TRUST
Air Conditioners

INVERTER VRF SYSTEM
(V SERIES)

TRUST AIR CONDITIONING EQUIPMENT CO.
Prepared By: Engineering & R & D Department.

Shiraz- May 2017

Troubleshooting

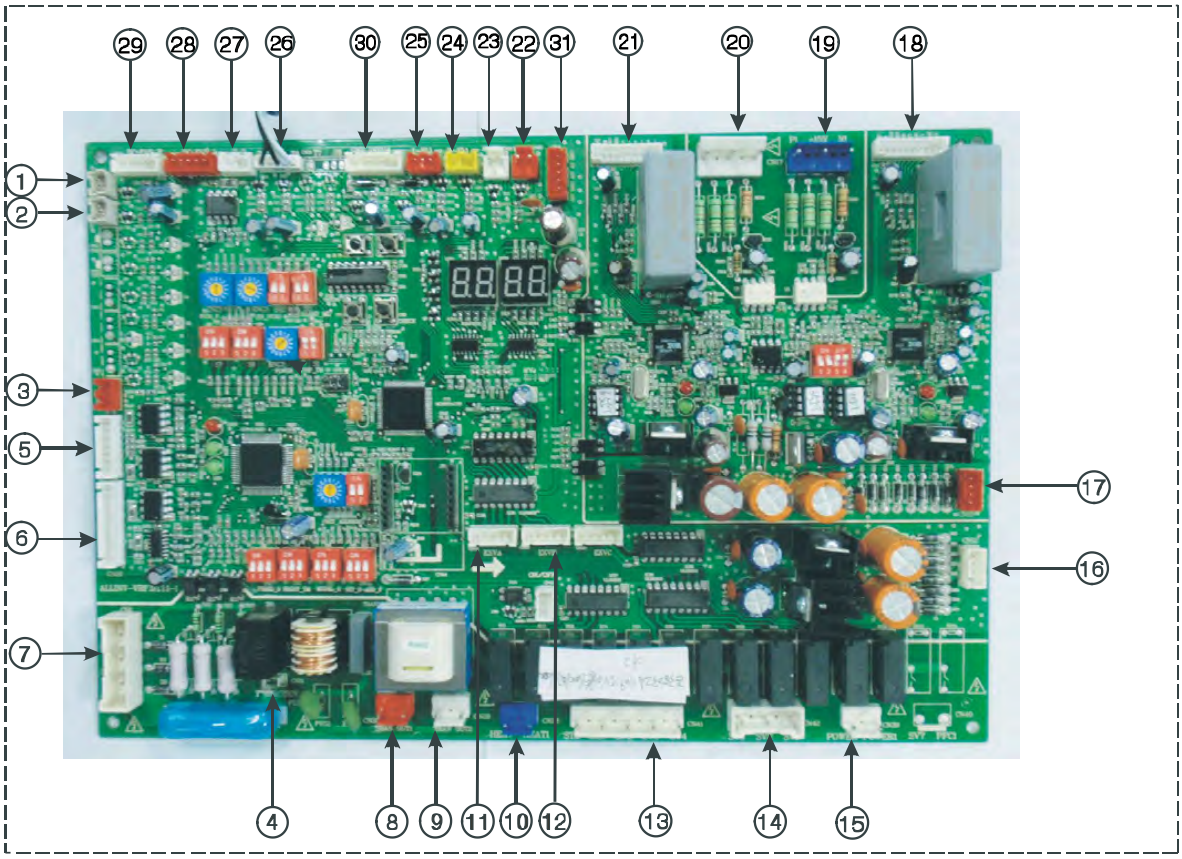
1. Main control board ports instructions 2
2. Main control board parts instructions 3
3. Error code table 7
4. Troubleshooting 9

توجه:

شرکت تراست حق تغییر مشخصات دستگاه ها را در جهت بهبود و ارتقای کیفیت برای خود محفوظ می دارد.

2013-08

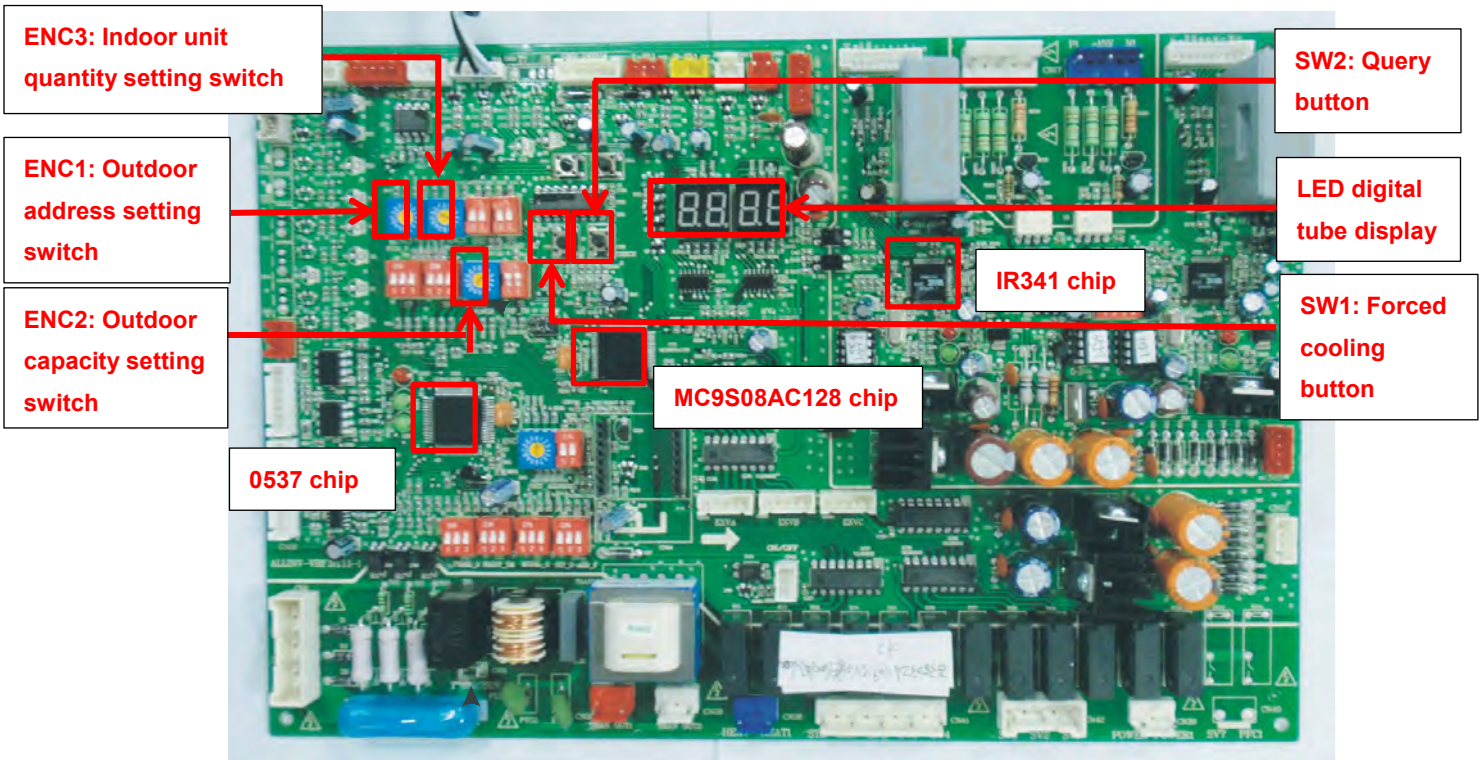
1. Main control board ports instructions



PCB ports instruction

No.	Content	Port voltage
1 CN10	Discharge temperature sensor port of the inverter compressor A	DC0~5V (in dynamic change)
2 CN11	Discharge temperature sensor port of the inverter compressor A or B	DC0~5V (in dynamic change)
3 CN2	Reserve	
4 CN31	Reserve	
5 CN22	Reserve	
6 CN16	Wiring port for communication between indoor and outdoor units, indoor unit network, outdoor unit network and network accounting	DC2.5~2.7V
7 CN1	Phase inspection port	380V
8 CN30	Power input of the NO.1 transformer	220V
9 CN29	Power input of the NO.2 transformer	220V
10 CN38	Loading output terminal	220V
11 CN36	EXV A driving port	The first pin on the left: DC 12V
12 CN35	EXV B driving port	The first pin on the left: DC 12V
13 CN41	Loading output terminal	220V
14 CN42	Loading output terminal	220V
15 CN39	Loading output terminal	220V
16 CN12	Power output of the NO.1 transformer	Yellow-Yellow: AC 9V
17 CN15	Power output of the NO.2 transformer	Yellow-Yellow: AC 14.5V
18 CN14	Activation port of inverter module B	The left the third pin: DC3.3V
19 CN17	Port for inverter module B voltage inspection	DC540V,+15V,N
20 CN18	Power supply port of 12V DC	12V
21 CN13	Activation port of inverter module A	The left the third pin: DC3.3V
22 CN25	ON/OFF signal input port for system low pressure inspection	0 or 5V
23 CN26	ON/OFF signal input port for system high pressure inspection	0 or 5V
24 CN7	Input port for system high pressure inspection	DC0~5V (in dynamic change)
25 CN6	Reserve	
26 CN28	Inspection port for outdoor ambient temperature and condenser coil	DC0~5V (in dynamic change)
27 CN24	Communication ports between outdoor units	DC2.5~2.7V
28 CN20	Control port of DC fan A	The first pin on the left: DC5V
29 CN21	Control port of DC fan B	The first pin on the left: DC5V
30 CN43	Current inspection port of the inverter compressors A and B	AC0~7.8V (in dynamic change)
31 CN19	Power supply connected port of the main control panel	GND +5V +12V

2. Main control board parts instructions

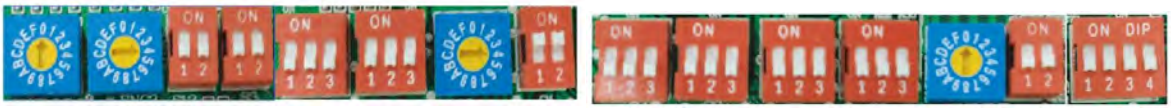


2.1 SW2 query instructions

No.	Content	Note
1	Address of outdoor unit	0,1,2,3
2	Capacity of outdoor unit	8,10,12,14,16,18
3	Quantity of Modular outdoor unit	Available for main unit
4.	Quantity setting of indoor units	Available for main unit
5	Total capacity of outdoor unit	Capacity requirement
6	Total requirement of indoor unit capacity	Available for main unit
7	Total requirement of main unit corrected capacity	Available for main unit
8	Operation mode	0,2,3,4 (0-OFF, 1-Air supply, 2-Cooling, 3-Heating (Cooling Only type without), 4-Forced cooling)
9	This outdoor unit actual operation capacity	Capacity requirement
10	Speed of fan A	0——OFF; 1~15——Speed increasing sequentially; 15——is the max. fan level.
11	Speed of fan B	0——OFF; 1~15——Speed increasing sequentially; 15——is the max. fan level.
12	T2/T2B average temperature	Actual value
13	T3 Pipe temperature	Actual value
14	T4 ambient temperature	Actual value
15	Discharge Temperature of Inverter Compressor A	Actual value
16	Discharge Temperature of Inverter compressor B	Actual value
17	Reserve	
18	Current of inverter compressor A	Actual value
19	Current of inverter compressor B	Actual value
20	Opening angle of EXV A	Actual value=Display value×8
21	Opening angle of EXV B	Actual value=Display value×8
22	High pressure	Actual value=Display value×0.1MPa
23	Reserve	
24	Quantity of indoor units	Actual value
25	Quantity of the working indoor units	Actual value
26	Priority mode	0,1,2,3,4
27	Night noise control mode	0,1,2,3
28	Static pressure mode	0,1,2,3
29	DC voltage A	Display value×10
30	DC voltage B	Display value×10
31	Reserve	
32	Reserve	
33	——	Check end

2.2 Dial codes definition

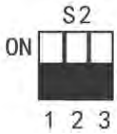
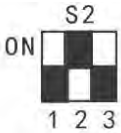
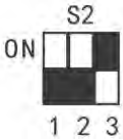
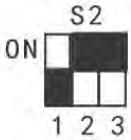
ENC1 ENC3 S12 S3 S7 S8 ENC2 S1 S4 S2 S5 S6 ENC4 S10 S11



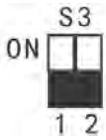
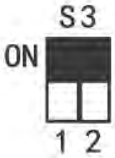
S1: starting up time setting

Starting time is set about 10 minutes	Starting time is set about 12 minutes(Default)

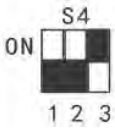
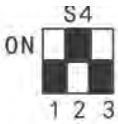
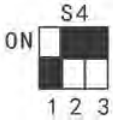
S2: night silent time selection

			
Night time selection is 6h/10h(Default)	Night time selection is 8h/10h	Night time selection is 6h/12h	Night time selection is 8h/12h

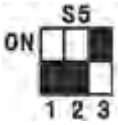
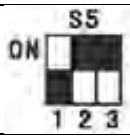
S3: silent mode selection

			
Night silent mode (Default the factory set)	Silent mode	Super silent mode	None silent mode

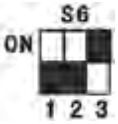
S4: ODU static pressure selection

			
Static pressure mode is 0 MPa (Default)	Static pressure mode is low pressure (Reserve position, use for customized unit)	Static pressure mode is medium pressure (Reserve position, use for customized unit)	Static pressure mode is high pressure (Reserve position, use for customized unit)

S5 : locking modes selection

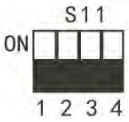
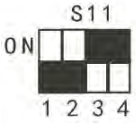
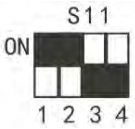
				
Heating priority mode(default)	Cooling priority mode	Priority mode (VIP priority or Vote priority)	Only respond to the heating mode	Only respond to the cooling mode

S6: addressing type selection

		
Automatic search addressing	Nonautomatic search address (The communication way of the original digital indoor units) (Default)	Clean the indoor unit addresses (Effective to automatic searching new digital indoor units)

S7: reserved
S8 : reserved
S10: reserved

S11: outdoor unit capacity setting

		
8, 10 HP outdoor unit setting	12, 14, 16 HP outdoor unit setting	18 HP outdoor unit setting

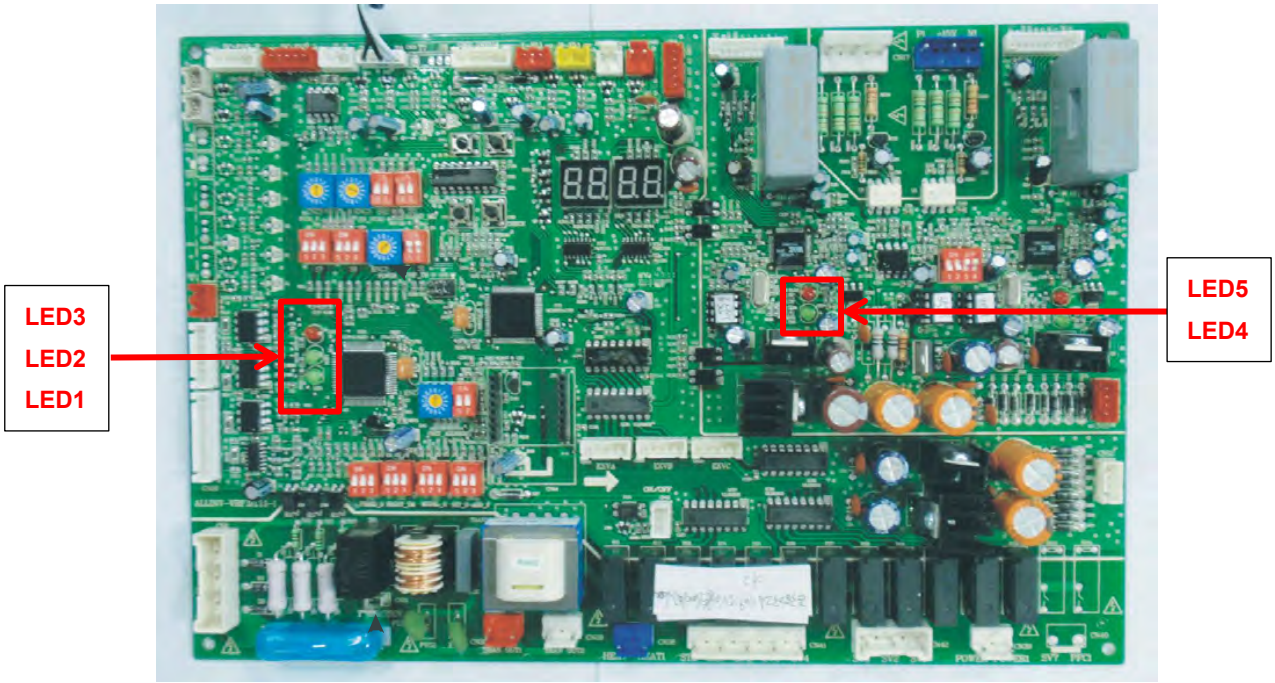
ENC1: Outdoor unit address setting switch, 0 indicates the master unit, 1-3 indicate slave unit.
ENC2: Outdoor unit capacity setting switch, effect to 0-5, 0-5 stand for 8HP-18HP.
ENC3 and S12:

		The quantity of indoor unit is 0-15 0~9 on ENC3 refer to 0~9 indoor units; A~F on ENC3 refer to 10~15 indoor units.
		The quantity of indoor unit is 16-31 0~9 on ENC3 refer to 16~25 indoor units; A~F on ENC3 refer to 26~31 indoor units.
		The quantity of indoor unit is 32-47 0~9 on ENC3 refer to 32~41 indoor units; A~F on ENC3 refer to 42~47 indoor units.
		The quantity of indoor unit is 48-63 0~9 on ENC3 refer to 48~57 indoor units; A~F on ENC3 refer to 58~63 indoor units.

ENC4 :

	Network address setting dial switch Effective to 0-7 0-7 stand for 0-7

2.3 LED on PCB instructions



LED1: Power supply indicator lamp. The lamp will be on if the power supply is normal.
LED2: Running indicator lamp. The lamp will be on if the system running is normal.
LED3: Malfunction indicator lamp of network centralized control chip. The lamp will flash in three-phase phase sequence protection.
LED4: Running indicator lamp of inverter module. The lamp will be on if the compressor is running.
LED5: Malfunction indicator lamp of inverter module. The lamp will flash if the inverter module is faulty and the error code will display on digital tube.

3. Error code table

Error code	Content	Note
E0	Communication error between outdoor units	Only display on faulty slave unit, all the ODU in standby
E1	Phase sequence error	Display on faulty unit, all the ODU in standby
E2	Indoor units and master unit communication error	Only display on master unit, all the ODU in standby
E3	Reserve	
E4	Ambient temperature sensor error	Display on faulty unit, all the ODU in standby
E5	Voltage error	Display on faulty unit, all the ODU in standby
E6	Reserve	
E7	Discharge temperature sensor error	Pc ≥3.5 MPa and discharge temperature ≤15 ℃ lasts for 2 minutes
E8	Outdoor unit address is wrong	
xE9	S11 setting doesn't match the capacity	x represents for a system, 1 is A system, 2 is B system.
xH0	Communication error between DSP and the main chip	x represents for a system, 1 is A system, 2 is B system.
H1	Communication error between 0537 and main chip	
H2	Outdoor unit quantities decreasing malfunction	Only master unit will display
H3	Outdoor unit quantities increasing malfunction	Only master unit will display
H4	There are 3 times P6 protection in 60 minutes	Recovery after power on again
H5	There are 3 times P2 protection in 60 minutes	Recovery after power on again
H6	There are 3 times P4 protection in 100 minutes	Recovery after power on again
H7	Indoor unit quantities decreasing malfunction	Indoor unit quantities decreasing over 3 minutes. Recovery when detected the max. number of units.
H8	High pressure sensor malfunction	Exhaust pressure ≤0.3Mpa will protect
H9	There are 3 times P9 protection in 60 minutes	Recovery after power on again
Hb	Low pressure sensor malfunction	Open circuit or short circuit fault
xHd	Slave unit malfunction	x represents which outdoor unit it is
P0	Inverter compressor top temperature protection	
P1	High pressure protection	
P2	Low pressure protection	There are 3 times P2 protection in 30 minutes. Display H5,can't recover.
xP3	Compressor over current protection	x represents for a system, 1 is A system, 2 is B system.
P4	Discharge temperature sensor protection	There are 3 times P2 protection in 100 minutes. Display H6, can't recover.
P5	Pipe temperature sensor protection	
xP6	Inverter module protection	x represents the system which it is. There are 3 times P6 protection in 30 minutes. Display H4, can't recover.
P9	Fan module protection	There are 3 times P9 protection in 30 minutes. Display H9, can't recover.
xL0	Module malfunction	x represents for a system, 1 is A system, 2 is

		B system.
xL1	DC bus low voltage protection	x represents for a system, 1 is A system, 2 is B system.
xL2	DC bus high voltage protection	x represents for a system, 1 is A system, 2 is B system.
xL3	Reserve	x represents for a system, 1 is A system, 2 is B system.
xL4	MCE malfunction/simultaneously/cycle loop	x represents for a system, 1 is A system, 2 is B system.
xL5	Zero speed protection	x represents for a system, 1 is A system, 2 is B system.
xL6	Reserve	x represents for a system, 1 is A system, 2 is B system.
xL7	Wrong phase protection	x represents for a system, 1 is A system, 2 is B system.
xL8	Protection of the speed change between a moment before and after is ＞15Hz	x represents for a system, 1 is A system, 2 is B system.
xL9	Protection of the speed change between the setting speed and the actual speed ＞15Hz	x represents for a system, 1 is A system, 2 is B system.

4. Troubleshooting

4.1 E0: Communication error between outdoor units (Only display on faulty slave unit, all the ODU in standby)

E0: Communication error between outdoor units

↓

ODU addresses (ENC1) are set incorrectly (the master unit address should be set as 0, slave units addresses should be set from 1 to 3, and the addresses should not be repeated in one system)

→ Yes → Reset the ODU addresses

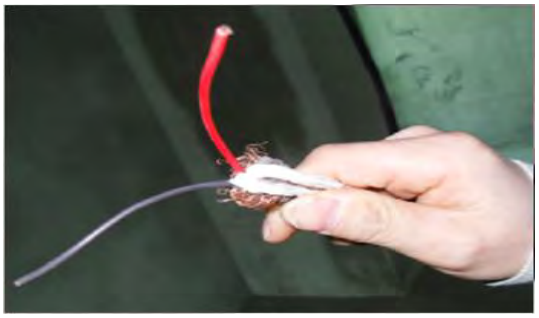
↓ No

ODU communication wires are connected incorrectly (all the wires for H1, H2, E connections should be 3-core shielded wire, the wiring should be polarity connection (H1 connect to H1, H2 connect to H2), the wiring should not be short circuit)

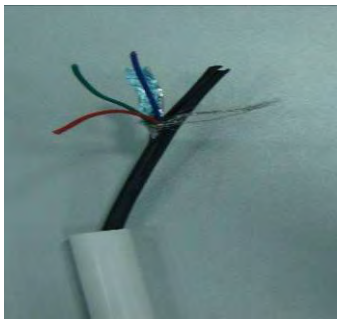
→ Yes → Replace the communication wires to 3-core shielded wire, reconnect the communication wire

↓ No

Outdoor main control board is damaged → Replace outdoor main control board

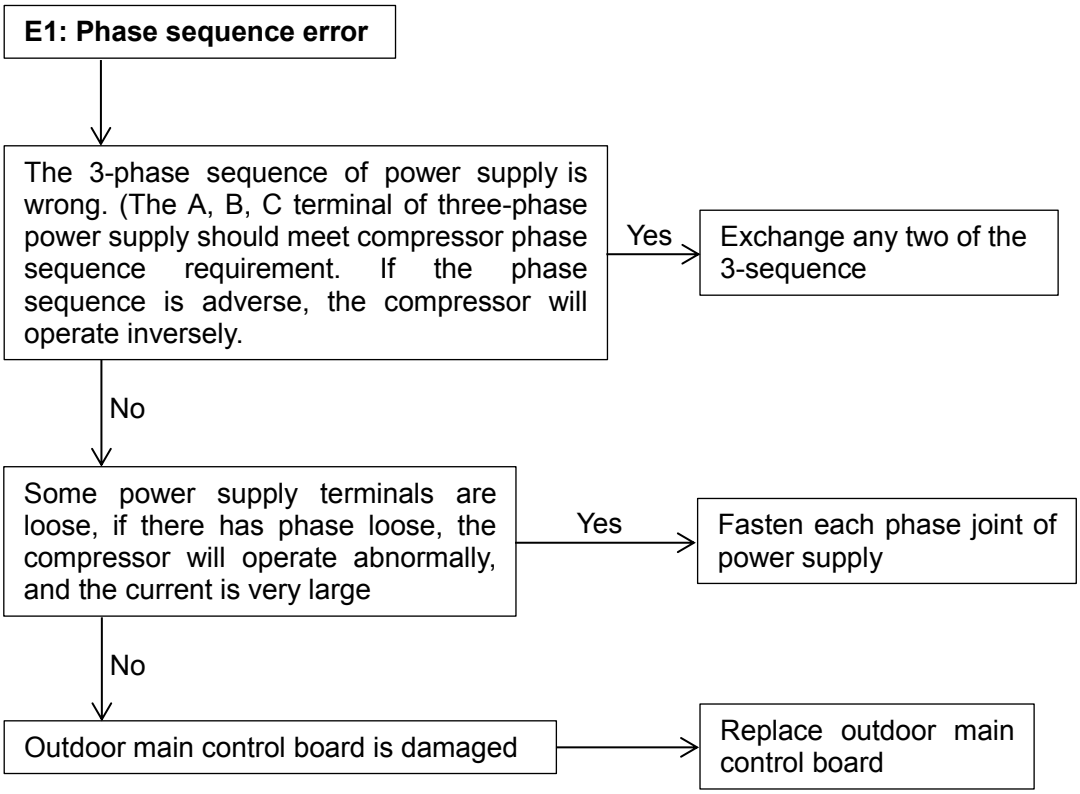


2-core shielded wire (×)

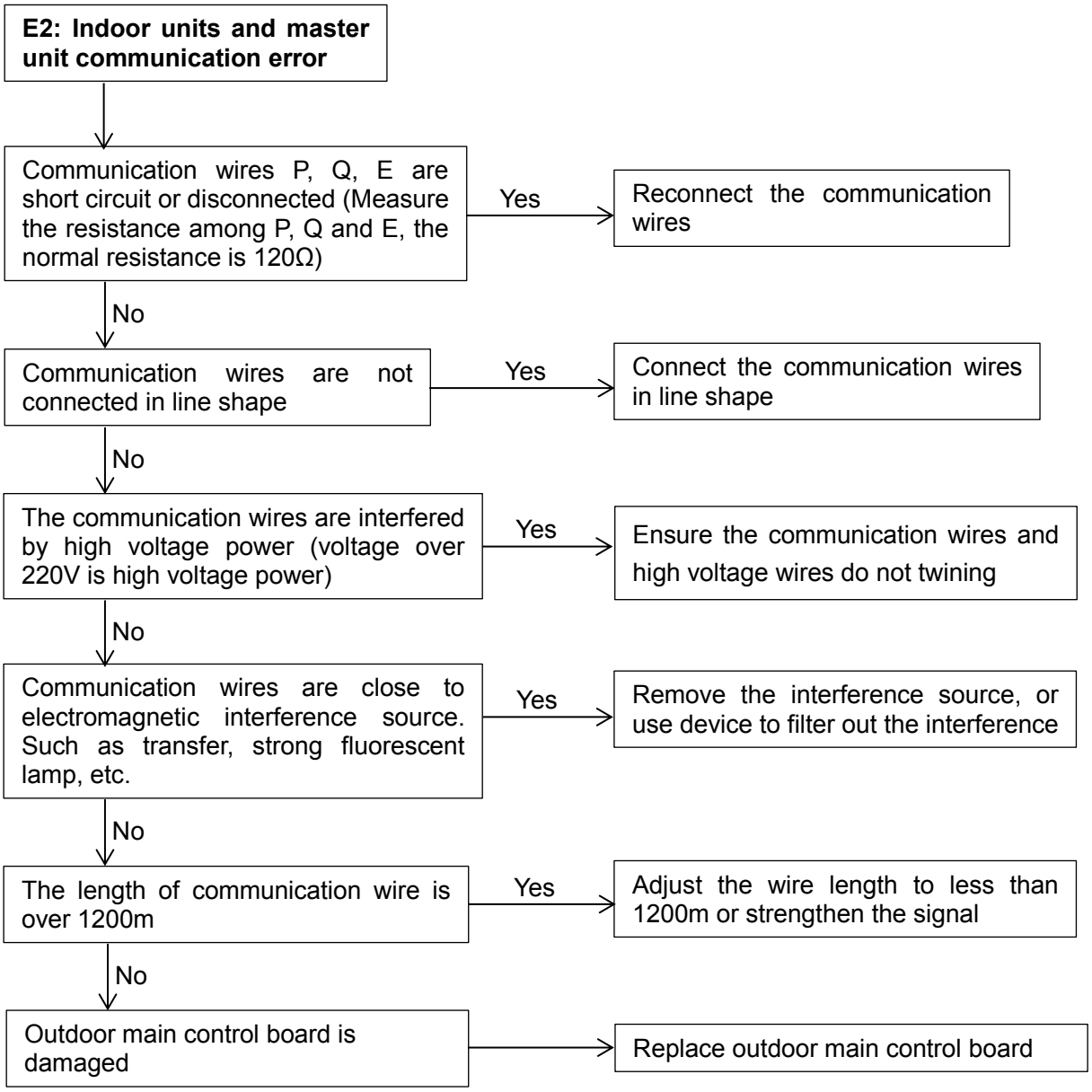


3-core shielded wire (√)

4.2 E1: Phase sequence error (Display on faulty unit, all the ODU in standby)

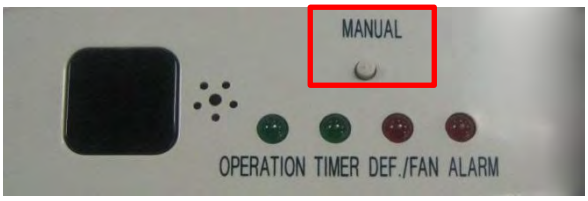


4.3 E2: Indoor units and master unit communication error (Only display on master unit, all the ODU in standby)



Note:

1. Press the manual button on display board of indoor unit for 5 seconds, the communication address code of indoor unit will display;



Codes are as follows:

Indicator light	Running	Timer	Fan/defend cold fan	Warning
Code	8	4	2	1

Buzzer	Communication address	Four LED display
Not warning	00---15	Normally on
Not warning	16---31	Flash
Warning	32---47	Normally on
Warning	48---63	Flash

For example:

Press the manual button for 5 seconds:

- If the “Operation”, “Timer” and “DEF./FAN” lights are normally on and the buzzer is not warning, that means the address code is 14=(8+4+2)
- If the four LED lights are flash and the buzzer isn’t warning, the address code should plus 16, that means the address code is 30=16+ (8+4+2)
- If the “Operation”, “Timer” and “DEF./FAN” lights are normally on and the buzzer is warning, that means the address code is 46=32+(8+4+2)
- If the four LED lights are flash and the buzzer is warning, that means the address code is 62=48+ (8+4+2)

2. Press the manual button on display board of indoor unit for 10 seconds, the capacity code of indoor unit will display;

Dial code	Capacity (×100W)	HP
0	22	0.8
1	28	1.0
2	36	1.2
3	45	1.6
4	56	2.0
5	71	2.5
6	80	3.0
7	90	3.2
8	112	4.0
9	140	5.0
A	160	6.0
B	160	6.0
C	160	6.0
D	160	6.0
E	160	6.0
F	160	6.0

For example

Pressing continued the manual button for 10 seconds:

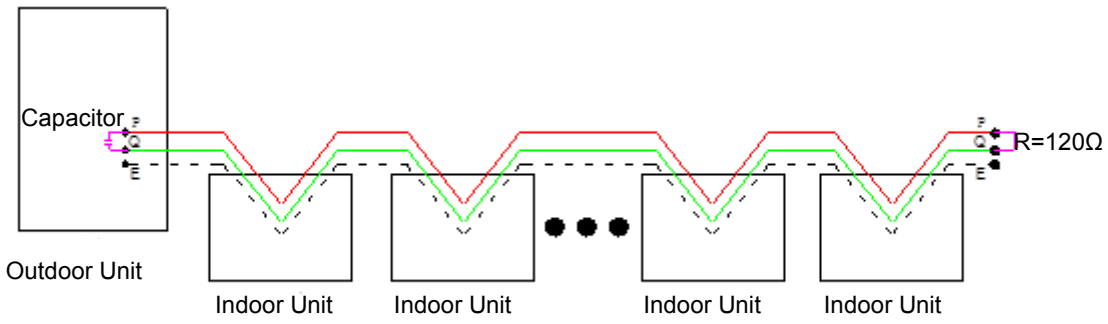
- If all the LED lights turn off, that means the capacity code is 0 and the capacity of indoor units is 22×100W(0.8HP);
- If the “Timer” and “Alarm” lights are normally on, that means the capacity code is 5=(4＋1) and the capacity of indoor unit is 71×100W(2.5HP);
- If the “Operation” and “Alarm” lights are normally on, that means the capacity code is 9=(8+1) and the capacity of indoor unit is 140×100W(5.0HP);
- If all the LED lights turn on, that means the capacity code is F=(8+4+2+1) and the capacity of indoor unit is 160×100W(6.0HP).

The above basic principle just applies to single PCB, if the indoor unit has more than one PCB, or one PCB can achieve a virtual multi blocks function, you must use the basic principle to Calculate the achievable capacity of single PCB at first, then add all the value as the capacity of the indoor unit .

For example

- The high static pressure duct have capacity of 20kW、25kW、28kW and larger capacity of 40kW、45kW、56kW.
- The “Operation” light is normally on, that means the capacity code is 8 and the achievable capacity of single PCB is 112×100W(4.0HP), then add the value of two PCB, so the capacity of indoor unit is 200×100W(8.0HP);
- The “Operation” and “Alarm” lights are normally on, that means the capacity code is 9=(8+1) and the achievable capacity of single PCB is 140×100W(5.0HP), then add the value of two PCB, so the capacity of indoor unit is 280×100W(10HP);
- The “Operation” light is normally on, that means the capacity code is 8 and the achievable capacity of single PCB is 112×100W(4.0HP), then add the value of four PCB, so the capacity of indoor unit is 450×100W(16HP);
- The “Operation” and “Alarm” lights are normally on, that means the capacity code is 9=(8+1) and the achievable capacity of single PCB is 140×100W(5.0HP), then add the value of four PCB, so the capacity of indoor unit is 560×100W(20HP).

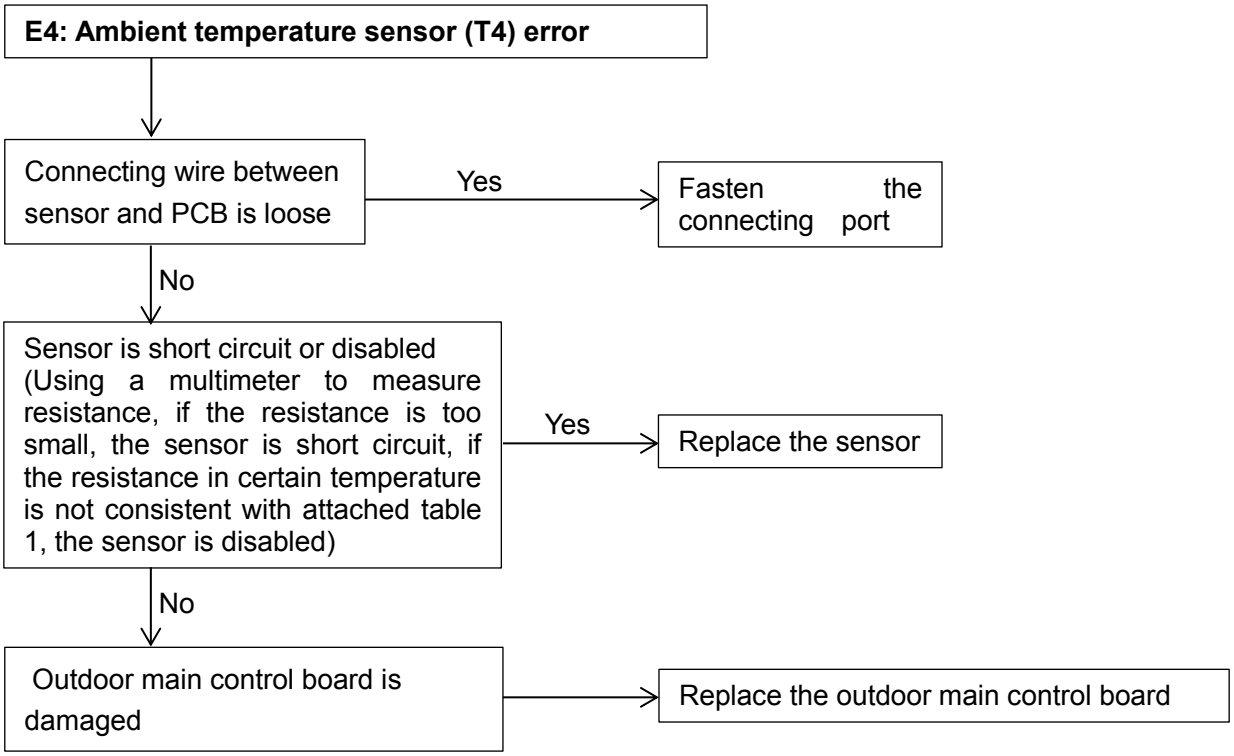
3. If the signal is weak, connect a 120Ω resistor between P and Q of the farthest indoor unit, or connect a 0.5-1.5uF capacitor between P and Q of outdoor unit. Installation refers to the following picture:



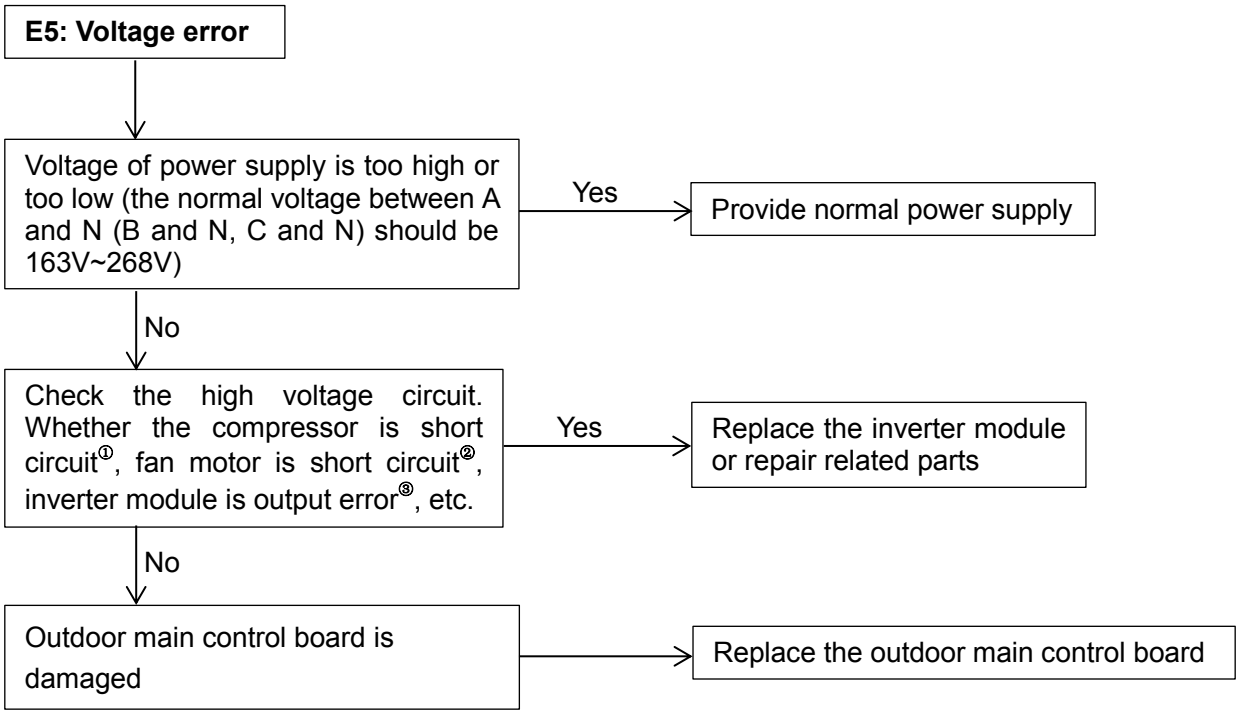
Note:

Signal wires should be shield wire and indoor units should be connected in series.

4.4 E4: Ambient temperature sensor (T4) error/ (Display on faulty unit, all the ODU in standby)



4.5 E5: Voltage error (Display on faulty unit, others in standby)



Note:

1. How to check whether the compressor is short circuit①:

The normal resistance value of inverter compressor among U V W is 0.7~1.5Ω, and infinity to earth. If the resistance value is out of the range, the compressor is abnormal.

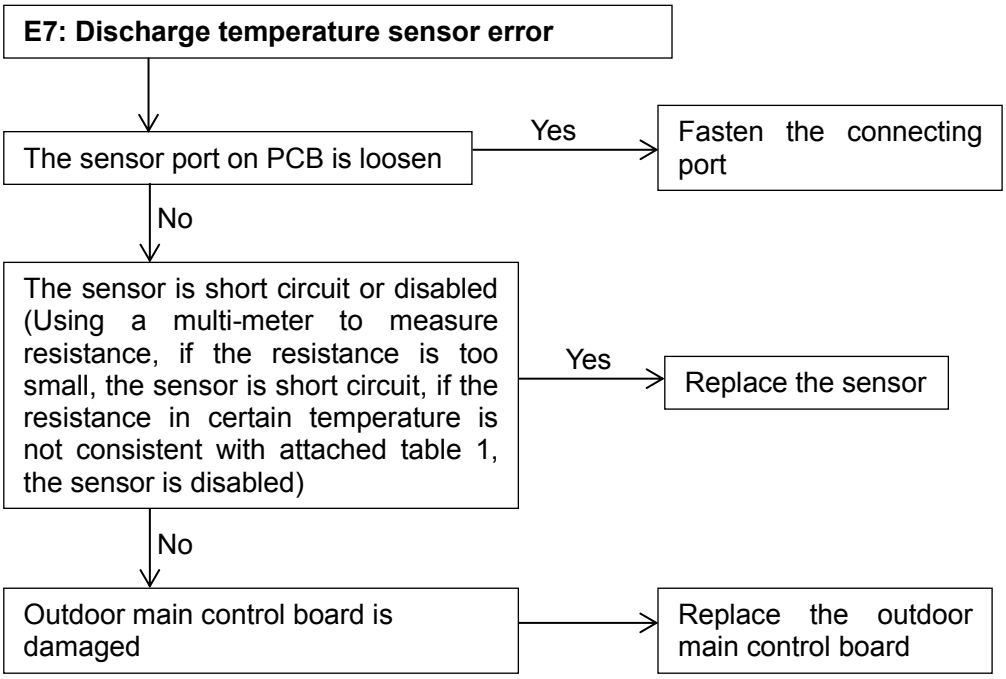
2. How to check whether the fan motor is short circuit②:

The normal value of DC fan motor coil among U V W is less than 10Ω, and the value of AC fan motor coil is from a few ohm to hundreds of ohm for different fan motor model. If the measured value is 0Ω, the fan motor is short circuit.

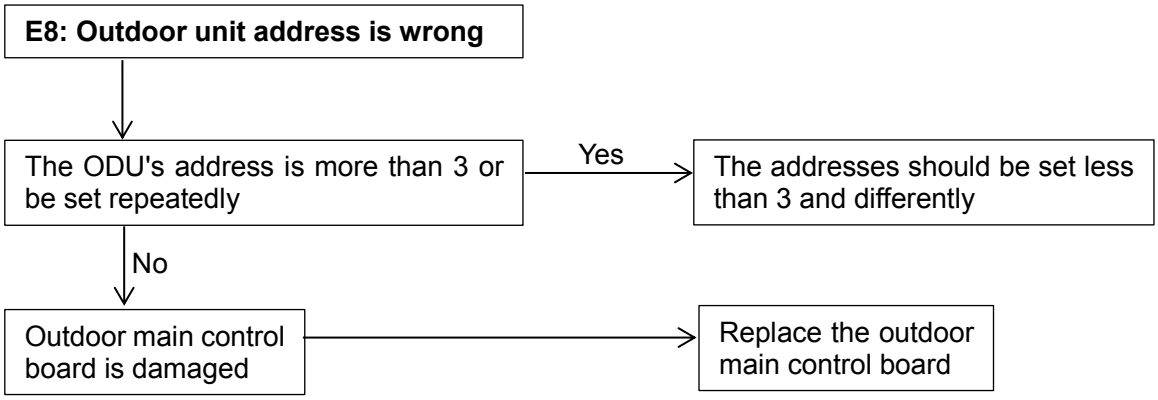
3. How to check whether the inverter module is output error③:

Dial the multimeter to diode file, black pen on P and red pen respectively on U,V,W, if the multimeter displays 0.4~0.7 V, it is normal; Red pen on N, black pen respectively on U,V,W, if the multimeter displays 0.4~0.7 V, it is normal. Satisfying the above two conditions at the same time indicates that the inverter module has no problem.

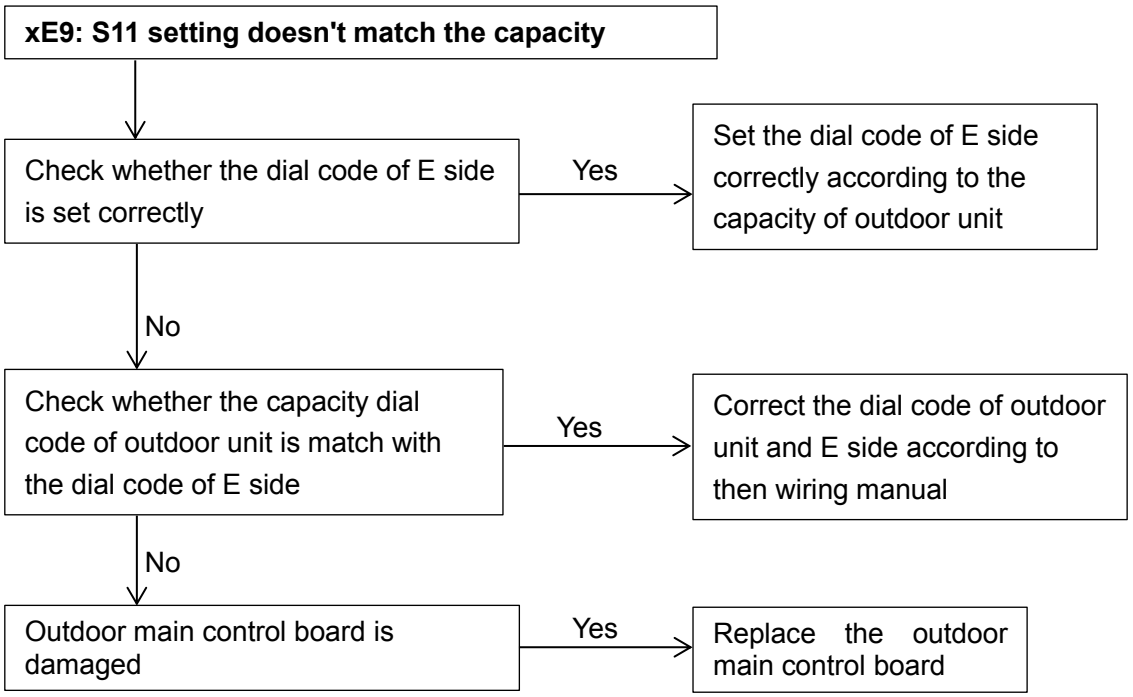
4.6 E7: Discharge temperature sensor error (Display on faulty unit, all the ODU in standby)



4.7 E8: Outdoor unit address is wrong (Only display on faulty slave unit, all the ODU in standby)



4.8 xE9: S11 setting doesn't match the capacity (Display on faulty unit, all the ODU in standby)



4.9 xH0/H1

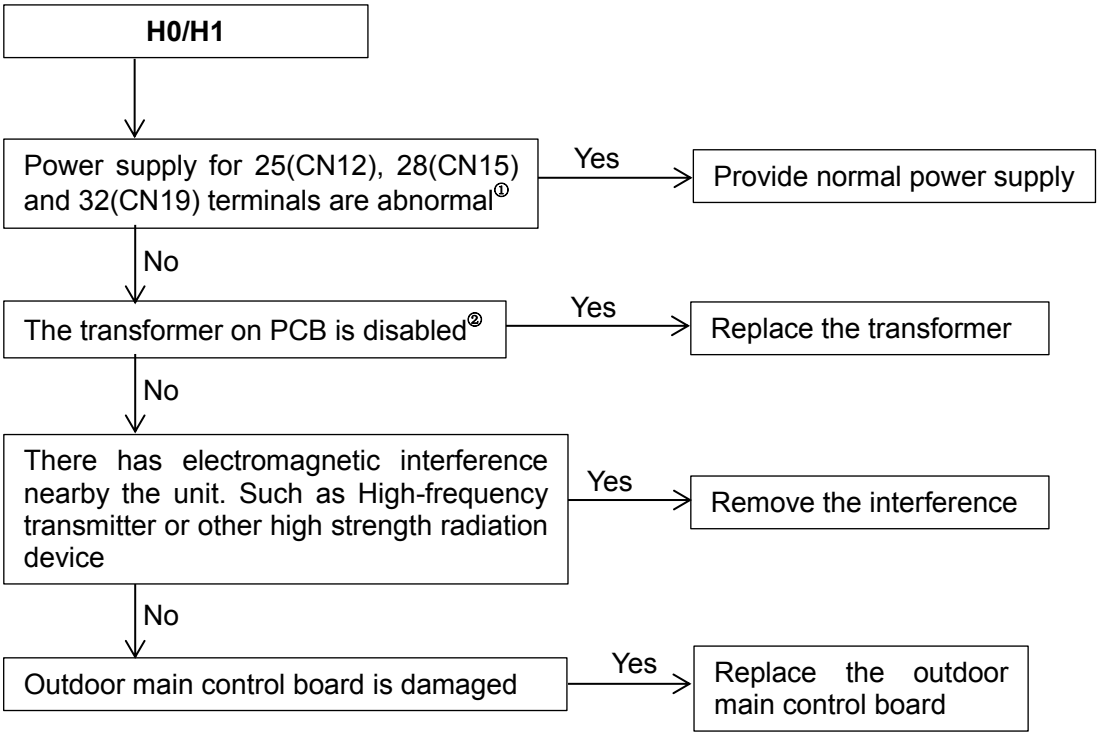
xH0: Communication error between DSP and the main chip (Display on faulty unit, all the ODU in standby)

H1: Communication error between 0537 and main chip (Display on faulty unit, all the ODU in standby)

IR341 chip: IR 341chip is used for inverter compressor drive.

0537 chip: 0537chip is used for control the communication between indoor unit and outdoor unit, and the communication between outdoors.

MC9S08AC128 chip: MC9S08AC128 chip is the main chip, it used for the whole system control.



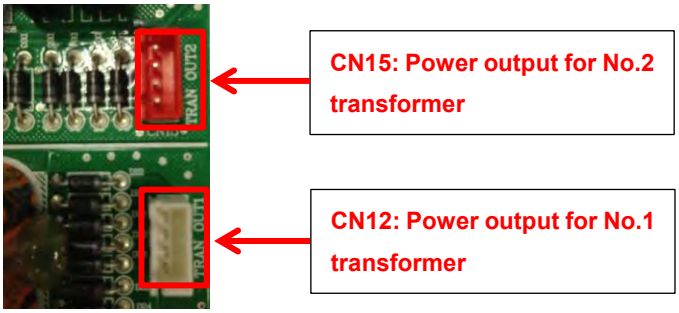
Note:

1. How to check whether power supply for 25(CN12), 28(CN15) and 32(CN19) terminals are abnormal①

The voltage input for 25(CN12) and 28(CN15) terminals are both 220V, the voltage input between “GND” and “+5V” terminals of 32(CN19) port is 5V, and between “GND” and “+12V” terminals of 32(CN19) port is 12V.

2. How to check whether the transformer on PCB is disabled②

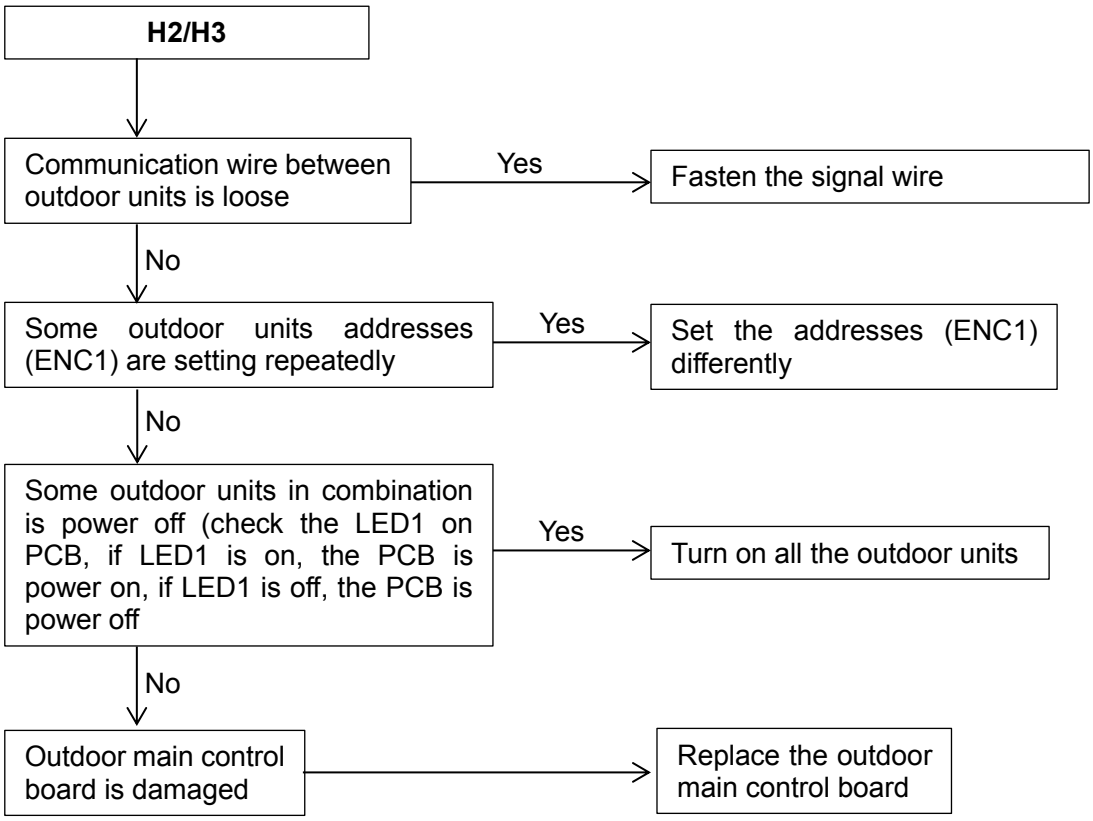
The voltage input for 25(CN12) and 28(CN15) terminals are both 220V, the voltage output of 25(CN12) terminal is AC9V (yellow-yellow) and AC13.5V (brown-brown); the voltage output of 28(CN15) terminal is AC14.5V (yellow-yellow) and AC 14.5V (blue-blue). If the voltage is out of the range, the transformer is disabled.



4.10 H2/H3

H2: Quantity of outdoor units decrease error (Only display on master unit, all the ODU in standby)

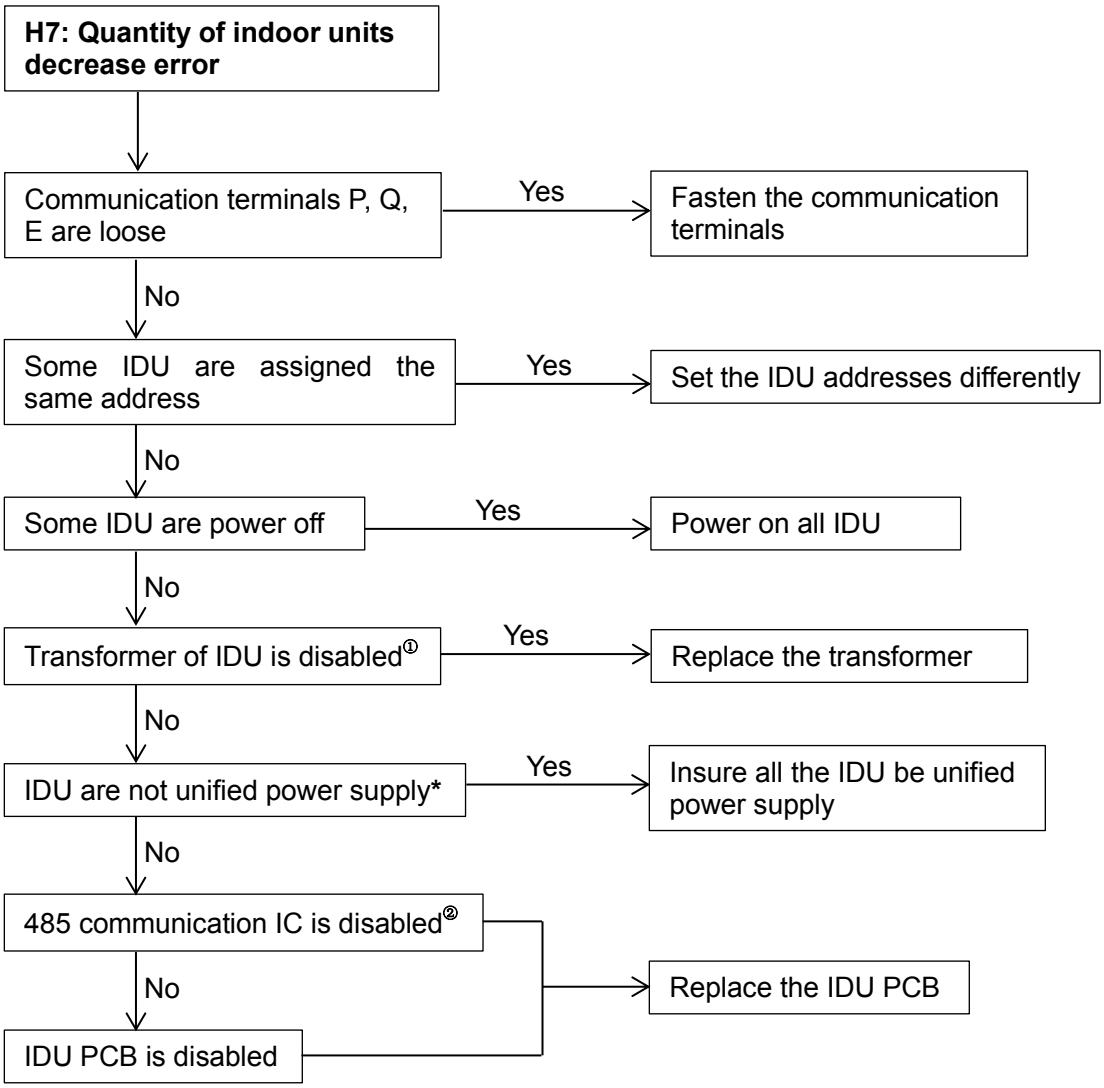
H3: Quantity of outdoor units increase error (Only display on master unit, all the ODU in standby)



Note: All the outdoor units should be unified power supply. If the outdoor units are note be unified power supply, once some outdoor unit is power off, other outdoor units are still running, it may cause system unbalance and damage devices.

4.11 H7: Quantity of indoor units decrease error (Only display on master unit, all the ODU in standby)

"H7" error will display when the quantity of indoor units decrease above 3 minutes.



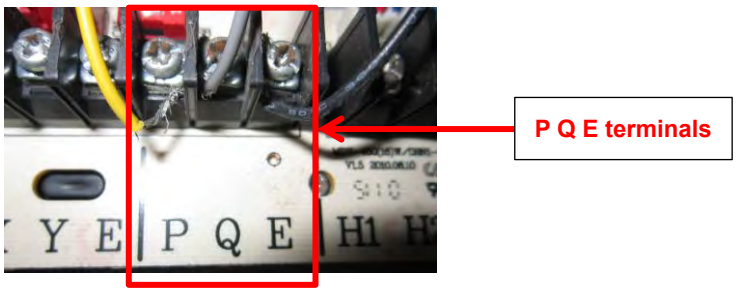
Note:

1. How to check whether the transformer of IDU is disabled①

The voltage input for IDU transformer is 220V, the voltage output of is AC9V (yellow-yellow) and AC13.5V (brown-brown)

2. How to check whether the 485 communication IC is disabled②

The normal voltage between "P" and "GND" is DC2.5~2.7V, between "Q" and "GND" is DC2.5~2.7V. If the voltage is out of the normal range, the 485 communication IC is disabled.



*Indoor units should be unified power supply, which can prevent compressor from liquid hammer caused by dropped indoor units with EXV unclosed.

4.12 P0/P4/H6: High temperature protection (Display on faulty unit, all the ODU in standby)

P0: Top temperature protection of inverter compressor

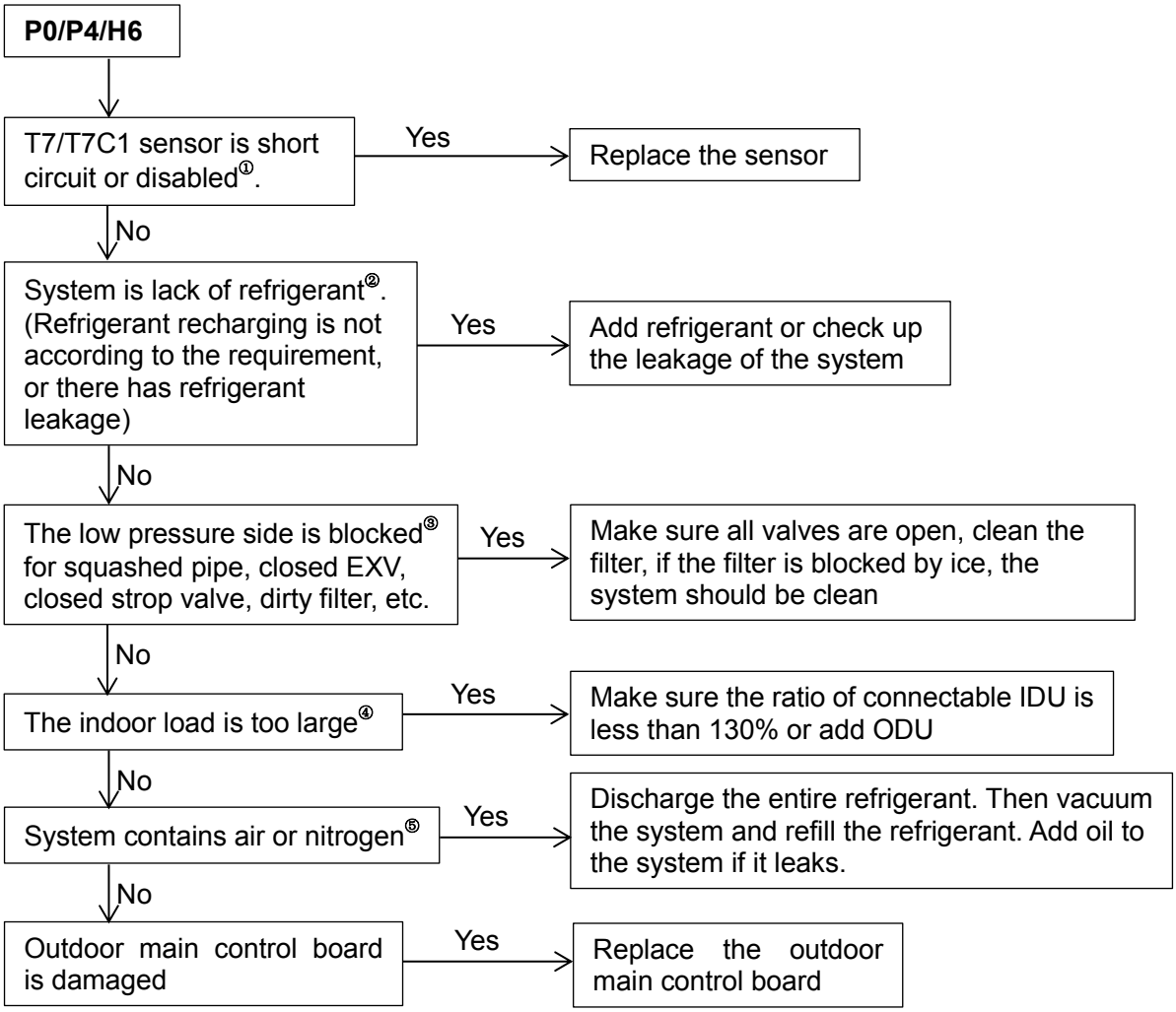
When the top temperature is over 120℃, the operation will stop, when the temperature goes back to normal range, P0 disappear and normal operation resumes.

P4: Discharge temperature protection of all compressors

When the discharge temperature of any compressor is over 120℃, the operation will stop, when the temperature goes back to normal range, P4 disappear and normal operation resumes.

H6: When system appear 3 times P4 protection in 100 minutes

It cannot resume automatically, and it can resume only by restarting the machine.



Note:

1. How to check whether the T7/T7C1 sensor is short circuit or disabled①:

Using a multimeter to measure resistance, if the resistance is too small, the sensor is short circuit, if the resistance in certain temperature is not consistent with attached table 2, the sensor is disabled

2. The phenomenon of lack of refrigerant②:

Top temperature and discharge temperature of all compressors are higher than normal value, discharge pressure and suction pressure are both lower than normal value, current is lower than normal value, suction pipe may be frosting. All the phenomenon will disappear after recharging refrigerant.

3. The phenomenon of the low pressure side is blocked③:

The discharge temperature is higher than normal value*, low pressure is lower than normal value*, current is lower than normal value* and suction pipe may be frosting.

4. The phenomenon of the indoor load is too large④:

The suction temperature and discharge temperature are both higher than normal value.

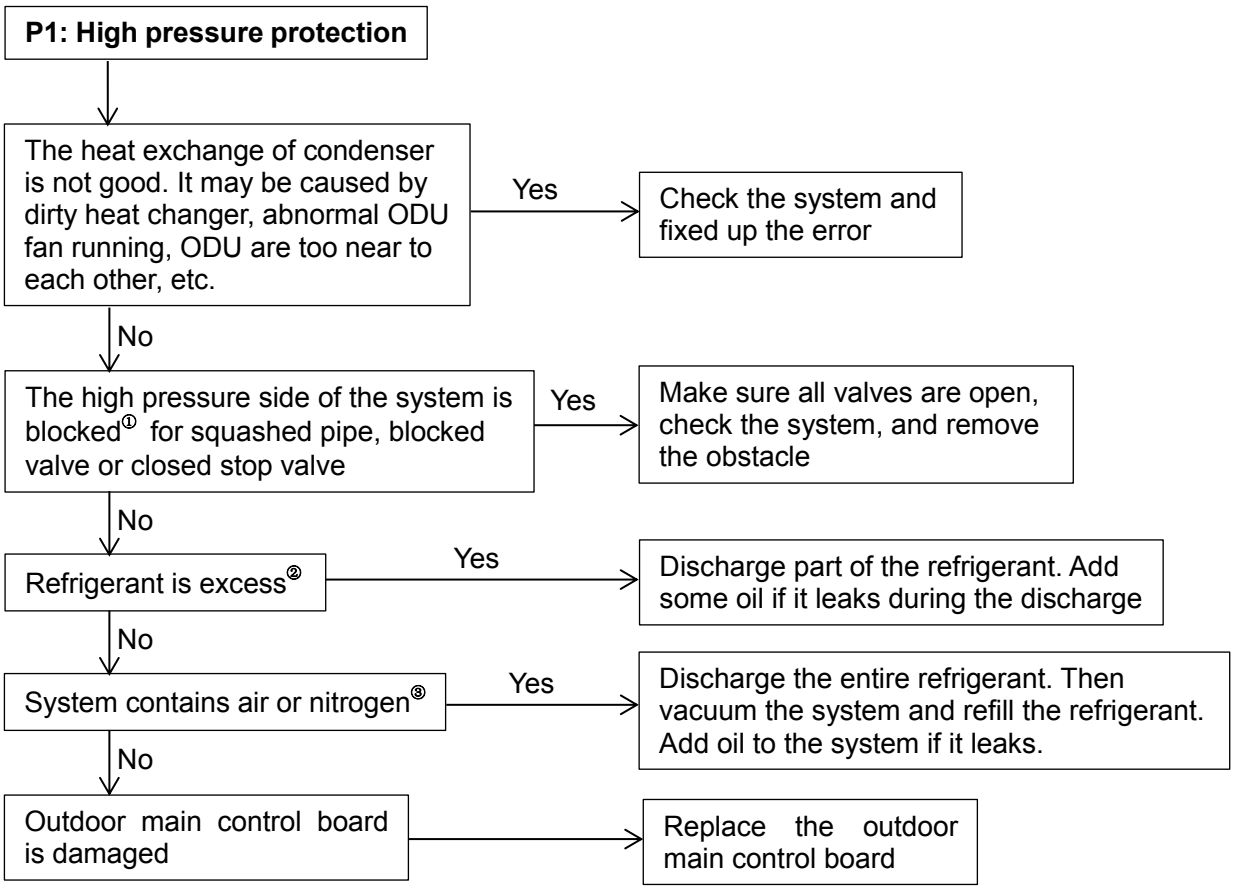
5. The phenomenon of the system contains air or nitrogen⑤:

The high pressure is higher than normal value, current is larger than normal value, discharge temperature is higher than normal value, compressor makes noise, pressure meter do not display steady.

*The normal system running parameters please refer to attached table 3.

4.13 P1: High pressure protection (Display on faulty unit, all the ODU in standby)

When the pressure is over 4.4MPa, the system will display P1 protection, all the ODU in standby. When the pressure is lower than 3.2MPa, P1 disappears and normal operation resumes.



Note:

1. The phenomenon of the high pressure side of the system is blocked①:

The high pressure is higher than normal value, the low pressure is lower than normal value, and the discharge temperature is higher than normal value.

2. The phenomenon of the refrigerant is excess②:

The high pressure is higher than normal value, the low pressure is higher than normal value, and the discharge temperature is lower than normal value.

3. The phenomenon of the system contains air or nitrogen③:

The high pressure is higher than normal value, current is larger than normal value, discharge temperature is higher than normal value, compressor makes noise, pressure meter do not display steady.

*The normal system running parameters please refer to attached table 3.

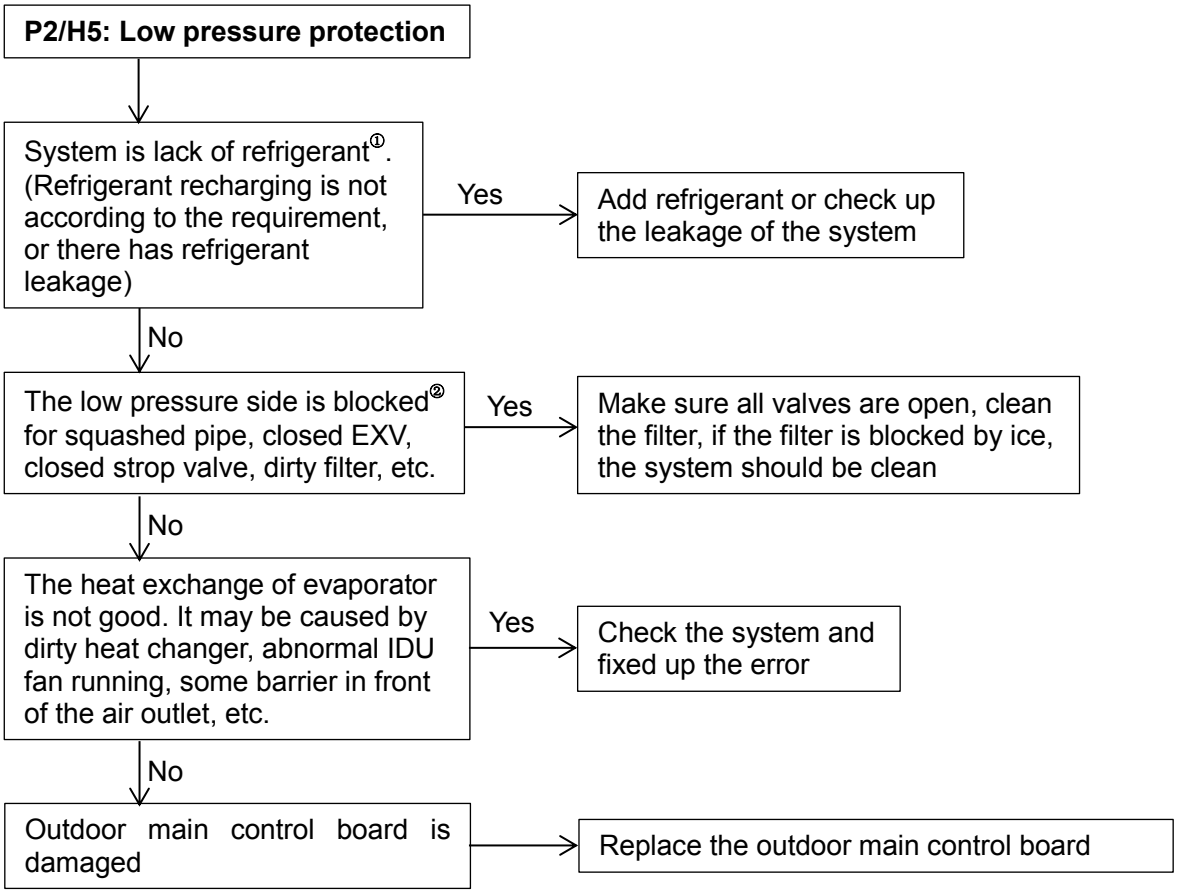
*If the system install three-phase protector, and the three-phase protector connect with high pressure switch in series connection, the system will display P1 protection when fist power on, and P1 protection will disappear after system is steady.

*If the system install three-phase protector, and the three-phase protector connect with low pressure switch in series connection, the system will display P2 protection when fist power on, and P2 protection will disappear after system is steady.

4.14 P2/H5: Low pressure protection (Display on faulty unit, all the ODU in standby)

When the pressure is lower than 0.05MPa, the system will display P2 protection, all the ODU in standby. When the pressure is higher than 0.15MPa, P2 disappear and resumes normal operation.

H5 error will display when system appear 3 times P2 protection in 30 minutes, it cannot resume automatically, and it can resume only by restarting the machine.



Note:

1. The phenomenon of lack of refrigerant①:

Top temperature and discharge temperature of all compressors are higher than normal value, discharge pressure and suction pressure are both lower than normal value, current is lower than normal value, suction pipe may be frosting. All the phenomenon will disappear after recharging refrigerant.

2. The phenomenon of the low pressure side is blocked②:

The discharge temperature is higher than normal value*, low pressure is lower than normal value*, current is lower than normal value* and suction pipe may be frosting.

*The normal system running parameters please refer to attached table 3.

*If the system install three-phase protector, and the three-phase protector connect with high pressure switch in series connection, the system will display P1 protection when fist power on, and P1 protection will disappear after system is steady.

*If the system install three-phase protector, and the three-phase protector connect with low pressure switch in series connection, the system will display P2 protection when fist power on, and P2 protection will disappear after system is steady.

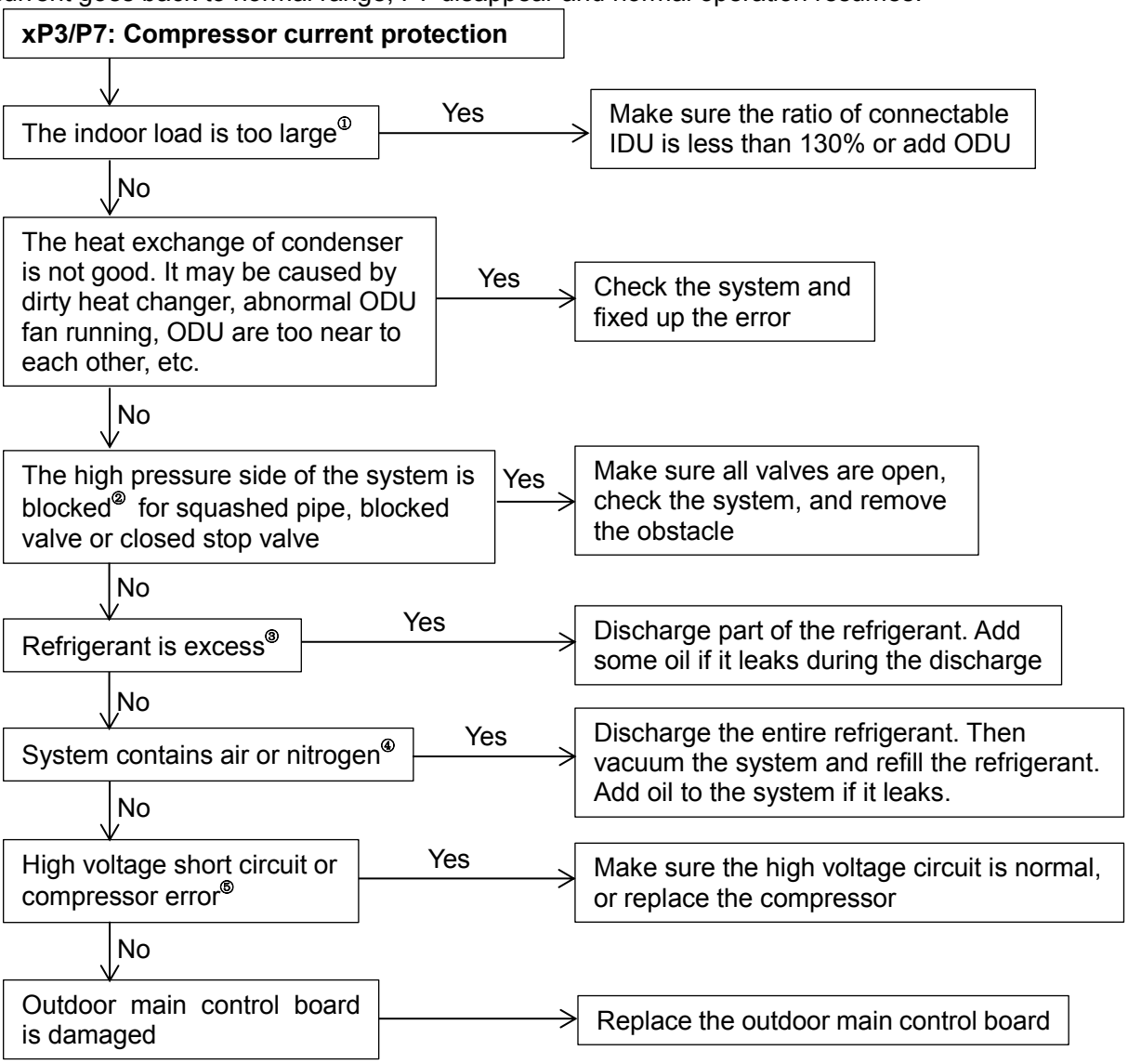
4.15 xP3/P7: Compressor current protection (Display on faulty unit, all the ODU in standby)

P3: Current protection of inverter compressor

When the current of inverter compressor is over12A, the system will display P3 protection, all the ODU in standby. When the current goes back to normal range, P3 disappear and normal operation resumes.

P7: Current protection of fixed compressor

When the current of fixed compressor is over 17A, the system will display P7 protection, all the ODU in standby. When the current goes back to normal range, P7 disappear and normal operation resumes.



Note:

1. The phenomenon of the indoor load is too large①:

The suction temperature and discharge temperature are both higher than normal value.

2. The phenomenon of The high pressure side of the system is blocked②:

The high pressure is higher than normal value, the low pressure is lower than normal value, and the discharge temperature is higher than normal value.

3. The phenomenon of the refrigerant is excess③:

The high pressure is higher than normal value, the low pressure is higher than normal value, and the discharge temperature is lower than normal value.

4. The phenomenon of the system contains air or nitrogen④:

The high pressure is higher than normal value, current is larger than normal value, discharge temperature is higher than normal value, compressor makes noise, pressure meter do not display steady.

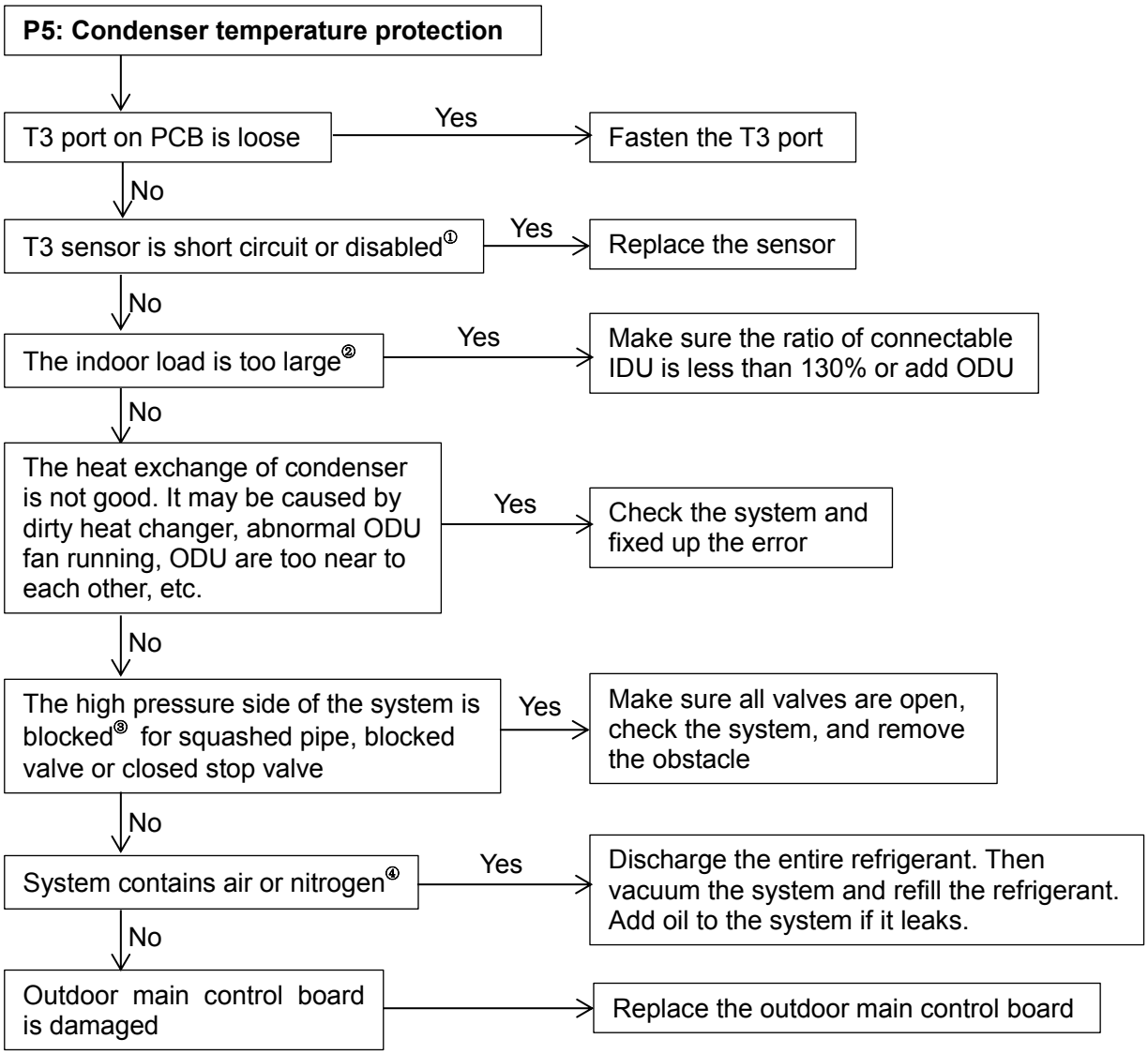
5. How to check whether compressor is error⑤:

Measure the resistance between two terminals among the three terminals of compressor. The resistance between two terminals is 2-5Ω, the resistance between each terminal and ground is infinity, if the resistance is out of the normal range, the compressor is error.

*The normal system running parameters please refer to attached table 3.

4.16 P5: Condenser temperature T3 protection (Display on faulty unit, all the ODU in standby)

When condenser temperature is over 65℃, the system will display P5 protection, all the ODU in standby. When the temperature goes back to normal range, P5 disappear and normal operation resumes.



Note:

1. How to check whether the T3 sensor is circuit or disabled①:

Using a multimeter to measure resistance, if the resistance is too small, the sensor is short circuit, if the resistance in certain temperature is not consistent with attached table 1, the sensor is disabled

2. The phenomenon of the indoor load is too large②:

The suction temperature and discharge temperature are both higher than normal value.

3. The phenomenon of The high pressure side of the system is blocked③:

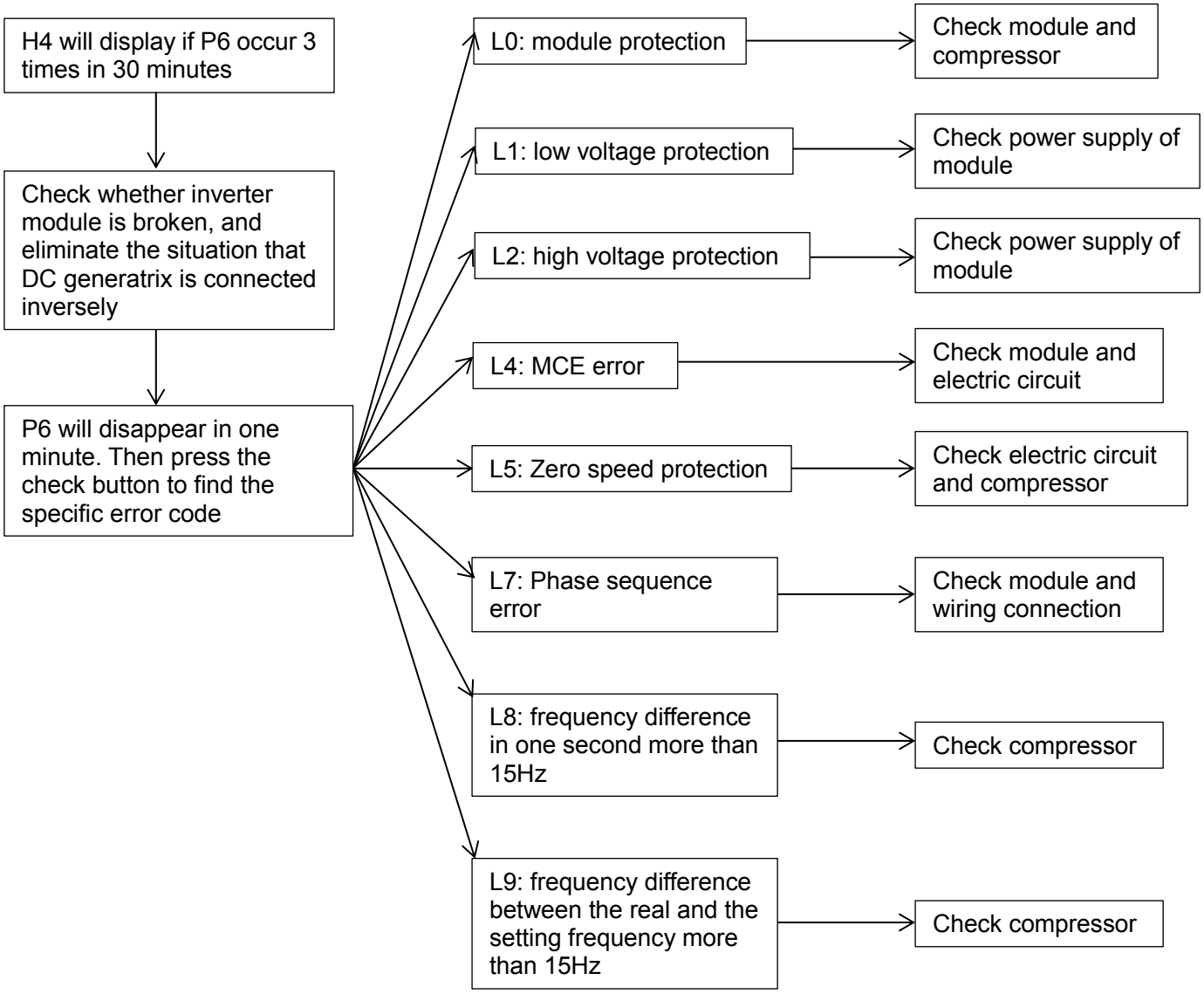
The high pressure is higher than normal value, the low pressure is lower than normal value, and the discharge temperature is higher than normal value.

4. The phenomenon of the system contains air or nitrogen④:

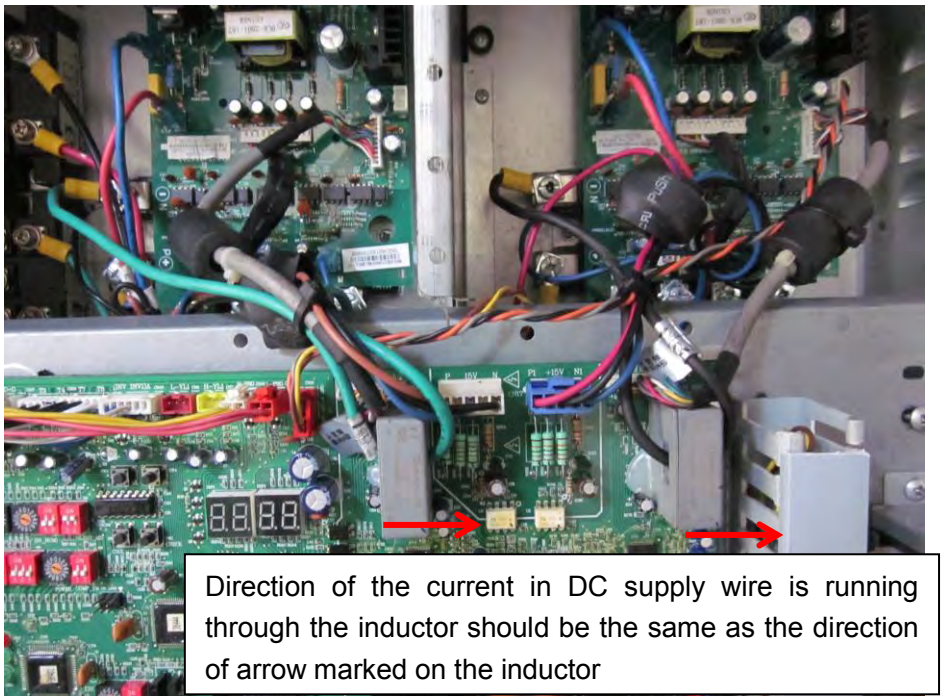
The high pressure is higher than normal value, current is larger than normal value, discharge temperature is higher than normal value, compressor makes noise, pressure meter do not display steady.

4.17 xP6/H4: Inverter module protection (Display on faulty unit, all the ODU in standby)

If the system display three times P6 protection in 30 minutes, the system will stop and display H4 error code. When the system displays H4 error code, the system can resume only by restarting the machine. At this time, malfunction should be disposed promptly to avoid further damage.

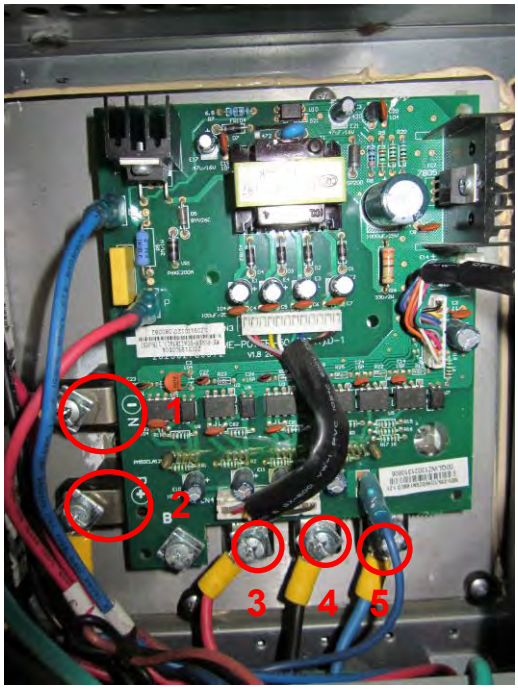


DC generatrix check



1) Check the voltage of DC generatrix, the normal value should be 510 to 580V. If the value is less than 510V, go to next step.
2) Check the wiring connection of rectifier circuit, find out any loose in the circuit, and check the filter board, single-phase rectifier stack, and three-phase rectifier stack. Note DC and AC switch in the measurement.
3) If none of the above works, replace the PCB.

Module check



1) DC voltage between P and N should be about 1.41 times of the local power supply voltage.
2) DC voltage between 1 and 2 should be 510V to 580V
3) First adjust multi -meter to diode position, put the red pen on the 1 point (N terminal), put black pen on the 3 or 4 or 5 point, the value should be approximate 0.378, if the value is 0, the IPM is broken. And then change the red pen to the 2 point (P terminal), the value should be infinity, if the value is 0, the IPM is broken.

4.17.1 xL0/xL8/xL9 troubleshooting

Step 1: Replace the modular with correctly wire connection and start the system, if system is still malfunction, then go to step 2 to check the compressor.

Step 2: Take out the compressor from the malfunction system, short-circuit the suction and the discharge, vacuum dry and charge 0.3kg~0.4kg R410A, and then connect the U,V,W terminals to control box B which is took apart from normal system.

If the compressor start normally, that means compressor is OK, control box A is malfunction, then check the inverter module.

If the compressor could not start normally, that means the compressor is malfunction, then go to step 3 to check the compressor.

Step 3: Check the compressor

Measure the resistance between each two of U, V, W terminals, all the resistance should be the same and equal to 0.9~5 Ohms. (Fig. A and Fig. B)

Measure the resistance between each of U, V, W terminals to ground (Fig. C), all the resistance should be the same and trend to be infinity (Fig. D), otherwise the compressor has been malfunction, needs to be replaced.

Fig. A

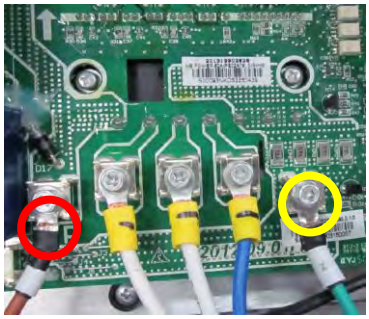
Fig. B

Fig. C

Fig. D

4.17.2 xL1/xL4 troubleshooting

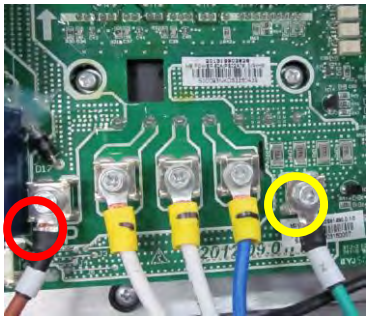
Step 1: Check the DC voltage between P and N terminal, the normal value should be 510V~580V, if the voltage is lower than 510V, go to step 2.



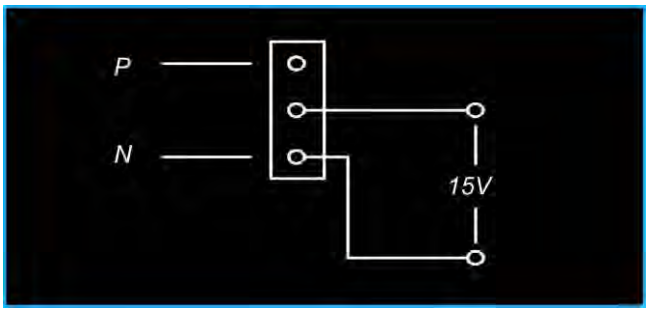
Step 2: Check whether the wires of rectifier circuit are loose or not. If wires are loosen, fasten the wires. If wires are OK, replace the PCB.

4.17.3 xL2 troubleshooting

Step 1: check the DC voltage between P and N terminal, the normal value should be 510V~580V, if it is normal, please go to step 2, or else go to step 3.



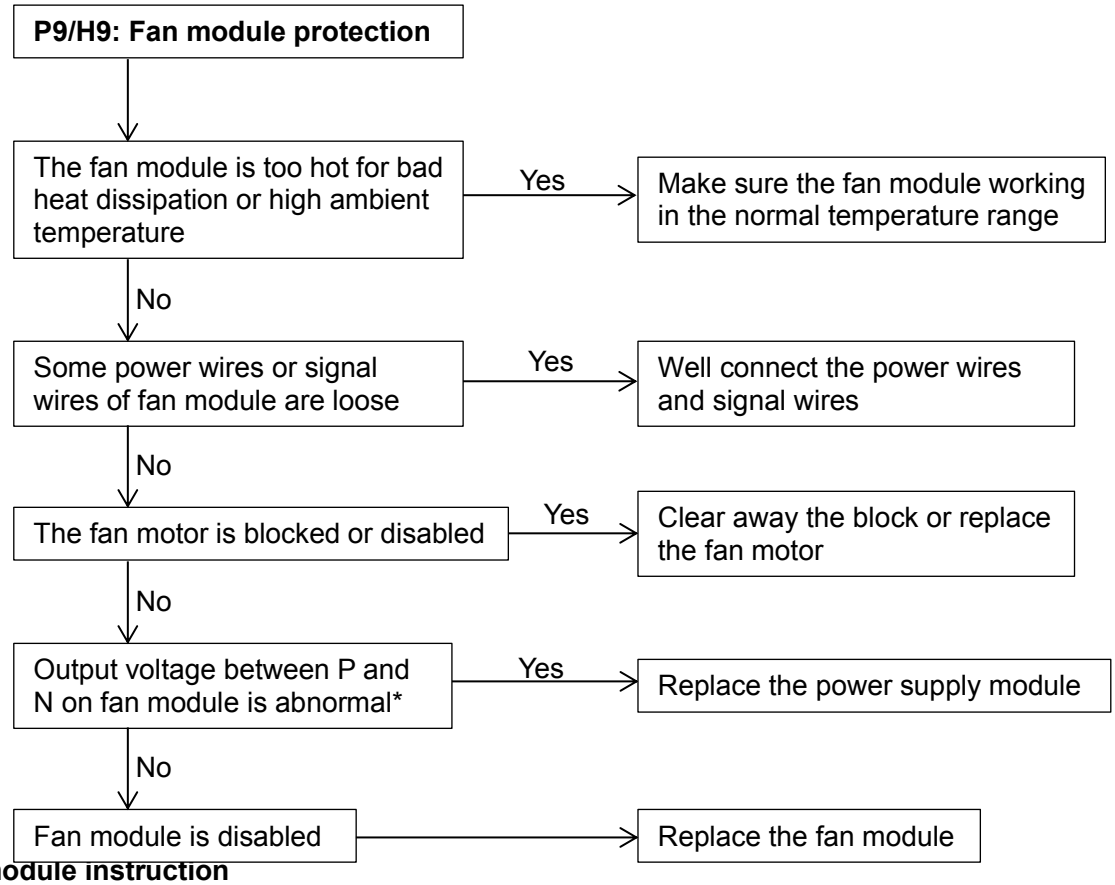
Step 2: check the voltage between P、+15V and N terminal on PCB, the normal value between P and N should be 1.4 times the rated voltage, the normal value between +15V and N should be 15V. If the values are normal, that means PCB has been malfunction, needs to be replaced, or else reinstall the wire connection.



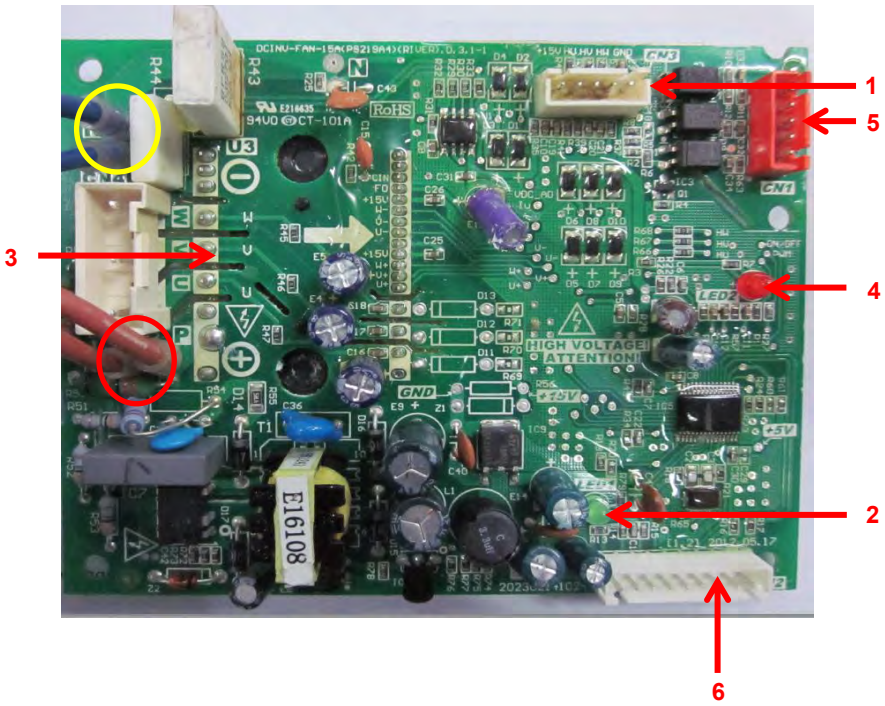
Step 3: check whether the power supply votage is higher than 1.1 times the rated voltage, if yes, fix the problem.

4.18 xP9/xH9: Fan module protection (Display on faulty unit, all the ODU in standby)

If the system display three times P9 protection in 30 minutes, the system will stop and display H9 error code. When the system displays H9 error code, the system can resume only by restarting the machine. At this time, malfunction should be disposed promptly to avoid further damage.



Fan module instruction



1 Program input port
2 Power supply indicator lamp
3 Fan motor U, V, W output port
4 Fault indicator lamp
5 PCB control signal input port
6 Signal feedback port

*** The normal value of output voltage between P and N on fan module is DC 310V**

P9 protection analysis

Conditions	Fault indicator lamp of fan module	Power supply indicator lamp of fan module	Digital tube display	Malfunction analysis
Power on	Off	Off	Quantity of IDU or “0”	Check the power supply circuit for fan module. Check whether there has power supply for lightning protection plate, whether the protective tube is broken, whether the voltage after rectification is normal, whether the bridge rectifier is broken.
Power on	Off	Flicker	Quantity of IDU or “0”	Power supply of fan module has problem, needs to replace the fan module.
When fan motor start	At first the lamp is on then the lamp is off	On	P9/H9	Check whether the drive port and signal feedback port is loose, whether the fan module and fan motor is installed firmly. If above conditions are all OK, it needs to replace the fan module.
When fan motor start	At first the lamp is on then the lamp flicker	On	P9/H9	Check whether the transformer in lightning protection plate Is open circuit, whether the relay is broken. If occurs above problem, it needs to replace the lightning protection plate.
Fan motor running several minutes	On	On	P9/H9	Check whether the capacity setting from dial switch is accordance with actual ODU capacity, whether the capacity from spot check is accordance with actual ODU capacity. If occurs above problem, it needs to adjust the capacity setting. If above conditions are both OK, it needs to replace the PCB.

Attached table 1:

Resistance value of ambient temperature and pipe temperature sensor

Temperature (℃)	Resistance value (kΩ)	Temperature (℃)	Resistance value (kΩ)	Temperature (℃)	Resistance value (kΩ)	Temperature (℃)	Resistance value (kΩ)
-20	115.266	**20**	12.6431	**60**	2.35774	**100**	0.62973
-19	108.146	**21**	12.0561	**61**	2.27249	**101**	0.61148
-18	101.517	**22**	11.5	**62**	2.19073	**102**	0.59386
-17	96.3423	**23**	10.9731	**63**	2.11241	**103**	0.57683
-16	89.5865	**24**	10.4736	**64**	2.03732	**104**	0.56038
-15	84.219	**25**	10	**65**	1.96532	**105**	0.54448
-14	79.311	**26**	9.55074	**66**	1.89627	**106**	0.52912
-13	74.536	**27**	9.12445	**67**	1.83003	**107**	0.51426
-12	70.1698	**28**	8.71983	**68**	1.76647	**108**	0.49989
-11	66.0898	**29**	8.33566	**69**	1.70547	**109**	0.486
-10	62.2756	**30**	7.97078	**70**	1.64691	**110**	0.47256
-9	58.7079	**31**	7.62411	**71**	1.59068	**111**	0.45957
-8	56.3694	**32**	7.29464	**72**	1.53668	**112**	0.44699
-7	52.2438	**33**	6.98142	**73**	1.48481	**113**	0.43482
-6	49.3161	**34**	6.68355	**74**	1.43498	**114**	0.42304
-5	46.5725	**35**	6.40021	**75**	1.38703	**115**	0.41164
-4	44	**36**	6.13059	**76**	1.34105	**116**	0.4006
-3	41.5878	**37**	5.87359	**77**	1.29078	**117**	0.38991
-2	39.8239	**38**	5.62961	**78**	1.25423	**118**	0.37956
-1	37.1988	**39**	5.39689	**79**	1.2133	**119**	0.36954
0	35.2024	**40**	5.17519	**80**	1.17393	**120**	0.35982
1	33.3269	**41**	4.96392	**81**	1.13604	**121**	0.35042
2	31.5635	**42**	4.76253	**82**	1.09958	**122**	0.3413
3	29.9058	**43**	4.5705	**83**	1.06448	**123**	0.33246
4	28.3459	**44**	4.38736	**84**	1.03069	**124**	0.3239
5	26.8778	**45**	4.21263	**85**	0.99815	**125**	0.31559
6	25.4954	**46**	4.04589	**86**	0.96681	**126**	0.30754
7	24.1932	**47**	3.88673	**87**	0.93662	**127**	0.29974
8	22.5662	**48**	3.73476	**88**	0.90753	**128**	0.29216
9	21.8094	**49**	3.58962	**89**	0.8795	**129**	0.28482
10	20.7184	**50**	3.45097	**90**	0.85248	**130**	0.2777
11	19.6891	**51**	3.31847	**91**	0.82643	**131**	0.27078
12	18.7177	**52**	3.19183	**92**	0.80132	**132**	0.26408
13	17.8005	**53**	3.07075	**93**	0.77709	**133**	0.25757
14	16.9341	**54**	2.95896	**94**	0.75373	**134**	0.25125
15	16.1156	**55**	2.84421	**95**	0.73119	**135**	0.24512
16	15.3418	**56**	2.73823	**96**	0.70944	**136**	0.23916
17	14.6181	**57**	2.63682	**97**	0.68844	**137**	0.23338
18	13.918	**58**	2.53973	**98**	0.66818	**138**	0.22776
19	13.2631	**59**	2.44677	**99**	0.64862	**139**	0.22231

Attached table 2:

Resistance value of compressor discharge temperature sensor

Temperature (℃)	Resistance value (kΩ)	Temperature (℃)	Resistance value (kΩ)	Temperature (℃)	Resistance value (kΩ)	Temperature (℃)	Resistance value (kΩ)
-20	542.7	**20**	68.66	**60**	13.59	**100**	3.702
-19	511.9	**21**	65.62	**61**	13.11	**101**	3.595
-18	483	**22**	62.73	**62**	12.65	**102**	3.492
-17	455.9	**23**	59.98	**63**	12.21	**103**	3.392
-16	430.5	**24**	57.37	**64**	11.79	**104**	3.296
-15	406.7	**25**	54.89	**65**	11.38	**105**	3.203
-14	384.3	**26**	52.53	**66**	10.99	**106**	3.113
-13	363.3	**27**	50.28	**67**	10.61	**107**	3.025
-12	343.6	**28**	48.14	**68**	10.25	**108**	2.941
-11	325.1	**29**	46.11	**69**	9.902	**109**	2.86
-10	307.7	**30**	44.17	**70**	9.569	**110**	2.781
-9	291.3	**31**	42.33	**71**	9.248	**111**	2.704
-8	275.9	**32**	40.57	**72**	8.94	**112**	2.63
-7	261.4	**33**	38.89	**73**	8.643	**113**	2.559
-6	247.8	**34**	37.3	**74**	8.358	**114**	2.489
-5	234.9	**35**	35.78	**75**	8.084	**115**	2.422
-4	222.8	**36**	34.32	**76**	7.82	**116**	2.357
-3	211.4	**37**	32.94	**77**	7.566	**117**	2.294
-2	200.7	**38**	31.62	**78**	7.321	**118**	2.233
-1	190.5	**39**	30.36	**79**	7.086	**119**	2.174
0	180.9	**40**	29.15	**80**	6.859	**120**	2.117
1	171.9	**41**	28	**81**	6.641	**121**	2.061
2	163.3	**42**	26.9	**82**	6.43	**122**	2.007
3	155.2	**43**	25.86	**83**	6.228	**123**	1.955
4	147.6	**44**	24.85	**84**	6.033	**124**	1.905
5	140.4	**45**	23.89	**85**	5.844	**125**	1.856
6	133.5	**46**	22.89	**86**	5.663	**126**	1.808
7	127.1	**47**	22.1	**87**	5.488	**127**	1.762
8	121	**48**	21.26	**88**	5.32	**128**	1.717
9	115.2	**49**	20.46	**89**	5.157	**129**	1.674
10	109.8	**50**	19.69	**90**	5	**130**	1.632
11	104.6	**51**	18.96	**91**	4.849		
12	99.69	**52**	18.26	**92**	4.703		
13	95.05	**53**	17.58	**93**	4.562		
14	90.66	**54**	16.94	**94**	4.426		
15	86.49	**55**	16.32	**95**	4.294	B(25/50)=3950K	
16	82.54	**56**	15.73	**96**	4.167		
17	78.79	**57**	15.16	**97**	4.045	R(90℃)=5KΩ±3%	
18	75.24	**58**	14.62	**98**	3.927		
19	71.86	**59**	14.09	**99**	3.812		

Attached table 3: Commissioning and operating parameters of refrigerant system

Conditions 1: Make sure outdoor unit can detect all the indoor units, the quantity of indoor units display steadily and be equal to actual quantity of installed indoor units.

Conditions 2: Make sure all the valves in outdoor unit are open, indoor units EXV have connected to indoor PCB.

Conditions 3: The ratio of connectable indoor units is 100%. When ambient temperature is high, operate the system in cooling mode and set the temperature 17℃. When ambient temperature is low, operate the system in heating mode and set the temperature 30℃. Then get the parameters after system running normally more than 30 minutes.

Outdoor unit cooling parameters table

Ambient temperature (T4)	℃	20-27	27-33	33-38	38-45
Discharge pressure (spot check)	MPa	2.1-2.3	2.8-3.1	3.3-3.5	3.7-3.9
Pressure of high pressure valve	MPa	1.8-2.0	2.4-2.7	2.8-3.0	3.2-3.5
Pressure of low pressure valve	MPa	0.7-0.9	0.8-1.0	1.0-1.2	1.2-1.4
Discharge temperature (spot check)	℃	50-65	70-85	70-90	80-90
DC Inverter compressor current (spot check)	A	4-5	6-7	7-8	9-11
Fixed compressor current (spot check)	A	6-7	8-9	9-11	11-12
Average temperature of evaporator outlet T2B	℃	8-9	12-15	16-17	20

Outdoor unit heating parameters table

Ambient temperature (T4)	℃	-15--5	-5-5	5-12	12-18
Discharge pressure (spot check)	MPa	2.0-2.2	2.2-2.7	3.0-3.1	2.6-2.7
Pressure of high pressure valve	MPa	1.7-1.8	1.8-2.4	2.6-2.8	2.1-2.4
Pressure of low pressure valve	MPa	2.0-2.2	2.2-2.6	3.0-3.1	2.5-2.7
Discharge temperature (spot check)	℃	50-70	60-70	60-85	60-70
DC Inverter compressor current (spot check)	A	5	5-6	6-8	5-6
Fixed compressor current (spot check)	A	6	6-7	9-10	8-9
Average temperature of condenser outlet T2	℃	33	33-40	46-50	39-41

TRUST

Air Conditioning Systems

Cooling & Heating

TRUST AIR-CONDITIONING EQUIPMENT CO.
Shiraz office: 8 th floor, Alvand Blog., Dostan St.,
Moaliabad Ave., SHIRAZ, IRAN., Post code: 71877-14446
Tel.: +98-71-36341070
Fax.: +98-71-36341094
Tehran office: No. 19- koohe nour St.- Motahhari St.-
TEHRAN, IRAN., Post code: 15876-73111
Tel.: +98-21-89389
Fax.: +98-21-88541903
Ahwaz office: No. 309- Kaveh St.- AHWAZ, IRAN., Post code: 61939-47911
Tel.: +98-61-32230647-8 **E-mail: info@trustacs.com**
Fax.: +98-61-32230647 **Web site: http://www.trustacs.com**

برند برتر در اولین جشنواره بین‌المللی
برترین نام و نشان‌های تجاری ایران

ISO 9001 REGISTERED
DNV
MGMT. SYS.
RvA C 024
DNV Certification B.V., The Netherlands