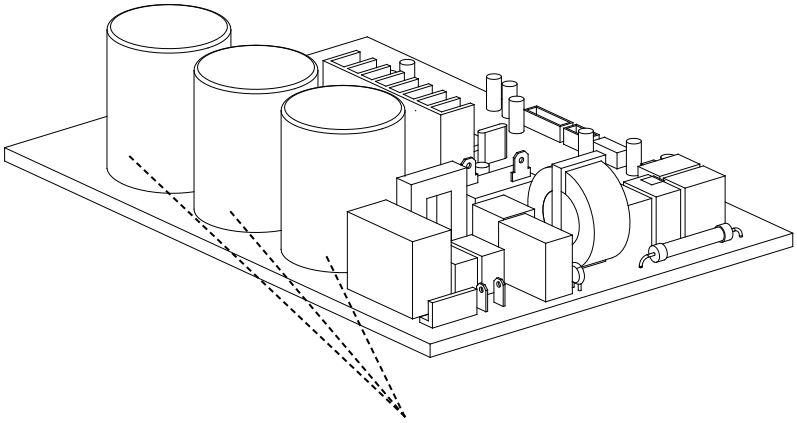
Troubleshooting

Contents

1. Safety Caution

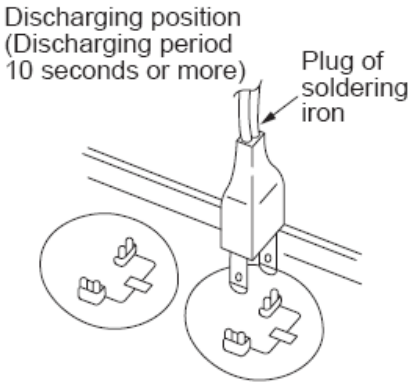
WARNING

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



Electrolytic Capacitors

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:

Indicator flashes	Timer Display	Display	Error Information	Solution
1	OFF	E0	Indoor unit EEPROM parameter error	Page 73
2	OFF	E1	Indoor / outdoor units communication error (only for 24k models)	Page 74
3	OFF	E2	Zero-crossing signal detection error	Page 75
4	OFF	E3	The indoor fan speed is operating outside of the normal range	Page 76
5	OFF	E4	Indoor room temperature sensor T1 is in open circuit or has short circuited	Page 78
6	OFF	E5	Evaporator coil temperature sensor T2 is in open circuit or has short circuited	Page 78
9	OFF	E7	Indoor PCB /Display board communication error	Page 79
7	OFF	EC	Refrigerant leak detected	Page 80
3	ON	F2	Condenser coil temperature sensor T3 open circuit or short circuit (only for MSAFD-23HRN1-NB8W, MSAFD-24HRN1-NC2W)	Page 78

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.

	Problem	Solution
1	Unit will not start	Page 67-68
2	The power switch is on but fans will not start	Page 67-68
3	The temperature on the display board cannot be set	Page 67-68
4	Unit is on but the wind is not cold(hot)	Page 67-68
5	Unit runs, but shortly stops	Page 67-68
6	The unit start ups and stops frequently	Page 67-68
7	Unit runs continuously but insufficient cooling(heating)	Page 67-68
8	Cool can not change to heat	Page 67-68
9	Unit is noisy	Page 67-68

3.2 Field maintenance

	Problem	Solution
1	Unit will not start	Page 69-70
2	Compressor will not start but fans run	Page 69-70
3	Compressor and condenser (outdoor) fan will not start	Page 69-70
4	Evaporator (indoor) fan will not start	Page 69-70
5	Condenser (Outdoor) fan will not start	Page 69-70
6	Unit runs, but shortly stops	Page 69-70
7	Compressor short-cycles due to overload	Page 69-70
8	High discharge pressure	Page 69-70
9	Low discharge pressure	Page 69-70
10	High suction pressure	Page 69-70
11	Low suction pressure	Page 69-70
12	Unit runs continuously but insufficient cooling	Page 69-70
13	Too cool	Page 69-70
14	Compressor is noisy	Page 69-70
15	Horizontal louver can not revolve	Page 69-70

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 starts up and stops 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

Check heat load			☆							Heavy load condition	Others
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

Replace the compressor														☆		Compressor stuck	Refrigerant Circuit
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	Others
Tighten bolts or screws		☆														Loosen hold down bolts and / or screws	
Remove them		☆														Shipping plates remain attached	
Choose AC of lager 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	

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 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	E7	EC	F2
Indoor PCB	✓	✓	✓	✓	✓	✓	✓	x	✓
Outdoor PCB	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	x	x
T2 Sensor	x	x	x	x	x	x	x	✓	x
T3 Sensor	x	x	x	x	x	x	x	x	✓
Additional refrigerant	x	x	x	x	x	x	x	✓	x
Display board	x	x	x	x	x	x	✓	x	x

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,

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

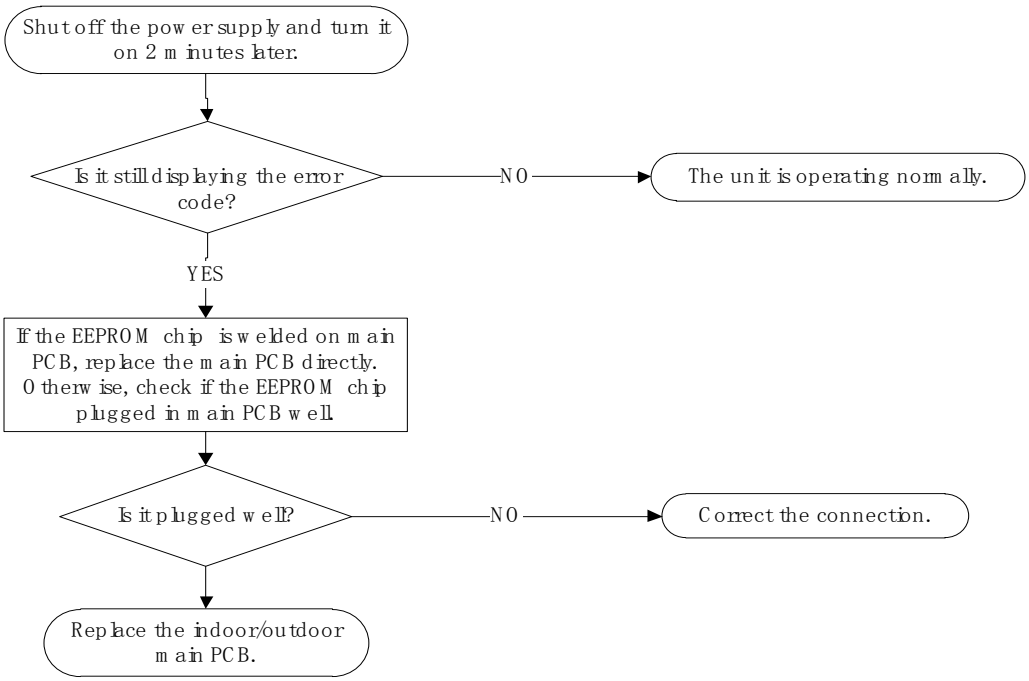
5.2 E0 (EEPROM parameter error)

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

Recommended parts to prepare:

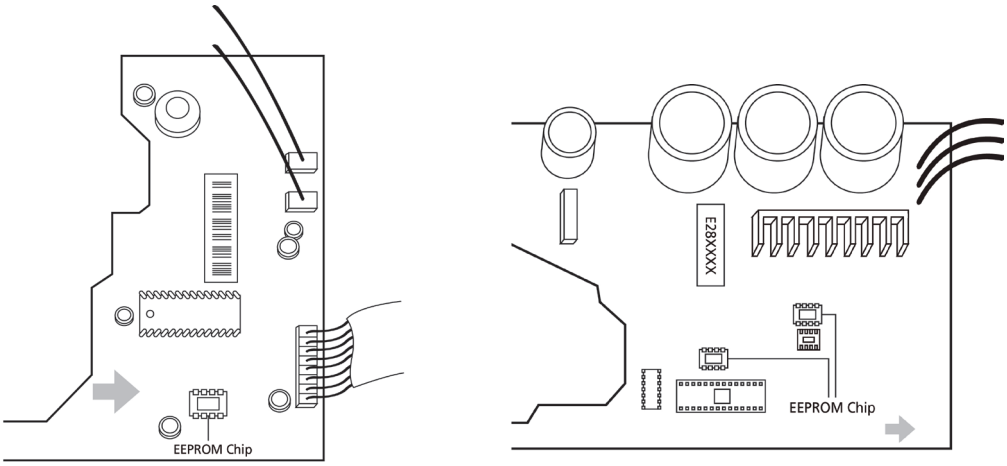
- Indoor PCB
- Outdoor PCB

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.

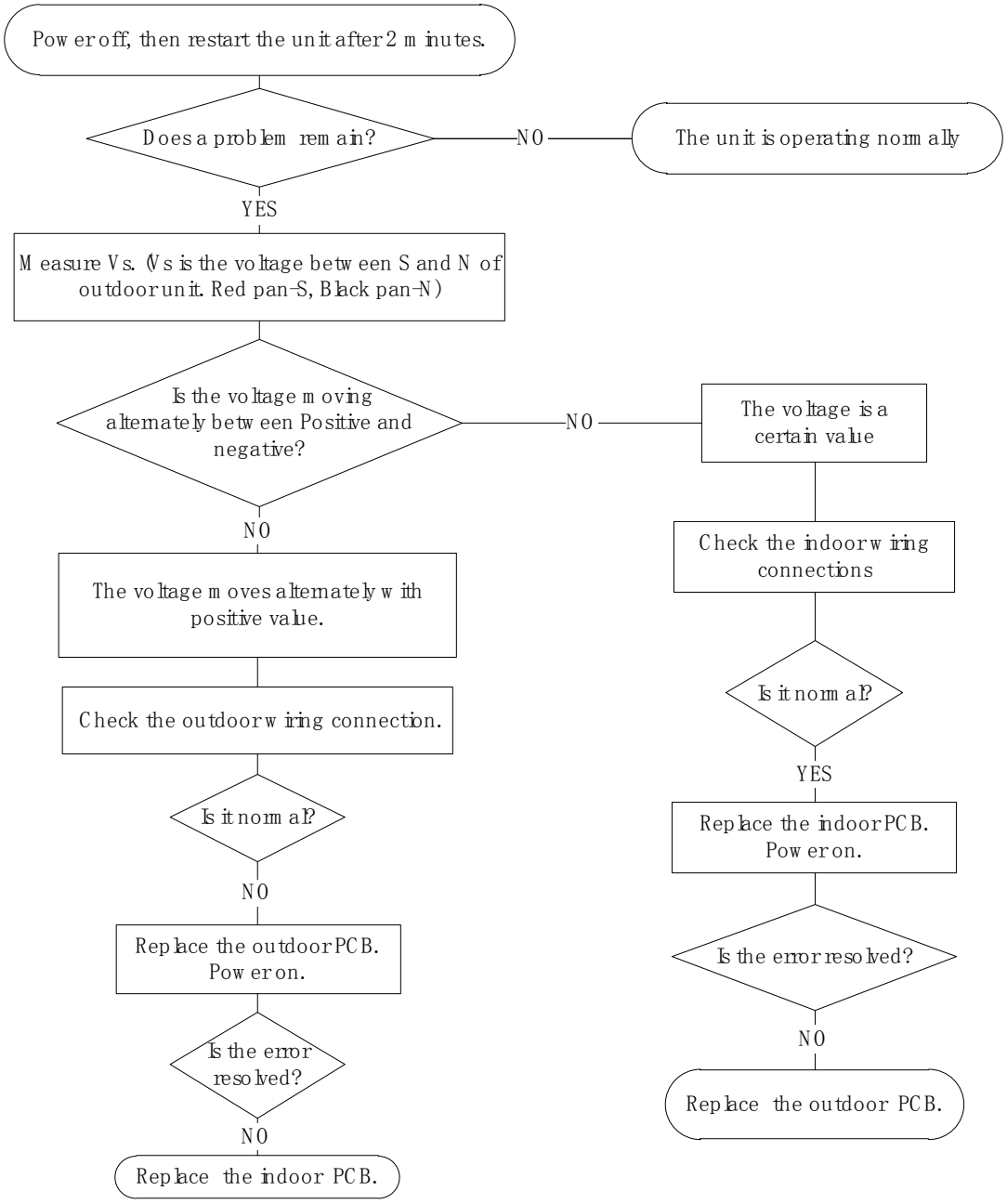
5.3 E1 (Indoor and outdoor unit communication error) (only for 24k models)

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:



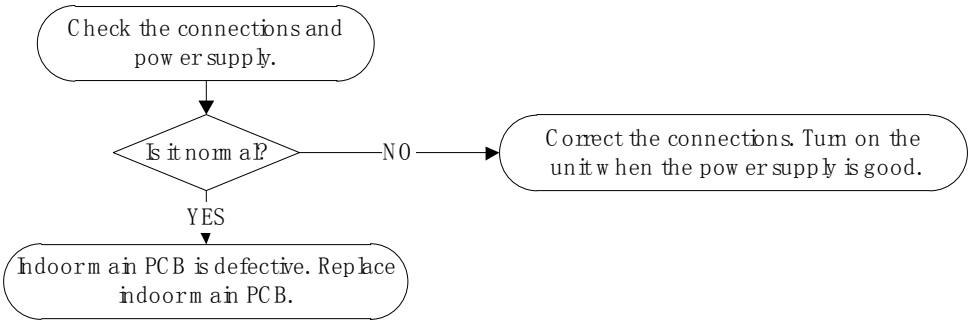
5.4 E2 (Zero crossing detection error diagnosis and solution)

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:



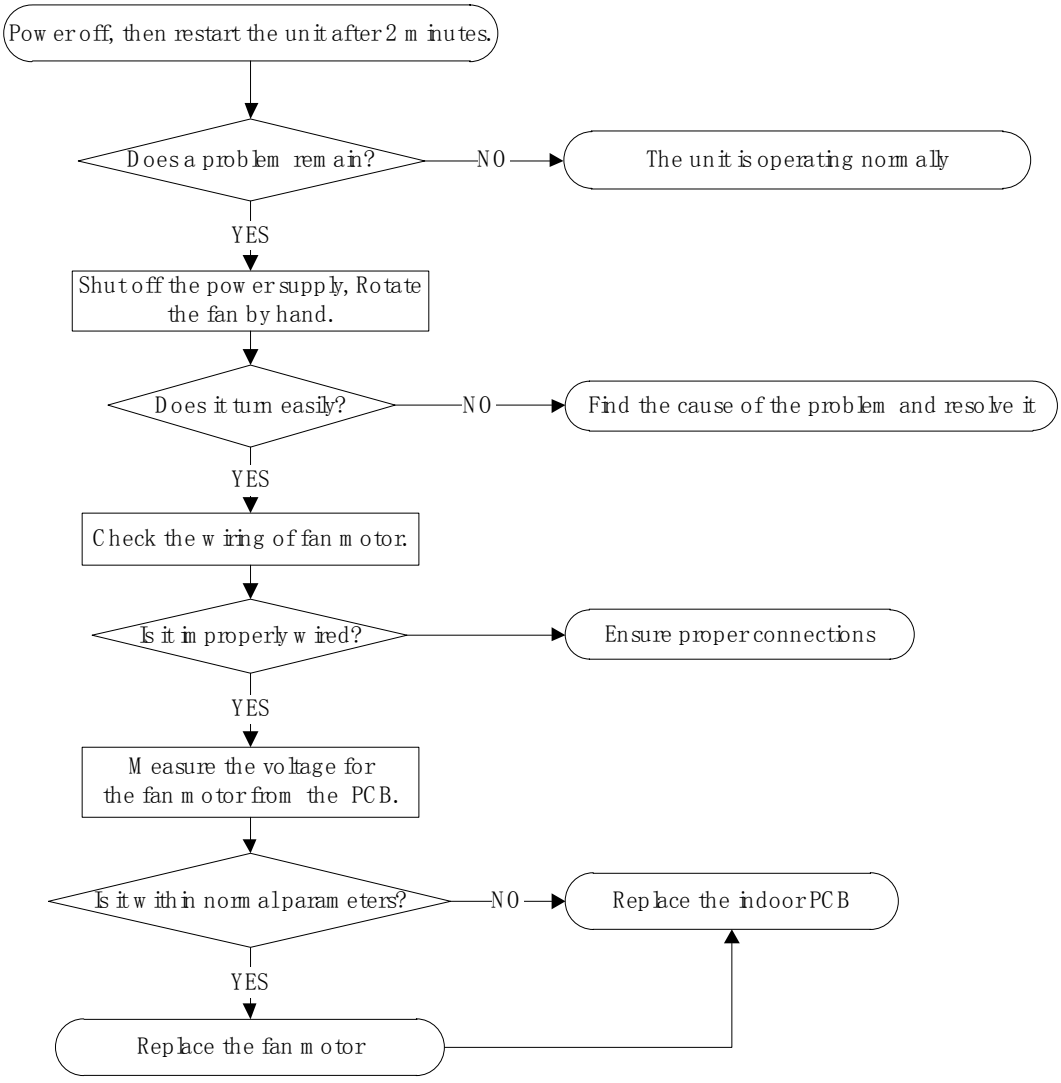
5.5 E3(Fan speed has been out of control diagnosis and solution)

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

Recommended parts to prepare:

- Wiring mistake
- Faulty fan assembly's faulty
- Faulty fan motor
- Faulty PCB

Troubleshooting and repair:



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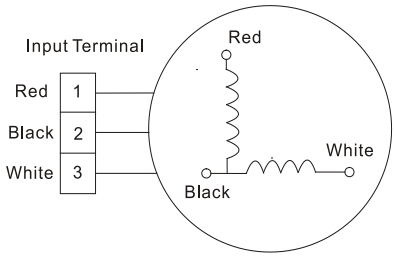
1. Indoor AC Fan Motor

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.



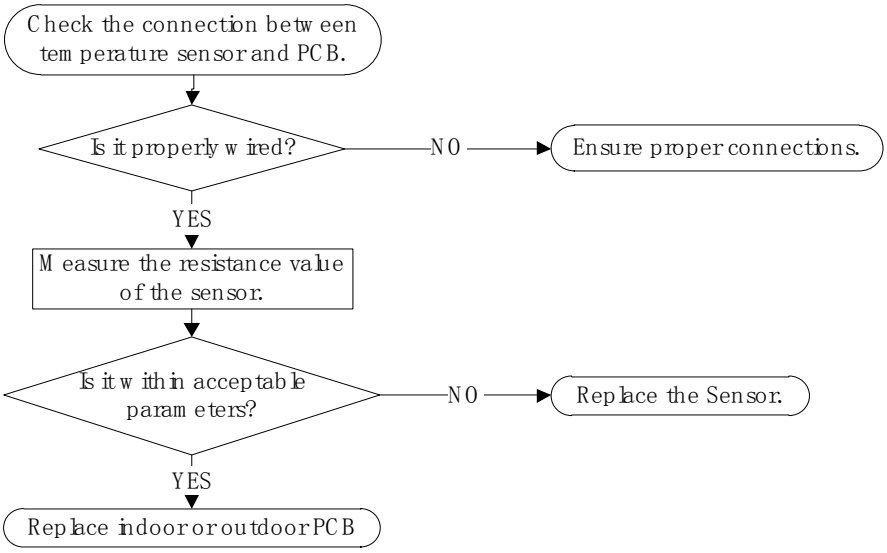
5.6 E4/E5/F2 (Open circuit or short circuit of temperature sensor diagnosis and solution)
(F2 is only for MSAFD-24HRN1-NC2W)

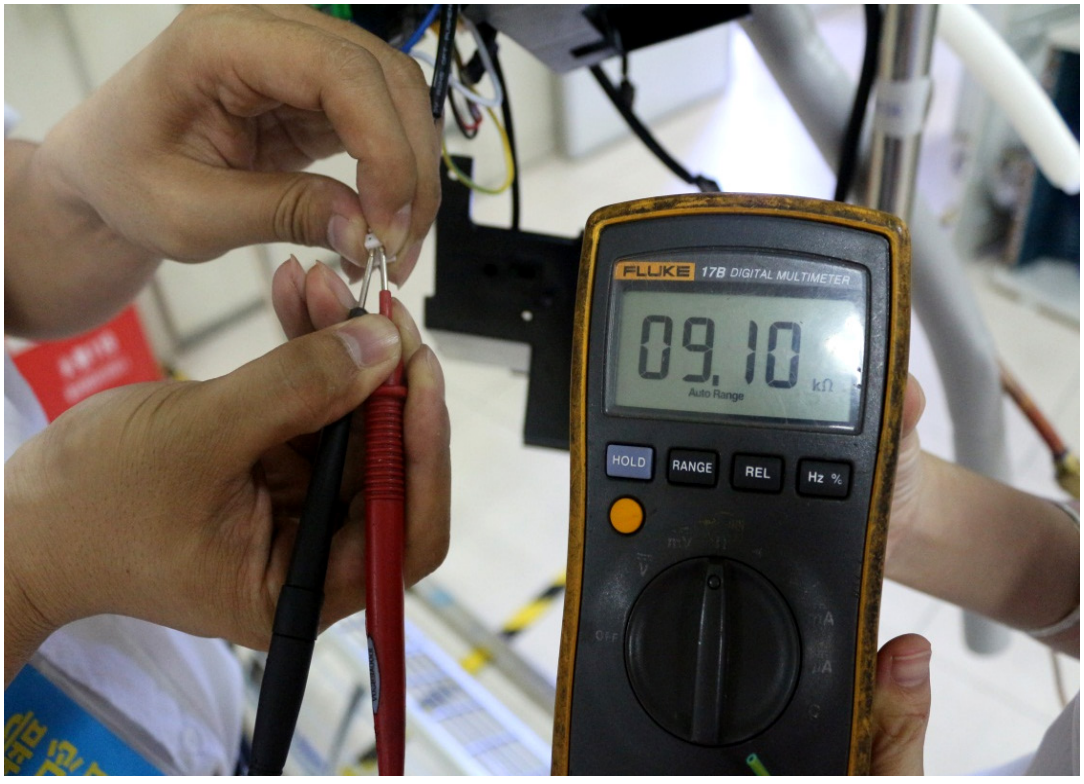
Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED will display the failure.

Recommended parts to prepare:

- Wiring mistake
- Faulty sensor
- Faulty PCB

Troubleshooting and repair:





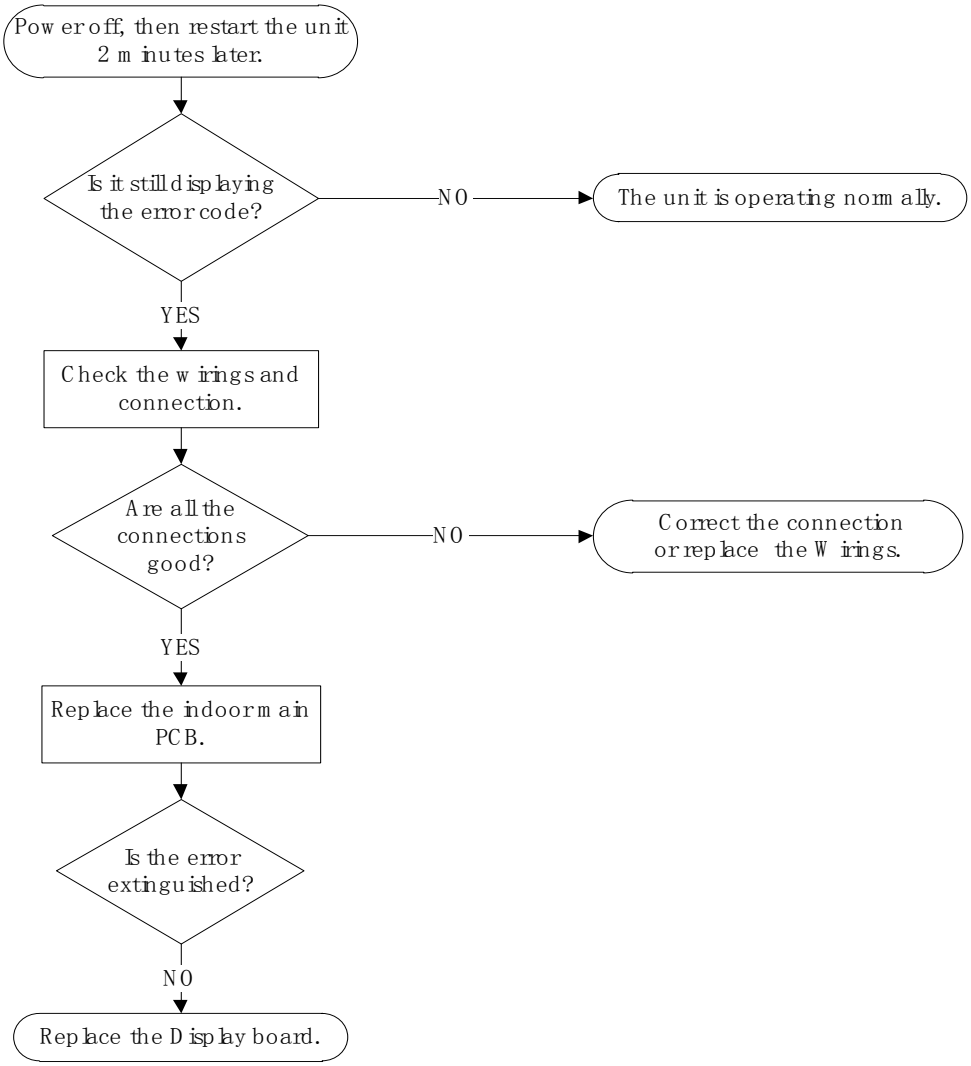
5.7 E7 (Indoor PCB /Display board communication error)

Description: Indoor PCB does not receive feedback from Display board.

Recommended parts to prepare:

- Wiring mistake
- Faulty PCB
- Display board malfunction

Troubleshooting and repair:



5.8 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 5 minutes after the compressor starts up, if T2<Tcool-2°C does not keep continuous 4 seconds 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: