



# DUAL CAPACITY INVERTER HEAT PUMP CONDENSING UNIT SERVICE MANUAL

(GC202006-I)

Capacity: 24kBtu/h~60kBtu/h

Rate Frequency: 60Hz

Operation Range:

Cooling: 5°F (-15°C) ~129.2°F (54°C )

Heating: -22°F (-30°C)~75.2°F (24°C)






## Foreword

Thank you for choosing Gree U-Match air conditioners. In order to correctly install and use our units, and for the satisfactory operation effect, please read this manual carefully.

This manual specifies safe operation requirements from perspectives of product introduction, control, troubleshooting and maintenance, as well as basic principles and implementation methods. Professional operators must abide by relevant national (local) safety requirements and technical specifications set forth in this manual during operations; otherwise, the air conditioning system may fail or be damaged, and personnel safety accident may also occur.

## Safety Notice

	Before using the air conditioner, please first read the instruction manual.
	Before installing the air conditioner, please first read the instruction manual.
	Before repairing the air conditioner, please first read the technical service manual.

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## Safety Notice on Maintenance



### PROHIBITED:

- (1) Do not pierce or burn.
- (2) Please note that refrigerant may be odorless.
- (3) The appliance shall be stored in a room without continuously operating ignition sources (For example: open flames, an operating gas appliance or an operating electric heater).
- (4) Indoor unit adopts special joints that can't be detached. The installation method is the same with the common joints. However, because the joint can't be detached, if it is badly connected and causes leakage, it needs to be cut and replaced by a new one through welding.
- (5) Using unsuitable parts or tools may lead to electric shock or fire hazard.
- (6) If refrigerant leaks during maintenance, please ventilate the room immediately. Heavy leakage may lead to breathing difficulty, severe injury or death.
- (7) Disconnect power before disassembling the appliance for maintenance.
- (8) The appliance should be maintained and cared by authorized technical personnel with necessary qualifications.



### WARNING:

- (1) If the working place is more than 2m's high, please wear a safety helmet, gloves and a safety belt.
- (2) Never mix any other substances except the specified refrigerant into the refrigerant circuit.
- (3) When re-locating the appliance, check whether the new location is strong enough to withstand the weight of the appliance.
- (4) If there is refrigerant leak, please fix the leak before charging in the refrigerant. After refrigerant is charged, check for refrigerant leaks. If you cannot spot the leak, stop the maintenance work. Please evacuate the system and close the service valve to prevent refrigerant leaking into the room.
- (5) Prepare suitable tools and protectors.
- (6) If you need to carry out maintenance or check the electric circuit without cutting off the power, please be careful not to touch the electrical parts.



### NOTICE:

- (1) If the appliance is maintained at a humid place, it should be grounded to avoid electric shock.
- (2) Never repair the unit with wet hands. Operating the unit with wet hands may lead to electric shock.
- (3) If the unit is not correctly grounded, please check and fix it.
- (4) Before cleaning the unit, please disconnect power to prevent the inner fan from starting up and running at

high speed; Otherwise personal injury may occur.

- (5) Measure the insulation resistance after maintenance. The resistance must be 1M or higher. Bad insulation may lead to electric shock.
- (6) Welding and cutting work must be done in a well-ventilated place.
- (7) Gas appliances, heaters and other fire sources should be kept away from the installation and maintenance site.
- (8) Maintenance should be done according to suggestions of the manufacturer.
- (9) Maintenance should be done only after the refrigerant is completely reclaimed from the unit.

**OBSERVED:**

- (1) After the maintenance work is done, check the drainage of indoor unit.
- (2) Do not tilt the unit, otherwise, water may spill out from the unit and make the floor and furniture wet.
- (3) Disassembly of the unit, handling of the refrigerant, oil and accessories should all be done according to applicable local rules and regulations.

## Safety Notice on Operation

**PROHIBITED:**

- (1) Never try to modify the unit, otherwise, it may cause electric shock, overheat or fire hazard.
- (2) If the power cord or conducting wires are scratched, please replace them.
- (3) Never use connected or extended power cord or share the power socket with other appliances.
- (4) Prepare a specialized power circuit for the appliance.

**WARNING:**

- (1) If the power plug is dirty, please clean it before inserting it to the power socket. If the power plug is loose, please tighten it up.
- (2) Do not damage the power cord. A damaged or refitted power cord may lead to electric shock or fire hazard.
- (3) Check frequently whether the appliance is in good condition.



**NOTICE:**

- (1) After changing the batteries of remote control, please discard them to avoid being swallowed by children.
- (2) When the unit is working, do not remove the fan cover.
- (3) Do not use organic solvents to wipe the controller operating panel.
- (4) Before cleaning the unit, cut off the power supply.





# 1 Product Introduction

## 1.1 Lists of Units

### 1.1.1 List of Outdoor Units

Model	Power Supply	Finished Product Code	Appearance
	V/Ph/Hz		
GTS18HN036A	208/230V-1Ph-60Hz	CF090W1530	
GTS18HN060A	208/230V-1Ph-60Hz	CF090W1820	

## 1.1.2 List of Indoor Units

Model		Cooling/Heating Capacity (Btu/h)	Power Supply	Finished Product Code	Appearance
			V/Ph/Hz		
Airhandler	GTA18H024A	24000/24000	208/230V-1Ph-60Hz	EH010N0040	
Airhandler	GTA18H036A	36000/36000	208/230V-1Ph-60Hz	EM116N0890	
Airhandler	GTA18H048A	48000/48000	208/230V-1Ph-60Hz	EH010N0050	
Airhandler	GTA18H060A	54000/54000	208/230V-1Ph-60Hz	EH010N0031	

**NOTE:** 1 Ton =12000Btu/h = 3.517kW

## 1.2 Electrical Parameters

Model	Power supply	Circuit breaker capacity
	V/Ph/Hz	A
GTS18HN036A	208/230V-1Ph-60Hz	35
GTS18HN060A	208/230V-1Ph-60Hz	45

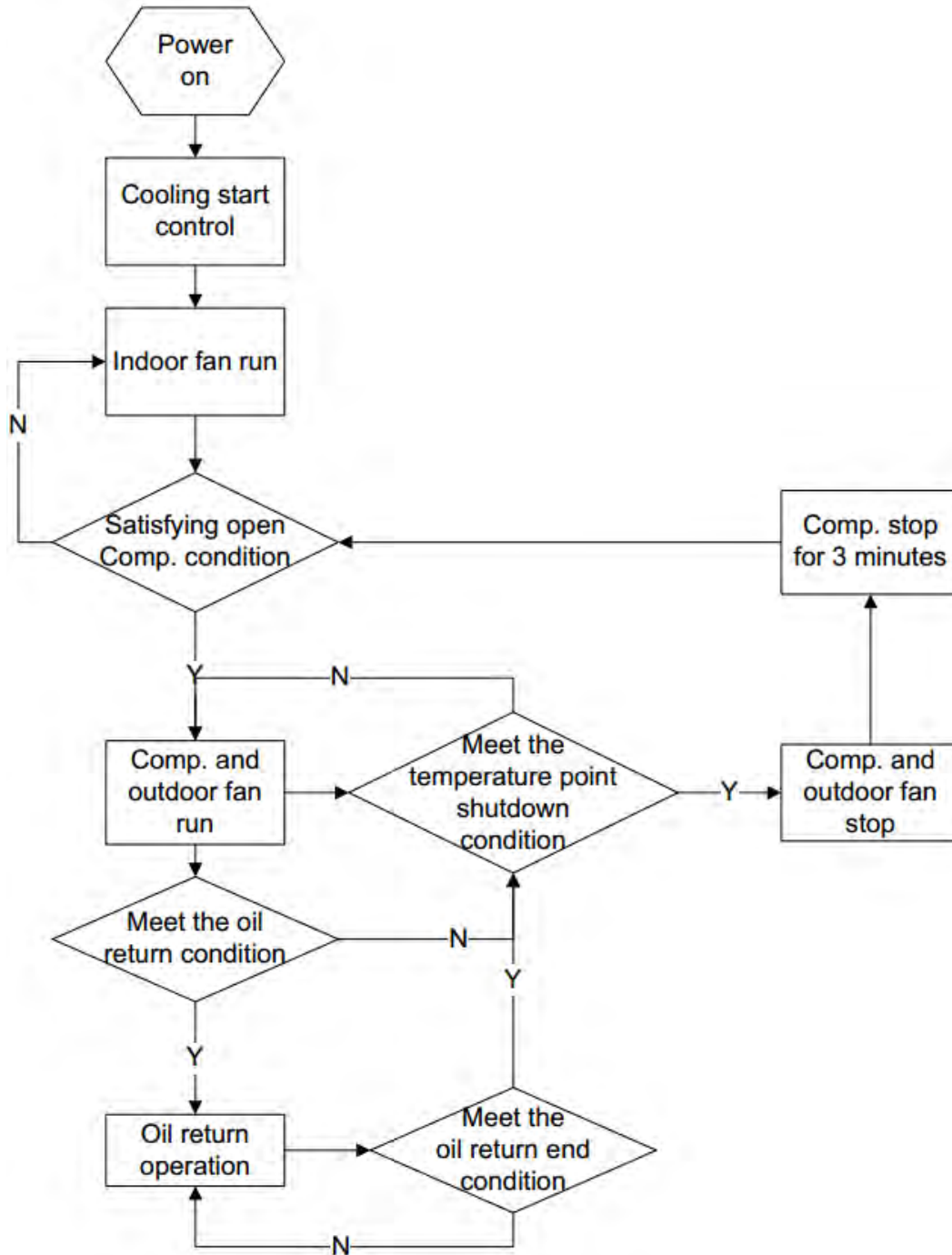
Model	Power Supply	Fuse Capacity	Circuit Breaker Capacity
	V/Ph/Hz	A	A
GTA18H024A	208/230V-1Ph-60Hz	3.15	15
GTA18H036A	208/230V-1Ph-60Hz	3.15	15
GTA18H048A	208/230V-1Ph-60Hz	3.15	15
GTA18H060A	208/230V-1Ph-60Hz	3.15	15



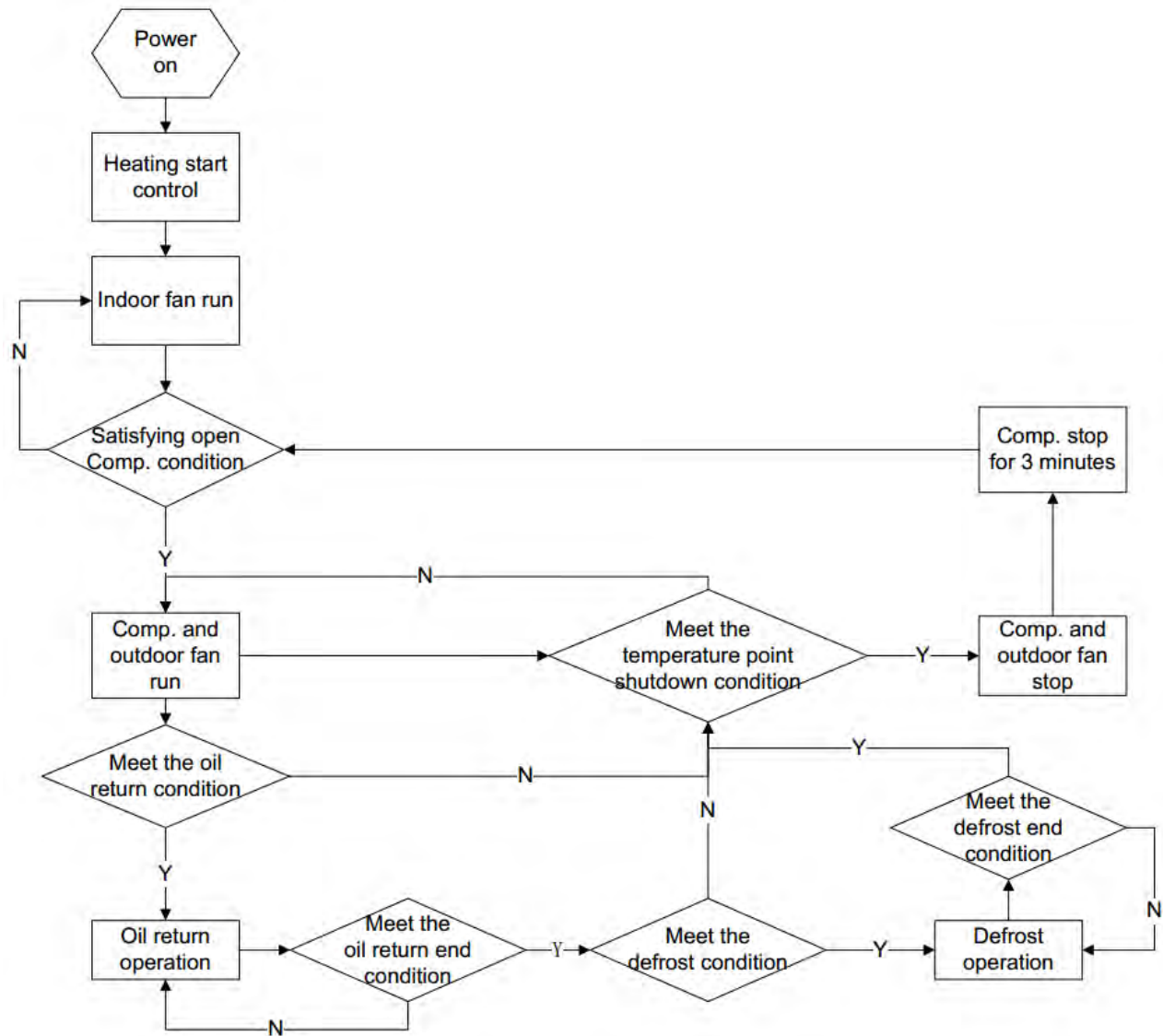
## 2 Control

### 2.1 Operation Mode

#### 2.1.1 Cooling Mode



## 2.1.2 Heating Mode



## **2.2 Control Mode**

### **2.2.1 Based Control**

#### **2.2.1.1 Compressor Control**

When cooling or heating mode is turned on, indoor fan will run for a while before the compressor starts. Under different modes, the compressor can only be stopped after running for some time (special cases excluded). This is to protect the compressor from frequent start or stop. Once the compressor is stopped, it must not be restarted right away. Please wait for a few minutes.

#### **2.2.1.2 EXV Control**

When the unit is first started, the electronic expansion valve will reset control. During the process, the expansion valve will produce rattling sound. When cooling or heating mode is turned on, the valve will be open at a certain step before the compressor starts.

#### **2.2.1.3 Outdoor Fan Control**

This series air conditioner has two types of outdoor units: one with a single fan and the other with double fans. The outdoor fan can run at the highest level 10 and the lowest level 1. By controlling the speed of outdoor fan, the unit can achieve cooling at low temperature and heating at high temperature. In fan mode, outdoor fan will not work.

#### **2.2.1.4 4-way Valve Control**

After heating mode is turned on for a while, 4-way valve will be energized to change the direction of refrigerant flow so that the system can run in heating and the indoor unit will not blow cold air. Under other modes, the valve will not be energized.

To avoid the 4-way valve from incorrectly changing directions, when the unit stops in heating, due to a temperature point or other protection reasons, the 4-way valve will continue to function temporarily and lose power after a while.

There must be adequate differential pressure for the 4-way valve to change directions.

### **2.2.2 Special Control**

#### **2.2.2.1 Defrosting Control**

ODU defrosting control in heating: Defrosting will start when the temperature sensed by outdoor tube temperature sensor reaches a preset value. During defrosting, the 4-way valve will switch to the cooling condition,

and outdoor and indoor fan will both stop. When the temperature sensed by outdoor tube temperature sensor reaches the preset value of defrosting stop, system will quit defrosting. The 4-way valve will switch back to the heating condition, compressor and outdoor unit fan restart.

#### 2.2.2.2 Oil Return Control

If the unit is running at low frequency for a long time, system will enable oil return control. This is to lead oil in the pipeline back to the compressor so that the compressor will not be lack of oil. Generally, the oil return takes about 5min. The compressor running frequency will be raised to the preset oil return frequency.

### 2.2.3 Protection Control

#### 2.2.3.1 High Pressure Protection Control

System will enable high pressure protection control if the high pressure switch is detected open for continuously a little time. Under high pressure protection, system will be shut down and display error code E1.

When high pressure protection occurs for the first time, system will restore operation if the high pressure switch is detected to be reclosed for continuously a little time. When high pressure protection occurs for the second time in a certain time period, system will not restore operation. You need to manually turn off the unit and clear the error before restarting up the unit. (If high pressure protection occurs frequently, please send for professional personnel to repair.)

#### 2.2.3.2 Low Pressure Protection Control

System will enable low pressure protection control if the low pressure switch is detected open for continuously a little time. Under low pressure protection, system will be shut down and display error code E3. When low pressure protection occurs, system will restore operation if the low pressure switch is detected to be reclosed within a few minutes after shutdown. If low pressure protection occurs for several times in a period of time, system will not restore operation automatically. You need to manually turn off the unit before restarting up the unit.

#### 2.2.3.3 High Temperature Prevention Control

Under heating mode, system will enable high temperature prevention control if the temperature sensed by indoor tube temperature sensor reaches a certain value. When high temperature prevention control is enabled, outdoor fan will slow down.

#### 2.2.3.4 Discharge High Temperature Protection Control

System will enable discharge temperature protection control if the discharge high temperature sensor is

detected open for continuously a little time. Under discharge high temperature protection, system will be shut down and display error code E4. When discharge high temperature protection occurs, system will restore operation if the discharge high temperature sensor is detected to be reclosed within a few minutes after shutdown. If discharge high temperature protection occurs for several times in a period of time, system will not restore operation automatically. You need to manually turn off the unit before restarting up the unit.

## 2.3 Functions

### 2.3.1 Set Capacity Dip Switch

Set the capacity of the outdoor unit through the four dip switches of the outdoor unit main control board. Specific dip switch definition, the first dip switch distinguishes the capacity.

Capacity	24K	36K	48K	60K
Dip Switches				

### 2.3.2 Set Defrost Mode

The second dip switch is selecting the defrost mode.

The second dip switch is used to change the defrost setting, factory default setting is standard defrost. Under extremely low environment temperature, if the standard defrost cannot have the condenser defrosted completely, please set the second dip switch to be strong defrost. Under strong defrost, the defrosting time will be longer, which enable the condenser to be defrosted completely.

Defrost mode	Outdoor unit dip switches
Standard Defrost (Default)	
Strong Defrost	

### 2.3.3 Set Operating Mode

The third dip switch and the fourth dip switch are selecting the operating mode. Standard mode is the conventional mode.

By setting the strong mode dip switches of the condensing unit, the air conditioner can quickly increase the capacity output and ensure reliable operation in a short time, so as to meet the user's demand for the indoor temperature to quickly reach the set temperature.

Energy saving mode is achieved by setting the condensing unit operating mode to operate the air conditioner within a small load range.

Operating mode	Outdoor unit dip switches
Standard mode (Default)	
Strong mode	
Energy saving mode	

### 2.3.4 Set Indoor Fan Speed

Set the indoor fan speed through the eight dip switches of the indoor main control board. The higher level, the higher speed of the indoor unit fan.

Capacity	24K indoor unit dip switches	36K indoor unit dip switches
Level 1 (Default)		
Level 2		

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Capacity	48K indoor unit dip switches	60K indoor unit dip switches																																																
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### 2.3.5 Forced Defrost Control

Press and hold "SW1" for about 5s to enter the first level menu of the debugging mode, the outdoor unit mainboard LED displayer flashes. Under the first level menu, short press "SW1" to switch various functions. After switching to "06", short press "SW2" or "SW3" to enter the forced defrosting mode, "ON" means open, "OF" means close, and then short press "SW1" to save. During debugging, if no operation is performed within 10s, the debugging mode interface will be exited.

### 2.3.6 Refrigerant Recovery Control

Press and hold "SW1" for about 5s to enter the first level menu of the debugging mode, the outdoor unit mainboard LED displayer flashes. Under the first level menu, short press "SW1" to switch various functions. After switching to "08", short press "SW2" or "SW3" to enter the refrigerant recovery control mode, "ON" means open, "OF" means close. And then short press "SW1" to save. During debugging, if no operation is performed within 10s, the debugging mode interface will be exited.

### 2.3.7 Forced Operation Control

Press and hold "SW1" for about 5s to enter the first level menu of the debugging mode, the outdoor unit mainboard LED displayer flashes. Under the first level menu, short press "SW1" to switch various functions. After

switching to "09", short press "SW2" or "SW3" to enter the forced operation control mode, "01" denotes that turn on the forced operation cooling mode; "02" denotes that turn on the forced operation cooling mode; "OF" indicates that shut down the forced cooling / heating mode. And then short press "SW1" to save. During debugging, if no operation is performed within 10s, the debugging mode interface will be exited.

### **2.3.8 Thermostat Functions**

Thermostat model: XE70-00/E1, please refer to the thermostat instruction manual for all functions.



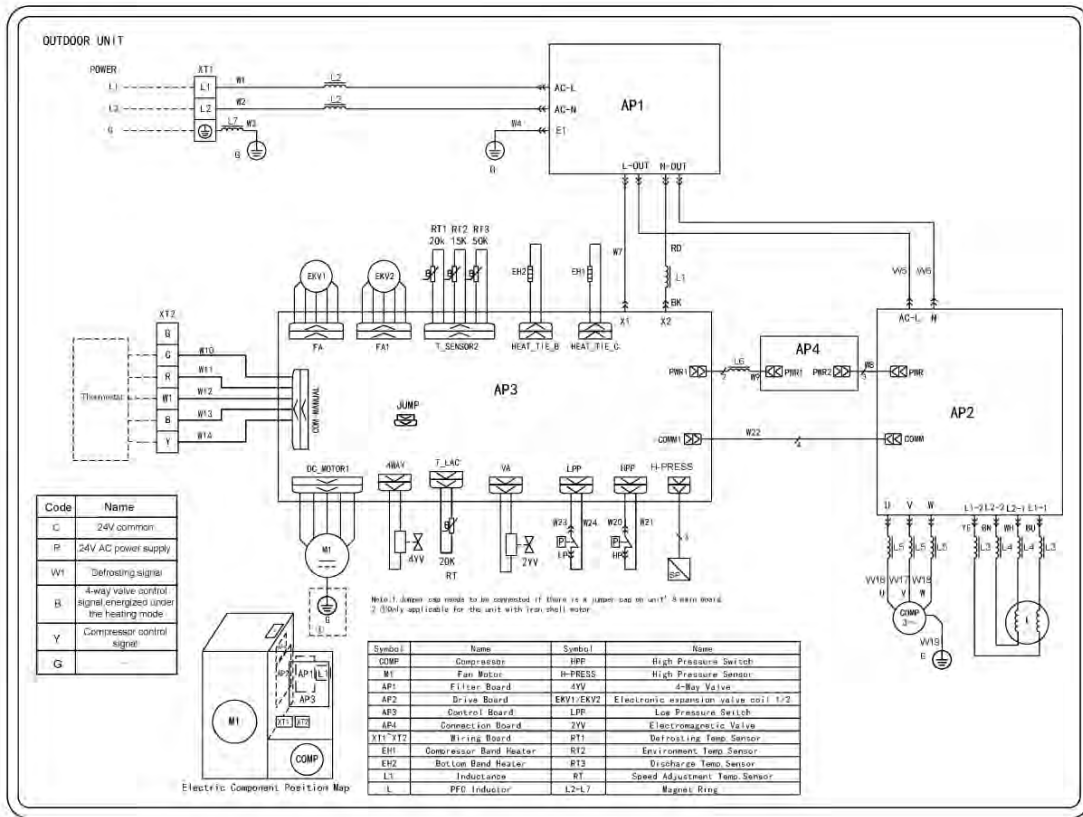
### 3 Troubleshooting

#### 3.1 Wiring Diagrams

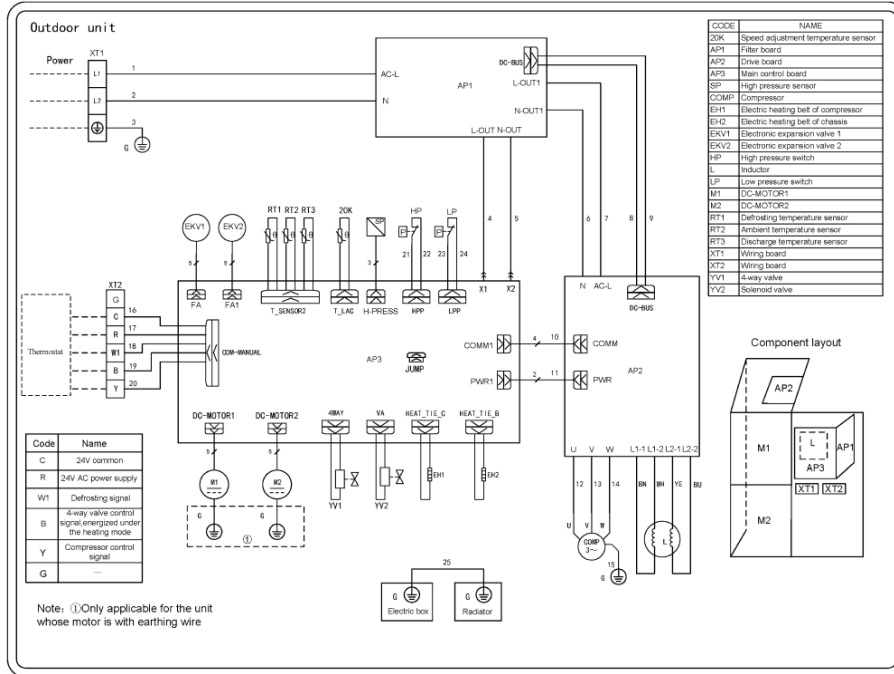
The following electric diagram is for reference only. Please refer to diagram stuck on the unit as the latest version.

##### 3.1.1 Wiring Diagrams of ODUS

Model: GTS18HN036A

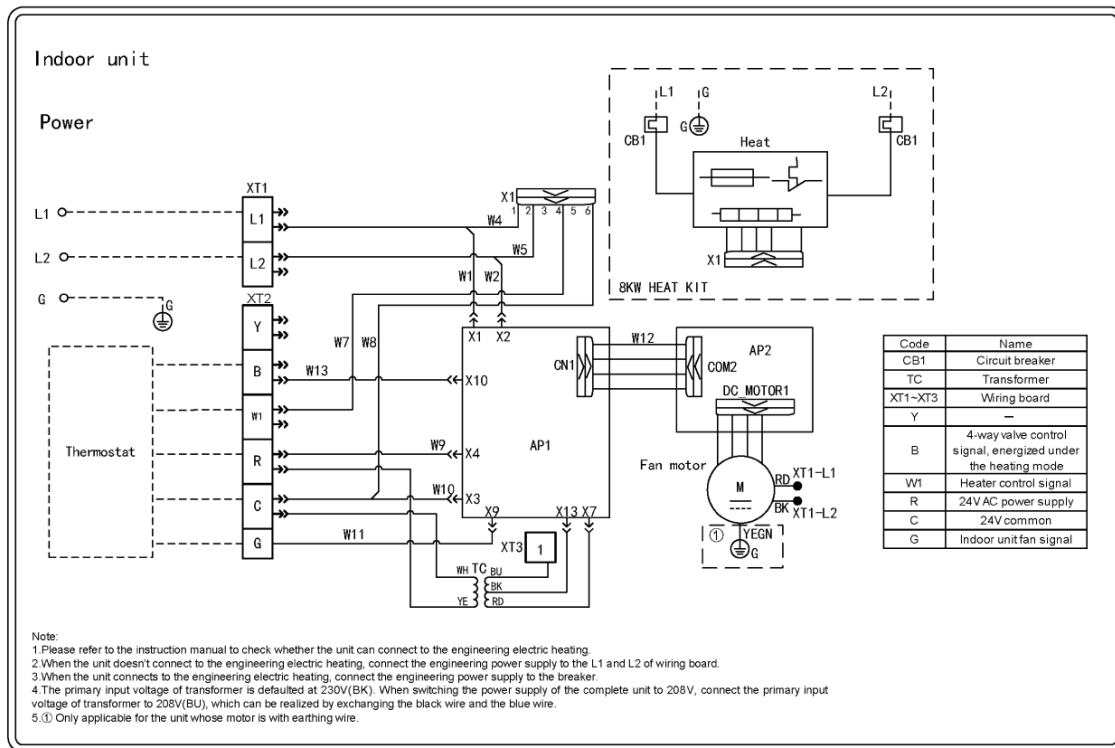


Model: GTS18HN060A

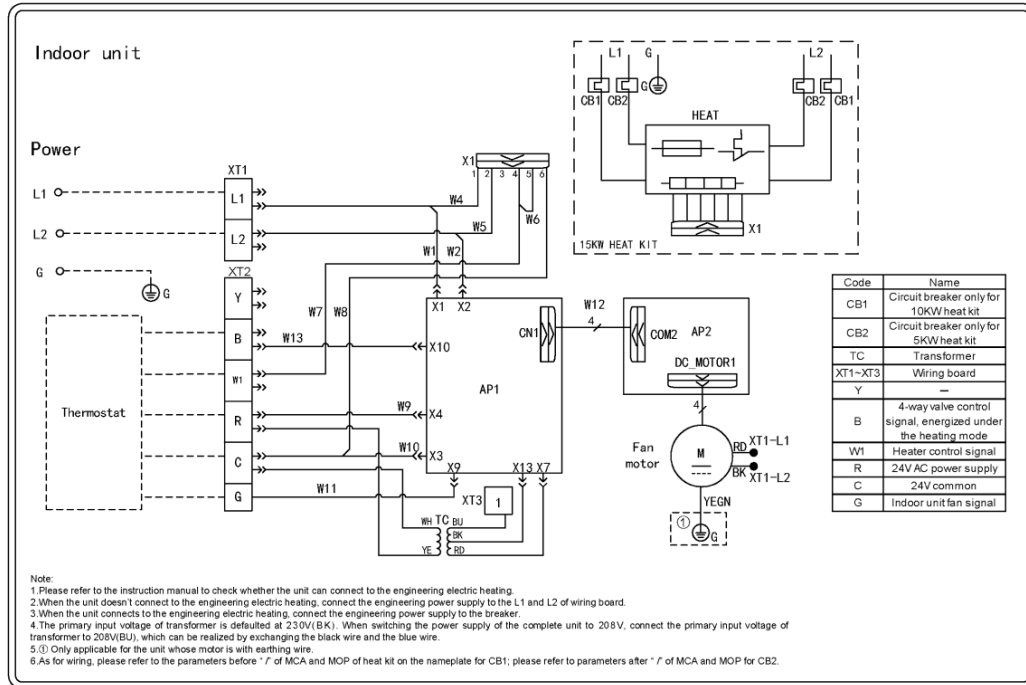


### 3.1.2 Wiring Diagrams of IDUs

Model: GTA18H024A; GTA18H036A



Model: GTA18H048A; GTA18H060A



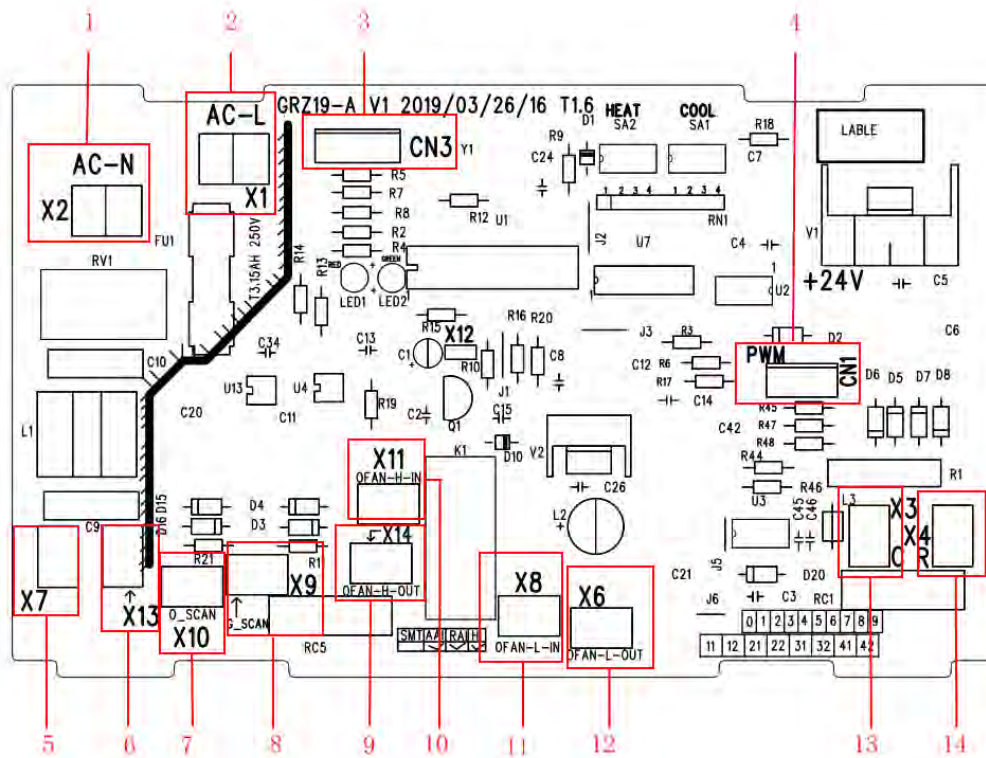
## 3.2 PCB Layout

### 3.2.1 Interface

Indoor unit:

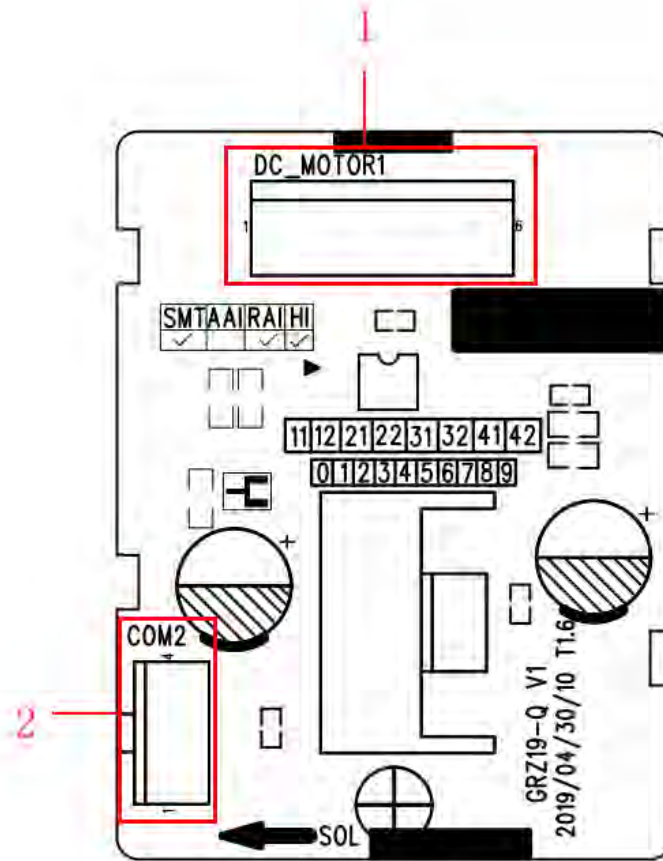
**Model:** GTA18H024A; GTA18H036A; GTA18H048A; GTA18H060A

Mainboard



No.	Printing	Interface	No.	Printing	Interface
1	AC-N (X2)	Neutral wire input	8	X9(G_SCAN)	Indoor motor check
2	AC-L (X1)	Live wire input	9	X14(OFAN-H-OUT)	AC motor high speed output
3	CN3	Wired control communication interface	10	X11(OFAN-H-IN)	AC motor high speed input
4	CN1	DC motor output	11	X8(OFAN-L-IN)	AC motor low speed input
5	X7	Transformer Neutral wire input	12	X6(OFAN-L-OUT)	AC motor low speed output
6	X13	Transformer Live wire input	13	X3(C)	Transformer Neutral wire output
7	X10(O_SCAN)	4-Way check	14	X4(R)	Transformer Live wire output

Pinboard

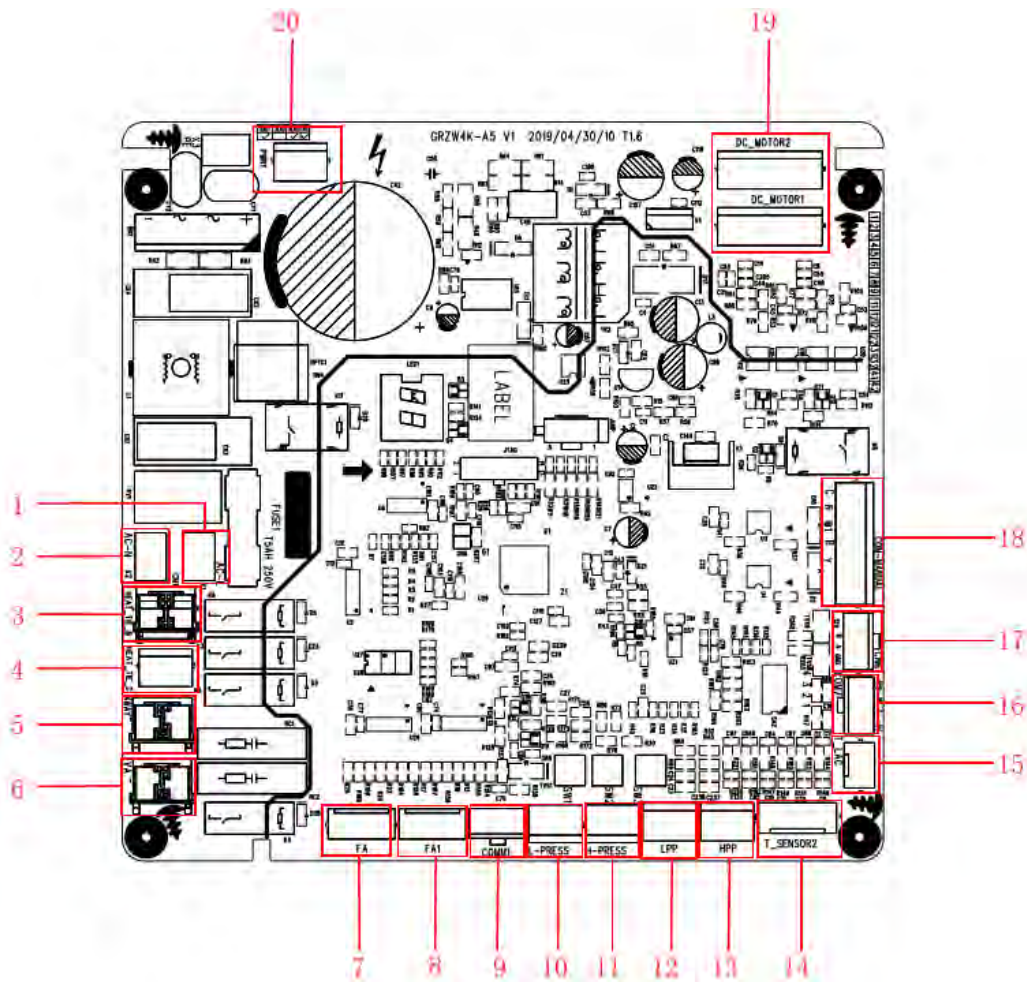


No.	Printing	Interface	No.	Printing	Interface
1	DC-MOTOR1	DC motor output	2	COM2	DC motor control signal input

Outdoor unit:

**Model:** GTS18HN036A; GTS18HN060A

Mainboard



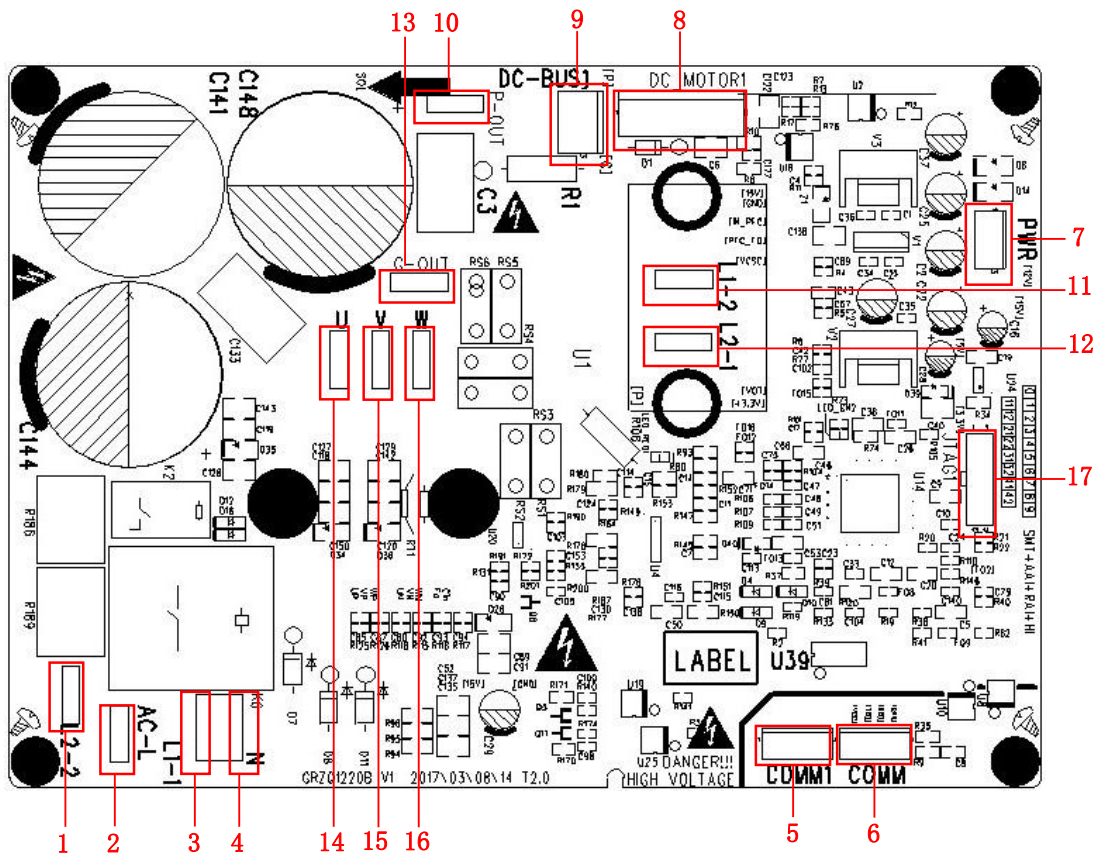
No.	Printing	Interface	No.	Printing	Interface
1	AC-L	Live wire input	11	H-PRESS	High pressure sensor interface
2	AC-N	Neutral wire input	12	LPP	System low pressure protection interface
3	HEAT_TIE_B	Chassis electric heating belt	13	HPP	System high pressure protection interface
4	HEAT_TIE_C	Compressor electric heating belt	14	T_SENSOR2	2. Outdoor tube temperature sensor interface 4. Outdoor ambient temperature sensor interface 6. Discharge temperature sensor interface
5	4WAY	4-way valve	15	T_LAC	Low temperature cooling temperature sensing

## DC INVERTER HEAT PUMP CONDENSING UNIT

No.	Printing	Interface	No.	Printing	Interface
6	VA	Electromagnetic valve interface	16	COM7	Unit communication interface
7	FA	Electronic expansion valve interface	17	CN6	GPRS communication interface
8	FA1	Electronic expansion valve 1 interface Refrigerant heat dissipation	18	COM-MANUAL	Thermostat interface
9	COMM1	Drive communication interface	19	DC_MOTOR1 DC_MOTOR2	DC motor output
10	L-PRESS	Low pressure sensor interface	20	PWR1	310V DC power supply interface

Drive Board:

**Model:** GTS18HN036A

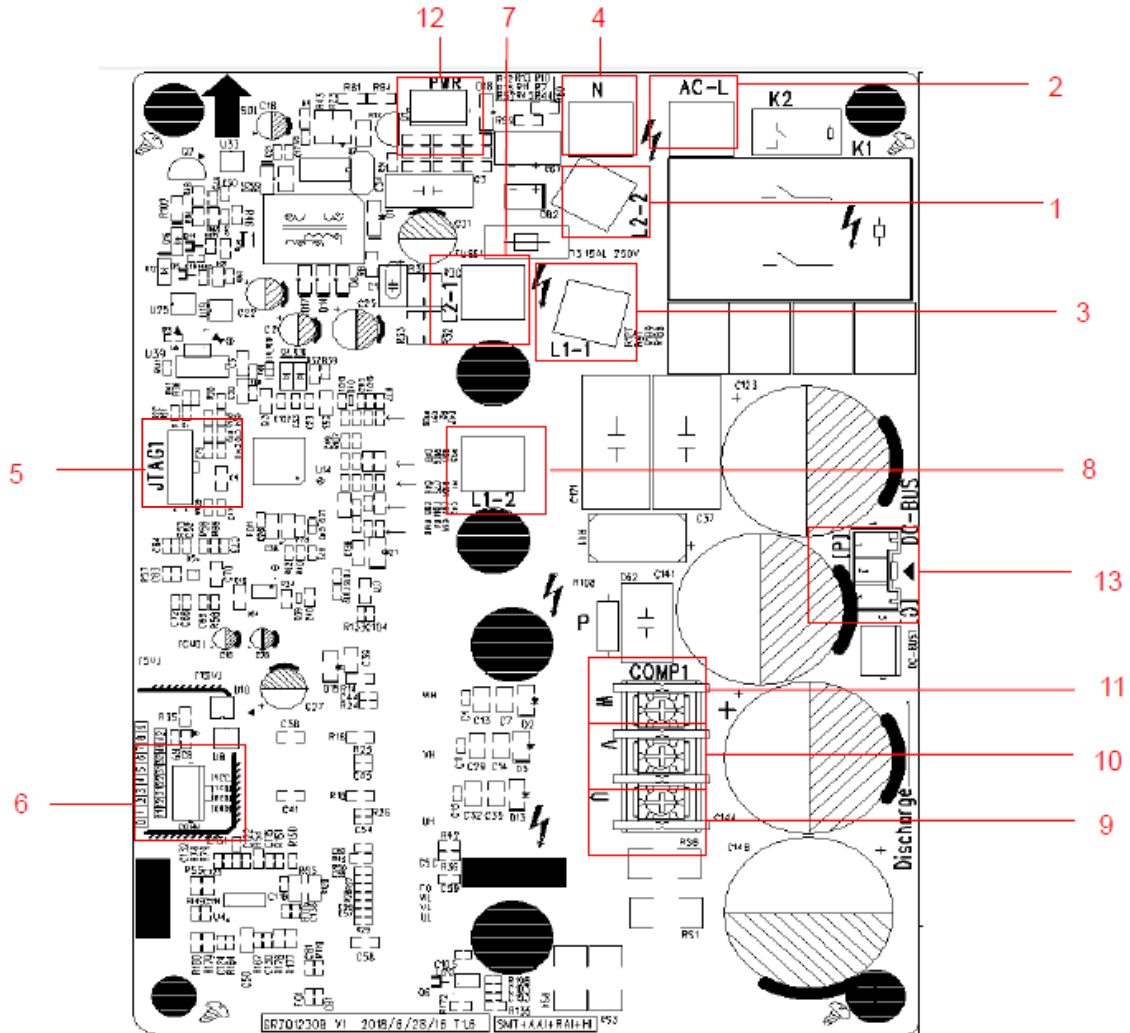


No.	Printing	Interface	No.	Printing	Interface
1	L2-2	PFC induction wire (blue)	10	P-OUT	Reserved
2	AC-L	Live wire	11	L1-2	PFC induction wire (white)
3	L1-1	PFC induction wire (brown)	12	L2-1	PFC induction wire (yellow)
4	N	Neutral wire	13	G-OUT	Reserved
5	COMM1	Communication terminal, same with COMM	14	U	Compressor U phase terminal

## DC INVERTER HEAT PUMP CONDENSING UNIT

No.	Printing	Interface	No.	Printing	Interface
6	COMM	Communication terminal, same with COMM1	15	V	Compressor V phase terminal
7	PWR	Drive power supply terminal	16	W	Compressor W phase terminal
8	DC-MOTOR1	DC fan terminal	17	JTAG1	Programming interface (for testing)
9	DC-BUS1	Power discharge terminal (for testing)	-	-	-

**Model:** GTS18HN060A

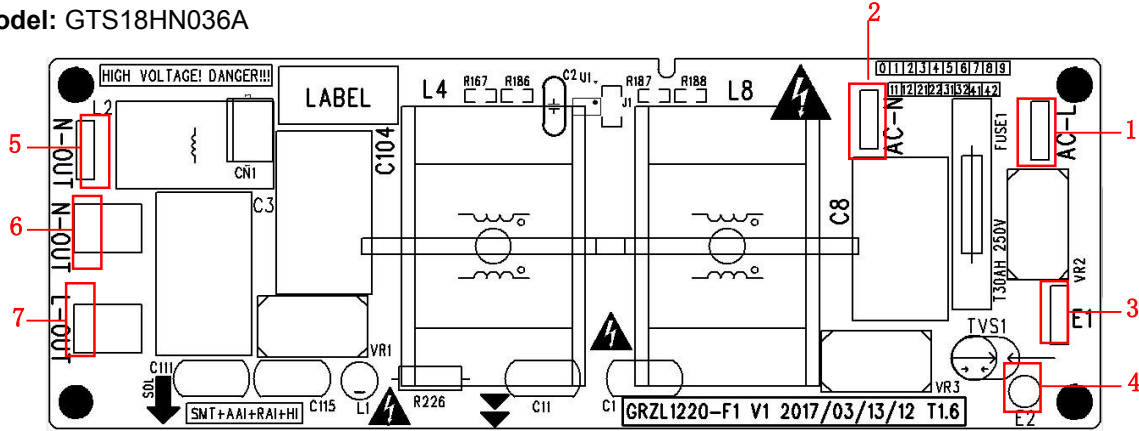


No.	Printing	Interface	No.	Printing	Interface
1	L2-2	PFC induction wire (blue)	8	L1-2	PFC induction wire (white)
2	AC-L	Live wire	9	U	Compressor U phase terminal
3	L1-1	PFC induction wire (brown)	10	V	Compressor V phase terminal
4	N	Neutral wire	11	W	Compressor W phase terminal
5	JTAG1	Programming interface (for testing)	12	PWR	Drive power supply terminal
6	COMM	Communication terminal, same with COMM	13	DC-BUS	Power discharge terminal (for testing)
7	L2-1	PFC induction wire (yellow)	-	-	-



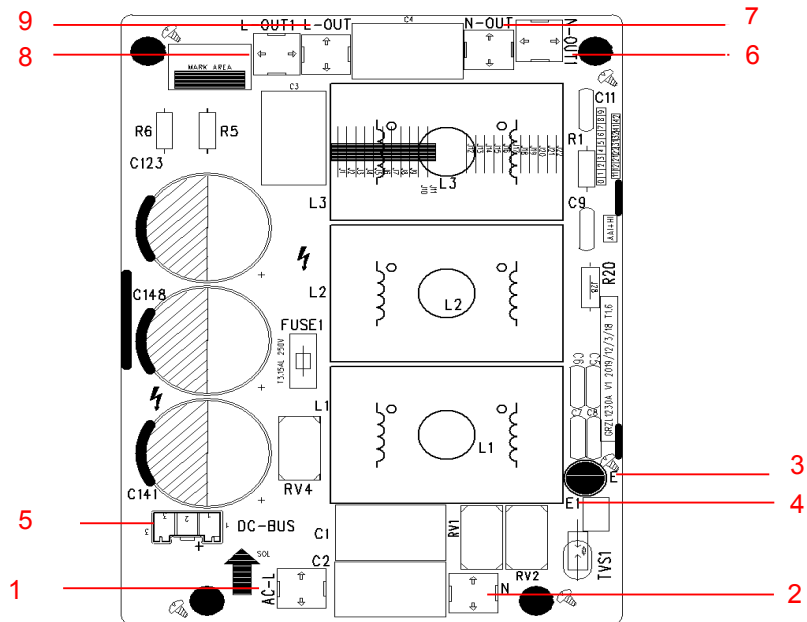
Filtering Board:

Model: GTS18HN036A



No.	Printing	Interface	No.	Printing	Interface
1	AC-L	Power input live wire terminal	5	N-OUT	Power output neutral wire terminal (reserved)
2	AC-N	Power input neutral wire terminal	6	N-OUT	Power output neutral wire terminal
3	E1	Filtering board ground wire terminal	7	L-OUT	Power output live wire terminal
4	E2	Filtering board grounding hole (reserved)	-	-	-

Model: GTS18HN060A



No.	Printing	Interface	No.	Printing	Interface
1	AC-L	Power input live wire terminal	6	N-OUT1	Power output neutral wire terminal (reserved)
2	N	Power input neutral wire terminal	7	N-OUT	Power output neutral wire terminal
3	E	Filtering board ground wire terminal	8	L-OUT1	Power output live wire terminal
4	E1	Filtering board grounding hole (reserved)	9	L-OUT	Power output live wire terminal
5	DC-BUS	Power discharge terminal (for testing)	-	-	-

## 3.2.2 IPM, PFC Testing Method

### 3.2.2.1 Method of Testing IPM Module

(1) Preparation before test: prepare a universal meter and turn to its diode option, and then remove the wires U, V, W of the compressor after it is powered off for one minute.

(2) Testing Steps

Step 1: put the black probe on the place P and the red one on the wiring terminal U, V, W respectively as shown in the following figure to measure the voltage between UP, VP and WP.

Step 2: put the red probe on the place N and the black one on the wiring terminal U, V, W respectively as shown in the following figure to measure the voltage between NU, NV and NW.

(3) If the measured voltages between UP, VP, WP, NU, NV, NW are all among 0.3V-0.7V, then it indicates the IPM module is normal; If any measured voltage is 0, it indicates the IPM is damaged.

### 3.2.2.2 Method of Testing PFC Module Short Circuit

(1) Preparation before test: prepare a universal meter and turn to its diode option, and then remove the wires L1-2, L2-1 after it is powered off for one minute.

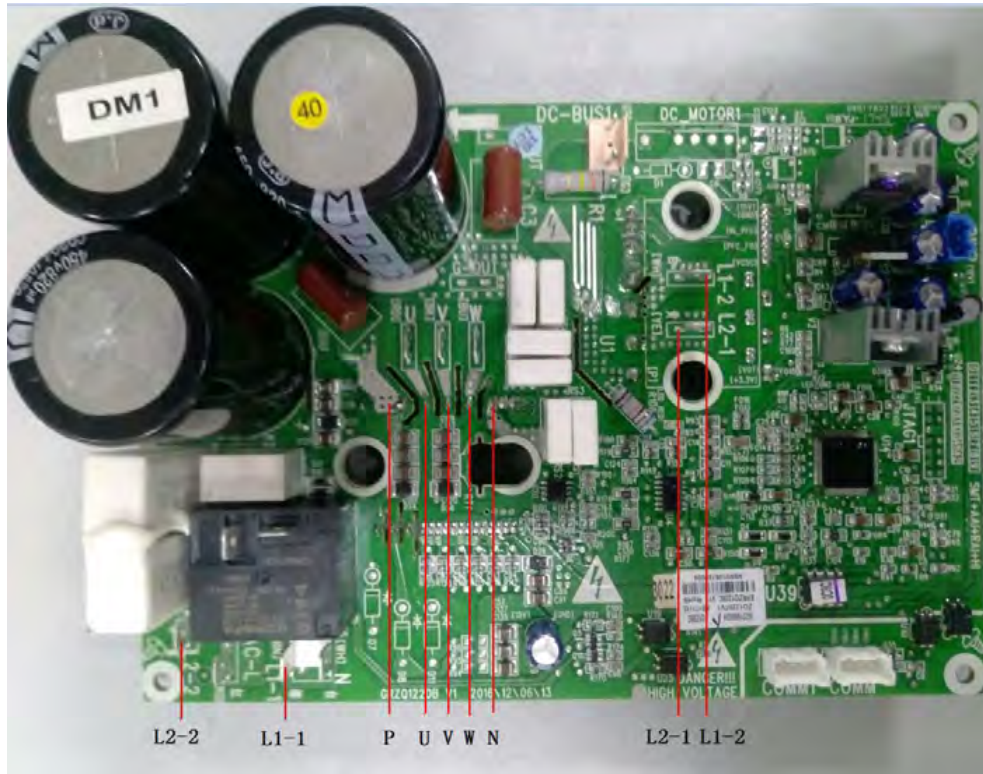
(2) Testing Steps:

Step 1: Put the black probe on the place P and the red one on the wiring terminal L1-2, L2-1 respectively as shown in the following figure to measure the voltage between L1-2 and P; L2-1 and P.

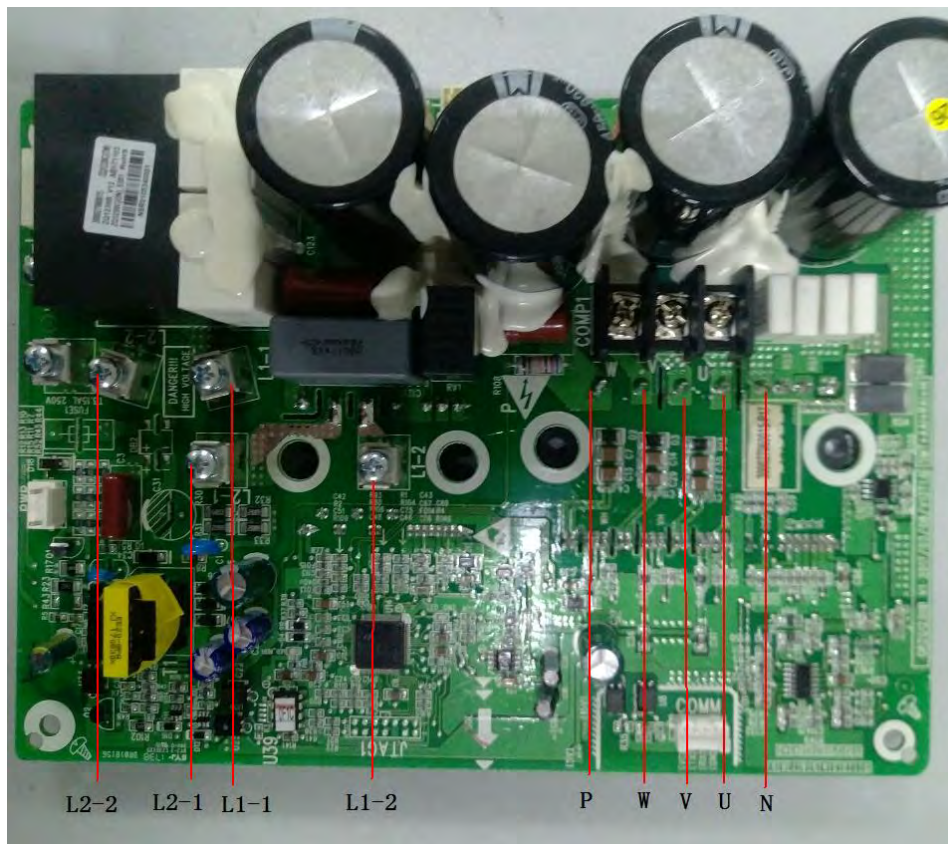
Step 2: Put the red probe on the place N and the black one on the wiring terminal L1-2, L2-1 respectively as shown in the following figure to measure the voltage between N and L1-2; N and L2-1.

(3) If the measured voltages between L1-2 and P; L2-1 and P; N and L1-2; N and L2-1 are all among 0.3V-0.7V, then it indicates the PFC module is normal; If any measured voltage is 0, it indicates the PFC is damaged.

GTS18HN036A



GTS18HN060A



### 3.3 Error Code

No.	Error code	Error
1	E1	Compressor high pressure protection
2	E3	Compressor low pressure protection
3	E4	Compressor air discharge high-temperature protection
4	F2	Condenser temperature sensor error
5	F3	Outdoor ambient temperature sensor error
6	F4	Discharge temperature sensor error
7	F6	ODU tube temperature sensor error
8	EE	ODU memory chip error
9	H4	Overload
10	H5	IPM protection
11	H6	DC fan error
12	H7	Driver out-of-step protection
13	HC	Pfc protection
14	Lc	Startup failure
15	P0	Driver reset protection
16	P5	Over-current protection
17	P6	Master control and driver communication error
18	P7	Driver module sensor error
19	P8	Driver module high temperature protection
20	PA	AC current protection
21	Pc	Driver current error
22	PL	Bus low-voltage protection
23	PH	Bus high-voltage protection
24	PU	Charge loop error
25	ee	Drive memory chip error
26	e1	High pressure sensor error
27	C4	ODU jumper cap error

If malfunction occurs during operation, LCD temperature display zone will show the failure information. If several malfunctions occur at the same time, their corresponding error codes will be shown in turn. When malfunction occurs, please shut off the unit and send for professional personnel to repair. For example, E1 (as shown below) indicates high pressure protection.

## 3.4 Troubleshooting

### 3.4.1 “E1” Compressor High Pressure Protection

**Error display:** ODU mainboard LED displayer

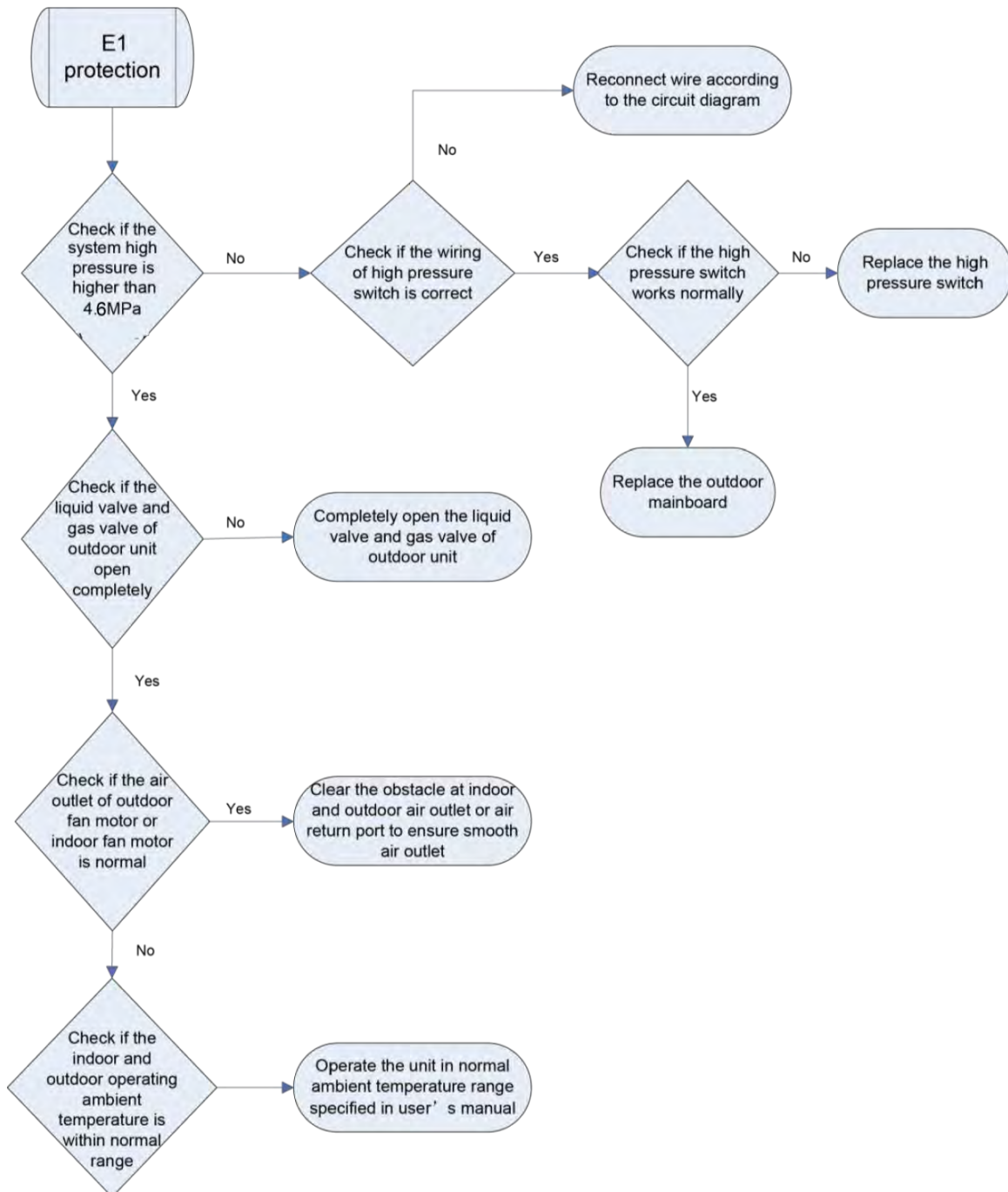
Error judgment condition and method:

It is judged through the action of high pressure switch. If the high pressure switch is cut off, it is judged that high pressure is too high and the system stops operation for protection.

Possible reason:

- Cut-off valve of ODU is not fully opened;
- High pressure switch is abnormal;
- Outdoor or indoor fan is not working properly;
- IDU filter or air duct is blocked (heating mode);
- Ambient temperature is too high;
- Refrigerant charging amount is too much;
- System pipeline is blocked

## Troubleshooting:



### 3.4.2 “E3” Compressor Low-pressure Protection, Refrigerant Shortage

#### Protection, Refrigerant Recovery Mode

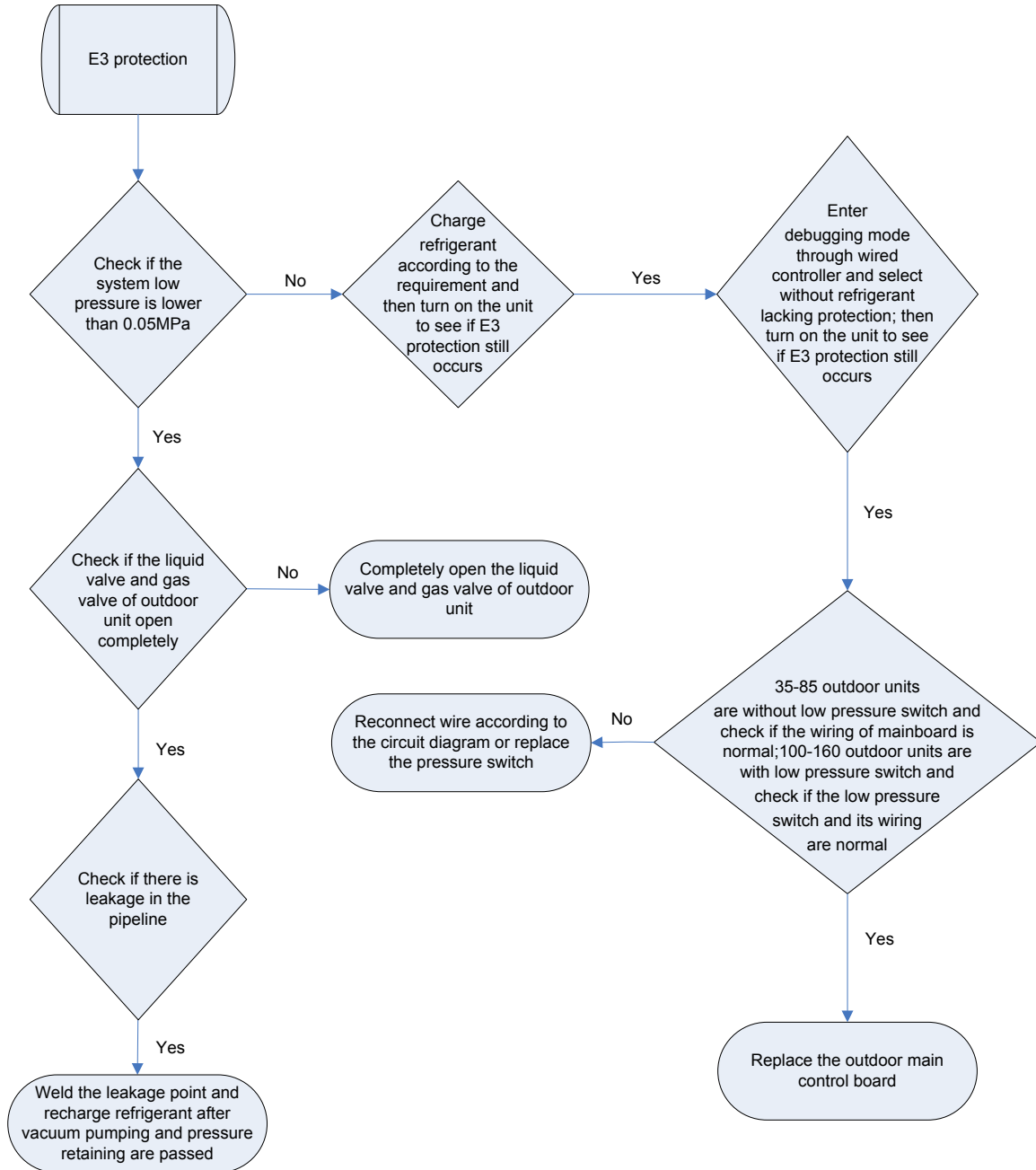
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

It is judged through the action of low pressure switch. If the low pressure switch is cut off, it is judged that low pressure is too low and the system stops operation for protection.

**Possible reason:**

- Cut-off valve of ODU is not fully opened;
- Low pressure sensor is abnormal;
- Outdoor or indoor fan is not working properly;
- IDU filter or air duct is blocked (cooling mode);
- Ambient temperature is too low;
- Refrigerant charging amount is insufficient;
- System pipeline is blocked;

**Troubleshooting:****3.4.3 “E4” Compressor Air Discharge High-temperature Protection**

**Error display:** ODU mainboard LED displayer

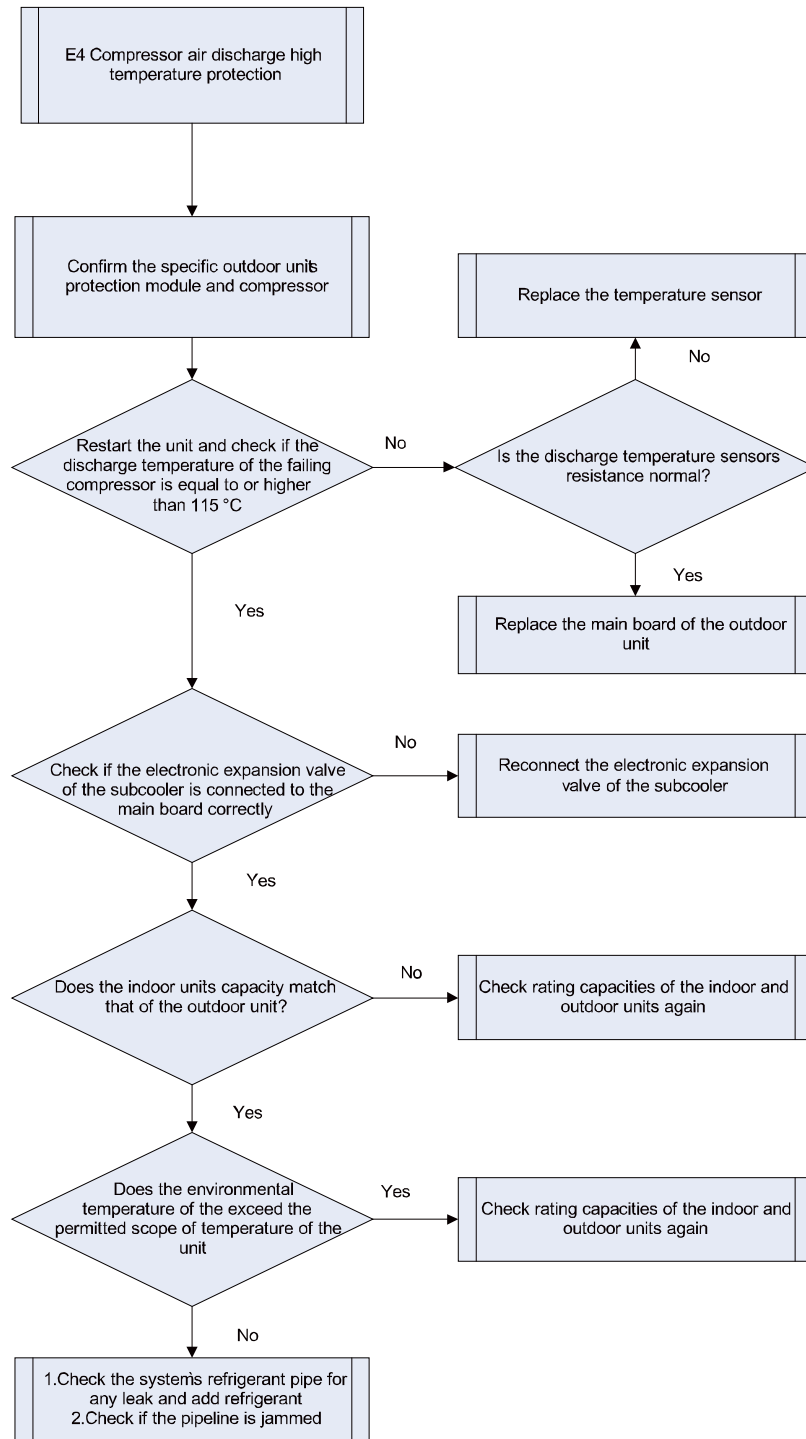
**Error judgment condition and method:**

Test the compressor discharge temperature through compressor discharge pipe and shell top temperature sensor. If the tested temperature value is higher than 115°C, the unit will stop for protection



**Possible reason:**

- Cut-off valve of ODU is not fully opened;
- Electronic expansion valve is abnormal;
- Outdoor or indoor fan is not working properly;
- IDU filter or air duct is blocked (cooling mode);
- Ambient temperature exceeds allowable operation range;
- Refrigerant charging amount is insufficient;
- System pipeline is blocked;

**Troubleshooting:****3.4.4 “F2” Condenser Temperature Sensor Error**

**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

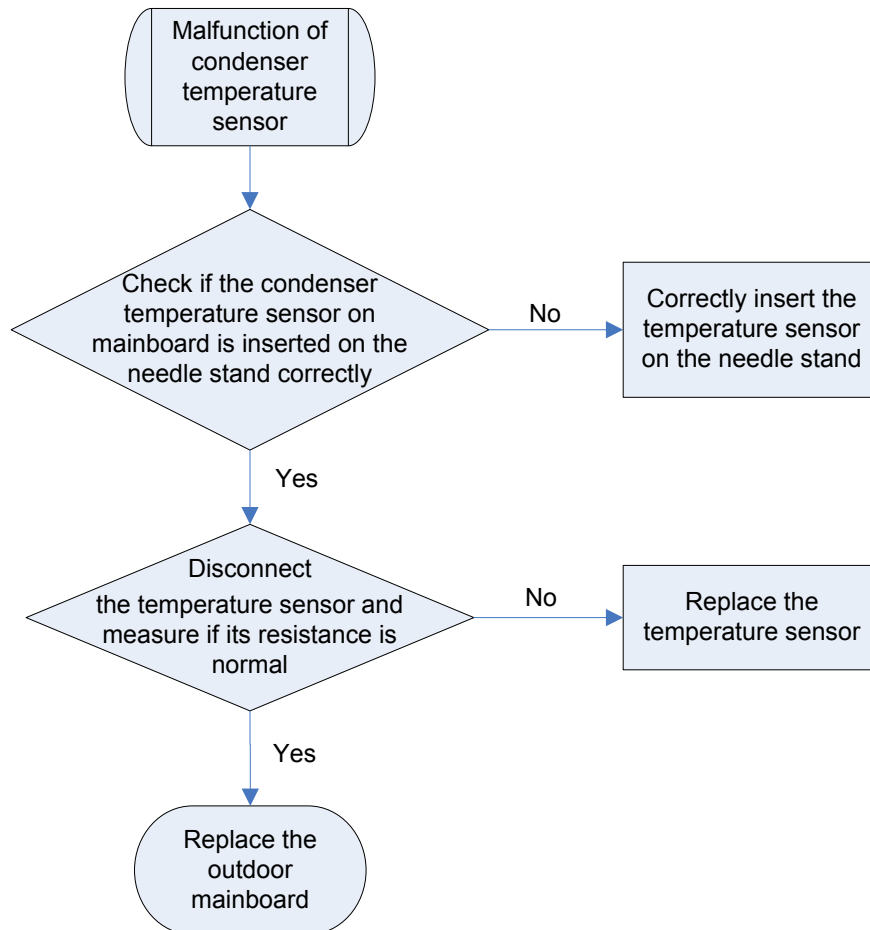
Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value, If the sampling AD value exceeds upper limit and lower limit in 5 seconds continuously, report

the error.

**Possible reason:**

- Poor contact between temperature sensor and terminal in mainboard interface
- Temperature sensor is abnormal
- Detecting circuit is abnormal

**Troubleshooting:**



**NOTE:**

Please refer to Appendix 1 for the relation between temperature and resistance of temperature sensor.

### 3.4.5 “F3” Outdoor Ambient Temperature Sensor Error

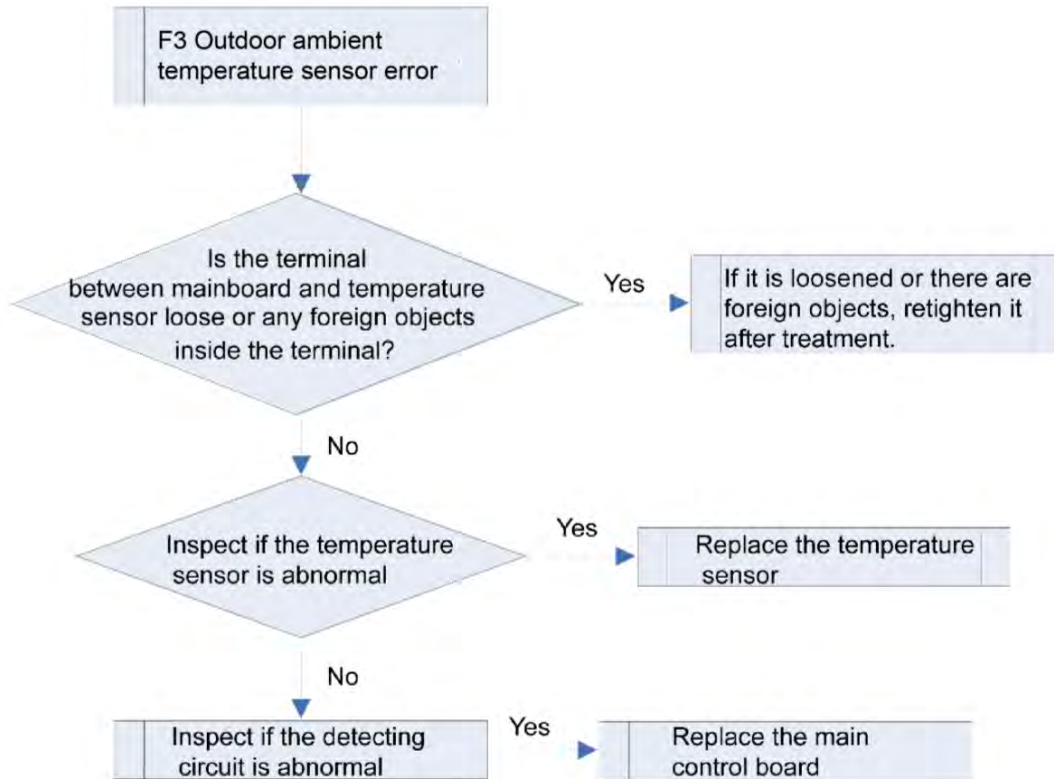
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value, If the sampling AD value exceeds upper limit and lower limit in 5 seconds continuously, report the error.

**Possible reason:**

- Poor contact between ambient temperature sensor and terminal in mainboard interface
- Ambient temperature sensor is abnormal
- Detecting circuit is abnormal

**Troubleshooting:****NOTE:**

Please refer to Appendix 1 for the relation between temperature and resistance of temperature sensor.

**3.4.6 “F4” Discharge Temperature Sensor Error**

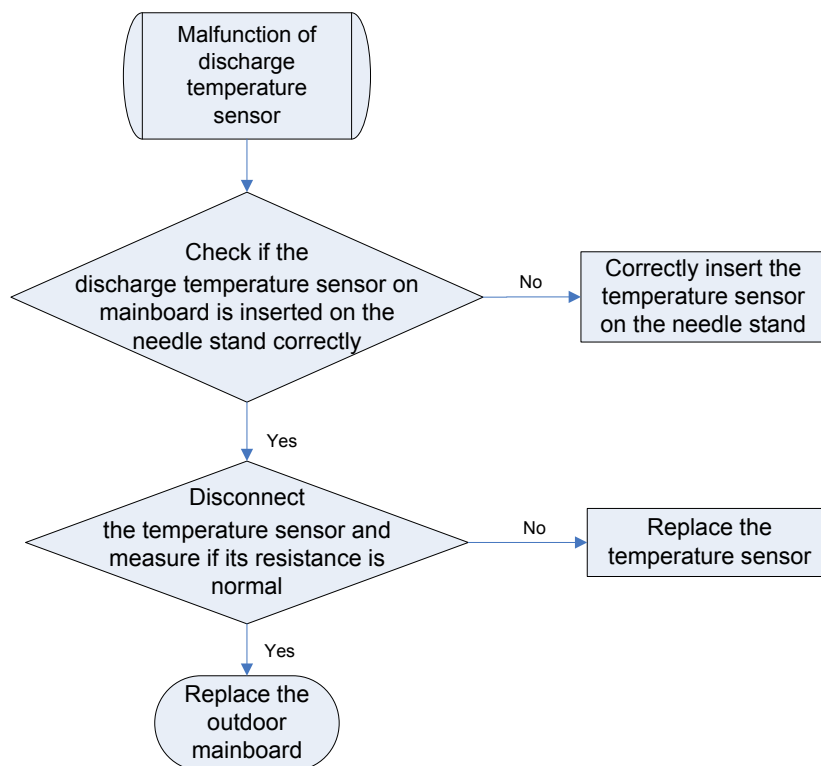
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value, If the sampling AD value exceeds upper limit and lower limit in 5 seconds continuously, report the error.

**Possible reason:**

- Poor contact between temperature sensor and terminal in mainboard interface
- Temperature sensor is abnormal
- Detecting circuit is abnormal

**Troubleshooting:****NOTE:**

Please refer to Appendix 1 for the relation between temperature and resistance of temperature sensor.

**3.4.7 “F6” ODU Tube Temperature Sensor Error**

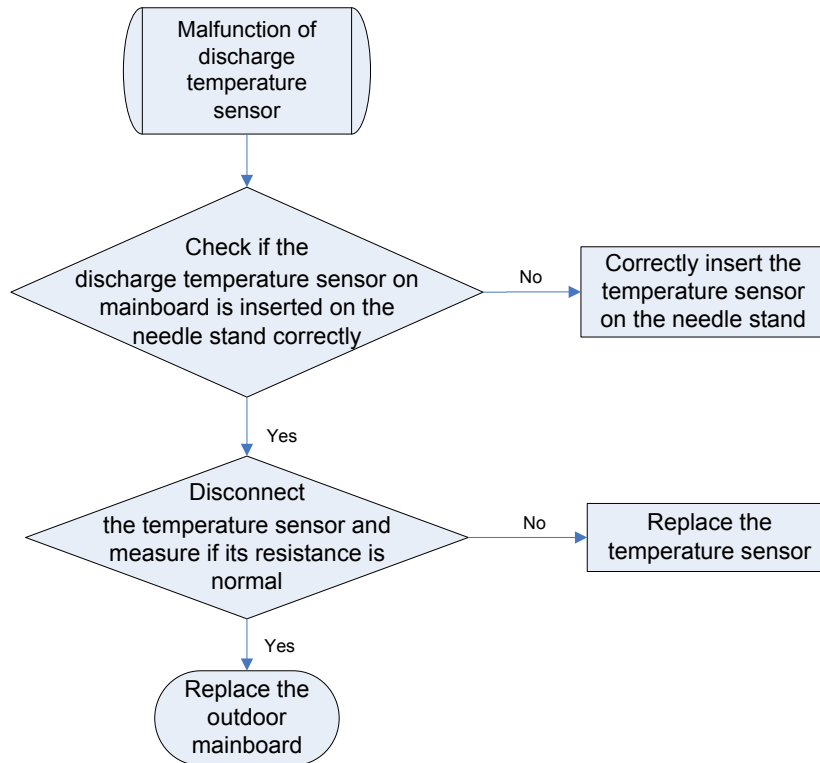
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value, If the sampling AD value exceeds upper limit and lower limit in 5 seconds continuously, report the error.

**Possible reason:**

- Poor contact between temperature sensor and terminal in mainboard interface
- Temperature sensor is abnormal
- Detecting circuit is abnormal

**Troubleshooting:****NOTE:**

Please refer to Appendix 1 for the relation between temperature and resistance of temperature sensor.

**3.4.8“EE” ODU Memory Chip Error**

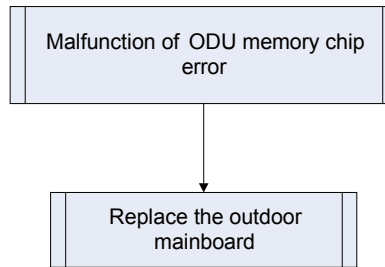
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

If ODU mainboard cannot read the memory chip, this error will be reported.

**Possible reason:**

- Memory chip on the ODU mainboard is damaged.
- Memory chip is weakly welded.
- Memory chip lead is short-circuited.

**Troubleshooting:****3.4.9 “H4” Overload**

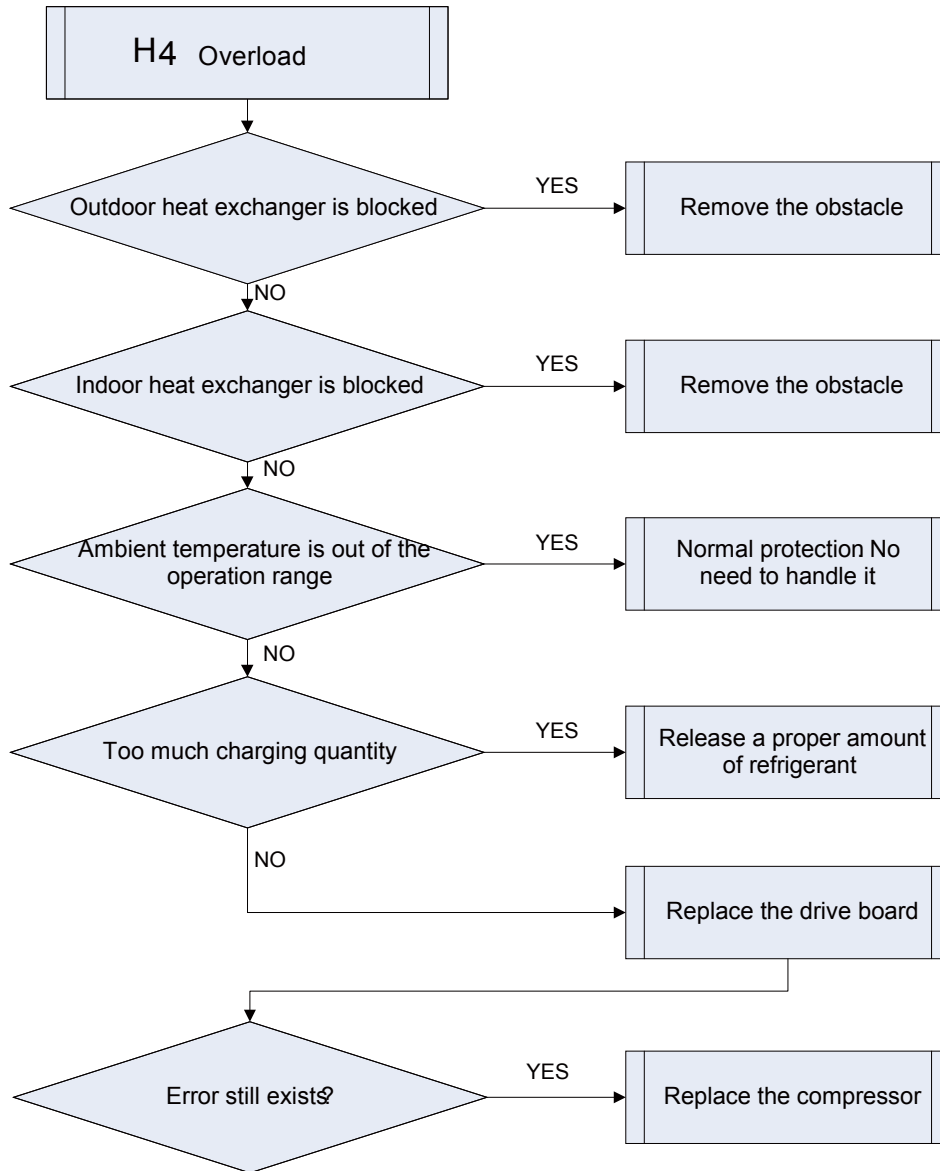
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

When condensing pressure is higher than the protection value, system will report overload protection.

**Possible reason:**

- Cooling ODU heat exchanger is blocked or heat exchange is bad.
- Heating IDU heat exchanger is blocked or heat exchange is bad.
- Operating temperature is too high.
- System charging quantity is too much.

**Troubleshooting:****3.4.10 “H5” IPM Protection**

**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

When power is connected and drive chip received IPM lead F0 that is of low level, than it is IPM module malfunction. System will shut down for protection.

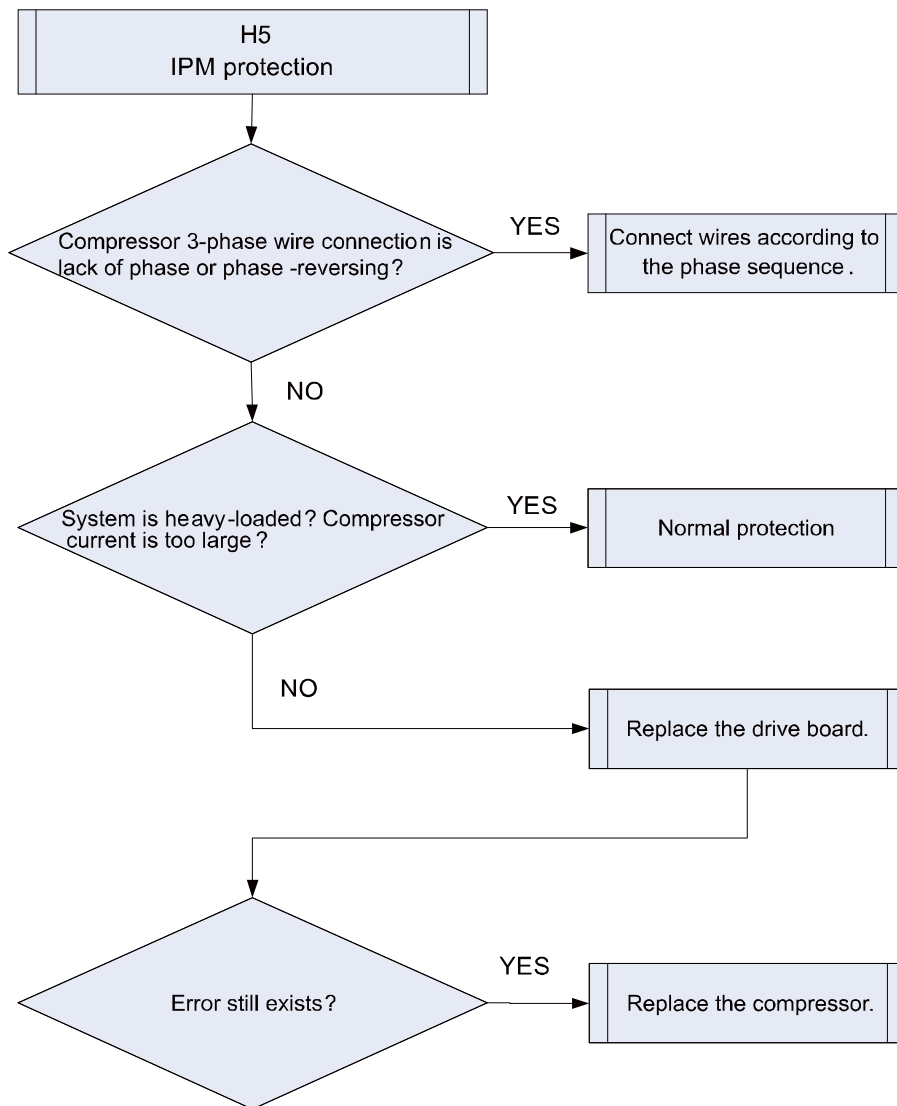
**Possible reason:**

- Compressor 3-phase wire connection is lack of phase or phase-reversed.
- System is overloaded and compressor current is too large.
- Drive board IPM module is damaged.



- Drive board IPM module's 15V power supply is lower than 13.5V.
- Drive board 6-line PWM signal and the corresponding element are abnormal.
- Drive board compressor current sampling circuit element is damaged or drive chip current sampling AD terminal is abnormal.
- Compressor is damaged.

#### Troubleshooting:



### 3.4.11 "H6" DC Fan Error

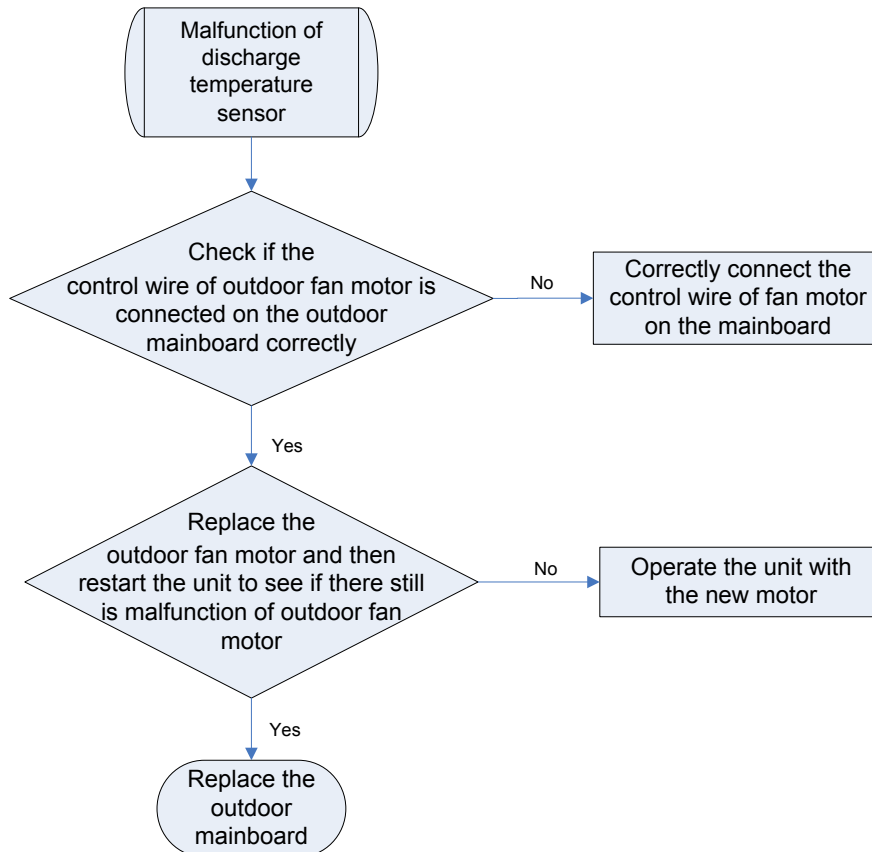
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

Mainboard doesn't receive the signal of outdoor fan within 30s after the outdoor fan starts up.

**Possible reason:**

- Outdoor fan wiring terminal is not correctly connected to the mainboard.
- Outdoor fan is damaged.
- If it is a new unit or a new motor has been replaced in the unit and the wire connection is correct, then probably it is the program that goes wrong.

**Troubleshooting:****3.4.12 “H7” Driver Out-of-Step Protection**

**Error display:** ODU mainboard LED displayer

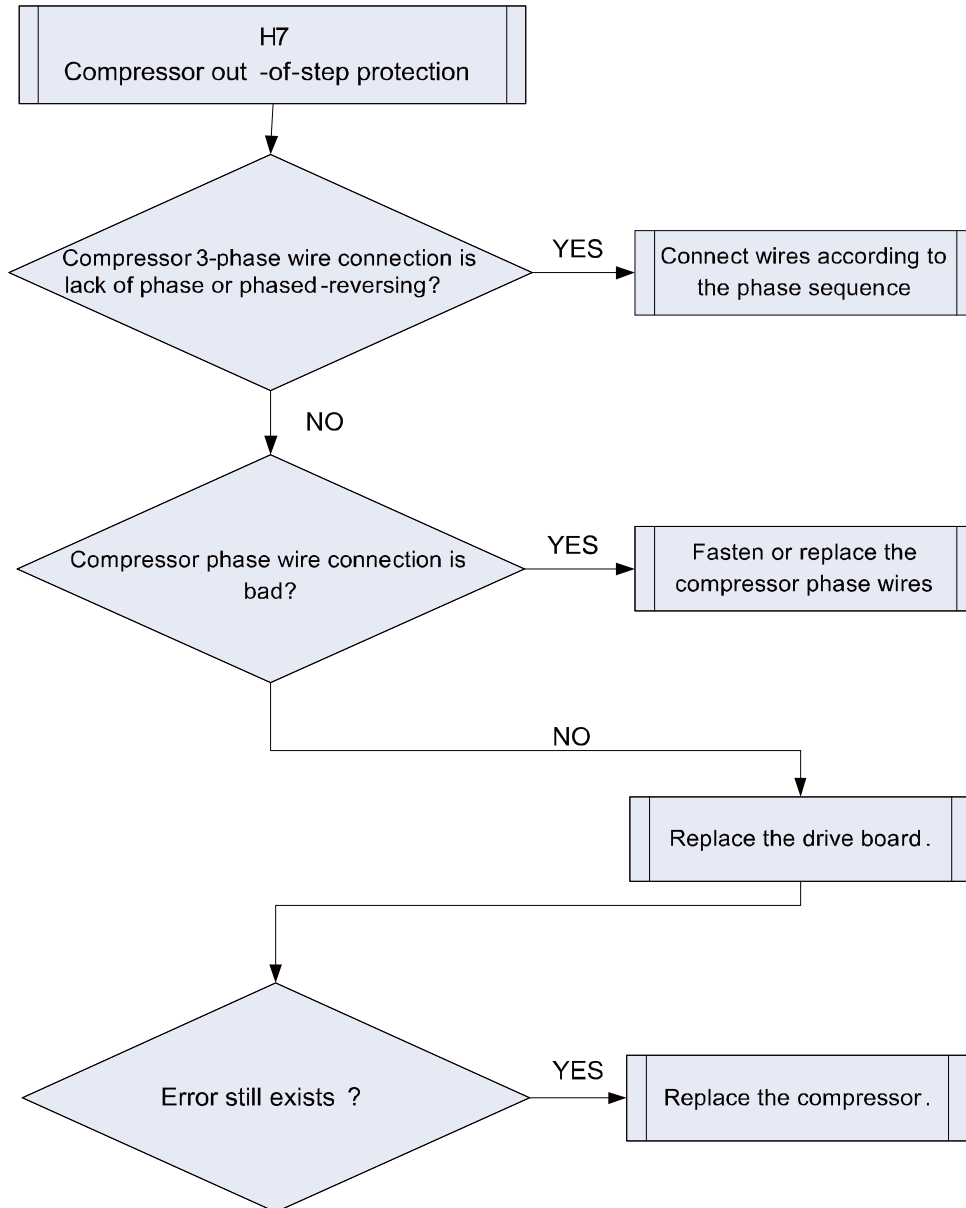
**Error judgment condition and method:**

During operation, it can't detect the rotor position and stops output. Or the actual running speed differs too much from the set running speed. In each case, compressor runs out of step and system stops for protection.

**Possible reason:**

- Compressor 3-phase wire connection is lack of phase or phased-reversed.
- Compressor phase wire connection is bad.
- System is blocked, short of refrigerant or compressor oil.
- Drive board IPM module is damaged.

- Drive board compressor current sampling circuit element is damaged or drive chip current sampling AD terminal is abnormal.
- Compressor is damaged.

**Troubleshooting:**

### 3.4.13 “HC” PFC Protection

**Error display:** ODU mainboard LED displayer

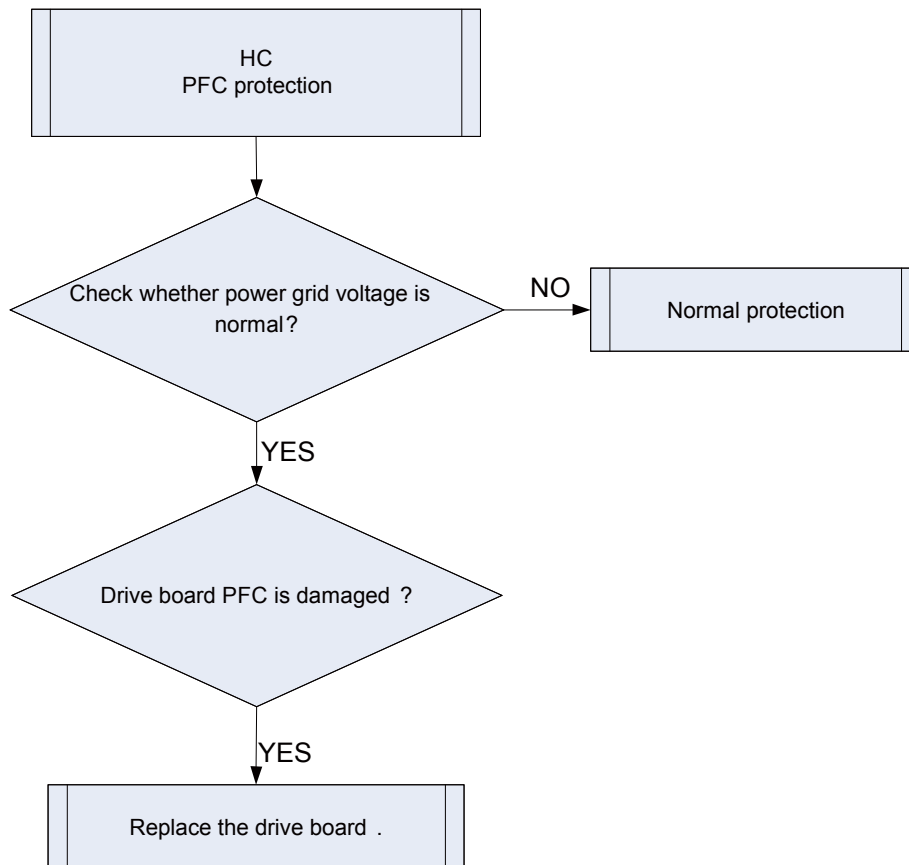
**Error judgment condition and method:**

After power is connected, and drive chip received PFC lead F0 that is of low level, then it is PFC module malfunction. System will shut down for protection.

**Possible reason:**

- Power grid voltage is abnormal.
- Drive board PFC module is damaged.
- Drive board PFC module's 15V power supply is lower than 13.5V.
- Drive board PWM signal for PFC and the corresponding element are abnormal.
- Drive board PFC current sampling circuit element is damaged or drive chip current sampling AD terminal is abnormal.

**Troubleshooting:**



### 3.4.14 “Lc” Startup Failure

**Error display:** ODU mainboard LED displayer

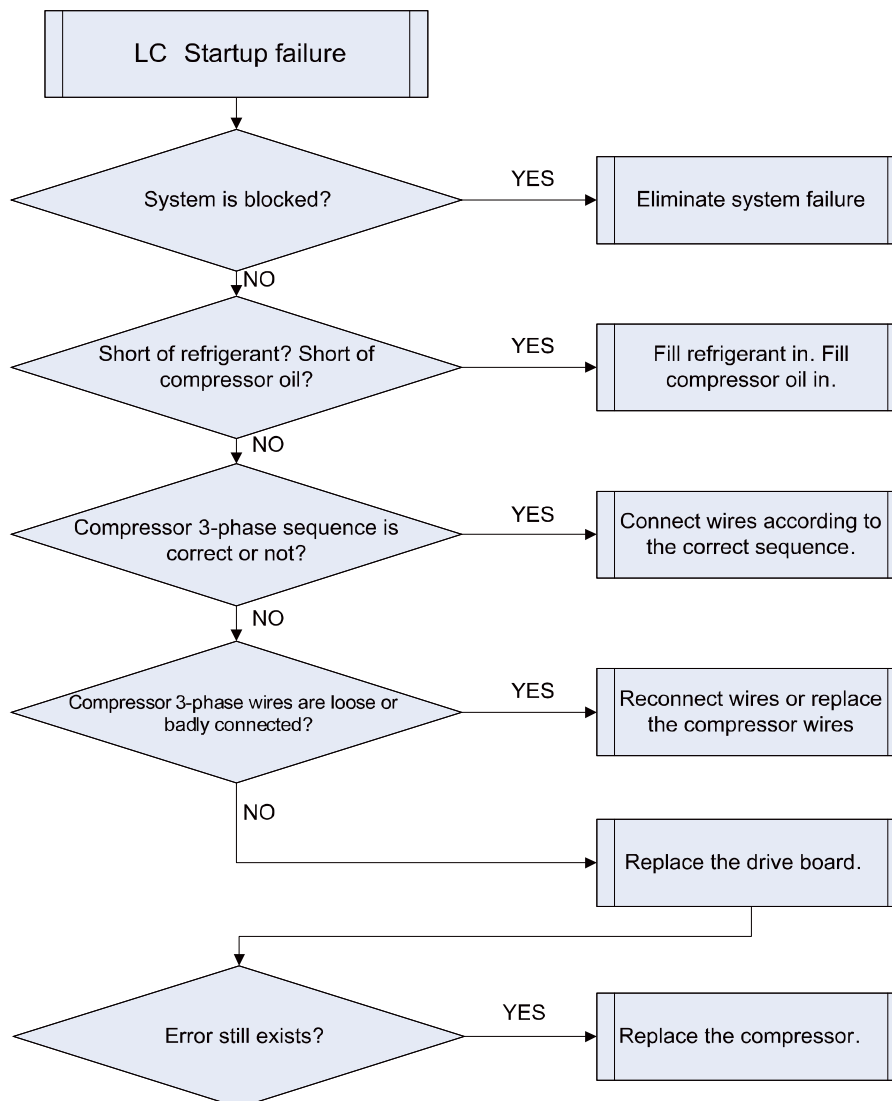
**Error judgment condition and method:**

Check the error code on nixie tube of ODU main control board. If PJ is displayed, it indicates inverter compressor startup failure

**Possible reason:**

- Poor contact of compressor UVW wire;
- Compressor is broken;
- Compressor drive board is broken;

**Troubleshooting:**



### 3.4.15 “P0” Driver Reset Protection

**Error display:** ODU mainboard LED displayer

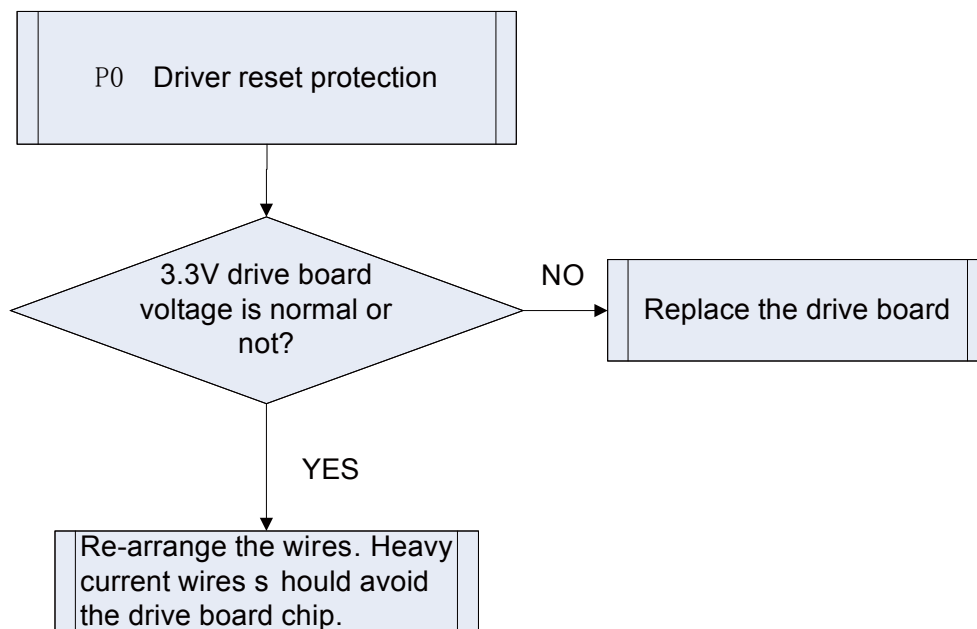
**Error judgment condition and method:**

Drive board chip resets and starts initialization. After the drive board is energized for 5s, it detects that the chip resets again. In this case, it can be judged as drive chip reset protection.

**Possible reason:**

- 3.3V drive chip supply voltage drop.
- TRST lead of JTAG programming is interrupted.

**Troubleshooting:**



### 3.4.16 “P5” Over-Current Protection

**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

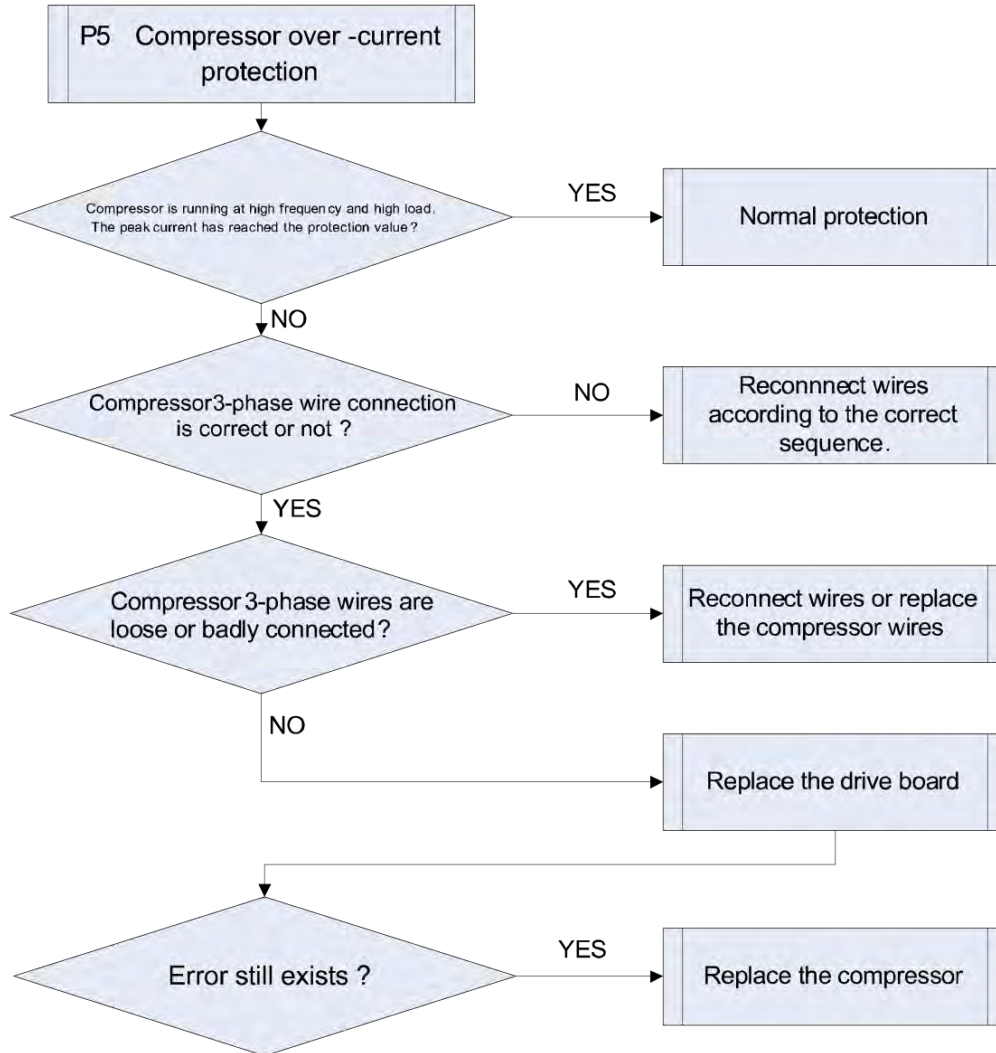
If compressor’s instant current value is higher than the set current protection value, then it can be judged that compressor over-current occurs and system will shut down for protection.

**Possible reason:**

- System load is too much and compressor current is too large.
- Compressor 3-phase wire connection is lack of phase or phase-reversed.
- Compressor phase wire is loose or has bad contact.

- Drive board current sampling circuit element is damaged or drive chip current sampling AD terminal is abnormal.
- Compressor is damaged.

#### Troubleshooting:



### 3.4.17 “P6” Master Control and Driver Communication Error

**Error display:** ODU mainboard LED displayer

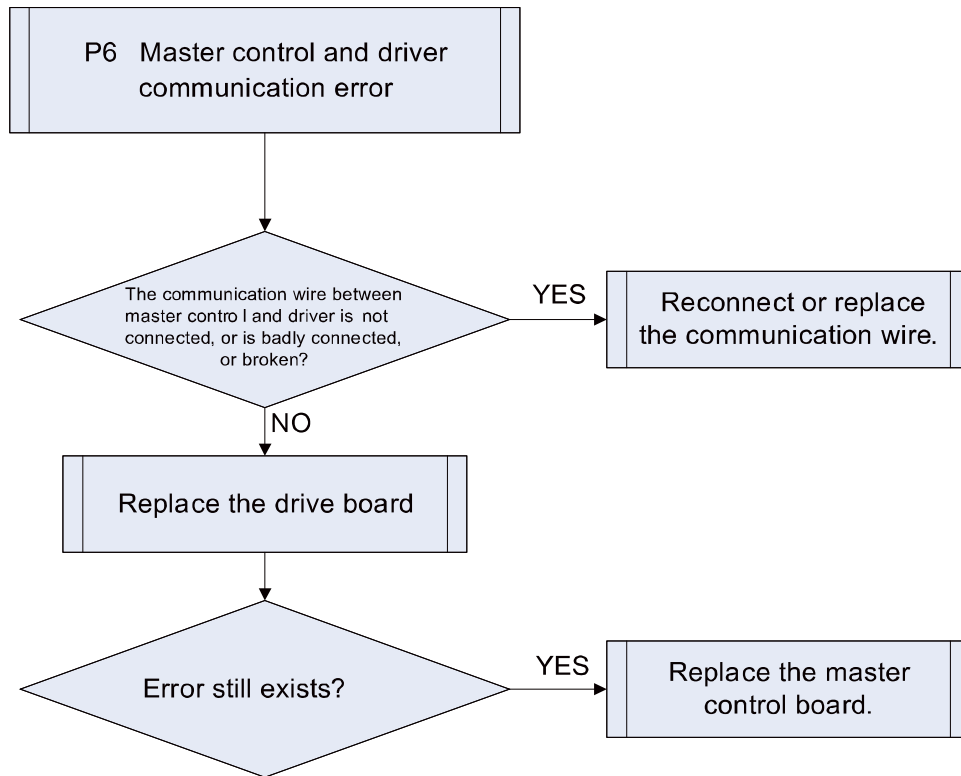
**Error judgment condition and method:**

If there is no other malfunction and the communication between master control and driver is cut off for 30s, then it can be judged that the communication between master control and driver is faulted. System will shut down for protection.

**Possible reason:**

- Communication wire between master control and driver is not well connected, or has bad contact, or is broken.

- The switch power of drive board is abnormal, therefore, the 3.3V power voltage is abnormal.
- Communication circuit of the drive board or the master control board is abnormal.

**Troubleshooting:****3.4.18 “P7” Driver Module Sensor Error**

**Error display:** ODU mainboard LED displayer

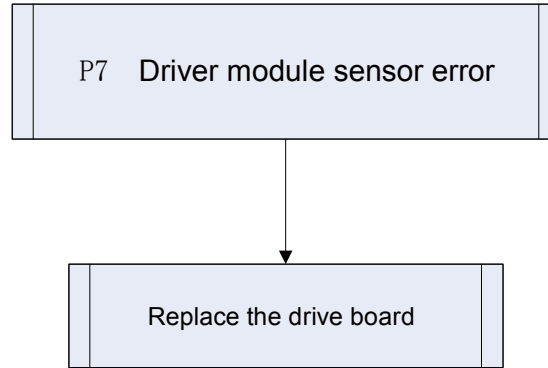
**Error judgment condition and method:**

If IPM or PFC module temperature is lower than the set protection value, then it can be judged that driver module sensor error occurs and system will shut down for protection.

**Possible reason:**

- Module temperature sensor is short-circuited or broken-circuited.
- Drive board current sampling circuit element is damaged or drive chip current sampling AD terminal is abnormal.



**Troubleshooting:****3.4.19 “P8” Driver Module High Temperature Protection**

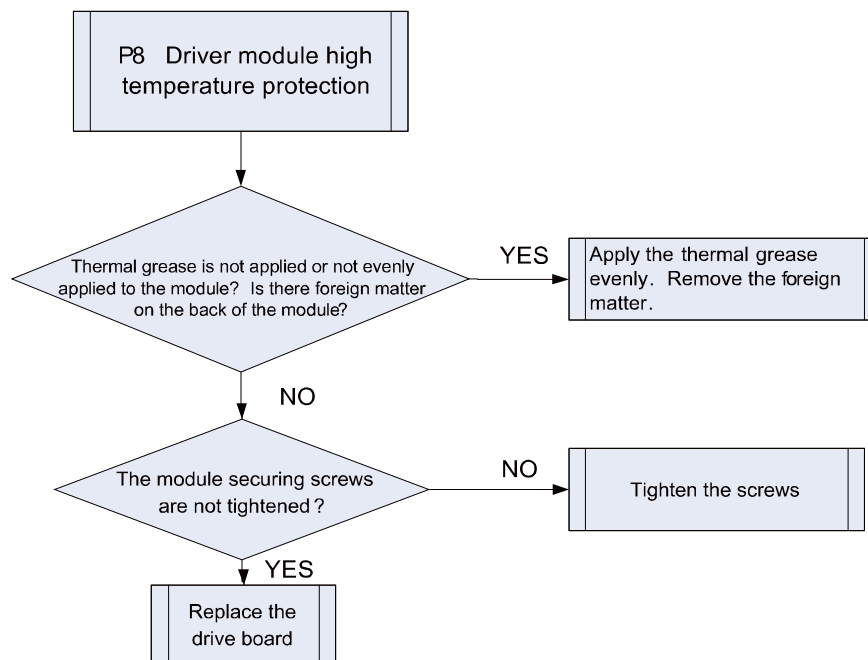
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

If IPM module temperature or PFC module temperature exceeds the set protection value, then it can be judged that driver module temperature is too high and system will shut down for protection.

**Possible reason:**

- Thermal grease is not applied or not evenly applied to the module, or there is other substance on the back of the module.
- The module securing screws are not tightened up.
- Drive board temperature sampling circuit element is damaged or drive chip temperature sampling AD terminal is abnormal.

**Troubleshooting:**

### 3.4.20 “PA” AC Current Protection

**Error display:** ODU mainboard LED displayer

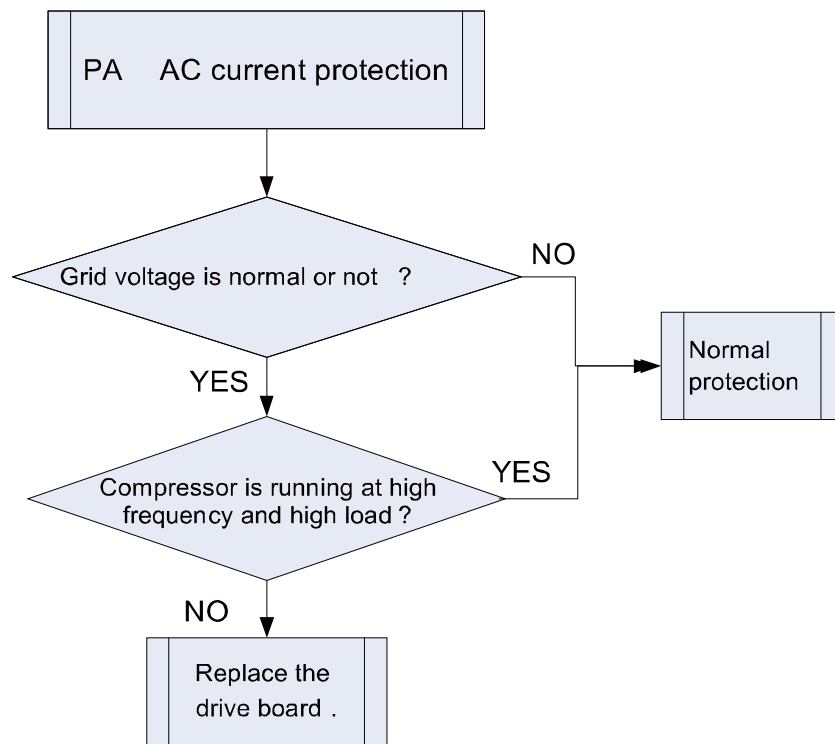
**Error judgment condition and method:**

If input current value exceeds the set protection value, then it can be judged that AC current protection occurs and system will shut down for protection.

**Possible reason:**

- System is heavy-loaded and compressor current is too large.
- Grid voltage is abnormal.
- PFC module is damaged.
- Drive board PFC current sampling circuit element is damaged or drive chip PFC current sampling AD terminal is abnormal.

**Troubleshooting:**



### 3.4.21 “Pc” Driver Current Error

**Error display:** ODU mainboard LED displayer

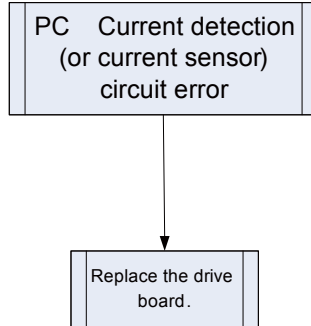
**Error judgment condition and method:**

After power charging, if offset voltage average is detected to exceed 12.5% of 1.65V in 1s, then it can be judged that current detection (or current sensor) circuit is faulted. System will shut down for protection.

**Possible reason:**

- Current detection (or current sensor) sampling circuit element is abnormal.
- Drive chip compressor current sampling AD terminal is badly welded or short-circuited.

**Troubleshooting:**



**3.4.22 “PL” Bus Low-Voltage Protection**

**Error display:** ODU mainboard LED displayer

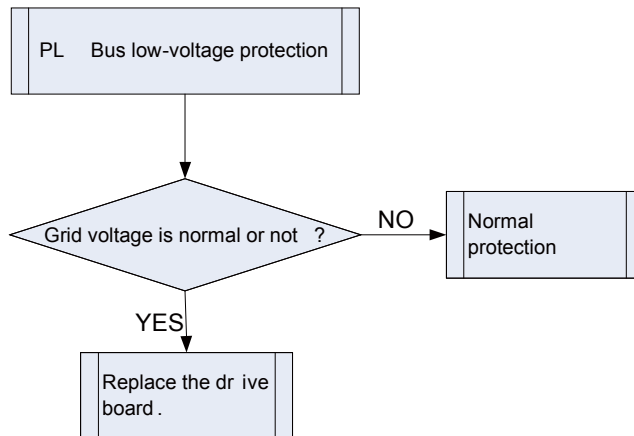
**Error judgment condition and method:**

When compressor is running and there is no other malfunction, if busbar voltage is lower than the set value for low voltage protection, then it can be judged that bus low-voltage protection occurs. System will shut down for protection.

**Possible reason:**

- Voltage of power grid is abnormal.
- Drive board busbar voltage sampling circuit element is damaged or drive board busbar voltage sampling AD terminal is abnormal.

**Troubleshooting:**



### 3.4.23 “PH” Bus High-Voltage Protection

**Error display:** ODU mainboard LED displayer

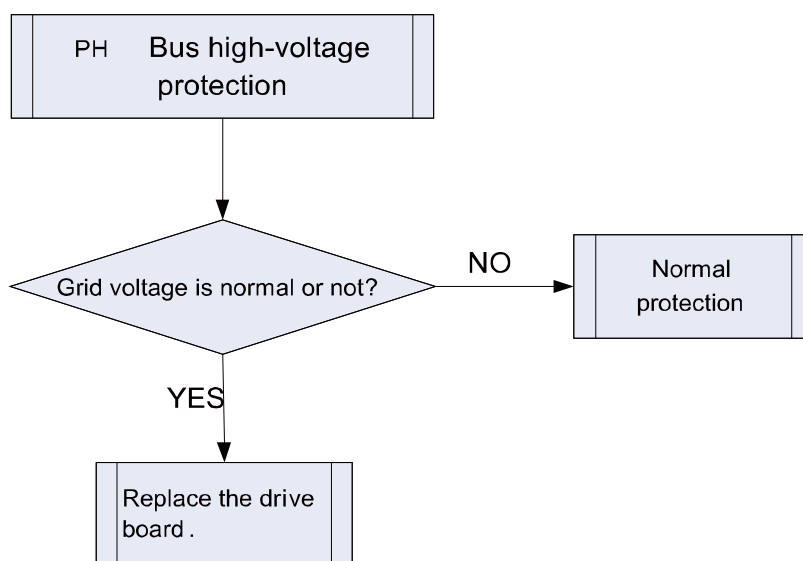
**Error judgment condition and method:**

If there is no other malfunction and the busbar voltage is higher than the set value for high voltage protection, then it can be judged that bus high-voltage protection occurs. System will shut down for protection.

**Possible reason:**

- Voltage of power grid is abnormal.
- Drive board busbar voltage sampling circuit element is damaged or drive board busbar voltage sampling AD terminal is abnormal.

**Troubleshooting:**



### 3.4.24 “PU” Charge Loop Error

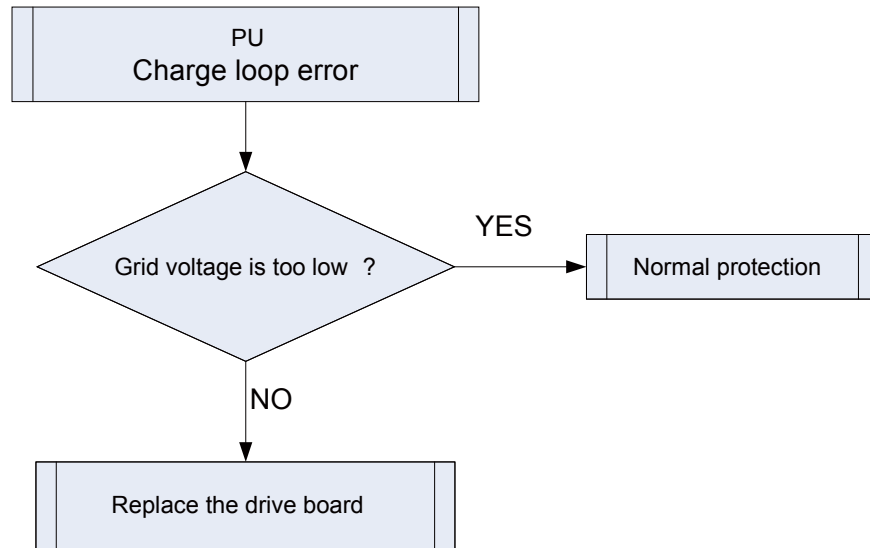
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

When the charge loop starts to get charged and the busbar voltage cannot reach the set value in a certain period of time, then it can be judged that charge loop error exists. System will shut down for protection.

**Possible reason:**

- Voltage of power grid is abnormal. Voltage is too low.
- Drive board charge loop element is abnormal.
- Drive board busbar voltage sampling circuit element is damaged or drive chip busbar voltage sampling AD terminal is abnormal.

**Troubleshooting:****3.4.25 “ee” Drive Memory Chip Error**

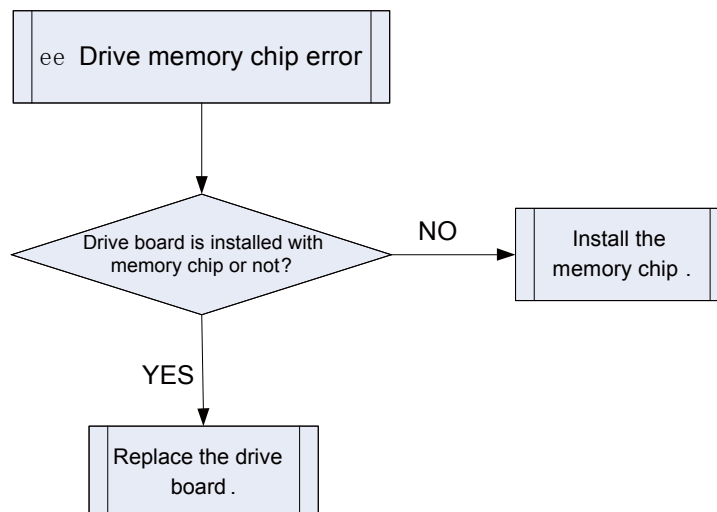
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

If power is connected but the drive board with memory chip cannot detect the memory chip or read the memory chip data correctly, then it can be judged that drive memory chip error exists.

**Possible reason:**

- The drive board that needs memory chip is not installed with the memory chip.
- The lead or connector of memory chip is badly welded or short-circuited.

**Troubleshooting:**

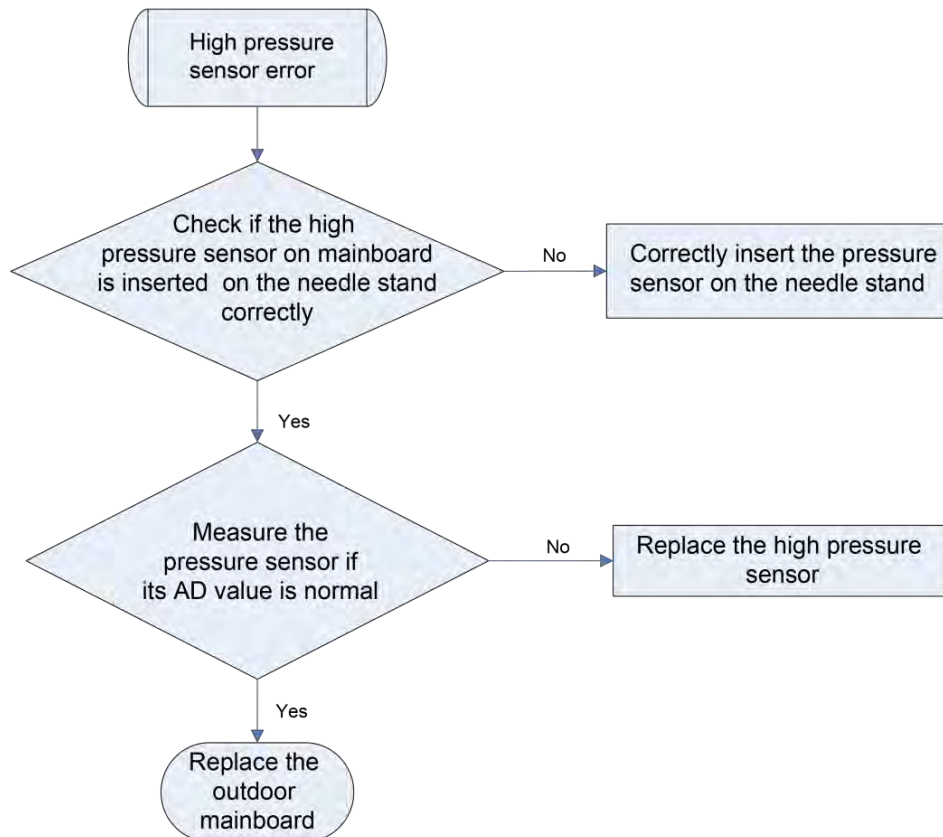
### 3.4.26 “e1” High Pressure Sensor Error

**Error display:** ODU mainboard LED displayer

Sample the AD value of pressure sensor through pressure sensor detecting circuit and judge the range of AD value, If the sampling AD value exceeds upper limit and lower limit in 30 seconds continuously, report the error.

- Poor contact between pressure sensor and terminal in mainboard interface
- Pressure sensor is abnormal
- Detecting circuit is abnormal

**Troubleshooting:**



### 3.4.27 “C4” ODU Jumper Cap Error

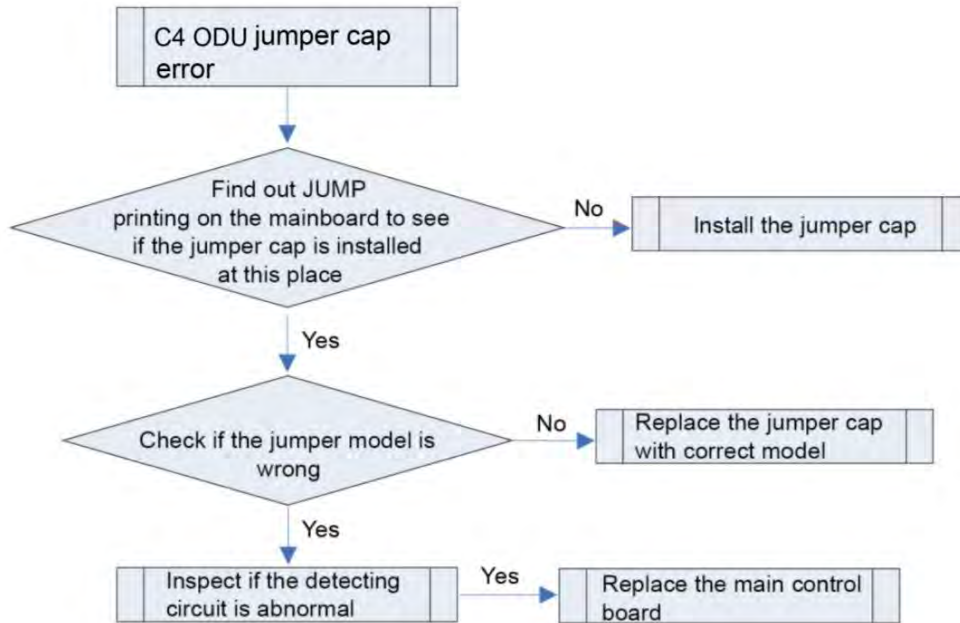
**Error display:** ODU mainboard LED displayer

**Error judgment condition and method:**

If jumper cap model doesn't match with mainboard, report the error

**Possible reason:**

- Jumper cap is not installed
- Jumper cap model is wrong
- Detecting circuit is abnormal

**Troubleshooting:**

### 3.5 Failures Not Caused by Errors

(1) If your air conditioner fails to function normally, please first check the following items before maintenance:

Problem	Cause	Corrective measure
The air conditioner can't run.	If you turn off the unit and then immediately turn it on, in order to protect the compressor and avoid system overload, compressor will delay running for 3min.	Please wait for a while.
	Wire connection is wrong.	Connect wires according to the wiring diagram.
	Fuse or circuit breaker is broken.	Replace the fuse or switch on the circuit breaker.
	Power failure.	Restart after power is resumed.
	Power plug is loose.	Re-insert the power plug.
	Thermostat has low battery.	Replace the batteries.
Bad cooling or heating effect.	Air inlet and outlet of the units have been blocked.	Clear the obstacles and keep the room for the units well ventilated.
	Improper temperature setting	Reset a proper temperature.
	Fan speed is too low.	Reset a proper fan speed.
	Air flow direction is not right.	Change the direction of air louvers.
	Doors or windows are open.	Close them.
	Exposed under direct sunshine.	Put on curtains or louvers in front of the windows.
	Too many heat sources in the room.	Remove unnecessary heat sources.
	Filter is blocked or dirty.	Send for a professional to clean the filter.
	Air inlets or outlets of the units are blocked.	Clear away obstacles that are blocking the air inlets and outlets of the units.



(2) The following situations are not operation failures.

Problem	Time of occurrence	Cause
Mist comes from the air conditioner.	During operation.	If the unit is running under high humidity, the wet air in the room will be quickly cooled down.
The air conditioner generates some noise.	System switches to heating mode after defrosting.	Defrosting process will generate some water, which will turn to water vapor.
	The air conditioner is buzzing at the beginning of operation.	Thermostat will be buzzing when it starts working. The noise will become weak 1min later.
Dust comes from the air conditioner.	When the unit is turned on, it purrs.	When the system is just started, the refrigerant is not stable. About 30s later, the purr of the unit becomes low.
	About 20s after the unit first enables the heating mode or there is refrigerant brushing sound when defrosting under heating.	It's the sound of 4-way valve switching direction. The sound will disappear after the valve changes its direction.
	There is hissing sound when the unit is started or stopped and a slight hissing sound during and after operation.	It's the sound of gaseous refrigerant that stops flowing and the sound of drainage system.
	There is a sound of crunching during and after operation.	Because of temperature change, front panel and other components may be swelled up and cause abrasion sound.
	There is a hissing sound when the unit is turned on or suddenly stopped during operation or after defrosting.	Because refrigerant suddenly stops flowing or changes the flow direction.
	The unit starts operation after being unused for a long time.	Dust inside the units come out together with the air.
The air conditioner generates some smell.	During operation.	The room smell or the smell of cigarette comes out through the units.



**NOTICE:**

Check the above items and adopt the corresponding corrective measures. If the air conditioner continues to function poorly, please stop the air conditioner immediately and contact Gree's authorized local service center. Ask our professional service staff to check and repair the unit.