



Y-Series

Troubleshooting Guide



This page intentionally left blank

TABLE OF CONTENTS

General Troubleshooting	4
Outdoor Unit Point Check Function	7
Information Inquiry	9
Error Diagnosis and Troubleshooting without Error Code	13
Quick Maintenance by Error Code	19
Troubleshooting by Error Code	21
7.1	21
7.2	22
7.3	25
7.4	27
7.5	28
7.6	29
7.7	30
7.8	31
7.9	32
7.10	33
7.11	34
7.12	35
7.13	36
7.14	37
7.15	39
7.16	40
7.17	41
7.18	42
7.19	42
7.20	43
7.21	45
7.22	46
7.23	47
7.24	48
7.25	48
7.26	49
7.27	49
Check Procedures	50



2. General Troubleshooting

2.1 Error Display (Indoor Unit)

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

Display	Error Information	Solution
E400	Indoor unit EEPROM parameter error	TS21
E401	Indoor / outdoor unit communication error	TS22
E416	Communication malfunction between adapter board and outdoor main board	TS48
E403	The indoor fan speed is operating outside of the normal range(for some models)	TS25
E460	Indoor room temperature sensor T1 is in open circuit or has short circuited	TS27
E461	Evaporator coil temperature sensor T2 is in open circuit or has short circuited	TS27
E462	Evaporator coil temperature sensor T2B is in open circuit or has short circuited	TS27
E465	Evaporator coil temperature sensor T2A is in open circuit or has short circuited	TS27
E40C	Refrigerant Leakage Detection(for some models)	TS28
E40b	Communication error between indoor two chips	TS47
E40E	Water-level alarm malfunction	TS29
E453	Outdoor room temperature sensor T4 is in open circuit or has short circuited	TS27
E452	Condenser coil temperature sensor T3 is in open circuit or has short circuited	TS27
E454	Compressor discharge temperature sensor TP is in open circuit or has short circuited	TS27
E456	Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for free-match indoor units)	TS27
E451	Outdoor unit EEPROM parameter error	TS21
E407	The outdoor fan speed is operating outside of the normal range(for some models)	TS25
P400	IPM malfunction or IGBT over-strong current protection	TS30
P401	Over voltage or over low voltage protection	TS31
P402	Top temperature protection of compressor or High temperature protection of IPM module	TS34
P404	Inverter compressor drive error	TS32

PC03	Low pressure protection (for some models)	TS33
EC0d	Outdoor unit malfunction	TS35
PC0L	Low ambient temperature protection	TS42
FL09	Mismatch between the new and old platforms	TS48

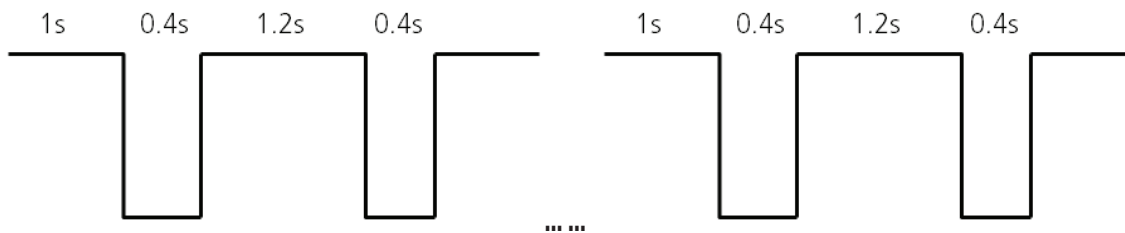
For other errors:

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.

LED flash frequency:



2.2 Error Display on Two Way Communication Wired Controller

Display	Malfunction or Protection	Solution
E1b3	Communication error between wire controller and indoor unit	TS49

The other error codes displayed on the wire controller are same from those on the unit.



2.3 Error Display (For Some Outdoor Unit)

Display	Malfunction or Protection	Solution
EE 51	Outdoor EEPROM malfunction	TS21
EL 01	Indoor / outdoor units communication error	TS22
EL 16	Communication malfunction between adapter board and outdoor main board	TS48
PE 00	IPM module protection	TS30
PE 02	Top temperature protection of compressor or High temperature protection of IPM module	TS34
PE 06	Temperature protection of compressor discharge	TS46
PE 08	Outdoor overcurrent protection	TS37
PE 0A	High temperature protection of condenser	TS45
PE 0F	PFC module protection	TS39
PE 10	Outdoor unit low AC voltage protection	TS31
PE 11	Outdoor unit main control board DC bus high voltage protection	TS31
PE 12	Outdoor unit main control board DC bus high voltage protection /341 MCE error	TS31
PE 30	High pressure protection	TS43
PE 31	Low pressure protection	TS33
PE 40	Communication malfunction between IPM board and outdoor main board	TS36
PE 41	Outdoor compressor current sampling circuit failure	TS49
PE 43	Outdoor compressor lack phase protection	TS41
PE 44	Outdoor unit zero speed protection	TS37
PE 45	Outdoor unit IR chip drive failure	TS42
PE 46	Compressor speed has been out of control	TS37
PE 49	Compressor overcurrent failure	TS37
EE 52	Condenser coil temperature sensor T3 is in open circuit or has short circuited	TS27
EE 53	Outdoor room temperature sensor T4 is in open circuit or has short circuited	TS27
EE 54	Compressor discharge temperature sensor TP is in open circuit or has short circuited	TS27
EE 57	Refrigerant pipe temperature sensor error	TS27
EE 5C	High pressure sensor is in open circuit or has short circuited	TS27
EE 71	Over current failure of outdoor DC fan motor	TS25
EE 72	Lack phase failure of outdoor DC fan motor	TS40
EE 73	Zero-speed failure of outdoor DC fan motor	TS25
EE 07	Outdoor fan speed has been out of control	TS25
PE 06	Low ambient temperature protection	TS42
LC 06	High temperature protection of IPM module	TS34



3. Outdoor Unit Point Check Function

- A check switch is included on the outdoor PCB.
- Push SW1 to check the unit's status while running. The digital display shows the following codes each time the SW1 is pushed.

Number of Presses	Display	Remark
00	Normal display	Displays 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) GA algorithm models display "--"
02	The frequency after the capacity requirement adapter	
03	Room temperature (T1)	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".
04	Indoor unit evaporator temperature (T2)	If the temp. is lower than -9 degree, the digital display tube 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: "--"
05	Condenser pipe temp.(T3)	
06	Outdoor ambient temp.(T4)	
07	Compressor discharge temp. (TP)	The display value is between 0~199 degree. If the temp. is lower than 0 degree, the digital display tube will show "0". 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)
08	AD value of current	The display value is a hex number.
09	AD value of voltage	For example, the digital display tube shows "Cd", it means AD value is 205.
10	Indoor unit running mode code	Standby:0,Cooling:1, Heating:2, Fan only 3, Drying:4, Forced cooling:6, Defrost:7
11	Outdoor unit running mode code	
12	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.)

13	Frequency limit symbol	Bit7	Frequency limit caused by IGBT radiator	The display value is a hexadecimal number. For example, the digital display show 2A, then Bit5=1, Bit3=1, and Bit1=1. This means that a frequency limit may be caused by T4, T3, or the current.
		Bit6	Reserved	
		Bit5	Reserved	
		Bit4	Frequency limit caused by low temperature of T2.(LH00)	
		Bit3	Frequency limit caused by T3.(LC01)	
		Bit2	Frequency limit caused by TP.(LC02)	
		Bit1	Frequency limit caused by current(LC03)	
		Bit0	Frequency limit caused by voltage (LC05)	
14	Outdoor unit fan speed	If it 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 fan speed is 120.) This value is multiplied by 8, and it is the current fan speed: 120*8=960		
15	The average value of the temperature values detected by the high and low pressure sensors in the last 10 seconds of the compressor frequency calculation period	The displayed value is the actual value plus 60 (that is, when the displayed value is 10, the actual value is -50). When the displayed value is higher than 99, the digital display tube will show single digit and tens digit. (if it displays 2.0, it means 120)		
16	The temperature value detected by the high and low pressure sensor	When there is no pressure sensor, it is displayed as --		
17	AD value detected by the high and low pressure sensor	If it is higher than 199, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "2.0", it means 220.) Otherwise, if the it is higher than 99 degree, the digital display tube will show tens digit. (For example, the digital display tube show "2.0", it means 120.) When there is no pressure sensor, it is displayed as --		
18	The currently running communication protocol version	00-99		



4. Information Inquiry

- To enter engineer mode, in power-on or standby mode, and in non-locked state, press the key combination "ON/OFF + Air Speed" for 7s:
- After entering the engineer mode, the remote control will display icons of "Auto, Cool, Dry, Heat", and the Battery icon; at the same time, it will also display the numeric code of the current engineer mode (for the initial engineer mode, the numeric code displayed is 0), and all other icons are inactive.
- In engineer mode, the value of the current numeric code can be adjusted circularly through the Up/Down key, with the setting range of 0 to 30. Each time the current numeric code is adjusted, the special code of the engineer mode will be transmitted with a delay of 0.6s. The code can also be transmitted by pressing "OK", and the special code of the engineer mode sent contains information of the currently displayed numeric code (if the numeric code is 0, the code to enter the engineer mode will be transmitted).
- In engineer mode, other keys or operations are invalid except for the On/Off key, the Up/Down key, the OK key or executing the operation to exit the engineer mode.

Code	Query Content	Advanced Function Setting
0	Error code	
1	T1 temperature	press "On/Off" for 2s to enter the Power Down Memory Selector, the code displayed is "Ch", press "OK" to send the Query Power Down Memory Selector code; press the Up/Down key to select 1 or 0 and press "OK" to confirm, 1 indicates that the power down memory exists, and 0 indicates that no power down memory exists; and press "On/Off" for 2s to exit.(Set within 1 minute after power on)
2	T2 temperature	press "On/Off" for 2s to enter the Internal Fan Control Selector after the pre-set temperature is reaches, the code displayed is "Ch", press "OK" to send the Query Internal Fan Control Selector code; press the Up/Down key to select 1 to 11: 1 - Stop the fan, 2 - Min. air speed, 3 - Set the air speed, 4 - Termal running for 5min, press "OK" to confirm, and press "On/Off" for 2s to exit. (Set within 1 minute after power on)
3	T3 temperature	press "On/Off" for 2s to enter the Mode Selector, press the Up/Down key to select CH (cool and heat, Auto + Cool + Dry + Heat + Fan), CC (Cool only without Auto, Cool + Dry + Fan) , press "OK" to confirm, and the mode selected can be memorized when the remote control is powered down and powered on; and press "On/Off" for 2s to exit. When the remote control does not burn any parameters, the mode setting will not be memorized. (Set within 1 minute after power on)
4	T4 temperature	press the "On/Off" for 2s to enter the Min. Set Temperature Selector, press the Up/Down key to select "16°C~24°C", press "OK" to confirm, and the Min. Set Temperature can be memorized when the remote control is powered on and power lost; and press "On/Off" for 2s to exit. When the remote control does not burn any parameters, the min. set temperature will not be memorized.(Set within 1 minute after power on)
5	TP temperature	press "On/Off" for 2s to enter the Max. Set Temperature Selector, press the Up/Down key to select "25°C~30°C", press "OK" to confirm, and the Max. Set Temperature can be memorized when the remote control is powered on and power lost; and press "On/Off" for 2s to exit. When the remote control does not burn any parameters, the max. set temperature will not be memorized.(Set within 1 minute after power on)
6	Compressor Target Frequency FT	/



7	Compressor Running Frequency Fr	press "On/Off" for 2s to enter Twins Selector, the code displayed is "Ch", press "OK" to send the Query Twins Selector code; press the Up/Down key to select, 0 indicates that there is no Twins, 1 indicates the host, and 2 indicates the slave. Press "OK" to confirm, and press "On/Off" for 2s to exit.
8	Current dL	/
9	Current AC Voltage Uo	/
10	Current indoor capacity test state Sn	/
11	/	press "On/Off" for 2S to enter the Min. Desired Cooling Frequency Selector, the code displayed is Ch, press "OK" to send the Query Min. Desired Cooling Frequency Selector code; press the Up/Down key to select the minimum cooling frequency desired and press "OK" to confirm; press "On/Off" for 2s to exit.(for some models)
12	Set Speed Pr of the outdoor fan	press "On/Off" for 2s to enter the Min. Desired Heating Frequency Selector, the code displayed is "Ch", press "OK" to send the Query Min. Desired Heating Frequency Selector code; press the Up/Down key to select the min. desired heating frequency value, press "OK" to confirm; and press the "On/Off" for 2s to exit.(for some models)
13	Opening Lr of EEV	press "On/Off" for 2s to enter the Max. Running Frequency Selector of the restricted area 6 in the cooling mode T4, the code displayed is "Ch", press "OK" to send the Query Max. Running Frequency Selector code of the restricted area 6 in the cooling mode T4; press the Up/Down key to select the limit, then press "OK" to confirm; and press "On/Off" for 2s to exit.(for some models)
14	Actual Running Speed ir of the indoor fan	/
15	Indoor Humidity Hu	press "On/Off" for 2s to enter the Outdoor Forced Running Frequency Selector, the code displayed is "Ch", press "OK" to send the Query Outdoor Forced Running Frequency Selector code; press the Up/Down key to select the outdoor forced running frequency, then press "OK" to confirm; and press "On/Off" for 2s to exit.(for some models)
16	Set Temperature TT after compensation	press "On/Off" for 2s to enter One-Key Recovery, the code displayed is "rS", then press "OK" to send the One-Key Recovery code, the mode selector of the remote control will recover to "Cooling and heating", the min. temperature recovers to 16°C, and the max. temperature recovers to 30°C; and press "On/Off" for 2s to exit.(for some models)
17	/	nA
18	/	/
19	DC bus voltage	press "On/Off" for 2s to enter the Cooling Frequency Threshold Settings; press the Up/Down key to select the cooling frequency threshold, press "OK" to confirm; and press the "On/Off" for 2s to exit. (Set within 1 minute after power on)
20	Indoor Target Frequency oT	press "ON/OFF" for 2s to enter the Heating Frequency Threshold Settings; press the Up/Down key to select the heating frequency threshold, press "OK" to confirm; and press "On/Off" for 2s to exit. (Set within 1 minute after power on)



21		press "On/Off" for 2s to enter the Cooling Temperature Compensation Value Settings, the code displayed is "Ch", then press "OK" to send the Query Cooling Temperature Compensation Value code; press the Up/Down key to select the cooling temperature compensation value, then press "OK"; and press "On/Off" for 2s to exit.
22		press "On/Off" for 2s to enter the Heating Temperature Compensation Value Settings, the code displayed is "Ch", press "OK" to send the Query Heating Temperature Compensation Value code; press the Up/Down key to select the heating temperature compensation value, then press "OK"; and press "On/Off" for 2s to exit.
23	Reserved	/
24		
25		
26		
27		
28		
29		
30		

- In Channel 1~30 settings of the engineer mode, long press the On/off key to return the previous engineer mode.

Exit of engineer mode:

- 1)In engineer mode, press the key combination of "On/Off + Air speed" for 2s;
- 2)The engineer mode will be exited if there are no valid key operations for continuous 60s.



Error code of engineer mode

Display	Error Information
E400	Indoor unit EEPROM parameter error
E401	Indoor / outdoor unit communication error
E416	Communication malfunction between adapter board and outdoor main board
E403	The indoor fan speed is operating outside of the normal range
EE51	Outdoor unit EEPROM parameter error
EE52	Condenser coil temperature sensor T3 is in open circuit or has short circuited
EE53	Outdoor room temperature sensor T4 is in open circuit or has short circuited
EE54	Compressor discharge temperature sensor TP is in open circuit or has short circuited
EE55	IGBT temperature sensor TH is in open circuit or has short circuited
EE56	Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for free-match indoor units)
EE0d	Outdoor unit malfunction
E460	Indoor room temperature sensor T1 is in open circuit or has short circuited
E461	Evaporator coil temperature sensor T2 is in open circuit or has short circuited
E462	Evaporator coil temperature sensor T2B is in open circuit or has short circuited
E465	Evaporator coil temperature sensor T2A is in open circuit or has short circuited
EE07	The outdoor fan speed is operating outside of the normal range(
E40b	Communication error between indoor two chips
E40c	Refrigerant leak detected
E40E	Water-level alarm malfunction
PL09	Mismatch between the new and old platforms
PC00	IPM malfunction or IGBT over-strong current protection
PC01	Over voltage or over low voltage protection
PC02	Top temperature protection of compressor or High temperature protection of IPM module
PC04	Inverter compressor drive error
PC08	Outdoor current protection
PC03	Pressure protection
PC0L	Outdoor low ambient temperature protection
PH90	Evaporator coil temperature over high protection
PH91	Evaporator coil temperature over low Protection
PC0R	Condenser high temperature protection

5. Error Diagnosis and Troubleshooting Without Error Code

WARNING

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

5.1 Remote maintenance

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

No.	Problem	Solution
1	Unit will not start	TS15 - TS16
2	The power switch is on but fans will not start	TS15 - TS16
3	The temperature on the display board cannot be set	TS15 - TS16
4	Unit is on but the wind is not cold(hot)	TS15 - TS16
5	Unit runs, but shortly stops	TS15 - TS16
6	The unit starts up and stops frequently	TS15 - TS16
7	Unit runs continuously but insufficient cooling(heating)	TS15 - TS16
8	Cool can not change to heat	TS15 - TS16
9	Unit is noisy	TS15 - TS16



5.2 Field maintenance

	Problem	Solution
1	Unit will not start	TS17 - TS18
2	Compressor will not start but fans run	TS17 - TS18
3	Compressor and condenser (outdoor) fan will not start	TS17 - TS18
4	Evaporator (indoor) fan will not start	TS17 - TS18
5	Condenser (Outdoor) fan will not start	TS17 - TS18
6	Unit runs, but shortly stops	TS17 - TS18
7	Compressor short-cycles due to overload	TS17 - TS18
8	High discharge pressure	TS17 - TS18
9	Low discharge pressure	TS17 - TS18
10	High suction pressure	TS17 - TS18
11	Low suction pressure	TS17 - TS18
12	Unit runs continuously but insufficient cooling	TS17 - TS18
13	Too cool	TS17 - TS18
14	Compressor is noisy	TS17 - TS18
15	Horizontal louver can not revolve	TS17 - TS18



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															



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

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

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

6. Quick Maintenance by Error Code

If you do not have the time to test which 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									
	E400	E401	E403	E460	E461	E462	E465	E40C	E40E	EC53
Indoor PCB	✓	✓	✓	✓	✓	✓	✓	✓	✓	x
Outdoor PCB	x	✓	x	x	x	x	x	x	x	✓
Indoor fan motor	x	x	✓	x	x	x	x	x	x	x
T1 sensor	x	x	x	✓	x	x	x	x	x	x
T2 Sensor	x	x	x	x	✓	x	x	x	x	x
T2B Sensor	x	x	x	x	x	✓	x	x	x	x
T2A Sensor	x	x	x	x	x	x	✓	x	x	x
T3 Sensor	x	x	x	x	x	x	x	x	x	x
T4 Sensor	x	x	x	x	x	x	x	x	x	✓
Reactor	x	✓	x	x	x	x	x	x	x	x
Compressor	x	x	x	x	x	x	x	x	x	x
Additional refrigerant	x	x	x	x	x	x	x	✓	x	x
Water-level switch	x	x	x	x	x	x	x	x	✓	x
Water pump	x	x	x	x	x	x	x	x	✓	x

Part requiring replacement	EC54	EC51	EC5C	EC52	EC 01/11 /12/13	PC00	PC01	PC02	PC04	PC03
Indoor PCB	x	x	x	x	x	x	x	x	x	x
Outdoor PCB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Outdoor fan motor	x	x	x	x	✓	✓	x	✓	✓	x
T3 Sensor	x	x	x	✓	x	x	x	x	x	x
TP Sensor	✓	x	x	x	x	x	x	x	x	x
Pressure sensor	x	x	✓	x	x	x	x	x	x	x
Reactor	x	x	x	x	x	x	✓	x	x	x
Compressor	x	x	x	x	x	✓	x	x	✓	x
IPM module board	x	x	x	x	x	✓	✓	✓	✓	x
Low pressure protector	x	x	x	x	x	x	x	x	x	✓
Additional refrigerant	x	x	x	x	x	x	x	x	x	✓



Part requiring replacement	EL 16	EH0b	PC 06	PC 08/44/ 49	PC 0R	PC 0F
Indoor PCB	x	✓	x	x	x	x
Outdoor PCB	✓	x	✓	✓	✓	✓
Outdoor fan motor	x	x	x	✓	✓	x
T3 Sensor	x	x	x	x	✓	x
TP Sensor	x	x	✓	x	x	x
Pressure sensor	x	x	x	x	x	x
Reactor	x	x	x	✓	x	✓
Compressor	x	x	x	x	x	x
IPM module board	x	x	x	✓	x	x
Data adapter board	✓	✓	x	x	x	x
High pressure valve assy	x	x	✓	x	x	x
High pressure protector	x	x	x	x	x	x
Low pressure protector	x	x	x	x	x	x
Additional refrigerant	x	x	✓	x	✓	x

Part requiring replacement	PC 41	PC 43	PC 10/11/12	PC 30	PC 31	PC 40
Indoor PCB	x	x	x	x	x	x
Outdoor PCB	✓	✓	✓	✓	✓	✓
Outdoor fan motor	x	x	x	✓	x	x
T3 Sensor	x	x	x	x	x	x
TP Sensor	x	x	x	x	x	x
Pressure sensor	x	x	x	x	x	x
Reactor	x	x	✓	x	x	x
Compressor	x	✓	x	x	x	x
IPM module board	x	x	✓	x	x	✓
Data adapter board	x	x	x	x	x	x
High pressure valve assy	x	x	x	x	x	x
High pressure protector	x	x	x	✓	x	x
Low pressure protector	x	x	x	x	✓	x
Additional refrigerant	x	x	x	x	✓	x
Electric control box	x	x	x	x	x	✓

Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

7. Troubleshooting by Error Code

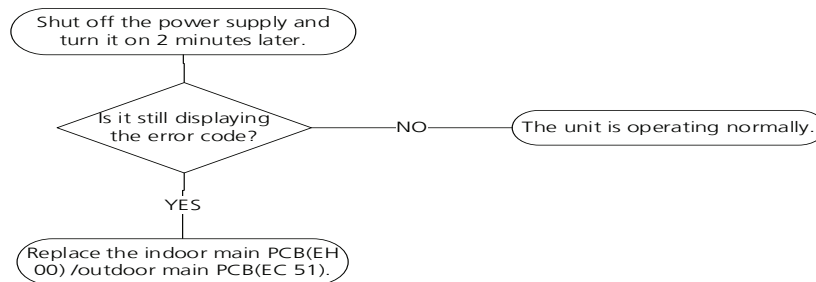
7.1 EH 00 / EC 51 (EEPROM Parameter Error Diagnosis and Solution)

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

Recommended parts to prepare:

- Indoor PCB
- Outdoor PCB

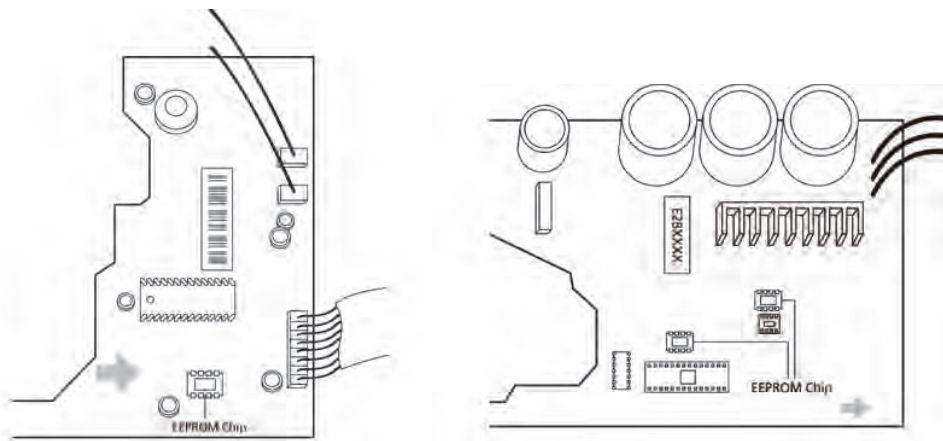
Troubleshooting and repair:



Remarks:

EEPROM: A read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

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



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole. This pictures are only for reference, actual appearance may vary.

Troubleshooting and repair of compressor driven chip EEPROM parameter error and communication error between outdoor main chip and compressor driven chip are same as EC 51.

7.2 EL 01 (Indoor and Outdoor Unit Communication Error Diagnosis and Solution)

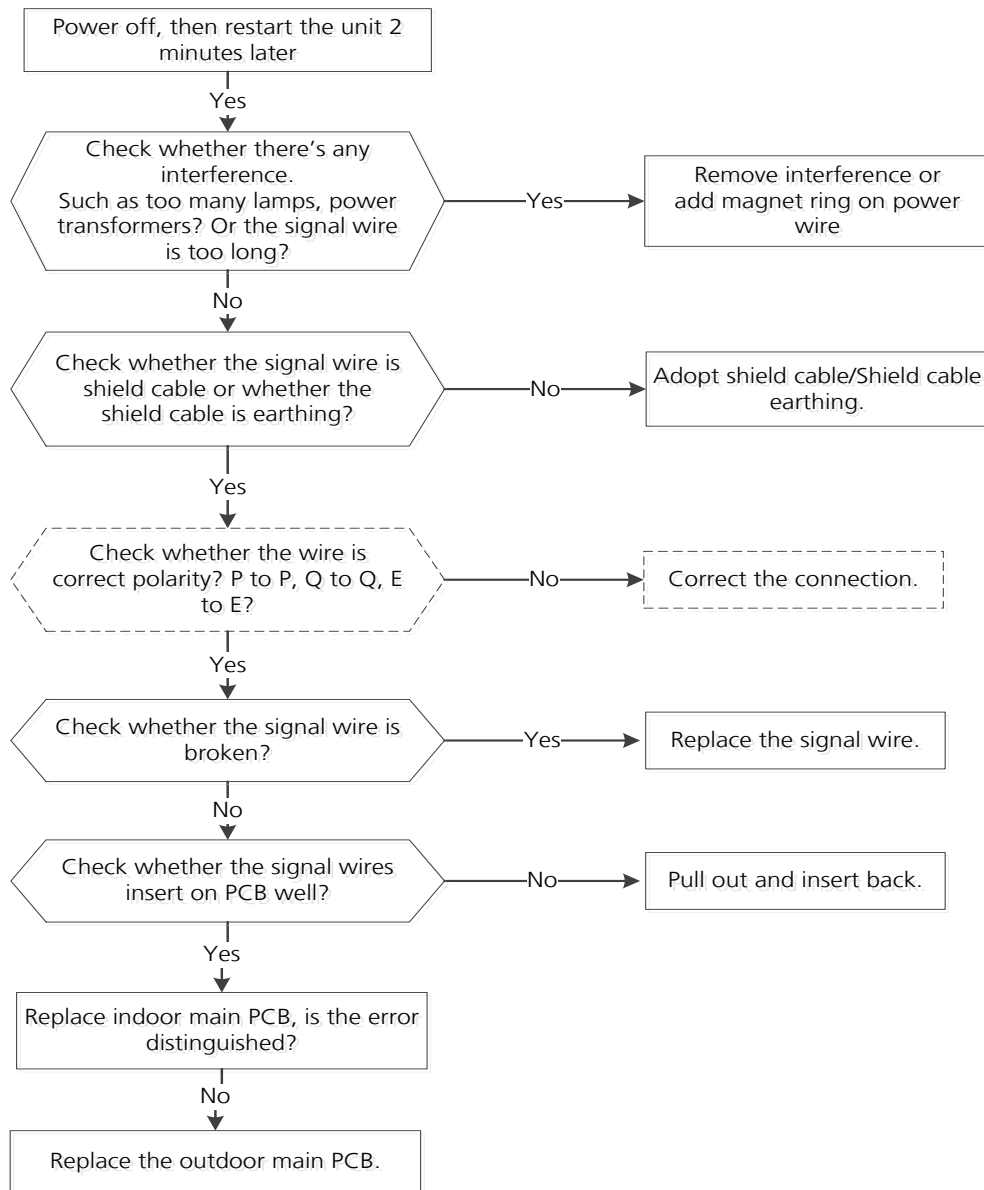
Description: Indoor unit can not communicate with outdoor unit

Recommended parts to prepare:

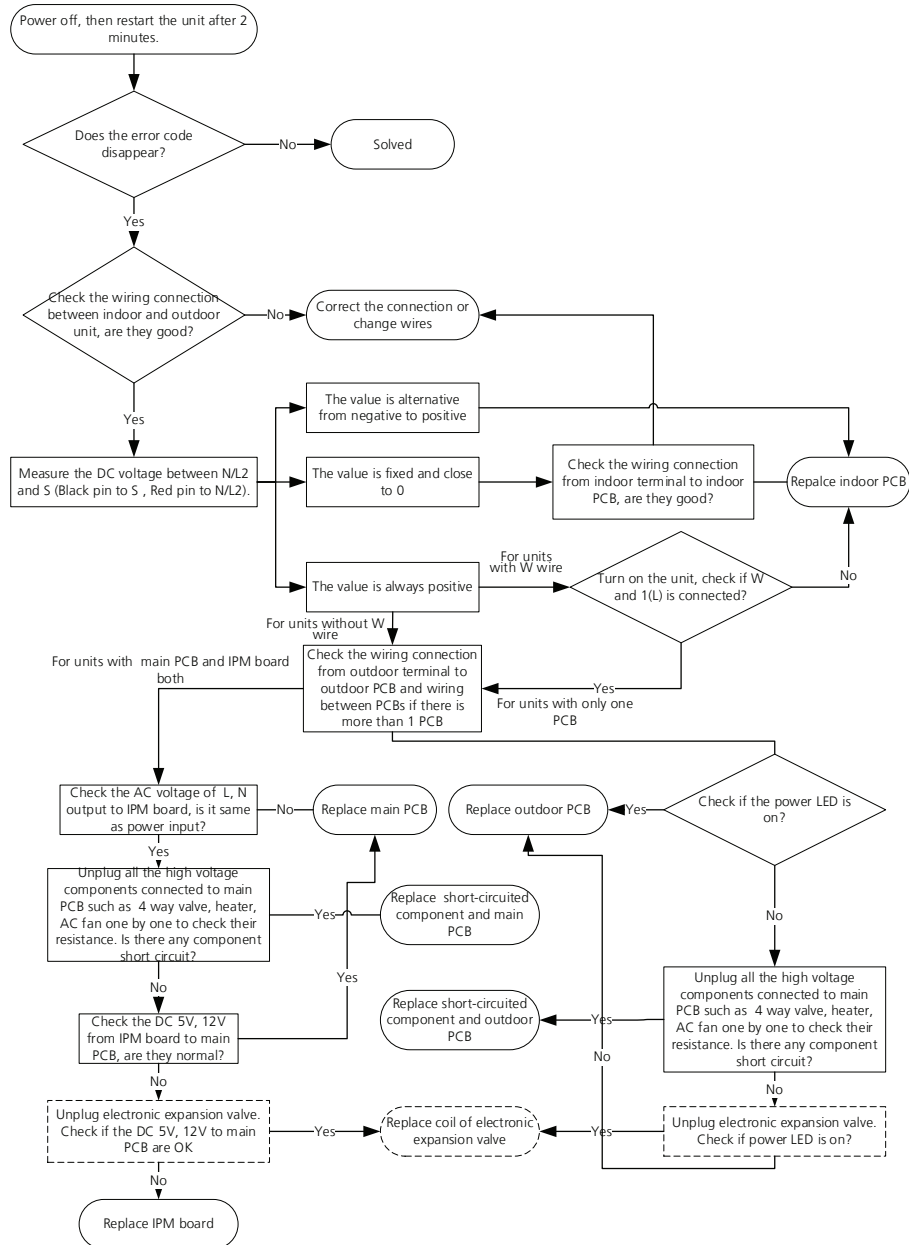
- Signal wires
- Magnet ring
- Indoor PCB
- Outdoor PCB

Troubleshooting and repair:

XYE Communication:



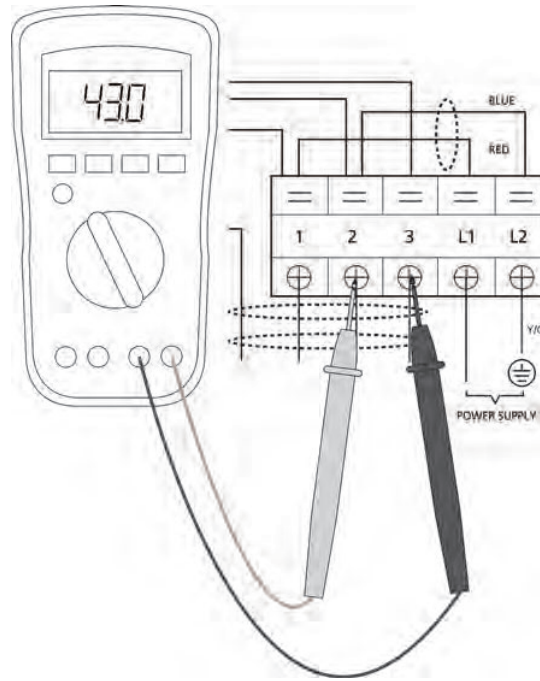
S Communication:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

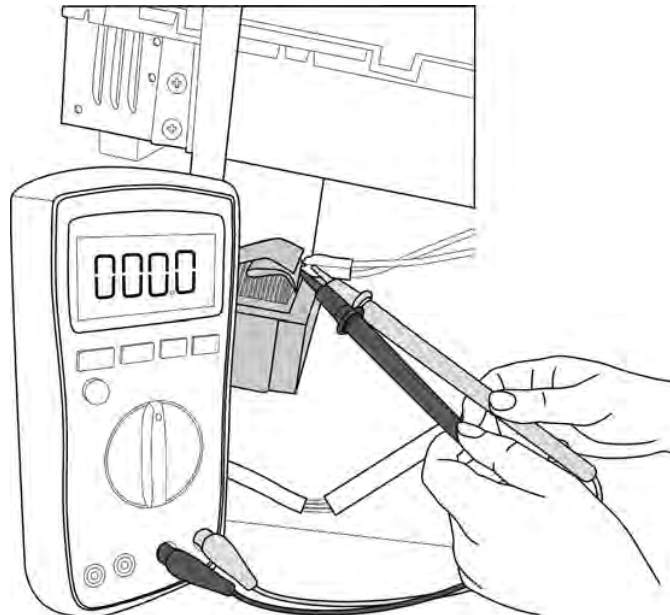
Remarks:

- Use a multimeter to test the DC voltage between 2 port(or S or L2 port) and 3 port(or N or S port) of outdoor unit.
The red pin of multimeter connects with 2 port(or S or L2 port) while the black pin is for 3 port(or N or S port) .
- When AC is normal running, the voltage is moving alternately as positive values and negative values
- If the outdoor unit has malfunction, the voltage has always been the positive value.
- While if the indoor unit has malfunction, the voltage has always been a certain value.



**S and N
or
L2 and S
or
2 and 3**

- 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.



Note: The picture and the value are only for reference, actual condition and specific value may vary.

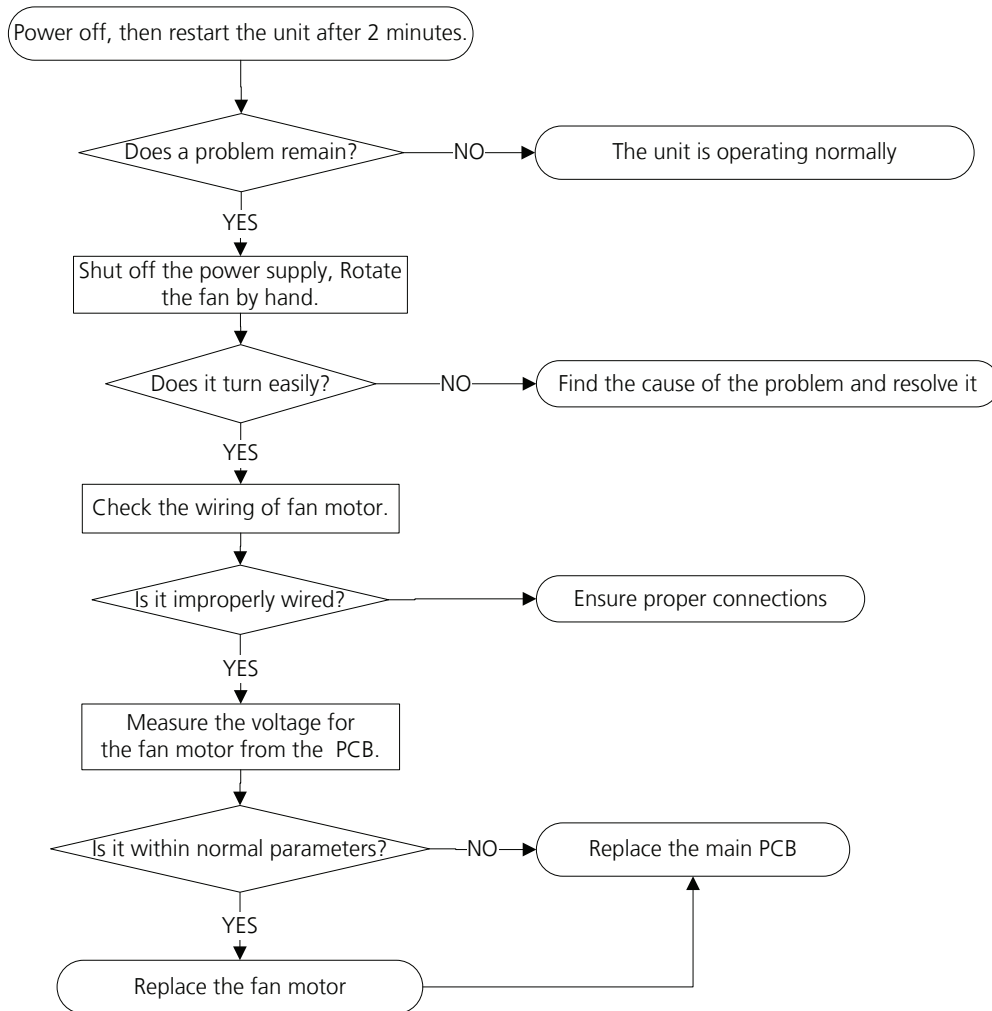
7.3 EH 03 / EC 07 (Fan Speed Is Operating Outside of Normal Range)/EC 71(Over Current Failure of Outdoor DC Fan Motor)/ EC73(Zero-speed failure of outdoor DC fan motor) Diagnosis and Solution

Description: When indoor / outdoor fan speed keeps too low or too high for a certain time, the unit ceases operation and the LED displays the failure.

Recommended parts to prepare:

- Connection wires
- Fan assembly
- Fan motor
- PCB

Troubleshooting and repair:

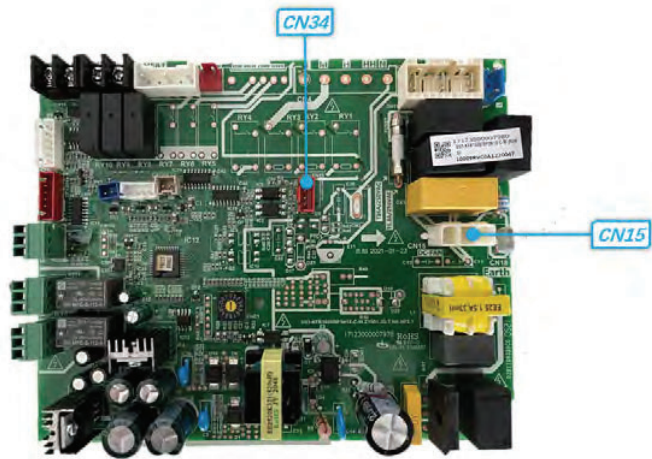


Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

Index:

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

Power on and when the unit is in standby, measure the voltage of pin1&pin2 of CN15, pin3 of CN34 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.



CN34

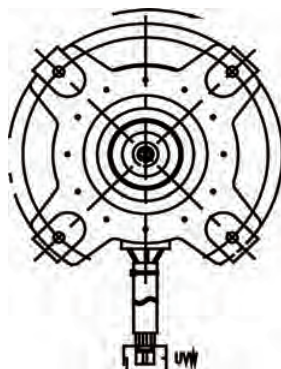
NO.	Color	Signal	Voltage
1	/	/	
2	Black	GND	
3	Orange	PWM	5-12VDC
4	Blue	FG	

CN15

NO.	Color	Signal	Voltage
1	Yellow		208/230VAC
2	Black		208/230VAC
3	Yellow-Green	GND	

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.



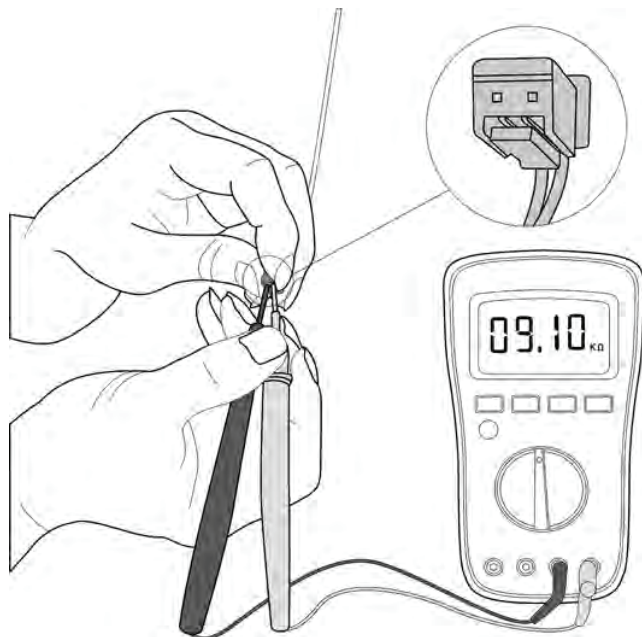
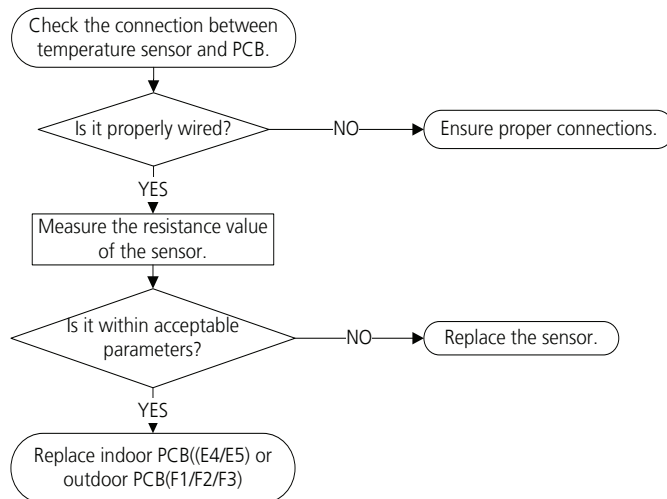
7.4 EH 60/EH 61/EH 62/ EH 65/ EC 53/EC 52/EC 54/EC 56/EC 57/EC 50/EC 5C (Open Circuit or Short Circuit of Temperature Sensor Diagnosis and Solution)

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

Recommended parts to prepare:

- Connection wires
- Sensors
- PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole. This picture and the value are only for reference, actual appearance and value may vary

7.5 EL 0C (Refrigerant Leakage Detection Diagnosis and Solution)

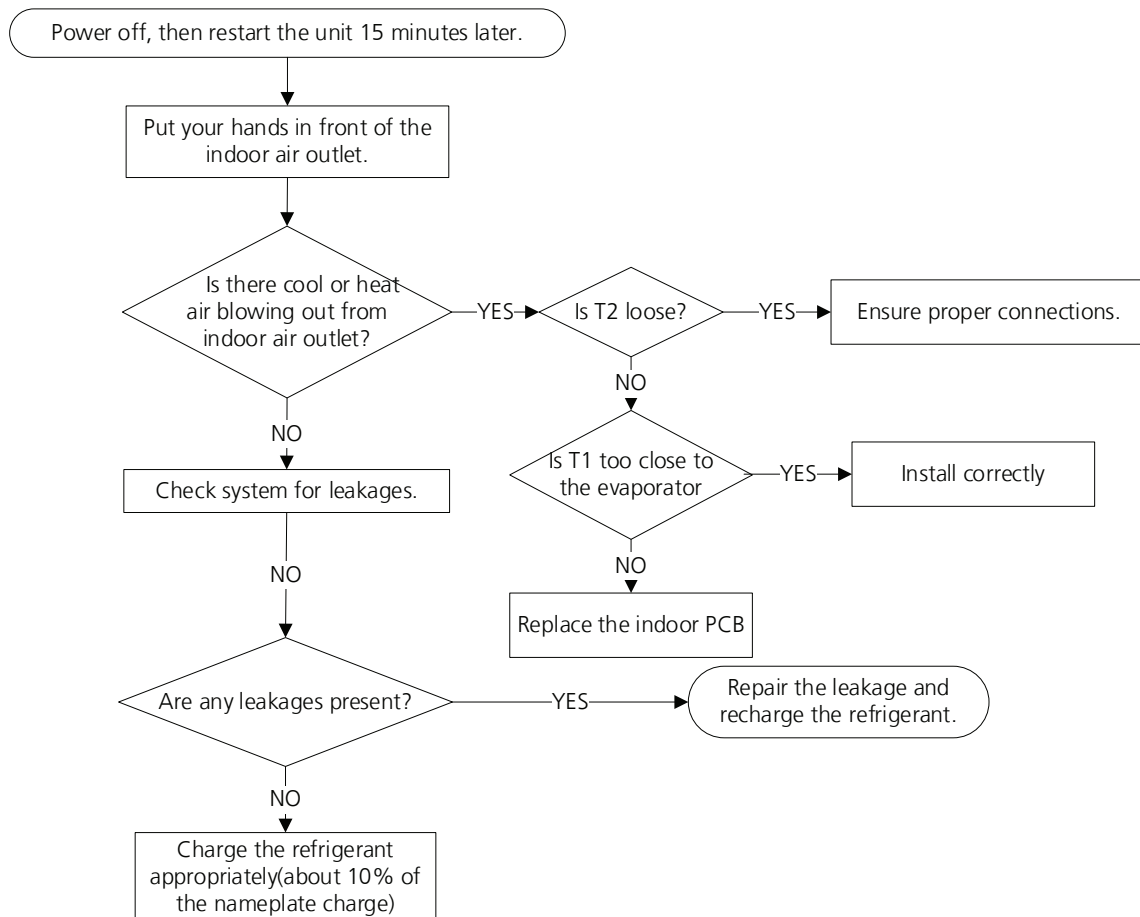
Description:

Judging the abnormality of the refrigeration system according to the number of compressor stops and the changes in operating parameters caused by excessive exhaust temperature.

Recommended parts to prepare:

- Indoor PCB
- Additional refrigerant

Troubleshooting and repair:

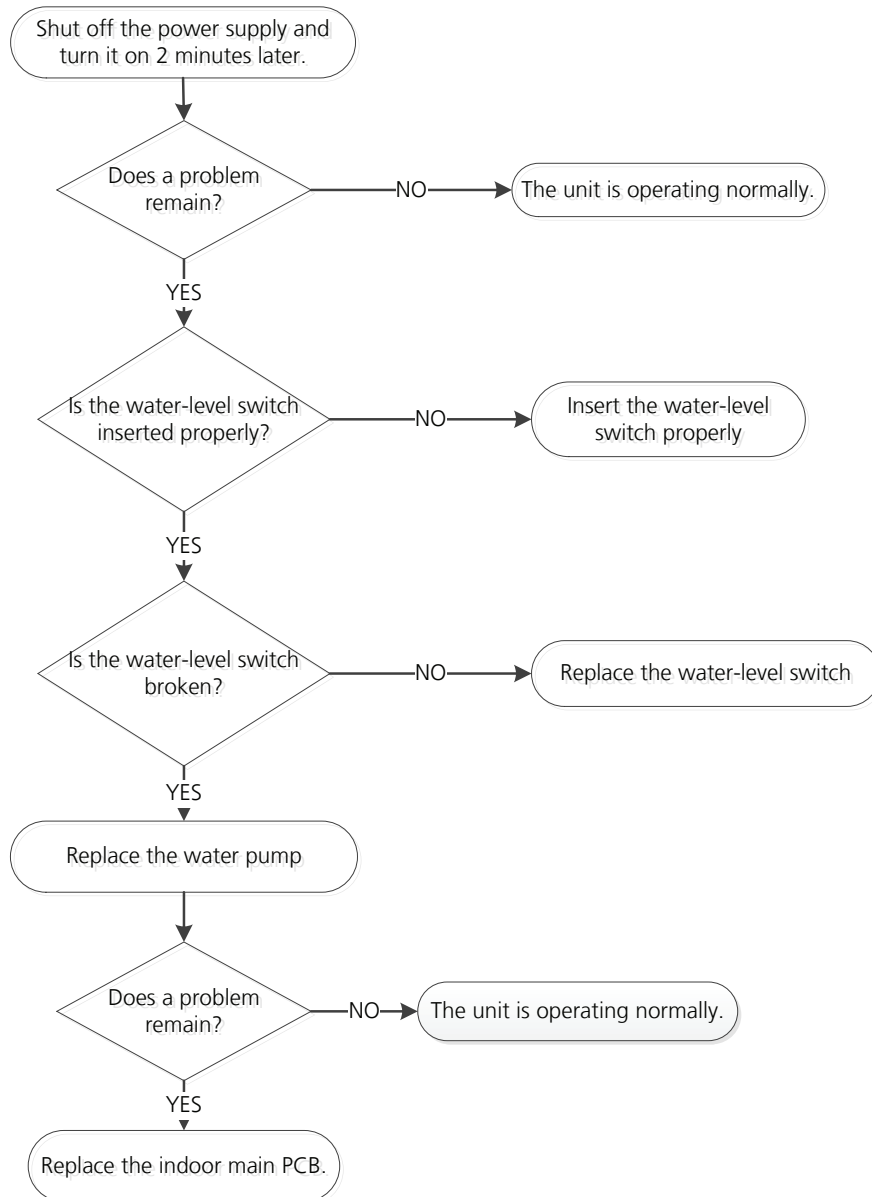


7.6 EH 0E(Water-Level Alarm Malfunction Diagnosis and Solution)

Description: If the sampling voltage is not 5V, the LED displays the failure code.

Recommended parts to prepare:

- Connection wires
- Water-level switch
- Water pump
- Indoor PCB



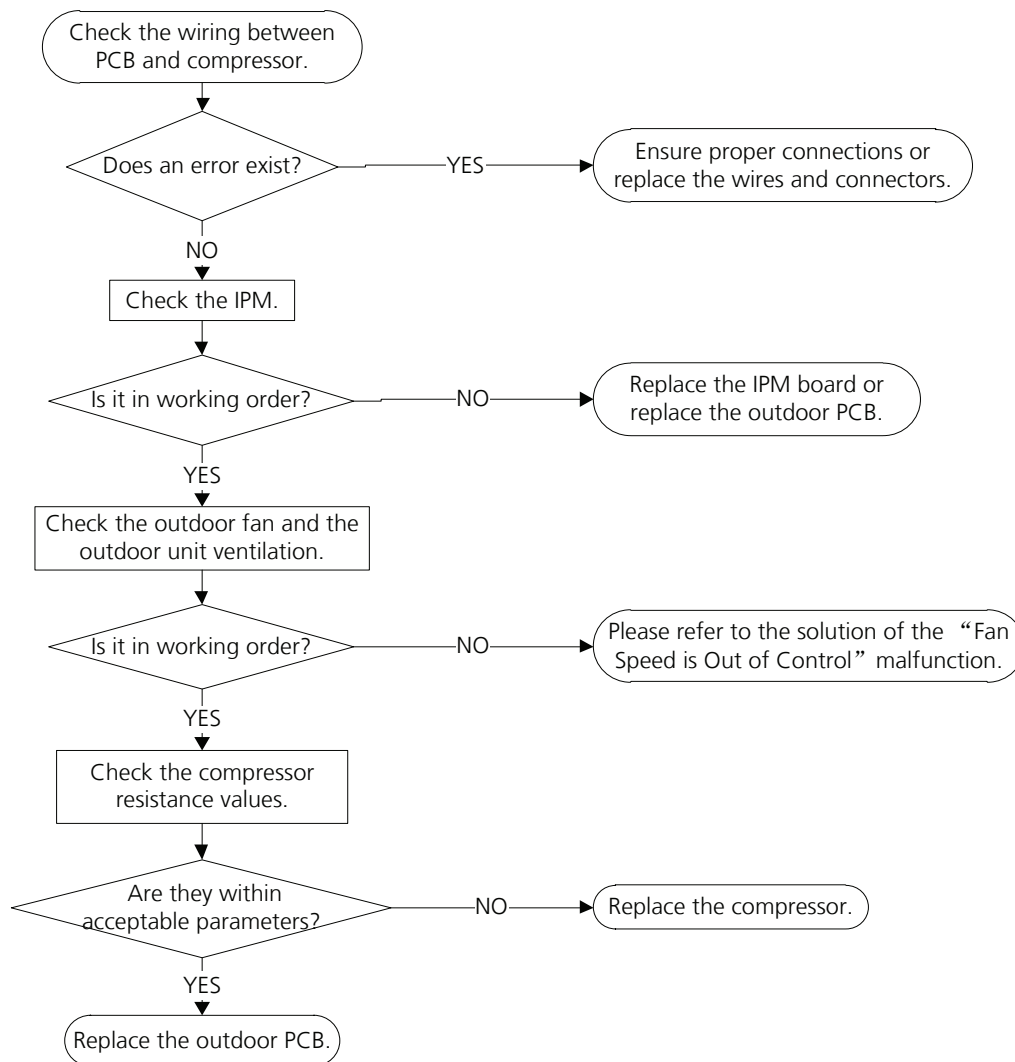
7.7 PC 00(IPM malfunction or IGBT over-strong current protection Diagnosis and Solution)

Description: When the voltage signal the IPM sends to the compressor drive chip is abnormal, the display LED shows “PC 00” and the AC turn off.

Recommended parts to prepare:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

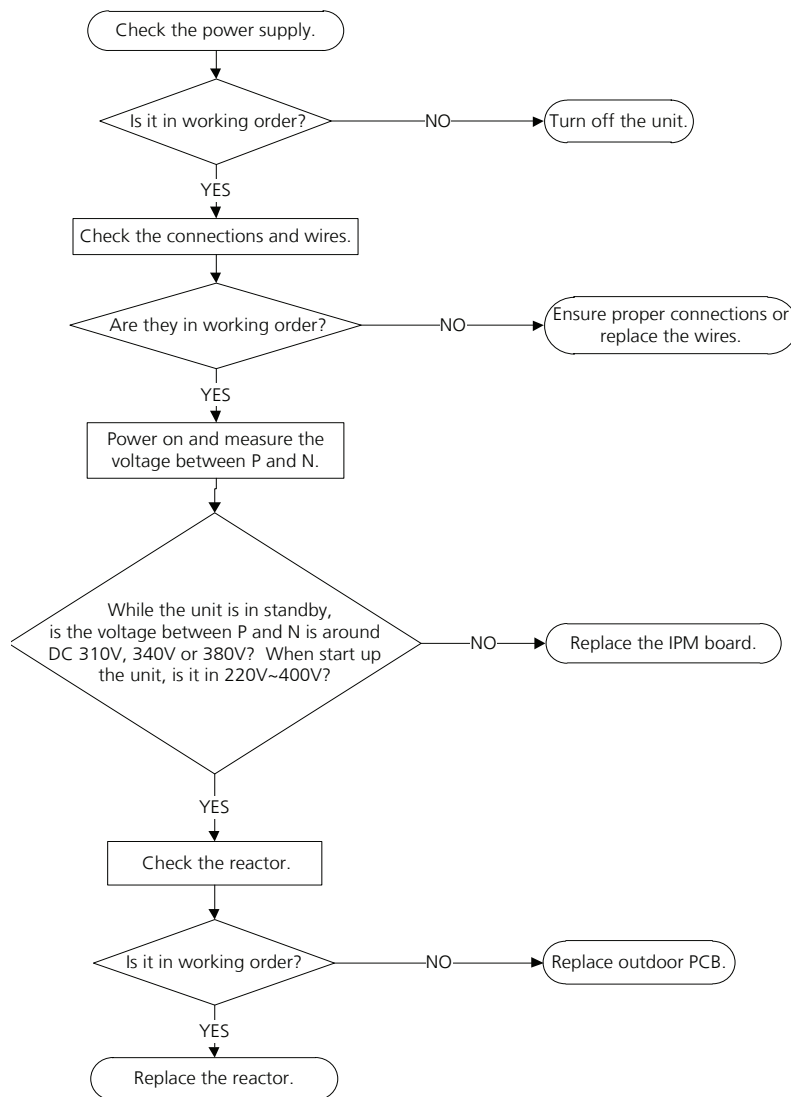
7.8 PC 01(Over voltage or too low voltage protection)/PC 10(Outdoor unit low AC voltage protection)/PC 11(Outdoor unit main control board DC bus high voltage protection)/PC 12(Outdoor unit main control board DC bus high voltage protection /341 MCE error) Diagnosis and Solution

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

Recommended parts to prepare:

- Power supply wires
- IPM module board
- PCB
- Reactor

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

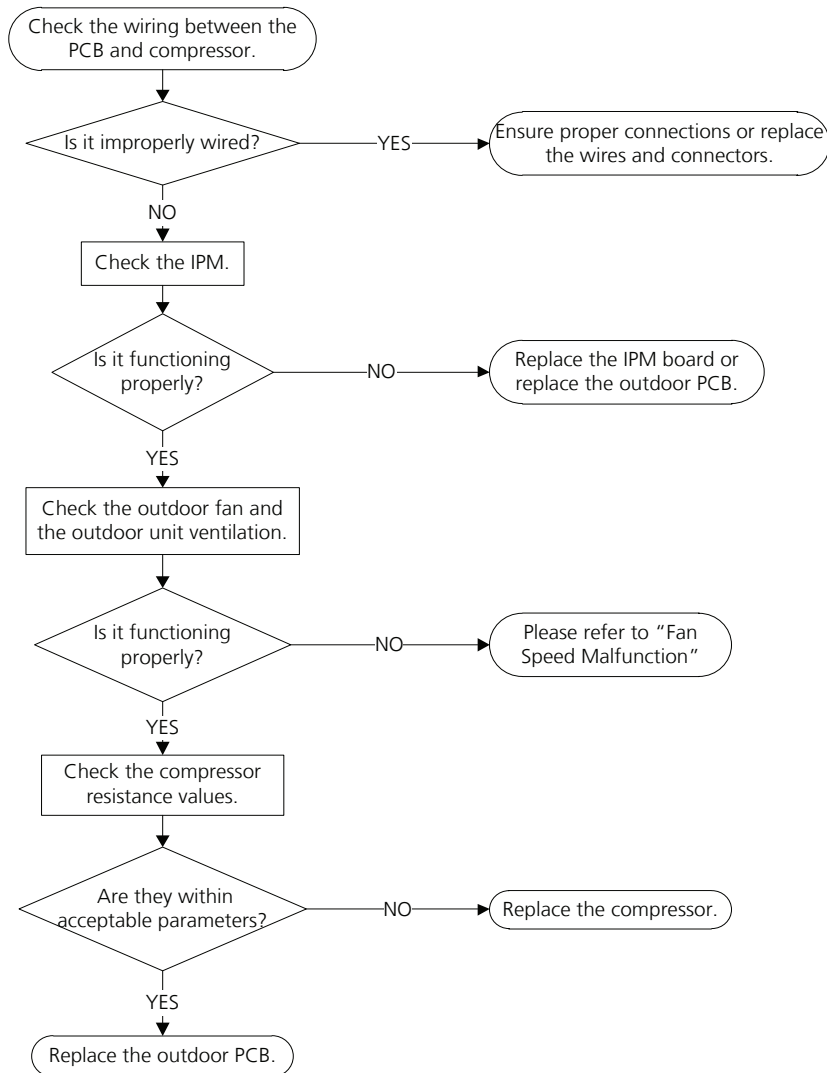
7.9 PC 04(Inverter compressor drive error Diagnosis and Solution)

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:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

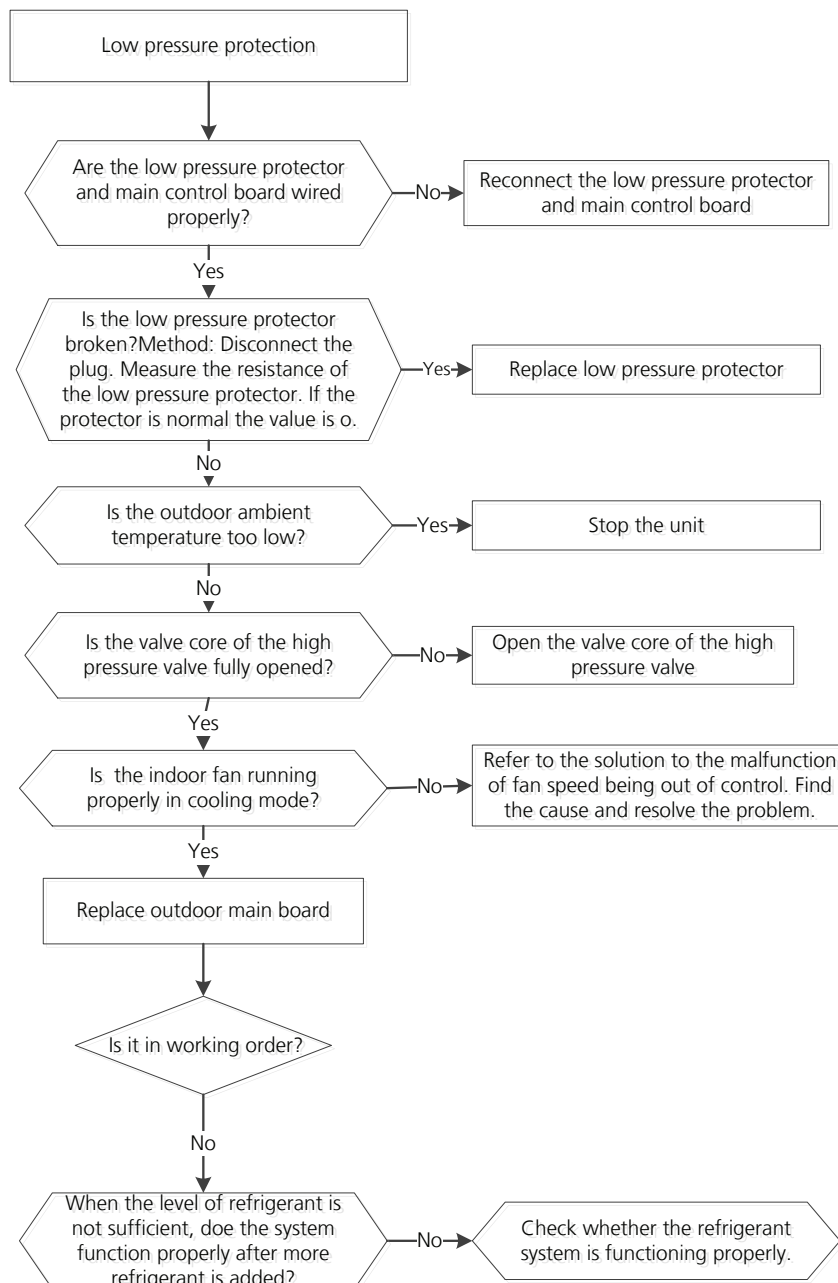
7.10 PC 03/PC 31(Low Pressure Protection Diagnosis and Solution)

Description: If the sampling voltage is not 5V, the LED displays a failure code.

Recommended parts to prepare:

- Connection wires
- Low pressure protector
- Indoor fan assembly
- Outdoor PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

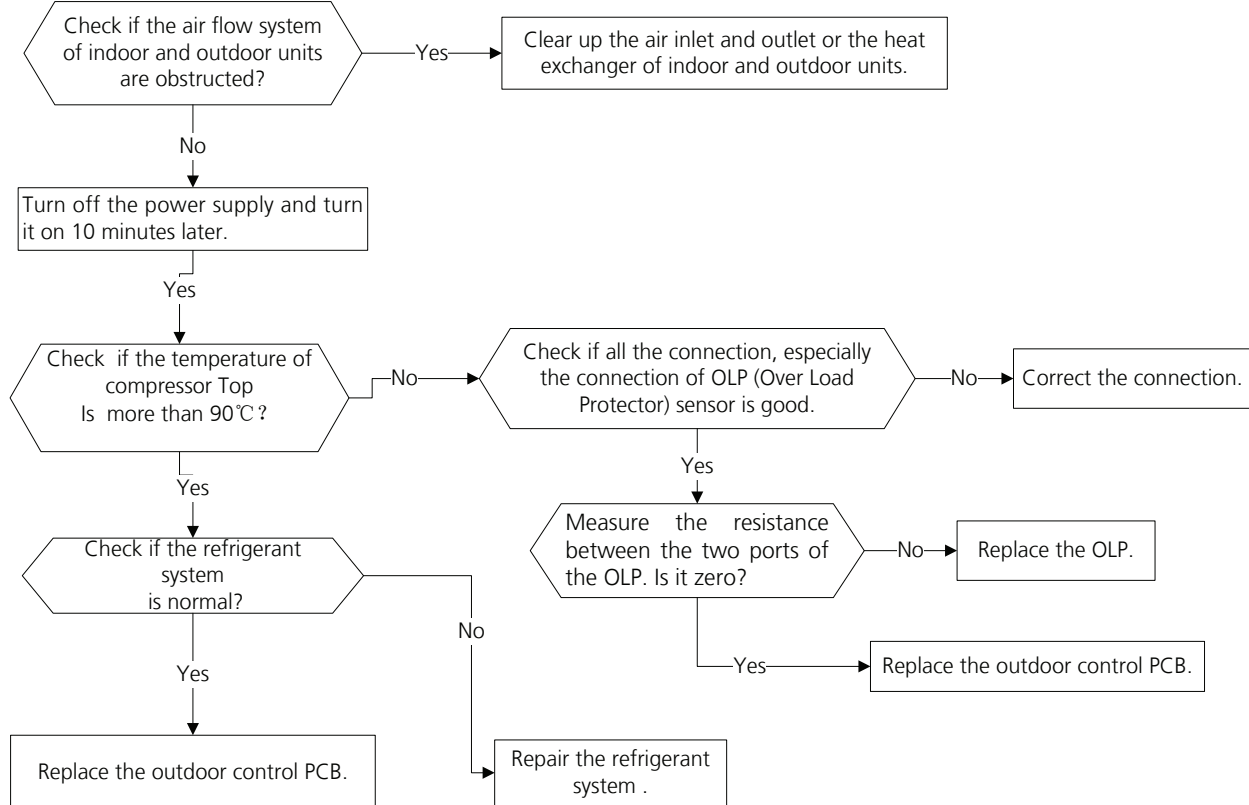
7.11 PC 02/LC 06(Top temperature protection of compressor or High temperature protection of IPM module diagnosis and solution)

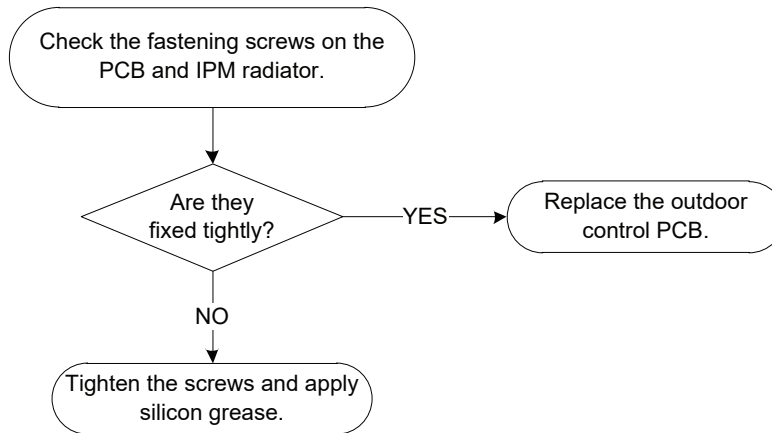
Description: For some models with overload protection, If the sampling voltage is not 5V, the LED will display the failure. If the temperature of IPM module is higher than a certain value, the LED displays the failure code.

Recommended parts to prepare:

- Connection wires
- Outdoor PCB
- IPM module board
- High pressure protector
- System blockages

Troubleshooting and repair:





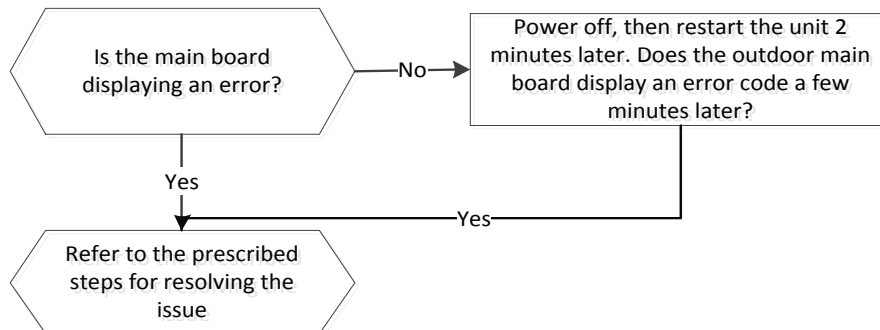
7.12 EC 0d(Outdoor unit malfunction Diagnosis and Solution)

Description: The indoor unit detect the outdoor unit is error.

Recommended parts to prepare:

- Outdoor unit

Troubleshooting and repair:



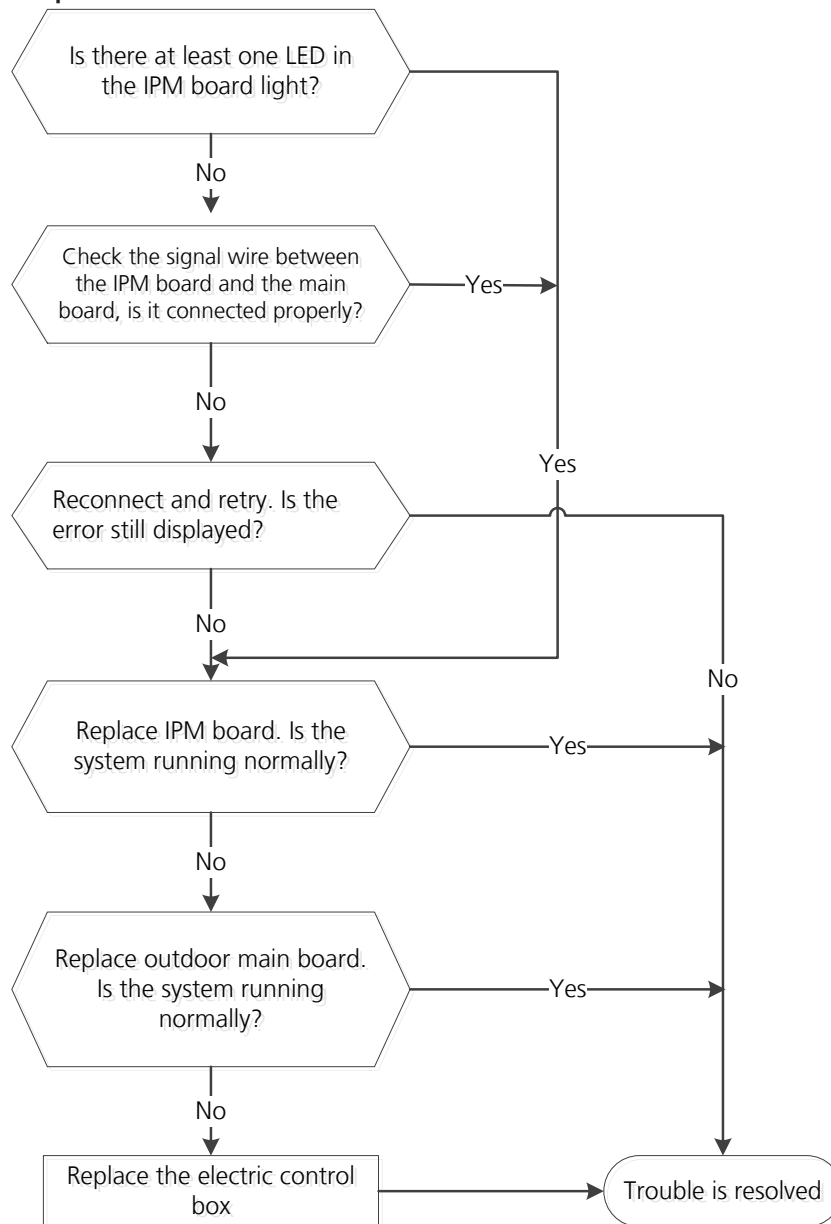
7.13 PC 40(Communication error between outdoor main PCB and IPM board diagnosis and solution)

Description: The main PCB cannot detect the IPM board.

Recommended parts to prepare:

- Connection wires
- IPM board
- Outdoor main PCB
- Electric control box

Troubleshooting and repair:





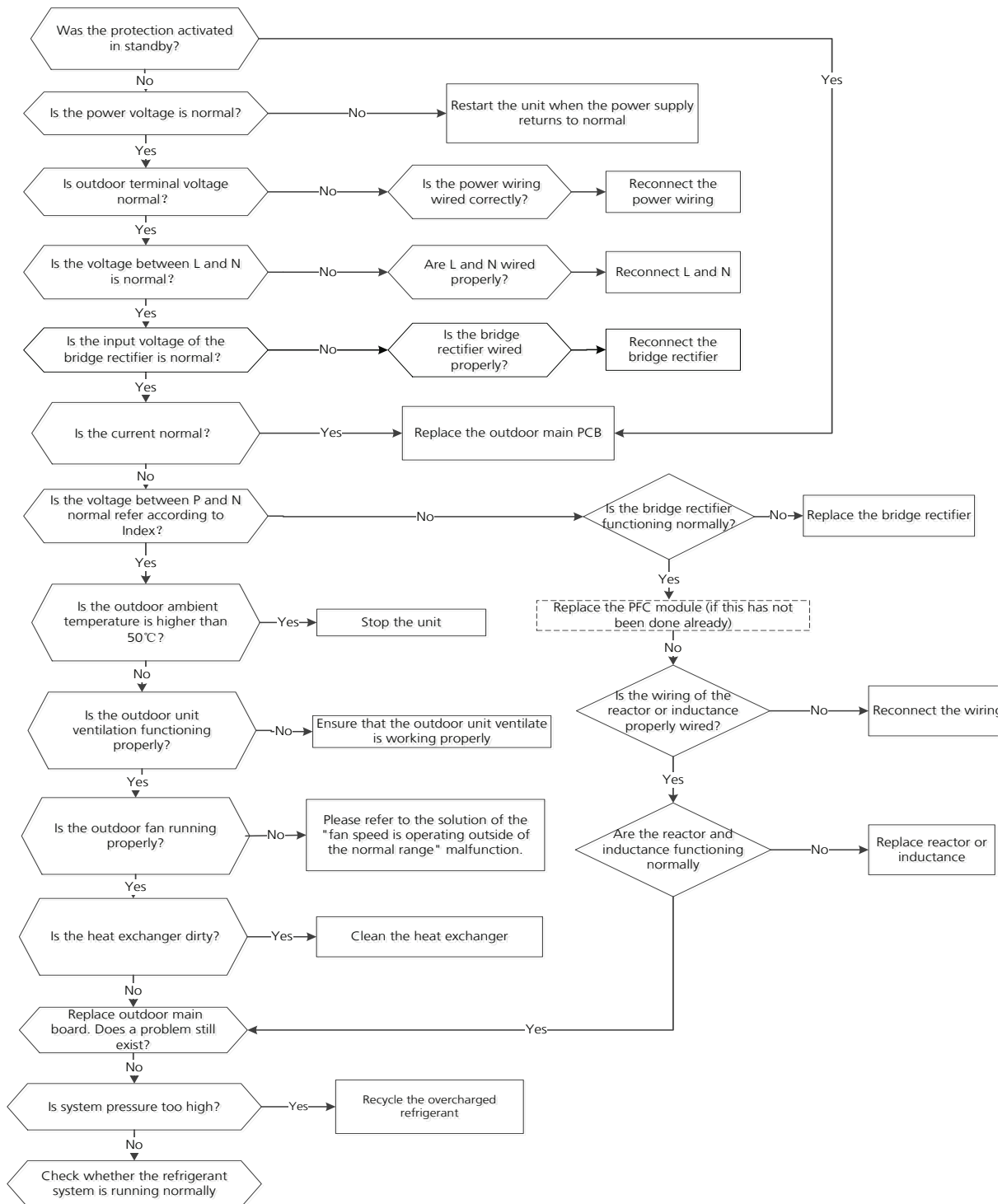
7.14 PC 08(Current overload protection)/PC 44(Outdoor unit zero speed protection)/ PC 46(Compressor speed has been out of control)/PC 49(Compressor overcurrent failure) diagnosis and solution

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

Recommended parts to prepare:

- Connection wires
- Rectifier
- PFC circuit or reactor
- Blocked refrigeration piping system
- Pressure switch
- Outdoor fan
- IPM module board
- Outdoor PCB

Troubleshooting and repair:



Note: For certain models, outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

7.15 PC 0F(PFC module protection diagnosis and solution)

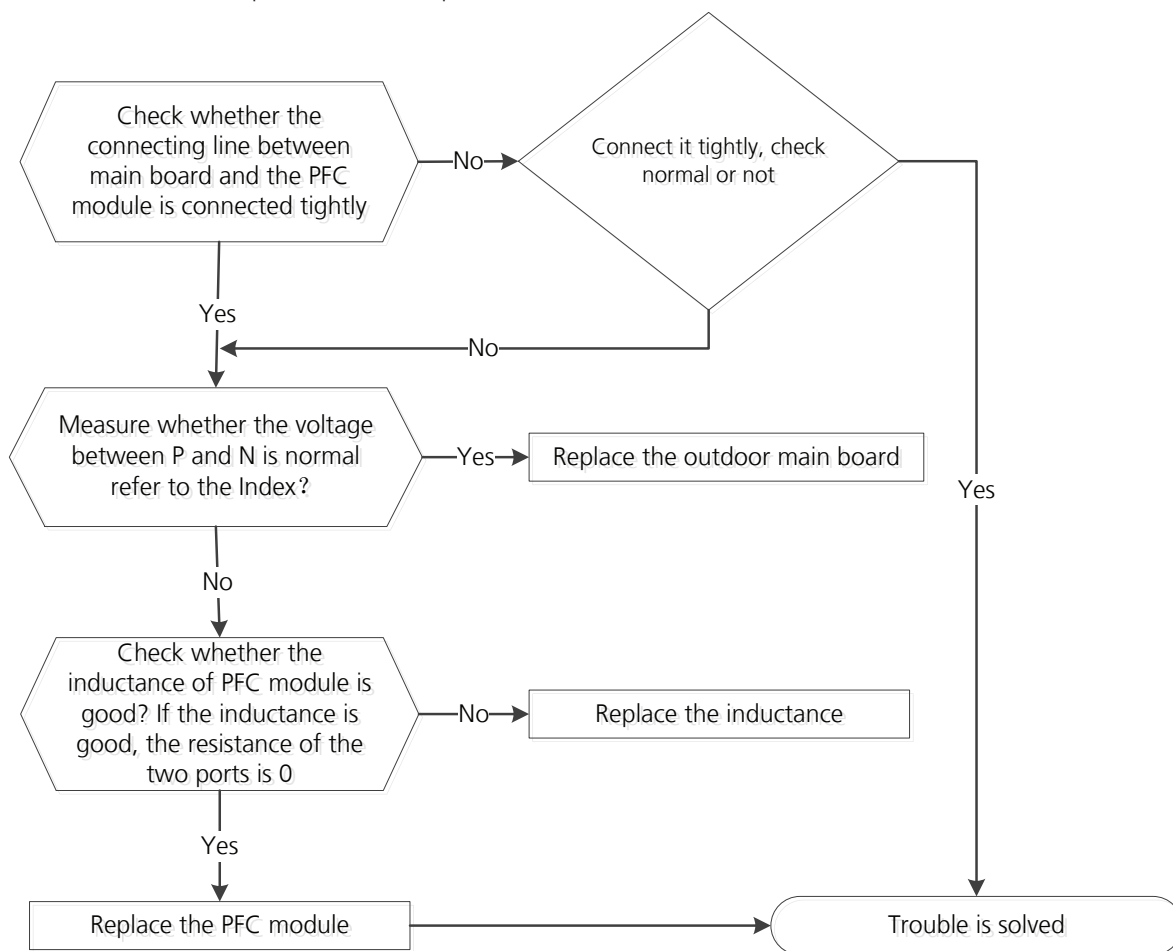
Description: When the voltage signal that IPM send to compressor drive chip is abnormal, the LED displays the failure code and the AC turns off.

Recommended parts to prepare:

- Connection wires
- Inductance
- Outdoor main PCB
- PFC module

Troubleshooting and repair:

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:



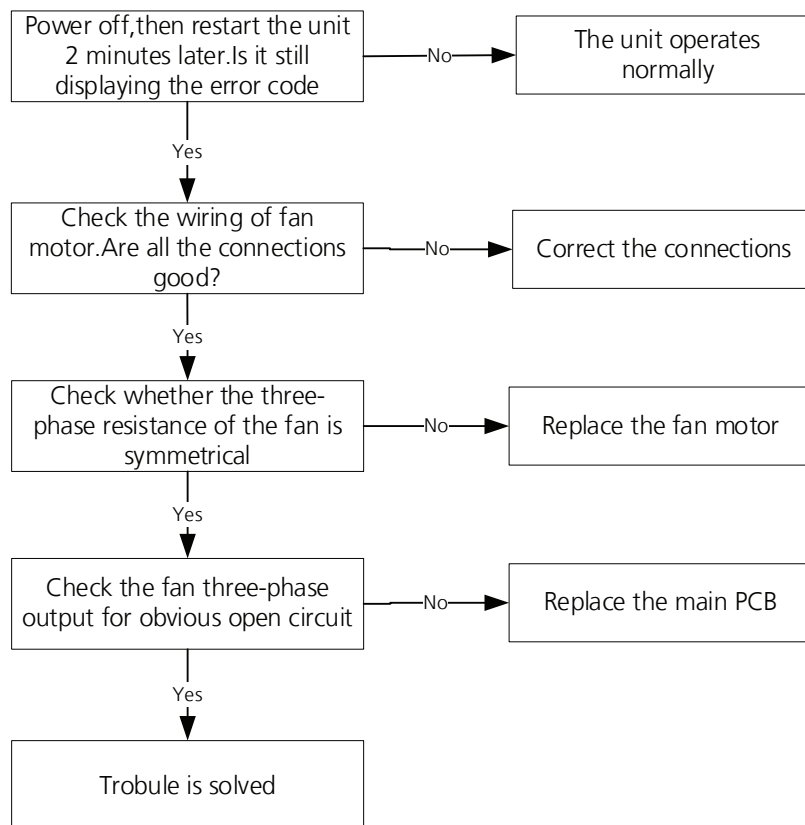
7.16 EC 72 (Lack phase failure of outdoor DC fan motor diagnosis and solution)

Description: When the three-phase sampling current of the DC motor is abnormal, especially when the current of one or more phases is always small and almost 0, the LED displays the failure code.

Recommended parts to prepare:

- Connection wire
- Fan motor
- Outdoor PCB

Troubleshooting and repair:



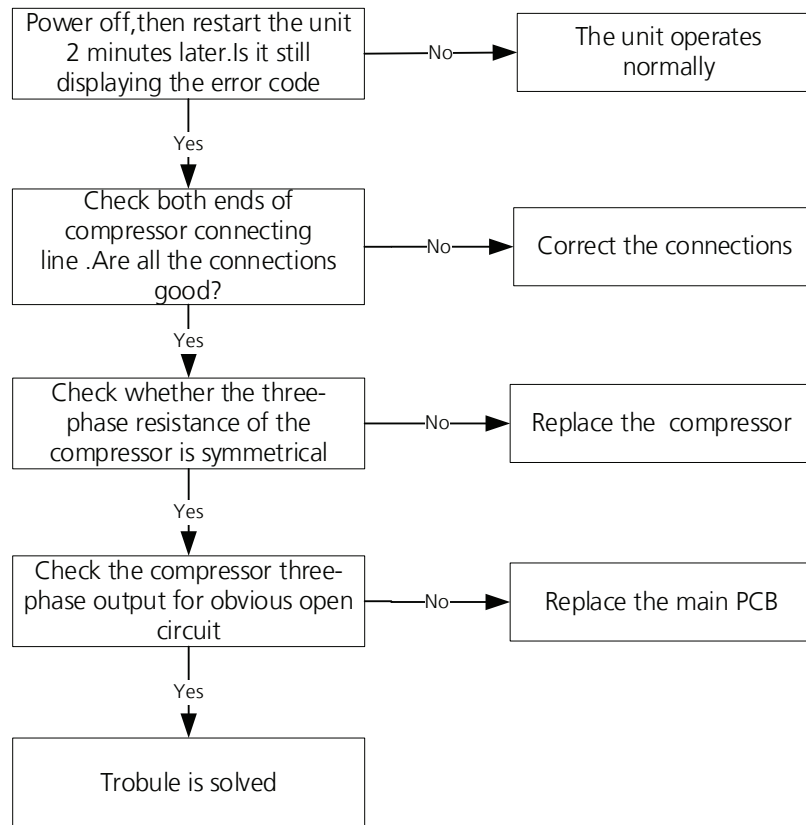
7.17 PC 43 (Outdoor compressor lack phase protection diagnosis and solution)

Description: When the three-phase sampling current of the compressor is abnormal, especially when the current of one or more phases is always small and almost 0, the LED displays the failure code

Recommended parts to prepare:

- Connection wire
- Compressor
- Outdoor PCB

Troubleshooting and repair:





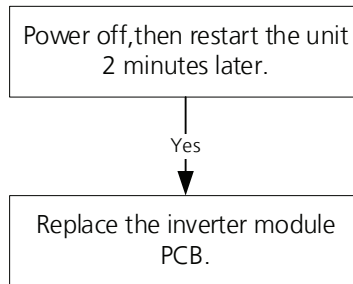
7.18 PC 45 (Outdoor unit IR chip drive failure diagnosis and solution)

Description: When the IR chip detects its own parameter error, the LED displays the failure code when power on.

Recommended parts to prepare:

- Inverter module PCB.

Troubleshooting and repair:



7.19 PC 0L (Low ambient temperature protection)

Description: It is a protection function. When compressor is off, outdoor ambient temperature(T4) is lower than -35°C. for 10s, the AC will stop and display the failure code.

When compressor is on, outdoor ambient temperature(T4) is lower than -40°C. for 10s, the AC will stop and display the failure code.

When outdoor ambient temperature(T4) is no lower than -32°C. for 10s, the unit will exit protection.



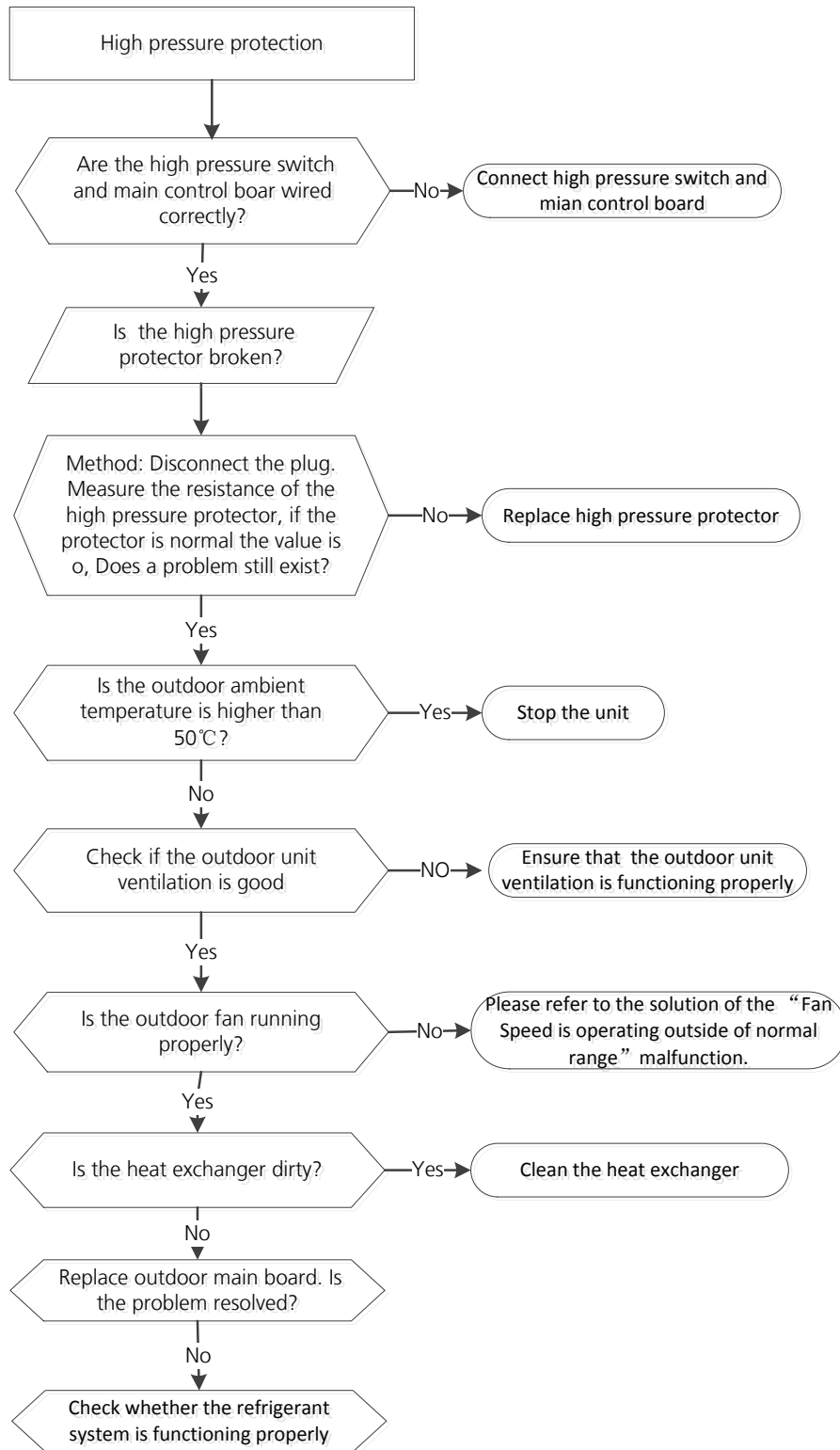
7.20 PC 30 (High pressure protection diagnosis and solution)

Description: Outdoor pressure switch cut off the system because high pressure is higher than 4.4 MPa

Recommended parts to prepare:

- Connection wires
- Pressure switch
- Outdoor fan
- Outdoor main PCB

Troubleshooting and repair:



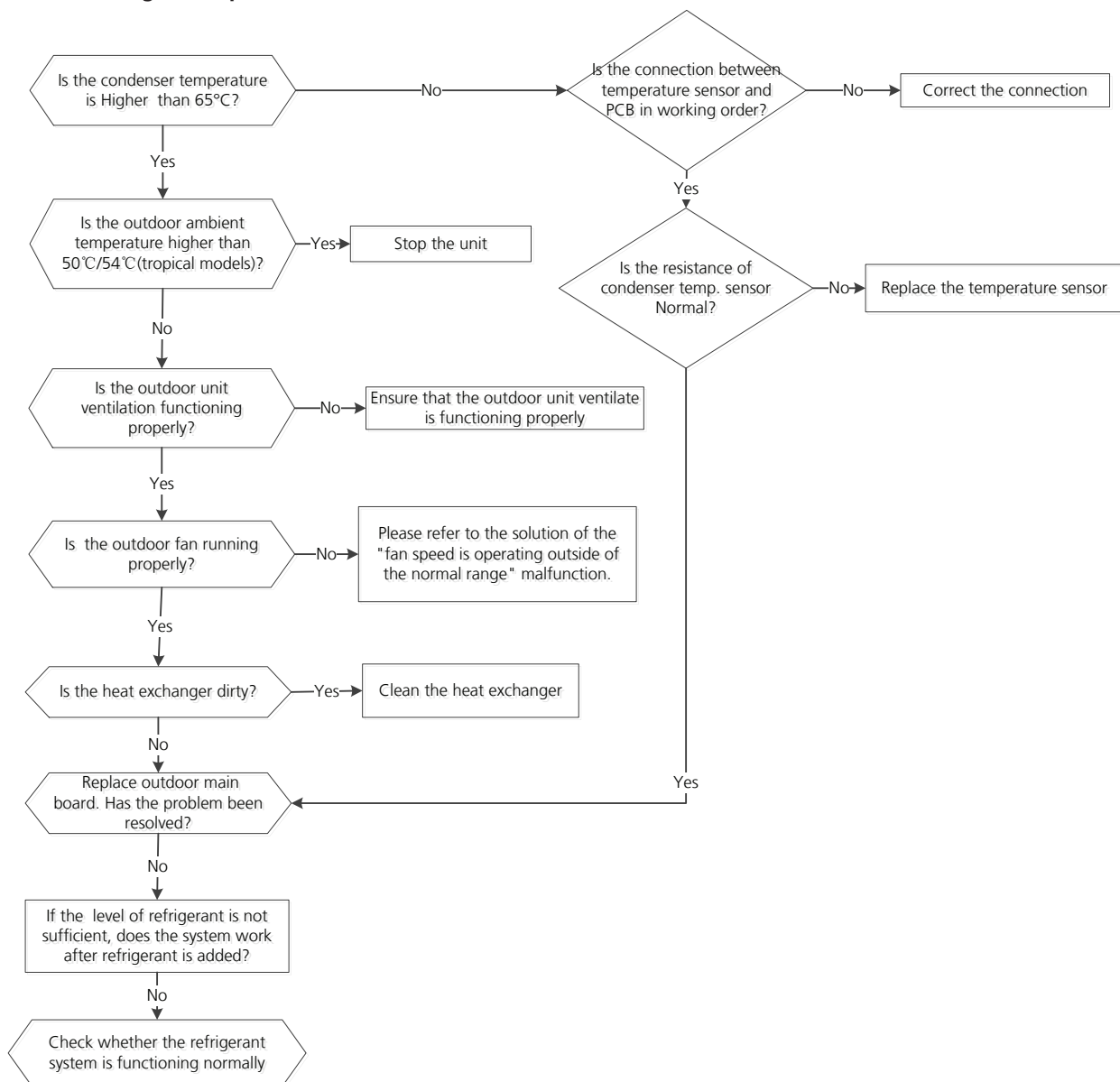
7.21 PC 0A (High temperature protection of condenser diagnosis and solution)

Description: When the outdoor pipe temperature is more than 65°C, the unit stops. It starts again only when the outdoor pipe temperature is less than 52°C.

Recommended parts to prepare:

- Connection wires
- Condenser temperature sensor
- Outdoor fan
- Outdoor main PCB
- Refrigerant

Troubleshooting and repair:



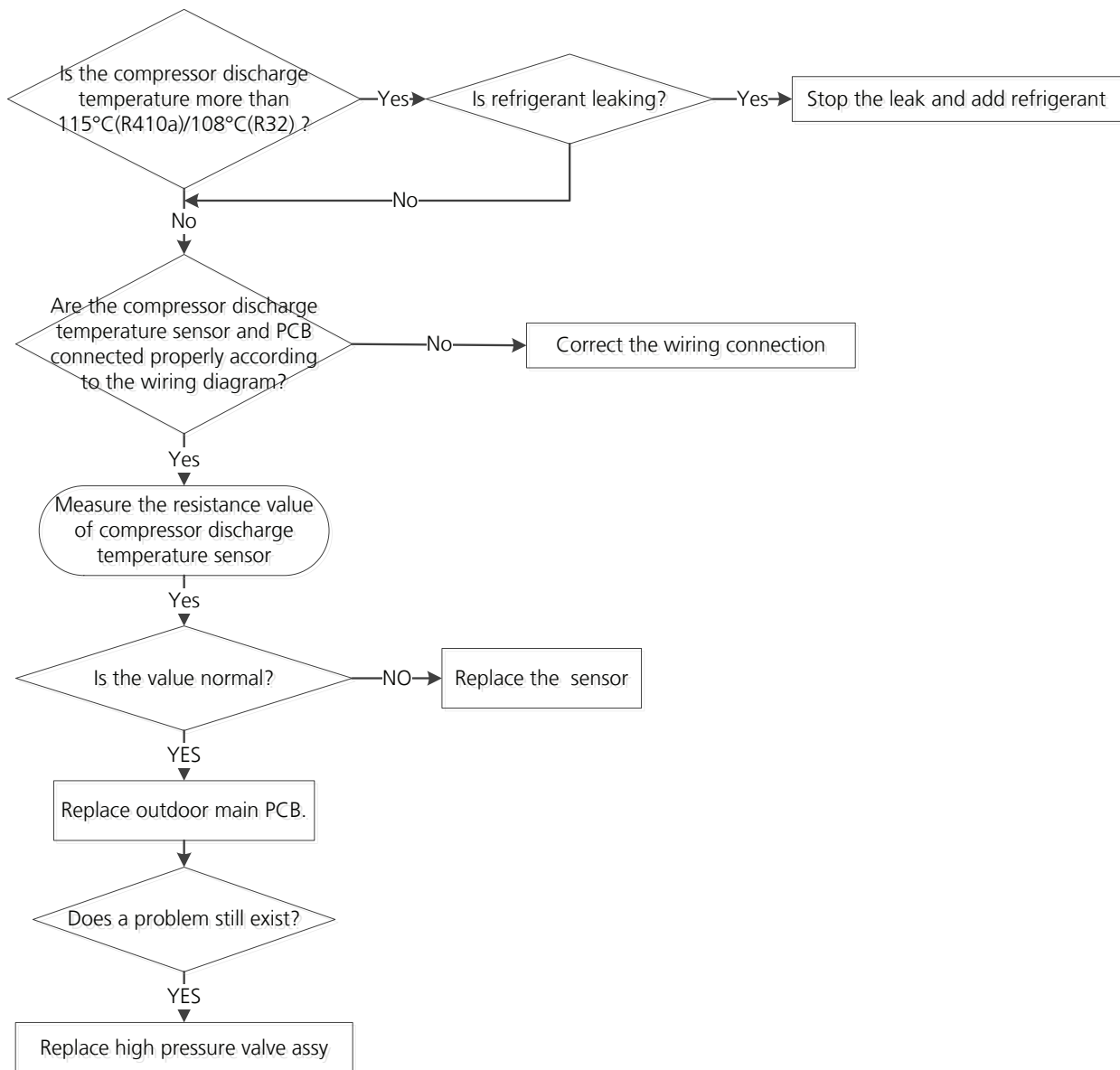
7.22 PC 06 (Discharge temperature protection of compressor diagnosis and solution)

Description: If the compressor discharge temperature exceeds a certain level for nine seconds, the compressor ceases operation, the LED displays the failure code

Recommended parts to prepare:

- Connection wires
- Discharge temperature sensor
- Additional refrigerant
- Outdoor main PCB

Troubleshooting and repair:



Note: For certain models, outdoor unit uses combination sensor, T3,T4 and TP are the same of sensor. This picture and the value are only for reference, actual appearance and value may vary.

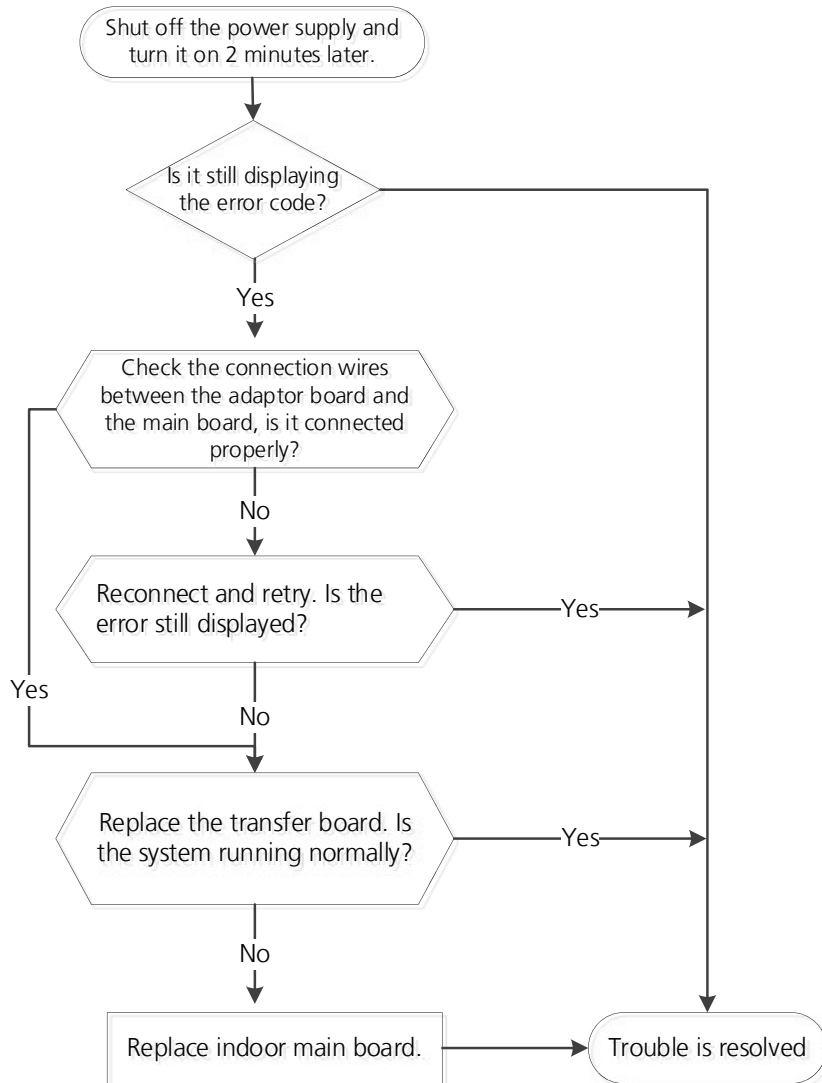
7.23 EH 0b(Communication error between indoor two chips diagnosis and solution)

Description: Indoor PCB main chip does not receive feedback from another chip.

Recommended parts to prepare:

- Indoor main board
- Adapter board

Troubleshooting and repair:



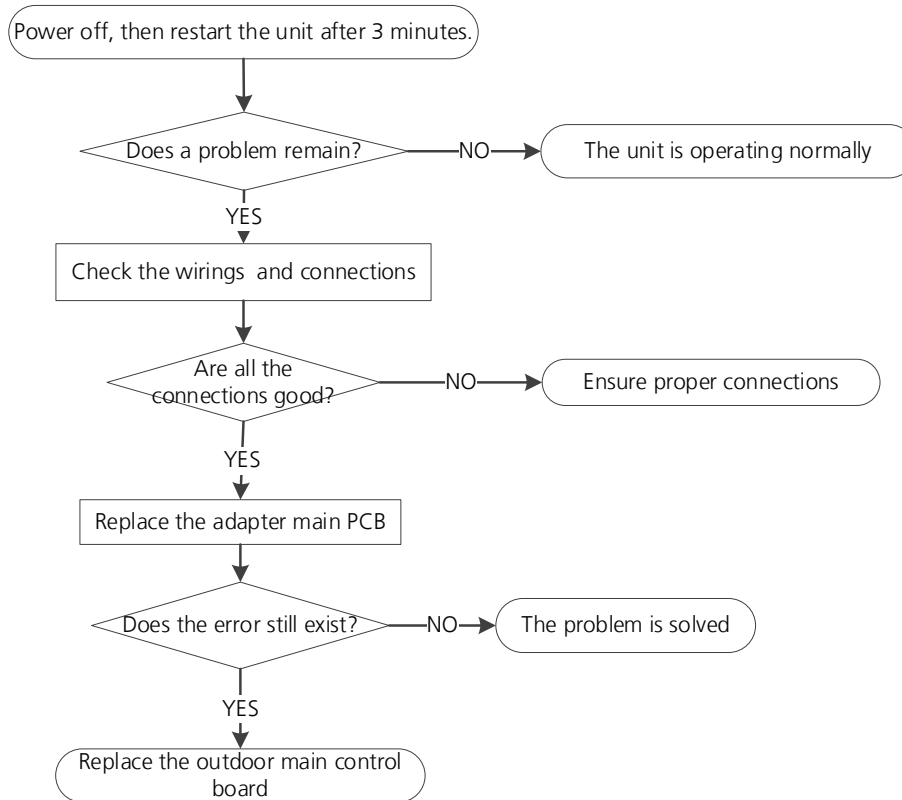
7.24 EL 16(Communication malfunction between adapter board and outdoor main board diagnosis and solution)

Description: The adapter PCB cannot detect the main control board.

Recommended parts to prepare:

- Connection wires
- Adapter board
- Outdoor main PCB

Troubleshooting and repair:



7.25 Indoor and outdoor mismatch malfunction diagnosis and solution

Description: Indoor and outdoor units are mismatched, the LED displays this code. Please replace the matching indoor or outdoor unit.

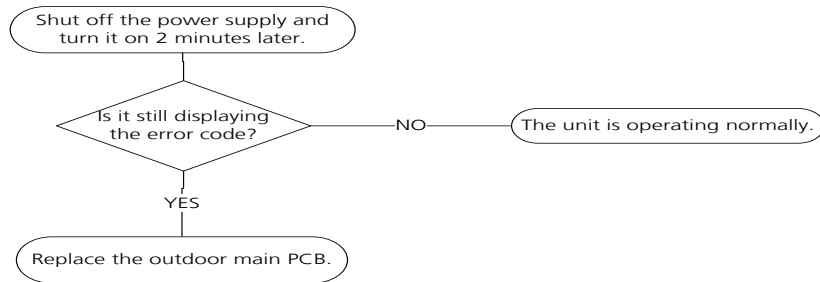
7.26 PC 41(Outdoor compressor current sampling circuit failure diagnosis and solution)

Description: Three-phase sampling offset voltage error, the static bias voltage is normally 2.5V

Recommended parts to prepare:

- Outdoor main PCB

Troubleshooting and repair:



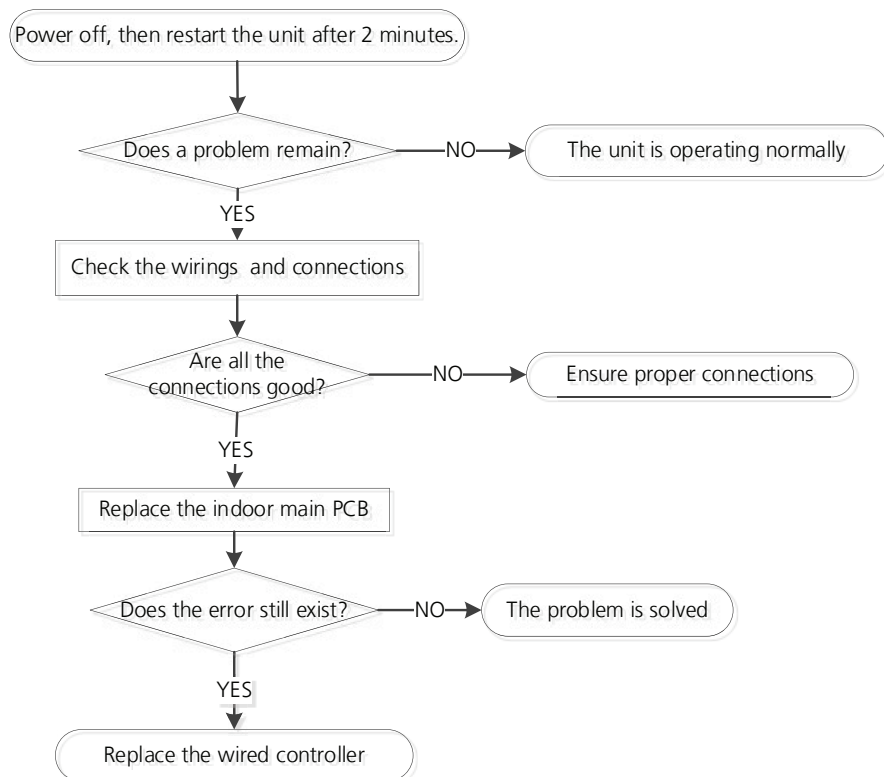
7.27 EH b3 (Communication error between wired controller and indoor unit Diagnosis and Solution)

Description: If Indoor PCB does not receive feedback from wired controller, the error displays on the wired controller

Recommended parts to prepare:

- Connection wires
- Indoor PCB
- Wired controller

Troubleshooting and repair:



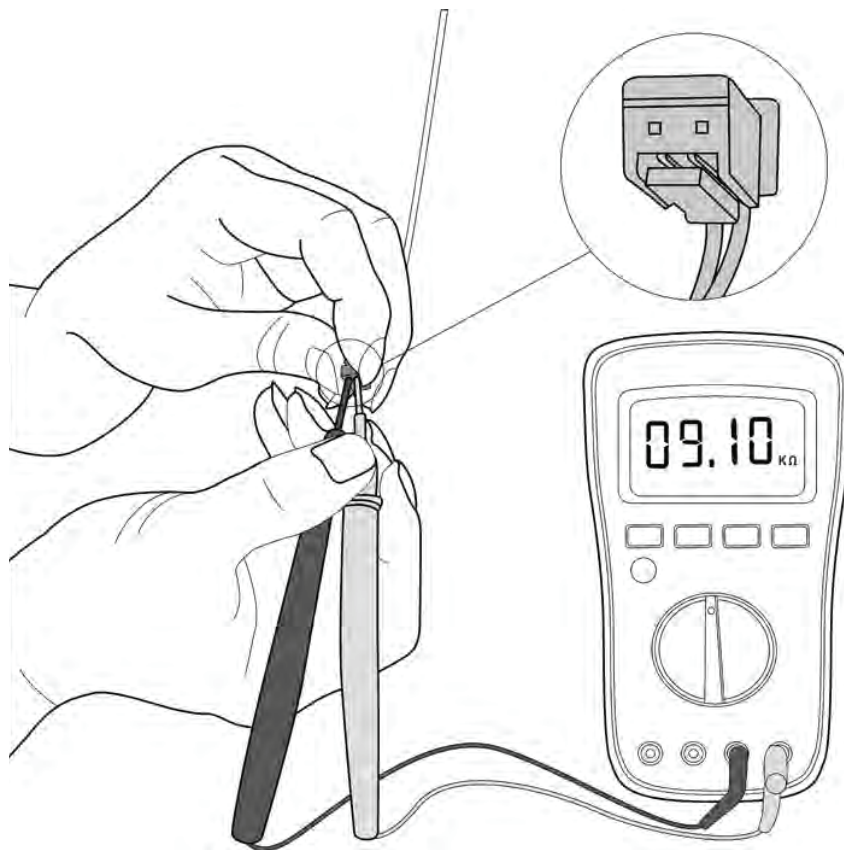
8. Check Procedures

8.1 Temperature Sensor Check

WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. Operate after compressor and coil have returned to normal temperature in case of injury.

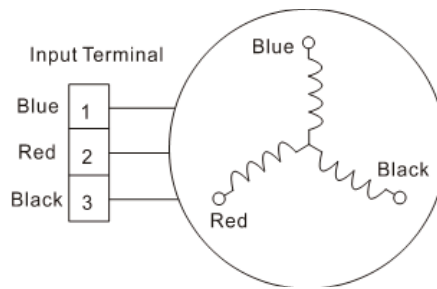
1. Disconnect temperature sensor from PCB (Refer to Chapter 5. Indoor Disassembly and Chapter 6. Outdoor Disassembly).
2. Measure the resistance value of the sensor using a multi-meter.
3. Check corresponding temperature sensor resistance value table (Refer to Chapter 8. Appendix).



Note: The picture and the value are only for reference, actual condition and specific value may vary.

8.2 Compressor Check

1. Disconnect the compressor power cord from outdoor PCB (Refer to Chapter 6. Outdoor Unit Disassembly)).
2. Measure the resistance value of each winding using a multi-meter.
3. Check the resistance value of each winding in the following table.

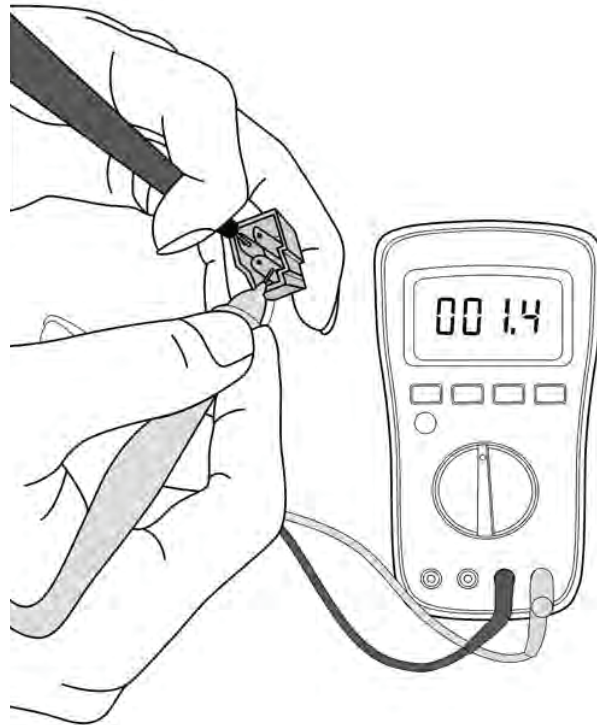


Resistance Value	ASM135D23UFZ	ATQ420D1UMU	ASN98D22UFZ	ATF235D22UMT	ATQ360D1UMU
Blue-Red	1.75Ω	0.37Ω	1.57Ω	0.75Ω	0.37Ω
Blue-Black					
Red-Black					

Resistance Value	ATM115D43UFZ2	ATF250D22UMT KTF250D22UMT	ATF310D43UMT	KSK103D33UEZ3	ASM98D32UFZ
Blue-Red	1.87Ω	0.75Ω	0.65Ω	2.13Ω	2.2Ω
Blue-Black					
Red-Black					

Resistance Value	ASN140D21UFZ	ASK89D29UEZD	KSN140D21UFZ	KTM240D57UMT	KSN140D58UFZ
Blue-Red	1.28Ω	1.99Ω	1.28Ω	0.62Ω	1.86Ω
Blue-Black					
Red-Black					

Resistance Value	KTF310D43UMT	KTQ420D1UMU	ATN150D30UFZA KTM240D43UKT	EAPQ420D1UMUA
Blue-Red	0.65Ω	0.37Ω	1.03Ω	0.37Ω
Blue-Black				
Red-Black				



Note: The picture and the value are only for reference, actual condition and specific value may vary.

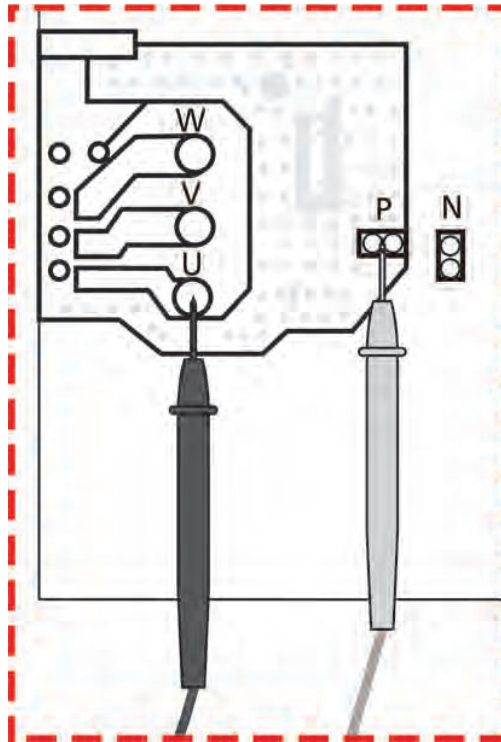
8.3 IPM Continuity Check

WARNING

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

1. Turn off outdoor unit and disconnect power supply.
2. Discharge electrolytic capacitors and ensure all energy-storage unit has been discharged.
3. Disassemble outdoor PCB or disassemble IPM board.
4. Measure the resistance value between P and U(V, W, N); U(V, W) and N.

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



Note: The picture and the value are only for reference, actual condition and specific value may vary.

Normal voltage of P and N

208-240V(1-phase,3-phase)		380-415V(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

This page intentionally left blank

The AC Pro Difference

No restocking fees

AC Pro tech support
855.972.2776

Instant warranty credits

Complimentary after-hours service
888.674.4822

Free drop-off for change-out units and job trash

HOURS:

MON – FRI 6 AM – 5 PM

SAT 7 AM – 11AM

California

Anaheim	3060 La Palma Ave.	714.933.1777
Baldwin Park	13409 Garvey Ave #4	626.507.1430
Bellflower	9214 Artesia Blvd,	562.257.1440
Chatsworth	9216 Eton Ave.	818.884.1100
Chino	12365 Central Ave.	909.267.1122
El Cajon	1402 N Magnolia Ave.	619.566.8130
Escondido	2181 Meyers Ave., Ste B	760.-233.2545
Laguna Hills	23456 S Pointe Dr., Ste B	949.598.8333
La Habra	591 S. Walnut St.	562.257.1133
Mission Viejo	23831 Vía Fabricante #301	949.680.1770
Oceanside	2040 Oceanside Blvd	760.797.6234
Palm Desert	75220 Merle Dr.	760.341.7007
Pasadena	170 N. Daisy Ave.	626.507.1440
Perris	1622 Illinois Ave., Unit 18-19	951.368.1405
Rancho Cucamonga	9409 Charles Smith Ave.	951.360.7849
Riverside	1751 Marlborough Ave.	951.361.6161
San Diego	13230 Evening Creek Dr. South, Ste. 202	858.386.5005
San Dimas	149 Village Court	909.835.1155
Santa Ana	1442 Ritchey St.	949.680.1975
Signal Hill	1198 Willow St.	562.595.5050
Temecula	27230 Madison Ave, Ste. C1	951.368.1978
Westminster	7606 Garden Grove Blvd.	714.464.1700

Nevada

Henderson	7365 Commercial Way, Ste. 155	702.560.5670
Las Vegas - North	2910 S Highland Dr., Ste D	702.-829.3010
Las Vegas - South	3480 Birtcher Dr.	702.795.4746

Arizona

Lake Havasu	1769 N McCulloch Blvd	928.846.8707
Mesa	954 East Juanita Ave	480.682.5405
Peoria	16681 N 84th Ave. #110	480.385.1380
Phoenix Central	11034 N. 23rd Dr., Ste. 105	602.648.9100
Phoenix	3906 E. Broadway Rd., Ste 104	602.648.0320