Part 6
Diagnosis and Troubleshooting

SYSVRF2 224 AIR EVO A HP R #319124
SYSVRF2 260 AIR EVO A HP R #319125
SYSVRF2 280 AIR EVO A HP R #319163

1 Error Code Table

Table 6-1.1: Error code table

Error code[1]	Content	Remarks	Manual re-start required[1]
E1	Phase sequence error	Displayed on the outdoor unit PCB	Yes
E2	Communication error between indoor and outdoor units	Displayed on the outdoor unit PCB	No
E4	Outdoor heat exchanger temperature sensor (T3) error or outdoor ambient temperature sensor (T4) error	Displayed on the outdoor unit PCB	No
E5	Abnormal power supply voltage	Displayed on the outdoor unit PCB	No
E6	DC fan motor error	Displayed on the outdoor unit PCB	No
Eb	E6 error appears 6 times in 1 hour	Displayed on the outdoor unit PCB	Yes
E7	Outdoor compressor discharge temperature sensor (T5) error	Displayed on the outdoor unit PCB	No
EH	Outdoor refrigerant cooling pipe temperature sensor (TL) error	Displayed on the outdoor unit PCB	No
F1	DC bus voltage error	Displayed on the outdoor unit PCB	No
H0	Communication error between main control chip and inverter driver chip	Displayed on the outdoor unit PCB	No
H4	Inverter module protection, P6 protection appears three times in 30 minutes	Displayed on the outdoor unit PCB	Yes
H5	P2 protection appears three times in 60 minutes	Displayed on the outdoor unit PCB	Yes
H7	Number of indoor units detected by outdoor unit not same as number set on main PCB	Displayed on the outdoor unit PCB	No
H8	High pressure sensor error	Displayed on the outdoor unit PCB	No
bL	High pressure switch protection on compressor inverter board	Displayed on the outdoor unit PCB	No
bH	PED board error	Displayed on the outdoor unit PCB	No
P1	Discharge pipe high pressure protection	Displayed on the outdoor unit PCB	No
P2	Suction pipe low pressure protection	Displayed on the outdoor unit PCB	No
P3	Compressor current protection	Displayed on the outdoor unit PCB	No
P4	Discharge temperature protection	Displayed on the outdoor unit PCB	No
P5	Outdoor heat exchanger temperature protection	Displayed on the outdoor unit PCB	No
P8	Typhoon protection	Displayed on the outdoor unit PCB	No
PL	Heat sink high temperature protection	Displayed on the outdoor unit PCB	No
L0	Inverter module protection	Displayed on the outdoor unit PCB	Yes
L1	DC bus low voltage protection	Displayed on the outdoor unit PCB	Yes
L2	DC bus high voltage Heat sink temperature sensor protection	Displayed on the outdoor unit PCB	Yes
L4	MCE error	Displayed on the outdoor unit PCB	Yes
L5	Zero speed protection	Displayed on the outdoor unit PCB	Yes
L7	Phase sequence error	Displayed on the outdoor unit PCB	Yes
L8	Compressor frequency variation greater than 15Hz within one second protection	Displayed on the outdoor unit PCB	Yes
L9	Actual compressor frequency differs from target frequency by more than 15Hz protection	Displayed on the outdoor unit PCB	Yes

Notes:

1. For some error codes, a manual restart is required before the system can resume operation.

2 Troubleshooting

2.1 Warning

Warning 

- All electrical work must be carried out by competent and suitably qualified, certified and accredited professionals and in accordance with all applicable legislation (all national, local and other laws, standards, codes, rules, regulations and other legislation that apply in a given situation).
- Power-off the outdoor units before connecting or disconnecting any connections or wiring, otherwise electric shock (which can cause physical injury or death) may occur or damage to components may occur.

2.2 E1: Phase sequence error

2.2.1 Digital display output

2.2.2 Description

- Phase sequence error.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

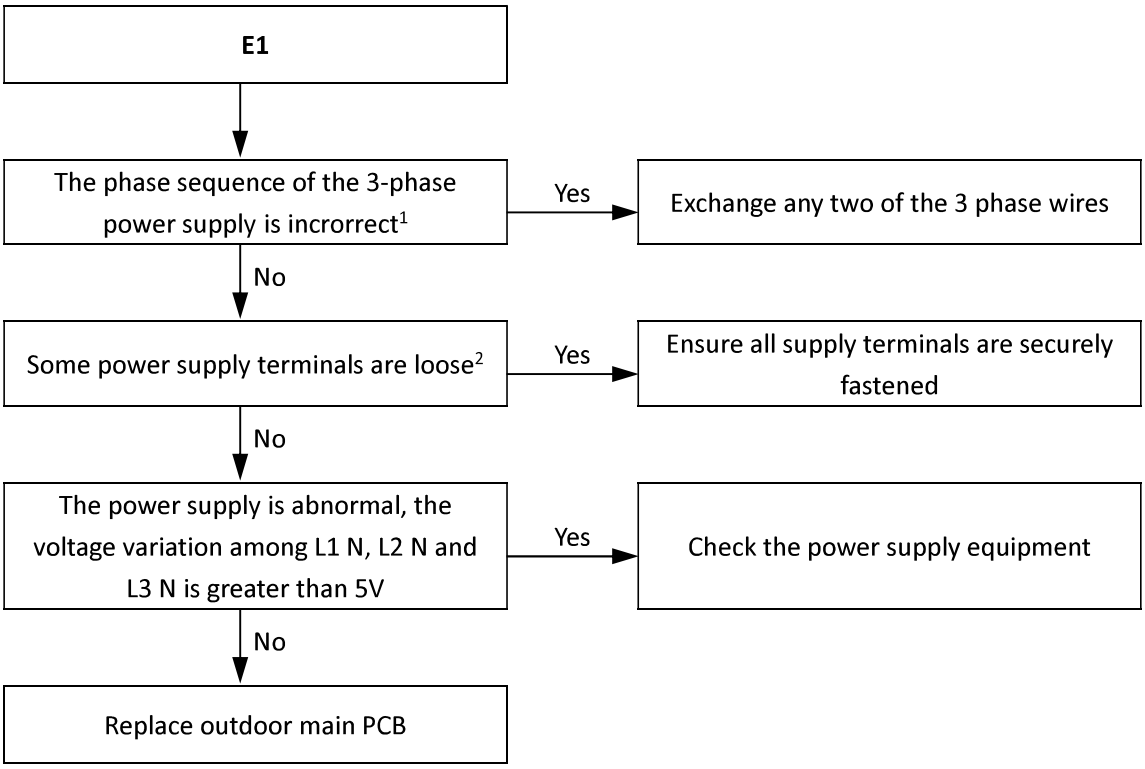
2.2.3 Trigger / recover condition

- Trigger condition: Wrong phase connection for 1.6s or phase missing for 48s.
- Recover condition: Correct phase connection.
- Reset method: Manually restart.

2.2.4 Possible causes

- Power supply phases not connected in correct sequence.
- Power supply terminals loose.
- Power supply abnormal.
- Main PCB damaged.

2.2.5 Procedure



Notes:

1. The L1, L2, L3 terminals of the 3-phase power supply should match compressor phase sequence requirements. If the phase sequence is inverted, the compressor will operate inversely.
2. Loose power supply terminals can cause the compressor to operate abnormally and compressor current to be very large.

2.3 E2: Communication error between indoor and outdoor unit

2.3.1 Digital display output

2.3.2 Description

- Communication error between indoor and outdoor unit.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

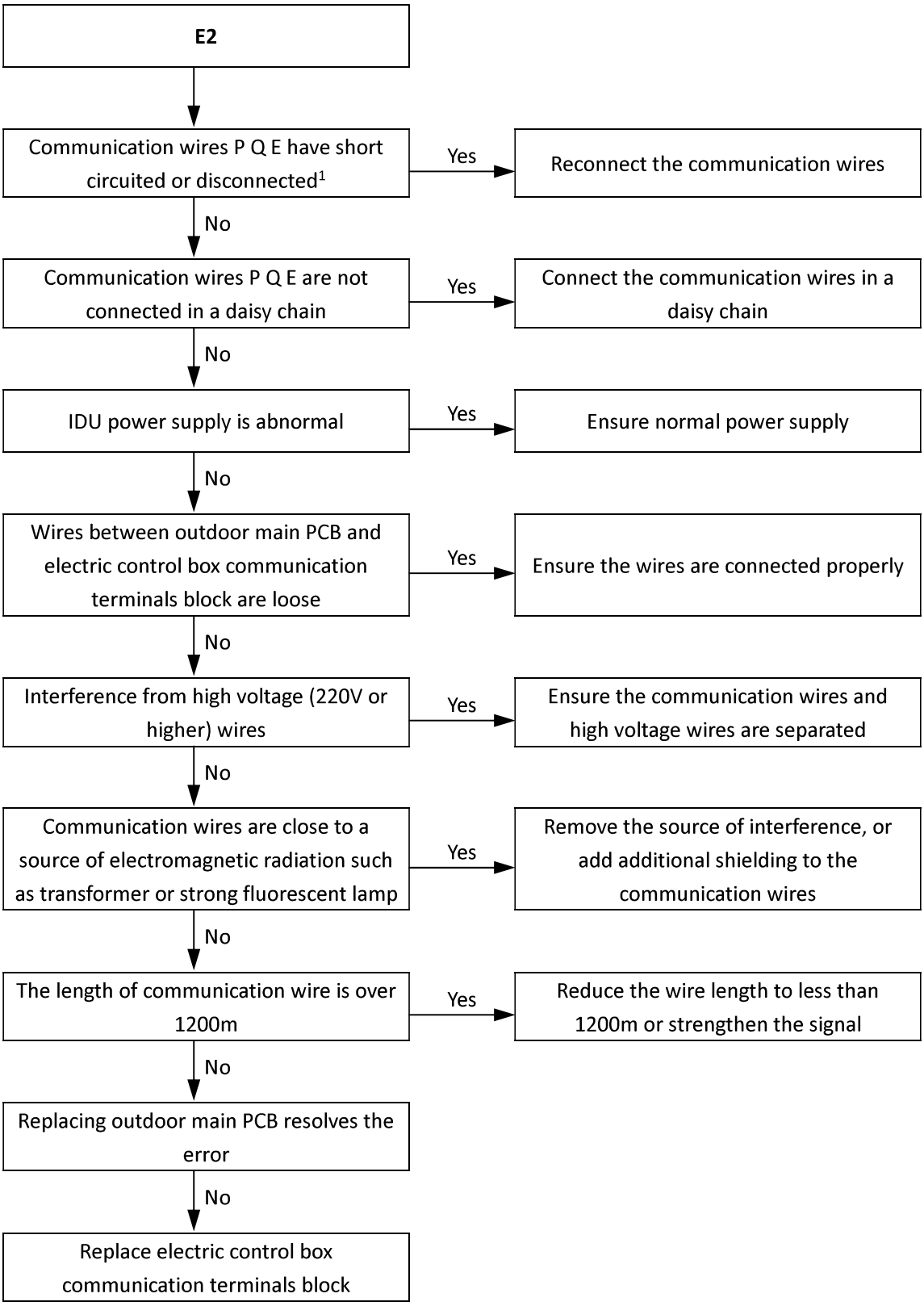
2.3.3 Trigger / recover condition

- Trigger condition: Indoor units and the outdoor unit cannot communicate for 2 minutes after the system is powered on for 20 minutes.
- Recover condition: Communication go back to normal.
- Reset method: Resume automatically.

2.3.4 Possible causes

- Communication wires between indoor and outdoor units not connected properly.
- Indoor unit power supply abnormal.
- Loosened wiring within electric control box.
- Interference from high voltage wires or other sources of electromagnetic radiation.
- Communication wire too long.
- Damaged main PCB or electric control box communication terminals block.

2.3.5 Procedure



Notes:

1. Measure the resistance among P, Q and E. The normal resistance between P and Q is 120Ω, between P and E is infinite, between Q and E is infinite.

2.4 E4: Temperature sensor (T3/T4) error

2.4.1 Digital display output

2.4.2 Description

- Outdoor heat exchanger temperature sensor (T3) error or outdoor ambient temperature sensor (T4) error.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

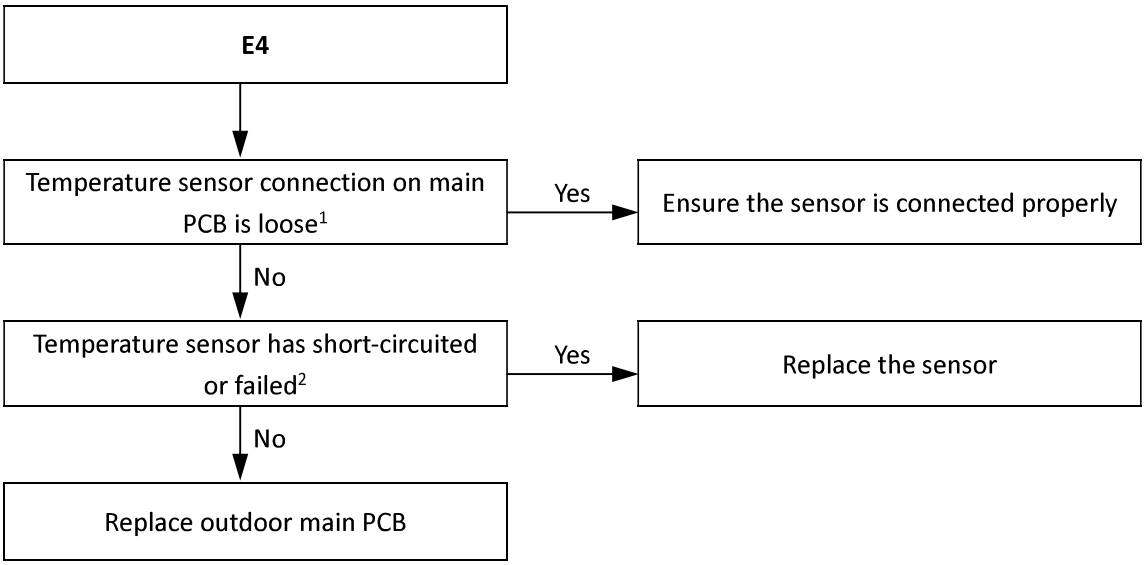
2.4.3 Trigger / recover condition

- Trigger condition: The main control board cannot receive the feedback signal of temperature sensor T3 or T4.
- Recover condition: The main control board can receive the feedback signal of temperature sensor T3 or T4.
- Reset method: Resume automatically.

2.4.4 Possible causes

- Temperature sensor not connected properly or has malfunctioned.
- Damaged main PCB.

2.4.5 Procedure



Notes:

1. Outdoor ambient temperature sensor (T4) and heat exchanger temperature sensor (T3) connection is port CN9 on the main PCB (labeled 10 in Figure 5-2.1 in Part 5, 2.1 “Ports”).
2. Measure sensor resistance. If the resistance is too low, the sensor has short-circuited. If the resistance is not consistent with the sensor’s resistance characteristics table, the sensor has failed. Refer to Table 6-3.1 in Part 6, 3.1 “Temperature Sensor Resistance Characteristics”.

2.5 E5: Abnormal power supply voltage

2.5.1 Digital display output

2.5.2 Description

- Abnormal power supply voltage.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

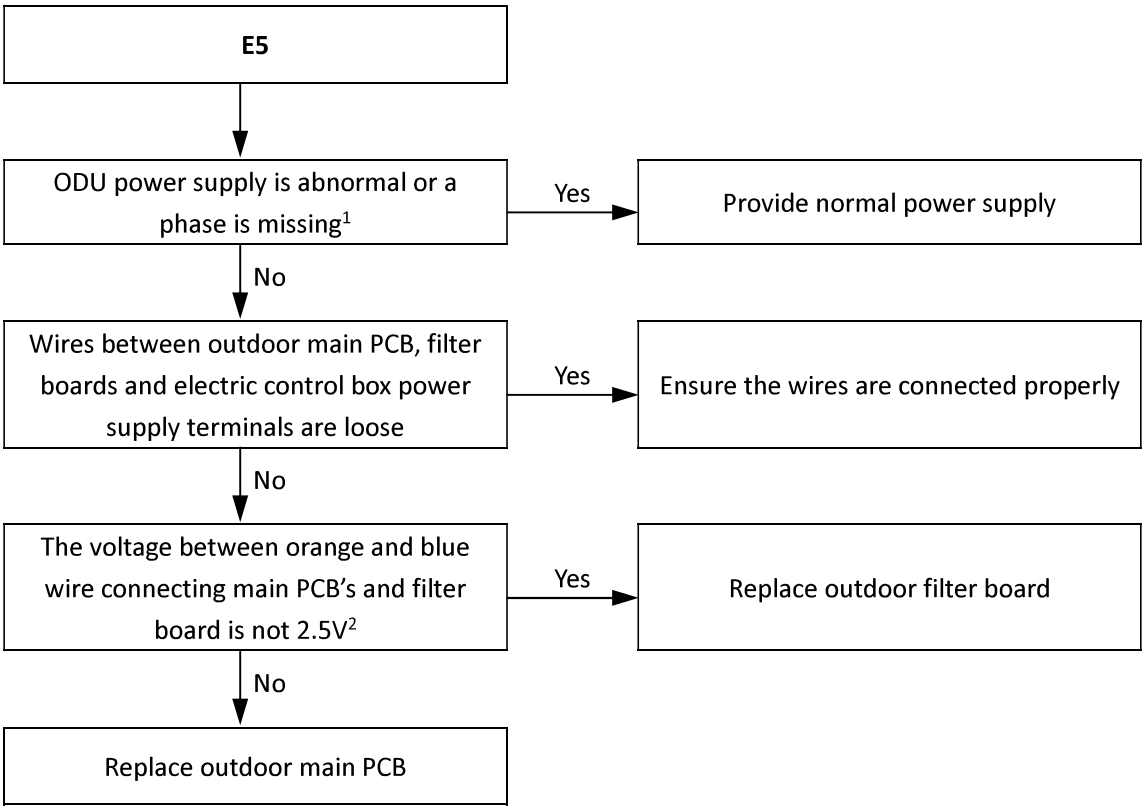
2.5.3 Trigger / recover condition

- Trigger condition: Outdoor unit power supply phase voltage < 172V.
- Recover condition: Outdoor unit power supply phase voltage is > 265V.
- Reset method: Resume automatically.

2.5.4 Possible causes

- Outdoor unit power supply voltage is abnormal or a phase is missing.
- Loosened wiring within electric control box.
- High voltage circuit error.
- Main PCB damaged.

2.5.5 Procedure



Notes:

1. The normal voltage between L1and N, L2 and N, and L3 and N is 172-265V.
2. Control port of filter board is CN4 on the main PCB (labeled 3 in Figure 5-2.1 in Part 5, 2.1 "Ports").

2.6 E6, Eb: DC fan motor error

2.6.1 Digital display output

2.6.2 Description

- DC fan motor error.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

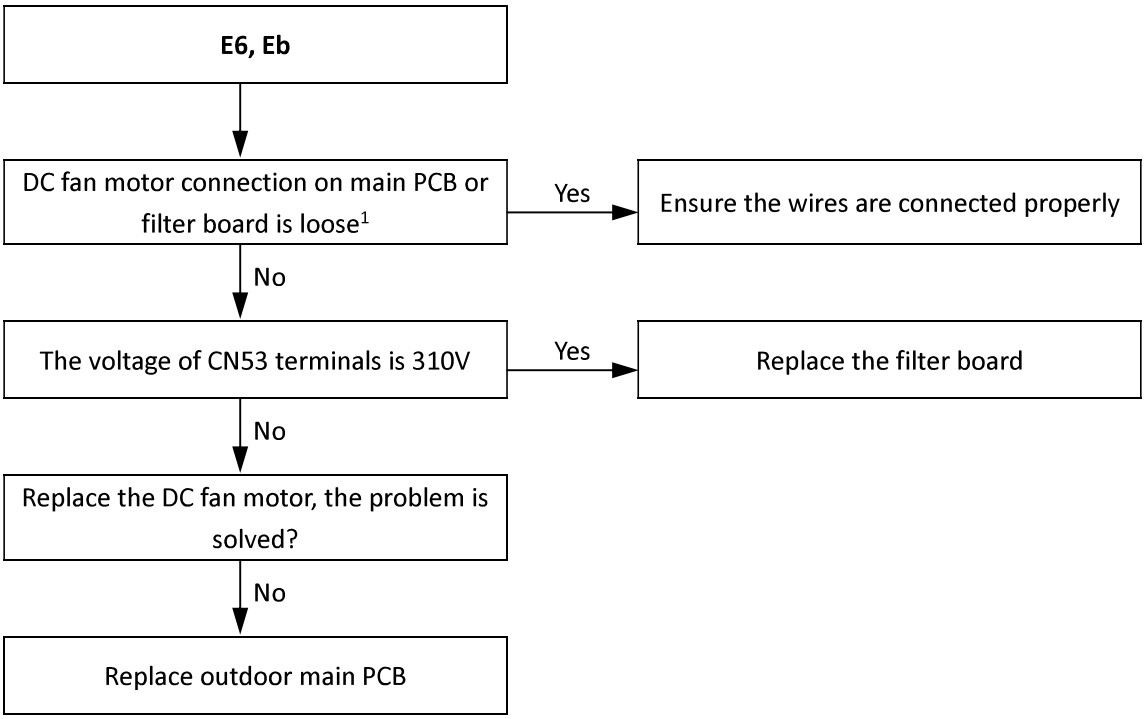
2.6.3 Trigger / recover condition

- Trigger condition:
  For E6 protection: Actual fan speed is < 120 rps more than 20S or the actual fan speed differs from target speed by more 200rps for more than 3 minutes.
  For Eb protection: E6 protection appears six times in 60 minutes.
- Recover condition: Actual fan speed is > 120 rps and the actual fan speed differs from target speed less than 200rps.
- Reset method: Resume automatically.
  For E6 protection: Resume automatically.
  For Eb protection: Manually restart.

2.6.4 Possible causes

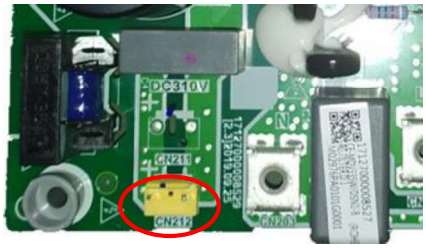
- Loosened wiring within electric control box.
- DC fan motor damaged.
- Filter board damaged.
- Main PCB damaged.

2.6.5 Procedure



Notes:

1. DC fan motor connections on main PCB are ports CN107, CN109 (labeled 14 in Figure 5-2.1 in Part 5, 2.1 "Ports") and CN53 (labeled 13 in Figure 5-2.1 in Part 5, 2.1 "Ports"). DC fan motor connection on filter board is ports CN212 (labeled 2 in Figure 5-3.2 in Part 5, 3.2 "Filter Board Ports").

DC fan motor connection ports CN36 on main PCB	DC fan motor connection port CN212 on filter board
	

2.7 E7: Temperature sensor (T5) error

2.7.1 Digital display output

2.7.2 Description

- A compressor discharge pipe temperature sensor (T5) error.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

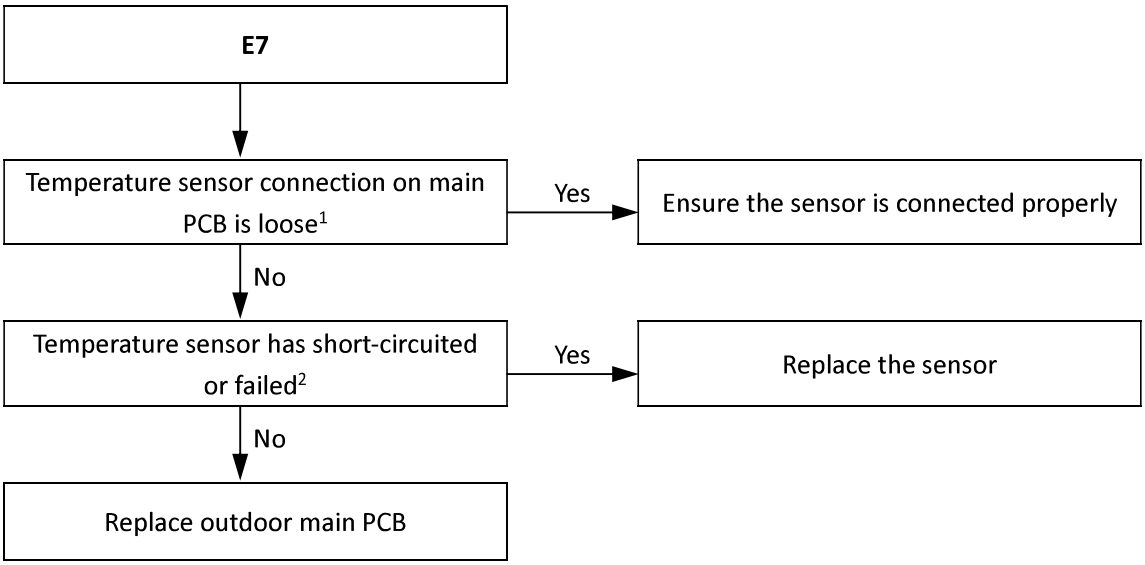
2.7.3 Trigger / recover condition

- Trigger condition: Discharge temperature < 15°C for 2 minutes after compressor startup for 10 minutes.
- Recover condition: Discharge temperature go back to normal.
- Reset method: Manually restart.

2.7.4 Possible causes

- Temperature sensor not connected properly or has malfunctioned.
- Damaged main PCB.

2.7.5 Procedure



Notes:

1. Compressor discharge pipe temperature sensor connection is port CN5 on the main PCB (labeled 6 in Figure 5-2.1 in Part 5, 2.1 “Ports”).
2. Measure sensor resistance. If the resistance is too low, the sensor has short-circuited. If the resistance is not consistent with the sensor’s resistance characteristics table, the sensor has failed. Refer to Table 6-3.2 in Part 6, 3.1 “Temperature Sensor Resistance Characteristics”.

2.8 EH: Outdoor refrigerant cooling pipe temperature sensor (TL) error

2.8.1 Digital display output

2.8.2 Description

- An outdoor refrigerant cooling pipe temperature sensor (TL) error.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

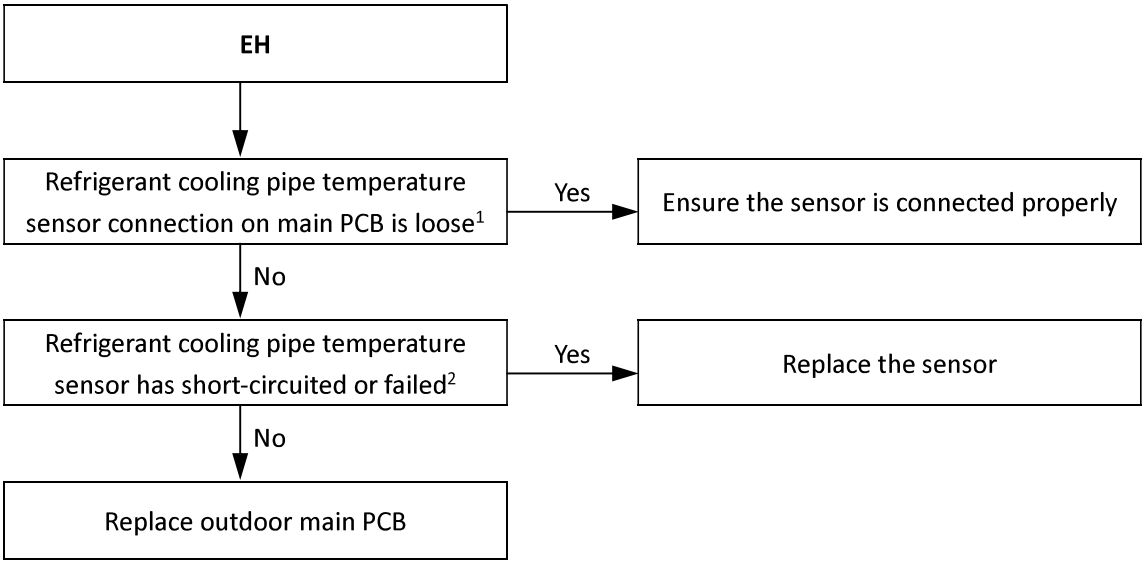
2.8.3 Trigger / recover condition

- Trigger condition: The main control board cannot receive the feedback signal of temperature sensor TL.
- Recover condition: The main control board can receive the feedback signal of temperature sensor TL.
- Reset method: Manually restart.

2.8.4 Possible causes

- Temperature sensor not connected properly or has malfunctioned.
- Damaged main PCB.

2.8.5 Procedure



Notes:

1. Outdoor refrigerant cooling pipe temperature sensor connection is port CN24 on the main PCB (labeled 5 in Figure 5-2.1 in Part 5, 2.1 “Ports”).
2. Measure sensor resistance. If the resistance is too low, the sensor has short-circuited. If the resistance is not consistent with the sensor’s resistance characteristics table, the sensor has failed. Refer to Table 6-3.1 in Part 6, 3.1 “Temperature Sensor Resistance Characteristics”.

2.9 F1: DC bus voltage error

2.9.1 Digital display output

2.9.2 Description

- F1 indicates compressor DC bus voltage error.
- The system stops running.
- Error code is displayed on the unit with the error.

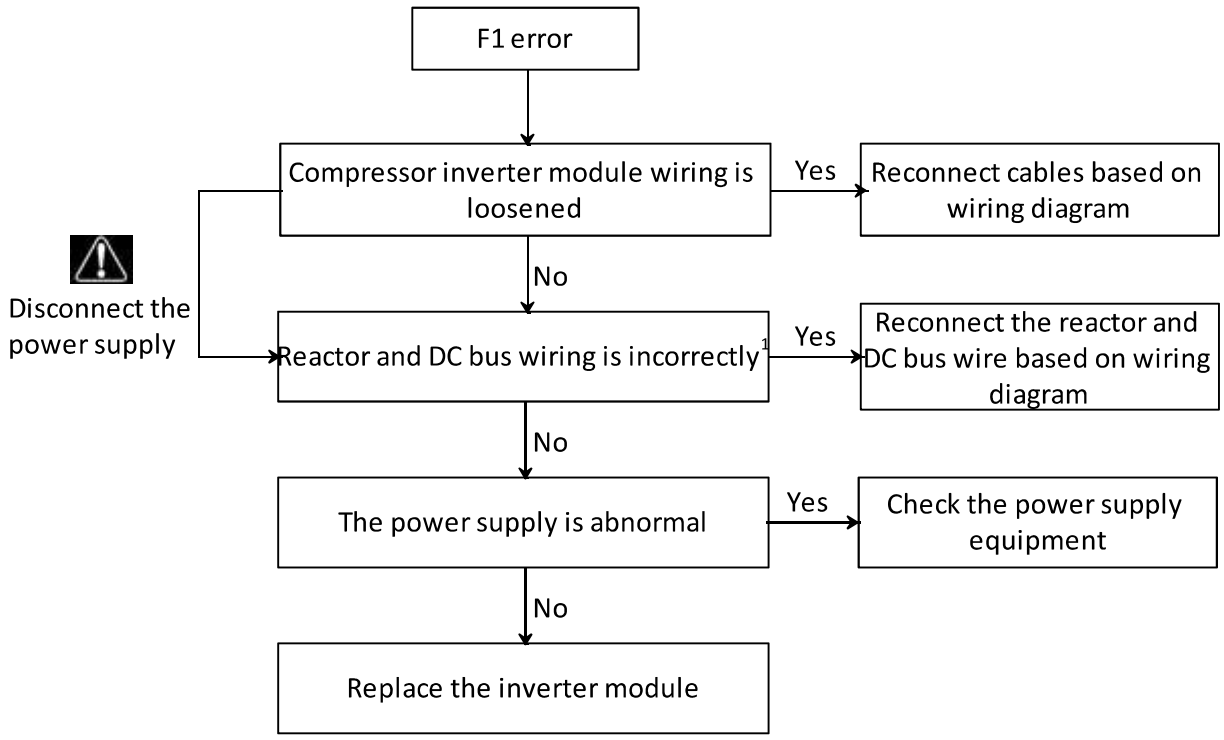
2.9.3 Trigger / recover condition

- Trigger condition: DC bus voltage < 200V continuously for 5 seconds.
- Recover condition: DC bus voltage goes back to normal.
- Reset method: Restart automatically.

2.9.4 Possible causes

- Loosened wiring of the compressor inverter module.
- Incorrect wiring of the reactor and DC bus wire.
- Abnormal power supply.
- Inverter module damaged.

2.9.5 Procedure



Note:

1. The normal DC voltage between terminals P and N on inverter module should be 450-650V.

Figure 6-2.1: P and N terminals on Inverter module

2.10 H0: Communication error

2.10.1 Digital display output

2.10.2 Description

- H0 indicates a communication error between the main control chip and the compressor inverter driver chip.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

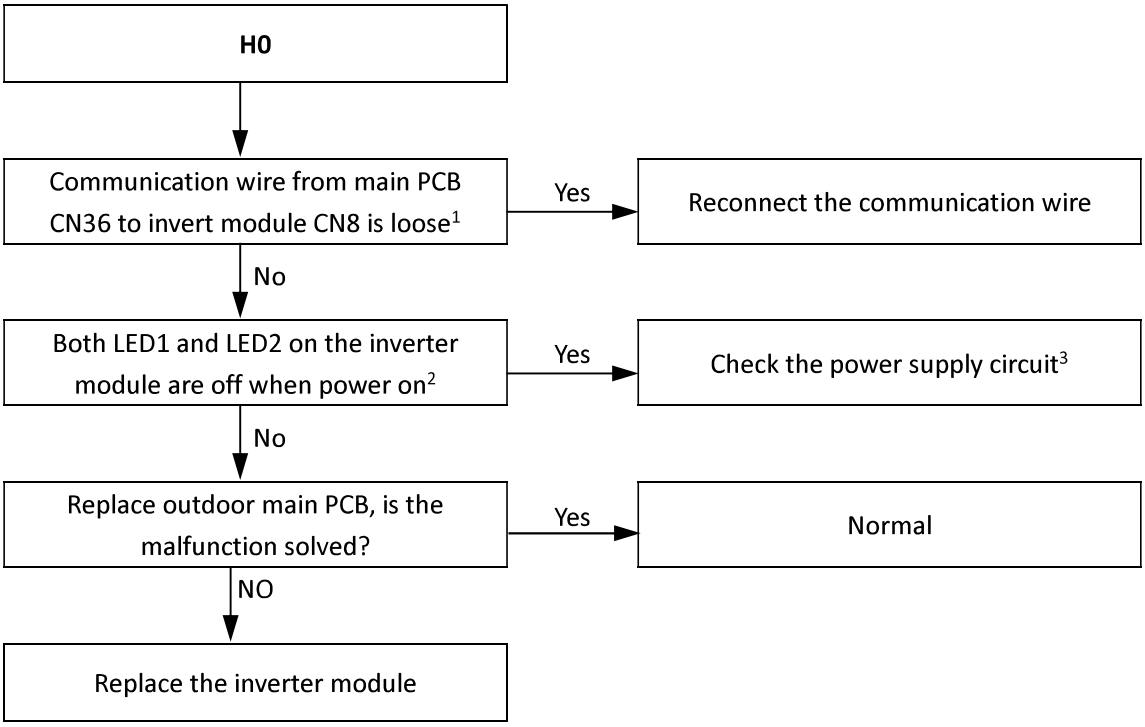
2.10.3 Trigger / recover condition

- Trigger condition: Main control chip and inverter driver chip cannot communication for 2 minutes.
- Recover condition: Communication go back to normal.
- Reset method: Resume automatically.

2.10.4 Possible causes

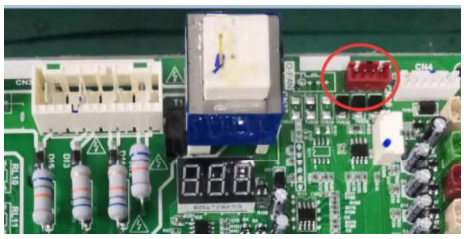
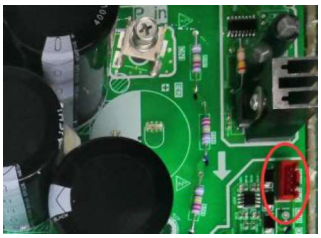
- Loosened communication wiring from the main PCB to the inverter module.
- Main PCB damaged.
- Compressor inverter module damaged.

2.10.5 Procedure



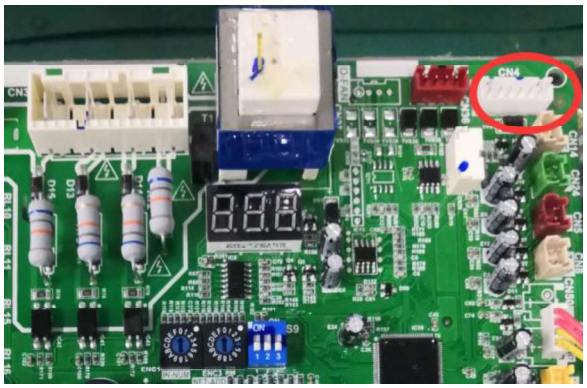
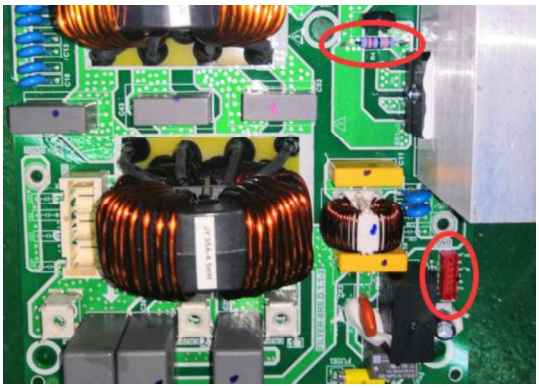
Notes:

1. Communication wire from outdoor main PCB CN36 to inverter module CN8.

Communication port CN36 on main PCB	Communication port CN8 on inverter module
	

2. LED1/2 on inverter module

3. Check the power supply for the compressor inverter module, port CN211 on filter board, the normal voltage should be DC310V; Check the single phase bridge and fuse on filter board; check the connection cable from ODU main PCB port CN4 to filter board port CN8 which is 12V DC power control port.

Communication port CN4 on main PCB	Communication port CN8 and fuse on filter board
	

2.11 H4: Inverter module protection

2.11.1 Digital display output

2.11.2 Description

- H4 indicates compressor inverter module protection.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

2.11.3 Trigger / recover condition

- Trigger condition: Compressor appears three inverter module protections.
- Recover condition: Inverter module goes back to normal.
- Reset method: Manually restart.

2.11.4 Possible causes

- Inverter module protection.
- DC bus low or high voltage protection.
- MCE error.
- Zero speed protection.
- Phase sequence error.
- Excessive compressor frequency variation.
- Actual compressor frequency differs from target frequency.

2.11.5 Specific error codes for H4 inverter module protection

If an H4 error code is displayed, enter menu mode “n31” (refer to Part 5, 2.2.3 “menu mode”) to check the history error code to check the following specific error code: L0, L1, L2, L4, L5, L7, L8, L9.

Table 6-2.1: Specific error codes for error H4

Specific error code[1]	Content
L0	Inverter module protection
L1	DC bus low voltage protection
L2	DC bus high voltage protection
L4	MCE error
L5	Zero speed protection
L7	Phase sequence error
L8	Compressor frequency variation greater than 15Hz within one second protection
L9	Actual compressor frequency differs from target frequency by more than 15Hz protection

The specific error codes L0, L1, L2 and L4 can also be obtained from the inverter module LED indicators. If an inverter module error has occurred, LED2 is continuously on and LED1 flashes.

Figure 6-2.2: LED indicators LED1 and LED2 on inverter module

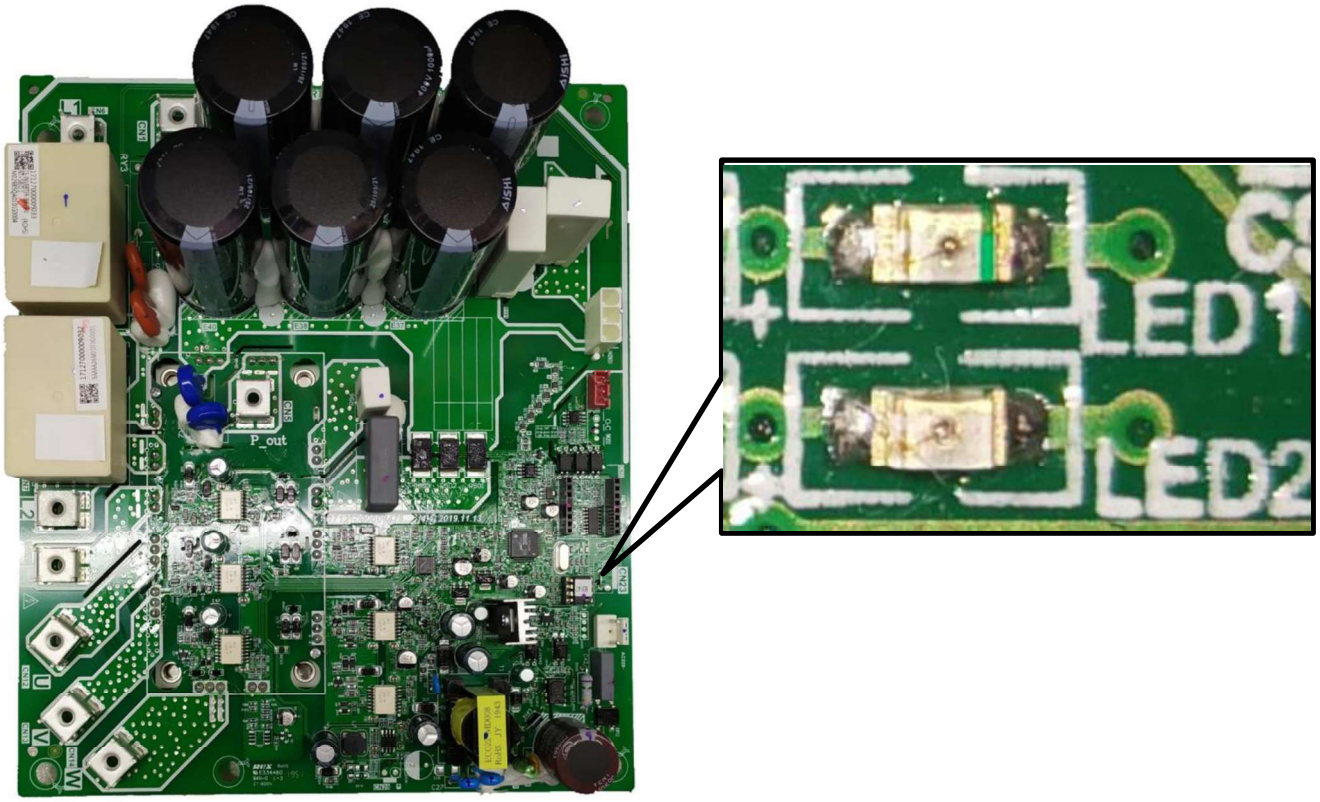
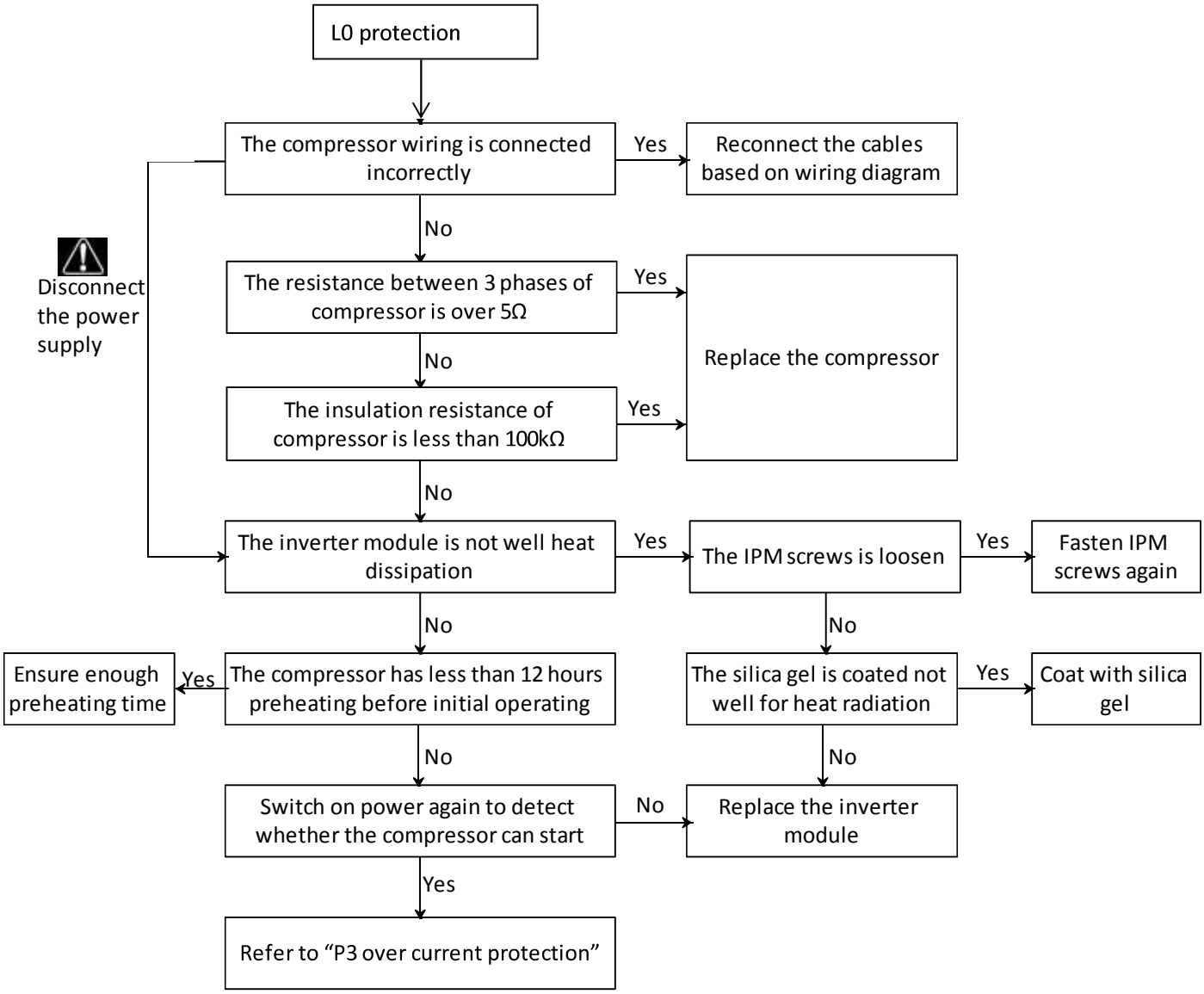


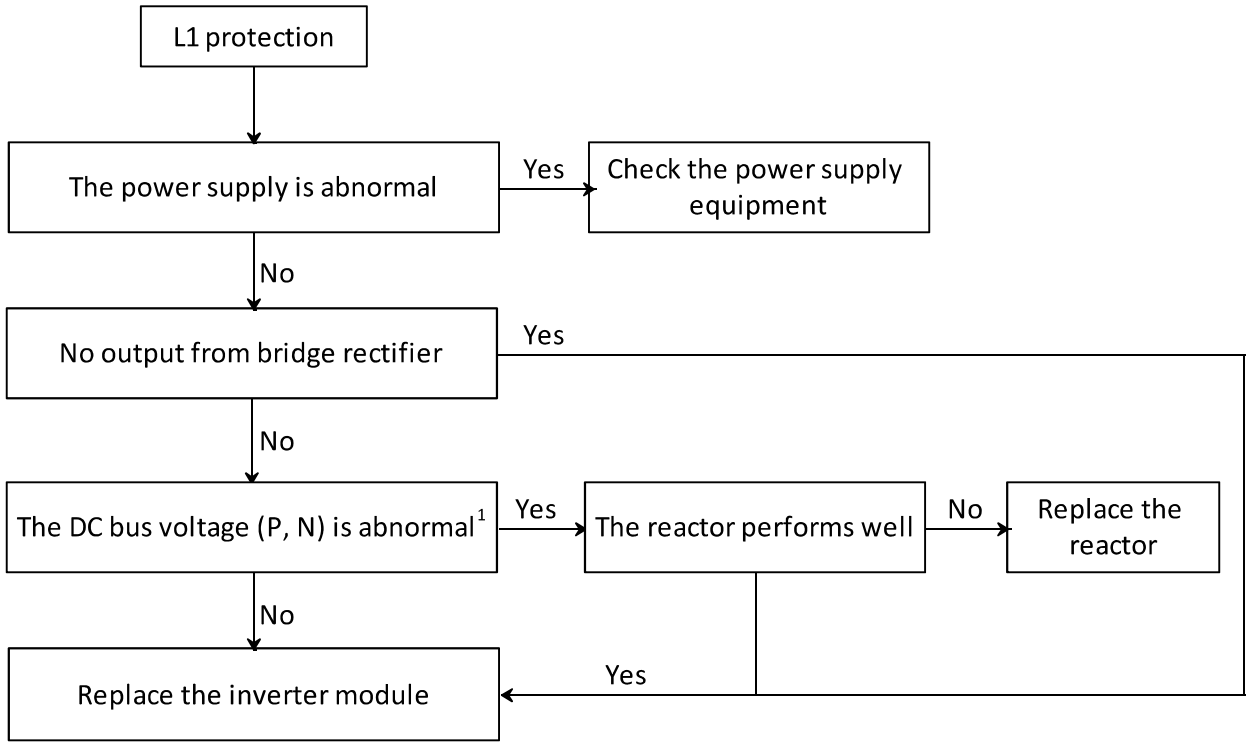
Table 2-6.2: Errors indicated on LED1

LED1 flashing pattern	Corresponding error
Flashes 8 times and stops for 1 second, then repeats	L0 - Inverter module protection
Flashes 9 times and stops for 1 second, then repeats	L1 - DC bus low voltage protection
Flashes 10 times and stops for 1 second, then repeats	L2 - DC bus high voltage protection
Flashes 12 times and stops for 1 second, then repeats	L4 - MCE error

2.11.6 L0: Inverter module protection



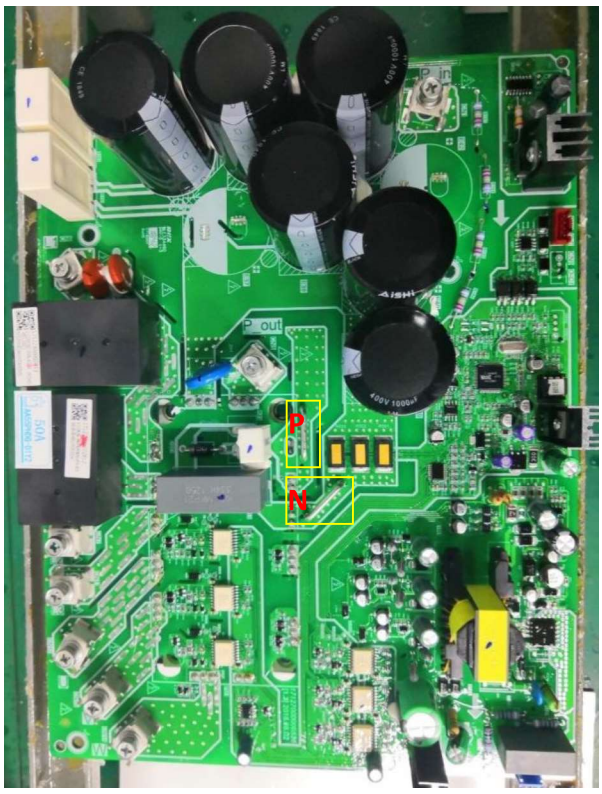
2.11.7 L1: DC bus low voltage protection



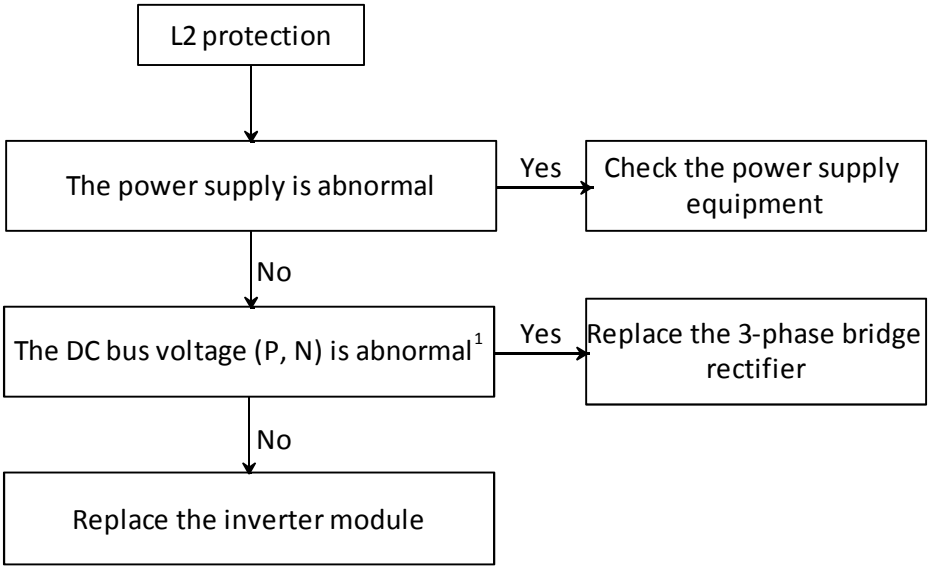
Note:

1. The normal DC voltage between terminals P and N on inverter module should be 450-650V. When the voltage is lower than 350V, L1 protection will be appeared.

Figure 6-2.3: P and N terminals on Inverter module



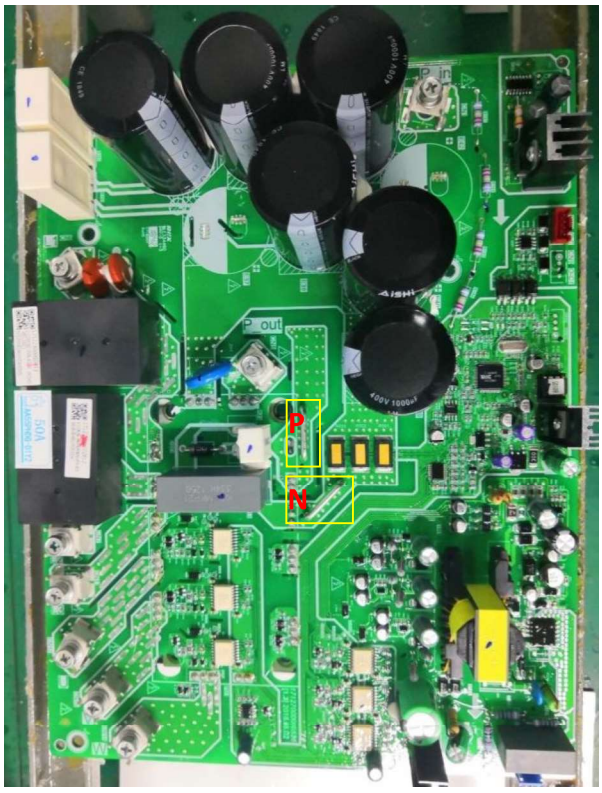
2.11.8 L2: DC bus high voltage protection



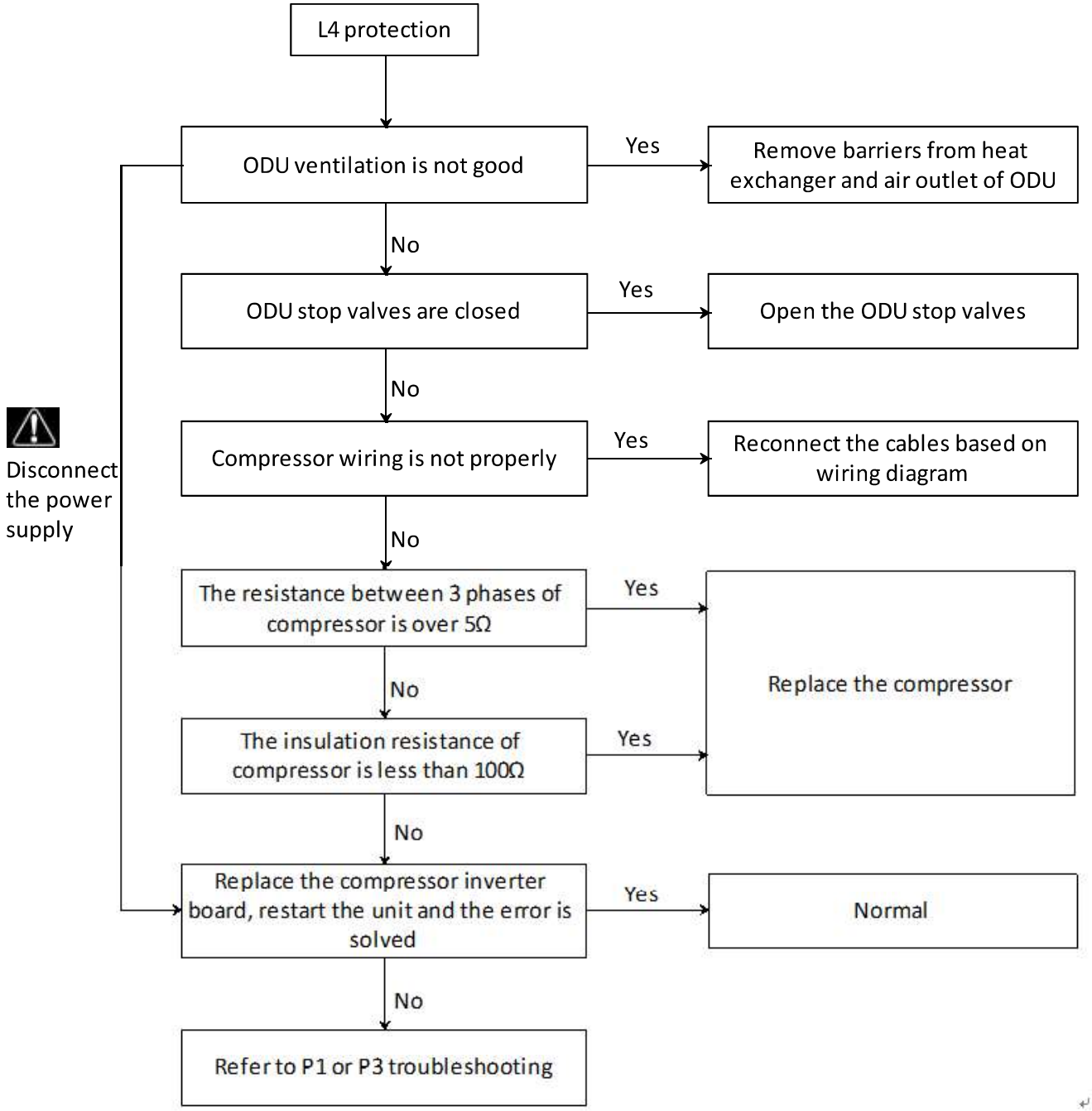
Note:

1. The normal DC voltage between terminals P and N on inverter module should be 520V. When the voltage is higher than 630V, L2 protection will be appeared.

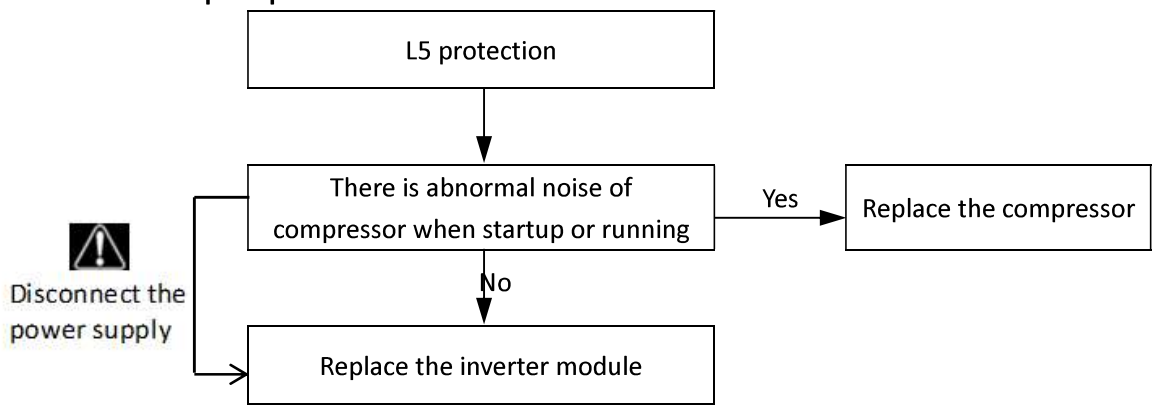
Figure 6-2.4: P and N terminals on Inverter module



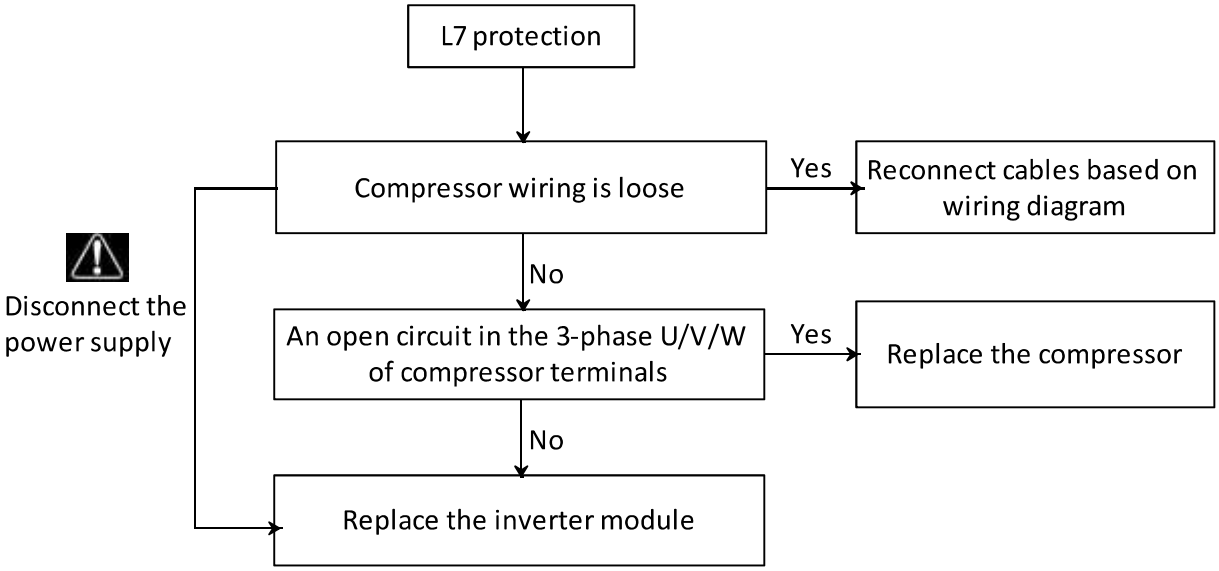
2.11.9 L4: MCE error



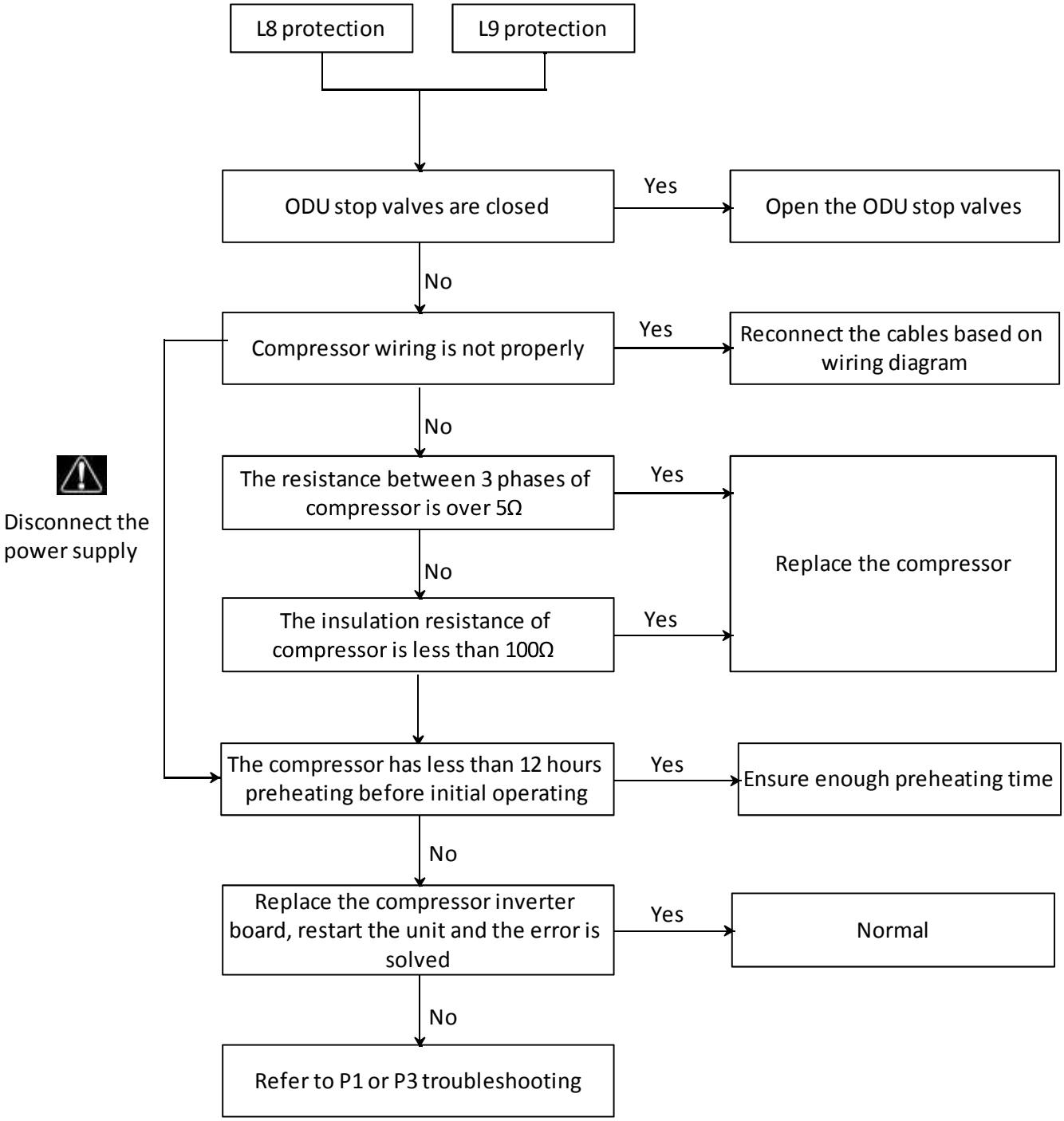
2.11.10 L5: Zero speed protection



2.11.11 L7: Phase sequence error



2.11.12 L8: Compressor frequency variation greater than 15Hz within one second protection
L9: Actual compressor frequency differs from target frequency by more than 15Hz protection



2.11.13 Compressor replacement procedure

Figure 6-2.5: Draining oil from a compressor

Step 1: Remove faulty compressor and remove oil

- Remove the faulty compressor from the outdoor unit.
- Before removing the oil, shake the compressor so as to not allow impurities to remain settled at the bottom.
- Drain the oil out of the compressor and retain it for inspection. Normally the oil can be drained out from the compressor discharge pipe.

Step 2: Inspect oil from faulty compressor

- The oil should be clear and transparent. Slightly yellow oil is not an indication of any problems. However, if the oil is dark, black or contains impurities, the system has problems and the oil needs to be changed. Refer to Figure 6-2.7 for further details regarding inspecting compressor oil. (If the compressor oil has been spoiled, the compressor will not be being lubricated effectively. The scroll plate, crankshaft and bearings will wear. Abrasion will lead to a larger load and higher current. More electric energy will get dissipated as heat and the temperature of the motor will become increasingly high. Finally, compressor damage or burnout will result.)

Step 3: Check oil in other compressors in the system

- If the oil drained from the faulty compressor is clean, go to Step 6.
- If the oil drained from the faulty compressor is spoiled (lightly or heavily), go to Step 4.

Step 4: Replace oil separator and accumulator

- If the oil from a compressor is spoiled (lightly or heavily), drain the oil from the oil separator and accumulator in that unit and then replace them.

Step 5: Check filters(s)

- If the oil from a compressor is spoiled (lightly or heavily), check the filter between the gas stop valve and the 4-way valve in that unit. If it is blocked, clean with nitrogen or replace.

Figure 6-2.6: Compressor piping

Step 6: Replace the faulty compressor and re-fit the other compressors

- Replace the faulty compressor.
- If the oil had been spoiled and was drained from the non-faulty compressor in Step 3, use clean oil to clean them before re-fitting it into the unit. To clean, add oil into the compressor through the discharge pipe using a funnel, shake the compressor, and then drain the oil. Repeat several times and then re-fit the compressors into the units. (The discharge pipe is connected to the oil pool of the compressor by the inner oil balance pipe.)

Step 7: Add compressor oil

- Add 2.3L of oil to each of the compressors from which oil was drained in Step 3.
- Only use FV50S oil. Different compressors require different types of oil. Using the wrong type of oil leads to various problems.
- Add additional 1.5L oil to the accumulator from which oil was drained in Step 4 such that the total amount of oil is 3.8L.

Step 8: Vacuum drying and refrigerant charging

- Once all the compressors and other components have been fully connected, vacuum dry the system and recharge refrigerant. Refer to the V4+i Engineering Data Book, Part 3.

Figure 6-2.7: Inspecting compressor oil

2.12 H7: Unmatched total number of indoor units

2.12.1 Digital display output

2.12.2 Description

- Number of indoor units detected by the outdoor unit not same as number set on main PCB.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

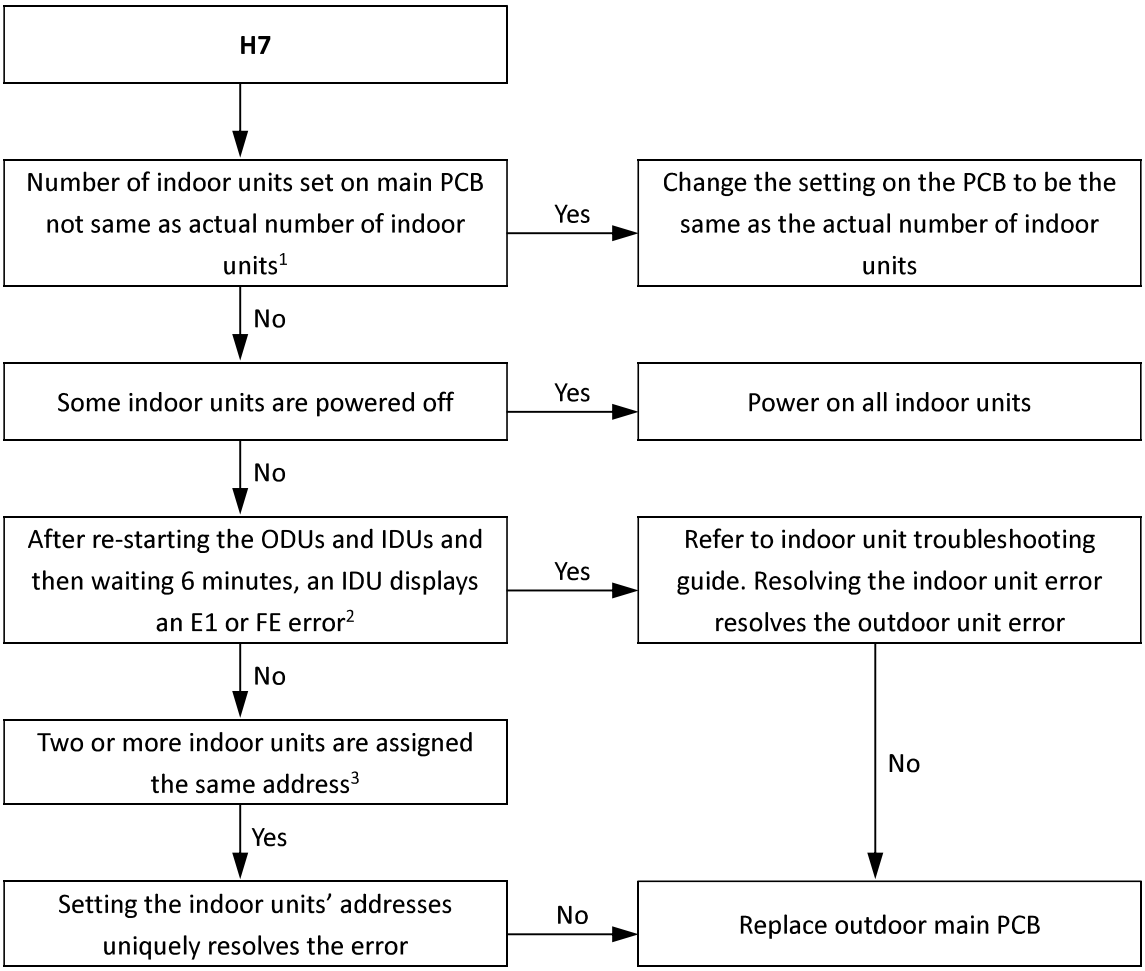
2.12.3 Trigger / recover condition

- Trigger condition: At least one indoor unit cannot be detected by the outdoor unit for more than 20 minutes for the first time powered on or at least one indoor unit cannot be detected by the outdoor unit for more than 3 minutes.
- Recover condition: Number of indoor units detected by the outdoor unit is same as number set on main PCB.
- Reset method: Resume automatically.

2.12.4 Possible causes

- Number of indoor units set on main PCB not same as actual number of indoor units.
- Some indoor units are powered off.
- Communication wires between indoor and outdoor units not connected properly.
- Indoor unit PCB damaged.
- Indoor unit without address or indoor unit address duplicated.
- Main PCB damaged.

2.12.5 Procedure



Notes:

1. The number of indoor units can be set on switches ENC1 and S9-3 on the main PCB.
2. Indoor unit error code E1 indicates a communication error between indoor and outdoor unit. Indoor unit error code FE indicates that an indoor unit has not been assigned an address.
3. Indoor unit addresses can be checked and manually assigned using indoor unit remote/wired controllers. Alternatively, indoor unit addresses can be automatically assigned by the outdoor unit.

2.13 H8: High pressure sensor error

2.13.1 Digital display output

2.13.2 Description

- High pressure sensor error.
- The system stops running.
- Error code is displayed on the unit with the error.

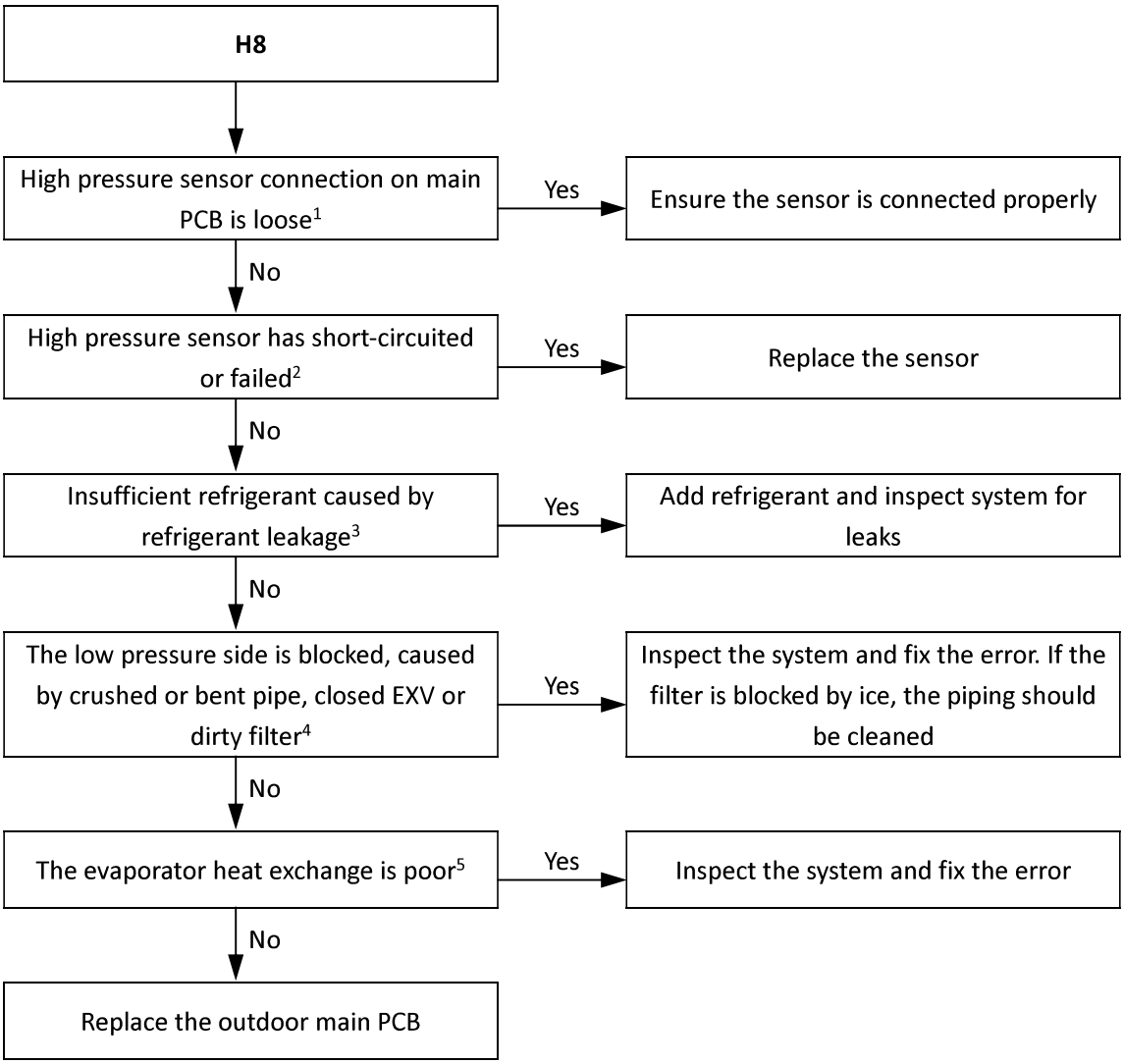
2.13.3 Trigger / recover condition

- Trigger condition: Discharge pressure ≤ 0.3MPa.
- Recover condition: Discharge pressure > 0.3MPa.
- Reset method: Resume automatically.

2.13.4 Possible causes

- Pressure sensor not connected properly or has malfunctioned.
- Insufficient refrigerant.
- Low pressure side blockage.
- Poor evaporator heat exchange.
- Main PCB damaged.

2.13.5 Procedure



Notes:

1. High pressure sensor connection is port CN12 on the main PCB (labeled 8 in Figure 5-2.1 in Part 5, 2.1 “Ports”).
2. Measure the resistance among the three terminals of the pressure sensor. If the resistance is of the order of mega Ohms or infinite, the pressure sensor has failed.
3. An insufficiency of refrigerant causes compressor discharge temperature to be higher than normal, discharge and suction pressures to be lower than normal and compressor current to be lower than normal, and may cause frosting to occur on the suction pipe. These issues disappear once sufficient refrigerant has been charged into the system. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
4. A low pressure side blockage causes compressor discharge temperature to be higher than normal, suction pressure to be lower than normal and compressor current to be lower than normal, and may cause frosting to occur on the suction pipe. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
5. In cooling mode check indoor heat exchangers, fans and air outlets for dirt/blockages. In heating mode check outdoor heat exchangers, fans and air outlets for dirt/blockages.

2.14 bL: High pressure switch protection on compressor inverter board

2.14.1 Digital display output

2.14.2 Description

- Discharge pipe high pressure protection or DC bus voltage abnormal.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

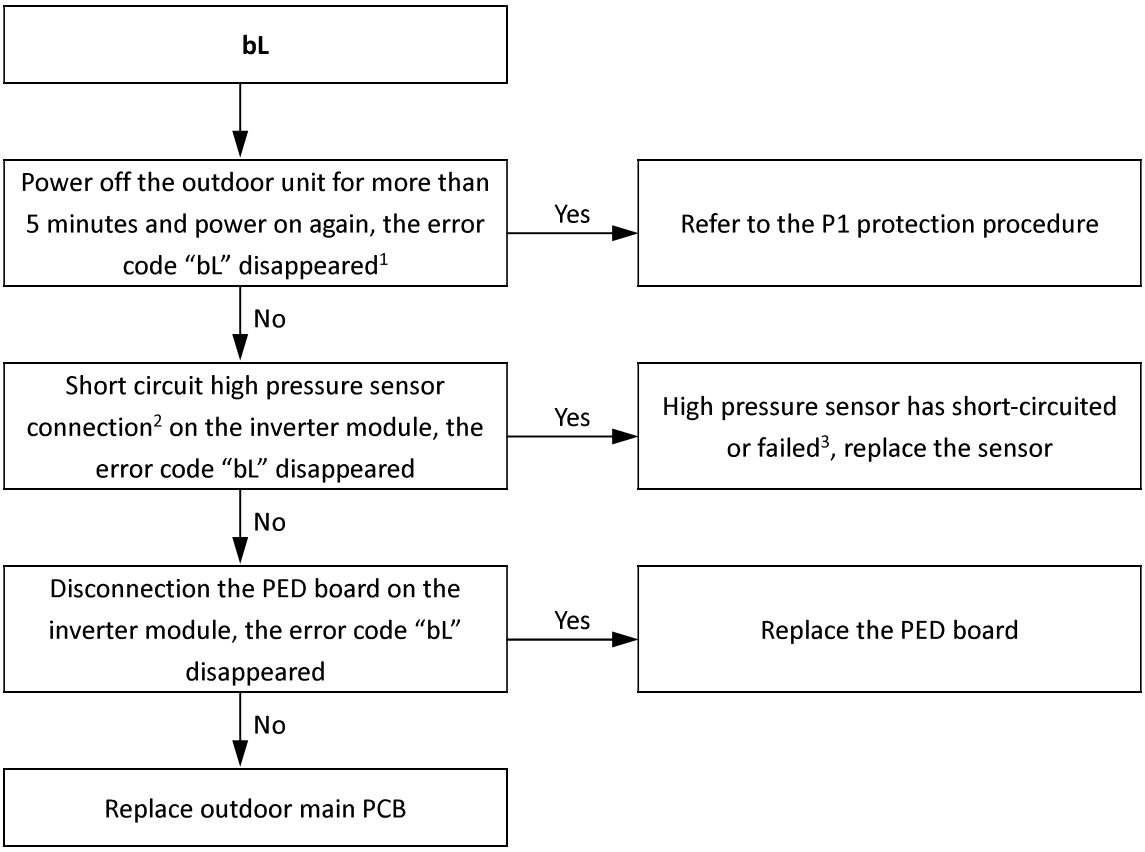
2.14.3 Trigger / recover condition

- Trigger condition: Discharge pressure ≥ 4.4MPa or DC bus voltage ≥ 325V
- Recover condition: Discharge pressure ≤ 3.2MPa or DC bus voltage < 325V.
- Reset method: Resume automatically.

2.14.4 Possible causes

- Pressure sensor/switch not connected properly or has malfunctioned.
- High pressure side blockage.
- Poor condenser heat exchange.
- Main PCB damaged.
- Inverter module damaged
- PED board damaged.

2.14.5 Procedure

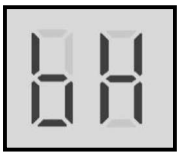


Notes:

1. For the first time the unit is powered on, the error code “bL” may disappeared in 5 minutes. It’s normal and no need to be treated.
2. The high pressure sensor connection is port CN23 on the inverter module (labeled 8 in Figure 5-3.1 in Part 5, 3.1 “Ports”).
3. Measure the resistance among the three terminals of the pressure sensor. If the resistance is of the order of mega Ohms or infinite, the pressure sensor has failed.

2.15 bH: PED board protection

2.15.1 Digital display output



2.15.2 Description

- PED board protection.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

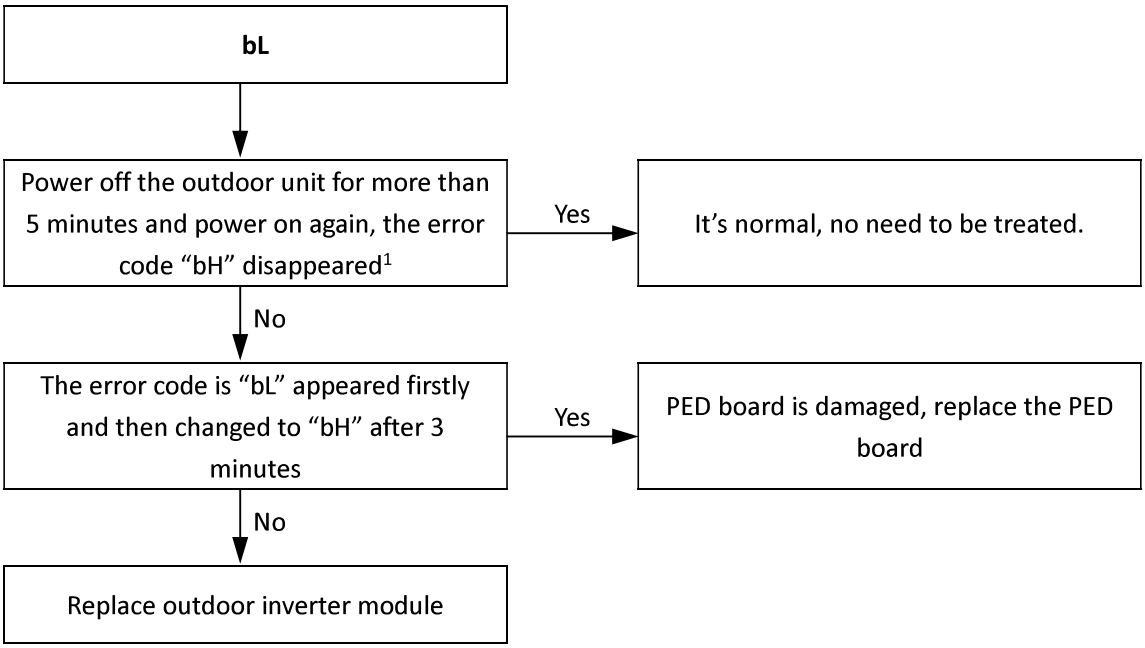
2.15.3 Trigger / recover condition

- Trigger condition: Contact conglutination or PED board self-check failure.
- Recover condition: Contact conglutination problem resolved or PED board self-check success.
- Reset method: Resume automatically.

2.15.4 Possible causes

- Inverter module damaged.
- PED board damaged.

2.15.5 Procedure



Notes:

1. For the first time the unit is powered on, the error code “bH” may disappeared in 5 minutes. It’s normal and no need to be treated.

2.16 P1: Discharge pipe high pressure protection

2.16.1 Digital display output

2.16.2 Description

- Discharge pipe high pressure protection.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

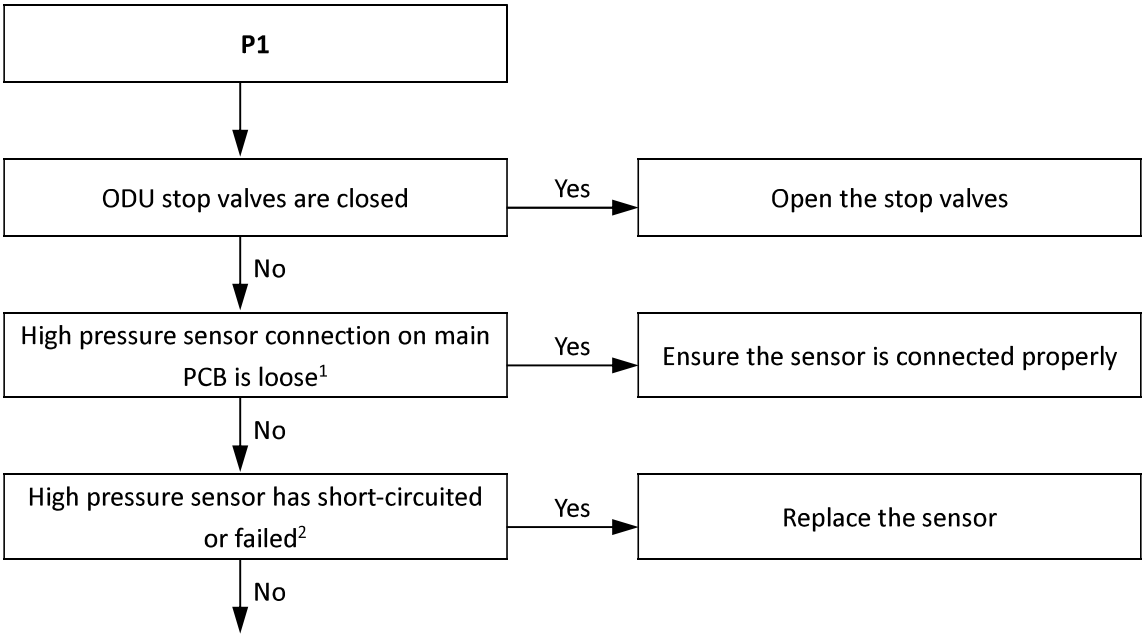
2.16.3 Trigger / recover condition

- Trigger condition: Discharge pressure ≥ 4.4MPa.
- Recover condition: Discharge pressure ≤ 3.2MPa.
- Reset method: Resume automatically.

2.16.4 Possible causes

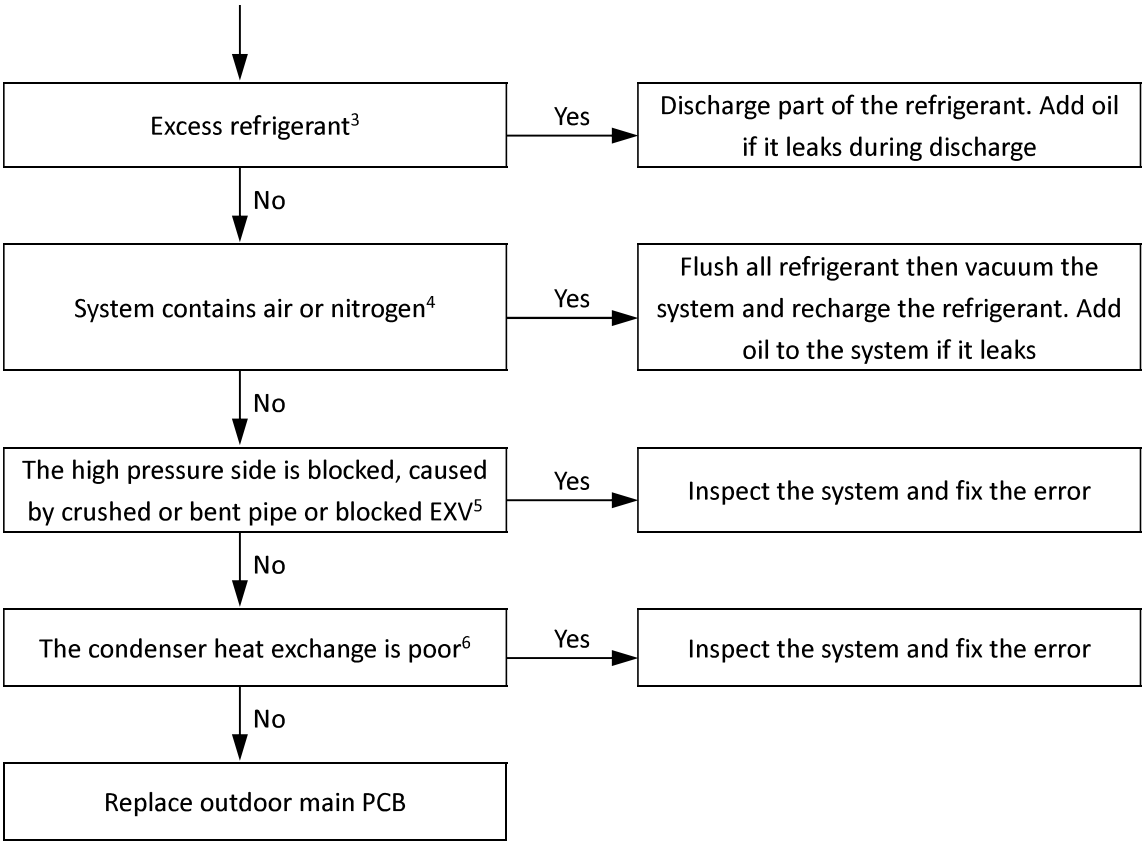
- Outdoor unit stop valves are closed.
- Pressure sensor/switch not connected properly or has malfunctioned.
- Excess refrigerant.
- System contains air or nitrogen.
- High pressure side blockage.
- Poor condenser heat exchange.
- Main PCB damaged.

2.16.5 Procedure



Flowchart continued on next page ...

... flowchart continued from previous page



Notes:

4. The high pressure sensor connection is port CN12 on the main PCB (labeled 8 in Figure 5-2.1 in Part 5, 2.1 “Ports”).
5. Measure the resistance among the three terminals of the pressure sensor. If the resistance is of the order of mega Ohms or infinite, the pressure sensor has failed.
6. Excess refrigerant causes discharge temperature to be lower than normal, discharge pressure to be higher than normal and suction pressure to be higher than normal. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
7. Air or nitrogen in the system causes discharge temperature to be higher than normal, discharge pressure to be higher than normal, compressor current to be higher than normal, abnormal compressor noise and an unsteady pressure meter reading. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
8. High pressure side blockage causes discharge temperature to be higher than normal, discharge pressure to be higher than normal and suction pressure to be lower than normal. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
9. In cooling mode check outdoor heat exchangers, fans and air outlets for dirt/blockages. In heating mode check indoor heat exchangers, fans and air outlets for dirt/blockages.

2.17 P2, H5: Suction pipe low pressure protection

2.17.1 Digital display output

2.17.2 Description

- Suction pipe low pressure protection.
- The system stops running.
- Error code is displayed on outdoor unit PCB.

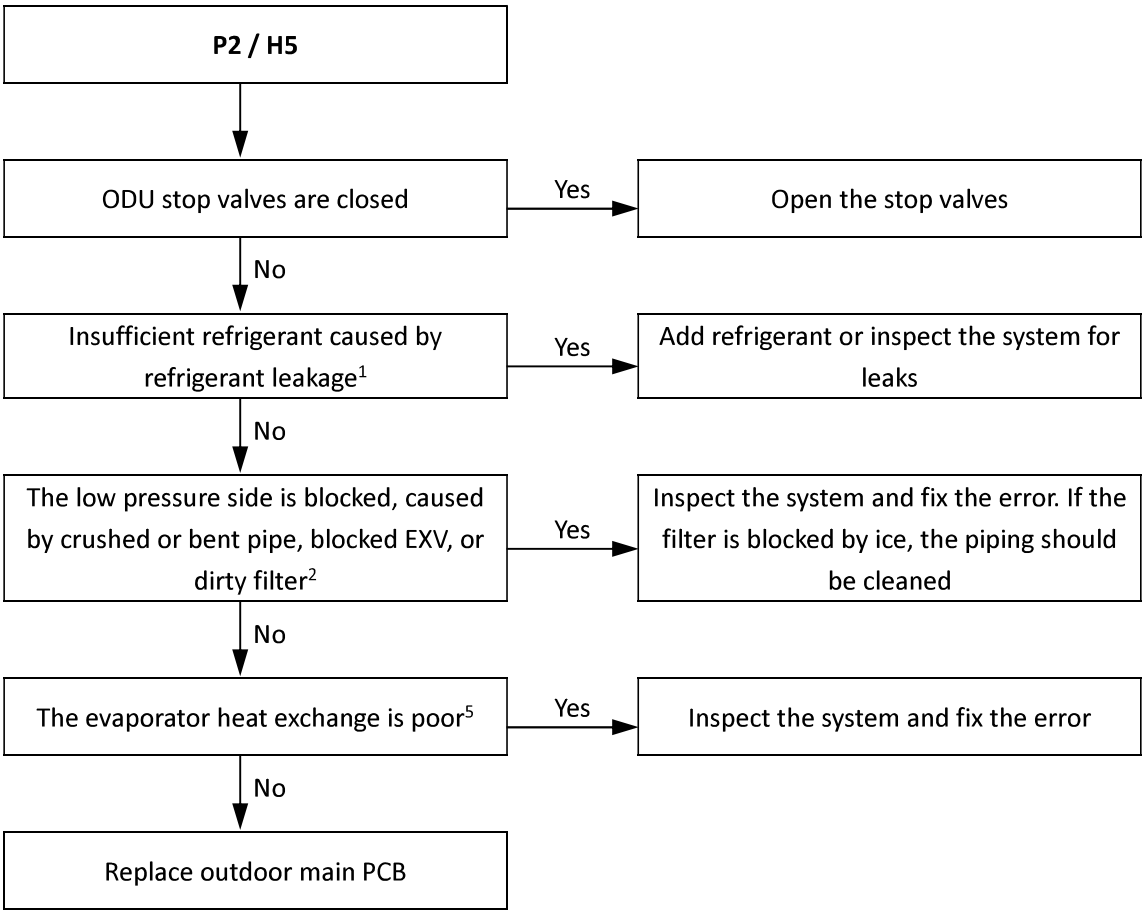
2.17.3 Trigger / recover condition

- Trigger condition:
  For P2 protection: Suction pressure ≤ 0.05MPa.
  For H5 protection: P2 protection appears three times in 30 minutes.
- Recover condition: Suction pressure ≥ 0.15MPa.
- Reset method:
  For P2 protection: Resume automatically.
  For H5 protection: Manually restart.

2.17.4 Possible causes

- Outdoor unit stop valves are closed.
- Insufficient refrigerant.
- Low pressure side blockage.
- Poor evaporator heat exchange.
- Main PCB damaged.

2.17.5 Procedure



Notes:

1. An insufficiency of refrigerant causes compressor discharge temperature to be higher than normal, discharge and suction pressures to be lower than normal and compressor current to be lower than normal, and may cause frosting to occur on the suction pipe. These issues disappear once sufficient refrigerant has been charged into the system. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
2. A low pressure side blockage causes compressor discharge temperature to be higher than normal, suction pressure to be lower than normal and compressor current to be lower than normal, and may cause frosting to occur on the suction pipe. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
3. In cooling mode check indoor heat exchangers, fans and air outlets for dirt/blockages. In heating mode check outdoor heat exchangers, fans and air outlets for dirt/blockages.

2.18 P3: Compressor current protection

2.18.1 Digital display output

2.18.2 Description

- P3 indicates current protection on compressor.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

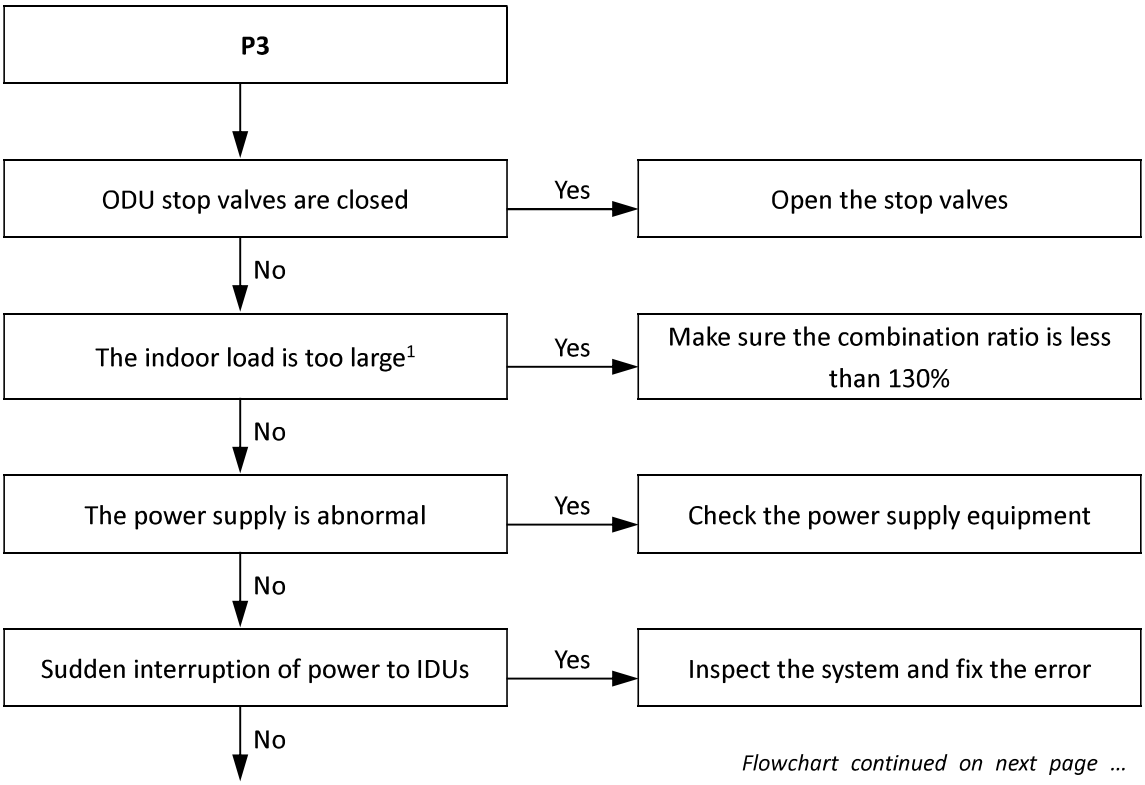
2.18.3 Trigger / recover condition

- Trigger condition: Current of compressor LNB65FAGMC ≥ 29A.
- Recover condition: Current of compressor LNB65FAGMC < 29A.
- Reset method: Resume automatically.

2.18.4 Possible causes

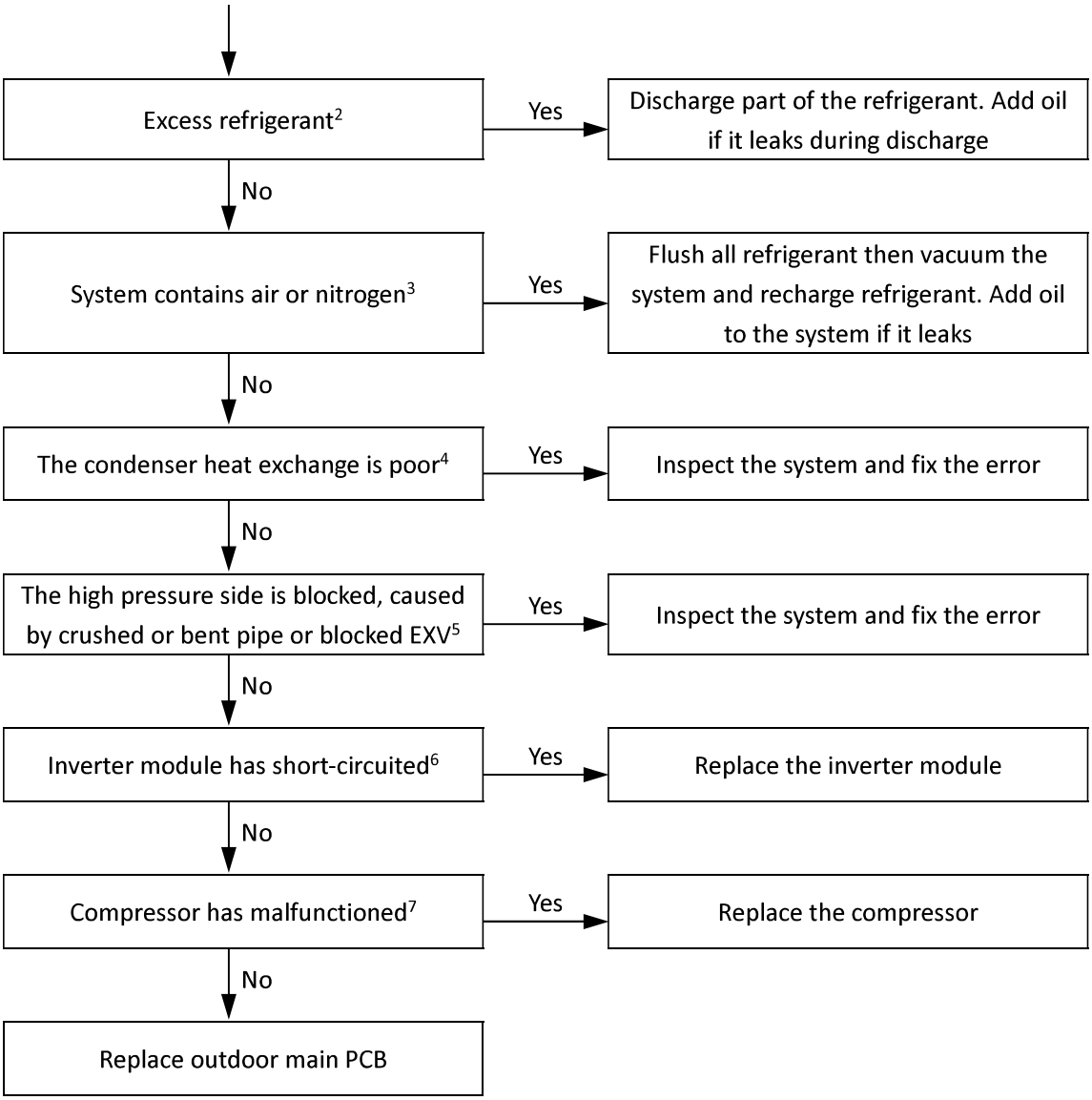
- Outdoor unit stop valves are closed.
- Indoor load too large.
- Power supply abnormal.
- Sudden interruption of power to IDUs.
- Excess refrigerant.
- System contains air or nitrogen.
- Poor condenser heat exchange.
- High pressure side blockage.
- Inverter module damaged.
- Compressor damaged.
- Main PCB damaged.

2.18.5 Procedure



Flowchart continued on next page ...

... flowchart continued from previous page



Notes:

1. An indoor load that is too large causes suction and discharge temperatures to be higher than normal. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
2. Excess refrigerant causes discharge temperature to be lower than normal, discharge pressure to be higher than normal and suction pressure to be higher than normal. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
3. Air or nitrogen in the system causes discharge temperature to be higher than normal, discharge pressure to be higher than normal, compressor current to be higher than normal, abnormal compressor noise and an unsteady pressure meter reading. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
4. In cooling mode check outdoor heat exchangers, fans and air outlets for dirt/blockages. In heating mode check indoor heat exchangers, fans and air outlets for dirt/blockages.
5. High pressure side blockage causes discharge temperature to be higher than normal, discharge pressure to be higher than normal and suction pressure to be lower than normal. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
6. Set a multi-meter to buzzer mode and test any two terminals of P N U V W of the inverter module. If the buzzer sounds, the inverter module has short-circuited.
7. The normal resistances of the inverter compressor are 0.7-1.5Ω among U V W and infinite between each of U V W and ground. If any of the resistances differ from these specifications, the compressor has malfunctioned.

2.19 P4: Discharge temperature protection

2.19.1 Digital display output

2.19.2 Description

- Discharge temperature protection.
- The system stops running.
- Error code is displayed on the unit with the error.

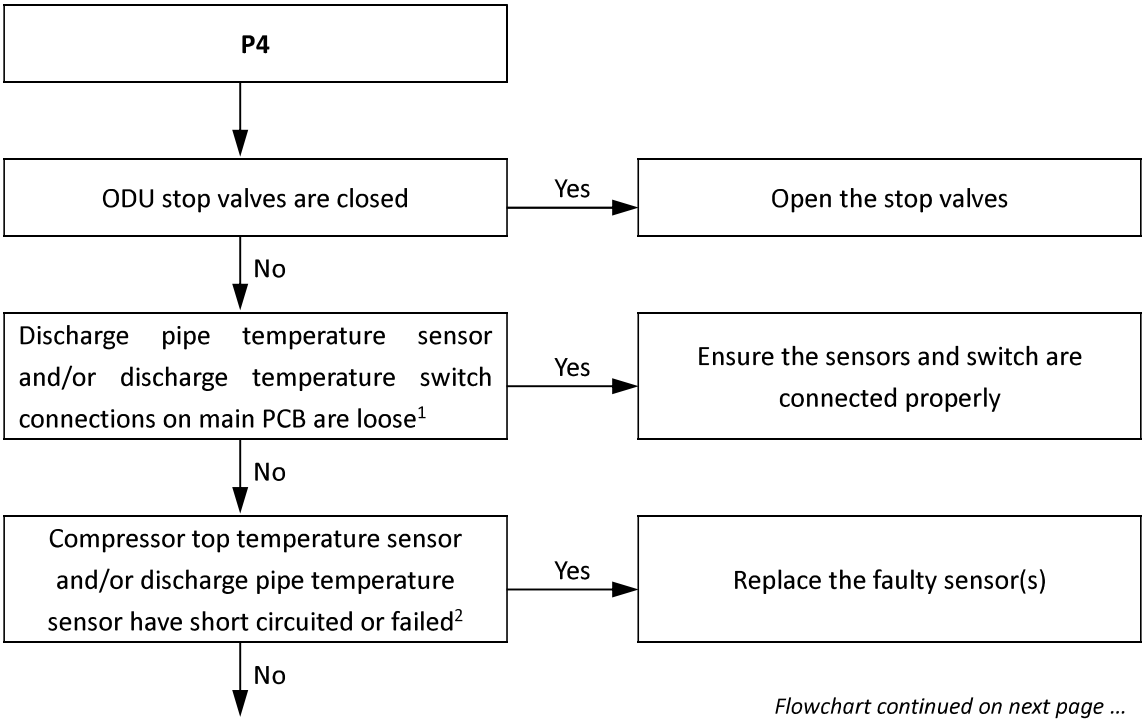
2.19.3 Trigger / recover condition

- Trigger condition:
  Discharge temperature (T5) > 110°C.
- Recover condition: Discharge temperature (T5) < 85 °C.
- Reset method:
  Resume automatically.

2.19.4 Possible causes

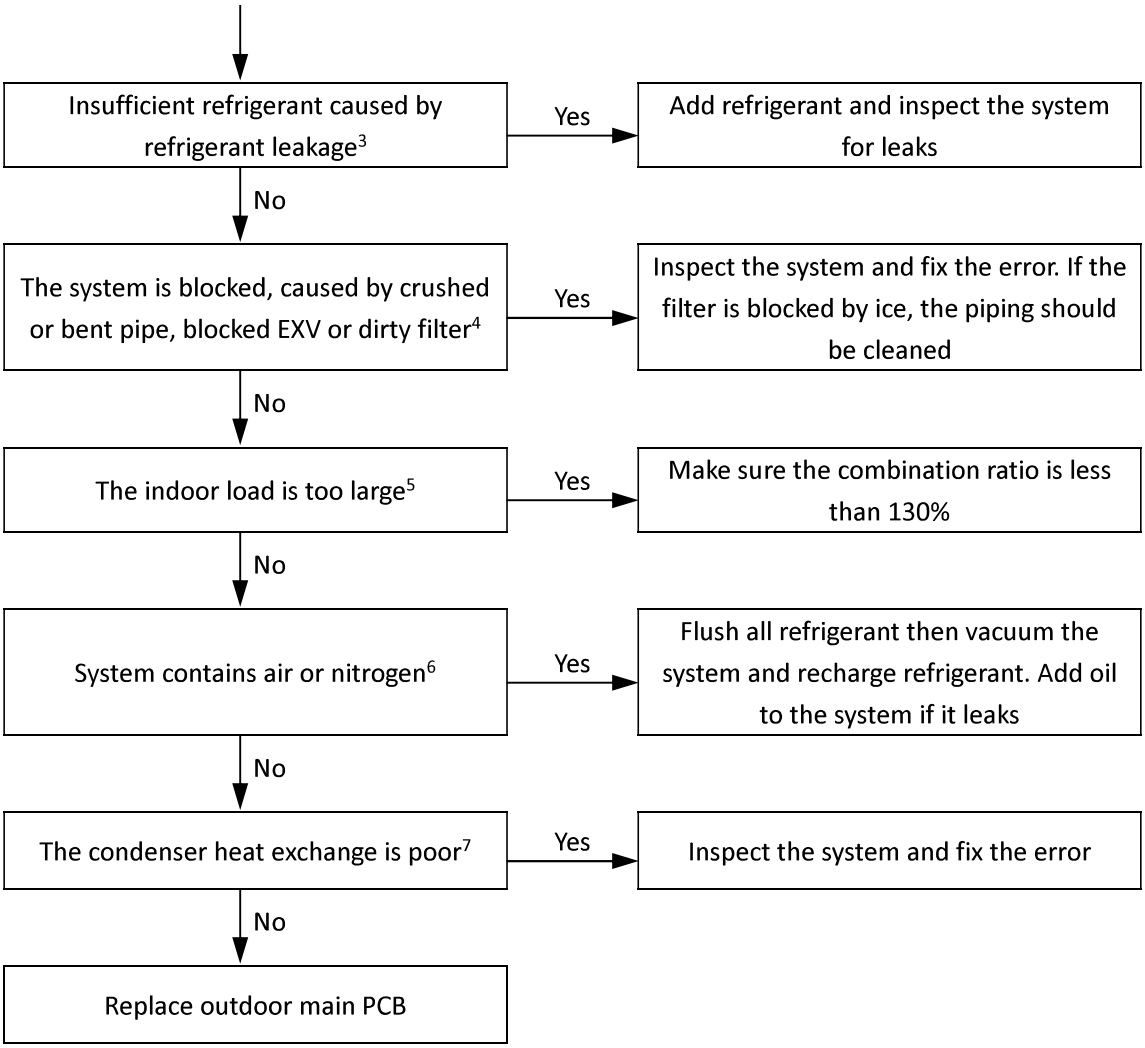
- Outdoor unit stop valves are closed.
- Temperature sensor/switch not connected properly or has malfunctioned.
- Insufficient refrigerant.
- System blockage.
- Indoor load too large.
- System contains air or nitrogen.
- Poor condenser heat exchange.
- Main PCB damaged.

2.19.5 Procedure



Flowchart continued on next page ...

... flowchart continued from previous page



Notes:

1. Compressor top temperature sensor and discharge pipe temperature sensor connections are ports CN4 and CN5 on the main PCB (labeled 3 and 4, respectively, in Figure 5-2.1 in Part 5, 2.1 “Ports”). The discharge temperature switch connection is port CN18 on the main PCB (labeled 2 in Figure 5-2.1 in Part 5, 2.1 “Ports”).
2. Measure sensor resistance. If the resistance is too low, the sensor has short-circuited. If the resistance is not consistent with the sensor’s resistance characteristics table, the sensor has failed. Refer to Table 6-3.2 in Part 6, 3.1 “Temperature Sensor Resistance Characteristics”.
3. An insufficiency of refrigerant causes compressor discharge temperature to be higher than normal, discharge and suction pressures to be lower than normal and compressor current to be lower than normal, and may cause frosting to occur on the suction pipe. These issues disappear once sufficient refrigerant has been charged into the system. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
4. A low pressure side blockage causes compressor discharge temperature to be higher than normal, suction pressure to be lower than normal and compressor current to be lower than normal, and may cause frosting to occur on the suction pipe. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
5. An indoor load that is too large causes suction and discharge temperatures to be higher than normal. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
6. Air or nitrogen in the system causes discharge temperature to be higher than normal, discharge pressure to be higher than normal, compressor current to be higher than normal, abnormal compressor noise and an unsteady pressure meter reading. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
7. In cooling mode check outdoor heat exchangers, fans and air outlets for dirt/blockages. In heating mode check indoor heat exchangers, fans and air outlets for dirt/blockages.

2.20 P5: Outdoor heat exchanger temperature protection

2.20.1 Digital display output

2.20.2 Description

- Outdoor heat exchanger temperature protection.
- The system stops running.
- Error code is displayed on the unit with the error.

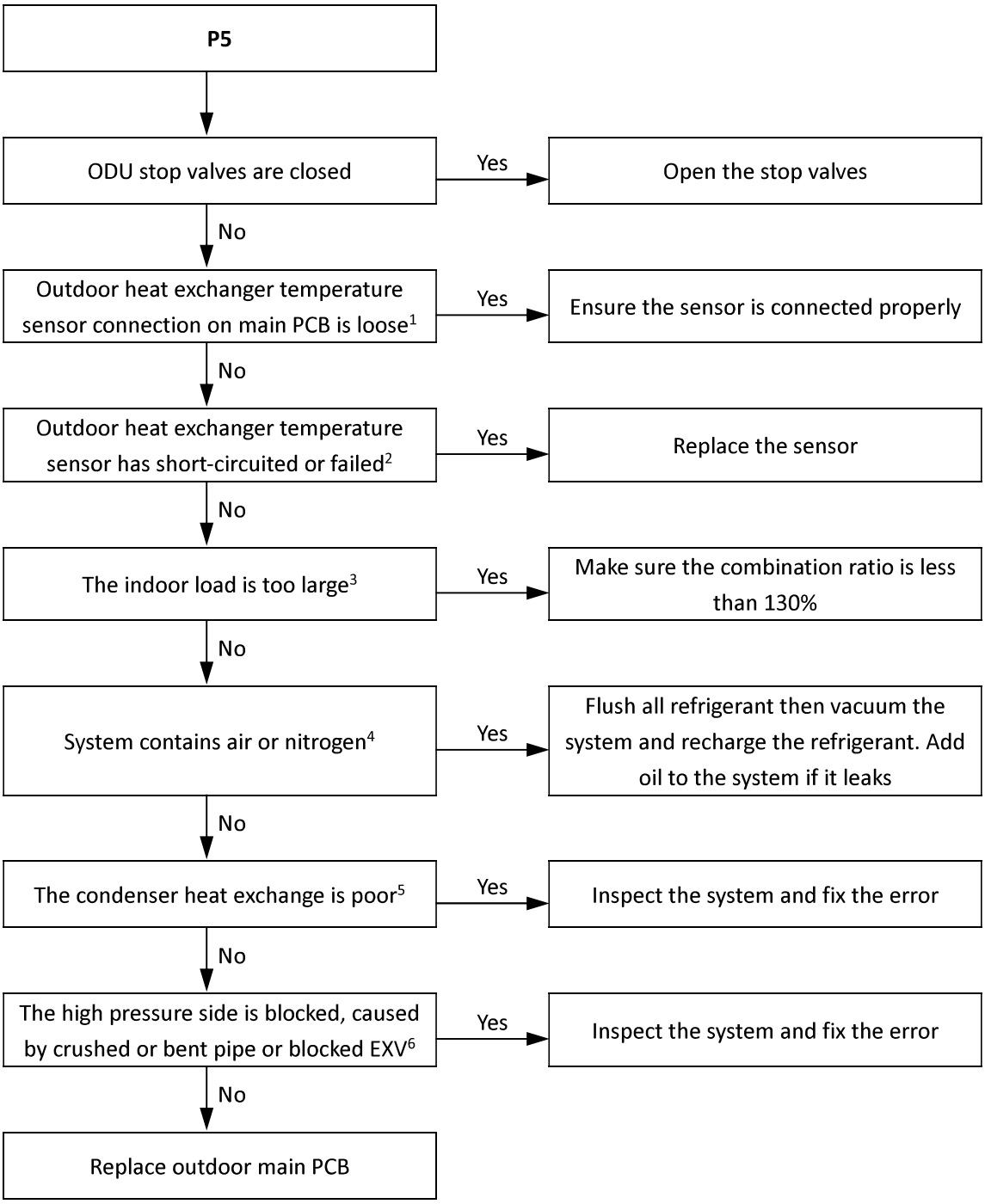
2.20.3 Trigger / recover condition

- Trigger condition: Outdoor heat exchanger temperature (T3) ≥ 65°C.
- Recover condition: Outdoor heat exchanger temperature (T3) < 55 °C.
- Reset method: Resume automatically.

2.20.4 Possible causes

- Outdoor unit stop valves are closed.
- Temperature sensor not connected properly or has malfunctioned.
- Indoor load too large.
- System contains air or nitrogen.
- Poor condenser heat exchange.
- High pressure side blockage.
- Main PCB damaged.

2.20.5 Procedure



Notes:

1. Outdoor heat exchanger temperature sensor connection is port CN1 on the main PCB (labeled 11 in Figure 5-2.1 in Part 5, 2.1 “Ports”).
2. Measure sensor resistance. If the resistance is too low, the sensor has short-circuited. If the resistance is not consistent with the sensor’s resistance characteristics table, the sensor has failed. Refer to Table 6-3.1 in Part 6, 3.1 “Temperature Sensor Resistance Characteristics”
3. An indoor load that is too large causes suction and discharge temperatures to be higher than normal. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
4. Air or nitrogen in the system causes discharge temperature to be higher than normal, discharge pressure to be higher than normal, compressor current to be higher than normal, abnormal compressor noise and an unsteady pressure meter reading. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.
5. In cooling mode check outdoor heat exchangers, fans and air outlets for dirt/blockages. In heating mode check indoor heat exchangers, fans and air outlets for dirt/blockages.
6. High pressure side blockage causes discharge temperature to be higher than normal, discharge pressure to be higher than normal and suction pressure to be lower than normal. For normal system parameters refer to Table 6-3.4 and 6-3.5 in Part 6, 3.2 “Normal Operating Parameters of Refrigerant System”.

2.21 P8: Typhoon protection

2.21.1 Digital display output

2.21.2 Description

- P8 indicates strong wind protection.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

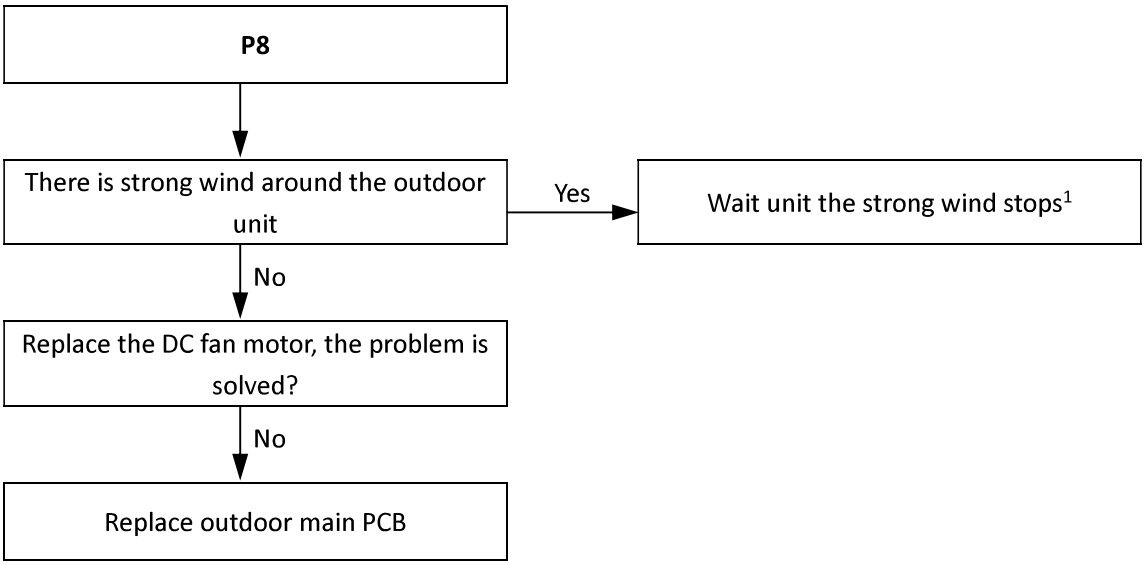
2.21.3 Trigger / recover condition

- Trigger condition:
  Fan speed ≥400rps when the outdoor unit is not start up.
- Recover condition:
  Both the upper and lower fan speed < 400rps for more than 120S.
- Reset method:
  Resume automatically.

2.21.4 Possible causes

- There is strong wind around the outdoor unit.
- DC fan motor is damaged.
- Main PCB damaged.

2.21.5 Procedure



Notes:

1. P8 protection recovers in 2 minutes when the strong wind stops.

2.22 PL: Inverter module temperature protection

2.22.1 Digital display output

2.22.2 Description

- PL indicates inverter module temperature protection.
- The system stops running.
- Error code is displayed on the outdoor unit PCB.

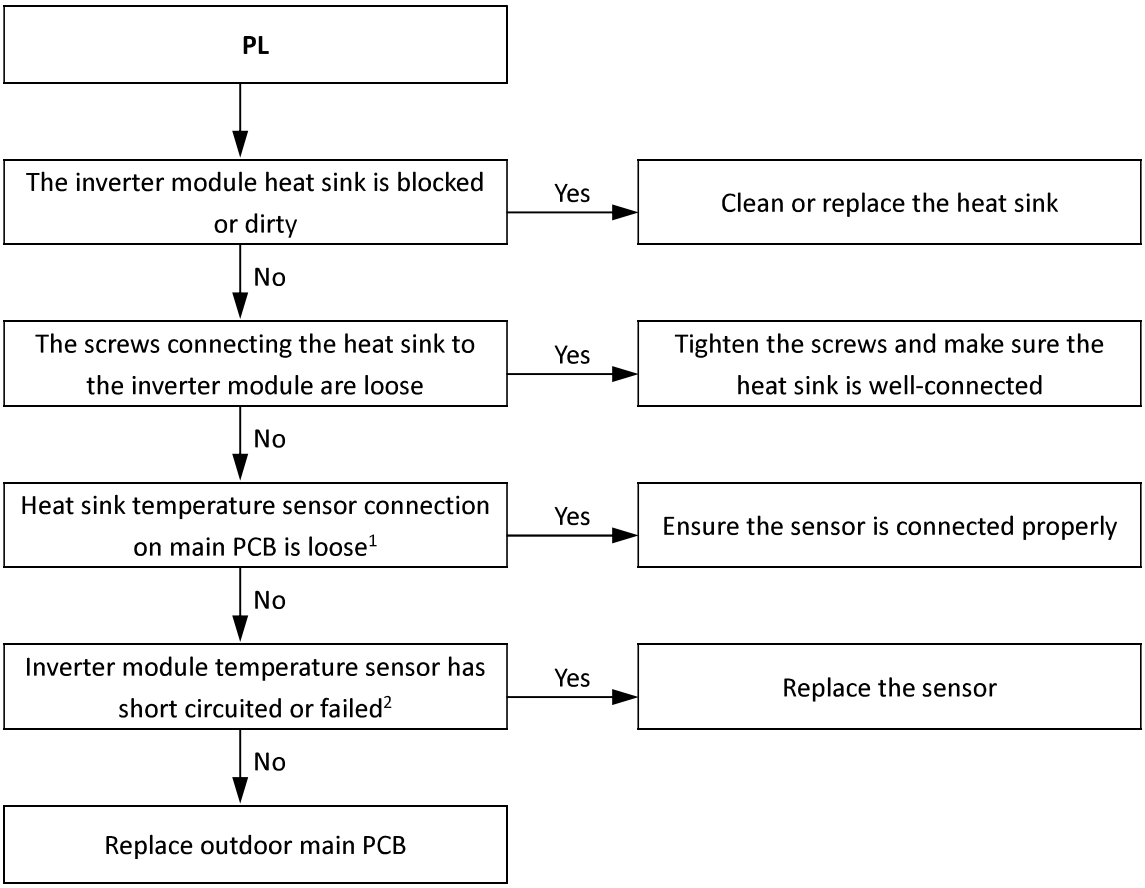
2.22.3 Trigger / recover condition

- Trigger condition:
  Inverter module heat sink temperature (Tf) ≥ 72°C.
- Recover condition:
  Inverter module heat sink temperature (Tf) < 66°C
- Reset method:
  Resume automatically.

2.22.4 Possible causes

- Blocked, dirty or loose heat sink.
- Temperature sensor not connected properly or has malfunctioned.
- Main PCB damaged.

2.22.5 Procedure



Notes:

1. Heat sink temperature sensor connection is port CN14 on the main PCB (labeled 4 in Figure 5-2.1 in Part 5, 2.1 “Ports”).
2. Measure sensor resistance. If the resistance is too low, the sensor has short-circuited. If the resistance is not consistent with the sensor’s resistance characteristics table, the sensor has failed. Refer to Table 6-3.3 in Part 6, 3.1 “Temperature Sensor Resistance Characteristics”.

3 Appendix to Part 6

3.1 Temperature Sensor Resistance Characteristics

Table 6-3.1: Outdoor ambient temperature sensor, outdoor heat exchanger temperature sensor and refrigerant cooling pipe temperature sensor resistance characteristics

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
-20	115.3	**20**	12.64	**60**	2.358	**100**	0.6297
-19	108.1	**21**	12.06	**61**	2.272	**101**	0.6115
-18	101.5	**22**	11.50	**62**	2.191	**102**	0.5939
-17	96.34	**23**	10.97	**63**	2.112	**103**	0.5768
-16	89.59	**24**	10.47	**64**	2.037	**104**	0.5604
-15	84.22	**25**	10.00	**65**	1.965	**105**	0.5445
-14	79.31	**26**	9.551	**66**	1.896	**106**	0.5291
-13	74.54	**27**	9.124	**67**	1.830	**107**	0.5143
-12	70.17	**28**	8.720	**68**	1.766	**108**	0.4999
-11	66.09	**29**	8.336	**69**	1.705	**109**	0.4860
-10	62.28	**30**	7.971	**70**	1.647	**110**	0.4726
-9	58.71	**31**	7.624	**71**	1.591	**111**	0.4596
-8	56.37	**32**	7.295	**72**	1.537	**112**	0.4470
-7	52.24	**33**	6.981	**73**	1.485	**113**	0.4348
-6	49.32	**34**	6.684	**74**	1.435	**114**	0.4230
-5	46.57	**35**	6.400	**75**	1.387	**115**	0.4116
-4	44.00	**36**	6.131	**76**	1.341	**116**	0.4006
-3	41.59	**37**	5.874	**77**	1.291	**117**	0.3899
-2	39.82	**38**	5.630	**78**	1.254	**118**	0.3796
-1	37.20	**39**	5.397	**79**	1.2133	**119**	0.3695
0	35.20	**40**	5.175	**80**	1.174	**120**	0.3598
1	33.33	**41**	4.964	**81**	1.136	**121**	0.3504
2	31.56	**42**	4.763	**82**	1.100	**122**	0.3413
3	29.91	**43**	4.571	**83**	1.064	**123**	0.3325
4	28.35	**44**	4.387	**84**	1.031	**124**	0.3239
5	26.88	**45**	4.213	**85**	0.9982	**125**	0.3156
6	25.50	**46**	4.046	**86**	0.9668	**126**	0.3075
7	24.19	**47**	3.887	**87**	0.9366	**127**	0.2997
8	22.57	**48**	3.735	**88**	0.9075	**128**	0.2922
9	21.81	**49**	3.590	**89**	0.8795	**129**	0.2848
10	20.72	**50**	3.451	**90**	0.8525	**130**	0.2777
11	19.69	**51**	3.318	**91**	0.8264	**131**	0.2708
12	18.72	**52**	3.192	**92**	0.8013	**132**	0.2641
13	17.80	**53**	3.071	**93**	0.7771	**133**	0.2576
14	16.93	**54**	2.959	**94**	0.7537	**134**	0.2513
15	16.12	**55**	2.844	**95**	0.7312	**135**	0.2451
16	15.34	**56**	2.738	**96**	0.7094	**136**	0.2392
17	14.62	**57**	2.637	**97**	0.6884	**137**	0.2334
18	13.92	**58**	2.540	**98**	0.6682	**138**	0.2278
19	13.26	**59**	2.447	**99**	0.6486	**139**	0.2223

Table 6-3.2: Compressor discharge pipe temperature sensor resistance characteristics

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
-30	913.239	**16**	83.541	**62**	12.809	**108**	2.918
-29	862.001	**17**	79.801	**63**	12.357	**109**	2.835
-28	813.806	**18**	76.248	**64**	11.923	**110**	2.755
-27	768.47	**19**	72.871	**65**	11.506	**111**	2.678
-26	725.821	**20**	69.66	**66**	11.105	**112**	2.603
-25	685.694	**21**	66.607	**67**	10.721	**113**	2.53
-24	647.937	**22**	63.703	**68**	10.352	**114**	2.46
-23	612.405	**23**	60.939	**69**	9.997	**115**	2.392
-22	578.963	**24**	58.31	**70**	9.656	**116**	2.326
-21	547.482	**25**	55.807	**71**	9.329	**117**	2.262
-20	517.845	**26**	53.424	**72**	9.014	**118**	2.2
-19	489.937	**27**	51.154	**73**	8.711	**119**	2.141
-18	463.653	**28**	48.992	**74**	8.42	**120**	2.082
-17	438.895	**29**	46.933	**75**	8.14	**121**	2.026
-16	415.569	**30**	44.97	**76**	7.871	**122**	1.972
-15	393.587	**31**	43.098	**77**	7.612	**123**	1.919
-14	372.869	**32**	41.314	**78**	7.363	**124**	1.868
-13	353.337	**33**	39.613	**79**	7.123	**125**	1.818
-12	334.92	**34**	37.989	**80**	6.892	**126**	1.77
-11	317.549	**35**	36.441	**81**	6.67	**127**	1.723
-10	301.161	**36**	34.963	**82**	6.456	**128**	1.678
-9	285.699	**37**	33.552	**83**	6.249	**129**	1.635
-8	271.104	**38**	32.205	**84**	6.051	**130**	1.592
-7	257.326	**39**	30.919	**85**	5.859	**131**	1.551
-6	244.316	**40**	29.691	**86**	5.675	**132**	1.511
-5	232.028	**41**	28.517	**87**	5.497	**133**	1.472
-4	220.418	**42**	27.395	**88**	5.325	**134**	1.435
-3	209.447	**43**	26.323	**89**	5.16	**135**	1.399
-2	199.077	**44**	25.298	**90**	5	**136**	1.363
-1	189.272	**45**	24.318	**91**	4.846	**137**	1.329
0	179.999	**46**	23.381	**92**	4.697	**138**	1.296
1	171.227	**47**	22.485	**93**	4.554	**139**	1.264
2	162.926	**48**	21.627	**94**	4.415	**140**	1.233
3	155.07	**49**	20.806	**95**	4.282	**141**	1.203
4	147.632	**50**	20.021	**96**	4.152	**142**	1.174
5	140.589	**51**	19.269	**97**	4.027	**143**	1.146
6	133.917	**52**	18.548	**98**	3.907	**144**	1.119
7	127.596	**53**	17.859	**99**	3.79	**145**	1.093
8	121.605	**54**	17.198	**100**	3.677	**146**	1.067
9	115.926	**55**	16.565	**101**	3.568	**147**	1.043
10	110.54	**56**	15.958	**102**	3.463	**148**	1.019
11	105.433	**57**	15.377	**103**	3.361	**149**	0.996
12	100.587	**58**	14.82	**104**	3.262	**150**	0.974
13	95.988	**59**	14.285	**105**	3.166		
14	91.622	**60**	13.773	**106**	3.091		
15	87.477	**61**	13.281	**107**	3.003		

Table 6-3.3: Heat sink temperature sensor resistance characteristics

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
-30	971.4	**10**	109.0	**50**	19.70	**90**	5.000
-29	912.8	**11**	103.9	**51**	18.97	**91**	4.855
-28	858.2	**12**	99.02	**52**	18.26	**92**	4.705
-27	807.3	**13**	94.44	**53**	17.59	**93**	4.566
-26	759.7	**14**	90.11	**54**	16.94	**94**	4.431
-25	715.3	**15**	86.00	**55**	16.32	**95**	4.301
-24	673.6	**16**	82.09	**56**	15.73	**96**	4.176
-23	634.7	**17**	78.38	**57**	15.16	**97**	4.055
-22	598.2	**18**	74.87	**58**	14.62	**98**	3.938
-21	564.1	**19**	71.53	**59**	14.10	**99**	3.825
-20	532.2	**20**	68.36	**60**	13.60	**100**	3.716
-19	502.2	**21**	65.34	**61**	13.12	**101**	3.613
-18	474.1	**22**	62.47	**62**	12.65	**102**	3.514
-17	447.7	**23**	59.75	**63**	12.22	**103**	3.418
-16	423.0	**24**	57.17	**64**	11.79	**104**	3.326
-15	399.8	**25**	54.71	**65**	11.39	**105**	3.235
-14	378.0	**26**	52.36	**66**	10.99	**106**	3.148
-13	357.5	**27**	50.13	**67**	10.62	**107**	3.063
-12	338.2	**28**	48.01	**68**	10.25	**108**	2.982
-11	320.1	**29**	45.99	**69**	9.909	**109**	2.902
-10	303.1	**30**	44.07	**70**	9.576	**110**	2.826
-9	287.1	**31**	42.23	**71**	9.253	**111**	2.747
-8	272.0	**32**	40.48	**72**	8.947	**112**	2.672
-7	257.8	**33**	38.81	**73**	8.646	**113**	2.599
-6	244.4	**34**	37.23	**74**	8.362	**114**	2.528
-5	231.9	**35**	35.71	**75**	8.089	**115**	2.460
-4	220.0	**36**	34.27	**76**	7.821	**116**	2.390
-3	208.7	**37**	32.89	**77**	7.569	**117**	2.322
-2	198.2	**38**	31.58	**78**	7.323	**118**	2.256
-1	188.2	**39**	30.33	**79**	7.088	**119**	2.193
0	178.8	**40**	29.13	**80**	6.858	**120**	2.132
1	169.9	**41**	27.98	**81**	6.640	**121**	2.073
2	161.5	**42**	26.89	**82**	6.432	**122**	2.017
3	153.6	**43**	25.85	**83**	6.230	**123**	1.962
4	146.1	**44**	24.85	**84**	6.033	**124**	1.910
5	139.1	**45**	23.90	**85**	5.847	**125**	1.859
6	132.3	**46**	22.98	**86**	5.667		
7	126.0	**47**	22.10	**87**	5.492		
8	120.0	**48**	21.26	**88**	5.322		
9	114.3	**49**	20.47	**89**	5.159		

3.2 Normal Operating Parameters of Refrigerant System

Under the following conditions, the operating parameters given in Tables 6-3.4 and 6-3.5 should be observed:

- The outdoor unit can detect all the indoor units.
- The number of indoor units displayed on DSP is steady and is equal to the actual number of indoor units installed.
- All stop valves are open and all indoor unit EXVs are connected to their unit's PCB.
- All the indoor units are currently running.
- If the outdoor ambient temperature is high, the system is being run in cooling mode with the following settings: temperature 17°C; fan speed high.
- If the outdoor ambient temperature is low, the system is being run in heating mode with the following settings: temperature 30°C; fan speed high.
- The system has been running normally for more than 30 minutes.

Table 6-3.4: Outdoor unit cooling mode operating parameters

Outdoor ambient temperature	**°C**	< 10	10 to 26	26 to 31	31 to 41	> 41
Average discharge temperature	**°C**	60-76	62-78	65-82	67-92	69-92
Average 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	3.1-4.2
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**	7-18	10-20	12-25	15-27	18-25

Table 6-3.5: Outdoor unit heating mode operating parameters

Outdoor ambient temperature	**°C**	< -10	-10 to 0	0 to 5	5 to 10	10 to 17	> 17
Average discharge temperature	**°C**	56-74	57-76	58-78	61-82	63-82	63-82
Average 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**	1.4-1.6	1.5-1.7	1.6-2.2	1.8-2.6	1.8-2.6	2.0-2.4
DC inverter compressor current	**A**	11-23	12-25	10-25	10-26	10-22	13-20