
Troubleshooting

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Troubleshooting

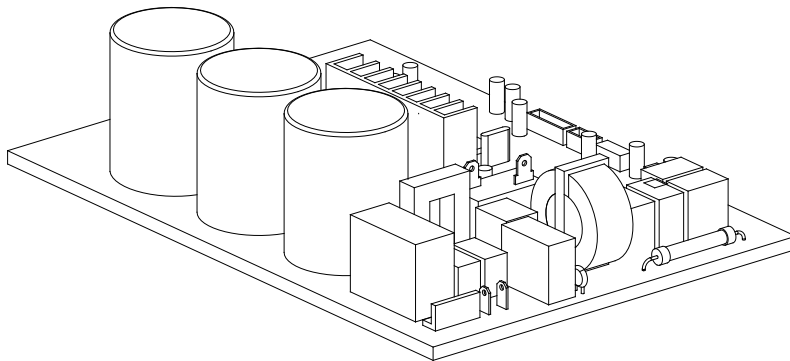
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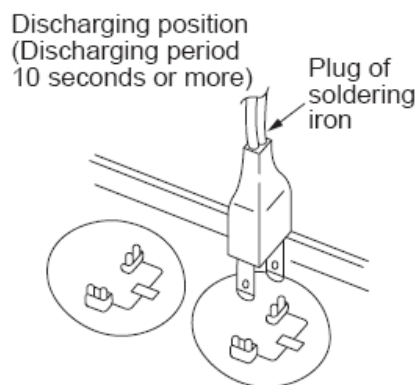
1. Safety Caution

WARNING

Electricity remains in capacitors even when the power supply is off.
Ensure the capacitors are fully discharged before troubleshooting.



For other models, connect discharge resistance (approx. 100Ω 40W) or a soldering iron plug between the positive and negative terminals of the electrolytic capacitor. The terminals are located on the bottom surface of the outdoor PCB.



Note: This picture is for reference only. Actual appearances may vary.

2. General Troubleshooting

2.1 Error Display (Indoor Unit)

When the indoor unit encounters a recognized error, the indicator light will flash in a corresponding series, the timer display may turn on or begin flashing, and an error code will be displayed. These error codes are described in the following table:

Operation Lamp	Timer Lamp	Display	Error Information	Solution
1 times	OFF	E0	Indoor unit EEPROM parameter error	Page 84
2 times	OFF	E1	Indoor / outdoor units communication error	Page 85
3 times	OFF	E2	Zero-crossing signal detection error	Page 87
4 times	OFF	E3	The indoor fan speed is operating outside of the normal range	Page 88
5 times	OFF	E4	Indoor room temperature sensor T1 is in open circuit or has short circuited	Page 90
6 times	OFF	E5	Evaporator coil temperature sensor T2 is in open circuit or has short circuited	Page 90
7 times	OFF	EC	Refrigerant leak detected	Page 91
1 times	ON	F0	Overload current protection	Page 92
2 times	ON	F1	Outdoor ambient temperature sensor T4 open circuit or short circuit	Page 90
3 times	ON	F2	Condenser coil temperature sensor T3 is in open circuit or has short circuited	Page 90
4 times	ON	F3	Compressor discharge temperature sensor TP open circuit or short circuit	Page 90
5 times	ON	F4	Outdoor unit EEPROM parameter error	Page 84
6 times	ON	F5	The outdoor fan speed is operating outside of the normal range	Page 88
1 times	FLASH	P0	IPM malfunction or IGBT over-strong current protection	Page 93
2 times	FLASH	P1	Over voltage or over low voltage protection	Page 95
3 times	FLASH	P2	High temperature protection of IPM module	Page 96
4 times	FLASH	P3*	Outdoor ambient temperature too low.	Page --
5 times	FLASH	P4	Inverter compressor drive error	Page 97
7 times	FLASH	P6	Low pressure protection(Only for 36K models)	Page 99

*P3

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

For other errors:

The display board may show a garbled code or a code undefined by the service manual. Ensure that this code is not a temperature reading.

Troubleshooting:

Test the unit using the remote control. If the unit does not respond to the remote, the indoor PCB requires replacement. If the unit responds, the display board requires replacement.

3. Error Diagnosis and Troubleshooting Without Error Code

WARNING

Be sure to turn off unit before any maintenance to prevent damage or injury.

3.1 Remote maintenance

SUGGESTION: When troubles occur, please check the following points with customers before field maintenance.

NO.	Problem	Solution
1	Unit will not start	Page 78-79
2	The power switch is on but fans will not start	Page 78-79
3	The temperature on the display cannot be set	Page 78-79
4	Unit is on but the wind is not cold(hot)	Page 78-79
5	Unit runs, but shortly stops	Page 78-79
6	The unit startup and stop frequently	Page 78-79
7	Unit runs continuously but insufficient cooling(heating)	Page 78-79
8	Cool can not change to heat	Page 78-79
9	Unit is noisy	Page 78-79

3.2 Field maintenance

NO.	Problem	Solution
1	Unit will not start	Page 80-81
2	Compressor will not start but fans run	Page 80-81
3	Compressor and condenser (outdoor) fan will not start	Page 80-81
4	Evaporator (indoor) fan will not start	Page 80-81
5	Condenser (Outdoor) fan will not start	Page 80-81
6	Unit runs, but shortly stops	Page 80-81
7	Compressor short-cycles due to overload	Page 80-81
8	High discharge pressure	Page 80-81
9	Low discharge pressure	Page 80-81
10	High suction pressure	Page 80-81
11	Low suction pressure	Page 80-81
12	Unit runs continuously but insufficient cooling	Page 80-81
13	Too cool	Page 80-81
14	Compressor is noisy	Page 80-81
15	Horizontal louver can not revolve	Page 80-81

4. Quick Maintenance by Error Code

If you do not have the time to test whether specific parts are faulty, you can directly change the required parts according to the error code.

You can find the parts to replace by error code in the following table.

Part requiring replacement	Error Code								
	E0	E1	E2	E3	E4	E5	EC	F0	F1
Indoor PCB	✓	✓	✓	✓	✓	✓	✓	x	x
Outdoor PCB	x	✓	x	x	x	x	x	✓	✓
Reactor	x	✓	x	x	x	x	x	x	x
Indoor fan motor	x	x	x	✓	x	x	x	x	x
Outdoor fan motor	x	x	x	x	x	x	x	x	x
Temperature sensor	x	x	x	x	✓	✓	✓	x	✓
T2 Sensor	x	x	x	x	x	x	✓	x	x
Additional refrigerant	x	x	x	x	x	x	x	x	x
Compressor	x	x	x	x	x	x	x	✓	x
IPM board	x	x	x	x	x	x	x	x	x
Outdoor unit	x	x	x	x	x	x	x	✓	x
Display board	x	x	✓	x	x	x	x	x	✓

Part requiring replacement	Error Code								
	F2	F3	F4	F5	P0	P1	P2	P4	P6
Indoor PCB	x	x	x	x	x	x	x	x	x
Outdoor PCB	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reactor	x	x	x	x	x	✓	x	x	x
Indoor fan motor	x	x	x	x	x	x	x	x	✓
Outdoor fan motor	x	x	x	✓	x	x	x	x	x
Temperature sensor	✓	✓	x	x	x	x	x	x	x
T2 Sensor	x	x	x	x	x	x	x	x	x
Additional refrigerant	x	x	x	x	x	x	x	x	x
Compressor	x	x	x	x	✓	x	x	✓	x
IPM board	x	x	x	x	✓	✓	x	✓	x
Outdoor unit	x	x	x	x	x	x	x	x	x

1.Remote Maintenance		Electrical Circuit					Refrigerant Circuit				
Possible causes of trouble	Power failure										
	The main power tripped										
	Loose connections										
	Faulty transformer										
	The voltage is too high or too low										
	The remote control is powered off										
	Broken remote control										
	Dirty air filter										
	Dirty condenser fins										
	The setting temperature is higher/lower than the room's(cooling/heating)										
	The ambient temperature is too high/low when the mode is cooling/heating										
Fan mode											
SILENCE function is activated(optional function)											
Frosting and defrosting frequently											
Unit will not start	☆	☆	☆	☆							
The power switch is on but fans will not start			☆	☆	☆						
The temperature on the display board cannot be set						☆	☆				
Unit is on but the wind is not cold(hot)								☆	☆	☆	
Unit runs, but shortly stops					☆			☆	☆		
The unit startup and stop frequently					☆				☆		☆
Unit runs continuously but insufficient cooling(heating)							☆	☆	☆	☆	
Cool can not change to heat											
Unit is noisy											
Test method / remedy	Test voltage										
	Close the power switch										
	Inspect connections - tighten										
	Change the transformer										
	Test voltage										
	Replace the battery of the remote control										
	Replace the remote control										
	Clean or replace										
	Clean										
	Adjust the setting temperature										
	Turn the AC later										
Adjust to cool mode											
Turn off SILENCE function.											
Turn the AC later											

Others	
Check heat load	Heavy load condition
Tighten bolts or screws	Loosen hold down bolts and / or screws
Close all the windows and doors	Bad airproof
Remove the obstacles	The air inlet or outlet of either unit is blocked
Reconnect the power or press ON/OFF button on remote control to restart	Interference from cell phone towers and remote boosters
Remove them	Shipping plates remain attached

2.Field Maintenance	Electrical Circuit														
Possible causes of trouble	Power failure	Blown fuse or varistor	Loose connections	Shorted or broken wires	Safety device opens	Faulty thermostat / room temperature sensor	Wrong setting place of temperature sensor	Faulty transformer	Shorted or open capacitor	Faulty magnetic contactor for compressor	Faulty magnetic contactor for fan	Low voltage	Faulty stepping motor	Shorted or grounded compressor	Shorted or grounded fan motor
Unit will not start	☆	☆	☆	☆	☆			☆							
Compressor will not start but fans run				☆		☆			☆	☆				☆	
Compressor and condenser (outdoor) fan will not start				☆		☆				☆					
Evaporator (indoor) fan will not start				☆					☆		☆				☆
Condenser (Outdoor) fan will not start				☆		☆			☆		☆				☆
Unit runs, but shortly stops										☆		☆			
Compressor short-cycles due to overload										☆		☆			
High discharge pressure															
Low discharge pressure															
High suction pressure															
Low suction pressure															
Unit runs continuously but insufficient cooling															
Too cool						☆	☆								
Compressor is noisy															
Horizontal louver can not revolve			☆	☆									☆		
Test method / remedy	Test voltage	Inspect fuse type & size	Inspect connections - tighten	Test circuits with tester	Test continuity of safety device	Test continuity of thermostat / sensor & wiring	Place the temperature sensor at the central of the air inlet grille	Check control circuit with tester	Check capacitor with tester	Test continuity of coil & contacts	Test continuity of coil & contacts	Test voltage	Replace the stepping motor	Check resistance with multimeter	Check resistance with multimeter

Refrigerant Circuit										Others
Replace the compressor										Compressor stuck
Leak test	☆									Shortage of refrigerant
Replace restricted part	☆	☆								Restricted liquid line
Clean or replace	☆	☆								Dirty air filter
Clean coil	☆	☆								Dirty evaporator coil
Check fan	☆	☆								Insufficient air through evaporator coil
Change charged refrigerant volume			☆							Overcharge of refrigerant
Clean condenser or remove obstacle	☆									Dirty or partially blocked condenser
Purge, evacuate and recharge	☆	☆								Air or incompressible gas in refrigerant cycle
Remove obstruction to air flow	☆									Short cycling of condensing air
Remove obstruction in air or water flow					☆					High temperature condensing medium
Remove obstruction in air or water flow					☆					Insufficient condensing medium
Replace compressor										Broken compressor internal parts
Test compressor efficiency	☆					☆				Inefficient compressor
Replace valve										Expansion valve obstructed
Replace valve										Expansion valve or capillary tube closed completely
Replace valve										Leaking power element on expansion valve
Fix feeler bulb							☆			Poor installation of feeler bulb
Check heat load							☆			Heavy load condition
Tighten bolts or screws										Loosen hold down bolts and / or screws
Remove them										Shipping plates remain attached
Choose AC of larger capacity or add the number of AC										Poor choices of capacity
Rectify piping so as not to contact each other or with external plate										Contact of piping with other piping or external plate

5. Troubleshooting by Error Code

5.1 Common Check Procedures

5.1.1 Temperature Sensor Check

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

Temperature Sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

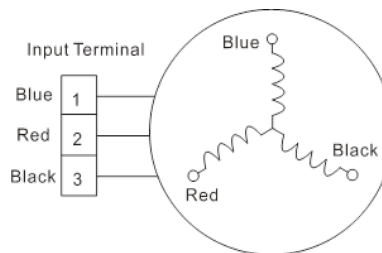
Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(Tp) sensor.

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

5.1.2 Compressor checking

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



Position	Resistance Value			
Model	ASN98D22UFZ	ASM135D23UFZ	ATF235D22UMT	ATF250D22UMT
Blue - Red	1.57Ω(20°C/68°F)	1.75Ω(20°C/68°F)	0.75Ω(20°C/68°F)	0.75Ω(20°C/68°F)
Blue - Black				
Red - Blue				



5.1.3 IPM Continuity Check

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

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

5.1.4 Normal voltage of P and N

Normal voltage of P and N			
208-240V(1-phase,3-phase)		380-420V(3-phase)	
In standby			
around 310VDC		around 530VDC	
In operation			
With passive PFC module	With partial active PFC module	With fully active PFC module	/
>200VDC	>310VDC	>370VDC	>450VDC

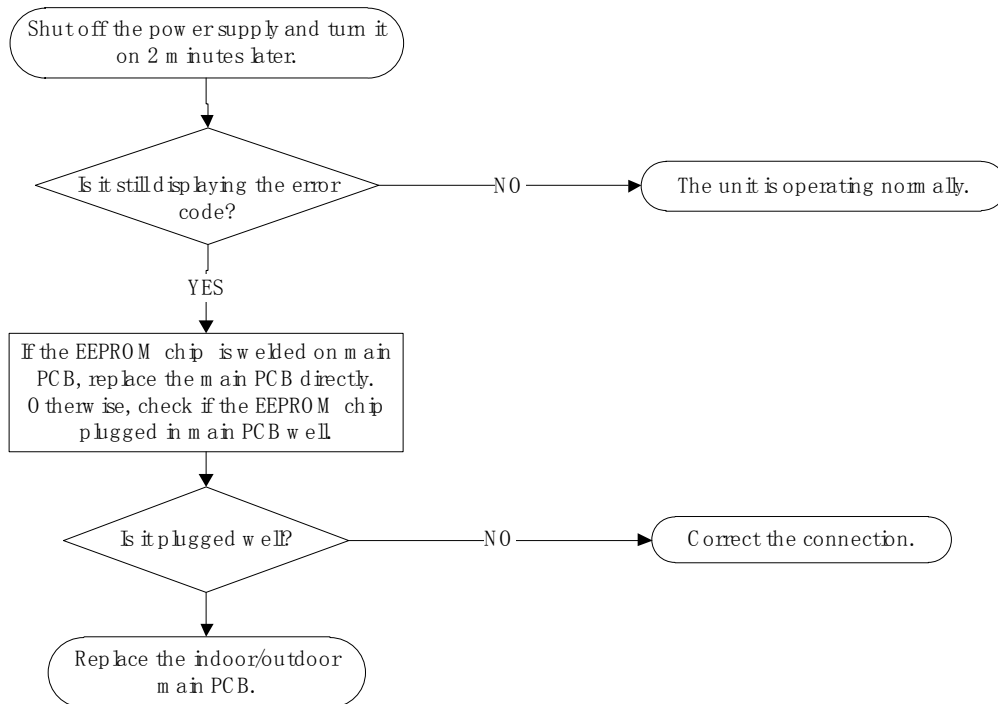
5.2 E0/F4 (EEPROM parameter error)

Description: Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.

Recommended parts to prepare:

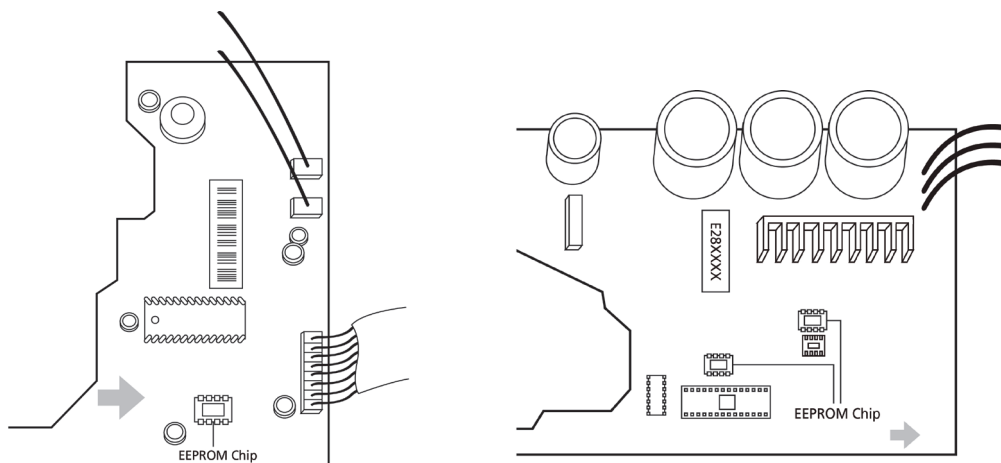
- Indoor PCB
- Outdoor PCB

Troubleshooting and repair:



Remarks:

The location of the EEPROM chip on the indoor and outdoor PCB is shown in the following two images:



Note: These images are for reference only.

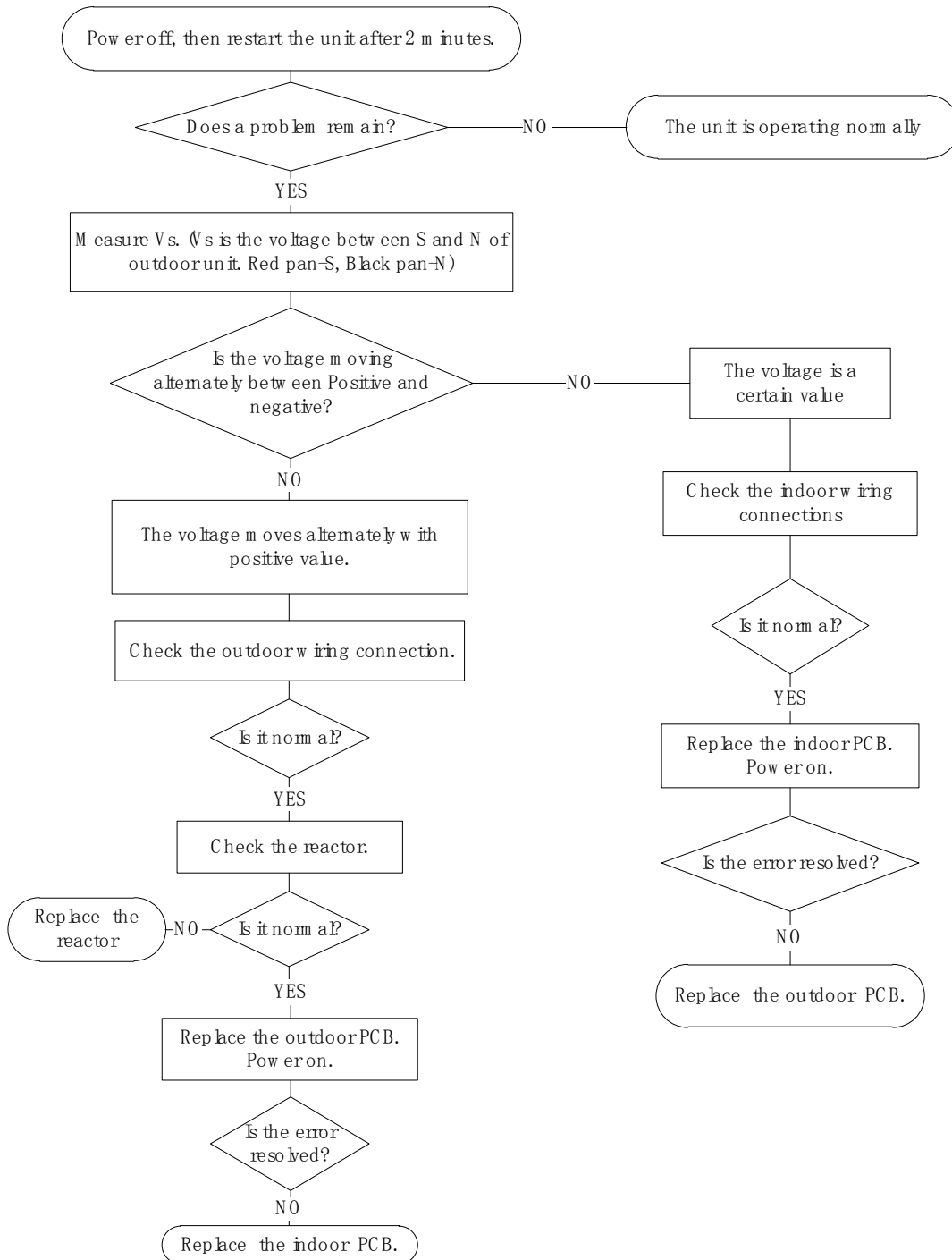
5.3 E1 (Indoor and outdoor unit communication error)

Description: The indoor unit has not received feedback from the outdoor unit for 110 seconds, four consecutive times.

Recommended parts to prepare:

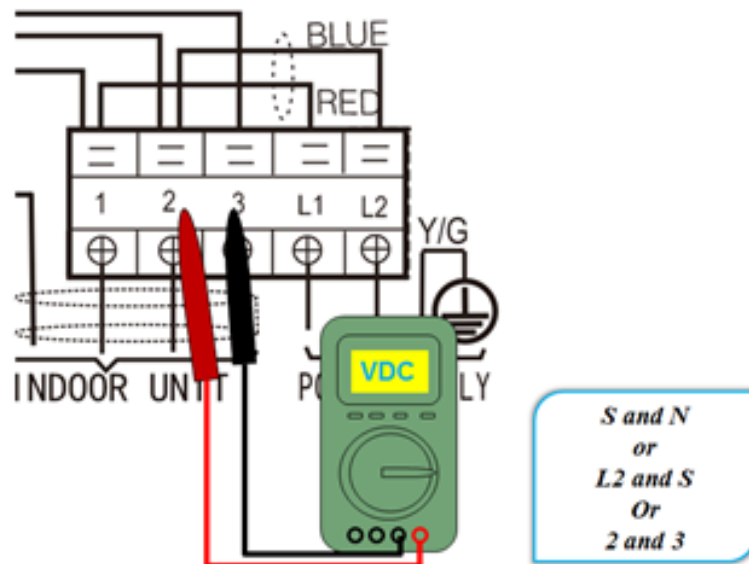
- Indoor PCB
- Outdoor PCB
- Reactor

Troubleshooting and repair:



Remarks:

- 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 -25V to 25V.
- 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.



- 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.



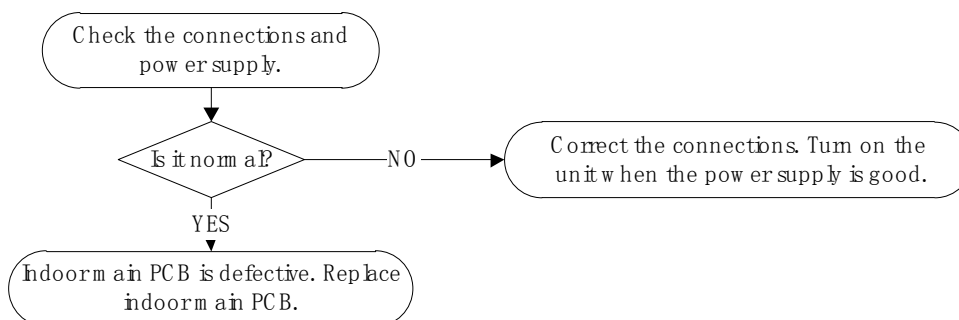
5.4 E2 (Zero crossing detection error diagnosis and solution)

Description: When PCB does not receive zero crossing signal feedback for 4 minutes or the zero crossing signal time interval is abnormal.

Recommended parts to prepare:

- Connection mistake
- PCB faulty

Troubleshooting and repair:



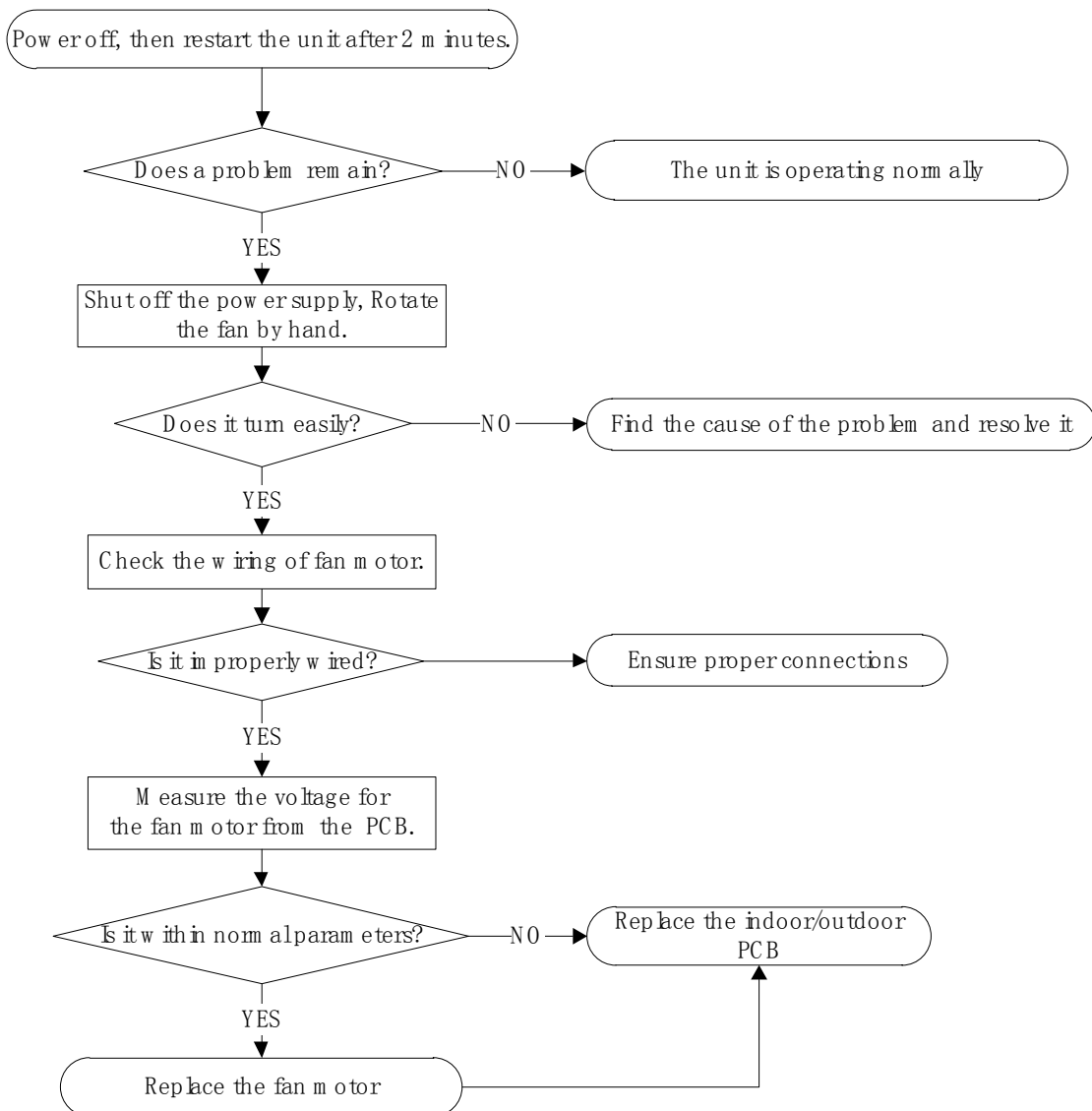
5.5 E3/F5(Fan speed is operating outside of the normal range)

Description: When the indoor fan speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure(E3). When the outdoor fan speed registers below 150RPM or over 1500RPM for an extended period of time, the unit will stop and the LED will display the failure(F5).

Recommended parts to prepare:

- Wiring mistake
- Faulty fan assembly
- Faulty fan motor
- Faulty PCB

Troubleshooting and repair:



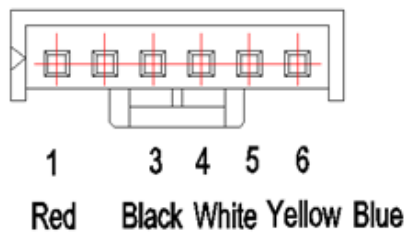
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1. Indoor or Outdoor DC Fan Motor(control chip is in fan motor)

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.

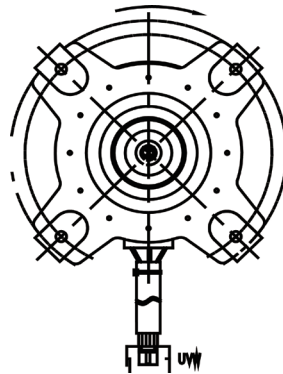
- DC motor voltage input and output (voltage: 220-240V~):

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



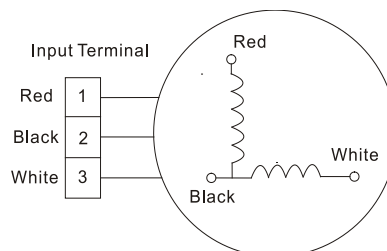
2. Outdoor DC Fan Motor (control chip is in outdoor PCB)

Release the UVW connector. Measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other, the fan motor must has 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.



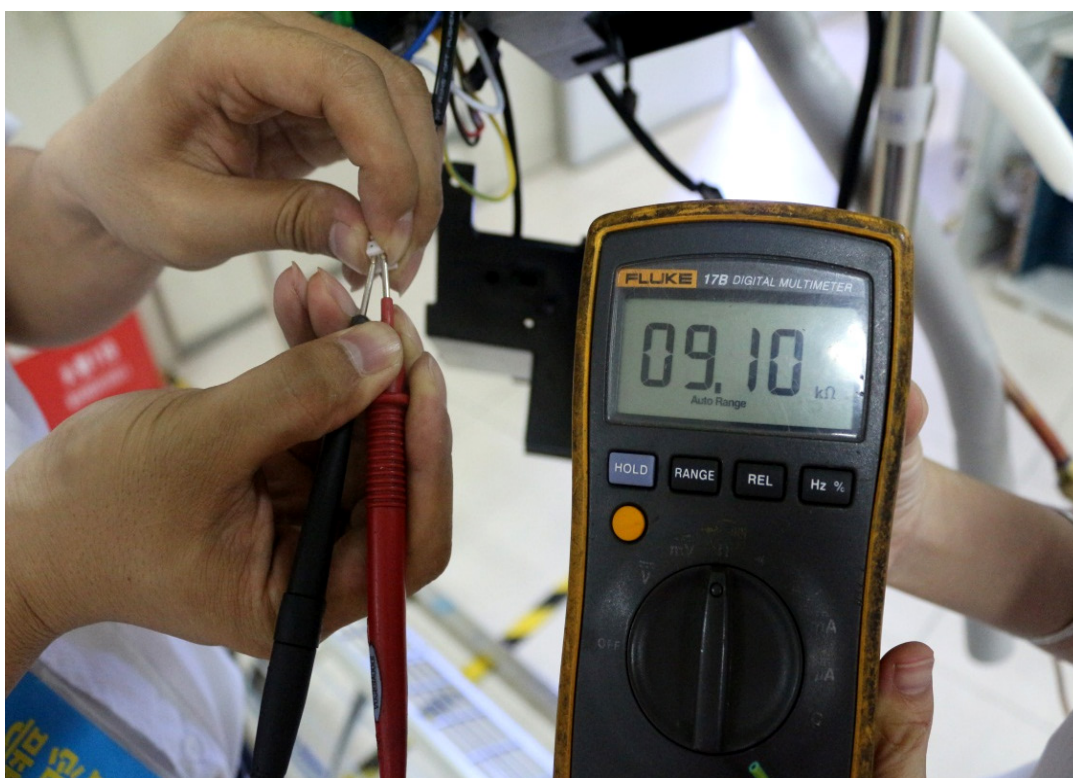
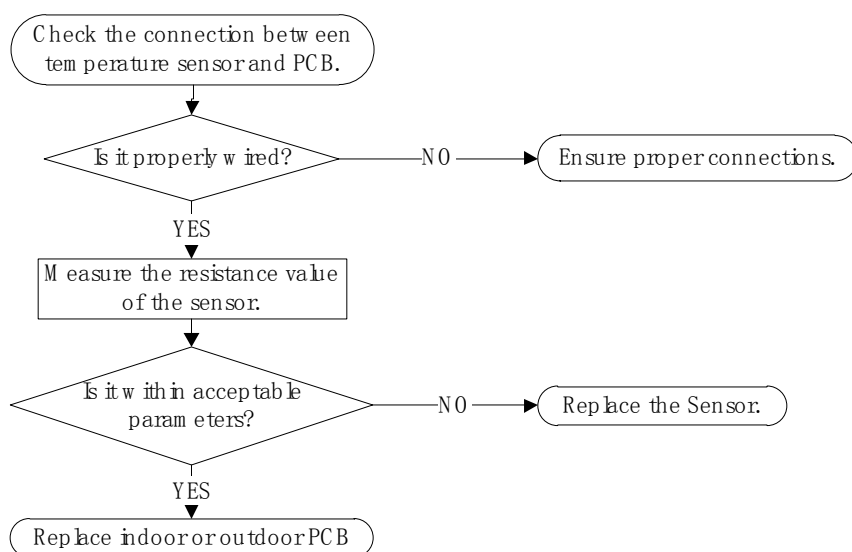
5.6 E4/E5/F1/F2/F3 (Open circuit or short circuit of temperature sensor diagnosis and solution)

Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED will display the failure.

Recommended parts to prepare:

- Wiring mistake
- Faulty sensor
- Faulty PCB

Troubleshooting and repair:



5.7 EC (Refrigerant Leakage Detection diagnosis and solution)

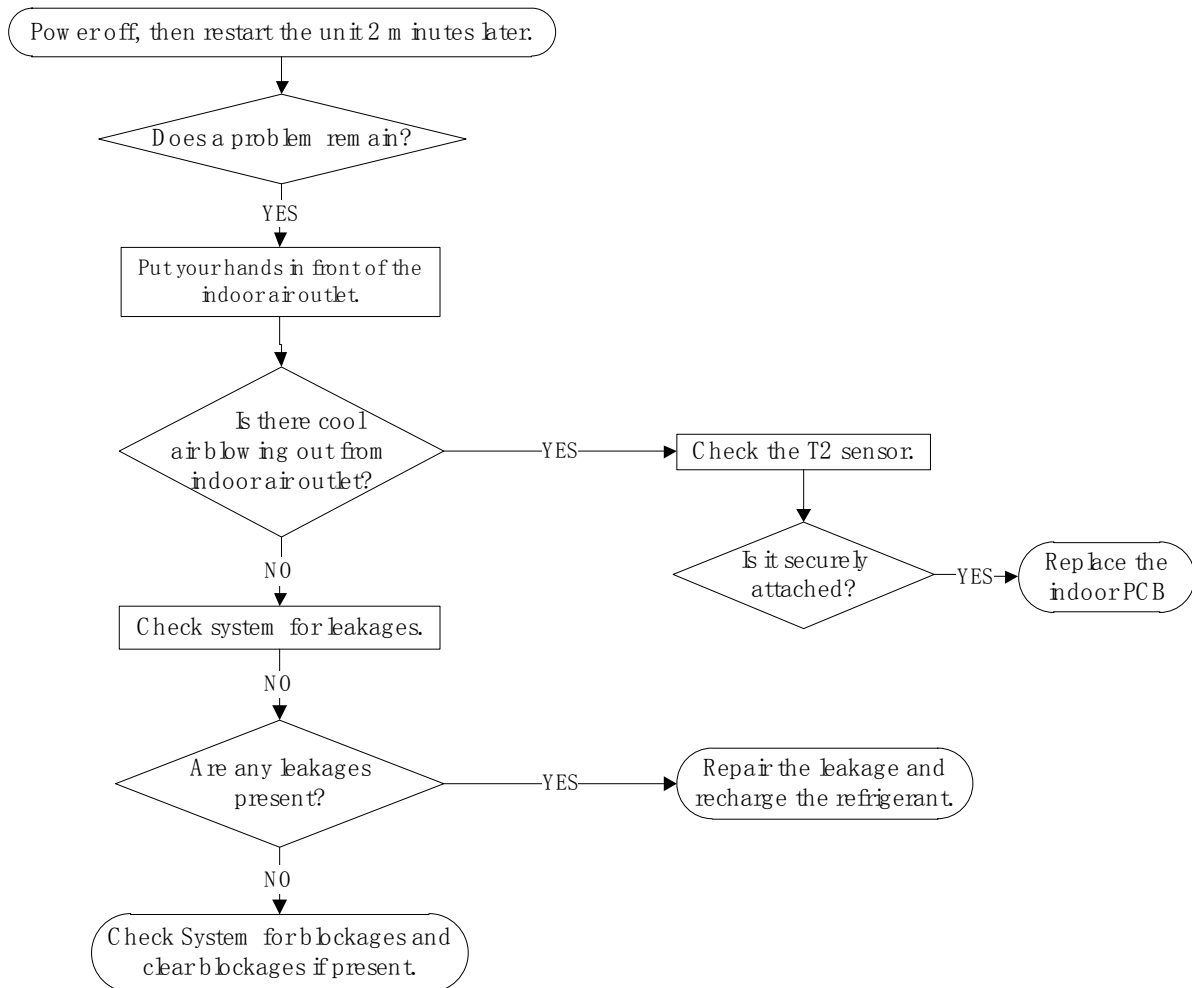
Description: Define the evaporator coil temp.T2 of the compressor just starts running as Tcool.

In the beginning 8 minutes after the compressor starts up, if $T2 < T_{cool} - 2^{\circ}\text{C}$ does not keep continuous 4 seconds and compressor running frequency higher than 50Hz does not keep continuous 3 minutes, and this situation happens 3 times, the display area will show "EC" and AC will turn off.

Recommended parts to prepare:

- Faulty T2 sensor
- Faulty indoor PCB
- System problems, such as leakage or blockages

Troubleshooting and repair:



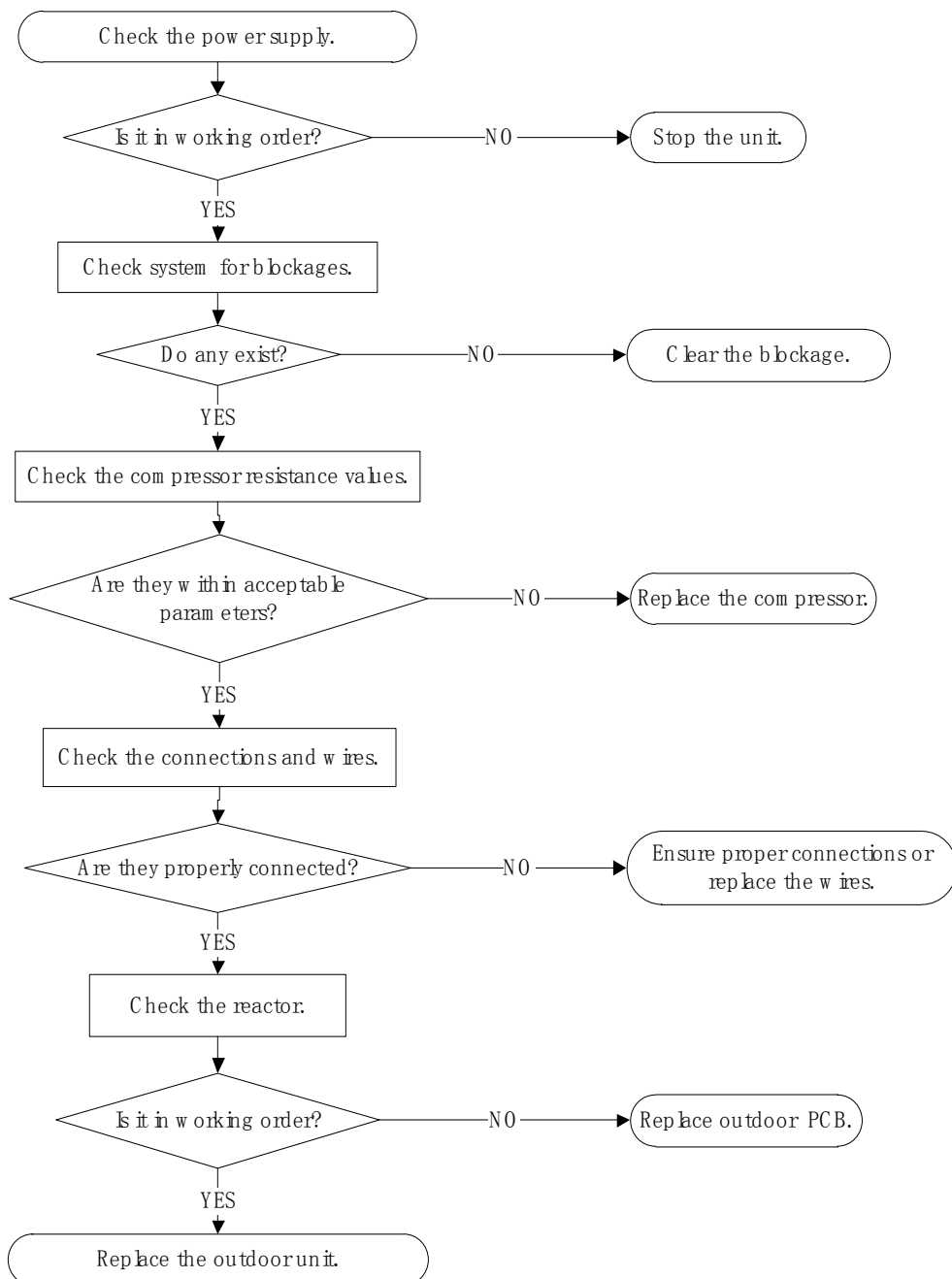
5.8 F0(Overload current protection diagnosis and solution)

Description: An abnormal current rise is detected by checking the specified current detection circuit.

Recommended parts to prepare:

- Power supply problems.
- System blockage
- Faulty PCB
- Wiring mistake
- Compressor malfunction

Troubleshooting and repair:



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

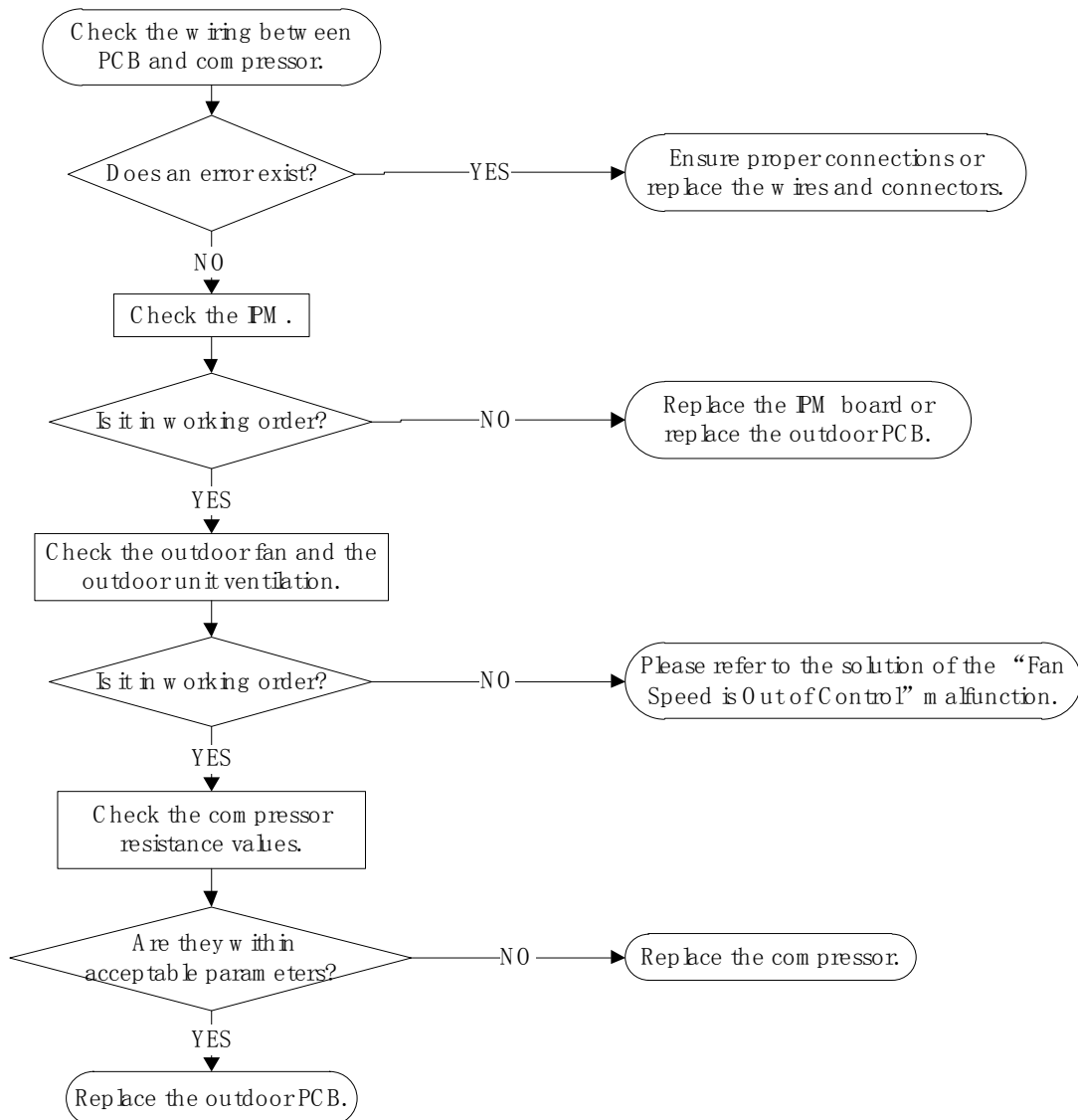
Description: When the voltage signal the IPM sends to the compressor drive chip is abnormal, the display LED shows “P0” and the AC turn off.

Recommended parts to prepare:

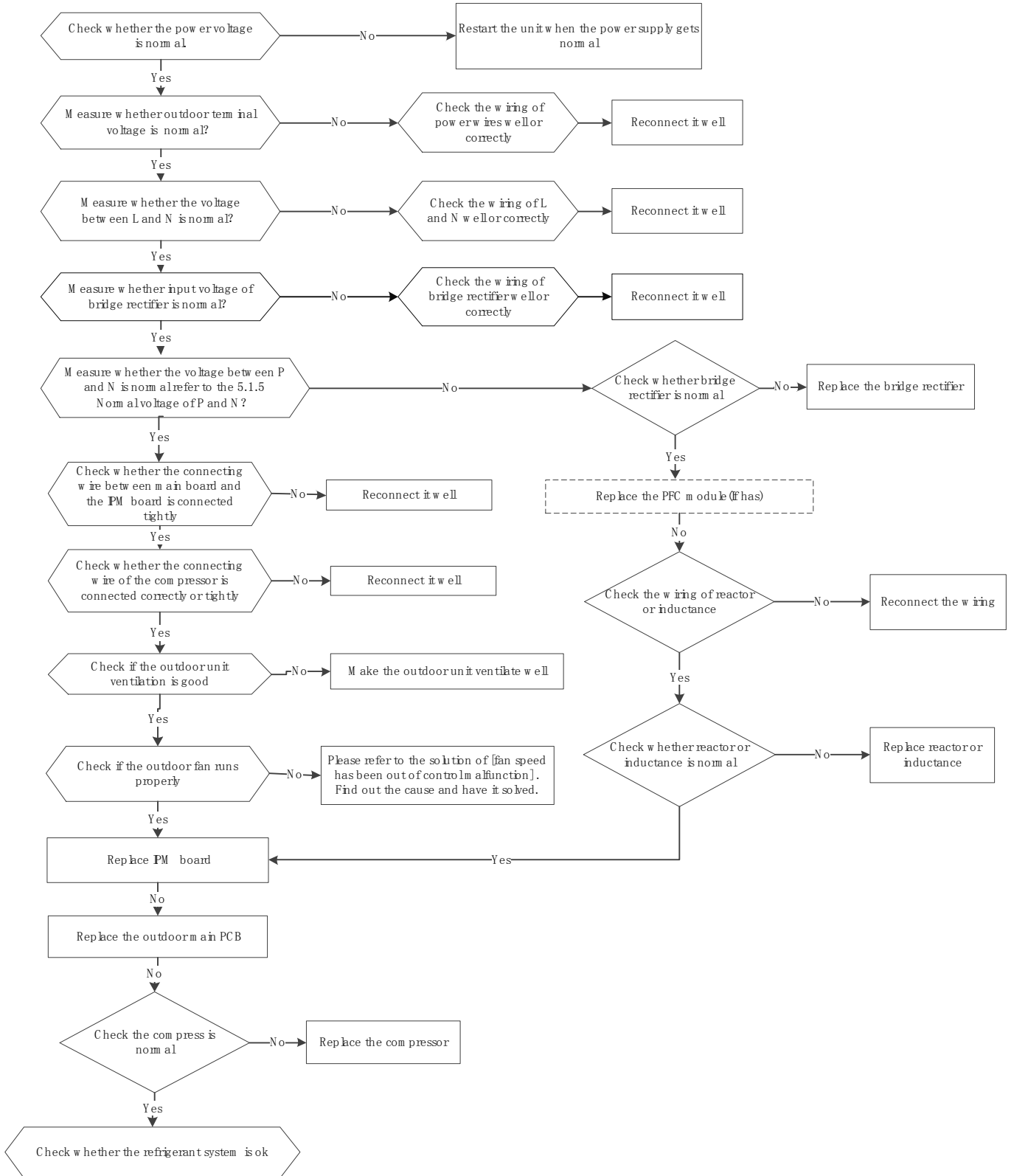
- Wiring mistake
- IPM malfunction
- Faulty outdoor fan assembly
- Compressor malfunction
- Faulty outdoor PCB

Troubleshooting and repair:

For 9K~24K:



For 30K~36K:



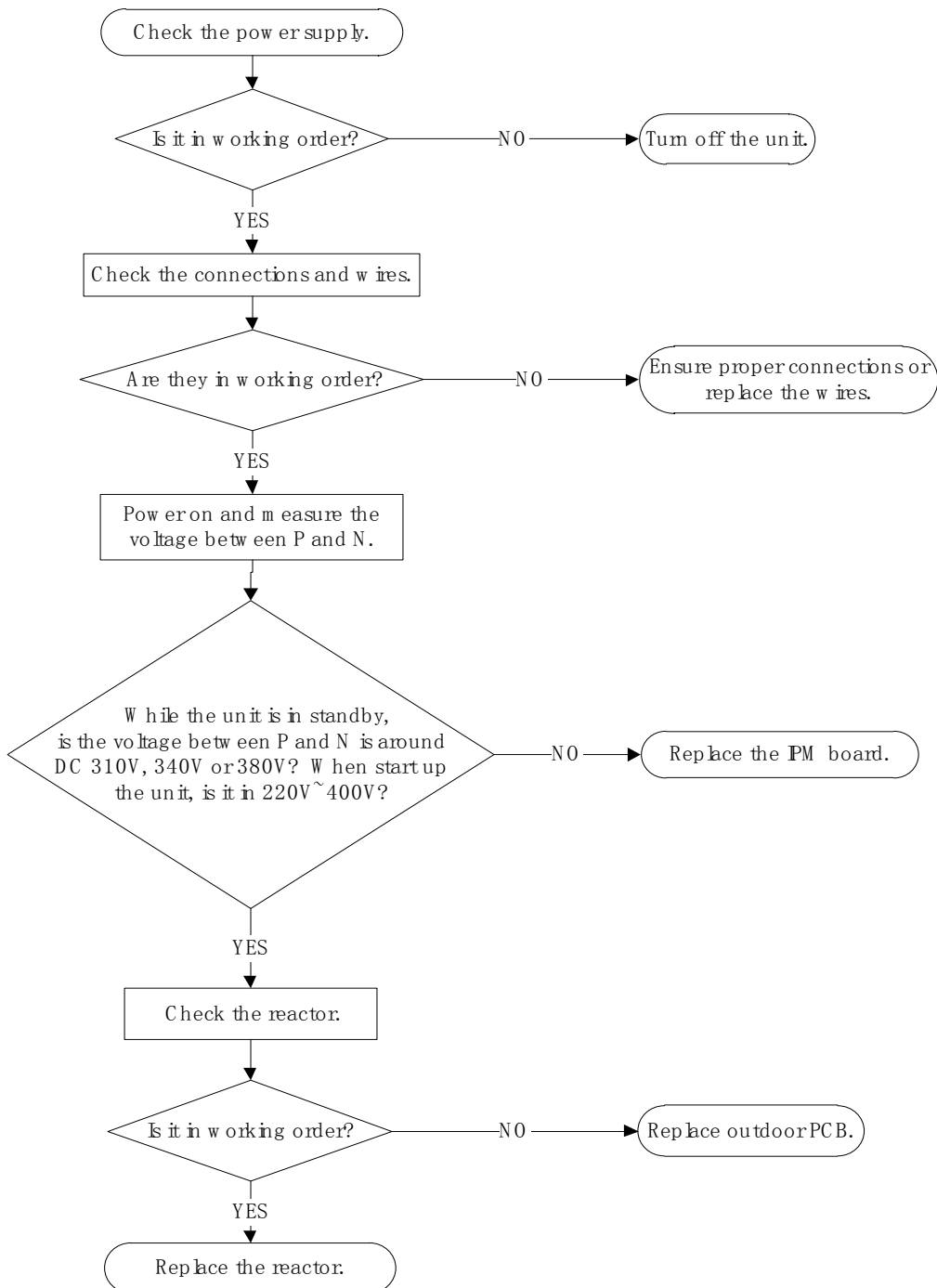
5.10 P1(Over voltage or too low voltage protection diagnosis and solution)

Description: Abnormal increases or decreases in voltage are detected by checking the specified voltage detection circuit.

Recommended parts to prepare:

- Power supply issues
- System leakage or blockage
- Faulty PCB

Troubleshooting and repair:



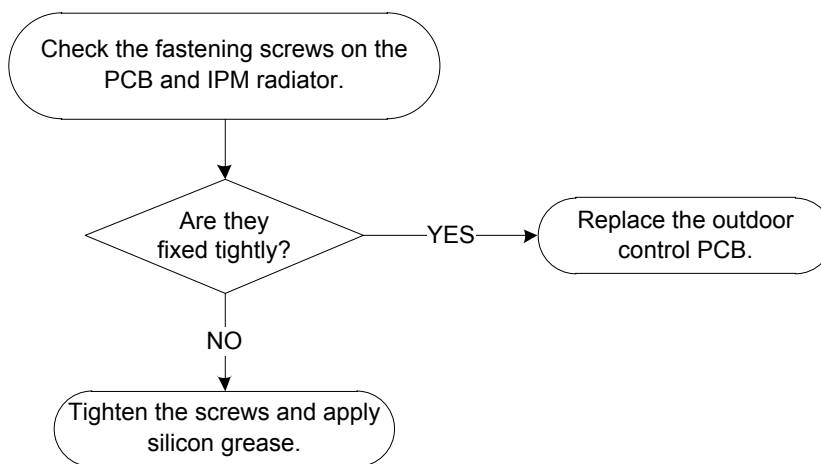
5.11 P2(High temperature protection of IPM module diagnosis and solution)

Description: If the temperature of IPM module is higher than setting value, the LED displays this failure code.

Recommended parts to prepare:

- Faulty PCB
- Connection problems

Troubleshooting and repair:



5.12 P4(Inverter compressor drive error diagnosis and solution)

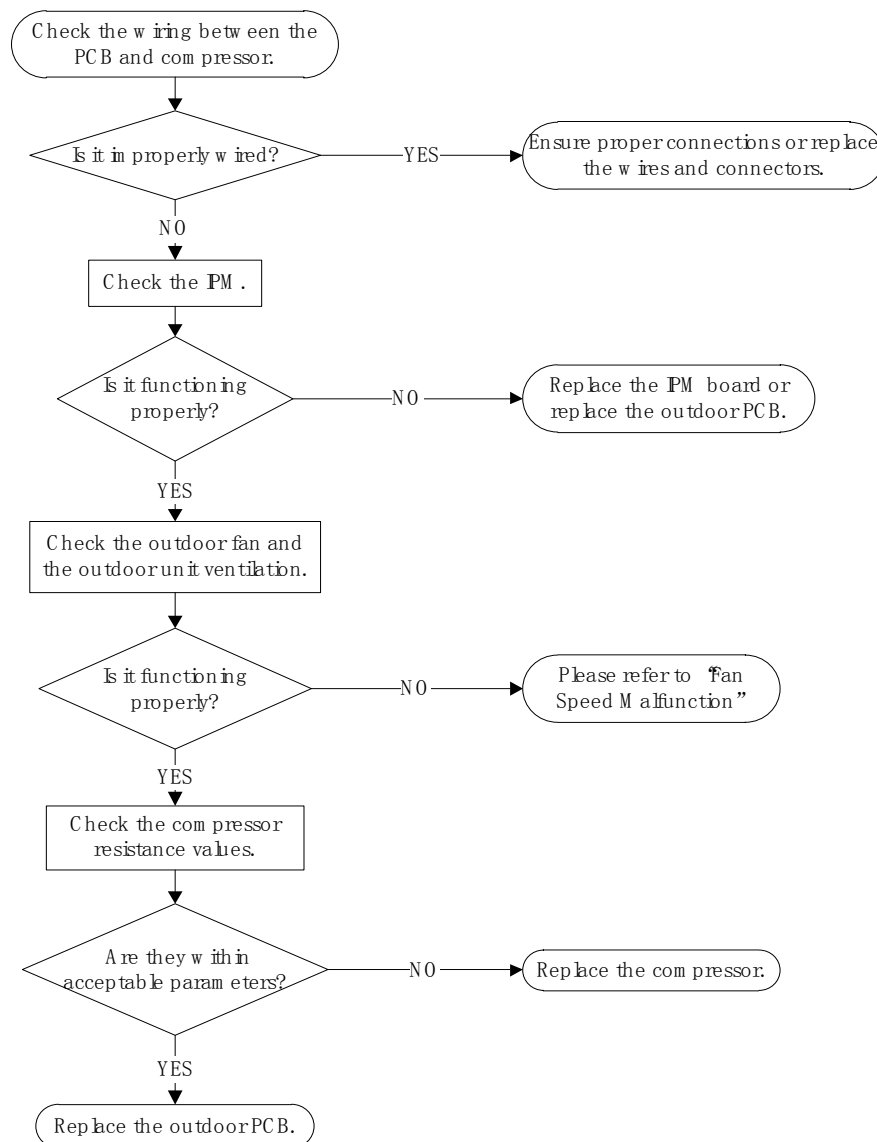
Description: An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on.

Recommended parts to prepare:

- Wiring mistake
- PM malfunction
- Faulty outdoor fan assembly
- Compressor malfunction
- Faulty outdoor PCB

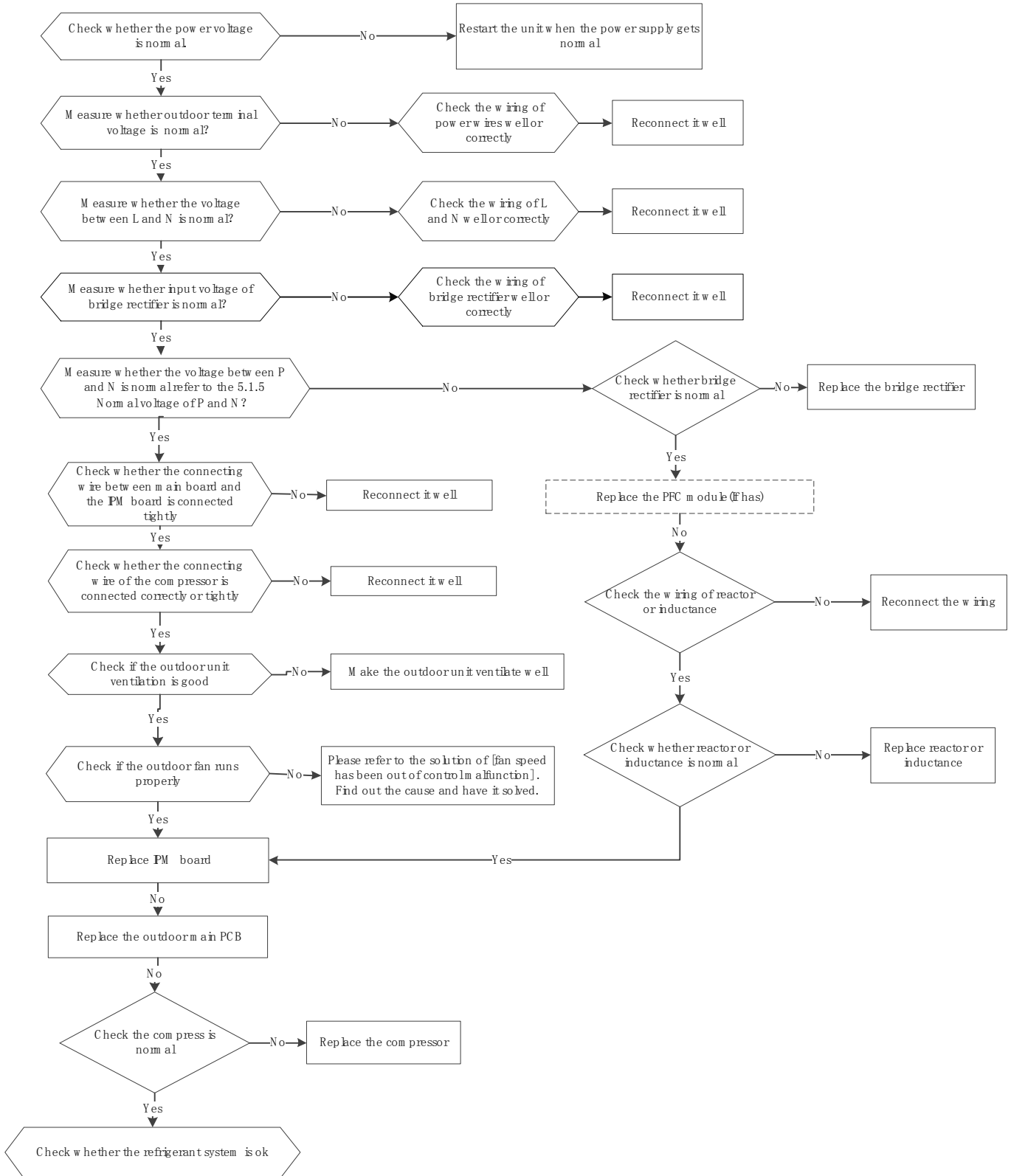
Troubleshooting and repair:

For 9K~24K:



For 30K~36K:

At first test the resistance between every two ports of U, V, W of IPM and P, N. If any result of them is 0 or close to 0, the IPM is defective. Otherwise, please follow the procedure below:



Troubleshooting

5.13 P6(Low pressure protection diagnosis and solution)

Description: When the pressure of system reach a certain value, the low pressure protector will switch off. After the pressure resume to normal ,the protection code will disappear.

Recommended parts to prepare:

- Wiring mistake
- Pressure protector faulty
- Fan motor faulty
- PCB faulty
- System problems.

Troubleshooting and repair:

Only for 36K models:

