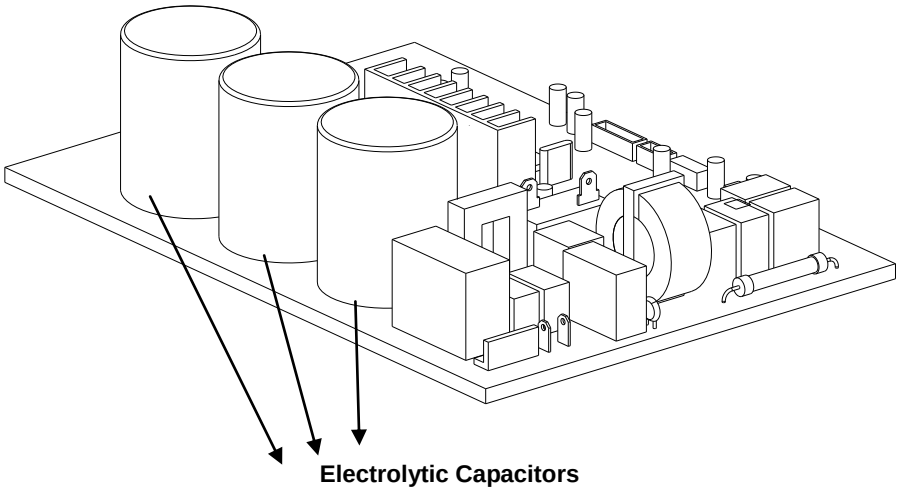
# 8. Troubleshooting

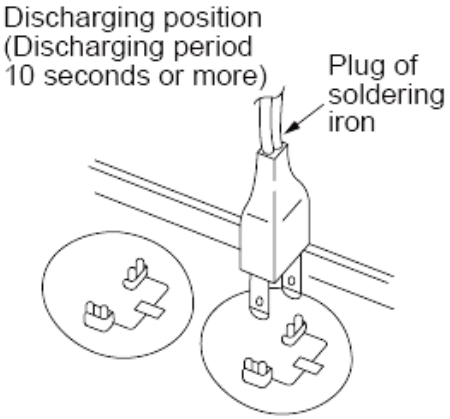
**Safety**

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



**Electrolytic Capacitors**
**(HIGH VOLTAGE! CAUTION!)**

For other models, please connect discharge resistance (approx.100Ω 40W) or soldering iron (plug) between +, - terminals of the electrolytic capacitor on the contrary side of the outdoor PCB.




**Note: The picture above is only for reference. The plug of your side may be different.**

## 8.1 Indoor Unit Error Display

| Operation lamp | Timer lamp | Display | LED STATUS |
|---|---|---|---|
| ☆ 1 time | X | E0 | Indoor unit EEPROM parameter error |
| ☆ 2 times | X | E1 | Indoor / outdoor units communication error |
| ☆ 4 times | X | E3 | Indoor fan speed has been out of control |
| ☆ 5 times | X | E4 | Indoor room temperature sensor T1 open circuit or short circuit |
| ☆ 6 times | X | E5 | Evaporator coil temperature sensor T2 open circuit or short circuit |
| ☆ 7 times | X | EC | Refrigerant leakage detection |
| ☆ 1 times | O | F0 | Overload current protection |
| ☆ 2 times | O | F1 | Outdoor ambient temperature sensor T4 open circuit or short circuit |
| ☆ 3 times | O | F2 | Condenser coil temperature sensor T3 open circuit or short circuit |
| ☆ 4 times | O | F3 | Compressor discharge temperature sensor T5 open circuit or short circuit |
| ☆ 5 times | O | F4 | Outdoor unit EEPROM parameter error |
| ☆ 6 times | O | F5 | Outdoor fan speed has been out of control |
| ☆ 1 times | ☆ | P0 | IPM malfunction or IGBT over-strong current protection |
| ☆ 2 times | ☆ | P1 | Over voltage or over low voltage protection |
| ☆ 3 times | ☆ | P2 | High temperature protection of compressor top diagnosis and solution |
| ☆ 5 times | ☆ | P4 | Inverter compressor drive error |

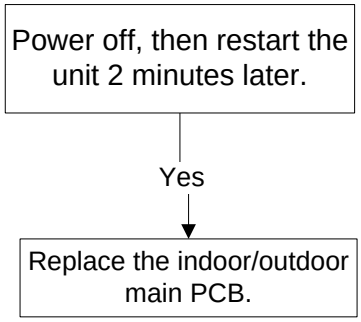
O（light）　　X（off）　　☆（flash）

## 8.2 Trouble shooting

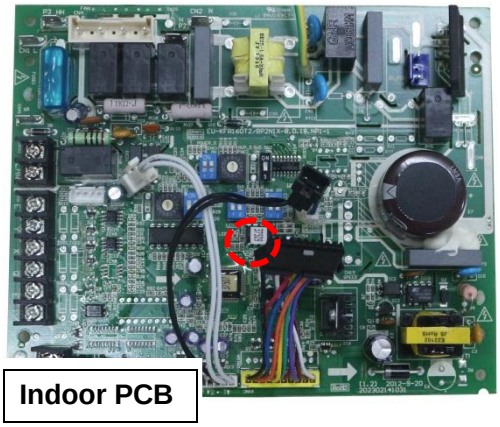
### 8.2.1 EEPROM parameter error diagnosis and solution(E0/F4)

| | |
|---|---|
| **Error Code** | **E0/F4** |
| **Malfunction decision conditions** | **Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.** |
| **Supposed causes** | ● **Installation mistake**<br>● **PCB faulty** |

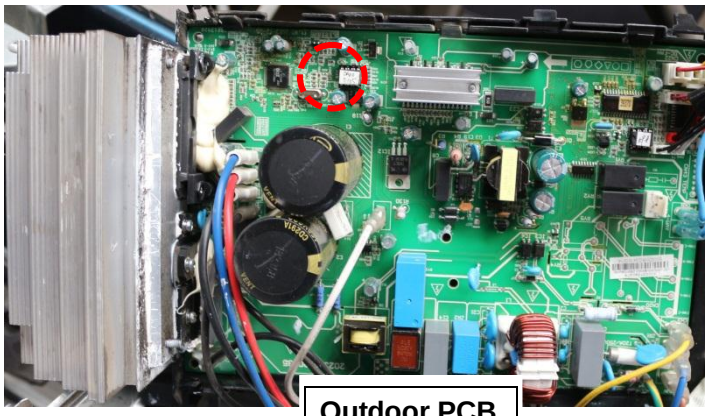
**Trouble shooting:**




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**



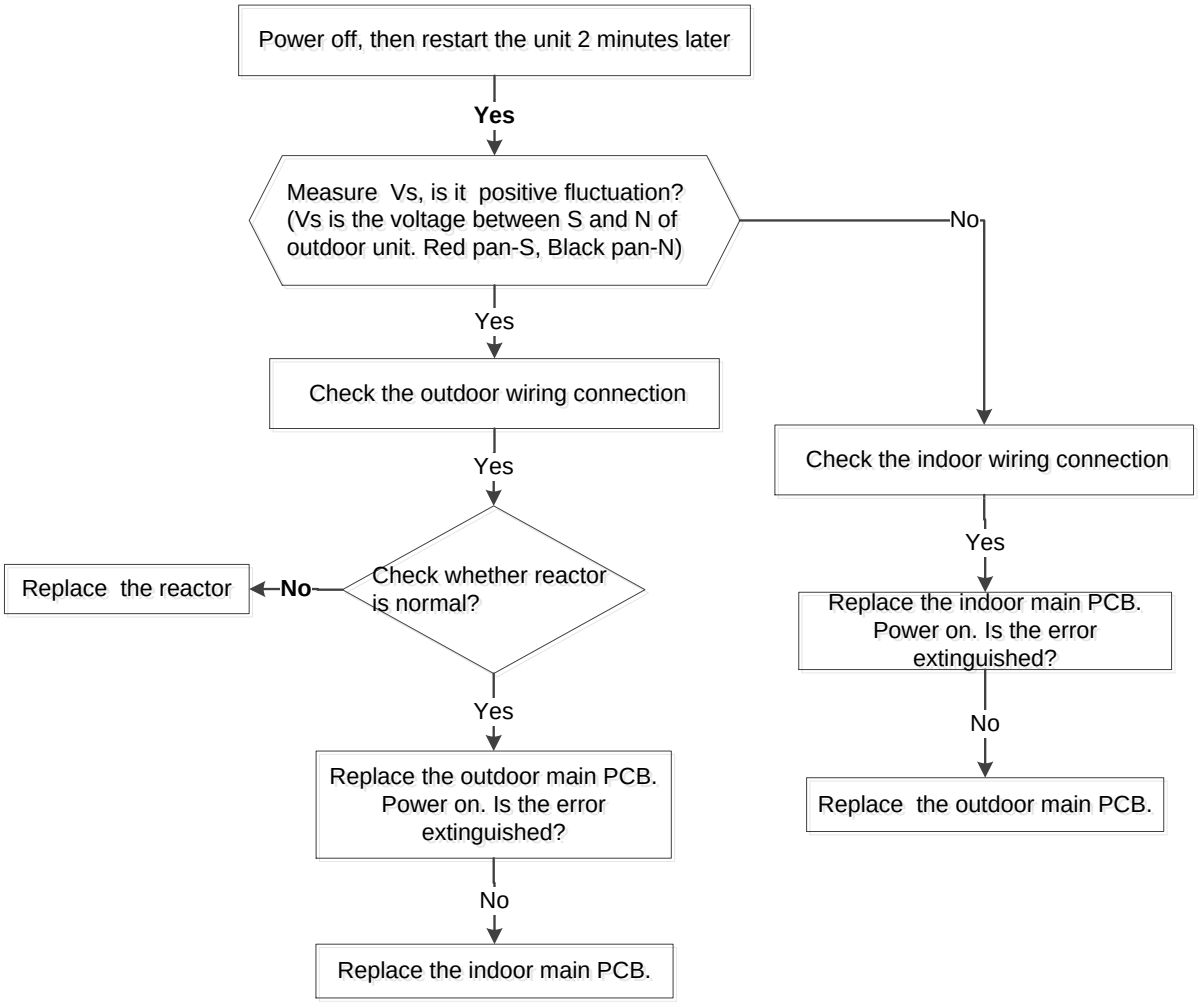
**Outdoor PCB**

**Note: The two photos above are only for reference, it's may be not same totally with the ones on your side.**

### 8.2.2 Indoor / outdoor unit's communication diagnosis and solution(E1)

| | |
|---|---|
| **Error Code** | **E1** |
| **Malfunction decision conditions** | **Indoor unit does not receive the feedback from outdoor unit during 110 seconds and this condition happens four times continuously.** |
| **Supposed causes** | ● **Wiring mistake**<br>● **Indoor or outdoor PCB faulty** |

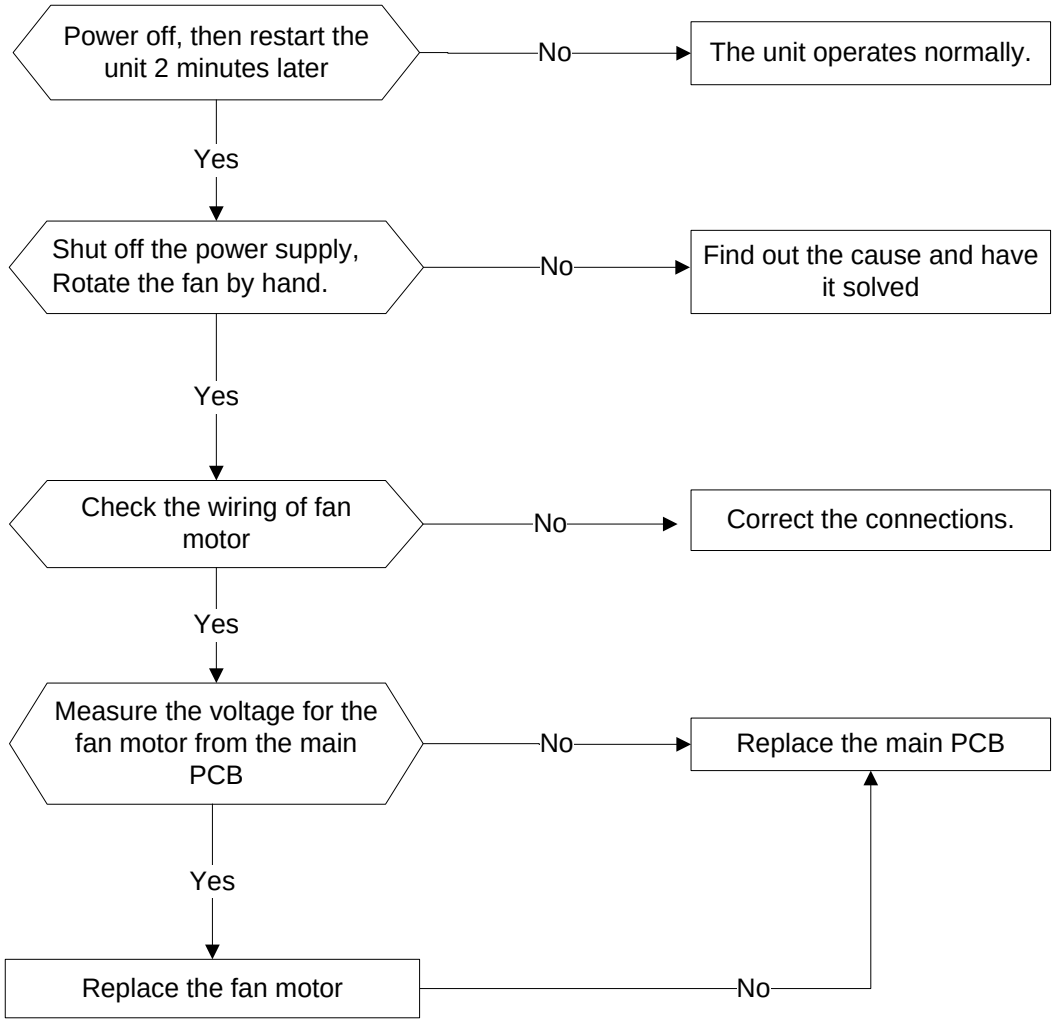
**Trouble shooting:**



### 8.2.4 Fan speed has been out of control diagnosis and solution(E3)

| | |
|---|---|
| **Error Code** | **E3/F5** |
| **Malfunction decision conditions** | **When indoor fan speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure.** |
| **Supposed causes** | ● **Wiring mistake**<br>● **Fan ass'y faulty**<br>● **Fan motor faulty**<br>● **PCB faulty** |

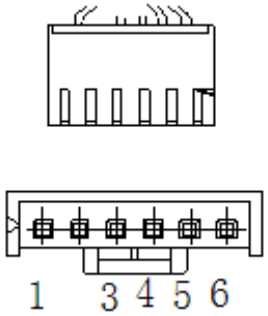
**Trouble shooting:**



Index1:

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 has problems and need to be replaced.




DC motor voltage input and output

| NO. | Color | Signal | Voltage |
|---|---|---|---|
| 1 | Red | Vs/Vm | 280V~380V |
| 2 | --- | --- | --- |
| 3 | Black | GND | 0V |
| 4 | White | Vcc | 14-17.5V |
| 5 | Yellow | Vsp | 0~5.6V |
| 6 | Blue | FG | 14-17.5V |

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 has problems and need 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 need to be replaced, otherwise the PCB must has problems and need to be replaced.

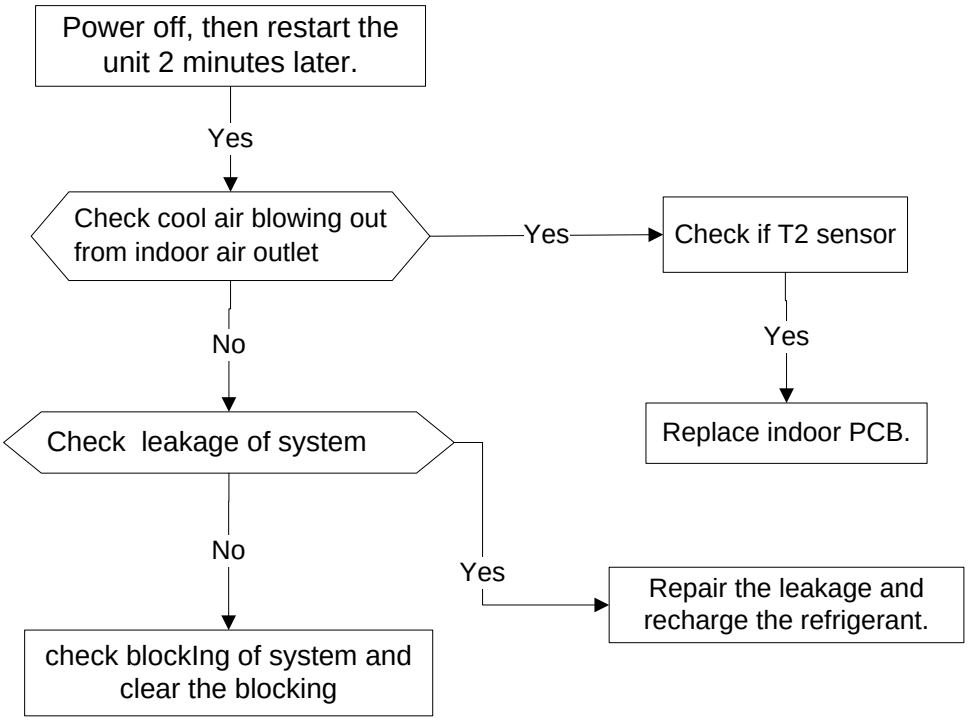
3. Indoor AC Fan Motor

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 has problems and need to be replaced.

### 8.2.4 Refrigerant Leakage Detection diagnosis and solution(EC)

| | |
|---|---|
| **Error Code** | **EC** |
| **Malfunction decision conditions** | **Define the evaporator coil temp.T2 of the compressor just starts running as Tcool.**<br>**In the beginning 5 minutes after the compressor starts up, if T2 ＜Tcool－2℃ does not keep continuous 4 seconds and this situation happens 3 times, the display area will show "EC" and AC will turn off.** |
| **Supposed causes** | ● **T2 sensor faulty**<br>● **Indoor PCB faulty**<br>● **System problems, such as leakage or blocking.** |

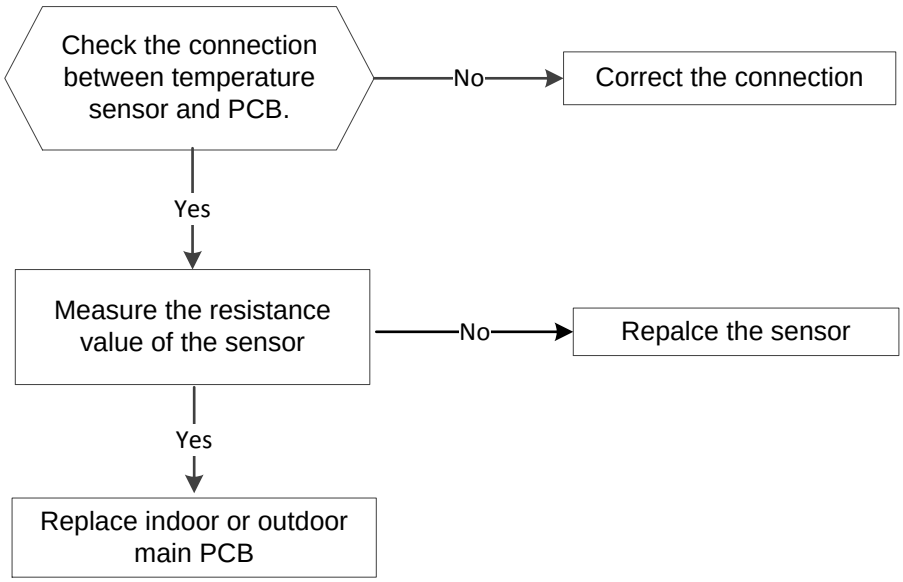
**Trouble shooting:**

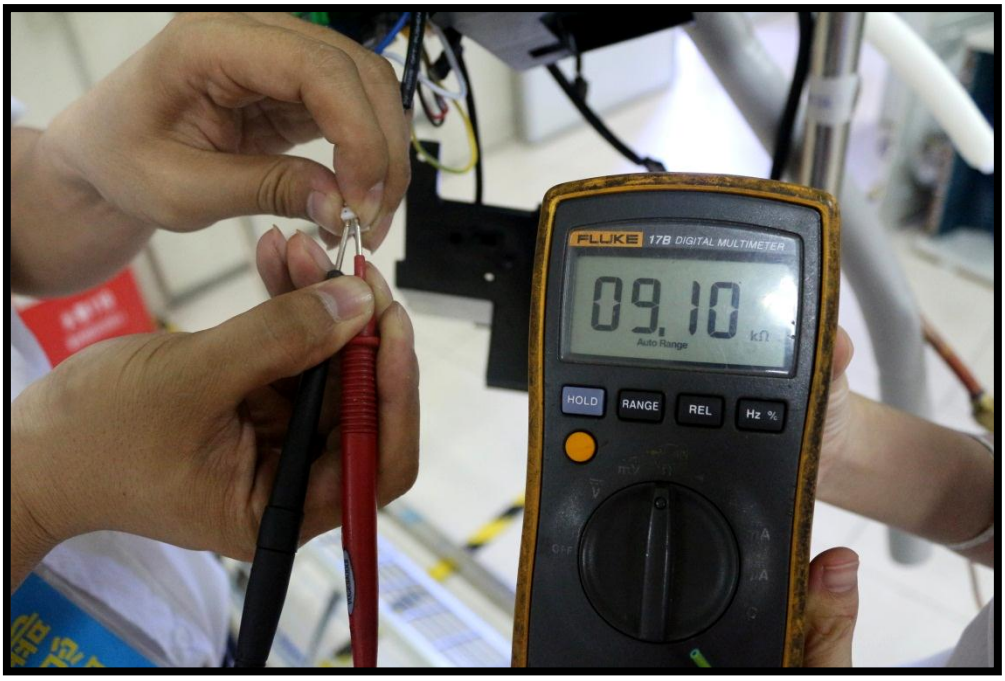


### 8.2.5 Open circuit or short circuit of temperature sensor diagnosis and solution(E5)

| | |
|---|---|
| **Error Code** | **E4/E5/F1/F2/F3** |
| **Malfunction decision conditions** | **If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED will display the failure.** |
| **Supposed causes** | • **Wiring mistake**<br>• **Sensor faulty** |

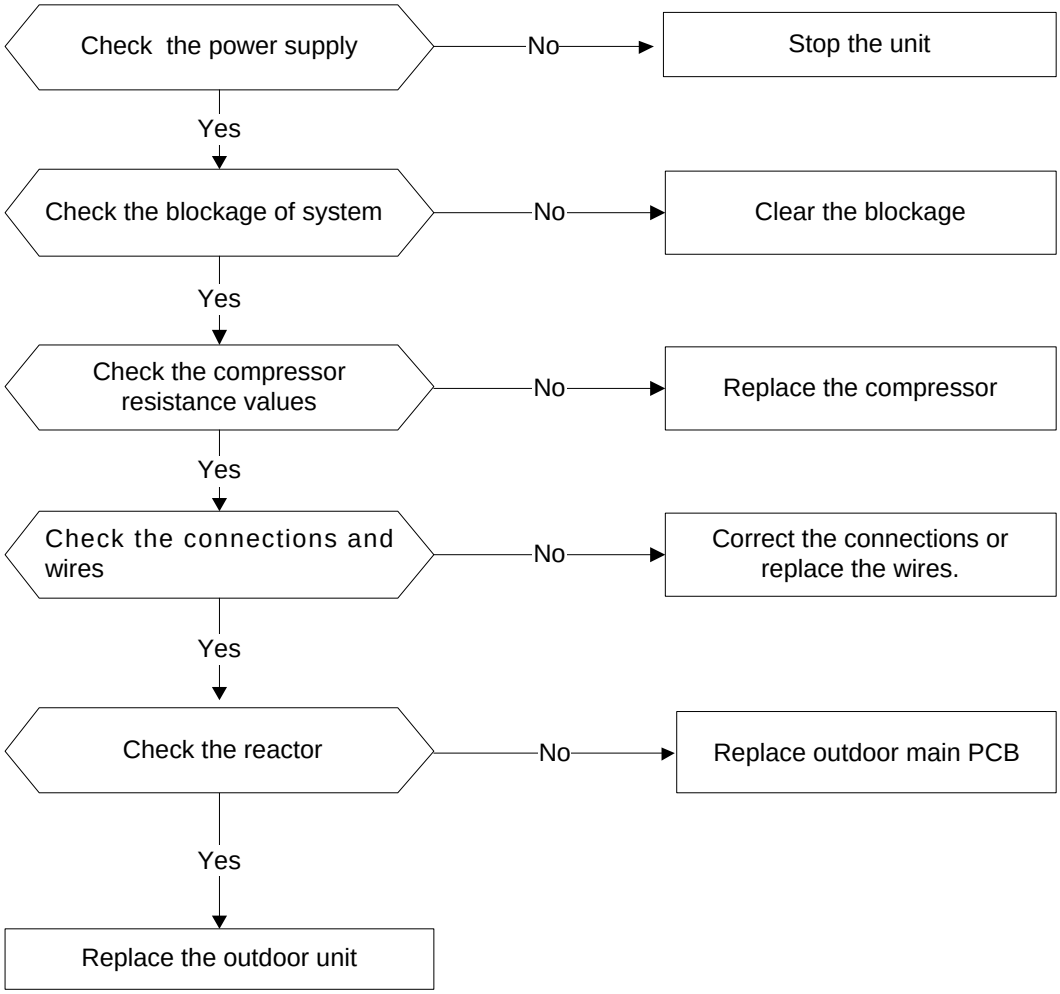
**Trouble shooting:**



### 8.2.6 Overload current protection diagnosis and solution(F0)

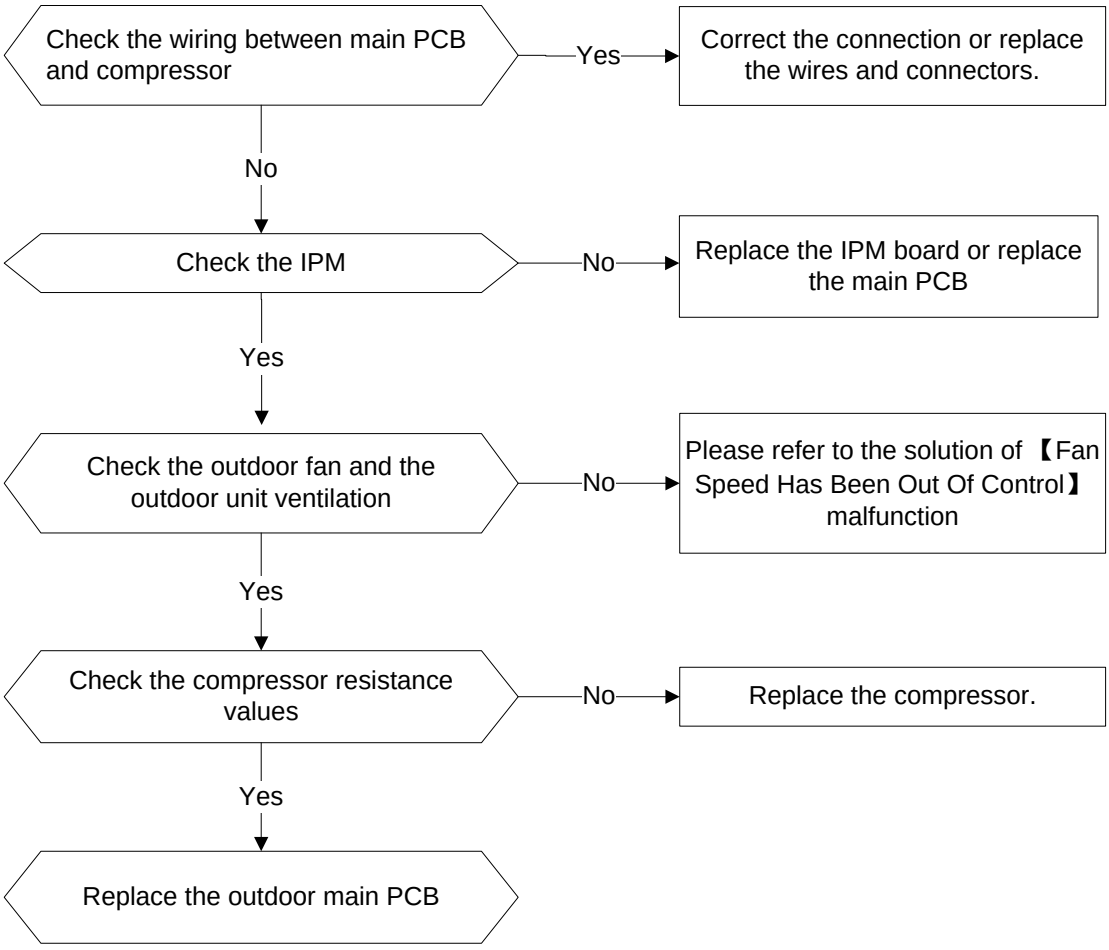
| | |
|---|---|
| **Error Code** | **F0** |
| **Malfunction decision conditions** | **An abnormal current rise is detected by checking the specified current detection circuit.** |
| **Supposed causes** | ● **Power supply problems.**<br>● **System blockage**<br>● **PCB faulty**<br>● **Wiring mistake**<br>● **Compressor malfunction** |



### 8.2.7 IPM malfunction or IGBT over-strong current protection diagnosis and solution(P0)

| | |
|---|---|
| **Error Code** | **P0** |
| **Malfunction decision conditions** | **When the voltage signal that IPM send to compressor drive chip is abnormal, the display LED will show "P0" and AC will turn off.** |
| **Supposed causes** | ● **Wiring mistake**<br>● **IPM malfunction**<br>● **Outdoor fan ass'y faulty**<br>● **Compressor malfunction**<br>● **Outdoor PCB faulty** |

**Trouble shooting:**




➢ **IPM continuity check**

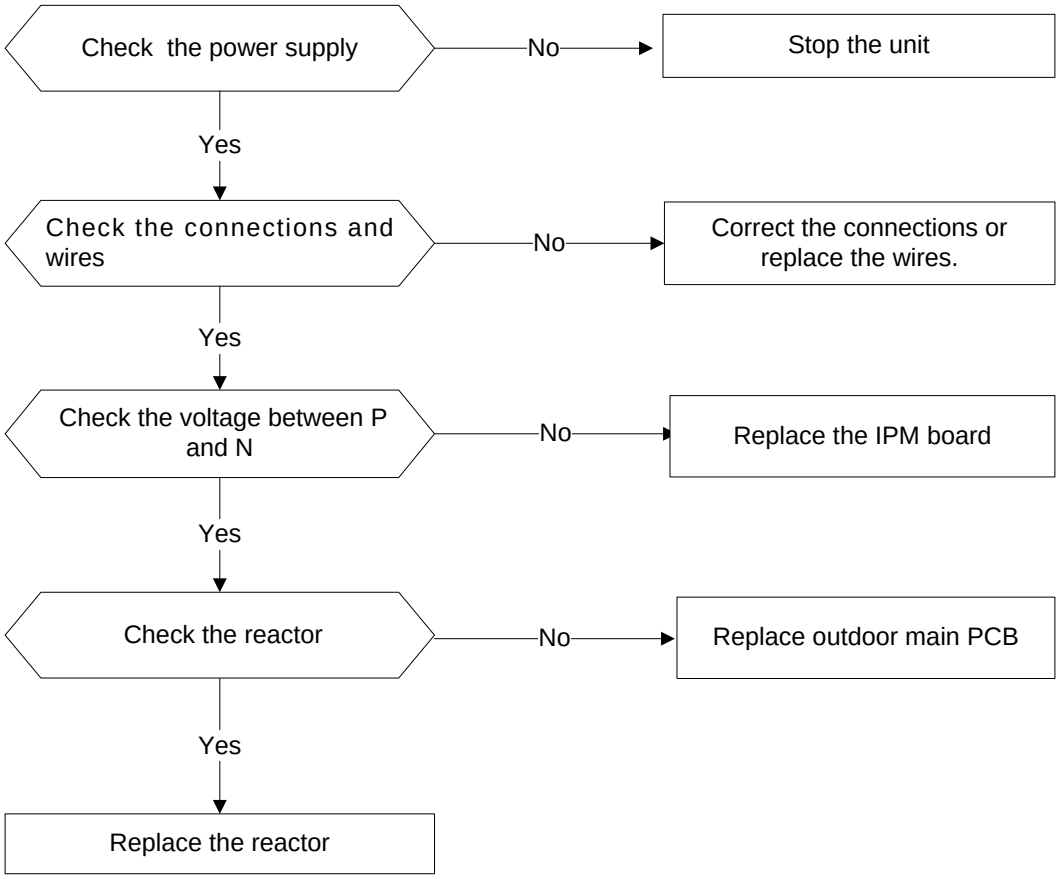
Turn off the power, let the large capacity electrolytic capacitors discharge completely, and dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

| Digital tester | | Normal resistance value | Digital tester | | Normal resistance value |
|---|---|---|---|---|---|
| (+)Red | (-)Black | | (+)Red | (-)Black | |
| P | N | ∞<br>(Several MΩ) | U | N | ∞<br>(Several MΩ) |
| | U | | V | | |
| | V | | W | | |
| | W | | (+)Red | | |

### 8.2.8 Over voltage or too low voltage protection diagnosis and solution(P1)

| | |
|---|---|
| **Error Code** | **P1** |
| **Malfunction decision conditions** | **An abnormal voltage rise or drop is detected by checking the specified voltage detection circuit.** |
| **Supposed causes** | ● **Power supply problems.**<br>● **System leakage or block**<br>● **PCB faulty** |

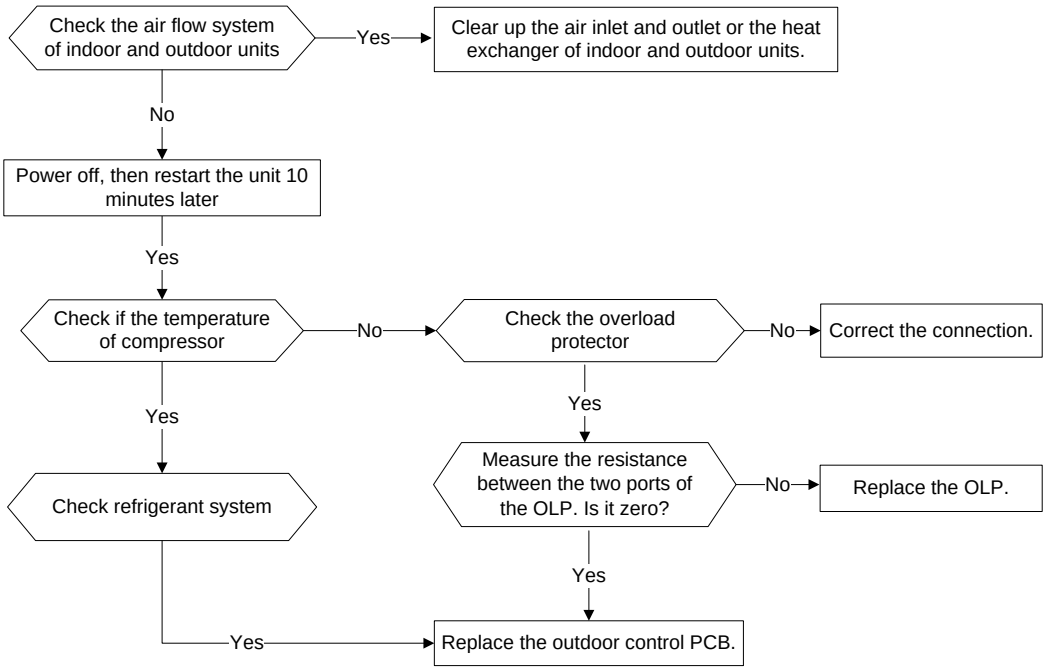
**Trouble shooting:**



### 8.2.9 High temperature protection of compressor top diagnosis and solution(P2)

| | |
|---|---|
| **Error Code** | **P2** |
| **Malfunction decision conditions** | **If the sampling voltage is not 5V, the LED will display the failure.** |
| **Supposed causes** | ● **Power supply problems.**<br>● **System leakage or block**<br>● **PCB faulty** |

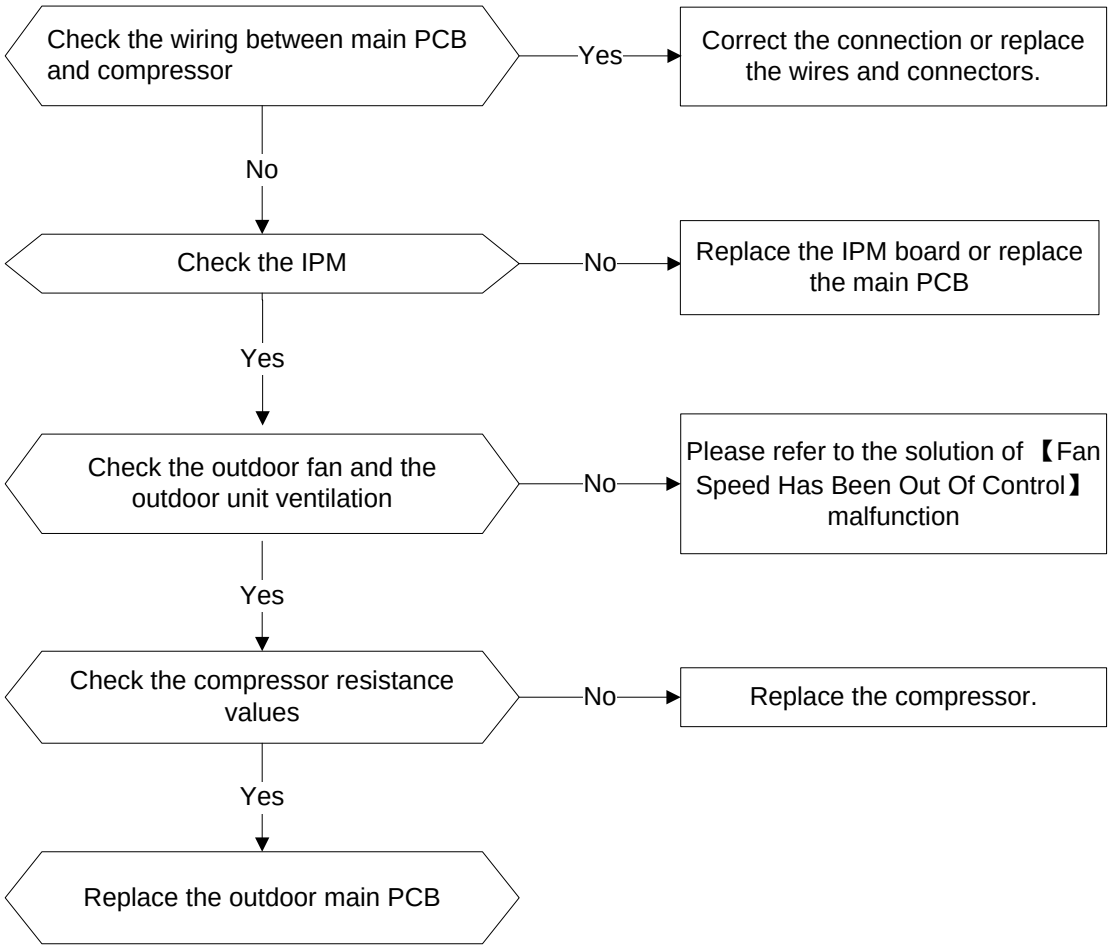
**Trouble shooting:**



### 8.2.10 Inverter compressor drive error diagnosis and solution(P4)

| Error Code | P4 |
|---|---|
| **Malfunction decision conditions** | **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.** |
| **Supposed causes** | ● **Wiring mistake**<br>● **IPM malfunction**<br>● **Outdoor fan ass'y faulty**<br>● **Compressor malfunction**<br>● **Outdoor PCB faulty** |

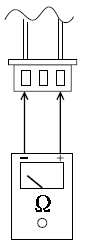
**Trouble shooting:**



## Main parts check

### 1. Temperature sensor checking

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




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.

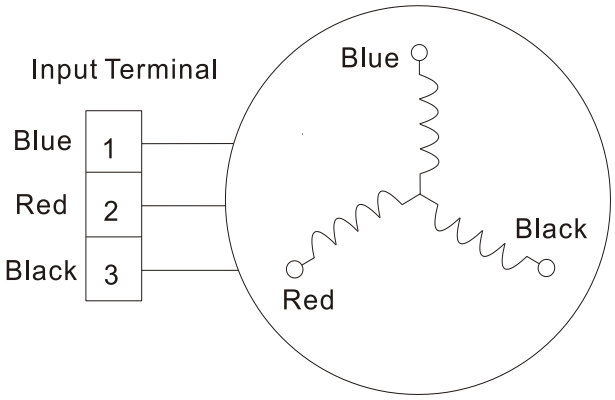
Measure the resistance value of each winding by using the multi-meter.

***Appendix*** 1 Temperature Sensor Resistance Value Table (℃--K)

| ℃ | K Ohm | ℃ | K Ohm | ℃ | K Ohm | ℃ | K Ohm |
|---|---|---|---|---|---|---|---|
| -20 | 115.266 | 20 | 12.6431 | 60 | 2.35774 | 100 | 0.62973 |
| -19 | 108.146 | 21 | 12.0561 | 61 | 2.27249 | 101 | 0.61148 |
| -18 | 101.517 | 22 | 11.5000 | 62 | 2.19073 | 102 | 0.59386 |
| -17 | 96.3423 | 23 | 10.9731 | 63 | 2.11241 | 103 | 0.57683 |
| -16 | 89.5865 | 24 | 10.4736 | 64 | 2.03732 | 104 | 0.56038 |
| -15 | 84.2190 | 25 | 10.000 | 65 | 1.96532 | 105 | 0.54448 |
| -14 | 79.3110 | 26 | 9.55074 | 66 | 1.89627 | 106 | 0.52912 |
| -13 | 74.5360 | 27 | 9.12445 | 67 | 1.83003 | 107 | 0.51426 |
| -12 | 70.1698 | 28 | 8.71983 | 68 | 1.76647 | 108 | 0.49989 |
| -11 | 66.0898 | 29 | 8.33566 | 69 | 1.70547 | 109 | 0.48600 |
| -10 | 62.2756 | 30 | 7.97078 | 70 | 1.64691 | 110 | 0.47256 |
| -9 | 58.7079 | 31 | 7.62411 | 71 | 1.59068 | 111 | 0.45957 |
| -8 | 56.3694 | 32 | 7.29464 | 72 | 1.53668 | 112 | 0.44699 |
| -7 | 52.2438 | 33 | 6.98142 | 73 | 1.48481 | 113 | 0.43482 |
| -6 | 49.3161 | 34 | 6.68355 | 74 | 1.43498 | 114 | 0.42304 |
| -5 | 46.5725 | 35 | 6.40021 | 75 | 1.38703 | 115 | 0.41164 |
| -4 | 44.0000 | 36 | 6.13059 | 76 | 1.34105 | 116 | 0.40060 |
| -3 | 41.5878 | 37 | 5.87359 | 77 | 1.29078 | 117 | 0.38991 |
| -2 | 39.8239 | 38 | 5.62961 | 78 | 1.25423 | 118 | 0.37956 |
| -1 | 37.1988 | 39 | 5.39689 | 79 | 1.21330 | 119 | 0.36954 |
| 0 | 35.2024 | 40 | 5.17519 | 80 | 1.17393 | 120 | 0.35982 |
| 1 | 33.3269 | 41 | 4.96392 | 81 | 1.13604 | 121 | 0.35042 |
| 2 | 31.5635 | 42 | 4.76253 | 82 | 1.09958 | 122 | 0.3413 |
| 3 | 29.9058 | 43 | 4.57050 | 83 | 1.06448 | 123 | 0.33246 |
| 4 | 28.3459 | 44 | 4.38736 | 84 | 1.03069 | 124 | 0.32390 |
| 5 | 26.8778 | 45 | 4.21263 | 85 | 0.99815 | 125 | 0.31559 |
| 6 | 25.4954 | 46 | 4.04589 | 86 | 0.96681 | 126 | 0.30754 |
| 7 | 24.1932 | 47 | 3.88673 | 87 | 0.93662 | 127 | 0.29974 |
| 8 | 22.5662 | 48 | 3.73476 | 88 | 0.90753 | 128 | 0.29216 |
| 9 | 21.8094 | 49 | 3.58962 | 89 | 0.87950 | 129 | 0.28482 |
| 10 | 20.7184 | 50 | 3.45097 | 90 | 0.85248 | 130 | 0.27770 |
| 11 | 19.6891 | 51 | 3.31847 | 91 | 0.82643 | 131 | 0.27078 |
| 12 | 18.7177 | 52 | 3.19183 | 92 | 0.80132 | 132 | 0.26408 |
| 13 | 17.8005 | 53 | 3.07075 | 93 | 0.77709 | 133 | 0.25757 |
| 14 | 16.9341 | 54 | 2.95896 | 94 | 0.75373 | 134 | 0.25125 |
| 15 | 16.1156 | 55 | 2.84421 | 95 | 0.73119 | 135 | 0.24512 |
| 16 | 15.3418 | 56 | 2.73823 | 96 | 0.70944 | 136 | 0.23916 |
| 17 | 14.6181 | 57 | 2.63682 | 97 | 0.68844 | 137 | 0.23338 |
| 18 | 13.9180 | 58 | 2.53973 | 98 | 0.66818 | 138 | 0.22776 |
| 19 | 13.2631 | 59 | 2.44677 | 99 | 0.64862 | 139 | 0.22231 |

## 2.Compressor checking

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




| Position | Resistance Value | | |
|---|---|---|---|
| | ASN98D22UFZ | ASM135D23UFZ | DA200S2C-10MT |
| Blue - Red | 1.57Ω (20℃/68℉) | 1.75Ω (20℃/68℉) | 0.51Ω (20℃/68℉) |
| Blue - Black | | | |
| Red - Blue | | | |