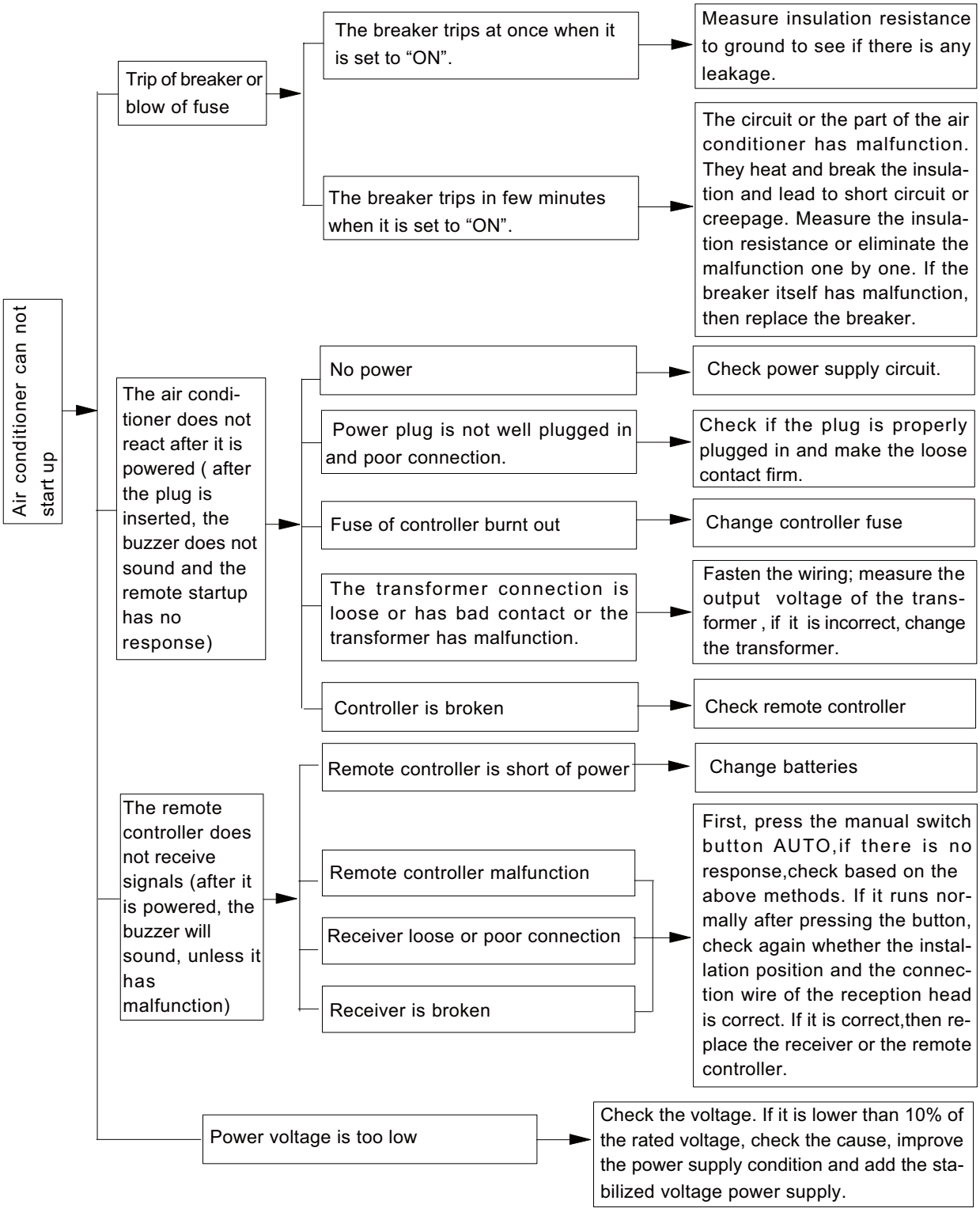
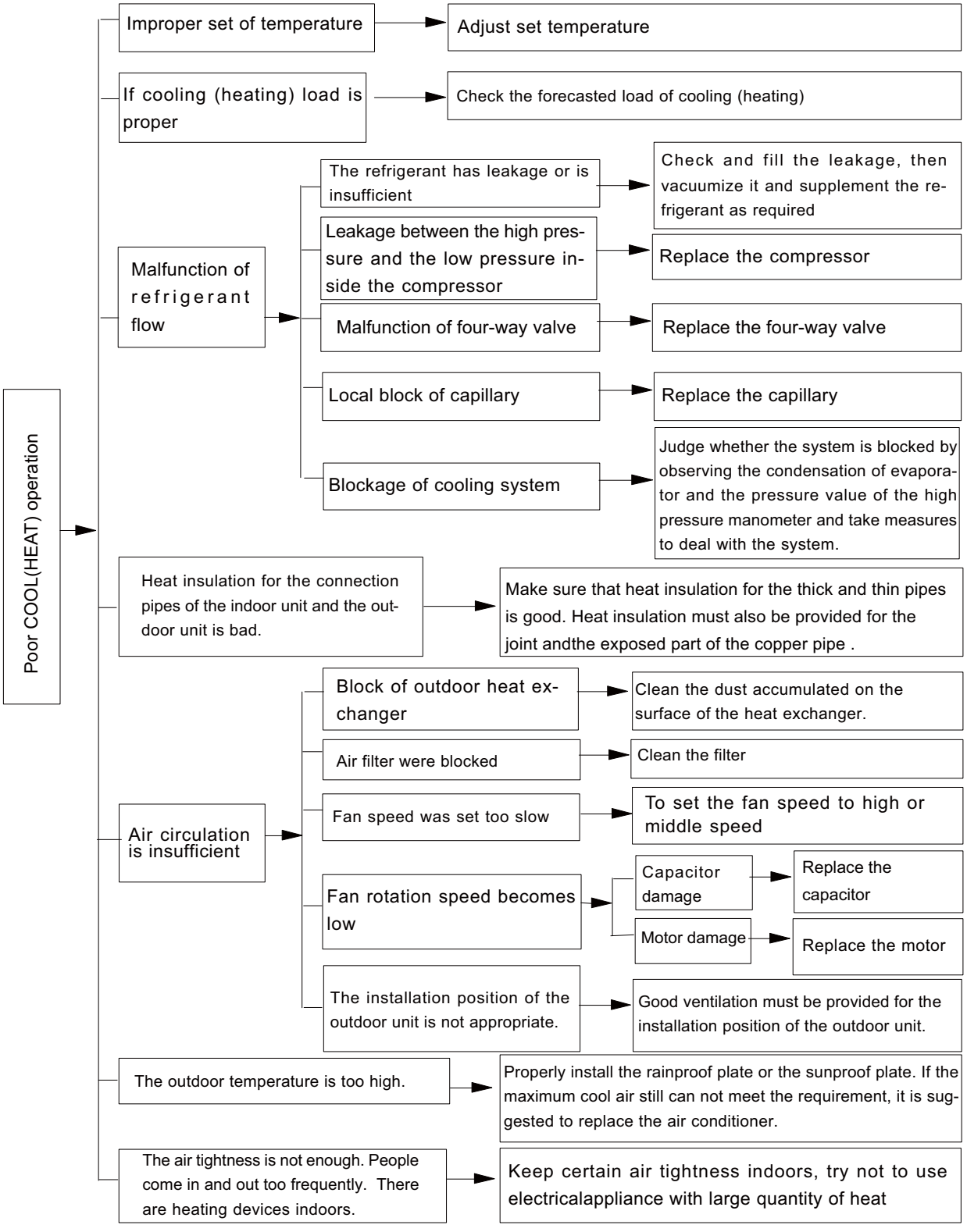
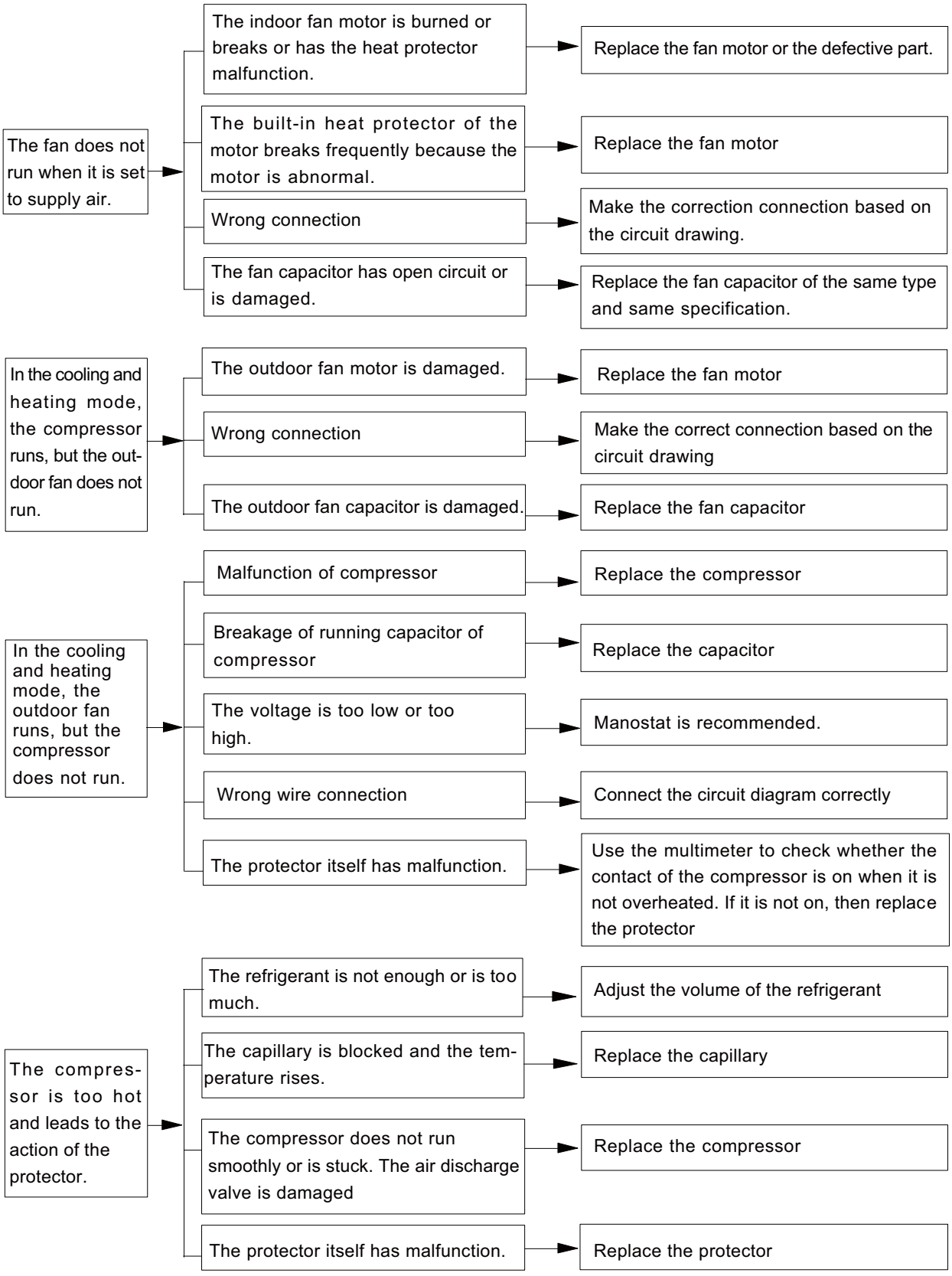
9. Maintenance

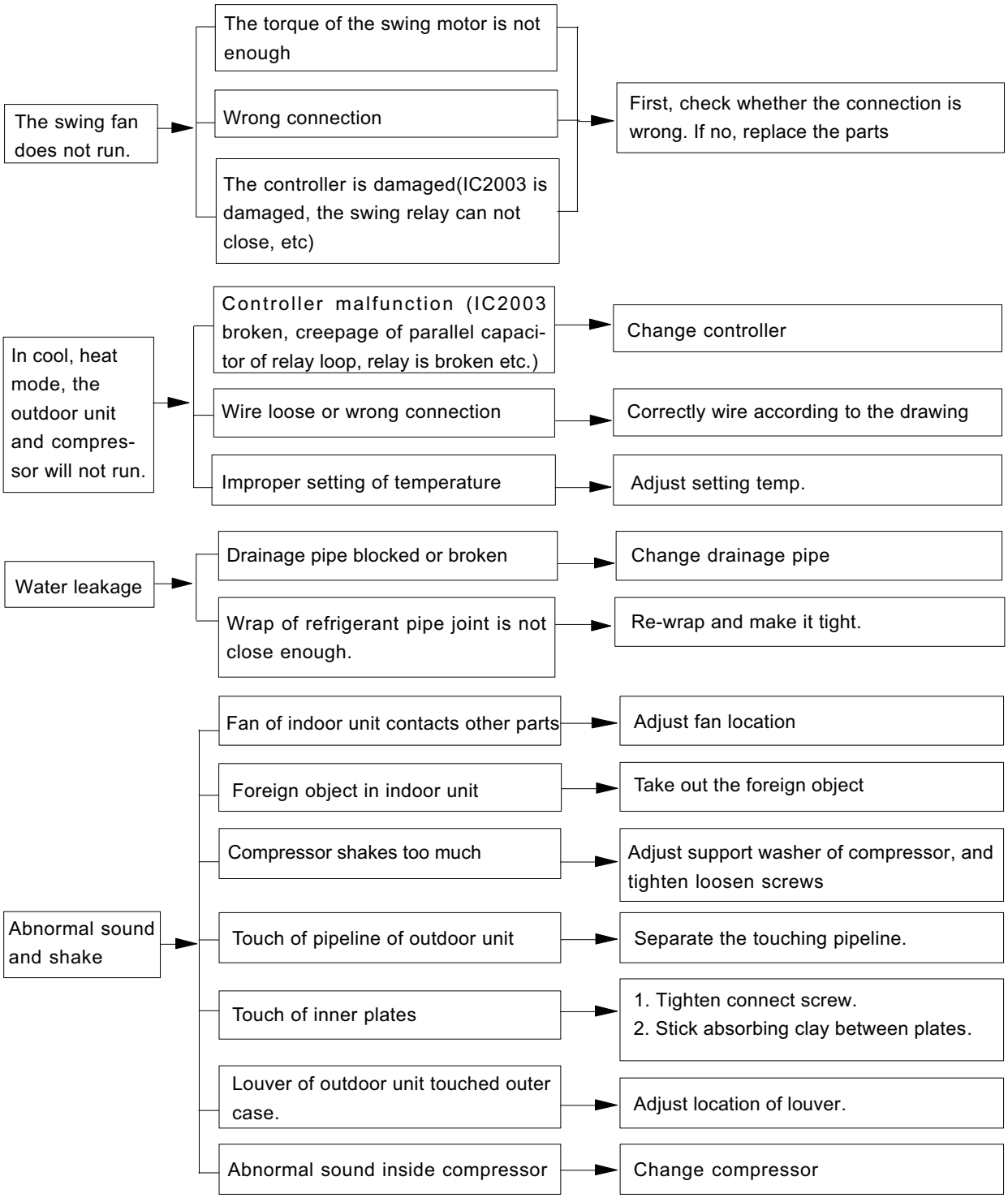
9.1 Troubleshooting for Normal Malfunction

Note: When replacing the controller, make sure insert the wire jumper into the new controller, otherwise the unit will display C5.




Poor COOL(HEAT) operation
Improper set of temperature
Adjust set temperature
If cooling (heating) load is proper
Check the forecasted load of cooling (heating)
Malfunction of refrigerant flow
The refrigerant has leakage or is insufficient
Check and fill the leakage, then vacuumize it and supplement the refrigerant as required
Leakage between the high pressure and the low pressure inside the compressor
Replace the compressor
Malfunction of four-way valve
Replace the four-way valve
Local block of capillary
Replace the capillary
Blockage of cooling system
Judge whether the system is blocked by observing the condensation of evaporator and the pressure value of the high pressure manometer and take measures to deal with the system.
Heat insulation for the connection pipes of the indoor unit and the outdoor unit is bad.
Make sure that heat insulation for the thick and thin pipes is good. Heat insulation must also be provided for the joint andthe exposed part of the copper pipe .
Air circulation is insufficient
Block of outdoor heat exchanger
Clean the dust accumulated on the surface of the heat exchanger.
Air filter were blocked
Clean the filter
Fan speed was set too slow
To set the fan speed to high or middle speed
Fan rotation speed becomes low
Capacitor damage
Replace the capacitor
Motor damage
Replace the motor
The installation position of the outdoor unit is not appropriate.
Good ventilation must be provided for the installation position of the outdoor unit.
The outdoor temperature is too high.
Properly install the rainproof plate or the sunproof plate. If the maximum cool air still can not meet the requirement, it is suggested to replace the air conditioner.
The air tightness is not enough. People come in and out too frequently. There are heating devices indoors.
Keep certain air tightness indoors, try not to use electricalappliance with large quantity of heat


The fan does not run when it is set to supply air.
The indoor fan motor is burned or breaks or has the heat protector malfunction.
Replace the fan motor or the defective part.
The built-in heat protector of the motor breaks frequently because the motor is abnormal.
Replace the fan motor
Wrong connection
Make the correction connection based on the circuit drawing.
The fan capacitor has open circuit or is damaged.
Replace the fan capacitor of the same type and same specification.
In the cooling and heating mode, the compressor runs, but the outdoor fan does not run.
The outdoor fan motor is damaged.
Replace the fan motor
Wrong connection
Make the correct connection based on the circuit drawing
The outdoor fan capacitor is damaged.
Replace the fan capacitor
In the cooling and heating mode, the outdoor fan runs, but the compressor does not run.
Malfunction of compressor
Replace the compressor
Breakage of running capacitor of compressor
Replace the capacitor
The voltage is too low or too high.
Manostat is recommended.
Wrong wire connection
Connect the circuit diagram correctly
The protector itself has malfunction.
Use the multimeter to check whether the contact of the compressor is on when it is not overheated. If it is not on, then replace the protector
The compressor is too hot and leads to the action of the protector.
The refrigerant is not enough or is too much.
Adjust the volume of the refrigerant
The capillary is blocked and the temperature rises.
Replace the capillary
The compressor does not run smoothly or is stuck. The air discharge valve is damaged
Replace the compressor
The protector itself has malfunction.
Replace the protector


The swing fan does not run.
The torque of the swing motor is not enough
Wrong connection
The controller is damaged(IC2003 is damaged, the swing relay can not close, etc)
First, check whether the connection is wrong. If no, replace the parts
In cool, heat mode, the outdoor unit and compressor will not run.
Controller malfunction (IC2003 broken, creepage of parallel capacitor of relay loop, relay is broken etc.)
Change controller
Wire loose or wrong connection
Correctly wire according to the drawing
Improper setting of temperature
Adjust setting temp.
Water leakage
Drainage pipe blocked or broken
Change drainage pipe
Wrap of refrigerant pipe joint is not close enough.
Re-wrap and make it tight.
Abnormal sound and shake
Fan of indoor unit contacts other parts
Adjust fan location
Foreign object in indoor unit
Take out the foreign object
Compressor shakes too much
Adjust support washer of compressor, and tighten loosen screws
Touch of pipeline of outdoor unit
Separate the touching pipeline.
Touch of inner plates
1. Tighten connect screw.
2. Stick absorbing clay between plates.
Louver of outdoor unit touched outer case.
Adjust location of louver.
Abnormal sound inside compressor
Change compressor

9.2 Error Code List

NO.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
1	High pressure protection of system	E1	OFF 3s and blink once						During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops.	Possible reasons: 1. Refrigerant was superabundant; 2. Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.
2	Antifreezing protection	E2	OFF 3S and blink twice			OFF 3S and blink 3 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates.	1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty.
3	System block or refrigerant leakage	E3	OFF 3S and blink 3 times				OFF 3S and blink 9 times		The Dual-8 Code Display will show E3 until the low pressure switch stop operation.	1.Low-pressure protection 2.Low-pressure protection of system 3.Low-pressure protection of compressor
4	High discharge temperature protection of compressor	E4	OFF 3S and blink 4 times			OFF 3S and blink 7 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	Please refer to the malfunction analysis (discharge protection, overload).
5	Overcurrent protection	E5	OFF 3S and blink 5 times			OFF 3S and blink 5 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	1. Supply voltage is unstable; 2. Supply voltage is too low and load is too high; 3. Evaporator is dirty.
6	Communi-cation Malfunction	E6	OFF 3S and blink 6 times					OFF	During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the corresponding malfunction analysis.
7	High temperature resistant protection	E8	OFF 3S and blink 8 times			OFF 3S and blink 6 times			During cooling operation: compressor will stop while indoor fan will operate. During heating operation, the complete unit stops.	Refer to the malfunction analysis (overload, high temperature resistant).
8	EEPROM malfunction	EE			OFF 3S and blink 15 times	OFF 3S and blink 11 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
9	Limit/ decrease frequency due to high temperature of module	EU		OFF 3S and blink 6 times	OFF 3S and blink 6 times				All loads operate normally, while operation frequency for compressor is decreased	Discharging after the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
10	Malfunction protection of jumper cap	C5	OFF 3S and blink 15 times						Wireless remote receiver and button are effective, but can not dispose the related command	1. No jumper cap insert on mainboard. 2. Incorrect insert of jumper cap. 3. Jumper cap damaged. 4. Abnormal detecting circuit of mainboard.

NO.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
11	Gathering refrigerant	F0	OFF 3S and blink 1 times	OFF 3S and blink 1 times					When the outdoor unit receive signal of Gathering refrigerant ,the system will be forced to run under cooling mode for gathering refrigerant	Nominal cooling mode
12	Indoor ambient temperature sensor is open/short circuited	F1		OFF 3S and blink once					During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.	1. Loosening or bad contact of indoor ambient temp. sensor and mainboard terminal. 2. Components in mainboard fell down leads short circuit. 3. Indoor ambient temp. sensor damaged.(check with sensor resistance value chart) 4. Mainboard damaged.
13	Indoor evaporator temperature sensor is open/short circuited	F2		OFF 3S and blink twice					AC stops operation once reaches the setting temperature. Cooling, drying: internal fan motor stops operation while other loads stop operation; heating: AC stop operation	1. Loosening or bad contact of Indoor evaporator temp. sensor and mainboard terminal. 2. Components on the mainboard fall down leads short circuit. 3. Indoor evaporator temp. sensor damaged.(check temp. sensor value chart for testing) 4. Mainboard damaged.
14	Outdoor ambient temperature sensor is open/short circuited	F3		OFF 3S and blink 3 times			OFF 3S and blink 6 times		During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
15	Outdoor condenser temperature sensor is open/short circuited	F4		OFF 3S and blink 4 times			OFF 3S and blink 5 times		During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
16	Outdoor discharge temperature sensor is open/short circuited	F5		OFF 3S and blink 5 times			OFF 3S and blink 7 times		During cooling and drying operation, compressor will sop after operating for about 3 mins, while indoor fan will operate; During heating operation, the complete unit will stop after operating for about 3 mins.	1.Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor) 2.The head of temperature sensor hasnt been inserted into the copper tube
17	Limit/ decrease frequency due to overload	F6		OFF 3S and blink for 6 times			OFF 3S and blink 3 times		All loads operate normally, while operation frequency for compressor is decreased	Refer to the malfunction analysis (overload, high temperature resistant)
18	Decrease frequency due to overcurrent	F8		OFF 3S and blink 8 times			OFF 3S and blink once		All loads operate normally, while operation frequency for compressor is decreased	The input supply voltage is too low; System pressure is too high and overload

NO.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
19	Decrease frequency due to high air discharge	F9		OFF 3S and blink 9 times			OFF 3S and blink twice		All loads operate normally, while operation frequency for compressor is decreased	Overload or temperature is too high; Refrigerant is insufficient; Malfunction of electric expansion valve (EKV)
20	Limit/ decrease frequency due to antifreezing	FH		OFF 3S and blink 2 times	OFF 3S and blink 2 times		OFF 3S and blink 4 times		All loads operate normally, while operation frequency for compressor is decreased	Poor air-return in indoor unit or fan speed is too low
21	Voltage for DC bus-bar is too high	PH		OFF 3S and blink 11 times		OFF 3S and blink 13 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 265VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
22	Voltage of DC bus-bar is too low	PL			OFF 3S and blink 21 times	OFF 3S and blink 12 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 150VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
23	Compressor Min frequence in test state	P0								Showing during min. cooling or min. heating test
24	Compressor rated frequence in test state	P1								Showing during nominal cooling or nominal heating test
25	Compressor maximum frequence in test state	P2								Showing during max. cooling or max. heating test

NO.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
26	Compressor intermediate frequence in test state	P3								Showing during middle cooling or middle heating test
27	Overcurrent protection of phase current for compressor	P5		OFF 3S and blink 15 times					During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
28	Charging malfunction of capacitor	PU			OFF 3S and blink 17 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Refer to the part three—charging malfunction analysis of capacitor
29	Malfunction of module temperature sensor circuit	P7			OFF 3S and blink 18 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
30	Module high temperature protection	P8			OFF 3S and blink 19 times				During cooling operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	After the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
31	Overload protection for compressor	H3			OFF 3S and blink 3 times	OFF 3S and blink 8 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Wiring terminal OVC-COMP is loosened. In normal state, the resistance for this terminal should be less than 1ohm. 2.Refer to the malfunction analysis (discharge protection, overload)
32	IPM protection	H5			OFF 3S and blink 5 times	OFF 3S and blink 4 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
33	Module temperature is too high	H5			OFF 3S and blink 5 times	OFF 3S and blink 10 times				

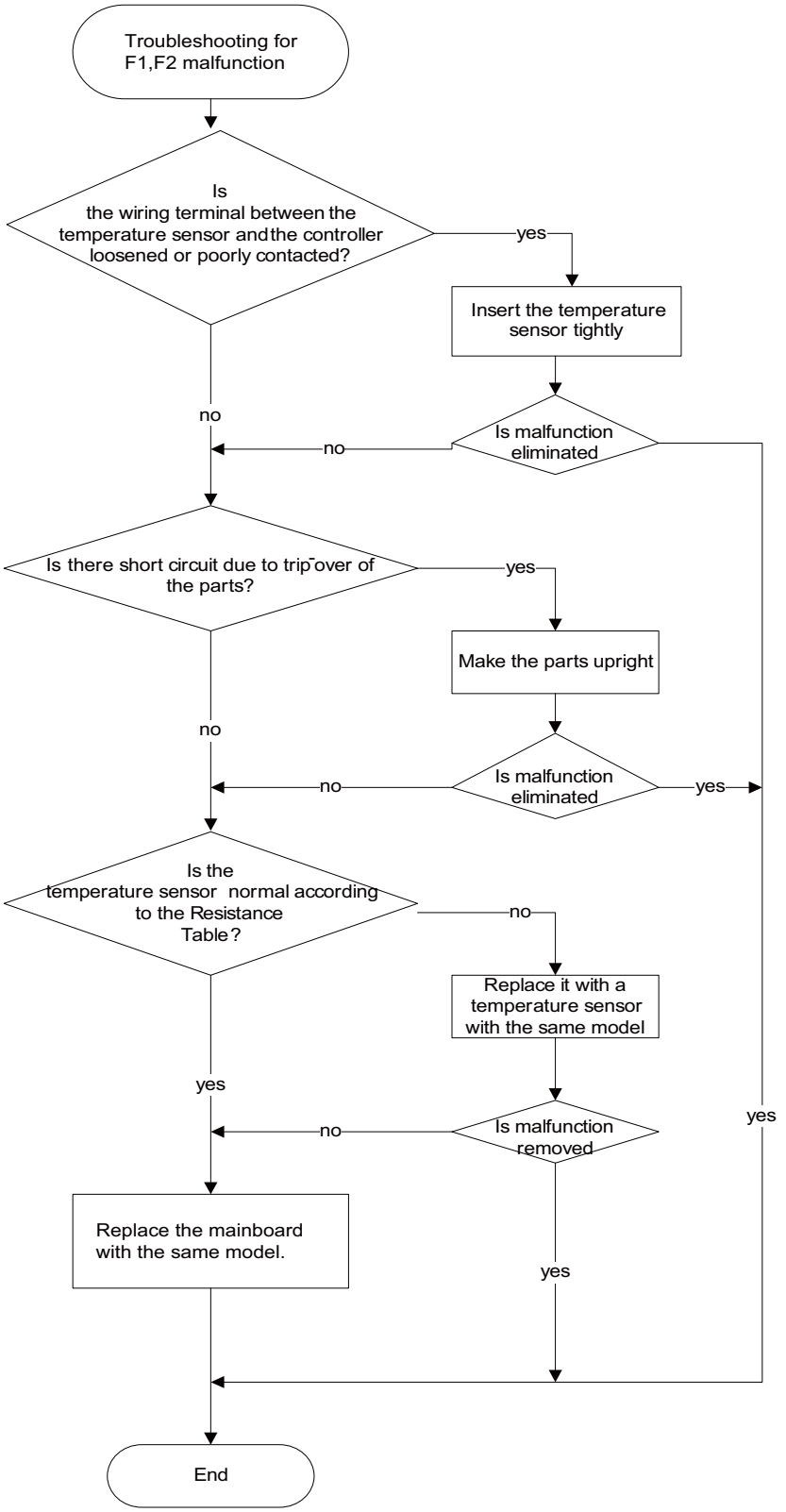
NO.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
34	Internal motor (fan motor) do not operate	H6	OFF 3S and blink 11 times						Internal fan motor, external fan motor, compressor and electric heater stop operation,guide louver stops at present location.	1. Bad contact of DC motor feedback terminal. 2. Bad contact of DC motor control end. 3. Fan motor is stalling. 4. Motor malfunction. 5. Malfunction of mainboard rev detecting circuit.
35	Desynchro-nizing of compressor	H7			OFF 3S and blink 7 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
36	PFC protection	HC			OFF 3S and blink 6 times	OFF 3S and blink 14 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
37	Outdoor DC fan motor malfunction	L3	OFF 3S and blink 23 times				OFF 3S and blink 14 times		Outdoor DC fan motor malfunction lead to compressor stop operation,	DC fan motor malfunction or system blocked or the connector loosed
38	power protection	L9	OFF 3S and blink 20 times			OFF 3S and blink 9 times			compressor stop operation and Outdoor fan motor will stop 30s latter , 3 minutes latter fan motor and compressor will restart	To protect the electronical components when detect high power
39	Indoor unit and outdoor unit doesn't match	LP	OFF 3S and blink 19 times			OFF 3S and blink 16 times			compressor and Outdoor fan motor can’t work	Indoor unit and outdoor unit doesn't match
40	Failure start-up	LC			OFF 3S and blink 11 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
41	Malfunction of phase current detection circuit for compressor	U1			OFF 3S and blink 13 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
42	Malfunction of voltage dropping for DC bus-bar	U3			OFF 3S and blink 20 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Supply voltage is unstable

NO.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit			A/C status	Possible Causes
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
43	Malfunction of complete units current detection	U5		OFF 3S and blink 13 times					During cooling and drying operation, the compressor will stop while indoor fan will operate; During heating operating, the complete unit will stop operation.	Theres circuit malfunction on outdoor units control panel AP1, please replace the outdoor units control panel AP1.
44	The four-way valve is abnormal	U7		OFF 3S and blink 20 times					If this malfunction occurs during heating operation, the complete unit will stop operation.	1.Supply voltage is lower than AC175V; 2.Wiring terminal 4V is loosened or broken; 3.4V is damaged, please replace 4V.
45	Frequency limiting (power)						OFF 3S and blink 13 times			
46	Compressor is open-circuited					OFF 3S and blink once				
47	The temperature for turning on the unit is reached						OFF 3S and blink 8 times			
48	Frequency limiting (module temperature)						OFF 3S and blink 11 times			
49	Normal communica-tion							continously		
50	Defrosting	H1			OFF 3S and blink once	OFF 1S and blink twice			Defrosting will occur in heating mode. Compressor will operate while indoor fan will stop operation.	Its the normal state

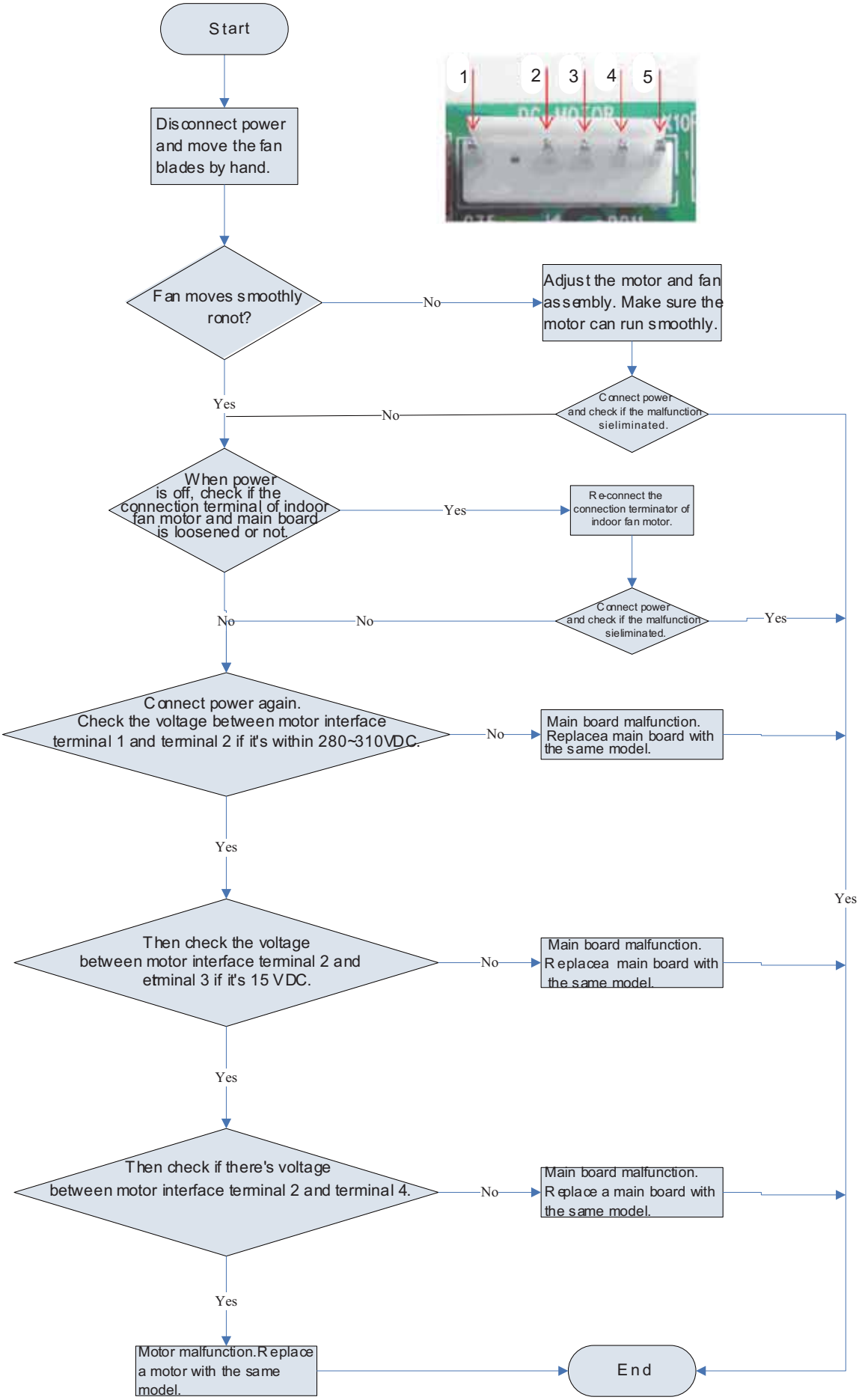
9.3 Troubleshooting for Main Malfunction

●Indoor unit:

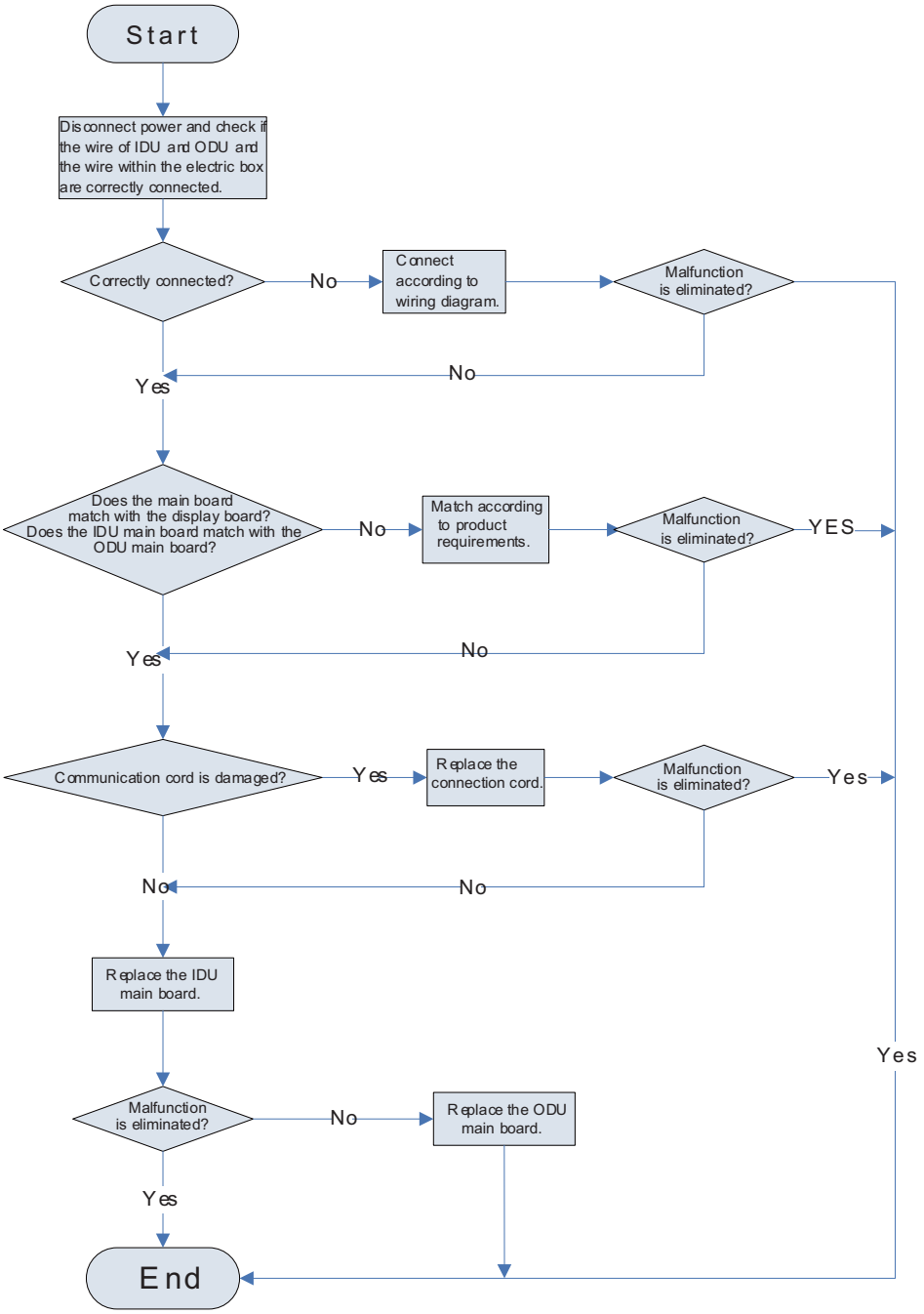
1. Malfunction of Temperature Sensor F1, F2



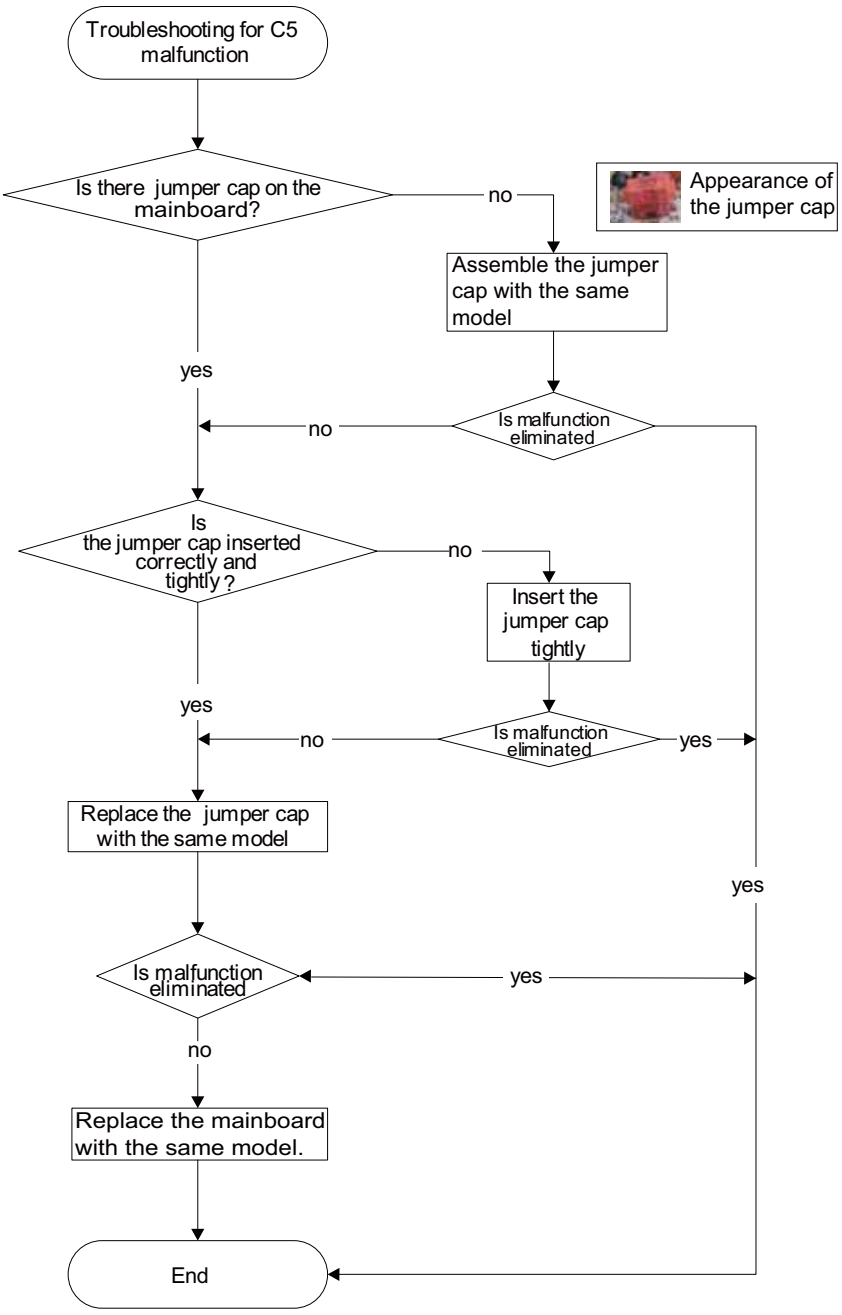
2. Troubleshooting for Malfunction H6—Indoor Fan Stops Operation



3. Communication Error of Mono-Split



4. Malfunction of Protection of Jumper Cap C5



●Outdoor unit:

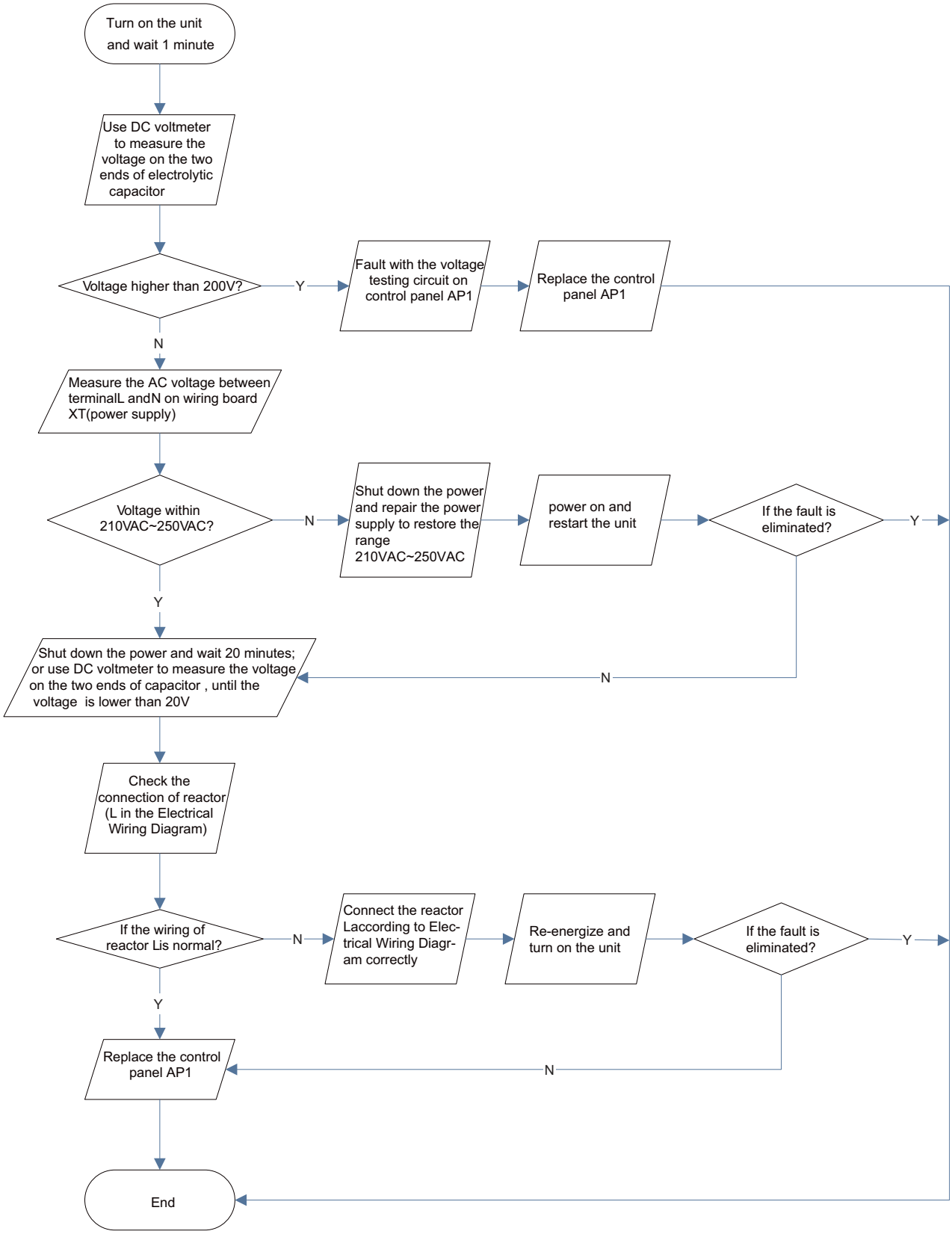
(1) Capacitor charge fault (Fault with outdoor unit) (AP1 below refers to the outdoor control panel)

Main Check Points:

●Use AC voltmeter to check if the voltage between terminal L and N on the wiring board is within 210VAC~240VAC.

●Is the reactor (L) correctly connected? Is the connection loose or fallen? Is the reactor (L) damaged?

Fault diagnosis process:



(2) IPM Protection, Out-of-step Fault, Compressor Phase Overcurrent (AP1 below refers to the outdoor control panel)

Main check points:

●Is the connection between control panel AP1 and compressor COMP secure? Loose? Is the connection in correct order?

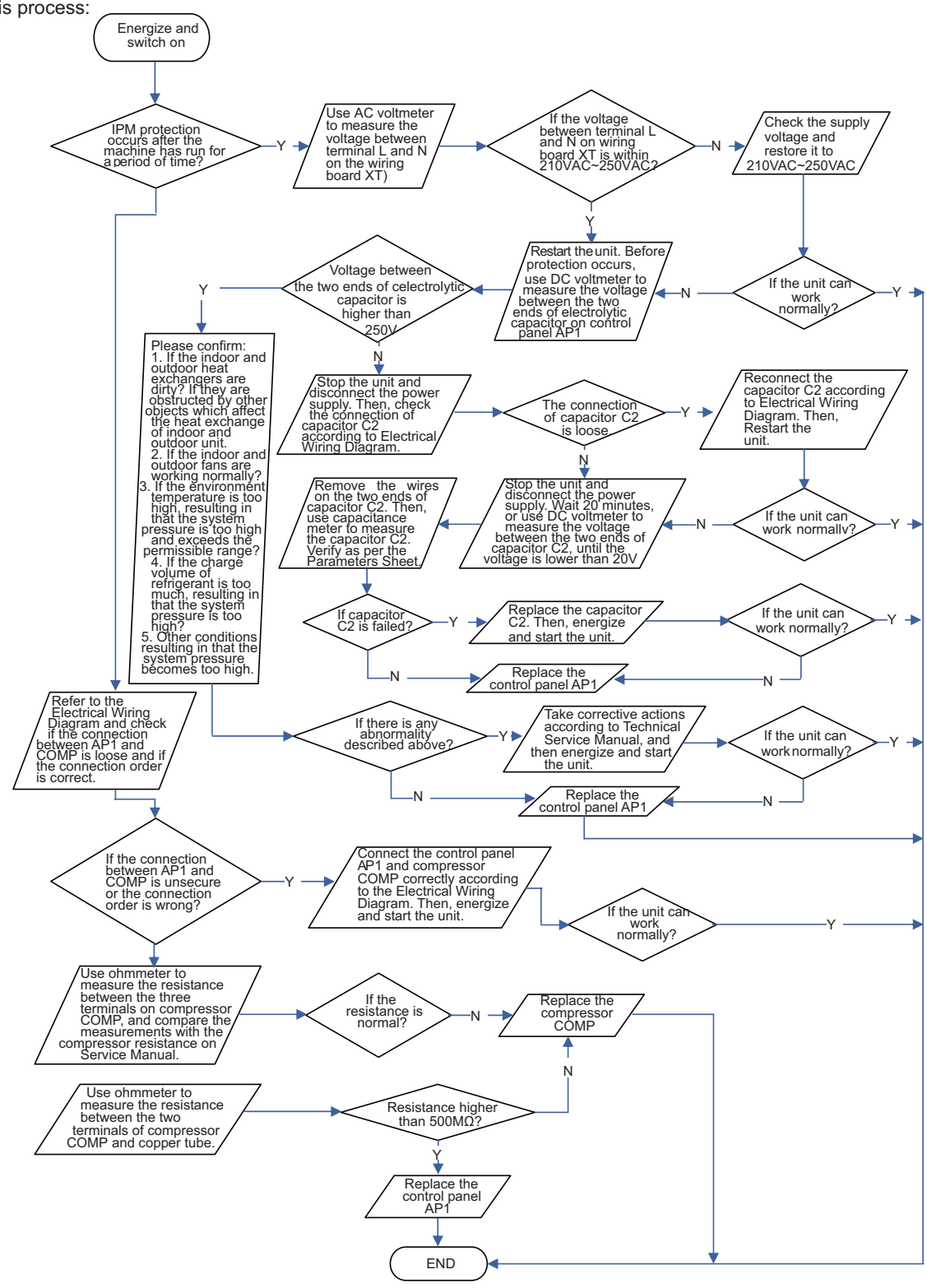
●Is the voltage input of the machine within normal range? (Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)

●Is the compressor coil resistance normal? Is the insulation of compressor coil against the copper tube in good condition?

●Is the working load of the machine too high? Is the radiation good?

I●s the charge volume of refrigerant correct?

Fault diagnosis process:



(3)High temperature and overload protection diagnosis (AP1 hereinafter refers to the control board of the outdoor unit)

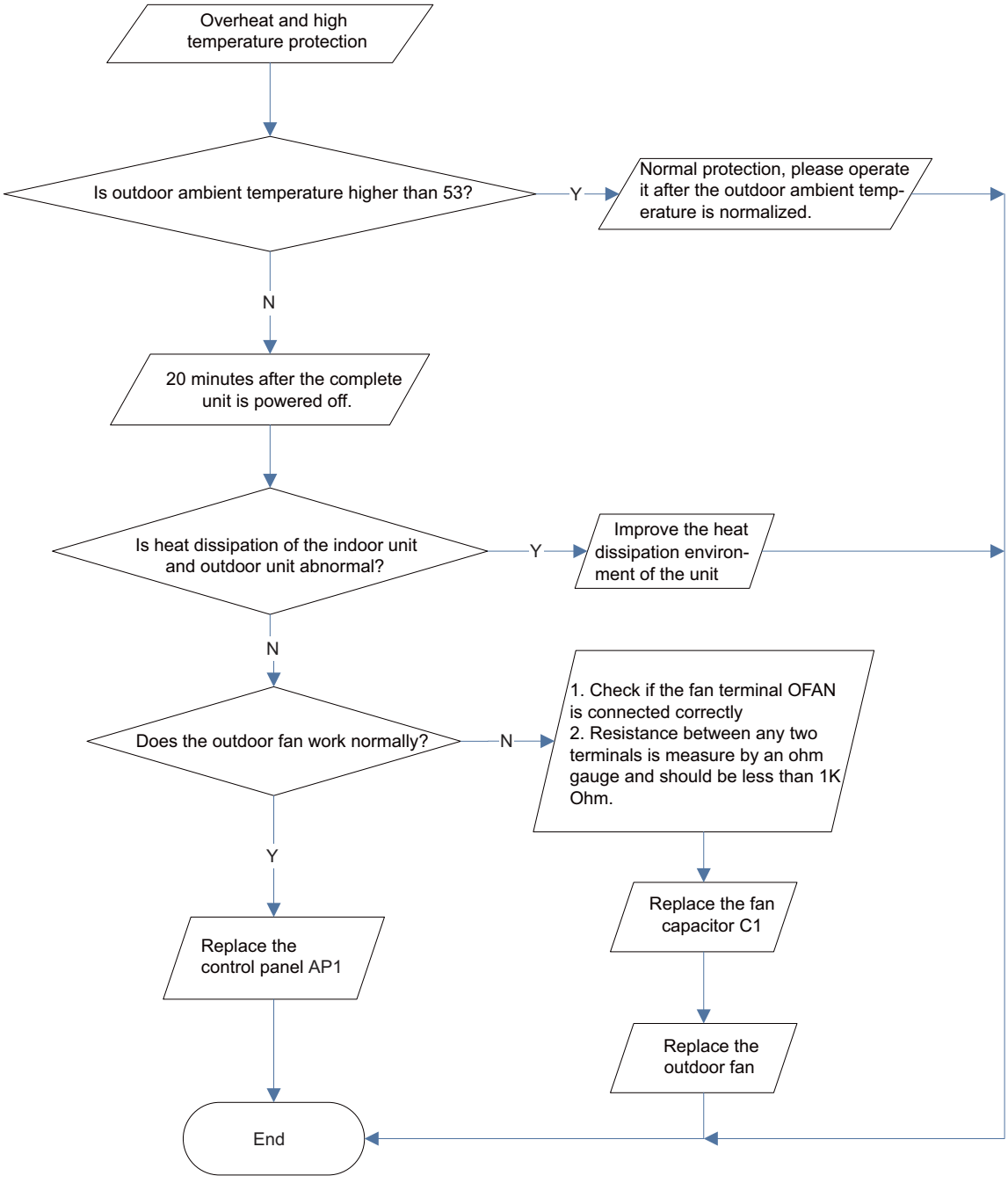
Mainly detect:

●Is outdoor ambient temperature in normal range?

●Are the outdoor and indoor fans operating normally?

●Is the heat dissipation environment inside and outside the unit good?

Fault diagnosis process:



(4) Start-up failure (following AP1 for outdoor unit control board)

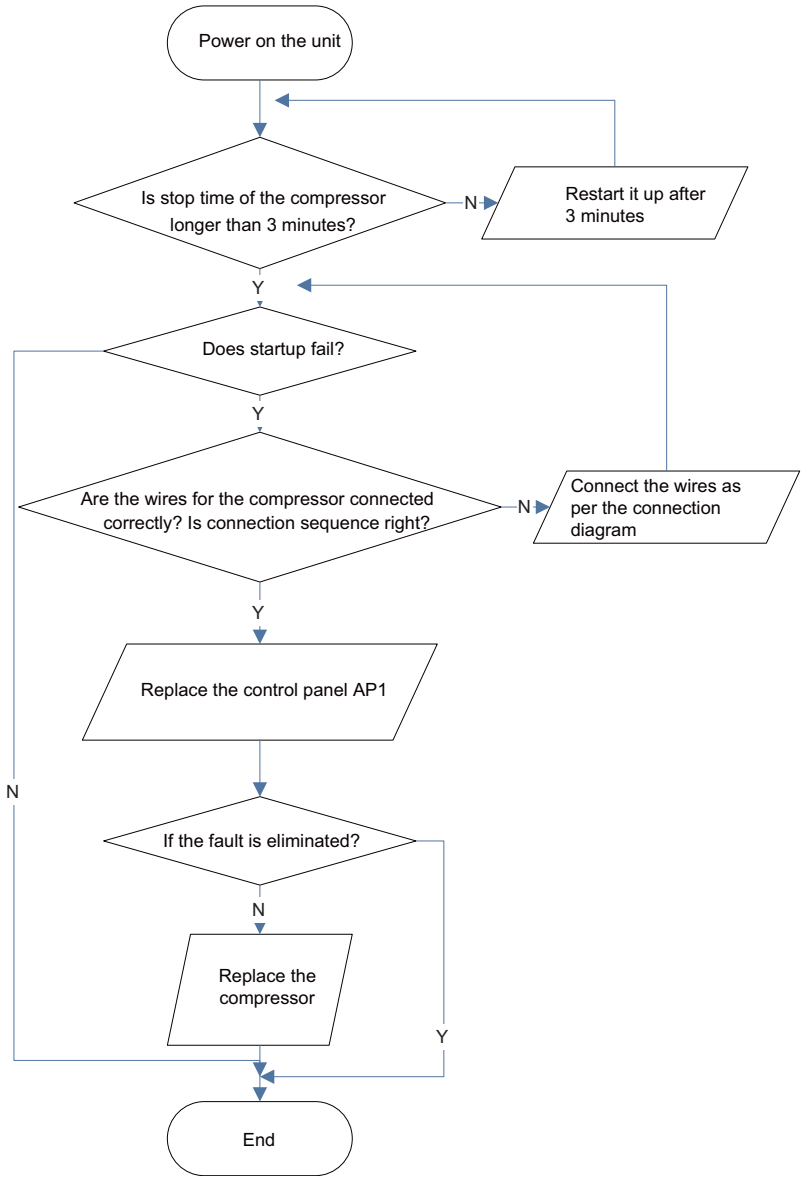
Mainly detect:

●Whether the compressor wiring is connected correct?

●Is compressor broken?

●Is time for compressor stopping enough?

Fault diagnosis process:



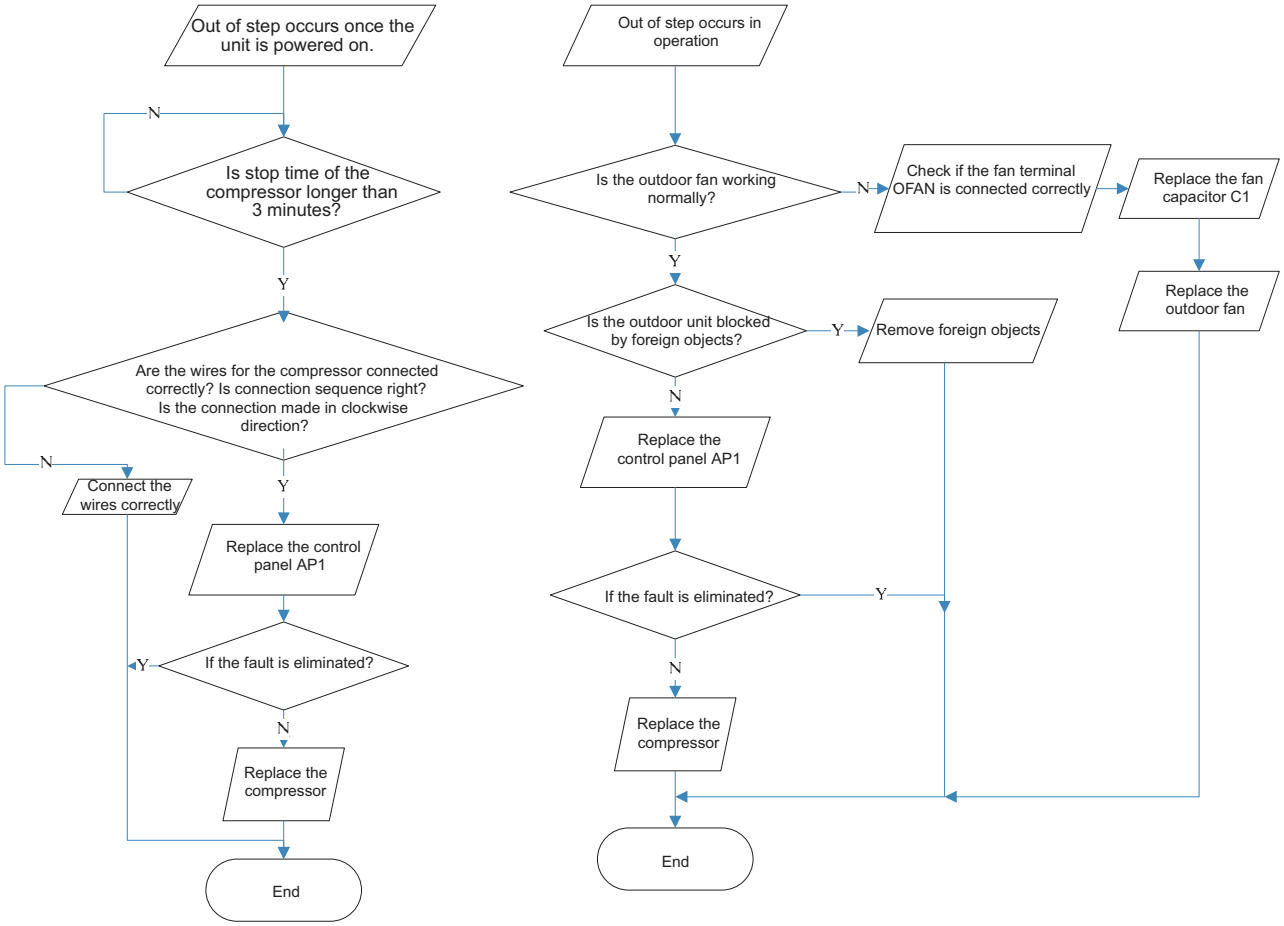
(5) Out of step diagnosis for the compressor (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

●Is the system pressure too high?

●Is the input voltage too low?

Fault diagnosis process:



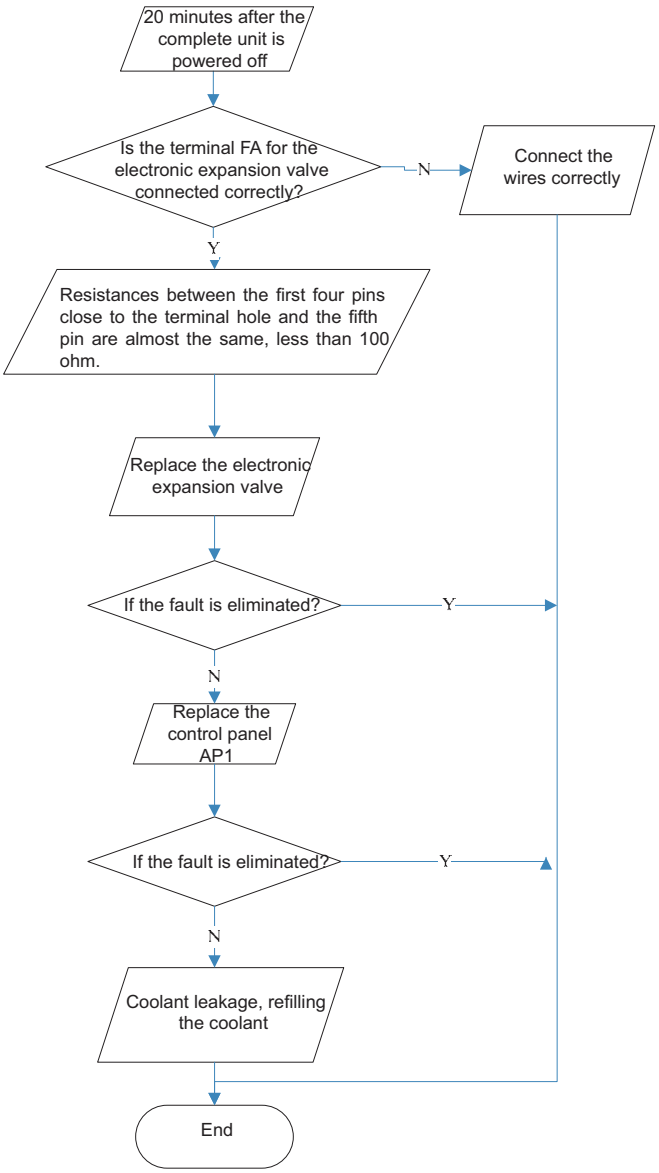
(6)Overload and air exhaust malfunction diagnosis (following AP1 for outdoor unit control board)

Mainly detect:

●Is the PMV connected well or not? Is PMV damaged?

●Is refrigerant leaked?

Fault diagnosis process:

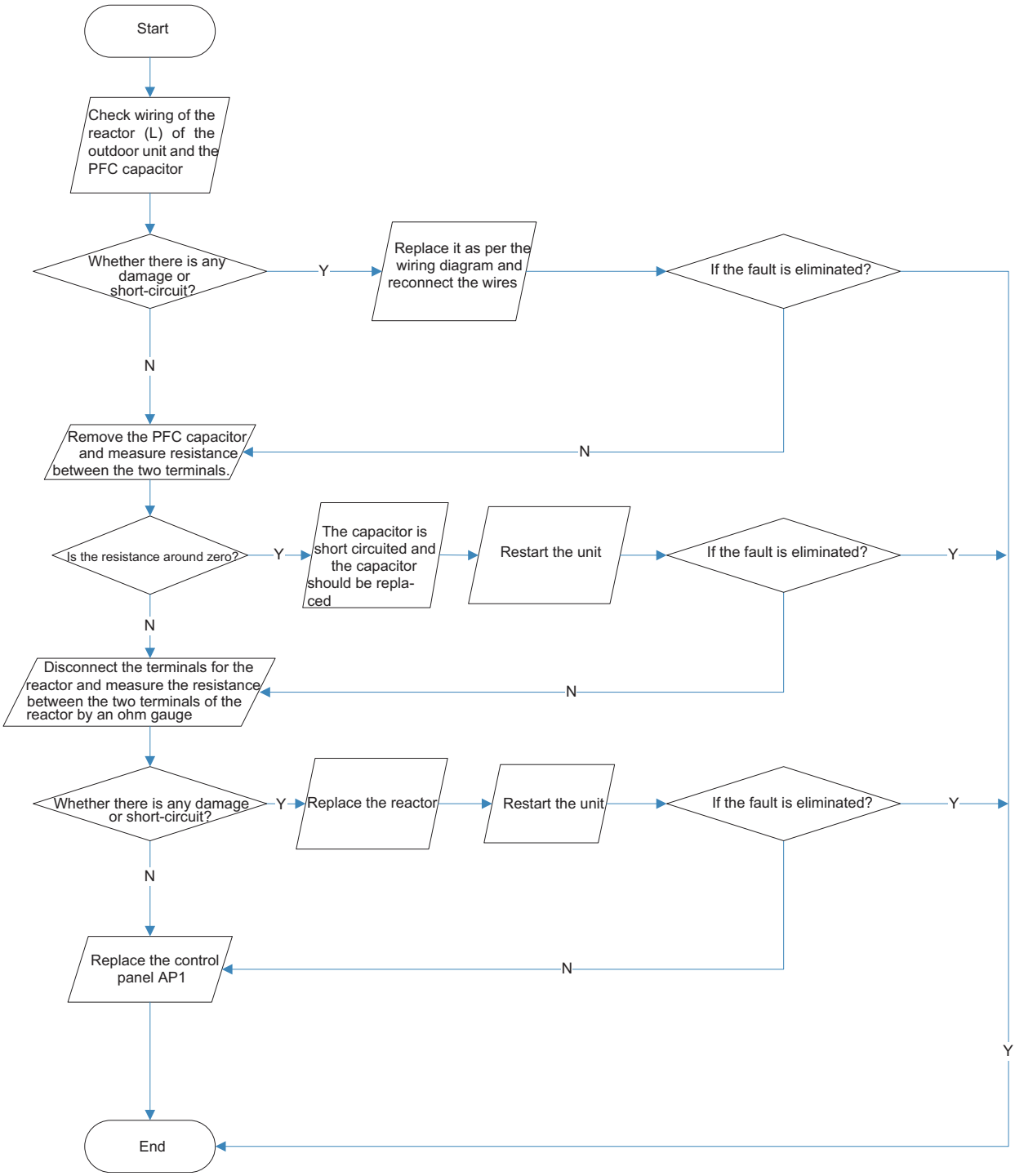


(7)Power factor correct or (PFC) fault (a fault of outdoor unit) (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

●Check if the reactor (L) of the outdoor unit and the PFC capacitor are broken

Fault diagnosis process:



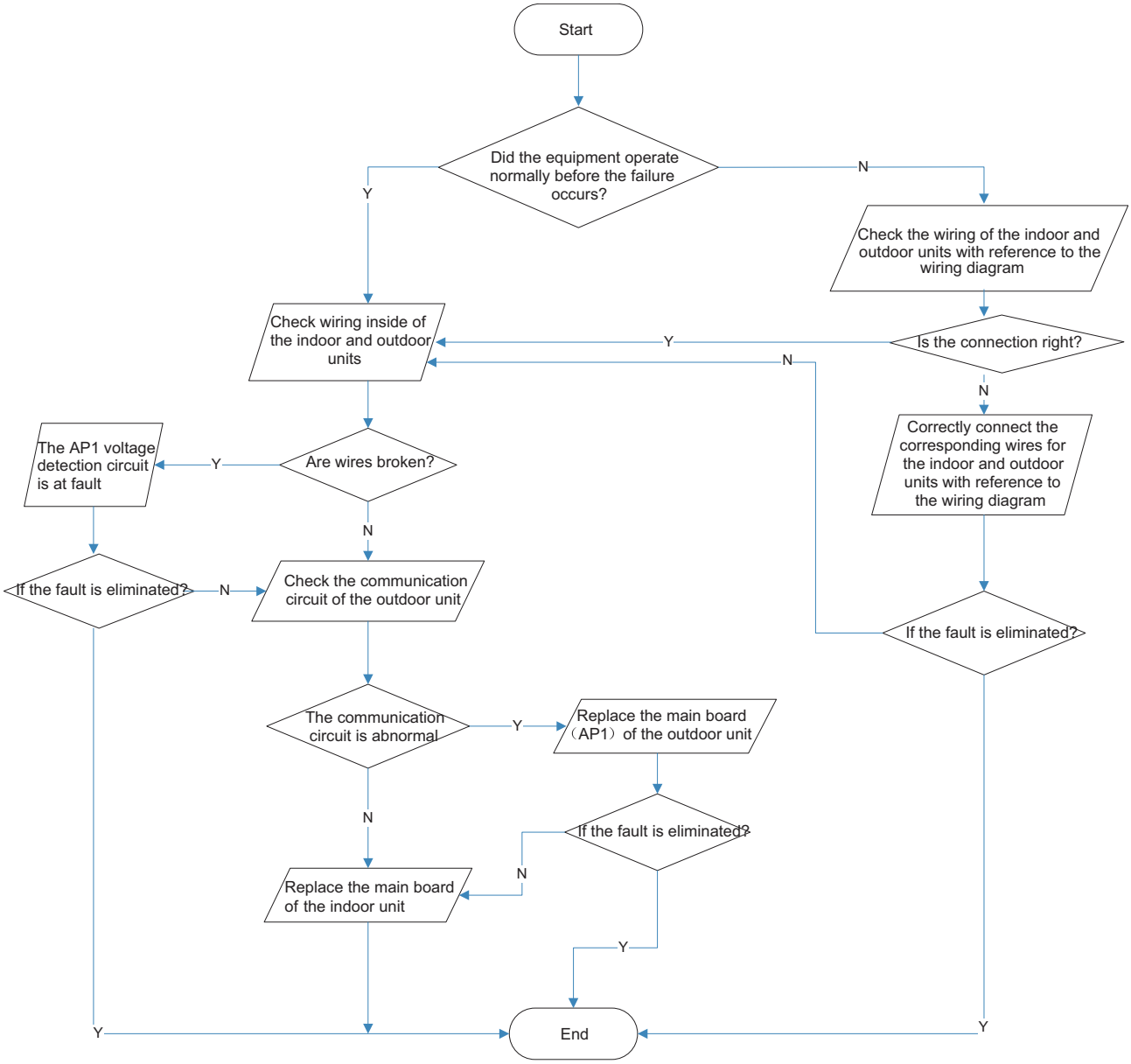
(8) Communication malfunction: (following AP1 for outdoor unit control board)

Mainly detect:

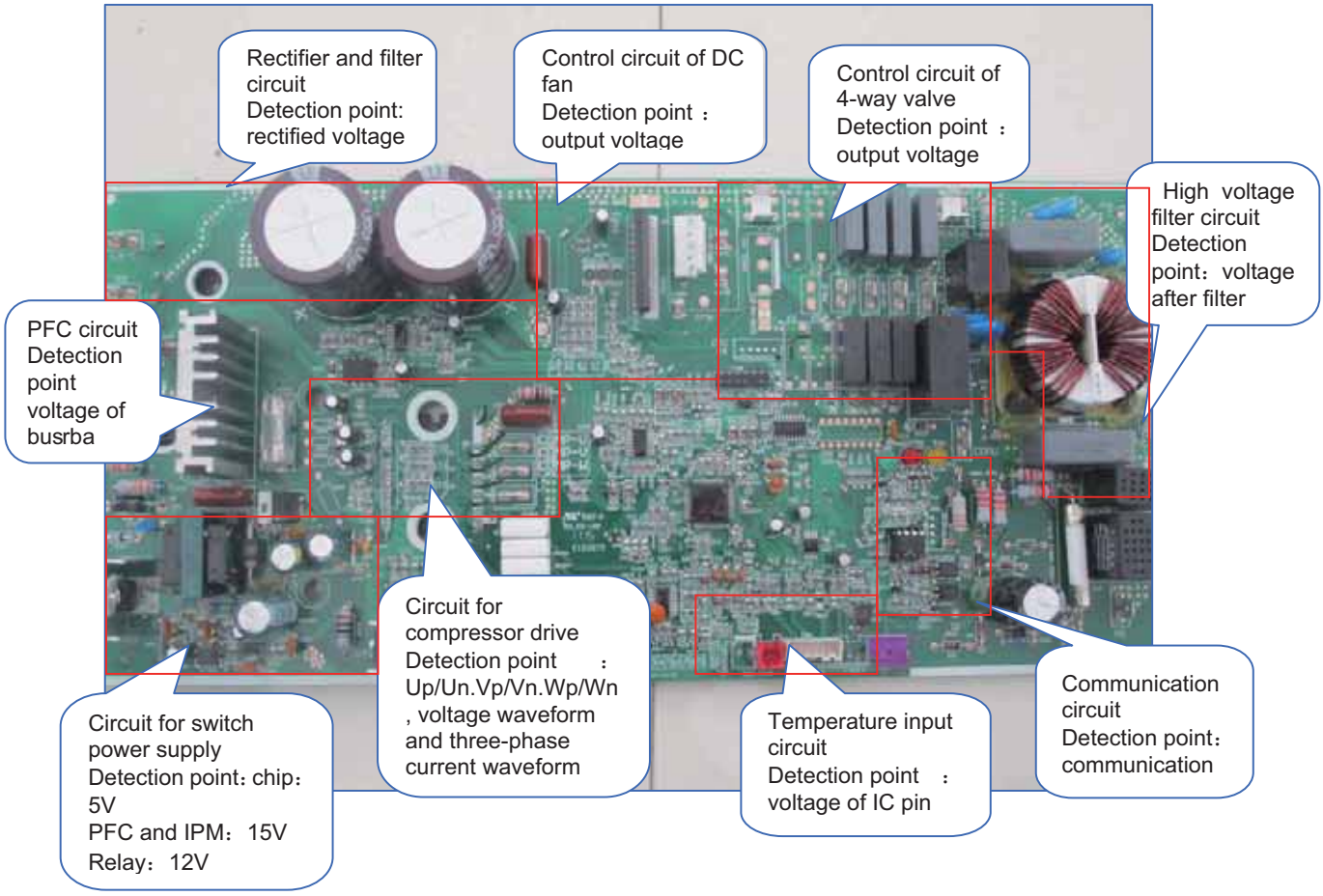
●Is there any damage for the indoor unit mainboard communication circuit? Is communication circuit damaged?

●Detect the indoor and outdoor units connection wire and indoor and outdoor units inside wiring is connect well or not, if is there any damage?

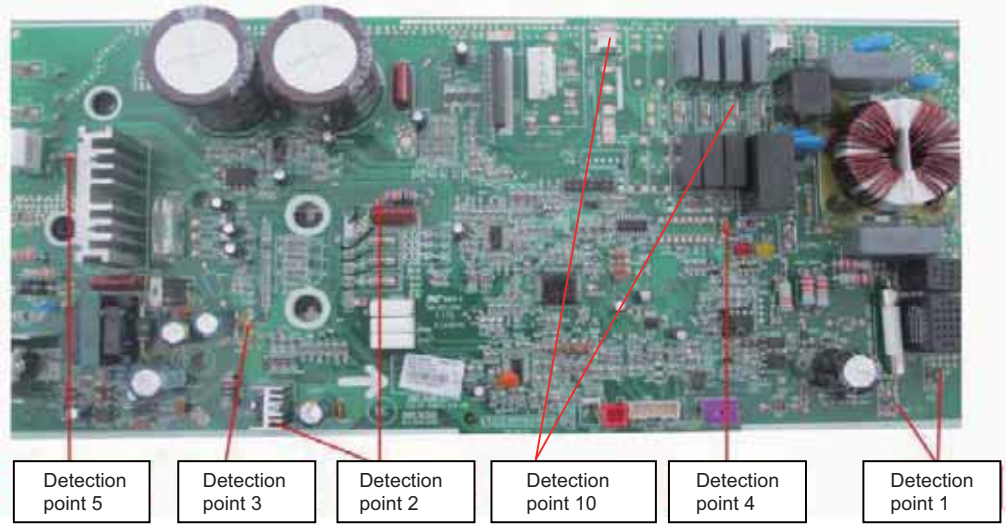
Fault diagnosis process:

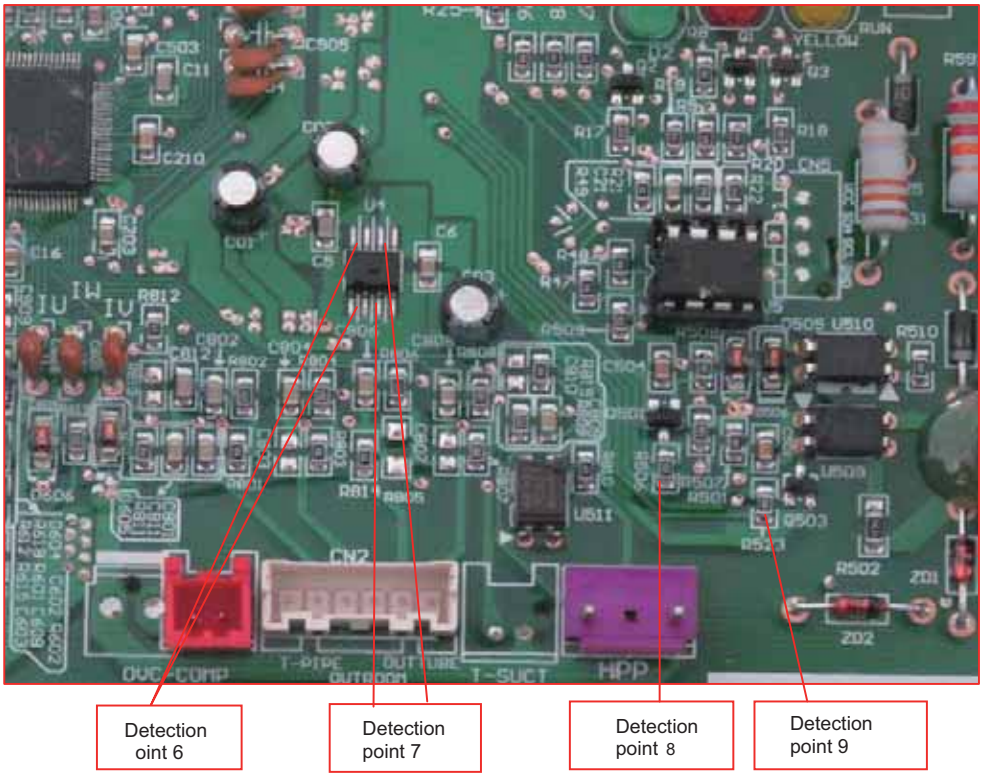


(9)Key detection point



No. of Detection point	Detection point	Corresponding parameter	Test value under normal conditions
Point 1	Between AC-L1,N1	Neutral and live wire	165 V ~ 253 V
Point 2	Right side of R201;U404 heat sink	DC bus bar	230 V ~ 380 V
Point 3	Top of D304;bottom of D304	IPM drive voltage+15V	13.5 V ~15.5 V
Point 4	Top of C116; bottom of C116	Relay drive voltage+12V	11 V ~13 V
Point 5	Right side of R228; left side of R228	PFC drive voltage+15V	13.5 V ~15.5 V
Point 6	Two pins on upper left of U4; bottom of U4 (the top is close to “U4”silk screen)	Chip+3.3V	3.1 V ~3.3 V
Point 7	Two pins on upper left of U4; Bottom of U4	+5V	4.8 V ~5.1 V
Point 8	Bottom of R506; bottom of U4	Signal is received by outdoor unit	Between 0 and 3.3V
Point 9	Bottom of R523; bottom of U4	Signal is sent by outdoor unit	Between 0 and 3.3V
Point 10	Between AC-L2.4V	Neutral and live wire	165 V ~ 253 V





2. Troubleshooting of Outdoor Unit

2.1 Firstly, check if power supply is normal

Check if power switch is turned on and the voltage is between 165V~253V.

2.2 Malfunction Code Table of Outdoor Unit

Malfunction Name	Nixie Tube	LED Lamp		
		Yellow LED Lamp	Red LED Lamp	Green LED Lamp
Freeze Protection	E2	Blinks for 3 times		
IPM protection	H5	Blinks for 4 times		
Overcurrent protection	E5	Blinks for 5 times		
EEPROM reading and writing malfunction	EE	Blinks for 11 times		
Low voltage protection	PL	Blinks for 12 times		
High voltage protection	PH	Blinks for 13 times		
PFC overcurrent protection	HC	Blinks for 14 times		
Mismatching of models of indoor and outdoor units	LP	Blinks for 16 times		
Malfunction of outdoor ambient temperature sensor	F3		Blinks for 6 times	
Malfunction of outdoor pipe temperature sensor	F4		Blinks for 5 times	
Malfunction of outdoor discharge temperature sensor	F5		Blinks for 7 times	
Communication malfunction	E6			Off
Low pressure protection(refrigerant leak)	E3		Blinks for 9 times	
Abnormality of 4-way valve	U7			
Over-load protection	E8	Blinks for 6 times		
Discharge temperature protection	E4	Blinks for 7 times		
Overload protection	H3	Blinks for 8 times		
Over power protection	L9	Blinks for 9 times		

2.3 Each Malfunction and Diagram

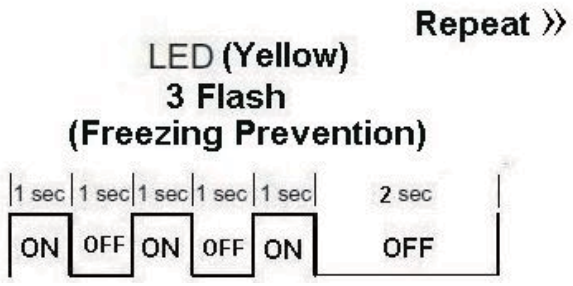
(1) LED Lamp Status Description

Different status of green, red and yellow indicators indicate different operation status and protection of the unit

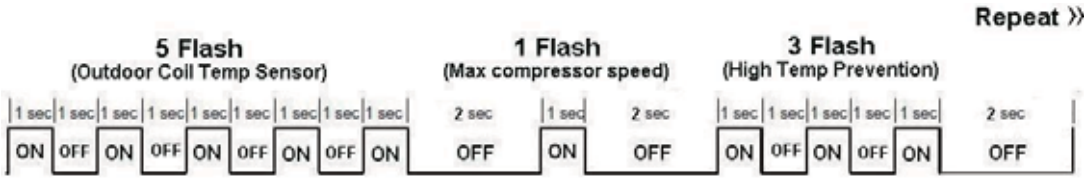
Note: The LED's flash at a 1 second rate for the required number of flashes, and then a 2 second pause before repeating the 1 second rate sequence.

Note: Two or more faults can appear in the one LED fault sequence.

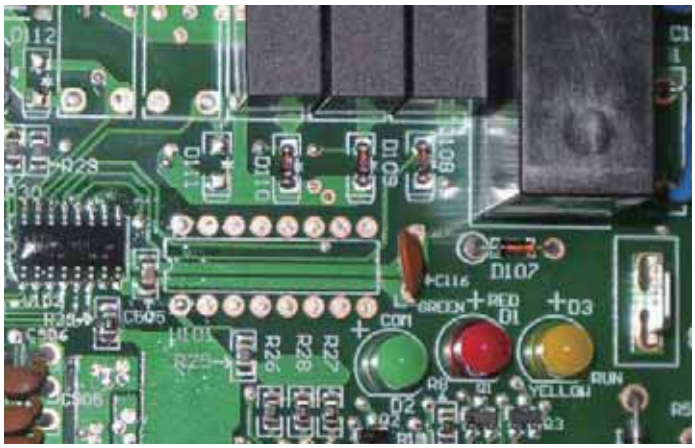
Example of LED sequence:



Single fault code sequence.



Mutable fault code sequence.



(2) Low Voltage protection

PL is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 12 times

Check voltage of power supply.

(3) High voltage protection

PH is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 13 times.

Check voltage of power supply.

(4) Communication Malfunction

E6 is displayed on indoor unit

Green LED lamp of outdoor unit doesn't blink.

If there is no LED lamp blinking,

1. Measure voltage between N1 (neutral wire) and 3 (live wire) on patching board of outdoor electric box by AC voltage grade of universal meter. If it is found that there is voltage, check if there is electricity for patching board of indoor unit. If there is no electricity, check if wiring of indoor unit is correct. Otherwise replace controller of indoor unit.

2. If power supply of indoor unit is normal, check if wiring of outdoor unit is correct and if there is any wrong or loose wiring.

3. If the above two conditions don't exist, outdoor controller can be replaced directly.

Any or a few of indicators are normally on,

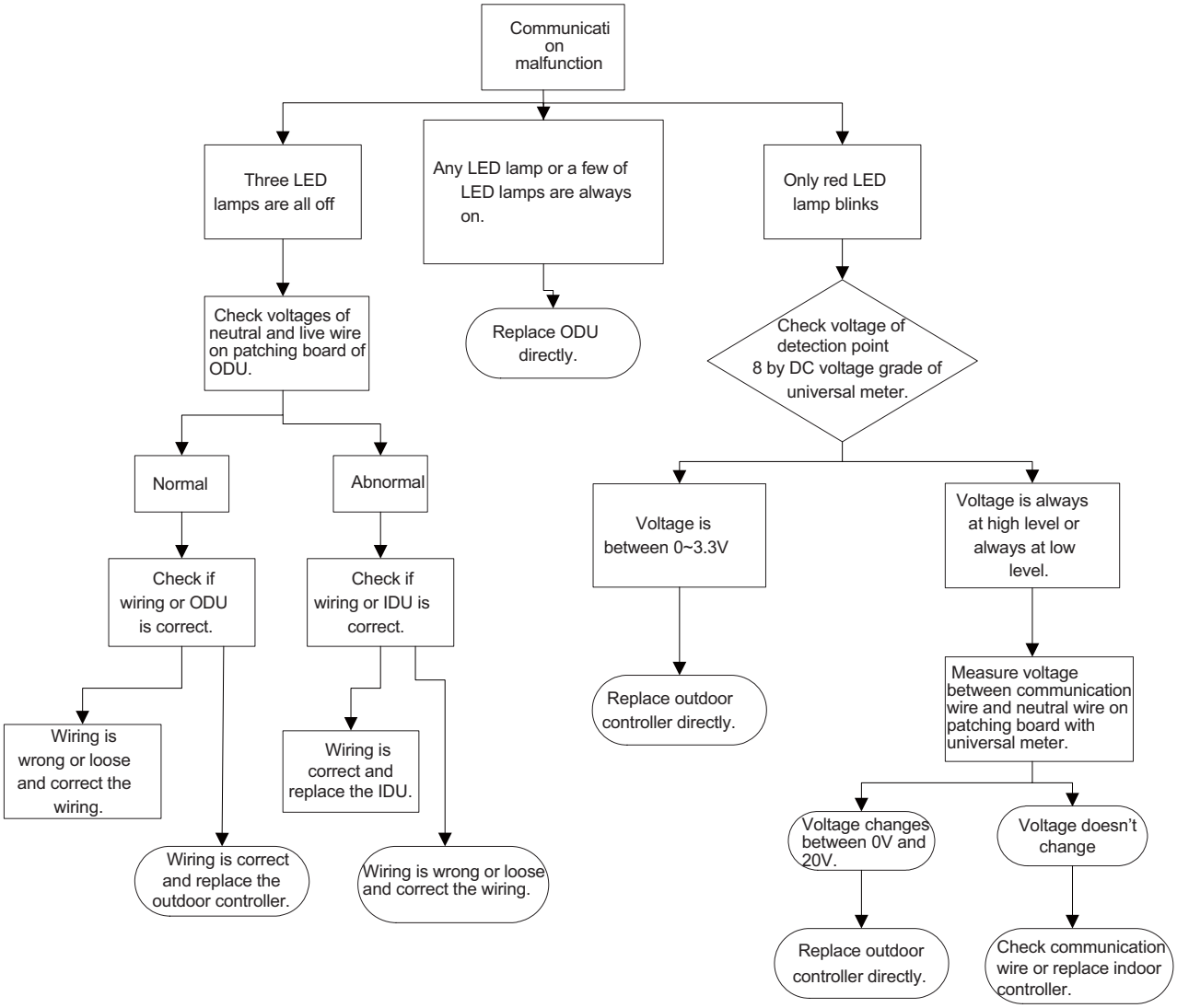
Such circumstance usually indicates that IC on outdoor controller doesn't work. Outdoor controller can be replaced directly.

There is only red indicator blinking

1. Set universal meter to DC voltage grade to measure voltage of detection point 8. If voltage is between 0~3.3V, the signal has been sent by indoor unit but not received by outdoor unit yet. In that case, replace outdoor controller directly.

2.If voltage of detection point 8 is always around 3.3V or around 0V, set universal meter to AC voltage to measure voltage between communication wire and neutral wire (N1) on patching board. If voltage swings between 0V and 20V, the signal

has been sent by indoor unit but not received by outdoor unit yet. In that case, replace outdoor controller directly. If voltage doesn't change, indoor unit has not sent signal or the communication wire is damaged. Check communication wire or replace indoor controller.



(5) Freeze Protection

E2 is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 3 times

It indicates that the temperature of indoor evaporator is too low so it is easily frozen. Check if indoor fan is operating.

(6) Over current protection

E5 is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 5 times

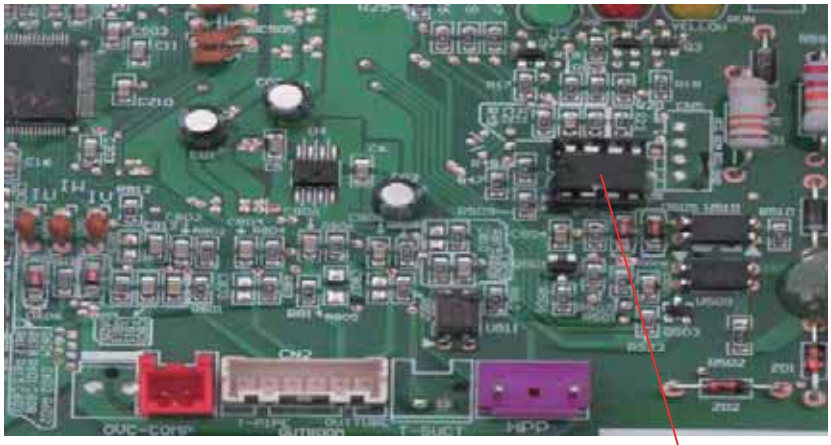
It indicates that the current of the complete unit is too large. Check if voltage of power supply is normal.

(7) EEPROM Reading and Writing Malfunction

EE is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 11 times

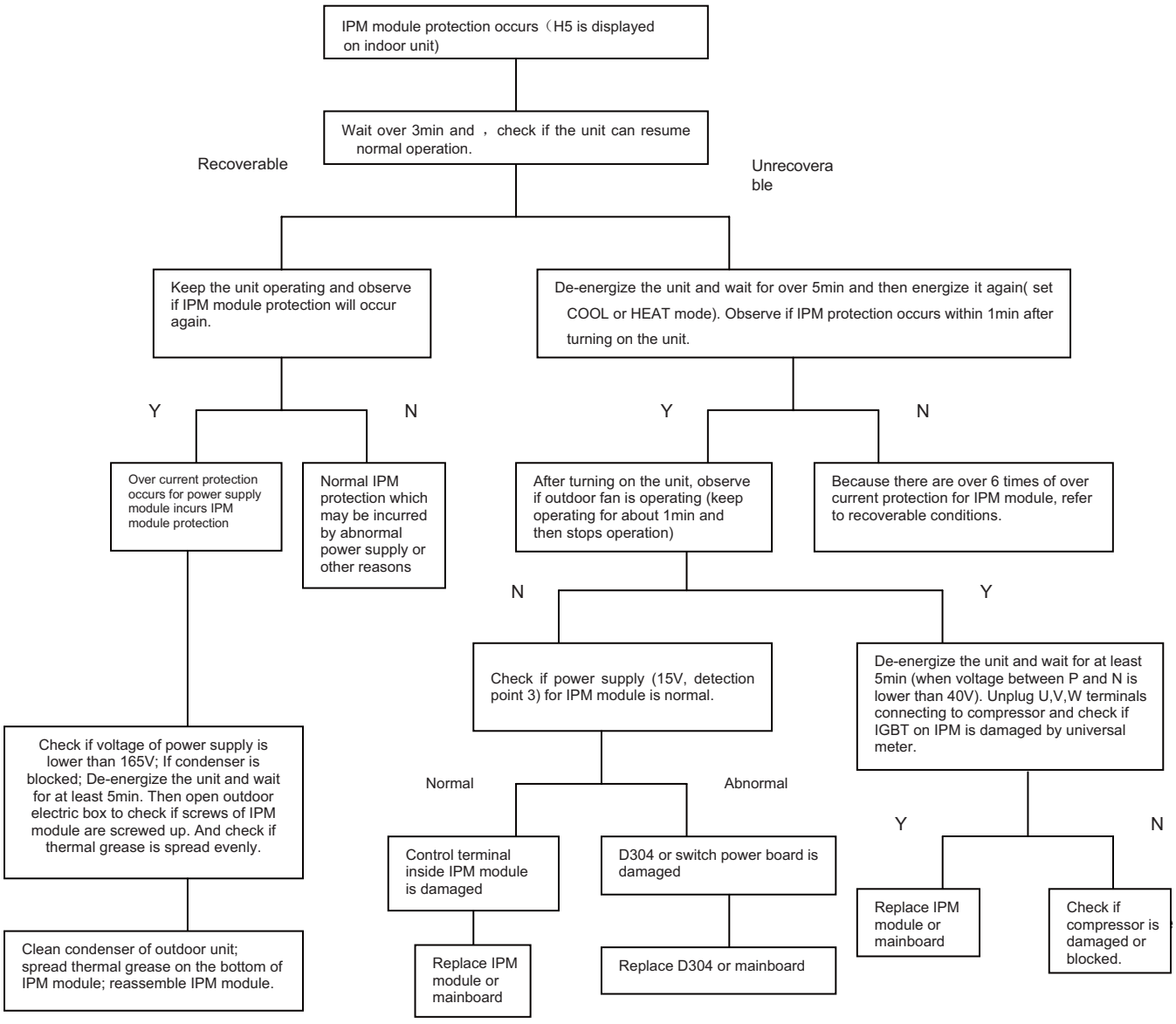
Check if EEPRPM is assembled correctly.



H5 is displayed on indoor unit.

Yellow LED lamp of outdoor unit blinks for 4 times

Check compressor module is no rmal: check there is short circuit between bus bar(left side of R201, refer to detection point 2 for more details) and phase U,V, W. Then check that between ground wire (heat sink of U404, refer to detection point 2 for more details) and phase U,V, W. If there is short circuit, the module has been burnt out. If not, the module is ok and the following steps shall be done.



Check if outdoor ambient temper ature sensor is well connected.

Check if outdoor ambient temperature sensor is open or short circuit.

(8) Malfunction of Outdoor Pipe Temperature Sensor

F4 is displayed on indoor unit

Red LED lamp of outdoor unit blinks for 5 times

Check if outdoor pipe temperatur e sensor is correctly connected

Check if resistor of outdoor pipe temp sensor is short or open circuit.

(9) Malfunction of Outdoor Discharge Temperature Sensor

F5 is displayed on indoor unit

Red LED lamp of outdoor unit blinks for 7 times.

Check if discharge temperature sensor is correctly connected

Check if resistor of discharge temp sensor is short or open circuit.

(10) PFC Over Current Protection

HC is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 14 times

Check if voltage of power supply is normal

Check if there is short circuit between any two pins. If so, IGBT is damaged. Replace the IGBT and turn on the unit again. If IGBT is still burnt out, the PFC drive circuit is damaged, replace the mainboard.

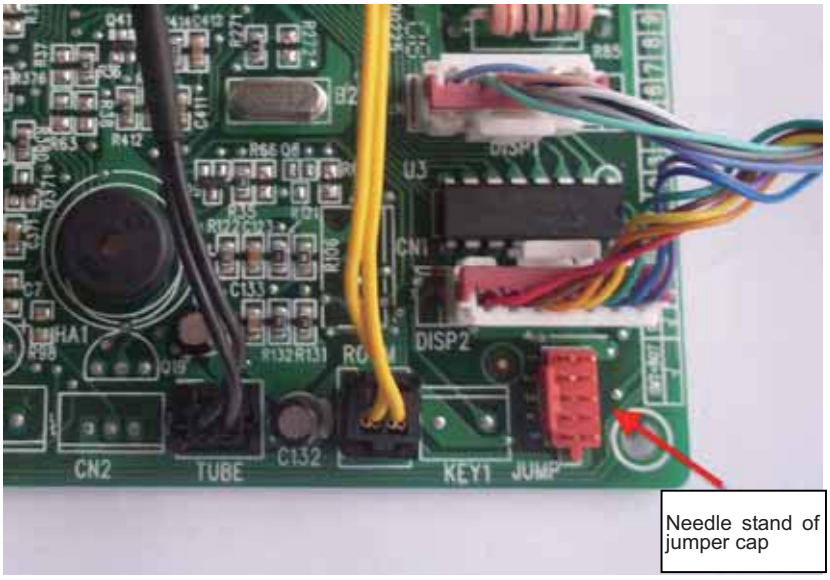
Check if voltage of PFC is normal (15V). If not, check switch power module.

(11)Mismatching of Models of Indoor and Outdoor Units

LP is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 16 times

Check if jumper cap of indoor unit is applicable.



(12) Low Pressure Protection (refrigerant leak) (not applicable to this model)

E3 is displayed on indoor unit

Red LED lamp of outdoor unit blinks for 9 time

Check if refrigerant leaks and if connecting pipe is correctly connected.

(13) Abnormality of 4-way valve

U7 is displayed on indoor unit

If 4-way valve is abnormally working, check 4-way valve is damaged; cut-off power and unplug 2 wire of 4-way valve. Then measure resistance between two wire. If the resistance is not between 1~2K, the electromagnetic valve is open circuit. In that case, replace coil of 4-way valve.

(14) Over-load Protection Function

E8 is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 6 times.

Measure temperature of outdoor heat exchanger during COOL operation; measuring temperature of indoor heat exchanger during HEAT operation.

When T_{pipe}≤T1℃, the previous operation status will be resumed.

When T_{pipe}≥T2℃, if T_{pipe}≤T1℃ for continuous 3min, normal operation will be resumed;

When T_{pipe}≥T3℃, compressor will operate at decreased frequency;

When T_{pipe}≥T4℃, compressor will stop operation;

During COOL and DRY operations：T1=52，T2=55，T3=58，T4=62；

During HEAT operation：T1=50，T2=53，T=56，T4=60；

Check if temperature of pipe meets the above conditions of over-load protection.

(15) Discharge Temperature Protection

E4 is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 7 times

When $TB_{discharge}$≥98℃, the frequency is prohibited to increase;

When $TB_{discharge}$≥103℃, the compressor operates at decreased frequency;

When $TB_{discharge}$≥110℃, the compressor stops operation;

When $TB_{discharge}$≤90, when compressor has stopped operation for 3min, it will resume operation.

Check if discharge temperature meets the above conditions of protection.

(16) Overload Protection

H3 is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 8 times.

Check the following points:

- Refrigerant charge.
- Restrictions within the capillary tube.
- Poor air flow across the indoor & outdoor coils.
- Correct operation of the four way reversing valve.

Check the Compressor Over Temperature connector plug located on the outdoor PCB for correct termination & continuity to the over temperature protector.

Check the over temperature protector located next to the three compressor terminals.

Note: This over temperature protector is “normally closed”.

(17) Power Protection

L9 is displayed on indoor unit

Yellow LED lamp of outdoor unit blinks for 9 times

When Pc≥1500w, if Pc≤1400w for continuous 3min, the unit will resume normal operation;

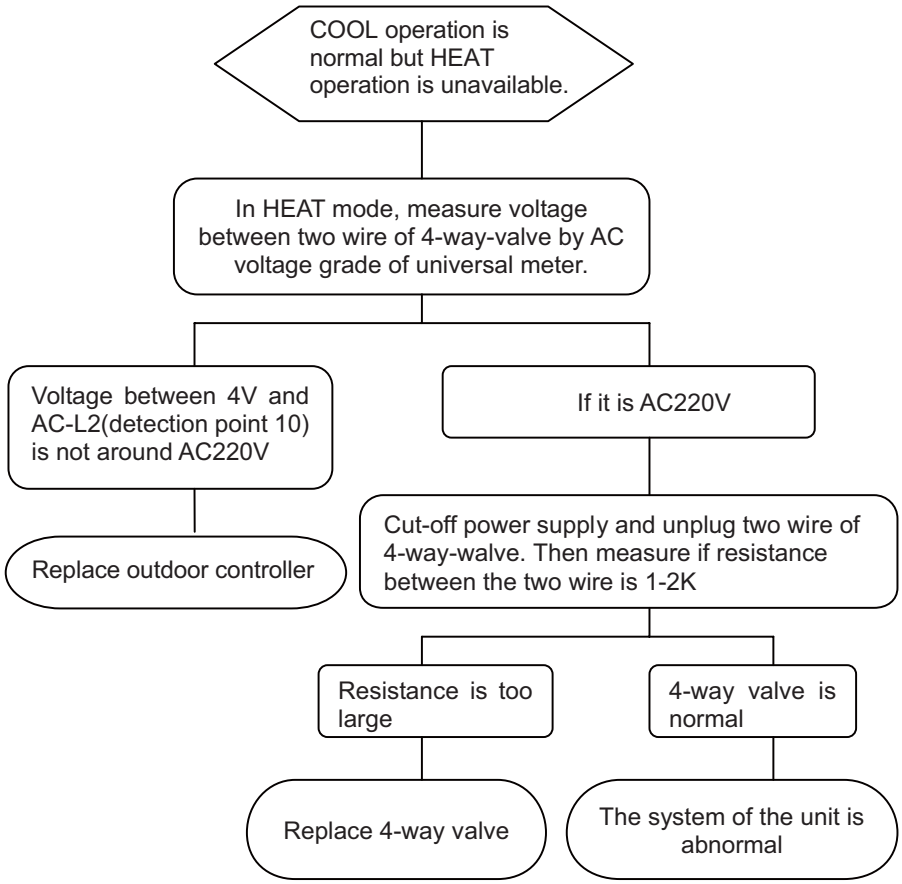
When Pc_B≥1600w, the unit will operate at decreased frequency;

When Pc≥1700w, compressor stops operation.

Check if power of compressor meets the conditions mentioned above. Decrease the frequency so as to reduce the power to less than 1400w for 3min. Then check if the compressor resumes operation.

(18) Other Normal Malfunction

COOL operation is normal but HE AT operation is unavailable.



HEAT operation is normal but COOL operation is unavailable.

It is usually due to K3 contact adhesion of outdoor controller , which can be judged by universal meter.

After replacing outdoor controller, the malfunction still exists:

In that case, check if communication wire, temp sensor, fan, compressor or 4-way valve is normal.

Communication wire: Check if communication wire, live wire and neutral wire are incorrectly connected, or wiring terminal is poorly connected. If the communication wire is prolonged, check if the joint is well connected.

Temperature sensor: measure resistances to ground of the 3.3V(detection point 6) and IPM15V(detection point 3). If there is short circuit to ground, check if each temp sensor is damaged.

Electric reactor: If communication malfunction still occurs after replacing electric box, unplug 2 wiring terminals of electric reactor and measure resistance between these two terminals by universal meter.

Fan: unplug wiring terminal of fan and measure resistance between any two wire among red, yellow, white wire by universal meter. Usually, the resistance will be hundreds of ohm, otherwise, there is open circuit and the fan is damaged.

Compressor: If operation environment is good, wiring is correct and system is in normal conditions, the H5 protection still frequently occurs after replacing controller, probably because compressor has malfunction.

4-way valve: unplug two purple wire of 4-way valve and then measure if resistance between these two wire is 1~2K. If the resistance is too large, there is open circuit of electromagnetic valve and coil of 4-way valve shall be replaced.

If malfunctions above don't exist, inspect indoor unit.

(19)Cautions:

1.Before replacing mainboard of inverter outdoor unit, check if the substituted mainboard is qualified. The following tests shall be done:

a. Check if there is short circuit between any two pins. If so, this mainboard of outdoor unit can't be used.

b. Check if there is short circuit between P,N of DC bus bar. If so, this mainboard of outdoor unit can't be used.

c. Check if there is short circuit between P and U,V,W and between N and U,V,W. If there is any short circuit, this mainboard can't be used.

2. Each kind of compressor is applicable to one kind of mainboard. There is one-to-one relationship between mainboard and compressor. Before replacement, check the model of the mainboard which has malfunction and then use the mainboard with the same model for replacement. Don't judge model of mainboard according to model of the unit, or else, mismatching between mainboard and compressor may be incurred.

3. Before replacing compressor, choosen compressor which has the same model for replacement. Don't judge model of compressor according to model of the unit, or else, mismatching between compressor and pipeline or controller may be incurred.

4. Wire can't contact each other, 4-way valve, compressor and sharp edge. Ground wire of compressor, fan and electric box shall be separately fixed.