R410A

Commercial Air Conditioners

Service Manual

EasyFit II Series VRF

MDVO-ViL200V2R1A

MDVO-ViL224V2R1A

MDVO-ViL260V2R1A

MDVO-ViL280V2R1A

MDVO-ViL335V2R1A

CONTENTS

Part 1

General Information

1 Indoor and Outdoor Unit Capacities

1.1 Indoor Units

1.1.1 Standard indoor units

Table 1-1.1: Standard indoor unit abbreviation codes

Abbreviation code	Type
C1	One-way Cassette
C2	Two-way Cassette
C4C	Compact Four-way Cassette
C4	Four-way Cassette
D3	Arc Duct

Abbreviation code	Type
D2	Medium Static Pressure Duct
D1	High Static Pressure Duct
WM	Wall-mounted
CF	Ceiling & Floor
FS	Floor Standing (Exposed/Concealed)

Table 1-1.2: Standard indoor unit capacity range

Capacity		Capacity index	C1	C2	C4C	C4	D1	D2	D3	WM	CF	FS
kW	HP											
1.5	0.5	15	—	—	15	—	15	15	—	—	—	—
1.8	0.6	18	18	—	—	—	—	—	—	—	—	—
2.2	0.8	22	22	22	22	—	22	22	—	22	—	22
2.8	1	28	28	28	28	28	28	28	—	28	—	28
3.6	1.25	36	36	36	36	36	36	36	—	36	36	36
4.5	1.6	45	45	45	45	45	45	45	—	45	45	45
5.6	2	56	56	56	56	56	56	56	—	56	56	56
6.3	2.25	63	—	—	63	—	—	—	—	—	—	—
7.1	2.5	71	71	71	—	71	71	71	71	71	71	71
8.0	3	80	—	—	—	80	80	80	80	80	80	80
9.0	3.2	90	—	—	—	90	90	90	90	90	90	—
10.0	3.6	100	—	—	—	100	100	—	—	—	—	—
11.2	4	112	—	—	—	112	112	112	112	—	112	—
14.0	5	140	—	—	—	140	—	140	140	—	140	—
16.0	6	160	—	—	—	160	—	160	160	—	160	—
20.0	7	200	—	—	—	—	—	—	200	—	—	—
22.4	8	224	—	—	—	—	—	—	—	—	—	—
25.0	9	250	—	—	—	—	—	—	250	—	—	—
28.0	10	280	—	—	—	—	—	—	280	—	—	—
40.0	14	400	—	—	—	—	—	—	400	—	—	—
45.0	16	450	—	—	—	—	—	—	450	—	—	—
56.0	20	560	—	—	—	—	—	—	560	—	—	—

1.1.2 Fresh air processing unit

Table 1-1.3: Fresh air processing unit capacity range

Capacity	11.2kW	12.5kW	14kW	20kW	25kW	28kW	45kW	56kW
Capacity index	112	125	140	200	250	280	450	560

1.2 Heat recovery ventilator

Table 1-1.4: Heat recovery ventilator capacity range

Airflow rate	200m³/h	300m³/h	400m³/h	500m³/h	800m³/h	1000m³/h	1500m³/h	2000m³/h

1.3 Outdoor Units

Table 1-1.5: Outdoor unit capacity range

Capacity	Model Name	Combination Type
7HP	MDVO-ViL200V2R1A	/
8HP	MDVO-ViL224V2R1A	/
9HP	MDVO-ViL260V2R1A	/
10HP	MDVO-ViL280V2R1A	/
12HP	MDVO-ViL335V2R1A	/

Notes:

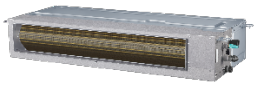
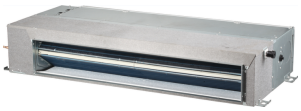
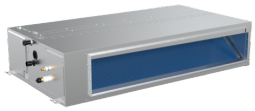
1. EasyFit II outdoor units could not be combined.

2 External Appearance

2.1 Indoor Units

2.1.1 Standard indoor units

Table 1-2.1: Standard indoor unit appearance

One-way Cassette C1 	Two-way Cassette C2 
Compact Four-way Cassette C4C 	Four-way Cassette C4 
Arc Duct D1 	Medium Static Pressure Duct D2 
High Static Pressure Duct D3 	Wall-mounted WM 
Floor Standing FS 	Ceiling & Floor CF 

2.1.2 Fresh air processing unit

Table 1-2.2: Fresh air processing unit appearance

Fresh Air Processing Unit OA 	Small Airflow Rate Fresh Air Processing Unit OA 

2.2 Heat Recovery Ventilator

Table 1-2.3: Heat recovery ventilator appearance

Heat Recovery Ventilator 

2.3 Outdoor Units

2.3.1 Single units

Table 1-2.4: Single outdoor unit appearance

7/8/9/10/12HP


3 Nomenclature

3.1 Indoor Units

3.1.1 Standard indoor units

V8 indoor units

MDV	I	3	18	C1	V	R12	R12
1	2	3	4	5	6	7	8

Legend		
No.	**Code**	**Remarks**
1	MDV	MDV
2	I	VRF indoor unit
3	3	Function code 3: Generation indoor unit
4	18	Capacity index (the capacity in kW multiplied by 10)
5	C1	Indoor unit type C1: One-way Cassette C2: Two-way Cassette C4C: Compact Four-way Cassette C4: Four-way Cassette D1: Arc Duct D2: Medium Static Pressure Duct D3: High Static Pressure Duct WM: Wall-mounted CF: Ceiling & Floor FS: Floor Standing (Exposed/Concealed) OA: Fresh air processing unit OA: Small Airflow Rate Fresh Air Processing Unit FS: Floor Standing
6	V	V: DC fan motor
7	R12	Refrigerant type (R12: R410A&R32)
8	D	Power supply D: 1 phase, 220-240V, 50Hz/60Hz E: 1 phase, 220-240V, 50

3.1.2 Heat recovery ventilator

AC Series

HRV - 200
1 2

Legend		
No.	**Code**	**Remarks**
1	HRV	Heat recovery ventilator
2	200	Airflow in m^3/h

DC Series

HRV - D 200
1 2 3

Legend		
No.	**Code**	**Remarks**
1	HRV	Heat recovery ventilator
2	D	Series category (D: DC series)
3	200	Airflow in m^3/h

3.2 Outdoor Units

MDV	O	-	V8i	S	L	200	V2	R1	A	E
1	2		3	4	5	6	7	8	9	10

Legend		
No.	**Code**	**Remarks**
1	MDV	MDV VRF
2	O	O: Outdoor unit
3	V8i	Series code, i: independent
4	S	Side discharge, top discharge omitted
5	L	Product version code
6	200	Capacity index (the capacity in kW multiplied by 10)
7	V2	Type (V2: All DC inverter)
8	R1	Refrigerant type (R1: R410A)
9	A	Power supply G:380-415V, 3N~, 50/60Hz
10	E	Version Number, E EU Version (V8 EU series omits this code, distinguished by power supply specifications)

4 Combination Ratio

$$\text{Combination ratio} = \frac{\text{Sum of capacity indexes of the indoor units}}{\text{Capacity index of the outdoor units}}$$

Table 1-4.1: Indoor and outdoor unit combination ratio limitations

Type	Minimum combination ratio	Maximum combination ratio		
		Standard indoor units only	Fresh air processing units only	Fresh air processing units and standard indoor units together
EasyFit II Series outdoor units	50%	130% 200%[1,2,3]	100%	100%[4]

Notes:

1. All the indoor units connected should be indoor units with ø5mm size copper tube heater exchanger. This limitation is to avoid too big indoor unit exchanger cause reliability and performance problem.
2. Piping between farthest indoor unit and first indoor branch joint should less than 40m.
3. Combination ratio greater than 130% is available as a customization option.
4. When fresh air processing units are installed together with standard indoor units, the total capacity of the fresh air processing units must not exceed 30% of the total capacity of the outdoor units and the total combination ratio must not exceed 100%.

Table 1-4.2: Combinations of indoor and outdoor units

Outdoor unit capacity			Sum of capacity indexes of connected indoor units (standard indoor units only)	Sum of capacity indexes of connected indoor units (fresh air processing units and standard indoor units together)	Maximum number of connected indoor units
kW	HP	Capacity index			
20	7	200	100 to 260	100 to 200	11
22.4	8	224	112 to 291.2	112 to 224	13
26	9	260	130 to 338	130 to 260	16
28	10	280	140 to 364	140 to 280	16
33.5	12	335	167.5 to 435.5	167.5 to 335	20

5 Selection Procedure

5.1 Procedure

Step 1: Establish design conditions

Design temperature and humidity (indoor and outdoor)
Required heat load of each room
System peak load
Piping length, level differences
Indoor unit specifications (type and quantity)

Step 2: Select indoor units

Decide indoor unit safety factor

Select indoor unit models ensuring that:
Indoor unit capacity corrected for indoor air temperature WB[1] ≥ Required heat load × Indoor unit safety factor

Step 3: Select outdoor units

Determine required total heat load on outdoor units

Use the sum of the peak load of each room

Use the system peak load

Provisionally select outdoor unit capacity based on combination ratio limitations

Confirm that the number of indoor units connected to the outdoor units is within limitation

Correct cooling and heating capacities of the outdoor units for the following items:
Outdoor air temperature / Indoor air temperature WB / Combination ratio / Piping length, level difference / Piping heat loss / Frost accumulation (for heating capacity only)

Is corrected outdoor unit capacity ≥ Required total heat load on outdoor units?

No

Yes

VRF system selection is complete

Notes:

1. If the indoor design temperature falls between two temperatures listed in the indoor unit's capacity table, calculate the corrected capacity by interpolation. If the indoor unit selection is to be based on total heat load and sensible heat load, select indoor units which satisfy not only the total heat load requirements of each room but also the sensible heat load requirements of each room. As with total heat capacity, the sensible heat capacity of indoor units should be corrected for indoor temperature, interpolating where necessary. For the indoor unit capacity tables, refer to the indoor unit technical manuals.

5.2 Example

The following is a selection example based on total heat load for cooling.

Figure 1-5.1: Room plan

<table>
<tr><td rowspan="3">Room A</td><td>Room D</td><td>Room E</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Room B</td><td>Room C</td></tr>
</table>

Step 1: Establish design conditions

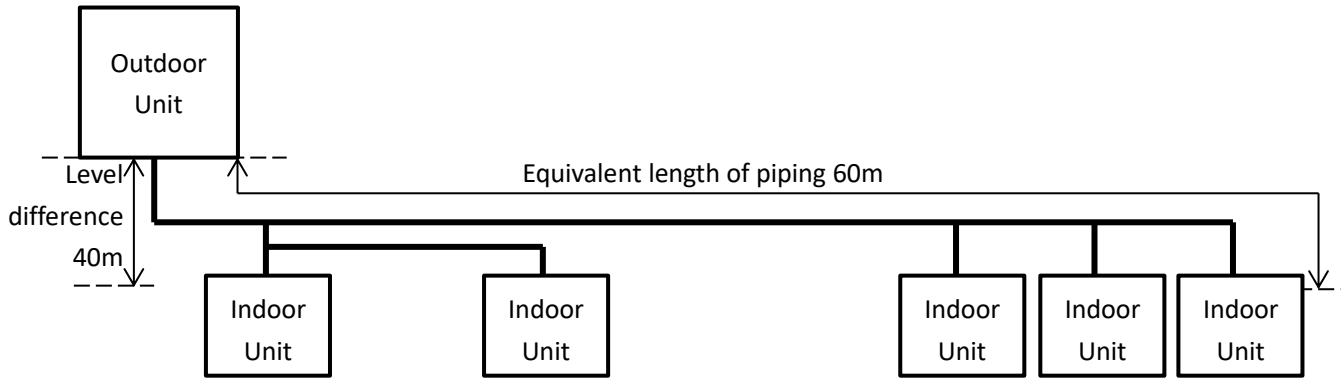
- Indoor air temperature 25.8°C DB, 18°C WB; outdoor air temperature 33°C DB.
- Determine peak load of each room and system peak load. As shown in Table 1-5.1, the system peak load is 26.5kW.

Table 1-5.1: Required heat load of each room (kW)

Time	Room A	Room C	Room D	Room E	Room F	Total
9:00	9.1	3.0	3.0	2.9	2.9	20.9
12:00	7.4	5.1	5.1	4.0	4.0	25.6
14:00	9.3	4.5	4.5	4.1	4.1	**26.5**
16:00	8.3	3.9	3.9	3.8	3.8	23.7

- The maximum piping lengths and level differences in this example are as given in Figure 1-5.2.

Figure 1-5.2: System diagram



-
-
- Indoor unit type for all rooms: Medium Static Pressure Duct (T2).

Step 2: Select indoor units

- In this example, a safety factor is not used (i.e. the safety factor is 1).
- Select indoor unit models using the medium static pressure duct cooling capacity table. Each indoor unit's corrected capacity needs to be greater than or equal to the peak load of the relevant room. The selected indoor units are shown in Table 1-5.3.

Table 1-5.2: Extract from medium static pressure duct (T2) cooling capacity table

Model	Capacity index	Indoor air temperature													
		14°C WB		16°C WB		18°C WB		19°C WB		20°C WB		22°C WB		24°C WB	
		20°C DB		23°C DB		26°C DB		27°C DB		28°C DB		30°C DB		32°C DB	
		TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC
T2	22	1.5	1.4	1.8	1.5	2.1	1.6	2.2	1.6	2.3	1.7	2.4	1.5	2.4	1.5
	28	1.9	1.7	2.3	1.9	2.6	2.1	2.8	2.1	3.0	2.1	3.1	2.0	3.1	1.9
	36	2.5	2.1	2.9	2.3	3.4	2.5	3.6	2.6	3.8	2.7	4.2	2.8	3.9	2.3
	45	3.1	2.6	3.7	2.8	4.2	3.1	4.5	3.2	4.8	3.2	4.9	3.1	5.1	2.9
	56	3.9	3.0	4.6	3.3	5.3	3.6	5.6	3.7	5.9	3.8	6.2	3.7	6.2	3.4
	71	4.9	3.9	5.8	4.3	6.7	4.7	7.1	4.9	7.5	4.8	7.8	4.6	7.8	4.3
	80	5.5	4.4	6.6	4.9	7.5	5.3	8.0	5.5	8.4	5.5	8.8	5.2	8.8	4.8
	90	6.2	5.3	7.3	5.8	8.4	6.3	9.0	6.4	9.6	6.5	9.9	6.1	9.9	5.7
	112	7.7	6.4	9.1	7.1	10.5	7.7	11.2	7.8	11.9	8.1	12.5	7.8	12.5	7.4
	140	9.7	7.8	11.3	8.6	13.2	9.6	14.0	9.8	14.8	9.8	15.7	9.7	15.4	8.8

Abbreviations:
TC: Total capacity (kW); SC: Sensible capacity (kW)

Table 1-5.3: Selected indoor units

	Room A	Room B	Room C	Room D	Room E
Peak heat load (kW)	9.3	5.1	5.1	4.1	4.1
Selected indoor unit	MDVI3-112D2VR12D	MDVI3-56D2VR12D	MDVI3-56D2VR12D	MDVI3-45D2VR12D	MDVI3-45D2VR12D
Corrected TC (kW)	10.5	5.3	5.3	4.2	4.2

Step 3: Select outdoor units

- Determine the required total heat load from the indoor units to the outdoor units based on either the sum of the peak loads of each room or the system peak load. In this example, it is determined based on the system peak load. Therefore, the required heat load is 26.5kW.
- Provisionally select an outdoor unit using the sum of the capacity indexes (CIs) of the selected indoor units (as shown in Table 1-5.4), ensuring that the combination ratio is between 50% and 130%. Refer to Table 1-5.5. As the sum of CIs of the indoor units is 314, outdoor units 9HP, 10HP and 12HP are potentially suitable. Start from the smaller, which is the 9HP unit.

Table 1-5.4: Sum of indoor unit capacity indexes

Model	Capacity Index	No. of units
MDVI3-112D2VR12D	112	1
MDVI3-56D2VR12D	56	2
MDVI3-45D2VR12D	45	2

Sum of CIs	314

Outdoor unit capacity			Sum of capacity indexes of connected indoor units (standard indoor units only)	Maximum number of connected indoor units
kW	HP	Capacity index		
20.0	7	200	100 to 260	11
22.4	8	224	112 to 291.2	13
26.0	9	260	130 to 338	15
28.0	10	280	140 to 364	16

- The number of connected indoor units is 5 and the maximum number of connected indoor units on the 9HP outdoor unit is 15, so the number of connected indoor units is within the limitation.
- Calculate the corrected capacity of the outdoor unit:
  a) The sum of the indoor unit CIs is 314 and the CI of the 9HP outdoor unit (MDVO-ViL260V2R1A) is 260, so the combination ratio is 314 / 260 = 121%.
  b) Using the outdoor unit's cooling capacity table, interpolate to obtain the capacity ("B") corrected for outdoor air temperature, indoor air temperature, and combination ratio. Refer to Tables 1-5.6 and 1-5.7.

Table 1-5.6: Extract from table 2-8.3 MDVO-ViL260V2R1A cooling capacity

CR	Outdoor air temp. (°C DB)	Indoor air temp. (°C DB / °C WB)	
		25.8 / 18.0	
		TC	PI
		kW	kW
130%	31	28.46	6.94
	33	28.03	7.21
	35	27.61	7.49
120%	31	27.95	6.72
	33	27.54	6.99
	35	27.10	7.27

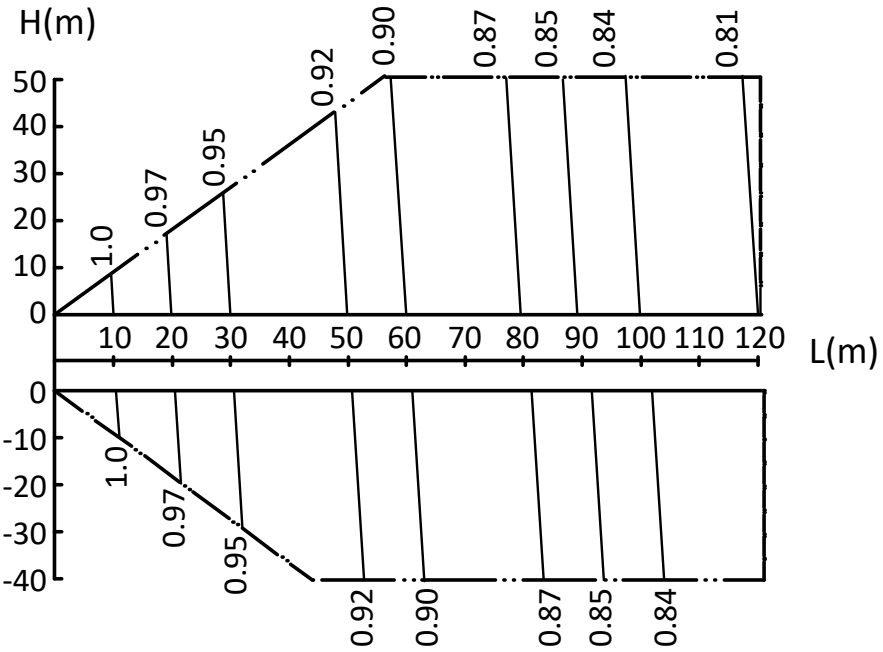
Table 1-5.7: Cooling capacity calculated by interpolation

CR	Outdoor air temp. (°C DB)	Indoor air temp. (°C DB / °C WB)	
		25.8 / 18.0	
		TC	PI
		kW	kW
130%			
	33	28.03	7.21
	B = 27.59[1]		
120%	33	27.54	6.99

Notes:
1. 27.54 + (28.03 – 27.54) × (121 – 120) / (130 – 120) = 27.59

c) Find the correction factor for piping length and level difference (“K1”)

Figure 1-5.3: EasyFit II rate of change in cooling capacity



Notes:

1. The horizontal axis shows equivalent length of piping between farthest indoor unit and first outdoor branch joint; the vertical axis shows the largest level difference between indoor unit and outdoor unit. For level differences, positive values indicate that the outdoor unit is above the indoor unit, negative values indicate that the outdoor unit is below the indoor unit.

d) Calculate the corrected capacity of MDVO-ViL260V2R1A (“C”) by using K1:

$$C = B \times K1 = 27.59 \times 0.898 = 24.77kW$$

- The corrected capacity 24.77 kW is lower than required total heat load 26.5kW, so selection is not complete. Step 3 should be repeated from the point where the outdoor unit capacity is provisionally selected.

Repeat Step 3: Select outdoor unit

- Determine the required total heat load from the indoor units to the outdoor unit based on either the sum of the peak loads of each room or the system peak load. In this example, it is determined based on the system peak load. Therefore, the required heat load is 26.5kW.
- Provisionally select an outdoor unit using the sum of the capacity indexes (CIs) of the selected indoor units (as shown in Table 1-5.4), ensuring that the combination ratio is between 50% and 130%. Refer to Table 1-5.5. As the sum of CIs of the indoor units is 314, outdoor units 9-16HP are potentially suitable. For the 9HP unit is not suitable, try to select 10HP unit.

Table 1-5.8: Sum of indoor unit capacity indexes

Model	Capacity Index	No. of units
MDVI3-112D2VR12D	112	1
MDVI3-56D2VR12D	56	2
MDVI3-45D2VR12D	45	2

Sum of CIs	314

Table 1-5.9: Combinations of Indoor and outdoor units

Outdoor unit capacity			Sum of capacity indexes of connected indoor units (standard indoor units only)	Maximum number of connected indoor units
kW	HP	Capacity index		
20.0	7	200	100 to 260	11
22.4	8	224	112 to 291.2	13
26.0	9	260	130 to 338	15
28.0	10	280	140 to 364	16

- The number of connected indoor units is 5 and the maximum number of connected indoor units on the 10HP outdoor unit is 16, so the number of connected indoor units is within the limitation.
- Calculate the corrected capacity of the outdoor unit:
  a) The sum of the indoor unit CIs is 314 and the CI of the 10HP outdoor unit (MDVO-ViL280V2R1A) is 280, so the combination ratio is 314 / 280 = 112%.
  b) Using the outdoor unit's cooling capacity table, interpolate to obtain the capacity ("B") corrected for outdoor air temperature, indoor air temperature, and combination ratio. Refer to Tables 1-5.10 and 1-5.11.

Table 1-5.10: Extract from table 2-8.4 MDVO-ViL280V2R1A cooling capacity

CR	Outdoor air temp. (°C DB)	Indoor air temp. (°C DB / °C WB)	
		25.8 / 18.0	
		TC	PI
		kW	kW
120%	31	30.64	7.43
	33	30.19	7.73
	35	29.71	8.03
110%	31	30.55	7.36
	33	29.96	7.78
	35	29.46	8.08

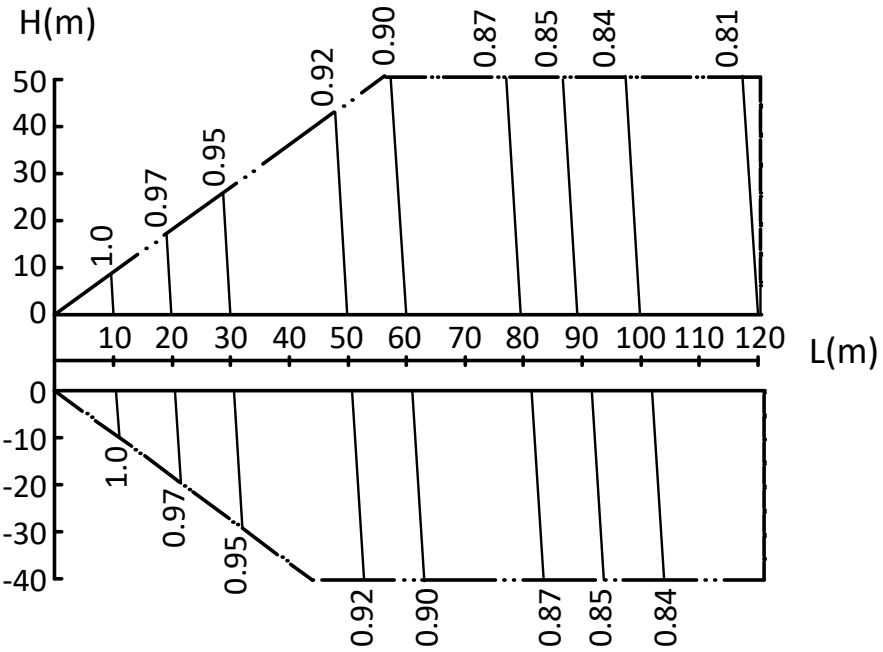
Table 1-5.11: Cooling capacity calculated by interpolation

CR	Outdoor air temp. (°C DB)	Indoor air temp. (°C DB / °C WB)	
		25.8 / 18.0	
		TC	PI
		kW	kW
120%			
	33	30.19	7.73
	B = 30.01[1]		
110%	33	29.96	7.78

Notes:
1. 29.96 + (30.19 – 29.96) × (112 – 110) / (120 – 110) = 30.01

c) Find the correction factor for piping length and level difference (“K1”)

Figure 1-5.4: V6-i rate of change in cooling capacity



Notes:

1. The horizontal axis shows equivalent length of piping between farthest indoor unit and outdoor unit; the vertical axis shows the largest level difference between indoor unit and outdoor unit. For level differences, positive values indicate that the outdoor unit is above the indoor unit, negative values indicate that the outdoor unit is below the indoor unit.

d) Calculate the corrected capacity of MDVO-ViL280V2R1A (“C”) by using K1:

$$C = B \times K1 = 30.01 \times 0.898 = 26.95kW$$

- The corrected capacity 26.95 kW is larger than required total heat load 26.5kW, so selection is complete.

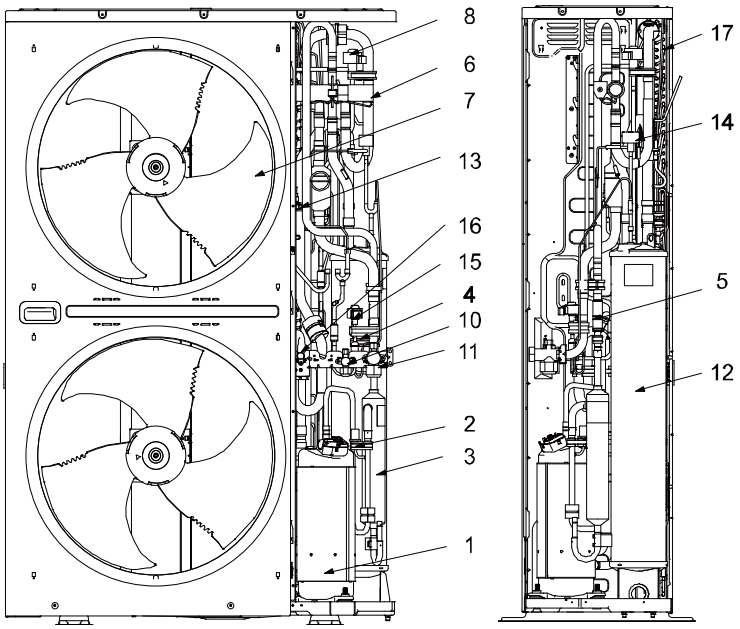
Part 2

Component Layout and Refrigerant Circuits

1 Layout of Functional Components

1.1 7-12HP layout of functional components

Figure 2-1.1: 7-12HP layout of functional component

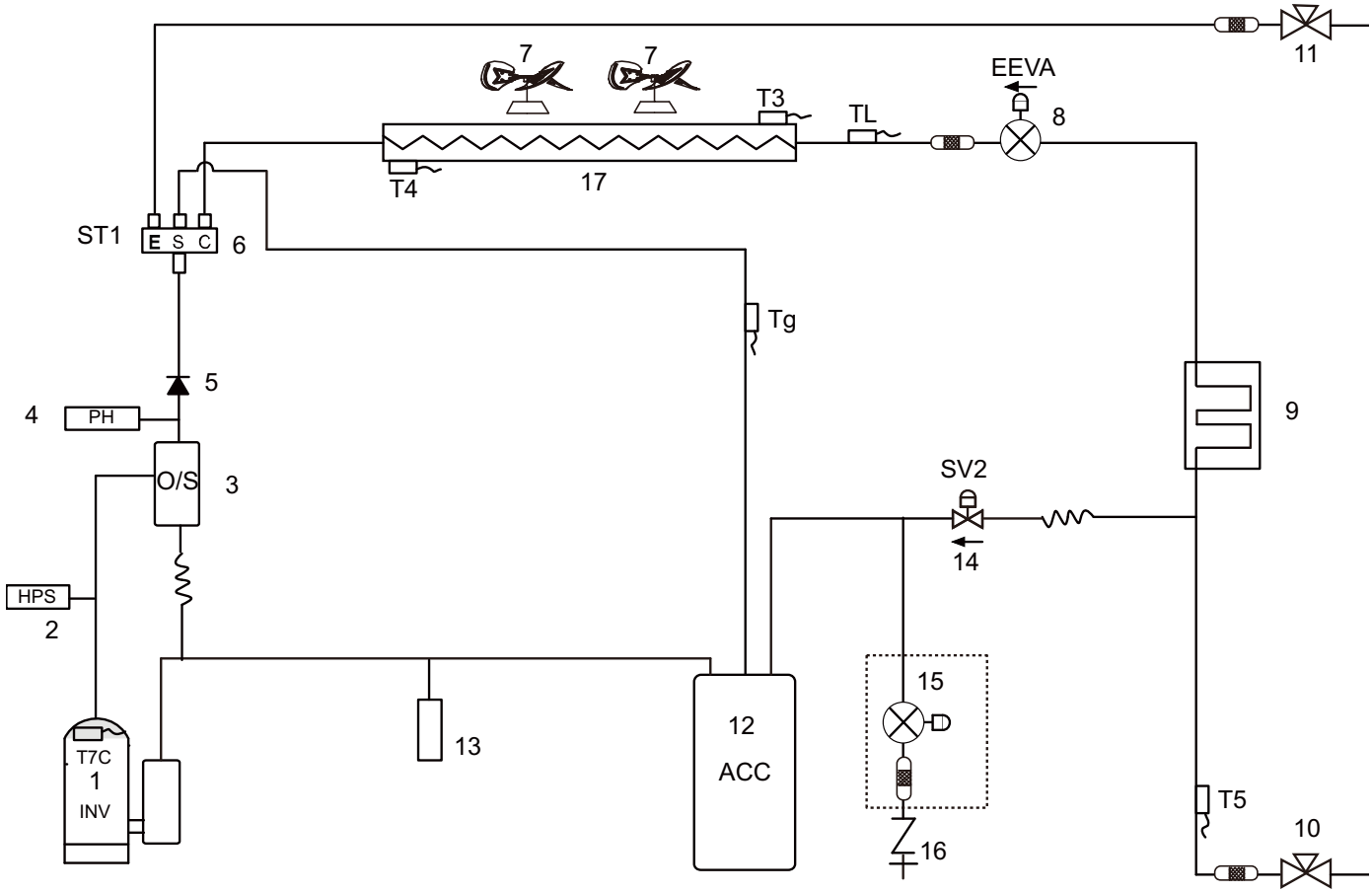


Legend			
No.	**Parts name**	**No.**	**Parts name**
1	Compressor	10	Stop valve (liquid side)
2	High pressure switch	11	Stop valve (gas side)
3	Oil separator	12	Gas-liquid separator
4	High pressure sensor	13	Low pressure sensor
5	Check value	14	Injection bypass solenoid valve (SV2)
6	Four-way valve	15	Electronic expansion valve (Optional EEVE)
7	Fan	16	Charge port
8	Electronic expansion valve (EEVA)	17	Heat exchanger
9	Heat exchanger cooling electric control box		

2 Piping Diagrams

7-12HP

Figure 2-2.1: 7-12HP piping diagram



Legend				
No.	**Parts name**		**No.**	**Parts name**
1	Inverter compressor		13	Low pressure sensor
2	High pressure switch		14	Injection bypass solenoid valve (SV2)
3	Oil separator		15	Electronic expansion valve (optional EEVE)
4	High pressure sensor		16	Charge port
5	Check value		17	Heat exchanger
6	Four-way valve		**Sensor Code**	**Description**
7	Inverter fan		T3	Outdoor heat exchanger temperatures sensor
8	Electronic expansion valve (EEVA)		T4	Outdoor ambient temperature sensor
9	Heat exchanger cooling electric control box		T5	Liquid pipe temperature sensor
10	Stop valve (liquid side)		T71	Discharge temperature sensor
11	Stop valve (gas side)		TL	Condenser outlet temperature sensor
12	Gas-liquid separator		Tg	Gas pipe temperature sensor

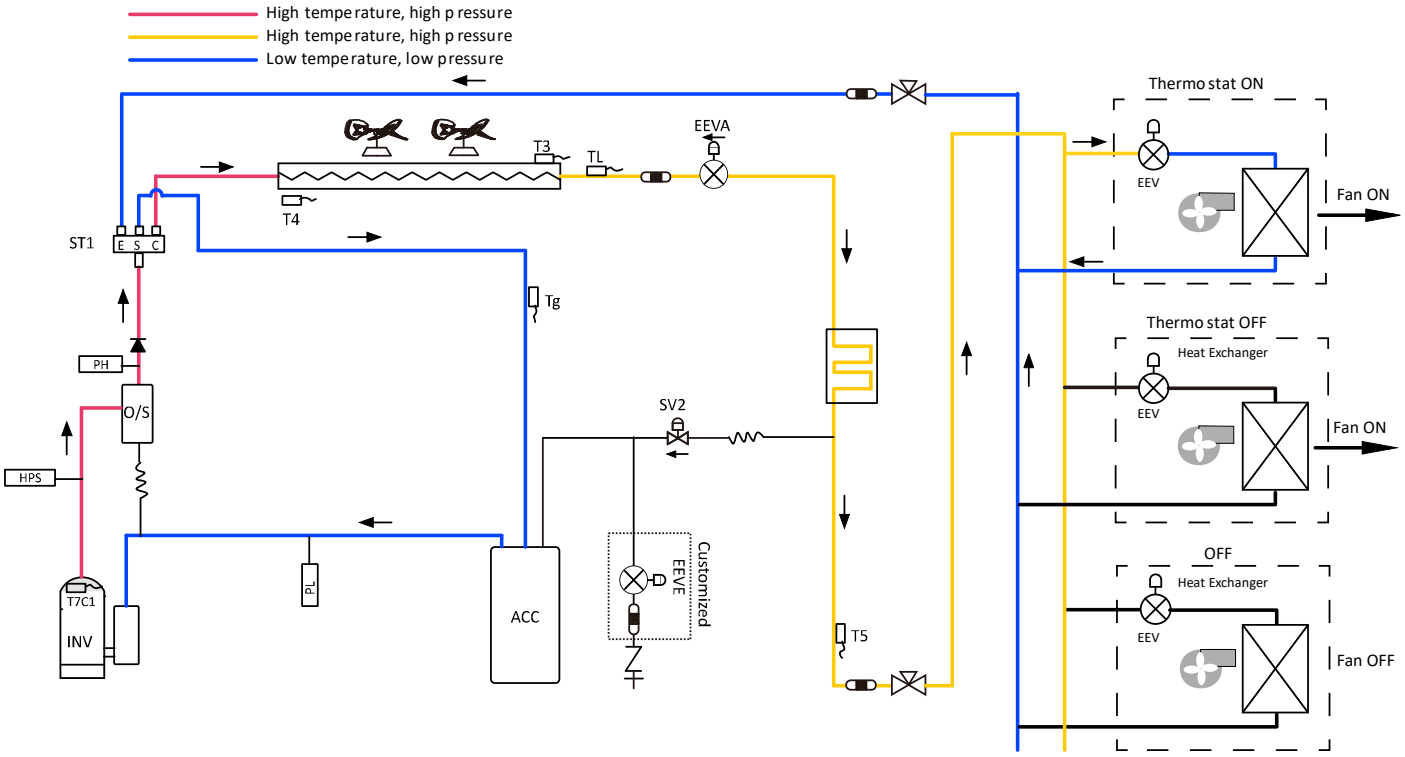
Key components:

1. **Oil separator:**
   Separates oil from gas refrigerant pumped out of the compressor and quickly returns it to the compressor. Separation efficiency is up to 99%.
2. **Gas-liquid separator:**
   Separates liquid refrigerant from gas refrigerant, stores liquid refrigerant and oil to protect compressor from liquid hammering.
3. **Electronic expansion valve (EEVA):**
   Controls refrigerant flow and reduces refrigerant pressure.
4. **Four-way valve:**
   Controls heat exchanger function. When open, the heat exchanger functions as an evaporator; when closed, the heat exchanger functions as a condenser.
5. **Solenoid valve SV2:**
   Pressure relief to prevent high-pressure protection activation, and reducing discharge temperature to prevent over-temperature protection activation.
6. **High pressure switch:**
   Regulate system pressure. When system pressure rises above the upper limit, the high pressure switch turn off, stopping the compressor. When the high pressure protection recovers, the compressor restarts.
7. **High/Low pressure sensor**
   Used to detect the system high/low pressure.

3 Refrigerant Flow Diagrams

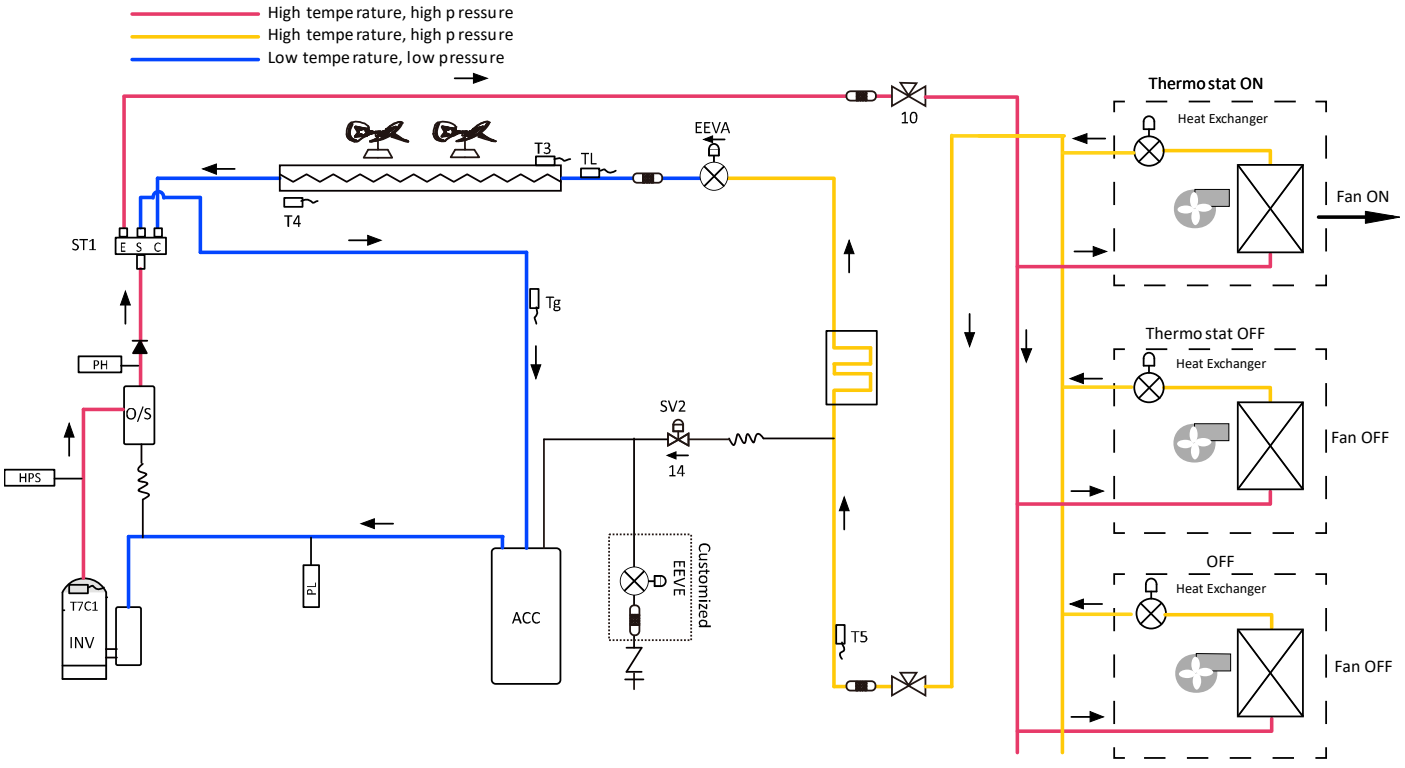
3.1 Cooling operation

Figure 2-3.1: 7-12HP refrigerant flow during cooling operation



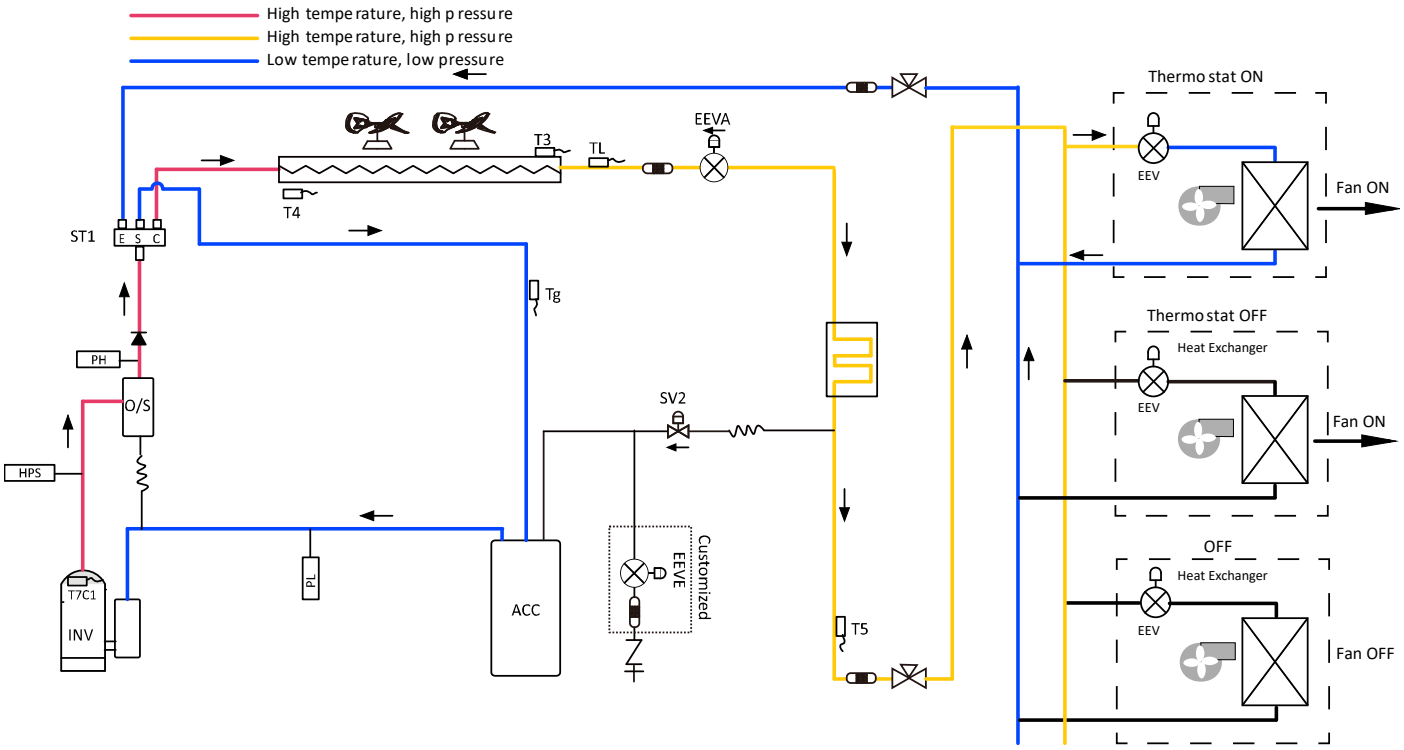
3.2 Heating operation

Figure 2-3.2: 7-12HP refrigerant flow during heating operation



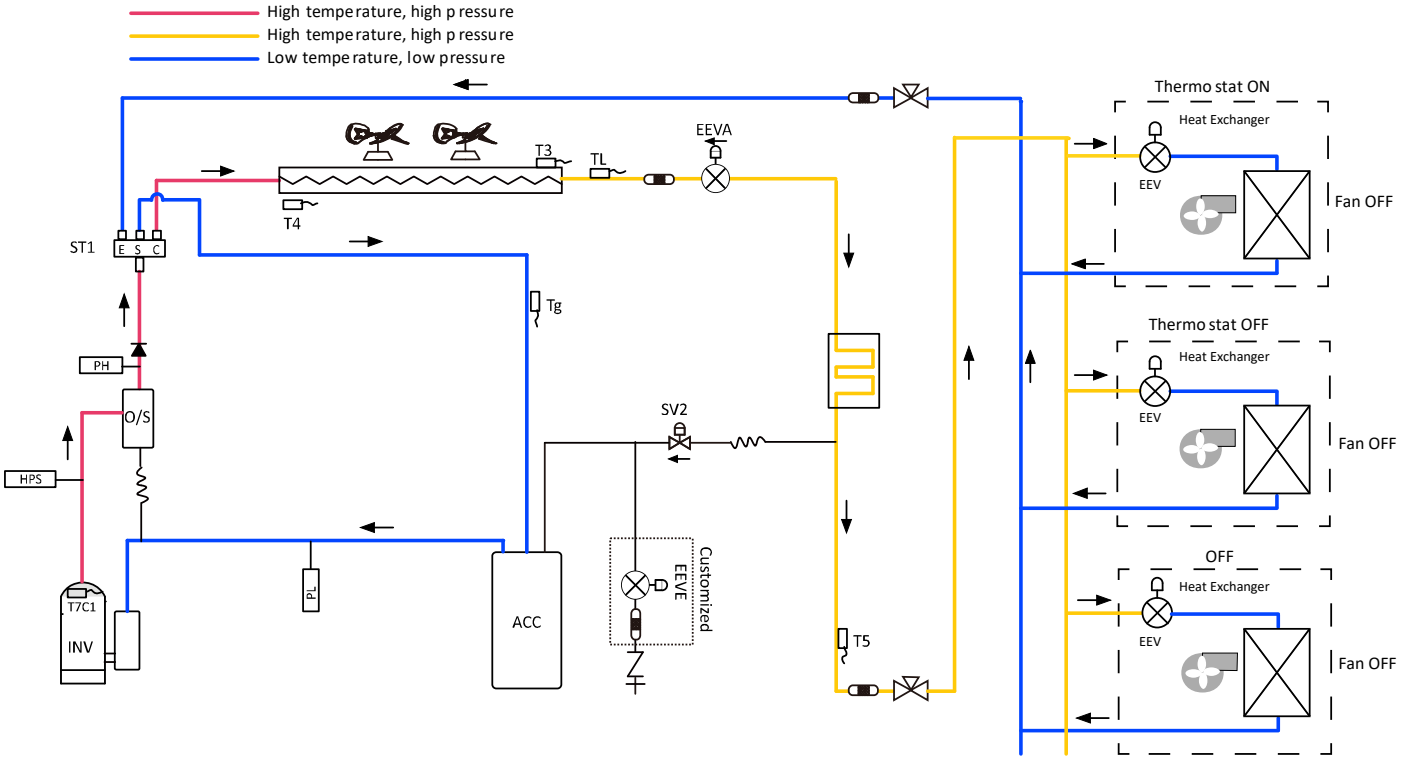
3.3 Oil return operation in cooling mode

Figure 2-3.3: 7-12HP refrigerant flow during oil return operation in cooling mode



3.4 Oil return operation in heating mode and defrosting operation (4-way valve change direction)

Figure 2-3.4: 7-12HP refrigerant flow during oil return operation in heating mode and defrosting operation (4-way valve change direction)

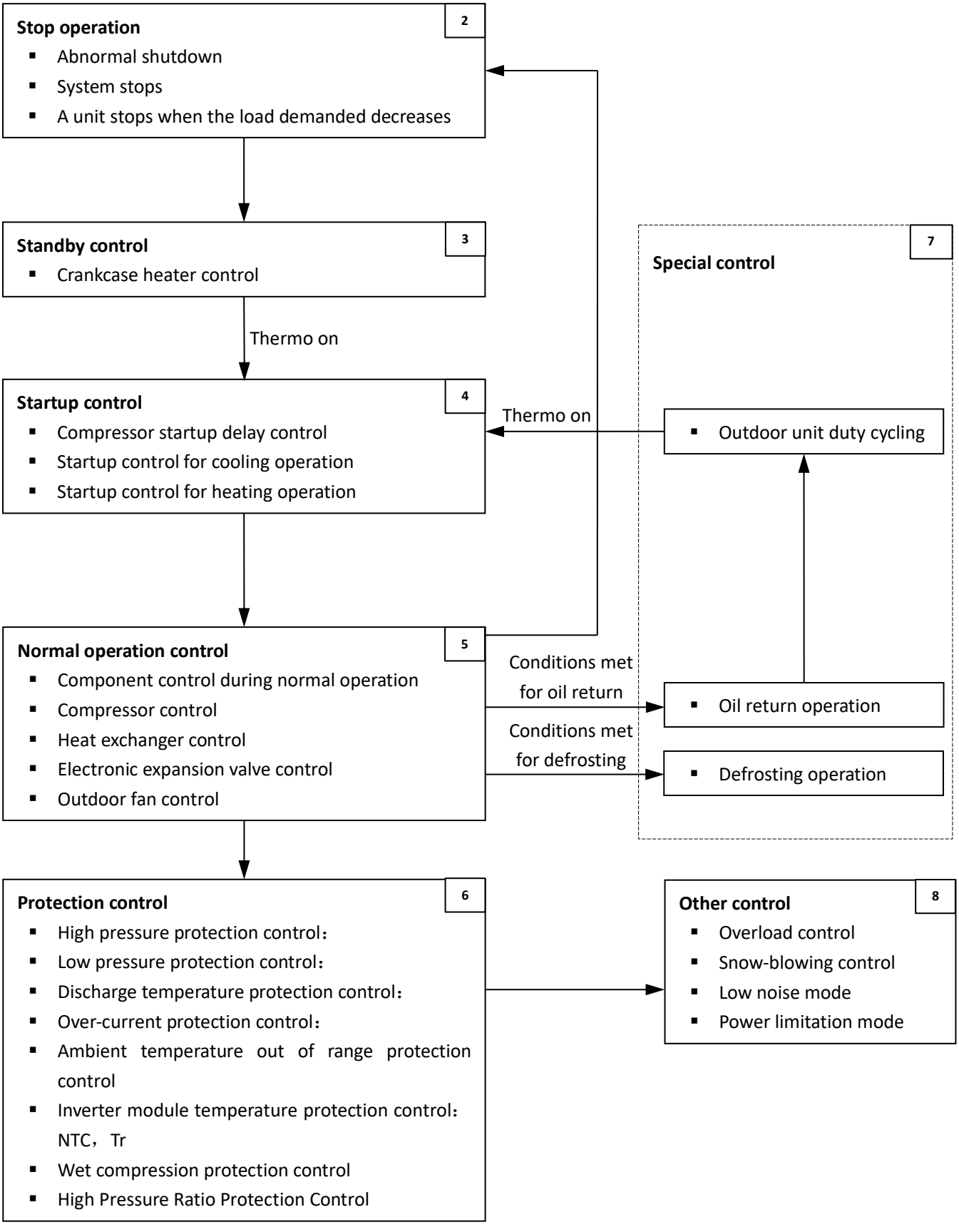


Part 3

Control

1 General Control Scheme Flowchart

Sections 2 to 8 on the following pages detail when each of the controls in the flowchart below is activated.



Legend
Numbers in the top right-hand corners of boxes indicate the relevant section of text on the following pages.

2 Stop Operation

The stop operation occurs for one of the three following reasons:

1. Abnormal shutdown: in order to protect the compressors, if an abnormal state occurs， the system will makes a 'stop with thermos-off' operation and an error code will be displayed on the outdoor unit digital displays.
2. The system stops when the set temperature of all indoor unit has been reached, or all indoor units has stop or error.
3. The ambient temperature is greater than 30°C and the number of cooling Thermo ON indoor unit is 0.

Table 3-2.1: Component control during stop operation

Part Name		Symbol	Stop control
ODU	Inverter compressor	COMP	OFF
	DC fan motor	FAN	Keeps for 2 min, then OFF
	Four way valve	4-WAY	Holds
	Electronic expansion valve	EXV	Cooling mode: 160pls Heating mode: 0pls
	Solenoid valve	SV2	OFF

3 Standby Control

3.1 Electromagnetic Heating Control

The electromagnetic heater is used to prevent refrigerant from mixing with compressor oil when the compressors are stopped. When the compressor is stopped, the electromagnetic heating is turned on. When the compressor is turned on, the electromagnetic heating cannot be turned on.

- When the outdoor environment is below 5 ℃, the electromagnetic heating is intermittently turned on. Open for 10 minutes each time, close for 15 minutes
- When the exhaust temperature is detected to be above 15 ℃, the electromagnetic heating is turned off
- The electromagnetic heating function can be turned on and off through the ‘ND5’ menu

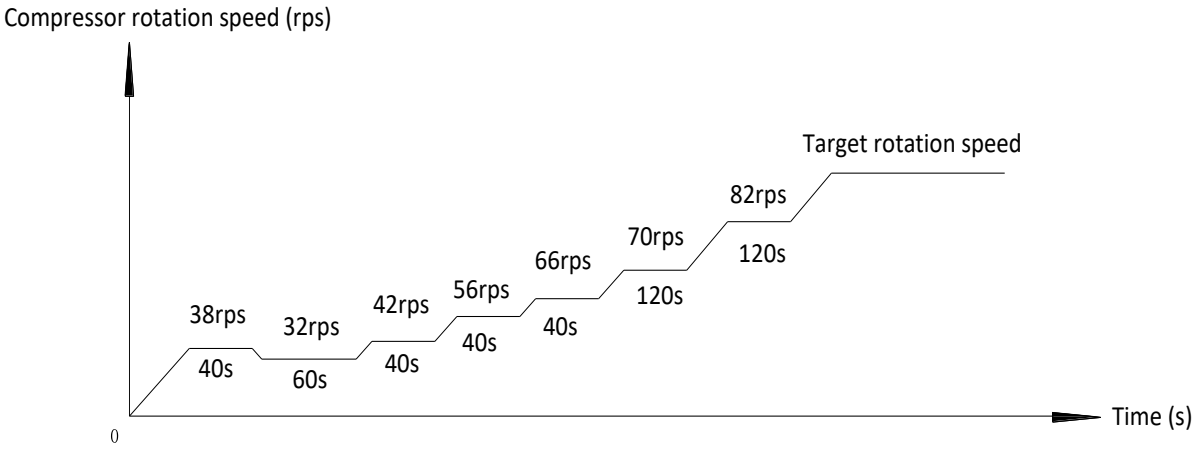
4 Startup Control

4.1 Compressor Startup Delay Control

In initial startup control and in restart control (except in oil return operation and defrosting operation), compressor startup is delayed such that a minimum of the set re-start delay time has elapsed since the compressor stopped, in order to prevent frequent compressor on/off and to equalize the pressure within the refrigerant system. The compressor re-start delays for cooling and heating modes are set on the user interface.

4.2 Compressor Startup Program

In initial startup control and in re-start control, compressor startup is controlled according to outdoor ambient temperature. Compressor startup follows one of two startup programs until the target rotation speed is reached.



Notes:

1. Once the first, 40-second stage of the program is complete, the program proceeds to the subsequent stages in a step-by-step fashion and exits when the target rotation speed has been reached.

4.3 Startup Control for Cooling Operation

Table 3-4.1: Component control during startup in cooling mode

Component	Wiring diagram label	20-33.5kW	Control functions and states
Inverter compressor	COMP	●	Compressor startup program selected according to ambient temperature[1]
DC fan motor	FAN	●	Fan run at maximum speed[2]
Electronic expansion valve	EXV	●	Position (steps) from 0 (fully closed) to 480 (fully open), controlled according to outdoor ambient temperature, discharge temperature, suction superheat, compressor speed and refrigerant system pressure
Four-way valve	4-WAY	●	Off

4.4 Startup Control for Heating Operation

Table 3-4.2: Component control during startup in heating mode

Component	Wiring diagram label	20-33.5kW	Control functions and states
Inverter compressor	COMP	●	Compressor startup program selected according to ambient temperature[1]
DC fan motor	FAN	●	Fan run at maximum speed[2]
Electronic expansion valve	EXV	●	Position (steps) from 0 (fully closed) to 480 (fully open), controlled according to outdoor ambient temperature, discharge temperature, suction superheat, compressor speed and refrigerant system pressure
Four-way valve	4-WAY	●	On

5 Normal Operation Control

5.1 Component Control during Normal Operation

Table 3-5.1: Component control during cooling operation

Component	Wiring diagram label	20-33.5kW	Control functions and states
Inverter compressor	COMP	•	Controlled according to load requirement from hydronic system
DC fan motor	FAN	•	Controlled according to outdoor heat exchanger pipe temperature
Electronic expansion valve	EXV	•	Position (steps) from 0 (fully closed) to 480 (fully open), controlled according to outdoor ambient temperature, discharge temperature, suction superheat, compressor speed and refrigerant system pressure
Four-way valve	4-WAY	•	Off

Table 3-5.2: Component control during heating operations

Component	Wiring diagram label	20-33.5kW	Control functions and states
Inverter compressor	COMP	•	Controlled according to load requirement from hydronic system
DC fan motor	FAN	•	Controlled according to outdoor heat exchanger pipe temperature
Electronic expansion valve	EXV	•	Position (steps) from 0 (fully closed) to 480 (fully open), controlled according to outdoor ambient temperature, discharge temperature, suction superheat, compressor speed and refrigerant system pressure
Four-way valve	4-WAY	•	On

5.2 Compressor Output Control

The compressor rotation speed is controlled according to the load requirement. Before compressor startup, the outdoor unit determines the compressor target speed according to outdoor ambient temperature runs the appropriate compressor startup program. Refer to “Compressor Startup Program”. Once the startup program is complete, the compressor runs at the target rotation speed. During operation the compressor speed is controlled according to the rate of change in refrigerant system pressure and refrigerant temperature.

5.3 Four-way Valve Control

The four-way valve is used to change the direction of refrigerant flow in order to switch between cooling and heating operations. Refer to “Refrigerant Flow Diagrams”.

During heating operations, the four-way valve is on; during cooling and defrosting operations, the four-way valve is off.

5.4 Electronic Expansion Valve Control

The position of the electronic expansion valve (EXV) is controlled in steps from 0 (fully closed) to 480 (fully open).

- At power-on:
  - The EXV first closes fully, then moves to the standby position (52 (steps)). After compressor runs at 38Hz for 40 seconds the EXV moves to an initial running position, which is determined according to outdoor ambient temperature. After a further 180 seconds, the EXV is controlled according to suction superheat and discharge temperature. Once a further 6 minutes have elapsed, the EXV is then controlled according to suction superheat, discharge temperature and compressor speed.
- When the outdoor unit is in standby:
  - The EXV is at position 52 (steps).
- When the outdoor unit stops:
  - The EXV first moves to 0 (steps) and remains for 30 seconds, then closes fully, then moves to the standby position (52 (steps)).

5.5 Outdoor Fan Control

The speed of the outdoor unit fan is adjusted in steps.

Table 3-4.1: Outdoor fan control

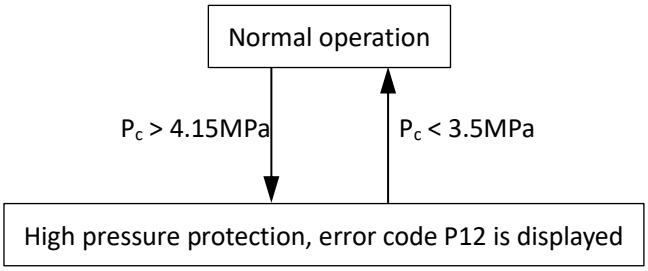
Fan speed index	Fan speed (rpm)				
	20kW	22.4kW	26kW	28kW	33.5kW
W1	500	500	500	500	500
W2	600	600	600	600	600
W3	700	700	700	700	700
W4	760	760	800	840	840
W5	800	800	840	880	900

6 Protection Control

6.1 High Pressure Protection Control

This control protects the refrigerant system from abnormally high pressure and protects the compressor from transient spikes in pressure.

Figure 3-6.1: High pressure protection control



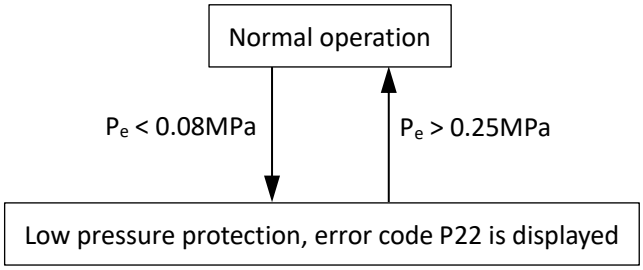
Notes:
1. P_c: Discharge pressure

When the discharge pressure rises above 4.15MPa the system displays P12 protection and the unit stops running. When the discharge pressure drops below 3.5MPa, the compressor enters re-start control.

6.2 Low Pressure Protection Control

This control protects the refrigerant system from abnormally low pressure and protects the compressor from transient drops in pressure.

Figure 3-6.2: Low pressure protection control



Notes:

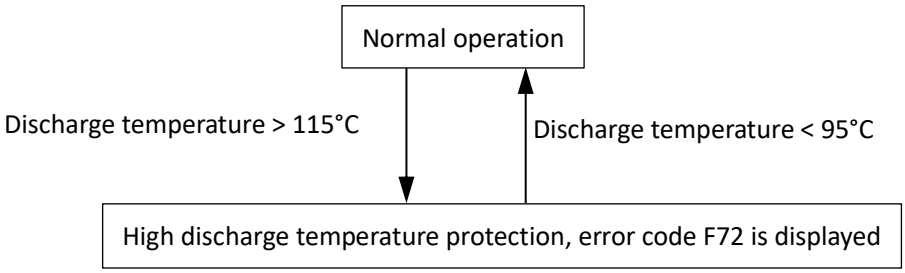
1. P_e: Suction pressure

When the suction pressure drops below 0.08MPa the system displays P22 protection and the unit stops running. When the suction pressure rises above 0.25MPa, the compressor enters re-start control.

6.3 Discharge Temperature Protection Control

This control protects the compressor from abnormally high temperatures and transient spikes in temperature.

Figure 3-6.3: High discharge temperature protection control

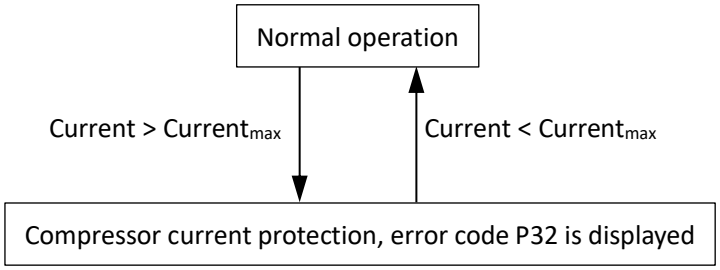


When the discharge temperature rises above 115°C the system displays F72 protection and the unit stops running. When the discharge temperature drops below 95°C, the compressor enters re-start control.

6.4 Compressor Current Protection Control

This control protects the compressor from abnormally high currents.

Figure 3-6.4: Compressor current protection control



When the compressor current rises above $Current_{max}$ the system displays P32 protection and the unit stops running. When the compressor current drops below $Current_{max}$, the compressor enters re-start control.

7 Special Control

7.1 Oil Return Operation

In order to prevent the compressor from running out of oil, the oil return operation is conducted to recover oil that has flowed out of the compressor and into the refrigerant piping. When the oil return operation is being conducted, the outdoor unit refrigerant system main PCB displays code d0.

The oil return operation ceases when any one of the following three conditions occurs:

- Oil return operation duration reaches 5 minutes.
- Compressor stops.

Tables 3-7.1 Component control during oil return operation in cooling mode.

Component	Wiring diagram label	20-33.5kW	Control functions and states
Inverter compressor	COMP	●	Runs at oil return operation rotation speed
DC fan motor	FAN	●	Controlled according to cooling mode
Electronic expansion valve	EXV	●	304 (steps)
Four-way valve	4-WAY	●	Off

Tables 3-7.2 Component control during oil return operation in heating modes

Component	Wiring diagram label	20-33.5kW	Control functions and states
Inverter compressor	COMP	●	Runs at oil return operation rotation speed
DC fan motor	FAN	●	Controlled according to heating mode
Electronic expansion valve	EXV	●	304 (steps)
Four-way valve	4-WAY	●	On

7.2 Defrosting Operation

In order to recover heating capacity, the defrosting operation is conducted when the outdoor unit air side heat exchanger is performing as a condenser. The defrosting operation is controlled according to outdoor ambient temperature, air side heat exchanger refrigerant outlet temperature and the compressor running time.

Table 3-6.3: Component control during defrosting operation

Component	Wiring diagram label	20-33.5kW	Control functions and states
Inverter compressor	COMP	●	Runs at defrosting operation rotation speed
DC fan motor	FAN	●	Off
Electronic expansion valve	EXV	●	Fully open
Four-way valve	4-WAY	●	Off

Part 4

Field Settings

1. Overview

This chapter describes how the system configuration can be implemented once the installation is completed, and other relevant information.

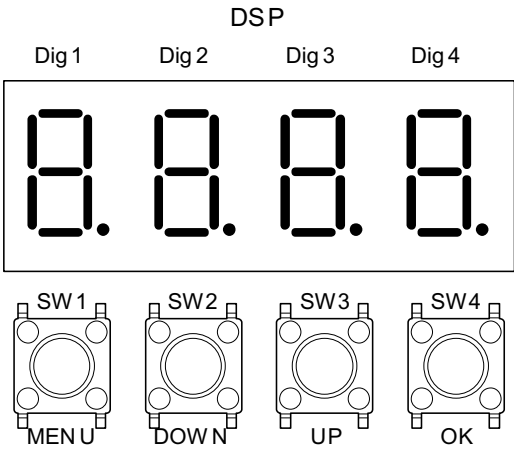
It contains the following information:

- Implement field settings
- Using the Check function

INFORMATION

The installation personnel should read this chapter.

2. Digital display and button settings



2.1 Digital display output

Table 4-2.1: Digital display output

Outdoor unit state	Parameters displayed on DSP1	Parameters displayed on DSP2
Standby	The address of outdoor unit	The number of indoor units in communication with the outdoor units
Normal operation	---	Running speed of the compressor in rotations per second
Error or protection	Placeholder and error or protection cod	
In menu mode	Display menu mode code	
System check	Display system check code	

2.2 Function of buttons SW1 to SW4

Table 4-2.2 Function of buttons SW1 to SW4

Button	Function
SW3(UP)	In menu mode: previous and next buttons for menu modes.
SW2(DOWN)	Not in menu mode: previous and next buttons for system check information.
SW1(MENU)	Enter / exit menu mode.
SW4(OK)	Confirm to enter specified menu mode.

2.3 Menu mode

Menu mode setting:

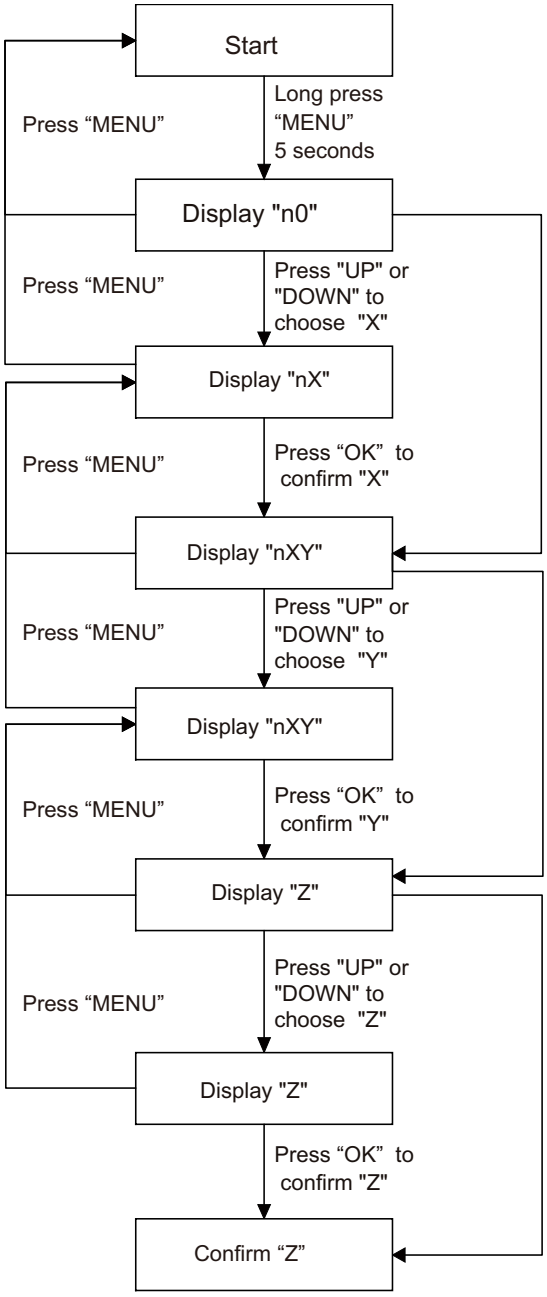
1. Long press SW1 “MENU” button for 5 seconds to enter menu mode, and the digital display displays “n0”.
2. Press SW3 / SW2 “UP / DOWN” button to select the first level menu “n1”, “n2”, “n3”, “n4”or “nb”.
3. Press SW4 “OK” button to enter specified first level menu, for example, enter “n4” mode.
4. Press SW3 / SW2 “UP / DOWN” button to select the second level menu from “n41” to “n45”.
5. Press SW4 “OK” button to enter specified second level menu, for example, enter “n42” mode.
6. Press SW3 / SW2 “UP / DOWN” button to select the specified menu mode code.
7. Press SW4 “OK” button to enter specified menu mode.

⚠ CAUTION

- Operate the switches and push buttons with an insulated stick (such as a closed ball-point pen) to avoid touching of live parts.

Menu mode selection flowchart:

Figure 4-2.1 Menu mode selection flowchart:



Menu mode function:

Table 4-2.3 Menu mode function:

First level menu	Second level menu	Specified menu mode	Description	Default
n0 (Information query)	0 (History error)	0	Query History error (last ten error codes)	-
		1	Cleaning history error	
	1 (address)	0	Query Indoor unit's address	
		2	Query the address of Indoor unit in power-off condition	
	2	1	Driver's version (compressor and fan displayed in turn)	
n1 (Installation and commissioning)	0	-	Shield C26 and C28 error in 3 hours	-
	1 (System test)	0	Cooling Test	
		1	Heating Test	
		2	Test running	
	2 (Refrigerant recovery)	0	Recycle Refrigerant to outdoor unit	
		1	Recycle Refrigerant to indoor unit	
		2	Balance system refrigerant	
	3 (Refrigerant charge)	0	Manual refrigerant charge	
		1	Auto refrigerant charge	
	5	-	Vacuum mode	
	6	-	Setting the VIP IDU address	
n2 (Mode setting)	0 (Priority mode)	0	Automatic priority mode	√
		1	Cooling priority mode	-
		2	VIP indoor unit voting priority mode	
		3	In response to heating mode only	
		4	In response to cooling mode only	
		5	Heating priority mode	
		6	Change over	
		7	Voting priority mode	
		8	First on priority mode	
		9	Capability requirements priority mode	
	1 (Silent mode)	0	Non silent mode	√
		1	Silent mode 1	-
		2	Silent mode 2	
		3	Silent mode 3	
		4	Silent mode 4	
		5	Silent mode 5	
	2 (static pressure)	0	0Pa static pressure	√
		1	10Pa static pressure	-
		2	20Pa static pressure	
		3	30Pa static pressure	
		4	35Pa static pressure (customized)	
		5	40Pa static pressure (customized)	
		6	60Pa static pressure (customized)	
		7	80Pa static pressure (customized)	
		14	Auto static pressure	
	3 (Power limitation mode)	40	Power limitation mode, Maximum current =MCA * setting value	-
		41		
		42		
		~		
		98		
		99		
		100		√

Table 4-2.3 Menu mode function(continued)

First level menu	Second level menu	Specified menu mode	Description	Default
n2 (Mode setting)	4 (Meta)	0	Meta function unavailable	√
		1	Meta function available	-
	5 (℃ or ℉)	0	Celsius will be enable on display	√
		1	Fahrenheit will be enabled on display	-
	7 (Auto dust-clean)	0	Auto dust-clean function unavailable	√
		1	Auto dust-clean function available	-
	8 (Dry contact)	0	Dry contact closing effective	√
		1	Dry contact opening effective	-
n3 (Installation parameters)	2 (Level difference)	0	0m level difference between indoor unit and outdoor unit	√
		1	20m level difference between indoor unit and outdoor unit	-
		2	40m level difference between indoor unit and outdoor unit	
		3	50m level difference between indoor unit and outdoor unit	
	4	0	Normal	√
		1	High sensible heat mode	-
		2	High sensible heat mode	
	7 (Ambient temperature)	0	Enable Internal ambient temperature sensor(T4)	√
		1	Enable External ambient temperature sensor(T10-Optional)	-
n4 (address)	0	-	Set address of Outdoor unit	-
	1	-	Set Network address of Outdoor unit	0
	2	-	Set number of indoor units	1
	4	0	Auto addressing (indoor and outdoor units address)	-
		1	Clear address (indoor and outdoor units address, network address)	
	5 (communication protocol)	0	V8 communication protocol (RS-485 (P Q) communication)	-
		1	Non-V8 communication protocol (RS-485 (P Q E) communication)	
		2	HyperLink (M1 M2) communication -IDUs uniform power supplied	
		3	HyperLink (M1 M2) communication -IDUs separate power supplied	
		4	Automatic recognition of communication protocol	√
n8	7	0	Nonstop compressor defrosting	√
		1	Stop compressor defrosting	-

Table 4-2.3 Menu mode function(continue)

First level menu	Second level menu	Specified menu mode	Description	Default
n9	5	-	Release central controller emergency stop statue	-
	7	0	Digital electricity meter	√
		1	Pulse electricity meter	-
nc[1] (Dry contact function)	0	0	Dry contact 1 function selection (Force cooling only)	-
		1	Dry contact 1 function selection (Force heating only)	
		2	Dry contact 1 function selection (Force incapacity requirements)	
		3	Dry contact 1 function selection (Force stop)	√
	1	0	Dry contact 2 function selection (Force cooling only)	-
		1	Dry contact 2 function selection (Force heating only)	
		2	Dry contact 2 function selection (Force incapacity requirements)	
		3	Dry contact 2 function selection (Force stop)	√
	2	0	Dry contact 3 function selection (Operation signal)	-
		1	Dry contact 3 function selection (Alarm signal)	√
		2	Dry contact 3 function selection (Compressor running signal)	-
		3	Dry contact 3 function selection (Defrosting signal)	

2.4 Special mode introduction

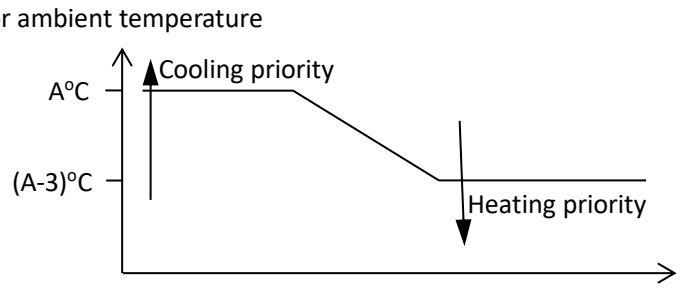
2.4.1 Priority mode setting

Priority mode can only be set on the master unit. When an indoor unit is in mode conflict with the outdoor units the unit displays the mode conflict error. The digital display on indoor main PCB will display error code E0.

There are ten priority mode options:

1. **Auto priority mode (default):** In auto priority mode, the outdoor unit will operate in heating priority mode or cooling priority mode according to the outdoor ambient temperature.
   In this function, the mode switching temperature is **A**, and A can be set by menu *n2-9-0/1/2*
   a) When the outdoor ambient temperature is below (**A-3**)℃, the outdoor units run in heating priority mode. The heating priority mode does not change until the outdoor ambient temperature is above **A**℃.
   b) When the outdoor ambient temperature is above **A**℃, the outdoor units run in cooling priority mode. The cooling priority mode does not change until the outdoor ambient temperature is below (**A-3**)℃.
   c) When the outdoor units restart under the outdoor ambient between (**A-3**)℃ and **A**℃, the outdoor units run the same priority as before the last stop.
   d) When the outdoor unit is initial startup under outdoor ambient temperature between (**A-3**)℃ and **A**℃, the outdoor units run in heating priority mode.

Figure 4-2.2: Auto priority mode control



2. **Cooling priority mode**:
   a) **During heating operation:** If an indoor unit requests cooling, the outdoor units stop and then restart in cooling mode after 5 minutes. Indoor units requesting cooling then start in cooling mode and indoor units requesting heating display the mode conflict error.
   b) **During cooling operation:** If an indoor unit requests heating, the outdoor units ignore the request and continue to run in cooling mode. The indoor unit requesting heating displays the mode conflict error. If all the indoor units requesting cooling are later turned off and one or more indoor units are still requesting heating, the outdoor units restart in heating mode after 5 minutes and any indoor units requesting heating then start in heating mode.
3. **Heating priority mode:**
   a) **During cooling operation:** If an indoor unit requests heating, the outdoor units stop and then restart in heating mode after 5 minutes. Indoor units requesting heating then start in heating mode and indoor units requesting cooling display the mode conflict error.
   b) **During heating operation:** If an indoor unit requests cooling, the outdoor units ignore the request and continue to run in heating mode. The indoor unit requesting cooling displays the mode conflict error. If all the indoor units requesting heating are later turned off and one or more indoor units are still requesting cooling, the outdoor units restart in cooling mode after 5 minutes and any indoor units requesting cooling then start in cooling mode.
4. **VIP priority mode:** The default VIP address is 63, the VIP address also can be changed through menu mode“n1-6”.
   In VIP priority mode, if the VIP indoor unit is operating, the outdoor units will operate in the mode of the VIP indoor unit. In the meantime indoor units, which are in a mode different to that of the VIP unit, will display the mode conflict error (E0).

5. **Changeover mode:** Before using this mode, you need to set the VIP indoor unit address. The default VIP address is 63, the VIP address also can be changed through menu mode“n1-6”.
   In changeover mode, if the VIP indoor unit is operating, the outdoor units will operate in the mode of the VIP indoor unit. The other units in the system will follow the mode of the VIP indoor unit, so there will be no mode conflict.
   In the changeover mode, the VIP indoor unit can select the auto mode, so that the system can run the auto mode, and other indoor unit can follow the VIP indoor unit without mode conflict.
6. **Voting priority mode:** In voting priority mode, the outdoor units operate in whichever of heating and cooling modes is being requested by the larger number of indoor units.
7. **First on priority mode:** The outdoor units will operate in the mode of the indoor unit (first open in the system). In the meantime indoor units, which are in a mode different to that of the first open unit, will display the mode conflict error (E0).
8. **Capability requirements priority mode:** In Capability requirements priority mode, the outdoor units operate in whichever of heating and cooling modes is being requested by the larger Capability requirements of indoor units.
9. **Heating only mode:** The outdoor units only operate in heating mode. Indoor units requesting heating operate in heating mode. Indoor units requesting cooling or in fan only mode display the mode conflict error.
10. **Cooling only mode:** The outdoor units only operate in cooling mode. Indoor units requesting cooling operate in cooling mode; indoor units in fan only mode operate in fan only mode. Indoor units requesting heating display the mode conflict error.

2.4.2 Refrigerant recovery

In this mode, the operation process is as follows:

a) Refrigerant recovery to outdoor unit:

(1) First, close the liquid pipe stop valve and keep the gas pipe stop valve open;

(2) Menu setting [n1-2-0], the system enters the refrigerant recovery mode, when the digital display alternately "End" and the system low pressure value, close the gas pipe stop valve.

b) Refrigerant recovery to indoor unit:

(1) First, manually close the liquid pipe stop valve and keep the gas pipe stop valve open;

(2) Menu setting [n1-2-1], the system enters the refrigerant recovery mode, when the digital display alternately displays "End" and the system low pressure value, close the gas pipe stop valve.

c) Balance system refrigerant:

(1) Ensure that both the gas pipe stop valve and the liquid pipe stop valve are open.

(2) Menu setting [n1-2-2], the system enters the Balance system refrigerant mode.

2.4.3 Refrigerant charge

a) Manual refrigerant charge:

(1) Without customized refrigerant charging valve (EEVE)

Charge the refrigerant through the stop valve

(2) With customized refrigerant charging valve (EEVE)

Menu setting [n1-3-0], refrigerant charging valve (EEVE) will open, you can charge the refrigerant through EEVE.

b) Auto refrigerant charge :

The refrigerant charging valve (EEVE) must be customized to use this function.

Menu setting [n1-3-1], refrigerant charging valve (EEVE) will open, the system will automatically charge refrigerant through EEVE. When refrigerant charging is completed, the digital displays “End” and EEVE will close.

3. System Parameter Check

3.1 UP / DOWN system check button

Before pressing UP or DOWN button, allow the system to operate steadily for more than an hour. On pressing UP or DOWN button, the parameters listed in below table will be displayed in sequence.

Table 4-3.1 system check list:

DSP1 content	Parameters displayed on DSP2	Remarks
----	"Standby (ODU address + IDU quantity) /frequency/special status"	
0.--	Outdoor unit address	0-3
1.--	Outdoor unit capacity	Actual value = value displayed (HP)
2.--	Number of outdoor units	1-4
3.--	Number of indoor units (set by master unit)	1-64
4.--	Total capacity of outdoor unit	Actual value = value displayed (HP)
5.--	Target frequency of this ODU	Displacement frequency (1)
6.--	Target frequency of ODU system	Target frequency= value displayed ×10
7.--	Actual frequency (Hz) of compressor	Actual value = value displayed
8.--	Operating mode	0: OFF
		2: Cooling
		3: Heating
9.--	Fan 1 speed index (rpm)	Actual value = value displayed
10.--	Fan 2 speed index (rpm)	Actual value = value displayed
11.--	Indoor heat exchanger pipe (**T2**) average temperature (°C)	Actual value = value displayed
12.--	Indoor heat exchanger pipe (**T2B**) average temperature (°C)	Actual value = value displayed
13.--	Main heat exchanger pipe (**T3**) temperature (°C)	Actual value = value displayed
14.--	Outdoor ambient (**T4**) temperature (°C)	Actual value = value displayed
15.--	Liquid pipe (**T5**) temperature (°C)	Actual value = value displayed
16.--	**T3B** temperature (°C)	Actual value = value displayed
17.--	Inverter compressor A discharge (**T7C1**) temperature (°C)	Actual value = value displayed
18.--	Inverter module heatsink (**NTC**)temperature (°C)	Actual value = value displayed
19.--	Gas pipe temperature **(Tg)** temperature (°C)	Actual value = value displayed
20.--	Condenser outlet temperature (**TL**) temperature (°C)	Actual value = value displayed
21--	Discharge superheat degree (°C)	Actual value = value displayed
22.--	Primary current(A)	Actual value = value displayed /10
23.--	Inverter compressor current (A)	Actual value = value displayed /10
24.--	EXVA position	Actual value = value displayed × 24
25.--	Compressor discharge pressure (MPa)	Actual value = value displayed × 0.01
26.--	Compressor suction pressure (MPa)	Actual value = value displayed × 0.01
27.--	Quantity of indoor units online	Actual value = value displayed
28.--	Quantity of indoor units online	Actual value = value displayed
29.--	Heat exchanger status (Outdoor unit)	【0】OFF
		【1】C1: Cooling mode
		【2】D1: Reserved
		【3】D2:Compressor OFF (Cooling mode)

		【4】E1:Heating mode
		【5】F1: Reserved
		【6】F2:Compressor OFF (Heating mode)
30.--	Special state	【0】No special mode
		【1】Oil return
		【2】Defrost
		【3】Start-up
		【4】Stop
		【5】Quick check
		【6】Self cleaning
31.--	Silent mode	0~5, 5 represents the most silent
32.--	Static pressure mode	【0】0Pa
		【1】10Pa
		【2】20Pa
		【3】30Pa
		【4】35Pa
		【5】40Pa
		【6】60Pa
		【7】80Pa
		【14】Auto
33.--	Tes (Target evaporating temperature) (°C)	Actual value = value displayed
34.--	Tcs (Target condensing temperature) (°C)	Actual value = value displayed
35.--	DC Voltage (V)	Actual value = value displayed
36.--	AC Voltage (V)	Actual value = value displayed
37.--	Quantity of cooling mode IDUs	Actual value = value displayed
38.--	Quantity of heating mode IDUs	Actual value = value displayed
39.--	Capacity of cooling mode IDUs (HP)	Actual value = value displayed
40.--	Capacity of heating mode IDUs (HP)	Actual value = value displayed
41.--	Fan error	
42.--	Software version	
43.--	Last error or protection code	
44.--	Reserved	
45.--	Reserved	
46.--	Compressor operating time (h)	Actual value = value displayed × 10
--		

Notes:

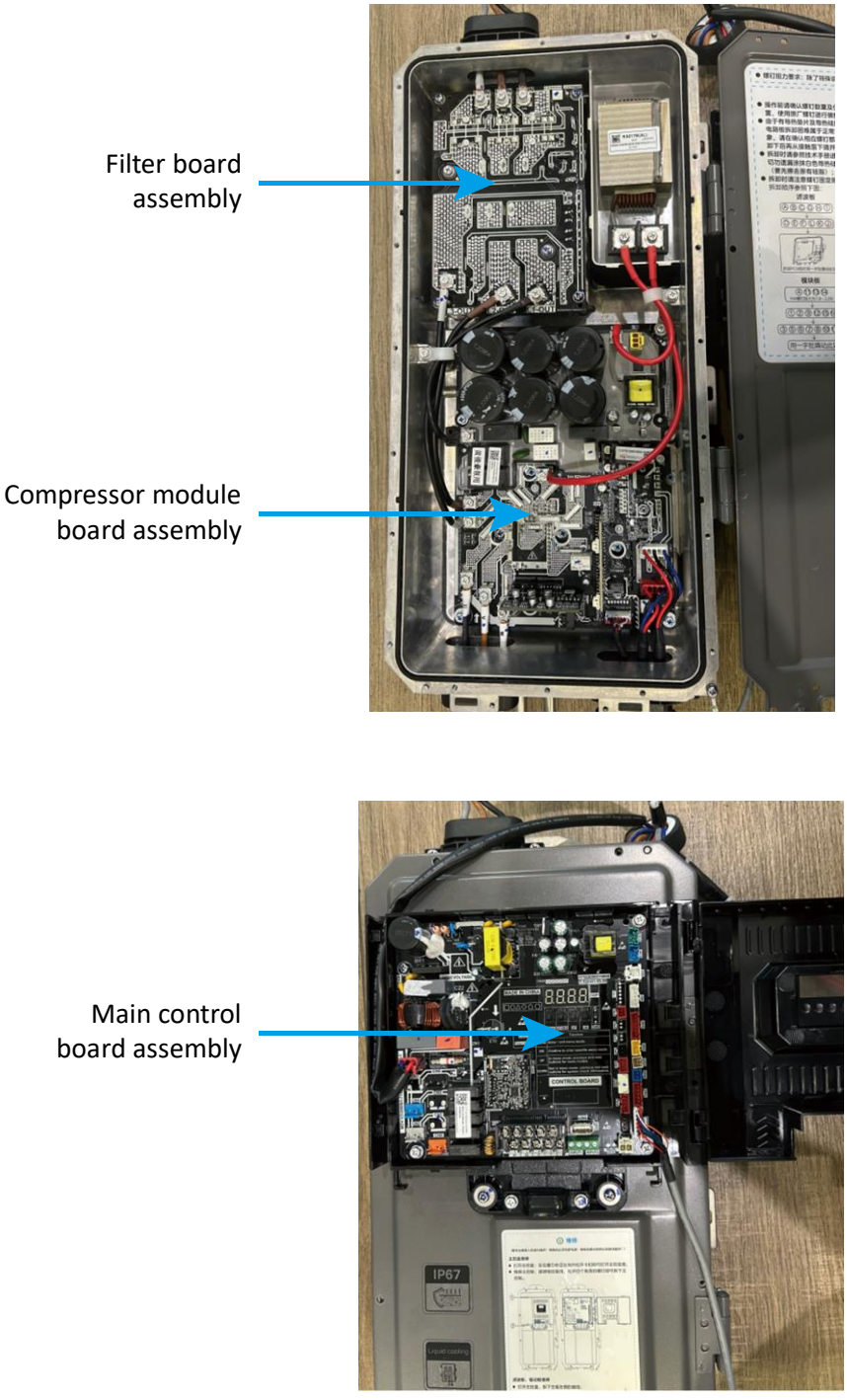
(1) Need to convert to current compressor output volume, example: compressor output volume is 58, Target frequency = Actual frequency * 58 / 60.

Part 5

Electrical Components and Wiring Diagrams

1. Outdoor Unit Electric Control Box Layout

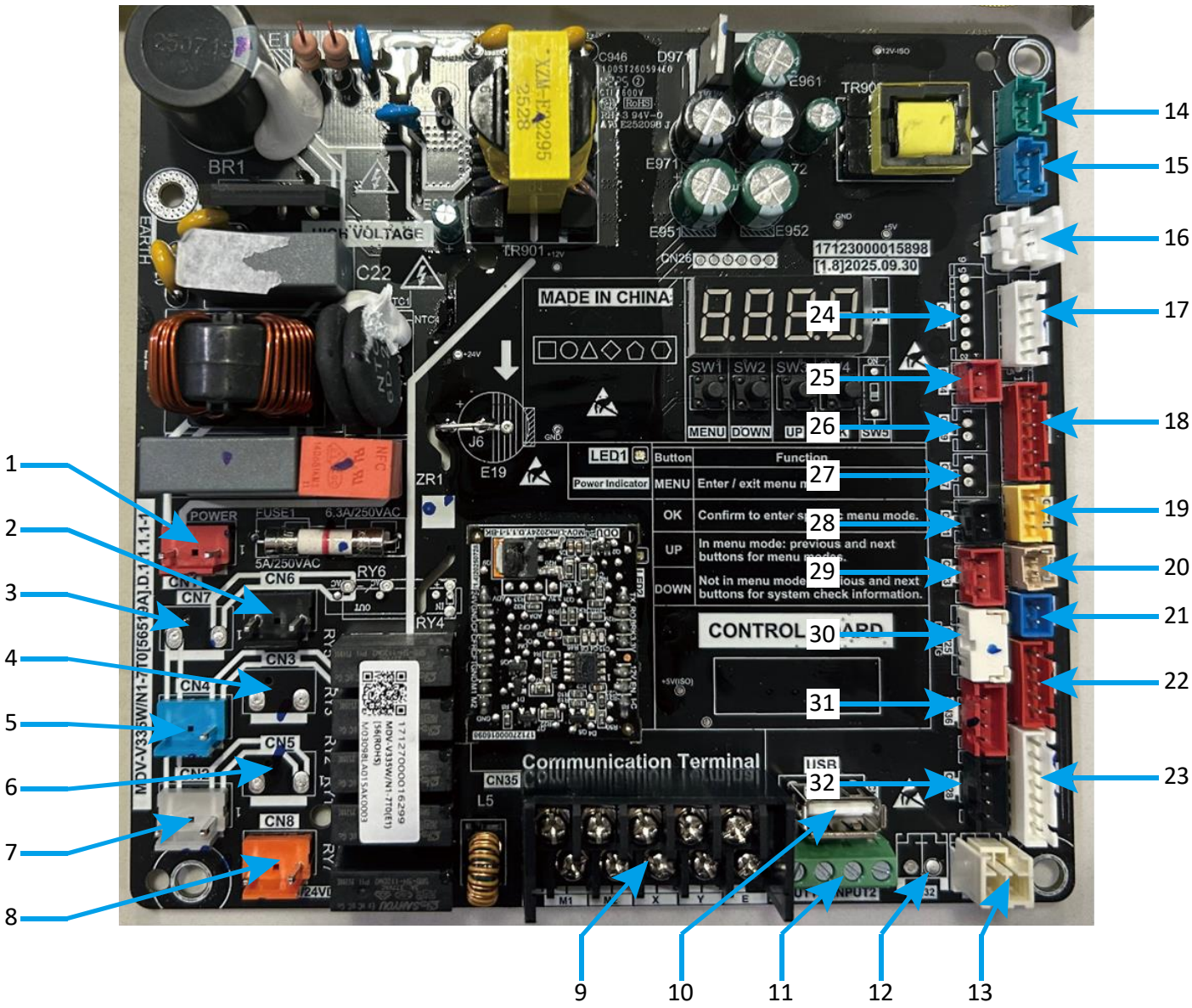
Figure 5-1.1: Outdoor Unit Electric Control Box Layout



2. Outdoor Unit Main Control Board

2.1 Outdoor unit main Control Board ports

Figure 5-2.1: Outdoor unit main Control Board ports[1]



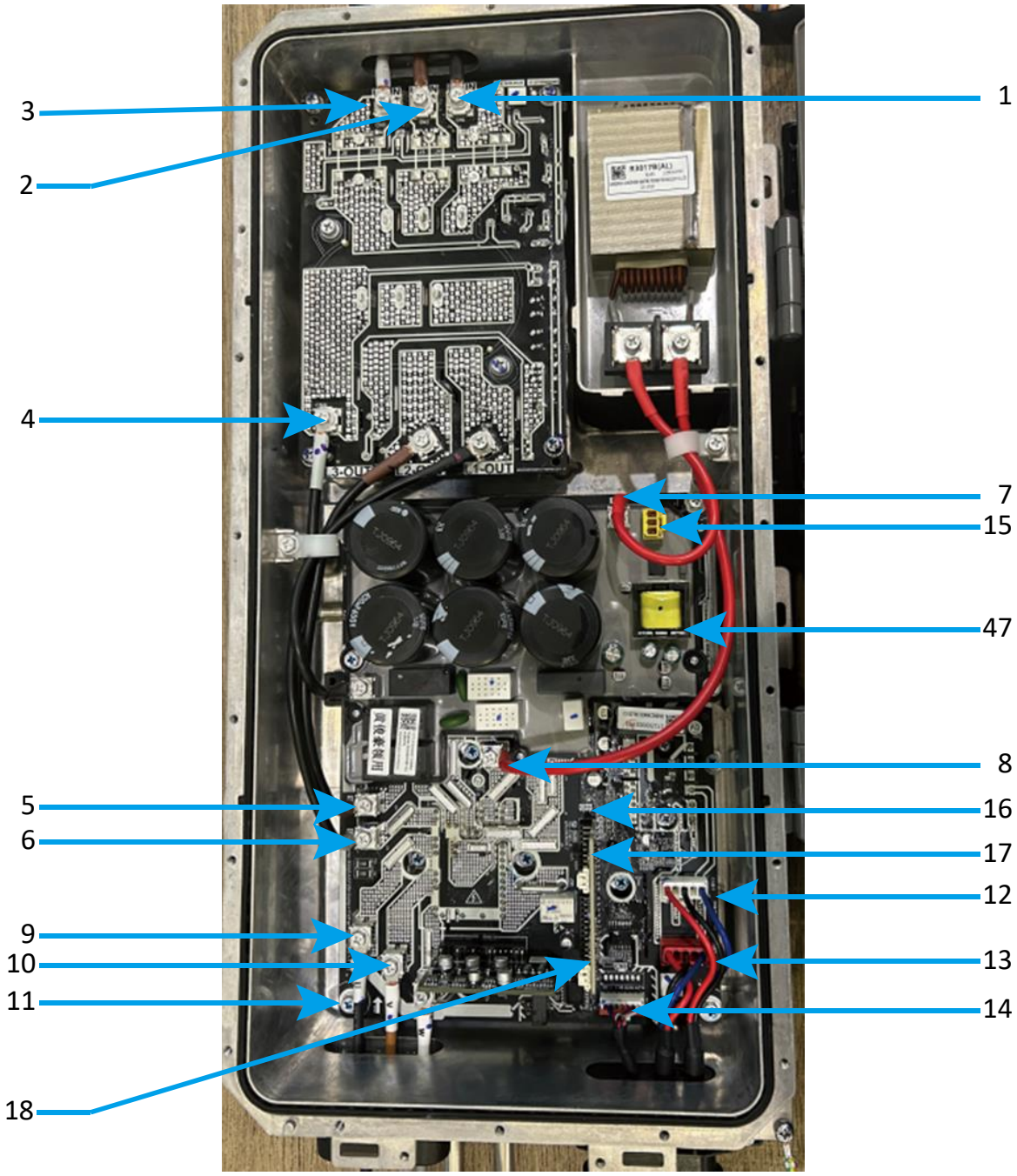
Notes: Label descriptions are given in table below.

Table 5-2.1: Main Control Board ports

Label in Figure 5-2.1	Port code	Content	Port voltage
1	CN1	Mainboard power input (L, N)	220VAC
2	CN6	Solenoid valve SV2	0 or 220VAC
3	CN7	Spray solenoid valve (reserved)	0 or 220VAC
4	CN3	Chassis electric heater (reserved)	0 or 220VAC
5	CN4	Four-way valve	0 or 220VAC
6	CN5	Compressor electric heater (reserved)	0 or 220VAC
7	CN2	Compressor electric heater (reserved)	0 or 220VAC
8	CN8	Output dry contact (220VAC/24VDC 0-1A)	
9	CN35/CN24	Communication terminals (PQE, XYE, OA, M1M2)	PQE and XYE: 5Vdc; M1M2: 16Vdc~21Vdc
10	CN27	USB	5Vdc
11	CN33	Input dry contacts: INPUT1, INPUT2	12Vdc
12	CN32	Low pressure switch (reserved)	0 or 8.11Vdc
13	CN31	High pressure switch	0 or 3.3Vdc
14	CN13	Low-pressure sensor (green terminal)	0~5Vdc
15	CN12	High-pressure sensor (blue terminal)	0~5Vdc
16	CN18	Temperature sensor T10	0~3.3Vdc
17	CN9	Electronic expansion valve EEVA	0~12Vdc
18	CN10	Electronic expansion valve EEVE	0~12Vdc
19	CN22	High-pressure sensor (yellow terminal)	0~5Vdc
20	CN15	Temperature sensor T3	0~3.3Vdc
21	CN16	Temperature sensor T4	0~3.3Vdc
22	CN14	Temperature sensors TL and T5	0~3.3Vdc
23	CN30	Communication terminal (connected to the driver board)	0~5Vdc+12Vdc
24	CN11	Electronic expansion valve EEVC	0~12Vdc
25	CN34	Temperature sensor Tg	0~3.3Vdc
26	CN29	Temperature sensor T6A	0~3.3Vdc
27	CN17	Temperature sensor T6B	0~3.3Vdc
28	CN21	Temperature sensor T7C1	0~3.3Vdc
29	CN23	High-pressure sensor (red terminal)	0~5Vdc
30	CN25	Software programming port	0~5Vdc
31	CN36	Electric meter communication port (reserved)	0~5Vdc+12Vdc
32	CN28	4G module	0~5Vdc+12Vdc

2.2 Outdoor unit filter board and drive board ports

Figure 5-2.2: Outdoor unit filter board and drive board ports



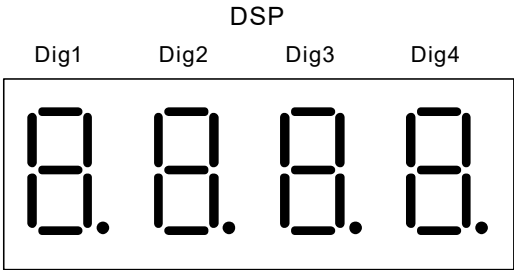
Notes: Label descriptions are given in table below.

Table 5-2.2: Outdoor unit filter board and drive board ports

Label no.	Port code	Function code	Content	Port voltage
1	CN1	L1	Three-phase power input, Phase L1	Rated phase-to-phase voltage 380VAC
2	CN2	L2	Three-phase power input, Phase L2	Rated phase-to-phase voltage 380VAC
3	CN3	L3	Three-phase power input, Phase L3	Rated phase-to-phase voltage 380VAC
4	L1	L1	Inverter module board input, Phase L1	Rated phase-to-phase voltage 380VAC
5	L2	L2	Inverter module board input, Phase L2	Rated phase-to-phase voltage 380VAC
6	L3	L3	Inverter module board input, Phase L3	Rated phase-to-phase voltage 380VAC
7	P_IN	P_IN	Positive input terminal of high-voltage electrolytic capacitor (connected to reactor)	Rated 540VDC (at 380VAC three-phase input)
8	P_OUT	P_OUT	Output terminal of three-phase rectifier bridge stack (connected to Reactor)	Rated 540VDC (at 380VAC three-phase input)
9	U	U	Inverter drive output, Phase U (connected to Compressor)	Rated phase-to-phase voltage 46-460VAC
10	V	V	Inverter drive output, Phase V (connected to Compressor)	Rated phase-to-phase voltage 46-460VAC
11	W	W	Inverter drive output, Phase W (connected to Compressor)	Rated phase-to-phase voltage 46-460VAC
12	CN2	DCFAN	Inverter fan drive output	Rated phase-to-phase voltage 46-460VAC
13	CN3	DCFAN	Inverter fan drive output	Rated phase-to-phase voltage 46-460VAC
14	CN8/CN9	/	Communication port between main board and inverter drive board, pre-charging relay control port of module board (main control)	Port definitions from left to right are as follows: 3.3V, B, A, GND, 12V, PED, Ry_CTR
15	CN4	/	Discharge Terminal	Rated phase-to-phase voltage 46-460VAC
16	LED3	Power	5V Control Power Indicator on Drive Board (Green): Steady on when 5V power is supplied. Caution: When this indicator is off, there may be residual high voltage on the drive board. Confirm with a multimeter before any operation.	
17	LED2	Fan	Fan Drive Status Indicator (Red): Steady on = Running; Slow flashing = Standby; Fast flashing = Fault Code (refer to the specific fault code on the main board nixie tube).	
18	LED1	COMP	Compressor Drive Status Indicator (Red): Steady on = Running; Slow flashing = Standby; Fast flashing = Fault (refer to the specific fault code on the main board nixie tube).	

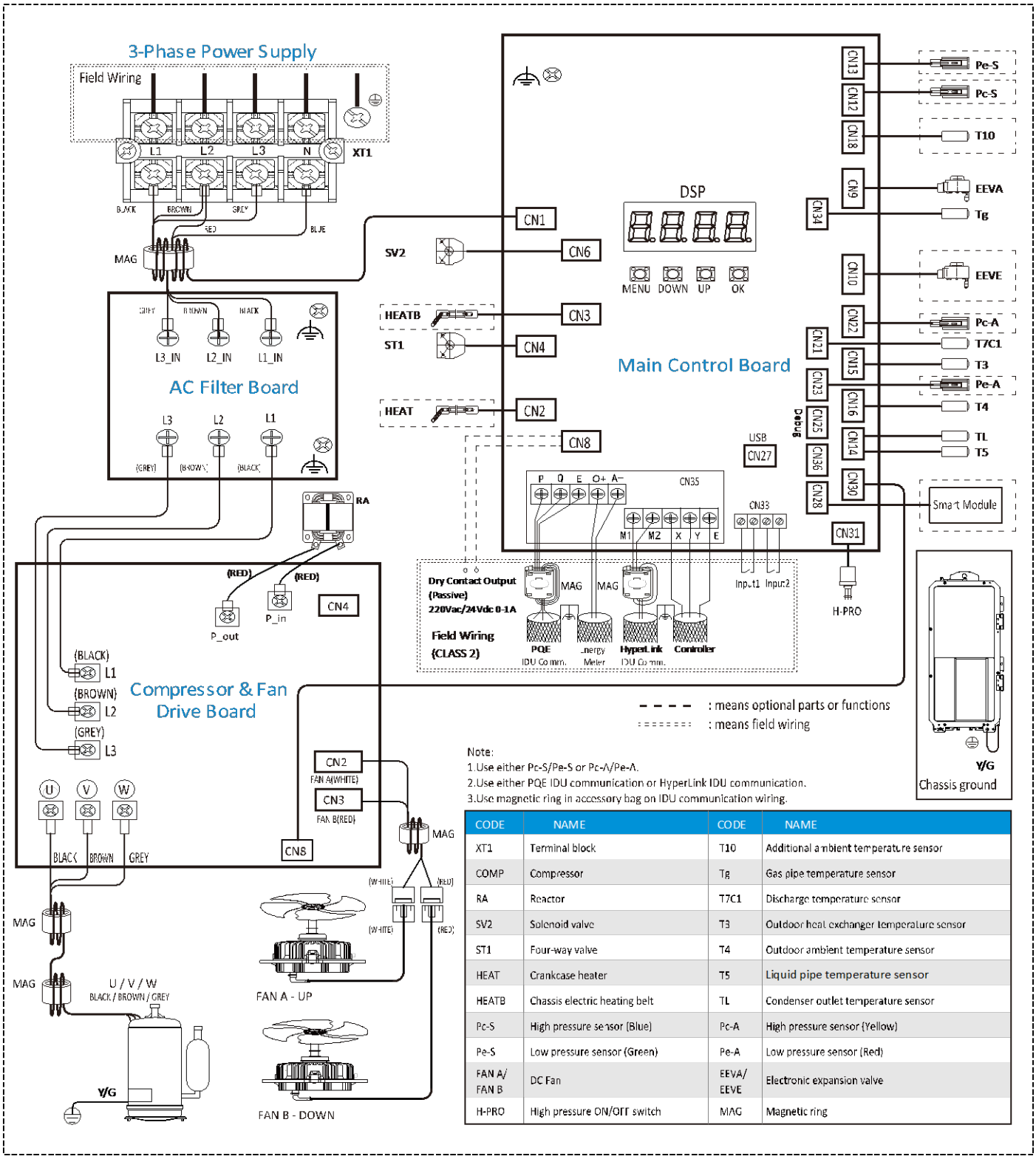
2.2.1 Digital display output

Table 5-2.3: Digital display output in different operating state



Outdoor unit state	Parameters displayed on Dig1 & Dig2	Parameters displayed on Dig3 & Dig4
Standby	The address of outdoor unit	The number of indoor units in communication with the outdoor units
Normal operation	--	Running speed of the compressor in rotations per second
Error or protection	Placeholder and error or protection cod	
In menu mode	Display menu mode code	
System check	Display system check code	

3. Wiring Diagrams



Note:
1. Use either Pc-S/Pe-S or Pc-A/Pe-A.
2. Use either PQE IDU communication or HyperLink IDU communication.
3. Use magnetic ring in accessory bag on IDU communication wiring.

CODE	NAME	CODE	NAME
XT1	Terminal block	T10	Additional ambient temperature sensor
COMP	Compressor	Tg	Gas pipe temperature sensor
RA	Reactor	T7C1	Discharge temperature sensor
SV2	Solenoid valve	T3	Outdoor heat exchanger temperature sensor
ST1	Four-way valve	T4	Outdoor ambient temperature sensor
HEAT	Crankcase heater	T5	Liquid pipe temperature sensor
HEATB	Chassis electric heating belt	TL	Condenser outlet temperature sensor
Pc-S	High pressure sensor (Blue)	Pc-A	High pressure sensor (Yellow)
Pe-S	Low pressure sensor (Green)	Pe-A	Low pressure sensor (Red)
FAN A/ FAN B	DC Fan	EEVA/ EEVE	Electronic expansion valve
H-PRO	High pressure ON/OFF switch	MAG	Magnetic ring

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	Manual re-start required[2]
AAx	No.x Inverter driver board does not match the main control board	NO
C21	Communication error between indoor and master outdoor unit	NO
C26	Number of indoor units detected by master unit has decreased or less than the setting amount	NO
C28	Number of indoor units detected by master unit has increased or more than the setting amount	NO
xC41	Communication Error between main control board and No.x inverter driver board	NO
E41	Outdoor ambient temperature sensor (T4) error(open/short)	NO
F62	Radiator temperature (Tf/Ntc) over-temperature protection	NO
xF71	Compressor discharge temperature sensor(T7C) error (open/short)	YES
F72	Compressor discharge temperature(T7C) protection	NO
xF75	Compressor discharge insufficient superheat protection	NO
F81	Low-pressure stop valve sensor (Tg) error (open/short)	NO
F91	Liquid pipe temperature sensor (T5) error (open/short)	NO
FC1	Outdoor heat exchanger liquid temperature sensor (TL) error (open/short)	NO
P11	High pressure sensor error	NO
P12	High pressure protection	NO
P13	High pressure switch protection	NO
P21	Low pressure sensor error	YES
P22	low pressure protection	NO
P24	Abnormal rise of low pressure	NO
P16	SENT high pressure sensor error	NO
P28	SENT low pressure sensor error	NO
P27	SENT reverse connection fault of high and low pressure sensors	NO
xP32	Compressor high DC bus current protection	NO
P51	High AC voltage protection	NO
P52	Low AC voltage protection	NO
P53	Phase B and N of the power cable are connected to the opposite protection	YES
P55	DC bus ripple over protection	YES
xP56	No.(x) Inverter module DC bus low voltage error	YES
xP57	No.(x) Inverter module DC bus high voltage error	YES
xP58	No.(x) Inverter module DC bus excessively high voltage error	YES
xP5A	Phase B misphase of inverter module input power supply	NO
P71	EEPROM error	YES
Pb1	HyperLink overcurrent error	NO
Pd1	Anti-condensation protection	NO
1b01	Electronic expansion valve (EEVA) error	YES
bA1	HyperLink cannot control indoor unit’s electronic expansion valve	NO
U11	Outdoor unit model is not set	YES
U12	Outdoor unit capacity setting error	YES
U32	Outdoor temperature out of operating range	YES
U33	Indoor temperature out of operating range	YES
U34	Outdoor and indoor temperature out of operating range	YES

U35	Liquid side stop valve is not opened	YES
U36	The stop valve at the high-pressure gas side is not opened	
U37	The stop valve at the low-pressure gas side is not opened	YES
U38	Outdoor unit has No address	YES
U3A	The refrigerant pipe connection is not consistent with the communication cable	NO
U3b	The installation environment is abnormal	YES
U3C	The VIP indoor unit is not set (valid in Changeover priority mode)	NO
U3E	The indoor unit is abnormal during test run	NO
U4x	Overconnection ratio contains U41-U48	YES
U51	Outdoor unit of Individual Series is installed in combined system.	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 Compressor drive error code table

Table 6-1.2 Compressor drive error code table

Error code	Error description	Manual re-start required[2]
xL1E	Hardware overcurrent	NO
xL11	Software overcurrent	NO
xL2E	Module overtemperature protection	NO
xL3E	The bus voltage is too low	NO
xL31	The bus voltage is too high	NO
XL34	Three-phase power supply input phase loss fault	NO
XL35	Three-phase B-phase power and zero line are connected reversely	NO
XL43	The current sampling bias is abnormal	NO
xL45	Motor code mismatch	YES
xL47	Module type mismatch	NO
xL5E	Startup failed	NO
xL52	Locked-rotor protection	NO
xL6E	Compressor motor lack of phase protection	NO
xLb0	Action of high voltage switch	NO
xLb7	Pressure safety diagnostic module (PED) check abnormal or error	NO

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

1.3 Fan motor error code table

Table 6-1.3 Fan motor error code table

Code	Error description	Manual re-start required2
xJ1E	Hardware overcurrent protection	NO
xJ11	Software overcurrent	NO
xJ2E	Module overtemperature protection	NO
xJ3E	Bus voltage too low fault	NO
xJ31	Bus voltage too high fault	NO
xJ43	The current sampling bias is abnormal	NO
xJ45	Motor code mismatch	YES
xJ47	Module Type Mismatch	YES
xJ5E	Startup failed	NO
xJ52	Locked-rotor protection	NO
xJ6E	Motor lack of phase protection	NO
xJ65	Fan IPM short circuit protection	NO

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

1.4 Status prompt code table

Table 6-1.4 Status prompt code table

Status code	Code description	Manual re-start required2
d0x	Oil return,"x" is the current step node	NO
dfx	Defrost," x" is the current step node	NO
d12	The outdoor ambient temperature exceeds the upper limit (Cooling mode)	NO
d13	The outdoor ambient temperature exceeds the lower limit (Cooling mode)	NO
d31	Refrigerant judgment: no result	NO
d32	Refrigerant quantity judgment: Significantly excessive	NO
d33	Refrigerant quantity judgment: Slightly excessive	NO
d34	Refrigerant quantity judgment: normal	NO
d35	Refrigerant quantity judgment: Slightly insufficient	NO
d36	Refrigerant quantity judgment: Significantly insufficient	NO
d37	IDU connected to system is not common	NO
d38	Too low proportion of running IDUs	NO

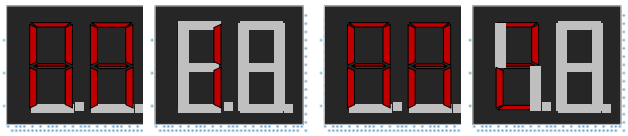
Table continued on next page …

Note: the above non-error code, no troubleshooting

2 Error in Main Control

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

2.1.1 Digital display output



2.1.2 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

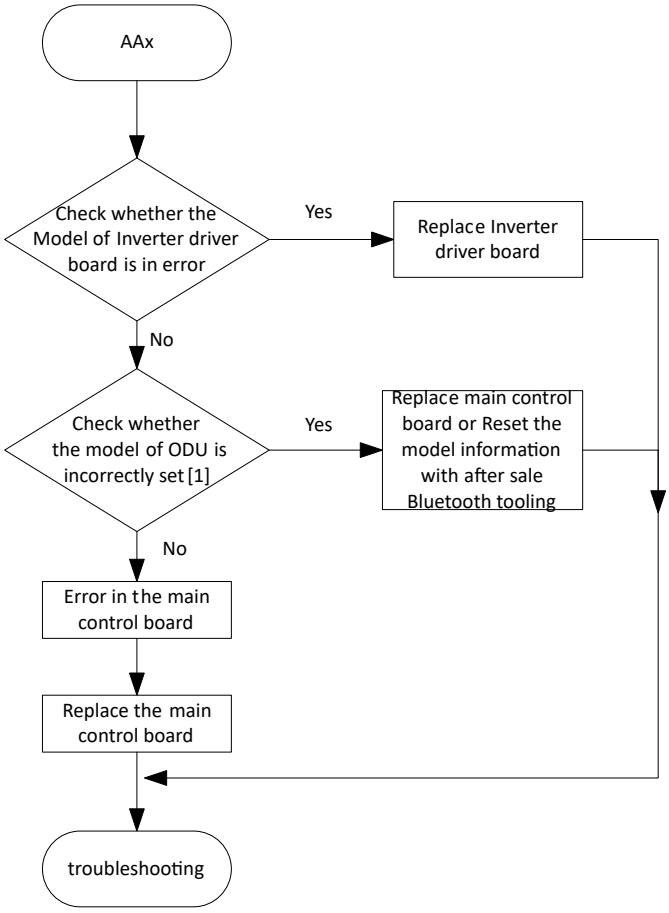
2.1.3 Trigger / recover condition

- Trigger condition: Parameters of the built-in drive in the module board do not match Outdoor Units
- Recover condition: Parameters of the built-in drive in the module board match Outdoor Units
- Reset method: Resume manually

2.1.4 Possible causes

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

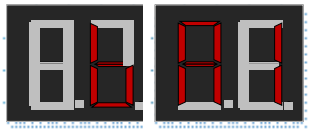
2.1.5 Procedure



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

2.2 bA1: HyperLink cannot open or close IDU's Electronic expansion valve

2.2.1 Digital display output



2.2.2 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
- Error is generated only under the M1M2 communication protocol.

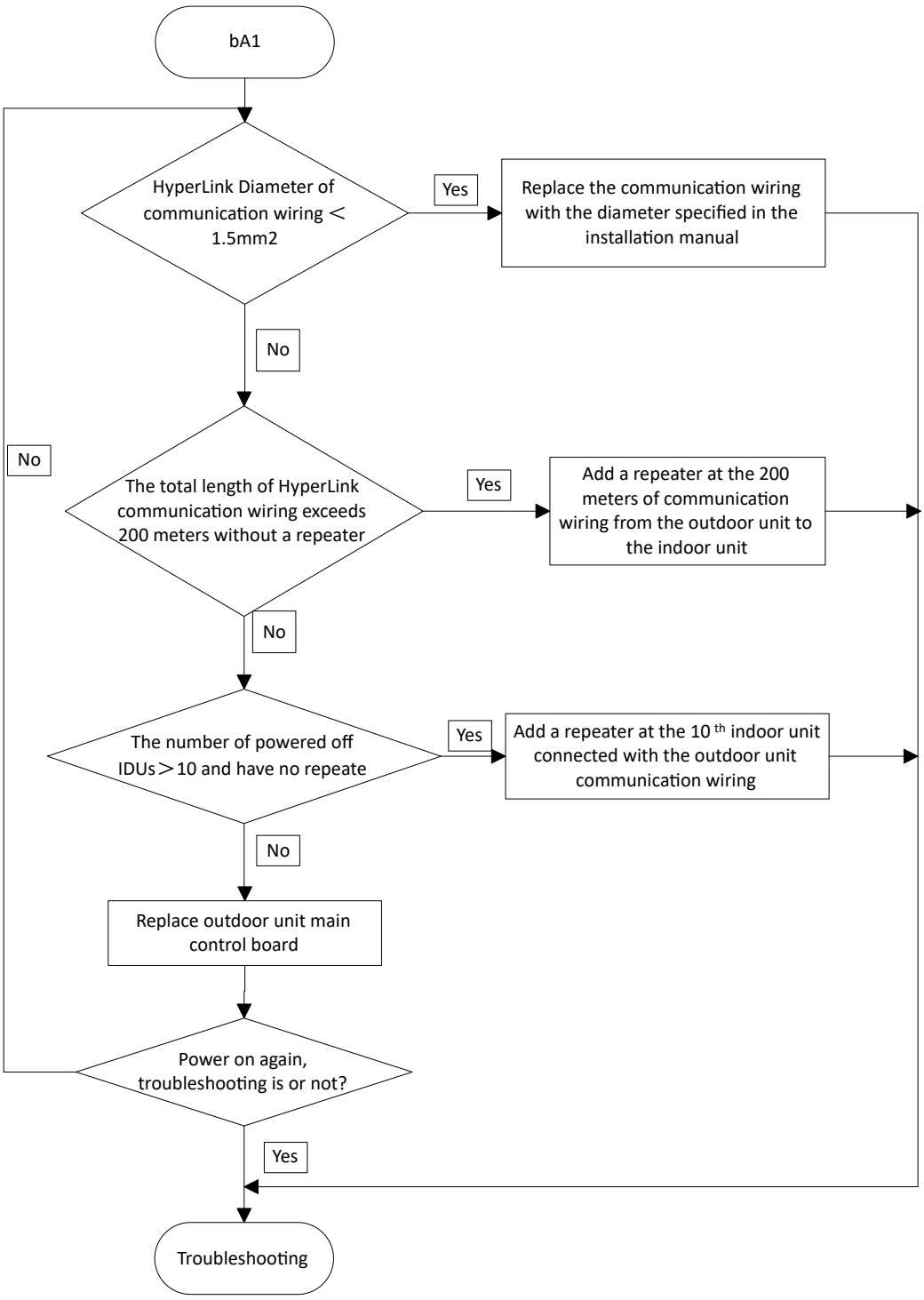
2.2.3 Trigger / recover condition

- 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

2.2.4 Possible causes

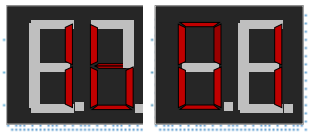
- HyperLink diameter of communication wiring＜1.5mm^2;
- The total length of HyperLink communication wiring exceeds 200 meters without a repeater;
- The number of powered off IDUs＞10 and have no repeater:
- Indoor main control board is damaged;
- Outdoor main control board is damaged.

2.2.5 Procedure



2.3 1b01 Disconnection of EEVA

2.3.1 Digital display output



2.3.2 Description

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

2.3.3 Trigger / recover condition

- Trigger condition: The main control board has not detected signals from the EEV for 2 minutes.
- Recover condition: The main control board detects a signal from the EEV.
- Reset condition: Resume automatically

2.3.4 Possible causes

- EEVA is disconnected or loose.
- EEVA wiring harness is damaged.
- Outdoor unit main control board is damaged.

2.3.5 Procedure

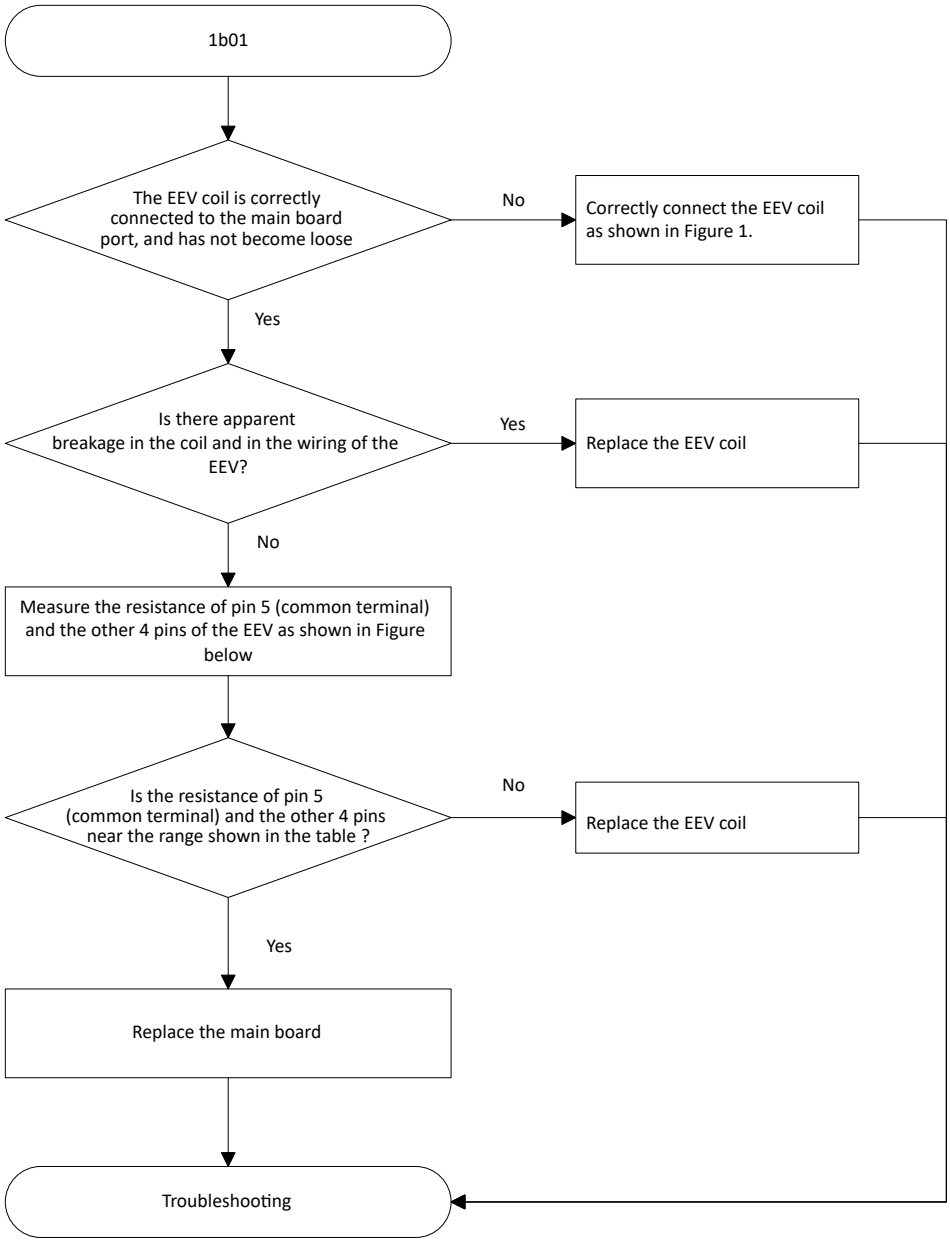
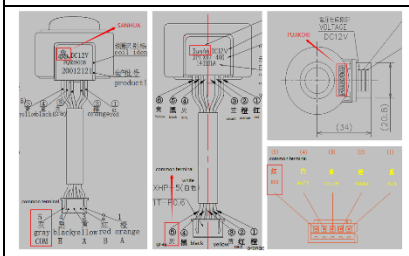


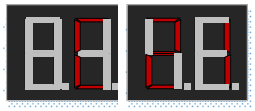
Figure: Five pin of EEV



Note: If the EEV coil is SANHUA, pin 5 is gray. If it is Fujikoki, pin 5 is red. Measure the resistance sequentially from pin 5 to the other 4 pins (for SANHUA coils, the sequence is gray-black, gray-yellow, gray-red, and gray-orange.)

2.4 C21: Communication error between IDU and ODU.

2.4.1 Digital display output



2.4.2 Description

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

2.4.3 Trigger / recover condition

- Trigger condition: 1. 20 minutes after the outdoor unit is power on,the communication signal from the IDU cannot be received by ODU for two minutes

  2. The IDU is not detected after automatic addressing.
- Recover condition: ODU receives the communication signal from the IDU.
- Reset method: Resume automatically

2.4.4 Possible causes

1. Error caused by communication interfaces and protocols

Table 6.2.1 Communication troubleshooting list:

ODU interface	IDU interface	IDU type	Communication protocol	Digital display output	Solution
PQE	PQE	V8	n45-0, V8 protocol P Q communication	/	/
			n45-1, V6 protocol PQE communication	/	/
			n45-2, V8 HyperLink protocol IDU uniform power supplied	/	It is recommended to be changed to V8 protocol PQ communication (n45-0).
			n45-3, V8 HyperLink protocol IDU separate power supply	/	It is recommended to be changed to V8 protocol PQ communication (n45-0).
M1M2	M1M2	V8	n45-0, V8 protocol P Q communication	C21	Modify the communication protocol. n45-3 is recommended.
			n45-1, V6 protocol PQE communication	C21	Modify the communication protocol. n45-3 is recommended.
			n45-2, V8 HyperLink protocol IDU uniform power supplied	/	/
			n45-3, V8 HyperLink protocol IDU separate power supply	/	/
PQE	PQE	V6	n45-0, V8 protocol P Q communication	C21	Modify the communication protocol. n45-1 is recommended.
			n45-1, V6 protocol PQE communication	/	/
			n45-2, V8 HyperLink protocol IDU uniform power supplied	C21	Modify the communication protocol. n45-1 is recommended.
			n45-3, V8 HyperLink protocol IDU separate power supply	C21	Modify the communication protocol. n45-1 is recommended.
PQE	M1M2	V8	All protocols	C21	It is recommended to connect M1M2 to the ODU port and adopt the n45-3 communication protocol.
M1M2	PQE	V8	All protocols	C21 (the IDU board may be damaged)	It is recommended to connect PQE to the ODU port and adopt the n45-0 communication protocol.
M1M2	PQE	V8 + V6	All protocols	C21 (the IDU board may be damaged)	Connect PQE to the ODU port and adopt the n45-1 communication protocol.
M1M2	PQE + M1M2	V8 + V6	All protocols	C21 (the PQE communication IDU board may be damaged)	Connect PQE to the ODU/IDU port and adopt the n45-1 communication protocol.
PQE	PQE + M1M2	V8 + V6	All protocols	C21	Connect PQE to the ODU/IDU port and adopt the n45-1 communication protocol.

2. Faults caused by other factors

(1) All indoor units are not set address;

(2) All indoor units are not powered on;

(3) The communication wiring between the master unit and the first IDU is not reliably connected:

- The communication wiring between the ODU and the first IDU is not tightened, or the surface contact of the power supply terminal is poor.
- The communication wiring between the ODU and the first IDU is disconnected or short-circuited for some reason.
- In PQ communication, the sequence of PQ and E is incorrect (for example, PEQ or QEP connection).

(4) The main communication wiring is connected to the slave ODU;

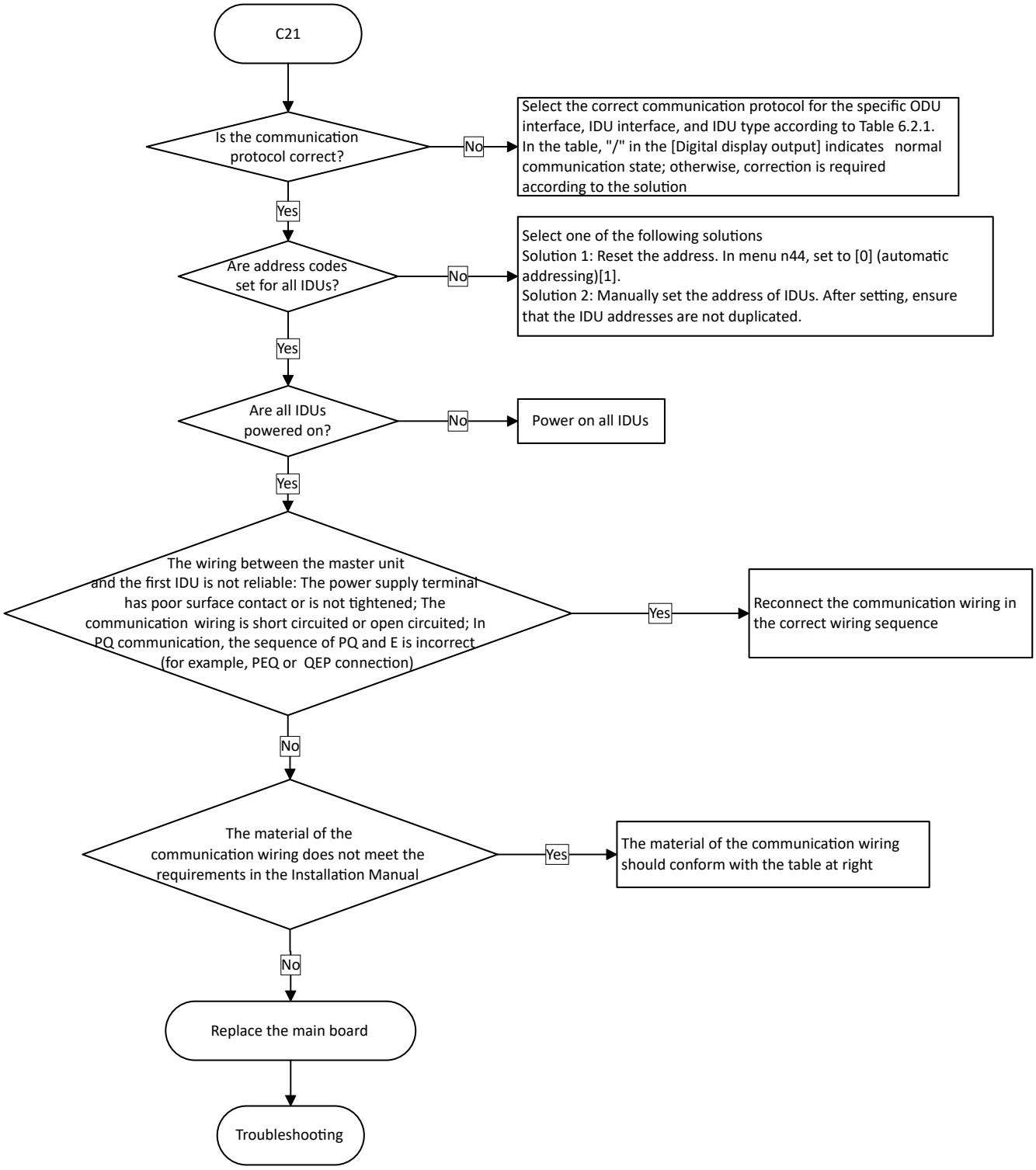
(5) Three-core shielded cable is used or the shielded layer is not grounded in PQ communication;

(6) When the function of IDU separate power supply in M1M2 communication is enabled, the diameter of the communication wiring is less than 1.5mm^2;

(7) The total length of the communication wiring exceeds range requirements: In PQE communication, the total length of the communication wiring (L) is less than or equal to 1200m; in M1M2 communication, the total length of the communication wiring (L) is less than or equal to 2000m. In M1M2 communication when the function of IDU separate power supply is enabled, the total length of the communication wiring (L) is less than or equal to 600m.

(8) The communication wiring is interfered with by a strong electromagnetic wave.

2.4.5 Procedure

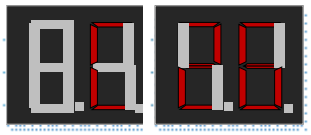


Note:

[1] Addressing will last for 10min, during which no operation is allowed.

2.5 C26 Abnormal reduction in the number of indoor units

2.5.1 Digital display output



2.5.2 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

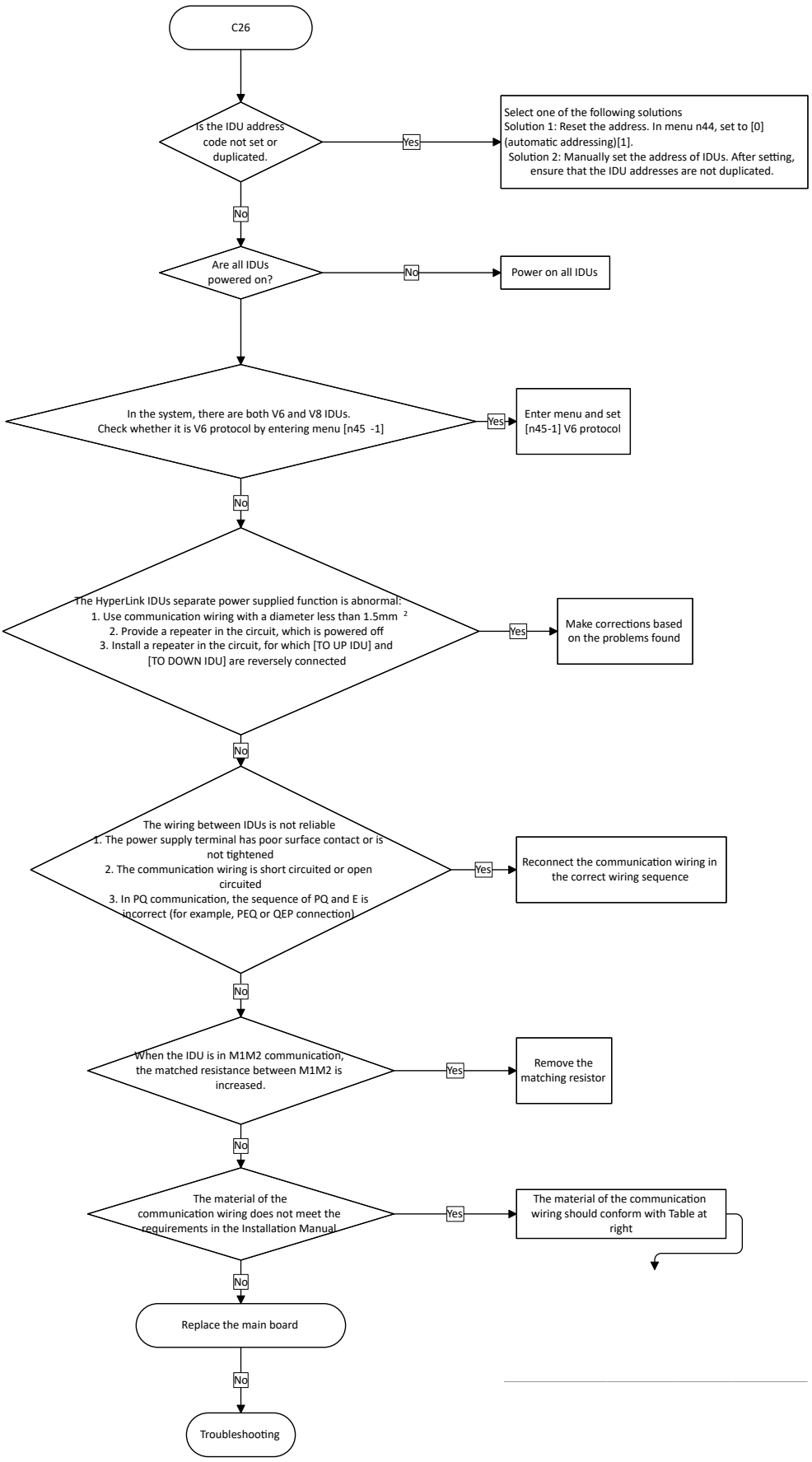
2.5.3 Trigger / recover condition

- Trigger condition: N0: The number of IDU set by ODU; N1: The number of online IDUs.
  1) When the unit is installed and commissioned, enter the number of IDUs (N0). The number of IDUs detected by the system is N1. If N1 < N0 lasts for 2min at any time, C26 is reported.
  2) If the number of IDUs (N1) detected within 20 min of initial power-on is less than the set number (N0), the outdoor unit does not start up (except for the quick check or service mode), but no error is reported. After 20 min, C26 is reported.
- Recover condition:
  N1 = N0 for 60 seconds
- Reset method: Resume automatically

2.5.4 Possible causes

- The IDU address code is not set or is duplicated.
- The IDU is not powered on or the power supply cable is incorrectly connected.
- In the system, there are V6 IDUs but the V6 protocol has not been set.
- When adopting the function of IDU separate power supply enabled in HyperLink communication, the communication wiring is improperly installed:
  When adopting the function of IDU separate power supply enabled in HyperLink communication with a repeater, the repeater is powered off;
  When adopting the function of IDU separate power supply enabled in HyperLink communication with a repeater, the repeater is incorrectly wired;
  The diameter of the communication wiring is less than 1.5mm^2.
- The IDU communication wiring is incorrectly connected:
  The communication wiring is not tightened or there is poor surface contact with the power supply terminal.
  The communication wiring is open-circuited or short-circuited for a certain reason.
  In PQ communication, the communication wiring is not connected in chain or the sequence of PQ and E is incorrect (for example, PEQ or QEP connection).
- When the IDU is in M1M2 communication, the matched resistance between M1M2 is increased.
- The material of the communication wiring does not meet requirements:
  Three-core shielded cable is used or the shielded layer is not grounded in PQ communication;
  The total length of the communication wiring exceeds range requirements: In PQE communication, the total length of the communication wiring (L) is less than or equal to 1200m; in M1M2 communication, the total length of the communication wiring (L) is less than or equal to 2000m. In M1M2 communication when the function of IDU separate power supply is enabled, the total length of the communication wiring (L) is less than or equal to 600m.
- The set number of IDUs does not match the actual number of IDUs.
- The communication wiring is interfered with by a strong electromagnetic wave.
- The IDU's main control board is damaged.

2.5.5 Procedure

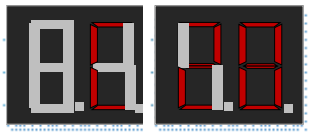


Note:

[1] Addressing will last for 10min, during which no operation is allowed.

2.6 C28: Abnormal increase in the number of indoor units

2.6.1 Digital display output



2.6.2 Description

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

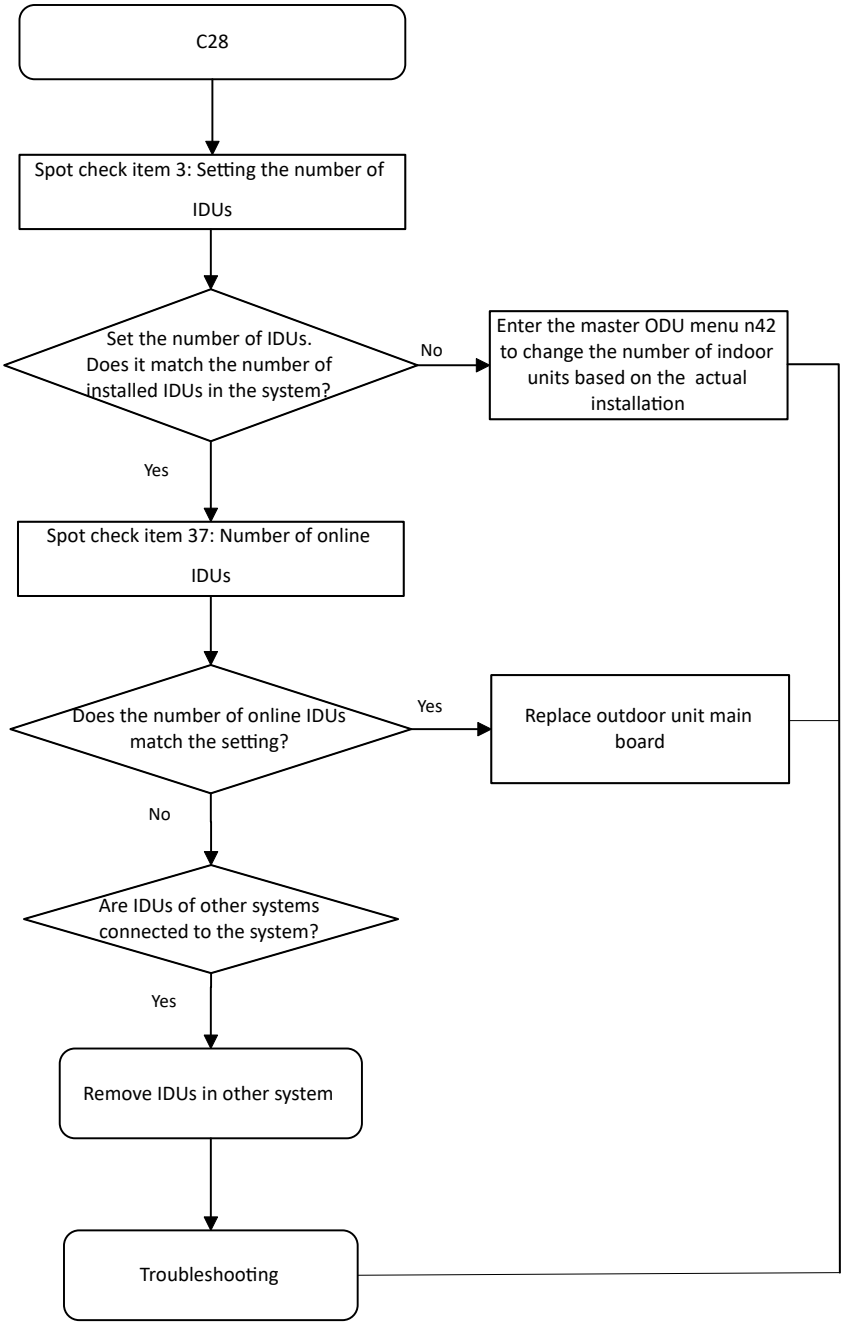
2.6.3 Trigger / recover condition

- Trigger condition: N0: The number of IDU set by ODU; N1: The number of online machines.
  1) When the unit is installed and commissioned, enter the number of IDUs (N0). The number of IDUs detected by the system is N1. If N1>N0 lasts for 2min at any time, C28 is reported.
  2) If the number of IDUs (N1) detected within 20 min of initial power-on is greater than the set number (N0), the outdoor unit does not start up (except for the quick check or service mode), but no error is reported. After 20 min, C26 is reported.
- Recover condition:
  N1 = N0 for 60 seconds
- Reset method: Resume automatically.

2.6.4 Possible causes

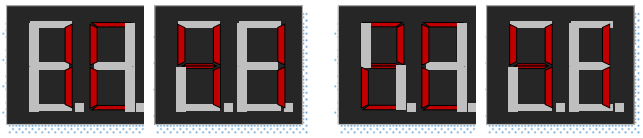
- The set number of IDUs is inconsistent with the number of IDUs installed in the system.
- The IDUs of other systems are connected to the system.
- The IDU communication wiring of the system (A) and system B are reversely connected, and the total number of IDUs of system B is greater than that of system A.

2.6.5 Procedure



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

2.7.1 Digital display output



2.7.2 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

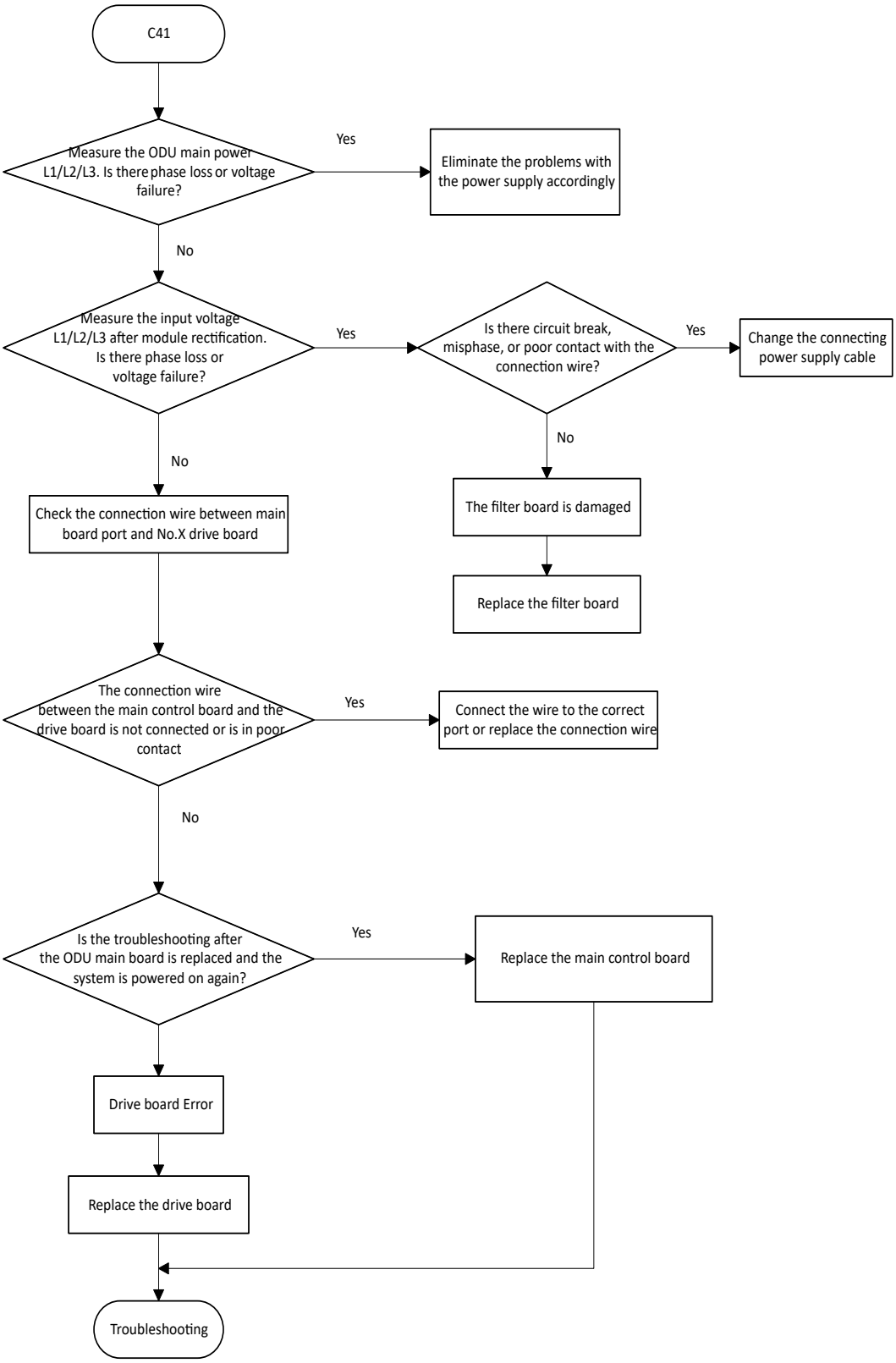
2.7.3 Trigger / recover condition

- 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.

2.7.4 Possible causes

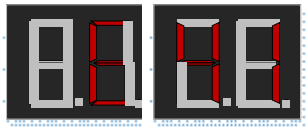
- The connection wire between No. x drive board and ODU main control board is poorly connected or disconnected.
- The main power has L1/L2/L3 misphase or abnormal voltage.
- The filter board is damaged.
- No. x inverter drive board is damaged.
- The ODU main control board is damaged

2.7.5 Procedure



2.8 E41: Outdoor ambient temperature sensor (T4) error(open/short)

2.8.1 Digital display output



2.8.2 Description

- T4 temperature sensor error
- All units stop running.
- Error code is displayed on the unit with the error

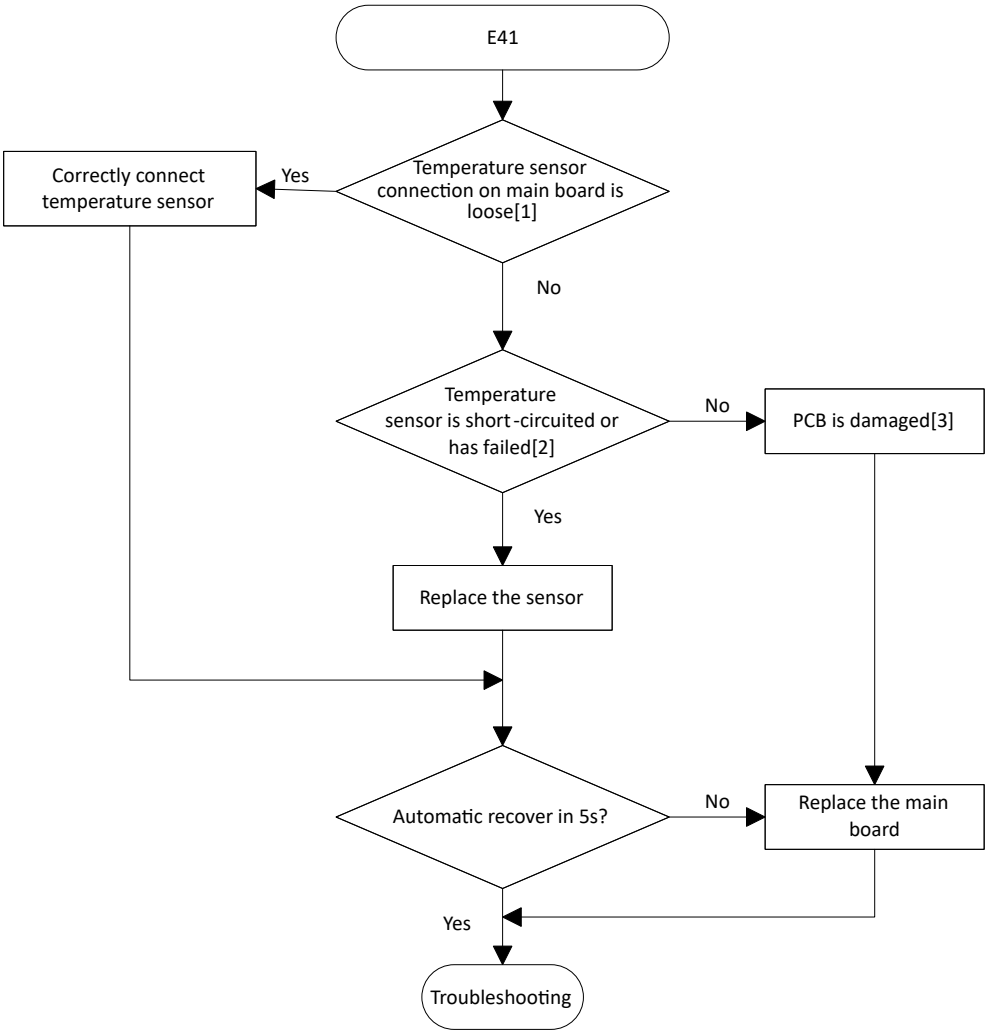
2.8.3 Trigger / recover condition

- Trigger condition: The main control board cannot obtain the normal AD value of the T4 temperature sensor
- Recover condition: The main control board obtain the normal AD value of the T4 temperature sensor
- Reset method: Resume automatically.

2.8.4 Possible causes

- The T4 temperature sensor is not properly connected to the main control board.
- The sensor is short-circuited or fails.
- The main control board is damaged

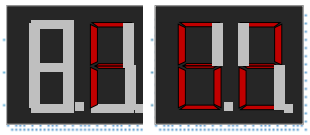
2.8.5 Procedure



Notes:
[1]. The port corresponding to the T4 sensor on the main control board is CN30. Refer to the Main Board Port Definition Table.
[2]. Measure the resistance of the T4 sensor. Unplug the T4 sensor and use the resistance range of a multimeter to measure the access resistance of the sensor: if the resistance is low (< 0.5 kΩ), the sensor is judged to be short-circuited; if the resistance is extremely high (> 380 kΩ), the sensor is judged to be faulty. (Refer to the Temperature Sensor Resistance Characteristic Table)
[3]. Measure the voltage of the CN30 port. If the sensor is tested normal, use the voltage range of a multimeter to measure the voltage of the corresponding port: after the main control board is powered on, if the port voltage is not 3.3V, the main control board is judged to be damaged and needs to be replaced.

2.9 F62, F6A: Tf/Ntc radiator overtemperature protection

2.9.1 Digital display output



2.9.2 Description

- The temperature of the Tf/Ntc radiator is too high.
- All units stop running
- Error code is displayed on the outdoor unit with the Error

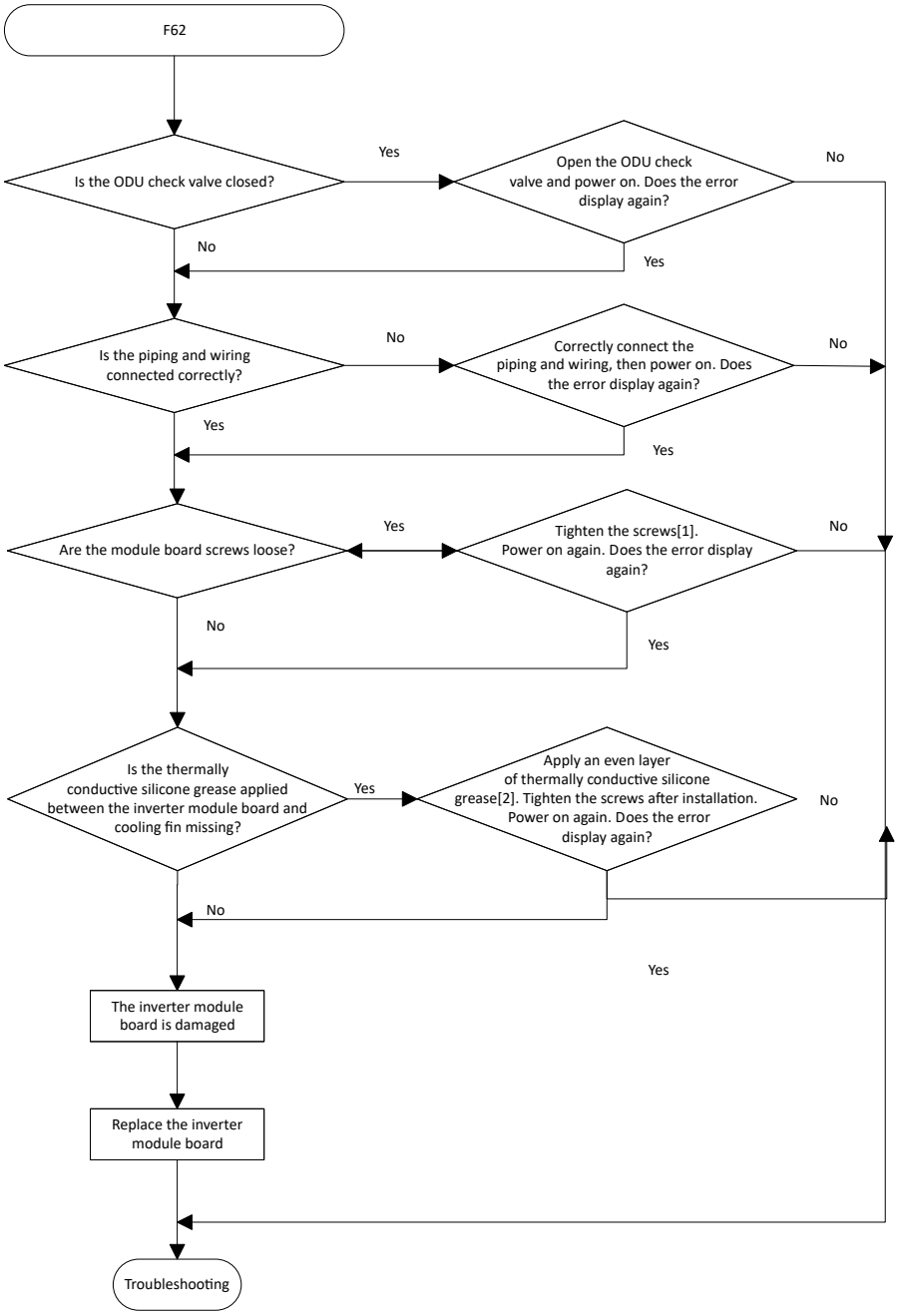
2.9.3 Trigger/ Recover condition

- Trigger condition: The temperature of the internal NTC of the compressor module board or fan module is higher than 100°C.
- Recover condition: The temperature of the internal NTC of the compressor module board or fan module is lower than 80°C.
- Reset method: Resume automatically

2.9.4 Possible causes

- The contact between the inverter drive module and radiator is poor.
- Thermally conductive silicone grease layer is missing.
- Inverter driver board is damaged
- The ODU check valve is not opened.
- Piping and wiring are inconsistent. For example, the piping for system A is connected to system A and the communication wiring is connected to system B.

2.9.5 Procedure



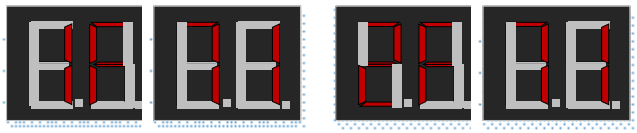
Notes:

[1]. Reinstall the Inverter driver board refer to the installation guide of Compressor & Fan drive board

[2]. The thermally conductive silicone grease layer is applied between the module board and radiator, about 0.2mm thick. If the thermally conductive silicone grease layer has deteriorated, this will cause poor radiation effect. It needs to be removed and re-applied.

2.10 xF71: Compressor discharge temperature sensor(T7C) error (open/short)

2.10.1 Digital display output



2.10.2 Description

- 1F71: Compressor discharge temperature sensor(T7C1) error.
- 2F71: Compressor discharge temperature sensor(T7C2) error.
- All units stop running
- Error code is displayed on the outdoor unit with the Error

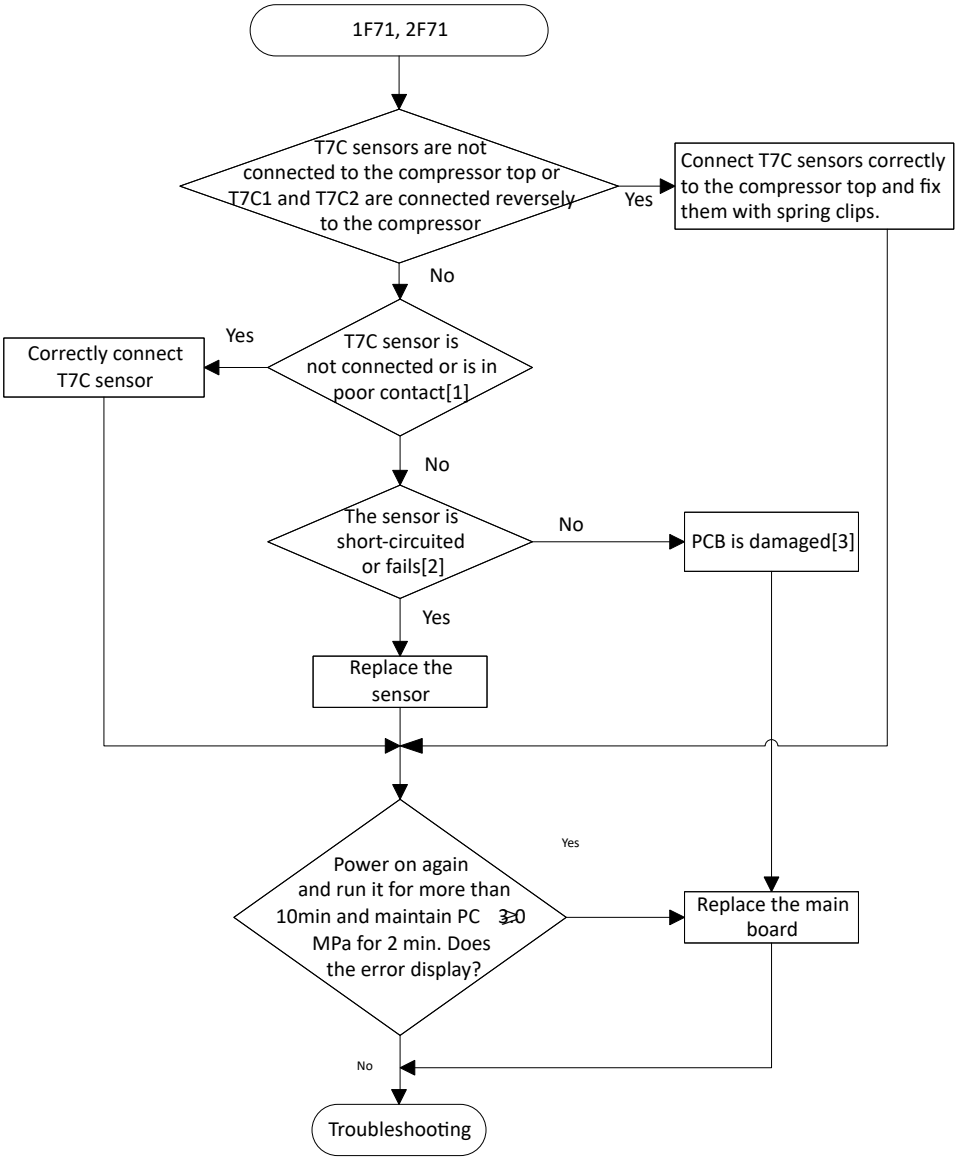
2.10.3 Trigger/ Recover condition

- Trigger condition: 1. Sensor T7C1/T7C2 failure (open circuit or short circuit); 2. After the compressor has been running for 10 minutes, the discharge temperature is lower than 15℃, and the compressor discharge pressure is higher than 3.0 MPa for 2 minutes continuously.
- Recover condition: 1. The main control board detects the normal resistance value of the sensor (0.97 kΩ to 743 kΩ); 2. The discharge pressure and discharge temperature have returned to normal.
- Reset method: Manually restart

2.10.4 Possible causes

- The T7C1/T7C2 temperature sensors are not properly installed inside the top snap-in of the compressor.
- The T7C1/T7C2 temperature sensors are not properly connected or have malfunctioned.
- The PCB is damaged..

2.10.5 Procedure



Notes:

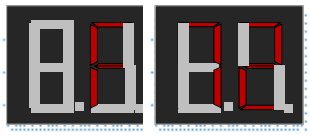
[1]. The port CN4 pin 9/10 (T7C1) on the main control board and port CN38 (T7C2) on the main control board.

[2]. Measure sensor resistance. Removing the sensor and use a multimeter to measure the sensor access resistance: If the resistance value is smaller than 0.97 kΩ, the sensor is short-circuited, whereas, if the impedance is very higher than 743 kΩ, the sensor is open-circuited (Refer to *Temperature sensor temperature resistance characteristic table*)

[3]. Measure the voltage at the ports of the T7C1 and T7C2 sensors. 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

2.11 F72: Discharge Temperature protection

2.11.1 Digital display output



2.11.2 Description

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

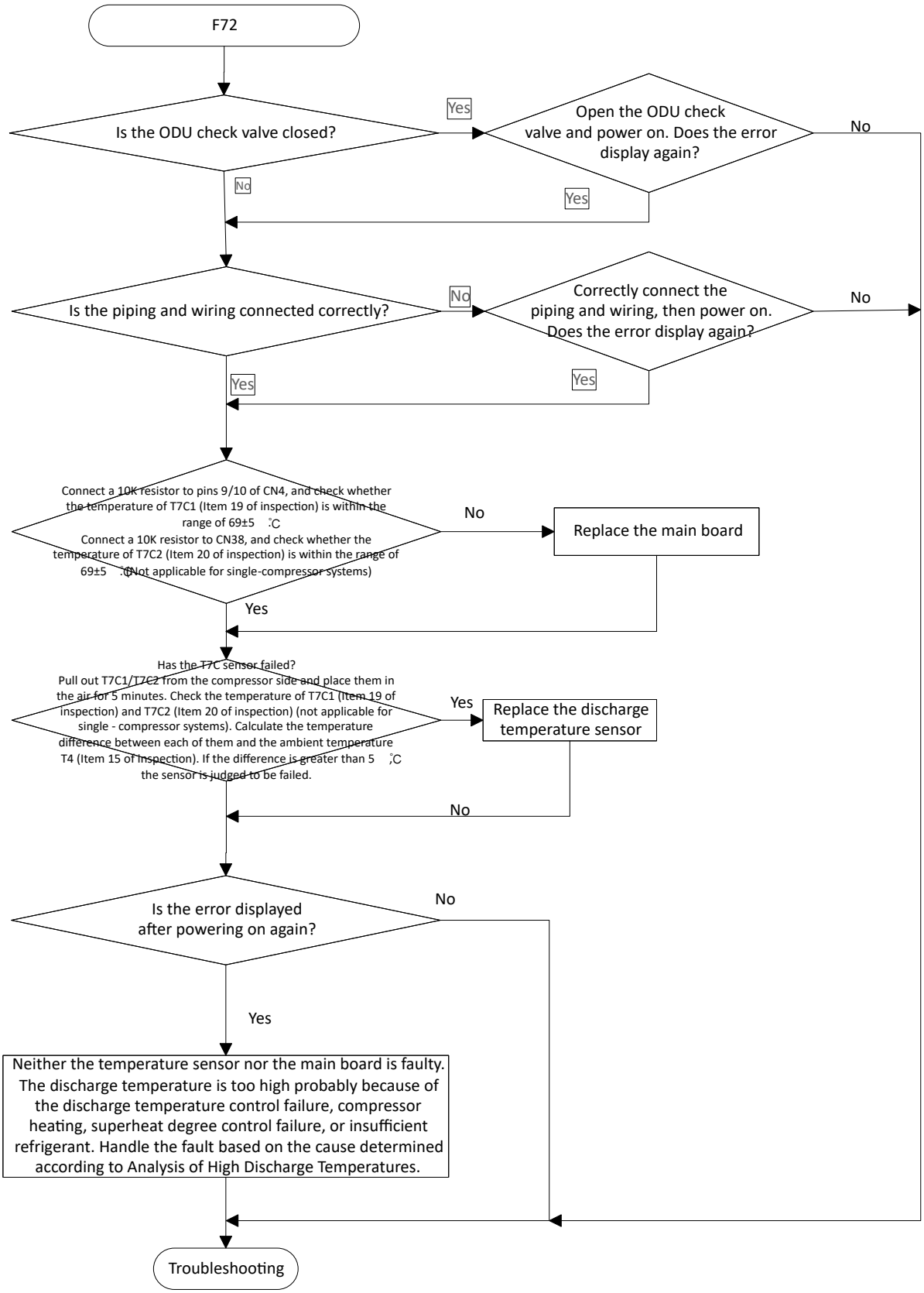
2.11.3 Trigger / Recover condition

- Trigger condition: Discharge Temperature (T7C1/T7C2) ≥ 115°C.
- Recover condition: Discharge Temperature (T7C1/T7C2) < 90 °C.
- Reset method: Resume automatically

2.11.4 Possible causes

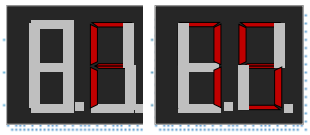
- The ODU check valve is not opened.
- Piping and wiring are inconsistent. For example, the piping for system A is connected to system A and the communication wiring is connected to system B.
- The discharge temperature sensor (T7C1/T7C2) has failed.
- The main board PCB is damaged.
- The system has insufficient refrigerant, the ODU or IDU EEV cannot be opened normally, or the ODU check valve is not opened.

2.11.5 Procdure



2.12 F75: Compressor discharge insufficient superheat protection

2.12.1 Digital display output



2.12.2 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.

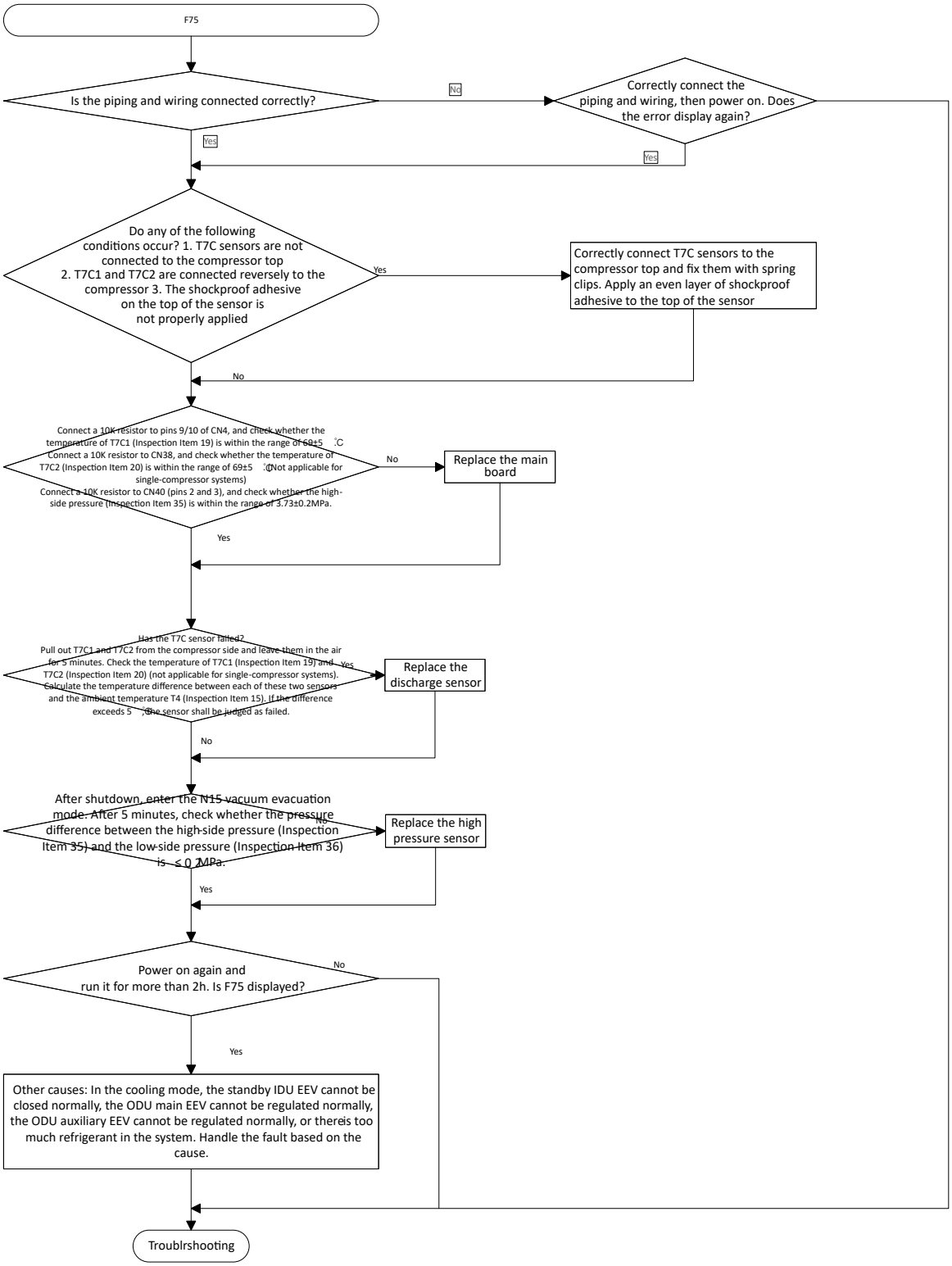
2.12.3 Trigger / recover condition

- 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

2.12.4 Possible causes

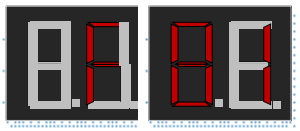
- Piping and wiring are inconsistent. For example, the piping for system A is connected to system A and the communication wiring is connected to system B.
- The discharge temperature sensor is not correctly connected or has failed.
- The high-pressure sensor is not correctly connected or has failed.
- The ODU main board is damaged.
- Certain IDU EEVs that are not opened in the cooling mode are not closed properly.
- The ODU main EEV cannot be adjusted normally.
- The ODU auxiliary EEV cannot be adjusted normally.
- There is too much refrigerant in the system.

2.12.5 Procedure



2.13 F81: Low-pressure stop valve sensor (Tg) error (open/short)

2.13.1 Digital display output



2.13.2 Description

- Tg low-pressure stop valve sensor error
- All units stop running.
- Error code is displayed on the unit with the error

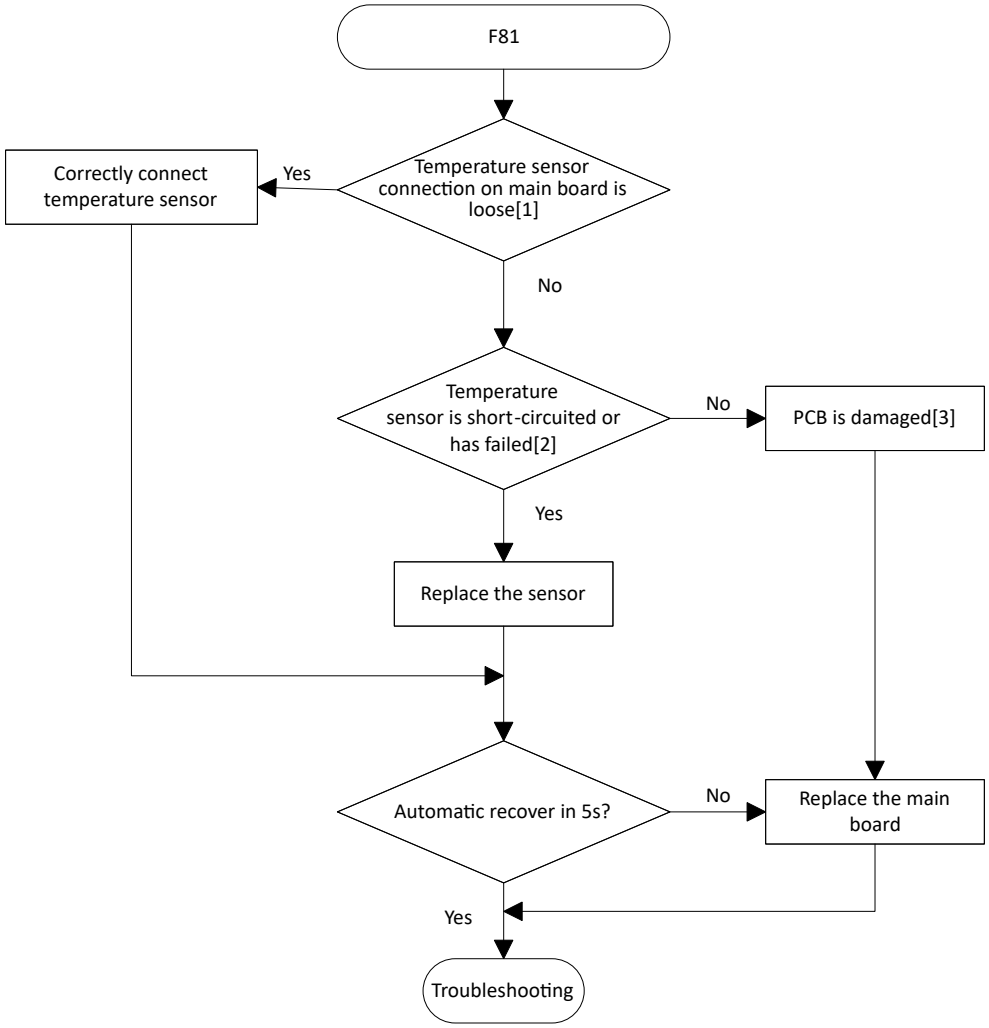
2.13.3 Trigger / recover condition

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

2.13.4 Possible causes

- The Tg temperature sensor is not properly connected to the main control board.
- The sensor is short-circuited or fails.
- The main control board is damaged

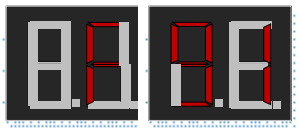
2.13.5 Procedure



Notes:
[1]. The port corresponding to the Tg sensor on the main control board is CN16. Refer to the Main Board Port Definition Table.
[2]. Measure the resistance of the Tg sensor. Unplug the Tg sensor and use the resistance range of a multimeter to measure the access resistance of the sensor: if the resistance is low (< 0.5 kΩ), the sensor is judged to be short-circuited; if the resistance is extremely high (> 380 kΩ), the sensor is judged to be faulty. (Refer to the Temperature Sensor Resistance Characteristic Table)
[3]. Measure the voltage of the CN16 port. If the sensor is tested normal, use the voltage range of a multimeter to measure the voltage of the corresponding port: after the main control board is powered on, if the port voltage is not 3.3V, the main control board is judged to be damaged and needs to be replaced.

2.14 F91: Liquid pipe temperature sensor (T5) error (open/short)

2.14.1 Digital display output



2.14.2 Description

- T5 liquid pipe temperature sensor error
- All units stop running.
- Error code is displayed on the unit with the error

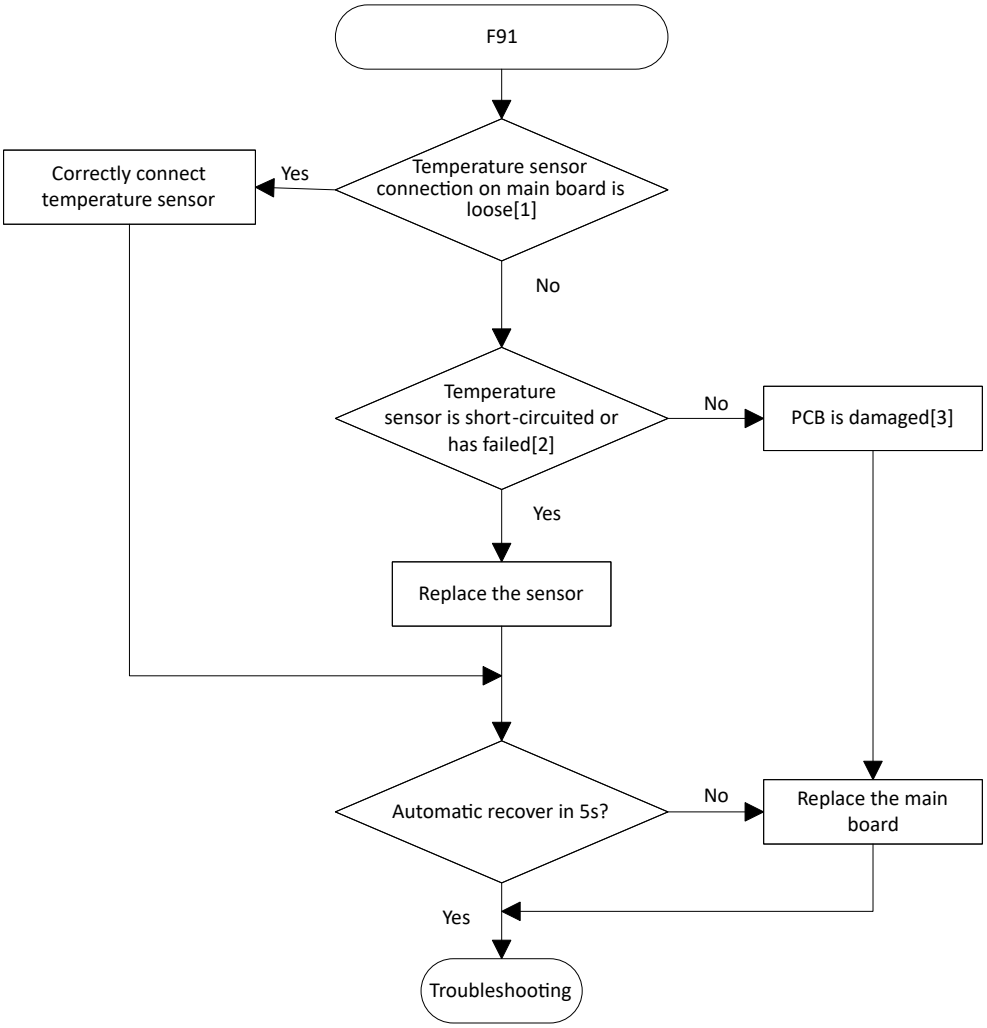
2.14.3 Trigger / recover condition

- Trigger condition: The main control board cannot obtain the normal AD value of the T5 temperature sensor
- Recover condition: The main control board obtain the normal AD value of the T5 temperature sensor
- Reset method: Resume automatically.

2.14.4 Possible causes

- The T5 temperature sensor is not properly connected to the main control board.
- The sensor is short-circuited or fails.
- The main control board is damaged

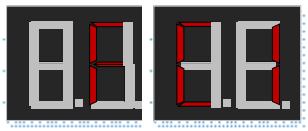
2.14.5 Procedure



Notes:
[1]. The port corresponding to the T5 sensor on the main control board is CN4 pin 3/4. Refer to the Main Board Port Definition Table.
[2]. Measure the resistance of the T5 sensor. Unplug the T5 sensor and use the resistance range of a multimeter to measure the access resistance of the sensor: if the resistance is low (< 0.5 kΩ), the sensor is judged to be short-circuited; if the resistance is extremely high (> 380 kΩ), the sensor is judged to be faulty. (Refer to the Temperature Sensor Resistance Characteristic Table)
[3]. Measure the voltage of the CN4 pin 3/4. If the sensor is tested normal, use the voltage range of a multimeter to measure the voltage of the corresponding port: after the main control board is powered on, if the port voltage is not 3.3V, the main control board is judged to be damaged and needs to be replaced.

2.15 FC1: Outdoor heat exchanger liquid temperature sensor (TL) error (open/short)

2.15.1 Digital display output



2.15.2 Description

- TL outdoor heat exchanger liquid temperature sensor error
- All units stop running.
- Error code is displayed on the unit with the error

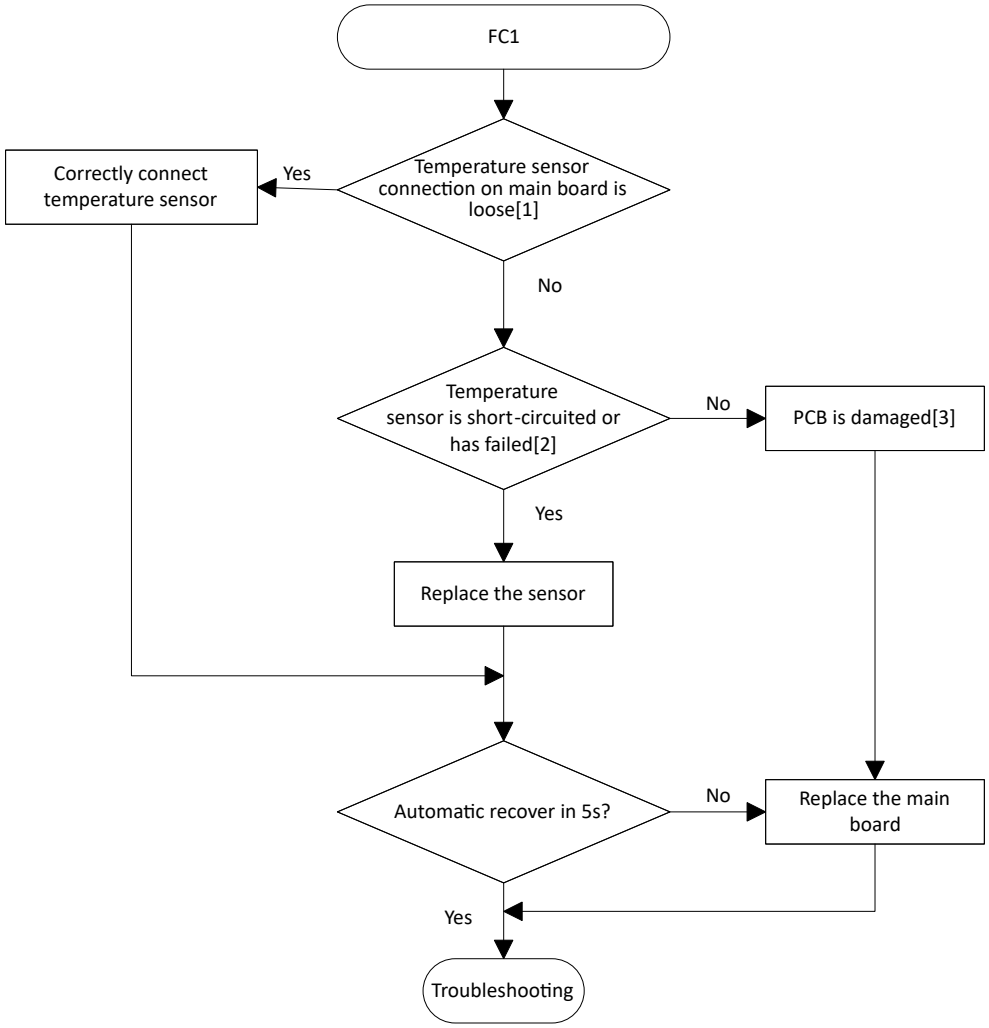
2.15.3 Trigger / recover condition

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

2.15.4 Possible causes

- The TL temperature sensor is not properly connected to the main control board.
- The sensor is short-circuited or fails.
- The main control board is damaged

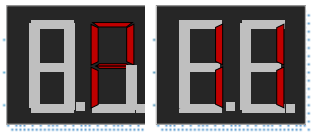
2.15.5 Procedure



Notes:
[1]. The port corresponding to the TL sensor on the main control board is CN3. Refer to the Main Board Port Definition Table.
[2]. Measure the resistance of the TL sensor. Unplug the TL sensor and use the resistance range of a multimeter to measure the access resistance of the sensor: if the resistance is low (< 0.5 kΩ), the sensor is judged to be short-circuited; if the resistance is extremely high (> 380 kΩ), the sensor is judged to be faulty. (Refer to the Temperature Sensor Resistance Characteristic Table)
[3]. Measure the voltage of the CN3. If the sensor is tested normal, use the voltage range of a multimeter to measure the voltage of the corresponding port: after the main control board is powered on, if the port voltage is not 3.3V, the main control board is judged to be damaged and needs to be replaced.

2.16 P11: High pressure sensor error

2.16.1 Digital display output



2.16.2 Description

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

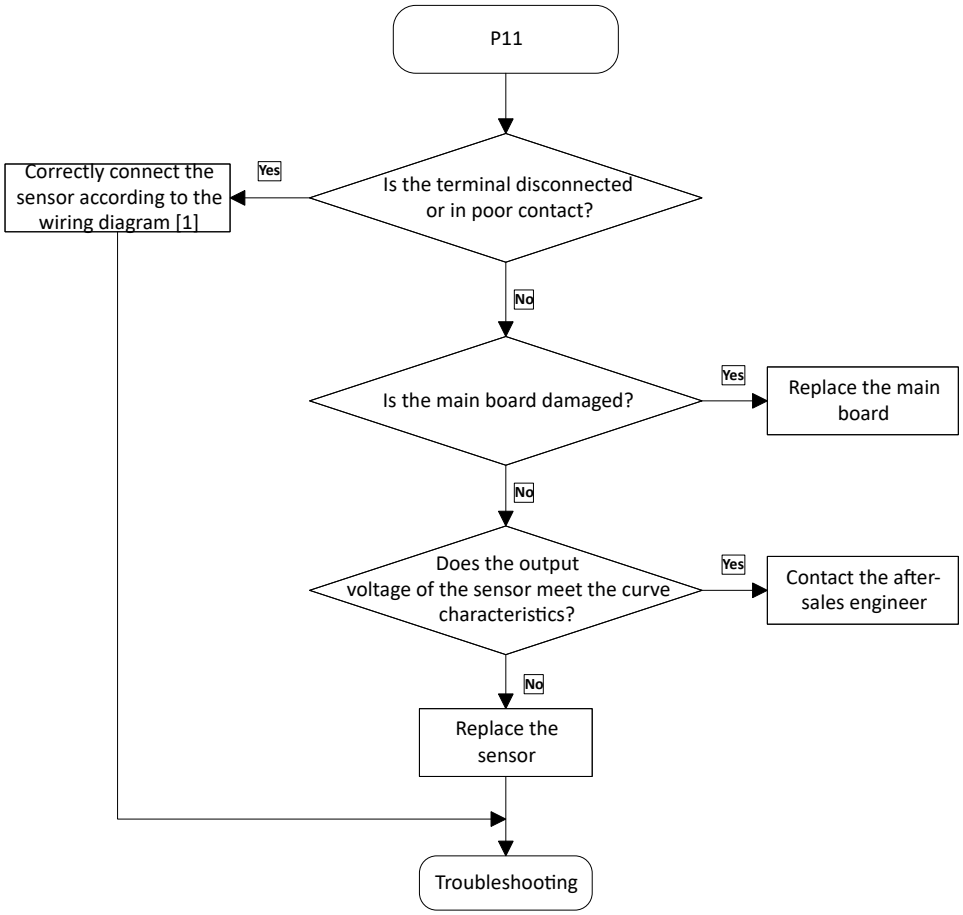
2.16.3 Trigger / recover condition

- Trigger condition: The high pressure sensor is open-circuited (the output voltage is 0V) or short-circuited.
- Recover condition: The voltage detected by the pressure sensor is within 0-5.0V.
- Reset method: Resume automatically.

2.16.4 Possible causes

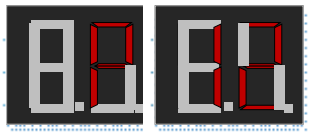
- The high pressure sensor is not properly connected to the main control board, or it fails.
- The main control board is damaged

2.16.5 Procedure



2.17 P12: High pressure protection

2.17.1 Digital display output



2.17.2 Description

- The high pressure is over the limit.
- All units stop running
- Error code is displayed on the unit with the Error

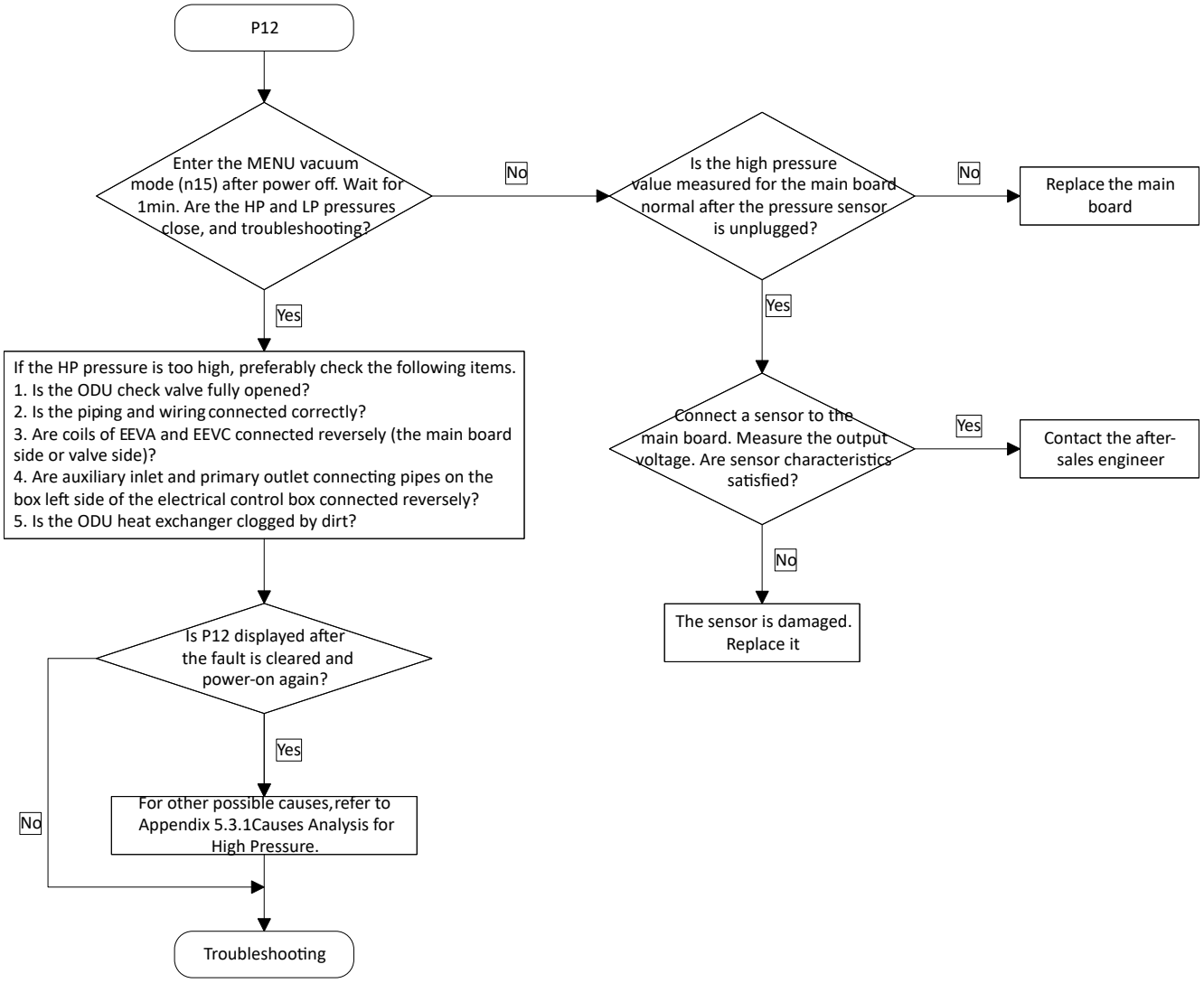
2.17.3 Trigger / recover condition

- Trigger condition: $P_{high\ pressure} \geqslant$ 4.15 MPa.
- Recover condition: $P_{high\ pressure}$ < 3.5MPa
- Reset method: Resume automatically.

2.17.4 Possible causes

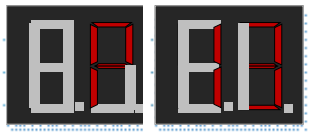
- Pressure sensor damaged
- Outdoor main control board damaged.
- Refer to Appendix - Cause Analysis of too high Pressure.
  Common causes of high pressure in operation:
  - The ODU check valve is not opened.
  - Piping and wiring are inconsistent. For example, the piping for system A is connected to system A and the communication wiring is connected to system B.
  - Coils of EEVA and EEVC are connected reversely (the main board side or valve side).
  - The auxiliary inlet and primary outlet connecting pipes on the left side of the electrical control box are connected reversely.
  - The ODU heat exchanger is clogged by dirt.

2.17.5 Procedure



2.18 P13: High pressure switch protection

2.18.1 Digital display output



2.18.2 Description

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

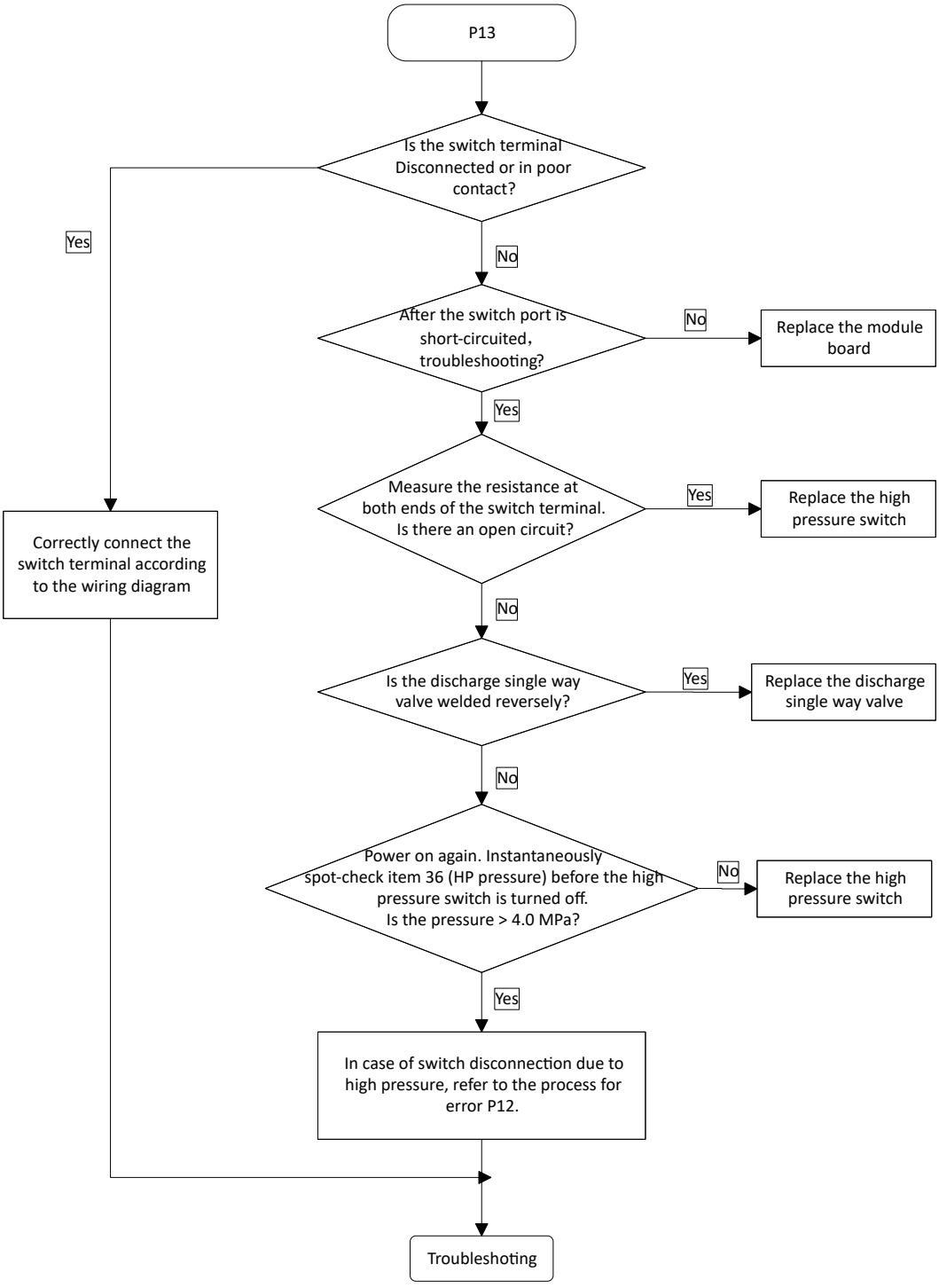
2.18.3 Trigger / recover condition

- Trigger condition: discharge pressure≥ 4.1MPa or the switch is open-circuited.
- Recover condition: pressure switch is closed.
- Reset method: Resume automatically.

2.18.4 Possible causes

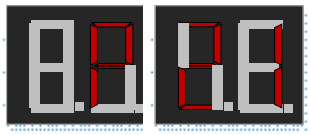
- Discharge single way valve is welded reversely.
- Pressure switch is not correctly connected or is damaged.
- Outdoor main control board damaged.
- For other causes, refer to Appendix - Cause Analysis of too high Pressure.

2.18.5 Procedure



2.19 P21: Low pressure sensor error

2.19.1 Digital display output



2.19.2 Description

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

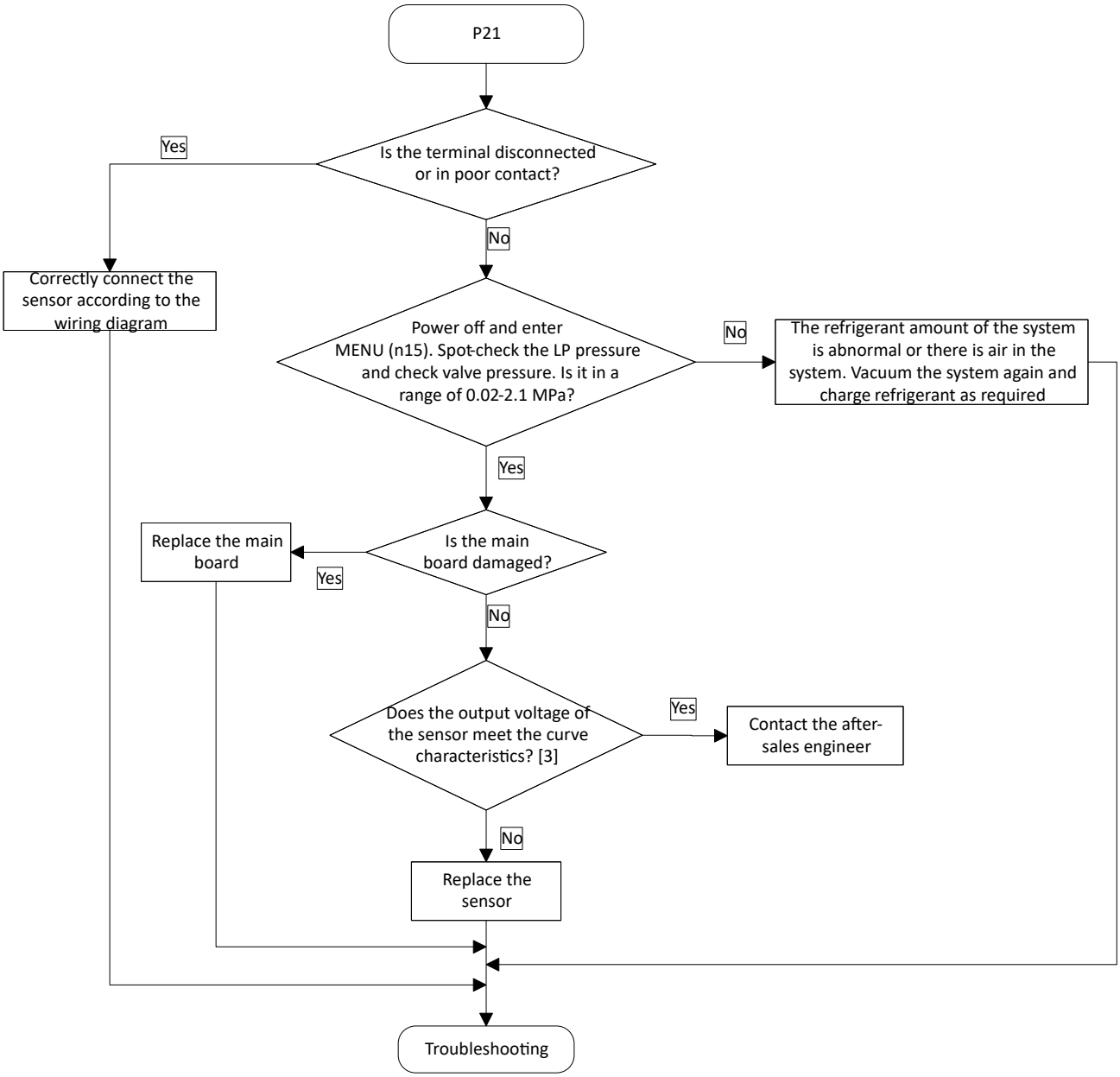
2.19.3 Trigger / recover condition

- Trigger condition: $P_{Low\ Pressure} < 0.02MPa$ or $P_{Low\ Pressure} > 2.1MPa$ (including sensor open circuit).
- Recover condition: $0.02Mpa \leqslant P_{Low\ Pressure} \leqslant 2.1Mpa$
- Reset method: Resume automatically.

2.19.4 Possible causes

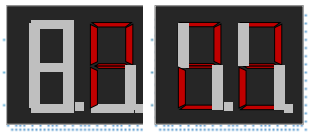
- There is air in the system.
- Low pressure sensor is not correctly connected to the main board.
- There is no refrigerant in the system.
- Pressure exceeds the operating range.
- Outdoor unit main board is damaged.
- Pressure sensor has failed.

2.19.5 Procedure



2.20 P22: Low pressure protection

2.20.1 Digital display output



2.20.2 Description

- Low pressure protection;
- All units stop running.
- Error code is displayed on the unit with the error.

2.20.3 Trigger/ Recover condition

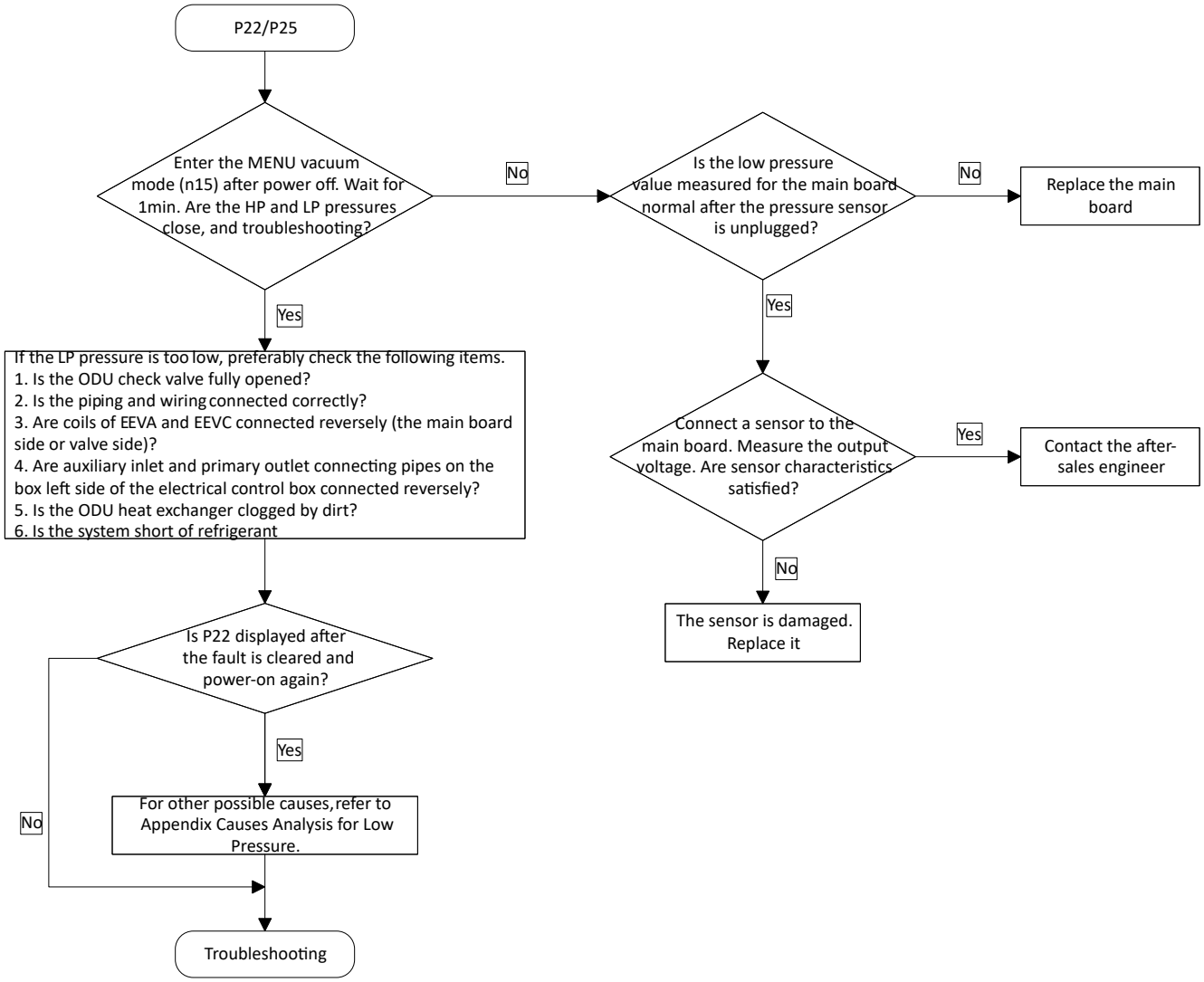
- Trigger condition: suction pressure < 0.07MPa and lasts 60 minutes.
- Recover condition: Suction pressure >0.15MPa
- Reset method: Resume automatically

2.20.4 Possible causes

- ODU check valve is not opened.
- Piping and wiring are inconsistent. For example, the piping for system A is connected to system A and the communication wiring is connected to system B.
- Sensor detection is abnormal.
- Outdoor unit main board is damaged.
- Refer to Appendix - Cause Analysis of too Low Pressure.

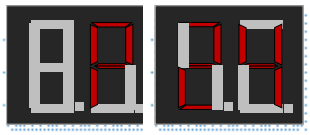
  Common causes of low pressure in operation:
  - Coils of EEVA and EEVC are connected reversely (the main board side or valve side).
  - The auxiliary inlet and primary outlet connecting pipes on the left side of the electrical control box are connected reversely.
  - EEVA is seized and cannot be opened in heating mode.
  - Insufficient refrigerant in the system.
  - Low-pressure side piping is clogged by ice.
  - Ourdoor unit heat exchanger is clogged by dirt.

2.20.5 Procedure



2.21 P24: Low Pressure too High Protection

2.21.1 Digital display output



2.21.2 Description

- All units stop running.
- ODU fault is determined based on the sensor.
- Error code is displayed on the unit with the error

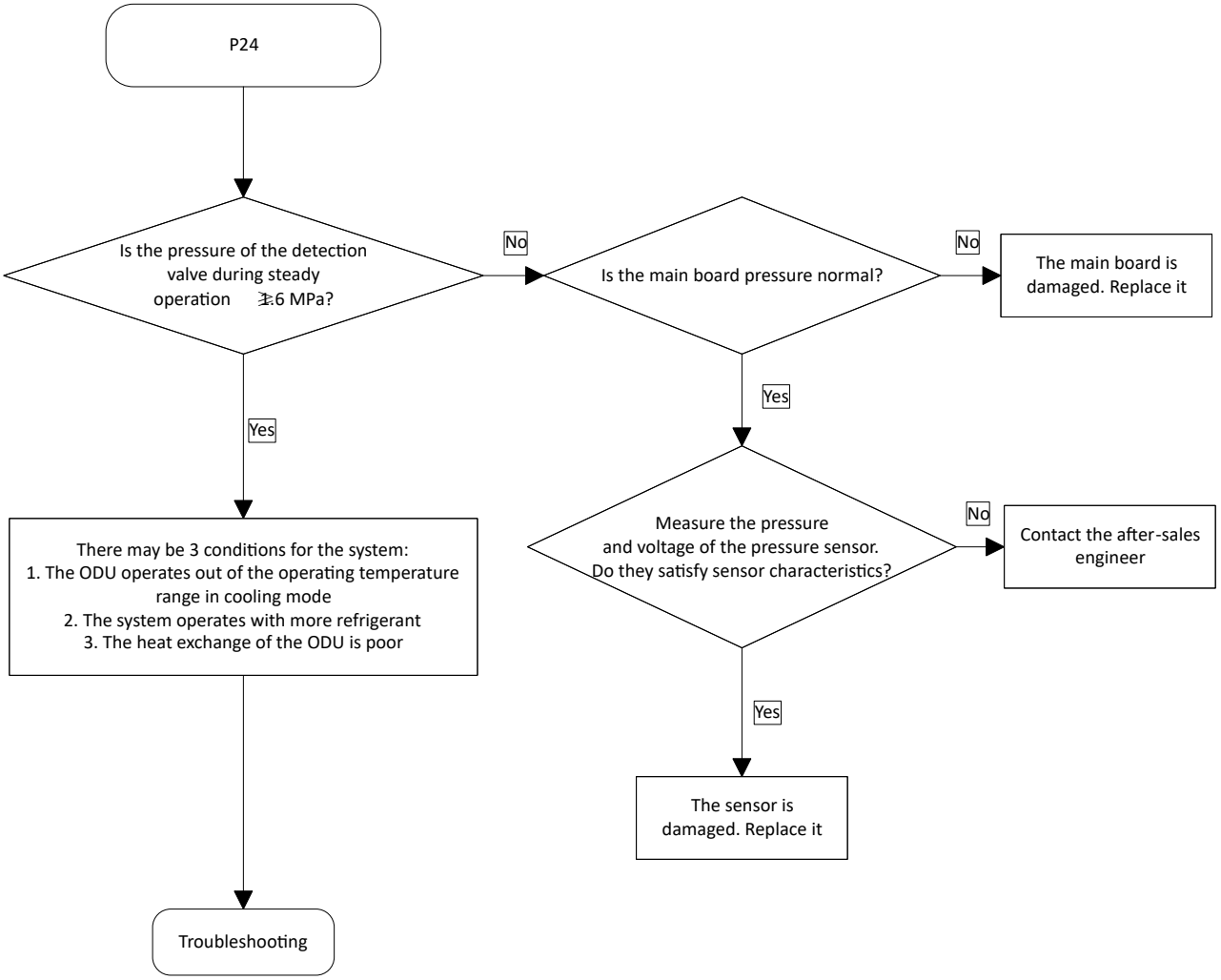
2.21.3 Trigger/ Recover condition

- Trigger condition: Suction pressure >1.6MPa and lasts 60 minutes
- Recover condition: Outdoor unit power off and resume automatically after 1 minute.
- Reset method: Resume automatically

2.21.4 Possible causes

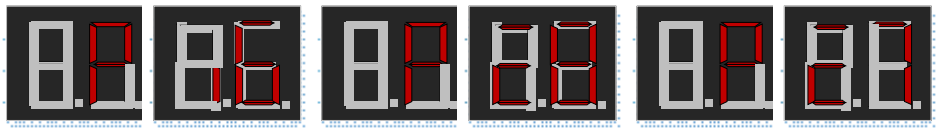
- Low pressure of the system is too high:
  1. There is too much refrigerant.
  2. The ambient temperature of the Outdoor unit exceeds the operating range.
  3. Heat exchange of the ODU is severely poor.
- Outdoor unit main board is damaged.
- Sensor fault

2.21.5 Procedure



2.22 P16/P27/P28 SENT Pressure Sensor Fault

2.22.1 Digital display output



2.22.2 Description

- P16 SENT high-pressure sensor open/short circuit fault.
- P28 SENT low-pressure sensor open/short circuit fault.
- P27 SENT high-low pressure sensor misconnection fault.
- All units stop running.
- Faults are displayed individually on each outdoor unit

2.22.3 Trigger/ Recover condition

- Trigger condition for P16: the condition where fast channel DEC = 0 or 4089 ⩽ fast channel DEC ⩽ 4095 occurs 10 consecutive times.
- Recovery condition for P16: 1 ⩽ fast channel DEC ⩽ 4088.
- Reset method for P16: Resume automatically

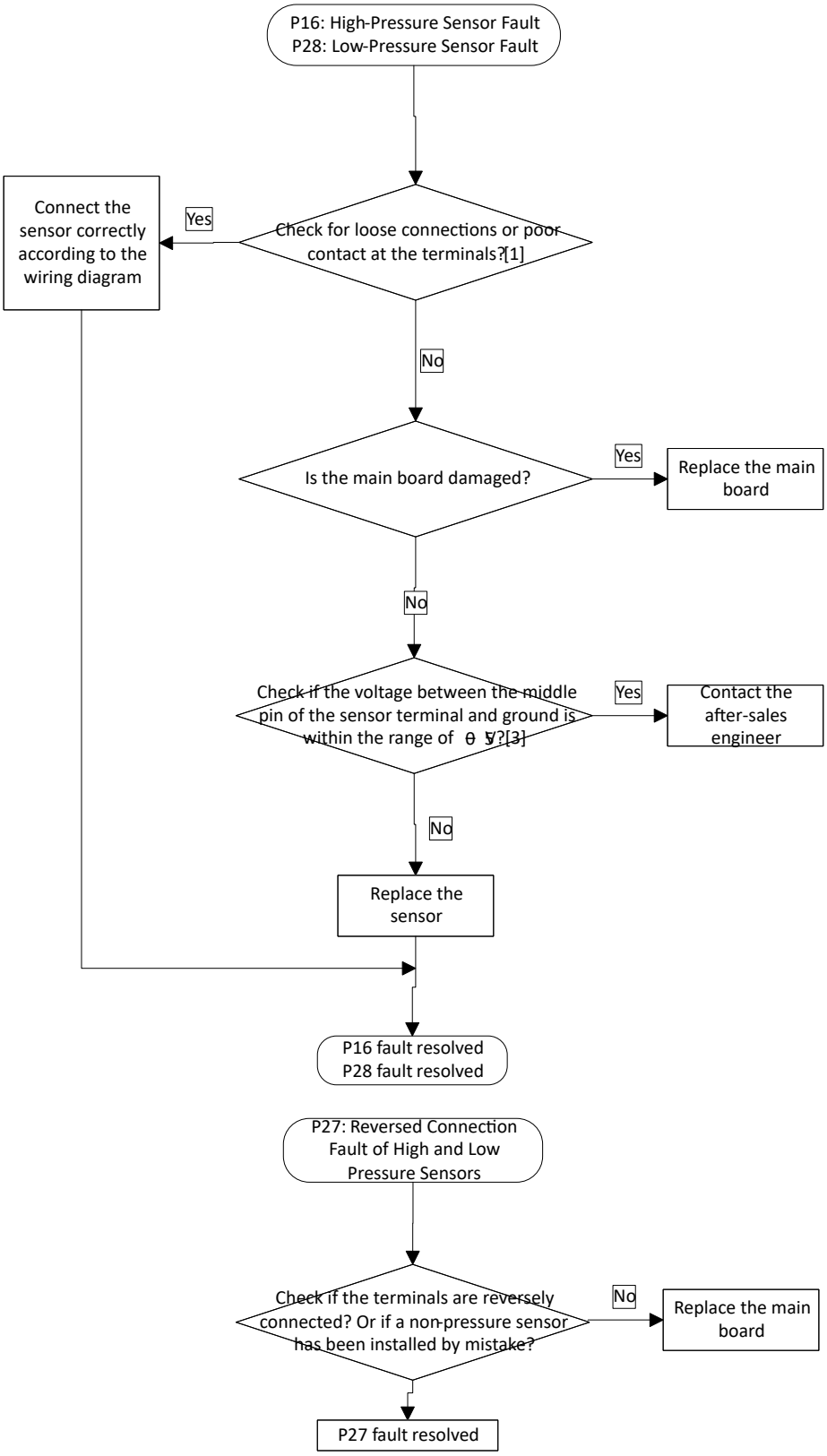
- Trigger condition for P28: the condition where fast channel DEC = 0 or 4089 ⩽ fast channel DEC ⩽ 4095 occurs 10 consecutive times, or Pe < 0.02 MPa persists for 5 seconds.
- Recovery condition for P28: 1 ⩽ fast channel DEC ⩽ 4088 and Pe ⩾ 0.02 MPa.
- Reset method for P28: Resume automatically

- Trigger condition for P27: incorrect installation position of high and low pressure sensors.
- Recovery condition for P27: correct installation position of high and low pressure sensors.
- Reset method for P27: Resume automatically

2.22.4 Possible causes

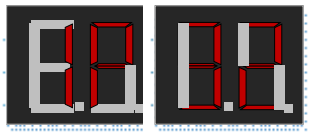
- Reversed connection of high and low pressure sensors
- Improper connection of high and low pressure sensors to the main board
- Sensor failure
- Pressure exceeding the operating range
- Main board damaged

2.22.5 Procedure



2.23 xP32: Compressor High DC Bus Current Protection

2.23.1 Digital display output



2.23.2 Description

- The DC bus current of compressor is too high, triggering protection shutdown
- All units stop running.
- Error code is displayed on the outdoor unit.

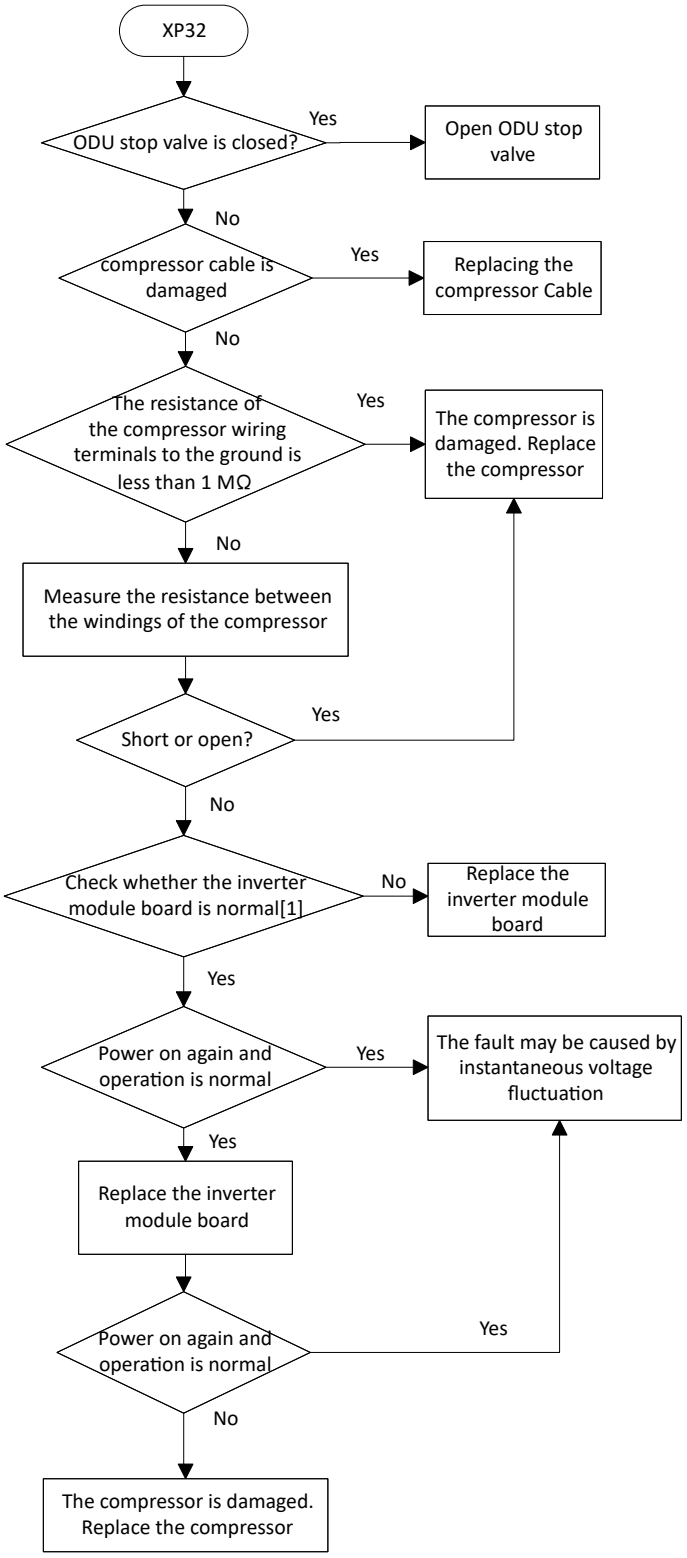
2.23.3 Trigger / recover condition

- Trigger condition: During operation, the DC bus current of any compressor exceeds the upper limit
- Recover condition: The DC bus current of all compressors is lower than the recovery value
- Reset method: Resume automatically

2.23.4 Possible causes

- The compressor is overloaded.
- The module board is damaged.
- The compressor cable is not connected.
- The compressor is damaged.

2.23.5 Procedure

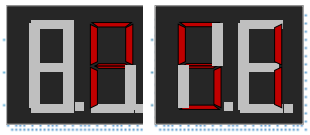


Note:

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

2.24 P51: High AC voltage protection

2.24.1 Digital display output



2.24.2 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.

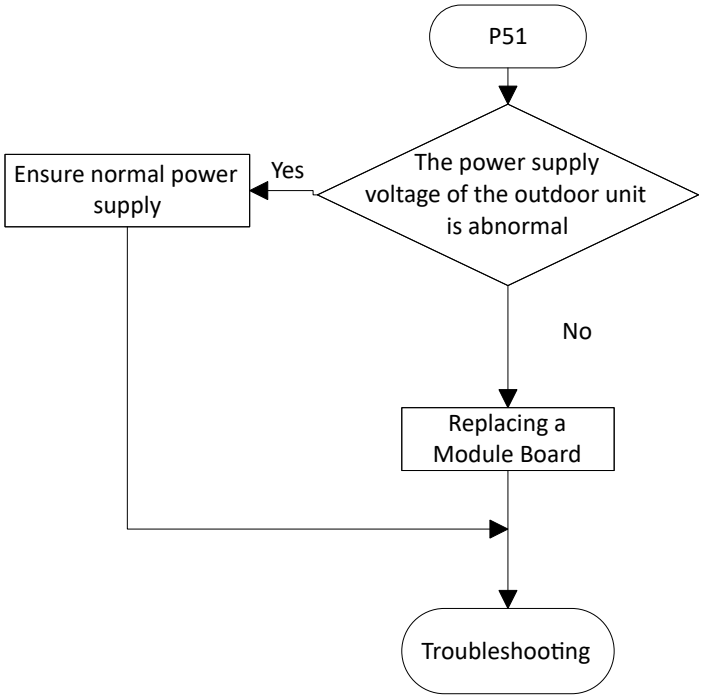
2.24.3 Trigger / recover condition

- 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.

2.24.4 Possible causes

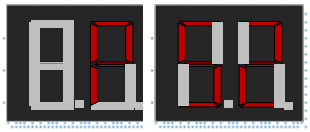
- The power supply voltage is too high
- The module is damaged.

2.24.5 Procedure



2.25 P52: Low voltage protection

2.25.1 Digital display output



2.25.2 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

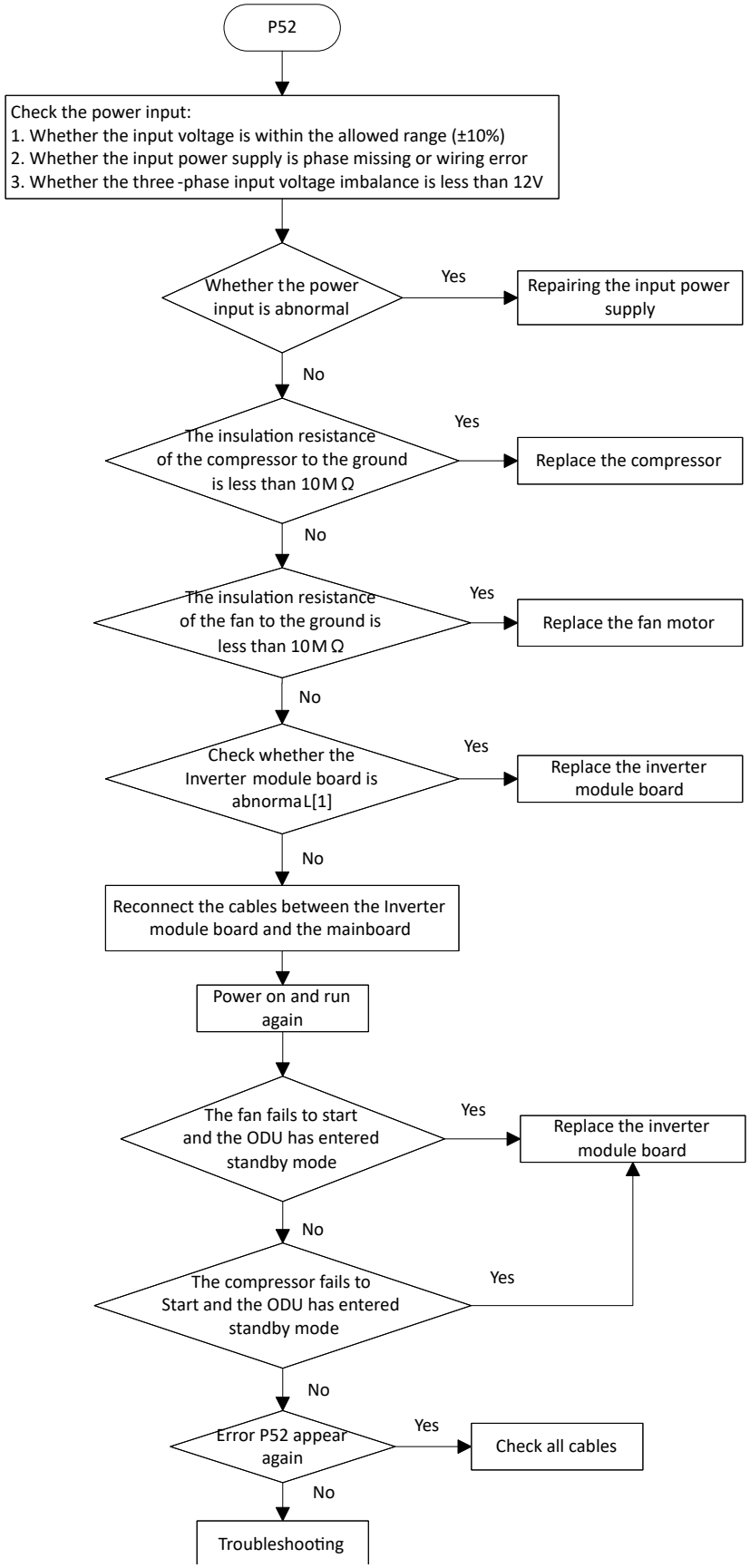
2.25.3 Trigger / recover condition

- 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.

2.25.4 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

2.25.5 Procedure

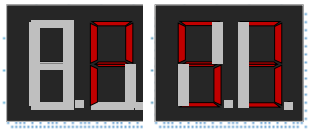


Note:

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

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

2.26.1 Digital display output



2.26.2 Description

- System phase and neutral wires are connected reversely and fail the inspection
- All units stop running
- Error code is displayed on the unit with the error

2.26.3 Trigger / recover condition

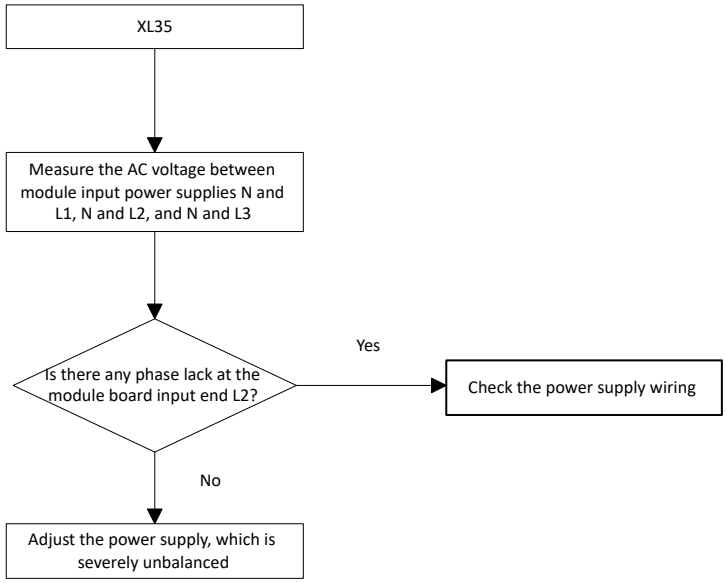
- Trigger condition: The drive board uploads L35 fault
- Recover condition: The drive board does not upload L35 fault
- Reset method: Resume automatically

2.26.4 Possible causes

- Outdoor Uint power supply B N is inversely connected
- Cables in the electric control box are loose
- The module board PCB is damaged

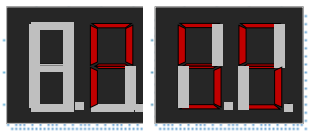
2.26.5 Procedure

Perform troubleshooting based on the xL35



2.27 P55: DC bus ripple over protection

2.27.1 Digital display output



2.27.2 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

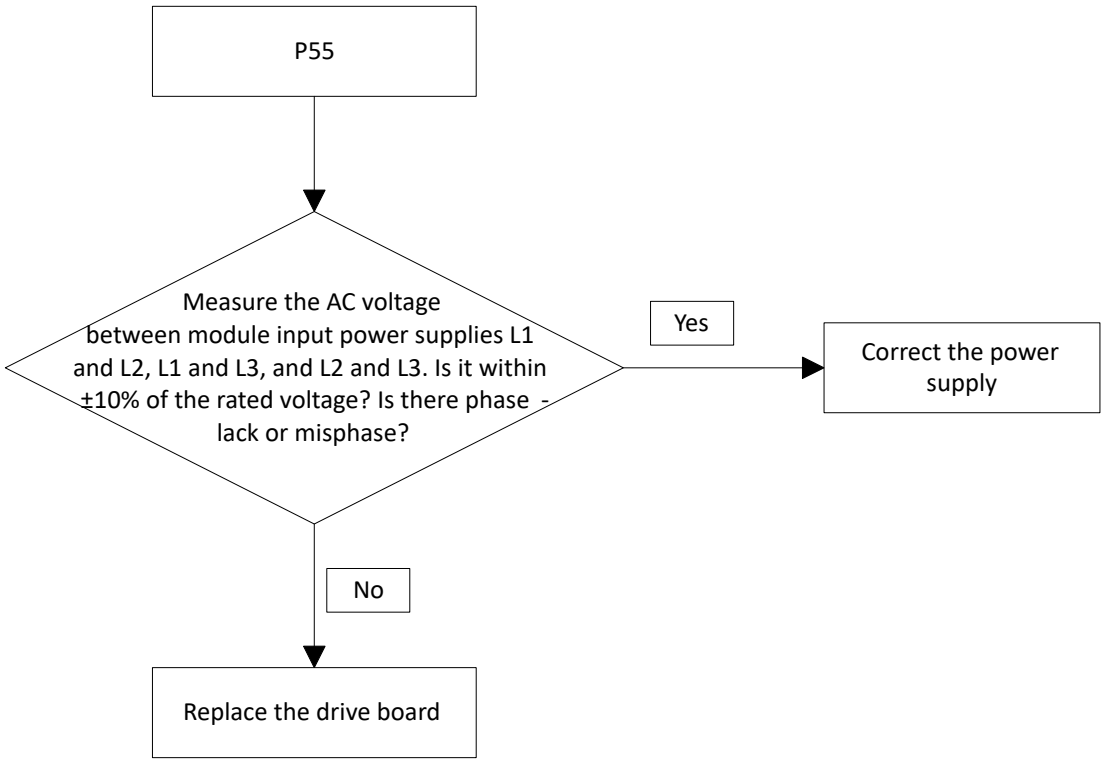
2.27.3 Trigger / recover condition

- Trigger condition: The DC bus ripple voltage uploaded by the drive board exceeds the threshold set by the main control board.
- Recover condition: The DC bus ripple voltage is lower than the threshold set by the main control board.
- Reset method: Resume automatically

2.27.4 Possible causes

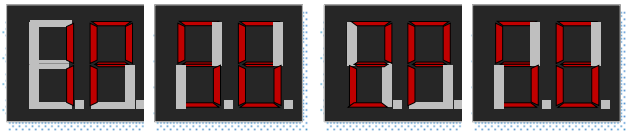
- The Outdoor Unit power supply is out of phase or seriously unbalanced
- Cables in the electric control box are loose
- Module board PCB is damaged.

2.27.5 Procedure



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

2.28.1 Digital display output



2.28.2 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

2.28.3 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.

2.28.4 Possible causes

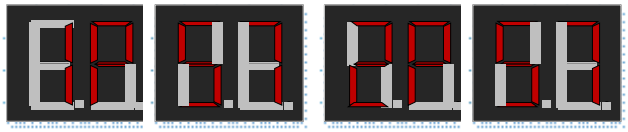
- The Outdoor Unit power supply is too low or phase is missing
- Cables in the electric control box are loose
- Inverter driver board is damaged

2.28.5 Procedure

Troubleshoot according to xJ3E/xL3E

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

2.29.1 Digital display output



2.29.2 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

2.29.3 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.

2.29.4 Possible causes

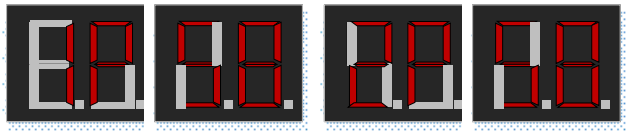
- The Outdoor Unit power supply is too high
- Inverter driver board is damaged

2.29.5 Procedure

Troubleshoot according to xJ31/xL31

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

2.30.1 Digital display output



2.30.2 Description

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

2.30.3 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.

2.30.4 Possible causes

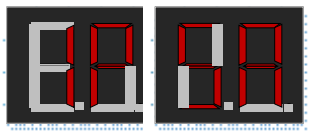
- The input voltage is too high, resulting in the high DC bus voltage
- The power grid voltage is too high
- Inverter driver board is damaged

2.30.5 Procedure

Troubleshoot according to xJ32/xL32

2.31 xP5A: Phase B Misphase of Inverter Module Input Power Supply

2.31.1 Digital display output



2.31.2 Description

- The phase and neutral wires are connected reversely and fail the inspection.
- All units stop running
- Error code is displayed on the unit with the error

2.31.3 Trigger / recover condition

- Trigger condition: phase and neutral wires are connected reversely
- Recover condition: phase and neutral wires are connected correctly
- Reset method: Resume automatically.

2.31.4 Possible causes

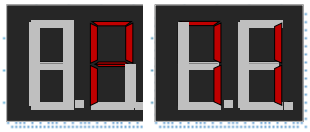
- The B and N phases of the ODU power supply are connected reversely.
- The internal wiring of the electrical control box is loose.
- The module board PCB is damaged.

2.31.5 Procedure

Troubleshoot according to xL35

2.32 P71: Error in EEPROM

2.32.1 Digital display output



2.32.2 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

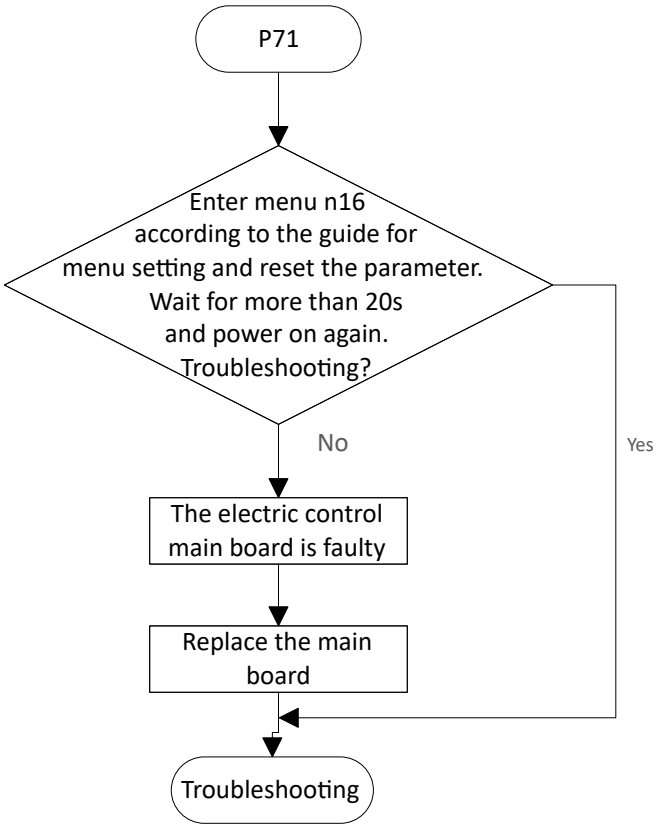
2.32.3 Trigger / recover condition

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

2.32.4 Possible causes

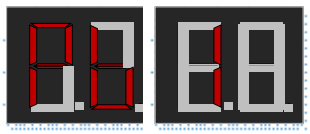
- EEPROM units damaged:
- Main control board is damaged
- Menu settings are incorrect

2.32.5 Procedure



2.33 Pb1: HyperLink overcurrent error

2.33.1 Digital display output



2.33.2 Description

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

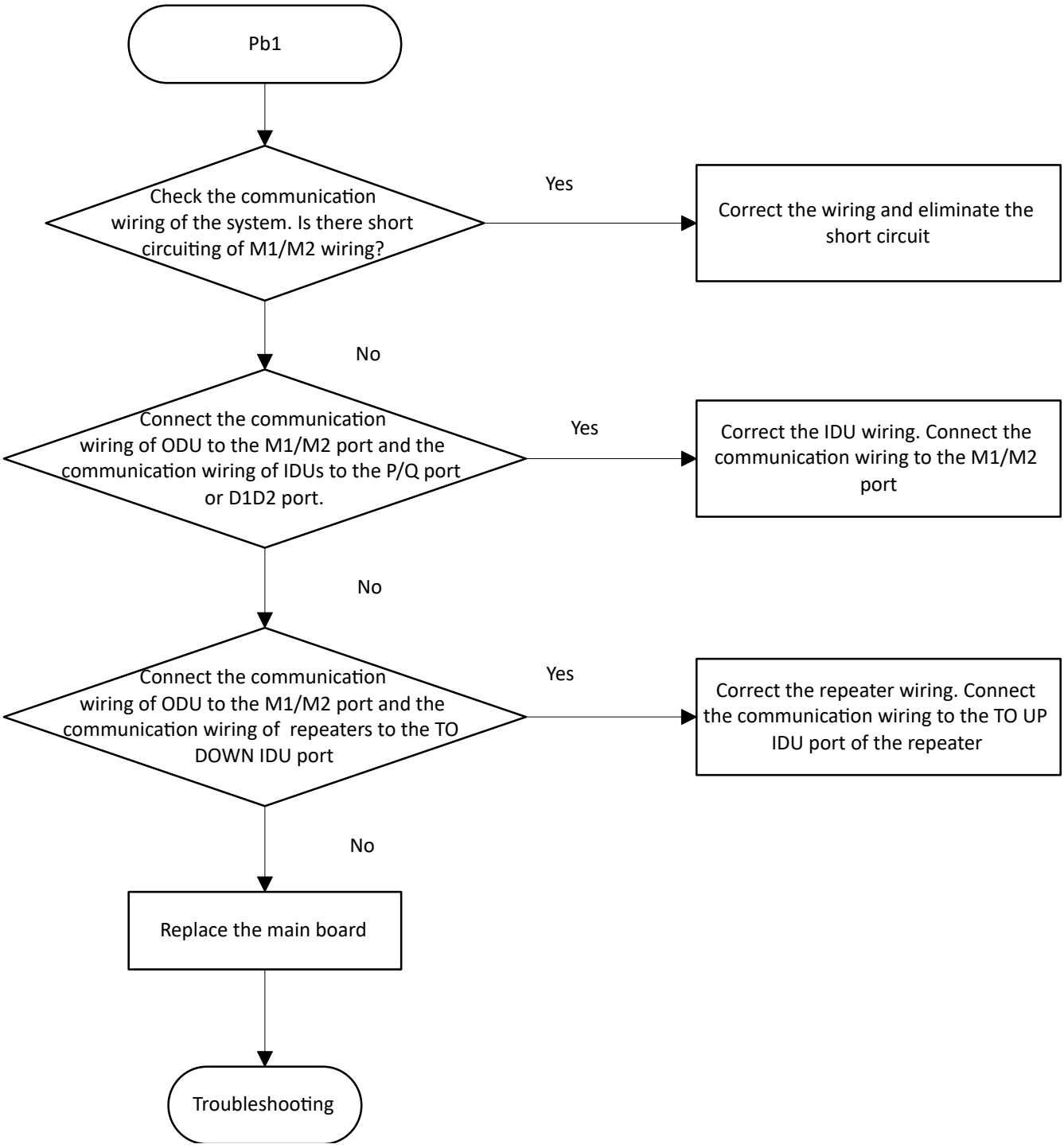
2.33.3 Trigger / recover condition

- Trigger condition: The M1M2 communication wiring is short-circuited, or M1M2 is connected to the 485 communication port by mistake
- Recover condition: Eliminate the short circuit/wrong connection
- Reset method: Automatic restoration if the error display time is less than 2h; power on again if the error display time is greater than 2h.

2.33.4 Possible causes

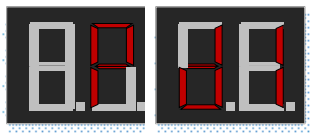
- The M1M2 communication wiring of the master ODU is short-circuited.
- The M1M2 communication wiring of the master ODU is connected to other communication wiring (not M1M2) of the IDU.
- The M1M2 communication wiring of the master ODU is connected to port “TO DOWN IDU” of the repeater.
- Main control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

2.33.5 Procedure



2.34 Pd1: Anti-condensation protection

2.34.1 Digital display output



2.34.2 Description

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

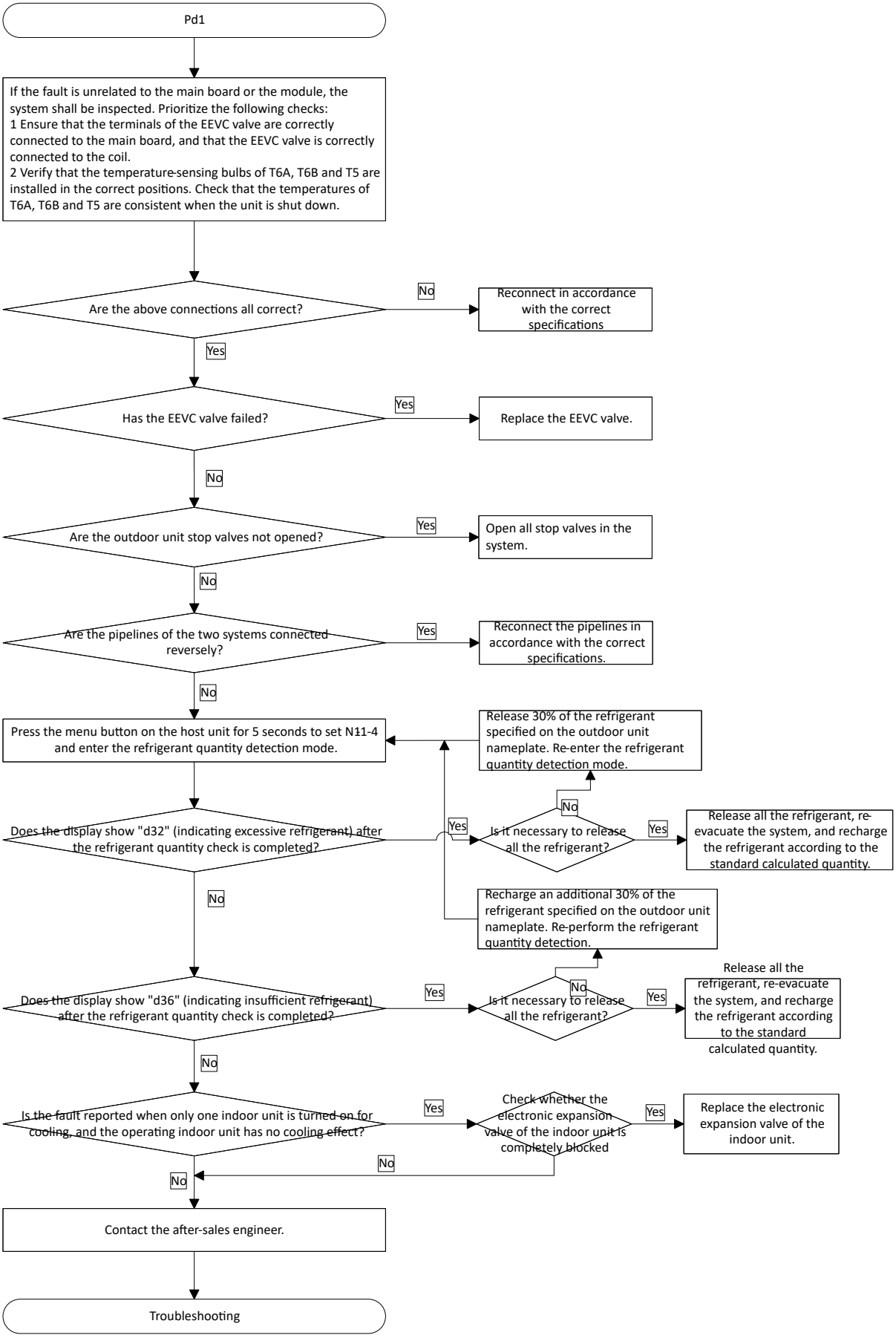
2.34.3 Trigger / recover condition

- Trigger condition: Liquid pipe inlet temperature (T5) remains lower than the anti-condensation setting temperature for more than 100 min
- Recover condition: Liquid pipe inlet temperature (T5) is higher than the anti-condensation setting temperature
- Reset method: Resume automatically

2.34.4 Possible causes

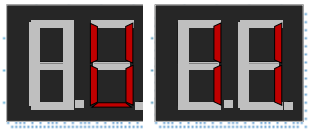
- The ODU check valve is not opened.
- Piping and wiring are inconsistent. For example, the piping for system A is connected to system A and the communication wiring is connected to system B.
- EEVC fails and cannot be closed normally.
- Low T5 temperature caused by excessive refrigerant in cooling mode or insufficient refrigerant in heating mode.
- Only one indoor unit is turned on in cooling mode, and the expansion valve of this indoor unit is completely blocked.

2.34.5 Procedure



2.35 U11: Outdoor unit model is not set

2.35.1 Digital display output



2.35.2 Description

- The outdoor unit model is not set into the main board.
- All units stop running
- Error code is displayed on the unit with the error

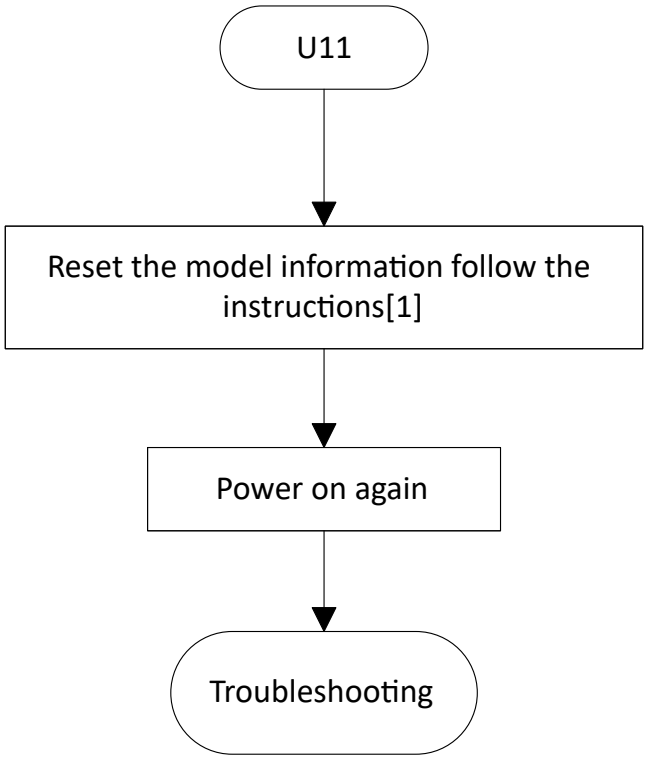
2.35.3 Trigger / recover condition

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

2.35.4 Possible causes

- Outdoor unit model is not set or setting fails after replacing the main board.

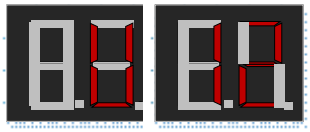
2.35.5 Procedure



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

2.36 U12: Outdoor unit Capacity setting error

2.36.1 Digital display output



2.36.2 Description

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

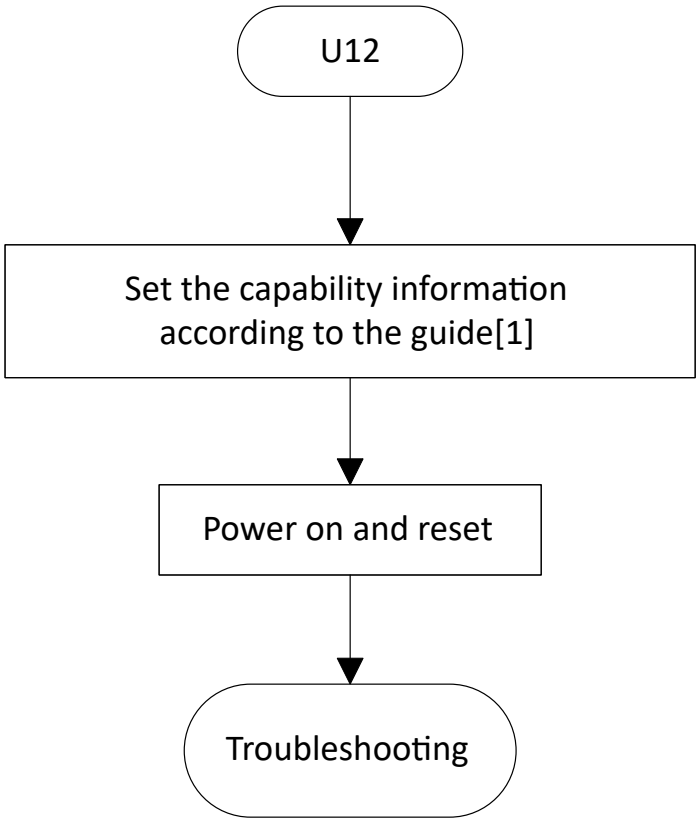
2.36.3 Trigger / recover condition

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

2.36.4 Possible causes

- The capability information of outdoor unit is not set

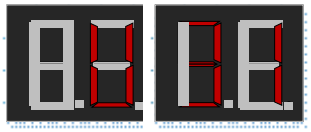
2.36.5 Procedure



Note:
[1] Use the Bluetooth module or Bluetooth after-sales kit set the capability information according to the nameplate

2.37 U31: The test run was never successful

2.37.1 Digital display output



2.37.2 Description

- The system is not in the test run or the test run is unsuccessful
- All units stop running
- Error code is only displayed on the master unit.

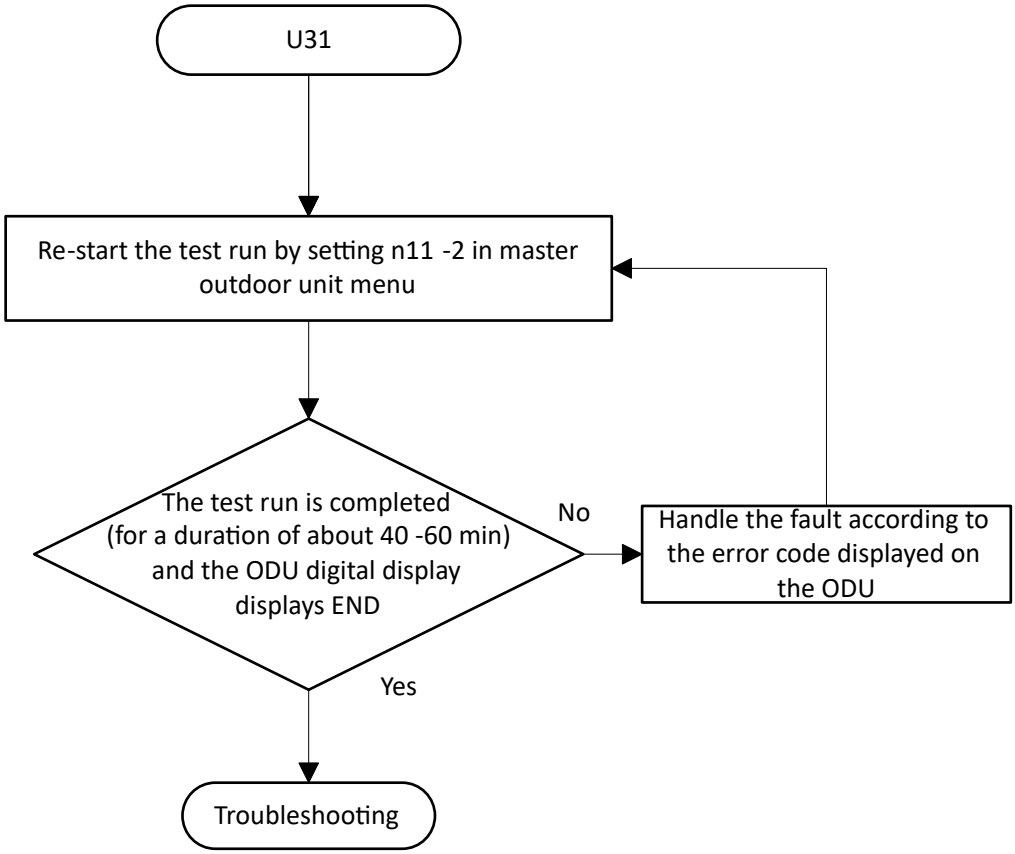
2.37.3 Trigger / Recover condition

- Trigger condition:
  - The system is not in the test run mode within 30 min of power-on
  - The test run is unsuccessful
- Recover condition: The test run complete successfully.
- Reset method: Resume manually

2.37.4 Possible causes

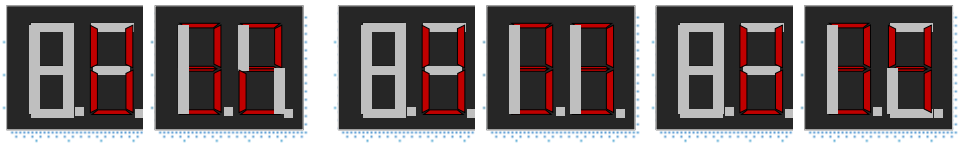
- The system is not in the test run or the test run is unsuccessful

2.37.5 Procedure



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

2.38.1 Digital display output



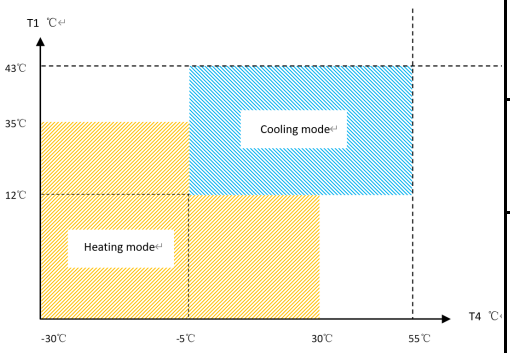
2.38.2 Description

- During the test run, the indoor or outdoor temperature exceeds the operating range
- All units stop running
- Error code is only displayed on outdoor unit

2.38.3 Trigger /Recover condition

- Trigger condition:

  After entering into test run, the outdoor 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”

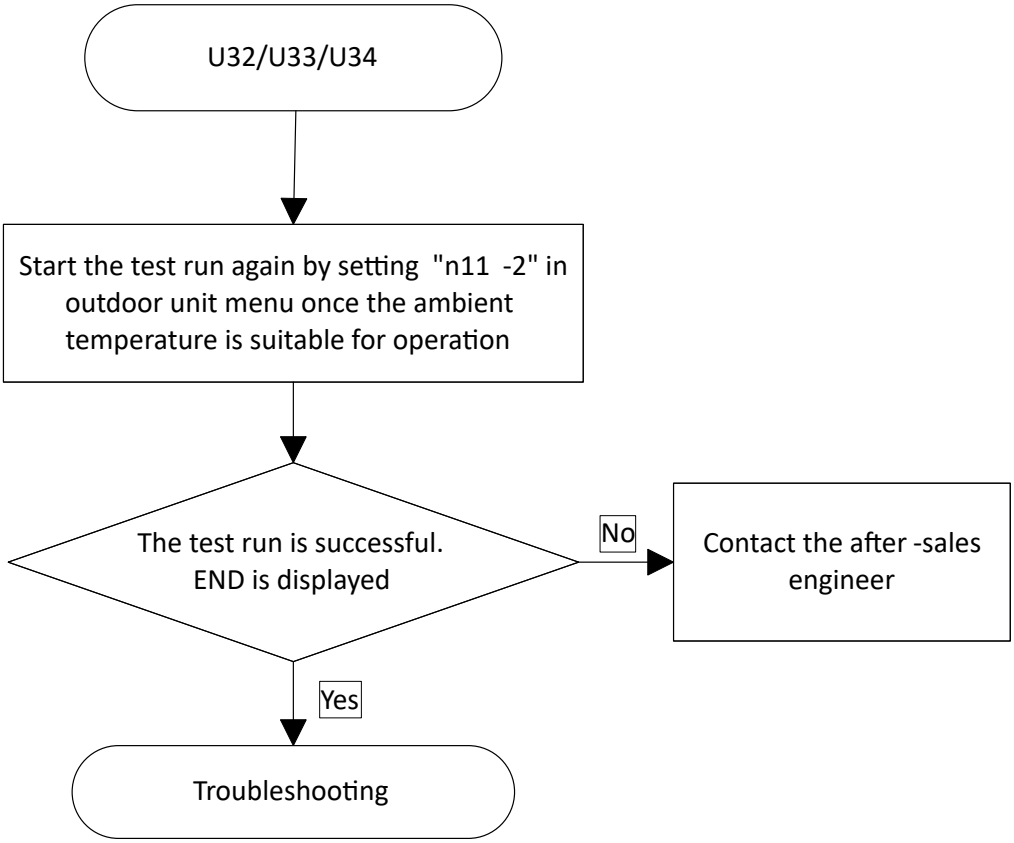
Temperature range	Error code	Description	
	**U32**	The outdoor temperature is not suitable	T4≤-30 ºC or T4>55 ºC
	U33	The indoor temperature is not suitable	Cooling mode: Average T1≥43 ºC Heating mode: Average T1≥35 ºC
	U34	The indoor and outdoor temperature is not suitable	When the indoor temperature is ≥ 12℃, the outdoor temperature is > 55℃ or < -30℃. When the indoor temperature is < 12℃, the outdoor temperature is > 30℃ or < -30℃.

- Recover condition: Maintain indoor and outdoor temperature within a suitable range. Set "n11-2" in the MENU for test run, and the test run succeeds.
- Reset method: If the test run is successful again, the system will reset automatically; If the fault persists after the re-test run, contact the after-sales engineer.

2.38.4 Possible causes

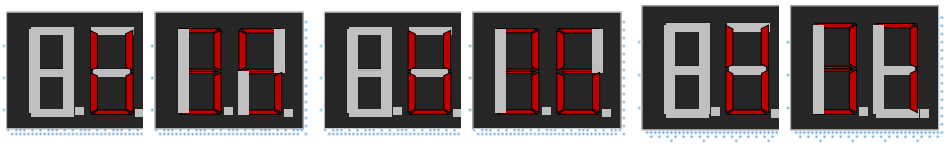
- The Temperature out of test run range

2.38.5 Procedure



2.39 U35, U36, U37: Stop valve is not open

2.39.1 Digital display output



2.39.2 Description

- The outdoor unit stop valve is not opened during the test run.
- All units stop running
- Error code is only displayed on the master unit.

2.39.3 Trigger/ Recover condition

- Trigger condition:

Error code	Description	
U35	The liquid side stop valve of the system is not opened	Discharge pressure of cooling mode≥ 3.9MPa Suction pressure of heating mode < 0.15MPa
U36	The gas side stop valve of the system is not opened	Discharge pressure of heating mode≥ 3.8MPa
U37	The gas side stop valve of the system is not opened	Suction pressure of cooling mode<0.3MPa The indoor unit is faulty.

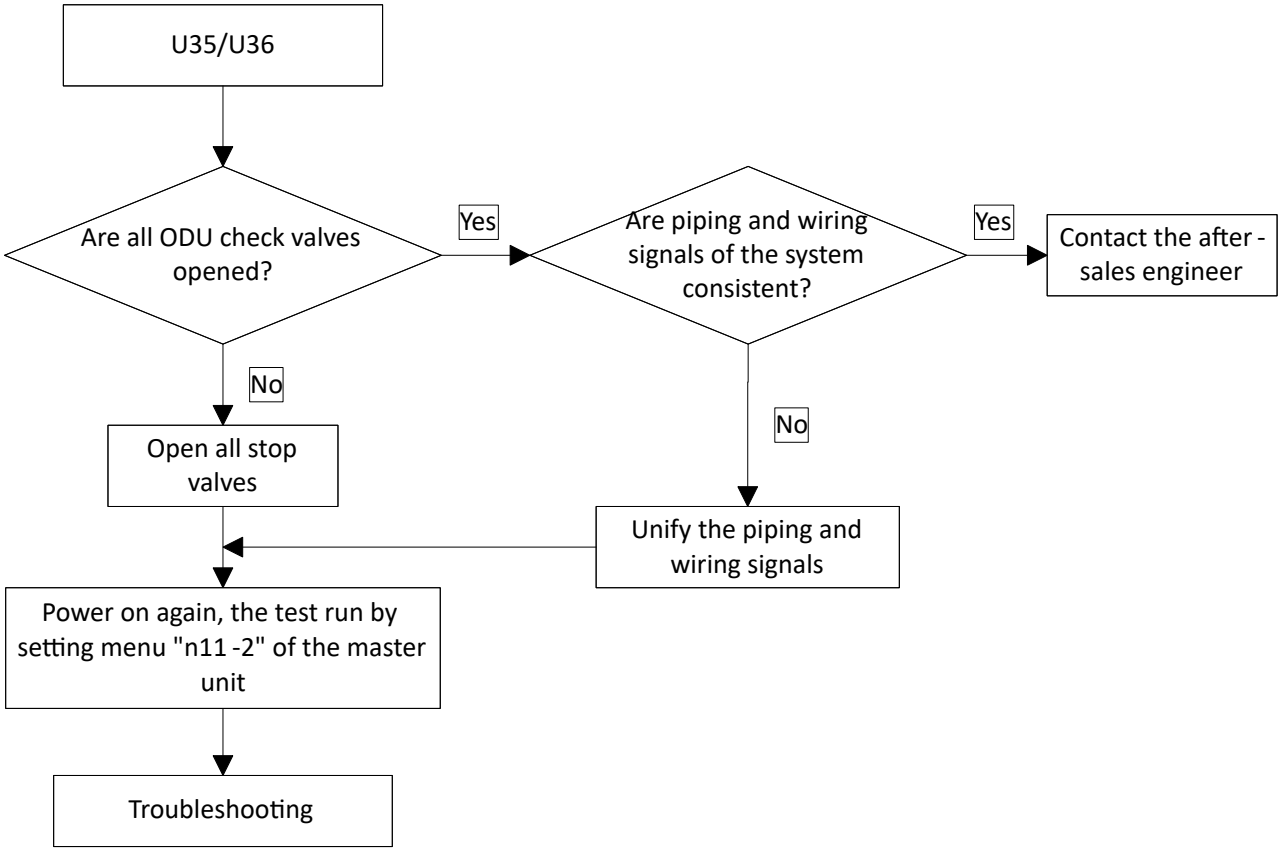
- Recover condition: Set "n11-2" in the MENU for test run, and the test run succeeds.
- Reset method: Resume automatically after the test run succeeds

2.39.4 Possible causes

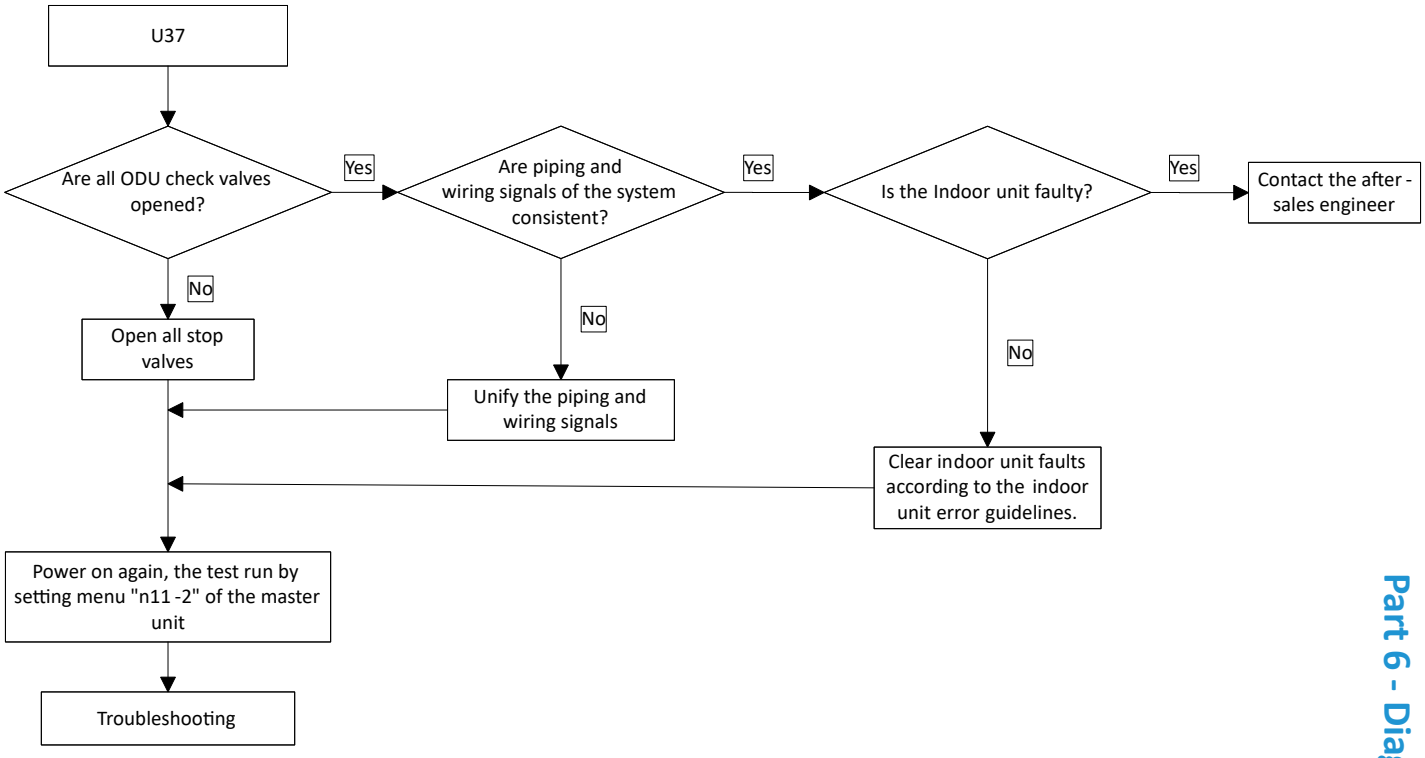
- Stop valve is not open
- Piping and wiring are inconsistent. For example, the piping for system A is connected to system A and the communication wiring is connected to system B.
- Indoor unit report “U37”

2.39.5 Procedure

1. U35/U36

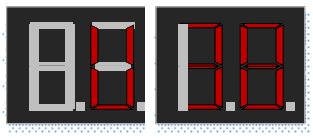


2. U37


U37
Are all ODU check valves opened?
Yes
Are piping and wiring signals of the system consistent?
Yes
Is the Indoor unit faulty?
Yes
Contact the after - sales engineer
No
Open all stop valves
No
Unify the piping and wiring signals
No
Clear indoor unit faults according to the indoor unit error guidelines.
Power on again, the test run by setting menu "n11 -2" of the master unit
Troubleshooting

2.40 U38: Outdoor Unit has no address.

2.40.1 Digital display output



2.40.2 Description

- Outdoor Unit has no address.
- Outdoor Unit with error can not run.
- Outdoor Unit with error cannot communicate with indoor units.

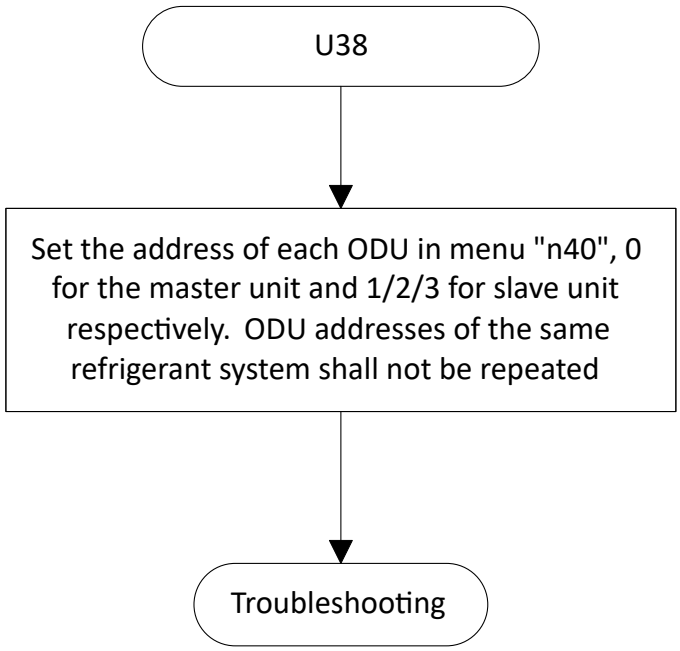
2.40.3 Trigger / recover condition

- Trigger condition: Outdoor unit address is not set
- Recover condition: Outdoor unit address detection is normal
- Reset method: Resume automatically

2.40.4 Possible causes

- The ODU's address is not set

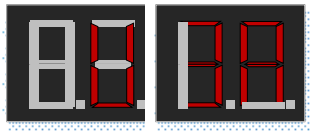
2.40.5 Procedure



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.

2.41 U3A: The communication wiring is connected incorrectly

2.41.1 Digital display output



2.41.2 Description

- Indoor unit piping and communication wiring are not connected in the same system.
- All units stop running
- Error code only displayed on the master unit.

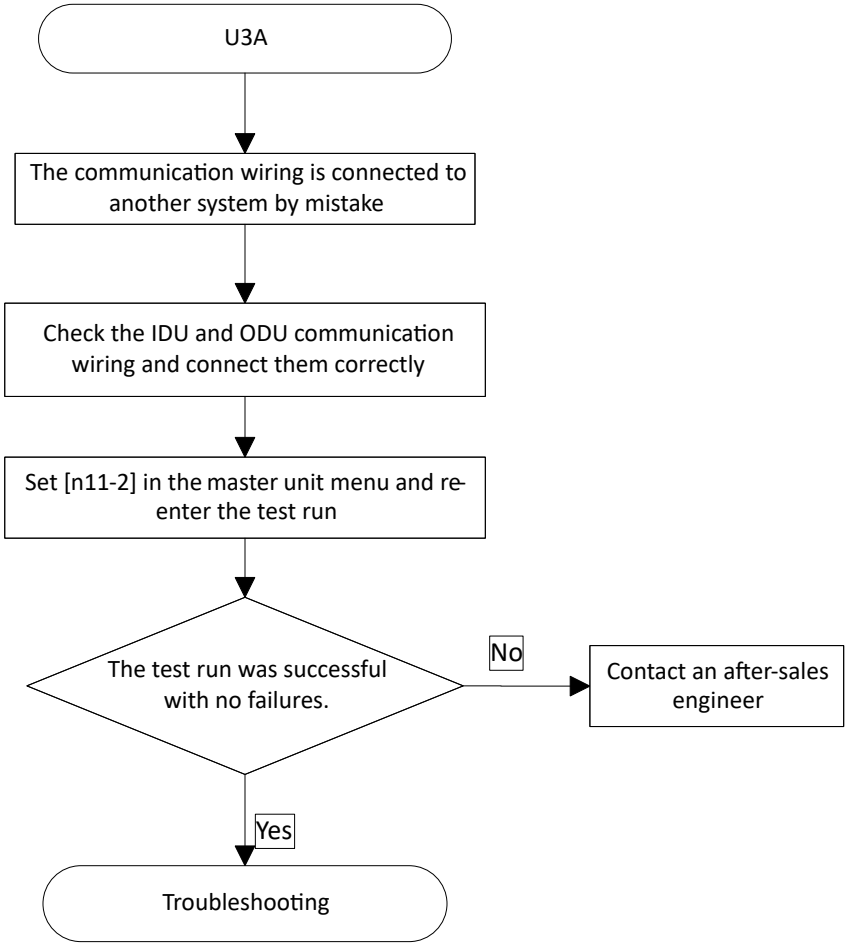
2.41.3 Trigger / Recover condition

- Trigger condition: Indoor unit piping and communication wiring are not connected in the same system. The communication wiring of the indoor unit is connected to another system.
- Recover condition: Set "n11-2" in the MENU for test run, and the test run succeeds.
- Reset method: Resume automatically after the test run succeeds

2.41.4 Possible causes

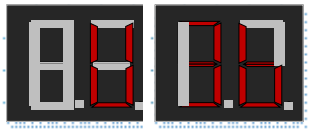
- Indoor unit piping and communication wiring are not connected in the same system. The communication wiring of the indoor unit is connected to another system.

2.41.5 Procedure



2.42 U3b: The installation environment is abnormal

2.42.1 Digital display output



2.42.2 Description

- Ambient temperature of the test environment exceeds the allowed range during the test run
- All units stop running
- Error code only displayed on the master unit.

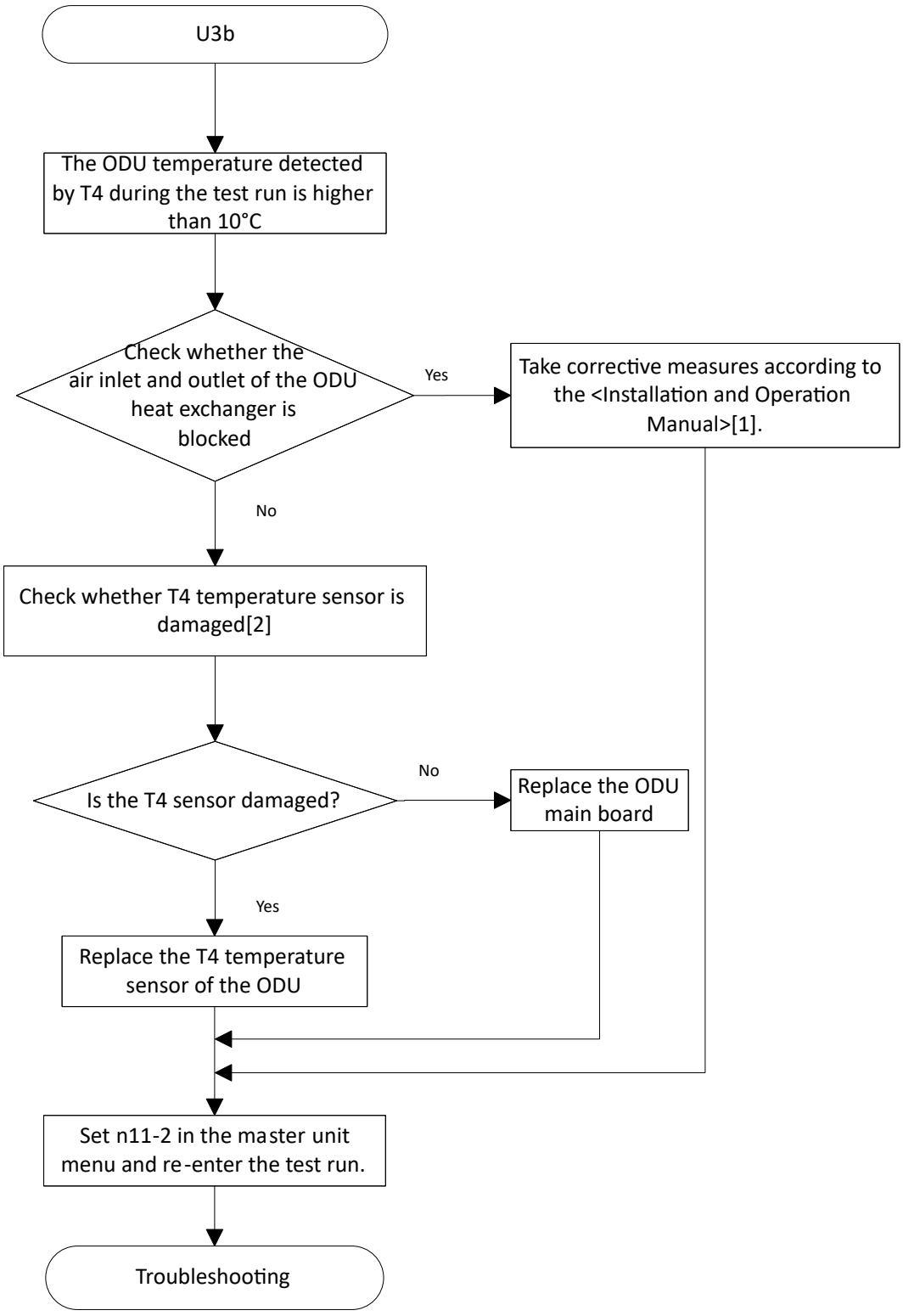
2.42.3 Trigger / Recover condition

- Trigger condition: Return air temperature is detected to increase more than 10℃ during test run.
- Recover condition: Set "n11-2" in the MENU for test run, and the test run succeeds.
- Reset method: Resume automatically after the test run succeeds

2.42.4 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

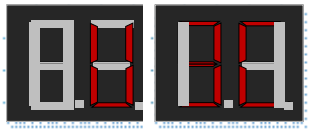
2.42.5 Procedure



Note:
[1]. Clear the obstructions beside the ODU. Ensure smooth air inlet and outlet of the ODU without a short circuit. In spaces that have limited area for heat dissipation, install a louver for air discharge or relocate the ODU
[2]. Refer to "E41: T4 Temperature Sensor Fault". Check whether T4 temperature sensor is damaged

2.43 U3C: Changeover mode error

2.43.1 Digital display output



2.43.2 Description

- ODU in changeover mode doesn’t set the VIP IDU address.
- ODUs stop running
- Error code only displayed on the master unit.

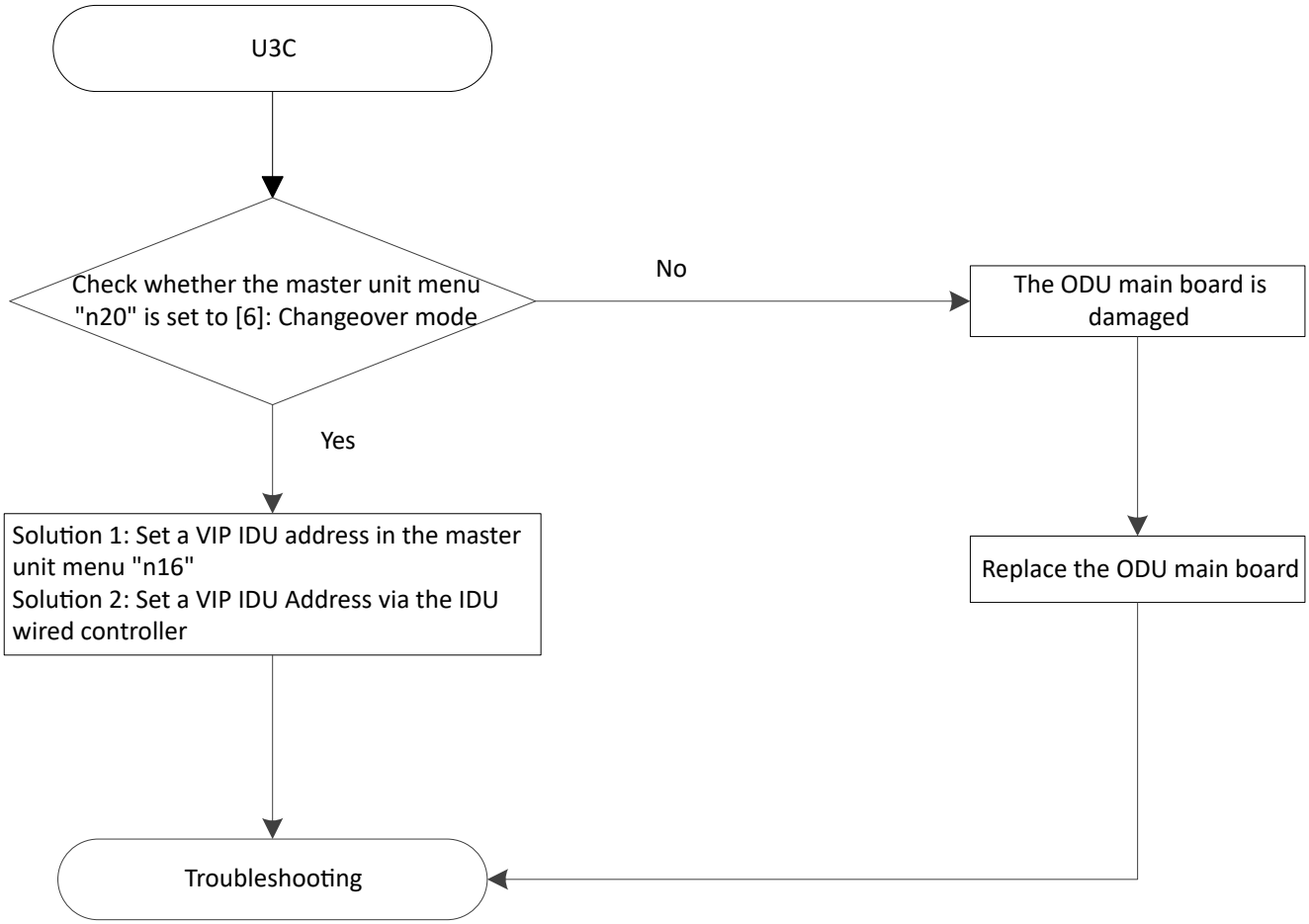
2.43.3 Trigger / Recover condition

- Trigger condition: Outdoor unit in changeover mode, but the VIP address has not been set.
- Recover condition: Outdoor unit in changeover mode detect the VIP IDU address.
- Reset method: Resume automatically

2.43.4 Possible causes

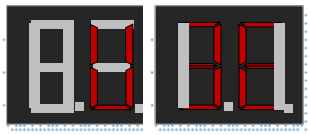
- VIP address has not been set
- Mainboard of ODU is damaged.

2.43.5 Procedure



2.44 U3E: The indoor unit is abnormal during test run

2.44.1 Digital display output



2.44.2 Description

- Fault detected in indoor unit during test run
- Outdoor unit stopped operation
- Only the main unit displays fault code

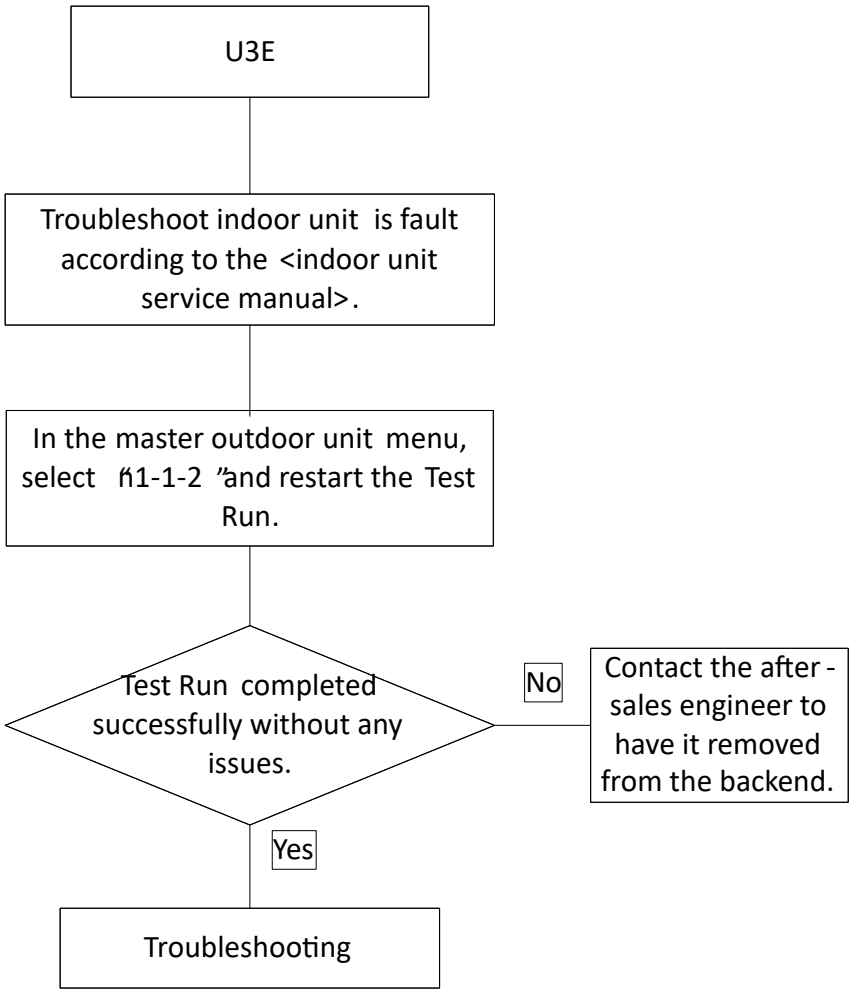
2.44.3 Trigger / Recover condition

- Trigger condition: Indoor unit is fault during test run.
- Recover condition: Troubleshoot the indoor unit fault according to the fault guide. Set “n11 setting [2] test run” in the main menu and successfully complete the test run.
- Reset method: Automatically resets after successfully completing a new test run.

2.44.4 Possible causes

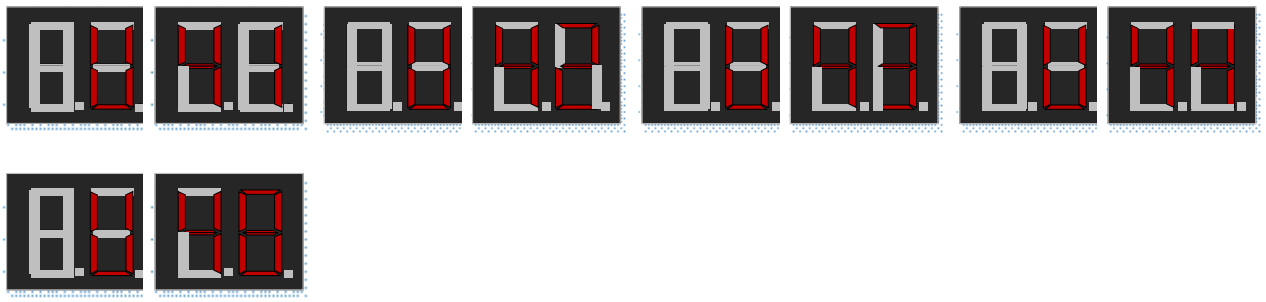
- Fault detected in indoor unit during test run

2.44.5 Procedure



2.45 U4x: Overconnection ratio

2.45.1 Digital display output



2.45.2 Description

- Combination ratio of indoor unit and outdoor unit is out of range
- All units stop running
- Error code only displayed on the master unit

2.45.3 Trigger / Recover condition

- Trigger condition:

Error code	Description
U41	The combination ratio of Standard VRF Indoor Unit is out of range.
U42	The combination ratio of Fresh Air Processing Uint is out of range.
U43	The combination ratio of AHU Kit (air discharge control) is out of range
U44	The combination ratio of AHU Kit (air return control) is out of range
U48	The combination ratios of all Indoor Units are out of range.

1) Code and type of Indoor Unit

Indoor unit code	**A**	**B**	**C**	**D**
Indoor unit type	Standard VRF Indoor Unit	Fresh Air Processing Unit(FAPU)	AHU Kit (air discharge control)	AHU Kit (air return control)

2) Connection type and combination ratio limit

	Connection type				Combination ratio (%)				
Indoor unit code	A	B	C	D	A	B	C	D	Total capacity combination ratio of all indoor units
Only one type of IDU is connected to the system	●				50%-130%				50%—130%
		●				50%-100%			50%—100%
			●				50%-100%		50%—100%
				●				50%-110%	50%—110%
Combination 1	●	●			50%-130%	≤30%			50%—130%
Combination 2	●		●		50%-130%		≤30%		50%—130%
Combination 3	●			●	50%-130%			≤60%	50%—110%
Combination 4	●	●	●	●	50%-130%	≤30%		50%-130%	50%—130%

3) Calculation of combination ratio: Combination ratio = Total capacity (HP) of online IDUs/Total capacity (HP) of ODUs

- Recover condition:

  Indoor/Outdoor Unit connection rate within allowable range

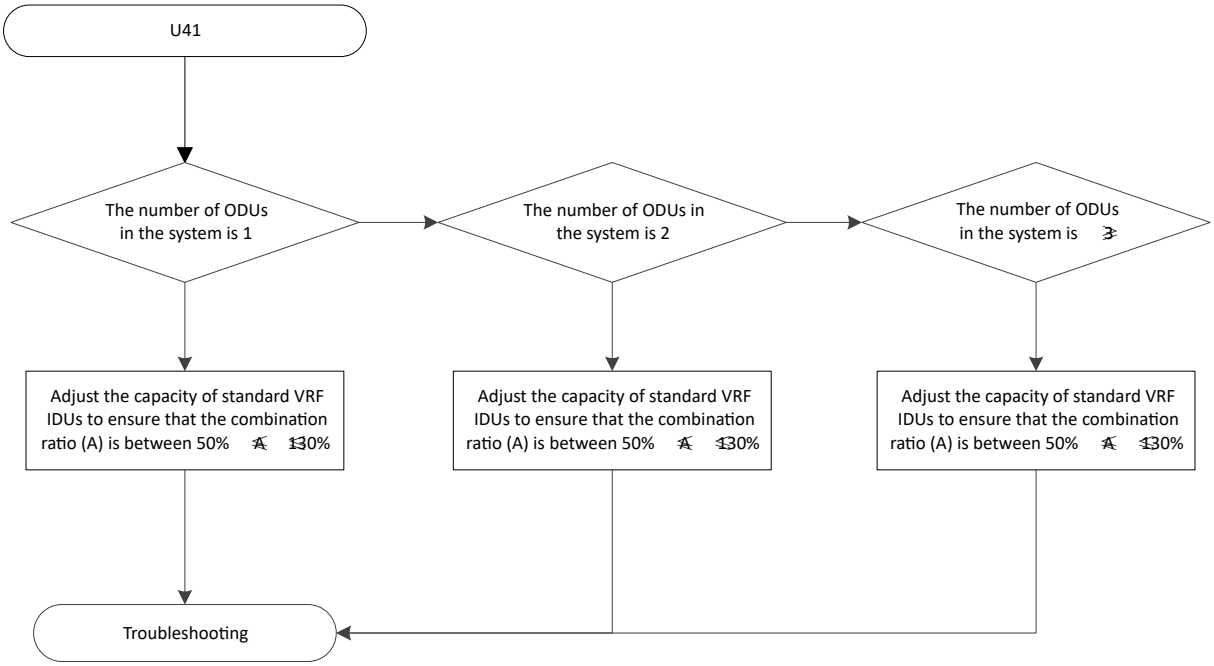
- Reset method: Resume manually

2.45.4 Possible causes

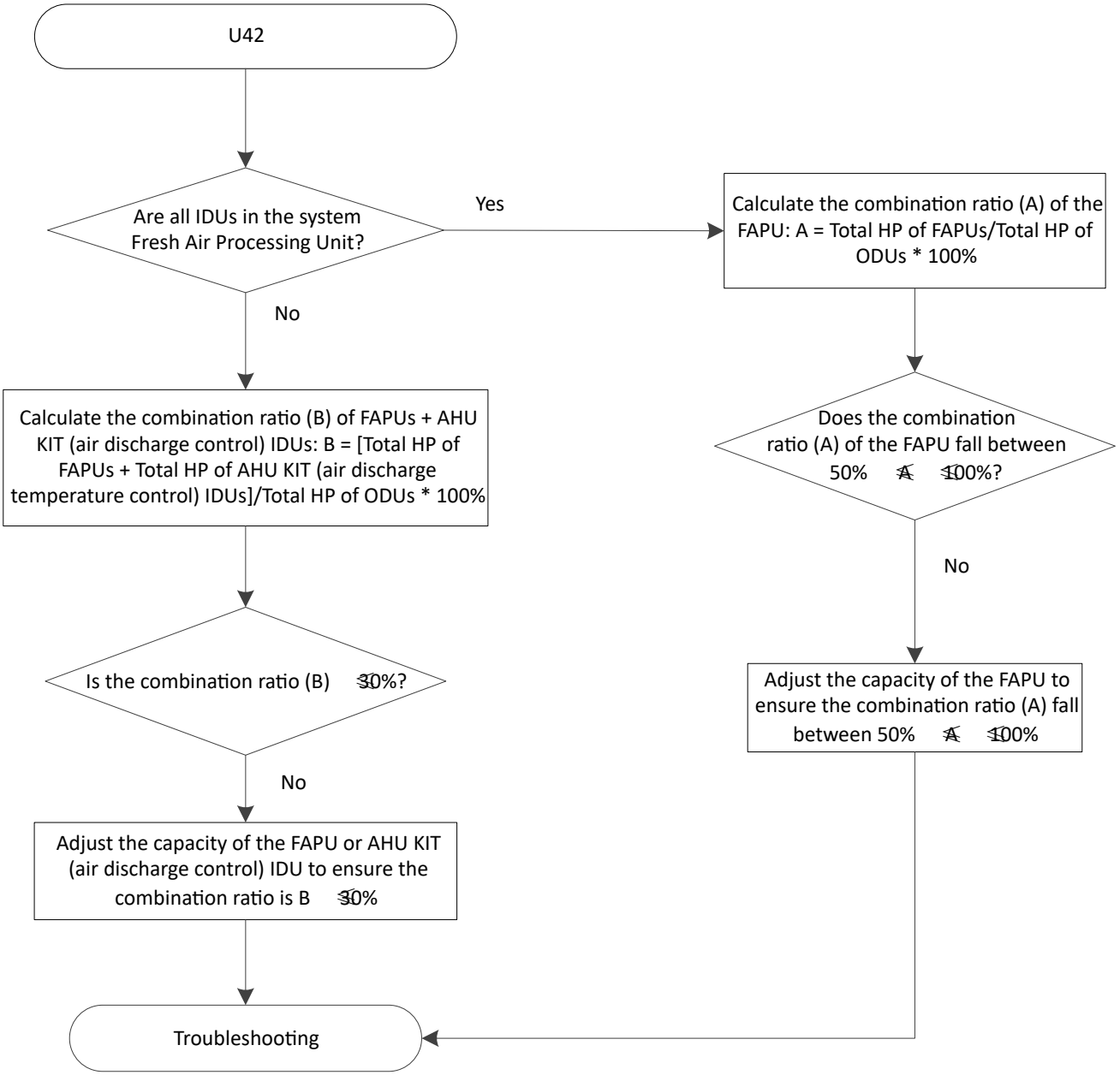
- Indoor units and outdoor units combination ratio is out of range.
- Outdoor unit address is repeated or the slave outdoor unit does not have an address.
- Individual series indoor unit is installed in combination with a combinable series.

2.45.5 Procedure

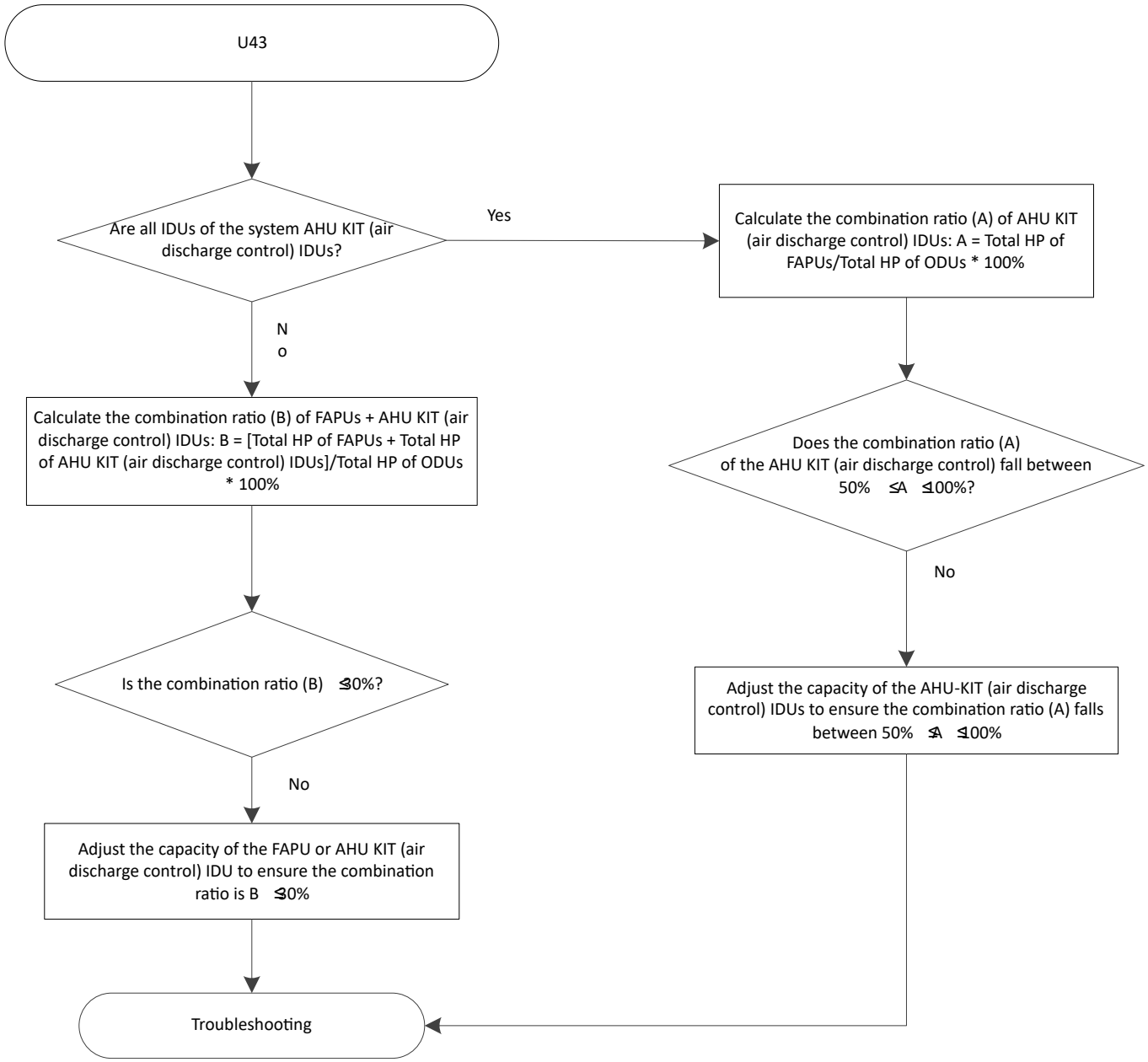
1. U41



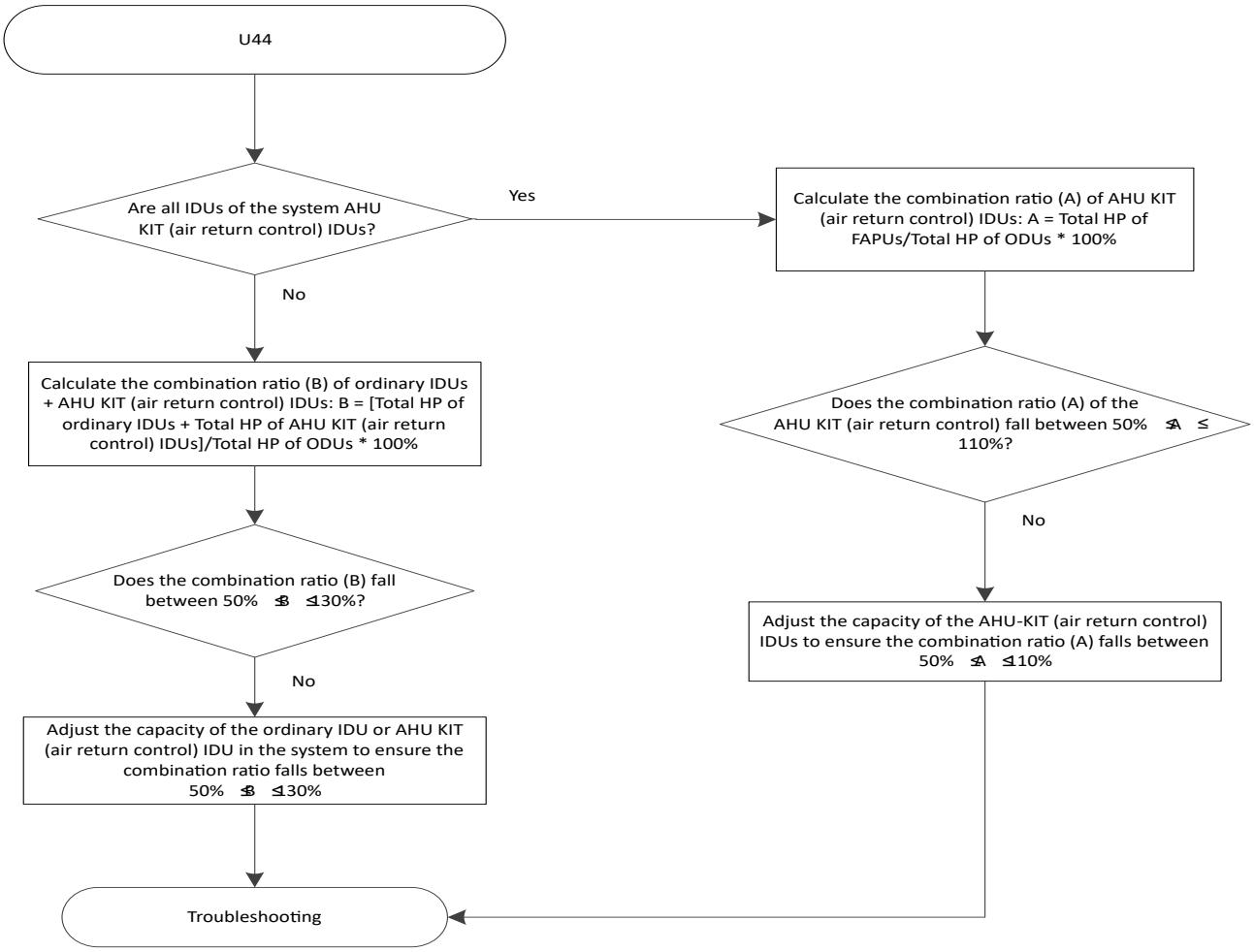
2. U42


U42
Are all IDUs in the system Fresh Air Processing Unit?
Yes
No
Calculate the combination ratio (A) of the FAPU: A = Total HP of FAPUs/Total HP of ODUs * 100%
Does the combination ratio (A) of the FAPU fall between 50% ≤ A ≤ 100%?
No
Adjust the capacity of the FAPU to ensure the combination ratio (A) fall between 50% ≤ A ≤ 100%
Calculate the combination ratio (B) of FAPUs + AHU KIT (air discharge control) IDUs: B = [Total HP of FAPUs + Total HP of AHU KIT (air discharge temperature control) IDUs]/Total HP of ODUs * 100%
Is the combination ratio (B) ≥ 30%?
No
Adjust the capacity of the FAPU or AHU KIT (air discharge control) IDU to ensure the combination ratio is B ≥ 30%
Troubleshooting

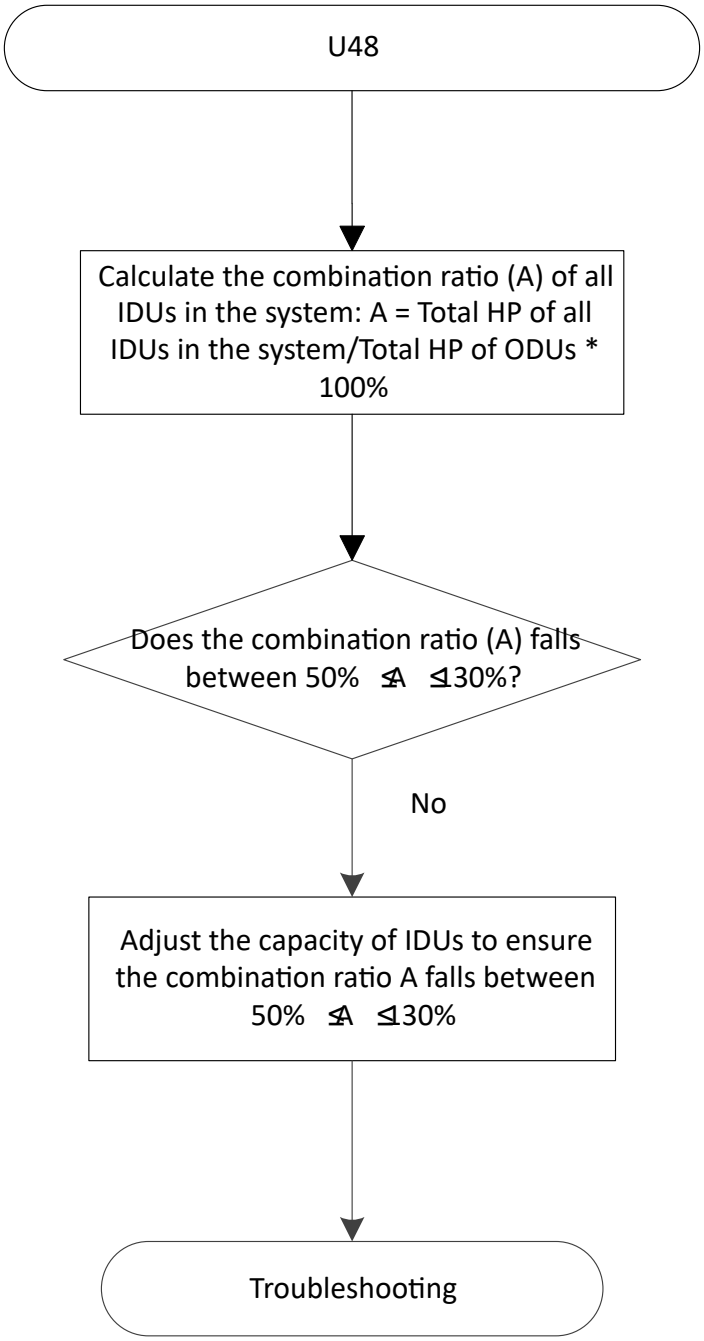
3. U43


U43
Are all IDUs of the system AHU KIT (air discharge control) IDUs?
Yes
No
Calculate the combination ratio (A) of AHU KIT (air discharge control) IDUs: A = Total HP of FAPUs/Total HP of ODUs * 100%
Does the combination ratio (A) of the AHU KIT (air discharge control) fall between 50% ≤A ≤100%?
No
Adjust the capacity of the AHU-KIT (air discharge control) IDUs to ensure the combination ratio (A) falls between 50% ≤A ≤100%
Calculate the combination ratio (B) of FAPUs + AHU KIT (air discharge control) IDUs: B = [Total HP of FAPUs + Total HP of AHU KIT (air discharge control) IDUs]/Total HP of ODUs * 100%
Is the combination ratio (B) ≤30%?
No
Adjust the capacity of the FAPU or AHU KIT (air discharge control) IDU to ensure the combination ratio is B ≤30%
Troubleshooting

4. U44

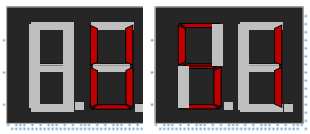

U44
Are all IDUs of the system AHU KIT (air return control) IDUs?
Yes
No
Calculate the combination ratio (A) of AHU KIT (air return control) IDUs: A = Total HP of FAPUs/Total HP of ODUs * 100%
Does the combination ratio (A) of the AHU KIT (air return control) fall between 50% ≤A ≤ 110%?
No
Adjust the capacity of the AHU-KIT (air return control) IDUs to ensure the combination ratio (A) falls between 50% ≤A ≤110%
Calculate the combination ratio (B) of ordinary IDUs + AHU KIT (air return control) IDUs: B = [Total HP of ordinary IDUs + Total HP of AHU KIT (air return control) IDUs]/Total HP of ODUs * 100%
Does the combination ratio (B) fall between 50% ≤B ≤130%?
No
Adjust the capacity of the ordinary IDU or AHU KIT (air return control) IDU in the system to ensure the combination ratio falls between 50% ≤B ≤130%
Troubleshooting

5. U48


U48
Calculate the combination ratio (A) of all IDUs in the system: A = Total HP of all IDUs in the system/Total HP of ODUs * 100%
Does the combination ratio (A) falls between 50% ≤A ≤130%?
No
Adjust the capacity of IDUs to ensure the combination ratio A falls between 50% ≤A ≤130%
Troubleshooting

2.46 U51: More than One Outdoor Unit Models in the Individual Series System

2.46.1 Digital display output



2.46.2 Description

- Outdoor unit of Individual Series is installed in combine system, and the number of ODUs detected is greater than 1.
- All units stop running
- Error code is only displayed on master unit.

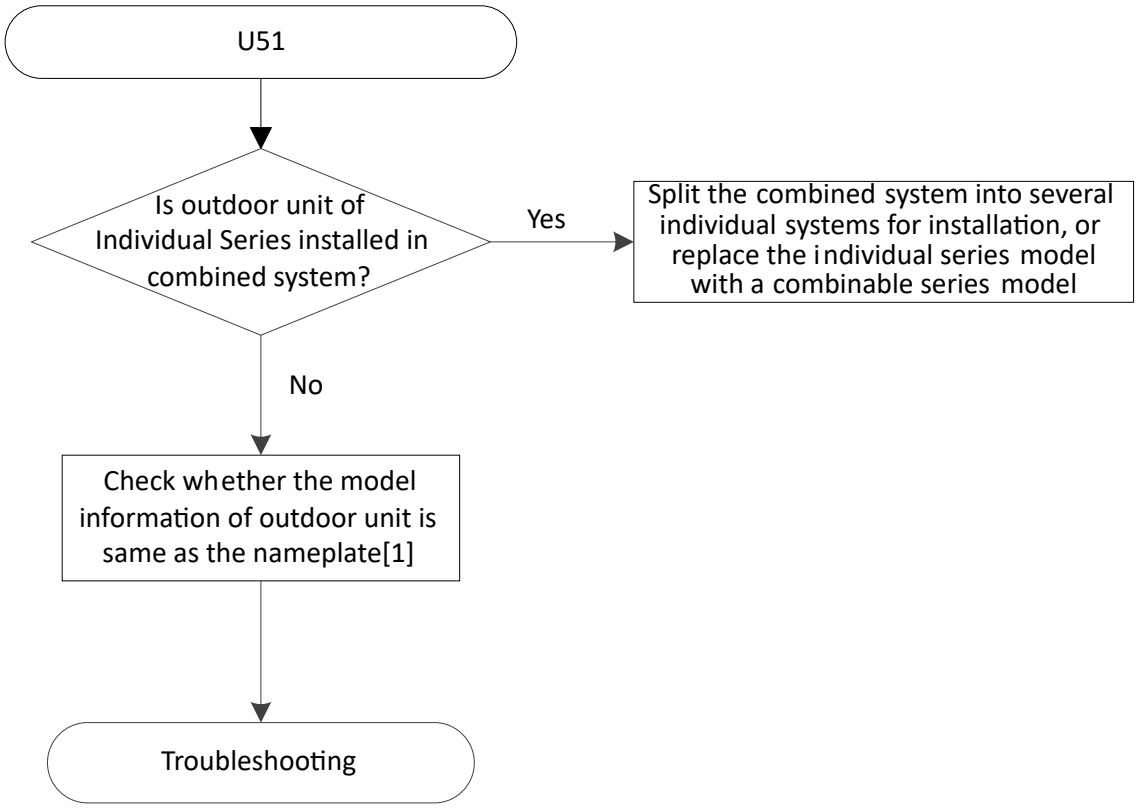
2.46.3 Trigger / Recover condition

- Trigger condition: The number of ODUs connected to the system detected by individual series is greater than 1
- Recover condition: The number of ODUs connected to the system detected by individual series is equal to 1
- Reset method: Resume manually (Power on again)

2.46.4 Possible causes

- Outdoor unit of Individual Series is installed in combine system, and the number of ODUs detected is greater than 1
- Outdoor unit model is incorrectly set

2.46.5 Procedure

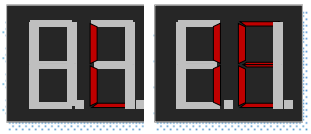


Note:
[1]Use Bluetooth module or bluetooth after-sales kit to check and reset the model parameter.

3 Error in Compressor Driver

3.1 xL1E: Hardware overcurrent

3.1.1 Digital display output



3.1.2 Description

- The compressor current exceeds the protection value set for the hardware.
- The compressor stops running after the error occurs. If the error disappears one minute later, the compressor starts again

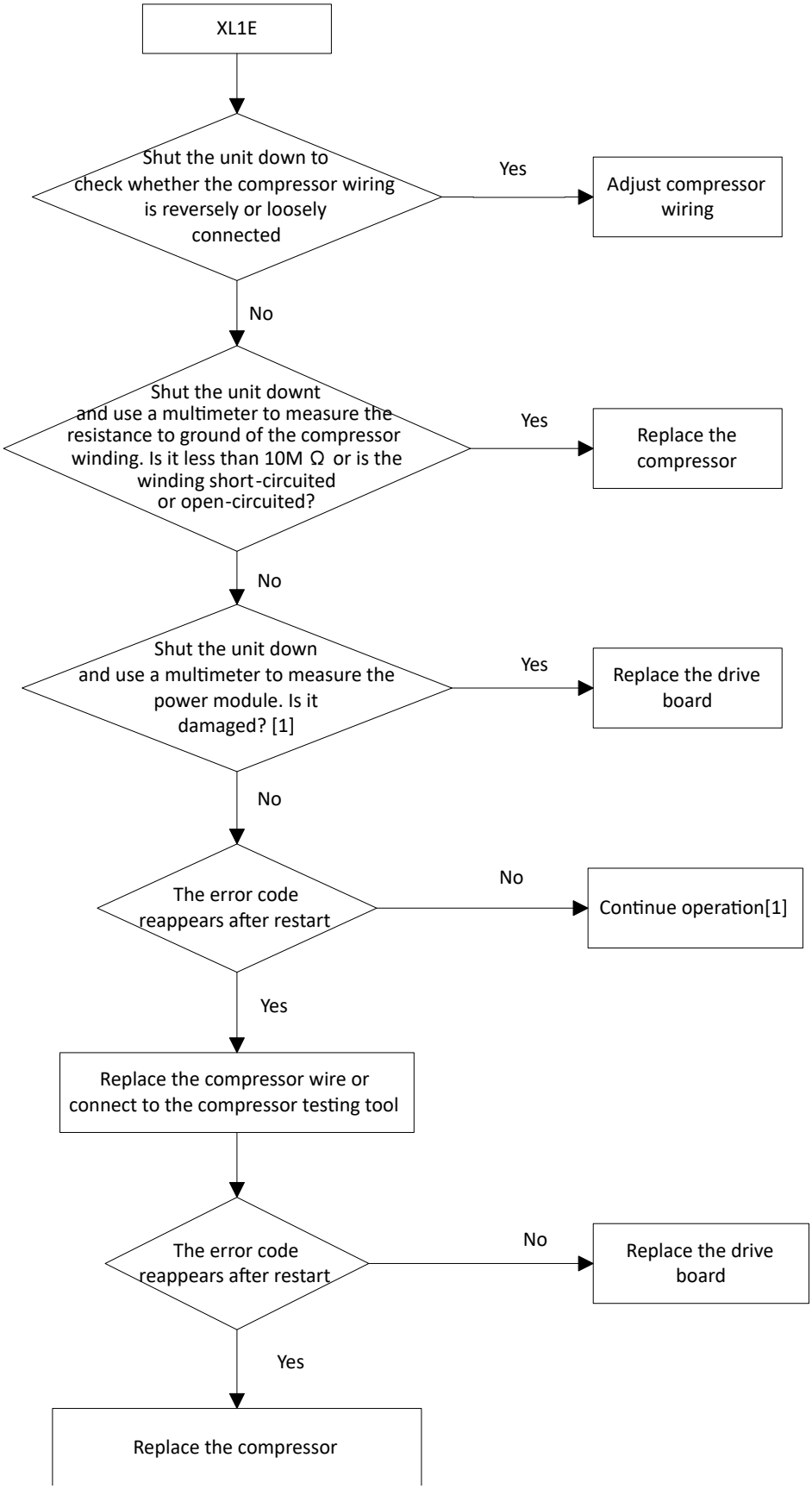
3.1.3 Trigger / recover condition

- Trigger condition: The current exceeds the protection value set for the hardware
- Recover condition: The compressor will stop after failure, and recover after one minute, if the condition for fault elimination is satisfied in 1 min, compressor operation resumes
- Reset method: The system automatically recovers one minute after the error exit condition is reached

3.1.4 Possible causes

- Compressor wiring is wrong. Compressor winding is open-circuited or short-circuited.
- System power supply is faulty.
- The system is faulty, due to reasons such as liquid return and impurities.
- The compressor is worn or locked upon startup.
- The compressor drive board is faulty.

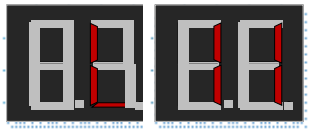
3.1.5 Procedure



Notes:
[1] 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 compressor current exceeds the 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.

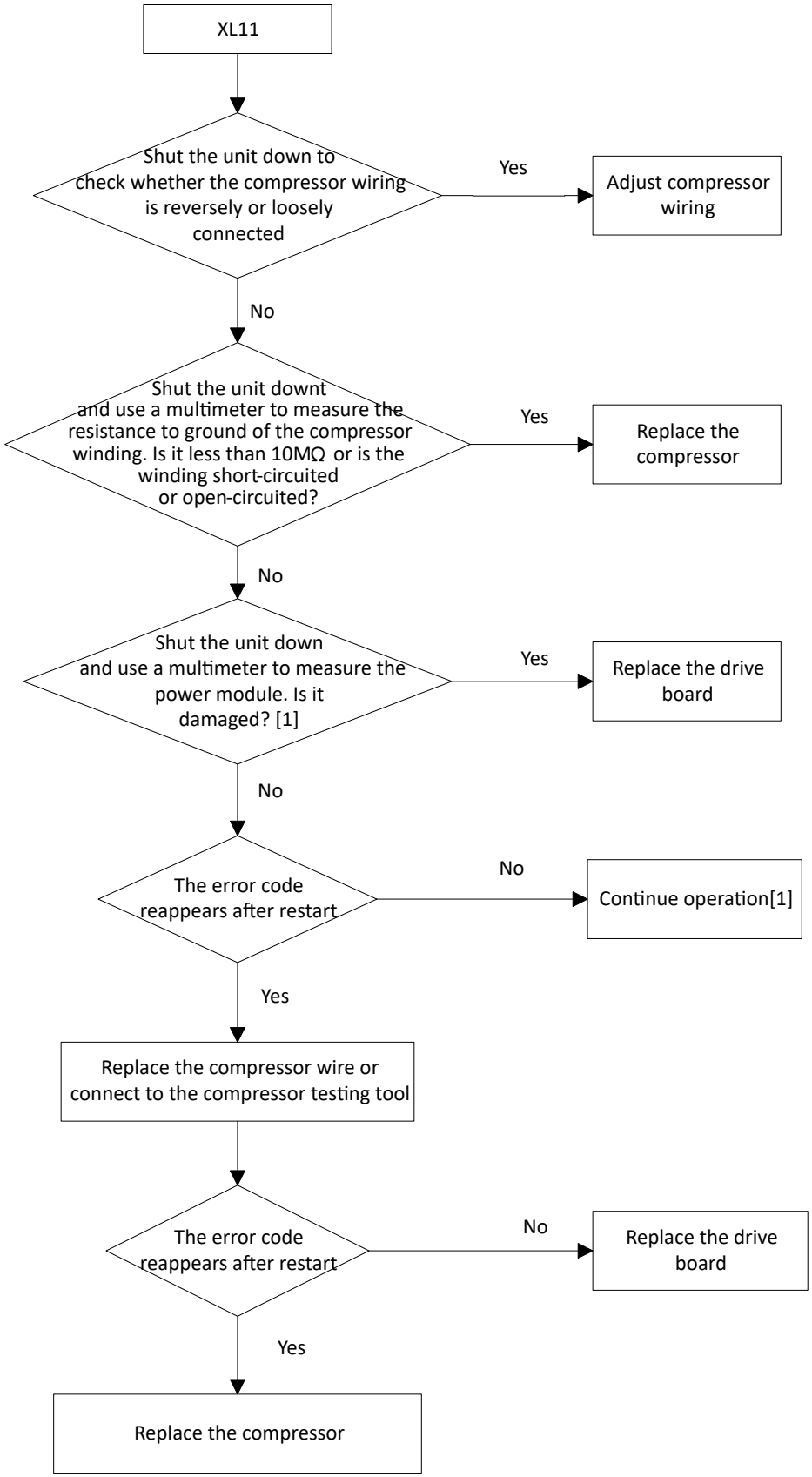
3.2.3 Trigger / recover condition

- Trigger condition: The compressor current is detected to have exceeded the protection value set for the software 3 times in a row.
- 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 is instantaneously locked.
- The compressor drive board is faulty.
- The system is faulty, due to reasons such as liquid return and impurities.

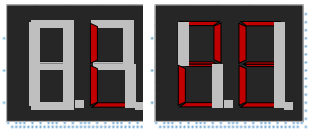
3.2.5 Procedure



Notes:
[1] Voltage fluctuation occurs when high-power equipment is started

3.3 xL2E: Module overtemperature protection

3.3.1 Digital display output



3.3.2 Description

- The temperature of the compressor or fan drive board (IPM) exceeds the set value (100°C).
- The compressor will stop when the error occurs. If the error disappears one minute later, the compressor will start again

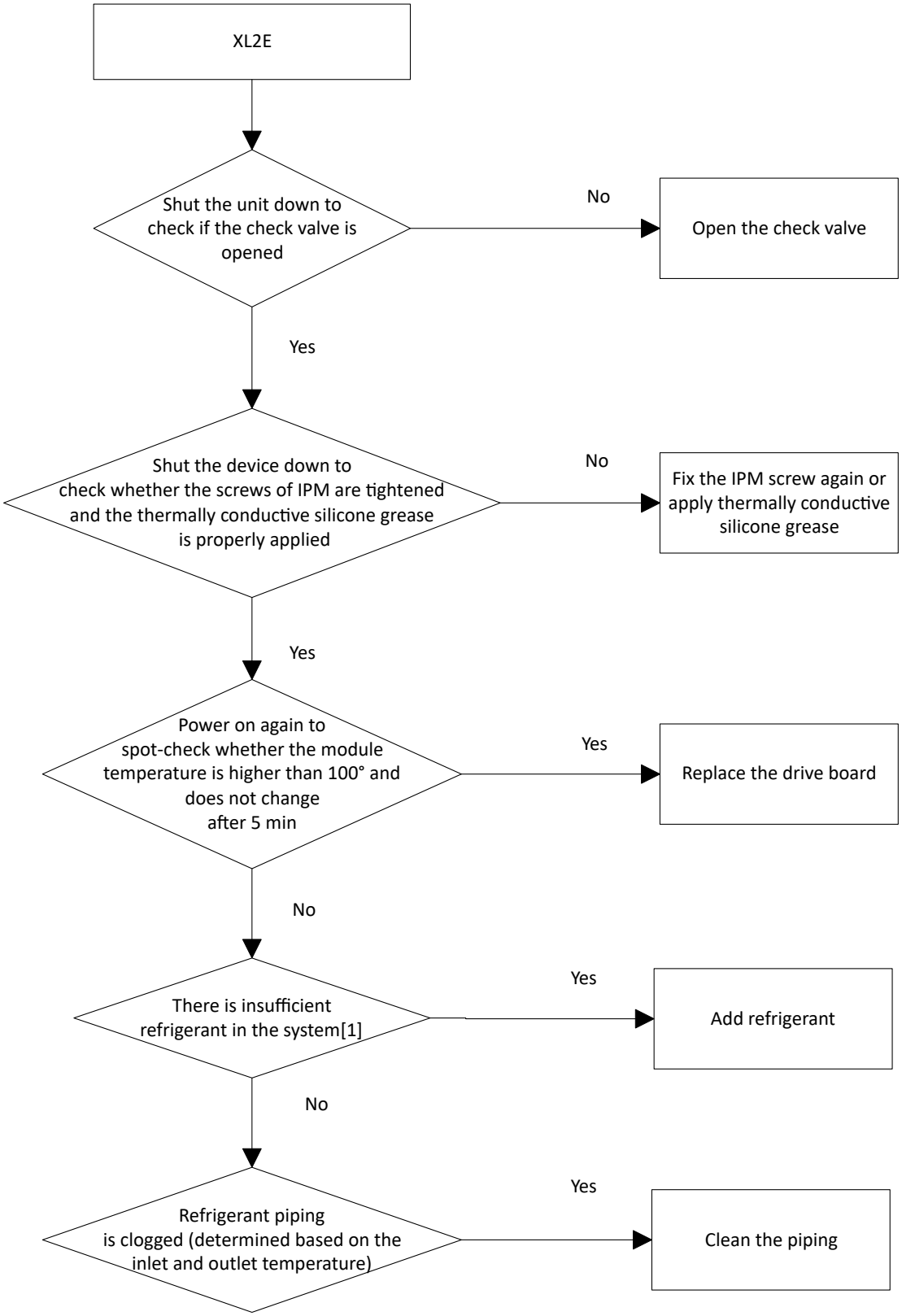
3.3.3 Trigger / recover condition

- Trigger condition: The temperature of the IPM exceeds the set value
- Recover condition: The compressor will stop when the error occurs. If the error disappears one minute later, the compressor will start again (when module temperature is lower than the set value).
- Reset method: Resume automatically

3.3.4 Possible causes

- The set screws of the compressor or fan drive board (IPM) 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:
- There is insufficient refrigerant in the system or the piping is clogged, resulting in poor cooling effect.
- The drive board is faulty.

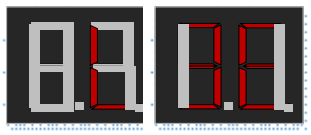
3.3.5 Procedure



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.

3.4 xL3E: The bus voltage is too low

3.4.1 Digital display output



3.4.2 Description

- The DC bus voltage of the drive board is lower than 350VDC.
- The compressor stops running after the error occurs. If the error disappears one minute later, the compressor starts again.

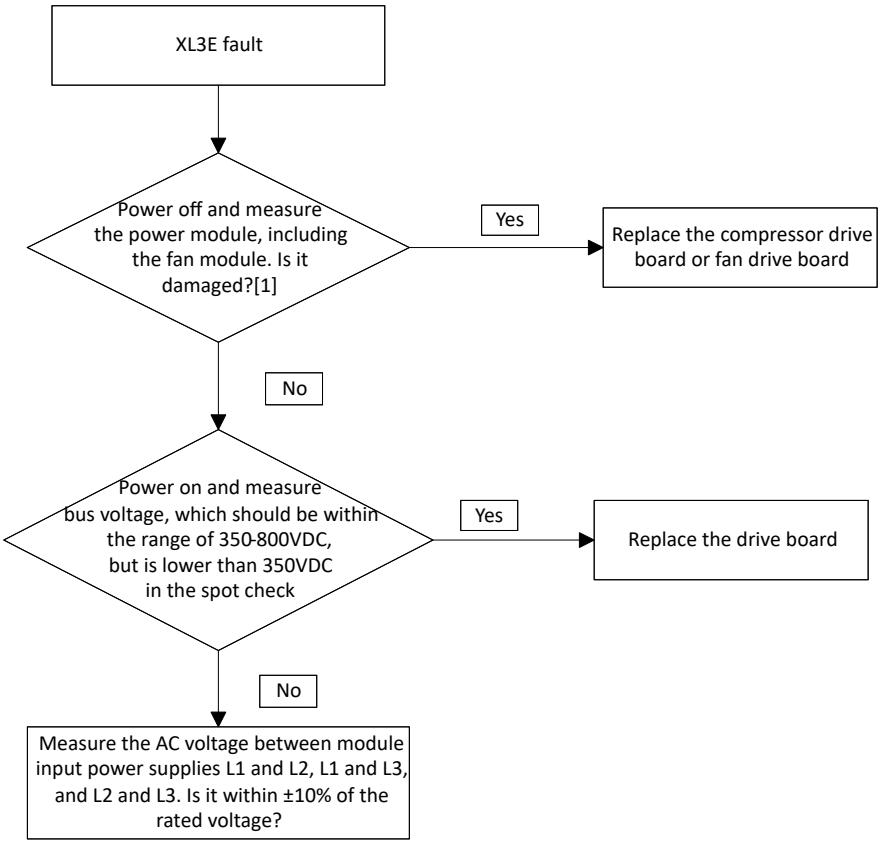
3.4.3 Trigger / recover condition

- Trigger condition: The bus voltage is lower than the bus voltage protection threshold set by the software.
- Recover condition: The compressor will stop when the error occurs. If the error disappears one minute later, the compressor will start again (bus voltage is higher than 350VDC).
- Reset method: Resume automatically after the error exit condition is reached.

3.4.4 Possible causes

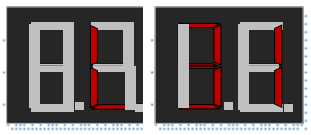
- The input voltage is too low, resulting in the low bus voltage:
- The power grid suffers short-time power outage or the voltage is too low within a short time.
- The compressor drive board is faulty.

3.4.5 Procedure



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.

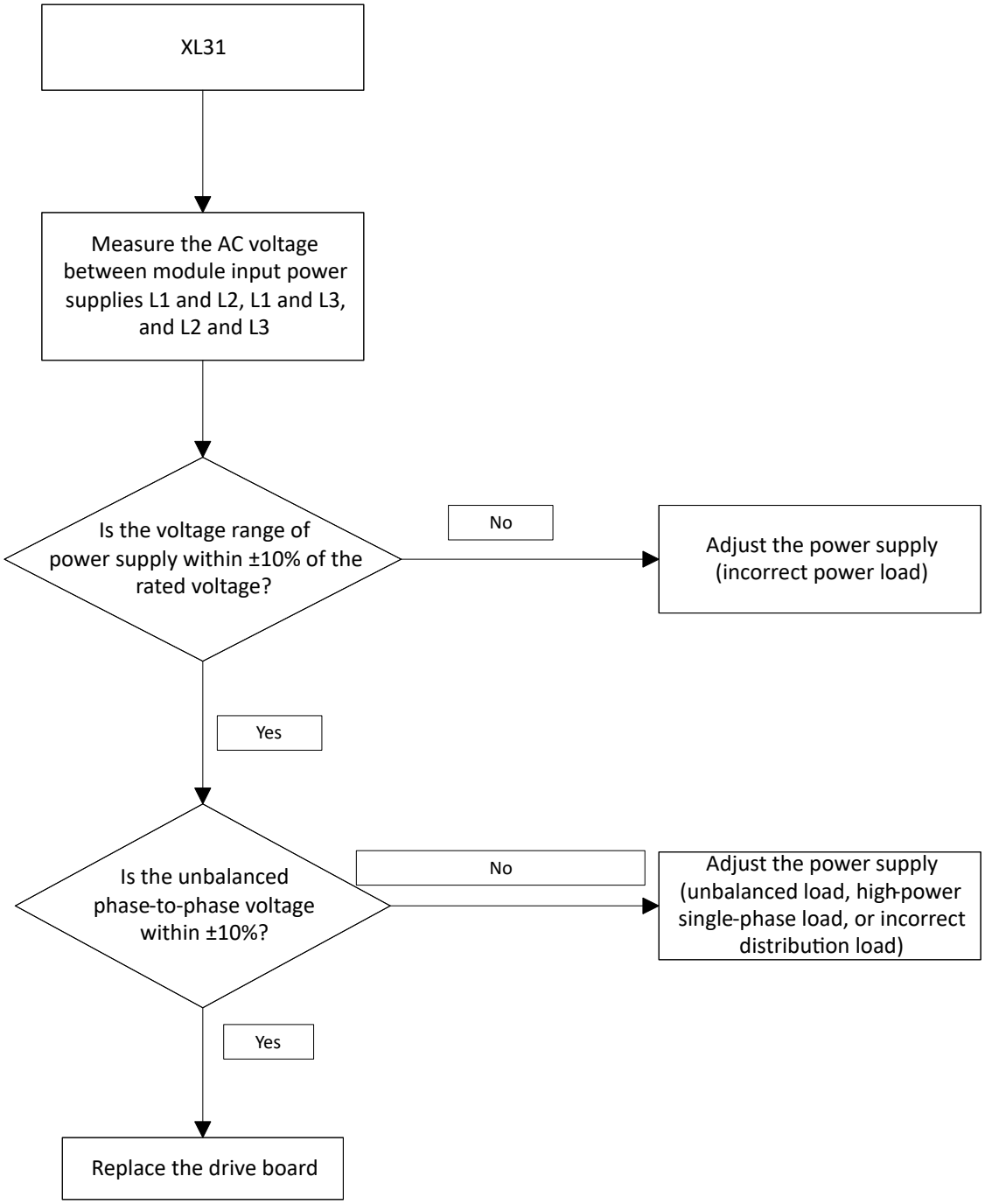
3.5.3 Trigger / recover condition

- Trigger condition: The bus voltage is higher than the software overvoltage protection threshold.
- Recover condition: The compressor will stop when the error occurs. If the error disappears one minute later, the compressor will start again (bus voltage is lower than 800VDC).
- Reset method: Resume automatically after the error exit condition is reached.

3.5.4 Possible causes

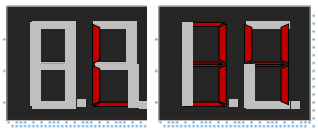
- The input voltage is too high, resulting in the high bus voltage;
- The power grid voltage is too high:
- The drive board is faulty.

3.5.5 Procedure



3.6 xL34: Three-phase power supply input phase loss fault

3.6.1 Digital display output



3.6.2 Description

- Phase loss of power supply input or serious unbalance of three-phase power supply.

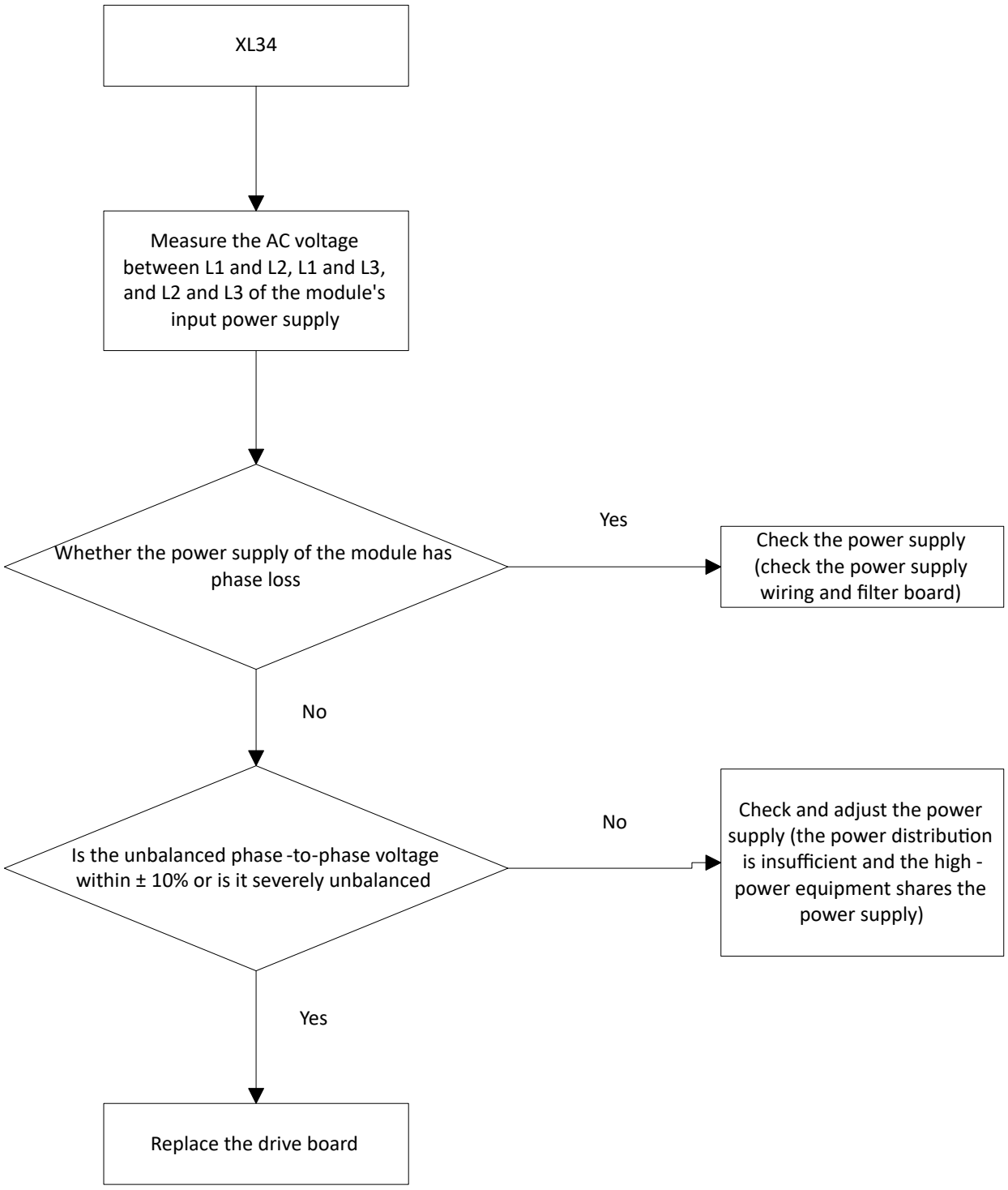
3.6.3 Trigger / recover condition

- Trigger condition: Phase loss of power supply input or serious unbalance of three-phase power supply
- Recover condition: No phase loss of three-phase power supply.
- Reset method: Resume automatically after no phase loss of three-phase power supply.

3.6.4 Possible causes

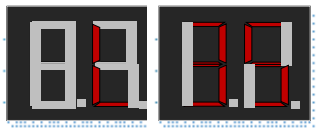
- Abnormal equipment wiring: phase loss, reverse connection of zero line and phase line L1/L2/L3, or poor contact of power line;
- Compressor drive board is abnormal;
- Abnormal power grid or power distribution: one or two phases of the power supply have a large load, resulting in unbalanced power supply voltage, and the unbalanced degree of power grid distribution phase exceeds 3% (unbalanced phase angle, or unbalanced three-phase voltage, or both).

3.6.5 Procedure



3.7 xL35: Three-phase B-phase power and zero line are connected reversely

3.7.1 Digital display output



3.7.2 Description

- Three-phase B-phase power and zero line are connected reversely.
- After the fault, the compressor stops running. If the fault disappears after one minute, the compressor starts again.

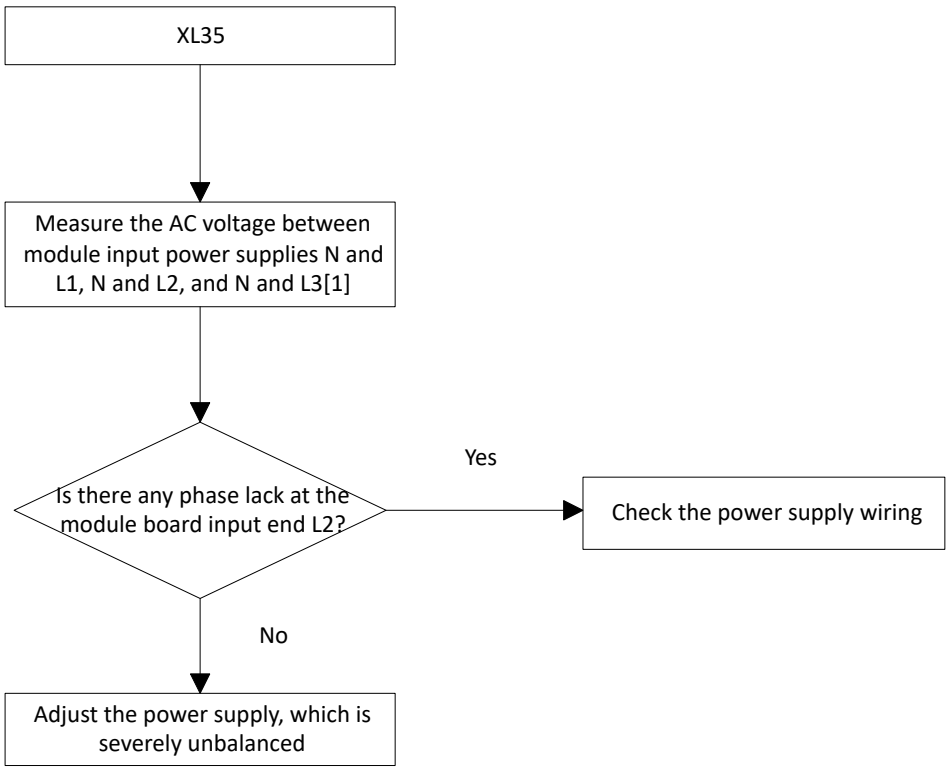
3.7.3 Trigger / recover condition

- Trigger condition: Three-phase B-phase power and zero line are connected reversely
- Recover condition: Three-phase B-phase power and zero line are connected correctly.
- Reset method: Resume automatically after three-phase B-phase power and zero line are connected correctly.

3.7.4 Possible causes

- Abnormal equipment wiring: the zero line and the phase line L2 are connected reversely, or the L2 phase wiring is poor;
- Abnormal power grid or power distribution: one phase or two phases of the system power supply have large load, resulting in unbalanced power supply voltage; the unbalanced degree of power grid distribution phase exceeds 3% (unbalanced phase angle, or unbalanced three-phase voltage, or both).

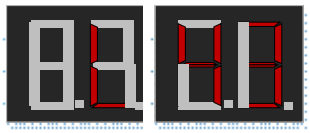
3.7.5 Procedure



Note: When the system is powered on, measure the voltage of the power input terminals CN16 (L1), CN17 (L2) and CN15 (L3) of the module board with a multimeter in the AC voltage range, and compare the voltage of L1-L2, L2-L3 and L1-L3 to see whether they are equal. If they are basically equal, it means that there is no problem with the power supply voltage; if there is a difference of more than 10 V, consider the phase imbalance of the power supply; if there is a difference of tens of volts or even hundreds of volts, consider that there is a problem with the power supply or the filter board.

3.8 xL43: The current sampling bias is abnormal.

3.8.1 Digital display output



3.8.2 Description

- The drive board is faulty upon the power-on self test.
- Once this fault occurs, the compressor cannot be started up, and the drive board must be checked.

3.8.3 Trigger / recover condition

- Trigger condition: The drive board fails the power-on self test.

3.8.4 Possible causes

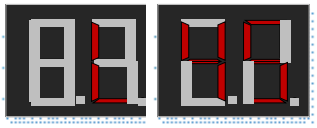
- The compressor and fan drive board is faulty.

3.8.5 Procedure

- Replace the compressor and fan drive board.

3.9 XL45: Motor Code Mismatch

3.9.1 Digital display output



3.9.2 Description

- The compressor parameters set by the main control board do not match the compressor parameters of the drive board.
- Once this fault occurs, the compressor cannot be started up, and the drive board must be checked.

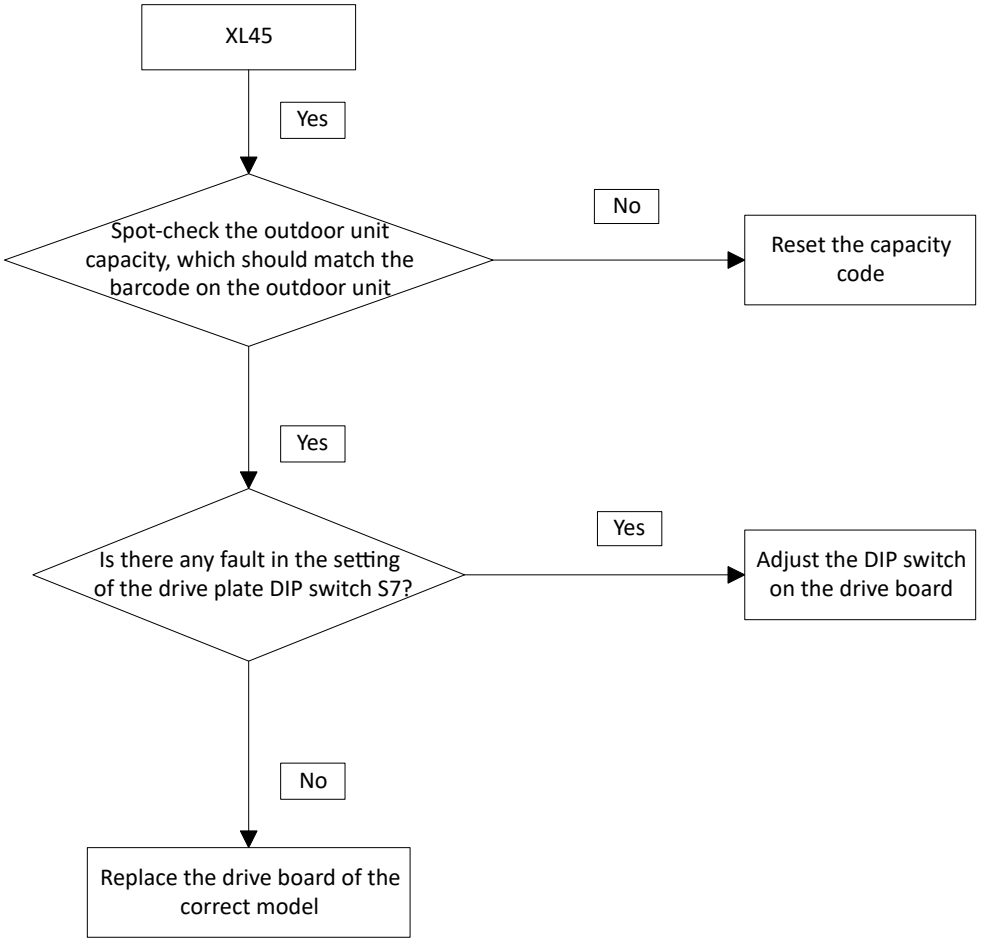
3.9.3 Trigger / recover condition

- Trigger condition: The compressor model selected through communication for the main control board does not match the compressor model in the drive.
- Restoration condition: Check whether the DIP switch of the model is wrong. Select a correct DIP switch for the model.
- Reset method: Resume manually (Select the correct DIP switch for the model, power the unit off, and power on again)

3.9.4 Possible causes

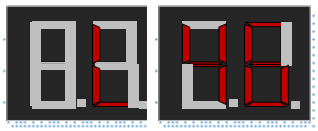
- The capacity DIP switch or model DIP switch of the main control board is incorrectly set.
- The model selected does not match the drive board.
- The main board or compressor drive board is faulty.

3.9.5 Procedure



3.10 XL46: IPM protection (FO)

3.10.1 Digital display output



3.10.2 Description

- IPM has overcurrent or IPM has drive undervoltage.
- The compressor stops running after the error occurs. If the error disappears one minute later, the compressor starts again.

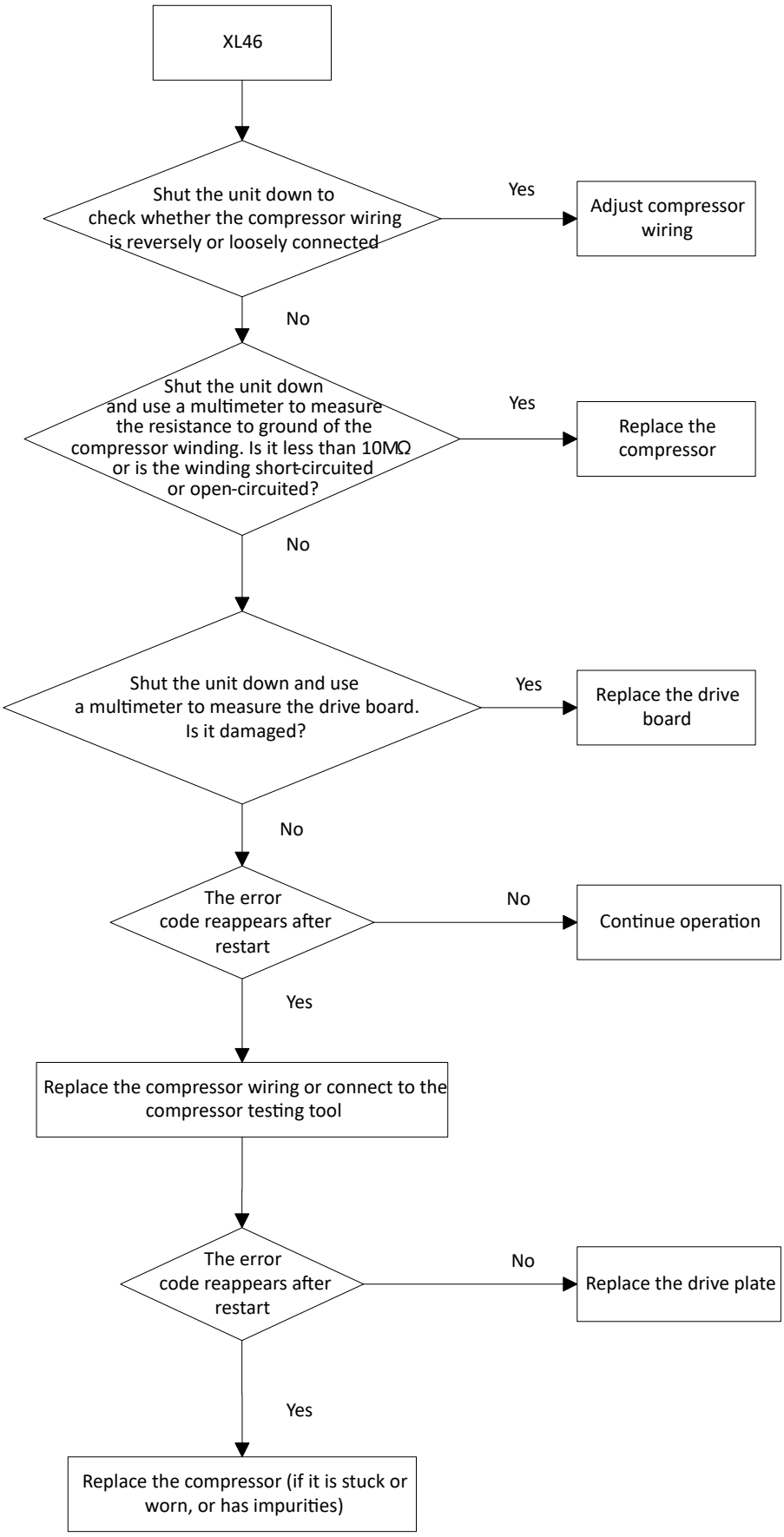
3.10.3 Trigger / recover condition

- Trigger condition: IPM has overcurrent or IPM has drive undervoltage.
- Restoration condition:
- Reset method: Resume manually

3.10.4 Possible causes

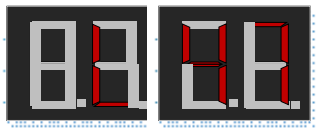
- The compressor wiring is reversely connected, in poor contact, or short-circuited.
- There is impurity in the refrigerant system or the compressor is instantaneously locked.
- The compressor drive board is faulty.

3.10.5 Procedure



3.11 XL47: Module type mismatch

3.11.1 Digital display output



3.11.2 Description

- The compressor parameters set by the main control board do not match the compressor parameters, the driver board specifications set by the main control board do not match the compressor specifications of the drive board.

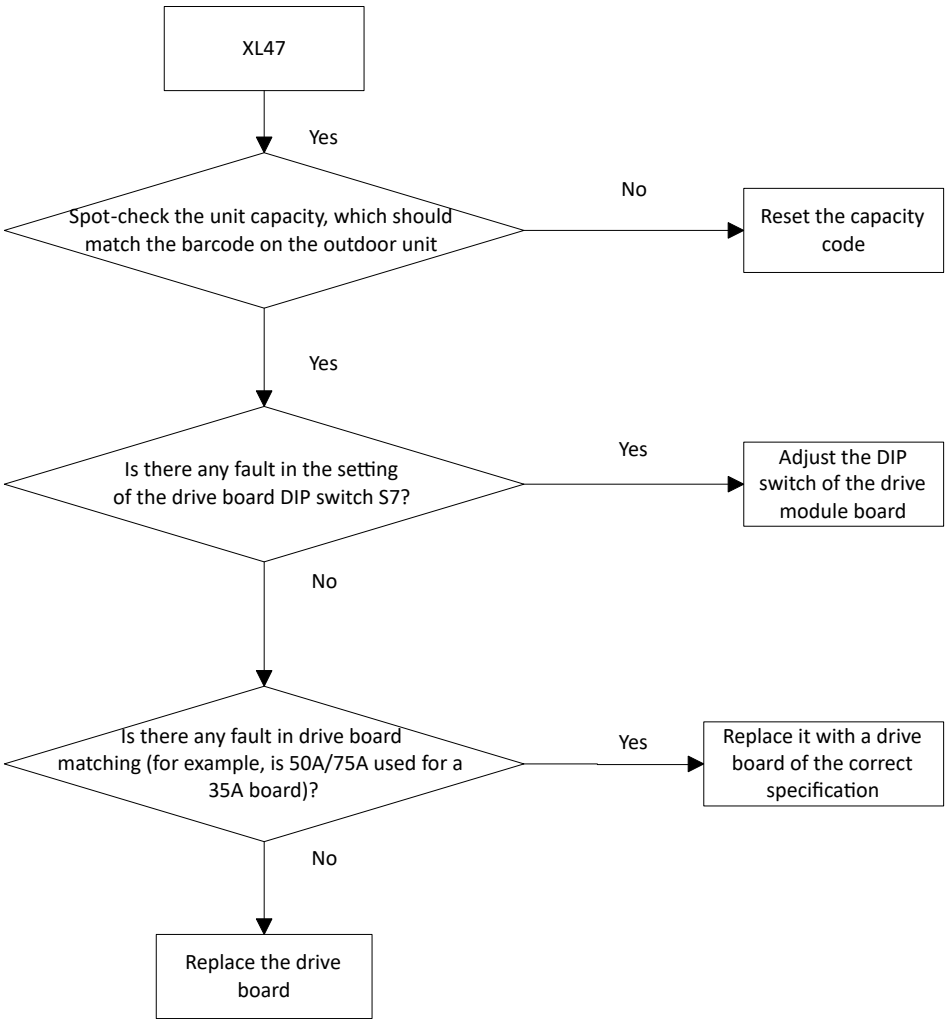
3.11.3 Trigger / recover condition

- Trigger condition: The compressor parameters set by the main control board do not match the compressor parameters, the driver board specifications set by the main control board do not match the compressor specifications of the drive board.
- Restoration condition: Select the correct drive board for the model, power the unit off, and start it up again.
- Reset method: Resume manually

3.11.4 Possible causes

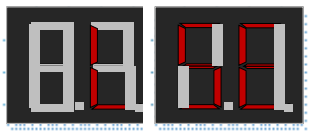
- Model configuration parameters are incorrect.
- The drive board used does not match the model.
- The compressor drive board is faulty.

3.11.5 Procedure



3.12 xL5E: Startup failed

3.12.1 Digital display output



3.12.2 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.

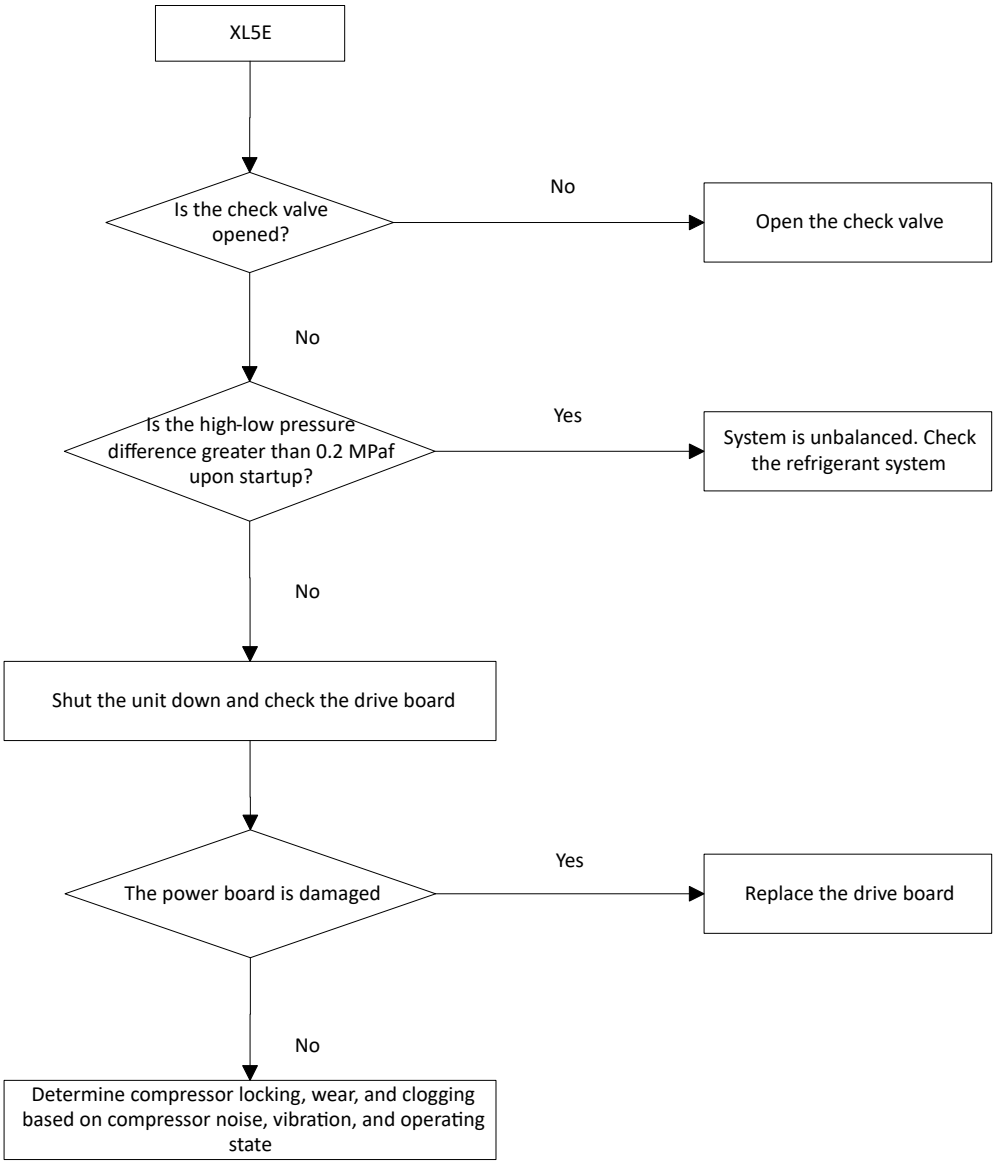
3.12.3 Trigger / recover condition

- 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.

3.12.4 Possible causes

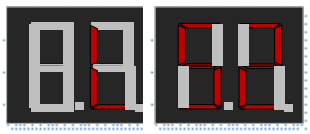
- The check valve is not opened.
- Differential pressure occurs upon system startup.
- The compressor is locked, worn, or blocked.
- The compressor drive board is faulty.

3.12.5 Procedure



3.13 xL52: Locked-rotor protection

3.13.1 Digital display output



3.13.2 Description

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

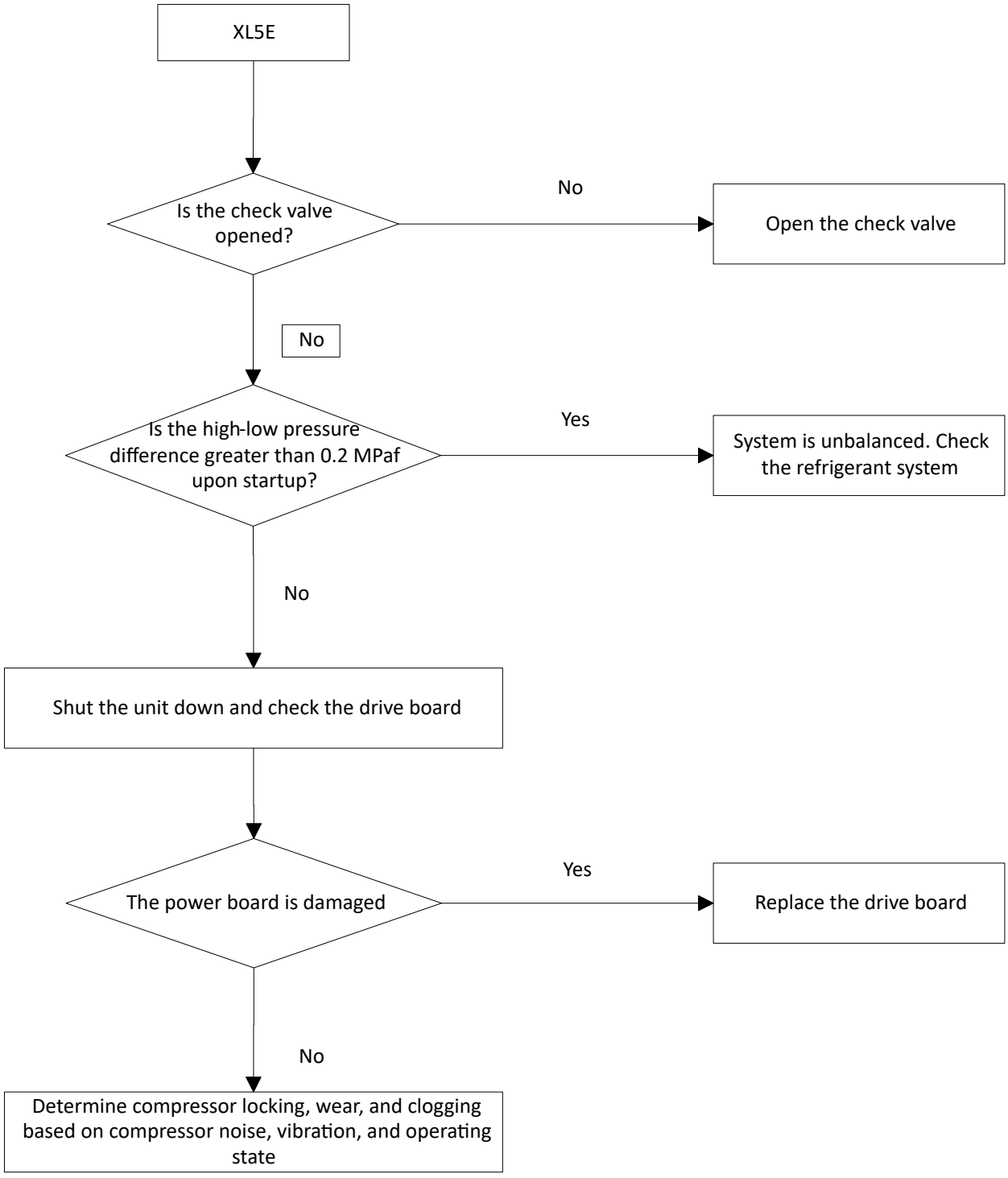
3.13.3 Trigger / recover condition

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

3.13.4 Possible causes

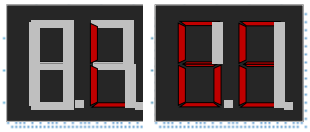
- The compressor is blocked due to impurities or lack of oil in the system.

3.13.5 Procedure



3.14 xL6E: Compressor motor lack of phase protection

3.14.1 Digital display output



3.14.2 Description

- Phase loss protection of compressor.
- When the fault occurs, the compressor stops operation. If the fault disappears in 1 min, the compressor is started up again.

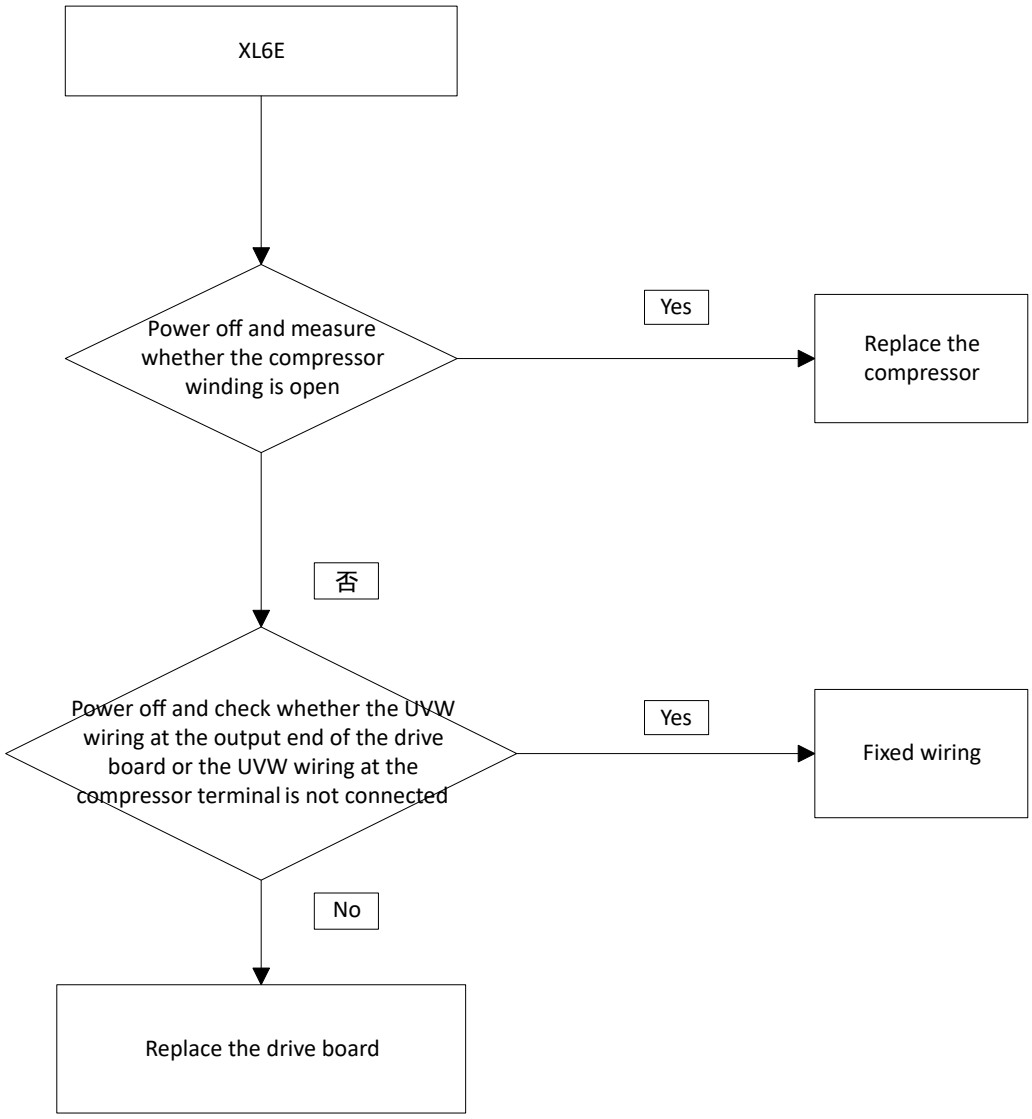
3.14.3 Trigger / recover condition

- Trigger condition: Compressor line is not connected or in poor contact.
- Reset method: Resume automatically after the error exit condition is reached.

3.14.4 Possible causes

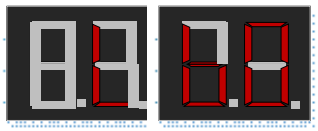
- Poor contact of compressor wire or screw of binding post not tightened.
- The compressor drive board is abnormal.

3.14.5 Procedure



3.15 xLb0: Action of high voltage switch

3.15.1 Digital display output



3.15.2 Description

- Action of the high pressure switch connected to the drive board.
- When the fault occurs, the compressor stops operation. If the fault disappears in 1 min, the compressor is started up again.

3.15.3 Trigger / recover condition

- Trigger condition: Detect high voltage open circuit.
- Reset method: Resume automatically after the error exit condition is reached.

3.15.4 Possible causes

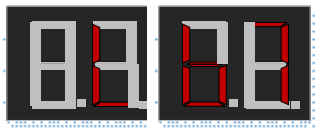
- System pressure is too high.
- The compressor drive board is abnormal.

3.15.5 Procedure

Refer to P13 for troubleshooting.

3.16 xLb7: Pressure safety diagnostic module (PED) check abnormal or error

3.16.1 Digital display output



3.16.2 Description

- The driver board detects a malfunction signal of the pressure safety diagnostic module (PED).
- When the fault occurs, the compressor stops operation. If the fault disappears in 1 min, the compressor is started up again.

3.16.3 Trigger / recover condition

- Trigger condition: Pressure safety diagnosis module (PED) output failure (self-failure or failure to pass self-test).
- Reset method: Resume automatically after the error exit condition is reached.

3.16.4 Possible causes

- PED diagnosis module is abnormal;
- The drive board is abnormal.

3.16.5 Procedure

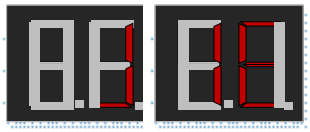
Remove the PED diagnostic module (it does not affect the operation of the system under normal conditions), and ovserve the operation of the system:

- If the fault still exists, it shall be determined that the drive board is abnormal and the drive board shall be replaced;
- If it can operate normally, it shall be determined as PED module failure, and replace the PED module.

4 Error in Fan Drive

4.1 xJ1E: Hardware overcurrent

4.1.1 Digital display output



4.1.2 Description

- The fan current exceeds the protection value set for the hardware.
- The fan stops running after the error occurs. If the error disappears five seconds, the fan starts again

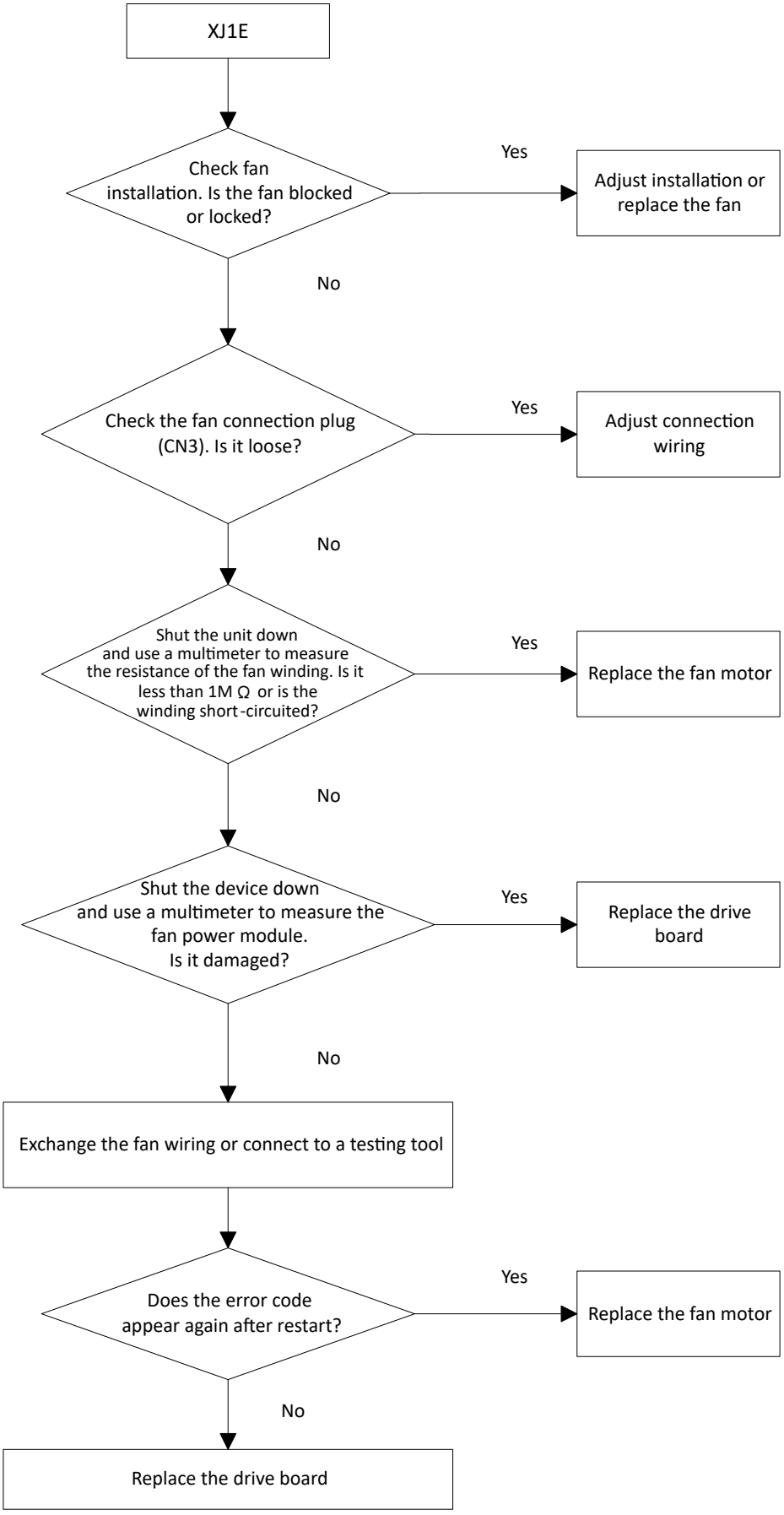
4.1.3 Trigger / recover condition

- Trigger condition: The instantaneous current of the fan exceeds the 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

4.1.4 Possible causes

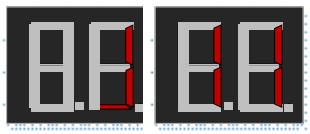
- The fan is blocked or the internal coil is short-circuited or damaged
- The fan drive board is damaged
- The circuits of Inverter drive board (fan section) are abnormal

4.1.5 Procedure



4.2 xJ11, xJ12: Software overcurrent

4.2.1 Digital display output



4.2.2 Description

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

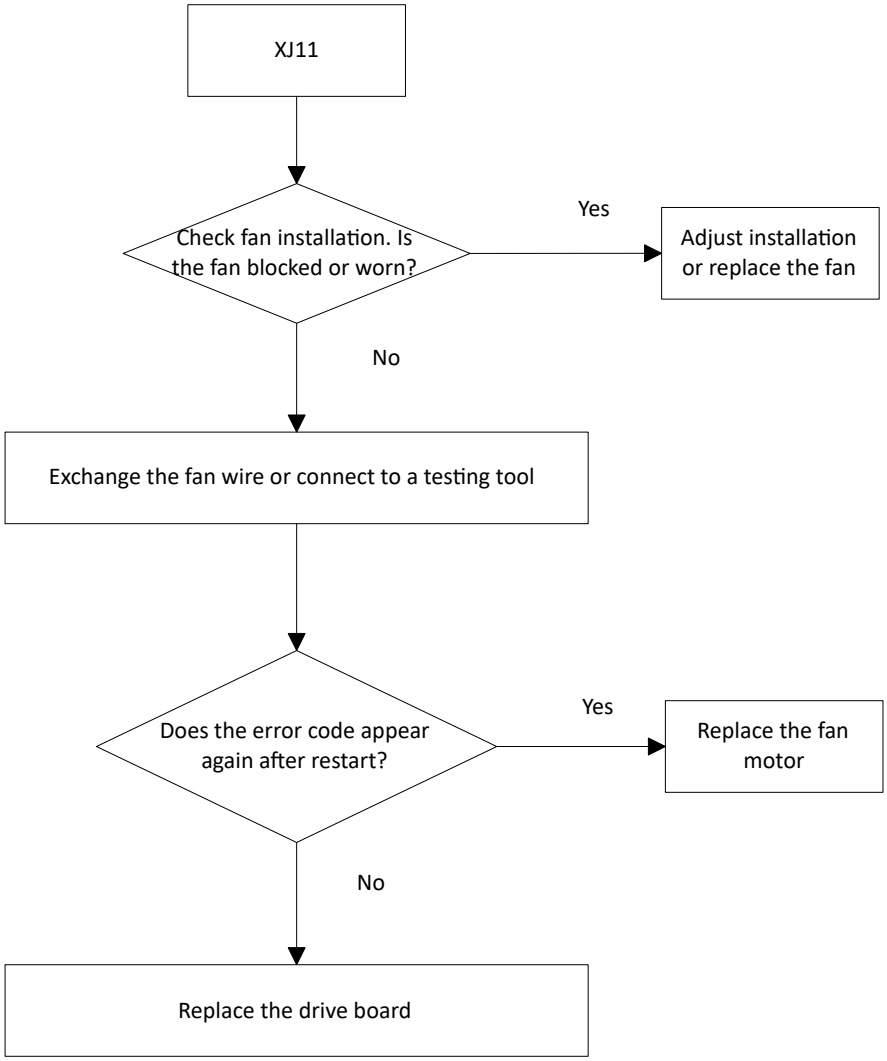
4.2.3 Trigger / recover condition

- Trigger condition: The compressor current is detected to have exceeded the protection value set for the software 3 times
- 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

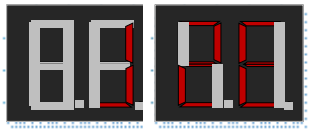
- Severe fan wear.
- The fan drive board is faulty.

4.2.5 Procedure



4.3 xJ2E: Module overtemperature protection

4.3.1 Digital display output



4.3.2 Description

- The internal temperature of the fan drive module (IPM) is higher than 100℃.

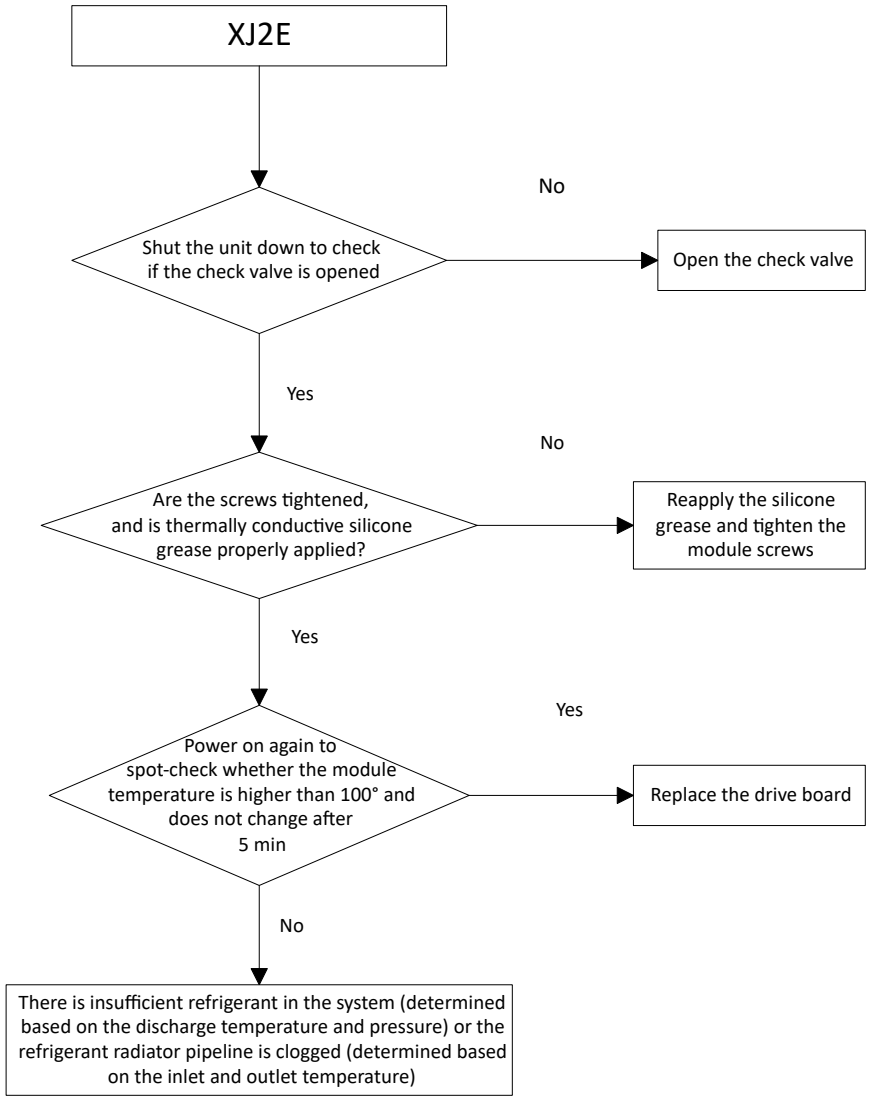
4.3.3 Trigger / recover condition

- Trigger condition:The temperature of the IPM exceeds 100℃
- Recover condition: After an 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 100℃).
- Reset method: Resume automatically after the error exit condition is reached.

4.3.4 Possible causes

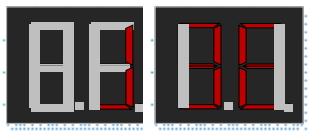
- The IPM screws are not tightened, resulting in poor heat dissipation:
- The heat dissipation silicone for the IPM module is not evenly applied, resulting in poor heat dissipation:
- The fan drive board is faulty.

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.

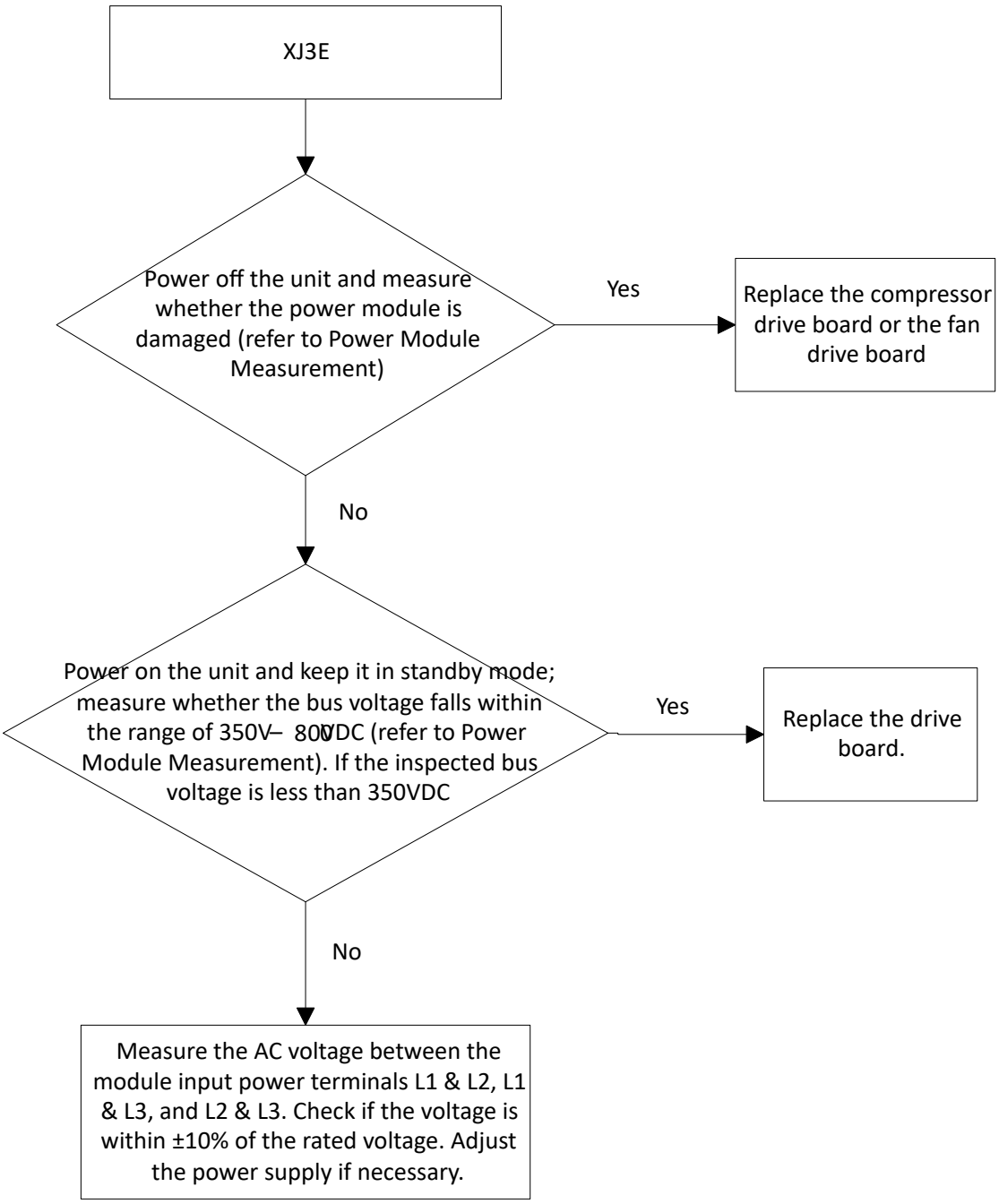
4.4.3 Trigger / recover condition

- 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

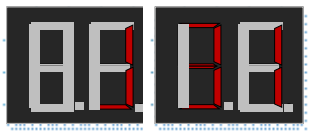
- The input voltage is too low, resulting in the low bus voltage:
- Voltage sag or interruption, resulting in transient bus voltage is too low:
- The bus voltage detection circuit of the module is abnormal:

4.4.5 Procedure



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 (750VDC).
- The fan stops running after the error occurs. If the error disappears five seconds later, the fan starts again.

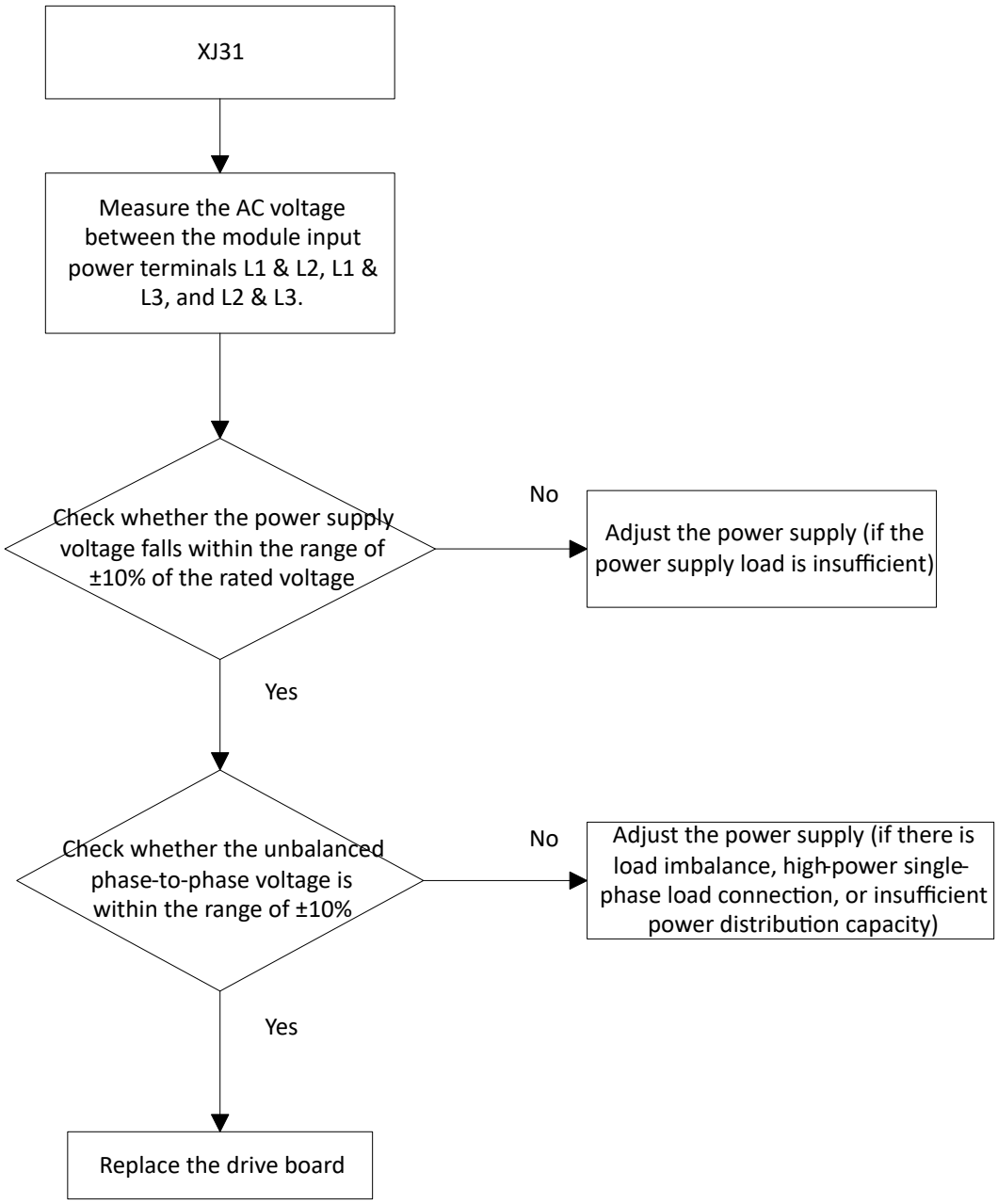
4.5.3 Trigger / recover condition

- 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

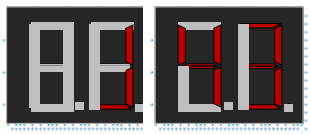
- The input voltage is too high, resulting in the high bus voltage;
- The power grid voltage is too high:
- The bus voltage detection circuit of the module is abnormal:

4.5.5 Procedure



4.6 xJ43: The current sampling bias is abnormal

4.6.1 Digital display output



4.6.2 Description

- The detection circuit of the drive board fails the power-on self test.
- After this error occurs, the fan cannot start. Check whether the inverter driver board is in error.

4.6.3 Trigger / recover condition

- Trigger condition: The drive board fails the power-on self test.
- Reset method: Restoration after passing the self test.

4.6.4 Possible causes

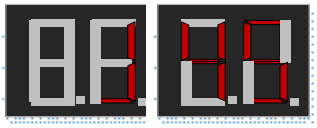
- The fan drive board is abnormal

4.6.5 Procedure

- Replace the inverter drive board

4.7 xJ45: Motor Code Mismatch

4.7.1 Digital display output



4.7.2 Description

- The fan model selected through communication for the main control board does not match the fan model in the drive.
- Once this fault occurs, the fan cannot be started up, and the drive board must be checked.

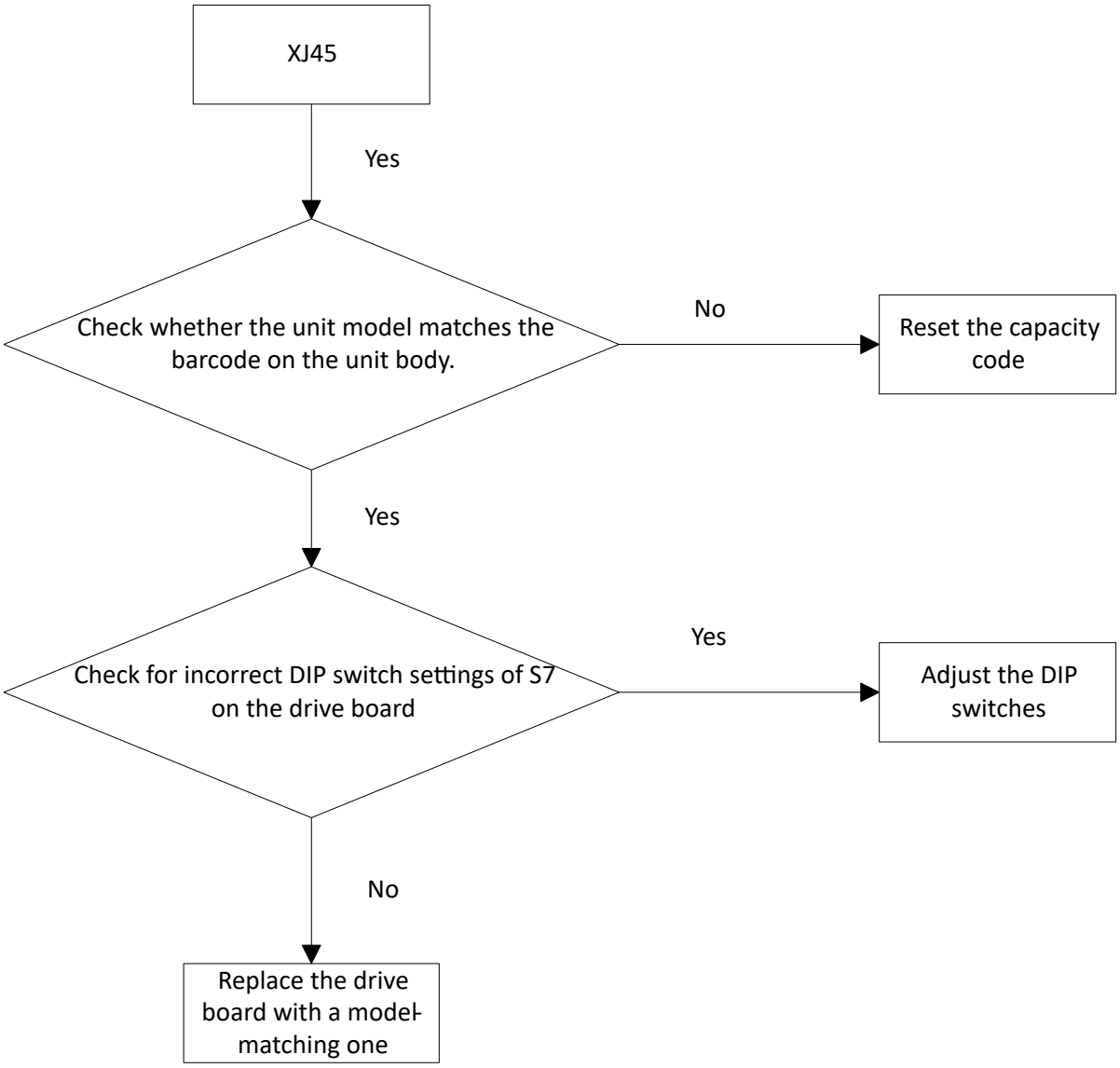
4.7.3 Trigger / recover condition

- Trigger condition: The fan model selected through communication for the main control board does not match the fan model in the drive.
- Restoration condition: Check whether the DIP switch of the model is wrong. Select a correct DIP switch for the model.
- Reset method: Resume manually (Select the correct DIP switch for the model, power the unit off, and power on again)

4.7.4 Possible causes

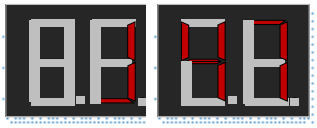
- The capacity DIP switch or model DIP switch of the main control board is incorrectly set.
- The model selected does not match the drive board.
- The fan drive board is faulty.

4.7.5 Procedure



4.8 xJ47: Module Type Mismatch

4.8.1 Digital display output



4.8.2 Description

- The fan parameters set by the main control board do not match the fan parameters, the driver board specifications set by the main control board do not match the fan specifications of the drive board.

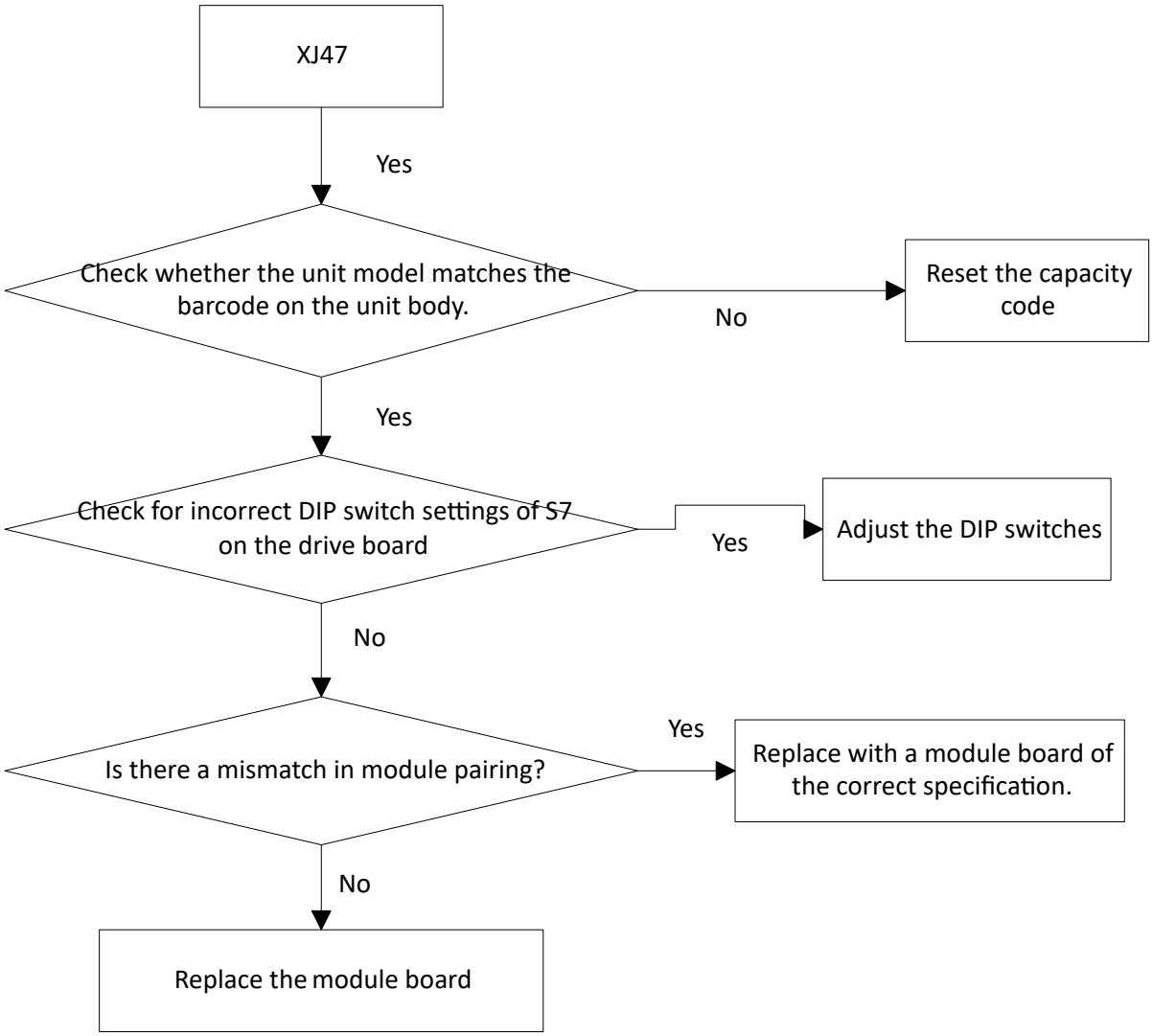
4.8.3 Trigger / recover condition

- Trigger condition: The fan parameters set by the main control board do not match the fan parameters, the driver board specifications set by the main control board do not match the fan specifications of the drive board.
- Restoration condition: Select the correct drive board for the model, power the unit off, and start it up again.
- Reset method: Resume manually

4.8.4 Possible causes

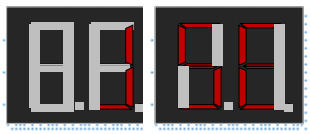
- Model configuration parameters are incorrect.
- The drive board used does not match the model.
- The drive board is faulty.

4.8.5 Procedure



4.9 xJ5E: Startup failed

4.9.1 Digital display output



4.9.2 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.

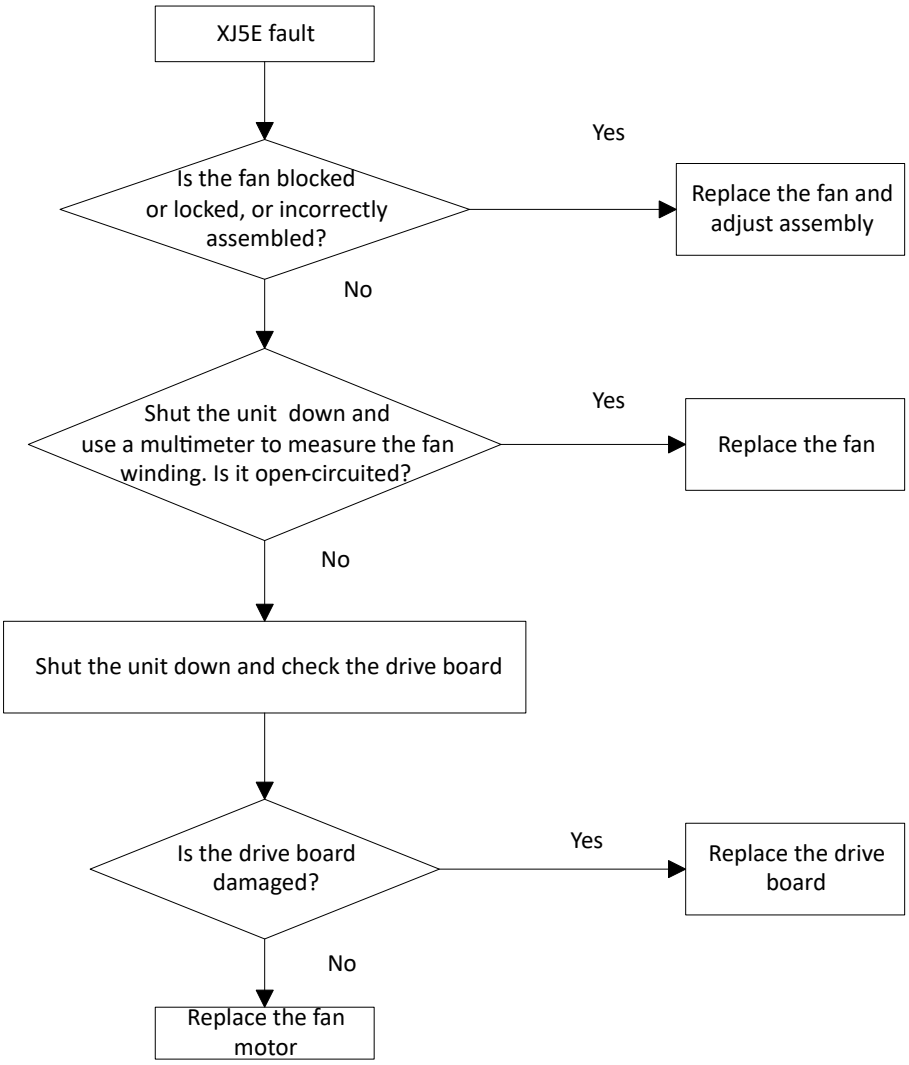
4.9.3 Trigger / recover condition

- 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.

4.9.4 Possible causes

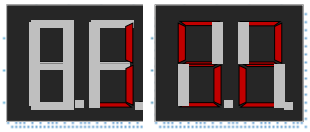
- Fan motor stuck:
- Fan is started against the wind:
- Fan drive board is abnormal:

4.9.5 Procedure



4.10 xJ52: Locked-rotor protection

4.10.1 Digital display output



4.10.2 Description

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

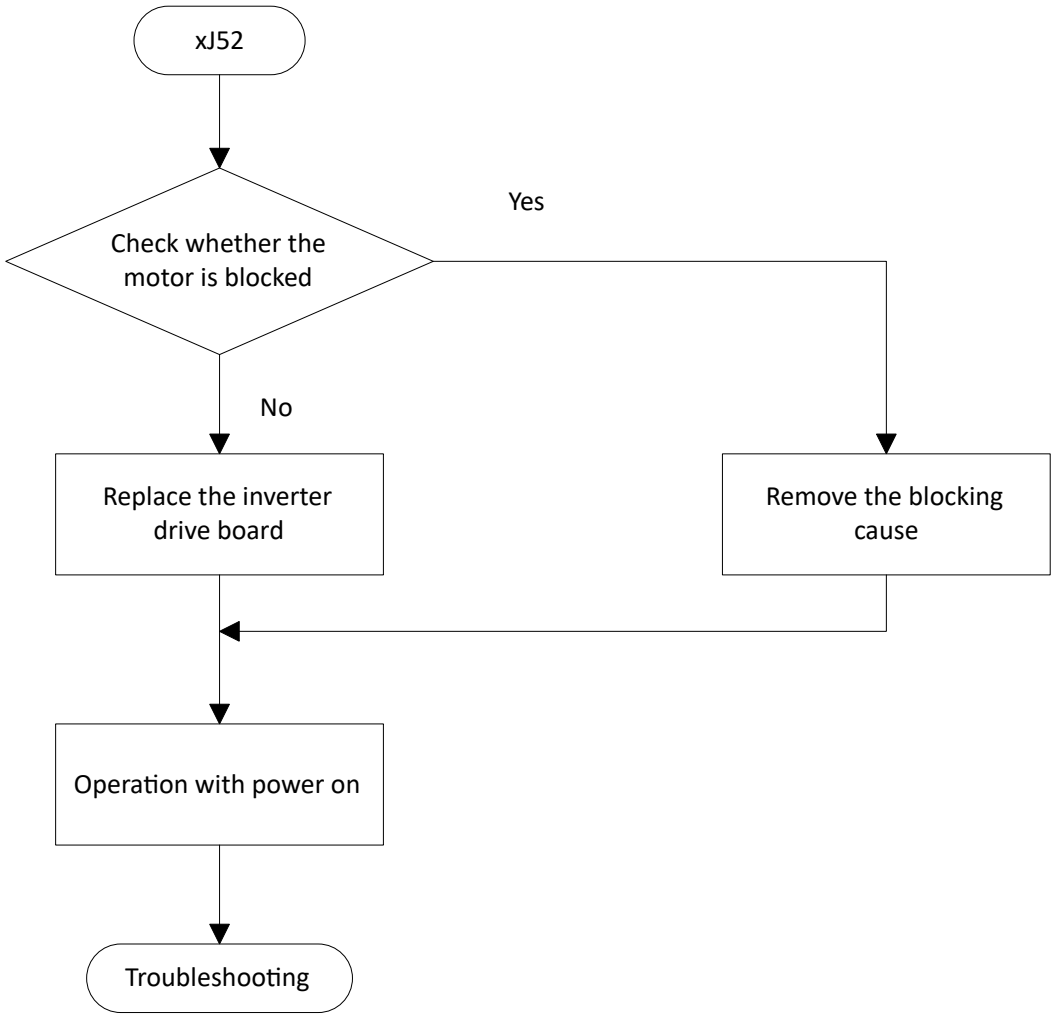
4.10.3 Trigger / recover condition

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

4.10.4 Possible causes

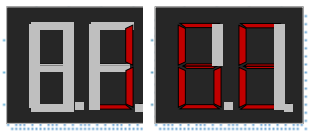
- The fan shaft is stuck.

4.10.5 Procedure



4.11 xJ6E: Motor lack of phase protection

4.11.1 Digital display output



4.11.2 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

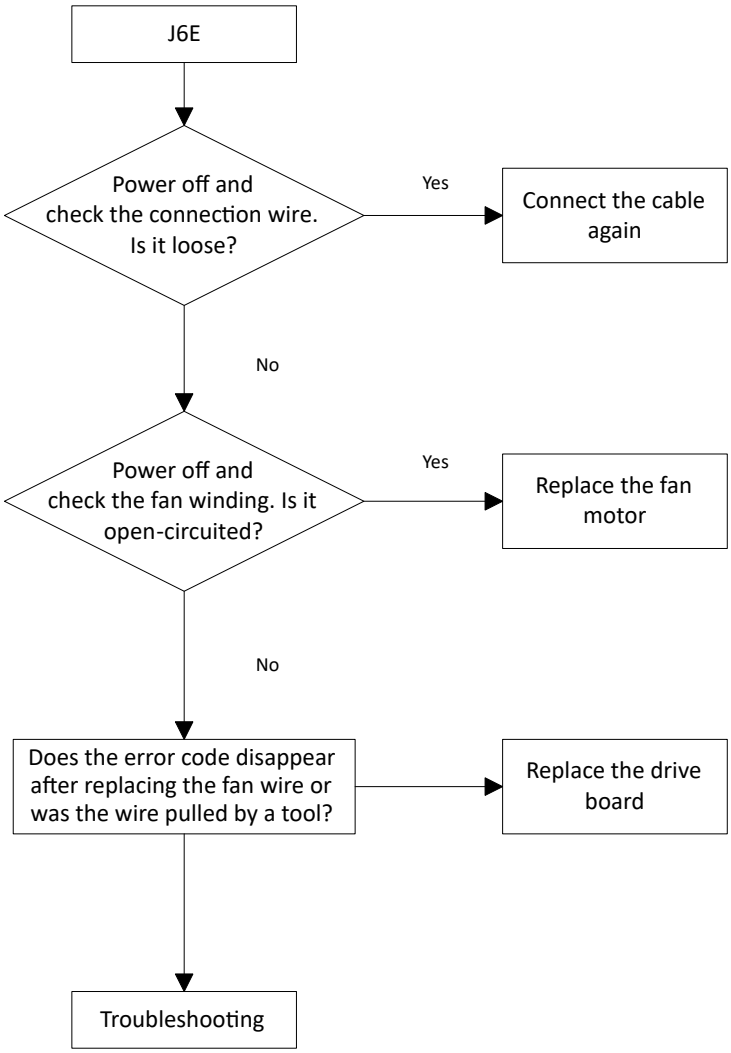
4.11.3 Trigger / recover condition

- Trigger condition: The fan has phase loss protection.
- 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

4.11.4 Possible causes

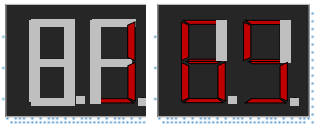
- The compressor cable is in poor contact or the terminal screw is not tightened.
- The IPM of inverter drive board is damaged:

4.11.5 Procedure



4.12 xJ65: Fan IPM Short Circuit Protection

4.12.1 Digital display output



4.12.2 Description

- The fan is in IPM short circuit protection.
- The fan stops running after the error. If the error disappears after five seconds, the fan starts again

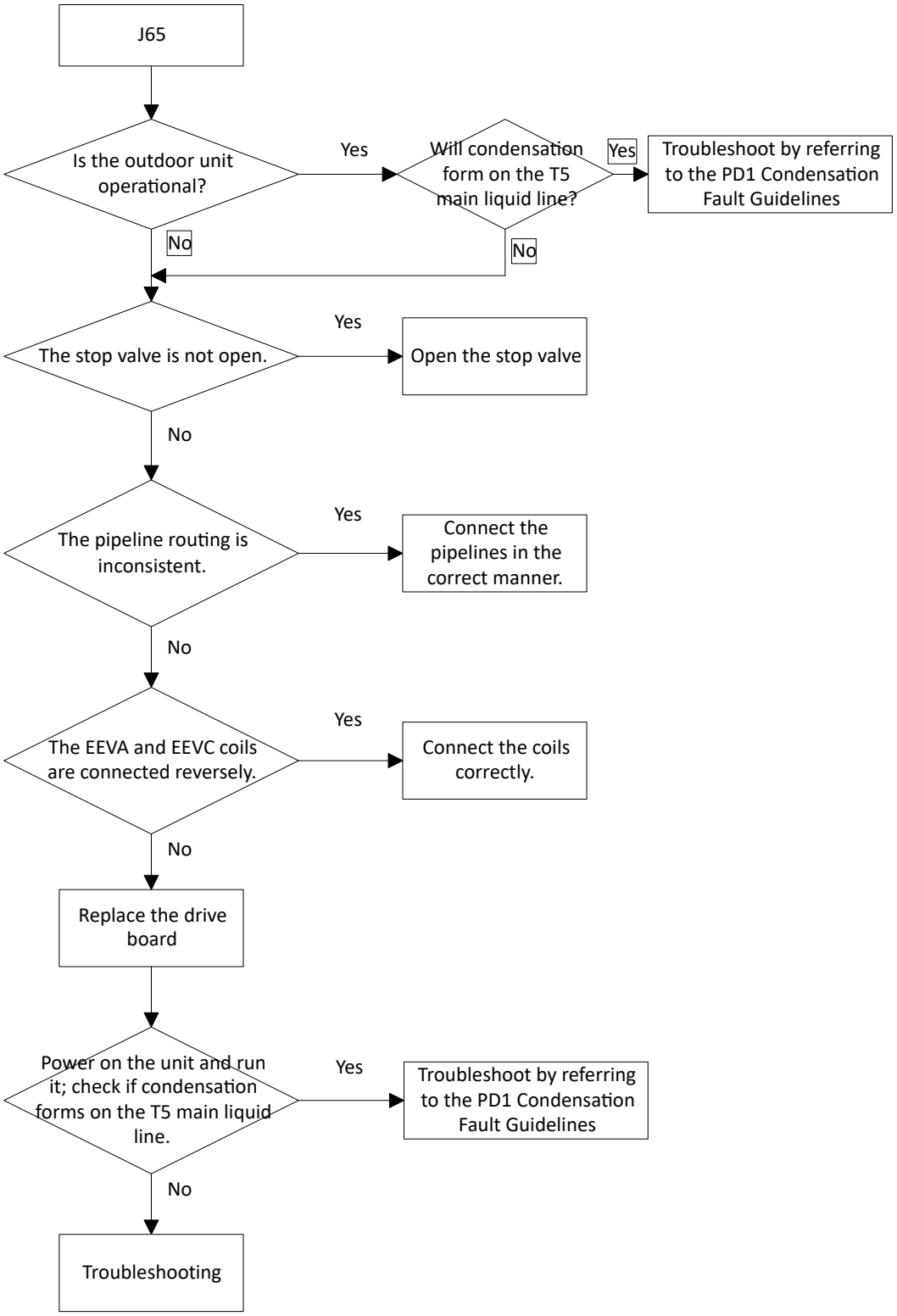
4.12.3 Trigger / recover condition

- Trigger condition: The fan is in IPM short circuit protection.
- Recover condition: IPM short circuit protection is disabled.
- Reset method: Resume Automatically after the error exit condition is reached

4.12.4 Possible causes

- The check valve is not opened.
- Piping and wiring are inconsistent. For example, the piping for system A is connected to system A and the communication wiring is connected to system B.
- Coils of EEVA and EEVC are reversely connected.
- The fan drive board is short-circuited or damaged.

4.12.5 Procedure



5 Appendix

5.1 Temperature Sensor Location and Definition

Temperature sensor location		Sensor type
T3	Bottom of the heat exchanger	A type
T4	Ambient temperature	A type
T5	Liquid pipe stop valve	A type
T7C1	Discharge of the main compressor	B type
T7C2	Discharge of the slave compressor	B type
TL	Condenser outlet	A type
Tg	Suction pipe stop valve	A type
NTC	Inverter drive board	C type
TdH	Temperature and humidity sensor	D type

5.2 Temperature Sensor Resistance Characteristic Table

Table 6-5.1: Temperature sensor resistance characteristic table

Temperature	Resistance (kΩ)		
(°C)	A type	B type	C type
-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
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
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
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

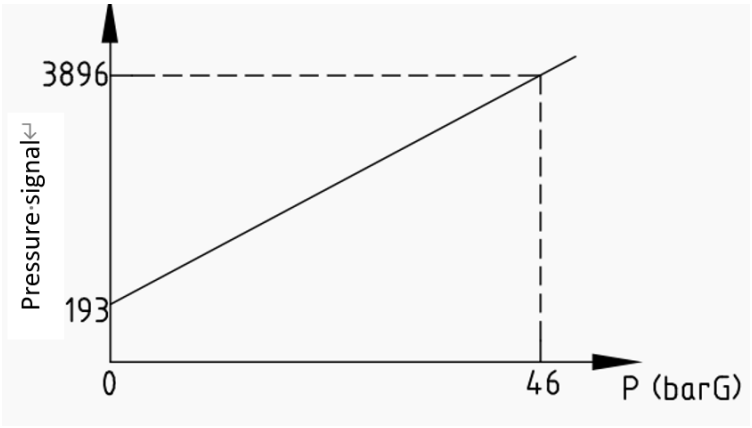
100	0.6297	3.702	3.716
101	0.6115	3.595	3.613
102	0.5939	3.492	3.514
103	0.5768	3.392	3.418
104	0.5604	3.296	3.326
105	0.5445	3.203	3.235
106	0.5291	3.113	3.148
107	0.5143	3.025	3.063
108	0.4999	2.941	2.982
109	0.486	2.86	2.902
110	0.4726	2.781	2.826
111	0.4596	2.704	2.747
112	0.447	2.63	2.672
113	0.4348	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	
130	0.2777	1.632	
131	0.2708		
132	0.2641		
133	0.2576		
134	0.2513		
135	0.2451		

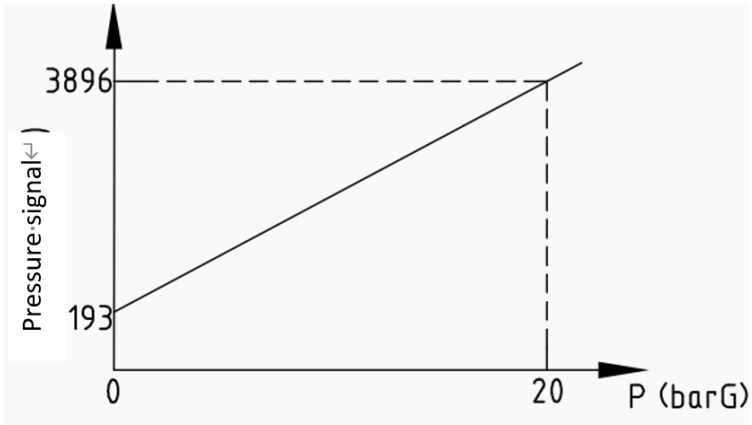
5.3 SENT Pressure Sensor Characteristic

The pressure signal detected by the SENT pressure sensor is a fast-channel DEC value, with a range of 1 to 4088. The Pc and Pe values are calculated according to the sensor pressure curve. Among them, the range of 193 to 3896 is calculated using a linear formula, while the ranges of 2 to 192 and 3897 to 4088 are calculated via extrapolation based on the aforementioned linear formula.

Details of the fast channel are as follows:

Specifications DEC	Description
0	Initialization
1	Underflow
2-192	Below minimum pressure
193-3896	Linear operating range: 0BarG:193 20/46BarG: 3896
3897-4087	Above maximum pressure
4088	Overflow
4089-4095	Diagnostic information (Diagnostic information can be configured to also be displayed in the fast channel)





5.4 Normal status parameter of refrigerant system

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

- The outdoor unit can detect all indoor units:
- 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 6-5.4: Outdoor unit cooling mode parameters

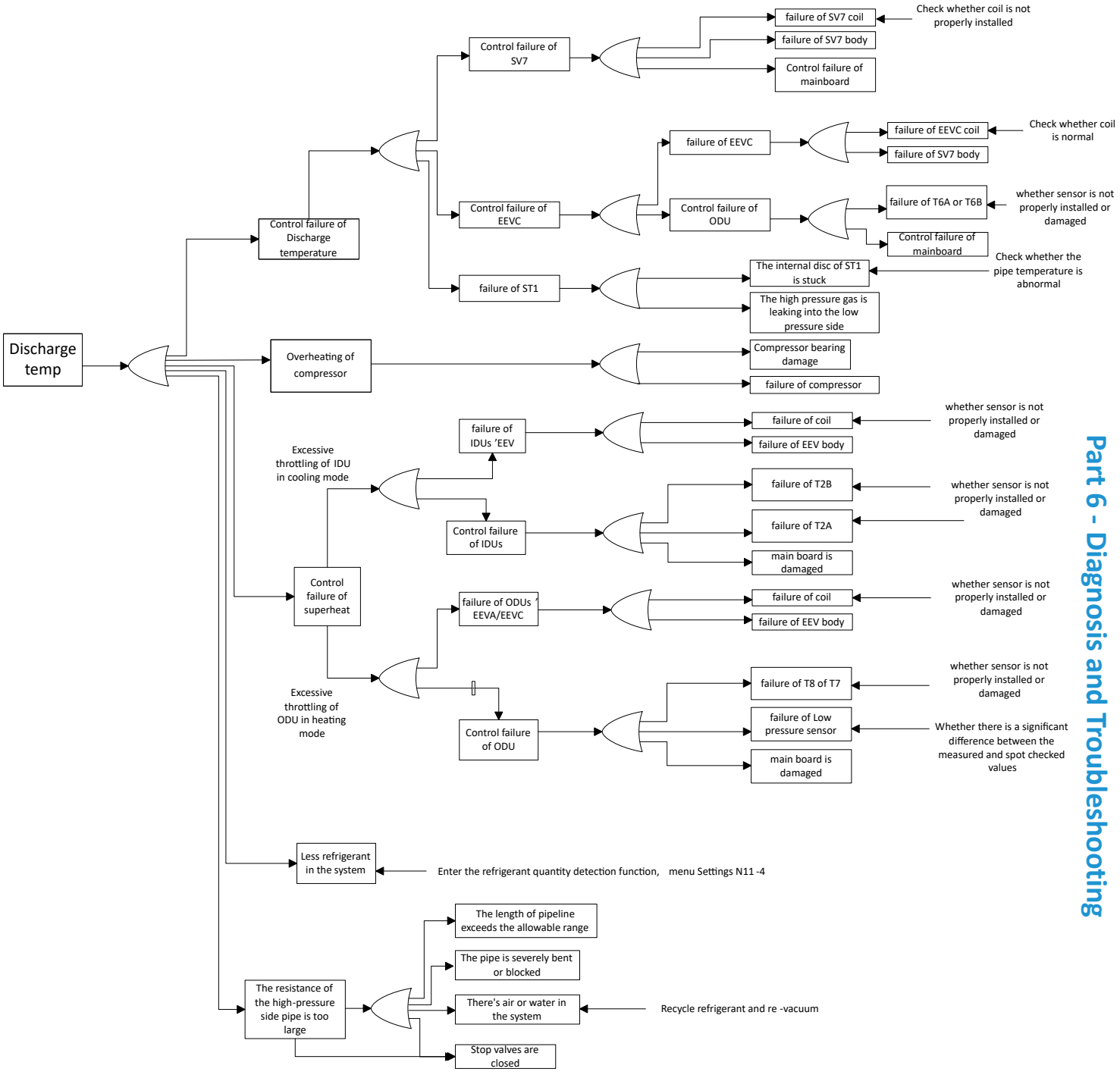
Outdoor ambient temperature	**°C**	< 10	10 to 26	26 to 31	31 to 41	> 41
Discharge temperature	**°C**	60-76	62-78	65-82	67-92	69-92
Discharge superheat	**°C**	17-30	17-33	17-34	17-36	10-32
Discharge pressure	**MPa**	2.3-2.8	2.3-2.8	2.4-3.6	2.6-3.8	3.1-4.1
Suction pressure	**MPa**	0.6-0.7	0.7-0.9	0.8-1.0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

Table 6-5.5: Outdoor unit heating mode parameters

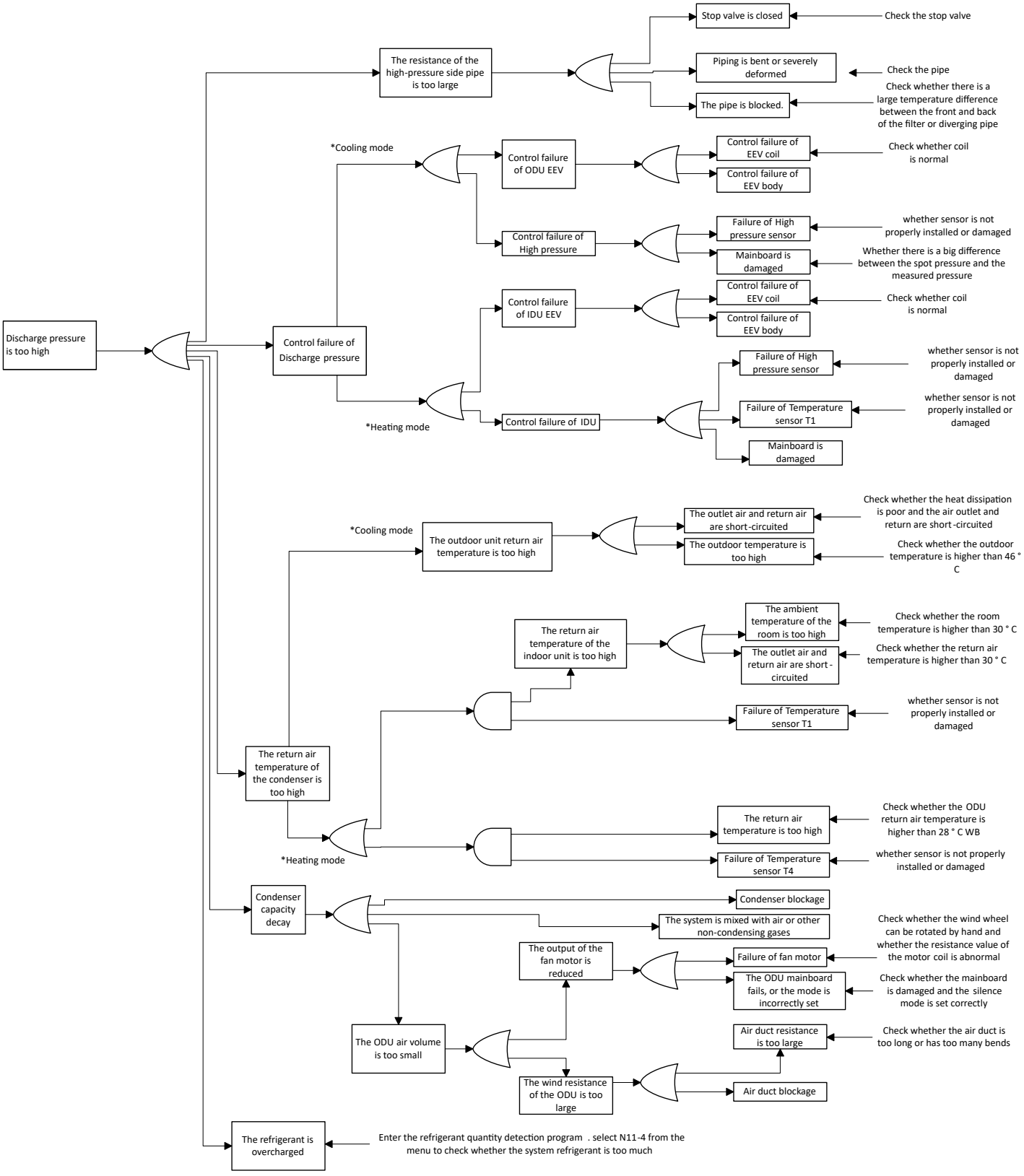
Outdoor ambient temperature	**°C**	< -10	-10 to 0	0 to 5	5 to 10	10 to 17	> 17
Discharge temperature	**°C**	56-74	57-76	58-78	61-82	63-82	63-82
Discharge superheat	**°C**	17-35	17-35	17-35	17-33	14-33	14-33
Discharge pressure	**MPa**	1.7-2.4	1.8-2.5	1.9-3.0	2.2-3.2	2.3-3.2	2.3-3.2
Suction pressure	**MPa**	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 inverter compressor current	**A**	14-38	15-38	16-30	20-40	18-42	12-35

5.5 Analysis of the cause of system anomalies

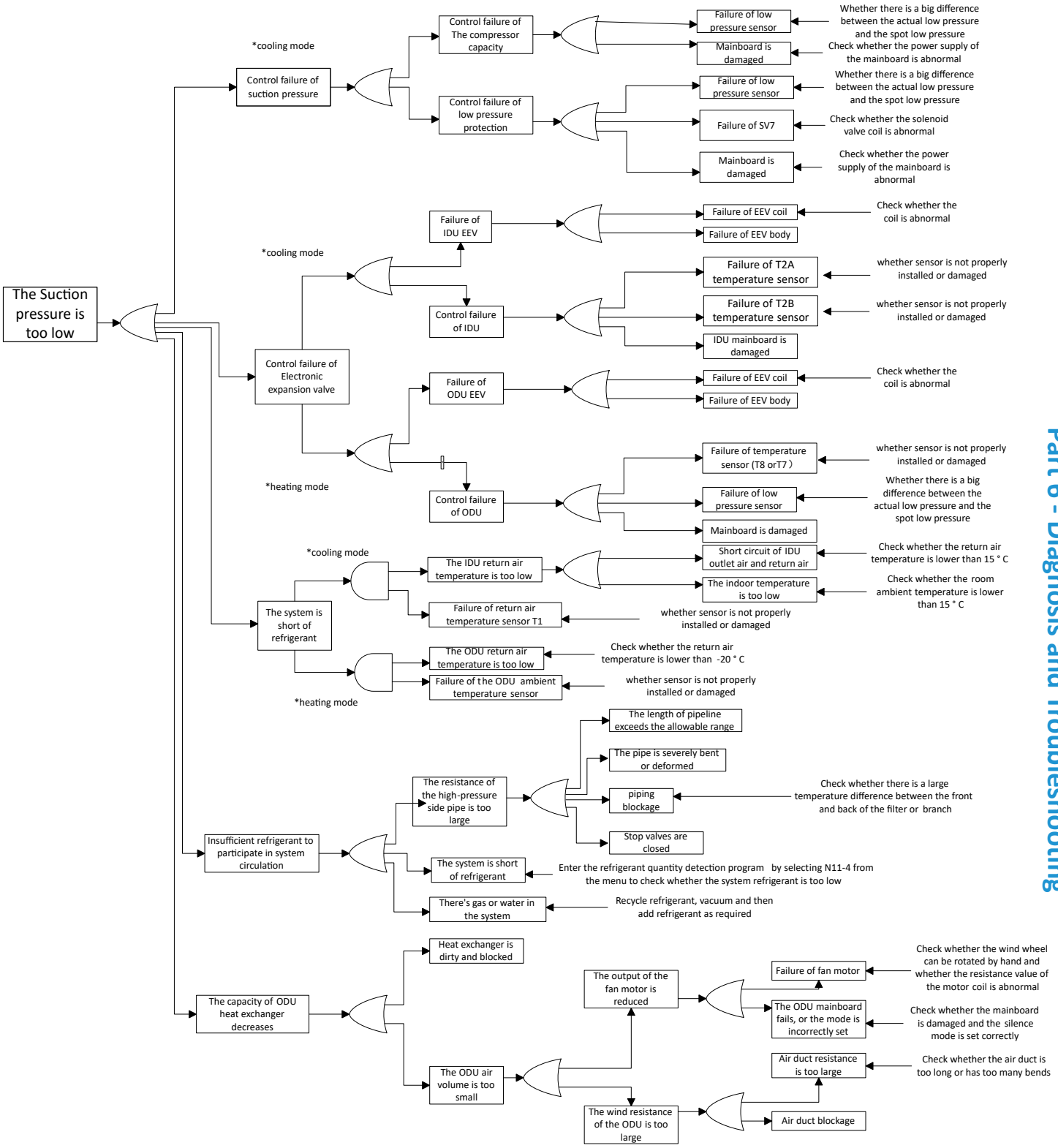
5.5.1 Cause Analysis of Excessive discharge Temperature



5.5.2 Cause Analysis of too high Pressure



5.5.3 Cause Analysis of too Low Pressure

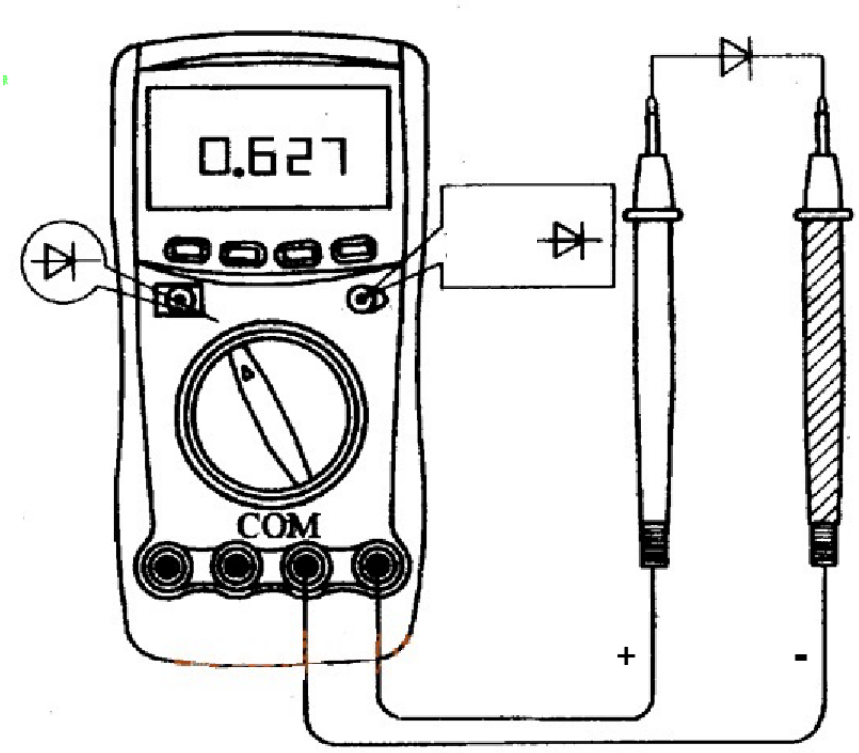


5.6 Inverter drive board measurement guidelines

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:

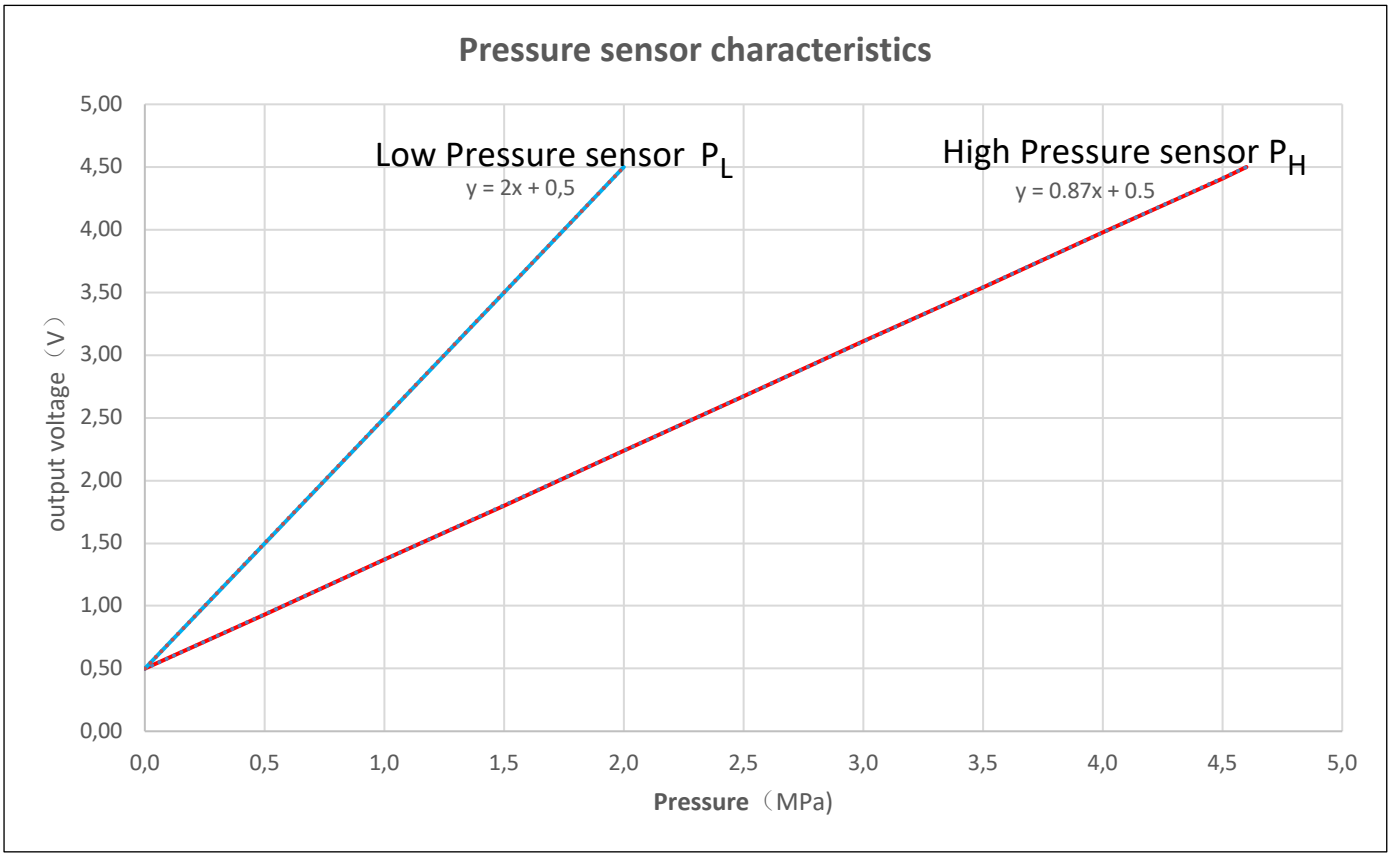
Inverter circuit measurement

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

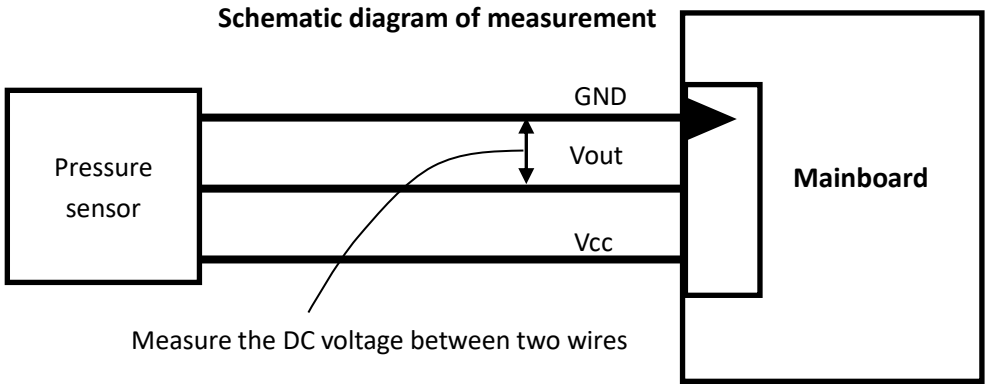
Number	Test point		Normal decision value	Notes
	+(Red)	-(Black)		
1	L1’	P-out	0.3-0.7V	0 or→+ ∞ is abnormal
2	L2’	P-out		
3	L3’	P-out		
4	N	L1’		
5	N	L2’		
6	N	L3’		

5.7 Appendix of Pressure Sensor Detection



P_H :Vout(H)=0.87×P_H+0.5

P_L:Vout(L)=2×P_L+0.5



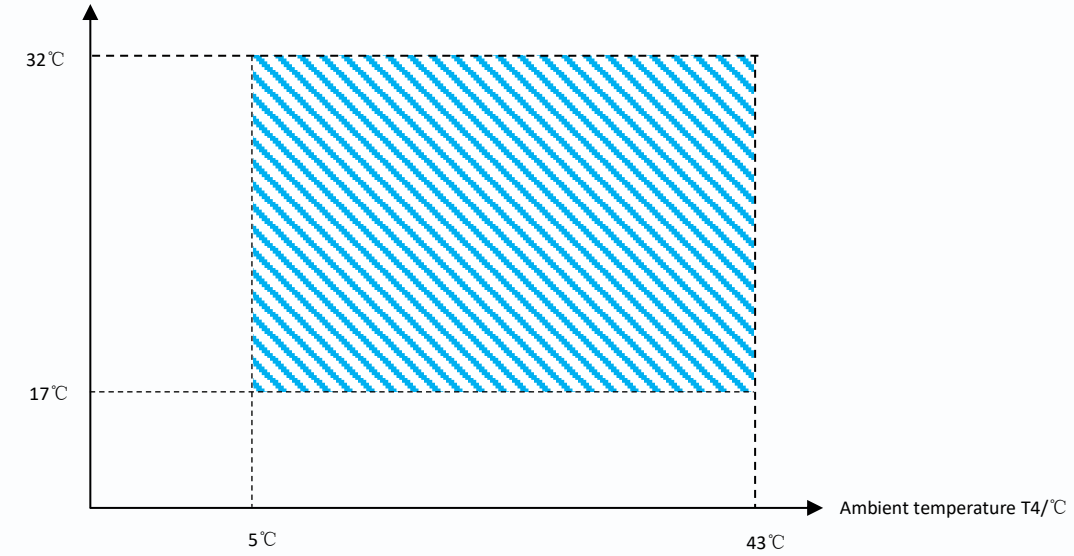
5.8 Refrigerant volume diagnosis

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

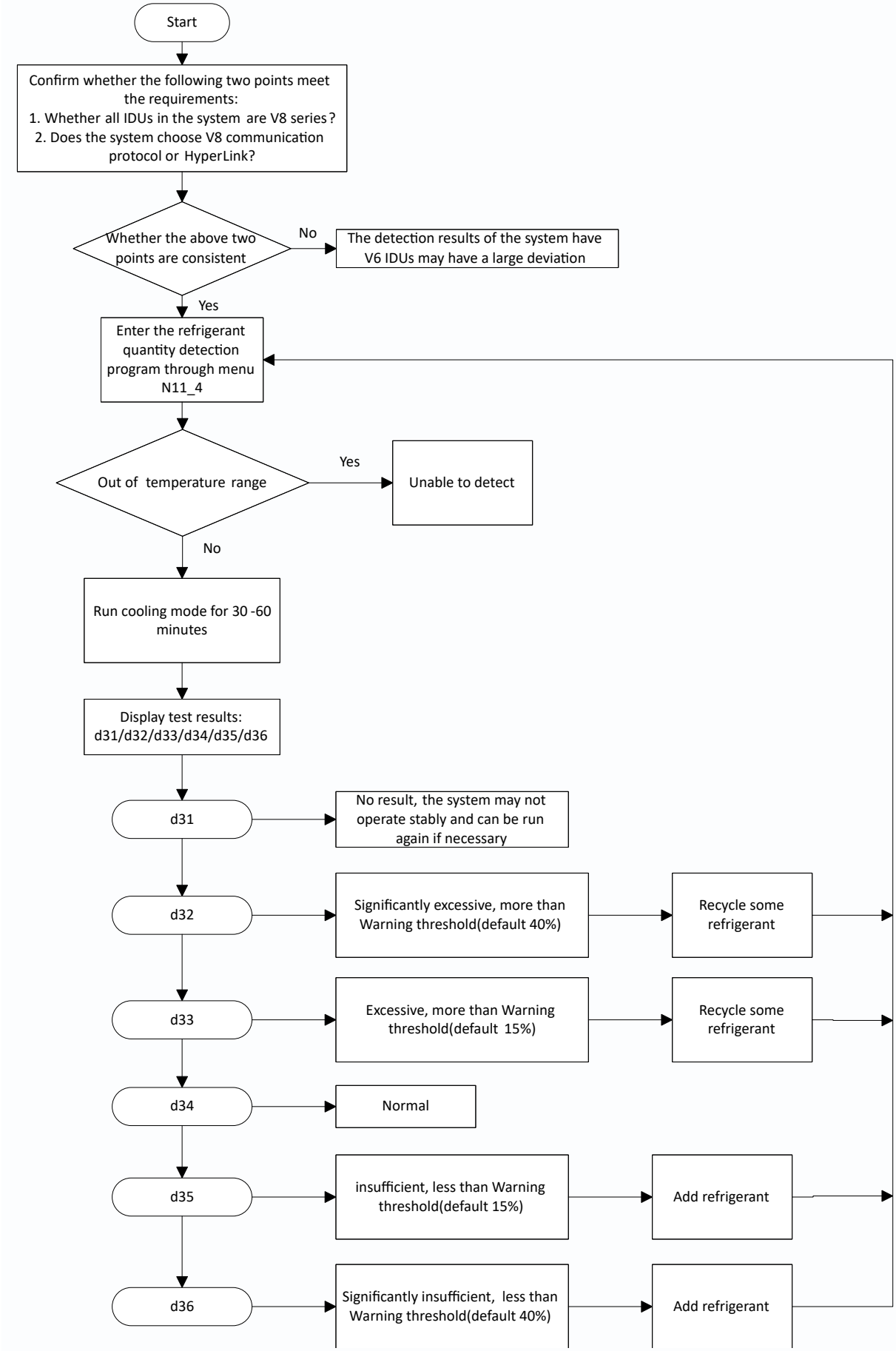
Refrigerant quantity detection operating range



Refrigerant quantity warning value setting:
Menu NB1 sets the warning threshold X of excessive or insufficient,
menu NB2 sets the warning threshold X of Significantly excessive or significantly insufficient refrigerant.
The setting parameters are shown in the following table:

		warning threshold	excessive	insufficient
【nb】	【1】	【0】10%	d33	d35
		【1】15%(default ）		
		【2】20%		
		【3】25%		
		【4】30%		
		【5】35%		
		【6】40%		
	【2】	【0】30%	d32	d36
		【1】35%		
		【2】40%(default ）		
		【3】45%		
		【4】50%		
		【5】55%		
		【6】60%		

5.8.1 Procedure



S-EasyFit II_7-12HP
Ver. 2026-01

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