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### 1. The phenomena from main component failure

The phenomena from main component failure

<table>
<thead>
<tr>
<th>Component</th>
<th>Phenomenon</th>
<th>Cause</th>
<th>Check method and Trouble shooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>Not operating</td>
<td>Motor insulation broken</td>
<td>Check resistance between terminals and chassis</td>
</tr>
<tr>
<td></td>
<td>Stop during running</td>
<td>Motor insulation failure</td>
<td>Check resistance between terminals and chassis</td>
</tr>
<tr>
<td></td>
<td>Loud noise during running</td>
<td>Phase sequence fault</td>
<td>Check wiring (R, S, T) sequence, or interchange last two phase connection.</td>
</tr>
<tr>
<td>Outdoor fan</td>
<td>High pressure error at cooling</td>
<td>Motor failure, bad ventilation around outdoor heat exchanger</td>
<td>Check the outdoor fan operation after being turned the outdoor units off for some time. Remove obstacles around the outdoor units</td>
</tr>
<tr>
<td>Outdoor LEV</td>
<td>Heating failure, frequent defrosting</td>
<td>Bad connector contact</td>
<td>Check connector</td>
</tr>
<tr>
<td></td>
<td>No operating sound at applying power</td>
<td>Coil failure</td>
<td>Check resistance between terminals</td>
</tr>
<tr>
<td></td>
<td>Heating failure, frozen outdoor heat exchanger part</td>
<td>LEV clogged</td>
<td>Service necessary</td>
</tr>
<tr>
<td></td>
<td>Low pressure error or discharge temperature error</td>
<td>LEV clogged</td>
<td>Service necessary</td>
</tr>
</tbody>
</table>

When system fault occurs, the error code is displayed at indoor unit display or remote control display, the trouble shooting guide is in the service manual.
2. Checking Method for Key Component

2.1 Compressor

Check and ensure in following order when error related with the compressor or error related with power occurs during operation:

<table>
<thead>
<tr>
<th>No.</th>
<th>Checking Item</th>
<th>Symptom</th>
<th>Countermeasure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is how long power on during operation?</td>
<td>1) Power on for 12 hours or more</td>
<td>* Go to No.2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) Power on for 12 hours or less</td>
<td>* Go to No.2 after applying power for designated time (12 hours).</td>
</tr>
<tr>
<td>2</td>
<td>Does failure appears again when starting operation? Method to measure insulation resistance</td>
<td>1) The compressor stops and same error appears again.</td>
<td>* Check IMP may fail.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) If output voltage of the inverter is stable *1</td>
<td>* Check coil resistor and insulation resistor. If normal, restart the unit. If same symptom occurs, replace the compressor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) If output voltage of the inverter is unstable or it is 0V. (When incapable of using a digital tester)</td>
<td>* Insulation resistor: 2MW or more</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coil resistor: U-V: 1.083Ω</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>V-W: 1.123Ω</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>W-U: 1.096Ω</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>* Check the IPM.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If the IPM is normal, replace the inverter board.</td>
</tr>
<tr>
<td></td>
<td>Method to measure coil resistance</td>
<td></td>
<td>* Check coil resistor and insulation resistor.</td>
</tr>
</tbody>
</table>

[Cautions when measuring voltage and current of inverter power circuit]

Measuring values may differ depending on measuring tools and measuring circuits since voltage, current in the power supply or output side of the inverter has no since waveform. Especially, output voltage changes when output voltage of the inverter has a pattern of pulse wave. In addition, measuring values appear largely differently depending on measuring tools.

1) If using a movable tester when checking that output voltage of the inverter is constant (when comparing relative voltage between lines), always use an analog tester. Especially exercise particular caution if the output frequency of the inverter is low, when using a movable tester, where change of measured voltage values is large between other lines, when virtually same values appear actually or where there is danger to determine that failure of the inverter occurred.

2) You can use rectification voltmeter ( - – ) if using commercial frequency tester when measuring output values of the inverter (when measuring absolute values). Accurate measuring values cannot be obtained with a general movable tester (For analog and digital mode).
## 2.2 Fan Motor

<table>
<thead>
<tr>
<th>Checking Item</th>
<th>Symptom</th>
<th>Countermeasure</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) The fan motor does not operate. Does failure appears again when starting operation?</td>
<td>1) When power supply is abnormal</td>
<td>* Modify connection status in front of or at the rear of the breaker, or if the power terminal console is at frosting condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Modify the power supply voltage is beyond specified scope.</td>
</tr>
<tr>
<td></td>
<td>2) For wrong wiring</td>
<td>* For following wiring.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Check connection status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Check contact of the connector.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Check that parts are firmly secured by tightening screws.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Check connection of polarity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Check short circuit and grounding.</td>
</tr>
<tr>
<td></td>
<td>3) For failure of motor</td>
<td>* Measure winding resistance of the motor coils. 8.9Ω ±5%(75°C)</td>
</tr>
<tr>
<td></td>
<td>4) For defective fuse</td>
<td>* Replace the fuse if there is defect (Fuse 800V 30A).</td>
</tr>
<tr>
<td></td>
<td>5) For failure of circuit board</td>
<td>Replace the circuit board in following procedures if problems occur again when powering on and if there are no matters equivalent to items as specified in above 1) through 4). (Carefully check both connector and grounding wires when replacing the circuit board.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Replace only fan control boards.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If starting is done, it means that the fan control board has defect.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Replace both fan control board and the main board.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If starting is done, it means that the main board has defect.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. If problems continue to occur even after countermeasure of No.1 and No.2, it means that both boards has defect.</td>
</tr>
</tbody>
</table>
2.3 Linear Expansion Valve

- **Pulse signal output value and valve operation**

<table>
<thead>
<tr>
<th>Output(ø) No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø1</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>ø2</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>ø3</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>ø4</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
</tbody>
</table>

- **Output pulse sequence**
  - In valve close state: 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 1
  - In valve open state: 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1 → 8

  * 1. If LEV open angle is not changed, all of output phase will be OFF
  * 2. If output phase is different or continuously in the ON state, motor will not operate smoothly and start vibrating.

- **LEV valve operation**

  - At power ON, open angle signal of 1400 pulses output and valve position is set to @
  - If valve is operated smoothly, no noise and vibration is occurred and if valve is closed, noise occurs.
  - If you contact screw driver to LEV, and contact your ear to driver hand grip. you can confirm the noise from LEV.
  - If liquid refrigerant is in LEV, the noise is lower.
Checking Method for Key Components

• LEV Coil and body(Outdoor unit)

- Remove and assemble the coil

- Grip the A part tightly, and pull up coil part upward.
- When the coil part is removed or assembled, be careful not to bend the pipe of the body.
## Checking Method for Key Components

- **LEV failure check method**

<table>
<thead>
<tr>
<th>Failure mode</th>
<th>Diagnosis</th>
<th>Repair process</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcomputer</td>
<td>1. Disconnect the LEV connector from control board and connect testing LED</td>
<td>Check and replace Indoor unit control board</td>
<td>Indoor unit</td>
</tr>
<tr>
<td>Driving circuit failure</td>
<td>2. Main power ON, pulse signal is out from LEV for 17 sec. If LEDs do not turn on, or are in on state continuously, then driving circuit is abnormal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lev locking</td>
<td>1. If LEV is locked, in no load state, the driving motor rotate, and clicking sound always occurs</td>
<td>Replace LEV</td>
<td>Indoor / Outdoor unit</td>
</tr>
<tr>
<td>Lev Motor coil short or misconnection</td>
<td>1. Check the resistance between coil terminal (red-white, red-yellow, red-orange, red-blue) 2. If the estimated resistance value is in $52 \pm 3 \Omega$ then the LEV is normal</td>
<td>Replace LEV</td>
<td>Outdoor unit</td>
</tr>
<tr>
<td></td>
<td>1. Check the resistance between coil terminal (brown-white, brown-yellow, brown-orange, brown-blue) 2. If the estimated resistance value is in $150 \pm 10 \Omega$ then the LEV is normal</td>
<td>Replace LEV</td>
<td>Indoor unit</td>
</tr>
<tr>
<td>Full closing (valve leakage)</td>
<td>1. Operate indoor unit with FAN mode and operate another indoor unit with COOLING mode 2. Check indoor unit (FAN mode) liquid pipe temperature (from operation monitor of outdoor unit control board) 3. When fan rotate and LEV is fully closed, if there is any leakage, then the temperature is down If estimated temperature is very low in comparison with suction temperature which is displayed at remote controller then the valve is not fully closed</td>
<td>If the amount of leakage is much, Replace LEV</td>
<td>Indoor unit</td>
</tr>
</tbody>
</table>
Checking Method for Key Components

2.4 3Phase Bridge Diode

Internal circuit diagram

+  
~ (U) ~ (V) ~ (W)  
−

Appearance

1. Unplug the + terminal of electrolytic capacitor from the + terminal of 3phase bridge diode

2. Set the multi meter to resistance mode
   Check and estimate the resistance between each pair of terminal (+, −), (+, −(U)), (+, −(V)), (+, −(W)), (~(U), −), (~(V), −), (~(W), −),
   the estimated value should be large enough to Mega Ohm unit.

3. Set the multi meter to diode mode, and estimate between each pair of terminal (~(U), +), (~(V), +), (~(W), +), (~, −(U)), (~, −(V)), (~, −(W)),
   the estimated value should be stable and be in between 0 to 1. (ex: 0.35, 0.46 etc.)

   If one of the above articles is not satisfied, bridge diode must be inferior and to be replaced

Caution

In case that the control box is opened and before checking electrical parts, it should be checked that the LED 01Y (in inverter board, refer to page 172) turned off (wait 3 minutes after main power OFF), otherwise it may cause electrical shock.
2.5 IPM(Integrated Power Module)

Internal circuit diagram

Appearance

1. Unplug the +, – terminal of electrolytic capacitor from the P and N terminal of IPM

2. Set the multi meter to resistance mode
   Check and estimate the resistance between each pair of terminal
   (P, N), (P, U), (P, V), (P, W), (U, N), (V, N), (W, N),
   the estimated value should be large enough to Mega Ohm unit.

3. Set the multi meter to resistance mode
   Check and estimate the resistance between each pair of terminal
   (3, U), (7, V), (11, W), (16, N), (17, N), (18, N),
   the check point is inside of the screw hole (U, V, W, N),
   if check points are plate face of the terminal, then estimated values are gate resistance.

4. Set the multi meter to diode mode, and estimate between each pair of terminal
   (U, P), (V, P), (W, P), (N, U), (N, V), (N, W),
   the estimated value should be stable and be in between 0 to 1. (ex: 0.35, 0.46 etc.)

If one of the above articles is not satisfied, IPM must be inferior and is to be replaced

Caution

In case that the control box is opened and before checking electrical parts, it should be checked that the LED 01Y (in inverter board, refer to page 172) turned off (wait 3 minutes after main power OFF), otherwise it may cause electrical shock.
2.6 Other

Electrolytic capacitor and resistor for voltage distribution

1) Disconnect an terminal of voltage distribution resistor from each DC link electrolytic capacitor
2) Set the multi meter to resistance mode, connect the probe to +,- terminal of the capacitor. If the estimated resistance value is increase continuously without short(value is 0), then the resistor is normal
3) Set the multi meter to resistance mode, confirm that the resistance value of the resistor is around 270 kOhm

Check and replace inferior components

Caution
In case that the control box is opened and before checking electrical parts, it should be checked that the LED 01Y turned off (wait 3 minutes after main power OFF), otherwise it may cause electrical shock.
3. Self-diagnosis function

Error Indicator

- This function indicates types of failure in self-diagnosis and occurrence of failure for air condition.
- Error mark is displayed on display window of indoor units and wired remote controller, and 7-segment LED of outdoor unit control board as shown in the table.
- If more than two troubles occur simultaneously, lower number of error code is first displayed.
- After error occurrence, if error is released, error LED is also released simultaneously.

<table>
<thead>
<tr>
<th>Display</th>
<th>Title</th>
<th>Cause of Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1</td>
<td>Air temperature sensor of indoor unit</td>
<td>Air temperature sensor of indoor unit is open or short</td>
</tr>
<tr>
<td>0 2</td>
<td>Inlet pipe temperature sensor of indoor unit</td>
<td>Inlet pipe temperature sensor of indoor unit is open or short</td>
</tr>
<tr>
<td>0 3</td>
<td>Transmission error : wired remote controller ↔ indoor unit</td>
<td>Failing to receive wired remote controller signal at indoor unit PCB</td>
</tr>
<tr>
<td>0 4</td>
<td>Drain pump</td>
<td>Malfunction of drain pump</td>
</tr>
<tr>
<td>0 5</td>
<td>Transmission error : outdoor unit ↔ indoor unit</td>
<td>Failing to receive outdoor unit signal at indoor unit PCB</td>
</tr>
<tr>
<td>0 6</td>
<td>Outlet pipe temperature sensor of indoor unit</td>
<td>Outlet pipe temperature sensor of indoor unit is open or short</td>
</tr>
<tr>
<td>0 7</td>
<td>Different operation mode</td>
<td>Operation mode between indoor unit and outdoor unit is different</td>
</tr>
<tr>
<td>0 8</td>
<td>Indoor LEV</td>
<td>Malfunction of indoor LEV</td>
</tr>
<tr>
<td>0 9</td>
<td>Serial No.</td>
<td>In the case that the serial number marked on EEPROM of indoor unit is 0 or FFFFF</td>
</tr>
<tr>
<td>1 0</td>
<td>Poor fan moto operation</td>
<td>Disconnecting the fan motor connector/Failure or indoor fan motor lock.</td>
</tr>
<tr>
<td>1 1</td>
<td>Transmission error : indoor unit ↔ main PCB of outdoor</td>
<td>When the addressing signal doesn't come out for 3mins. suddenly, while the indoor unit gets the calling signal coming from the outdoor unit.</td>
</tr>
<tr>
<td>2 1</td>
<td>DC peak</td>
<td>IPM fault or overcurrent to compressor</td>
</tr>
<tr>
<td>2 2</td>
<td>Overcurrent of inverter comp.</td>
<td>Overcurrent flows to inverter compressor</td>
</tr>
<tr>
<td>2 3</td>
<td>Poor voltage charge for driving INV compressor</td>
<td>DC charging is not performed after starting relay turn on</td>
</tr>
<tr>
<td>2 4</td>
<td>High pressure switch</td>
<td>System is off by high pressure switch</td>
</tr>
<tr>
<td>2 5</td>
<td>Low/Over voltage</td>
<td>Input voltage is out of tolerable range.</td>
</tr>
<tr>
<td>3 2</td>
<td>Discharge temperature (INV compressor A)</td>
<td>System is off due to rising of INV compressor A discharge temperature</td>
</tr>
<tr>
<td>3 3</td>
<td>Discharge temperature (INV compressor B)</td>
<td>System is off due to rising of INV compressor B discharge temperature</td>
</tr>
<tr>
<td>3 4</td>
<td>High pressure</td>
<td>System is off by excessive increase of high pressure</td>
</tr>
<tr>
<td>3 5</td>
<td>Low pressure</td>
<td>System is off by excessive decrease of low pressure</td>
</tr>
</tbody>
</table>
## Self-diagnosis function

<table>
<thead>
<tr>
<th>Display</th>
<th>Title</th>
<th>Cause of Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 0</td>
<td>Current sensor of inverter compressor</td>
<td>Current sensor of inverter compressor is open or short</td>
</tr>
<tr>
<td>4 1</td>
<td>Discharge temperature sensor of inverter compressor A</td>
<td>Discharge temperature sensor of inverter compressor A is open or short</td>
</tr>
<tr>
<td>4 2</td>
<td>Low pressure sensor</td>
<td>Low pressure sensor is open or short</td>
</tr>
<tr>
<td>4 3</td>
<td>High pressure sensor</td>
<td>High pressure sensor is open or short</td>
</tr>
<tr>
<td>4 4</td>
<td>Air temperature sensor</td>
<td>Air temperature sensor is open or short</td>
</tr>
<tr>
<td>4 5</td>
<td>Temperature sensor of Upper-part heat exchanger</td>
<td>Temperature sensor of Upper-part heat exchanger is open or short</td>
</tr>
<tr>
<td>4 6</td>
<td>Suction temperature sensor of main outdoor unit</td>
<td>Suction temperature sensor of main outdoor unit is open or short</td>
</tr>
<tr>
<td>4 7</td>
<td>Discharge temperature sensor of inverter compressor B</td>
<td>Discharge temperature sensor of inverter compressor B is open or short.</td>
</tr>
<tr>
<td>4 8</td>
<td>Temperature sensor of Lower-part heat exchanger</td>
<td>Temperature sensor of Lower-part heat exchanger is open or short.</td>
</tr>
</tbody>
</table>
| 4 9     | Outdoor voltage sensing error              | 1. Abnormal input voltage  
2. Outdoor line fuse damage  
3. Defective outdoor main PCB                                               |
| 5 1     | Excessive capacity of indoor units         | Excessive connection of indoor units compared to capacity of outdoor unit      |
| 5 2     | Transmission error : inverter PCB ➔ main PCB | Failing to receive inverter signal at main PCB                                |
| 5 3     | Transmission error : indoor unit ➔ main PCB of outdoor unit | Failing to receive indoor unit signal at main PCB of outdoor unit            |
| 5 4     | Reverse connection of R, S, T power of main outdoor unit | Reverse connection or omitting connection of R, S, T power of main outdoor unit |
| 5 7     | Transmission error : main PCB ➔ inverter PCB | Failing to receive main PCB signal at inverter PCB                           |
| 6 2     | Overheat of inverter heatsink              | Overheat of inverter heatsink                                                 |
| 6 5     | Temperature sensor of heatsink             | Temperature sensor of heatsink is open or short                              |
## Self-diagnosis function

<table>
<thead>
<tr>
<th>Display</th>
<th>Title</th>
<th>Cause of Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 0 5</td>
<td>Transmission error: fan PCB ↔ main PCB</td>
<td>Failing to receive fan signal at main PCB</td>
</tr>
<tr>
<td>1 0 6</td>
<td>Over-current of fan motor (IPM fault)</td>
<td>Over-current of fan motor (IPM fault)</td>
</tr>
<tr>
<td>1 0 7</td>
<td>Low voltage of fan motor driver</td>
<td>Low voltage of fan motor driver</td>
</tr>
<tr>
<td>1 0 8</td>
<td>Transmission error: main PCB ↔ fan PCB</td>
<td>Failing to receive main signal at fan PCB</td>
</tr>
<tr>
<td>1 1 3</td>
<td>Liquid pipe temperature sensor</td>
<td>Liquid pipe temperature sensor is open or short</td>
</tr>
<tr>
<td>1 1 4</td>
<td>Subcooling inlet temperature sensor</td>
<td>Subcooling inlet temperature sensor is open or short</td>
</tr>
<tr>
<td>1 1 5</td>
<td>Subcooling outlet temperature sensor</td>
<td>Subcooling outlet temperature sensor is open or short</td>
</tr>
<tr>
<td>1 5 1</td>
<td>Failure of operation mode conversion</td>
<td>Pressure unbalance between outdoor units</td>
</tr>
</tbody>
</table>

### CAUTION

In case that the control box is opened and before checking electrical parts, it should be checked that the LED 01M (Refer to next page) turned off (wait 3 minutes after main power OFF), otherwise, it may cause electrical shock.
### Troubleshooting Guide

#### Indoor Unit Room Temperature Sensor Error

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Indoor Unit room temp. sensor error</td>
<td>Indoor Unit sensor open or short</td>
<td>1. Sensor wrong connection</td>
<td>Concerned Remote Controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Sensor open/Short</td>
<td>Panel Display</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Defective Indoor Unit PCB</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Defective Sensor</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Unit inlet pipe temp. sensor error</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Indoor Unit)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Outlet pipe temp. sensor error</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Indoor Unit)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Defect inspection method:**

1. Check the connecting point of the sensor with the PCB (Sensor's Connector). Is the sensor connecting condition correct? Otherwise, reconnect the sensor at the correct position.

2. Remove the sensor and measure its resistance with a tester.
   - Room temp sensor: $10^\circ C = 20.7 \Omega$; $25^\circ C = 10k \Omega$; $50^\circ C = 3.4k \Omega$
   - Pipe temp sensor: $10^\circ C = 10k \Omega$; $25^\circ C = 5k \Omega$; $50^\circ C = 1.8k \Omega$

3. Replace the sensor if it is not having a correct resistance value.

4. If there is no problem with the sensor and the sensor connection then replace the Indoor Unit PCB.

- Panel Display indication method: Error code and the LED blinking counts are indication.

#### Communication Error between Indoor Unit and Wired Remote Controller

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>Communication error between Indoor Unit and Wired</td>
<td>In case the wired Remote Controller can't receive</td>
<td>1. Defective wired Remote controller.</td>
<td>Concerned Wired Remote Controller</td>
</tr>
<tr>
<td></td>
<td>Remote Controller and the signal from the Indoor</td>
<td>the signal from the Indoor Unit</td>
<td>2. Defective Indoor Unit PCB.</td>
<td>Panel Display</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td></td>
<td>3. Defective Connector connection</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Defective wire of the Wired Remote Controller</td>
<td></td>
</tr>
</tbody>
</table>

**Defect inspection method:**

1. Check the connection point of the Wired Remote Controller (Connecting Connector).

2. In case the Wired Remote Controller's cable is installed near the AC power line, then they must be separated by distance of at least 30cm.

3. In case the replaced Remote Controller has no defect, then the originally installed Remote Controller is defective.

4. In case the error code exists even after the replacement of the Remote Controller, then the Remote Controller is not defective and hence only Indoor Unit PCB should be replaced.

5. In case error code exists even after the replacement of the Wired Remote Controller and the Indoor Unit PCB, then replace the cable connecting the Wired Remote Controller and Indoor Unit.
### Troubleshooting Guide

#### Error Code 04

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 04         | Indoor Unit drain pump error | In case of the Indoor Unit drain pump defect the condensed water level rises and the float switch (sensor) detects the error. | 1. Defective drain pump / float switch  
2. Defective drain (hose chocked / improper inclination)  
3. Defective PCB in the Indoor Unit | Concerned Remote controller  
Panel Display |

#### Defect inspection method:

1. Check the proper functioning of the drain pump in case of any drain water? (Functioning sound / check the water flowing)
2. In case the drain pump is not working properly, then check the 220V power supply at the drain pump terminal with a tester.  
   In case the drain pump do not function properly after power supply to the PCB, then replace the drain pump.
3. In case of no power at the PCB terminal, then replace the Indoor Unit PCB.
4. In case the drain pump is OK, then check whether the hose is chocked or the drain pipe is improper and make sure to correct the drain flow error if any.
5. In case the drain pump is OK and there is no drain water in drain pan and still the error code is displayed? Then check whether the float sensor is touching the chassis. In case the float switch sensor is not touching the chassis and still the error code exists, then the float switch has the error. In such a case, the drain pump assembly must be replaced.

![Drain Pump connector](image-url)
![Troubleshooting Guide](image)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 05         | Communication error between the Outdoor and Indoor Unit                        | In case the Indoor Unit does not receive any signal from the Outdoor Unit.                                                                      | 1. Defective "Auto-Addressing"
2. Defective communication connections between Indoor and Outdoor Unit
3. Communication cable is open or short
4. Defective Indoor Unit communication circuit
5. Defective outdoor unit communication circuit
6. Insufficient distance between the power line and the communication cable
7. Outdoor main power Line Fuse damage.                                                                                                     | Concerned Remote controller Panel Display                                                                                                     |

**Defect inspection method:**

**[In case all Indoor Units display 'ch05' error code]**

1) Check whether the "Auto-Addressing" was in operation or not.

2) Check whether the Outdoor Unit power is off.
   - If the Outdoor Unit power is Off then check the cause and put the power On. (Cause: Comp electric leakage or damage, ELB (breaker) defect, electric short between the power line etc.)

3) Check whether the outdoor control box communication wire is connected properly at the terminal

4) Check whether the communication wire is open or short, in such a case remove the defect cause.
   - (Wire open confirmation: After power Off, short the communication wire with each other and measure the resistance of the communication wire by a tester. In case the resistance is above 5Ω, then the wire is open.
   - Wire short confirmation: After power Off, separate the communication wire and measure the resistance of the communication wire by a tester. In case the resistance is below 5Ω, then the wire is short.)

5) In case the causes mentioned in clause 1)–3) does not exists, then all communication wire of the Indoor Unit must be separated and the all Indoor Unit communication wire by connecting to the Outdoor Unit one by one.
   - (Defective Indoor Unit PCB connection can cause the communication error) Replace the concerned Indoor Unit PCB.
Troubleshooting Guide

[In case only one Indoor Unit or only few Indoor Units display ‘ch05’ error ]

1) Re-operate the Auto-Addressing function and then confirm the Auto-Addressing in all Indoor Units. Auto-Addressing can be confirmed at the Wired Remote Controller. In case of the Indoor Units not having the Wired Remote Controller, check the blinking counts of the Indoor Unit panel (Auto-Addressing must be operated after minimum 1 minute of power On ) › Check the Indoor Unit not having Auto-Addressing and replace the concerned unit PCB if required.

2) Make sure to separate the communication wire and the power line (AC220/380V) by a distance of minimum 30 cm.

⚠️ CAUTION

• In case you replace the communication wire by power 220V line, then the connected PCB gets damaged or burnt.

To carry out Auto-Addressing function, press red button until you see ‘88’ displayed on 88 segment as shown in left side picture.

7 segment
Troubleshooting Guide

Terminal A, B:
- Communication terminal between outdoor & indoor

Short the communication wire with each other
Troubleshooting Guide

- Communication wire & terminal in the outdoor

Measure resistance

- Communication wire & terminal in the indoor

Communication terminal
In the indoor.
## Troubleshooting Guide

### Error Code 06

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>Indoor Unit outlet pipe temp. sensor error</td>
<td>Indoor Unit sensor open or short</td>
<td>Refer to CH01</td>
<td></td>
</tr>
</tbody>
</table>

### Error Code 07

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>07</td>
<td>All Indoor Units are not running in the same mode (All units must run either in heating or cooling mode)</td>
<td>The Indoor Unit later started is in different mode than the unit started at first.</td>
<td>1. The Indoor Units are in a different operation mode. 2. The error display will be in the Wired Remote Controller of the unit stared later.</td>
<td>Concerned Remote controller Panel Display</td>
</tr>
</tbody>
</table>

#### Defect inspection method:

1) Error removal method: Press the On/Off button on the Wired Remote controller. The error code will be removed automatically after a few seconds.

2) Immediately change the operation mode after the pressing the On/Off button. (The same operation mode as in the original Indoor Unit started at first (other than the defective unit mode) (heating/cooler)

### Error Code 09

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>09</td>
<td>Indoor Unit EEPROM error</td>
<td>Problem developed in the EEPROM inside the PCB of the Indoor Unit</td>
<td>1. Error developed in communication between the Microprocessor and the EEPROM on the surface of the PCB. 2. ERROR due to the EEPROM damage</td>
<td>Concerned Remote controller Panel Display</td>
</tr>
</tbody>
</table>

#### Defect inspection method:

1) Check whether there is some stains at the EEPROM PIN (Lead remnants). Remove this unwanted material and re-operate the "Auto-Addressing".

2) Replace the Indoor Unit PCB.
## Troubleshooting Guide

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Indoor unit related error</td>
<td>Failure of the fan motor operation</td>
<td>Disconnecting the fan motor connector / failure</td>
<td>Concerned Remote controller Panel Display</td>
</tr>
</tbody>
</table>

### Cause of problem

- The fan is locked by an interference with another object.
  - 1) Remove motor connector
  - 2) Remove housing terminal
  - 3) Disconnected or crushed wired

- Burn out of PCB within the motor etc.

- Failure capacitor part (TD chassis)

- PCB indoor unit

### Checking method

- Turn the fan with hand and check whether it is locked
  - 1) Check with naked eye
  - 2) Check with naked eye
  - 3) Check with naked eye

- Check the resistance value of each terminal with the tester

<table>
<thead>
<tr>
<th>Tester</th>
<th>Normal resistance (±10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>TH chassis</td>
</tr>
<tr>
<td>2</td>
<td>TD chassis</td>
</tr>
<tr>
<td>3</td>
<td>TH chassis</td>
</tr>
<tr>
<td>4</td>
<td>TH chassis</td>
</tr>
<tr>
<td>5</td>
<td>TH chassis</td>
</tr>
<tr>
<td>6</td>
<td>TD chassis</td>
</tr>
<tr>
<td>7</td>
<td>TH chassis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cable</th>
<th>Normal resistance (±10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>102kΩ</td>
</tr>
<tr>
<td></td>
<td>5MΩ</td>
</tr>
<tr>
<td></td>
<td>~ 30MΩ</td>
</tr>
<tr>
<td>1</td>
<td>∞</td>
</tr>
<tr>
<td>2</td>
<td>∞</td>
</tr>
<tr>
<td>3</td>
<td>235kΩ</td>
</tr>
<tr>
<td>4</td>
<td>251kΩ</td>
</tr>
</tbody>
</table>

### Measures

- Unlock by reassembling etc.
- Repair or exchange motor
- Exchange motor
- Exchange capacitor
### Troubleshooting Guide

#### Indoor unit related error

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Indoor unit related error</td>
<td>Outdoor unit cannot recognize the indoor unit</td>
<td>Auto addressing does not work after exchanging to new PCB</td>
<td>Concerned Remote controller Panel Display</td>
</tr>
</tbody>
</table>

- Auto addressing for outdoor unit
Troubleshooting Guide

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Protection of Inverter compressor from over current (Detection of over 80A per 1.8ms IPM )</td>
<td>Defective inverter compressor, Inverter element (IPM) defect</td>
<td>1. Over current detection at the inverter compressor (U,V,W)</td>
<td>Concerned Remote controller Panel Display Outdoor unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. IPM Overheating</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Insulation damage of the compressor / motor damage</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Low input voltage at the outdoor</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Inverter compressor terminal disconnected or loose</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6. Inverter PCB/IPM PCB defect</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Defect inspection method :**

1) Check whether the insulation of the compressor, motor coil resistance is normal? Otherwise, replace the compressor.
   - Motor Coil resistance normalcy: Resistance between each terminal of Inverter compressor =1.33Ω±7% ,
     Resistance between the each terminal of the constant speed compressor =1.83Ω±7% (The 3 measured value must be similar)
   - Insulation normalcy: Resistance between the compressor terminal and the product body = Above 2MΩ
     (Measured within specified time after the compressor stop)

2) Check whether the IPM/3 phase rectification Diode is normal? Otherwise, replace the IPM/ Diode.
   - Tester: After setting the Diode mode, test with the tester probe in +,- sequence.
   - IPM: 'U-P/V-P/W-P' measurement: 0.3~0.6 V, Reverse polarity measurement: Above 2.6 V
     'N-U/N-V/N-W' measurement: 0.3~0.6 V, Reverse polarity measurement: Above 2.6 V
   - 3 phase rectification diode: ~ & + / ~ & + / ~ & + sequence measurement: 0.3~0.6 V,
     Reverse polarity measurement: Above 2.6V

3) Check whether the input voltage is 360V~410V(AC).

4) Check the balance between each phase at the main breaker of the building (phase distribution) (Below 5~10V).

5) Check whether the terminal connection is normal?
   (Comp connecting terminal, IPM connecting terminal, diode connecting terminal, capacitor connecting terminal)

6) Check whether the IPM Pin connecting to PCB soldering is normal?
   (Dismantle the PCB and check the soldering at the back side of the PCB.)
   In case if any abnormality please replace the IPM PCB.

7) Check whether the Outdoor Unit fan is working? In case of any abnormality please check the outdoor fan
   (Refer to CH105~CH108)

8) Check whether the supplied power is normal or insufficient.

9) After the inspection, check whether the input power to the IPM during the trial run is 450V~560V(DC).
   (Set the tester at the DC mode)
   Check the IPM terminal connecting condition.
   (Comp connecting terminal, IPM connecting terminal, diode connecting terminal, capacitor connecting terminal)

10) Measure the current at each phase (U,V,W) of the inverter compressor during the trial run after the completion
    of the inspection.
    In case the deviation between the current in each phase is above 1.5A then replace the PCB.
Resistance measure between phases of compressor
Troubleshooting Guide

- Resistance measure between phase and body of compressor

- Check IPM/3 phase rectification Diode : P-U/V/W
► Check IPM/3 phase rectification Diode : U/V/W-N

► Check 3 phase rectification diode : ~+~
Troubleshooting Guide

▶ Check 3 phase rectification diode : ---

Measure input power between phases (R-S, R-T, S-T)

▶ Measure input power between phases (R-S, R-T, S-T)
Measure input power of one phase (R, S, T)

Connector of compressor
Troubleshooting Guide

► Connector of reactor

► Connectors of 3phase diode
Connectors of capacitor

Check IPM PCB
Troubleshooting Guide

▸ Measure current of IPM U-V-W

▸ Measure voltage of IPM P-N
### Troubleshooting Guide

#### Maximum over current (MAX CT)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
</tr>
</thead>
</table>
| 22         | Maximum over current (MAX CT) | The current flowing at the CT sensing circuit should be more than the maximum value of the current tolerance for the product. | 1. Comp. damage  
2. Current sensing sensor damage (CT)  
3. Low input voltage  
4. Comp. terminal is disconnected or loose  
5. Abnormality at the Outdoor /Indoor Unit fan  
6. Defective inverter PCB/IPM PCB  |

#### Defect inspection method: Refer error code 21

1) Check whether the current measured at the R phase during operation is above 18~20A?  
   In case the current measurement is normal (During compressor operation :3~16A), Replace the inverter PCB.

2) In case the current is above 18~20A, check the comp. insulation and the motor coil resistance  
   (Refer error code 21) → In case the resistance is abnormal, then replace the comp.

3) Check whether the Main input power is 360Vac~410Vac.  
   Check whether a deviation exists between the main power voltage of each phase (Below 5~10V)?  
   In case there is a deviation in the required power supply in each phase or the abnormality of the input voltage, then please request the building electricity in charge to change the power supply accordingly.

4) Please remove any obstacle in path of the outdoor heat exchange and also clean the Indoor filter.

5) Check whether the IPM Pin connecting PCB soldering is normal?  
   (Check the PCB soldering at the back side of PCB after dismantling the PCB)  
   In case of any abnormality, then please replace the IPM PCB.

6) Measure the current between each phase of the inverter comp (U,V,W) during the trial run after the inspection.  
   In case of current deviation between each phase is above 1.5A, then replace the inverter PCB.

**Measure current of Phase 'R'**
<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
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<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>

### Defect inspection method: Refer error code 21

1. Check whether the starting relay / magnetic contactor at the control box are normal?
   (After about 30 seconds of operation the voltage at the IPM P/N terminal should be above 450Vdc)

2. In case the voltage is below 450Vdc,
   - Make sure that the outdoor main input voltage is (360Vac~410Vac),
   - Make sure that the magnetic contactor coil resistance (400~700Ω) when the power is Off and also check the connecting conditions,
   - Check whether the comp capacitor connection and the outer shape is normal.
   (In case of any abnormality there is a shape change or expansion of the capacitor outer body)

3. Compressor insulation and the coil resistance and 3 phase rectification diode should also be checked.
   (Refer error code 21).

4. In case the error code is still displayed after solving the issue from clause 1)~3), then replace the inverter PCB.
Troubleshooting Guide

- Measure resistance of magnetic contactor coil
- Capacitor of compressor
- Inverter IPM
- P-N connector of IPM
## Troubleshooting Guide

### Error Code | Error Contents | Meaning | Main Causes | Error display position
---|---|---|---|---
24 | Excessive rise in outdoor high pressure | Compressor Off due to the high pressure switch in outdoor unit | 1. Defective high pressure switch  2. Defective Indoor or Outdoor fan  3. Chocked compressor check valve  4. Pipe chocked due to the pipe damage  5. Refrigerant overcharge  6. Defective LEV at the Indoor or Outdoor Unit  7. Covering or chocking (Outdoor covering during the cooling mode / Indoor Unit filter chocking during the heating mode)  8. SVC valve chocking  9. Defective Outdoor PCB | Concerned Remote controller  Panel Display  Outdoor unit

### Defect inspection method

1) In case the Indoor / Outdoor Unit fan is not working normally, please check and replace them if required. (Refer to CH105–CH108)

2) Check whether Indoor / Outdoor Unit heat exchange is being accomplished successfully. Otherwise, check and modify the installation condition as per the required heat exchange. In case of heat exchanger covering please remove the outdoor condenser covering and also check the Indoor Unit filter.

3) Is the actual pressure reached high enough for the high pressure switch to be operational. Connect the manifold gauge at the high pressure service valve and compare the value of the high pressure sensor.

4) Check whether the SVC valve is open and other conditions (fold, dent etc).

5) In case the pressure is not high enough for the high pressure switch to come into action, then please check the high pressure switch. In case, after temporary shorting of the pressure switch of the inverter and constant speed compressor on one by one if there is no error code display, then please replace the concerned high pressure switch. In case the error code is displayed after shorting the high pressure switch, then please replace the concerned PCB.

6) Required refrigerant re-calculation and check the refrigerant recharging condition.

7) Check whether the temperature of the both ends of the check valve are similar? In case a temperature difference is sensed, then please replace the check valve.
SVC valve

Measure resistance on the pressure switch connector
Troubleshooting Guide

Pressure switch

CHECK VALVE
### Error Code 25 - Low voltage / High voltage

<table>
<thead>
<tr>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Input voltage in the installation region = 3 phase 380-10%, 415+10%</td>
<td>1. Abnormality of the input voltage</td>
<td>Concerned Remote controller</td>
<td></td>
</tr>
<tr>
<td>2. Single phase = 220-10%, 240+10%</td>
<td>2. Outdoor Unit main line fuse damage</td>
<td>Panel Display</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Outdoor Unit main PCB defect</td>
<td>Outdoor unit</td>
<td></td>
</tr>
</tbody>
</table>

**Defect inspection method**

1) Check whether the input power (3 phase = 380V-10% ~ 415+10% single phase = 220V-10% ~ 240+10%).
   In case there is a deviation from the required power in each phase or is not the rated voltage, then please request the building electricity in charge to supply the required power.

2) Check whether the Outdoor Unit PCB power input is 220V-10%, 240+10%.
   Otherwise, Outdoor Unit line fuse be installed and required input voltage should be supplied.

3) In case the Outdoor Unit PCB power input is normal then replace the PCB.
Troubleshooting Guide

Measure power input of outdoor unit
Troubleshooting Guide

Measure power input of outdoor unit
## Troubleshooting Guide

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 32         | Excessive rise of the inverter comp.(A) discharge temp. | Inverter comp. Off due to the excessive rise in discharge temp | 1. Inverter comp. discharge temp. sensor defect  
2. Refrigerant shortage / leakage  
3. Defective LEV  
4. Defective Liquid Injection Valve  
5. Defective Hot Gas Bypass Valve | Concerned Remote controller  
Panel Display  
Outdoor unit |

**Defect inspection method:**

1) In case there is no actual rise of the discharge temp of the inverter comp.(A) but the sensor shows abnormal rise of the temp, then please replace the discharge pipe sensor

- Discharge temp sensor $10^\circ\text{C} = 362k\Omega$, $25^\circ\text{C} = 200k\Omega$, $50^\circ\text{C} = 82k\Omega$, $100^\circ\text{C} = 18.5k\Omega$

   In case there is no actual rise of the discharge temp of the inverter comp.(A), then please replace the outdoor MAIN PCB.

2) Check the indoor / outdoor LEV / Hot gas / Liquid Injection valve connector connecting condition.

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 33         | Excessive rise of the inverter comp.(B) discharge temp. | Inverter comp. Off due to the excessive rise in discharge temp | 1. Inverter comp. discharge temp. sensor defect  
2. Refrigerant shortage / leakage  
3. Defective LEV  
4. Defective Liquid Injection Valve  
5. Defective Hot Gas Bypass Valve | Concerned Remote controller  
Panel Display  
Outdoor unit |

**Defect inspection method:**

1) In case there is no actual rise of the discharge temp of the inverter comp.(B) but the sensor shows abnormal rise of the temp, then please replace the discharge pipe sensor

- Discharge temp sensor $10^\circ\text{C} = 362k\Omega$, $25^\circ\text{C} = 200k\Omega$, $50^\circ\text{C} = 82k\Omega$, $100^\circ\text{C} = 18.5k\Omega$

   In case there is no actual rise of the discharge temp of the inverter comp.(B), then please replace the outdoor MAIN PCB.

2) Check the indoor / outdoor LEV / Hot gas / Liquid Injection valve connector connecting condition.
3) Check the LEV/Hot gas / Liquid Injection valve's coil resistance.
   LEV normalcy : Resistance between each terminal of the LEV  45~90Ω
   hot gas :
   liquid injection :
   In case the coil R is normal, then please check LEV/ Hot Gas /Liquid Injection Bypass Valve.

4) Recalculate the amount of refrigerant to be charged and check the charging condition.

- Hot gas by pass connector
Liquid injection by pass valve
Measure resistance of LEV coil
## Troubleshooting Guide

### Error Code 34: Excessive rise in high pressure

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 34         | Excessive rise in high pressure | Com. Off due to the high pressure sensor | 1. Defective high pressure sensor  
2. Defective Indoor / Outdoor Unit fan  
3. Change in shape of pipe due to the damage  
4. Excessive refrigerant charging  
5. Defective Indoor / Outdoor Unit LEV  
6. Covering or chocking (Outdoor covering during the cooling mode / Indoor filter chocking during the heating mode)  
7. SVC valve chocked .  
8. Defective outdoor PCB  
9. Defective Indoor Unit pipe temp. sensor | Concerned Remote controller  
Panel Display  
Outdoor unit |

### Defect inspection method

1) Check the Indoor and Outdoor Unit fan and replace if required. (Refer to CH105~CH108)

2) Check if the proper heat exchange is obtained in Indoor and Outdoor Unit  
   Otherwise, modify the installation condition to get the proper heat exchange. Remove the outdoor cover (by dust etc) if any and also check the Indoor Unit filter also.

3) Check the SVC valve Open and pipe condition (bent, dent etc).

4) Check whether the actual discharge pressure is high.  
   Connect the manifold gauge to the svc valve and compare the high pressure reading.

5) Check the Indoor / Outdoor Unit LEV connector connecting condition.

6) Check the LEV / Hot gas valve's coil resistance.  
   LEV : Resistance between each terminal of the LEV 45~90Ω  
   hot gas :  
   liquid injection :  
   In case the coil resistance is normal then please check the LEV/ Hot Gas Valve. (Refer to Check!!)

7) Recalculate the refrigerant charging and Check the charging condition.

8) Check the Indoor Unit pipe temp sensor connecting condition and temp sensor resistance.  
   (Resistance measurement method : Refer to CH02/CH06)

9) In case the above given contents are normal, then please replace the Outdoor Unit PCB.

10) In case a similar error code exists even after the replacement of the PCB, then replace the high pressure sensor.
<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Excessive low pressure drop</td>
<td>Comp. off due to the low pressure sensor</td>
<td>1. Defective low pressure sensor&lt;br&gt;2. Defective Indoor / Outdoor Unit fan&lt;br&gt;3. Refrigerant shortage or leakage&lt;br&gt;4. Pipe shape change due the damage&lt;br&gt;5. Defective indoor outdoor LEV&lt;br&gt;6. Covering or chocking (Outdoor covering during the cooling mode / Indoor filter chocking during the heating mode)&lt;br&gt;7. SVC valve chocking&lt;br&gt;8. Defective outdoor PCB&lt;br&gt;9. Defective indoor pipe temp. sensor</td>
<td>Concerned Remote controller&lt;br&gt;Panel Display&lt;br&gt;Outdoor unit</td>
</tr>
</tbody>
</table>

### Defect inspection method

1) Check the indoor and outdoor fan and replace if required. (Refer to CH105~CH108)

2) Check if the proper heat exchange is obtained in Indoor and Outdoor Unit
   - Otherwise, modify the installation condition to get the proper heat exchange.
   - Remove the outdoor cover (by dust etc) if any and also check the Indoor Unit filter also.

3) Check the SVC valve open and pipe condition (bent, dent etc).

4) Check whether the actual low pressure is excessively low.
   - Connect the manifold gauge to the svc valve and compare the low pressure reading.

5) Check the Indoor / Outdoor Unit LEV connector connecting condition.

6) Check the LEV / Hot gas valve’s coil resistance
   - LEV : Resistance between each terminal of the LEV 45~90Ω
   - hot gas : liquid injection :

   In case the coil resistance is normal, then please check the LEV / Hot Gas Valve. (Refer to Check!!)

7) Recalculate the refrigerant charging and check the charging condition.

8) Check the Indoor Unit pipe temp. sensor connecting condition and temp. sensor resistance.
   - (Resistance measurement method : Refer to CH02/CH06)

9) In case the above given contents are normal, then please replace the outdoor PCB.

10) In case a similar error code exists even after the replacement of the PCB, then replace the high pressure sensor.
### Error Code 41: Comp. discharge pipe temp. sensor error

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 41         | Comp. discharge pipe temp. sensor error | Sensor measurement value is abnormal (Open / Short) | 1. Defective connection of the comp. discharge pipe temp. sensor  
2. Defective discharge pipe temp. sensor of the comp (Open/Short)  
3. Defective outdoor PCB | Concerned Remote controller  
Panel Display  
Outdoor unit |

#### Defect inspection method

1. Check the comp. discharge pipe temp. sensor and the lead wire connecting condition.
2. Check whether the sensor resistance value is normal? Otherwise, replace the sensor.
   - Comp. discharge pipe temp. sensor: $10^\circ C = 362\Omega$, $25^\circ C = 200\Omega$, $50^\circ C = 82\Omega$, $100^\circ C = 18.5\Omega$
3. In case the sensor connecting condition and the resistance value are normal, then please replace the outdoor PCB.
4. If "n1" is displayed at the 7 segment, check comp A  
   If "n2" is displayed at the 7 segment, check comp B
Check discharge temp sensor of inverter compressor

Check discharge temp sensor of constant compressor
### Troubleshooting Guide

#### Low pressure sensor error

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 42         | Low pressure sensor error | Sensor measured value is not normal (Open / Short) | 1. Defective low pressure sensor connector  
2. Defective low pressure sensor (Open/Short)  
3. Defective outdoor PCB | Concerned Remote controller  
Panel Display  
Outdoor unit |

#### High pressure sensor error

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 43         | High pressure sensor error | Sensor measured value is not normal (Open/Short) | 1. Defective high pressure sensor connector  
2. Defective high pressure sensor error (Open/Short)  
3. Outdoor PCB defect | Concerned Remote controller  
Panel Display  
Outdoor unit |

#### Defect inspection method

1) Check the pressure sensor connecting condition and lead wire connecting condition.
2) In case the above condition is normal then replace the outdoor PCB.
3) If the error code persists even after the replacement of PCB then replace the concerned pressure sensor.
Troubleshooting Guide

Outdoor Unit

Pressure sensor connector
High pressure sensor
Low pressure sensor

Pressure sensor connector
## Troubleshooting Guide

### Outdoor Unit air temperature sensor error

<table>
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<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 44         | Outdoor Unit air temperature sensor error | Sensor measured value is not normal (Open/Short) | 1. Defective connection of the temp. sensor  
2. Defective temp. sensor (Open / Short)  
3. Defective Outdoor Unit PCB | Concerned Remote controller  
Panel Display  
Outdoor unit |

### The pipe sensor error of the Outdoor Unit's heat exchanger

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 45 (Heat exchanger Upper parts)  
48 (Heat exchanger Lower parts) | The pipe sensor error of the Outdoor Unit's heat exchanger | Sensor measured value is not normal (Open / Short) | 1. Defective connection of the temp. sensor  
2. Defective temp. sensor (Open / Short)  
3. Defective Outdoor Unit PCB | Concerned Remote controller  
Panel Display  
Outdoor unit |

### Comp. suction temp. sensor error

<table>
<thead>
<tr>
<th>Error Code</th>
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<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 46         | Comp. suction temp. sensor error | Sensor measured value is not normal (Open/Short) | 1. Defective connection of the temp. sensor  
2. Defective temp. sensor (Open / Short)  
3. Defective Outdoor Unit PCB | Concerned Remote controller  
Panel Display  
Outdoor unit |

### Defect inspection methods

1. Check the temp. sensor connecting condition and also the lead wire connecting condition.
2. Check whether the temp. sensor resistance value is normal? Otherwise, replace the sensor.
   - Air temp. sensor: 10°C = 20.7kΩ, 25°C = 10kΩ, 50°C = 3.4kΩ
   - Pipe temp. sensor: 10°C = 10kΩ, 25°C = 5kΩ, 50°C = 1.8kΩ
3. In case the sensor connection and the resistance value is normal, then please replace the outdoor PCB.
Troubleshooting Guide

- Measure resistance of outdoor air temperature sensor
- Measure resistance of outdoor HEX(A) temperature sensor
- Measure resistance of outdoor HEX(B) temperature sensor
### Error Code | Error Contents | Meaning | Main Causes | Error display position
--- | --- | --- | --- | ---
48 (Heat exchanger B) | Outdoor heat exchanger (A,B) Pipe temp sensor error | The measured value of the sensor is not normal (Open/Short) | Refer to CH45 |  

### Error Code | Error Contents | Meaning | Main Causes | Error display position
--- | --- | --- | --- | ---
49 | Outdoor voltage sensing error | The measured value of the sensor is not normal (Open/Short) | 1. Abnormal input voltage  
2. Outdoor line fuse damage  
3. Defective outdoor main PCB | Concerned Remote Controller |  

#### Defect inspection method

1. Check whether the input power (3 phase =380-10%, 415+10% single phase = 220-10%, 240+10%) is normal. In case of any deviation in supplied power or the rated power please request the the electric in charge of the building to supply the suitable power.

2. Is the power input to the the outdoor PCB 220-10%, 240+10%.
   Otherwise, a outdoor line fuse or the required input power to be formed.

3. In case the the power input to the outdoor PCB is normal then please replace the PCB because PCB may be causing the voltage sensing error in the outdoor unit.
Troubleshooting Guide

**Measure input power of outdoor unit**

![Image of the outdoor unit with labeled components](image-url)
<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 51         | Excessive capacity (Indoor capacity is in excess) | The combined spec of the indoor units exceed the capacity of the outdoor unit | 1. Excess of indoor capacities more than 130% of the outdoor unit  
2. Auto-Addressing is not in operation  
3. The communication cable connection error ie the indoor unit connected to some other outdoor unit has the communication cable mixed up or confused | Concerned Remote Controller Outdoor unit |

**Defect inspection method**

1) Check the total capacity of the all indoor units and compare it with the 130% of the capacity of the outdoor unit.
2) Check whether the communication cable of some of the indoor unit is connected to some other outdoor unit. (Refer to CH05)
3) Please operate the Auto-Addressing.
4) In case the error code is still in display even when the above given contents are normal then please replace the PCB.
5) In case the error code exists even after the outdoor PCB is replaced then please check the indoor PCBs one by one.

To carry out Auto-Addressing function, press red button until you see ‘88’ displayed on 88 segment as shown in left side picture.
## Troubleshooting Guide

### Error Code 52: Communication error (Inverter PCB 'Main PCB')

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>Communication error (Inverter PCB 'Main PCB')</td>
<td>The inverter PCB cannot receive the signal from the Main PCB</td>
<td>1. Power line or the communication line is not connected</td>
<td>Concerned Remote Controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Communication cable is Open/Short</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Outdoor main fuse is damaged</td>
<td>Outdoor unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Defective outdoor Main/inverter PCB.</td>
<td></td>
</tr>
</tbody>
</table>

### Defect inspection method

1) Check whether the communication cable connection is normal. Otherwise, check the communication cable and replace if required.

2) Check whether the Outdoor Main /inverter PCB is working on power input
   Check whether the PCB orange color LED is blinking.
   (if the power input and the communication is normal then the LED is blinking)

3) Check the outdoor Main / inverter PCB and replace the PCB if required.

**Communication connector & LED in the main PCB**

![Communication connector & LED in the main PCB](image1)

**Communication connector & LED in the inverter PCB**

![Communication connector & LED in the inverter PCB](image2)
**Troubleshooting Guide**

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 53         | Communication error (indoor › Main PCB ) | The indoor cannot receive signal from the Main PCB | 1. The communication cable is not connected  
2. Communication cable is cut or short  
3. Defective outdoor Main / indoor PCB | Concerned Remote Controller  
Outdoor unit |

**Defect inspection method**

1) Check the indoor unit's control box's power supply and communication connecting condition (terminal block )
2) Check if the communication cable is short or open and remove the cause if any
   (Open confirmation : After the power OFF short the two cables with each other and measure the resistance with a tester › If above 5Ω then it is Open)
   (Short confirmation :After power OFF separate the cables and measure the resistance with a tester › If below 5Ω then it is short )
3) In case there is no error in above given cases 1–2 the separate all the communication cables and recheck after connecting the indoor units individually
   (The error code is displayed when the defective PCB is connected to the indoor unit) › Replace the concerned indoor unit's PCB.
4) In case one indoor or a few indoor has ‘CH53‘ error display :
   Re operate the Auto-Addressing and check whether the all indoor units have Auto-Addressing setting .
   (After the power ON, make sure to operate the Auto-Addressing after one minute )
   › In case the any PCB has not got the Auto-Addressing then recheck the communication cable and replace the indoor PCB if required.
5) Make sure to separate the power line (AC220/380V) and the communication line by at least 30 cm

**CAUTION**

- In case you replace the communication cable with the power cable by mistake then al indoor units PCB can be damaged

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 54         | Outdoor 3 phase power supply wrong wiring (Phase omission ) | Wrong wiring at the outdoor 3 phase (Phase omission ) | 1. Defective inverter PCB  
2. R, S, T power not connected  
3. Main Fuse damaged | Concerned Remote Controller  
Outdoor unit |

**Defect inspection method**

1) Check the outdoor Main fuse .
2) If the error code exists even after replacing the outdoor PCB then request the building's electric in charge to recheck the power supplied.
Check main fuse of outdoor unit
<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>Communication error (Main PCB ' inverter PCB )</td>
<td>Main PCB cannot receive the signal from the inverter PCB</td>
<td>Refer to CH52</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>

**Defect inspection method**

1) Check whether the heat sink cooling fan is normal?
   - Check the power supply connector to the cooling fan of the heat sink on the upper side of the Main PCB is 12Vdc (Always operating when the inverter comp is operating)
   - Also check the heat sink cooling fan Lead-Wire

2) Check whether the air is coming out from the cooling fan of the heat sink on the upper side of the of the control box.
   - Check the assembly condition in the surrounding of the heat sink

6) In case the above given 4,5, the fan is not working then replace the cooling fan.

7) Check the compressor IPM and replace of required.(refer: error code 21)

8) Check if the fan IPM is normal. Otherwise, replace the IPM.

9) In case the error persists even after the fan IPM is replaced then replace the fan main PCB.
# Troubleshooting Guide

If "n1" is displayed at the 7 segment in the main PCB, check Fan Motor "n1" or Fan PCB "n1"

If "n2" is displayed at the 7 segment in the main PCB, check Fan Motor "n2" or Fan PCB "n2"

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 105        | Communication error between the Inverter PCB and the fan PCB (Fan → outdoor, outdoor → fan) | Communication error between the Inverter PCB and the fan PCB | 1. Defective communication Cable connection  
2. Communication cable Open/Short  
3. Defective outdoor PCB  
4. Defective fan PCB | Concerned Remote Controller  
Outdoor Unit |

- Communication connector & LED between inverter PCB and fan PCB

![Inverter PCB](image1)

![Fan PCB](image2)

If "n1" is displayed at the 7 segment in the main PCB, check Fan Motor "n1" or Fan PCB "n1"
If "n2" is displayed at the 7 segment in the main PCB, check Fan Motor "n2" or Fan PCB "n2"
## Troubleshooting Guide

### Over current of Main outdoor Fan motor (Fan IPM error)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| 106        | Over current of Main outdoor Fan motor (Fan IPM error) | Over current of Main outdoor Fan motor | 1. Defective fan motor connector connection  
2. Fan Lock  
3. Defective heart sink | Concerned Remote Controller  
Outdoor Unit |

### Defect inspection method

1) Check the fan motor connector connection.
2) Is outdoor fan in Fan Lock condition  
   Otherwise, remove the LOCK causing obstacle (stick etc ).
3) Check the heat sink fan operation . (Refer to CH62)
4) In case all of the above contents are normal and still the error code is displayed then please replace the fan IPM PCB .
5) In case the error code still persists even after replacing the fan IPM PCB then replace the fan Main PCB .

![Fan motor connector](image-url)
Fan IPM
## Troubleshooting Guide

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>107</td>
<td>Low voltage in the fan motor</td>
<td>Low voltage in the fan motor</td>
<td>1. Defective fan PCB DC link voltage lead wire connection</td>
<td>Concerned Remote Controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Abnormal fan PCB Capacitor</td>
<td>Outdoor Unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Abnormal fan PCB input power</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Fan PCB defect</td>
<td></td>
</tr>
</tbody>
</table>

**Defect inspection method**

1) Check the fan PCB DC link voltage lead wire connecting condition.
2) Check Fan PCB input power voltage (normal : rated ± 10%)
3) Check whether the fan PCB Capacitor has any abnormality.
   In case it is abnormal then outer shape is deformed (outer shape expansion).
4) In case of Capacitor abnormality replace the fan PCB.
5) In case the error code exists even after the PCB replacement then replace the fan IPM PCB

**DC link location of outdoor fan**

![DC link location of outdoor fan](image-url)
Measure input power of fan main PCB
### Troubleshooting Guide

<table>
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<tr>
<th>Error Code</th>
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<th>Meaning</th>
<th>Main Causes</th>
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</tr>
</thead>
<tbody>
<tr>
<td>108</td>
<td>Communication error between the Main PCB and the fan PCB</td>
<td>Communication error between the Main PCB and the fan PCB (Fan › outdoor, outdoor › fan)</td>
<td></td>
<td>Refer to CH105</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Error Code</th>
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<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
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</thead>
<tbody>
<tr>
<td>113</td>
<td>Sensor error at the outdoor Liquid Refrigerant pipe</td>
<td>Abnormal value of Sensor measurement (Open/Short)</td>
<td>1. Defective temp sensor connector connection&lt;br&gt;2. Defective temp sensor Open/Short&lt;br&gt;3. Defective outdoor PCB</td>
<td>Concerned Remote Controller&lt;br&gt;Outdoor unit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
<tbody>
<tr>
<td>114(Main Sub cool inlet)&lt;br&gt;115(Main Sub cool outlet)</td>
<td>Sensor error at the outdoor sub cooling inlet or outlet</td>
<td>Abnormal value of the sensor measurement (Open/Short)</td>
<td>1. Defective temp sensor connector connection&lt;br&gt;2. Defective temp sensor Open/Short&lt;br&gt;3. Defective outdoor PCB</td>
<td>Concerned Remote Controller&lt;br&gt;Outdoor unit</td>
</tr>
</tbody>
</table>

#### Defect inspection method

1. Check the temp sensor connector connecting condition and lead wire.
2. Is the temp sensor resistance value normal? Otherwise, replace the sensor<br>- Pipe temp sensor : $10^\circ\text{C} = 10\,\text{k}\Omega$ : $25^\circ\text{C} = 5\,\text{k}\Omega$ : $50^\circ\text{C} = 1.8\,\text{k}\Omega$
3. In case the sensor connection and the resistance value is correct then replace the outdoor PCB.
Troubleshooting Guide

- Measure resistance of LEV coil
- Measure temp sensor of liquid pipe
- Measure temp sensor of sub-cool outlet
- Measure temp sensor of sub-cool inlet

Sub-cool circuit in the outdoor unit
### Error Code 151

<table>
<thead>
<tr>
<th>Error Contents</th>
<th>Meaning</th>
<th>Main Causes</th>
<th>Error display position</th>
</tr>
</thead>
</table>
| Outdoor 4way (reversing valve) Switching Error | When the Main or the Sub outdoor has one of them having a 4way valve error | 1. 4 way valve error due to the inlet of sludge into the valve  
2. Comp damage leading to pressure change does not occur  
3. Wrong installation of common pipe between the outdoor units  
4. 4way valve error | Concerned Remote Controller  
Outdoor unit |

### Defect inspection method

1. Check whether the piping between the outdoor units is normal  
   (liquid pipe should be connected to liquid pipe, common pipe be connected to common pipe)  
   *fi Pipe modification*
2. Check whether the Main/Sub outdoor compressor is damaged or not. (Refer to CH21)
3. Please confirm the Main PCB’s 4way valve terminal voltage (220V±10%).  
   In case of abnormal voltage please replace the outdoor main PCB
4. Check the outdoor PCB’s 4way valve connector connections and coil connections.
5. Measure the 4way valve’s coil resistance at the connector  
   *Normal resistance :*
6. In case the error still persists even after the all above conditions are normal then replace the 4way valve.
Troubleshooting Guide

4way valve in the outdoor unit

4way valve connector on the Main PCB