Part 6

Diagnosis and Troubleshooting

1 Error Code Table

1.1 Outdoor Error code table

Table 6-1.1 Outdoor Error code table

Error code	Error description	Remarks	Manual re-start required[2]
A01	Emergency shutdown	Outdoor unit's fault	NO
AAx	No.x Inverter driver board does not match the main control board	Outdoor unit's fault	NO
xA61	No.x slave unit error	Salve unit's fault	NO
xb53	No.x Heat dissipation fan error	system failure	YES
C13	The address of outdoor Unit is repeated	communication failure	NO
C21	Communication error between indoor and master outdoor unit	communication failure	NO
C26	Number of indoor units detected by master unit has decreased or less than the setting amount	communication failure	NO
C28	Number of indoor units detected by master unit has increased or more than the setting amount	communication failure	NO
xC31	Communication error between No.x slave outdoor unit and master outduoor unit	communication failure	NO
C32	Number of slave units detected by master unit has decreased	communication failure	NO
C33	Number of slave units detected by master unit has increased	communication failure	NO
xC41	Communication Error between main control board and No.x inverter driver board	communication failure	NO
E41	Outdoor ambient temperature sensor (T4) error(open/short)	sensor error	NO
F31	Microchannel heat exchanger outlet temperature sensor(T6B) error(open/short)	sensor error	NO
F41	Main heat exchanger pipe temperature sensor (T3) error(open/short)	sensor error	NO
F51	Microchannel heat exchanger inlet temperature sensor(T6A) error(open/short)	sensor error	NO
F62	Inverter driver board temperature (Tf) protection	Temperature proteection	NO
F63	Non-inductive resistance temperature(Tr)protection	Temperature proteection	NO
F6A	F62 protection occurs 3 times in 100 minutes	Temperature proteection	YES
xF71	Discharge temperature sensor(T7C1/T7C2) error (open/short)	sensor error	YES
F72	Discharge temperature(T7C1/T7C2) protection	Temperature proteection	NO
F75	Compressor discharge insufficient superheat protection	Temperature proteection	NO
F7A	F72 protection occurs 3 times in 100 minutes	Temperature proteection	YES

Error code	Error description	Remarks	Manual re-start required[2]
F81	Gas pipe temperature sensor (Tg) error (open/short)	sensor error	NO
F91	Liquid pipe temperature sensor (T5) error (open/short)	sensor error	NO
FA1	Outdoor Heat exchanger gas temperature sensor (T8) error (open/short)	sensor error	NO
FC1	Outdoor heat exchanger liquid temperature sensor (TL) error (open/short)	sensor error	NO
xFd1	Compressor suction temperature sensor (T71/T72) error (open/short)	sensor error	NO
Fp1	Electric control box chamber temperature sensor (Tb) error (open/short)	sensor error	NO
xL01	xL1* or xL2* error occurs 3 times in 60 minutes	power-on again	YES
xL--	No.(x) compressor error, "--" refer to Table 6-1.3 Compressor drive error code table	Troubleshoot errors according to the Service Manual	YES
xJ01	xJ1* or xJ2* error occurs 10 times in 60 minutes	power-on again	YES
xJ--	No.(x) fan motor error, "--" refer to Table 6-1.4 Fan motor error code table	Troubleshoot errors according to the Service Manual	YES
P11	High pressure sensor error	sensor error	NO
P12	High pressure protection	Pressure protection	NO
P13	High pressure switch protection	Pressure protection	NO
P14	P12 protection occurs 3 times in 60 minutes	Pressure protection	YES
P21	Low pressure sensor error	Sensor error	YES
P22	low pressure protection	Pressure protection	NO
P24	Abnormal rise of low pressure	Pressure protection	NO
P25	P22 protection occurs 3 times in 100 minutes	Pressure protection	YES
xP32	No.(x) compressor high DC bus current protection	Current protection	NO
xP33	xP32 protection occurs 3 times in 100 minutes	Current protection	YES
P51	High AC voltage protection	Voltage protection	NO
P52	Low AC voltage protection	Voltage protection	NO
P53	Phase B and N of the power cable are connected to the opposite protection	Power protection	YES
P54	DC bus low voltage protection	Voltage protection	NO
P55	DC bus ripple over protection	Power protection	YES
xP56	No.(x) Inverter driver board DC bus low voltage error	Power protection	YES
xP57	No.(x) Inverter driver board DC bus high voltage error	Power protection	YES
xP58	No.(x) Inverter driver board DC bus excessively high voltage error	Power protection	YES

Error code	Error description	Remarks	Manual re-start required[2]
P71	EEPROM error	E party error	YES
Pb1	HyperLink overcurrent error	Overcurrent protection	YES
Pd1	Anti-condensation protection	condensation	NO
Pd2	Pd1 protection occurs 2 times in 60 minutes	condensation	YES
1b01	Electronic expansion valve (EEVA) error	missing Connection	YES
2b01	Electronic expansion valve (EEVB) error	missing Connection	YES
3b01	Electronic expansion valve (EEVC) error	missing Connection	YES
4b01	Electronic expansion valve (EEVE) error	missing Connection	YES
bA1	HyperLink cannot open or close indoor unit's Electronic expansion valve	System error	YES

Note:

'x' is a placeholder for the fan or compressor address, with 1 representing fan A or compressor A and 2 representing fan B or compressor B.

1.2 Installation and debugging error code table

Table 6-1.2 Installation and debugging error code table

Error code	Error description	Remarks	Manual re-start required[2]
U11	Outdoor unit model is not set	System configuration	YES
U12	Outdoor unit Capacity setting error	System configuration	YES
U21	System contains the old Indoor Unit with old platforms	System configuration	YES
U31	The test run was never successful, and did not run within 30 minutes after power-on	Pilot run	YES
U32	Outdoor temperature out of operating range	Pilot run	YES
U33	Indoor temperature out of operating range	Pilot run	YES
U34	Outdoor and indoor temperature out of operating range	Pilot run	YES
U35	Liquid side stop valve is not opened	Pilot run	YES
U37	Gas side stop valve is not opened	Pilot run	YES
U38	Outdoor unit has No address	Outdoor Unit set	YES
U3A	The refrigerant pipe connection is not consistent with the communication cable	Pilot run	NO
U3b	The installation environment is abnormal	Pilot run	YES
U3C	The VIP indoor unit is not set (valid in Changeover priority mode)	Pilot run	NO
U4x	Overconnection ratio contains U41-U46	System configuration	YES
U51	Outdoor unit of Individual Series is installed in combined system.	System configuration	YES
U53	Different series of outdoor units are detected in the same VRF system.	System configuration	YES

1.3 Compressor drive error code table

Table 6-1.3 Compressor drive error code table

Error code	Error description	Remarks	Manual re-start required[2]
xL1E	Hardware overcurrent	current overload error	NO
xL11	Software overcurrent		NO
xL12	Software overcurrent protection last 30s		NO
xL2E	Module overtemperature protection	Over-temperature error	NO
xL3E	Low bus voltage error	Power supply error	NO
xL31	High bus voltage error		NO
xL32	The bus voltage is excessively high		NO
xL33	Bus voltage drop fault		NO
XL43	The current sampling bias is abnormal	Hardware error	NO
xL5E	Startup failed	Control error	NO
xL51	Out-of-step error	Control error	NO
xL52	Locked-rotor protection	Motor error	NO
xL6E	Compressor motor lack of phase protection	Diagnosis error	NO

Note:'x' is a placeholder for the fan or compressor address, with 1 representing fan A or compressor A and 2 representing fan B or compressor B.

1.4 Fan motor error code table

Table 6-1.4 Fan motor error code table

Code	Error description	Remarks	Manual re-start required2
xJ1E	Hardware overcurrent	current overload error	NO
xJ11	Software overcurrent		NO
xJ12	Software overcurrent protection last 30s		NO
xJ2E	Module overtemperature protection	Over-temperature error	NO
xJ3E	Low bus voltage error	Power supply error	NO
xJ31	High bus voltage error		NO
xJ32	The bus voltage is excessively high		NO
xJ43	The current sampling bias is abnormal	Hardware error	NO
xJ5E	Startup failed	Control error	NO
xJ51	Out-of-step error		NO
xJ52	Locked-rotor protection		NO
xJ6E	Motor lack of phase protection	Diagnosis error	NO

Note: 'x' is a placeholder for the fan address, with 1 representing fan A and 2 representing fan B

1.5 Status prompt code table

Table 6-1.5 Status prompt code table

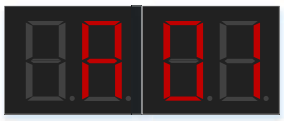
Status code	Code description	Remarks	Manual re-start required2
d0x	Oil return,”x” is the current step node	Status hint	NO
dfx	Defrost, ”x” is the current step node	Status hint	NO
d11	The outdoor ambient temperature exceeds the upper limit (Heating mode)	Status hint	NO
d12	The outdoor ambient temperature exceeds the lower limit (Heating mode)	Status hint	NO
d13	The outdoor ambient temperature exceeds the upper limit (Cooling mode)	Status hint	NO
d14	The outdoor ambient temperature exceeds the lower limit (Cooling mode)	Status hint	NO
d31	Refrigerant judgment: no result	Status hint	NO
d32	Refrigerant quantity judgment:Significantly excessive	Status hint	NO
d33	Refrigerant quantity judgment:Slightly excessive	Status hint	NO
d34	Refrigerant quantity judgment:normal	Status hint	NO
d35	Refrigerant quantity judgment:Slightly insufficient	Status hint	NO
d36	Refrigerant quantity judgment:Significantly insufficient	Status hint	NO
d41	System exist no power indoor unit, HyperLink is controlling this indoor unit’s valve	Status hint	NO

Note: the above non-error code, no troubleshooting

2 Error in Main Control

2.1 A01: emergency shutdown of Outdoor Units

2.1.1 Digital display output



2.1.2 Description

- Compressor protection shut down
- All Outdoor Units stop running
- Error codes are displayed only on master uint.

2.1.3 Trigger / recover condition

(1)Check menu N28 = 0:

- Trigger condition:Dry contact x(main control board CN55/CN56)is short-circuited
- Recover condition:remove Dry contact x short-circuited
- Reset method:Resume automatically

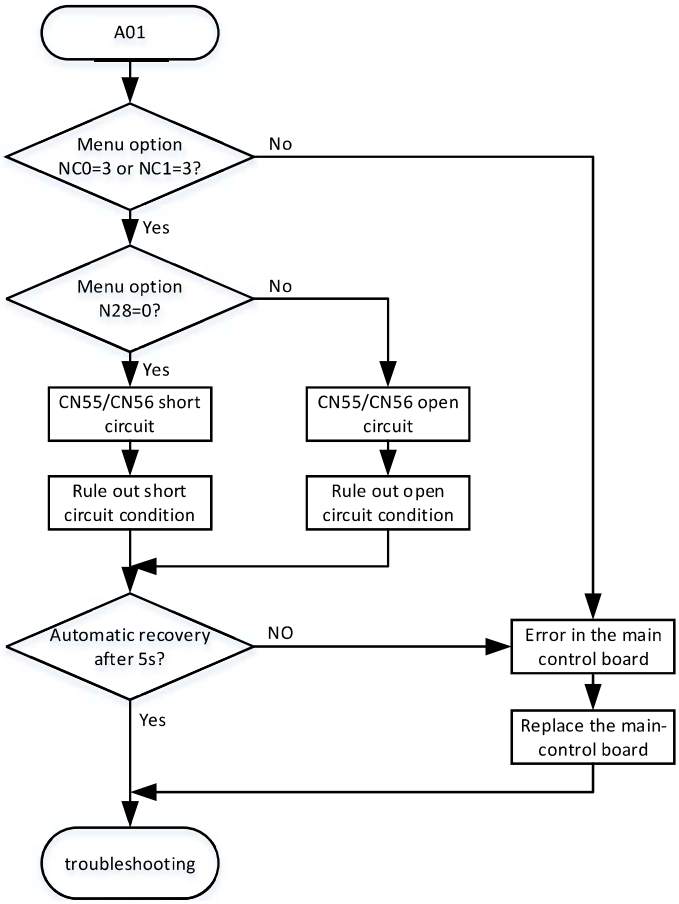
(2)Check menu N28 = 1 :

- Trigger condition:Dry contact x(PCB CN55/CN56)is open-circuited
- Recover condition:remove Dry contact x short-circuited
- Reset method:Resume automatically

2.1.4 Possible causes

- Damaged outdoor unit main control board.
- Centralized controller command

2.1.5 Procedure


A01
Menu option NC0=3 or NC1=3?
No
Yes
Menu option N28=0?
No
Yes
CN55/CN56 short circuit
CN55/CN56 open circuit
Rule out short circuit condition
Rule out open circuit condition
Automatic recovery after 5s?
NO
Error in the main control board
Yes
Replace the main-control board
troubleshooting

2.2 xA61: No.x slave unit error

2.2.1 Digital display output

2.2.2 Description

- xA6 shows The Outdoor Unit at address X is in error(x=1,2,3)
- All Outdoor Units stop running
- Error code are displayed only on master unit.

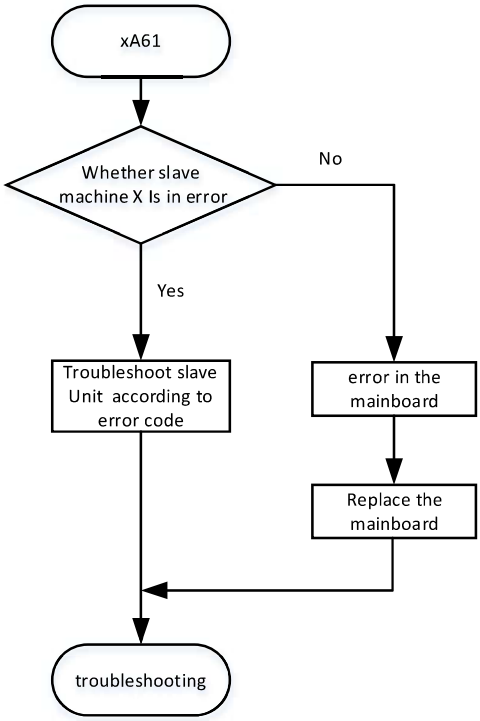
2.2.3 Trigger / recover condition

- Trigger condition: Slave machine is in error.
- Recover condition: Error of slave unit recover
- Reset method:Resume automatically

2.2.4 Possible causes

- Driven machine is in error

2.2.5 Procedure



2.3 AAx: Inverter driver board X does not match the main control board

2.3.1 Digital display output

2.3.2 Description

- No.x Inverter driver board does not match the main control board
- All units stop running.
- Error code is displayed on the unit with the error

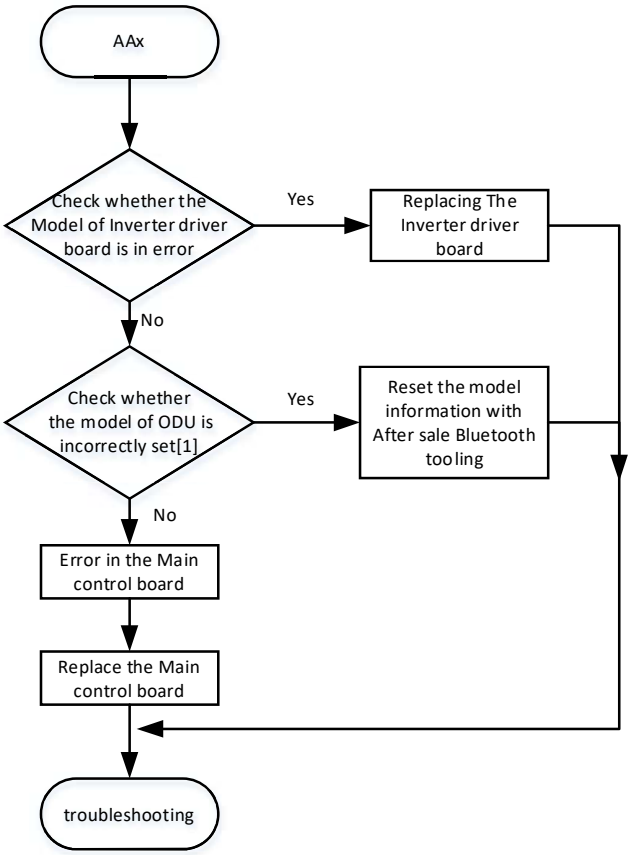
2.3.3 Trigger / recover condition

- Trigger condition:the internal driver parameters of the module board do not match Outdoor Units
- Recover condition:the internal driver parameters of the module board match Outdoor Units
- Reset method: Rectify the error and power-on again

2.3.4 Possible causes

- Model error of Inverter driver board
- The model of Outdoor Unit is incorrectly set.
- Main control board is damaged

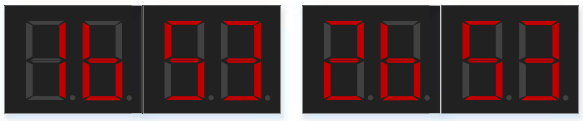
2.3.5 Procedure



Notes:
[1]. Use after-sale Bluetooth tooling connect with outdoor unit can check the model of ODU.

2.4 xb53: No.x Recirculation fan error

2.4.1 Digital display output



2.4.2 Description

- No.x Recirculation Fan[1] is in error
- All units stop running.
- Error code is displayed on the unit with the error

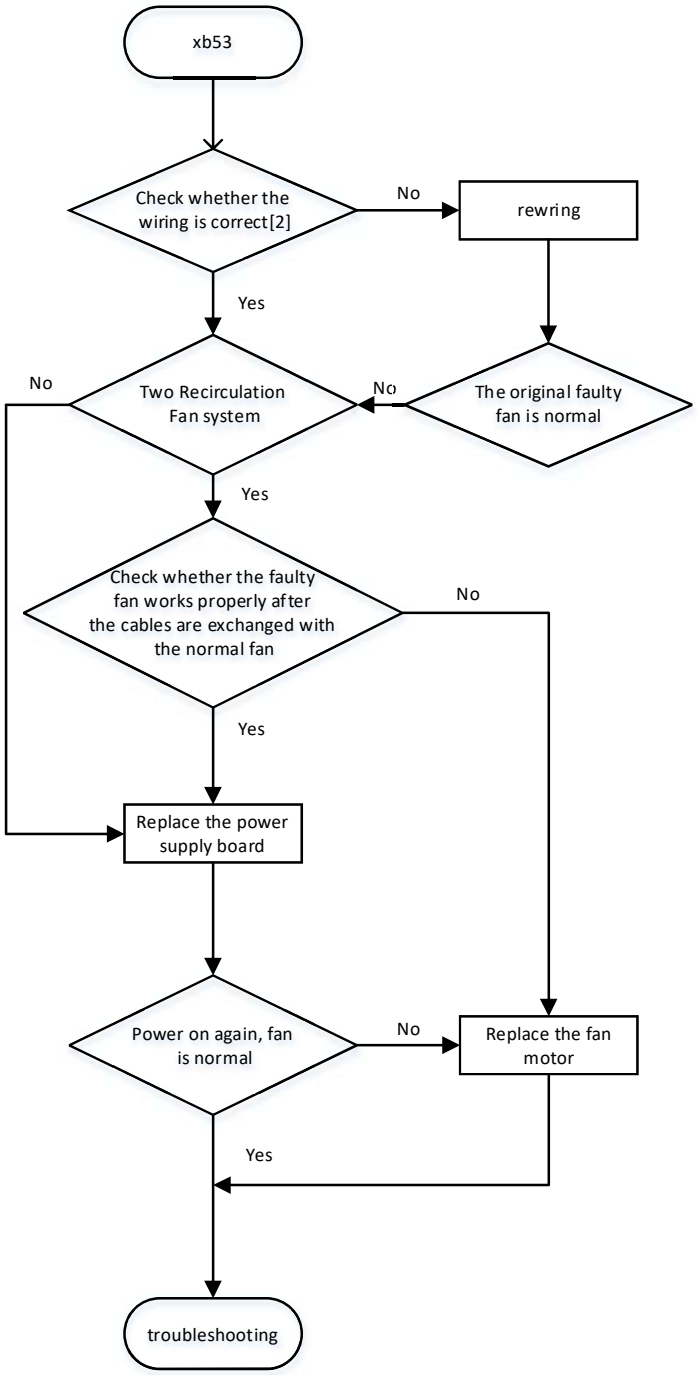
2.4.3 Trigger / recover condition

- Trigger condition: the difference between the actual fan speed and the set fan speed is 300rpm, lasting for 50s.
- Recover condition: the difference between the actual fan speed and the set fan speed is within 300rpm
- Reset method: Rectify the error and power-on again

2.4.4 Possible causes

- The cable connect Recirculation Fan and Recirculation Fan power supply disconnected.
- The Recirculation Fan is damaged
- The Recirculation Fan power supply is damaged
- ODU main control board is damaged

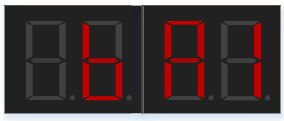
2.4.5 Procedure



Notes:
[1]. The fan runs only when the fan or compressor is running, but does not run in standby mode
[2]. Refer to the Part 5 *Figure 5-2.1 and Table 5-2.1*

2.5 bA1: HyperLink cannot open or close IDU’s Electronic expansion valve

2.5.1 Digital display output



2.5.2 Description

- When some IDUs are powered off, HyperLink fail to close their EEV.
- All units stop running.
- Error code is only displayed on the master unit

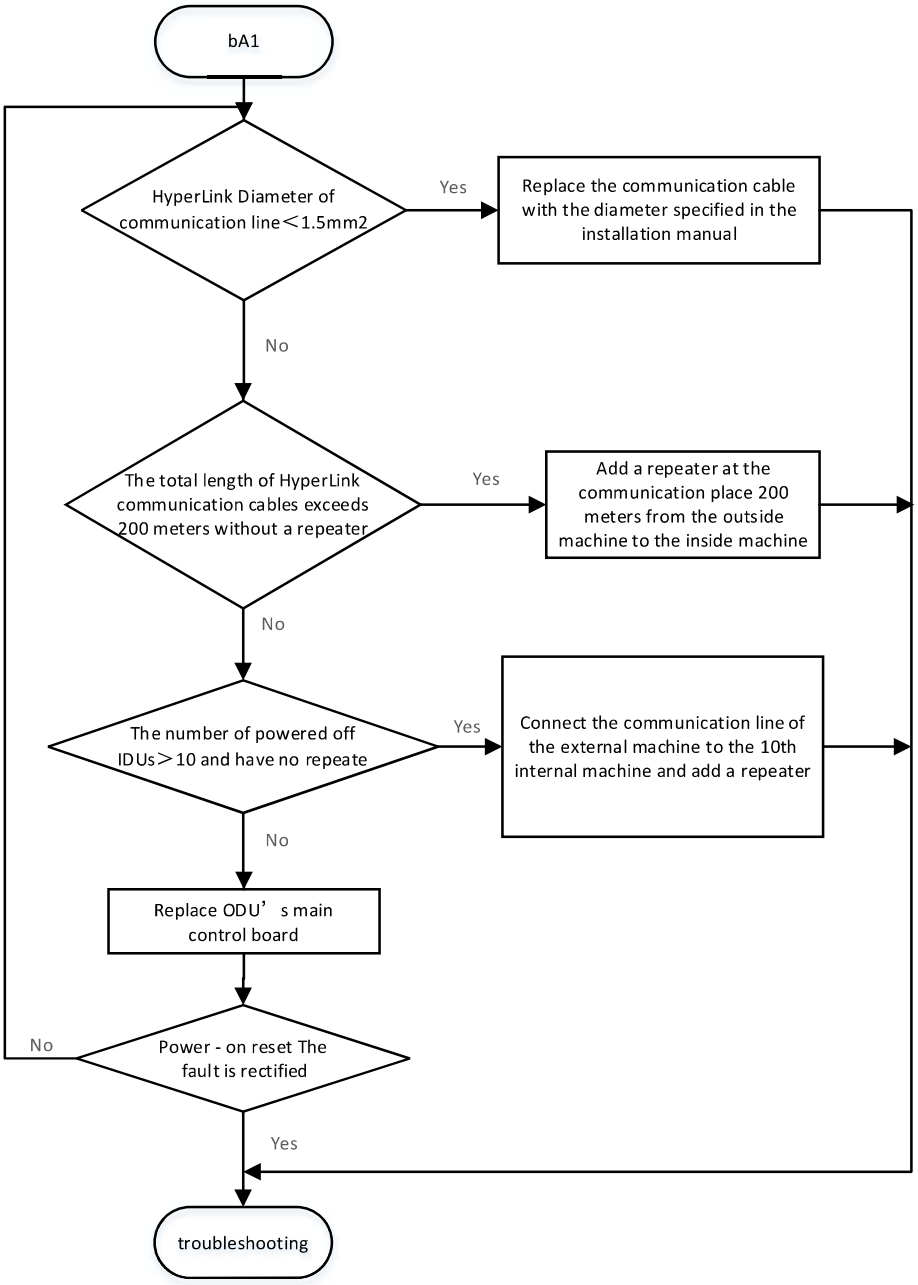
2.5.3 Trigger / recover condition

- Trigger condition:when some IDUs in the system are powered off, HyperLink board voltage＜17V
- Recover condition: HyperLink board voltage＞17V
- Reset method: Resume manually
-

2.5.4 Possible causes

- HyperLink Diameter of communication line＜1.5mm^2;
- The total length of HyperLink communication cables exceeds 200 meters without a repeater;
- The number of powered off IDUs＞10 and have no repeater:
- Indoor main control board is damaged;
- Outdoor main control board is damaged.

2.5.5 Procedure



2.6 U38: Outdoor Unit has no address.

2.6.1 Digital display output

Description

- Outdoor Unit has no address.
- The ODU with error can not run.
- The master outdoor unit cannot communicate with indoor units.

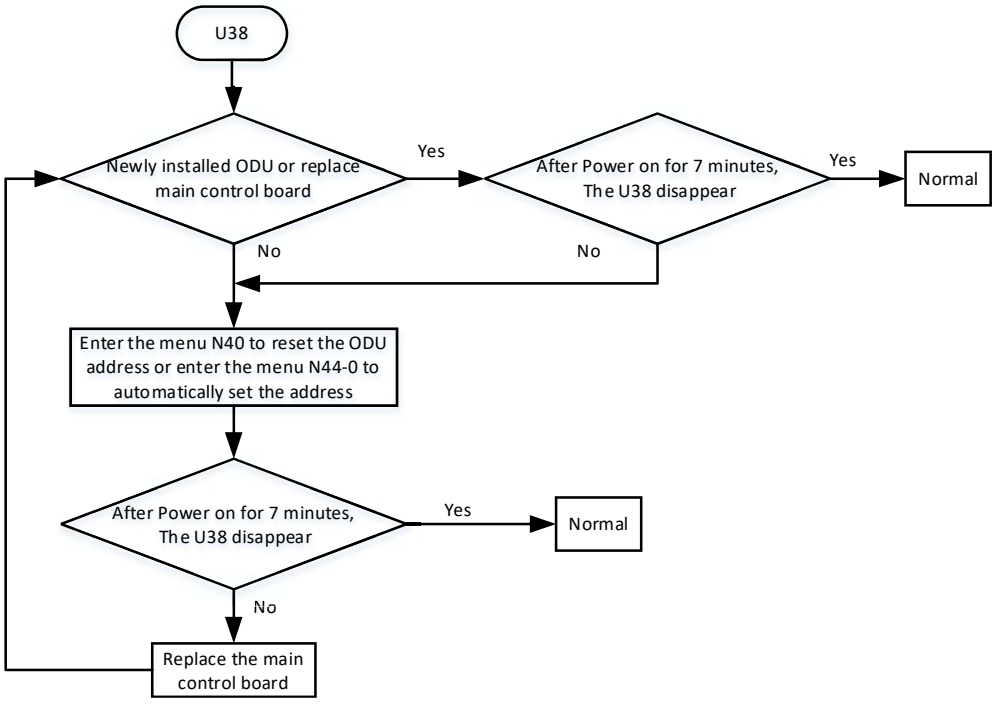
2.6.2 Trigger / recover condition

- Trigger condition: The ODU's address is not set
- Recover condition: Enter the menu N40 to reset the outdoor unit address. The master address is 0 and the slave address is 1 ~ 3
- Reset method: Resume manually

2.6.3 Possible causes

- The ODU's address is not set
- Outdoor main control board is damaged

2.6.4 Procedure



Notes:

[1]After setting the outdoor unit address, waiting for 30 seconds then, powering off the ODU, next waiting another 30 seconds, and then powering on the ODU again.

2.7 C13: The address of Outdoor Unit is repeated

2.7.1 Digital display output

2.7.2 Description

- The address of Outdoor Unit is repeated.

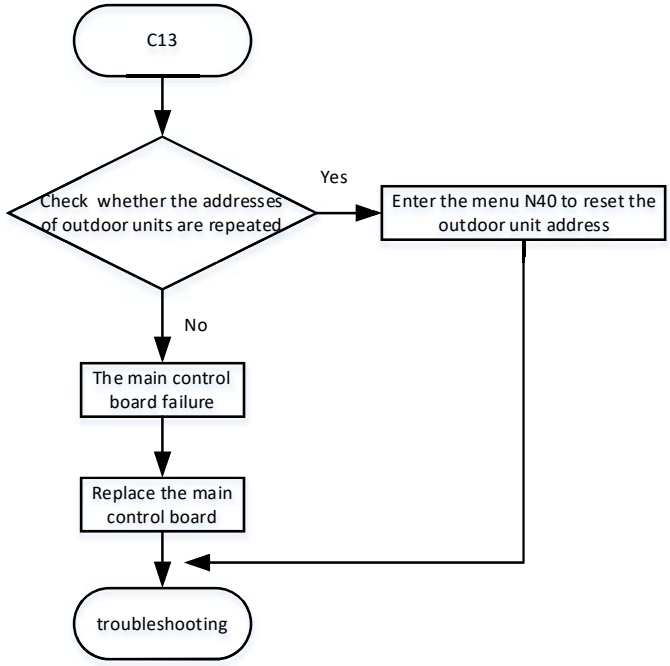
2.7.3 Trigger /recover condition

- Trigger:Two or more outdoor units in the Combined system have the same address
- Recover condition:the address of master and slave unit are set to be 0~3 successively
- Reset method: Manually restart

2.7.4 Possible causes

- Two or more outdoor units in the Combined system have the same address
- Damaged outdoor main control board

2.7.5 Procedurem



Notes:

After setting the outdoor unit address, waiting for 30 seconds then, powering off the device, next waiting another 30 seconds, and then powering on the device again.The master address must be set to 0

2.8 C21: Communication error between IDU and ODU.

2.8.1 Digital display output

2.8.2 Description

- Communication error between IDU and ODU
- All units stop running.
- Error code is only displayed on the master unit.

2.8.3 Trigger / recover condition

- Trigger condition:20 minutes after the outdoor unit is power on,the communication signal from the IDU cannot be received by ODU for two minutes
- Recover condition: the ODU receives the communication signal from the IDU.
- Reset method: Resume automatically

2.8.4 Possible causes

(1)PQ communication is adopted

- The three-core shield cable is not in use or the shield layer is not grounded.
- The communication cable is not tightened or the surface contact of the wiring block is poor
- Communication cable is disturbed by strong electromagnetic wave
- The communication cable is disconnected or in bad contact due to various reasons
- Communication cables are not connected hand in hand or the PQE cable sequence is incorrect
- The address of an IDU is incorrect
- Indoor main control board is damaged.
- Outdoor main control board is damaged.

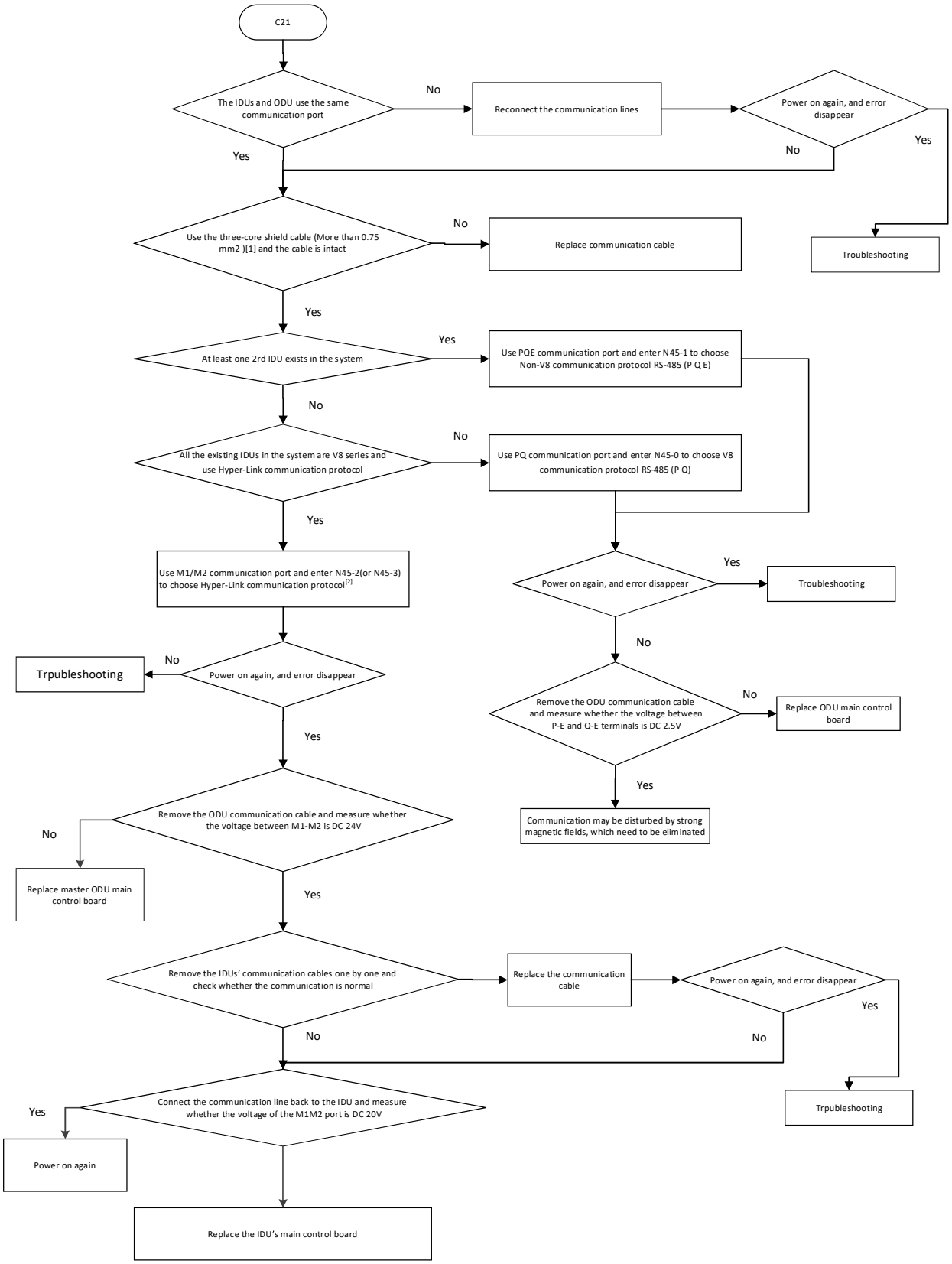
(2)M1M2 communication is adopted

- The communication cable is not tightened or the surface contact of the wiring block is poor
- Communication line is disturbed by strong electromagnetic wave
- The communication cable is disconnected or in bad contact due to various reasons
- The address of an IDU is incorrect
- Indoor main control board is damaged.
- Outdoor main control board is damaged.

[1] If Hyper-Link communication is used, the communication wire diameter should be 1.5mm^2

[2] N45-2 IDUs uniform power supplied; N45-3-IDUs separate power supplied

2.8.5 Procedure



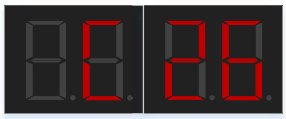
Note:

[1] If Hyper-Link communication is used, the communication wire diameter should be 1.5mm^2

[2] N45-2 IDUs uniform power supplied; N45-3-IDUs separate power supplied

2.9 C26 Abnormal reduction in the number of indoor units

2.9.1 Digital display output



2.9.2 Description

- The number of online indoor units is smaller than the configured number
- All units stop running.
- Error code is only displayed on the master unit

2.9.3 Trigger / recover condition

- Trigger condition:

  N0: The number of IDU set by ODU; N1: The number of online machines.

  (1)During operation, N1 < N0 and lasts for 2 minutes

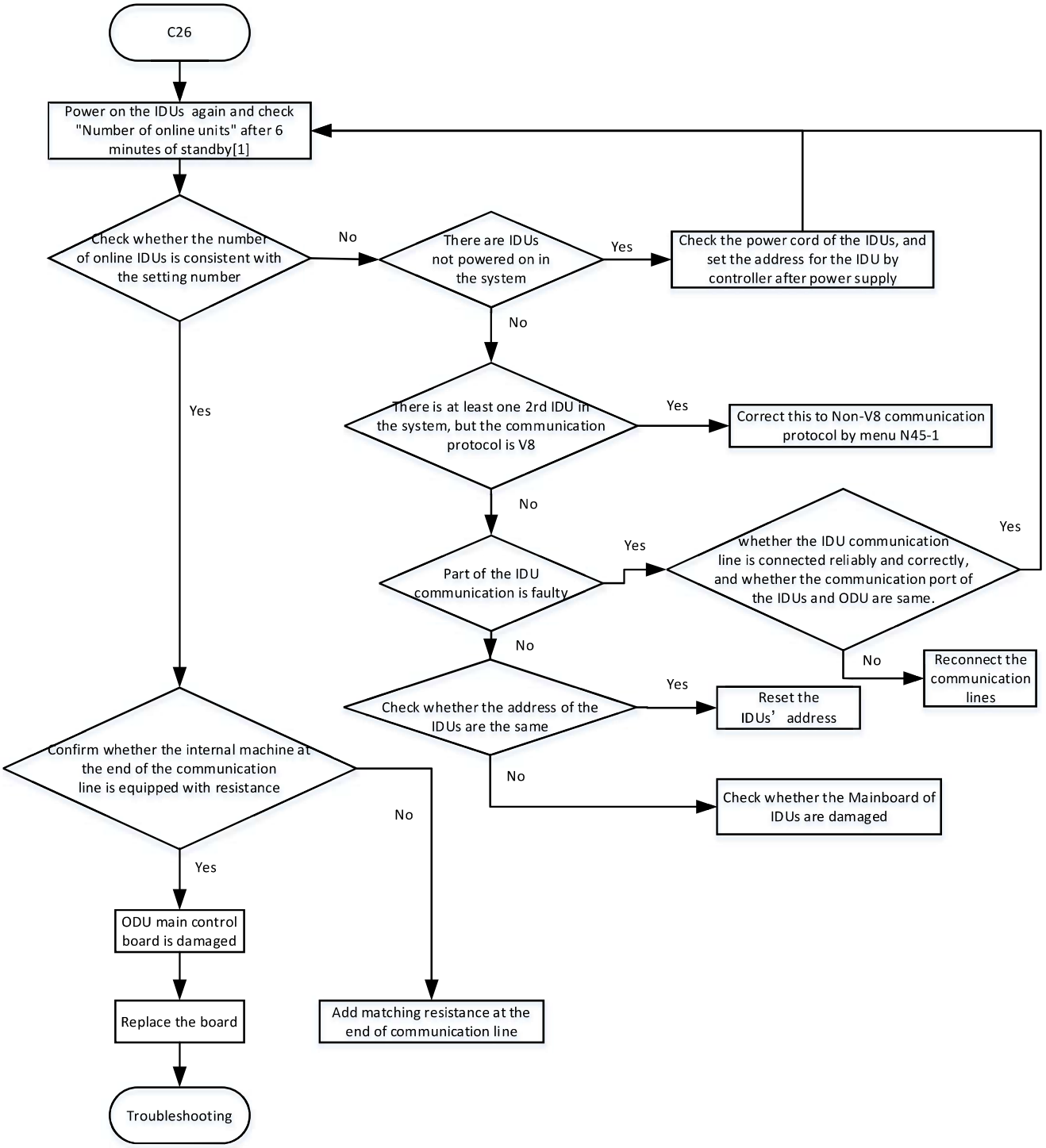
  (2) After the first power-on, N1<N0 within 20 minutes, ODU can not start starts and display that error
- Recover condition:

  N1 = N0 for 60 seconds
- Reset method: Resume automatically

2.9.4 Possible causes

- The three-core shield cable is not in use or the shield layer is not grounded.
- The communication cable is not tightened or the surface contact of the wiring block is poor
- Communication cable is disturbed by strong electromagnetic wave
- The communication cable is disconnected or in bad contact due to various reasons
- Communication cables are not connected hand in hand or the PQE cable sequence is incorrect
- The address of an indoor unit is incorrect
- Indoor main control board is damaged.
- Outdoor main control board is damaged.
- The number of IDU set by ODU is inconsistent with the actual number of IDU

2.9.5 Procedure



Note:
[1] Check the Number of indoor units (set by master unit) refer to the ***Part 4*** - *4.4.1*

2.10 C28: Abnormal increase in the number of indoor units

2.10.1 Digital display output

2.10.2 Description

- Abnormal increase in the number of indoor units
- All units stop running.
- Error code is only displayed on the master unit

2.10.3 Trigger / recover condition

- Trigger condition:

  N0: The number of IDU set by ODU; N1: The number of online machines.

  (1) During operation, N1 >N0 and lasts for 2 minutes

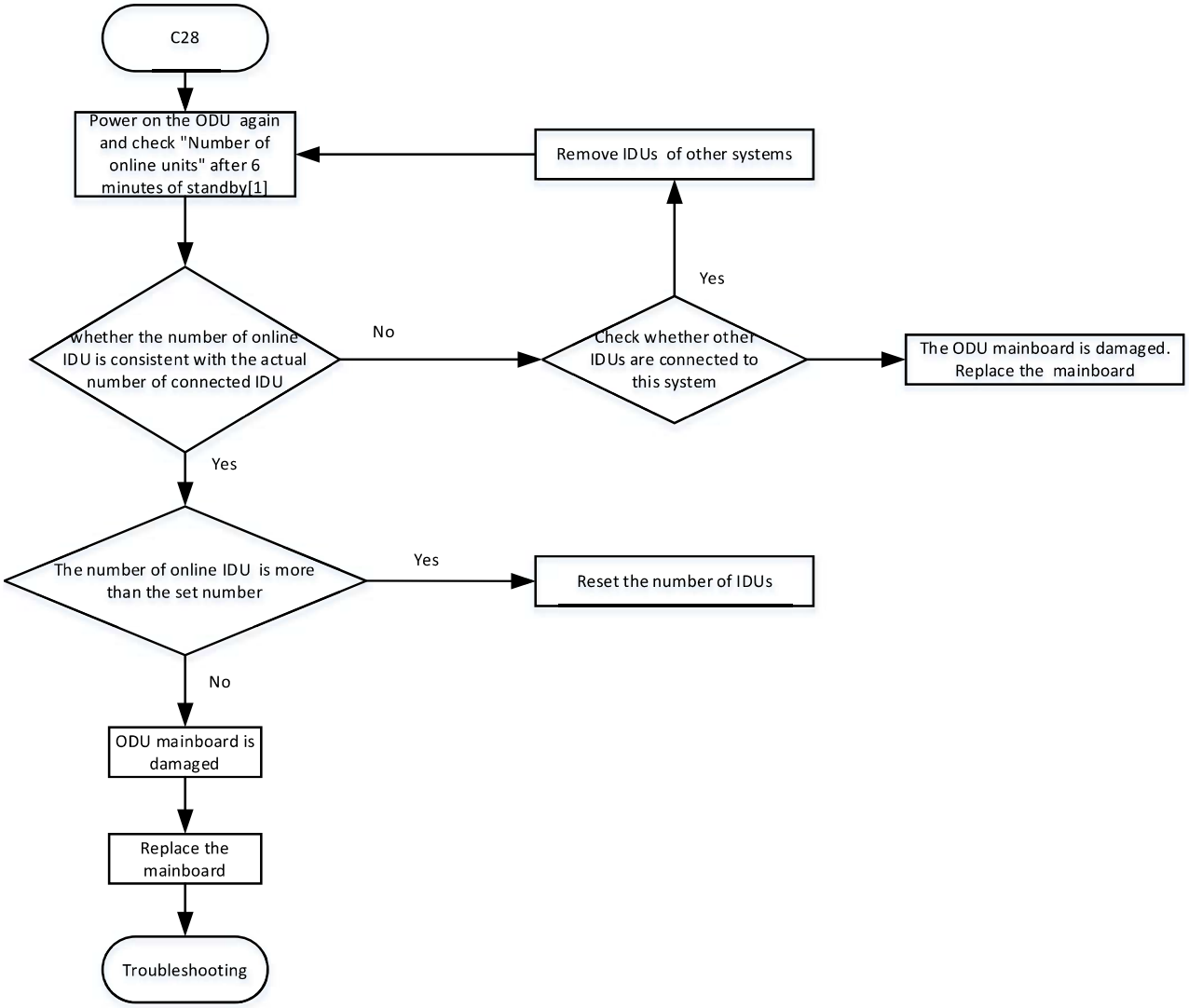
  (2) After the first power-on, N1>N0 within 20 minutes, ODU can not start starts and display the error
- Recover condition:

  N1 = N0 for 60 seconds
- Reset method: Resume automatically.

2.10.4 Possible causes

- The three-core shield cable is not in use or the shield layer is not grounded.
- The communication cable is not tightened or the surface contact of the wiring block is poor
- Communication cable is disturbed by strong electromagnetic wave
- The communication cable is disconnected or in bad contact due to various reasons
- Communication cables are not connected hand in hand or the PQE cable sequence is incorrect
- The address of an indoor unit is incorrect
- Indoor main control board is damaged.
- Outdoor main control board is damaged.
- The number of IDU set by ODU is inconsistent with the actual number of IDU

2.10.5 Procedure



Note:
[1] Check the Number of indoor units (set by master unit) refer to the *Part 4 - 4.4.1*

2.11 xC31: Communication error between No.x slave outdoor unit and master outduoor unit.

2.11.1 Digital display output

2.11.2 Description

- The No.x outdoor slave unit cannot communicate with the outdoor master unit.
- All units stop running.
- Error code is only displayed on the slave unit with the error.

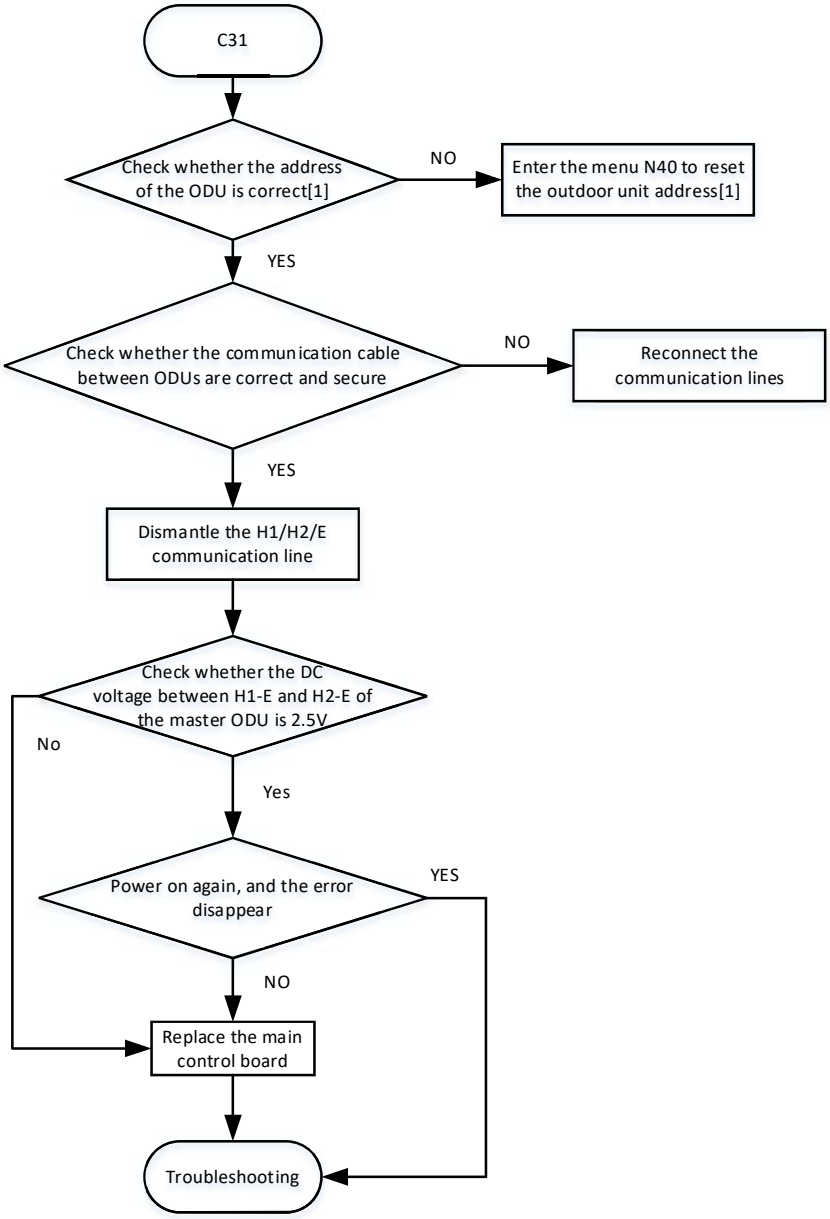
2.11.3 Trigger / recover condition

- Trigger condition:The communication between the slave unit and the master unit of the Combined system is interrupted for more than 2 minute
- Recover condition:The communication between the slave unit and the master unit of the Combined system is restored
- Reset method:Power off the device for 30 seconds and then power it on again

2.11.4 Possible causes

- Communication cables are not tightened on the wiring block
- The surface of the wiring block is corroded
- The outdoor unit address is incorrectly set
- Outdoor main control board is damaged

2.11.5 Procedure



Note:

[1]The master is 0, and the slave is 1-3

2.12 C32: Abnormal reduction in the number of outdoor units

2.12.1 Digital display output

2.12.2 Description

- The number of online slave outdoor units detected by the master outdoor unit decreases
- All units stop running.
- Error code is only displayed on the master unit

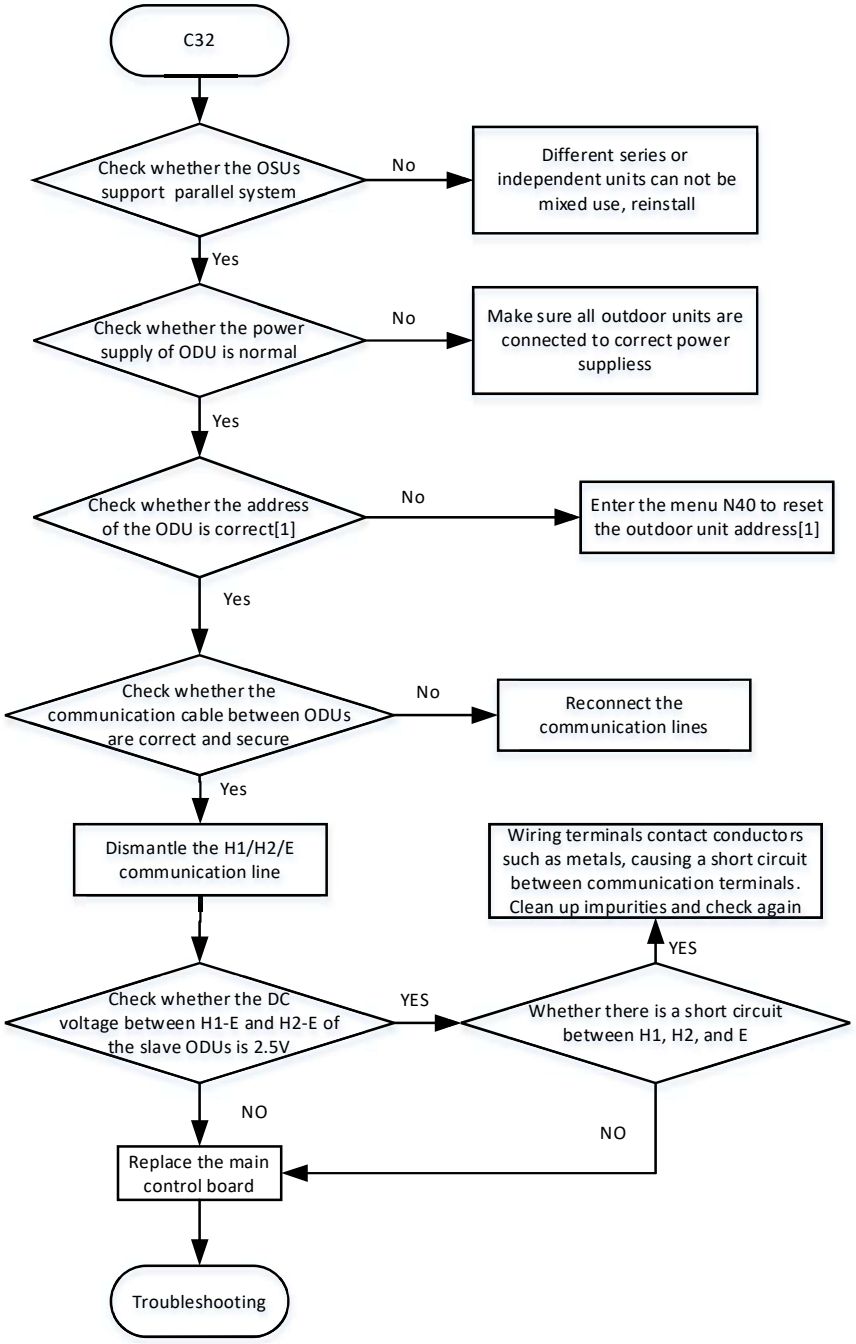
2.12.3 Trigger / recover condition

- Trigger condition:The number of online outdoor slave units detected by the outdoor master unit decreases
- Recover condition:The number of outdoor units recovers
- Reset method: Resume automatically

2.12.4 Possible causes

- Some outdoor slave units are powered off
- The outdoor units' address are repeated
- The outdoor unit address is false.
- Outdoor main control board is damaged
- The H1/H2 cable sequence is incorrect
- Outdoor Units do not support Combined connection

2.12.5 Procedure



Note:

[1]The master is 0, and the slave is 1-3

2.13 C33: Abnormal increase in the number of outdoor units

2.13.1 Digital display output

2.13.2 Description

- The number of online outdoor slave units detected by the outdoor master unit increases
- All units stop running.
- Error code is only displayed on the master unit

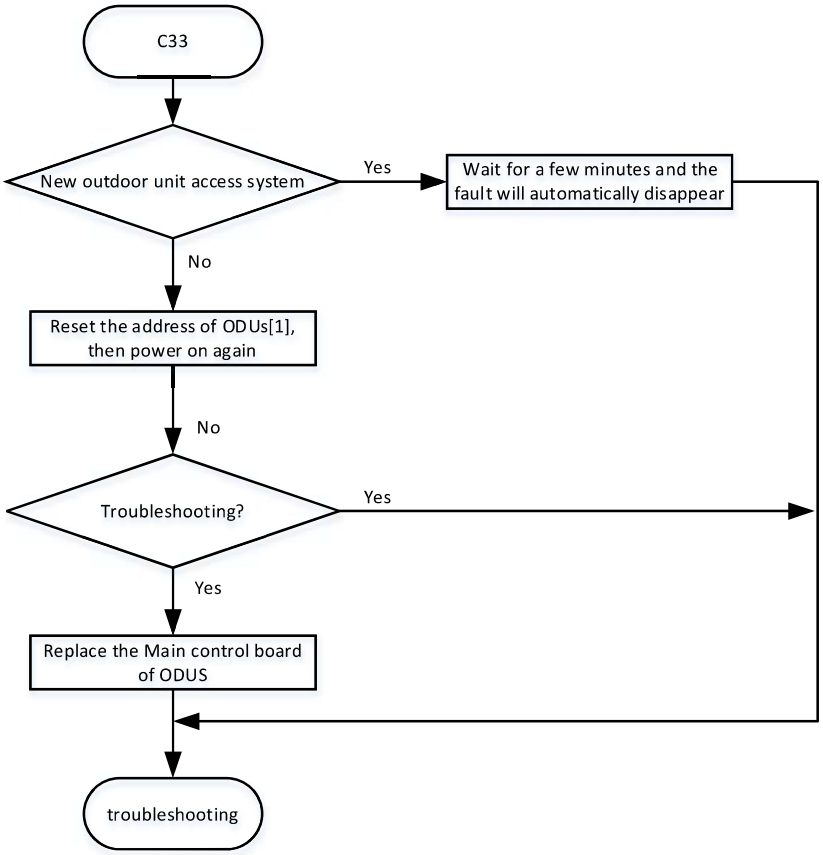
2.13.3 Trigger / recover condition

- Trigger condition:One or more slave Outdoor unit is newly connected during system operation
- Recover condition:Check the system connection status and power on the system again
- Reset method: Resume manually

2.13.4 Possible causes

- The number of outdoor unit increases(One or more slave outdoor units newly Join Combined system)
- Set the outdoor unit address correctly if it is repeated or incorrect.

2.13.5 Procedure

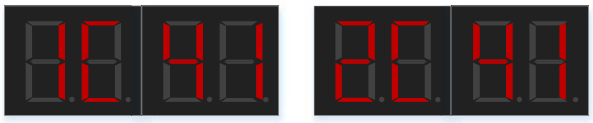


Note:

[1]The master is 0, and the slave is 1-3

2.14 xC41: Communication Error between main control board and No.x inverter driver board

2.14.1 Digital display output



2.14.2 Description

- The communication between the main control board and No.x inverter driver board is error
- All units stop running.
- Error code is displayed on the unit with the error

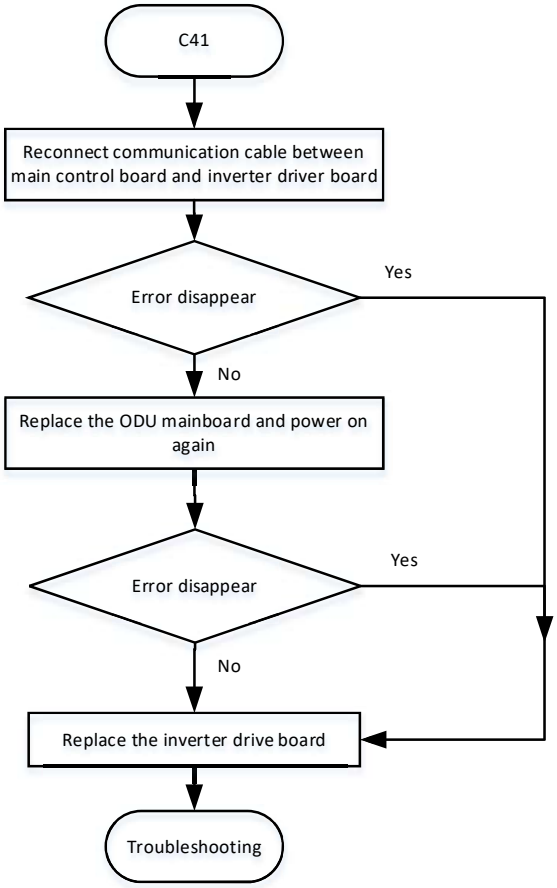
2.14.3 Trigger / recover condition

- Trigger condition: Communication between main control board and No.x inverter driver board is interrupted for more than 2 minutes
- Recover condition:Communication between the main control board and No.x inverter driver board is restored
- Reset method: Resume automatically.

2.14.4 Possible causes

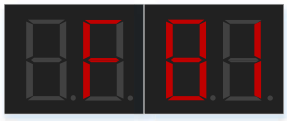
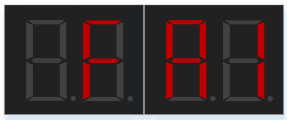
- Communication between main control board and No.x inverter driver board is interrupted
- No.x inverter driver board is damaged
- Main control board is damaged

2.14.5 Procedure



2.15 E41,F31,F41,F51,xF71,F81,F91,FA1,FC1,xFd1,Fp1: Temperature sensor error

2.15.1 Digital display output

Error code	Error description	Remarks	Digital display output
E41	Outdoor ambient temperature sensor (**T4**) error(open/short)	sensor error	
F31	Microchannel heat exchanger outlet temperature sensor(**T6B**) error(open/short)	sensor error	
F41	Main heat exchanger pipe temperature sensor (**T3**) error(open/short)	sensor error	
F51	Microchannel heat exchanger inlet temperature sensor(**T6A**) error(open/short)	sensor error	
xF71	Discharge temperature sensor(**T7C1/T7C2**) error (open/short)	sensor error	
F81	Gas pipe temperature sensor (**Tg**) error (open/short)	sensor error	
F91	Liquid pipe temperature sensor (**T5**) error (open/short)	sensor error	
FA1	Outdoor Heat exchanger gas temperature sensor (**T8**) error (open/short)	sensor error	
FC1	Outdoor heat exchanger liquid temperature sensor (**TL**) error (open/short)	sensor error	
xFd1	Compressor suction temperature sensor (**T71/T72**) error (open/short)	sensor error	
Fp1	Electric control box chamber temperature sensor (**Tb**) error (open/short)	sensor error	

2.15.2 Description

- All units stop running.
- Error code is displayed on the unit with the error
  Trigger / recover condition

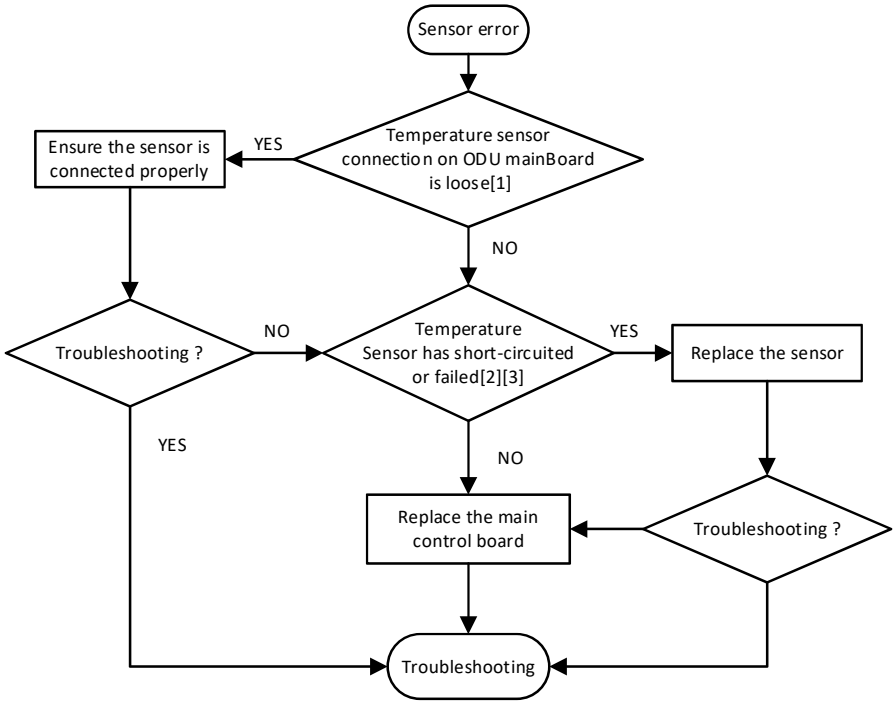
2.15.3

- Trigger condition:The main control board cannot obtain the normal AD value of the temperature sensor
- Recover condition:The main control board obtain the normal AD value of the temperature sensor
- Reset method: Resume automatically.

2.15.4 Possible causes

- The temperature sensor is not properly connected to the main control board.
- Sensor failure
- The main control board is damaged

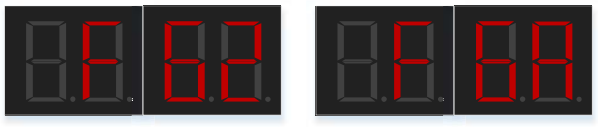
2.15.5 Procedure



Notes:
[1].The port on the main control board corresponding to the Temperature sensor refer to *Table5.3.1: Main Control Board port definition Table*.
[2].Measure sensor resistance. Removing the sensor and Use a multimeter to measure the sensor access resistance:If the resistance value is smaller than 0.5 kΩ(T7C1/T7C2 is 0.97 kΩ), the sensor is short-circuited, whereas, if the impedance is very higher than 380 kΩ (T7C1/T7C2 is 743 kΩ), the sensor is open-circuited(Refer to *Table 5.1.1: Temperature sensor temperature resistance characteristic table*)
[3]. Measure the voltage of the port on main control board. If the sensor resistance is normal, then use a multimeter to measure the port voltage: If the port voltage is not 3.3V with main control board is powered on, the main control board is damaged and needs to be replaced.

2.16 F62, F6A: Inverter driver board NTC overtemperature protection

2.16.1 Digital display output



2.16.2 Description

- All units stop running
- Error code is displayed on the unit with the error.

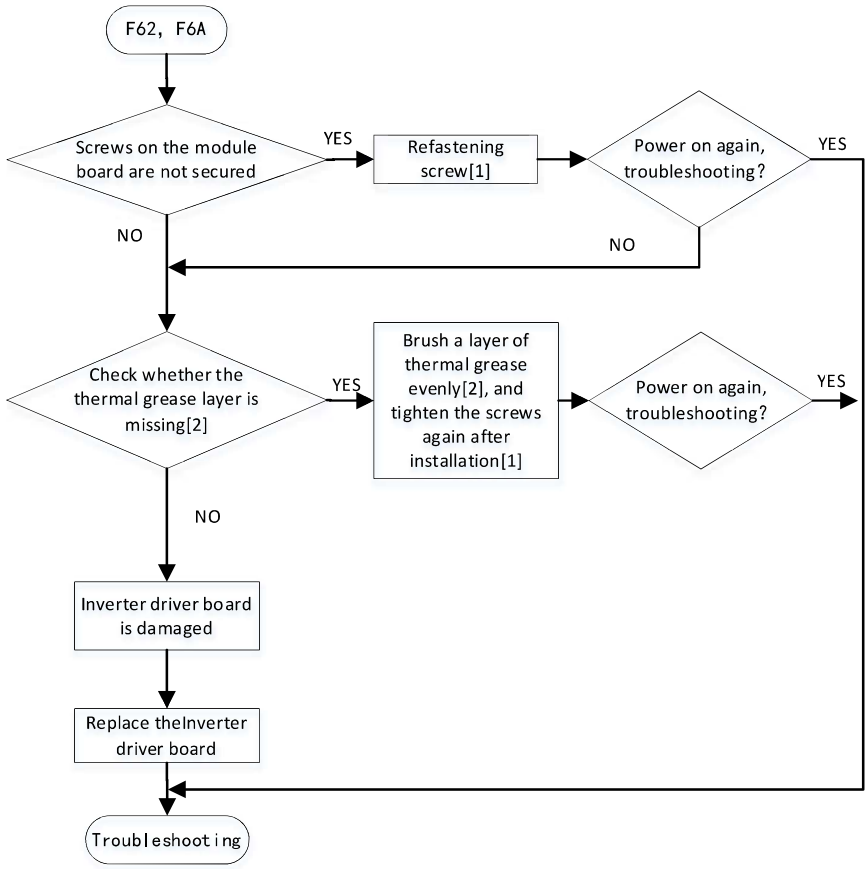
2.16.3 Trigger/ Recover condition

- Trigger condition:
  F62: The NTC temperature inside the compressor board or fan module is higher than 100 ° C
  F6A: F62 protection occurs 3 times in 100 minutes
- Recover condition: The NTC temperature is lower than 80 ° C
- Reset method:
  F62: Resume automatically
  F6A: Manually restart

2.16.4 Possible causes

- Inverter driver board is in poor contact with the radiator
- The thermal grease layer is missing
- Inverter driver board is damaged

2.16.5 Procedure



Notes:

[1] Reinstall the Inverter driver board refer to **Part 5** *-3.5 The installation guide of Compressor & Fan drive board*

[2]The thermal grease layer is located between the Inverter driver board and the radiator, and the thickness is about 0.2 mm.If the thermal grease layer is in poor condition, it is easy to lead to poor heat dissipation effect. You need to clean it and fill it again

2.17 F63: Non-inductive resistance Tr overtemperature protection

2.17.1 Digital display output

2.17.2 Description

- All units stop running
- Error code is displayed on the outdoor unit with the Error

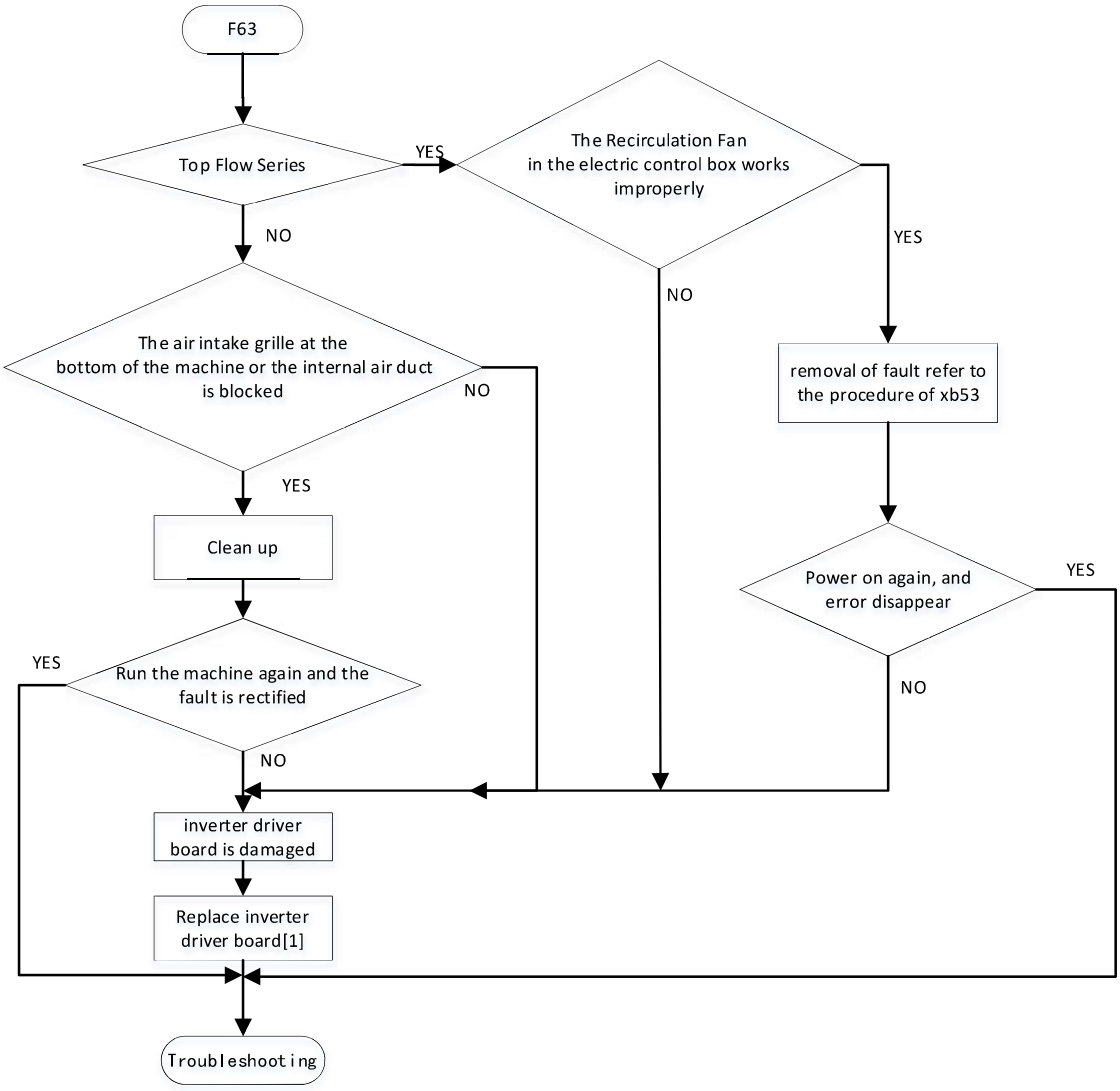
2.17.3 Trigger/ Recover condition

- Trigger condition: The non-inductive resistance temperature exceeds 95 ° C
- Recover condition: The non-inductive resistance temperature is lower than 70 ° C
- Reset method: Resume automatically

2.17.4 Possible causes

- The Recirculation Fan in the electric control box works improperly(Top Flow Series)
- The air intake grille at the bottom of the machine or the internal air duct is blocked(Side Flow Series)
- Inverter driver board is damaged

2.17.5 Procedure



Notes:
[1]. Reinstall the Inverter driver board refer to **Part 5**-*3.5 The installation guide of Compressor & Fan drive board*

2.18 F72, F7A: Discharge Temperature protection

2.18.1 Digital display output

2.18.2 Description

- Discharge Temperature is over the limit.
- All outdoor Unit stop running
- Error code is displayed on the unit with the error

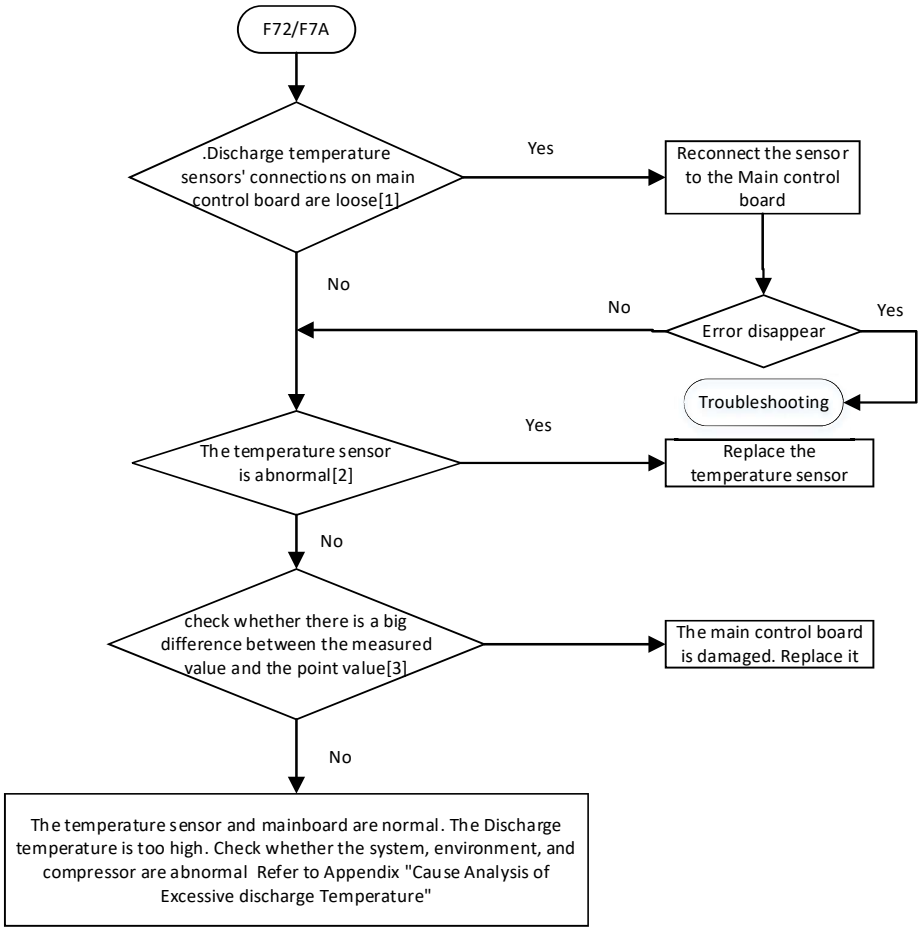
2.18.3 Trigger / Recover condition

- Trigger condition:
  F72: Discharge Temperature (T7C1/T7C2) ≥ 115°C.
  F7A:F72 protection occurs 3 times in 100 minutes
- Recover condition: Discharge Temperature (T7C1/T7C2) < 90 °C.
- Reset method:
  F72: Resume automatically
  F7A: Manually restart

2.18.4 Possible causes

- The discharge temperature sensor temperature failure
- Main control board is damaged
- The discharge temperature sensor temperature is too high

2.18.5 Procdure



Notes:
[1] The main control board port of Discharge temperature sensor 1 (T7C1) is CN4 and Discharge temperature sensor 2(T7C2) is CN38:
[2] Measure sensor resistance. If the resistance is too low, the sensor has short-circuited. If the resistance is not consistent with the sensor's resistance characteristics table, the sensor has failed. Refer to "*Table 5.1.1: Temperature sensor temperature resistance characteristic table"*
[3] Use the temperature measuring tool to measure the Discharge temperature. Less refrigerant system results in higher Discharge temperature of the compressor, lower Discharge and suction pressure, lower current, and frost on the gas return pipe. These phenomena disappear when the system is replenished with normal refrigerant. Refer to *Table 5.2.1 and 5.2.2* "Normal Refrigerant System parameters" in Chapter 5 for normal system parameters.

2.19 F75: Compressor discharge insufficient superheat protection

2.19.1 Digital display output

2.19.2 Description

- Superheat degree of Compressor discharge temperature is too low, triggering protection shutdown
- Determination during operation of outdoor unit.
- All units stop running.
- The error code is displayed on the outdoor unit with error.

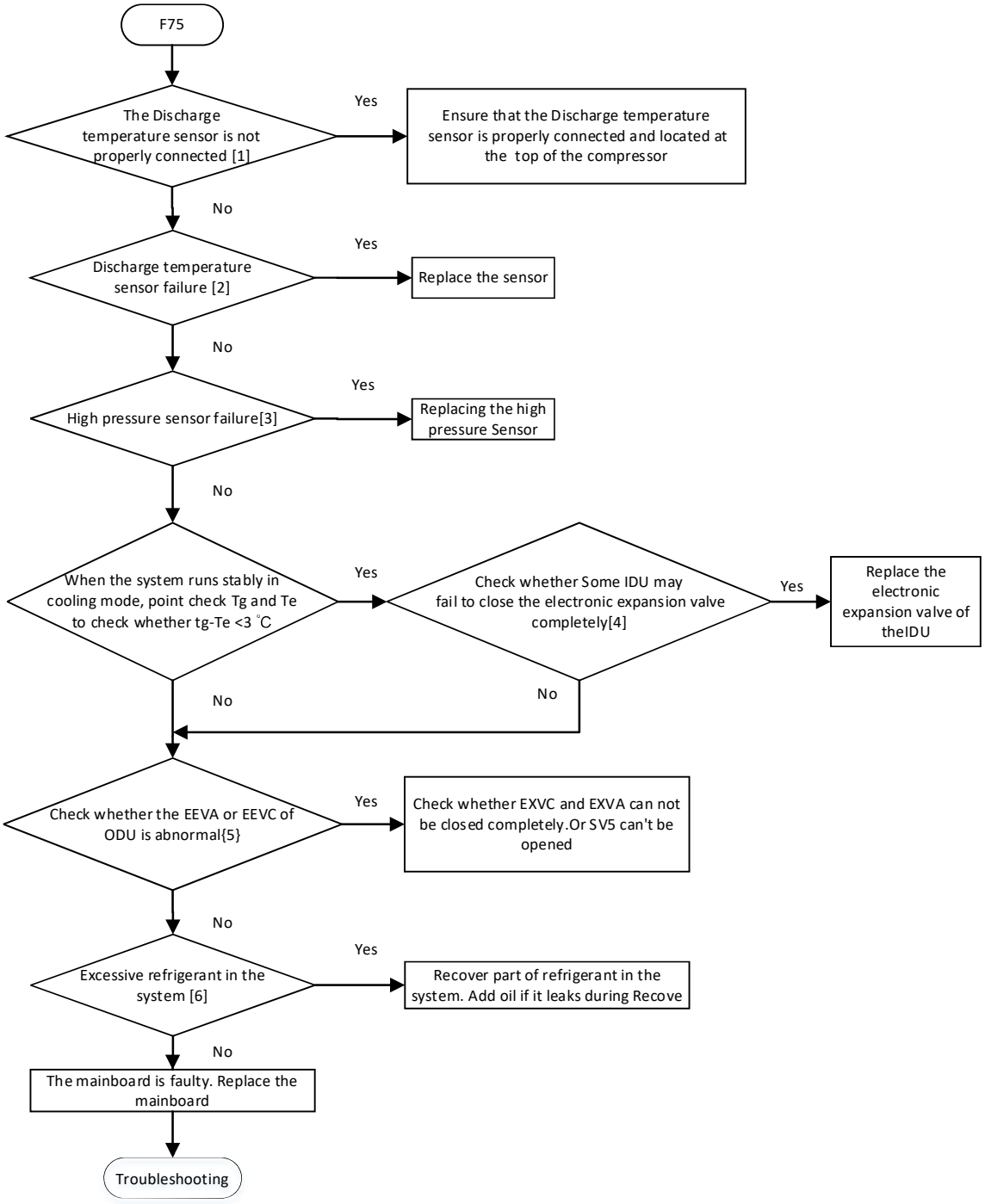
2.19.3 Trigger / recover condition

- Trigger condition:During the system operation, the discharge superheat of the compressor is lower than 6 ° C and lasts for more than 90 minutes
- Recover condition: Resume automatically after 30 seconds of downtime
- Reset method: Resume automatically

2.19.4 Possible causes

- Temperature sensor not connected properly or has malfunction.
- High pressure sensor not connected properly or has malfunction.
- Excess refrigerant.
- Some valves of ODU can’t be fully closed.
- Some valves of IDU can’t be fully closed.
- Outdoor main control board damaged.

2.19.5 Procedure



Notes:

[1] The main control board port of Discharge temperature sensor 1 (T7C1) is CN4 and Discharge temperature sensor 2(T7C2) is CN38:

[2] Measure sensor resistance. If the resistance is too low, the sensor has short-circuited. If the resistance is not consistent with the sensor's resistance characteristics table, the sensor has failed. Refer to Table 6-4.2 in Part 6, 4.1 "Temperature Sensor Resistance Characteristics "

[3] Measure the resistance among the three terminals of the pressure sensor. If the resistance is of the order of mega Ohms or infinite, the pressure sensor has failed.

[4] Close the IDU and check whether the temperature of the Gas pipe is too low or frosted or the evaporator is frosted

[5] If the following happens the EEVA or EEVC of ODU is abnormal

1. T6B-T6A<3°C and T6A-Te <3°C when EEVC minimum opening (0pls or 17pls)?
2. T8 -Te <2°C when EEVA minimum opening (0pls or 17pls) in heating mode?

[6] Excess refrigerant causes discharge temperature to be lower than normal, discharge pressure to be higher than normal and suction pressure to be higher than normal.Normal system parameters refer to *Table 5.2.1 and 5.2.2* "Normal Refrigerant System Parameters" in Chapter 5.

2.20 P11: High pressure sensor error

2.20.1 Digital display output

2.20.2 Description

- Open/short circuit error of high pressure sensor
- All units stop running.
- The error code is displayed on the Outdoor Unit with error.

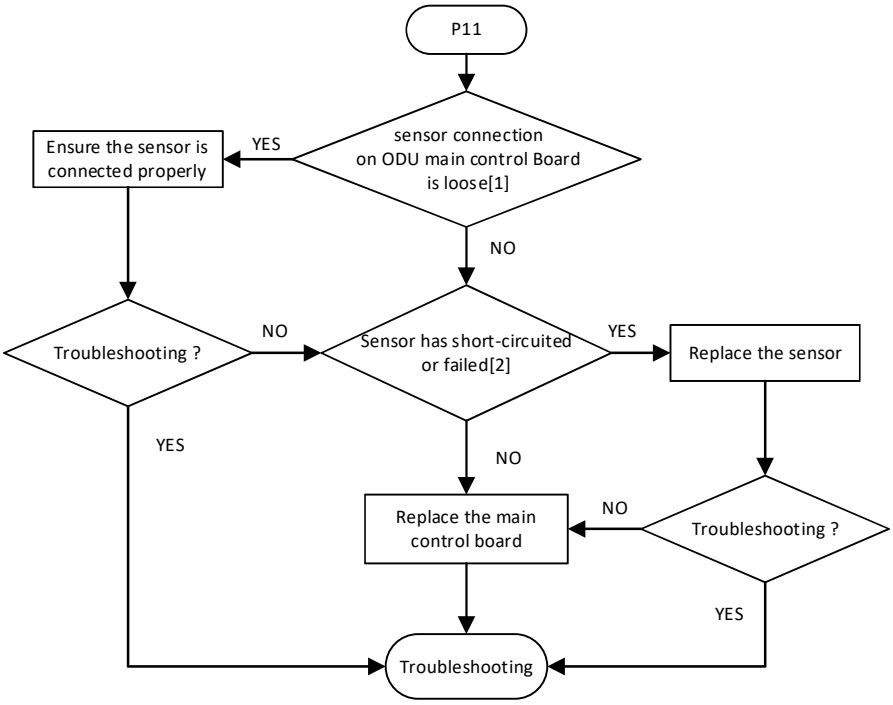
2.20.3 Trigger / recover condition

- Trigger condition:The main control board cannot obtain the normal AD value of the high pressure pressure sensor
- Recover condition:The main control board can obtain the normal AD value of the high pressure pressure sensor
- Reset method: Resume automatically.

2.20.4 Possible causes

- The high-pressure pressure sensor is not properly connected to the main control board, or it fails.
- The main control board is damaged

2.20.5 Procedure



Notes:

[1] The ports on the main control board corresponding to the high-pressure pressure sensor are CN40, please refer to **Table5.3.1:** *Main Control Board port definition Table.*

[2].Measure the voltage of the CN40 port.If the sensor is normal, use a multimeter to measure the port voltage; After the main control board is powered on, if the port voltage is not 3.3V, the main control board is damaged and needs to be replaced.

2.21 P12/P14:High pressure protection

2.21.1 Digital display output

2.21.2 Description

- P12: The high pressure is over the limit.
- P14: 3 times P12 in 100 minutes
- All units stop running
- Error code is displayed on the unit with the Error

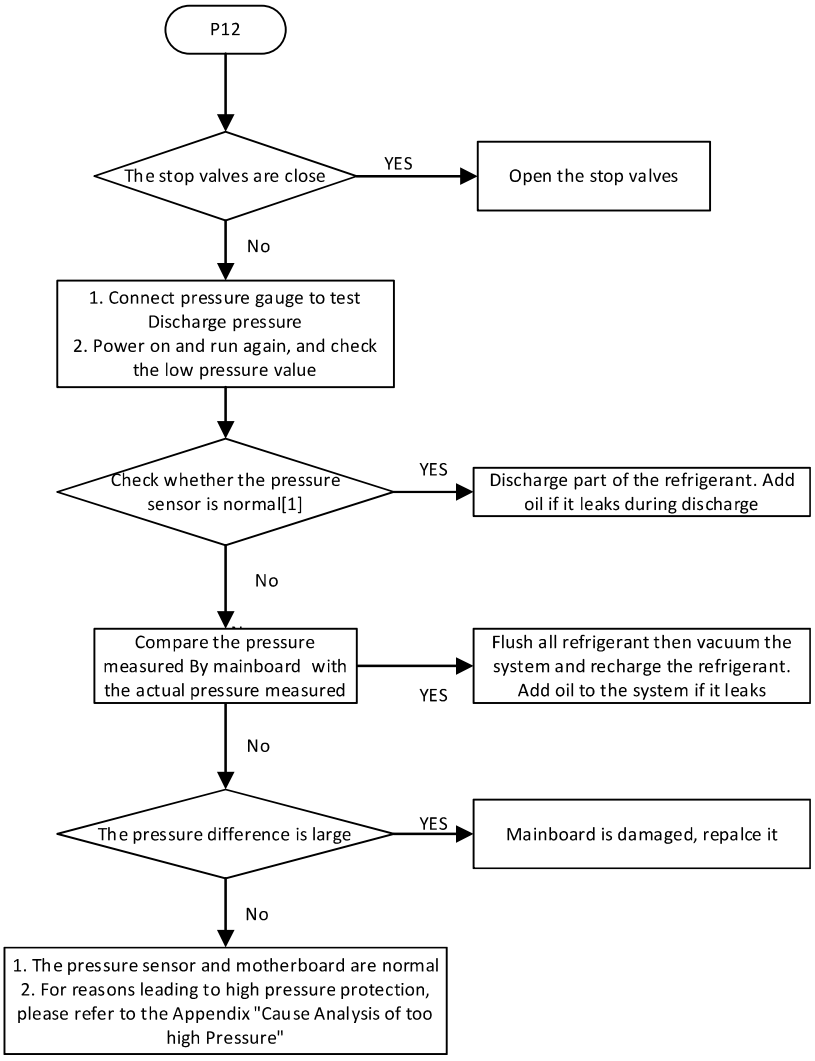
2.21.3 Trigger / recover condition

- Trigger condition:
  - P12: discharge pressure≥ 4.15 MPa.
  - P14: P12 occurs 3 times within 100 minutes
- Recover condition:
  - P12: Cooling mode: discharge pressure< 3.5MPa
    Heating mode: discharge pressure< 3.1MPa
  - P14: Remove high pressure protection from Outdoor Unit
- Reset method:
  - P12: Resume automatically.
  - P14: Resume manually

2.21.4 Possible causes

- Outdoor unit stop valves are closed.
- Pressure sensor/switch not connected properly or has malfunction.
- Poor condenser heat exchange.
- Outdoor main control board damaged.
- Refer to Appendix "Cause Analysis of Excessive Discharge Pressure".

2.21.5 Procedure



Note:
[1] The high voltage sensor port is connected to the Outdoor Unit main control board port CN40
[2] Measure the resistance between the three terminals of the pressure sensor.If the resistance is megohm or infinite, the pressure sensor fails

2.22 P13: High pressure switch protection

2.22.1 Digital display output

2.22.2 Description

- All units stop running
- Error code is displayed on the unit with the Error

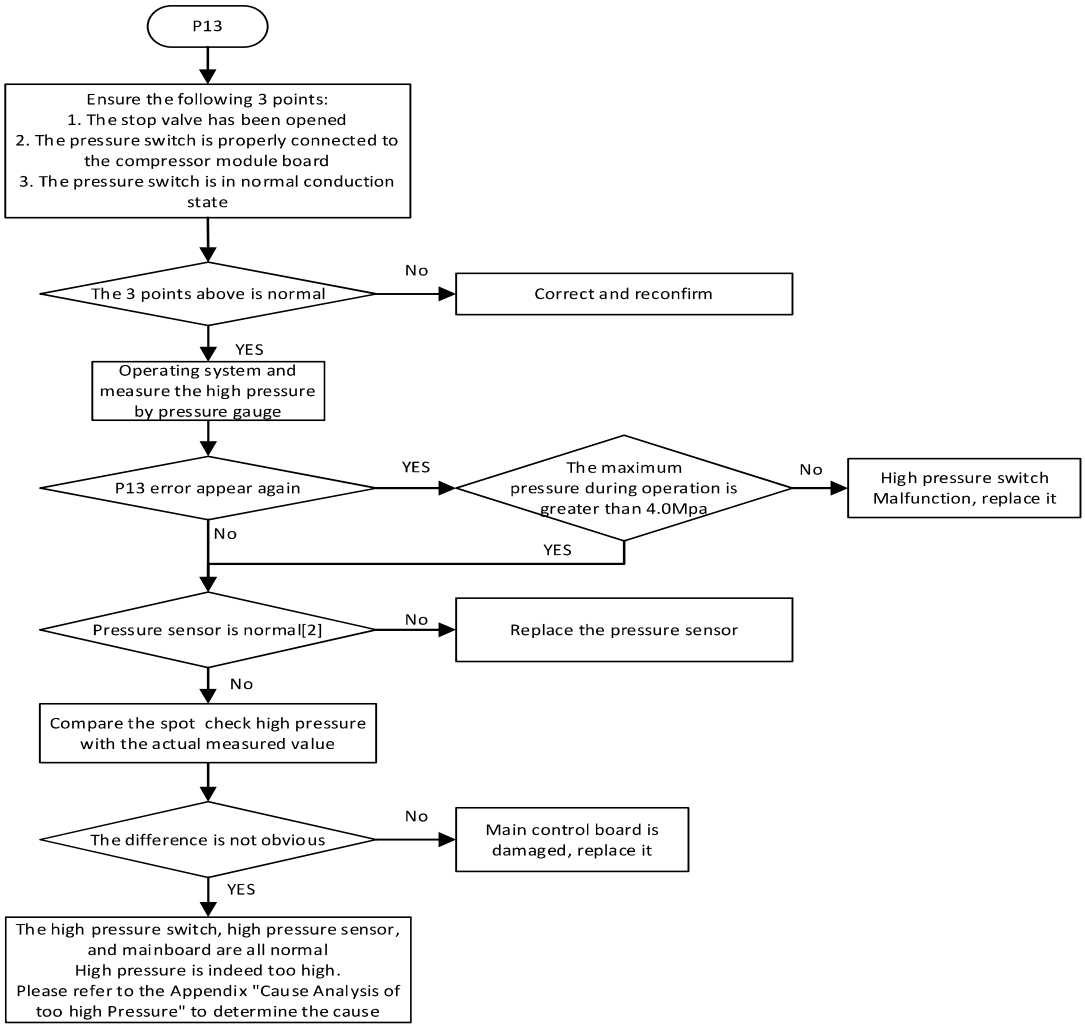
2.22.3 Trigger / recover condition

- Trigger condition: discharge pressure≥ 4.2MPa.
- Recover condition:discharge pressure< 3.0
- Reset method: Resume automatically.

2.22.4 Possible causes

- Outdoor unit stop valves are closed.
- Pressure switch not connected properly or has malfunction.
- Excess refrigerant.
- System contains air or nitrogen.
- High pressure side blockage.
- Poor condenser heat exchange.
- Outdoor main control board damaged.

2.22.5 Procedure



Note:

1. The High pressure switch port is connected to the Outdoor Unit Inverter driver board port CN21
2. To check whether the pressure sensor is abnormal, refer to the Appendix “Pressure Sensor Detection”

2.23 P21: Low pressure sensor error

2.23.1 Digital display output

2.23.2 Description

- Open/short circuit Error in suction pressure sensor
- All units stop running.
- Error code is only displayed on the slave unit with the error.

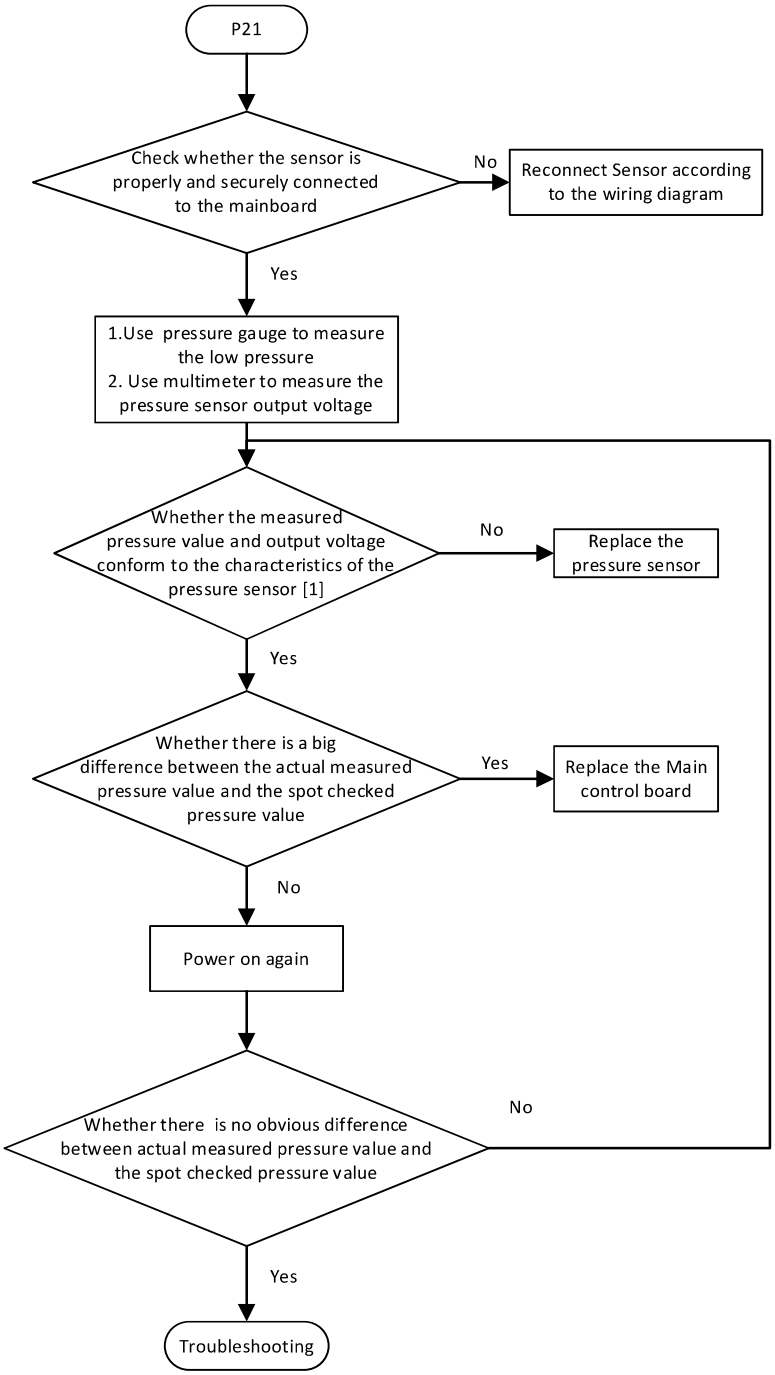
2.23.3 Trigger / recover condition

- Trigger condition:Abnormal values of the low-pressure sensor have been detected for 2 consecutive minutes
- Recover condition:Rectify the Error of the low-voltage sensor and power it on again
- Reset method:power it on again

2.23.4 Possible causes

- Suction pressure sensor has poor contact or it is damaged
- main control board is damaged
- The low pressure sensor is inversely connected to the high pressure sensor

2.23.5 Procedure



Note:

1. To check whether the pressure sensor is abnormal, refer to the Appendix “Pressure Sensor Detection”.

2.24 P22, P25: Low pressure protection

2.24.1 Digital display output

2.24.2 Description

- All units stop running.
- Error code is displayed on the unit with the error.

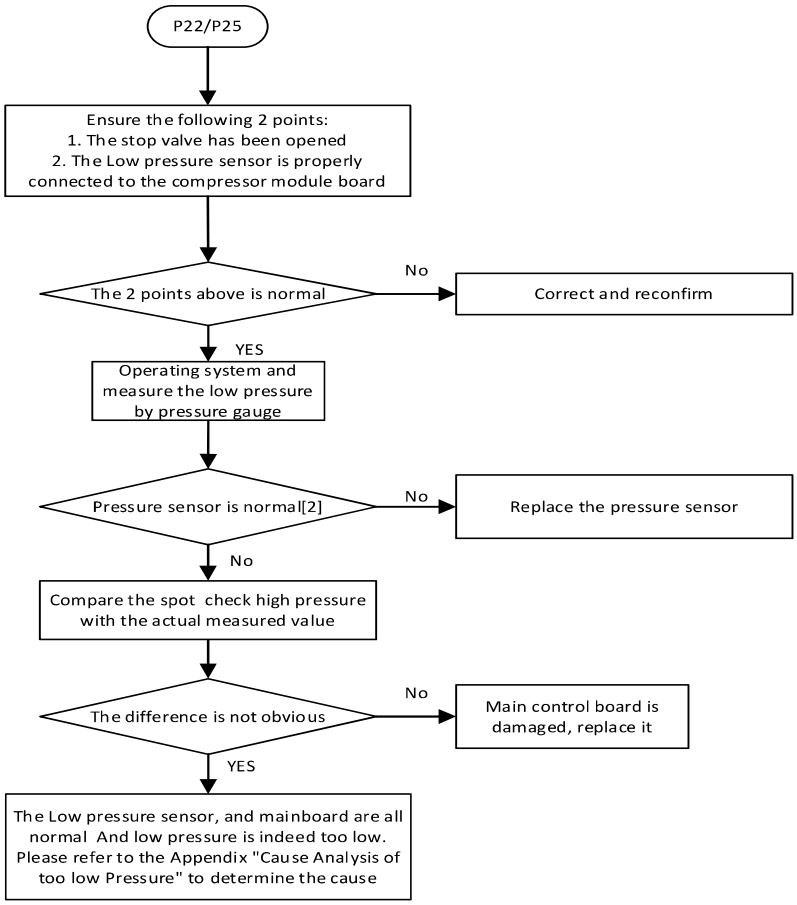
2.24.3 Trigger/ Recover condition

- Trigger condition:
  - P22: suction pressure < 0.07MPa.
  - P25: P22 occurs 3 times within 60 minutes
- Recover condition: Suction pressure >0.15MPa
- Reset method:
  - P22: Resume automatically
  - P25: Resume manually

2.24.4 Possible causes

- Outdoor unit stop valves are closed.
- Low pressure sensor is damaged
- Main control board of Outdoor Unit is damaged
- The actual pressure is too low

2.24.5 Procedure



Note:

1. The low pressure sensor port is connected to the Outdoor Unit main control board port CN41
2. To check whether the pressure sensor is abnormal, refer to the Appendix “Pressure Sensor Detection”.

2.25 P24: Abnormal elevation of low pressure

2.25.1 Digital display output

2.25.2 Description

- All units stop running.
- Error code is displayed on the unit with the error

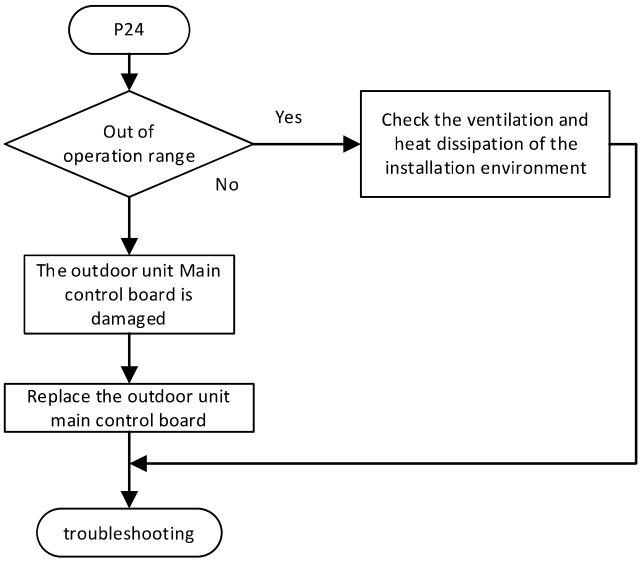
2.25.3 Trigger/ Recover condition

- Trigger condition:
  Suction pressure >1.6MPa and lasts 60 minutes
- Recover condition:
  The ODU shutdown and resume automatically after 1 minute.
- Reset method:
  Resume automatically

2.25.4 Possible causes

- Outdoor Unit out of range operation
- Main control board of Outdoor Unit is damaged

2.25.5 Procedure



2.26 xP32, xP33: No.(x) compressor high DC bus current protection

2.26.1 Digital display output

2.26.2 Description

- The DC bus current of No.x compressor is too high, triggering protection shutdown
- All units stop running..
- Error code is displayed on the unit with the error.

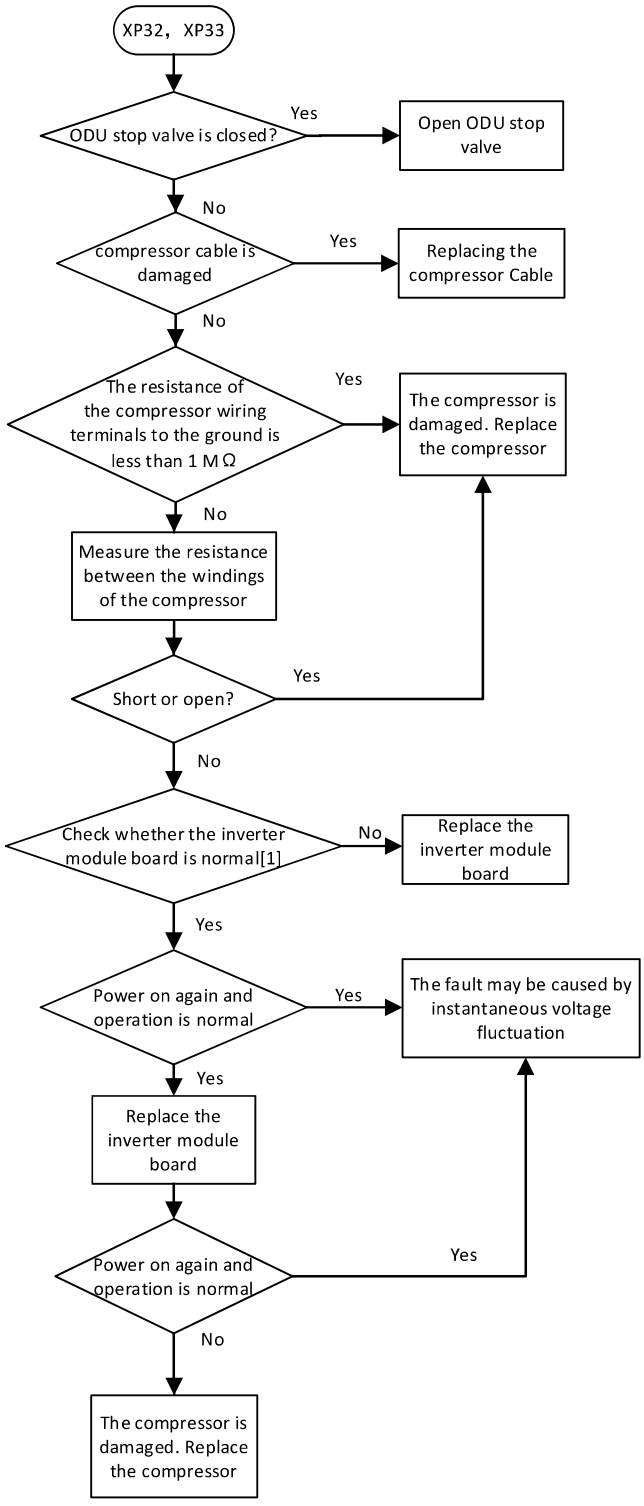
2.26.3 Trigger / recover condition

- Trigger condition:
  P32: During operation, the DC bus current of any compressor exceeds the upper limit
  P33: Within 100min, No.x compressor appears P32 for 3 times
- Recover condition:
  P32: The DC bus current of all compressors is lower than the recovery value
  P33: After the device is powered on again, release the lock
- Reset method:
  P32: Resume automatically
  P33: Resume manually

2.26.4 Possible causes

- The compressor is overload
- The motor coil inside the compressor is damaged and short-circuited
- The high-pressure pipe side is blocked.
- The inverter module board is damaged

2.26.5 Procedure



Note:

1. Refer to the Appendix “Measurement Guide for inverter Module Board”.

2.27 P51: High AC voltage protection

2.27.1 Digital display output

2.27.2 Description

- The AC voltage of the system is too high, triggering the protection shutdown
- All units stop running
- Error code is displayed on the unit with the error.

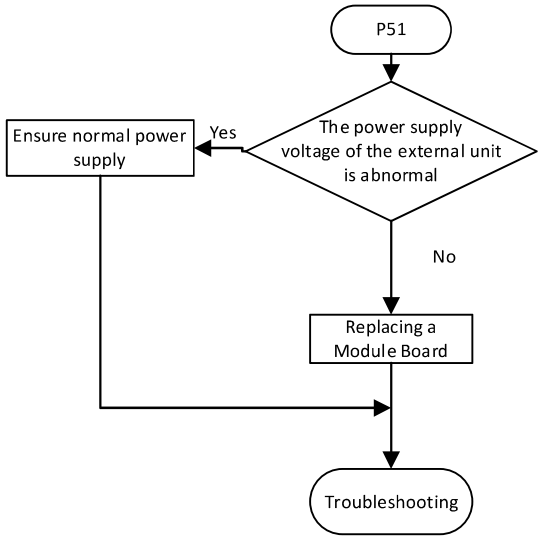
2.27.3 Trigger / recover condition

- Trigger condition:The AC voltage of Outdoor Unit over 265 V
- Recover condition: Wait 7/15/30min for each occurrence, and the AC voltage of Outdoor Unit drops below 250 V
- Reset method: Resume automatically.

2.27.4 Possible causes

- The power supply voltage is too high
- The module is damaged. The module is damaged

2.27.5 Procedure



2.28 P52: Low voltage protection

2.28.1 Digital display output

2.28.2 Description

- The AC voltage of the system is too low, triggering the protection shutdown
- All units stop running.
- Error code is displayed on the unit with the error

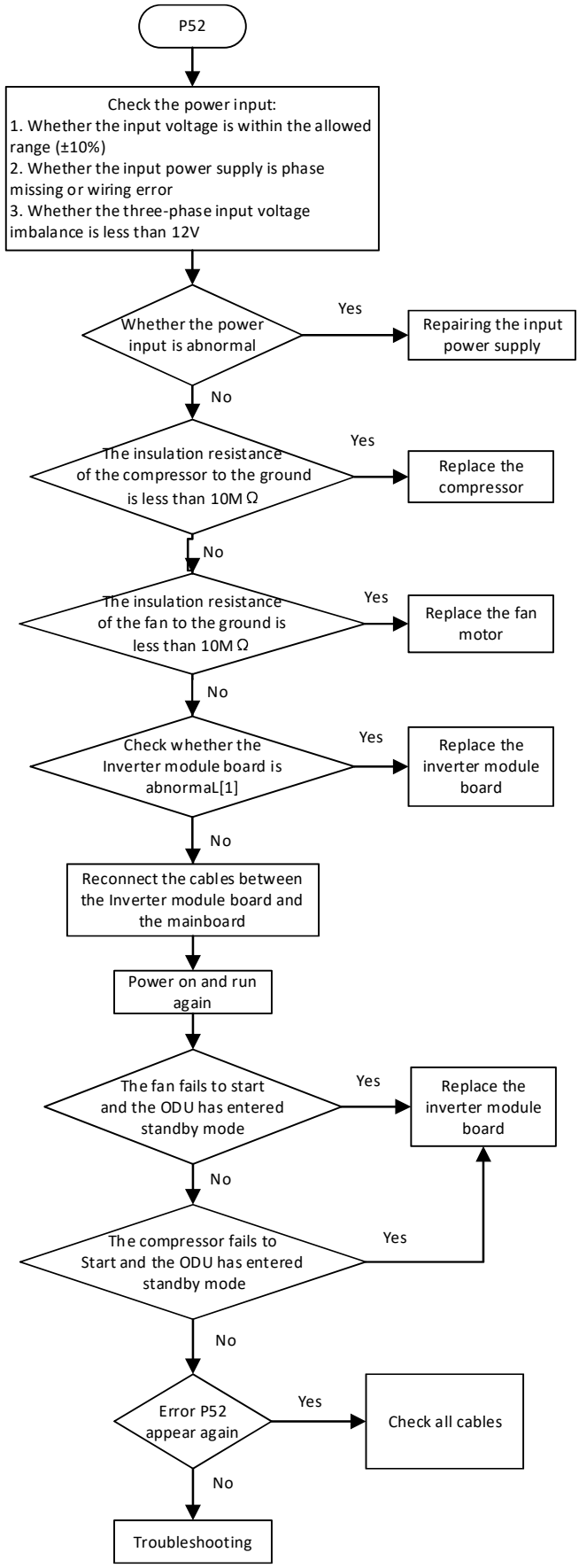
2.28.3 Trigger / recover condition

- Trigger condition:The Vac of Outdoor Unit less than 170 V
- Recover condition: Wait 7/15/30min for each occurrence, and the Vac of Outdoor Unit rises above 180 V
- Reset method: Resume automatically.

2.28.4 Possible causes

- The power supply voltage of the outdoor unit is abnormal or phase is missing
- Cables in the electric control box are loose
- Error in the high voltage circuit
- Inverter driver board is damaged

2.28.5 Procedure



Note:

1. Refer to the Appendix “Inverter Module Board Detection”.

2.29 P53: Phase B and N of the power cable are connected to the opposite protection

2.29.1 Digital display output

2.29.2 Description

- System zero line, phase line reverse connection
- All units stop running
- Error code is displayed on the unit with the error

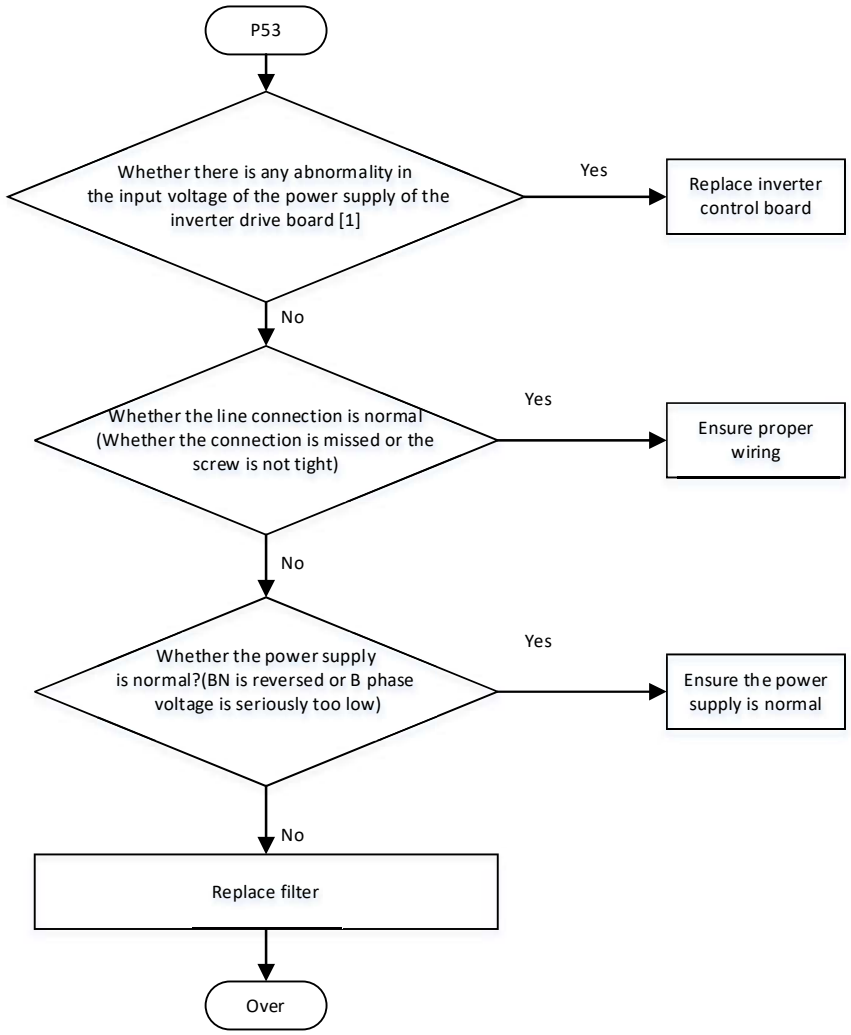
2.29.3 Trigger / recover condition

- Trigger condition: Phase B is connected to the zero line in reverse
- Recover condition: Three-phase power phase sequence detection is correct
- Reset method: Resume automatically

2.29.4 Possible causes

- Outdoor Uint power supply B N is inversely connected
- Cables in the electric control box are loose
- inverter driver board is damaged
- A phase or two of the system power supply has a large load, resulting in power supply voltage imbalance:
- The distribution phase imbalance of the grid exceeds 3% (phase Angle imbalance, or three-phase voltage imbalance, or both):

2.29.5 Procedure



Notes:

1. When the system is powered on, use a multimeter to measure the voltages of the power input terminals L1,2, and L3 of the inverter dirve board. Compare the voltages of L1-L2, L2-L3, and L1-L3.If basically equal, the power supply voltage is fine;If there is a difference of more than 10V, consider the power phase imbalance;If there is a difference of tens or even hundreds of volts, consider the power supply or the filter board has a problem.

2.30 P54: DC bus low voltage protection

2.30.1 Digital display output

2.30.2 Description

- The DC bus voltage of the compressor is too low
- All units stop running.
- Error code is displayed on the unit with the error

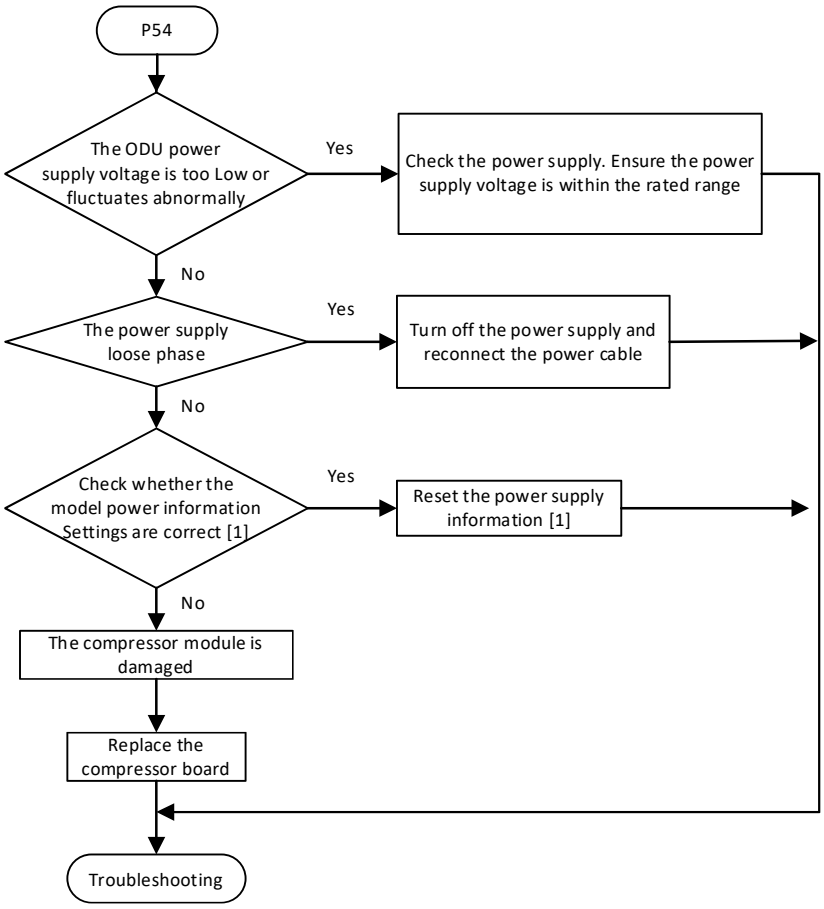
2.30.3 Trigger / recover condition

- Trigger condition: The DC bus voltage of the Outdoor Unit is lower than the threshold.
- Recover condition: The DC bus voltage of the external unit is recovered above the threshold.
- Reset method: Resume automatically

2.30.4 Possible causes

- The input voltage is too low
- The power supply loose phase
- The model power supply information is incorrectly configured
- Inverter driver board is damaged

2.30.5 Procedure



Note:[1] according to the power supply parameters

2.31 P55: Dc bus ripple over protection

2.31.1 Digital display output

2.31.2 Description

- The ripple of the dc bus on the module is over the limits.
- All units stop running.
- Error code is displayed on the unit with the error

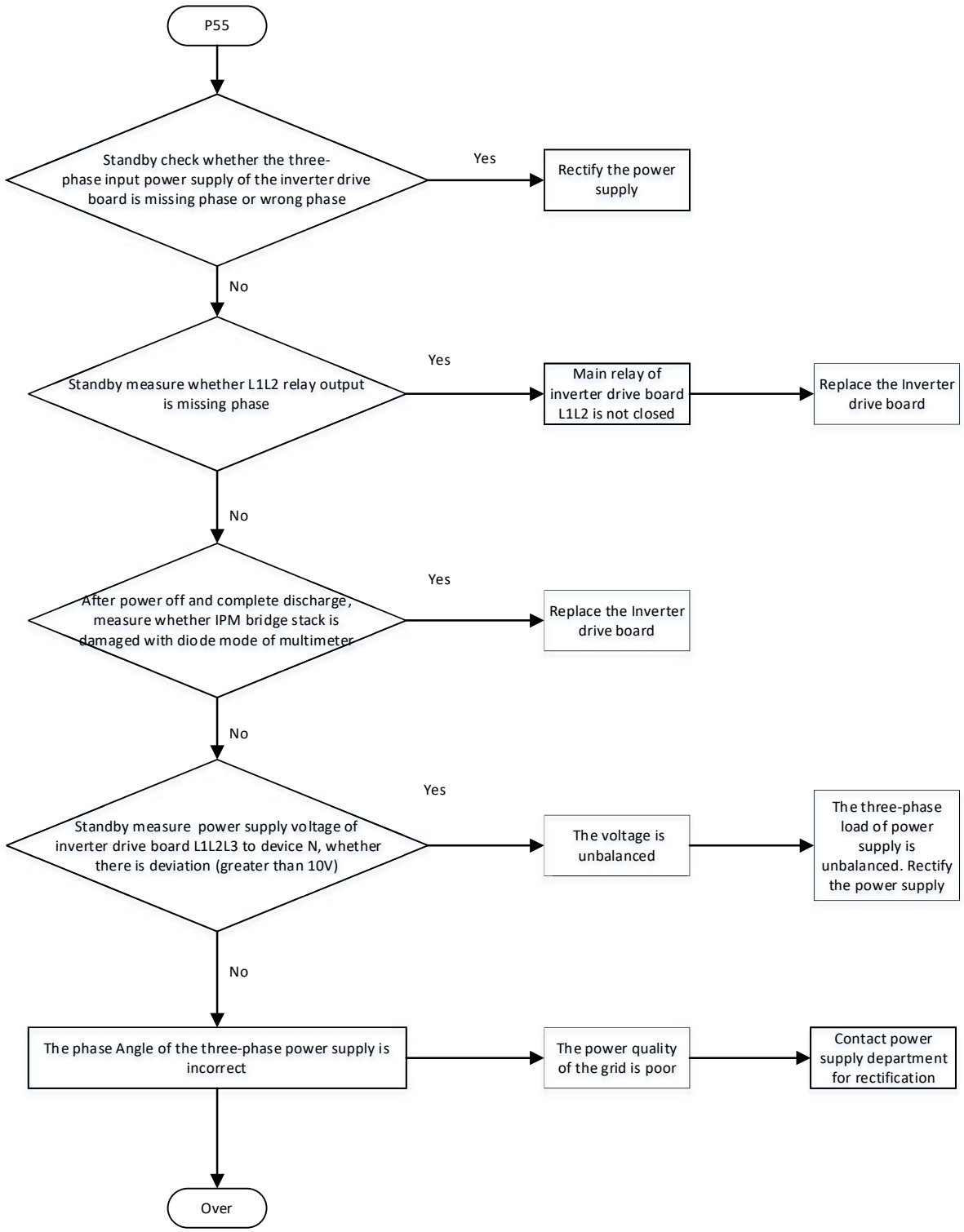
2.31.3 Trigger / recover condition

- Trigger condition: Power input is out of phase or the three-phase power supply is seriously unbalanced
- Recover condition: Three-phase power supply without phase loss
- Reset method: Resume automatically when fault exit condition reached

2.31.4 Possible causes

- The Outdoor Unit power supply is out of phase or seriously unbalanced
- Cables in the electric control box are loose
- Inverter driver board is damaged
- Power supply is abnormal.

2.31.5 Procedure



2.32 xP56: No.x inverter driver board DC bus voltage is too low

2.32.1 Digital display output

2.32.2 Description

- No.x inverter driver board DC bus voltage is too low
- All units stop running..
- Error code is displayed on the unit with the error

2.32.3 Trigger / recover condition

- Trigger condition: The inverter driver board upload L3E/J3E fails
- Recover condition: The inverter driver board does not upload L3E/J3E fails
- Reset method: Resume automatically.

2.32.4 Possible causes

- The Outdoor Unit power supply is too low or phase is missing
- Cables in the electric control box are loose
- Inverter driver board is damaged

2.32.5 Procedure

Troubleshoot according to J3E/L3E

2.33 xP57: No.x inverter driver board DC bus voltage is too high

2.33.1 Digital display output

2.33.2 Description

- No.x inverter driver board DC bus voltage is too high
- All units stop running..
- Error code is displayed on the unit with the error

2.33.3 Trigger / recover condition

- Trigger condition: The inverter driver board upload L31/J31 fails
- Recover condition: The inverter driver board does not upload L31/J31 fails
- Reset method: Resume automatically.

2.33.4 Possible causes

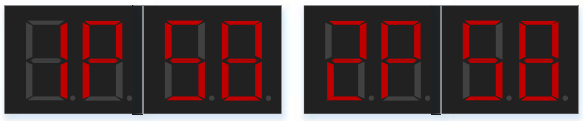
- The Outdoor Unit power supply is too high
- Inverter driver board is damaged

2.33.5 Procedure

Troubleshoot according to J31/L31

2.34 xP58: No.x inverter driver board DC bus voltage is seriously too high

2.34.1 Digital display output



2.34.2 Description

- No.x inverter driver board DC bus voltage is seriously too high
- All units stop running..
- The error is displayed separately on each Outdoor Unit.

2.34.3 Trigger / recover condition

- Trigger condition: The inverter driver board upload L32/J32 fails
- Recover condition: The inverter driver board does not upload L32/J32 fails
- Reset method: Resume automatically.

2.34.4 Possible causes

- The input voltage is too high, resulting in the high DC bus voltage
- The power grid voltage is too high
- Inverter driver board is damaged

2.34.5 Procedure

Troubleshoot according to J32/L32

2.35 P71: Error in EEPROM

2.35.1 Digital display output

2.35.2 Description

- The EEPROM parameter of the ODU main control board is incorrect
- All units stop running.
- Error code is displayed on the unit with the error

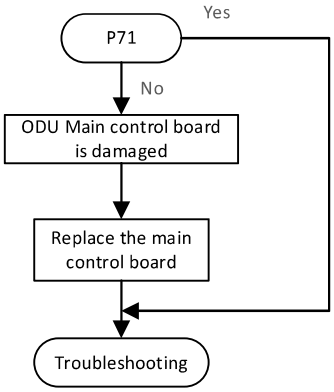
2.35.3 Trigger / recover condition

- Trigger condition:EEPROM parameter verification is incorrect
- Recover condition:EEPROM parameter verification is correct
- Reset method:Resume manually

2.35.4 Possible causes

- EEPROM units damaged:
- Main control board is damaged:

2.35.5 Procedure



2.36 Pb1: HyperLink overcurrent error

2.36.1 Digital display output

2.36.2 Description

- HyperLink overcurrent error
- All units stop running.
- Error code is displayed on master ODU.

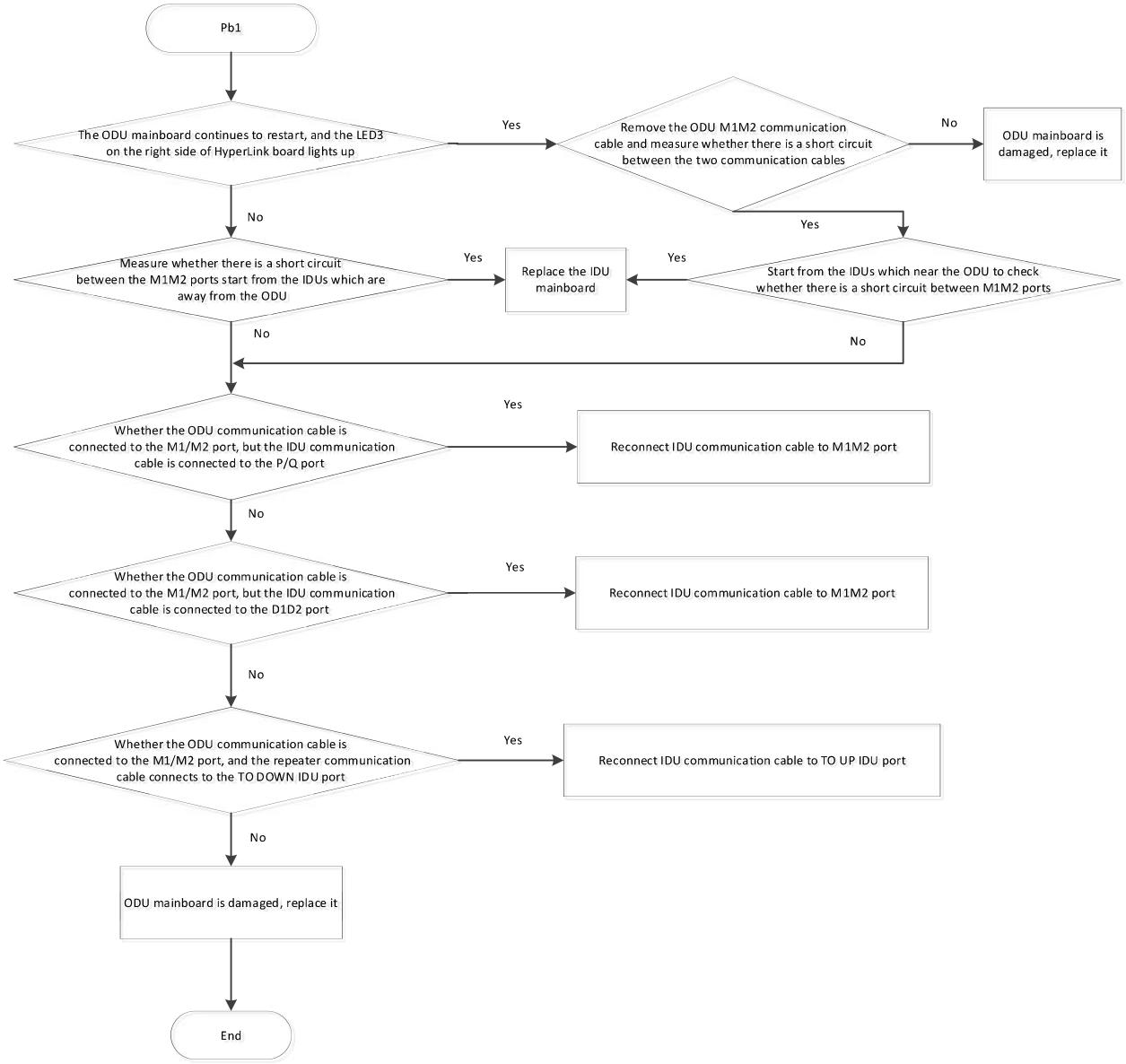
2.36.3 Trigger / recover condition

- Trigger condition:
  No IDU is in power down mode and the feedback voltage of the HyperLink board is > 1.5V for 120ms.
- Recover condition: HyperLink board feedback voltage < 0.2V
- Reset method: fault time < 2 hours, automatic recovery; If the fault time > 2 hours, power on again

2.36.4 Possible causes

- The M1M2 communication line of the master ODU is short-circuited.
- The M1M2 communication line of the master ODU is connected to other communication line (not M1M2) of the IDU.
- The M1M2 communication line of the master ODU is connected to port “TO DOWN IDU” of the repeater.
- Main control board is damaged

2.36.5 Procedure



2.37 Pd1, Pd2: Anti-condensation protection

2.37.1 Digital display output

2.37.2 Description

- Anti-condensation protection
- All units stop running.
- Error code is displayed on the unit with the error

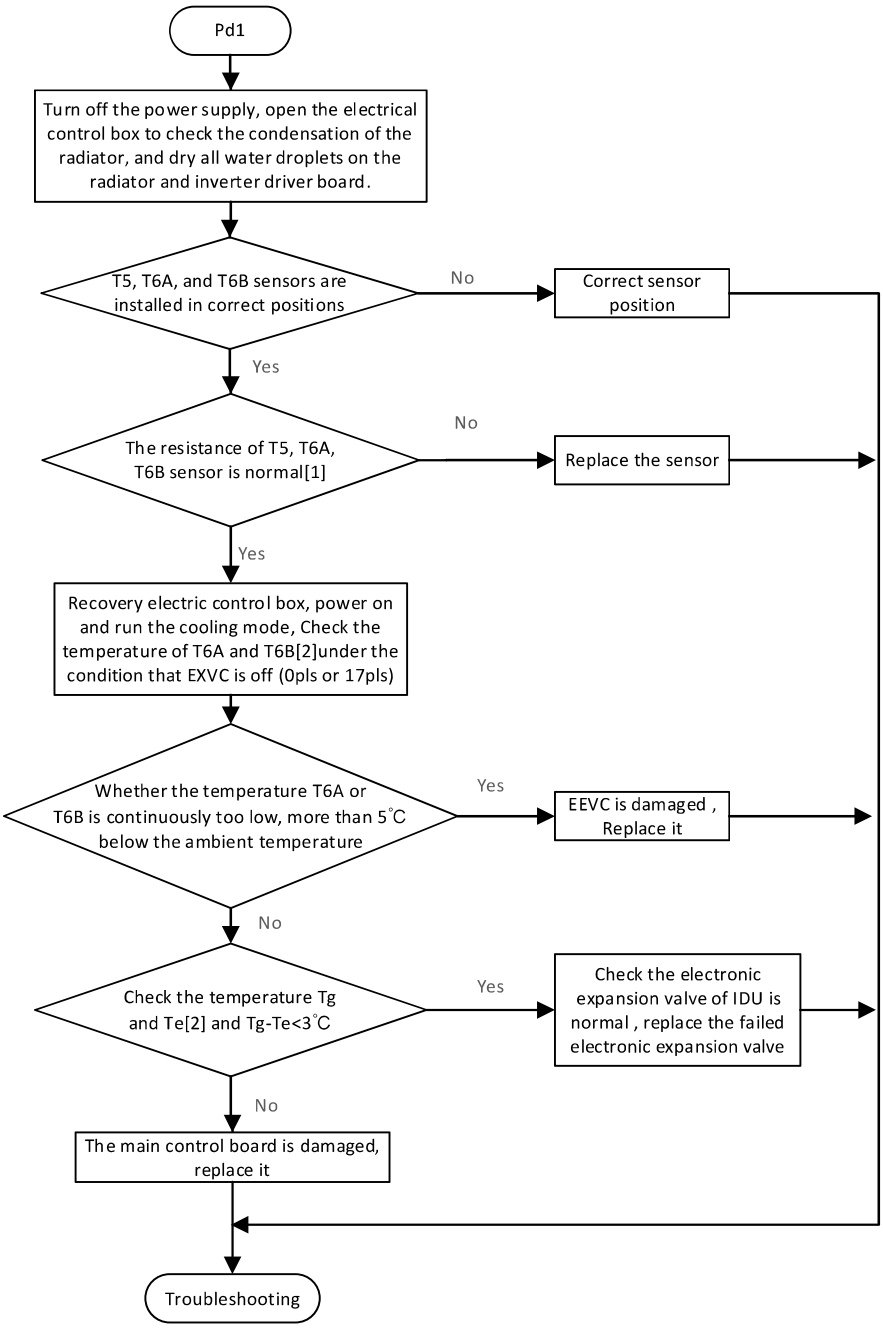
2.37.3 Trigger / recover condition

- Trigger condition:
  Pd1:The outlet temperature of Microchannel heat exchanger is below the dew point temperature for more than 10 minutes
  Pd2:Pd1 protection occurs 2 times in 60 minutes
- Recover condition:The outlet temperature of Microchannel heat exchanger is higher than the dew point temperature
- Reset method: Power on again.

2.37.4 Possible causes

- Temperature sensors T6A, T6B, and T5 are not installed in the correct positions
- Temperature sensor T6A, T6B, and T5 are damaged
- Electronic expansion valve EXVC cannot be fully closed
- The internal electronic expansion valve is too open or cannot be adjusted.
- Main control board is damaged

2.37.5 Procedure



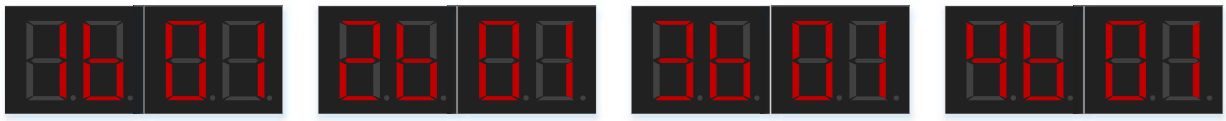
Note:

[1] Refer to the *Table 5.1.1: Temperature sensor temperature resistance characteristic table*

[2] Refer to the **Part 4**-*4.4 Digital display and button settings*

2.38 xb01: The electronic expansion valve is in error

2.38.1 Digital display output



2.38.2 Description

- No.x electronic expansion valve's connection on main control board is missing(1 to 4 correspond to expansion valves A, B, C, and E respectively)
- All units stop running Electronic
- Error code is displayed on the outdoor unit with error.

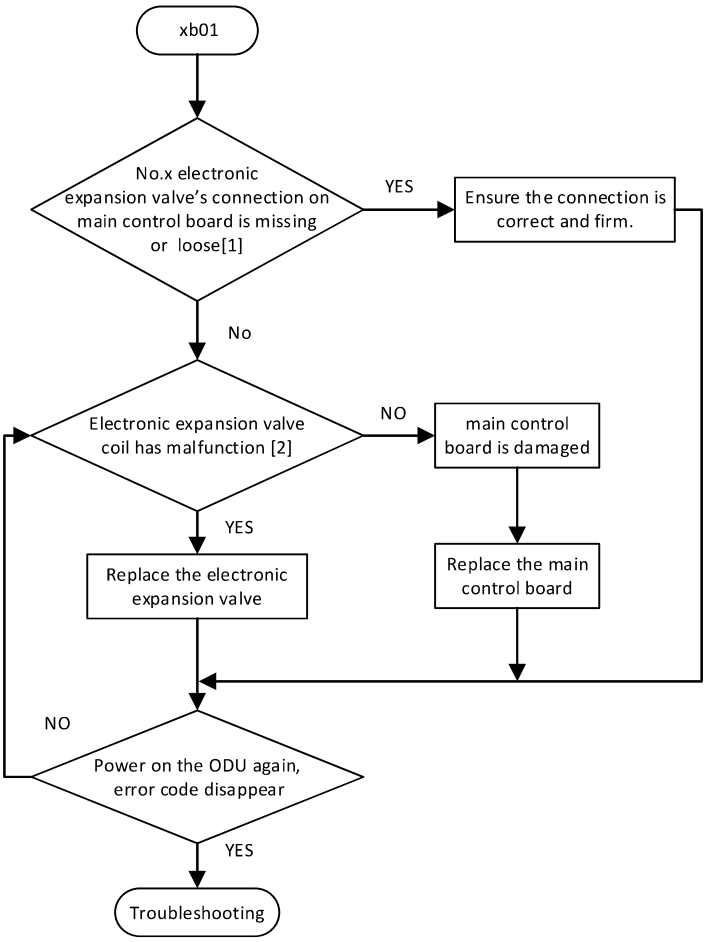
2.38.3 Trigger / recover condition

- Trigger condition: After the system is powered on, the outdoor unit cannot detect the signal of electronic expansion valve within 2 minutes.
- Recover condition: After the system is powered on again, the outdoor unit can detect the signal of electronic expansion valve.
- Reset method: Resume manually, and power on again.

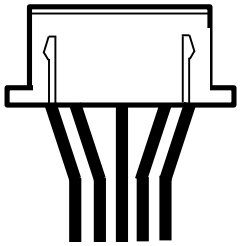
2.38.4 Possible causes

- Electronic expansion valve is not connected to main control board correctly.
- The electronic expansion valve coil is damaged
- The main control board is damaged.

2.38.5 Procedure



Notes:
[1] All models of ODU have electronic expansion valves A and C, which are connected to the main boards CN70 and CN72. Some models have electronic expansion valves B and E with CN71 and CN73 ports
[2] Schematic diagram of coil resistance measurement of electronic expansion valve and reference range of resistance



Top Flow Series			
Model capacity range	8-16HP	18-32HP	
The body coil	Valve A/C/E	Valve C/E	Valve A
Measurement point	resistance	resistance	resistance
1-5	40-50Ω	40-50Ω	90-110Ω
2-5	40-50Ω	40-50Ω	90-110Ω
3-5	40-50Ω	40-50Ω	90-110Ω
4-5	40-50Ω	40-50Ω	90-110Ω

2.39 U11: Outdoor unit model is not set

2.39.1 Digital display output

2.39.2 Description

- All units stop running
- Error code is displayed on the unit with the error

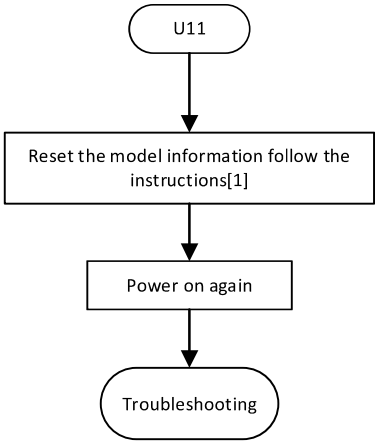
2.39.3 Trigger / recover condition

- Trigger condition: The model information is not set.
- Recover condition: The model information of the unit is set correctly
- Reset method: Resume manually

2.39.4 Possible causes

- The model information is not set

2.39.5 Procedure



Note:

[1] Use the Bluetooth module or Bluetooth after-sales kit

2.40 U12: Outdoor unit Capacity setting error

2.40.1 Digital display output

2.40.2 Description

- The capability information of outdoor unit is not set
- All units stop running
- Error code is displayed on the unit with the Error

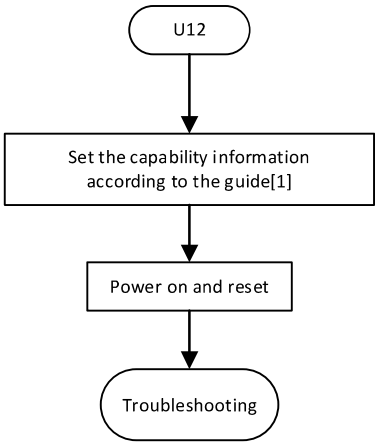
2.40.3 Trigger / recover condition

- Trigger condition: The capability information of outdoor unit is not set
- Recover condition: Reset the capability information of outdoor unit
- Reset method: Resume manually

2.40.4 Possible causes

- The capability information of outdoor unit is not set

2.40.5 Procedure



Note:

[1] Set the capability information according to the nameplate

2.41 U21: The indoor unit connection is incorrect

2.41.1 Digital display output

2.41.2 Description

- The indoor unit connection is incorrect
- All Outdoor units stop running
- Error is only displayed in main control board

2.41.3 Trigger / recover condition

- Trigger condition:

  The following devices can be connected to the VRF system:

  - Standard air-cooled indoor units
  - AHU KIT
  - Hydraulic module

  The following join combinations are allowed:

  - VRF Indoor Unit + AHU KIT
  - VRF Indoor Unit + Hydraulic module
  - VRF Indoor Unit

  Apart from the above three combination modes, the system detects the combination of indoor units and reports the following failure prompt

Error code	The system checks the connected Indoor Unit type
U21	The system is connected to the old Indoor Unit

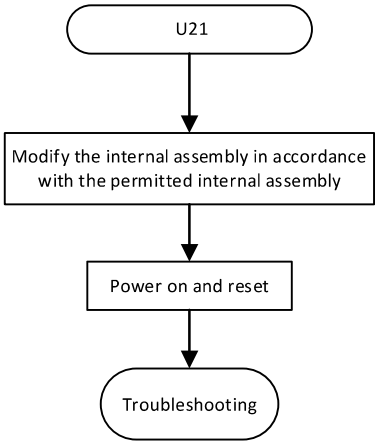
- Recover condition:

  Correct Indoor Unit assembly is detected
- Reset method: Resume manually

2.41.4 Possible causes

- the Indoor Unit assembly does not meet the requirement

2.41.5 Procedure



2.42 U31: The test run was never successful

2.42.1 Digital display output

2.42.2 Description

- The test run was unsuccessful
- All units stop running
- Error code is only displayed on the master unit.

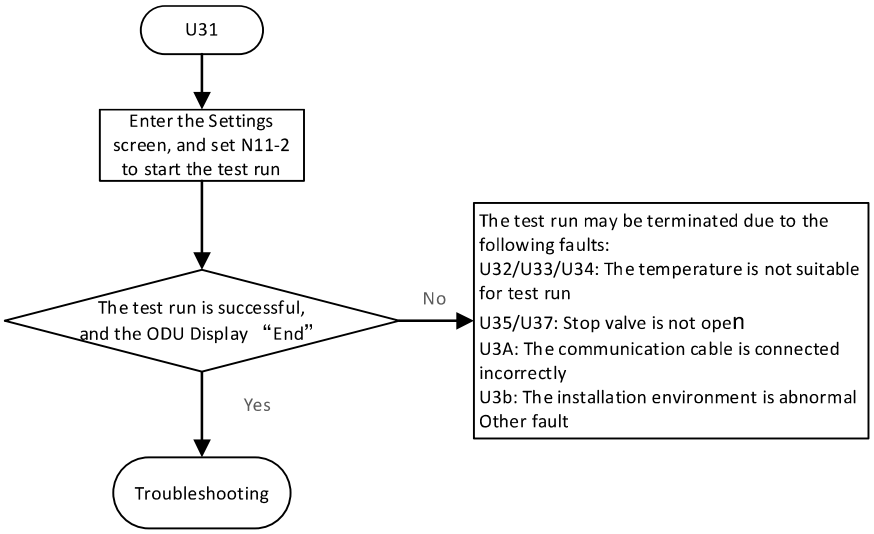
2.42.3 Trigger / Recover condition

- Trigger condition: The test run was unsuccessful
- Recover condition: The test run complete Successfully.
- Reset method: Resume manually

2.42.4 Possible causes

- The test run was unsuccessful

2.42.5 Procedure



2.43 U32, U33, U34: The temperature is not suitable for test run

2.43.1 Digital display output

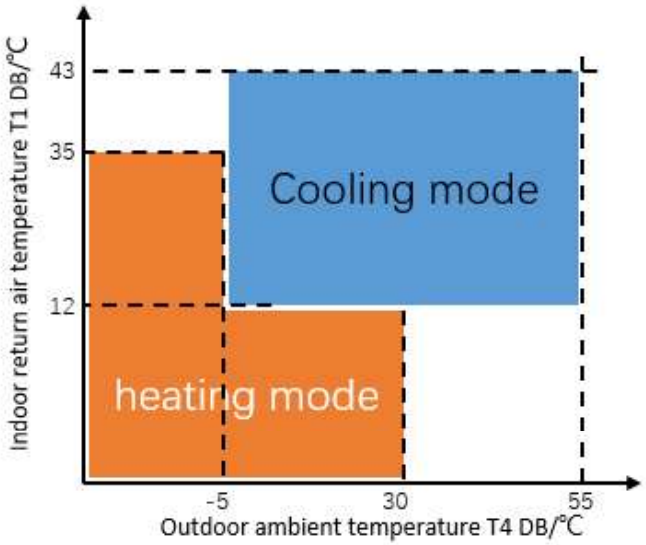
2.43.2 Description

- Ambient temperature is out the allowed range of test run
- All units stop running
- Error code is only displayed on Outdoor Unit

2.43.3 Trigger /Recover condition

- Trigger condition:
  After entering into test run, the master unit estimates whether it is suitable for test run according to the indoor average return air temperature T1 and outdoor average ambient temperature T4(Refer to the following figure and table). If it is not suitable for test run, the outdoor unit displays an error code like “U32, U33, U34”

Figure 2-4.1*: ambient temperature range of test run*



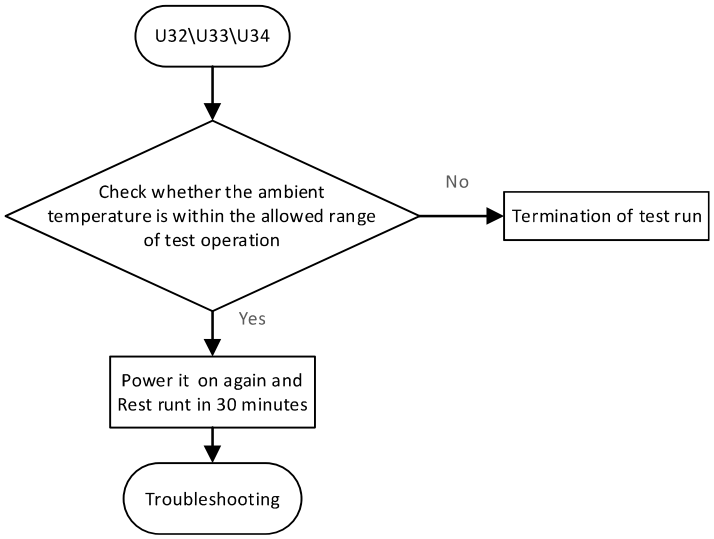
Error code	Description	
U32	The outdoor temperature is not suitable	Average T1<-12°C :T4min>30 °C or T4min<-30 °C Average T1≥12 °C : T4min>55 °C or T4min<-30 °C
U33	The indoor temperature is not suitable	T4min≤-5 °C: Average T1>35 °C T4min≥-5 °C: Average T1>43 °C
U34	The indoor and outdoor temperature is not suitable	Average T1>43 °C and T4min>55 °C

- Recover condition: Press the "OK" button on the main control board for 5 seconds to exit the rest run.
- Reset method: Resume manually

2.43.4 Possible causes

- The Temperature out of test run range

2.43.5 Procedure



2.44 U35, U37: Stop valve is not open

2.44.1 Digital display output

2.44.2 Description

- Stop valve is not open
- All units stop running
- Error code is only displayed on the master unit.

2.44.3 Trigger/ Recover condition

- Trigger condition:

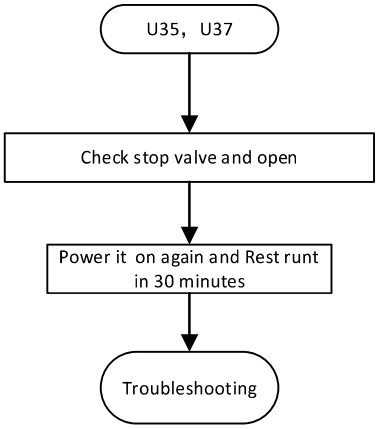
Error code	Description	
U35	The liquid side stop valve of the system is not opened	discharge pressure of heating mode≥ 3.9MPa
U37	The gas side stop valve of the system is not opened	suction pressure of cooling mode< 0. 12MPa

- Recover condition:
  Press the "OK" button on the main control board for 5 seconds to exit the test run.
- Reset method: Resume manually

2.44.4 Possible causes

- Stop valve is not open

2.44.5 Procedure



2.45 U3A: The communication cable is connected incorrectly

2.45.1 Digital display output

2.45.2 Description

- There are indoor unit in the communication system outside the refrigerant system.
- All units stop running
- Error code only displayed on the master unit.

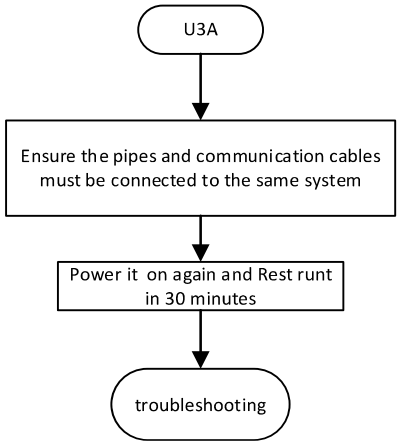
2.45.3 Trigger / Recover condition

- Trigger condition: There are indoor unit in the communication system outside the refrigerant system.
- Recover condition: Press the “OK” button on the main board for 5 seconds to exit the rest run.
- Reset method: Resume manually

2.45.4 Possible causes

- There are IDU in other refrigerant system connect with ODU by commication cable

2.45.5 Procedure



2.46 U3b: The installation environment is abnormal

2.46.1 Digital display output

2.46.2 Description

- During the test run, abnormal changes in ambient temperature are detected and the operation is stopped.
- All units stop running
- Error code only displayed on the master unit.

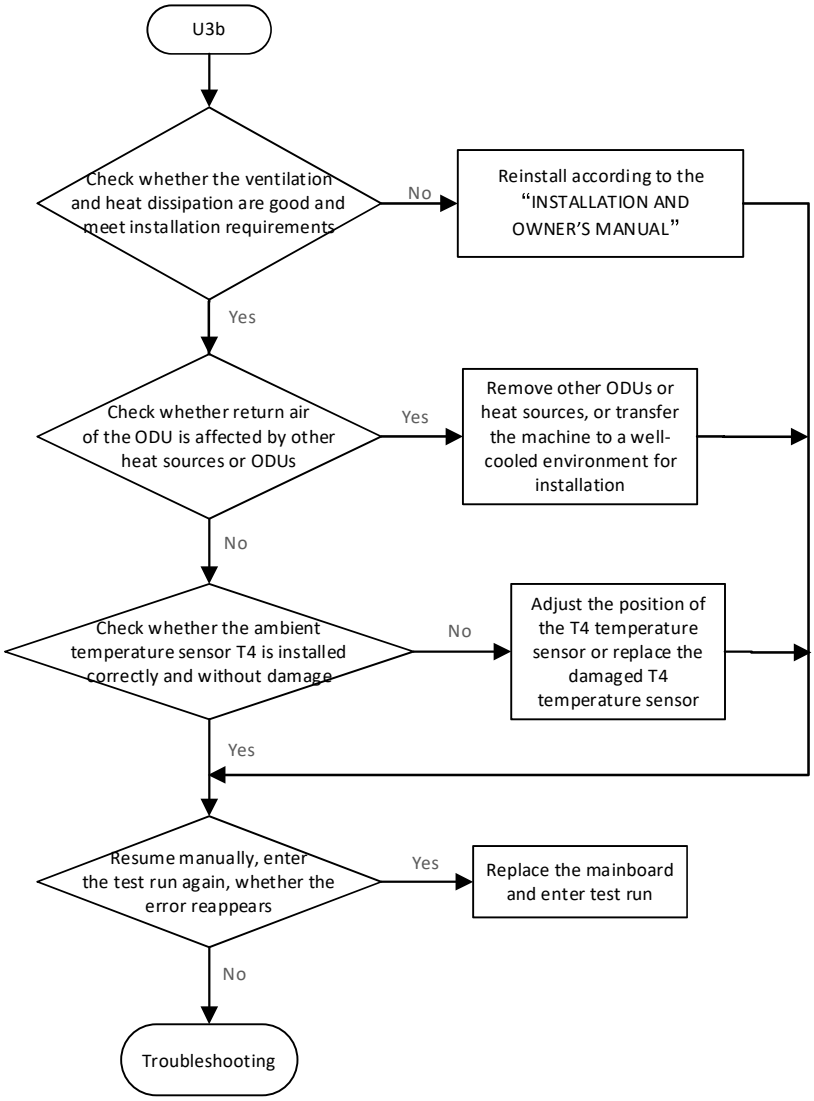
2.46.3 Trigger / Recover condition

- Trigger condition:
  ①Cooling mode: the return air temperature is detected to increase more than 10℃ during test run.
  ②Heating mode: the return air temperature is detected to decrease more than 10℃ during test run.
- Recover condition: Press the “OK” button on the main board for 5 seconds to exit the rest run.
- Reset method: Resume manually

2.46.4 Possible causes

- The installation environment of the IDU has poor ventilation and heat dissipation, and the outlet air and return air form short circuit
- Return air of the IDU is affected by other heat sources
- The return air temperature sensor of the IDU is improperly installed or damaged

2.46.5 Procedure



2.47 U3C: Changeover mode error

2.47.1 Digital display output

2.47.2 Description

- The ODU in changeover mode doesn't detect the signal of VIP IDU.
- ODUs stop running
- Error code only displayed on the master unit.

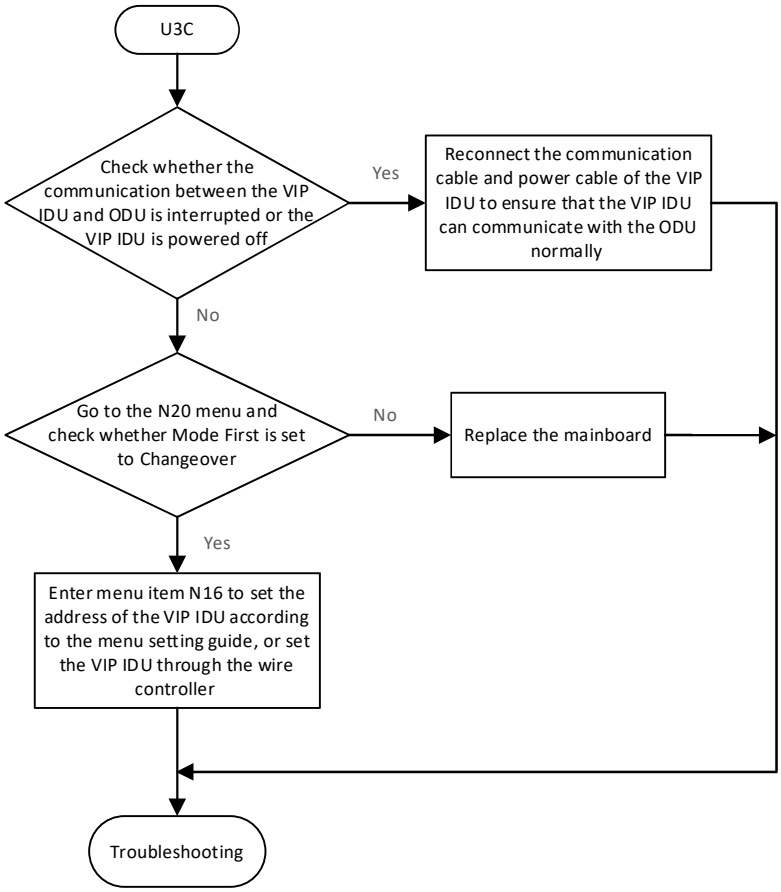
2.47.3 Trigger / Recover condition

- Trigger condition:
  ①The ODU in changeover mode , but the VIP address has not been set.
  ②The ODU in changeover mode doesn't detect the signal of VIP IDU(the VIP address has been set).
- Recover condition: The ODU in changeover mode detect the signal of VIP IDU.
- Reset method: Resume automatically

2.47.4 Possible causes

- The VIP address has not been set
- The communication between the VIP IDU and ODU is abnormal
- The mainboard of ODU is damaged.

2.47.5 Procedure



2.48 U4x: Overconnection ratio

2.48.1 Digital display output

2.48.2 Description

- Protection Overconnection ratio
- All units stop running

2.48.3 Trigger / Recover condition

- Trigger condition:

1) Code of Indoor Unit and type analysis

Code of Indoor Unit	Indoor Unit **A**	Indoor Unit **B**	Indoor Unit **C**	Indoor Unit **D**
Type of Indoor Unit	VRF Air-cooled indoor unit	Fresh Air Processing Uint	AHU KIT(Air outlet temperature control)	AHU KIT(Return air temperature control)

Error code	Description
U41	connection ratio A <45% or connection ratio A >135%
	connection ratio A+D <45% or connection ratio A+D >135%
U42	connection ratio B <45% or connection ratio B >105%
	connection ratio B+C >35%
U43	connection ratio C <45% or connection ratio C >105%
U44	connection ratio D <45% or connection ratio D >115%
U48	connection ratio A+B+C+D >135%

2) computing method of connection ratio:

Connection ratio A=total capacity of Online Indoor UnitA /total capacity of Outdoor Unit
Connection ratio B=total capacity of Online Indoor UnitB /total capacity of Outdoor Unit
Connection ratio C=total capacity of Online Indoor UnitC /total capacity of Outdoor Unit
Connection ratio D=total capacity of Online Indoor UnitD /total capacity of Outdoor Unit
Connection ratio A+D=total capacity of Online Indoor UnitA+ UnitD/total capacity of Outdoor Unit
Connection ratio B+C=total capacity of Online Indoor UnitB+ UnitC/total capacity of Outdoor Unit
Connection ratio A+B+C+D= total capacity of Online Indoor UnitA+ UnitB+ UnitC+ UnitD/total capacity of Outdoor Unit

- Recover condition:

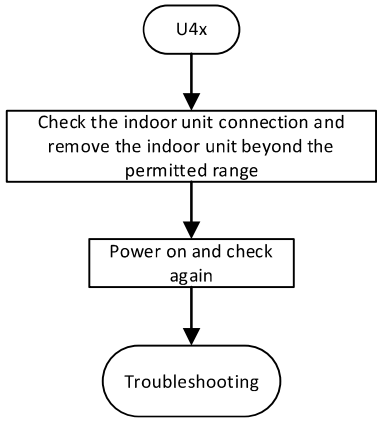
Indoor/Outdoor Unit connection rate within allowable range

- Reset method: Resume manually

2.48.4 Possible causes

Indoor/Outdoor Unit connection rate out of allowable range

2.48.5 Procedure



2.49 U51: Outdoor unit of Individual Series is installed in combine system

2.49.1 Digital display output

2.49.2 Description

- Outdoor unit of Individual Series is installed in combine system
- All units stop running
- Error code is only displayed on master unit.

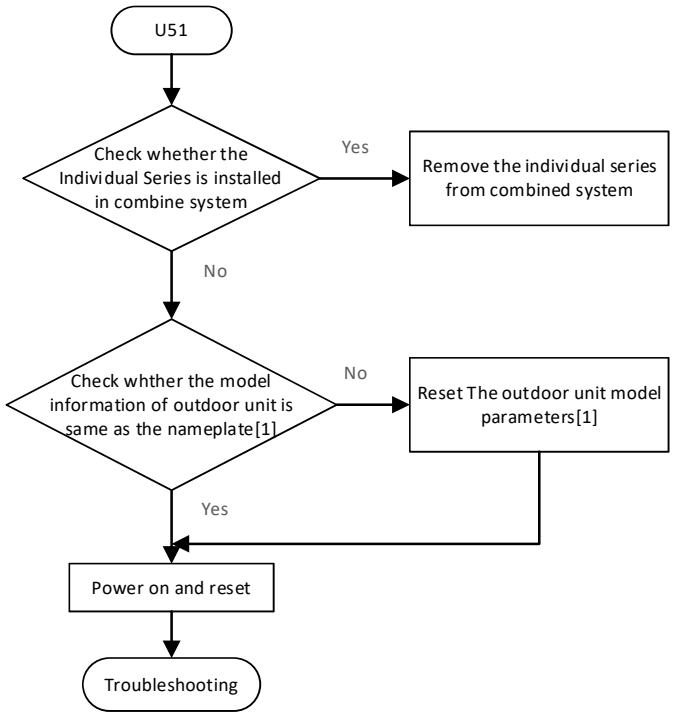
2.49.3 Trigger / Recover condition

- Trigger condition:
  Outdoor unit of Individual Series is installed in combine system
- Recover condition:
  Remove the Individual Series from combined system
- Reset method: Resume manually

2.49.4 Possible causes

- Outdoor unit of Individual Series is installed in combine system
- Outdoor unit model is incorrectly set

2.49.5 Procedure

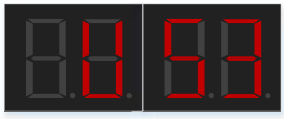


Note:

[1]Use Bluetooth module or bluetooth after-sales kit to check and reset the model parameter.

2.50 U53: Detected different series outdoor units in the same VRF system

2.50.1 Digital display output



2.50.2 Description

- Detected different series outdoor units in the same VRF system
- All units stop running
- Error code is only displayed master unit

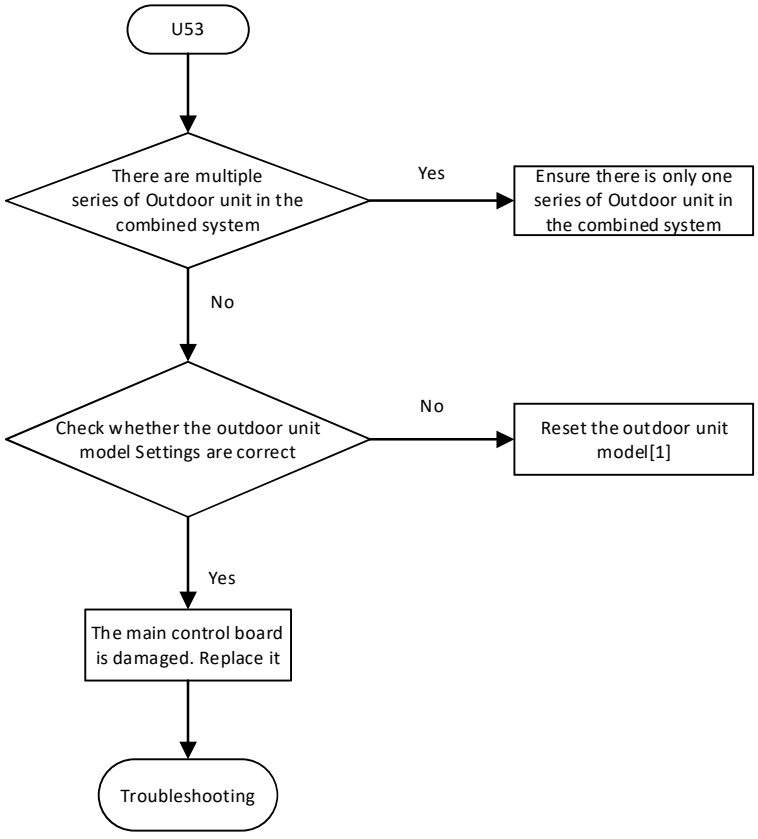
2.50.3 Trigger / Recover condition

- Trigger condition:
  Detected different series outdoor units in the same VRF system
- Recover condition:
  There is only one series of Outdoor Unit in combined system
- Reset method: Resume manually

2.50.4 Possible causes

- Detected different series outdoor units in the same VRF system

2.50.5 Procedure



Note:

[1]Use Bluetooth module or bluetooth after-sales kit to check and reset the model parameter.

3 Error in Compressor Driver

3.1 xL1E: Hardware overcurrent

3.1.1 Digital display output

3.1.2 Description

- The current exceeds the OCP protection value (peak value) set by the hardware or the IPM module receives an FO signal
- The compressor stops running after the error occurs. If the error disappears one minute later, the compressor starts again

3.1.3 Trigger / recover condition

(1)Current reaches OCP protection value:

- Trigger condition:Current reaches OCP protection value
- Recover condition:The compressor will stop after failure, and recover after one minute when the condition of failure exit is reached
- Reset method:The system automatically recovers one minute after the error exit condition is reached

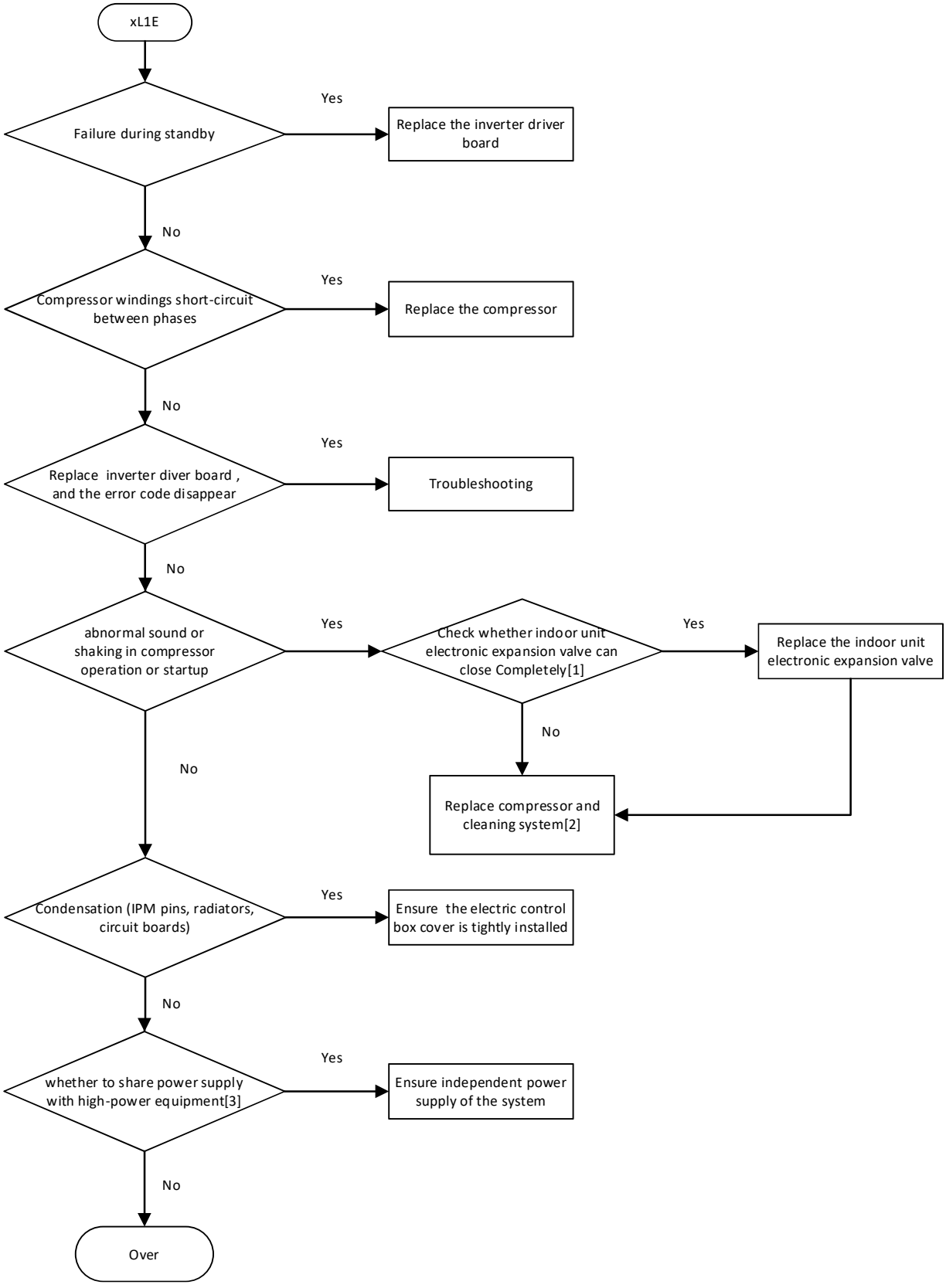
(2)Falling edge of FO signal or continuous low level is detected:

- Trigger condition: A falling edge or continuous low level of FO signal is detected.
- Recover condition: The FO signal becomes high level.
- Reset method: Resume automatically one minute after the error exit condition is reached.

3.1.4 Possible causes

- There are impurities in the refrigerant system or the compressor suddenly freezes the cylinder, resulting in abnormal current increase and triggering OCP:
- Compressor windings short-circuit between phases, resulting in instantaneous large current triggering OCP or FO:
- The OCP is triggered when the system power supply voltage falls or is interrupted for a short time:
- The IPM module condenses, causing a short circuit between control pins:
- Liquid refrigerant back to the compressor:
- Before starts the compressor has a certain speed:
- Module board is abnormal. (Idc operational amplifier circuit, OCP comparison circuit, PWM circuit, IPM, IGBT drive power circuit) Causes control out-of-step to generate high current to trigger OCP.

3.1.5 Procedure



Notes:

[1] Close the IDU and check whether the temperature of the Gas pipe is too low or frosted or the evaporator is frosted.

[2] Maybe there are impurities in the refrigerant system

[3] Voltage fluctuation occurs when high-power equipment is started

3.2 xL11, xL12 : Software overcurrent

3.2.1 Digital display output

3.2.2 Description

- The current exceeds the OCP protection value set by the software.
- The compressor will shutdowm when the error occurs. If the error disappears one minute later, the compressor will start again.

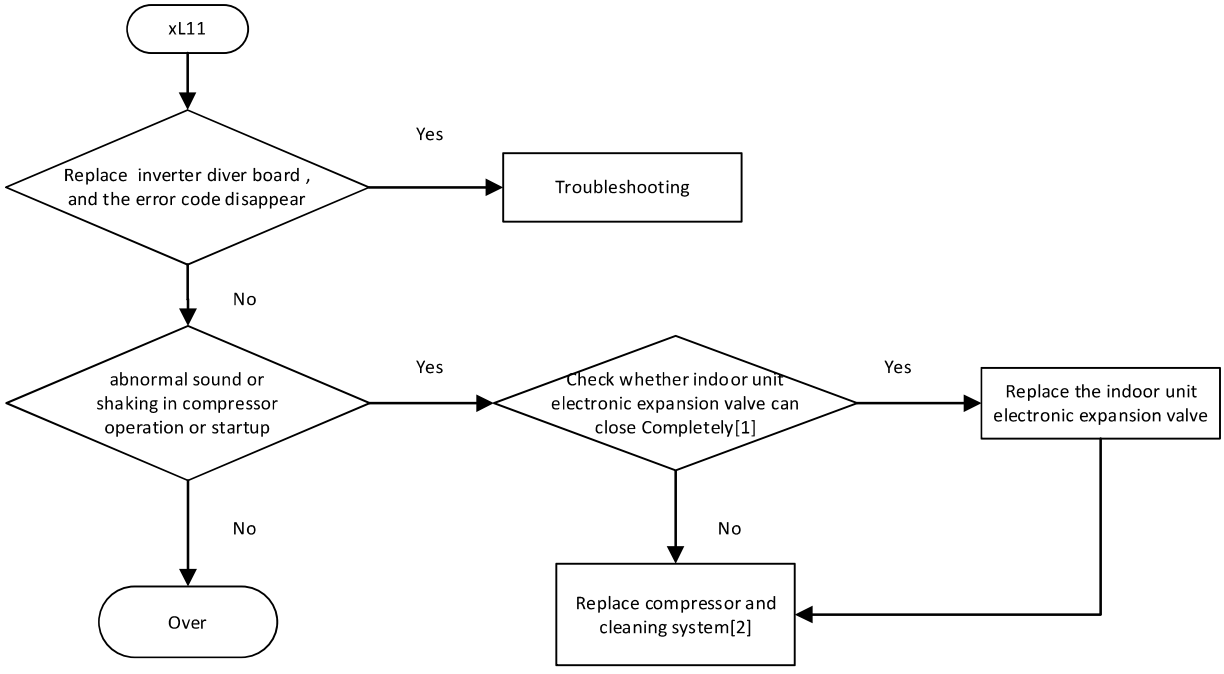
3.2.3 Trigger / recover condition

- Trigger condition:
  xL11: The compressor current exceeds the OCP protection value set by the software in three consecutive carrier periods
  xL12: Software overcurrent protection last 30s
- Recover condition: The compressor will stop when the error occurs. If the error disappears one minute later, the compressor will start again
- Reset method:Resume automatically after reaching exit condition of Error

3.2.4 Possible causes

- There are impurities in the refrigerant system or the compressor suddenly jam the cylinder:
- The Idc op-amp sampling circuit on the module is abnormal:

3.2.5 Procedure



Notes:

[1] Close the IDU and check whether the temperature of the Gas pipe is too low or frosted or the evaporator is frosted.

[2] Maybe there are impurities in the refrigerant system

3.3 xL2E: Module overtemperature protection

3.3.1 Digital display output

3.3.2 Description

- The temperature of the IPM exceeds 105° C.
- The compressor will stop when the error occurs. If the error disappears one minute later, the compressor will start again

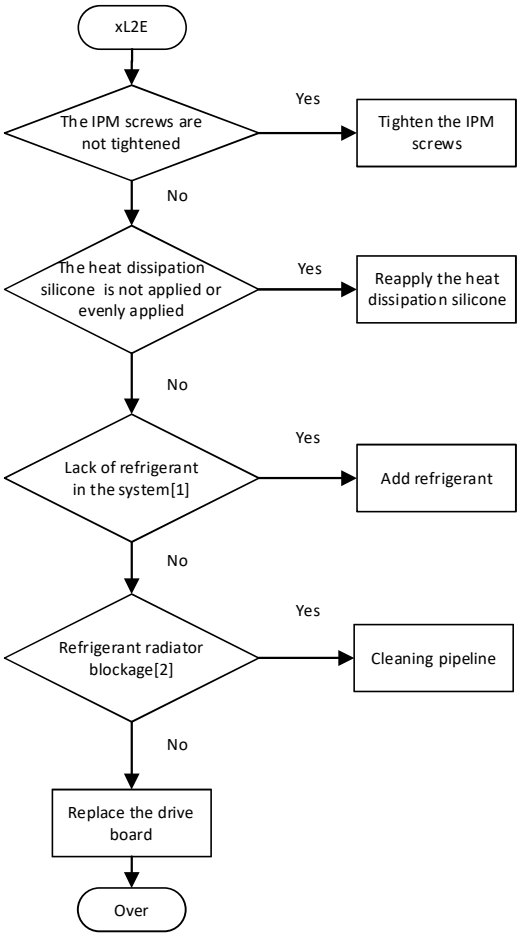
3.3.3 Trigger / recover condition

- Trigger condition:The temperature of the IPM exceeds 105° C
- Recover condition: the module temperature is lower than 105°
- Reset method:Resume automatically

3.3.4 Possible causes

- The IPM screws are not tightened, resulting in poor heat dissipation:
- The heat dissipation silicone for the IPM module is not evenly applied, resulting in poor heat dissipation:
- The refrigerant radiator is poor due to lack of refrigerant or the refrigerant radiator pipe is blocked:
- The welding of the refrigerant radiator is abnormal, resulting in poor heat dissipation
- The IPM temperature detection circuit is abnormal

3.3.5 Procedure



Notes:

[1] Less refrigerant system results in higher Discharge temperature of the compressor, lower Discharge and suction pressure, lower current, and frost on the gas return pipe. Refer to **Table 5.2.1 and 5.2.2** "Normal Refrigerant System parameters" in Chapter 5 for normal system parameters.

[2] Refer to radiator inlet and outlet temperature

3.4 xL3E: The bus voltage is too low

3.4.1 Digital display output

3.4.2 Description

- Bus voltage is lower than the low bus voltage protection threshold set by the software (350VDC).
- The compressor stops running after the error occurs. If the error disappears one minute later, the compressor starts again.

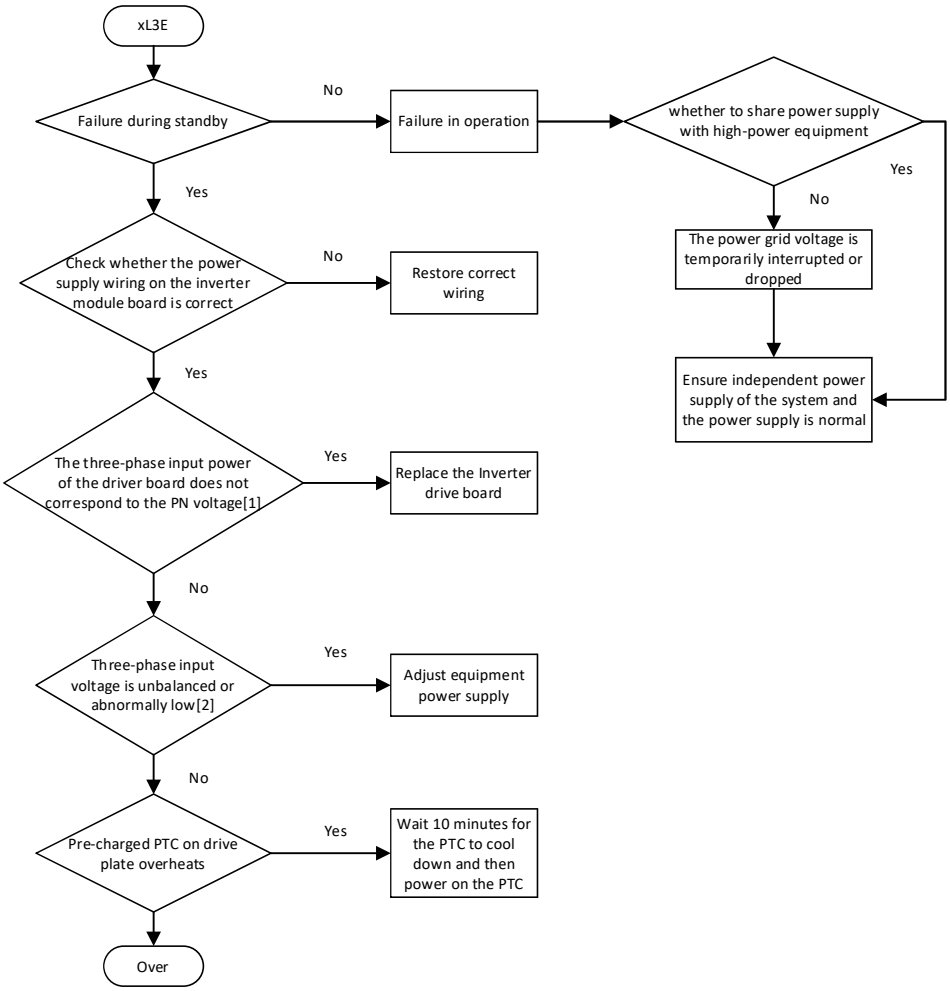
3.4.3 Trigger / recover condition

- Trigger condition: The bus voltage is lower than the bus voltage protection threshold set by the software.
- Recover condition: The bus voltage is higher than the low bus voltage protection threshold set by the software
- Reset method: Resume automatically after the error exit condition is reached.

3.4.4 Possible causes

- The input voltage is too low, resulting in the low bus voltage:
- Voltage sag or interruption, resulting in transient bus voltage is too low:
- The bus voltage detection circuit of the module is abnormal:

3.4.5 Procedure



Notes:

[1] Vdc=VAC*1.732, such as the corresponding PN Vdc=540VDC for the 380V input.

[2] Line voltage below 247VAC

3.5 xL31: The bus voltage is too high

3.5.1 Digital display output

3.5.2 Description

- Bus voltage is higher than the high bus voltage protection threshold set by the software (800VDC).
- The compressor stops running after the error occurs. If the error disappears one minute later, the compressor starts again.

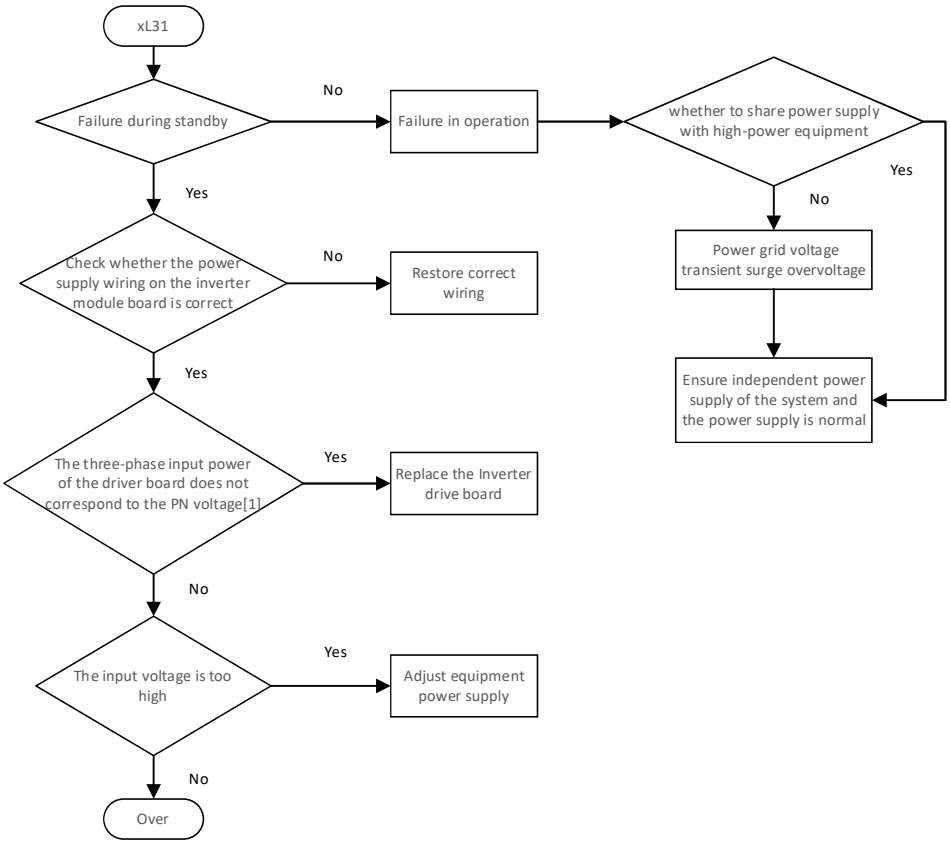
3.5.3 Trigger / recover condition

- Trigger condition:The bus voltage is higher than the software overvoltage protection threshold.
- Recover condition: the bus voltage is lower than the overvoltage protection threshold set by the software.
- Reset method: Resume automatically after the error exit condition is reached.

3.5.4 Possible causes

- The input voltage is too high, resulting in the high bus voltage;
- The power grid voltage is too high:
- The bus voltage detection circuit of the module is abnormal:

3.5.5 Procedure



Notes:

[1] Vdc=VAC*1.732, such as the corresponding PN Vdc=540VDC for the 380V input.

3.6 xL32: The bus voltage is excessively high

3.6.1 Digital display output

3.6.2 Description

- Bus voltage is higher than the high bus voltage protection threshold set by the software (820VDC).
- The compressor stops running after the error occurs. If the error disappears one minute later, the compressor starts again.

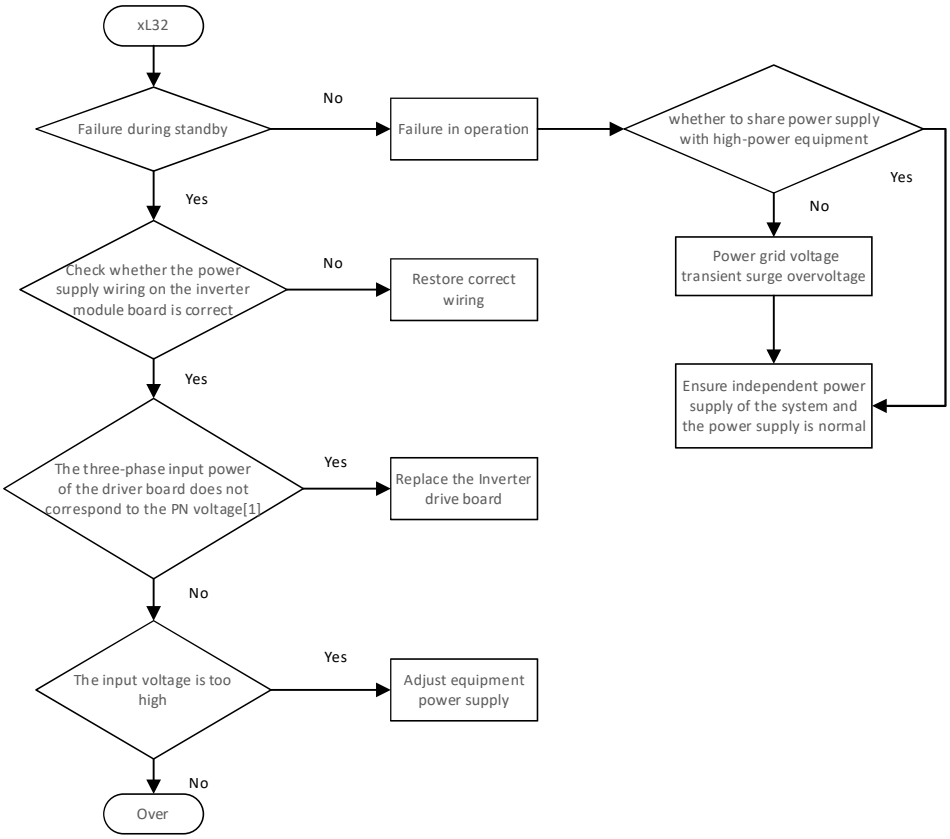
3.6.3 Trigger / recover condition

- Trigger condition: The bus voltage is too high, higher than the high bus voltage protection threshold set by the software (820VDC)
- Recover condition: The bus voltage is lower than the high bus voltage protection threshold.
- Reset method: Resume automatically after the error exit condition is reached.

3.6.4 Possible causes

- The input voltage is too high, resulting in the high bus voltage;
- The power grid voltage is too high:
- The bus voltage detection circuit of the module is abnormal:

3.6.5 Procedure



Notes:

[1] Vdc=VAC*1.732, such as the corresponding PN Vdc=540VDC for the 380V input.

3.7 xL43: The current sampling bias is abnormal.

3.7.1 Digital display output

3.7.2 Description

- Bias calibration of the current sampling circuit is in error.ias calibration of the current sampling circuit is in error.
- After this error occurs, the compressor cannot start. Check whether the inverter driver board is in error.

3.7.3 Trigger / recover condition

- Trigger condition:The AD bias value of the current sampling circuit exceeds half of the AD value range.
- Recover condition:The AD bias value of the current sampling circuit is less than half of the AD range.
- Reset method: Resume automatically.

3.7.4 Possible causes

- The sampling circuit of the inverter drive board is abnormal

3.7.5 Procedure

- Replace the inverter drive board.

3.8 xL5E: Startup failed

3.8.1 Digital display output

3.8.2 Description

- The compressor fails to start
- The compressor stops running after the error occurs. If the error disappears one minute later, the compressor starts again.

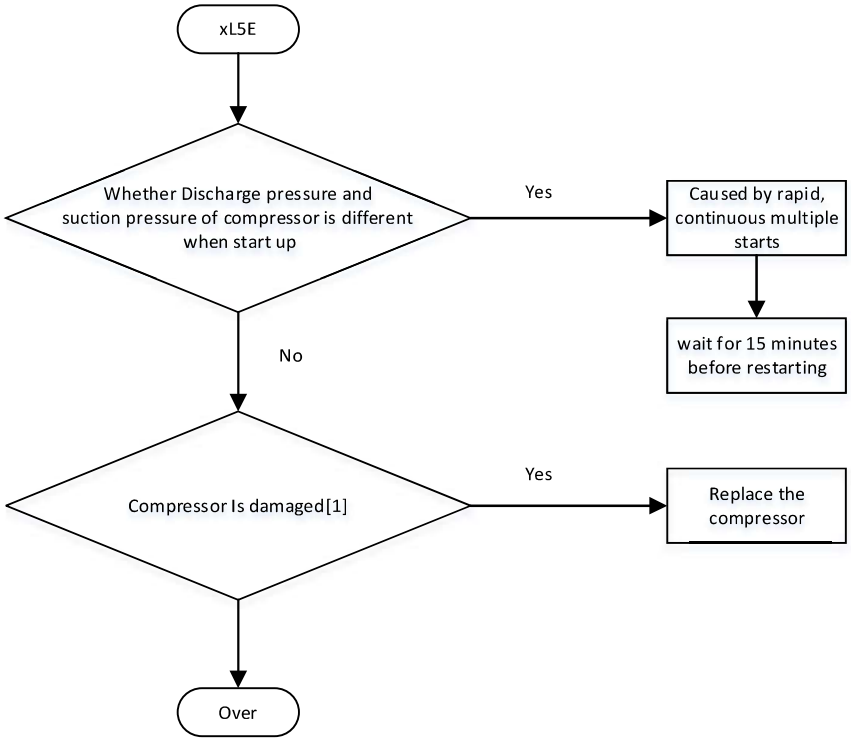
3.8.3 Trigger / recover condition

- Trigger condition:The compressor fails to start
- Recover condition: If the compressor fails to start and starts again successfully, the error will be rectified.
- Reset method: Resume automatically.

3.8.4 Possible causes

- Discharge pressure and suction pressure of compressor is different when start up:
- The compressor is stuck:

3.8.5 Procedure



Note:

[1] Abnormal sound or shaking in compressor when startup (Compressor stuck cylinder, or Impurities in the system)

3.9 xL52: Locked-rotor protection

3.9.1 Digital display output

3.9.2 Description

- The compressor is blocked.
- The compressor stops running after the error occurs. If the error disappears one minute later, the compressor starts again.

3.9.3 Trigger / recover condition

- Trigger condition:The compressor is blocked.
- Recover condition:The blocking error is removed.
- Reset method: Resume automatically after the error exit condition is reached.

3.9.4 Possible causes

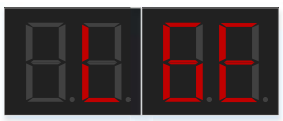
- The compressor is blocked due to impurities or lack of oil in the system.

3.9.5 Procedure

- Matching normal and faulty compressors if possible and replace the two compressors if the problem persists

3.10 xL6E: Compressor motor lack of phase protection

3.10.1 Digital display output



3.10.2 Description

- Compressor motor lack of phase protection.
- The compressor stops running after the error occurs. If the error disappears one minute later, the compressor starts again.

3.10.3 Trigger / recover condition

- Trigger condition: The compressor cable is not connected or in poor contact.
- Recover condition: Check the cable connection of the compressor. After the cable connection is good, the error of missing phase protection is removed and recovered.
- Reset method: Resume automatically after the error exit condition is reached.

3.10.4 Possible causes

- The compressor cable is in poor contact or the terminal screw is not tightened.
- The inverter drive board is abnormal:

3.10.5 Procedure

① Check the UVW output connection line of the inverter drive board and the UVW connection line of the compressor:

② If possible connect the compressor with a normal inverter driver board to verify whether the original driver board is normal.If not , replace the inverter drive board.

4 Error in Fan Drive

4.1 xJ1E: Hardware overcurrent

4.1.1 Digital display output

4.1.2 Description

- The current exceeds the OCP protection value (peak value) set by the hardware or the IPM module receives an FO signal
- The fan stops running after the error occurs. If the error disappears five seconds, the fan starts again

4.1.3 Trigger / recover condition

(1)Current reaches OCP protection value:

- Trigger condition:Current reaches OCP protection value
- Recover condition:The fan will stop after failure, and recover after five seconds when the condition of failure exit is reached
- Reset method:The system automatically recovers five seconds after the error exit condition is reached

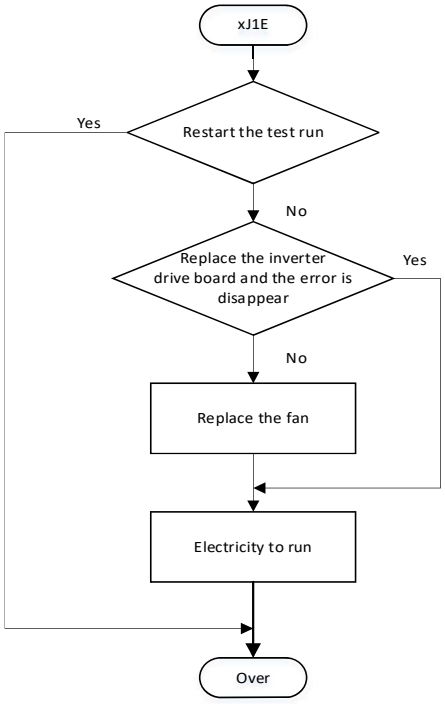
(2)Falling edge of FO signal or continuous low level is detected:

- Trigger condition: A falling edge or continuous low level of FO signal is detected.
- Recover condition: The FO signal becomes high level.
- Reset method: Resume automatically five seconds after the error exit condition is reached.

4.1.4 Possible causes

- The software out of control leads to fan running stall
- The fan is blocked or the internal coil is short-circuited
- The IPM of Inverter drive board(fan section) is damaged
- The circuits of Inverter drive board(fan section) are abnormal

4.1.5 Procedure



4.2 xJ11, xJ12: Software overcurrent

4.2.1 Digital display output

4.2.2 Description

- The current exceeds the OCP protection value set by the software.
- The fan will stop when the error occurs. If the error disappears five seconds later, the fan will start again.

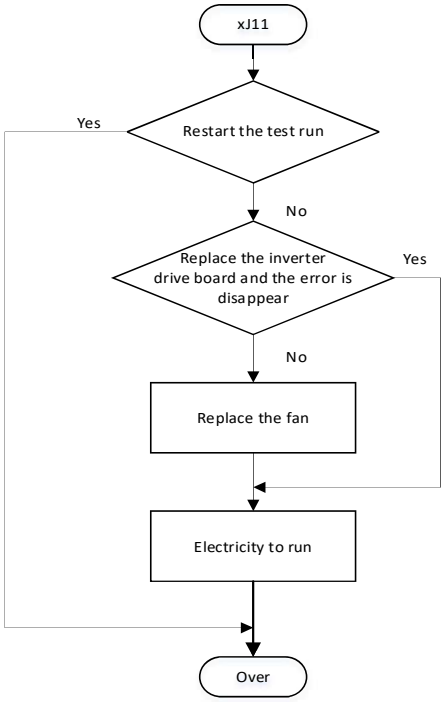
4.2.3 Trigger / recover condition

- Trigger condition:
  xJ11: The fan current exceeds the OCP protection value set by the software in three consecutive carrier periods
  xJ12: Software overcurrent protection last 30s
- Recover condition: The fan will stop when the error occurs. If the error disappears five seconds later, the fan will start again
- Reset method:Resume automatically after reaching exit condition of Error

4.2.4 Possible causes

- Severe fan wear.
- The software out of control leads to fan running stall.
- The driver or detection part of the inverter drive board is damaged.

4.2.5 Procedure



4.3 xJ2E: Module overtemperature protection

4.3.1 Digital display output

4.3.2 Description

- The temperature of the IPM exceeds 105° .
- The fan stops running after the error. If the error disappears after five seconds, the fan starts again.

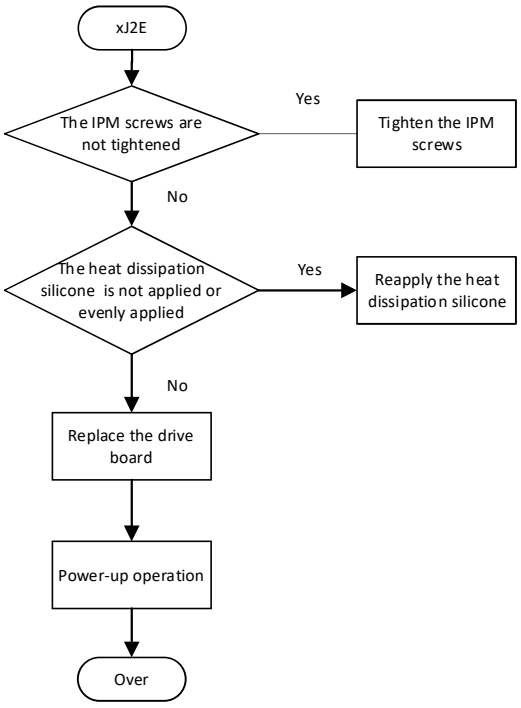
4.3.3 Trigger / recover condition

- Trigger condition:The temperature of the IPM exceeds 105 ° C
- Recover condition:After a error occurs, the fan is shut down. The fan will recover five seconds later when the error exit condition is reached (the module temperature is lower than 105 ° C).
- Reset method: Resume automatically after the error exit condition is reached.

4.3.4 Possible causes

- The IPM screws are not tightened, resulting in poor heat dissipation:
- The heat dissipation silicone for the IPM module is not evenly applied, resulting in poor heat dissipation:
- The IPM temperature detection circuit is abnormal

4.3.5 Procedure



4.4 xJ3E: The bus voltage is too low

4.4.1 Digital display output

4.4.2 Description

- Bus voltage is lower than the low bus voltage protection threshold set by the software (350VDC).
- The fan stops running after the error occurs. If the error disappears five seconds later, the fan starts again.

4.4.3 Trigger / recover condition

- Trigger condition: The bus voltage is lower than the bus voltage protection threshold set by the software.
- Recover condition: The bus voltage is higher than the low bus voltage protection threshold set by the software
- Reset method: Resume automatically after the error exit condition is reached.

4.4.4 Possible causes

- The input voltage is too low, resulting in the low bus voltage:
- Voltage sag or interruption, resulting in transient bus voltage is too low:
- The bus voltage detection circuit of the module is abnormal:

4.4.5 Procedure

Troubleshoot according to xL3E

4.5 xJ31: The bus voltage is too high

4.5.1 Digital display output

4.5.2 Description

- Bus voltage is higher than the high bus voltage protection threshold set by the software (800VDC).
- The fan stops running after the error occurs. If the error disappears five seconds later, the fan starts again.

4.5.3 Trigger / recover condition

- Trigger condition: The bus voltage is higher than the software overvoltage protection threshold.
- Recover condition: The bus voltage is lower than the overvoltage protection threshold set by the software.
- Reset method: Resume automatically after the error exit condition is reached.

4.5.4 Possible causes

- The input voltage is too high, resulting in the high bus voltage;
- The power grid voltage is too high:
- The bus voltage detection circuit of the module is abnormal:

4.5.5 Procedure

Troubleshooting according to xL31

4.6 xJ32: The bus voltage is excessively high

4.6.1 Digital display output

4.6.2 Description

- Bus voltage is higher than the high bus voltage protection threshold set by the software (820VDC).
- The fan stops running after the error occurs. If the error disappears five seconds later, the fan starts again.

4.6.3 Trigger / recover condition

- Trigger condition: The bus voltage is too high, higher than the high bus voltage protection threshold set by the software (820VDC)
- Recover condition: The bus voltage is lower than the high bus voltage protection threshold.
- Reset method: Resume automatically after the error exit condition is reached.

4.6.4 Possible causes

- The input voltage is too high, resulting in the high bus voltage;
- The power grid voltage is too high:
- The bus voltage detection circuit of the module is abnormal:

4.6.5 Procedure

Troubleshooting according to xL32

4.7 xJ43: The current sampling bias is abnormal

4.7.1 Digital display output

4.7.2 Description

- Bias calibration of the current sampling circuit is in error.ias calibration of the current sampling circuit is in error.
- After this error occurs, the fan cannot start. Check whether the inverter driver board is in error.

4.7.3 Trigger / recover condition

- Trigger condition: The AD bias value of the current sampling circuit exceeds half of the AD value range.
- Recover condition: The AD bias value of the current sampling circuit is less than half of the AD range.
- Reset method: Resume automatically after the error exit condition is reached.

4.7.4 Possible causes

- The sampling circuit of the inverter drive board is abnormal

4.7.5 Procedure

- Replace the inverter drive board

4.8 xJ5E: Startup failed

4.8.1 Digital display output

4.8.2 Description

- The fan fails to be started.
- The fan stops running after the error. If the error disappears after five seconds, the fan starts again.

4.8.3 Trigger / recover condition

- Trigger condition: Fan startup failure.
- Recover condition: If the fan fails to start, the fan restarts again and the error is rectified after the fan starts successfully.
- Reset method: Resume automatically after the fan starts successfully.

4.8.4 Possible causes

- fan motor stuck:
- The fan is started against the wind:
- The driver is abnormal:

4.8.5 Procedure

① Check whether the motor is stuck:
② Check whether there is a large headwind:
③ If possible, connecting a normal inverter drive board and the fan with error, check whether the fan is normal. Otherwise, replace the fan.

4.9 xJ52: Locked-rotor protection

4.9.1 Digital display output

4.9.2 Description

- The fan is blocked.
- The fan stops running after the error. If the error disappears after five seconds, the fan starts again.

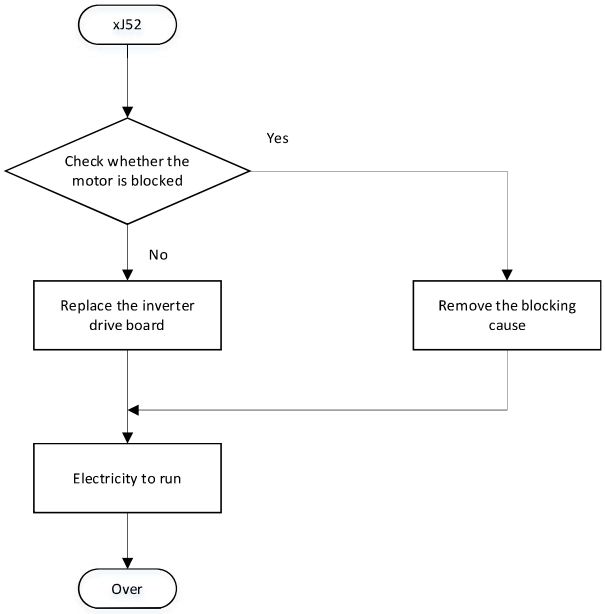
4.9.3 Trigger / recover condition

- Trigger condition: The fan is blocked.
- Recover condition: The blocking error is removed.
- Reset method: Resume automatically after the error exit condition is reached.

4.9.4 Possible causes

- The fan shaft is stuck.

4.9.5 Procedure



4.10 xJ6E: Motor lack of phase protection

4.10.1 Digital display output

4.10.2 Description

- The fan has phase loss protection.
- The fan stops running after the error. If the error disappears after five seconds, the fan starts again.

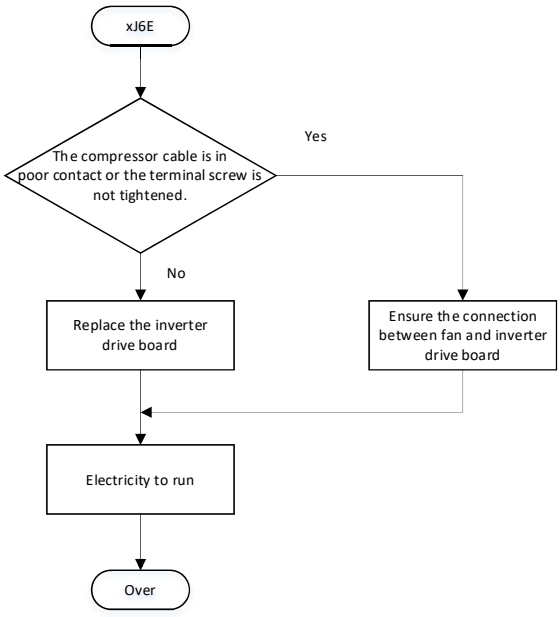
4.10.3 Trigger / recover condition

- Trigger condition:The fan cable is not connected or in bad contact.
- Recover condition:Check the fan wiring, after the wiring is good, the error of missing phase protection is removed.
- Reset method:Resume Automatically after the error exit condition is reached

4.10.4 Possible causes

- The compressor cable is in poor contact or the terminal screw is not tightened.
- The IPM of inverter drive board is damaged:

4.10.5 Procedure



5 Appendix

5.1 Resistance characteristics of temperature sensor

Table 6-5.1: Temperature probe symbol and position

Temperature probe symbol and position		The probe type
T3	Bottom of heat exchanger	Type A
T4	Outdoor ambient temperature	Type A
T5	Liquid pipe stop valve	Type A
T6A	Microchannel heat exchanger inlet pipe	Type A
T6B	Microchannel heat exchanger outlet pipe	Type A
T71	Inverter compressor A suction	Type A
T7C1	Inverter compressor A discharge	Type B
T8	Outdoor Heat exchanger gas pipe	Type A
TL	Outdoor Heat exchanger liquid pipe	Type A
Tg	Gas pipe stop valve	Type A
Tb	Electric control box cavity	Type A
Tr	Sampling resistance of inverter drive board	Type C
NTC	inverter drive board	Type C

Notes: Type A is mainly used for general pipe temperature and ambient temperature detection

Type B is mainly used for compressor discharge temperature detection

TypeC is mainly used for internal temperature detection of electronic control board

Table 6-5.2: Temperature sensor temperature resistance characteristic table

temperature	resistance (kΩ)		
(°C)	Type A	Type B	Type C
-20	115.3	542.7	532.2
-19	108.1	511.9	502.2
-18	101.5	483	474.1
-17	96.34	455.9	447.7
-16	89.59	430.5	423
-15	84.22	406.7	399.8
-14	79.31	384.3	378
-13	74.54	363.3	357.5
-12	70.17	343.6	338.2
-11	66.09	325.1	320.1
-10	62.28	307.7	303.1
-9	58.71	291.3	287.1
-8	56.37	275.9	272
-7	52.24	261.4	257.8
-6	49.32	247.8	244.4
-5	46.57	234.9	231.9
-4	44	222.8	220
-3	41.59	211.4	208.7
-2	39.82	200.7	198.2
-1	37.2	190.5	188.2
0	35.2	180.9	178.8

Table 6-5.2: Temperature sensor temperature resistance characteristic table (continues)

temperature	resistance (kΩ)		
(°C)	Type A	Type B	Type C
1	33.33	171.9	169.9
2	31.56	163.3	161.5
3	29.91	155.2	153.6
4	28.35	147.6	146.1
5	26.88	140.4	139.1
6	25.5	133.5	132.3
7	24.19	127.1	126
8	22.57	121	120
9	21.81	115.2	114.3
10	20.72	109.8	109
11	19.69	104.6	103.9
12	18.72	99.69	99.02
13	17.8	95.05	94.44
14	16.93	90.66	90.11
15	16.12	86.49	86
16	15.34	82.54	82.09
17	14.62	78.79	78.38
18	13.92	75.24	74.87
19	13.26	71.86	71.53
20	12.64	68.66	68.36
21	12.06	65.62	65.34
22	11.5	62.73	62.47
23	10.97	59.98	59.75
24	10.47	57.37	57.17
25	10	54.89	54.71
26	9.551	52.53	52.36
27	9.124	50.28	50.13
28	8.72	48.14	48.01
29	8.336	46.11	45.99
30	7.971	44.17	44.07
31	7.624	42.33	42.23
32	7.295	40.57	40.48
33	6.981	38.89	38.81
34	6.684	37.3	37.23
35	6.4	35.78	35.71
36	6.131	34.32	34.27
37	5.874	32.94	32.89
38	5.63	31.62	31.58
39	5.397	30.36	30.33
40	5.175	29.15	29.13
41	4.964	28	27.98
42	4.763	26.9	26.89
43	4.571	25.86	25.85

Table 6-5.2: Temperature sensor temperature resistance characteristic table (continues)

temperature	resistance (kΩ)		
(°C)	Type A	Type B	Type C
44	4.387	24.85	24.85
45	4.213	23.89	23.9
46	4.046	22.89	22.98
47	3.887	22.1	22.1
48	3.735	21.26	21.26
49	3.59	20.46	20.47
50	3.451	19.69	19.7
51	3.318	18.96	18.97
52	3.192	18.26	18.26
53	3.071	17.58	17.59
54	2.959	16.94	16.94
55	2.844	16.32	16.32
56	2.738	15.73	15.73
57	2.637	15.16	15.16
58	2.54	14.62	14.62
59	2.447	14.09	14.1
60	2.358	13.59	13.6
61	2.272	13.11	13.12
62	2.191	12.65	12.65
63	2.112	12.21	12.22
64	2.037	11.79	11.79
65	1.965	11.38	11.39
66	1.896	10.99	10.99
67	1.83	10.61	10.62
68	1.766	10.25	10.25
69	1.705	9.902	9.909
70	1.647	9.569	9.576
71	1.591	9.248	9.253
72	1.537	8.94	8.947
73	1.485	8.643	8.646
74	1.435	8.358	8.362
75	1.387	8.084	8.089
76	1.341	7.82	7.821
77	1.291	7.566	7.569
78	1.254	7.321	7.323
79	1.2133	7.086	7.088
80	1.174	6.859	6.858
81	1.136	6.641	6.64
82	1.1	6.43	6.432
83	1.064	6.228	6.23
84	1.031	6.033	6.033
85	0.9982	5.844	5.847
86	0.9668	5.663	5.667

Table 6-5.2: Temperature sensor temperature resistance characteristic table (continues)

temperature	resistance (kΩ)		
(°C)	Type A	Type B	Type C
87	0.9366	5.488	5.492
88	0.9075	5.32	5.322
89	0.8795	5.157	5.159
90	0.8525	5	5
91	0.8264	4.849	4.855
92	0.8013	4.703	4.705
93	0.7771	4.562	4.566
94	0.7537	4.426	4.431
95	0.7312	4.294	4.301
96	0.7094	4.167	4.176
97	0.6884	4.045	4.055
98	0.6682	3.927	3.938
99	0.6486	3.812	3.825
100	0.6297	3.702	3.716
101	0.6115	3.595	3.613
102	0.5939	3.492	3.514
103	0.5768	3.392	3.418
104	0.5604	3.296	3.326
105	0.5445	3.203	3.235
106	0.5291	3.113	3.148
107	0.5143	3.025	3.063
108	0.4999	2.941	2.982
109	0.486	2.86	2.902
110	0.4726	2.781	2.826
111	0.4596	2.704	2.747
112	0.447	2.63	2.672
113	0.4348	2.559	2.599
114	0.423	2.489	2.528
115	0.4116	2.422	2.46
116	0.4006	2.357	2.39
117	0.3899	2.294	2.322
118	0.3796	2.233	2.256
119	0.3695	2.174	2.193
120	0.3598	2.117	2.132
121	0.3504	2.061	2.073
122	0.3413	2.007	2.017
123	0.3325	1.955	1.962
124	0.3239	1.905	1.91
125	0.3156	1.856	1.859
126	0.3075	1.808	
127	0.2997	1.762	
128	0.2922	1.717	
129	0.2848	1.674	

Table 6-5.2: Temperature sensor temperature resistance characteristic table (continues)

temperature	resistance (kΩ)		
(°C)	Type A	Type B	Type C
130	0.2777	1.632	
131	0.2708		
132	0.2641		
133	0.2576		
134	0.2513		
135	0.2451		

5.2 Normal status parameter of refrigerant system

The parameters listed in Tables 5.2.1 and 5.2.2 need to be noted when the following conditions are met::

- The master can detect all indoor machines:
- The number of indoor units displayed for outdoor units is consistent with the actual installation.
- All stop valves have been opened and all indoor units' electronic expansion valve have been connected to their main control board:
- If the indoor unit connection rate is less than 100% and all indoor units are running.If the connection rate of the indoor unit is greater than 100%, the operating capacity of the indoor units is equal to the total capacity of the outdoor units.
- If the outdoor ambient temperature is high, and the system is in cooling mode and set the temperature to 17 ° C with high wind speed;
- If the outdoor ambient temperature is low, and the system is in heating mode and set to 30 ° C, high wind speed:
- The system runs properly for more than 30 minutes

Table 6-5.3: outdoor unit cooling mode parameters

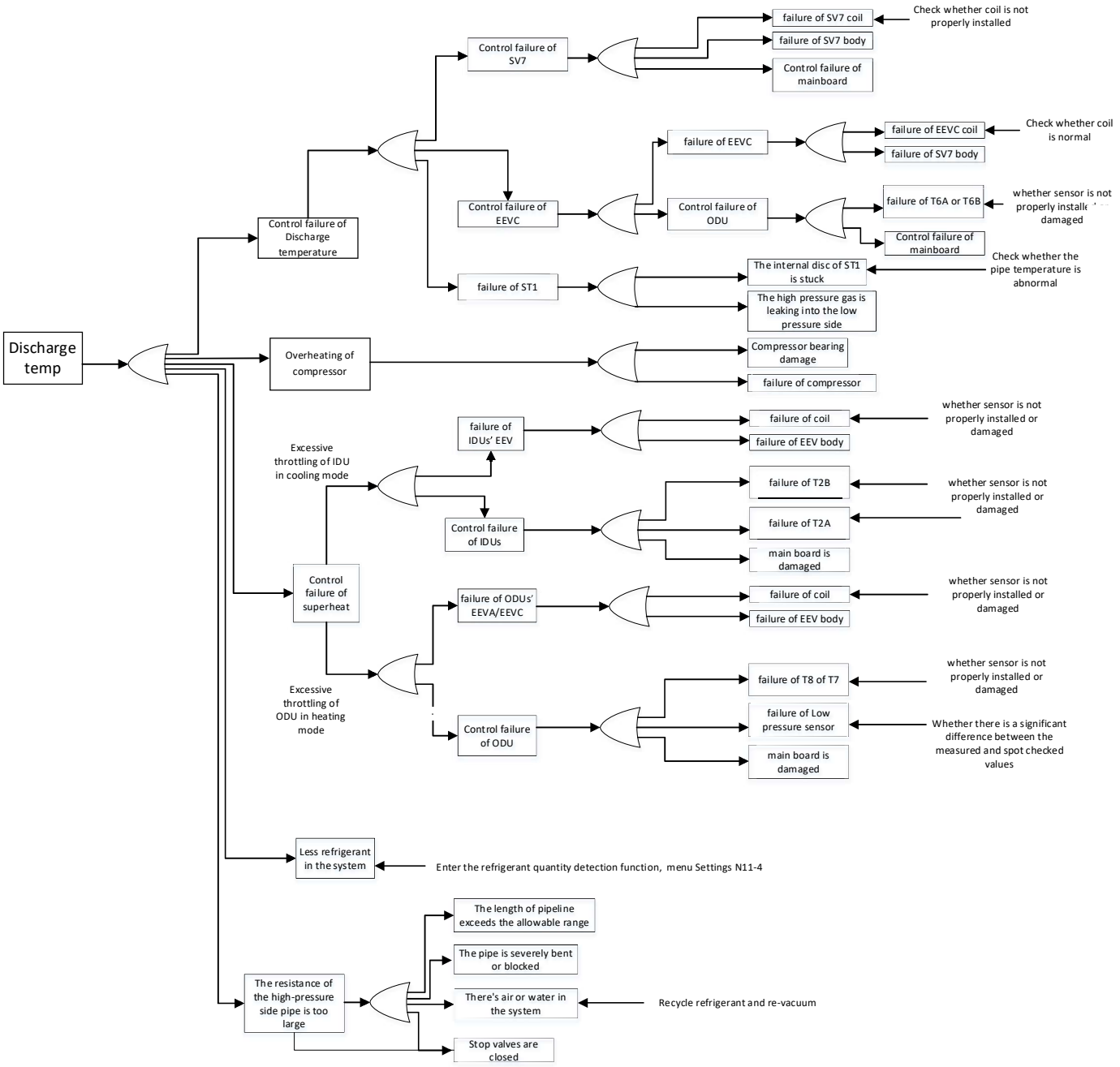
Outdoor ambient temperature	**℃**	< 10	10 to 26	26 to 31	31 to 41	> 41
Discharge temperature	**℃**	60-76	62-78	65-82	67-92	69-92
Discharge superheat	**℃**	17-30	17-33	17-34	17-36	10-32
discharge pressure	**MPa**	2.3-2.8	2.3-2.8	2.4-3.6	2.6-3.8	3.1-4.1
suction pressure	**MPa**	0.6-0.7	0.7-0.9	0.8-1.0	1.0-1.2	1.2-1.4
Dc bus compressor current	**A**	9-32	11-38	20-44	26-44	20-46

Table 6-5.4: outdoor unit heating mode parameters

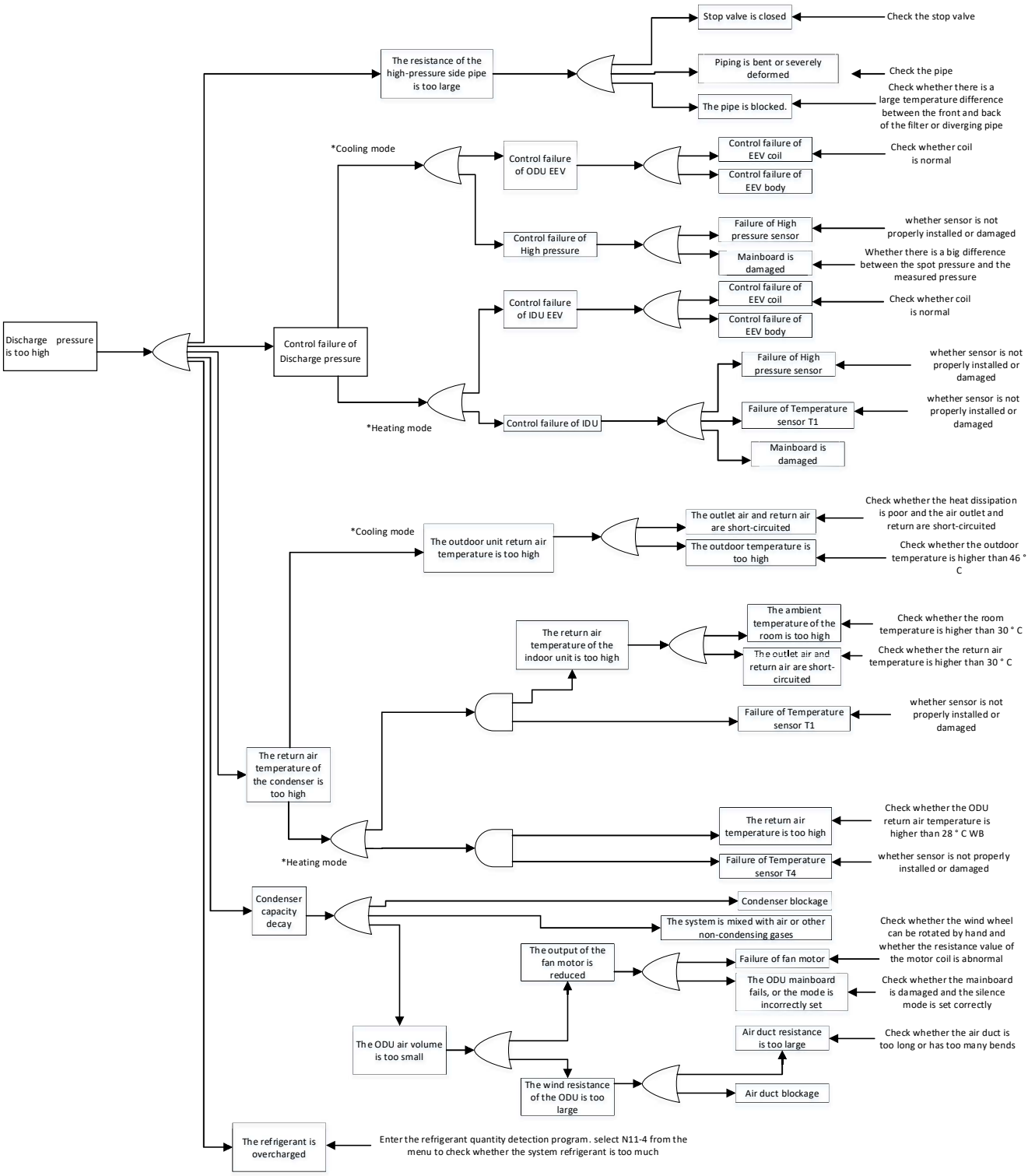
Outdoor temperature	**℃**	< -10	-10 to 10	0 to 5	5 to 10	10 to 17	> 17
Discharge temperature	**℃**	56-74	57-76	58-78	61-82	63-82	63-82
Discharge superheat	**℃**	17-35	17-35	17-35	17-33	14-33	14-33
discharge pressure	**MPa**	1.7-2.4	1.8-2.5	1.9-3.0	2.2-3.2	2.3-3.2	2.3-3.2
Back to the gas pressure	**MPa**	0.4-1.0	0.5-1.2	0.5-1.2	0.5-1.3	0.5-1.3	0.6-1.4
Dc bus compressor current	**A**	14-38	15-38	16-30	20-40	18-42	12-35

5.3 Analysis of the cause of system anomalies

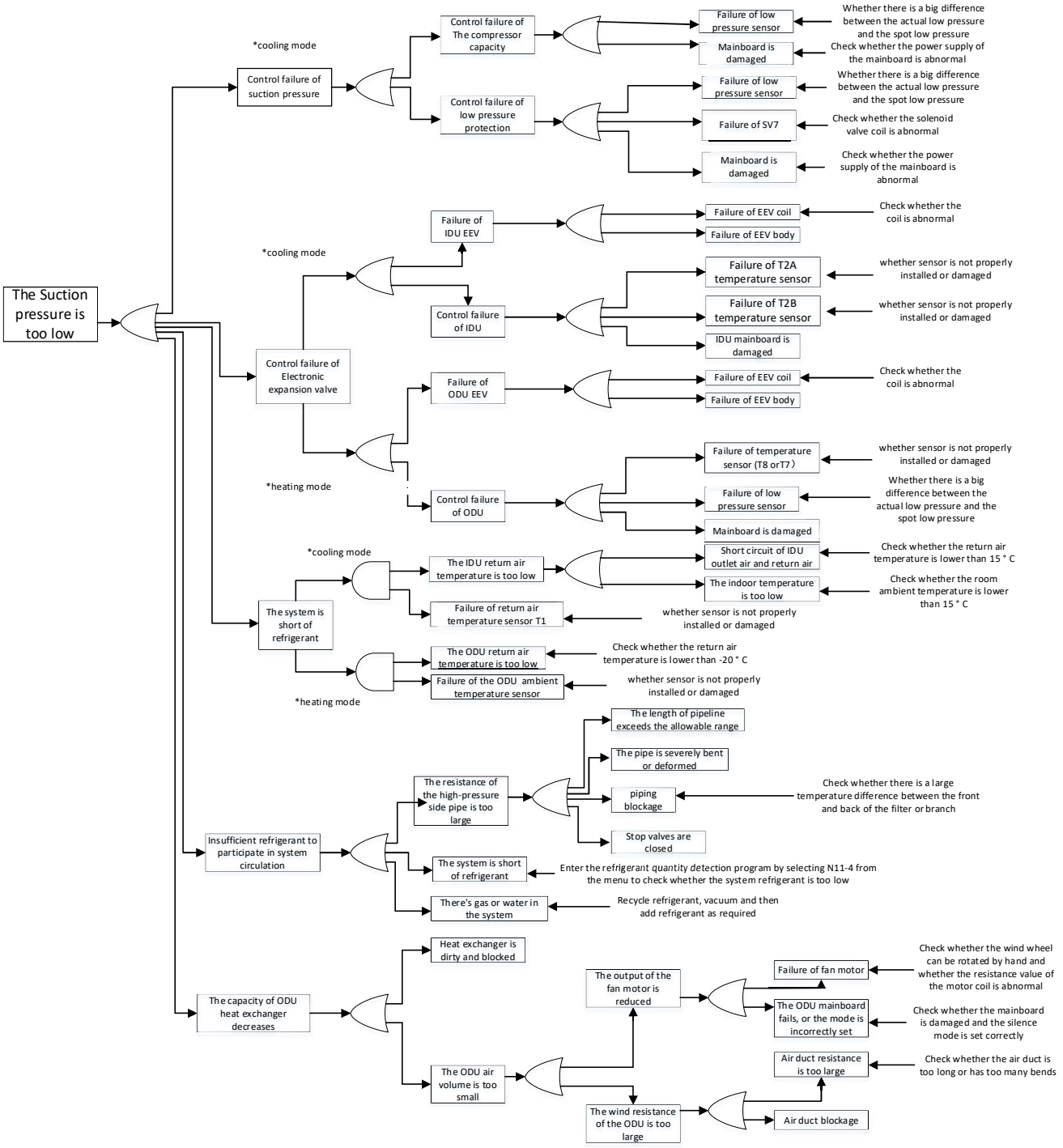
5.3.1 Cause Analysis of Excessive discharge Temperature



5.3.2 Cause Analysis of too high Pressure



5.3.3 Cause Analysis of too Low Pressure



5.4 Outdoor unit main Control Board ports table

Figure 6-5.1: Outdoor unit main Control Board ports

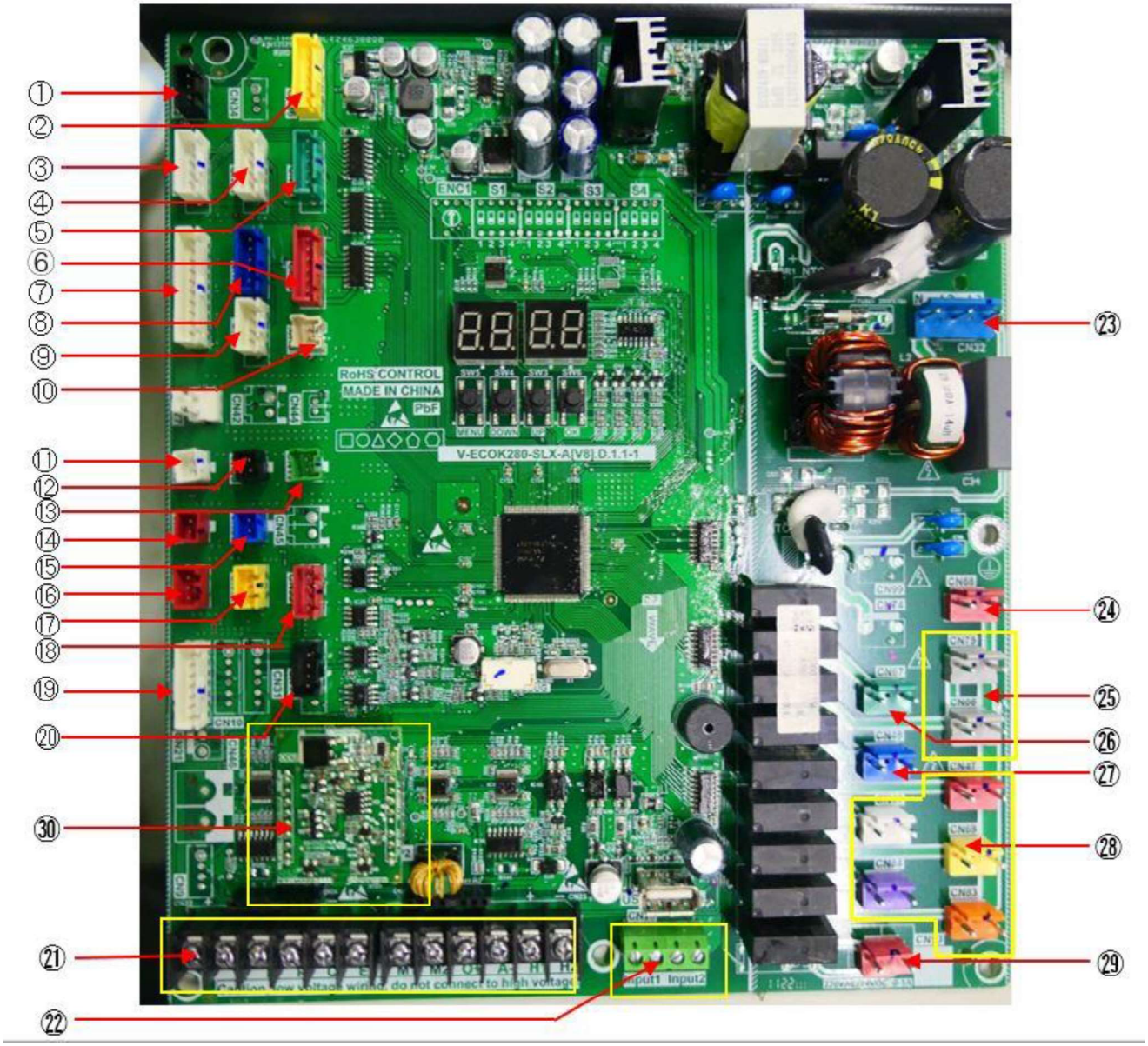


Table 6-5.5: Main Control Board port definition Table

Label in Figure 5-2.1	Port code	Content	Port voltage
1	CN82	Reserved	5Vdc
2	CN36	Recirculation fan control port	3.3Vdc
3	CN70	EEVA drive port	12Vdc
4	CN71	EEVB drive port(Reserved)	12Vdc
5	CN72	EEVC drive port	12Vdc
6	CN73	EXVE drive port	12Vdc
7	CN4	Microchannel heat exchanger inlet temperature sensor(**T6A**) /Liquid pipe inlet temperature sensor(**T5**) /Microchannel heat exchanger outlet temperature sensor(**T6B**) /Suction temperature sensor 1 (**T71**) /Discharge temperature sensor 1 (**T7C1**) (**From top to bottom**)	3.3Vdc
8	CN35	Reserved	3.3Vdc
9	CN8	Condenser inlet temperature sensor(T8)/Main exchanger pipe temperature sensor(**T3**) (**From top to bottom**)	3.3Vdc
10	CN3	Condenser outlet temperature sensor(**TL**)	3.3Vdc
11	CN16	Gas pipe temperature sensor(**Tg**)	3.3Vdc
12	CN38	Discharge temperature sensor 2 (**T7C2**)	3.3Vdc
13	CN11	Electric control box chamber temperature sensor(**Tb**)	3.3Vdc
14	CN37	Suction temperature sensor 2 (**T72**)	3.3Vdc
15	CN30	Outdoor ambient temperaturesensor(**T4**)	3.3Vdc
16	CN41	Low pressure sensor	5Vdc
17	CN40	High pressure sensor	5Vdc
18	CN33	Expanded communication port	12Vdc
19	CN26	Communication port to Compressor & Fan Drive Board	5Vdc+12Vdc
20	CN14	Communication port to data transfer module	12Vdc
21	CN22/CN23	Communication port	0-5V DC (varying)
22	CN28	Emergency stop port	0V or Open
23	CN32	Power input of main board	176Vac~264Vac
24	CN68	Recirculation fan power	176Vac~264Vac
25	CN75/CN66	Power supply to compressor crankcase heater	176Vac~264Vac
26	CN67	Solenoid valve drive ports CN67-SV4(Reserved)	176Vac~264Vac
27	CN48	Four-way valve drive ports(**ST1**)	176Vac~264Vac
28	CN47 /CN49/CN69 /CN84/CN83	Solenoid valve drive ports CN47-SV6 ; CN49-SV5 ; CN69-SV7 ; CN84-SV8A; CN83-SV8B	176Vac~264Vac
29	CN93	Dry contact output	0V or Open
30	-	HyperLink board	-

5.5 Compressor & Fan drive board ports detection

5.5.1 Port reference and function definition of Compressor & Fan drive board

Figure 6-5.2: Compressor & Fan drive board ports

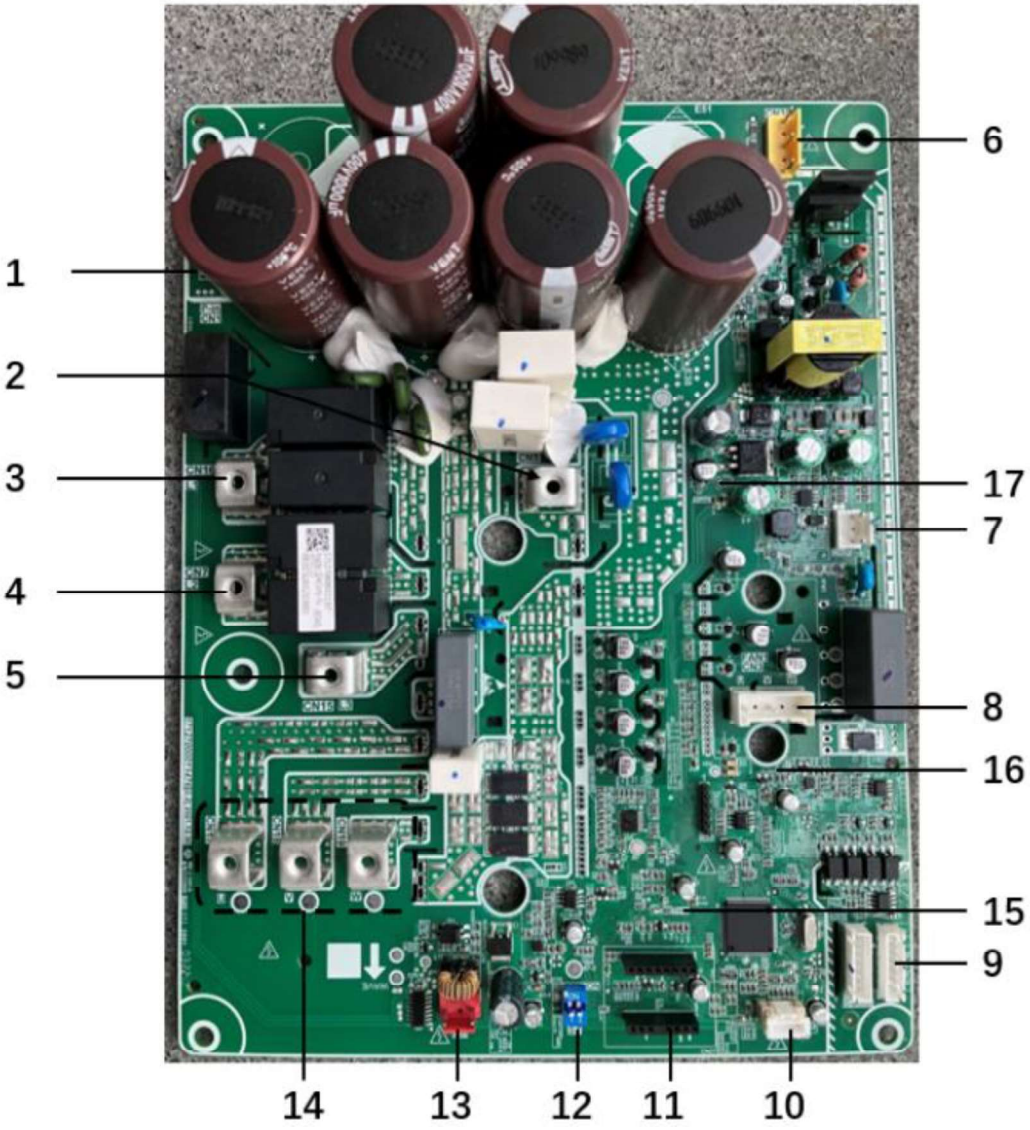


Table 6-5.5: Port definition and functions table:

Label in Figure 6-2.5	Port code	Feature identifier	Content	Port voltage
1	CN1	P-in	Positive pole Input terminal of the high voltage capacitors (connected to reactor)	438Vdc-650Vdc(Rated at 540Vdc)
2	CN5	P-out	Positive pole output terminal of the three-phase rectifier (connected to reactor)	438Vdc-650Vdc(Rated at 540Vdc)
3	CN16	L1	Three phase power input of L1 phase	310Vac-460Vac(Rated 380Vac between phases)
4	CN7	L2	Three phase power input of L2 phase	310Vac-460Vac(Rated 380Vac between phases)
5	CN15	L3	Three phase power input of L3 phase	310Vac-460Vac(Rated 380Vac between phases)

Table 6-5.5: Port definition and functions table (continues):

Label in Figure 6-2.5	Port code	Feature identifier	Content	Port voltage
6	CN38	-	Power supply terminal for DC fan drive board (P,N) (Reserved)	438Vdc~650Vdc(Rated 540Vdc; P is positive, N is negative)
7	CN26	-	Fan module controls power supply(Reserved)	19V
8	CN3	DCFAN	Three phase output of the inverter ,connected to the DC fan	0~100%*input voltage(varying)
9	CN8/CN9	O-Motor	Communication port between main control board and Inverter drive board	Ports from top to bottom are defined as follows: 5V, +, -, GND, 12V, empty, and Ry2.
10	CN25	-	Debug port	--
11	CN27	-	PED Diagnostic Module	--
12	S7	-	Dial switches of address setting (Compressor & Fan drive module)	--
13	CN21	H-Pro	High pressure switch connection	Close: 0 Vdc ; Open: 6 Vdc
14	CN17/18/19	U/V/W	Three phase output of the inverter ,connected to the compressor	0~100%*input voltage(varying)
15	LED1	COMP	Compressor drive status indicator: red, steady on indicates running, slow blinking indicates standby, and quick blinking indicates error (see the specific error code of the nixie tube on the main board)	--
16	LED2	Fan	Fan drive status indicator: red, steady on means running, slow blinking means standby, quick blinking means error code (see the specific error code of the nixie tube on the main board)	--
17	LED3	Power	Drive board 5V control power indicator light, green, 5V power is always on.Note That there may be residual high voltage on the drive board when the indicator is off. Use a multimeter to measure and confirm the operation.	--

5.5.2 Fan drive board

Figure 6-5.3: Fan drive board

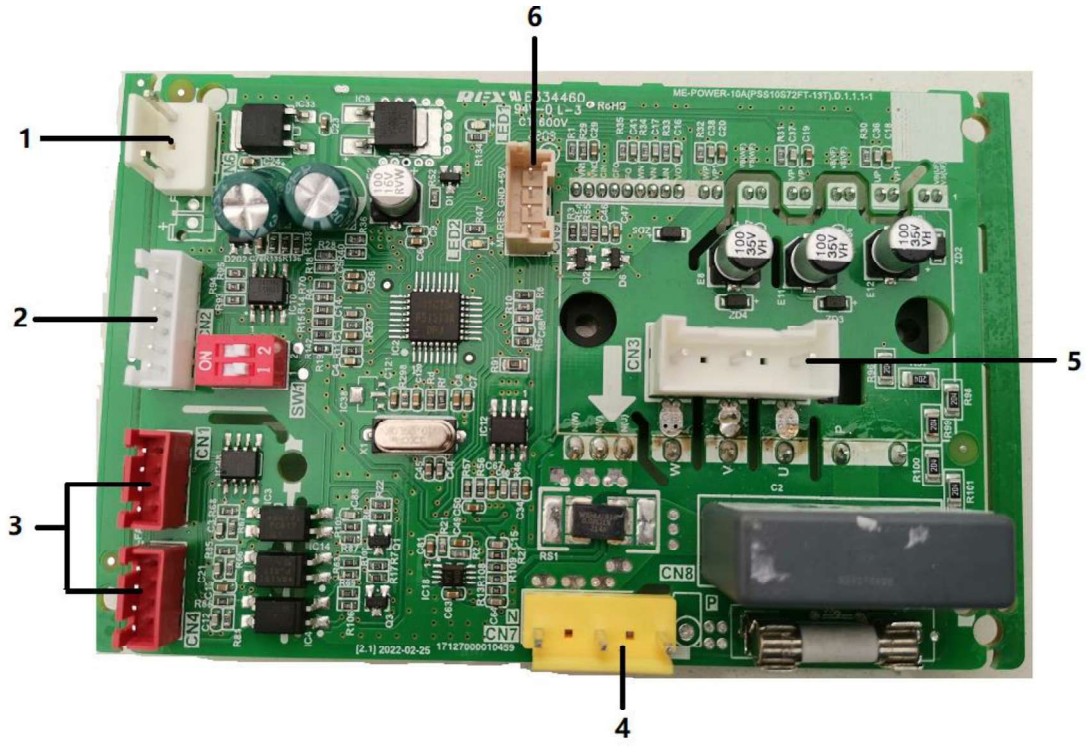


Table 6-5.6: Compressor & Fan drive board port

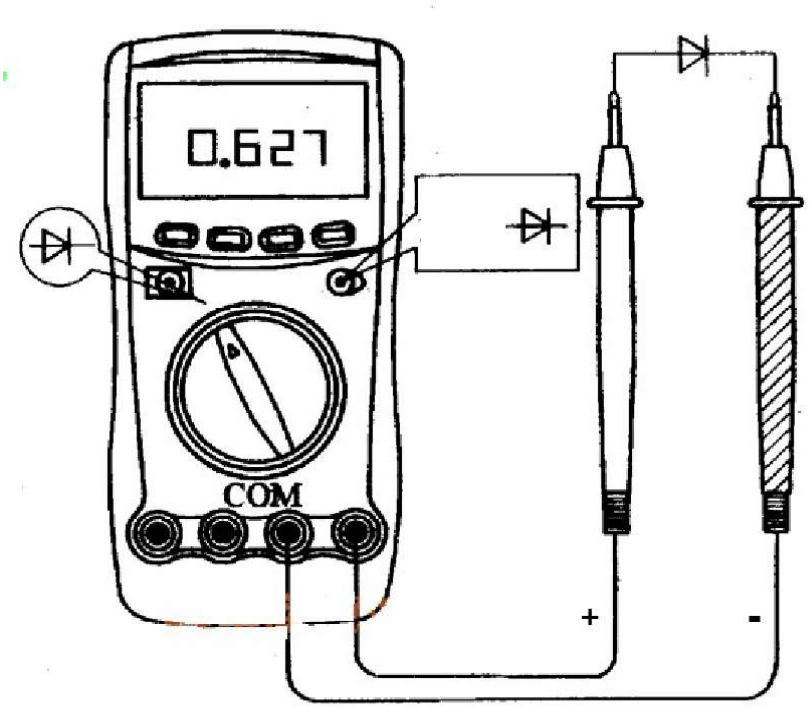
Label in Figure 5-2.5	Port code	Content	Port voltage
1	CN6	Fan module controls power supply(Reserved)	19V
2	CN2	EEPROM Program burning port	5V
3	CN4\CN1	Communication port between main control board and Fan drive board	5V
4	CN7	Power supply terminal for DC fan drive board (P,N) From main control board.	Rated voltage 540V DC P(+), N(-)
5	CN3	Output power supply for fan motor	46~460V AC
6	CN9	Main Program burning port	--

5.5.3 Inverter drive board measurement guidelines

Please give priority to the following things before testing Inverter drive board:

1) Cut off the power supply:
2) To avoid electric shock from capacitor discharge, power off for 10 minutes and wait for capacitor discharge before operation:
3) Remove all wiring on the Inverter drive board.

Tools: multimeter (measurable secondary pipe)



The following measurements are for reference:

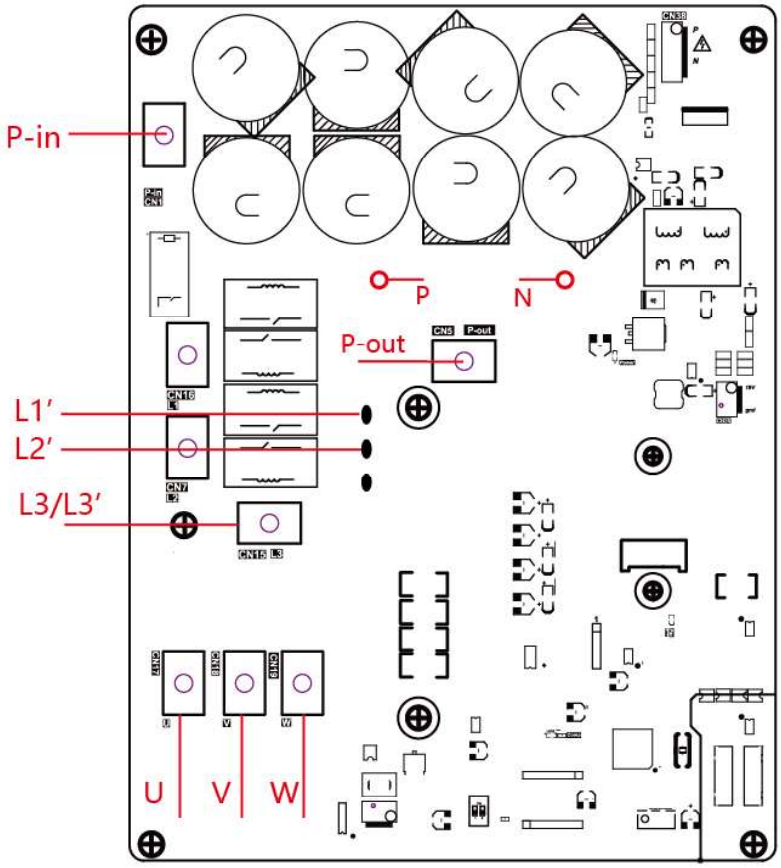
Inverter circuit measurement

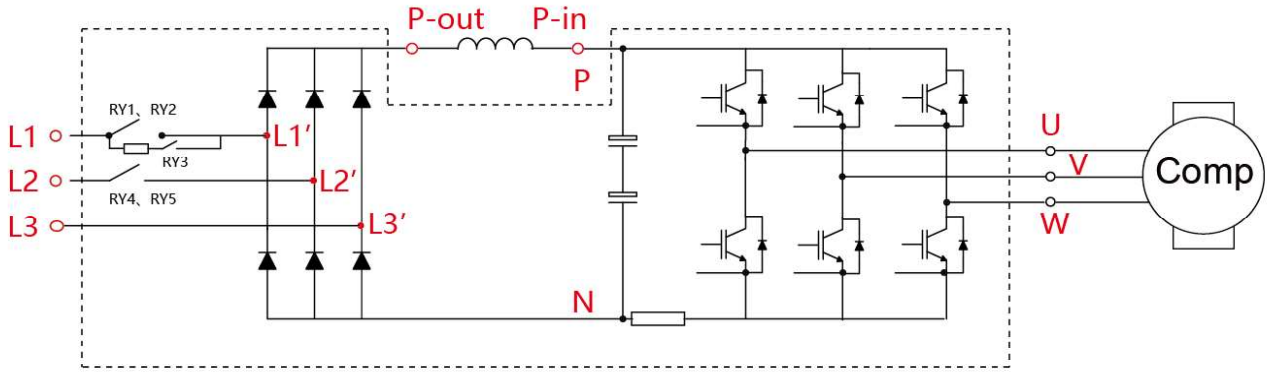
Number	Test point		Normal decision value	Notes
	+(Red)	-(Black)		
1	U	P-in	0.3-0.7V	0 or→+ ∞ is abnormal
2	V	P-in		
3	W	P-in		
4	N	U		
5	N	V		
6	N	W		

Rectifier bridge stack measurement

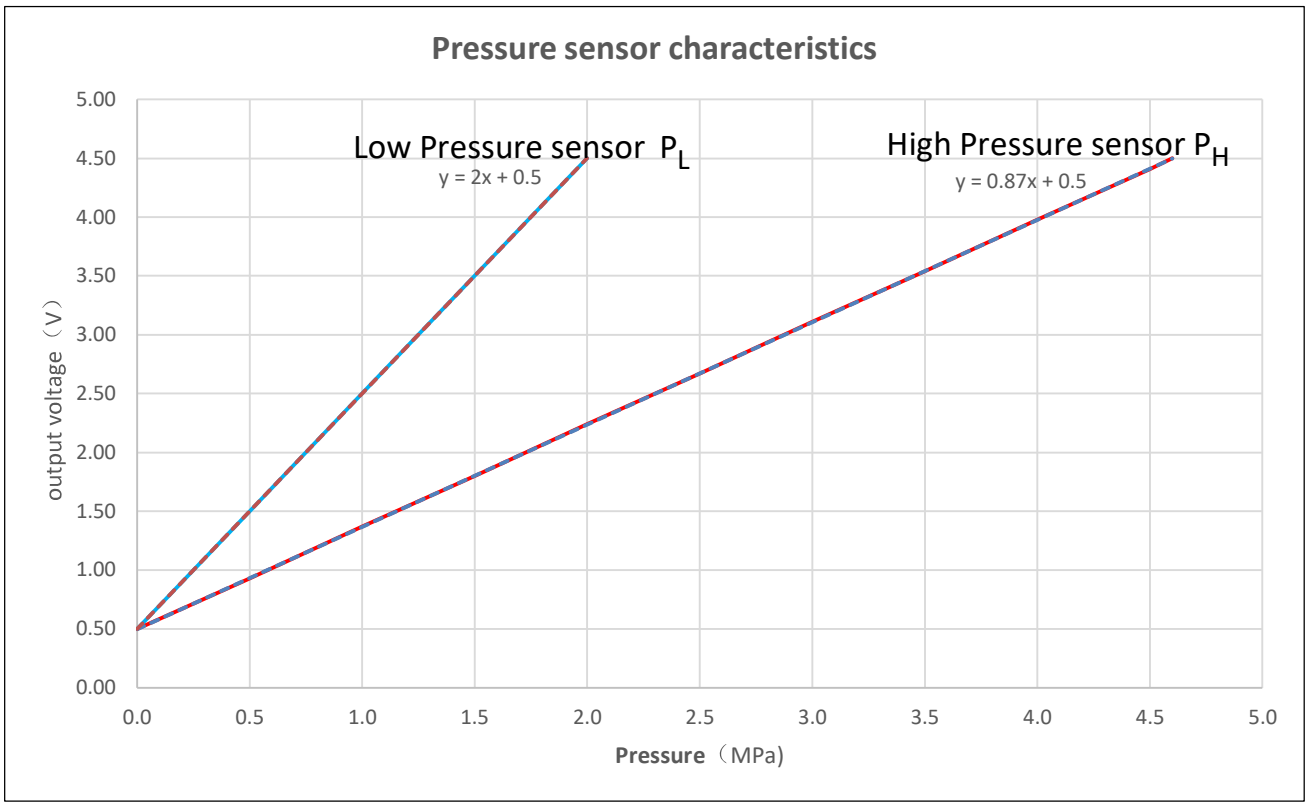
Number	Test point		Normal decision value	Notes
	+(Red)	-(Black)		
1	L1’	P-out	0.3-0.7V	0 or→+ ∞ is abnormal
2	L2’	P-out		
3	L3’	P-out		
4	N	L1’		
5	N	L2’		
6	N	L3’		

Schematic diagram of measuring points of Inverter drive board:



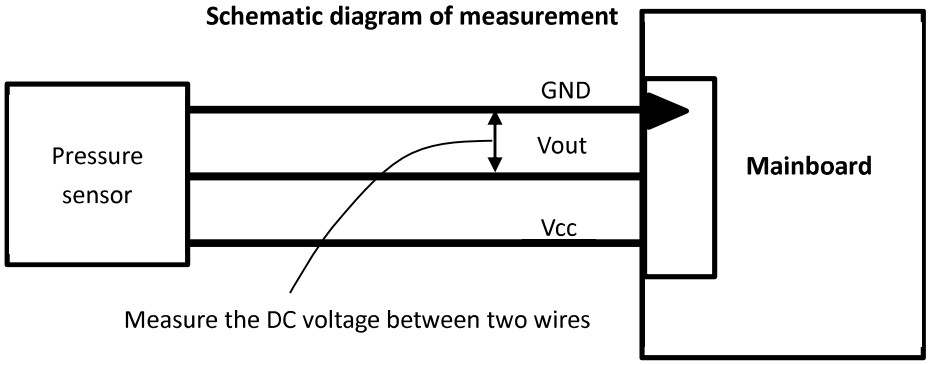


5.6 Appendix of Pressure Sensor Detection



P_H :Vout(H)=0.87×P_H+0.5

P_L:Vout(L)=2×P_L+0.5

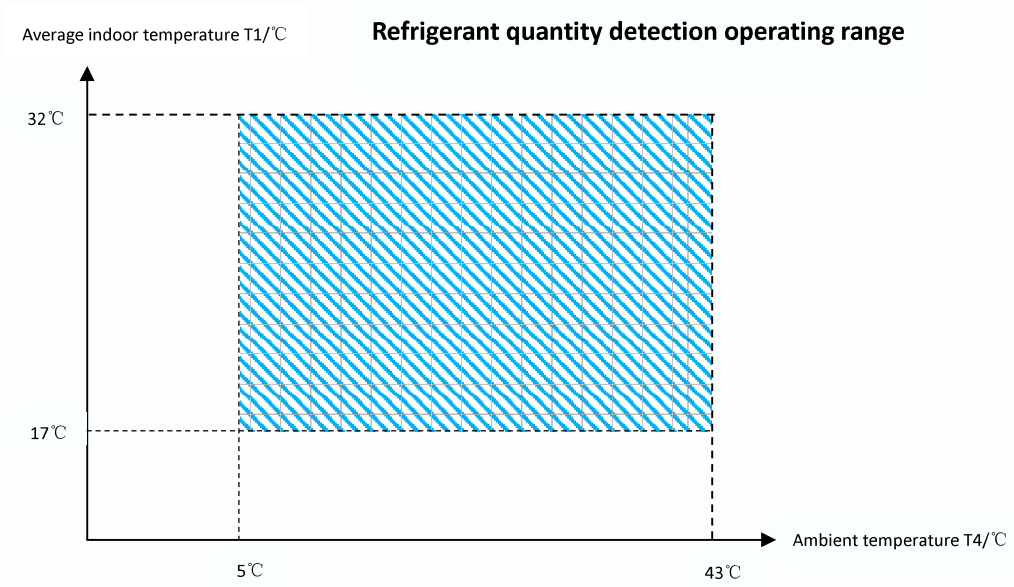


5.7 Refrigerant volume diagnosis

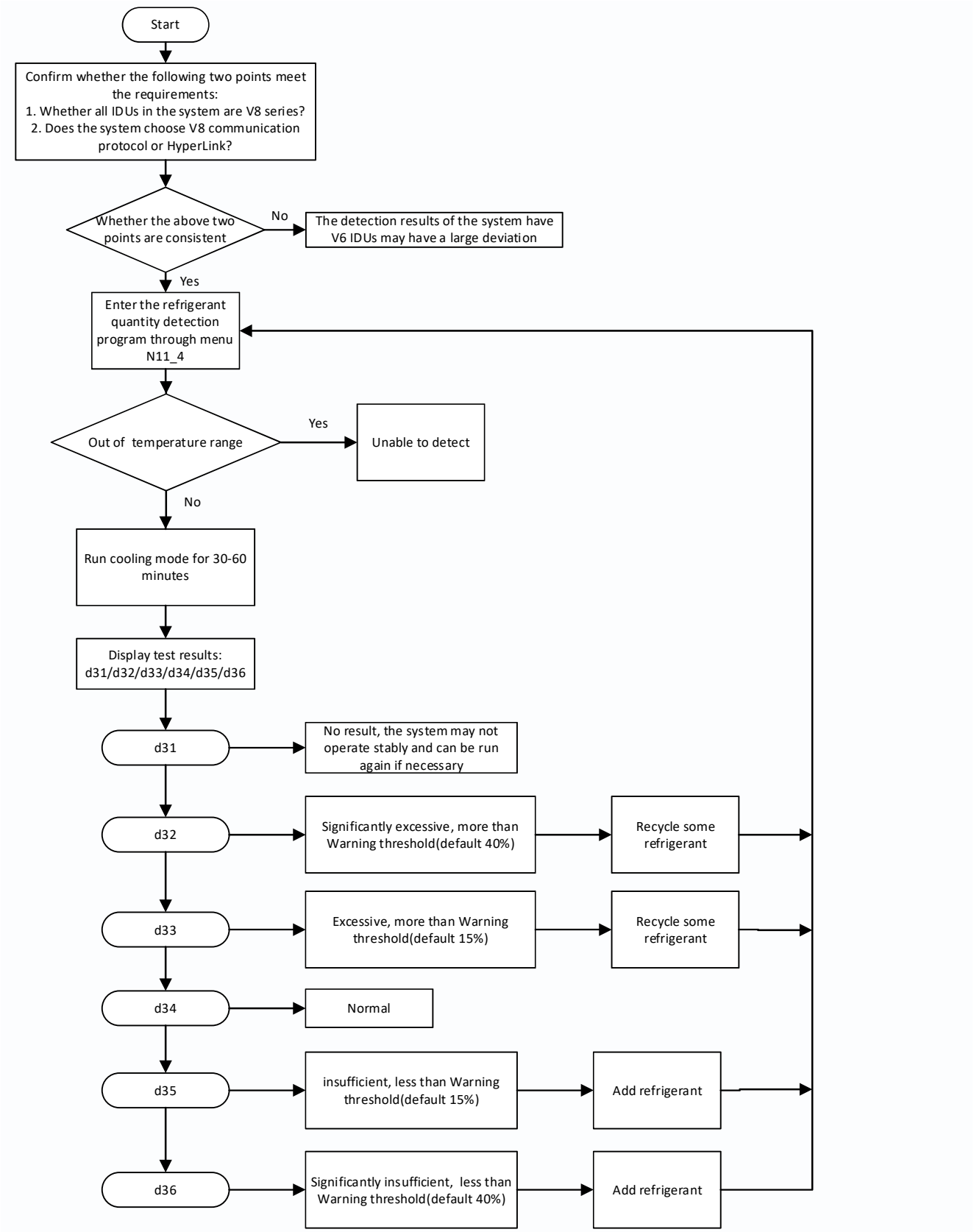
When running the refrigerant quantity detection program, the machine calculates the system refrigerant quantity according to the ambient temperature, condensing temperature and evaporation temperature, heat exchanger inlet and outlet temperature and other parameters, and give hints according to the results

The detection results of the system have V6 IDUs may have a large deviation. It is recommended to perform the refrigerant quantity diagnostic test when the system is all V8 IDUs and the communication protocol is V8 communication.

The following operating ranges must be met



5.7.1 Procedure



5.8 Oil volume table

Table 6-5.6: V8 Oil volume table:

HP	Oil model	Compressor A (Y1)	Compressor B (Y2)	Total compressors oil	additional adding oil Volume	TOTAL OIL	TOTAL OIL
8HP	FV68H	1.1L		1.1L	5L	5L+1.1L	6.1L
10HP	FV68H	1.1L		1.1L	5L	5L+1.1L	6.1L
12HP	FV68H	1.1L		1.1L	5L	5L+1.1L	6.1L
14HP	FV68H	1.1L		1.1L	6L	6L+1.1L	7.1L
16HP	FV68H	1.1L		1.1L	6L	6L+1.1L	7.1L
18HP	FV68H	1.1L	1.1L	1.1L+1.1L	6L	6L+1.1L+1.1L	8.2L
20HP	FV68H	1.1L	1.1L	1.1L+1.1L	6L	6L+1.1L+1.1L	8.2L
22HP	FV68H	1.1L	1.1L	1.1L+1.1L	6L	6L+1.1L+1.1L	8.2L
24HP	FV68H	1.1L	1.1L	1.1L+1.1L	6L	6L+1.1L+1.1L	8.2L
26HP	FV68H	1.1L	1.1L	1.1L+1.1L	8L	8L+1.1L+1.1L	10.2L
28HP	FV68H	1.1L	1.1L	1.1L+1.1L	9L	9L+1.1L+1.1L	11.2L
30HP	FV68H	1.1L	1.1L	1.1L+1.1L	9L	9L+1.1L+1.1L	11.2L
32HP	FV68H	1.1L	1.1L	1.1L+1.1L	9L	9L+1.1L+1.1L	11.2L

Table 6-5.6: V8i Oil volume table:

HP	Oil model	Compressor A (Y1)	Compressor B (Y2)	Total compressors oil	additional adding oil Volume	TOTAL OIL	TOTAL OIL
8HP	FV68H	1.1L		1.1L	5L	5L+1.1L	6.1L
10HP	FV68H	1.1L		1.1L	5L	5L+1.1L	6.1L
12HP	FV68H	1.1L		1.1L	5L	5L+1.1L	6.1L
14HP	FV68H	1.1L		1.1L	6L	6L+1.1L	7.1L
16HP	FV68H	1.1L		1.1L	6L	6L+1.1L	7.1L
18HP	FV68H	1.1L	1.1L	1.1L+1.1L	6L	6L+1.1L+1.1L	8.2L
20HP	FV68H	1.1L	1.1L	1.1L+1.1L	6L	6L+1.1L+1.1L	8.2L
22HP	FV68H	1.1L	1.1L	1.1L+1.1L	6L	6L+1.1L+1.1L	8.2L
24HP	FV68H	1.1L	1.1L	1.1L+1.1L	6L	6L+1.1L+1.1L	8.2L
26HP	FV68H	1.1L	1.1L	1.1L+1.1L	8L	8L+1.1L+1.1L	10.2L
28HP	FV68H	1.1L	1.1L	1.1L+1.1L	9L	9L+1.1L+1.1L	11.2L
30HP	FV68H	1.1L	1.1L	1.1L+1.1L	9L	9L+1.1L+1.1L	11.2L
32HP	FV68H	1.1L	1.1L	1.1L+1.1L	9L	9L+1.1L+1.1L	11.2L

1. If we only need to replace the compressor, do not need to replace the Gas-liquid separator and the pipe, then how much oil you pulled out (for example you pulled out X), then you need to add X-Y1-Y2(for 30HP, Y1 is 1.1L, Y2 is 1.1L)

2. If we need to replace all the compressors and we need to replace the Gas-liquid separator, then we need to add the additional adding oil Volume as above show.

3 Pls add the additional oil to the innlet of Gas-liquid separator, not directly to the compressor.