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1. Troubleshooting

Model Numbers:

Indoor Unit:

KDIR09-H2, KTIR09-H2, KUIR09-H2

KDIR12-H2; KTIR12-H2, KUIR12-H2

KDIR18-H2, KTIR18-H2, KUIR18-H2

KDIR24-H2, KTIR24-H2, KUIR24-H2

KDIR036-H2G1, KTIR036-H2G1, KFUF036-H2G1

KDIR048-H2G1, KTIR048-H2G1, KFUF048-H2G1

Outdoor Unit:

KSIE009-H221-O, KSIE012-H220-O, KSIE018-H220-O

KSIE024-H220-O, KSIR036-H218, KSIR048-H218



WARNING

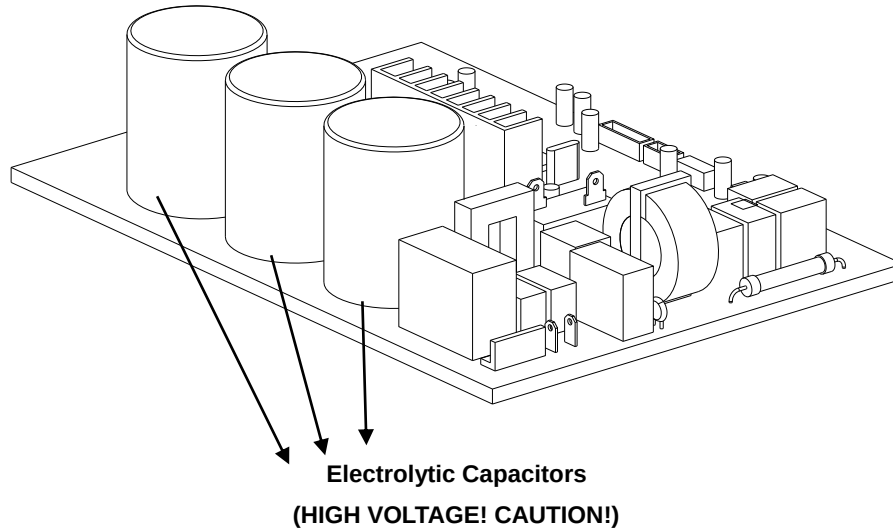
- Installation MUST conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA70/ANSI C1-1993 or current edition and Canadian Electrical Code Part1 CSA C.22.1.
- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments
- Installation or repairs made by unqualified persons can result in hazards to you and others.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.
- This service is only for service engineer to use.



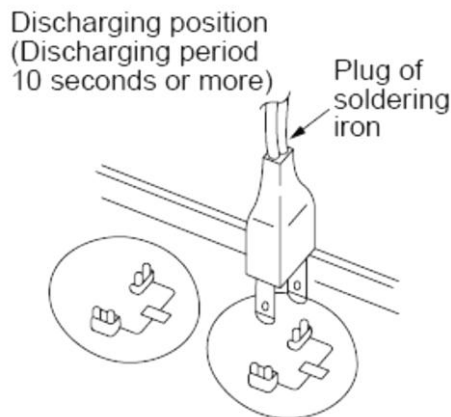
16. Troubleshooting

Safety

Electricity is stored in capacitors, even when the power supply is shut off. Do not forget to discharge the electricity in the capacitors.



For other models, For other models, connect a discharge resistor (approx.100Ω 40W) or a soldering iron plug between the + and - terminals of the electrolytic capacitor on the opposite side of the outdoor printed circuit board (PCB).



Note: The picture above is for reference purposes only. The design of the devices depicted may vary by model.

16.1 Indoor Unit Error Display

Operation lamp	Timer lamp	Display	LED STATUS
☆ 1 time	X	E0	Indoor unit EEPROM parameter error
☆ 2 times	X	E1	Communication malfunction between indoor and outdoor units
☆ 4 times	X	E3	Indoor fan speed malfunction
☆ 5 times	X	E4	Indoor room temperature sensor (T1) malfunction
☆ 6 times	X	E5	Evaporator coil temperature sensor (T2) malfunction
☆ 7 times	X	EC	Refrigerant leakage detection
☆ 8 times	X	EE	Water-level alarm malfunction
☆ 1 time	O	F0	Current overload protection
☆ 2 times	O	F1	Outdoor ambient temperature sensor (T4) malfunction
☆ 3 times	O	F2	Condenser coil temperature sensor (T3) malfunction
☆ 4 times	O	F3	Compressor discharge temperature sensor (T5) malfunction
☆ 5 times	O	F4	Outdoor unit EEPROM parameter error
☆ 6 times	O	F5	Outdoor fan speed malfunction
☆ 7 times	O	F6	Indoor coil outlet pipe sensor(Located on outdoor unit low pressure valve)
☆ 8 times	O	F7	Communication malfunction between Cassette optional lift panel and the unit
☆ 9 times	O	F8	Cassette optional lift panel malfunction
☆ 10 times	O	F9	Cassette optional lift panel not closed
☆ 1 times	☆	P0	Inverter module (IPM) malfunction
☆ 2 times	☆	P1	Over-voltage or under-voltage protection
☆ 3 times	☆	P2	Compressor top high temperature protection (OLP)
☆ 4 times	☆	P3	Low ambient temperature cut off in heating
☆ 5 times	☆	P4	Compressor drive malfunction
☆ 6 times	☆	P5	Indoor units mode conflict
☆ 7 times	☆	P6	Low pressure protection
☆ 8 times	☆	P7	Outdoor IPM temperature sensor error

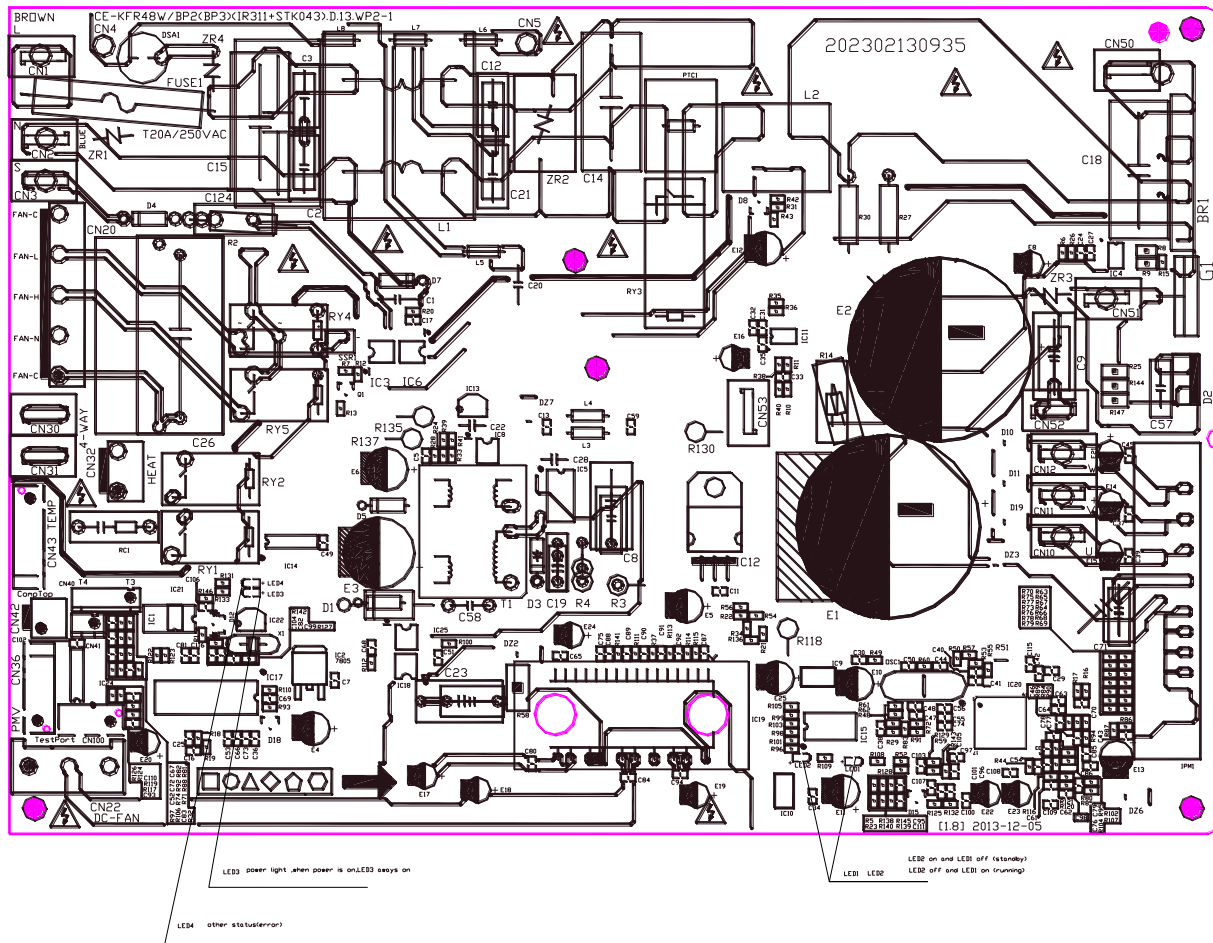
O (light)

X (off)

☆ (flash)

16.2 Outdoor unit error display

For 9K-24K outdoor unit:



No.	Problems	LED2 (Green)	LED1 (Red)	IU display
1	standby for normal	O	X	
2	Operation normally	X	O	
3	Compressor drive board EEPROM error	O	☆	E5
4	IPM malfunction or IGBT over-strong current protection	☆	X	P0
5	Over voltage or too low voltage protection	O	O	P1
6	Inverter compressor drive error	X	☆	P4
7	Inverter compressor drive error	☆	O	P4
8	Communication malfunction between main control board and driver board	☆	☆	P4

For 36K-48K Outdoor Unit

No	Problems	Error Code
1	Communication malfunction between indoor and outdoor units	E1
2	Current overload protection	F0
3	Outdoor ambient temperature sensor (T4) malfunction	F1
4	Condenser coil temperature sensor (T3) malfunction	F2
5	Compressor discharge temperature sensor (T5) malfunction	F3
6	Outdoor unit EEPROM parameter error	F4
7	Outdoor fan speed malfunction	F5
8	Inverter module (IPM) malfunction	P0
9	Over-voltage or under-voltage protection	P1
10	Compressor top high temperature protection (OLP)	P2
11	Low ambient temperature cut off in heating	P3
12	Compressor drive malfunction	P4
13	High temperature protection of indoor coil in heating	J0
14	Outdoor temperature protection of outdoor coil in cooling	J1
15	Temperature protection of compressor discharge	J2
16	PFC module protection	J3
17	Communication malfunction between control board and IPM board	J4
18	High pressure protection	J5
19	Low pressure protection	J6
20	Outdoor IPM module temperature sensor malfunction	P7
21	AC voltage protection	J8

Outdoor check function

N	Display	Remark
00	Normal display	Display running frequency, running state or malfunction code
01	Indoor unit capacity demand code	Actual data*HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "5.0",it means the capacity demand is 15. the digital display tube show "60",it means the capacity demand is 6.0)
02	Amendatory capacity demand code	
03	The frequency after the capacity requirement transfer	
04	The frequency after the frequency limit	
05	The frequency of sending to 341 chip	
06	Indoor unit evaporator outlet temp.(heating T2, cooling T2B)	If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 70 degree, the digital display tube will show "70".
07	Condenser pipe temp.(T3)	If the temp. is lower than -9 degree, the digital display tube

08	Outdoor ambient temp.(T4)	will show “-9”.If the temp. is higher than 70 degree, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “——”		
09	Compressor discharge temp.(T5)	The display value is between 13~129 degree. If the temp. is lower than 13 degree, the digital display tube will show “13”.If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. (For example, the digital display tube show “0.5”,it means the compressor discharge temp. is 105 degree. the digital display tube show “1.6”,it means the compressor discharge temp. is 116 degree)		
10	AD value of current	The display value is hex number.		
11	AD value of voltage			
12	Indoor unit running mode code	Off:0, Fan only 1,Cooling:2, Heating:3		
13	Outdoor unit running mode code	Off:0, Fan only 1,Cooling:2, Heating:3, Forced cooling:4		
14	EXV open angle	Actual data/4. If the value is higher than 99, the digital display tube will show single digit and tens digit. For example, the digital display tube show “2.0”,it means the EXV open angle is 120×4=480p.)		
15	Frequency limit symbol	Bit7	Frequency limit caused by IGBT radiator	The display value is hex number. For example, the digital display tube show 2A, then Bit5=1, Bit3=1, Bit1=1. It means frequency limit caused by T4, T3 and current.
		Bit6	Frequency limit caused by PFC	
		Bit5	Frequency limit caused by T4.	
		Bit4	Frequency limit caused by T2.	
		Bit3	Frequency limit caused by T3.	
		Bit2	Frequency limit caused by T5.	
		Bit1	Frequency limit caused by current	
		Bit0	Frequency limit caused by voltage	
16	DC fan motor speed			
17	IGBT radiator temp.	The display value is between 30~120 degree. If the temp. is lower than 30 degree, the digital display tube will show “30”.If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. (For example, the digital display tube show “0.5”,it means the IGBT radiator temp. is 105 degree. the digital display tube show “1.6”,it means the IGBT radiator temp. is 116 degree)		
18	Indoor unit number	The indoor unit can communicate with outdoor unit well. General:1, Twins:2		
19	Evaporator pipe temp. T2 of 1# indoor unit	If the temp. is lower than 0 degree, the digital display tube will show “0”.If the temp. is higher than 70 degree, the digital display tube will show “70”. If the indoor unit is not		
20	Evaporator pipe temp. T2 of 2# indoor unit			
21	Evaporator pipe temp. T2 of 3# indoor unit			

		connected, the digital display tube will show: "——"
22	1# Indoor unit capacity demand code	Actual data*HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "5.0",it means the capacity demand is 15. the digital display tube show "60",it means the capacity demand is 6.0). If the indoor unit is not connected, the digital display tube will show: "——"
23	2# Indoor unit capacity demand code	
24	3# Indoor unit capacity demand code	
25	Room temp. T1 of 1# indoor unit	If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 70 degree, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "——"
26	Room temp. T1 of 2# indoor unit	
27	Average room temp. T1	
28	Reason of stop	
29	Evaporator pipe temp. T2B of 1# indoor unit	If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 70 degree, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "——"
30	Evaporator pipe temp. T2B of 2# indoor unit	

16.3 Diagnosis and Solution

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

Error Code	E0/F4
Malfunction conditions	Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.
Potential causes	● Installation mistake ● Faulty PCB

Trouble shooting:

Power off, then restart the unit 2 minutes later. Does a problem still remain?

Yes

Replace the indoor/outdoor main PCB.

EEPROM: a type of read-only memory. The contents can be erased and reprogrammed using a pulsed voltage. To locate the EEPROM chip,



Indoor PCB



Outdoor PCB

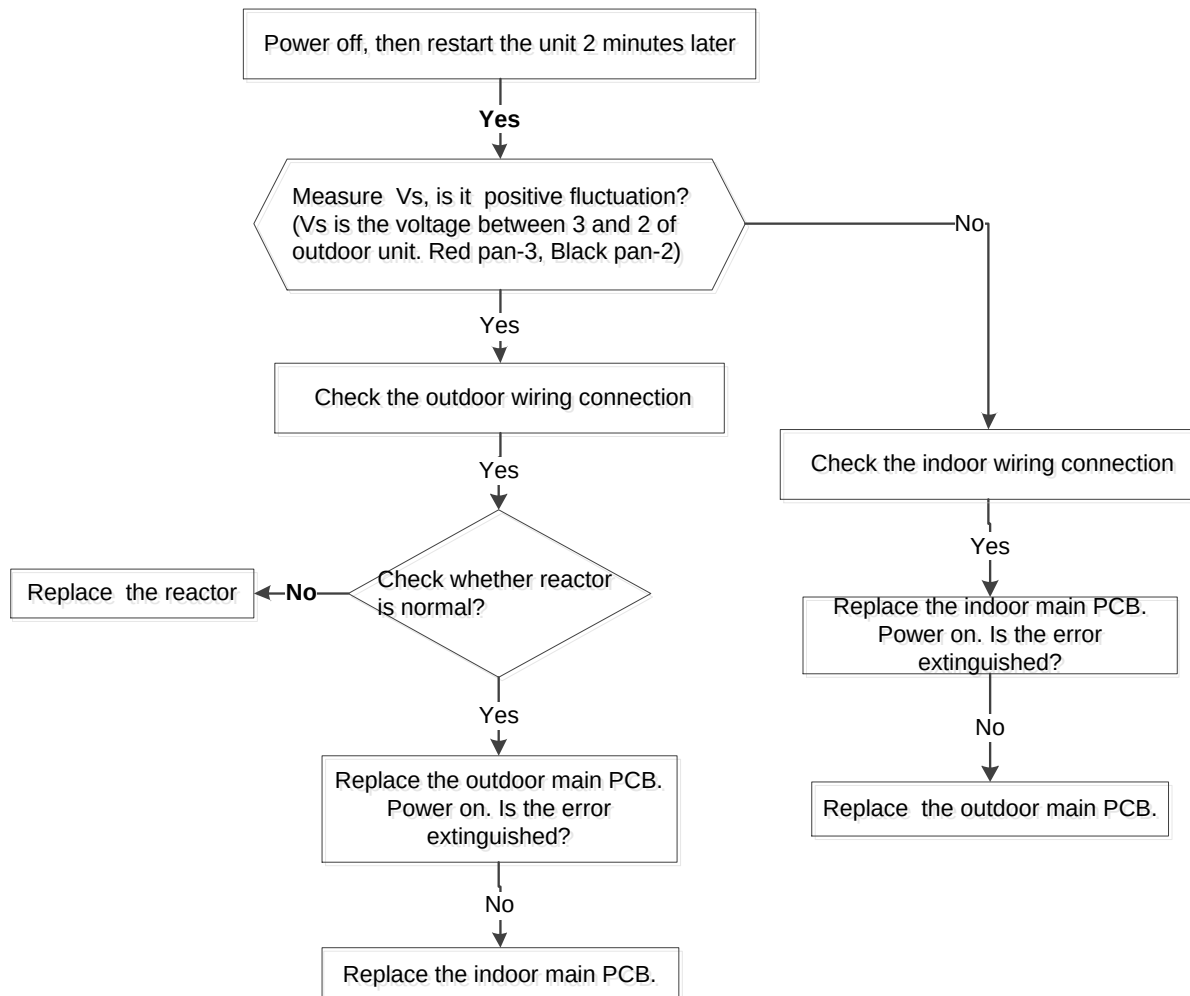
Note: The two photos above are only for reference purposes only. The design of the devices depicted may vary by model.

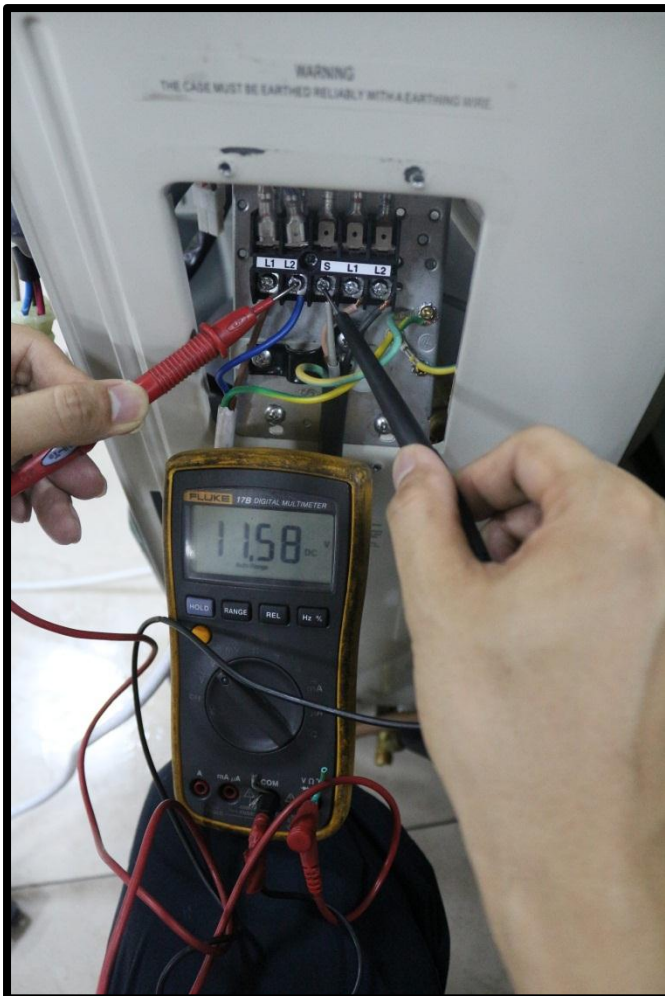
16.3.2 Communication malfunction between indoor and outdoor units diagnosis and solution (E1)

For 9K-24K:

Error Code	E1
Malfunction conditions	If the indoor unit does not receive feedback from outdoor unit for 110 seconds 4 consecutive times.
Potential causes	- Wiring mistake - Faulty indoor or outdoor PCB

Trouble shooting:





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 -50V to 50V.

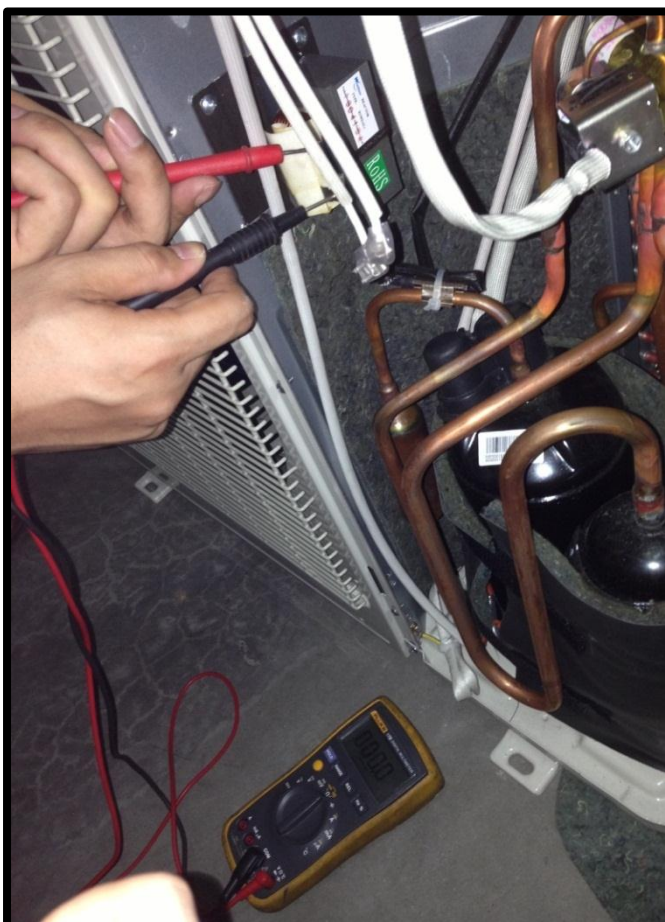
If the outdoor unit has malfunction, the voltage will move alternately with positive value.

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

Remark,

The old label is L1,L2,S, L1,L2

The new label is 1, 2, 3, L1,L2



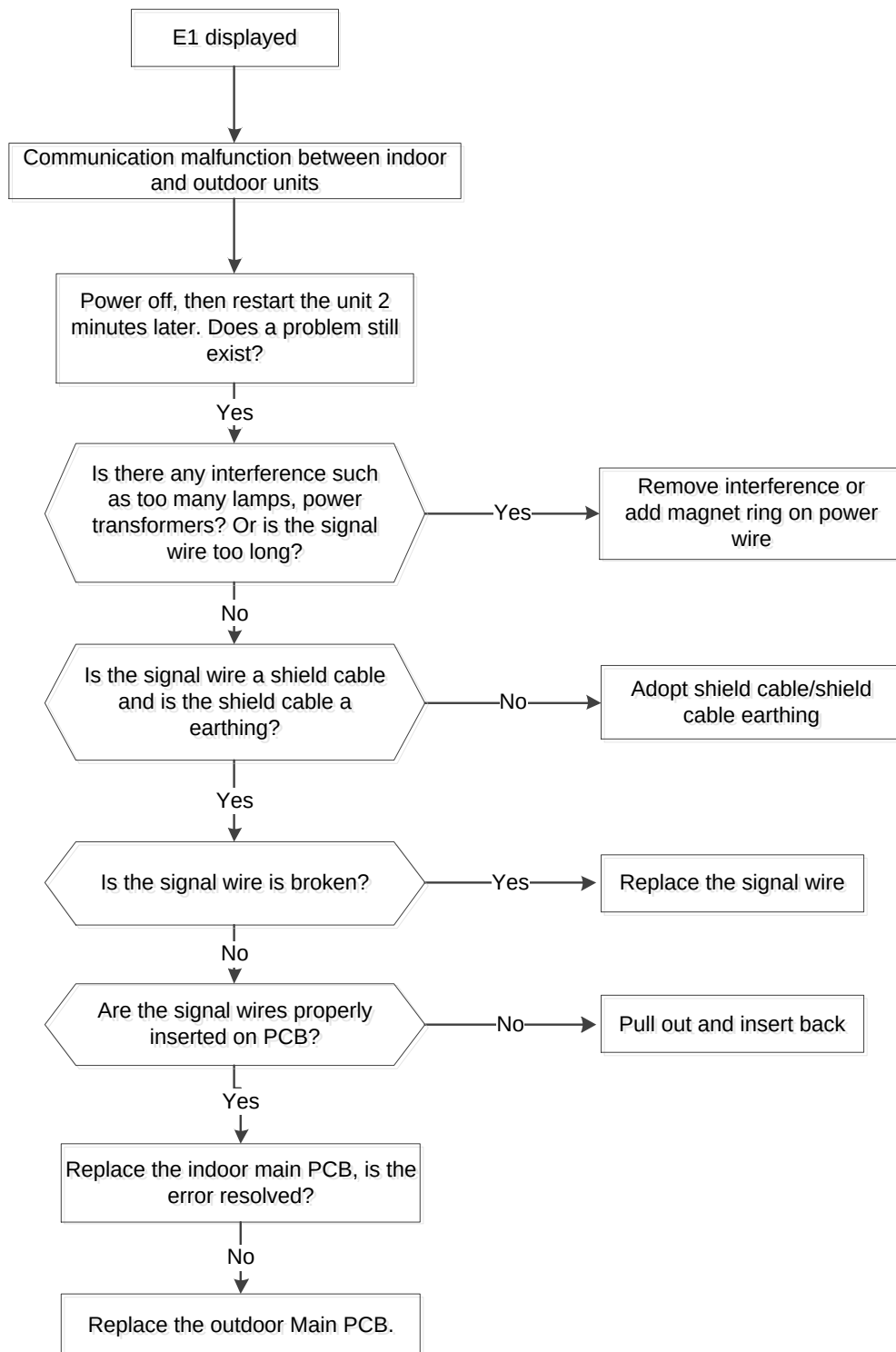
Remark:

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

The normal value should be around zero ohm. Otherwise, the reactor must have malfunction and need to be replaced.

For 36K-48K:

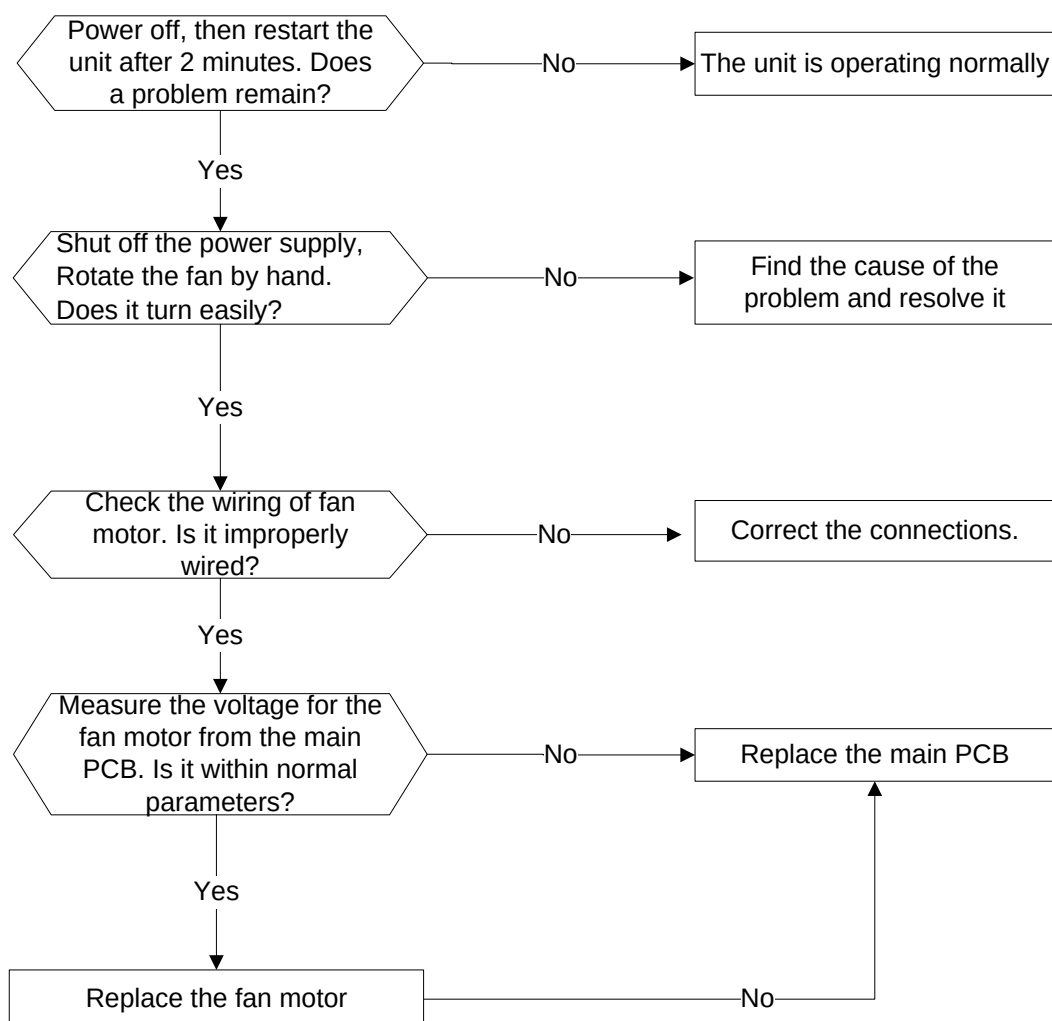
Malfunction conditions	Indoor unit does not receive feedback from outdoor unit for 60 seconds OR outdoor unit does not receive feedback from indoor unit for 120 seconds.
Possible causes	● Wiring mistakes ● Faulty indoor or outdoor PCB



16.3.3 Fan speed malfunction diagnosis and solution (E3)

Error Code	E3
Malfunction conditions	When indoor fan speed is too low (300RPM) for a certain period of time, the unit ceases operation and the LED displays a failure code.
Potential Causes	● Wiring mistake ● Faulty fan assembly ● Faulty fan motor ● Faulty PCB

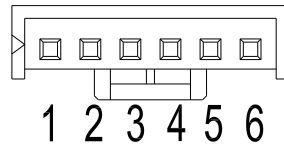
Trouble shooting:



Index 1:

1. Indoor DC fan motor (Control Chip is in Fan Motor)

Turn power on and while the unit is on standby, measure the voltage between pin1 and pin3 as well as between pin4 and pin3 in fan motor connector. If the value of the voltage is not within the range shown in the following table, the PCB may be experiencing problems and need to be replaced.



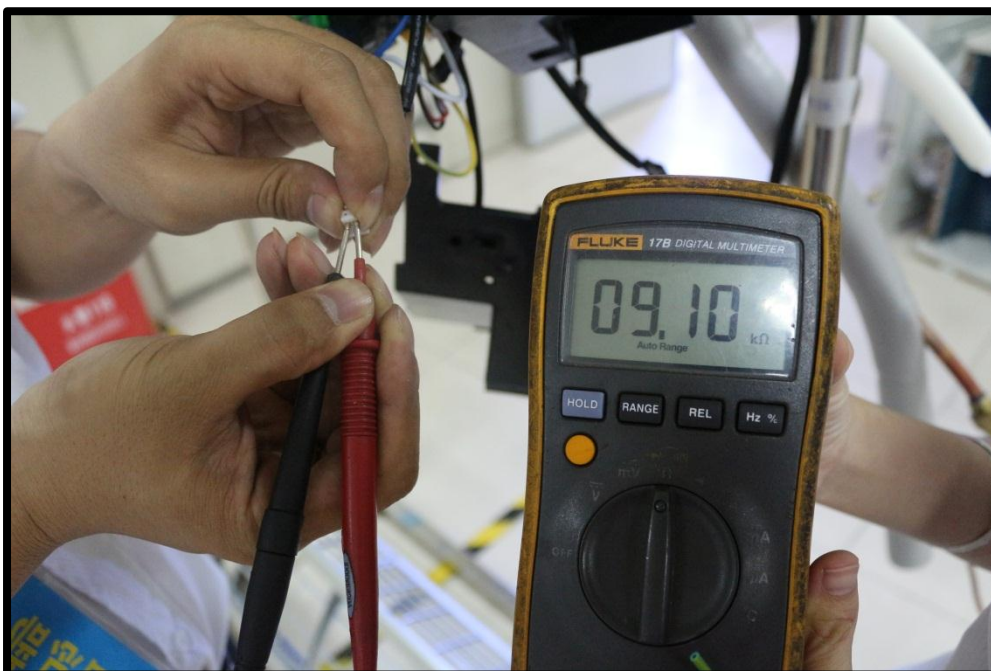
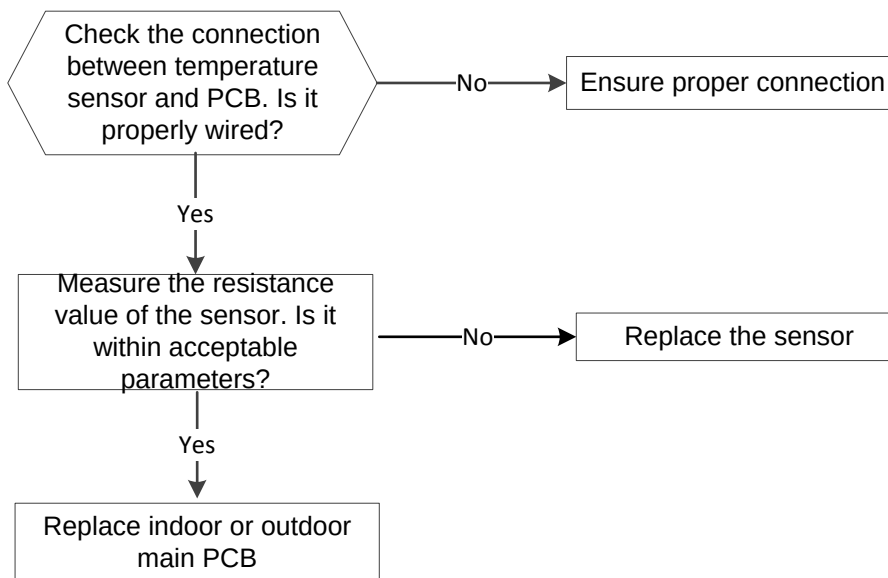
DC motor voltage input and output

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	200~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5~16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5~16.5V

16.3.4 Open or short circuit of temperature sensor diagnosis and solution (E4/E5/F1/F2/F3)

Error Code	E4/E5/F1/F2/F3
Malfunction conditions	If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays a failure.
Potential causes	• Wiring mistake • Faulty sensor

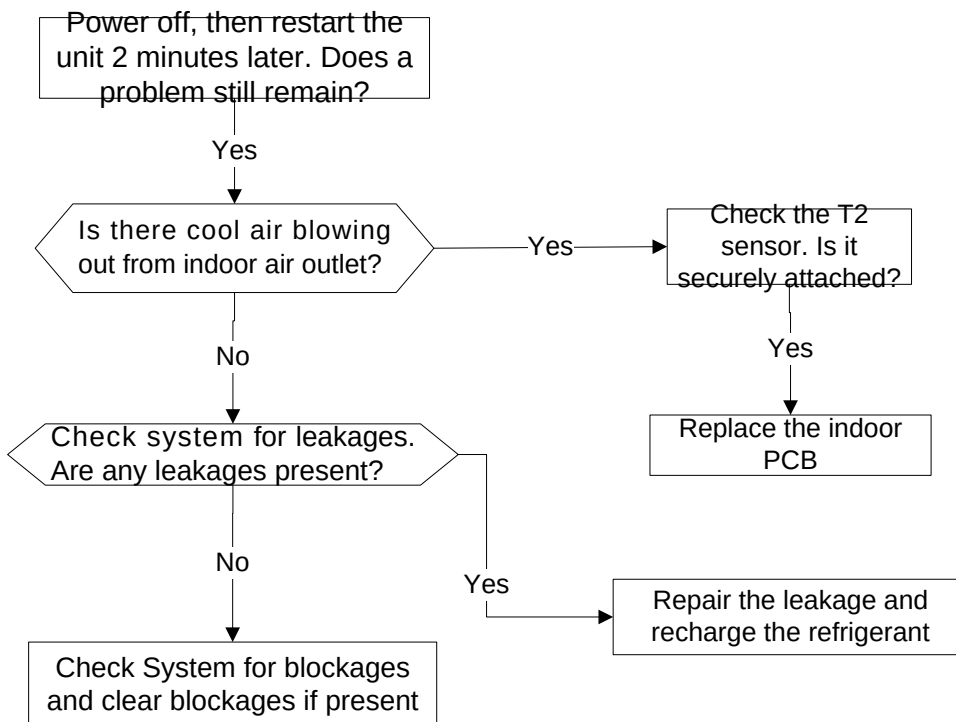
Trouble shooting:



16.3.5 Refrigerant Leakage Detection diagnosis and solution (EC)

Error Code	EC
Malfunction conditions	Define the evaporator coil temperature T2 of the compressor starts running as Tcool. If the following occurs 3 times, the display shows "EC" and the unit switches off: In the first 8 minutes after the compressor starts up, if $T2 < T_{cool} - 2^{\circ}\text{C}$ is not maintained for 4 seconds and compressor
Potential Causes	● Faulty T2 sensor ● Faulty indoor PCB ● System problems, such as leakage or blockages

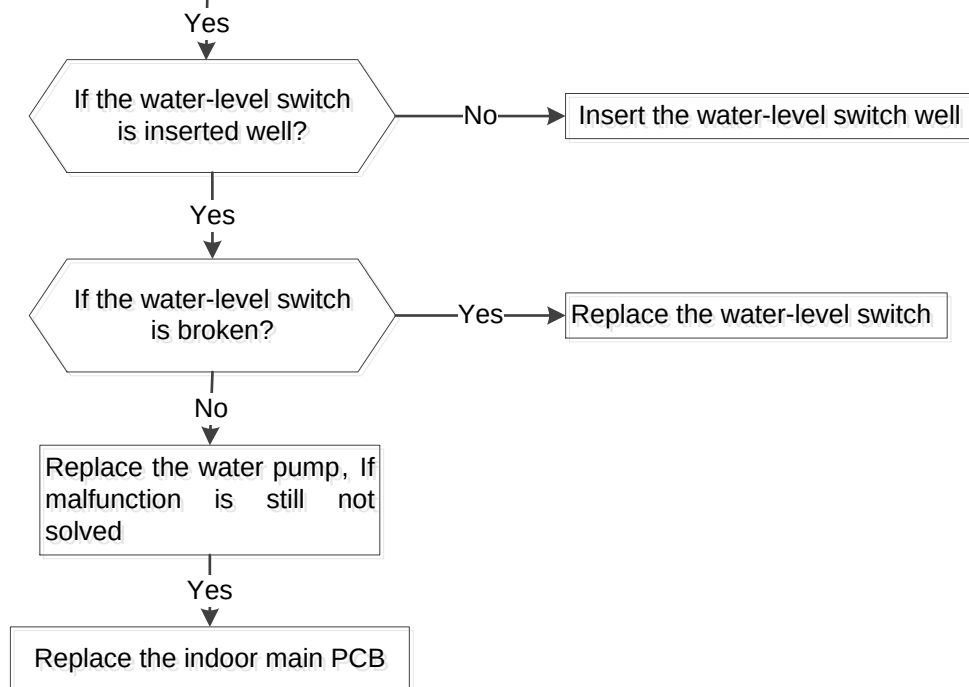
Trouble shooting:



16.3.6 Water-level alarm malfunction diagnosis and solution

Error Code	EE
Malfunction conditions	If the sampling voltage is not 5V, the LED will display the failure code.
Possible causes	● Wiring mistakes ● Faulty water-level switch ● Faulty water pump ● Faulty indoor PCB

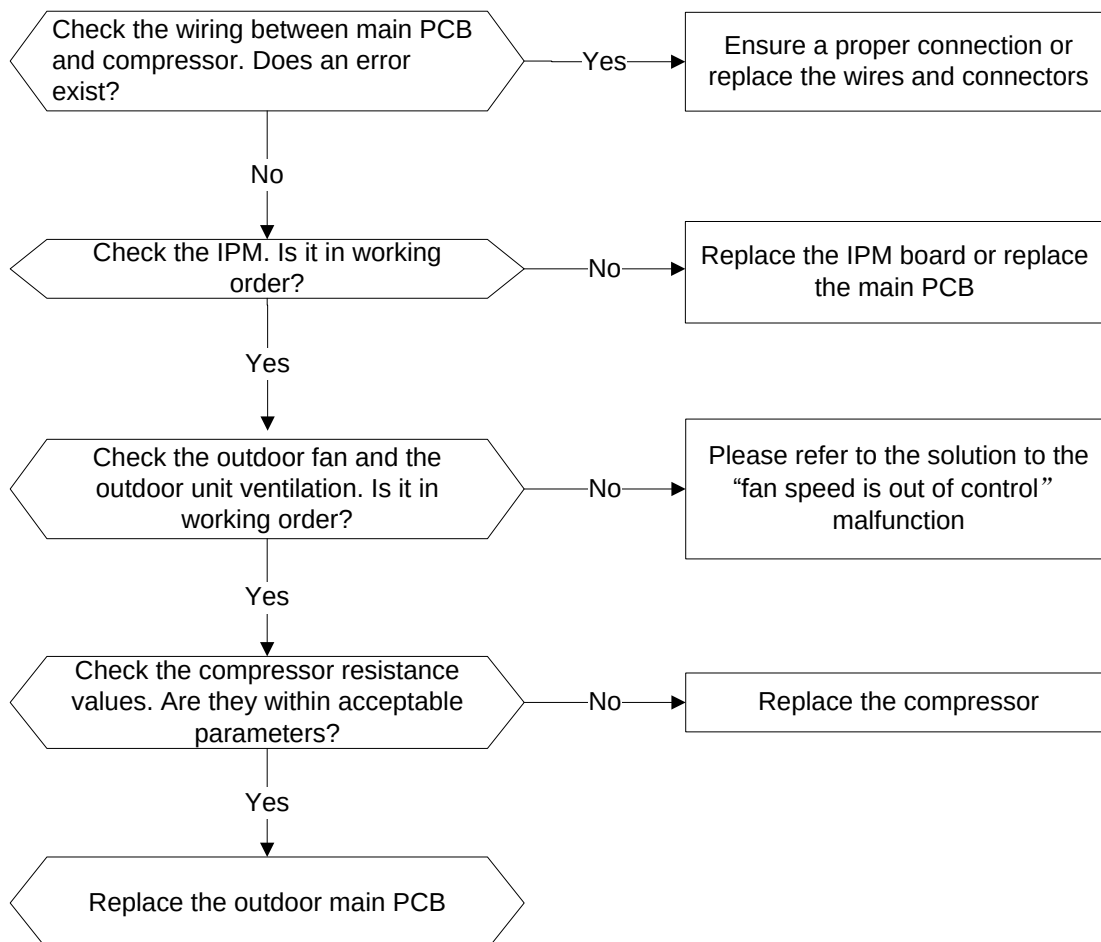
Power off, then restart the unit 3 minutes later. Is it still displaying the error code?

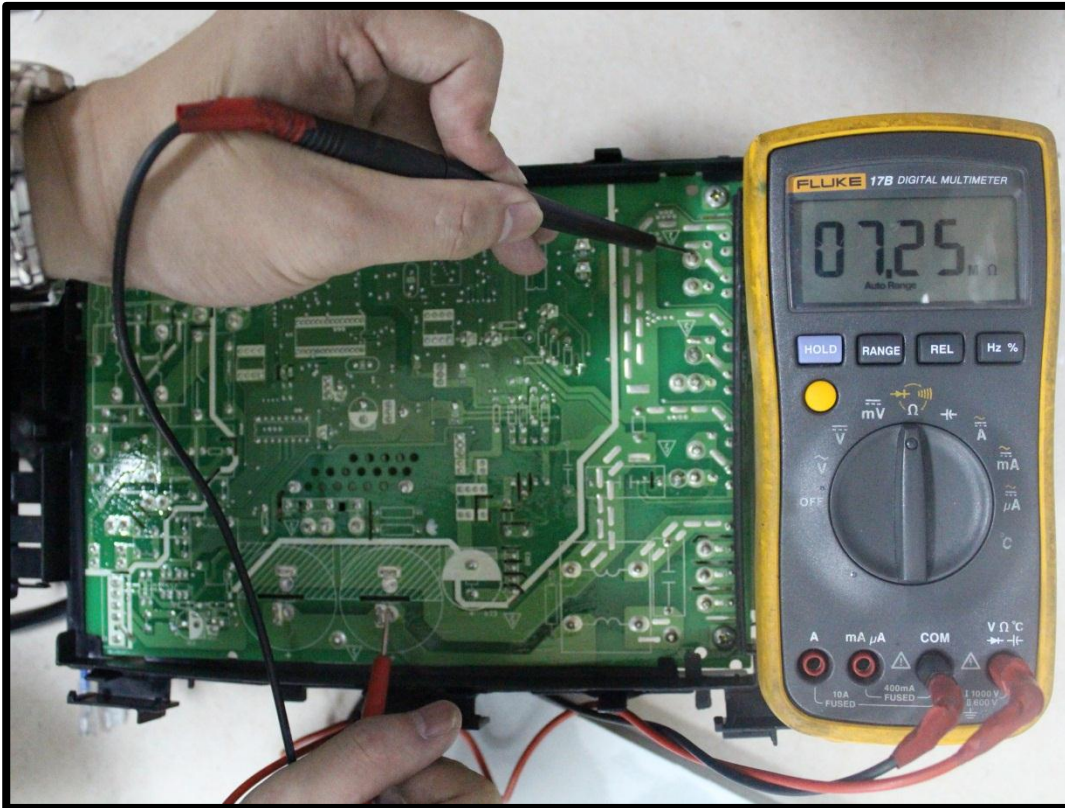


16.3.7 IPM malfunction or IGBT over-strong current protection diagnosis and solution (P0)

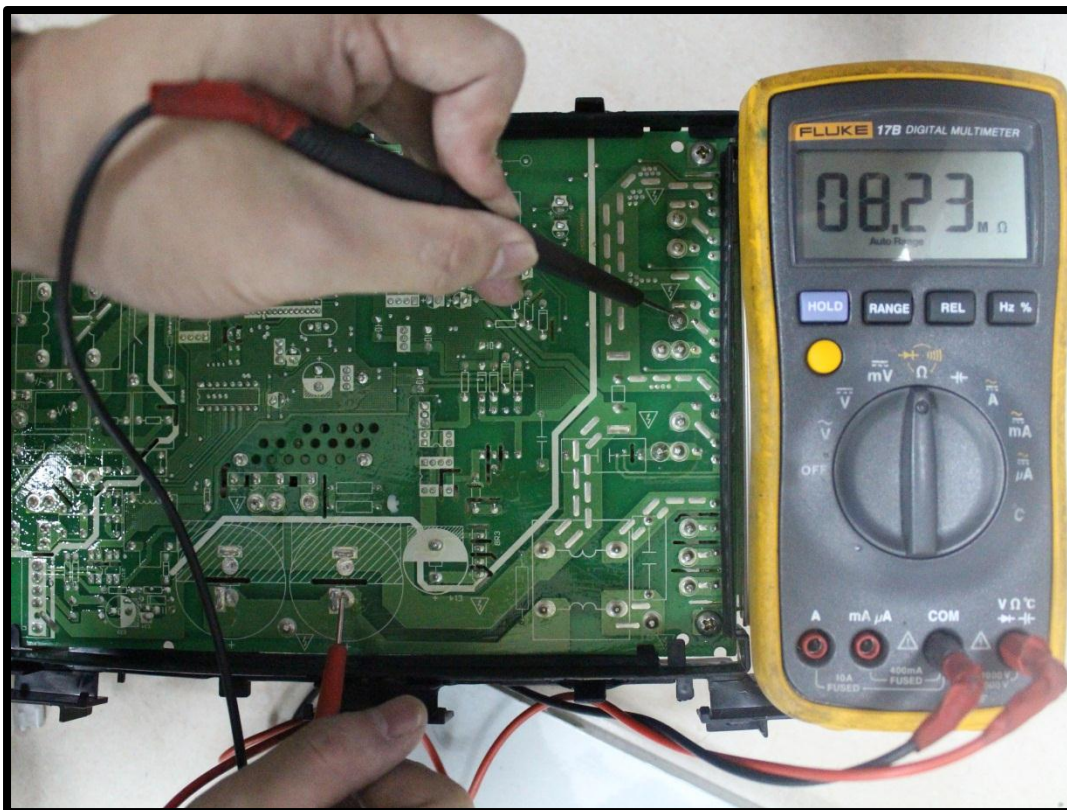
Error Code	P0
Malfunction conditions	When the voltage signal the IPM sends to the compressor drive chip is abnormal, the display LED shows “P0” and the AC turn
Possible causes	• Wiring mistake • IPM malfunction

Trouble shooting:

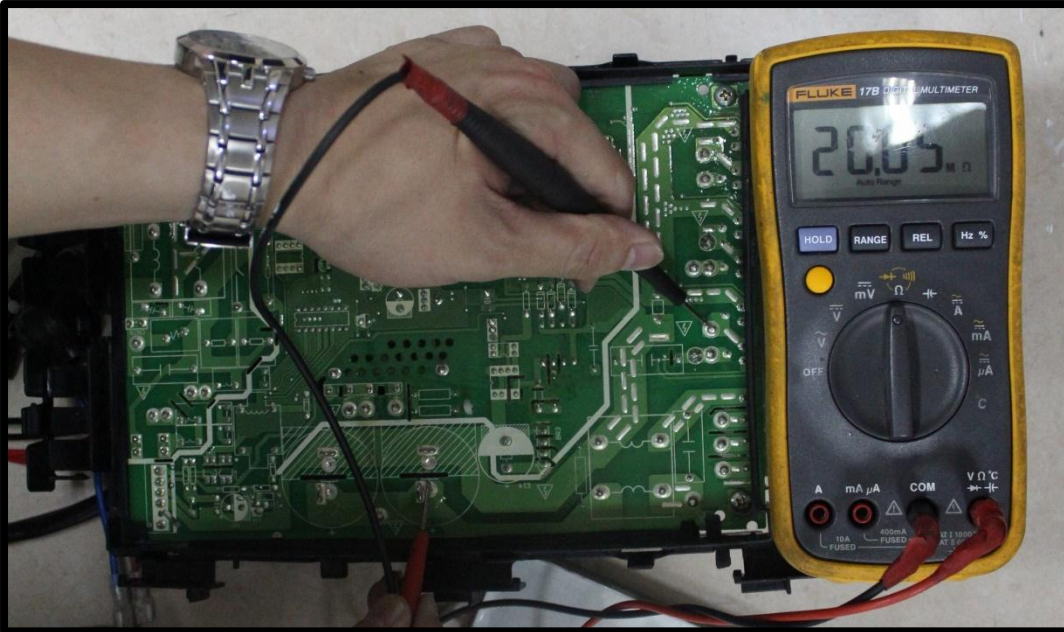




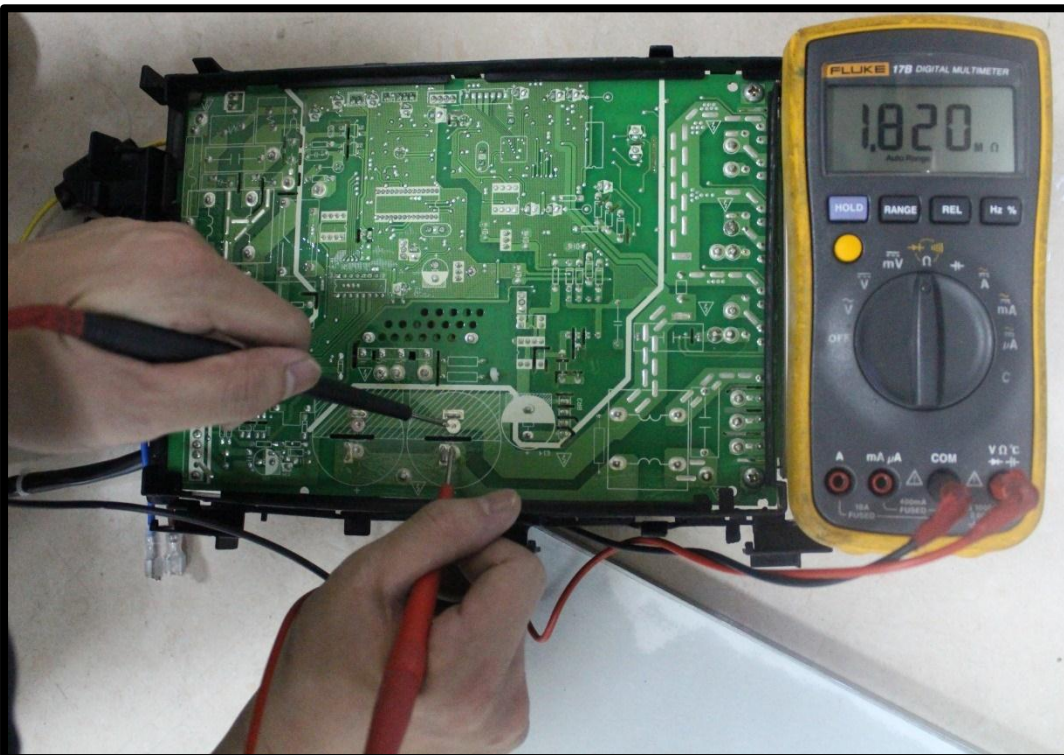
P-U



P-V



P-W

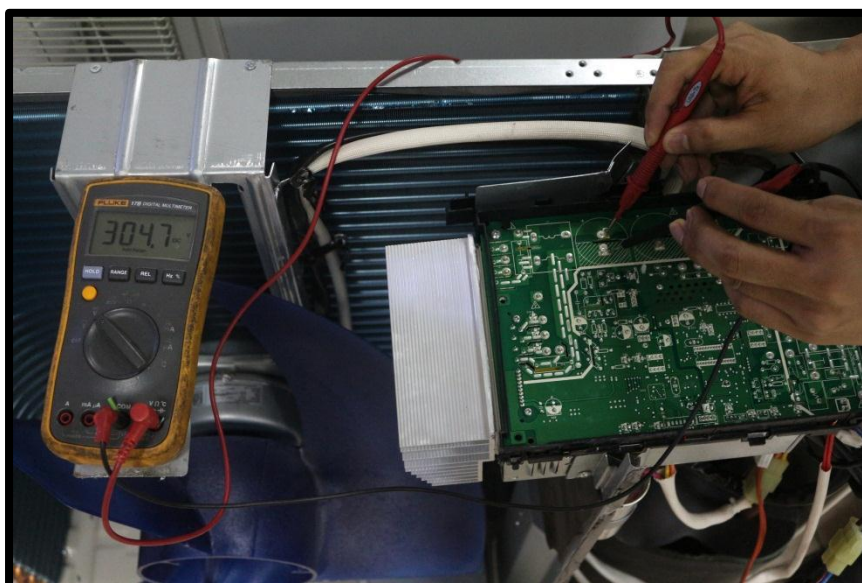
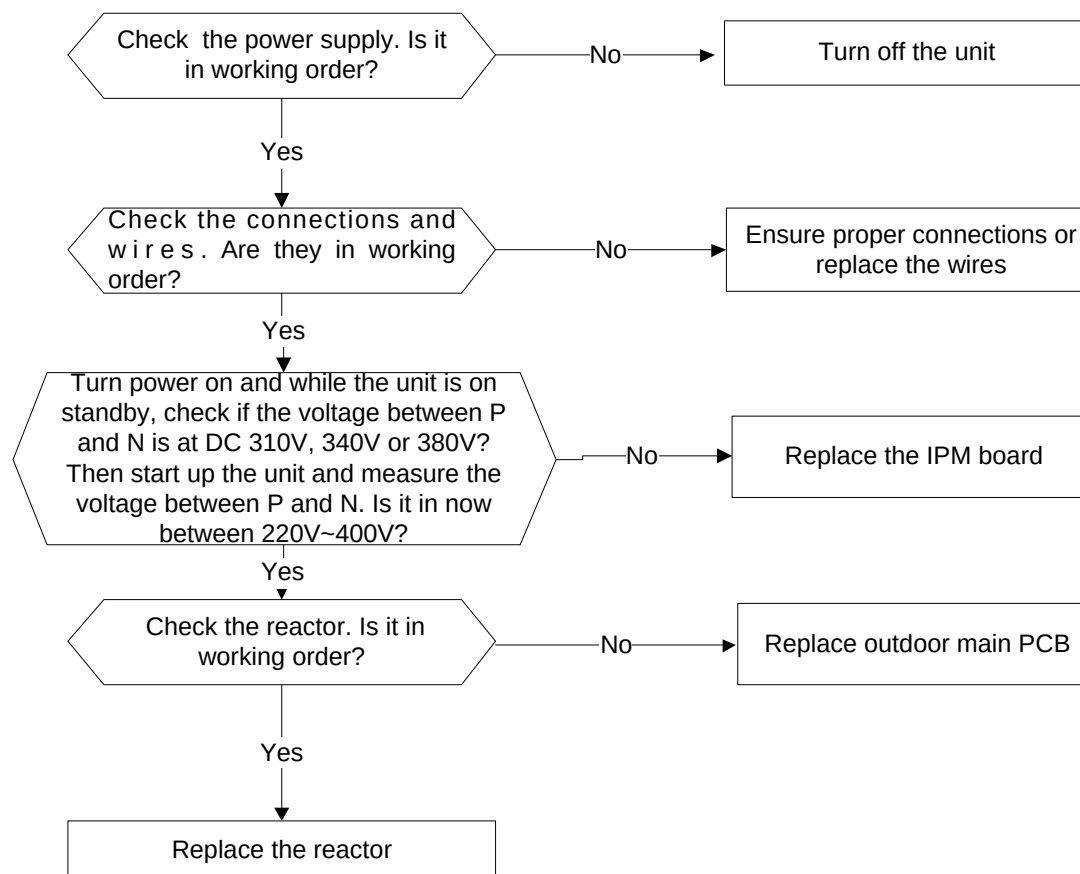


P-N

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

Error Code	P1
Malfunction conditions	Abnormal increases or decreases in voltage are detected by checking the specified voltage detection circuit.
Potential causes	● Power supply issues ● System leakage or blockage ● Faulty PCB

Trouble shooting:



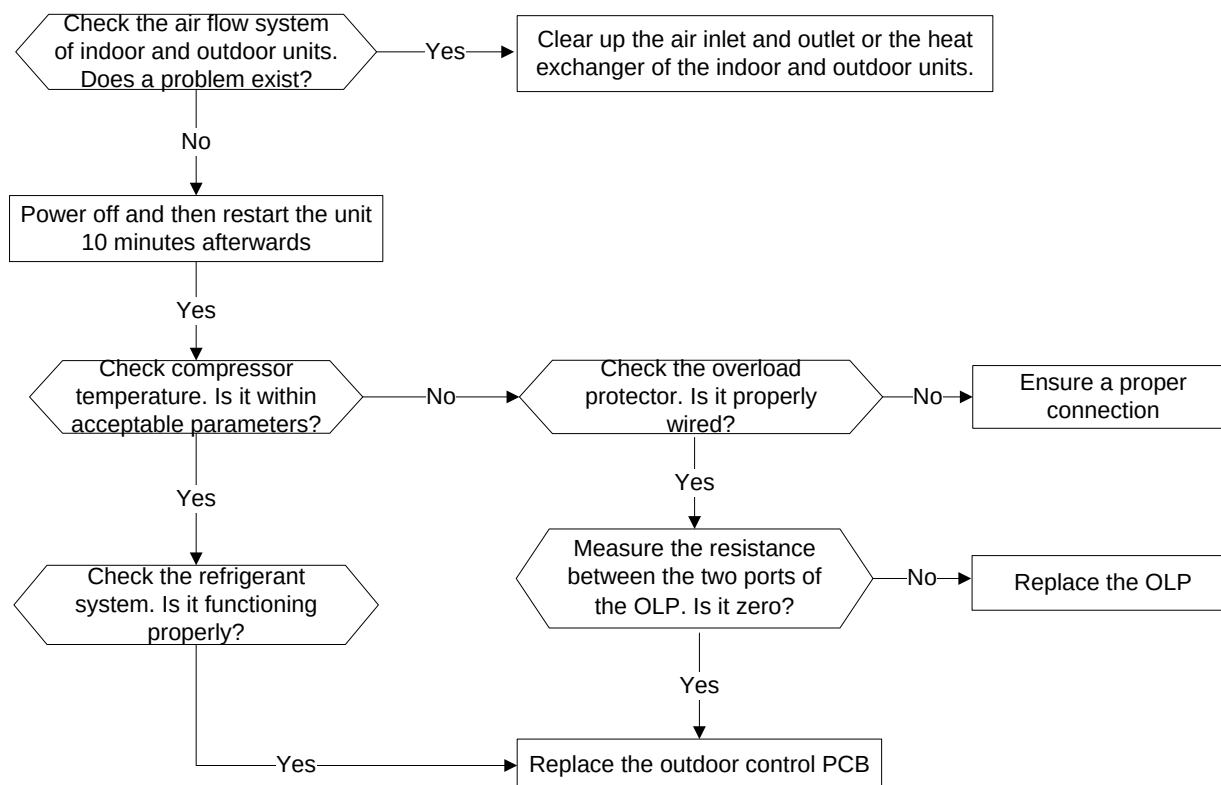
Remark:

Measure the DC voltage between P and N port.
The normal value should be around 310V.340V or 380V

16.3.9 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. • System leakage or block • PCB faulty

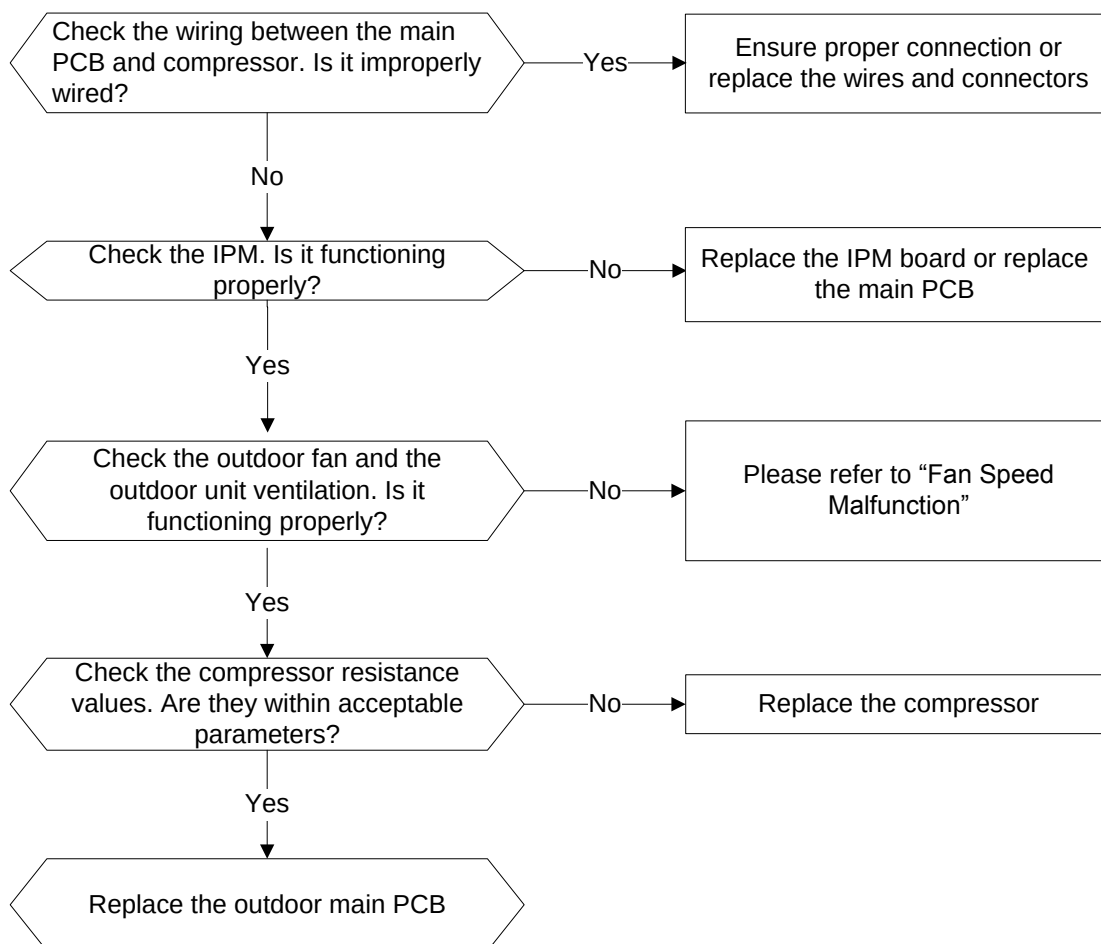
Trouble shooting:



16.3.10 Inverter compressor drive error diagnosis and solution(P4)

Error Code	P4
Malfunction conditions	Abnormalities in the inverter compressor drive is detected by a special detection circuit, which can perform communication signal detection, voltage detection, and compressor rotation speed signal detection.
Potential causes	● Wiring mistake ● IPM malfunction ● Faulty outdoor fan assembly ● Compressor malfunction ● Faulty outdoor PCB

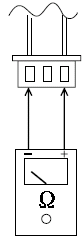
Trouble shooting:



16.4 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.



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