to tighten the service port cap to a torque of 18N.m. Be sure to check for gas leakage.
6.8 Operation characteristics

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Cooling operation</th>
<th>Heating operation</th>
<th>Drying operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room temperature</td>
<td>62°F - 90°F</td>
<td>32°F - 86°F</td>
<td>50°F - 90°F</td>
</tr>
<tr>
<td>(17°C - 32°C)</td>
<td>(0°C - 30°C)</td>
<td>(10°C - 32°C)</td>
<td></td>
</tr>
<tr>
<td>Outdoor temperature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS500-AAS009-0CSXXA</td>
<td>-13°F - 122°F</td>
<td>-13°F - 122°F</td>
<td>32°F - 122°F</td>
</tr>
<tr>
<td>BMS500-AAS009-1CSXXA</td>
<td>(−25°C - 50°C)</td>
<td>(−25°C - 50°C)</td>
<td>(0°C - 50°C)</td>
</tr>
<tr>
<td>BMS500-AAS012-0CSXXA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS500-AAS012-1CSXXA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS500-AAS018-1CSXXA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS500-AAS024-1CSXXA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8

Equation to convert Celsius to Fahrenheit

\[ °F = 1.8 \times °C + 32 \]

**CAUTION:**

- If the air conditioner is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.
- The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.
- The optimum performance will be achieved during this operating temperature zone.
7 Electronic Functions

7.1 Abbreviation

T1: Indoor room temperature
T2: Coil temperature of evaporator
T3: Coil temperature of condenser
T4: Outdoor ambient temperature
T5: Compressor discharge temperature
Ts: Room temperature setting
Td: Off-set value (Td is an advanced feature)
T2b-A: suction temp for zone A in cooling (discharge temp for each zone in heating)
T2b-B: suction temp for zone B in cooling (discharge temp for each zone in heating)
T2b-C: suction temp for zone C in cooling (discharge temp for each zone in heating)
T2b-D: suction temp for zone D in cooling (discharge temp for each zone in heating)
T2b-E: suction temp for zone E in cooling (discharge temp for each zone in heating)

7.2 Display function

7.2.1 Icon explanation on indoor display board.

Digital display:

► Displays the temperature settings when the air conditioner is operational.
► Displays the room temperature in FAN mode.
► Displays the self-diagnostic codes.
► Displays **ON** for three seconds when Timer ON, Fresh, Swing, Turbo or Silence feature is activated.
► Displays **OF** for three seconds when Fresh, Swing, Turbo or Silence feature is cancelled.
► Displays **DF** under defrosting operation (10min max).
► Displays **c F** when anti-cold air feature is activated under heating mode.
► Displays **SC** during self clean operation (if applicable).
► Displays **FP** and maintains a minimum temperature of 46°F (8°C) in the space during heating operation.

► When ECO function (optional) is activated, the "**BB**" illuminates gradually one by one as **E → C → O → set temperature → E**...

in one second intervals.

A guide on using the infrared remote is not included in this literature package. A separate user guide is available for the remote operations.

7.3 Main protection

7.3.1 Three minutes delay at restart for compressor

1 minute delay for the 1st time start-up and 3 minutes delay for others.

7.3.2 Temperature protection of compressor discharge

Compressor discharge temp. T5 > 239 °F (115°C) for 5s, compressor stops.

7.3.3 Fan speed is out of control

When indoor fan speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure.

7.3.4 Inverter module protection

The Inverter module has a protection function about current, voltage and temperature. If these protections happen, the corresponding code will display on indoor unit and the unit will stop working.

7.3.5 Indoor fan delayed open function

When the unit starts up, the louver will be active immediately and the indoor fan will open 7s later. If the unit is running in heating mode, the indoor fan will be also controlled by anti-cold air function.

7.3.6 Compressor preheating functions

Preheating permitting condition:

When T4 (outdoor ambient temperature) 37.4 °F (3°C), the preheating function will be activated.

7.3.7 Sensor protection at open circuit and breaking disconnection.

When there’s only one temperature sensor in malfunction, the air conditioner will keep working but show the error code, in case of any emergency use.

When there’s more than one temperature sensor in malfunction, the air conditioner will stop working.
7.4 Operation modes and functions

7.4.1 Fan mode
(1) Outdoor fan and compressor stop.
(2) Temperature setting function is disabled and no setting temperature is displayed.
(3) Indoor fan can be set to high/med/low/auto.
(4) The louver operates same as in cooling mode.
(5) Auto fan:

7.4.2 Cooling mode
7.4.2.1 Compressor running rules
When T1-Ts<ΔT 3.6°F (2℃), the compressor will stop.
When T1—Ts >ΔT 0.9°F (0.5℃) the compressor will be activated.
ΔT is the programmed parameter of temperature compensation. This parameter is preset at the factory.
When the AC run in mute mode, the compressor will run with low frequency. When the current is more than setting value, the current protection function will be activated, and the compressor will stop.

7.4.2.2 Outdoor fan running rules
The outdoor unit will run at different fan speeds according to T4. For different outdoor units, the fan speeds are different.

7.4.2.3 Indoor fan running rules
In cooling mode, indoor fan runs all the time and the speed can be selected as high, medium, low and auto.

7.4.2.4 Condenser temperature protection
- TP3<T3<TP3+5, the compressor frequency will decrease to the lower level until to F1 and then runs at F1. If TP3-3<T3<TP3, the compressor will keep running at the current frequency.
- T3<TP3-3, the compressor will not limit the frequency and resume to the former frequency.
- T3>TP3+5 for 5 seconds, the compressor will stop until T3<TP3-3.

7.4.2.5 Evaporator temperature protection
When Evaporator temperature is less than setting value, the compressor will stop.

7.4.3 Heating mode
7.4.3.1 Compressor operation
When T1-Ts>ΔT, the compressor will stop.
When T1-TS<ΔT-2.8°F (1.5℃) the compressor will be on.
ΔT is the programmed parameter of temperature compensation.
When the AC runs in mute mode, the compressor will run with low frequency. When the current is more than the setting value, the current protection function will be activated and the compressor will stop.

7.4.3.2 Outdoor fan operation
The outdoor unit will be run at different fan speed according to T4. For different outdoor units, the fan speeds are different.

7.4.3.3 Indoor fan operation
When the compressor is on, the indoor fan can be set to high/med/low/auto and the anti-cold wind function has the priority.

7.4.3.4 Defrosting mode
AC will enter the defrosting mode according to the value of T3 and the value range of change in T3 and also the compressor running time.
During the defrosting mode, the compressor will run, indoor and outdoor motor will stop and defrost lamp of the indoor unit will be lighted “DF” will be displayed.
If any one of the following items is satisfied, the defrosting will finish and the machine will turn to normal heating mode.
- T3 rises to be higher than TCDE 33.8°F (1℃).
- T3 keeps to be higher than TCDE 35.6°F (2℃) for 80 seconds.
- The machine has run for 15 minutes in defrosting mode.

7.4.3.5 Evaporator coil temperature protection

7.4.4 Auto-mode
This mode can be chosen with the remote controller and the setting temperature can be changed between 62.6°F~86°F (17°C~30°C)
In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT (ΔT =T1-Ts).

<table>
<thead>
<tr>
<th>ΔT=T1-Ts</th>
<th>Running mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔT&gt;3.6°F (2℃)</td>
<td>Cooling</td>
</tr>
<tr>
<td>-3.6°F (-2℃)≤ΔT≤3.6°F (2℃)</td>
<td>Fan-only</td>
</tr>
<tr>
<td>ΔT&lt; -3.6°F (-2℃)</td>
<td>Heating</td>
</tr>
</tbody>
</table>

Table 9
Indoor fan will run at auto fan of the relevant mode.
The louver operates same as in relevant mode. If the machine switches mode between heating and cooling, the compressor will keep stopping for 15 minutes and then choose mode according to T1-Ts. If the setting temperature is modified, the machine will choose running function again.
7.4.5 Drying mode
Indoor fan speed is fixed at breeze (low fan) and can’t be changed. The louver angle is the same as in cooling mode.
All protections are active and the same as that in cooling mode.

7.4.6 Forced operation function
- Forced cooling mode: The compressor and outdoor fan keep running and the indoor fan runs at low speed. After running for 30 minutes, AC will turn to auto mode with 75.2°F (24℃) setting temperature.
- Forced auto mode: The action of forced auto mode is the same as normal auto mode with 75.2°F (24℃) setting temperature.
When AC receives signals, such as switch on, switch off, timer on, timer off, mode setting, fan speed setting, sleeping mode setting, follow me setting, it will quit the forced operation.

7.4.7 Timer function
- Timing range is 24 hours.
- Timer on. The machine will turn on automatically when reaching the setting time.
- Timer off. The machine will turn off automatically when reaching the setting time.
- Timer on/off. The machine will turn on automatically when reaching the setting “on” time, and then turn off automatically when reaching the setting “off” time.
- Timer off/on. The machine will turn off automatically when reaching the setting “off” time, and then turn on automatically when reaching the setting “on” time.
- The timer function will not change the AC current operation mode. Suppose AC is off now, it will not start up firstly after setting the “timer off” function. And when reaching the setting time, the timer LED will be off and the AC running mode has not been changed.
- The setting time is relative time.
- The AC will quit the timer function when it has malfunction.

7.4.8 Sleep function
- The sleep function is available in cooling, heating or auto mode.
- Operation process in sleep mode is as follow:
  When cooling, the setting temperature rises 1.8°F (1℃) (be lower than 86°F (30℃)) every one hour, 2 hours later the setting temperature stops rising and the indoor fan is fixed at low speed.
  When heating, the setting temperature decreases 1.8°F (1℃) (be higher than 62.6°F (17℃)) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed at low speed. (Anti-cold wind function has the priority).
- Operation time in sleep mode is 7 hours. After 7 hours, the AC will turn off and sleep mode will also be turned off.
- Timer setting is available

7.4.9 Auto-restart function
The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including swing function) automatically after 3 minutes when power returns.
If the memorization condition is forced cooling mode, the unit will run in cooling mode for 30 minutes and turn to auto mode as 75.2°F (24℃) setting temp.
If AC is off before power off and AC is required to start up now, the compressor will have 1 minute delay when power on. Other conditions, the compressor will have 3 minutes delay when restarts.

7.4.10 Refrigerant leakage detection
With this new technology, the display area will show “EC” when the outdoor unit detects refrigerant leakage. This function is only available in cooling mode.

7.4.11 Louver position memory function
When starting the unit again after shutting down, its louver will restore to the angle originally set by the user, but the precondition is that the angle must be within the allowable range, if it exceeds, it will memorize the maximum angle of the louver.
During operation, if the power fails or the end user shuts down the unit in the turbo mode, the louver will restore to the default angle.

7.4.12 46.4°F (8°C) heating
In heating operation, the preset temperature of the air conditioner can be as low as 46.4°F (8°C), which keeps the room temperature steady at 46.4°F (8°C) and prevents household things freezing when the house is unoccupied for a long time in severe cold weather. This 46.4°F (8°C) heating mode is activated from the remote controller by pressing the FP button.
7.4.13 Self clean (optional)
For heat pump models which are provided with this function, after running in cooling or drying mode, if the user press “Self Clean” button on remote controller, firstly, indoor unit runs in fan only mode for a while, then low heat operation and finally runs in fan only again. This function can keep the inside of indoor unit dry and prevent breeding of mold.

7.4.14 Follow me
1. If the indoor PCB receives the signal which results from pressing the FOLLOW ME button on remote controller, the buzzer will emit a sound and this indicates the follow me function is initiated. But when the indoor PCB receives signal which sent from remote controller every 3 minutes, the buzzer will not respond. When the unit is running with follow me function, the PCB will control the unit according to the temperature from follow me signal, and the temperature collection function of room temperature sensor will be inactive, but the error detective function of room temperature sensor will be still valid.
2. When the follow me function is available, the PCB will control the unit according to the room temperature from the remote controller and the setting temperature.
3. The PCB will take action to the mode change information from remote controller signal, but it will not be affected by the setting temperature.
4. When the unit is running with follow me function, if the PCB doesn’t receive any signal from remote controller for 7 minutes or pressing FOLLOW ME button again, the follow me function will be turned off automatically, and the temperature will control the unit according to the room temperature detected from its own room temperature sensor and setting temperature.

7.4.15 Silence operation (optional)
Press the “silence” button on remote controller to initiate SILENCE function. When the Silence function is activated, the compressor running frequency will keep lower than F2 (compressor frequency) and the indoor unit will bring faint breeze, which will reduce the noise to the lowest level and create a quiet and comfortable room for you.
### 7.4.16 Point check function (engineering troubleshooting mode)

Press the LED DISPLAY or LED or MUTE button of the remote controller three times, and then press the AIR DIRECTION or SWING button three times in ten seconds, the buzzer will keep ring for two seconds. The air conditioner will enter into the information enquiry status. You can press the LED DISPLAY or AIR DIRECTION button to check the next or front item’s information.

When the AC enter the “information enquiry” status, it will display the code name in 2 seconds, the details are as follows.

<table>
<thead>
<tr>
<th>Enquiry information</th>
<th>Displaying code</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>T1</td>
<td>Indoor room temperature</td>
</tr>
<tr>
<td>T2</td>
<td>T2</td>
<td>Coil temperature of evaporator</td>
</tr>
<tr>
<td>T3</td>
<td>T3</td>
<td>Coil temperature of condenser</td>
</tr>
<tr>
<td>T4</td>
<td>T4</td>
<td>Outdoor ambient temperature</td>
</tr>
<tr>
<td>T2B</td>
<td>Tb</td>
<td>Coil temperature of evaporator</td>
</tr>
<tr>
<td>TP</td>
<td>TP</td>
<td>Compressor discharge temperature</td>
</tr>
<tr>
<td>TH</td>
<td>TH</td>
<td>Compressor suction temperature</td>
</tr>
<tr>
<td>Targeted Frequency</td>
<td>FT</td>
<td>Targeted Frequency</td>
</tr>
<tr>
<td>Actual Frequency</td>
<td>Fr</td>
<td>Actual Frequency</td>
</tr>
<tr>
<td>Indoor fan speed</td>
<td>IF</td>
<td>Indoor fan speed</td>
</tr>
<tr>
<td>Outdoor fan speed</td>
<td>OF</td>
<td>Outdoor fan speed</td>
</tr>
<tr>
<td>EXV opening angle</td>
<td>LA</td>
<td>EXV opening angle</td>
</tr>
<tr>
<td>Compressor continuous running time</td>
<td>CT</td>
<td>Compressor continuous running time</td>
</tr>
<tr>
<td>Causes of compressor stop.</td>
<td>ST</td>
<td>Causes of compressor stop.</td>
</tr>
<tr>
<td>Reserve</td>
<td>A0</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>A1</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>b0</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>b1</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>b2</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>b3</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>b4</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>b5</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>b6</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>Ac</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>Uc</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>Td</td>
<td></td>
</tr>
</tbody>
</table>

Table 10
When the AC enter into information enquiry status, it will display code value in next 25s, the details are as follows:

<table>
<thead>
<tr>
<th>Enquiry information</th>
<th>Display value</th>
<th>Meaning</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1,T2,T3,T4, T2B,TP,TH, Targeted Frequency, Actual Frequency</td>
<td>-1F,-1E,-1d,-1c,-1b,-1A</td>
<td>-25,-24,-23,-22,-21,-2,0</td>
<td>1. All the displaying temperature is actual value.</td>
</tr>
<tr>
<td></td>
<td>-19–99</td>
<td>-19–99</td>
<td>2. All the temperature is °C no matter what kind of remote controller is used.</td>
</tr>
<tr>
<td></td>
<td>A0,A1,…A9</td>
<td>100,101,…109</td>
<td>3. T1,T2,T3,T4,T2B display range: -25<del>70, TP display range: 20</del>130.</td>
</tr>
<tr>
<td></td>
<td>b0,b1,…b9</td>
<td>110,111,…119</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c0,c1,…c9</td>
<td>120,121,…129</td>
<td>4. Frequency display range: 0~159HZ.</td>
</tr>
<tr>
<td></td>
<td>d0,d1,…d9</td>
<td>130,131,…139</td>
<td>5. If the actual value exceeds the range, it will display the maximum value or minimum value.</td>
</tr>
<tr>
<td></td>
<td>E0,E1,…E9</td>
<td>140,141,…149</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F0,F1,…F9</td>
<td>150,151,…159</td>
<td></td>
</tr>
<tr>
<td>Indoor fan speed /Outdoor fan speed</td>
<td>0</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,2,3,4</td>
<td>Low speed, Medium speed, High speed, Turbo</td>
<td>For some big capacity motors.</td>
</tr>
<tr>
<td></td>
<td>14-FF</td>
<td>Actual fan speed=Display value turns to decimal value and then multiply 10. The unit is RPM.</td>
<td>For some small capacity motors, display value is from 14-FF(hexadecimal), the corresponding fan speed range is from 200-2550RPM.</td>
</tr>
<tr>
<td>EXV opening angle</td>
<td>0-FF</td>
<td>Actual EXV opening value=Display value turns to decimal value and then multiply 2.</td>
<td>The min opening angle for the EXV is 0. The max opening angle for EXV are different for different model.</td>
</tr>
<tr>
<td>Compressor continuous running time</td>
<td>0-FF</td>
<td>0-255 minutes</td>
<td>If the actual value exceeds the range, it will display the maximum value or minimum value.</td>
</tr>
<tr>
<td>Causes of compressor stop.</td>
<td>0-99</td>
<td>For detailed meaning please consult with manufacturer</td>
<td>Decimal display</td>
</tr>
<tr>
<td>Reserve</td>
<td>0-FF</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11

0-FF is a hexadecimal display value. Not OFF.
8 Troubleshooting

Safety

WARNING:
- Electricity power is still kept in capacitors even the power supply is shut off. Do not forget to discharge the electricity power in capacitor.

For other models, please connect discharge resistance (approx. 100Ω 40W) between +, - terminals of the electrolytic capacitor on the opposite side of the outdoor PCB. A screwdriver will also work as a resistive element.

For reference the most common error codes are E1, P0, and P3.
8.1 Indoor unit error display

<table>
<thead>
<tr>
<th>Operation lamp</th>
<th>Timer lamp</th>
<th>Display</th>
<th>LED STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>★ 1 time</td>
<td>X</td>
<td>E0</td>
<td>Indoor unit EEPROM parameter error</td>
</tr>
<tr>
<td>★ 2 times</td>
<td>X</td>
<td>E1</td>
<td>Indoor / outdoor units communication error</td>
</tr>
<tr>
<td>★ 3 times</td>
<td>X</td>
<td>E2</td>
<td>Zero-crossing signal detection error</td>
</tr>
<tr>
<td>★ 4 times</td>
<td>X</td>
<td>E3</td>
<td>Indoor fan speed has been out of control</td>
</tr>
<tr>
<td>★ 5 times</td>
<td>X</td>
<td>E4</td>
<td>Indoor room temperature sensor T1 open circuit or short circuit</td>
</tr>
<tr>
<td>★ 6 times</td>
<td>X</td>
<td>E5</td>
<td>Evaporator coil temperature sensor T2 open circuit or short circuit</td>
</tr>
<tr>
<td>★ 7 times</td>
<td>X</td>
<td>EC</td>
<td>Refrigerant leakage detection</td>
</tr>
<tr>
<td>★ 1 times</td>
<td>O</td>
<td>F0</td>
<td>Overload current protection</td>
</tr>
<tr>
<td>★ 2 times</td>
<td>O</td>
<td>F1</td>
<td>Outdoor ambient temperature sensor T4 open circuit or short circuit</td>
</tr>
<tr>
<td>★ 3 times</td>
<td>O</td>
<td>F2</td>
<td>Condenser coil temperature sensor T3 open circuit or short circuit</td>
</tr>
<tr>
<td>★ 4 times</td>
<td>O</td>
<td>F3</td>
<td>Compressor discharge temperature sensor T5 open circuit or short circuit</td>
</tr>
<tr>
<td>★ 5 times</td>
<td>O</td>
<td>F4</td>
<td>Outdoor unit EEPROM parameter error</td>
</tr>
<tr>
<td>★ 6 times</td>
<td>O</td>
<td>F5</td>
<td>Outdoor fan speed has been out of control</td>
</tr>
<tr>
<td>★★ 1 times</td>
<td>★</td>
<td>P0</td>
<td>IPM malfunction or IGBT over-strong current protection</td>
</tr>
<tr>
<td>★★ 2 times</td>
<td>★</td>
<td>P1</td>
<td>Over voltage or over low voltage protection</td>
</tr>
<tr>
<td>★★ 3 times</td>
<td>★</td>
<td>P2</td>
<td>High temperature protection of IPM module or compressor top</td>
</tr>
<tr>
<td>★★ 4 times</td>
<td>★</td>
<td>P3*</td>
<td>Outdoor ambient temperature too low</td>
</tr>
<tr>
<td>★★ 5 times</td>
<td>★</td>
<td>P4</td>
<td>Inverter compressor drive error</td>
</tr>
<tr>
<td>★★ 6 times</td>
<td>★</td>
<td>P5</td>
<td>Indoor units mode conflict (multi-zone ONLY)</td>
</tr>
</tbody>
</table>

Table 12
- light
- off
- flash

★ P3
1. In heating mode, when the outdoor temperature is lower than -13°F (-25℃) for 1 hour, the indoor unit display error code P3.
2. If the outdoor temperature is higher than -7.6°F (-22℃) for 10 minutes and compressor stop for 1 hour or outdoor temperature is higher than 23°F (-5℃) for 10 minutes, then the unit will return to work.

* Fault Symptom: The display board shows a garbled code or a code that is not an error code found in the service manual nor a temperature reading.

Troubleshooting:
Use the remote controller. If the unit does not respond to the remote, the indoor PCB needs to be replaced; if the unit does respond, then the display board needs to be replaced.
8.2 Outdoor unit error display

BMS500-AAS009-0CSXXA, BMS500-AAS012-0CSXXA

Figure 17
Figure 18
Figure 19
After power on, LED3 (Green color) and LED2 (Red color) will be flashing if the unit has some problems.

<table>
<thead>
<tr>
<th>No.</th>
<th>Problems</th>
<th>LED3 (Green)</th>
<th>LED2 (Red)</th>
<th>IU display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Standby for normal</td>
<td>O</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Operation normal</td>
<td>X</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>IPM malfunction or IGBT over-strong current protection</td>
<td>¥</td>
<td>X</td>
<td>P0</td>
</tr>
<tr>
<td>4</td>
<td>Over voltage or too low voltage protection</td>
<td>O</td>
<td>O</td>
<td>P1</td>
</tr>
<tr>
<td>5</td>
<td>EEPROM parameter error</td>
<td>O</td>
<td>¥</td>
<td>E5</td>
</tr>
<tr>
<td>6</td>
<td>Inverter compressor drive error</td>
<td>X</td>
<td>¥</td>
<td>P4</td>
</tr>
<tr>
<td>7</td>
<td>Inverter compressor drive error</td>
<td>¥</td>
<td>O</td>
<td>P4</td>
</tr>
<tr>
<td>8</td>
<td>Inverter compressor drive error</td>
<td>¥</td>
<td>¥</td>
<td>P4</td>
</tr>
</tbody>
</table>

Table 13

○ - light
X - off
¥ - LED flashes at 2.5 Hz (5 flashes every 2 seconds)
8.3 Diagnosis and solution

8.3.1 EEPROM parameter error diagnosis and solution (E0/F4)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>E0 (indoor) / F4 (outdoor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.</td>
</tr>
</tbody>
</table>
| Supposed causes  | ► Incorrect installation of indoor to outdoor control wire or line voltage wiring
                        ► PCB faulty |

Table 14

Troubleshooting:

- Power off, then restart the unit 2 minutes later.
- If error continues:
  - Replace the outdoor main PCB.
  - If error continues:
    - Replace the indoor main PCB.

Figure 20

**EEPROM**: a read-only memory whose contents can be erased and reprogrammed using a pulsed voltage. For the location of EEPROM chip, please refer to the below photos.

**Indoor PCB**

**Outdoor PCB**

Figure 21

The two photos above are for reference only, they may not be identical to the PCBs in shipped with your equipment.
8.3.2 Indoor / outdoor unit’s communication diagnosis and solution (E1)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>E1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>Indoor unit does not receive the feedback from outdoor unit during 110 seconds and this condition happens four times continuously.</td>
</tr>
</tbody>
</table>
| Supposed causes | Incorrect installation of indoor to outdoor control wire  
                        Electromagnetic interference  
                        Indoor or outdoor PCB faulty |

Table 15

Troubleshooting:

- Power off, then restart the unit 2 minutes later. Is the error extinguished?
- Measure Vs. Is the voltage moving alternately between -25VDC to 25VDC?
- Check the outdoor wiring connection. Is the wiring correct?
- Replace the reactor
- Check whether reactor is normal?
- Replace the outdoor main PCB. Power on. Is the error extinguished?
- Replace the outdoor main PCB.

- Check the indoor wiring connection. Is the wiring correct?
- Replace the indoor main PCB.
- Replace the indoor main PCB.
- Check whether reactor is normal?
- Replace the reactor

Figure 22
Remark:

- Use a multimeter to test the DC voltage between 2 port and 3 port of outdoor unit. The red pin of multimeter connects with 2 port while the black pin is for 3 port.

- When AC is normal running, the voltage will move alternately between -25VDC to 25VDC.

- If the outdoor unit has malfunctioned, the voltage will move alternately with positive value.

- While if the indoor unit has malfunction, the voltage will be a certain value.

Remark:

- Use a multimeter to test the resistance of the reactor which does not connect with capacitor.

- The normal value should be around zero ohms. Otherwise, the reactor must have malfunctioned and may need to be replaced.

Figure 23
8.3.3 Zero crossing detection error diagnosis and solution (E2)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>When PCB does not receive zero crossing signal feedback for 4 minutes or the zero crossing signal time interval is abnormal.</td>
</tr>
<tr>
<td>Supposed causes</td>
<td>Connection mistake, PCB faulty</td>
</tr>
</tbody>
</table>

Table 16

Troubleshooting:

Check if the connections and power supply are normal. The power supply should not exceed 10% of the rated voltage.

No → Correct the connections. Turn on the unit when the power supply is good.

Yes → Indoor main PCB is defective. Replace indoor main PCB.

Figure 24
8.3.4 Fan speed has been out of control diagnosis and solution (E3)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>E3/F5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>When indoor fan speed is too low (300RPM) for certain time, the unit will stop and the LED will display the failure.</td>
</tr>
<tr>
<td>Supposed causes</td>
<td>Wiring mistake, Fan assembly faulty, Fan motor faulty, PCB faulty</td>
</tr>
</tbody>
</table>

Table 17

Troubleshooting:

- Power off, then restart the unit 2 minutes later
  - No → The unit operates normally.
  - Yes → Shut off the power supply, Rotate the fan by hand.
    - No → Find out the cause and have it solved.
    - Yes → Check the wiring of fan motor
      - No → Correct the connections.
      - Yes → Measure the fan motor voltage from the main PCB
        - No → Replace the main PCB
        - Yes → Replace the fan motor

Figure 25
Index 1:
1. Indoor or Outdoor DC Fan Motor (control chip is in fan motor)

   Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must have problems and needs to be replaced.

   ![Image of fan motor connector]

   **Figure 26**

   **Table 18**

<table>
<thead>
<tr>
<th>NO.</th>
<th>Color</th>
<th>Signal</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red</td>
<td>Vs/Vm</td>
<td>280V~380V</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Black</td>
<td>GND</td>
<td>0V</td>
</tr>
<tr>
<td>4</td>
<td>White</td>
<td>Vcc</td>
<td>14-17.5V</td>
</tr>
<tr>
<td>5</td>
<td>Yellow</td>
<td>Vsp</td>
<td>0~5.6V</td>
</tr>
<tr>
<td>6</td>
<td>Blue</td>
<td>FG</td>
<td>14-17.5V</td>
</tr>
</tbody>
</table>

   **Table 19**

<table>
<thead>
<tr>
<th>NO.</th>
<th>Color</th>
<th>Signal</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red</td>
<td>Vs/Vm</td>
<td>140V~190V</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Black</td>
<td>GND</td>
<td>0V</td>
</tr>
<tr>
<td>4</td>
<td>White</td>
<td>Vcc</td>
<td>14-17.5V</td>
</tr>
<tr>
<td>5</td>
<td>Yellow</td>
<td>Vsp</td>
<td>0~5.6V</td>
</tr>
<tr>
<td>6</td>
<td>Blue</td>
<td>FG</td>
<td>14-17.5V</td>
</tr>
</tbody>
</table>

2. Outdoor DC Fan Motor (control chip is in outdoor PCB)

   Power on, and check if the fan can run normally, if the fan can run normally, the PCB must have problems and needs to be replaced. If the fan can’t run normally, measure the resistance of each two pins. If the resistance is not equal to each other, the fan motor must have problems and needs to be replaced, otherwise the PCB must have problems and needs to be replaced.

3. Indoor AC Fan Motor

   Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin1 and pin2. If the value of the voltage is less than 100V (208~240V power supply) or 50V (115V power supply), the PCB must have problems and needs to be replaced.
8.3.5 Open circuit or short circuit of temperature sensor diagnosis and solution (E5)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>E4/E5/F1/F2/F3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED will display the failure.</td>
</tr>
</tbody>
</table>
| Supposed causes | ▶ Wiring mistake  
▶ Sensor faulty |

Table 20

Troubleshooting:

![Flowchart](flowchart.png)

Figure 27
Sensor locations

Figure 28  T1 Indoor room temperature sensor position

Figure 29  T2 Evaporator coil temperature sensor position

Figure 30  T2b-A,B,C,D,E evaporator suction/discharge temperature sensor position.
Figure 31  T3 Condenser coil temperature sensor position

Figure 32  T4 Outdoor ambient temperature sensor position

Figure 33  T5 Compressor discharge temperature sensor position
8.3.6 Refrigerant Leakage Detection diagnosis and solution(EC)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>EC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>Define the initial evaporator coil temperature $T_2$ when the compressor just starts running as $T_{cool}$. In the first 5 minutes after the compressor starts up in cooling mode, if $T_2 &lt; T_{cool} - 2^\circ C$ ($T_{cool} - 35.6^\circ C$) does not keep continuous 4 seconds and this situation happens 3 times, the display area will show &quot;EC&quot; and the unit will turn off.</td>
</tr>
</tbody>
</table>
| Supposed causes | ▶ T2 sensor faulty  
▶ Indoor PCB faulty  
▶ System problems, such as leakage or blocking. |

Table 21

Troubleshooting:

- Power off, then restart the unit 2 minutes later.
- Check cool air blowing out from indoor air outlet
- Check leakage of system
- Check blocking of system and clear the blocking

Figure 34
8.3.7 Overload current protection diagnosis and solution (F0)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>F0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>An abnormal current rise is detected by checking the specified current detection circuit.</td>
</tr>
</tbody>
</table>
| Supposed causes | ▶ Power supply problems.  
▶ System blockage  
▶ PCB faulty  
▶ Wiring mistake  
▶ Compressor malfunction |

Table 22

Troubleshooting:

![Flowchart diagram for troubleshooting]

Figure 35
8.3.8 IPM malfunction or IGBT over-strong current protection diagnosis and solution (P0)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>P0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>When the voltage signal that IPM send to compressor drive chip is abnormal, the display LED will show “P0” and AC will turn off.</td>
</tr>
</tbody>
</table>
| Supposed causes | → Wiring mistake  
→ IPM malfunction  
→ Outdoor fan assembly faulty  
→ Compressor malfunction  
→ Outdoor PCB faulty |

Table 23

Troubleshooting:

1. Check the wiring between main PCB and compressor
   - Yes → Correct the connection or replace the wires and connectors.
   - No → Check the IPM
2. Check the IPM
   - Yes → Check the outdoor fan and the outdoor unit ventilation
   - No → Replace the IPM board or replace the main PCB
3. Check the outdoor fan and the outdoor unit ventilation
   - Yes → Check the compressor resistance values
   - No → Please refer to the solution of 【Fan Speed Has Been Out Of Control】malfunction
4. Check the compressor resistance values
   - Yes → Replace the outdoor main PCB
   - No → Replace the compressor.

Figure 36

In most cases the main PCB will fail before the compressor fails. To check if the compressor fails, check the coloring of the material wrapped around the compressor. If the part that touches the compressor has turned brownish due to the compressor running hot, then the compressor most likely has failed.
8.3.9 Over voltage or too low voltage protection diagnosis and solution (P1)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>P1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>An abnormal voltage rise or drop is detected by checking the specified voltage detection circuit.</td>
</tr>
</tbody>
</table>
| Supposed causes | ▶️ Power supply problems.  
▶️ System leakage or block  
▶️ PCB faulty |

Table 24

**Troubleshooting:**

- **Check the power supply**
  - No ➔ Stop the unit
  - Yes ➔ **Check the connections and wires**

- **Check the connections and wires**
  - No ➔ Correct the connections or replace the wires.
  - Yes ➔ **Check the voltage between P and N**

- **Check the voltage between P and N**
  - No ➔ Replace the IPM board
  - Yes ➔ **Check the reactor**

- **Check the reactor**
  - No ➔ Replace outdoor main PCB
  - Yes ➔ Replace the reactor

Figure 37

> Measure the DC voltage between P and N port. The normal value should be around 310V.
8.3.10 High temperature protection of IPM module or compressor top
diagnosis and solution (P2)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>If the sampling voltage is not 5V, the LED will display the failure.</td>
</tr>
</tbody>
</table>
| Supposed causes | ▶ Installation mistake  
▶ Power supply problems.  
▶ System leakage or block  
▶ PCB faulty |

Table 25

Troubleshooting:

For 18K, 24K,

Check if the Fastening screws on the PCB and IPM radiator are fixed tightly.

- Yes
- No

Tighten the screws and apply silicon grease.  
Replace the outdoor control PCB.

For other models,

Check if the air flow systems of indoor and outdoor units are obstructed?

- Yes  
  Clear up the air inlet and outlet or the heat exchanger of indoor and outdoor units.
- No  
  Turn off the power supply and turn it on 10 minutes later.

Check if the temperature of compressor Top is more than 90°C?

- Yes
- No

Check if all the connections, especially the connection of OLP (Over Load Protector) sensor is good.

- Yes  
  Measure the resistance between the two ports of the OLP. Is it zero?
- No  
  Correct the connection.

Replace the outdoor control PCB.

- Yes
- No

Replace the OLP.

Replace the refrigerant system.

Replace the outdoor control PCB.

Figure 38
8.3.11 Inverter compressor drive error diagnosis and solution(P4)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>P4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction decision conditions</td>
<td>An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on.</td>
</tr>
</tbody>
</table>
| Supposed causes | • Wiring mistake  
• IPM malfunction  
• Outdoor fan assembly faulty  
• Compressor malfunction  
• Outdoor PCB faulty |

Table 26

Troubleshooting:

- Check the wiring between main PCB and compressor
  - Yes: Correct the connection or replace the wires and connectors.
  - No: Check the IPM
    - Yes: Replace the IPM board or replace the main PCB
    - No: Please refer to the solution of [Fan Speed Has Been Out Of Control] malfunction
- Check the outdoor fan and the outdoor unit ventilation
  - Yes: Check the compressor resistance values
    - Yes: Replace the outdoor main PCB
    - No: Replace the compressor.
  - No: Replace the outdoor main PCB
Main parts check

1. Temperature sensor checking

Disconnect the temperature sensor from PCB, measure the resistance value with a tester.

Temperature sensors:

- Room temp. (T1) sensor,
- Indoor coil temp. (T2) sensor,
- Outdoor coil temp. (T3) sensor,
- Outdoor ambient temp. (T4) sensor,
- Compressor discharge temp. (T5) sensor.

Measure the resistance value of each winding by using the multi-meter.
### Appendix 1  Resistance to Temperature value table for resistive sensors:
\[ \text{ °C--K }\]

<table>
<thead>
<tr>
<th>°C</th>
<th>°F</th>
<th>K Ohm</th>
<th>°C</th>
<th>°F</th>
<th>K Ohm</th>
<th>°C</th>
<th>°F</th>
<th>K Ohm</th>
<th>°C</th>
<th>°F</th>
<th>K Ohm</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20</td>
<td>-4</td>
<td>115.266</td>
<td>20</td>
<td>68</td>
<td>12.6431</td>
<td>60</td>
<td>140</td>
<td>2.35774</td>
<td>100</td>
<td>212</td>
<td>0.62973</td>
</tr>
<tr>
<td>-19</td>
<td>108.146</td>
<td>21</td>
<td>70</td>
<td>12.0561</td>
<td>61</td>
<td>142</td>
<td>2.27249</td>
<td>101</td>
<td>214</td>
<td>0.61148</td>
<td></td>
</tr>
<tr>
<td>-18</td>
<td>101.517</td>
<td>22</td>
<td>72</td>
<td>11.5</td>
<td>62</td>
<td>144</td>
<td>2.19073</td>
<td>102</td>
<td>216</td>
<td>0.59386</td>
<td></td>
</tr>
<tr>
<td>-17</td>
<td>96.3423</td>
<td>23</td>
<td>73</td>
<td>10.9731</td>
<td>63</td>
<td>145</td>
<td>2.11241</td>
<td>103</td>
<td>217</td>
<td>0.57683</td>
<td></td>
</tr>
<tr>
<td>-16</td>
<td>89.5865</td>
<td>24</td>
<td>75</td>
<td>10.4736</td>
<td>64</td>
<td>147</td>
<td>2.03732</td>
<td>104</td>
<td>219</td>
<td>0.56038</td>
<td></td>
</tr>
<tr>
<td>-15</td>
<td>84.219</td>
<td>25</td>
<td>77</td>
<td>10</td>
<td>65</td>
<td>149</td>
<td>1.96532</td>
<td>105</td>
<td>221</td>
<td>0.54448</td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td>79.311</td>
<td>26</td>
<td>79</td>
<td>9.55074</td>
<td>66</td>
<td>151</td>
<td>1.89627</td>
<td>106</td>
<td>223</td>
<td>0.52912</td>
<td></td>
</tr>
<tr>
<td>-13</td>
<td>74.536</td>
<td>27</td>
<td>81</td>
<td>9.12445</td>
<td>67</td>
<td>153</td>
<td>1.83003</td>
<td>107</td>
<td>225</td>
<td>0.51426</td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td>70.1698</td>
<td>28</td>
<td>82</td>
<td>8.71983</td>
<td>68</td>
<td>155</td>
<td>1.76647</td>
<td>108</td>
<td>226</td>
<td>0.49989</td>
<td></td>
</tr>
<tr>
<td>-11</td>
<td>66.0898</td>
<td>29</td>
<td>84</td>
<td>8.35666</td>
<td>69</td>
<td>156</td>
<td>1.70547</td>
<td>109</td>
<td>228</td>
<td>0.486</td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td>62.7256</td>
<td>30</td>
<td>86</td>
<td>7.97078</td>
<td>70</td>
<td>158</td>
<td>1.64691</td>
<td>110</td>
<td>230</td>
<td>0.47256</td>
<td></td>
</tr>
<tr>
<td>-9</td>
<td>58.7079</td>
<td>31</td>
<td>88</td>
<td>7.62411</td>
<td>71</td>
<td>160</td>
<td>1.59068</td>
<td>111</td>
<td>232</td>
<td>0.45957</td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td>56.3694</td>
<td>32</td>
<td>90</td>
<td>7.29464</td>
<td>72</td>
<td>162</td>
<td>1.53668</td>
<td>112</td>
<td>234</td>
<td>0.44699</td>
<td></td>
</tr>
<tr>
<td>-7</td>
<td>52.2438</td>
<td>33</td>
<td>91</td>
<td>6.98142</td>
<td>73</td>
<td>163</td>
<td>1.48481</td>
<td>113</td>
<td>235</td>
<td>0.43482</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td>49.3161</td>
<td>34</td>
<td>93</td>
<td>6.68355</td>
<td>74</td>
<td>165</td>
<td>1.43498</td>
<td>114</td>
<td>237</td>
<td>0.42304</td>
<td></td>
</tr>
<tr>
<td>-5</td>
<td>46.5725</td>
<td>35</td>
<td>95</td>
<td>6.40021</td>
<td>75</td>
<td>166</td>
<td>1.38703</td>
<td>115</td>
<td>239</td>
<td>0.41164</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td>44</td>
<td>36</td>
<td>97</td>
<td>6.13059</td>
<td>76</td>
<td>169</td>
<td>1.34105</td>
<td>116</td>
<td>241</td>
<td>0.4006</td>
<td></td>
</tr>
<tr>
<td>-3</td>
<td>41.5878</td>
<td>37</td>
<td>99</td>
<td>5.87359</td>
<td>77</td>
<td>171</td>
<td>1.29078</td>
<td>117</td>
<td>243</td>
<td>0.38991</td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td>39.8239</td>
<td>38</td>
<td>100</td>
<td>5.62961</td>
<td>78</td>
<td>172</td>
<td>1.25423</td>
<td>118</td>
<td>244</td>
<td>0.37956</td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td>37.1988</td>
<td>39</td>
<td>102</td>
<td>5.39689</td>
<td>79</td>
<td>174</td>
<td>1.2133</td>
<td>119</td>
<td>246</td>
<td>0.36954</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>35.2024</td>
<td>40</td>
<td>104</td>
<td>5.17519</td>
<td>80</td>
<td>176</td>
<td>1.17393</td>
<td>120</td>
<td>248</td>
<td>0.35982</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>33.3269</td>
<td>41</td>
<td>106</td>
<td>4.96392</td>
<td>81</td>
<td>178</td>
<td>1.13604</td>
<td>121</td>
<td>250</td>
<td>0.35042</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>31.5635</td>
<td>42</td>
<td>108</td>
<td>4.76253</td>
<td>82</td>
<td>180</td>
<td>1.09958</td>
<td>122</td>
<td>252</td>
<td>0.3413</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>29.9058</td>
<td>43</td>
<td>109</td>
<td>4.5705</td>
<td>83</td>
<td>181</td>
<td>1.06448</td>
<td>123</td>
<td>253</td>
<td>0.33246</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>28.3459</td>
<td>44</td>
<td>111</td>
<td>4.38736</td>
<td>84</td>
<td>183</td>
<td>1.03069</td>
<td>124</td>
<td>255</td>
<td>0.3239</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>26.8778</td>
<td>45</td>
<td>113</td>
<td>4.21263</td>
<td>85</td>
<td>185</td>
<td>0.99815</td>
<td>125</td>
<td>257</td>
<td>0.31559</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>25.4954</td>
<td>46</td>
<td>115</td>
<td>4.04589</td>
<td>86</td>
<td>187</td>
<td>0.96681</td>
<td>126</td>
<td>259</td>
<td>0.30754</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>24.1932</td>
<td>47</td>
<td>117</td>
<td>3.88673</td>
<td>87</td>
<td>189</td>
<td>0.93662</td>
<td>127</td>
<td>261</td>
<td>0.29974</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>22.5662</td>
<td>48</td>
<td>118</td>
<td>3.73476</td>
<td>88</td>
<td>190</td>
<td>0.90753</td>
<td>128</td>
<td>262</td>
<td>0.29216</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>21.0094</td>
<td>49</td>
<td>120</td>
<td>3.58962</td>
<td>89</td>
<td>192</td>
<td>0.8795</td>
<td>129</td>
<td>264</td>
<td>0.28482</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>20.7184</td>
<td>50</td>
<td>122</td>
<td>3.45097</td>
<td>90</td>
<td>194</td>
<td>0.85248</td>
<td>130</td>
<td>266</td>
<td>0.2777</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>19.6891</td>
<td>51</td>
<td>124</td>
<td>3.31847</td>
<td>91</td>
<td>196</td>
<td>0.82643</td>
<td>131</td>
<td>268</td>
<td>0.27078</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>18.7177</td>
<td>52</td>
<td>126</td>
<td>3.19183</td>
<td>92</td>
<td>198</td>
<td>0.80132</td>
<td>132</td>
<td>270</td>
<td>0.26408</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>17.8005</td>
<td>53</td>
<td>127</td>
<td>3.07075</td>
<td>93</td>
<td>199</td>
<td>0.77709</td>
<td>133</td>
<td>271</td>
<td>0.25757</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>16.9341</td>
<td>54</td>
<td>129</td>
<td>2.95896</td>
<td>94</td>
<td>201</td>
<td>0.75373</td>
<td>134</td>
<td>273</td>
<td>0.25125</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>16.1156</td>
<td>55</td>
<td>131</td>
<td>2.84421</td>
<td>95</td>
<td>203</td>
<td>0.73119</td>
<td>135</td>
<td>275</td>
<td>0.24512</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>15.3418</td>
<td>56</td>
<td>133</td>
<td>2.73823</td>
<td>96</td>
<td>205</td>
<td>0.70944</td>
<td>136</td>
<td>277</td>
<td>0.23916</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>14.6181</td>
<td>57</td>
<td>135</td>
<td>2.63682</td>
<td>97</td>
<td>207</td>
<td>0.68844</td>
<td>137</td>
<td>279</td>
<td>0.23338</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>13.918</td>
<td>58</td>
<td>136</td>
<td>2.53973</td>
<td>98</td>
<td>208</td>
<td>0.66818</td>
<td>138</td>
<td>280</td>
<td>0.22776</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>13.2631</td>
<td>59</td>
<td>138</td>
<td>2.44677</td>
<td>99</td>
<td>210</td>
<td>0.64862</td>
<td>139</td>
<td>282</td>
<td>0.22231</td>
<td></td>
</tr>
</tbody>
</table>

Table 27
### Appendix 2  Resistance to Temperature value table for resistive sensors: T5 (°C → K)

<table>
<thead>
<tr>
<th>°C</th>
<th>°F</th>
<th>K Ohm</th>
<th>°C</th>
<th>°F</th>
<th>K Ohm</th>
<th>°C</th>
<th>°F</th>
<th>K Ohm</th>
<th>°C</th>
<th>°F</th>
<th>K Ohm</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20</td>
<td>-4</td>
<td>542.7</td>
<td>20</td>
<td>68</td>
<td>68.66</td>
<td>40</td>
<td>96</td>
<td>96.22</td>
<td>100</td>
<td>212</td>
<td>3.702</td>
</tr>
<tr>
<td>-19</td>
<td>-2</td>
<td>511.9</td>
<td>21</td>
<td>70</td>
<td>65.62</td>
<td>41</td>
<td>98</td>
<td>97.62</td>
<td>101</td>
<td>214</td>
<td>3.595</td>
</tr>
<tr>
<td>-18</td>
<td>0</td>
<td>483</td>
<td>22</td>
<td>72</td>
<td>62.73</td>
<td>62</td>
<td>142</td>
<td>12.65</td>
<td>102</td>
<td>216</td>
<td>3.492</td>
</tr>
<tr>
<td>-17</td>
<td>1</td>
<td>455.9</td>
<td>23</td>
<td>73</td>
<td>59.98</td>
<td>43</td>
<td>109</td>
<td>14.52</td>
<td>103</td>
<td>217</td>
<td>3.392</td>
</tr>
<tr>
<td>-16</td>
<td>3</td>
<td>430.5</td>
<td>24</td>
<td>75</td>
<td>57.37</td>
<td>44</td>
<td>112</td>
<td>14.17</td>
<td>104</td>
<td>219</td>
<td>3.296</td>
</tr>
<tr>
<td>-15</td>
<td>5</td>
<td>406.7</td>
<td>25</td>
<td>77</td>
<td>54.89</td>
<td>65</td>
<td>149</td>
<td>11.38</td>
<td>105</td>
<td>221</td>
<td>3.203</td>
</tr>
<tr>
<td>-14</td>
<td>7</td>
<td>384.3</td>
<td>26</td>
<td>79</td>
<td>52.53</td>
<td>66</td>
<td>151</td>
<td>10.99</td>
<td>106</td>
<td>223</td>
<td>3.113</td>
</tr>
<tr>
<td>-13</td>
<td>9</td>
<td>363.3</td>
<td>27</td>
<td>81</td>
<td>50.28</td>
<td>67</td>
<td>153</td>
<td>10.61</td>
<td>107</td>
<td>225</td>
<td>3.025</td>
</tr>
<tr>
<td>-12</td>
<td>10</td>
<td>343.6</td>
<td>28</td>
<td>82</td>
<td>48.14</td>
<td>68</td>
<td>154</td>
<td>10.25</td>
<td>108</td>
<td>226</td>
<td>2.941</td>
</tr>
<tr>
<td>-11</td>
<td>12</td>
<td>325.1</td>
<td>29</td>
<td>84</td>
<td>46.11</td>
<td>69</td>
<td>156</td>
<td>9.902</td>
<td>109</td>
<td>228</td>
<td>2.86</td>
</tr>
<tr>
<td>-10</td>
<td>14</td>
<td>307.7</td>
<td>30</td>
<td>86</td>
<td>44.17</td>
<td>70</td>
<td>158</td>
<td>9.569</td>
<td>110</td>
<td>230</td>
<td>2.781</td>
</tr>
<tr>
<td>-9</td>
<td>16</td>
<td>291.3</td>
<td>31</td>
<td>88</td>
<td>42.33</td>
<td>71</td>
<td>160</td>
<td>9.248</td>
<td>111</td>
<td>232</td>
<td>2.704</td>
</tr>
<tr>
<td>-8</td>
<td>18</td>
<td>275.9</td>
<td>32</td>
<td>90</td>
<td>40.57</td>
<td>72</td>
<td>162</td>
<td>8.94</td>
<td>112</td>
<td>234</td>
<td>2.63</td>
</tr>
<tr>
<td>-7</td>
<td>19</td>
<td>261.4</td>
<td>33</td>
<td>91</td>
<td>38.89</td>
<td>73</td>
<td>163</td>
<td>8.643</td>
<td>113</td>
<td>235</td>
<td>2.559</td>
</tr>
<tr>
<td>-6</td>
<td>21</td>
<td>247.8</td>
<td>34</td>
<td>93</td>
<td>37.3</td>
<td>74</td>
<td>165</td>
<td>8.358</td>
<td>114</td>
<td>237</td>
<td>2.489</td>
</tr>
<tr>
<td>-5</td>
<td>23</td>
<td>234.9</td>
<td>35</td>
<td>95</td>
<td>35.78</td>
<td>75</td>
<td>167</td>
<td>8.084</td>
<td>115</td>
<td>239</td>
<td>2.422</td>
</tr>
<tr>
<td>-4</td>
<td>25</td>
<td>222.8</td>
<td>36</td>
<td>97</td>
<td>34.32</td>
<td>76</td>
<td>169</td>
<td>7.82</td>
<td>116</td>
<td>241</td>
<td>2.357</td>
</tr>
<tr>
<td>-3</td>
<td>27</td>
<td>211.4</td>
<td>37</td>
<td>99</td>
<td>32.94</td>
<td>77</td>
<td>171</td>
<td>7.566</td>
<td>117</td>
<td>243</td>
<td>2.294</td>
</tr>
<tr>
<td>-2</td>
<td>28</td>
<td>200.7</td>
<td>38</td>
<td>100</td>
<td>31.62</td>
<td>78</td>
<td>172</td>
<td>7.321</td>
<td>118</td>
<td>244</td>
<td>2.233</td>
</tr>
<tr>
<td>-1</td>
<td>30</td>
<td>190.5</td>
<td>39</td>
<td>102</td>
<td>30.36</td>
<td>79</td>
<td>174</td>
<td>7.086</td>
<td>119</td>
<td>246</td>
<td>2.174</td>
</tr>
<tr>
<td>0</td>
<td>32</td>
<td>180.9</td>
<td>40</td>
<td>104</td>
<td>29.15</td>
<td>80</td>
<td>176</td>
<td>6.859</td>
<td>120</td>
<td>248</td>
<td>2.117</td>
</tr>
<tr>
<td>1</td>
<td>34</td>
<td>171.9</td>
<td>41</td>
<td>106</td>
<td>28</td>
<td>81</td>
<td>178</td>
<td>6.641</td>
<td>121</td>
<td>250</td>
<td>2.061</td>
</tr>
<tr>
<td>2</td>
<td>36</td>
<td>163.3</td>
<td>42</td>
<td>108</td>
<td>26.9</td>
<td>82</td>
<td>180</td>
<td>6.43</td>
<td>122</td>
<td>252</td>
<td>2.007</td>
</tr>
<tr>
<td>3</td>
<td>37</td>
<td>155.2</td>
<td>43</td>
<td>109</td>
<td>25.86</td>
<td>83</td>
<td>181</td>
<td>6.228</td>
<td>123</td>
<td>253</td>
<td>1.955</td>
</tr>
<tr>
<td>4</td>
<td>39</td>
<td>147.6</td>
<td>44</td>
<td>111</td>
<td>24.85</td>
<td>84</td>
<td>183</td>
<td>6.033</td>
<td>124</td>
<td>255</td>
<td>1.905</td>
</tr>
<tr>
<td>5</td>
<td>41</td>
<td>140.4</td>
<td>45</td>
<td>113</td>
<td>23.89</td>
<td>85</td>
<td>185</td>
<td>5.844</td>
<td>125</td>
<td>257</td>
<td>1.856</td>
</tr>
<tr>
<td>6</td>
<td>43</td>
<td>133.5</td>
<td>46</td>
<td>115</td>
<td>22.89</td>
<td>86</td>
<td>187</td>
<td>5.663</td>
<td>126</td>
<td>259</td>
<td>1.808</td>
</tr>
<tr>
<td>7</td>
<td>45</td>
<td>127.1</td>
<td>47</td>
<td>117</td>
<td>21.8</td>
<td>87</td>
<td>189</td>
<td>5.488</td>
<td>127</td>
<td>261</td>
<td>1.762</td>
</tr>
<tr>
<td>8</td>
<td>46</td>
<td>121</td>
<td>48</td>
<td>118</td>
<td>20.76</td>
<td>88</td>
<td>190</td>
<td>5.32</td>
<td>128</td>
<td>262</td>
<td>1.717</td>
</tr>
<tr>
<td>9</td>
<td>48</td>
<td>115.2</td>
<td>49</td>
<td>120</td>
<td>20.46</td>
<td>89</td>
<td>192</td>
<td>5.157</td>
<td>129</td>
<td>264</td>
<td>1.674</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
<td>109.8</td>
<td>50</td>
<td>122</td>
<td>19.69</td>
<td>90</td>
<td>194</td>
<td>5</td>
<td>130</td>
<td>266</td>
<td>1.632</td>
</tr>
<tr>
<td>11</td>
<td>52</td>
<td>104.6</td>
<td>51</td>
<td>124</td>
<td>18.96</td>
<td>91</td>
<td>196</td>
<td>4.849</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>54</td>
<td>99.69</td>
<td>52</td>
<td>126</td>
<td>18.26</td>
<td>92</td>
<td>198</td>
<td>4.703</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>55</td>
<td>95.05</td>
<td>53</td>
<td>127</td>
<td>17.58</td>
<td>93</td>
<td>199</td>
<td>4.562</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>57</td>
<td>90.66</td>
<td>54</td>
<td>129</td>
<td>16.94</td>
<td>94</td>
<td>201</td>
<td>4.426</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>59</td>
<td>86.49</td>
<td>55</td>
<td>131</td>
<td>16.32</td>
<td>95</td>
<td>203</td>
<td>4.294</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>61</td>
<td>82.54</td>
<td>56</td>
<td>133</td>
<td>15.73</td>
<td>96</td>
<td>205</td>
<td>4.167</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>63</td>
<td>78.79</td>
<td>57</td>
<td>135</td>
<td>15.16</td>
<td>97</td>
<td>207</td>
<td>4.045</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>64</td>
<td>75.24</td>
<td>58</td>
<td>136</td>
<td>14.62</td>
<td>98</td>
<td>208</td>
<td>3.927</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>66</td>
<td>71.86</td>
<td>59</td>
<td>138</td>
<td>14.09</td>
<td>99</td>
<td>210</td>
<td>3.812</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 28
Appendix 3

Figure 41

\[(\degree F) = 1.8 \times (\degree C) + 32\]

<table>
<thead>
<tr>
<th>°C</th>
<th>°F</th>
<th>°C</th>
<th>°F</th>
<th>°C</th>
<th>°F</th>
<th>°C</th>
<th>°F</th>
<th>°C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5</td>
<td>23</td>
<td>21</td>
<td>69.8</td>
<td>51</td>
<td>123.8</td>
<td>82</td>
<td>179.6</td>
<td>113</td>
<td>235.4</td>
</tr>
<tr>
<td>-4</td>
<td>24.8</td>
<td>22</td>
<td>71.6</td>
<td>52</td>
<td>125.6</td>
<td>83</td>
<td>181.4</td>
<td>114</td>
<td>237.2</td>
</tr>
<tr>
<td>-3</td>
<td>26.6</td>
<td>23</td>
<td>73.4</td>
<td>53</td>
<td>127.4</td>
<td>84</td>
<td>183.2</td>
<td>115</td>
<td>239</td>
</tr>
<tr>
<td>-2</td>
<td>28.4</td>
<td>24</td>
<td>75.2</td>
<td>54</td>
<td>129.2</td>
<td>85</td>
<td>185</td>
<td>116</td>
<td>240.8</td>
</tr>
<tr>
<td>-1</td>
<td>30.2</td>
<td>25</td>
<td>77</td>
<td>55</td>
<td>131</td>
<td>86</td>
<td>186.8</td>
<td>117</td>
<td>242.6</td>
</tr>
<tr>
<td>0</td>
<td>32</td>
<td>25.5</td>
<td>77.9</td>
<td>56</td>
<td>132.8</td>
<td>87</td>
<td>188.6</td>
<td>118</td>
<td>244.4</td>
</tr>
<tr>
<td>0.5</td>
<td>32.9</td>
<td>26</td>
<td>78.8</td>
<td>57</td>
<td>134.6</td>
<td>88</td>
<td>190.4</td>
<td>119</td>
<td>246.2</td>
</tr>
<tr>
<td>1</td>
<td>33.8</td>
<td>27</td>
<td>80.6</td>
<td>58</td>
<td>136.4</td>
<td>89</td>
<td>192.2</td>
<td>120</td>
<td>248</td>
</tr>
<tr>
<td>1.5</td>
<td>34.7</td>
<td>28</td>
<td>82.4</td>
<td>59</td>
<td>138.2</td>
<td>90</td>
<td>194</td>
<td>121</td>
<td>249.8</td>
</tr>
<tr>
<td>2</td>
<td>35.6</td>
<td>29</td>
<td>84.2</td>
<td>60</td>
<td>140</td>
<td>91</td>
<td>195.8</td>
<td>122</td>
<td>251.6</td>
</tr>
<tr>
<td>2.5</td>
<td>36.5</td>
<td>30</td>
<td>86</td>
<td>61</td>
<td>141.8</td>
<td>92</td>
<td>197.6</td>
<td>123</td>
<td>253.4</td>
</tr>
<tr>
<td>3</td>
<td>37.4</td>
<td>31</td>
<td>87.8</td>
<td>62</td>
<td>143.6</td>
<td>93</td>
<td>199.4</td>
<td>124</td>
<td>255.2</td>
</tr>
<tr>
<td>3.5</td>
<td>38.3</td>
<td>32</td>
<td>89.6</td>
<td>63</td>
<td>145.4</td>
<td>94</td>
<td>201.2</td>
<td>125</td>
<td>257</td>
</tr>
<tr>
<td>4</td>
<td>39.2</td>
<td>33</td>
<td>91.4</td>
<td>64</td>
<td>147.2</td>
<td>95</td>
<td>203</td>
<td>126</td>
<td>258.8</td>
</tr>
<tr>
<td>4.5</td>
<td>40.1</td>
<td>34</td>
<td>93.2</td>
<td>65</td>
<td>149</td>
<td>96</td>
<td>204.8</td>
<td>127</td>
<td>260.6</td>
</tr>
<tr>
<td>5</td>
<td>41</td>
<td>35</td>
<td>95</td>
<td>66</td>
<td>150.8</td>
<td>97</td>
<td>206.6</td>
<td>128</td>
<td>262.4</td>
</tr>
<tr>
<td>6</td>
<td>42.8</td>
<td>36</td>
<td>96.8</td>
<td>67</td>
<td>152.6</td>
<td>98</td>
<td>208.4</td>
<td>129</td>
<td>264.2</td>
</tr>
<tr>
<td>7</td>
<td>44.6</td>
<td>37</td>
<td>98.6</td>
<td>68</td>
<td>154.4</td>
<td>99</td>
<td>210.2</td>
<td>130</td>
<td>266</td>
</tr>
<tr>
<td>8</td>
<td>46.4</td>
<td>38</td>
<td>100.4</td>
<td>69</td>
<td>156.2</td>
<td>100</td>
<td>212</td>
<td>131</td>
<td>267.8</td>
</tr>
<tr>
<td>9</td>
<td>48.2</td>
<td>39</td>
<td>102.2</td>
<td>70</td>
<td>158</td>
<td>101</td>
<td>213.8</td>
<td>132</td>
<td>269.6</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
<td>40</td>
<td>104</td>
<td>71</td>
<td>159.8</td>
<td>102</td>
<td>215.6</td>
<td>133</td>
<td>271.4</td>
</tr>
<tr>
<td>11</td>
<td>51.8</td>
<td>41</td>
<td>105.8</td>
<td>72</td>
<td>161.6</td>
<td>103</td>
<td>217.4</td>
<td>134</td>
<td>273.2</td>
</tr>
<tr>
<td>12</td>
<td>53.6</td>
<td>42</td>
<td>107.6</td>
<td>73</td>
<td>163.4</td>
<td>104</td>
<td>219.2</td>
<td>135</td>
<td>275</td>
</tr>
<tr>
<td>13</td>
<td>55.4</td>
<td>43</td>
<td>109.4</td>
<td>74</td>
<td>165.2</td>
<td>105</td>
<td>221</td>
<td>136</td>
<td>276.8</td>
</tr>
<tr>
<td>14</td>
<td>57.2</td>
<td>44</td>
<td>111.2</td>
<td>75</td>
<td>167</td>
<td>106</td>
<td>222.8</td>
<td>137</td>
<td>278.6</td>
</tr>
<tr>
<td>15</td>
<td>59</td>
<td>45</td>
<td>113</td>
<td>76</td>
<td>168.8</td>
<td>107</td>
<td>224.6</td>
<td>138</td>
<td>280.4</td>
</tr>
<tr>
<td>16</td>
<td>60.8</td>
<td>46</td>
<td>114.8</td>
<td>77</td>
<td>170.6</td>
<td>108</td>
<td>226.4</td>
<td>139</td>
<td>282.2</td>
</tr>
<tr>
<td>17</td>
<td>62.6</td>
<td>47</td>
<td>116.6</td>
<td>78</td>
<td>172.4</td>
<td>109</td>
<td>228.2</td>
<td>140</td>
<td>284</td>
</tr>
<tr>
<td>18</td>
<td>64.4</td>
<td>48</td>
<td>118.4</td>
<td>79</td>
<td>174.2</td>
<td>110</td>
<td>230</td>
<td>141</td>
<td>285.8</td>
</tr>
<tr>
<td>19</td>
<td>66.2</td>
<td>49</td>
<td>120.2</td>
<td>80</td>
<td>176</td>
<td>111</td>
<td>231.8</td>
<td>142</td>
<td>287.6</td>
</tr>
<tr>
<td>20</td>
<td>68</td>
<td>50</td>
<td>122</td>
<td>81</td>
<td>177.8</td>
<td>112</td>
<td>233.6</td>
<td>143</td>
<td>289.4</td>
</tr>
</tbody>
</table>

Table 29
2. **Compressor checking**

Measure the resistance value of each winding by using the tester.

![Input Terminal Diagram](image)

**Table 30**

<table>
<thead>
<tr>
<th>Position</th>
<th>Resistance Value per Compressor Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ASN98D22UFZ</td>
</tr>
<tr>
<td>Blue - Red</td>
<td>1.57Ω</td>
</tr>
<tr>
<td>Blue - Black</td>
<td></td>
</tr>
<tr>
<td>Red - Black</td>
<td></td>
</tr>
</tbody>
</table>

![Resistor Measurement](image)
3. **IPM continuity check**

Turn off the power, let the large capacity electrolytic capacitors discharge completely, and dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

<table>
<thead>
<tr>
<th>Digital tester</th>
<th>Normal resistance value</th>
<th>Digital tester</th>
<th>Normal resistance value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(+)Red</td>
<td>(-)Black</td>
<td>(+)Red</td>
<td>(-)Black</td>
</tr>
<tr>
<td>P</td>
<td>N</td>
<td>U</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>(∞) (Several MΩ)</td>
<td></td>
<td>(∞) (Several MΩ)</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td></td>
<td>W</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 31

4. **Fan Motor**

Measure the resistance value of each winding by using the tester.

<table>
<thead>
<tr>
<th>Model</th>
<th>YKT-32-6-202L</th>
<th>YKT-32-6-3L</th>
<th>YKT-48-6-206</th>
<th>YKT-63-6-200L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black – Red</td>
<td>Tongde</td>
<td>Welling</td>
<td>Welling</td>
<td>Welling</td>
</tr>
<tr>
<td>Main Ω</td>
<td>86</td>
<td>213</td>
<td>152</td>
<td>88.5</td>
</tr>
<tr>
<td>Blue – Black</td>
<td>64</td>
<td>156</td>
<td>142</td>
<td>138</td>
</tr>
<tr>
<td>AUX Ω</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 32
5. Suction pressure at the service port

Cooling chart:

<table>
<thead>
<tr>
<th>°F (°C)</th>
<th>IDT / ODT</th>
<th>75 (23.89)</th>
<th>85 (29.44)</th>
<th>95 (35)</th>
<th>105 (40.56)</th>
<th>115 (46.11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAR</td>
<td>70/59</td>
<td>8.2</td>
<td>7.8</td>
<td>8.1</td>
<td>8.6</td>
<td>10.1</td>
</tr>
<tr>
<td>BAR</td>
<td>75/63</td>
<td>8.6</td>
<td>8.3</td>
<td>8.7</td>
<td>9.1</td>
<td>10.7</td>
</tr>
<tr>
<td>BAR</td>
<td>80/67</td>
<td>9.3</td>
<td>8.9</td>
<td>9.1</td>
<td>9.6</td>
<td>11.2</td>
</tr>
<tr>
<td>PSI</td>
<td>70/59</td>
<td>119</td>
<td>113</td>
<td>117</td>
<td>125</td>
<td>147</td>
</tr>
<tr>
<td>PSI</td>
<td>75/63</td>
<td>124</td>
<td>120</td>
<td>126</td>
<td>132</td>
<td>155</td>
</tr>
<tr>
<td>PSI</td>
<td>80/67</td>
<td>135</td>
<td>129</td>
<td>132</td>
<td>140</td>
<td>162</td>
</tr>
<tr>
<td>MPA</td>
<td>70/59</td>
<td>0.82</td>
<td>0.78</td>
<td>0.81</td>
<td>0.86</td>
<td>1.01</td>
</tr>
<tr>
<td>MPA</td>
<td>75/63</td>
<td>0.86</td>
<td>0.83</td>
<td>0.87</td>
<td>0.91</td>
<td>1.07</td>
</tr>
<tr>
<td>MPA</td>
<td>80/67</td>
<td>0.93</td>
<td>0.89</td>
<td>0.91</td>
<td>0.96</td>
<td>1.12</td>
</tr>
</tbody>
</table>

Table 33

Heating chart:

<table>
<thead>
<tr>
<th>°F (°C)</th>
<th>IDT / ODT</th>
<th>57/53 (13.89/11.67)</th>
<th>47/43 (8.33/6.11)</th>
<th>37/33 (2.78/0.56)</th>
<th>27/23 (-2.78/-5)</th>
<th>17/13 (-8.33/-10.56)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAR</td>
<td>55</td>
<td>30.3</td>
<td>28.5</td>
<td>25.3</td>
<td>22.8</td>
<td>20.8</td>
</tr>
<tr>
<td>BAR</td>
<td>65</td>
<td>32.5</td>
<td>30.0</td>
<td>26.6</td>
<td>25.4</td>
<td>23.3</td>
</tr>
<tr>
<td>BAR</td>
<td>75</td>
<td>33.8</td>
<td>31.5</td>
<td>27.8</td>
<td>26.3</td>
<td>24.9</td>
</tr>
<tr>
<td>PSI</td>
<td>55</td>
<td>439</td>
<td>413</td>
<td>367</td>
<td>330</td>
<td>302</td>
</tr>
<tr>
<td>PSI</td>
<td>65</td>
<td>471</td>
<td>435</td>
<td>386</td>
<td>368</td>
<td>339</td>
</tr>
<tr>
<td>PSI</td>
<td>75</td>
<td>489</td>
<td>457</td>
<td>403</td>
<td>381</td>
<td>362</td>
</tr>
<tr>
<td>MPA</td>
<td>55</td>
<td>3.03</td>
<td>2.85</td>
<td>2.53</td>
<td>2.28</td>
<td>2.08</td>
</tr>
<tr>
<td>MPA</td>
<td>65</td>
<td>3.25</td>
<td>3.00</td>
<td>2.66</td>
<td>2.54</td>
<td>2.33</td>
</tr>
<tr>
<td>MPA</td>
<td>75</td>
<td>3.38</td>
<td>3.15</td>
<td>2.78</td>
<td>2.63</td>
<td>2.49</td>
</tr>
</tbody>
</table>

Table 34
9 Disassembly Guide

This part is for reference, the photos may have slight differences with your machine.

9.1 Indoor unit

9.1.1 How to Remove the filter

- Step 1: Put your hands at A and B (Fig. 62), lift the filter a little to loosen the fastener.
- Step 2: Pull the filter gently along the horizontal direction.
- Step 3: Pull out the filter.

9.1.2 How to Remove the horizontal louver (Fig. 63)

- Step 1: Open the horizontal louver, push the locker towards right to open it.
- Step 2: Bend the horizontal louver lightly, remove it from the indoor unit.

9.1.3 How to hold the indoor for piping connection

- Step 1: Open the screw caps A and B (Fig. 64), remove the two screws.
- Step 2: Open the panel assembly, move the slider to fix the panel.
Step 3: Press the locker A and B (Fig. 65), to loosen the indoor from the installation plate.

Step 4: Unfold the supporter of installation plate, then let it to hold the indoor unit, helpful to do pipe connection in the back.

9.1.4 How to Remove the panel assembly

Step 1: Open the screw caps A and B (Fig. 66), remove the two screws.

Step 2: Open the panel assembly, loosen the display board connector.

Step 3: Pull the panel assembly along the direction indicated in Fig. 67 to remove it.
9.1.5 How to Remove the PCB (Fig. 68)

- Step 1: Press A to remove the terminal cover.
- Step 2: Remove screw B to remove the cover of the electronic control box.
- Step 3: Then you can remove the PCB.

9.1.6 How to Remove the Electrical control box

- Step 1: Remove screw A, B, C, pull out the coil temp. sensor D from the sensor holders (Fig. 69).
- Step 2: Pull out the Electrical control box.

It is not necessary to remove the panel to remove the PCB. In order to show clearly inside, these pictures are without panel.

It is not necessary to remove the panel to remove the Electrical control box, in order to show clearly inside, these pictures are without panel.
9.1.7 How to Remove the Chassis assembly

**CAUTION:**

- Because the 24K indoor unit is relatively large and heavy, it must have two persons to implement the following steps.

- Step 1: Remove the left and right pipe cover.

- Step 2: Remove the 5 screws A, B, C, D, E remove support part F and G (Fig. 70).

- Step 3: Open the E-box (Fig. 71), to loosen the fan motor and louver motor connectors from the PCB.

- Step 4: Press the locker H and I, to lose the indoor from the installation plate, lift it a little and pull it out along the direction indicated in Fig. 71.

**Figure 52**

**Figure 53**

It is not necessary to remove the panel to remove the Chassis assembly, in order to show clearly inside, these pictures are without panel.

**Figure 53**

Screw E is behind the E-box by mistake for this sample, you need to remove screw X, to lift the E-box a little. Then you can remove the Screw E.
9.1.8 How to Remove the Evaporator assembly

**CAUTION:**
- Because the 24K indoor unit is relatively large and heavy, it must have two persons to implement the following steps.

- Step 1: Remove the Electric control box (Fig. 72).

- Step 2: Remove the Chassis assembly (Fig. 73)

- Step 3: Unfold the Pipe clamp board C, remove screw A and B (Fig. 74).

- Step 4: Pull out the evaporator.
9.2 Outdoor unit

This part is for reference, the photos may have slight difference with your machine.

For models: BMS500-AAS009-0CSXXA, BMS500-AAS009-1CSXXA

Removing the panel plate
1. Stop operation of the air conditioner and turn “OFF” the power breaker.
2. Remove the big handle first, then remove the top cover (3 screws).
3. Remove the screws of front panel (7 screws).

Removing the fan assembly
1. Remove the panel plate.
2. Remove the nut fixing the fan, and remove the fan.
3. After remove the top cover. Unfix the hooks and then open the electronic control box cover.

Figure 57

Figure 58

Figure 59

Figure 60

Figure 61
4. Disconnect the connector for fan motor from the electronic control board.

5. Remove the four fixing screws of the fan motor, then remove the motor.

Removing the electrical parts

1. After removing the panel plate and fan assembly, remove the connector for the compressor.

2. Pull out the two blue wires connected with the four way valve.

3. Pull out connectors of the condenser coil temp. sensor(T3), outdoor ambient temp. sensor(T4) and discharge temp. sensor(T5).
4. Disconnect the electronic expansion valve wire (Fig. 85, pos. 4) from the control board.

**Figure 67**

5. Remove the ground wires (Fig. 86, pos. 5).

6. Remove the wires 1, 2, 3 (Fig. 86, pos. 6).

**Figure 68**

7. Then remove the electronic control box.

**Removing the reversing valve**

1. First remove the panel plates and electrical parts.

2. Recover refrigerant from the refrigerant circuit.

3. Remove the screw of the coil (Fig. 87, pos. 3) and then remove the coil.

4. Detach the welded parts (Fig. 87, pos. 4) of reversing valve and pipe.

**Figure 69**

5. Then the reversing valve assembly can be removed.
Removing the compressor
1. First remove the panel plates and electrical parts.
2. Recover refrigerant from the refrigerant circuit.
3. Remove the discharge pipe and suction pipe with a burner.
4. Remove the hex nuts and washers fixing the compressor on bottom plate.
5. Lift the compressor from the base pan assembly.

For models: BMS500-AAS012-0CSXXA, BMS500-AAS012-1CSXXA
Removing the panel plate
1. Stop operation of the air conditioner and turn “OFF” the power breaker.
2. Remove the big handle first, then remove the top panel (3 screws).
3. Remove the screws of front panel (6 screws)
4. Remove the screws of the right side panel (8 screws)
Removing the fan assembly
1. Remove the panel plate.
2. Remove the hex nut fixing the fan, and then remove the fan.
3. Unfix the hooks and then open the electronic control box cover.
4. Disconnect the connector for fan motor from the electronic control board.
5. Remove the four fixing screws of the fan motor. Then remove the fan motor.

Figure 74

Figure 76

Figure 77

Figure 78
Removing the electrical parts

1. After removing the panel plate and fan assembly, remove the connectors for the compressor.

2. Pull out the two blue wires connected with the reversing valve.

3. Pull out connectors of the condenser coil temp. sensor(T3), outdoor ambient temp. sensor(T4) and discharge temp. sensor(T5).

4. Disconnect the electronic expansion valve wire.

5. Remove the grounding screw (Fig. 101, pos. 1).

6. Remove the wires 1, 2, 3 (Fig. 101, pos. 2). Then remove the electronic control box.
Removing the reversing valve
1. First remove the panel plates and electrical parts.
2. Recover refrigerant from the refrigerant circuit.
3. Remove the screw of the coil (Fig. 102, pos. 1) and then remove the coil.
4. Detach the welded parts (Fig. 102, pos. 2) of reversing valve and pipe.
5. Then the reversing valve assembly can be removed.

Removing the compressor
1. First remove the panel plates and electrical parts.
2. Recover refrigerant from the refrigerant circuit.
3. Remove the discharge pipe and suction pipe with a burner.
4. Remove the hex nuts and washers fixing the compressor on bottom plate.
5. Lift the compressor from the base pan assembly.
For model: BMS500-AAS018-1CSXXA

Removing the panel plate
1. Stop operation of the air conditioner and turn "OFF" the power breaker.
2. Remove the top panel (3 screws).
3. Remove the screws of front panel (9 screws)

4. Remove the screws of the right side panel (8 screws)

Removing the fan assembly
1. Remove the panel plate.
2. Remove the hex nut fixing the fan, and then remove the fan.
3. Unfix the hooks and then open the electronic control box cover.

Figure 87

Figure 88

Figure 89

Figure 90

Figure 91
4. Disconnect the connector for fan motor from the electronic control board.

5. Remove the four fixing screws of the fan motor. Then remove the fan motor.

**Removing the electrical parts**

1. After removing the panel plate and fan assembly, remove the connectors for the compressor and reactor.

2. Pull out the two blue wires connected with the reversing valve.

3. Pull out connectors of the condenser coil temp. sensor(T3), outdoor ambient temp. sensor(T4) and discharge temp. sensor(T5).
4. Disconnect the electronic expansion valve wire.

![Figure 97](image1.png)

5. Remove the electric heaters.

![Figure 98](image2.png)

6. Remove the grounding screws.

7. Remove the wires (1, 2, 3 or L1, L2, S). Then remove the electronic control box.

![Figure 99](image3.png)

---

**Removing the reversing valve**

1. First remove the panel plates and electrical parts.
2. Recover refrigerant from the refrigerant circuit.
3. Remove the screw of the coil (Fig. 118, pos. 1) and then remove the coil.
4. Detach the welded parts (Fig. 118, pos. 2) of reversing valve and pipe.

![Figure 100](image4.png)

5. Then the reversing valve assembly can be removed.
Removing the compressor
1. First remove the panel plates and electrical parts.
2. Recover refrigerant from the refrigerant circuit.
3. Remove the discharge pipe and suction pipe with a burner.
4. Remove the hex nuts and washers fixing the compressor on bottom plate.
5. Lift the compressor from the base pan assembly.

For model: BMS500-AAS024-1CSXXA
Removing the panel plate
1. Stop operation of the air conditioner and turn "OFF" the power breaker.
2. Remove the big handle first, then remove the top cover (7 screws).
3. Remove the screws of front panel (11 screws)
4. Remove the screws of the right side panel (13 screws)
Removing the fan assembly

1. Remove the panel plates.

2. Remove the hex nut fixing the fan, and then remove the fan.

3. Unfix the hooks and then open the electronic control box cover.

4. Disconnect the connector for fan motor from the electronic control board.

5. Remove the four fixing screws of the fan motor. Then remove the fan motor.
Removing the electrical parts

1. After removing the panel plate and fan assembly, remove the connector for the compressor.

![Figure 110](image1.png)

2. Pull out the two blue wires connected with the reversing valve.

![Figure 113](image2.png)

3. Pull out connectors of the condenser coil temp. sensor (T3), outdoor ambient temp. sensor (T4) and discharge temp. sensor (T5).

![Figure 114](image3.png)

4. Disconnect the pressure switch connector.

5. Disconnect the electronic expansion valve wire from the control board.

6. Remove the grounding wires (Fig.133, pos.1).

7. Remove the wires 1,2,3 or L1,L2,S (Fig.133, pos.2). Then remove the electronic control box.

![Figure 112](image4.png)
Removing the reversing valve

1. First remove the panel plates and electrical parts.
2. Recover refrigerant from the refrigerant circuit.
3. Remove the screw of the coil (Fig. 134, pos. 1) and then remove the coil.
4. Detach the welded parts (Fig. 134, pos. 2) of reversing valve and pipe.

Then the reversing valve assembly can be removed.
Removing the compressor
1. First remove the panel plates and electrical parts.
2. Recover refrigerant from the refrigerant circuit.
3. Remove the discharge pipe and suction pipe with a burner.
4. Remove the hex nuts and washers fixing the compressor on bottom plate.
5. Lift the compressor from the base pan assembly.
10  Care and Maintenance

10.1  Cleaning precautions

**CAUTION:**
- Any maintenance and cleaning of outdoor unit must be performed by qualified service personnel only.
- Any unit repairs must be performed by qualified service personnel only.

**DANGER: BEFORE CLEANING AND MAINTENANCE**
- Always turn off your air conditioner system and disconnect its power supply before cleaning or maintenance.

**CAUTION:**
- Always turn off your air conditioner system and disconnect its power supply before cleaning or maintenance.
- Do not use chemicals or chemically treated cloths to clean the unit.
- Do not use benzene, paint thinner, polishing powder or other solvents to clean the unit. They can cause the plastic surface to crack or deform.
- Do not use water hotter than 40°C (104°F) to clean the front panel. This can cause the panel to deform or become discolored.

A clogged air conditioner can reduce the cooling efficiency of your unit, and can also be bad for your health. Make sure to clean the filter once every two weeks.

1. The air filter is under the top air inlet grill.
2. Grip the tab on the end of the filter, lift it up, then pull it towards yourself.

3. If your filter has a small air freshening filter, lift the front panel of the indoor unit, unclip it from the filter holder. Clean this air freshening filter with a handheld vacuum.

---

**Figure 119**

**Figure 120**
4. Clean the large air filter with warm, soapy water. Be sure to use a mild detergent.

5. Rinse the filter with fresh water, then shake off excess water.
6. Dry it in a cool, dry place, and refrain from exposing it to direct sunlight.
7. Close the front panel of the indoor unit.

10.3 Air filter reminders (optional)

Air filter cleaning reminder
- After 240 hours of use, the display window on the indoor unit will flash “CL.” This is a reminder to clean your filter. After 15 seconds, the unit will revert to its previous display.
- To reset the reminder, press the LED button on your remote control 4 times, or press the MANUAL CONTROL button 3 times. If you don’t reset the reminder, the “CL” indicator will flash again when you restart the unit.

Air filter replacement reminder
- After 2,880 hours of use, the display window on the indoor unit will flash “nF.” This is a reminder to replace your filter. After 15 seconds, the unit will revert to its previous display.
- To reset the reminder, press the LED button on your remote control 4 times, or press the MANUAL CONTROL button 3 times. If you don’t reset the reminder, the “nF” indicator will flash again when you restart the unit.

Replacement filters

<table>
<thead>
<tr>
<th>Description</th>
<th>Bosch Part Number</th>
<th>9000 BTU</th>
<th>12000 BTU</th>
<th>18000 BTU</th>
<th>24000 BTU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air filter</td>
<td>7738005526</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air filter</td>
<td>7738005615</td>
<td></td>
<td>X (2)</td>
<td>X (2)</td>
<td></td>
</tr>
<tr>
<td>Air freshening filter</td>
<td>7738005555</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 35
Consult your local dealer for replacement filters.

10.4 Maintenance - long periods of non-use
If you plan not to use your air conditioner for an extended period of time, do the following:

- Turn on FAN function until unit dries out completely
- Turn off the unit and disconnect the power
- Remove batteries from remote control

10.5 Maintenance - pre-season inspection
After long periods of non-use, or before periods of frequent use, do the following:

- Check for damaged wires
- Clean all filters
- Check for leaks
- Replace batteries
- Make sure nothing is blocking all air inlets and outlets