

TROPICAL DIGITAL VRF SYSTEM



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

Troubleshooting

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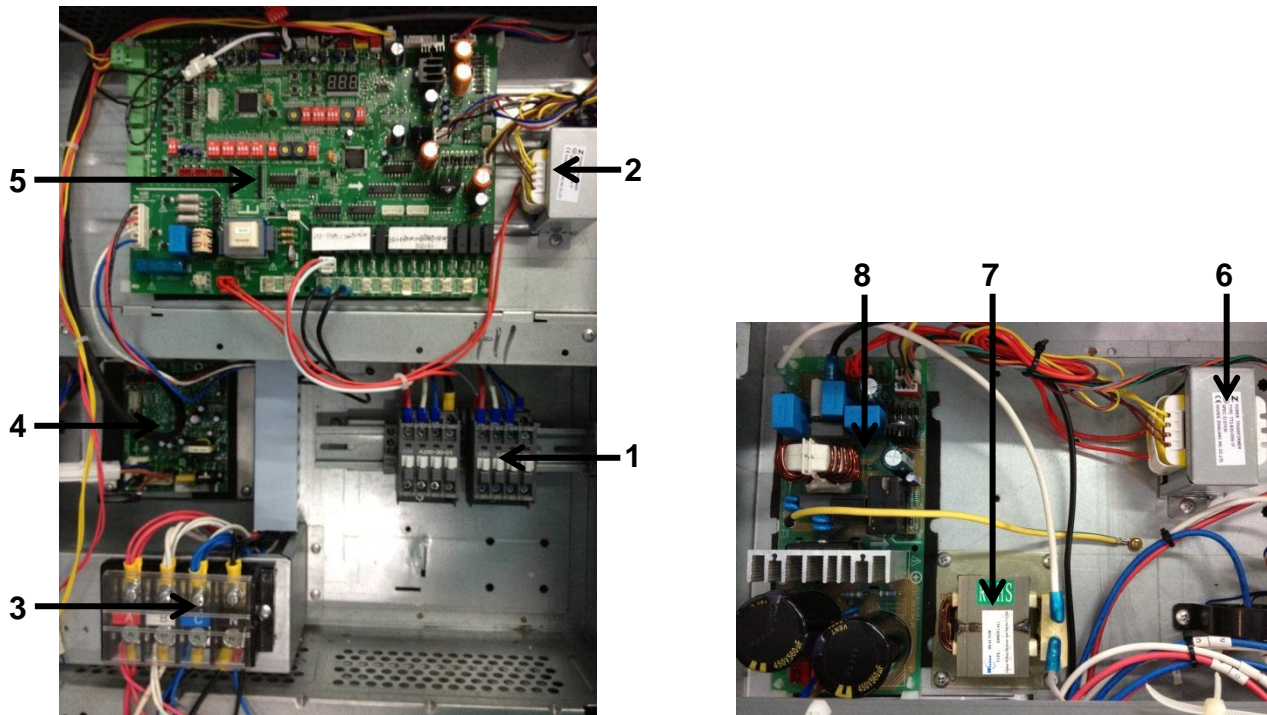
توجه:

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

2015-06

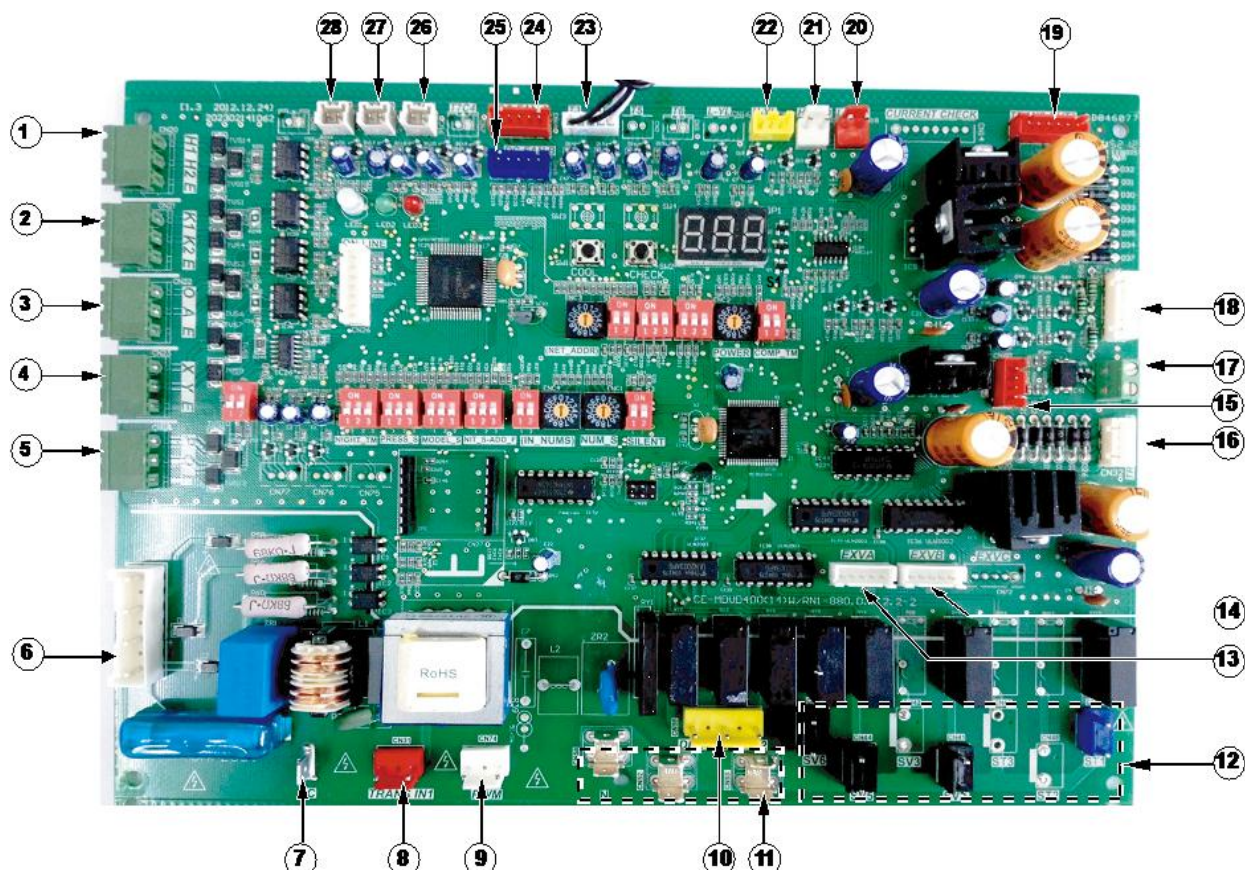
1. Outdoor electric control box assembly instructions

Top view of electric control box



No.	Content
1	Contactor
2	Transformer
3	Terminal, 4P
4	DC fan module assembly
5	Outdoor main control board
6	Transformer
7	Reactor
8	Power supply board assembly

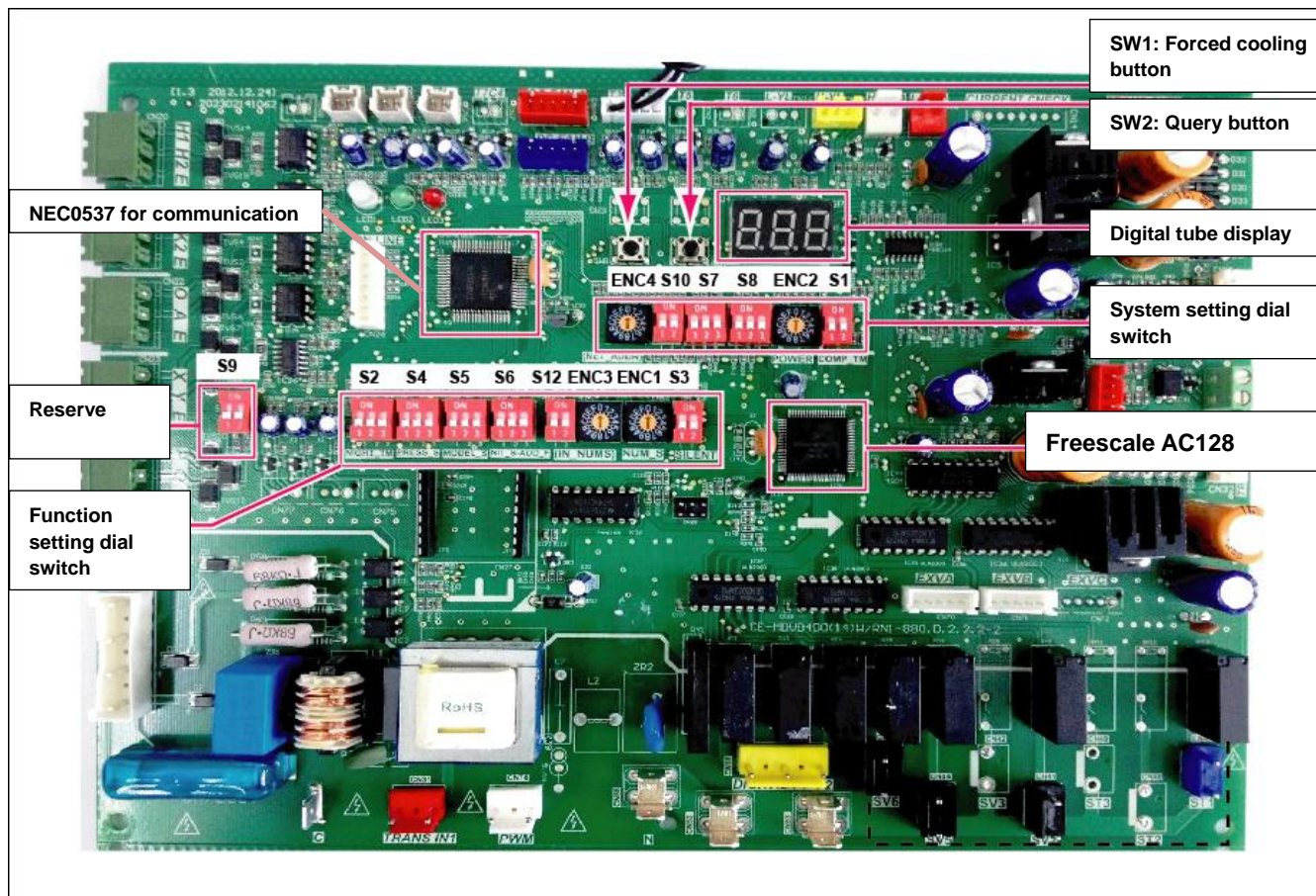
2. Main board ports instructions



Main board ports instruction

No.	Content	Port voltage
1 CN20	Communication port among outdoor units (H1,H2,E)	2.5~2.7V DC
2 CN21	Outdoor centralized controller port(K1,K2,E)	2.5~2.7V DC
3 CN22	Digital electric ammeter port(O,A,E)	2.5~2.7V DC
4 CN23	Indoor centralized controller port(X,Y,E)	2.5~2.7V DC
5 CN24	Communication port among indoor units(P,Q,E)	2.5~2.7V DC
6 CN30	Phase sequence test port	380V AC
7 CN69	C-phase power supply	220V AC
8 CN31	Power input of NO.1 transformer	220V AC
9 CN74	Signal output port of PWM unloading valve	220V AC
10 CN56	Driver port of digital compressor, NO.1 and NO.2 fixed compressor	220V AC
11 CN53	Output port of N-phase	220V AC
12 CN47	Load output port	220V AC
13 CN70	Driver port of EXV A	The first pin on left: DC 12V The other four pins: in dynamic change
14 CN71	Driver port of EXV B	
15 CN60	Driver port of AC motor (only for DC+AC condenser fan type)	12V
16 CN32	Power output of NO.1 transformer	Yellow-Yellow: AC9V Brown-Brown: AC13.5V
17 CN29	Remote ON/OFF control port	5V
18 CN15	Current test port of digital compressor, NO.1 and NO. 2 fixed compressor	DC0~5V (in dynamic change)
19 CN34	Power output of NO.2 transformer	Yellow-Yellow: AC9V Brown-Brown: AC13.5V
20 CN18	Signal input port of low pressure switch	5V
21 CN19	Signal input port of high pressure switch	5V
22 CN17	Signal input port of system pressure sensor switch	DC0~5V (in dynamic change)
23 CN1	Temp. sensor port of outdoor ambient temp. and outdoor condenser pipe temp.	DC0~5V (in dynamic change)
24 CN64	Driver port of DC motor A	5V
25 CN21	Driver port of DC motor B(only for DC+DC condenser fan type)	5V
26 CN6	Discharge temp. test port of NO.2 fixed compressor	DC0~5V (in dynamic change)
27 CN5	Discharge temp. test port of NO.1 fixed compressor	DC0~5V (in dynamic change)
28 CN4	Discharge temp. test port of digital compressor	DC0~5V (in dynamic change)

3. Main board parts instructions



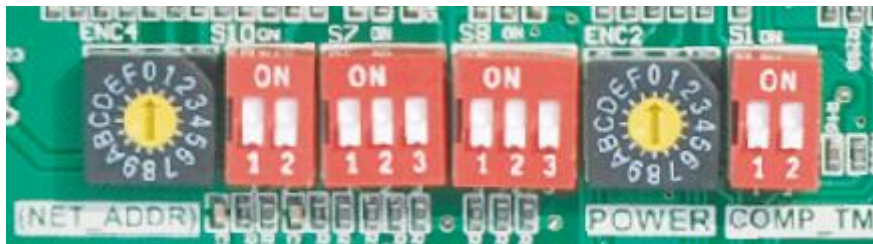
3.1 SW2query instructions



No.	Content	Note
1	Address of outdoor unit	0,1,2,3
2	Capacity of outdoor unit	8,10,12,14,16
3	Quantity of outdoor unit	Only Effective to main unit
4	Quantity of setting indoor unit	Only Effective to main unit
5	Total capacity of outdoor unit	Capacity requirements
6	Capacity REQT. Of indoor units	Only Effective to main unit
7	Capacity REQT. Of master unit (after correction)	Only Effective to main unit
8	Performance mode	0-OFF/FAN,2-COOL,3-HEAT,4-Constraint Cool
9	Actual capacity of outdoor unit	Capacity requirements
10	Fan speed	0-Fan stop, 1~13-Speed increase sequentially, 13-The maximum fan speed.
11	Average temp. of T2B/T2	Actual value
12	T3 pipe temp.	Actual value
13	T4 ambient temp.	Actual value
14	Discharge temp. of digital scroll compressor	Actual value

15	Discharge temp. of No.1 fixed compressor	Actual value
16	Discharge temp. of No.2 fixed compressor	Actual value
17	Current of digital scroll compressor	Actual value
18	Current of No.1 fixed compressor	Actual value
19	Current of No.2 fixed compressor	Actual value
20	Opening degree of EXV A	Actual value=Display value×8
21	Opening degree of EXV B	Actual value=Display value×8
22	Discharge pressure	Actual value=Display value×0.1MPa
23	Quantity of indoor units	Actual value
24	Quantity of running indoor units	Actual value
25	Running mode	0-Heating priority, 1-Cooling priority, 2-First priority, running mode of 63#; Second priority, running mode of larger quantity. 3-Only respond the heating mode, 4-Only respond the cooling mode.
26	Noise control mode	3-None priority,0-Night noise control,1-Noise control,2-Super noise control
27	Static pressure mode	0-None static pressure,1-20Pa static pressure,2-40Pa static pressure,3-60Pa static pressure
28	The last error or protection code	Display 00 if there is no error or protection
29	--	Check over

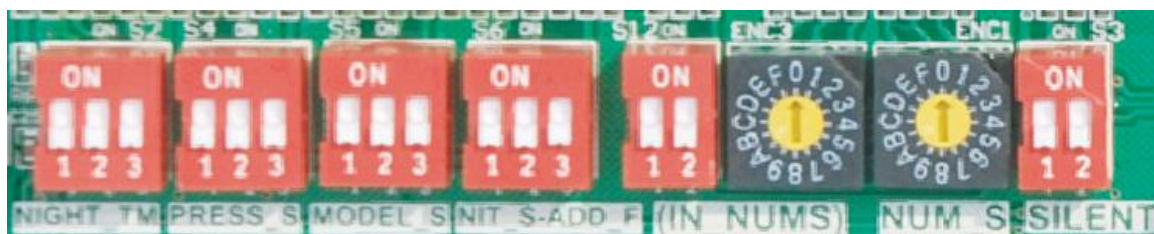
* Normal display: In case of capacity requirement, display percentage of capacity output of digital scroll ODU; Display number of all the IDUs in standby.

3.2 System setting dial switches instructions







Dial switch	Content	Note
ENC4	System address setting	Setting range: 0-7
S10	Reserve	
S7	Reserve	
S8	Condenser fan type setting	0: DC fan+ AC fan; 1: DC fan +DC fan
ENC2	Outdoor unit capacity setting	0: 8HP; 1: 10HP; 2: 12HP; 3: 14HP; 4: 16HP
S1	Starting up time setting	 : starting time is 5 minutes;  starting time is 12 minutes (default)





3.3 Function setting dial switches instructions





S2: Night silent time selection

	Night silent time is 6h/10h (default)
	Night silent time is 6h/12h
	Night silent time is 8h/10h
	Night silent time is 8h/12h


S3: Night silent mode

	Night silent mode (default)
	Silent mode
	Super silent mode
	No silent mode






S4: Static pressure selection of outdoor unit

	Static pressure is 0MPa (default)
	High static pressure (customized)




ENC1: Outdoor unit address setting

	Outdoor unit address setting switch, Effective to 0-3, 0 Stand for main unit, 1-3 Stand for slave unit
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







S5: Locking modes selection

	Heating priority mode (default)
	Cooling priority mode
	VIP priority or vote priority
	Only respond the heating mode
	Only respond the cooling mode

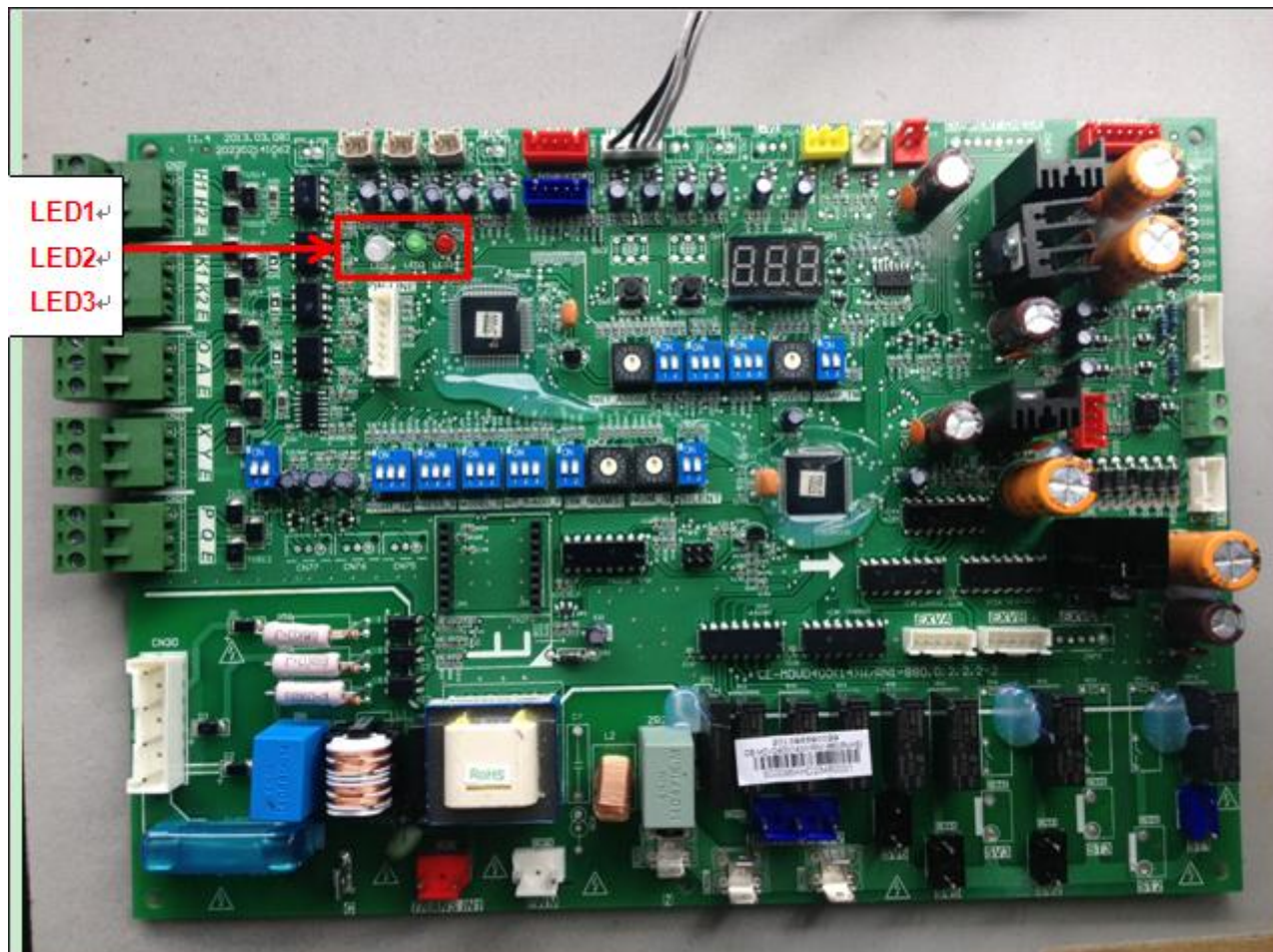
S6: Address searching

	Auto addressing
	Non-auto addressing (default)
	Clean the indoor unit addresses

ENC3 and S12: Quantity setting of indoor units

		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.

3.4LED on main board instructions



LED1- Indicator lamp of refrigerant diagnosis

- 1) When outdoor units have not checked refrigerant charge, green light flash;
- 2) When outdoor units begin to check the refrigerant charge and refrigerant charge is right, green light on;
- 3) When refrigerant charge is insufficient, red light flash;
- 4) When refrigerant charge is excessive, red light on.

LED2-Running indicator lamp of network centralized control chip

- 1) When outdoor units are in standby condition, green light flash;
- 2) When outdoor units are in operation condition, green light on.

LED3- Malfunction indicator lamp of network centralized control chip

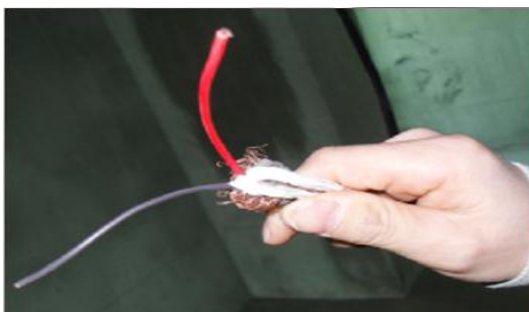
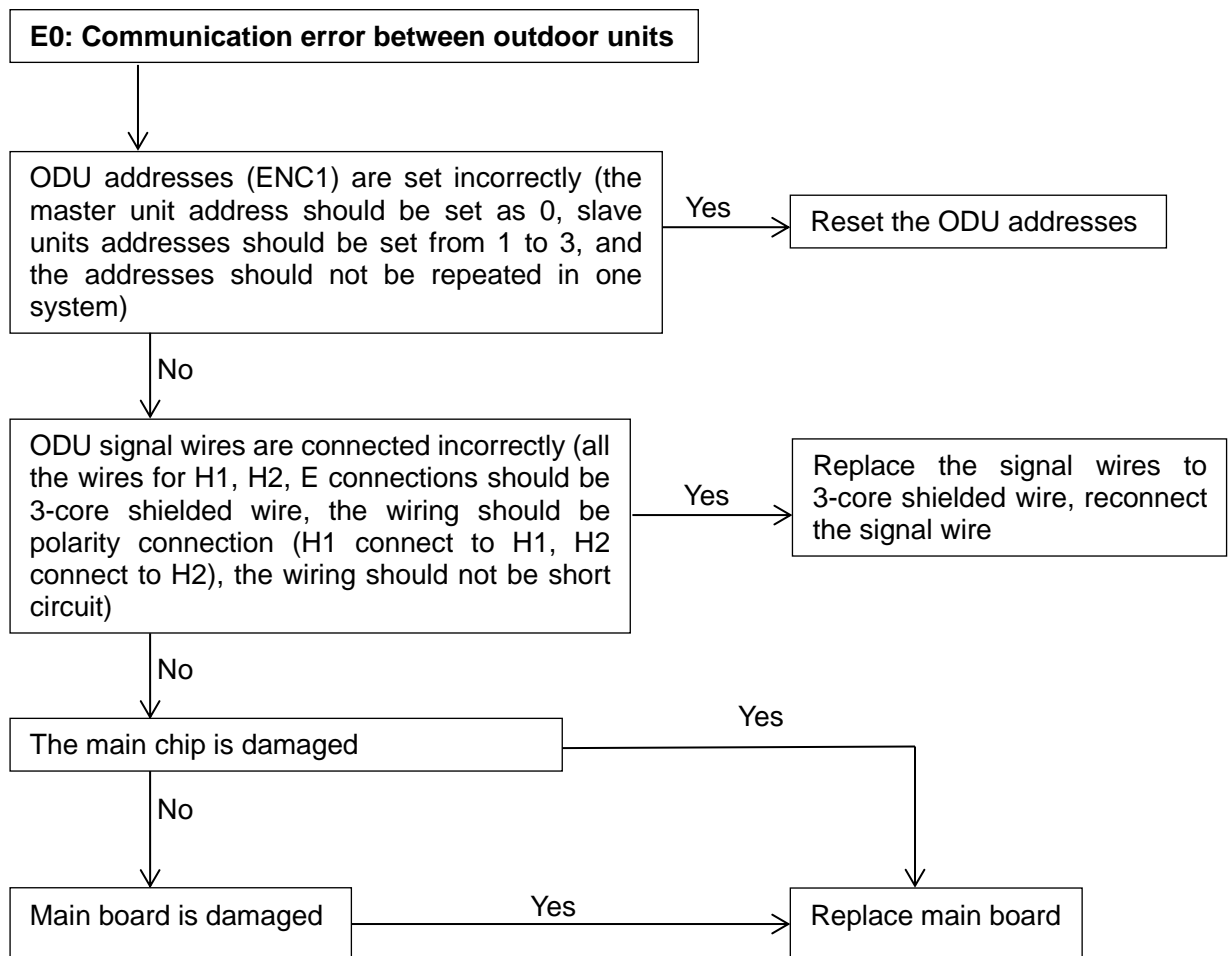
- 1) When units are in communication malfunction, red light flash slowly;
- 2) When units are in other malfunction, red light flash quickly.

4. Error code table

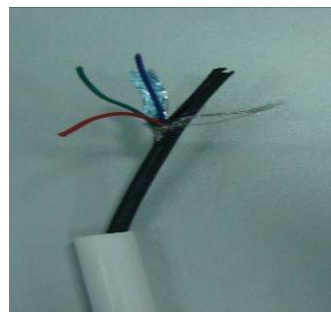
Error code	Content	Note
E0	Communication error between outdoor units	Only display on the faulty slave unit, all the ODUs are in standby.
E1	Phase sequence error	Display on the faulty unit, all the ODUs are in standby.
E2	Communication error between indoors and the master unit.	Only display on the master unit, all the ODUs are in standby.
E4	Outdoor ambient temperature sensor and condenser pipe temperature sensor error	Display on the faulty unit, all the ODUs are in standby.
E5	Power voltage error	Display on the faulty unit, all the ODUs are in standby.
E7	Discharge temp sensor malfunction	The unit is running for 10 minutes and then stay the status with the discharge temperature is lower than 15℃ and the discharge pressure is over 3.5MPa for 2 minutes.
E8	Outdoor unit address is wrong	Only display on the faulty slave unit, all the ODUs are in standby.
H1	Communication error between 0537 chip and MC9S08AC128 chip	Display on the faulty unit, all the ODUs are in standby.
H2	Quantity of outdoor unit decreased	Only display on the master unit, all the ODUs are in standby.
H3	Quantity of outdoor unit increased	Only display on the master unit, all the ODUs are in standby.
H5	3 times of P2 protection in 30 minutes	Display on the faulty unit, all the ODUs are in standby. Cannot be recovered until re-power on.
H6	3 times of P4 protection in 100 minutes	Display on the faulty unit, all the ODUs are in standby. Cannot be recovered until re-power on.
H7	Quantity of indoor unit decreased	Only display on the master unit, all the ODUs are in standby.
H8	High pressure sensor error	The discharge pressure $P_c \leq 0.3\text{MPa}$.
H9	3 times of P9 protection in 30 minutes	Display on the faulty unit, all the ODUs are in standby. Cannot be recovered until being power on again.
Hd	Slave units malfunction	Only display on the master unit, all the ODUs are in standby.
P1	High pressure protection	Display on the faulty unit, all the ODUs are in standby.
P2	Low pressure protection	Display on the faulty unit, all the ODUs are in standby.
P3	Over current protection of digital compressor	Display on the faulty unit, all the ODUs are in standby.
P4	Compressor high discharge temp protection	Display on the faulty unit, all the ODUs are in standby.
P5	Condenser high temperature protection	Display on the faulty unit, all the ODUs are in standby.
P7	Over current protection of No.1 fixed compressor	Display on the faulty unit, all the ODUs are in standby.
P8	Over current protection of No.2 fixed compressor	Display on the faulty unit, all the ODUs are in standby.
P9	Fan module protection	Display on the faulty unit, all the ODUs are in standby.

5. Troubleshooting

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

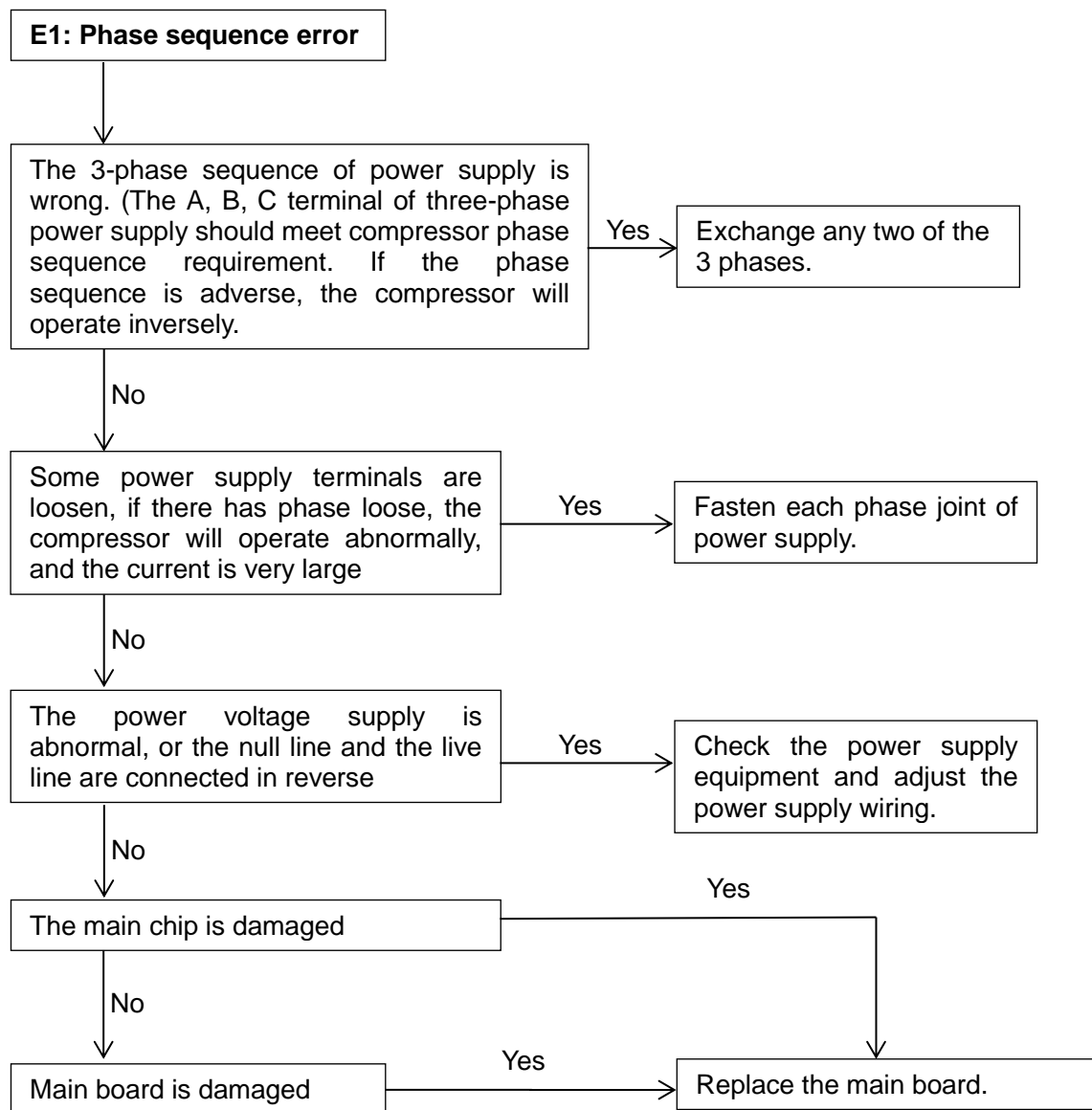


2-core shielded wire (✗)



3-core shielded wire (✓)

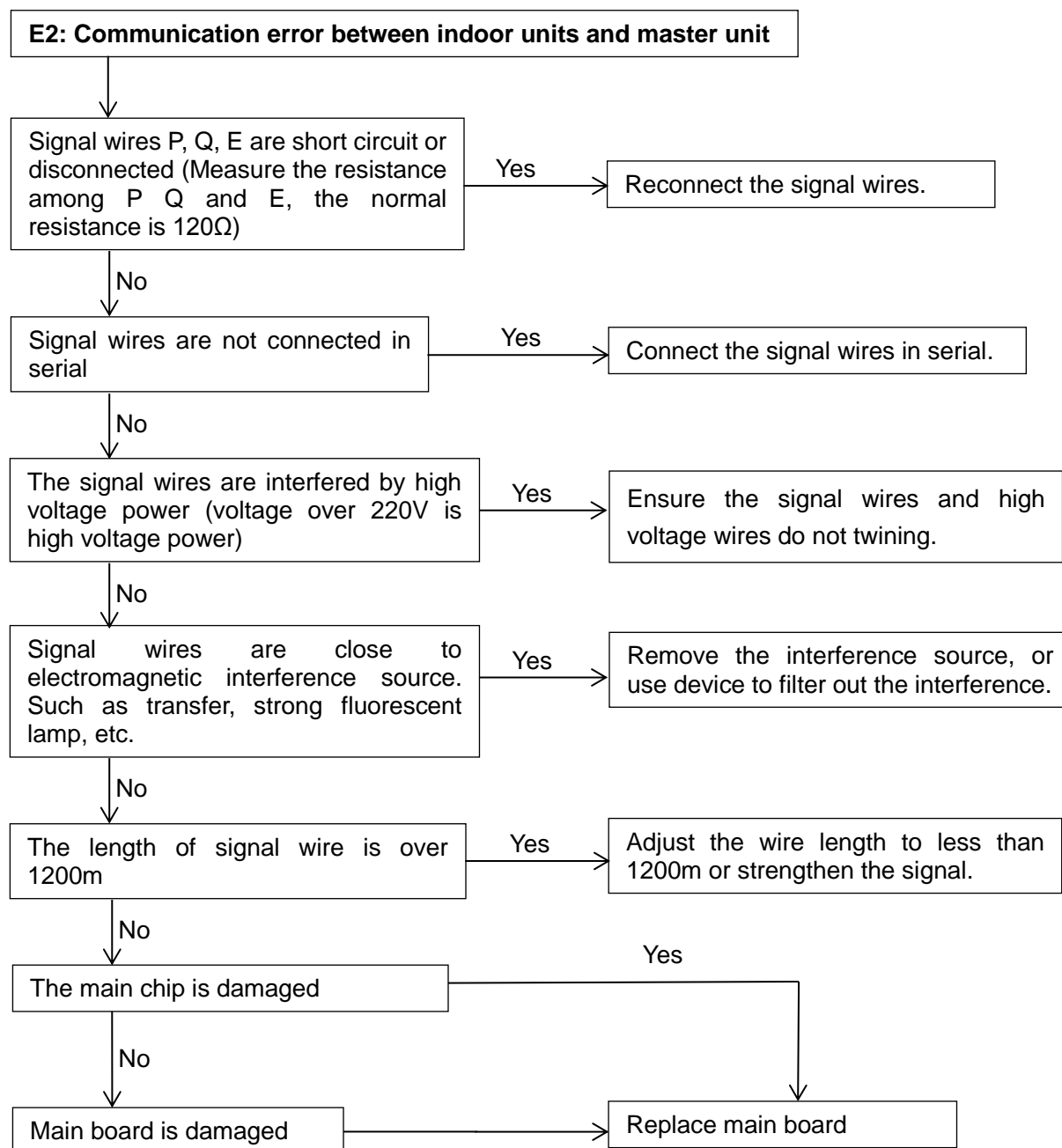
5.2 E1: Phase sequence error (Display on faulty unit, all the ODU in standby)



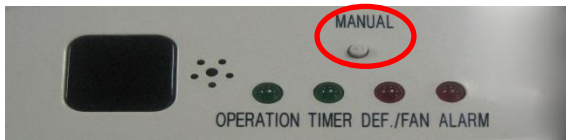
Note:

If the wiring connection of each outdoor unit is according to A, B, C phase sequence, when the quantity of outdoor units is large, the current difference between C phase and A, B phase will be very large for the power supply load of each outdoor unit is on C phase, it is very easy to lead to air switch break and wiring terminal burnout. So when the quantity of outdoor units is large, the phase sequence should be staggered, then the current can be distributed to the three phases equally.

5.3 E2: Communication error between indoor units and master unit (Only display on master unit, all the ODU in standby)



1. Pressing the manual button continued for 5 seconds, it will display the indoor units communication address.



LED light	Operation	Timer	DEF./FAN	Alarm
Code	8	4	2	1

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

For example:

Pressing the manual button continued for 5 seconds:

- If the “Operation”, “Timer” and “DEF./FAN” lights are normally on and the buzzer isn’t 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 $31=16+(8+4+2+1)$
- 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 $63=48+(8+4+2+1)$

2. Pressing the manual button continued for 10 seconds, it will display the capacity of indoor units.

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 the manual button continued for 10 seconds:

- If all the LED lights turn off, that means the capacity code is 0 and the capacity of indoor units is $22 \times 100\text{W}$ (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 $71 \times 100\text{W}$ (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 $140 \times 100\text{W}$ (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 $160 \times 100\text{W}$ (6.0HP).

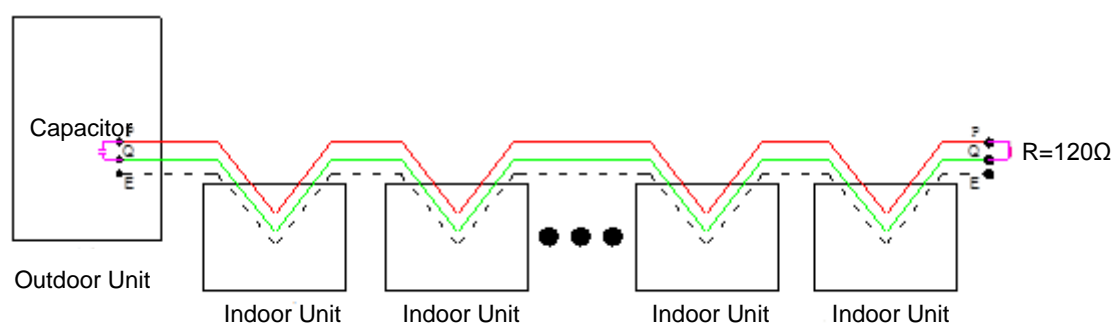
The above basic principle just applies to single PCB, if the indoor unit has more than one PCB, or one PCB can achieve a virtual multi blocks function, you must use the basic principle to calculate the achievable capacity of single PCB at first, then add all the value as the capacity of the indoor unit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

For example

The high static pressure duct has 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 $112 \times 100\text{W}$ (4.0HP), then add the value of two PCB, so the capacity of indoor unit is $200 \times 100\text{W}$ (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 $140 \times 100\text{W}$ (5.0HP), then add the value of two PCB, so the capacity of indoor unit is $280 \times 100\text{W}$ (10HP);
- The “Operation” light is normally on, that means the capacity code is 8 and the achievable capacity of single PCB is $112 \times 100\text{W}$ (4.0HP), then add the value of four PCB, so the capacity of indoor unit is $450 \times 100\text{W}$ (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 $140 \times 100\text{W}$ (5.0HP), then add the value of four PCB, so the capacity of indoor unit is $560 \times 100\text{W}$ (20HP).

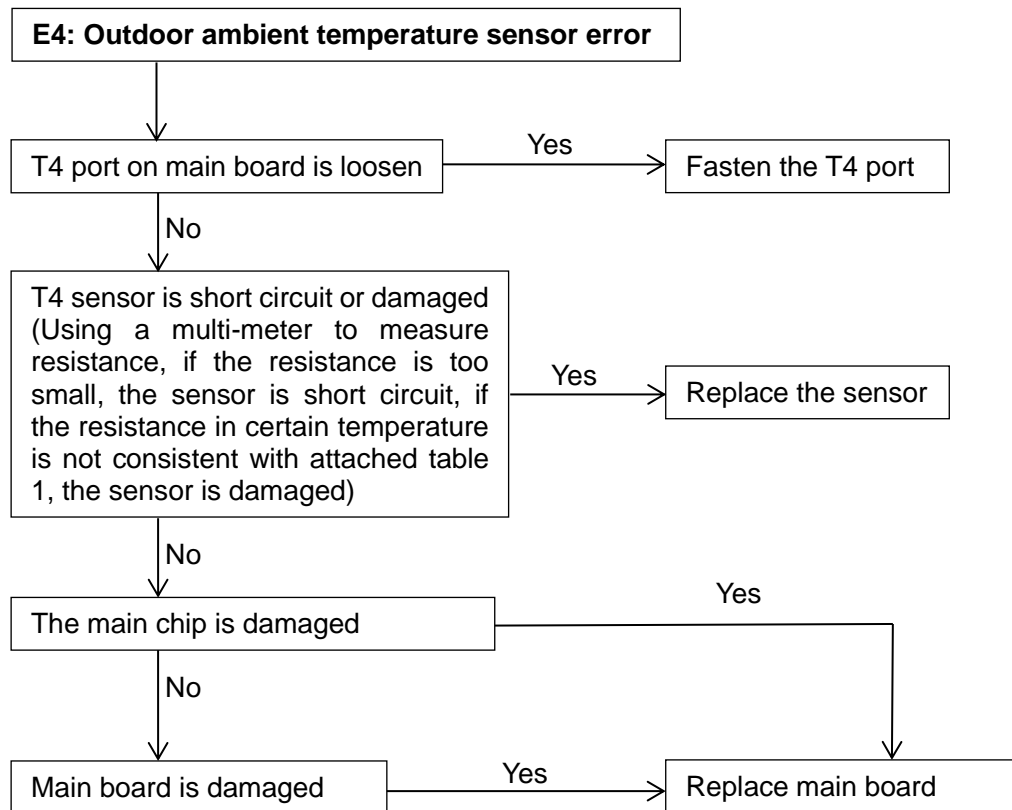
3. If the signal is weak, connect a 120Ω resistor between P and Q of the farthest indoor unit, or connect a 0.5-1.5uF capacitor between P and Q of outdoor unit. Installation refers to the following picture:



Note:

Signal wires should be 3-core shielded wires and indoor units should be connected in serial.

5.4 E4: Outdoor ambient temperature sensor (T4) error (Display on faulty unit, all the ODU in standby)



Case: There is no display on main board of one system, and the problem still exists after replacing main board. Voltage values on measuring plate (such as 220V, 5V, 12V, etc.) are normal; after measuring resistance value of sensor, find that T4 thermo-bulb is earth-continuity, and further discover that the thermal cable of T4 sensor is punched by bolt, as follows:

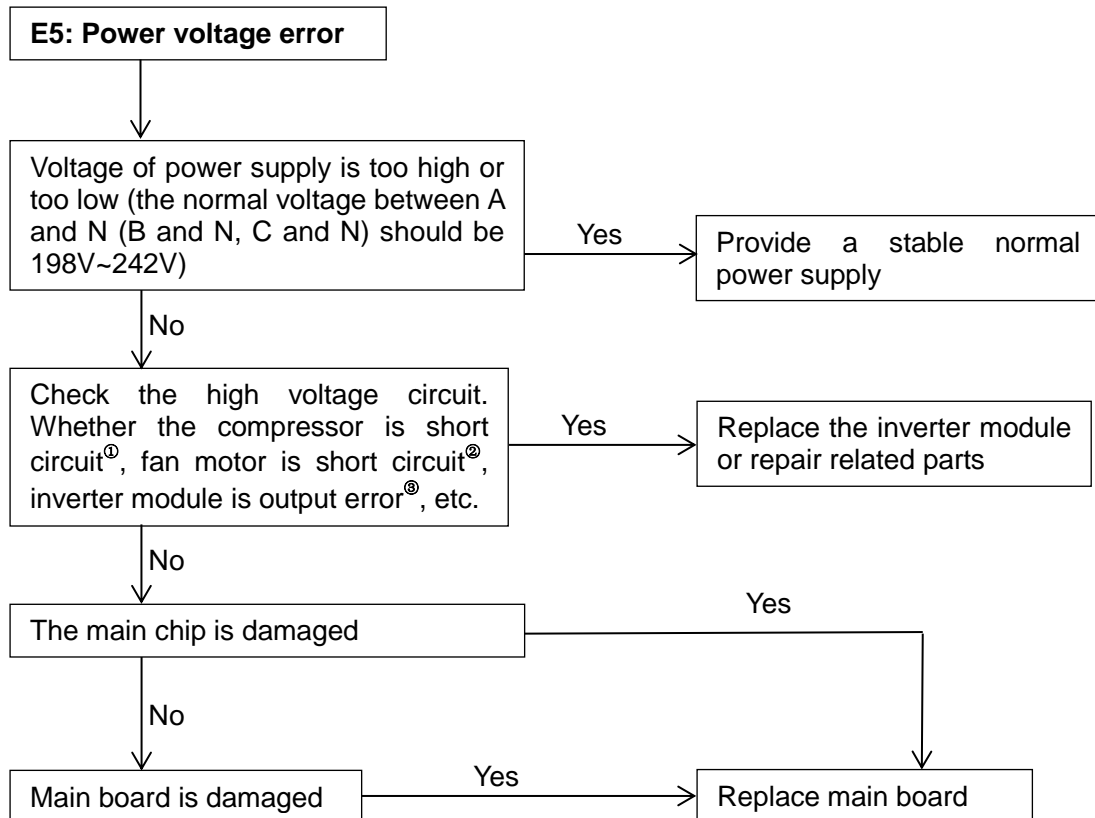


T4 sensor is worn out and connected with sheet metal



After being reconnected, the system becomes normal

5.5 E5: Power voltage error (Display on the faulty unit, all the ODU are in standby)



Note:

1. How to check whether the compressor is short circuit^①:

The normal resistance value of digital compressor among U V W is 2.27Ω , and infinity to earth. If the resistance value is out of the range, the compressor is abnormal.

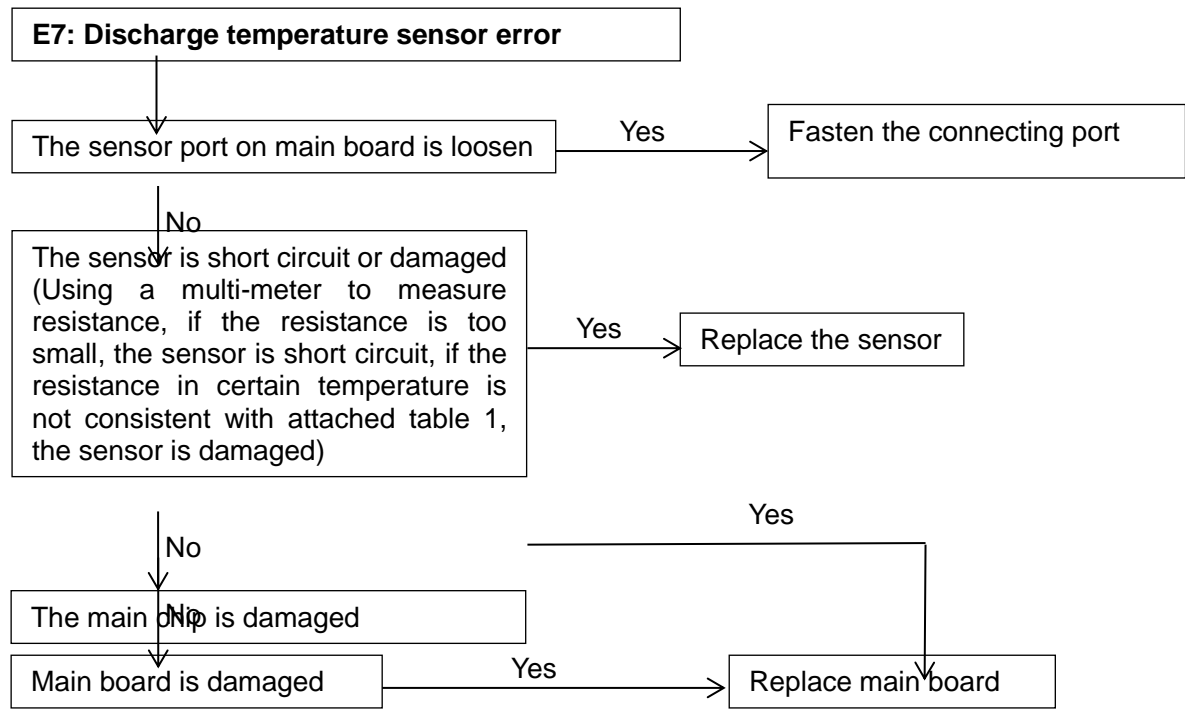
2. How to check whether the fan motor is short circuit^②:

The normal value of DC fan motor coil among U V W is less than 10Ω , If the measured value is 0Ω , the fan motor is short circuit.

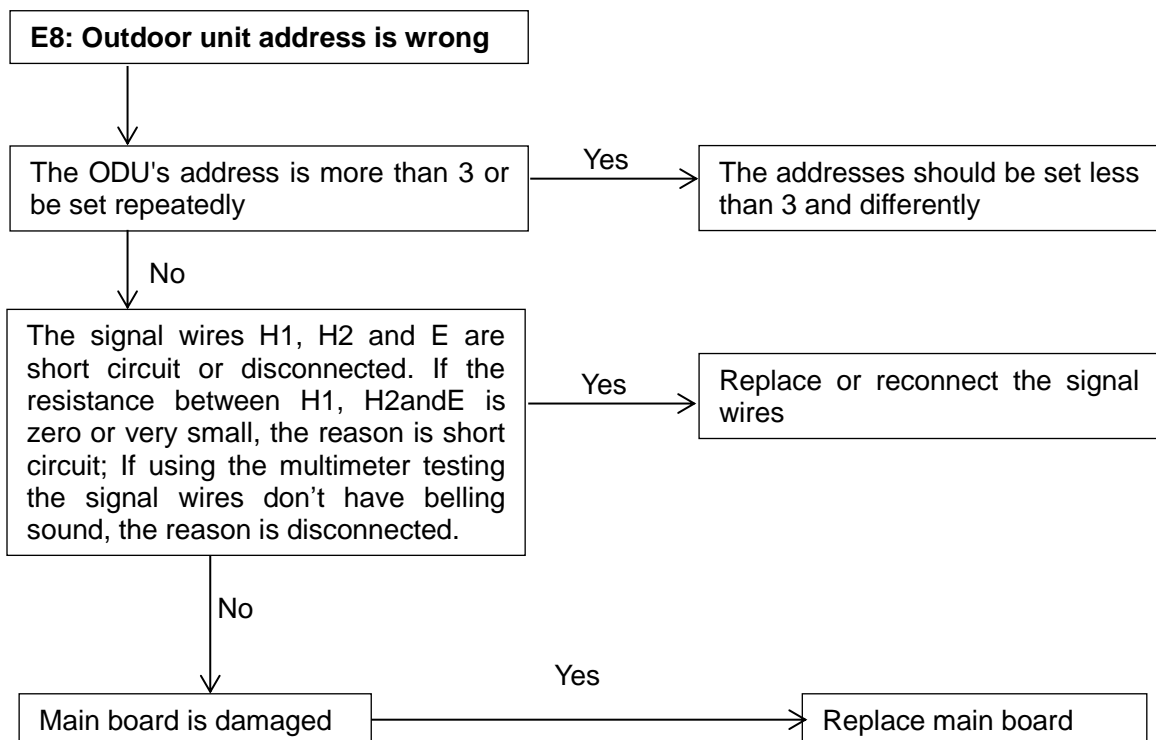
3. How to check whether the inverter module is output error^③:

Let PN and U V M of inverter module short circuit, then dial multimeter to buzzer file, if the multimeter is ring, the inverter module is output error.

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



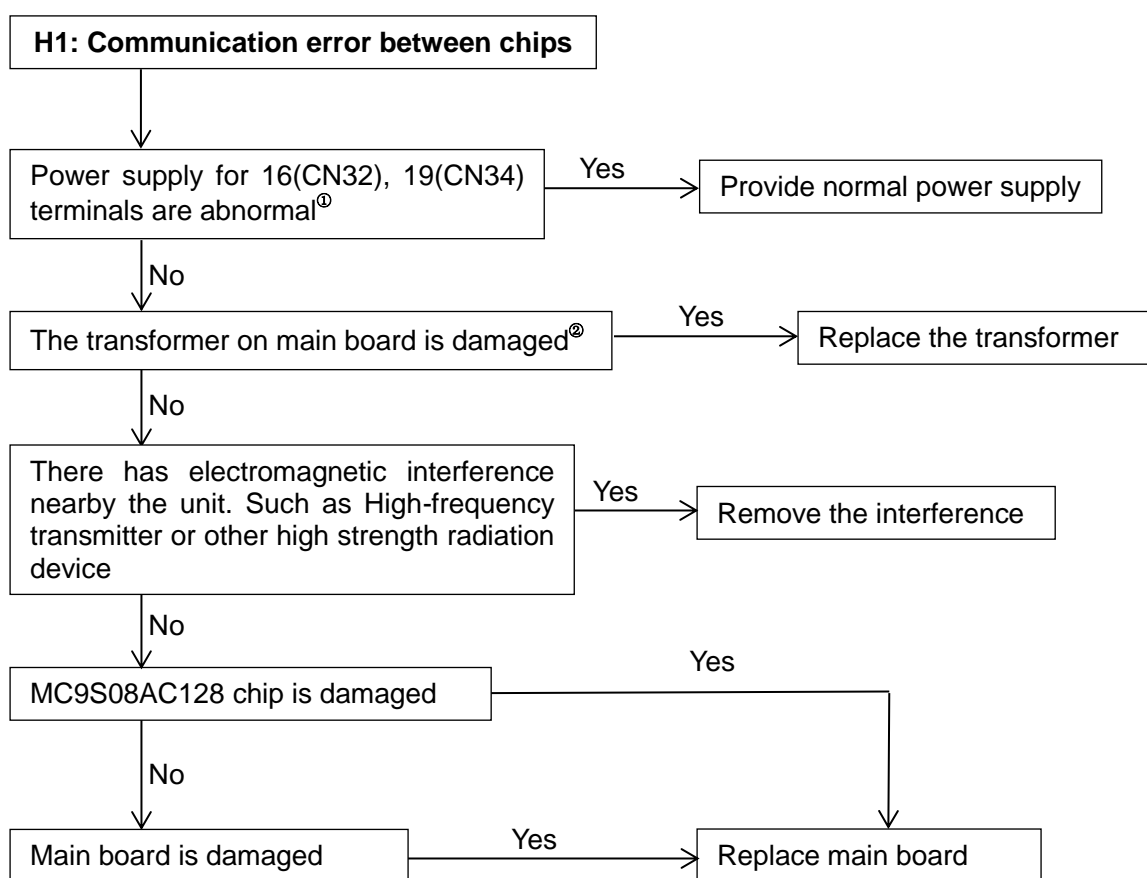
5.7 E8: Outdoor unit address is wrong (Only display on faulty slave unit, all the ODU in standby)



5.8 H1: Communication error between 0537 and MC9S08AC128 (Display on faulty unit, all the ODU in standby)

0537 chip: 0537chip is used for control the communication between indoor units and outdoor units, and the communication between outdoor units

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



Note:

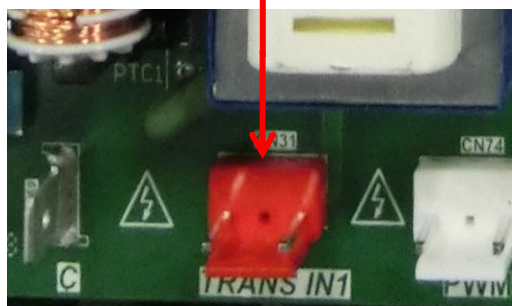
1. How to check whether power supply for 16(CN32), 19(CN34) terminals are abnormal^①

The voltage input 16(CN32), 19(CN34) terminal is AC9V (yellow-yellow) and AC13.5V (brown-brown)

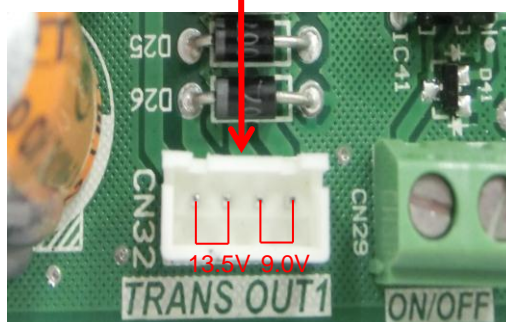
2. How to check whether the transformer on main board is damaged^②

The voltage input for 8(CN31) is 220V, the voltage output of 16(CN32), 19(CN34) terminal is AC9V (yellow-yellow) and AC13.5V (brown-brown). If the voltage is out of the range, the transformer is damaged.

CN31: Power supply for main board

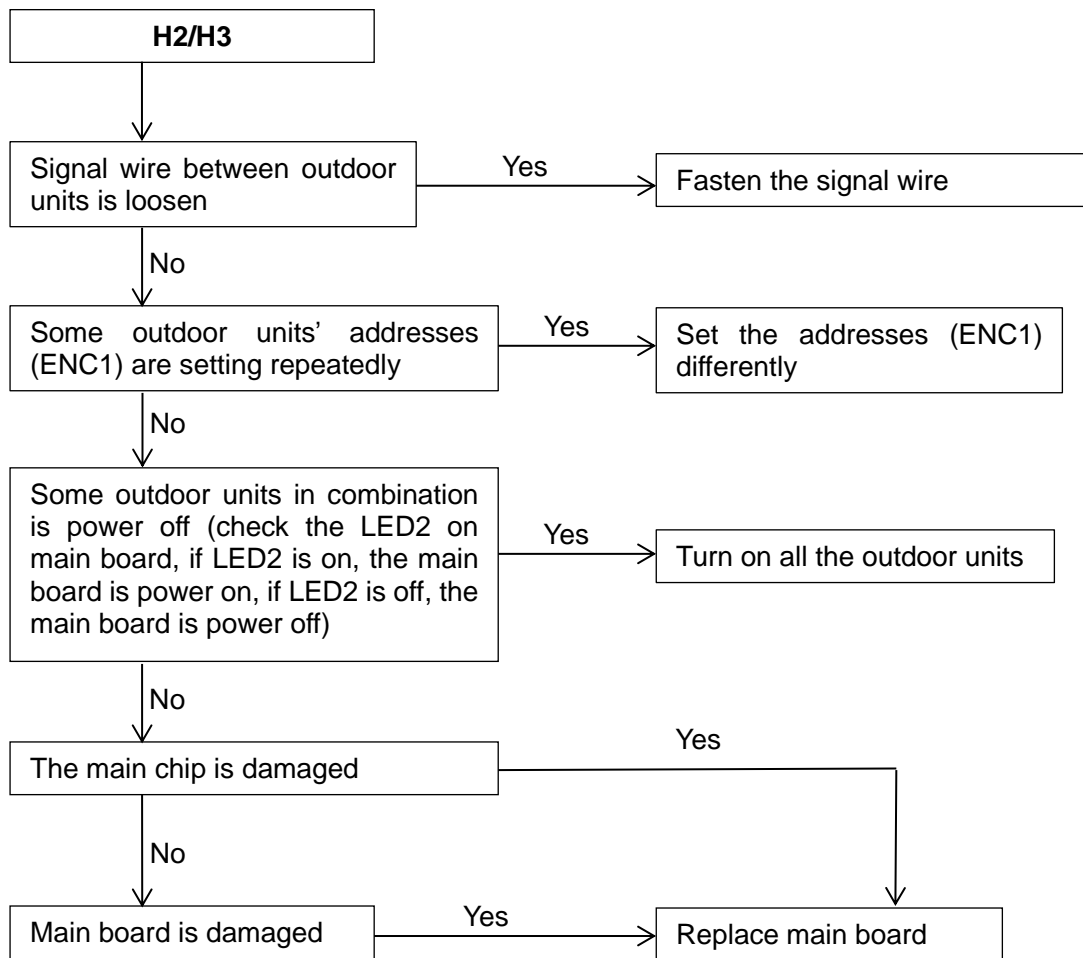


CN32: Power output for transformer



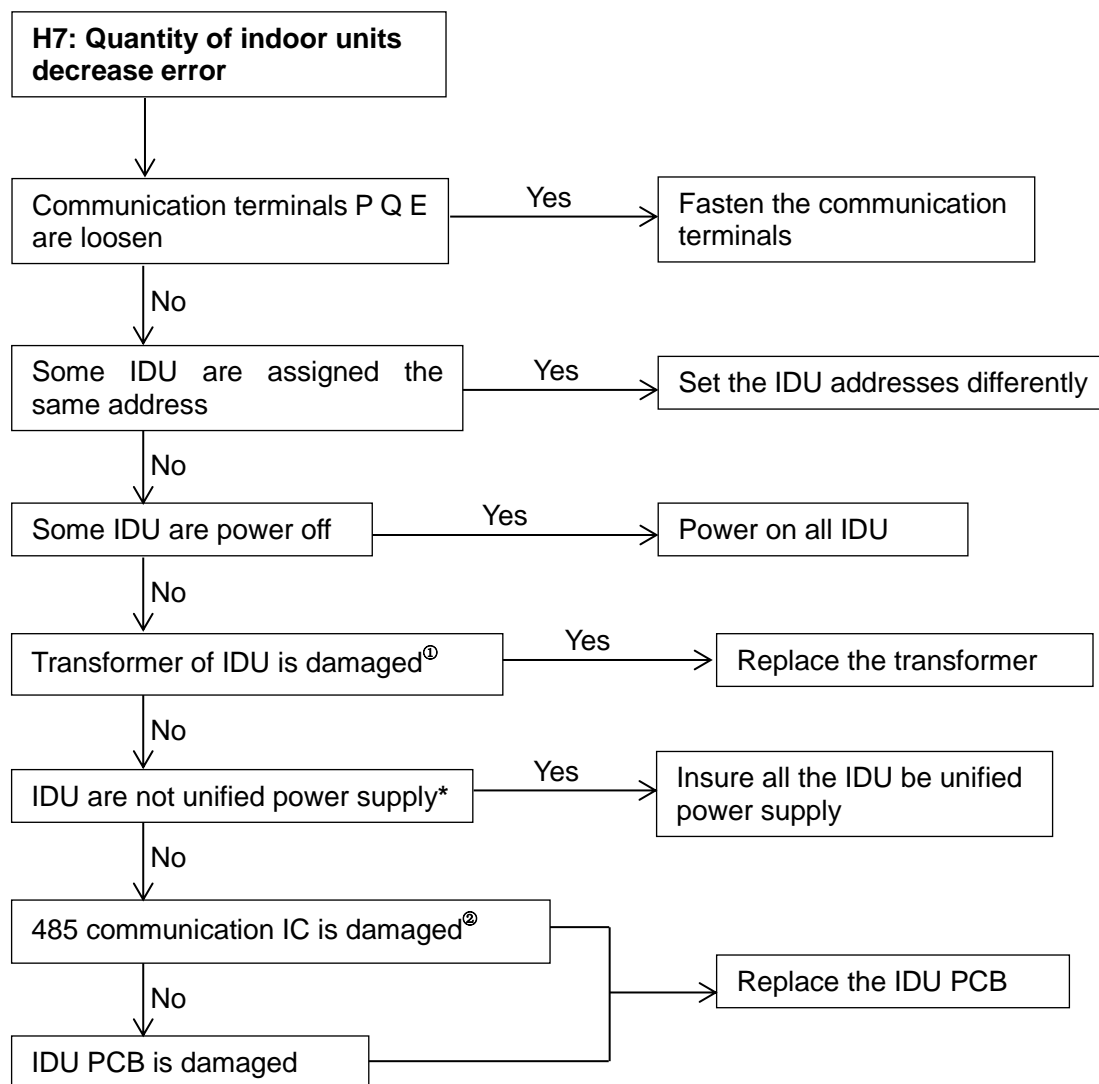
5.9 H2/H3

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

H3: Quantity of outdoor unit increased (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 not 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.

5.10 H7: Quantity of indoor units decreased (Only display on master unit, all the ODU in standby)



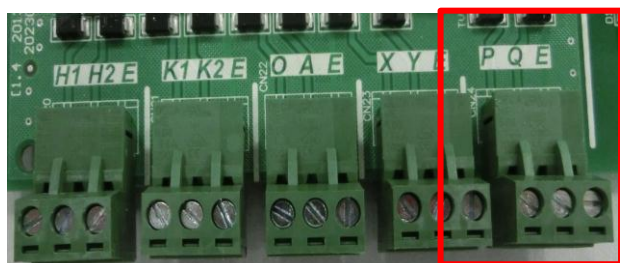
Note:

1. How to check whether the transformer of IDU is damaged^①

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

2. How to check whether the 485 communication IC is damaged^②

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 damaged.

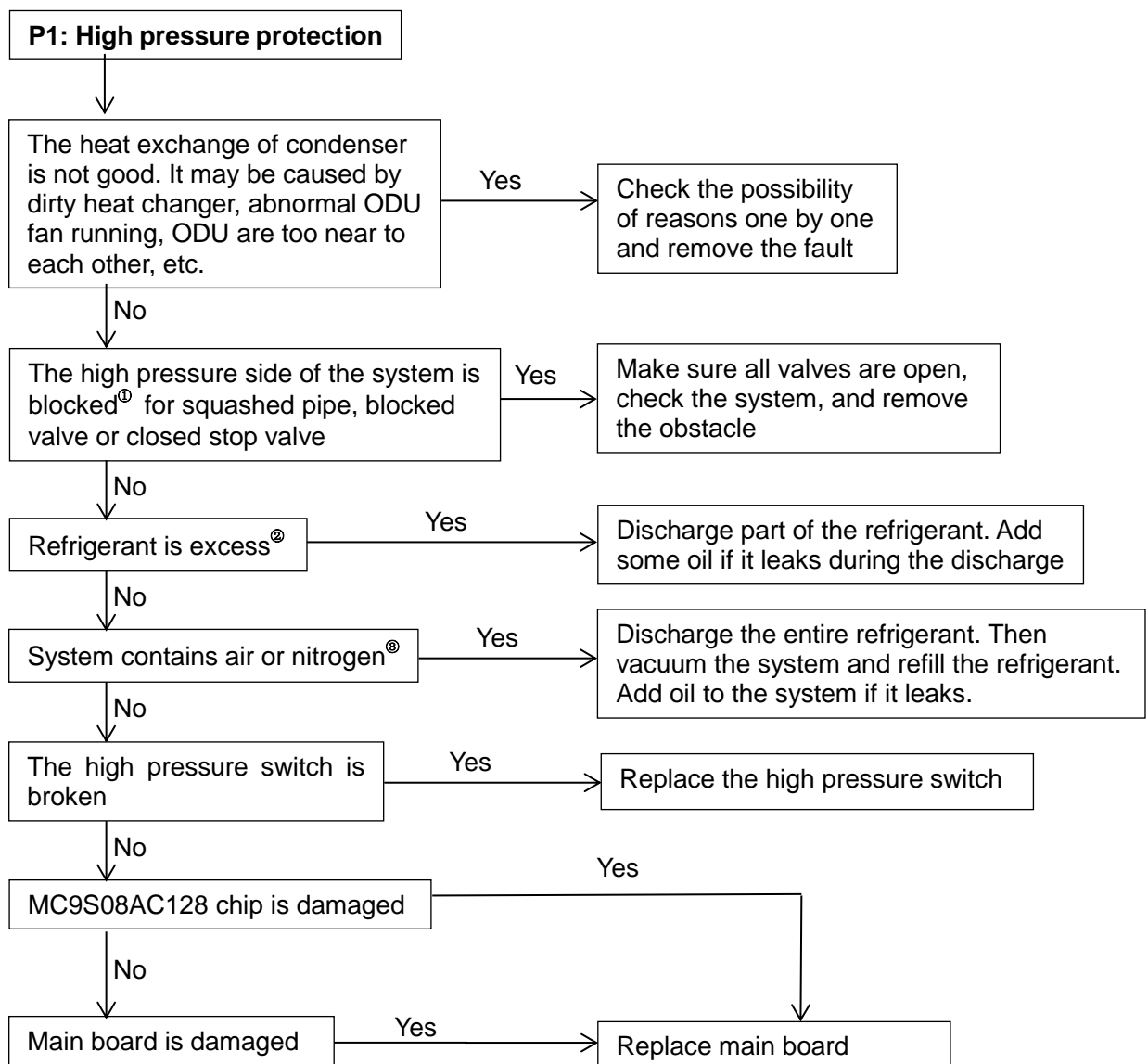


P Q E terminals

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

5.11 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 blocked[®]:

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 excess[®]:

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 nitrogen[®]:

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.

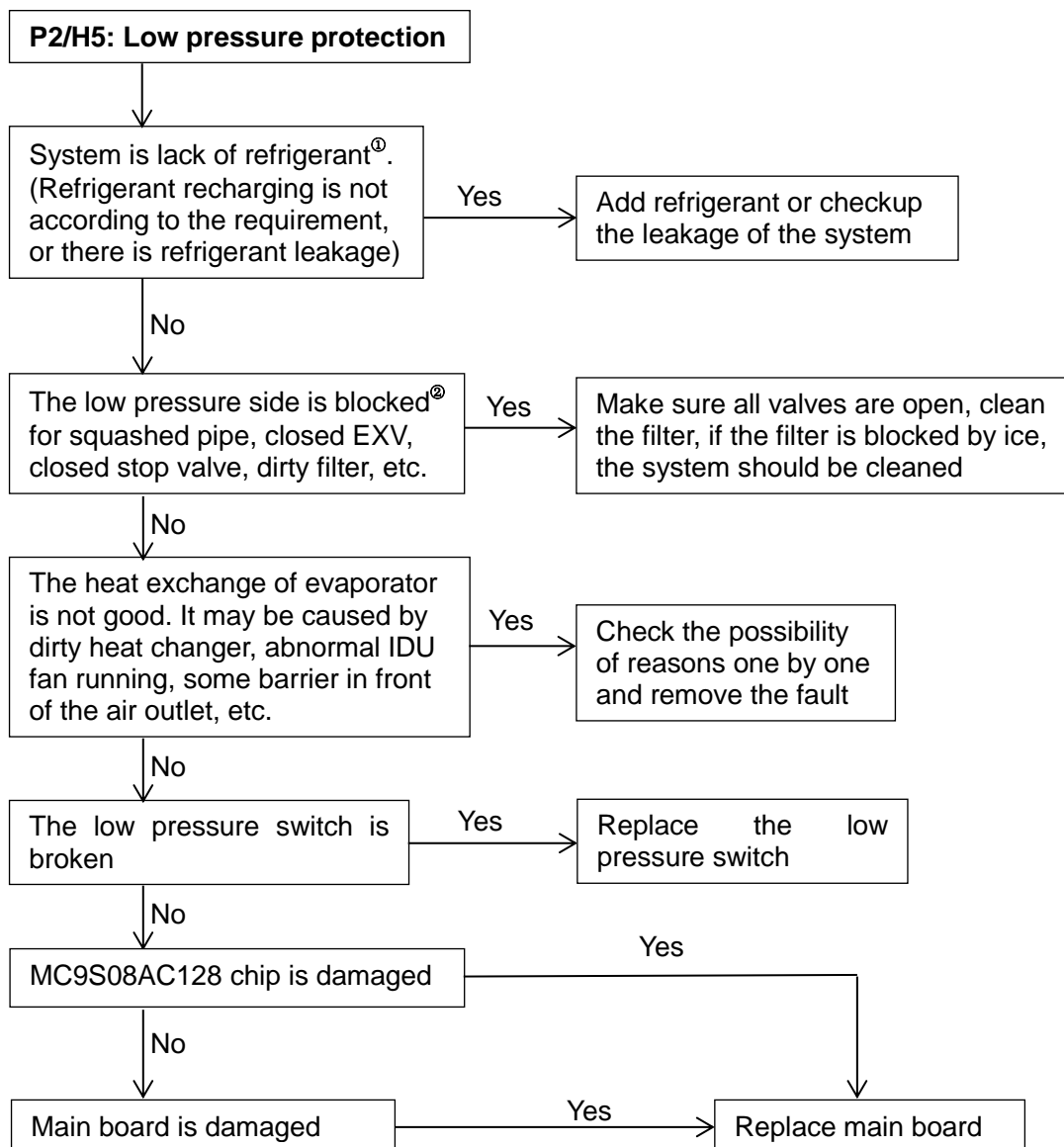
*The normal system running parameters please refer to attached table 3.

*If the system install three-phase protector and the three-phase protector connect with high pressure switch in serial, the system will display P1 protection when first 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 serial, the system will display P2 protection when first power on, and P2 protection will disappear after system is steady.

5.12 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 refrigerant[®]:

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 blocked[®]:

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 serial, the system will display P1 protection when fist power on, and P1 protection will disappear after system is steady.

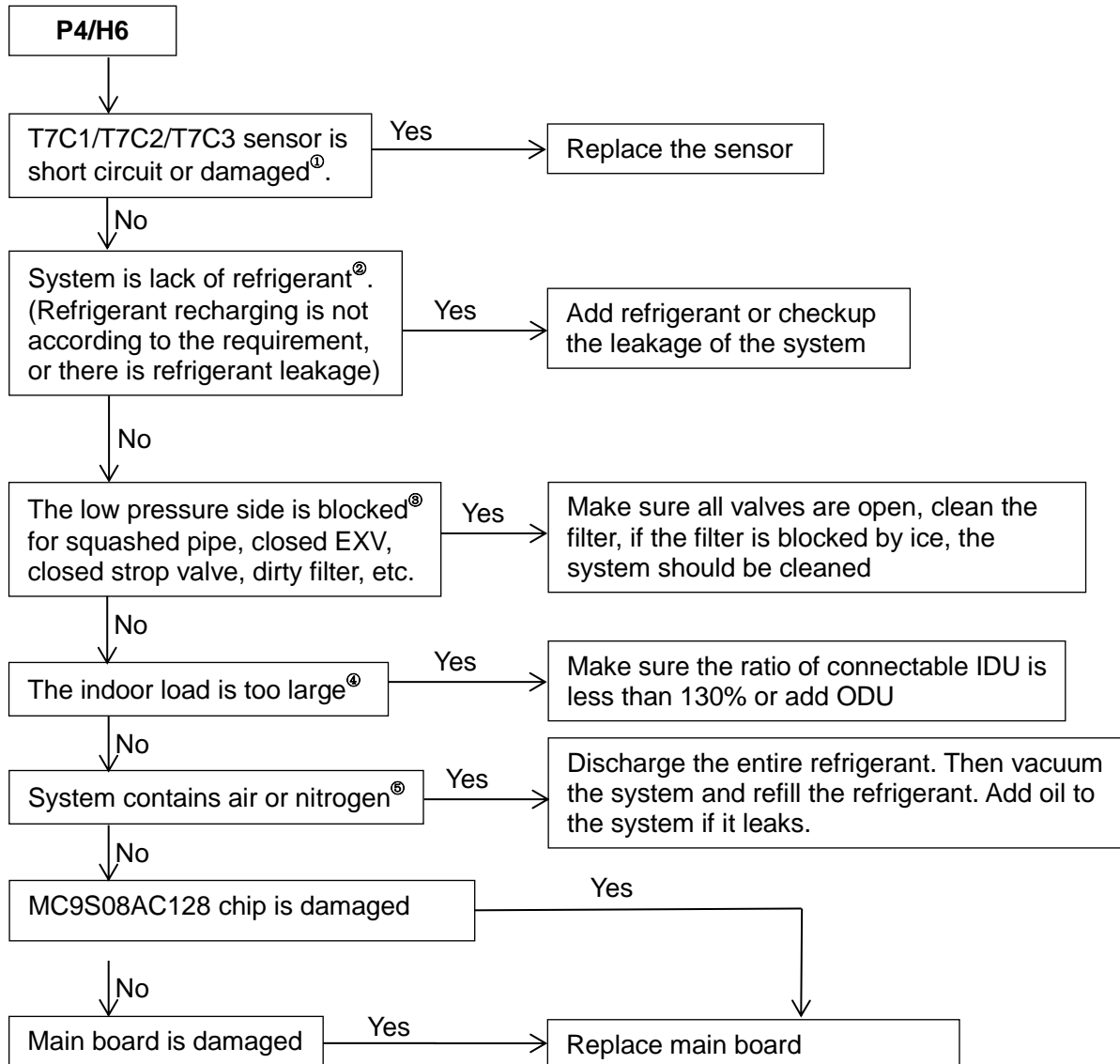
*If the system install three-phase protector, and the three-phase protector connect with low pressure switch in serial, the system will display P2 protection when fist power on, and P2 protection will disappear after system is steady.

5.13 P4/H6: Compressor high discharge temperature protection (Display on faulty unit, all the ODU in standby)

P4: Compressor high discharge temperature protection

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

H6 error will display 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 T7C1/T7C2/T7C3 sensor is short circuit or damaged^①:

Using a multi-meter 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 damaged

2. The phenomenon of lack of refrigerant^②:

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 blocked^③:

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 large^④:

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

5. The phenomenon of the system contains air or nitrogen^⑤:

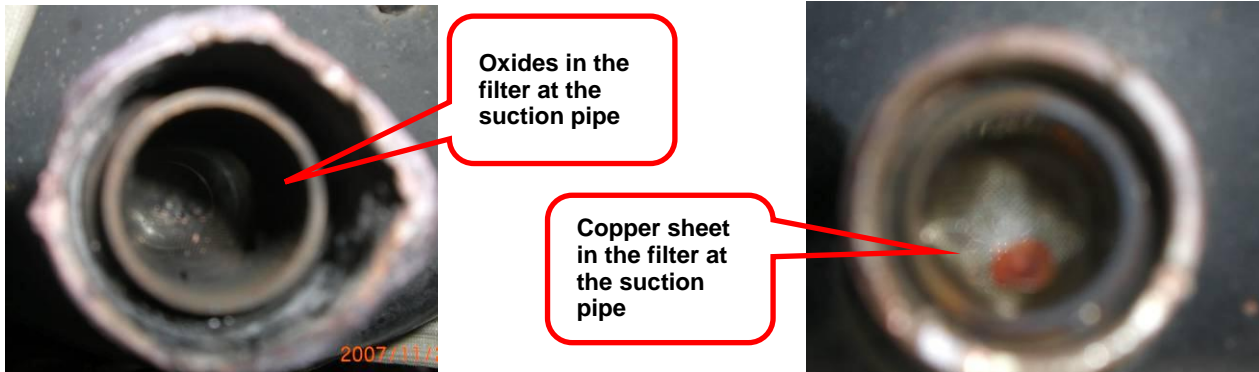
The high pressure is higher than normal value, current is larger than normal value, discharge temperature is higher than normal value, compressor makes noise, pressure meter do not display steady.

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

CASE:

There are some feedbacks about P4 protection from the market, the basic reason is that the quantity of compressor suction is insufficient or there is no suction. There is 4 reasons summarized below:

- ① Shortage of refrigerant. Symptom: Discharge and suction temperature is little higher, low pressure is little lower, current is low and suction pipe may be frosted. Inject refrigerant can solve this problem.
- ② The filter mesh of a compressor's suction pipe is dirty blocking. Symptoms: this temperature at the top of compressor is high, P4 protection appear, but discharge temperature is not high, one or more compressor's top temperature is low; The reason is that the refrigerant cannot be absorbed by compressor which leads refrigerant flow to other compressors and other compressors' suction quantity is too high. Solution: Remove the filter mesh and clean it. (Filter mesh belongs to compressor, at the entry of suction pipe.)



- ③ Outdoor unit suction pipe filter mesh is blocking. Symptoms: all the compressors' top temperature is too high, while there is little discharge pressure and temperature. In heating mode, the four-way valve cannot work; the pressure of gas pipes is substantially the same as liquid pipes. Main suction pipe is frosted from the filter mesh to compressor. Solution: if it is dirty blocking, clean the filter mesh; if it is ice blocking, use filter mesh to dry the moisture in System.
- ④ Filter mesh in the suction pipe of compressor is blocked by ice. Symptoms: the temperature at the top of compressor is high, but discharge temperature is not that high. One or some other compressors' top temperature is very low; after restart the machine, moisture may moves to another compressors' suction pipe filter mesh, causing P4 protection. Solution: 1. Use filter mesh to remove moisture; 2. If there is too much moisture, (In R410A system, refrigerating machine oil is of good water absorbability, so there is much moisture dissolved in refrigerating machine oil and it is very hard to remove it by filter mesh.) it must replace the entire oil of the system and use dry nitrogen to clean pipe of the whole system at the same time.

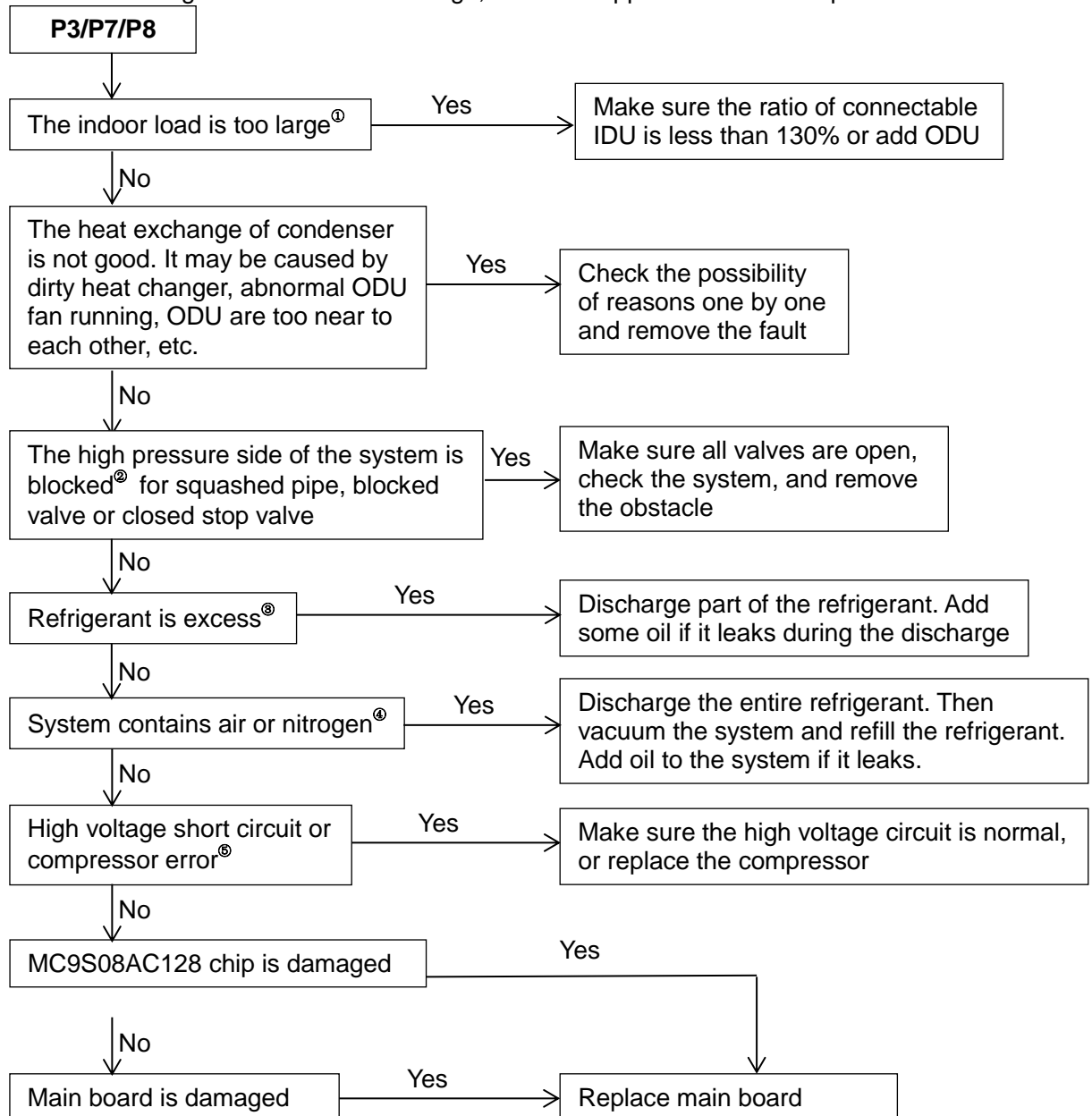
5.14 P3/P7/P8: Over current protection of compressor (Display on faulty unit, all the ODU in standby)

P3: Over current protection of digital compressor

When the current of digital Scroll compressor is over 12A, 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/P8: Over current protection of No.1/No.2 fixed compressor

When the current of fixed compressor is over 18A, the system will display P7 or P8 protection, all the ODU in standby. When the current goes back to normal range, P7/P8 disappear and normal operation resumes.



Note:

1. The phenomenon of the indoor load is too large^①:

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

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

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 excess^③:

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 nitrogen^④:

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.

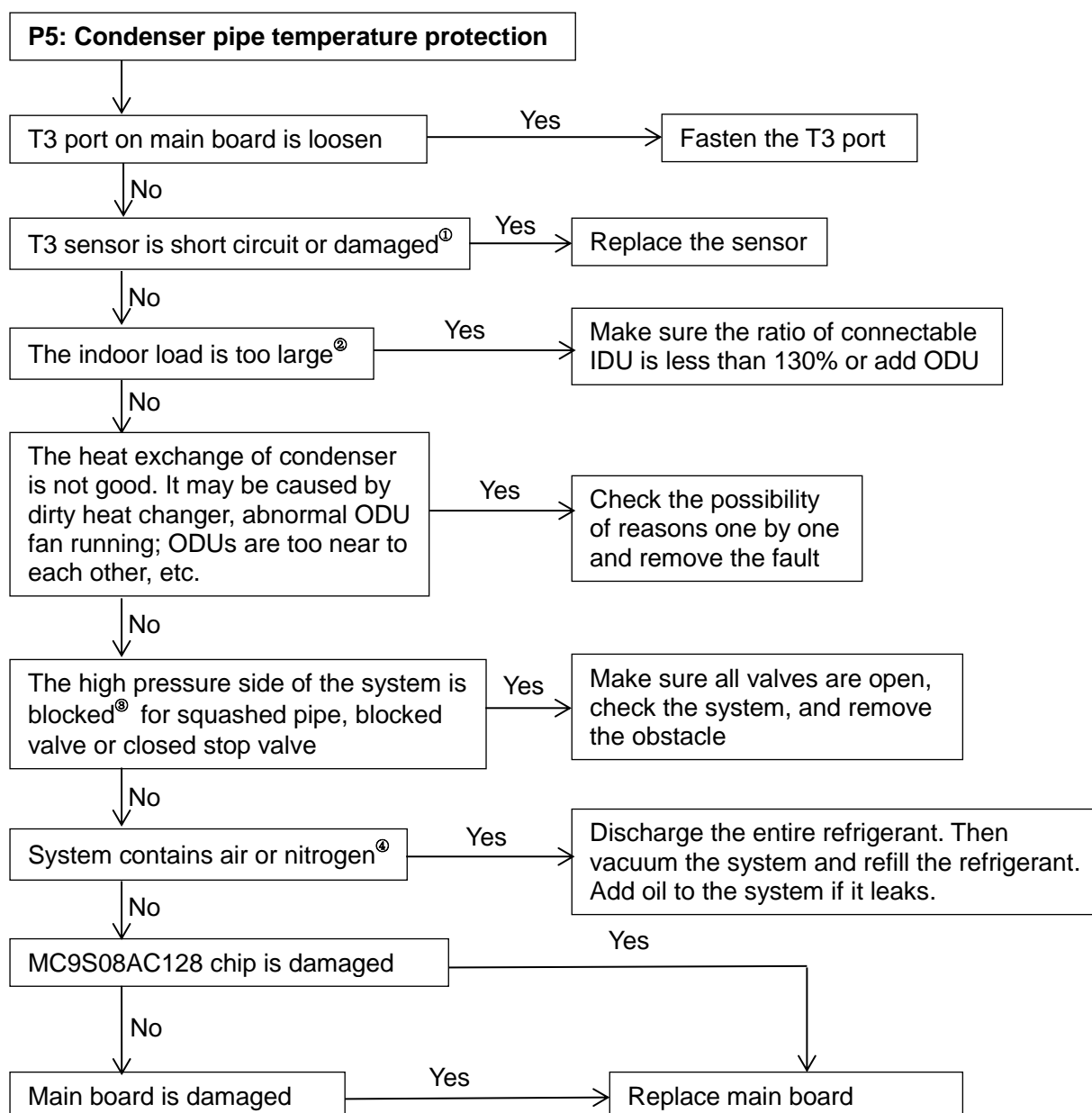
5. How to check whether compressor is error^⑤:

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.

5.15 P5: Condenser pipe temperature 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 the normal range, P5 disappear and normal operation resumes.



Note:

1. How to check whether the T3sensor is circuit or damaged^①:

Using a multi-meter 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 damaged

2. The phenomenon of the indoor load is too large^②:

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

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

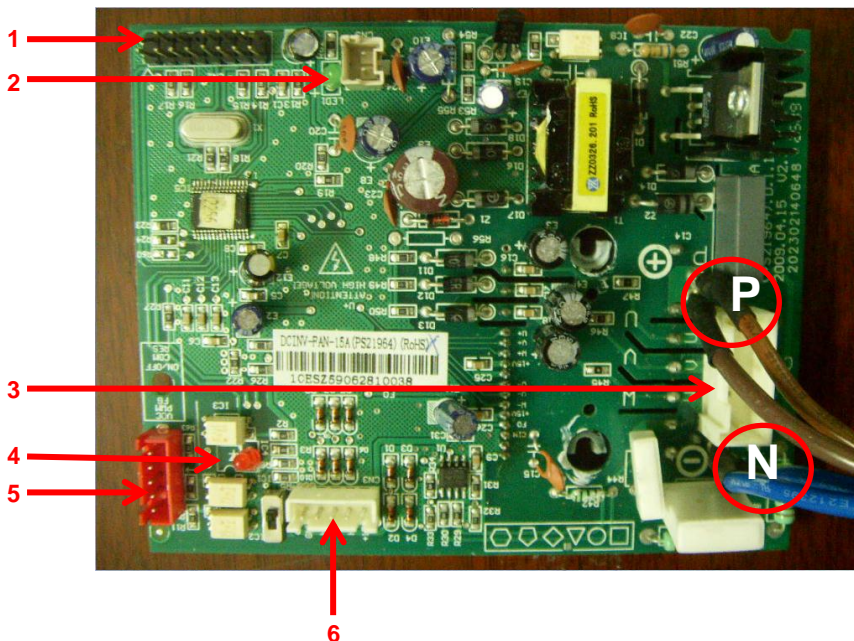
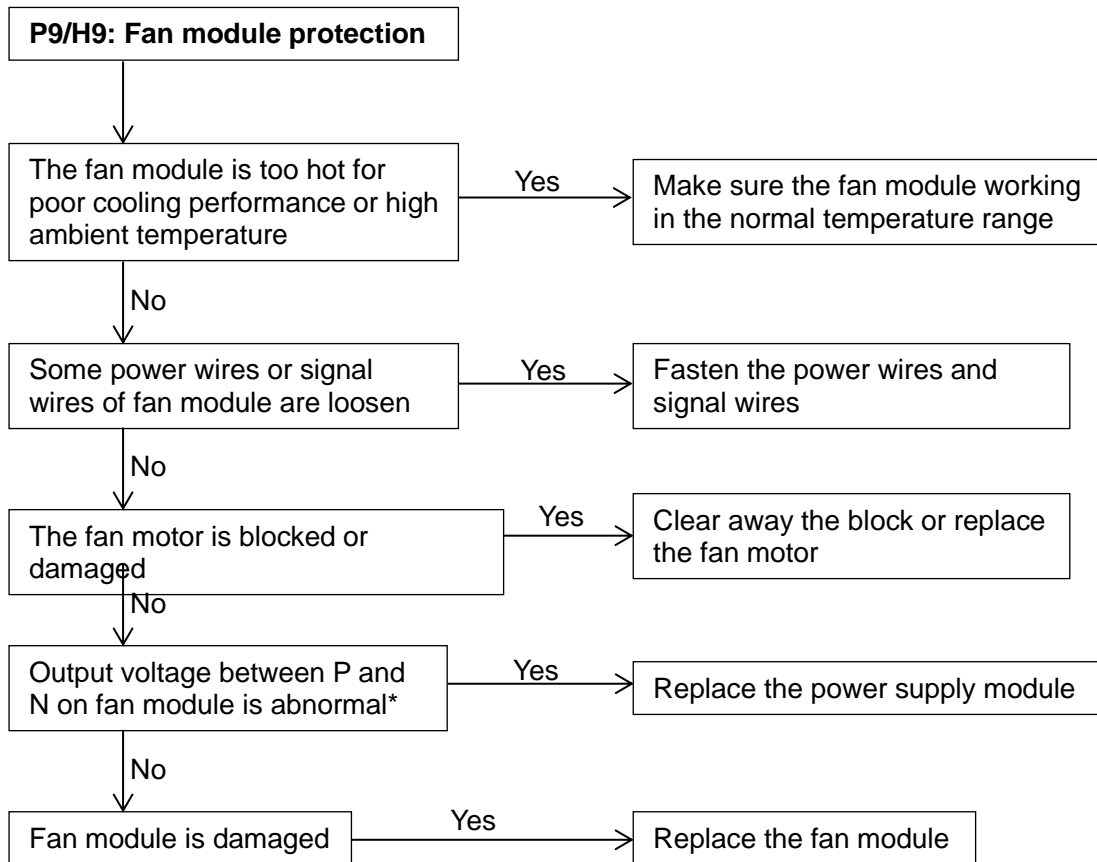
The high pressure is higher than normal value, the low pressure is lower than normal value, and the discharge temperature is higher than normal value.

4.The phenomenon of the system contains air or nitrogen^④:

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.

5.16 P9/H9: 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.



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

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

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 main board.

Attached table 1:
Resistance value of ambient temperature sensor and pipe temperature sensor

Temperature (°C)	Resistance value (kΩ)	Temperature (°C)	Resistance value (kΩ)	Temperature (°C)	Resistance value (kΩ)	Temperature (°C)	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 table2:
Resistance value of compressor discharge temperature sensor

Temperature (°C)	Resistance value (kΩ)	Temperature (°C)	Resistance value (kΩ)	Temperature (°C)	Resistance value (kΩ)	Temperature (°C)	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°C)=5KΩ±3%	
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		

Attached table3: 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	45-54
Discharge pressure (spot check)	MPa	2.2-2.5	2.6-3.0	2.9-3.4	3.3-3.8	3.5-4.1
Pressure of high pressure valve	MPa	1.8-2.2	2.4-2.7	2.6-3.0	3.1-3.5	3.3-3.8
Pressure of low pressure valve	MPa	0.7-0.9	0.8-1.0	0.8-1.1	1.0-1.3	1.0-1.5
Discharge temperature (spot check)	℃	50-65	70-85	70-90	80-90	80-98
Digital scroll compressor current (spot check)	A	2-7	2-8	2~11	3-12	3-13
Fixed compressor current (spot check)	A	6-7	7-8	8-10	9-11	9-12
Average temperature of evaporator outlet T2B	℃	8-9	12-15	16-17	18~21	20-25

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	2.5-3.0	2.6-2.7
Pressure of high pressure valve	MPa	1.7-1.8	1.8-2.4	2.3-2.7	2.1-2.4
Pressure of low pressure valve	MPa	2.0-2.2	2.2-2.6	2.5-3.0	2.5-2.7
Discharge temperature (spot check)	℃	50-70	60-70	60-85	60-70
DC Inverter compressor current (spot check)	A	2-8	2-9	2-10	2-9
Fixed compressor current (spot check)	A	6-8	6-8	6-9	8-9
Average temperature of condenser outlet T2	℃	33	33-40	46-50	39-41



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برترین نام و نشان های تجاری ایران

