

INVERTER VRF SYSTEM (I SERIES-SIDE DISCHARGE)



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

Troubleshooting

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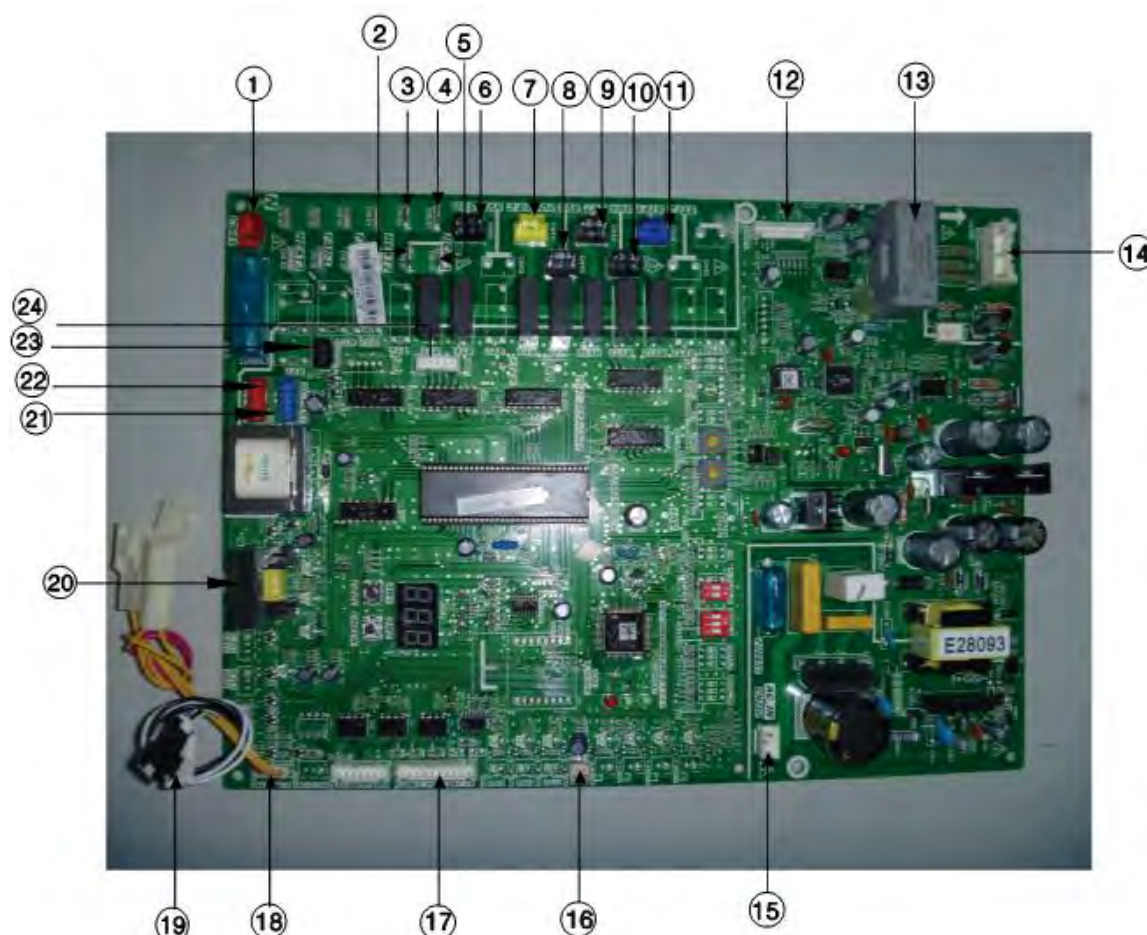
توجه:

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

215-02

1. Main PCB ports instructions

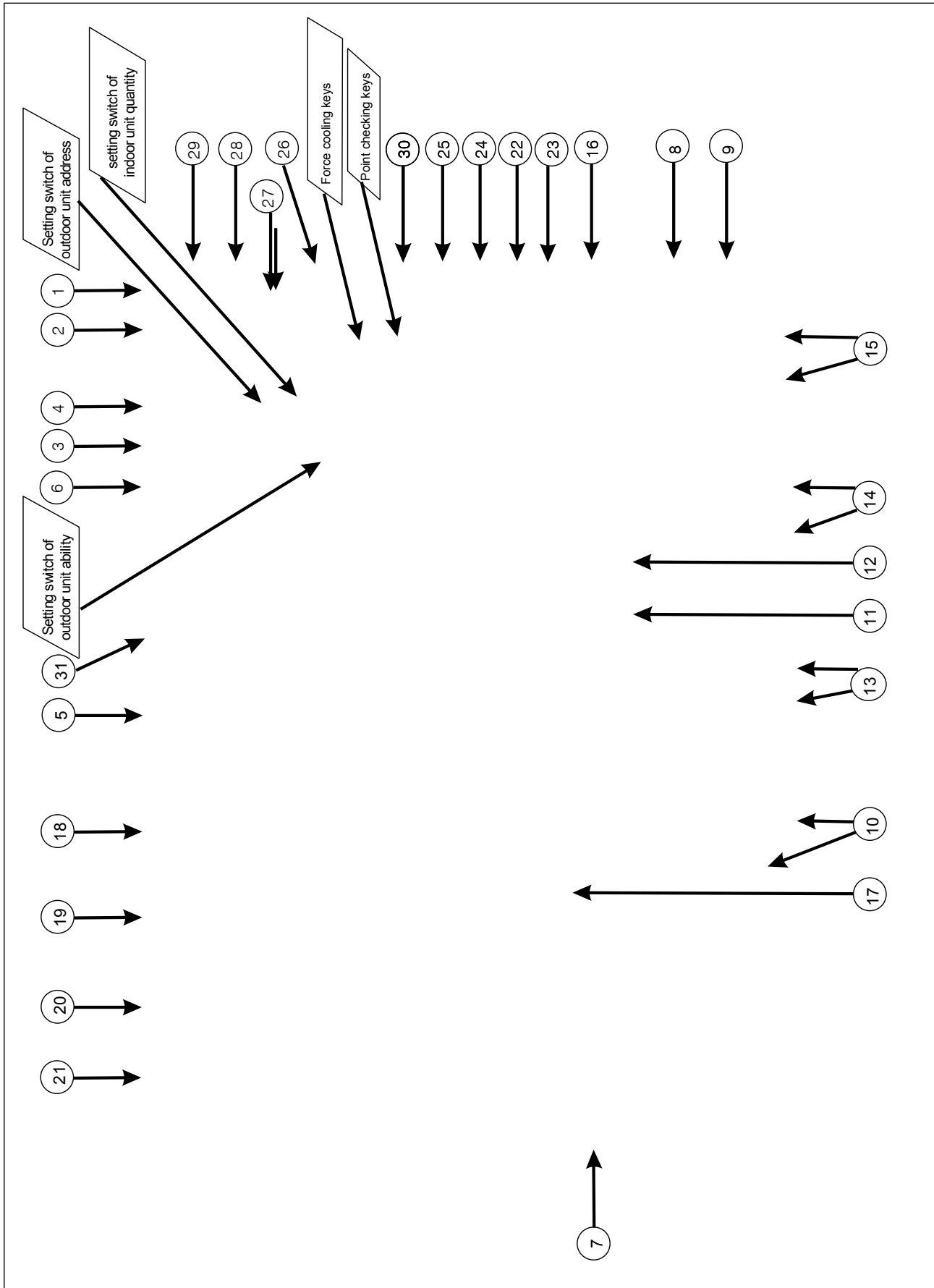
1.1 20/22.4/26kW models



Ports instructions:

No.	Content	Port voltage
1	Power input port of the main PCB	220V
2	Load output port (crankcase heater HAET 1&HEAT 2)	220V
3	Load output port	220V
4	Load output port	220V
5	Load output port	220V
6	Load output port (solenoid valve SV6 control)	220V
7	Load output port (contactor control POWER-C port)	220V
8	Load output port (solenoid valve SV2 control)	220V
9	Load output port (solenoid valve SV7 control)	220V
10	Load output port (solenoid valve SV4 control)	220V
11	Load output port (solenoid valve ST1 control)	220V
12	Inverter module drive port	The third pin on the left: DC3.3V Other pins: in dynamic change
13	Mutual inductor for DC main lead current inspection	In dynamic change
14	Voltage detection port of inverter module	DC540V, +15V, N
15	Power input port of the main PCB	220V
16	Discharge temperature detection port of inverter compressor	DC0~5V (in dynamic change)
17	Communication port	DC2.5~5V
18	Signal input port for high pressure and low pressure detection switch	DC0~5V (in dynamic change)
19	Outdoor ambient temperature detection port	DC0~5V (in dynamic change)
20	Current detection port	DC0~5V (in dynamic change)
21	Control port of DC fan 1	The right pin: +5V
22	Control port of DC fan 2	The right pin: +5V
23	Power output port of the main PCB	The first pin on the left: +12V
24	EXV drive port	The first pin on the left: DC12V The other four pins: in dynamic change

1.2 40/45kW models

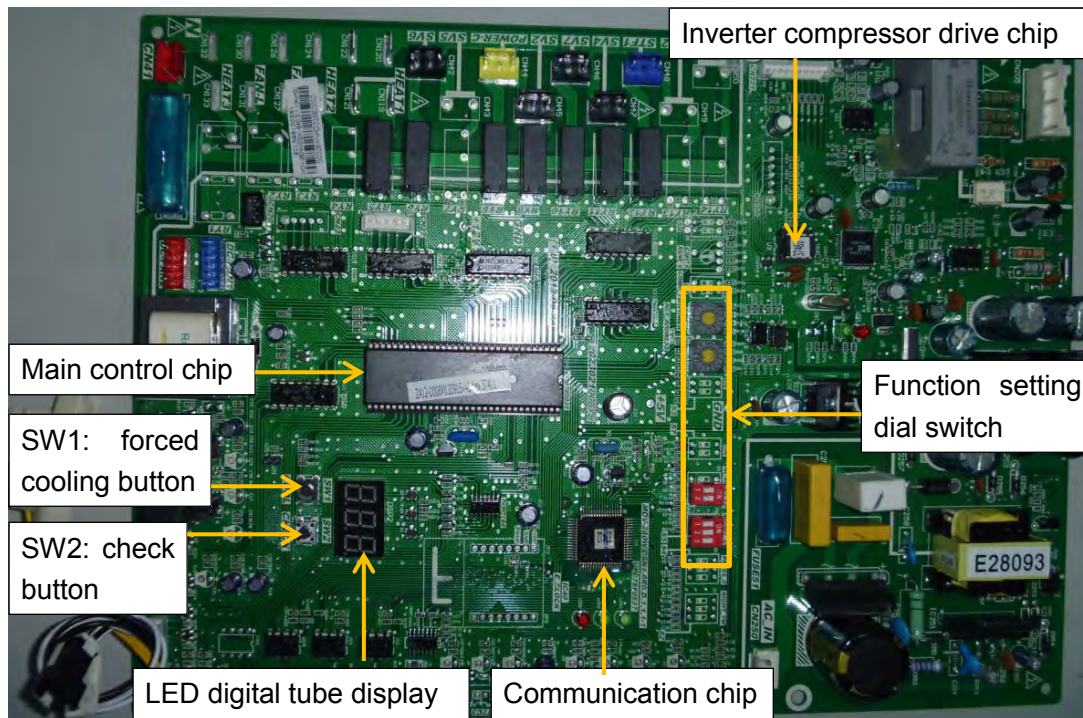


Ports instructions:

No.	Content	Port voltage
1	Discharge temp detection port of inverter compressor A	DC 0~5V (in dynamic change)
2	Discharge temp detection port of inverter compressor B	DC 0~5V (in dynamic change)
3	Temp detection port of inverter module radiator	DC 0~5V (in dynamic change)
4	Reserved	/
5	Reserved	/
6	Wiring port for communication between indoor and outdoor units, indoor unit network and network accounting	DC 2.5~2.7V
7	Phase-sequence detection port	380V
8	Power supply port of No. 1 transformer	220V
9	Power supply port of No. 2 transformer	220V
10	Load output port	220V
11	Drive port of EXVA	The first pin on left: DC 12V The other four pins: in dynamic change
12	Drive port of EXVB	
13	Load output port	220V
14	Load output port	220V
15	Load output port	220V
16	Power output port of No.1 transformer	AC 13.5V (between upper two pins) AC 9V (between under two pins)
17	Power output port of No.2 transformer	AC 14.5V (between upper two pins) AC 14.5V (between under two pins)
18	Drive port of inverter module B	The third pin on left: DC 3.3V
19	Voltage detection port of inverter module B	DC 540V (between P and N), +DC 15V (between +15V and N)
20	Voltage detection port of inverter module A	DC 540V (between P and N), +DC 15V (between +15V and N)
21	Drive port of inverter module A	The third pin on left: DC 3.3V
22	Signal input port for system low pressure detection switch	DC 0~5V (in dynamic change)
23	Signal input port for system high pressure detection switch	DC 0~5V (in dynamic change)
24	Reserved	/
25	Reserved	/
26	Temperature detection port of ambient temp and condenser temp	DC 0~5V (in dynamic change)
27	Reserved	/
28	Control port of DC fan 1	The right pin: +5V
29	Control port of DC fan 2	The right pin: +5V
30	Current detection port of inverter compressor A and B	AC 0~7.8V (in dynamic change)
31	PCB power supply port	+5V(between GND and 5V pins) +12V(between GND and 12V pins)

2. Main PCB parts instructions

2.1 20/22.4/26kW models



2.1.1 Check content instructions (SW2)

No.	Display content	Display content	Note
		Normal display*1	/
1	0--	Capacity of this outdoor unit	7HP, 8HP, 10HP
2	1--	Total capacity requirements of indoor units	Actual value
3	2--	Revised total capacity requirements of outdoor unit	Actual value
4	3--	Operating mode*2	0, 2, 3, 4
5	4--	Fan speed*3	0, 1, 2, 3, 4, 5, 6, 7, 8, 9
6	5--	Average temperature of T2B/T2	Actual value
7	6--	T3 pipe temperature	Actual value
8	7--	T4 ambient temperature	Actual value
9	8--	Discharge temperature of inverter compressor	Actual value
10	9--	Discharge temperature of fixed compressor (reserved)	0
11	0--	Surface temperature of radiator (reserved)	0
12	1--	Open degree of EXV	Actual value=display×8
13	2--	Current of inverter compressor	Actual value
14	3--	Current of fixed compressor (reserved)	0
15	4--	Discharge pressure (reserved)	0
16	5--	Priority mode*4	0, 1, 2, 3, 4
17	6--	Total quantity of indoor units	Actual value
18	7--	Quantity of running units	Actual value
19	8--	The last error or protection code	Display 00 if it has no error or protection code
20	9--	--	Check over

Note:

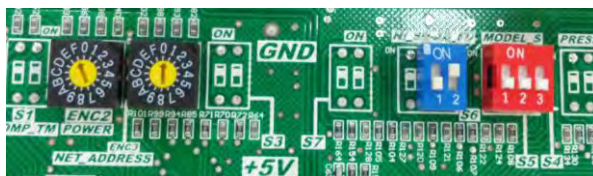
*1: Display compressor frequency when system is running and display the quantity of indoor unit which communicate with outdoor unit when system is standby.











*2: Operating mode: 0 – standby mode; 2 – cooling mode; 3 – heating mode; 4 – forced cooling.

*3: Fan speed: 0 – fan stop; 1~9 – speed increase sequentially; 9 – the maximum fan speed.

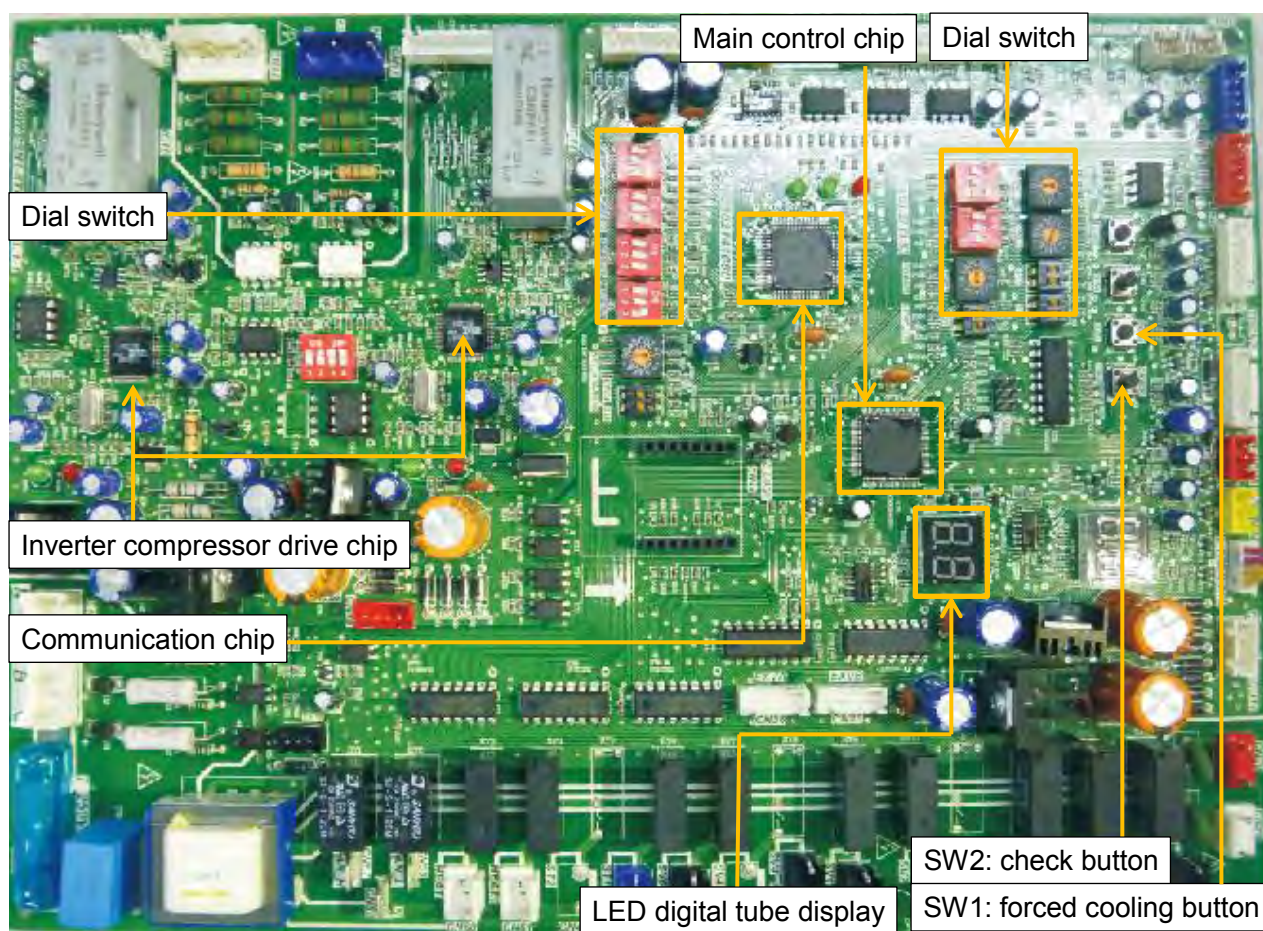
*4: Priority mode: 0 – heating priority; 1 – cooling priority; 2 – first running mode priority; 3 – only respond heating mode; 4 – only respond cooling mode.

2.1.2 System setting dial switches instructions



ENC2: Outdoor unit capacity setting	
ENC2 	Outdoor unit capacity setting: 0-2 are available (capacity code 0—20kW; capacity code 1—22.4kW); capacity code 2—26kW)
ENC3: Quantity of indoor units setting	
ENC3 	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.
S5: Locking modes selection	
	Heating priority mode (factory default)
	Cooling priority mode
	No.63 indoor unit running mode priority when there has No.63 indoor unit or larger capacity requirement priority when there has on No.63 indoor unit
	Only response to heating mode
	Only response to cooling mode
S6: Addressing mode selection	
	Auto addressing mode
	Manual addressing mode (factory default)
	Clean the indoor unit address (only available for auto searching new indoor unit)

2.2 40/45kW models



2.2.1 Query content instructions

No.	Normal display	Content (present frequency)	Note
1	0.- -	Outdoor unit address	0 (individual type)
2	1.- -	Outdoor unit capacity setting	Refer to note 1
3	2.- -	Outdoor unit quantity	Reserved
4	3.- -	Setting quantity of indoor units	Actual value=display value
5	4.- -	Total capacity of outdoor units	Capacity requirement
6	5.- -	Total capacity requirement of indoor units	Actual value=display value
7	6.- -	Revised total capacity requirements of outdoor unit	Actual value=display value
8	7.- -	Running mode	Refer to note 2
9	8.- -	Actual running capacity of this outdoor unit	Capacity requirement
10	9.- -	No.1 fan speed ³	Refer to note 3
11	10.- -	No.2 fan speed ³	Refer to note 3
12	11.- -	T2B/T2 average temperature	Actual value=display value
13	12.- -	T3 pipe temperature	Actual value=display value
14	13.- -	T4 ambient temperature	Actual value=display value
15	14.- -	Discharge temperature of No. 1 inverter compressor	Actual value=display value
16	15.- -	Discharge temperature of No. 2 inverter compressor	Actual value=display value
17	16.- -	Reserved	/
18	17.- -	Current of No. 1 inverter compressor	Actual value=display value
19	18.- -	Current of No. 2 inverter compressor	Actual value=display value
20	19.- -	EXVA opening degree	Pulsed value=display value×8
21	20.- -	EXVB opening degree	Pulsed value=display value×8
22	21.- -	High pressure	Reserved

23	22.- -	T3B	/
24	23.- -	Indoor units quantity	Actual value=display value
25	24.- -	Running indoor units quantity	Actual value=display value
26	25.- -	Mode priority ⁴	Refer to note 4
27	26.- -	Silent mode ⁵	Refer to note 5
28	27.- -	Static pressure mode ⁶	Refer to note 6
29	28.- -	DC voltage A	Actual value=display value×10
30	29.- -	DC voltage B	Actual value=display value×10
31	30.- -	Reserved	/
32	- -	Reserved	/
33	- -	- -	Over

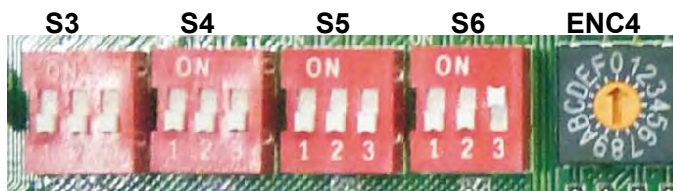
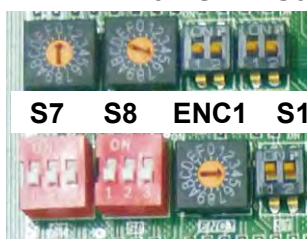
Note:

When the outdoor unit is in standby, the LED digital tube will display the indoor unit's quantity which can communicate with outdoor unit, and it will display inverter compressor running frequency when there has capacity requirement.





















1. Outdoor unit capacity setting: capacity code4—40kW; capacity code 5—45kW;
2. Running mode: 0—closed; 2—cooling mode; 3—heating mode; 4—forced cooling mode.
3. Fan speed: 0—closed; 1~10—fan speed increase in sequence.
4. Mode priority: 0—heating priority; 1—cooling priority; 2—No.63 indoor unit running mode priority when there has No.63 indoor unit or larger capacity requirement priority when there has on No.63 indoor unit; 3—only response to heating; 4—only response to cooling.
5. Silent mode: 0—nighttime silent mode; 1—silent mode; 2—reserved; 3—no silent mode.
6. Static pressure mode: 0—no static pressure; 1—low static pressure; 2—medium static pressure; 3—high static pressure.




2.2.2 System setting dial switches instructions

ENC1 ENC3 S12 S3



ENC2: Outdoor unit capacity setting	
ENC2 	Outdoor unit capacity setting: 4-5 are available (capacity code4—40kW; capacity code 5—45kW)
ENC3+S12: Quantity of indoor units setting	
ENC3 	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.
ENC3 	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.
ENC3 	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.
ENC3 	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.
S3: Silent mode selection	
S3 	Nighttime silent mode (factory default)
S3 	Silent mode

	Super silent mode
	No silent mode
S1: Starting time setting	
	Starting time is 5 minutes
	Starting time is 12 minutes (factory default)
S2: Night silent time selection	
	Nighttime silent time 6h/10h (factory default)
	Nighttime silent time 6h/12h
	Nighttime silent time 8h/10h
	Nighttime silent time 8h/12h
S4: Static pressure mode selection	
	No static pressure mode (factory default)
	Low static pressure mode (should be customized)
	Medium static pressure mode (should be customized)
	High static pressure mode (should be customized)
S5: Locking modes selection	
	Heating priority mode (factory default)
	Cooling priority mode
	No.63 indoor unit running mode priority when there has No.63 indoor unit or larger capacity requirement priority when there has on No.63 indoor unit
	Only response to heating mode
	Only response to cooling mode
S6: Addressing mode selection	
	Auto addressing mode
	Manual addressing mode (factory default)
	Clean the indoor unit address (only available for auto searching new indoor unit)

S7: ON/OFF for indoor unit quantity setting function	
	Indoor unit quantity setting function is open (factory default)
	Indoor unit quantity setting function is closed
ENC4: Outdoor unit network address setting	
	Outdoor unit network address setting (0-7 is effective)

3. Error code table

Error code	Content	Note
E1	Phase sequence error	
E2	Indoor units and master unit communication error	
E4	Pipe temp T3/ambient temp T4 sensor error	
E5	Voltage error	
E6	DC fan motor error	
E7	Discharge temp sensor error	
EA	T3 pipe temperature protection in heating mode	
EB	E6 protection appears twice in 10 minutes	
H0	Communication error between main control chip and module chip	
H1	Communication error between main control chip and communication chip	
H4	P6 protection appears three times in 60 minutes	
H5	P2 protection appears three times in 60 minutes	
H6	P4 protection appears three times in 100 minutes	
H7	Quantity of indoor units decrease	
H8	High pressure sensor error	
H9	P9 protection appears three times in 60 minutes	
P0	Top temperature protection of inverter compressor	
P1	High pressure protection	
P2	Low pressure protection	
P3	Current protection of inverter compressor	
P4	Discharge temperature protection	
P5	Pipe temperature protection	
P6	Module protection (don't display)	
P8	Typhoon protection	
P9	Module protection of DC fan	
PL	Temperature protection of inverter module	Only available for 40-45kW models
C7	PL protection appears three times in 100 minutes	
L0	Inverter module error	
L1	Low voltage protection of DC generatrix	
L2	High voltage protection of DC generatrix	
L3	Reserved	
L4	MCE error/ synchronization/ closed loop	

L5	Zero speed protection	
L6	Reserved	
L7	Phase sequence error	
L8	Frequency difference in one second more than 15Hz protection	
L9	Frequency difference between the real and the setting frequency more than 15Hz protection	

Note: P6, L0~L9 error codes can't display on digital tube automatically, these error codes will display on digital tube only through SW3 button (press SW3 ten times, every one second for a time)

The large capacity V4+ individual system (56-90kW) have the function of refrigerant volume automatic judgment.

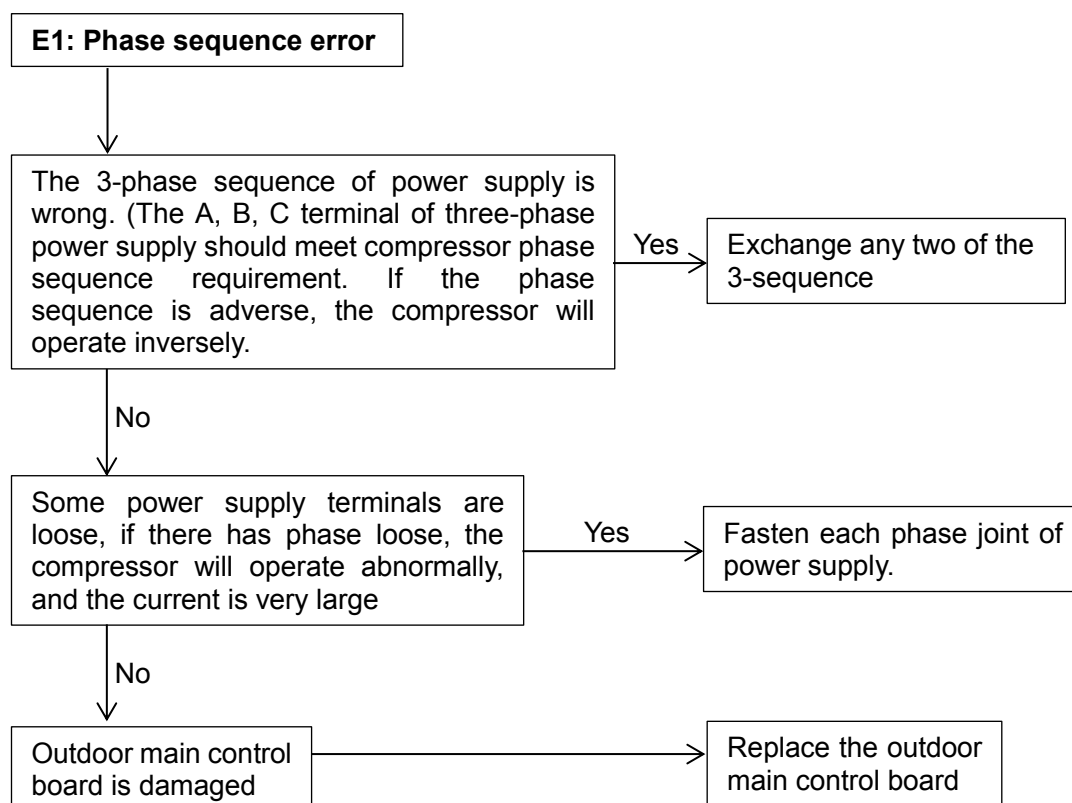
When all the indoor units are in cooling or heating mode, the system will be in refrigerant volume judgment mode automatically. If the system judges that the refrigerant volume is normal, the system will operate normally, no error code will display. If the system judges that the refrigerant volume is abnormal, corresponding error code will display on digital tube.

When only partial indoor units are in cooling or heating mode, the system will not judge the refrigerant volume and the digital tube will reserve the last judging result.

Error code	Content
r1	Lack of refrigerant
r2	Obvious lack of refrigerant
r3	Serious lack of refrigerant
R1	Too much refrigerant
R2	Serious too much refrigerant

4. Troubleshooting

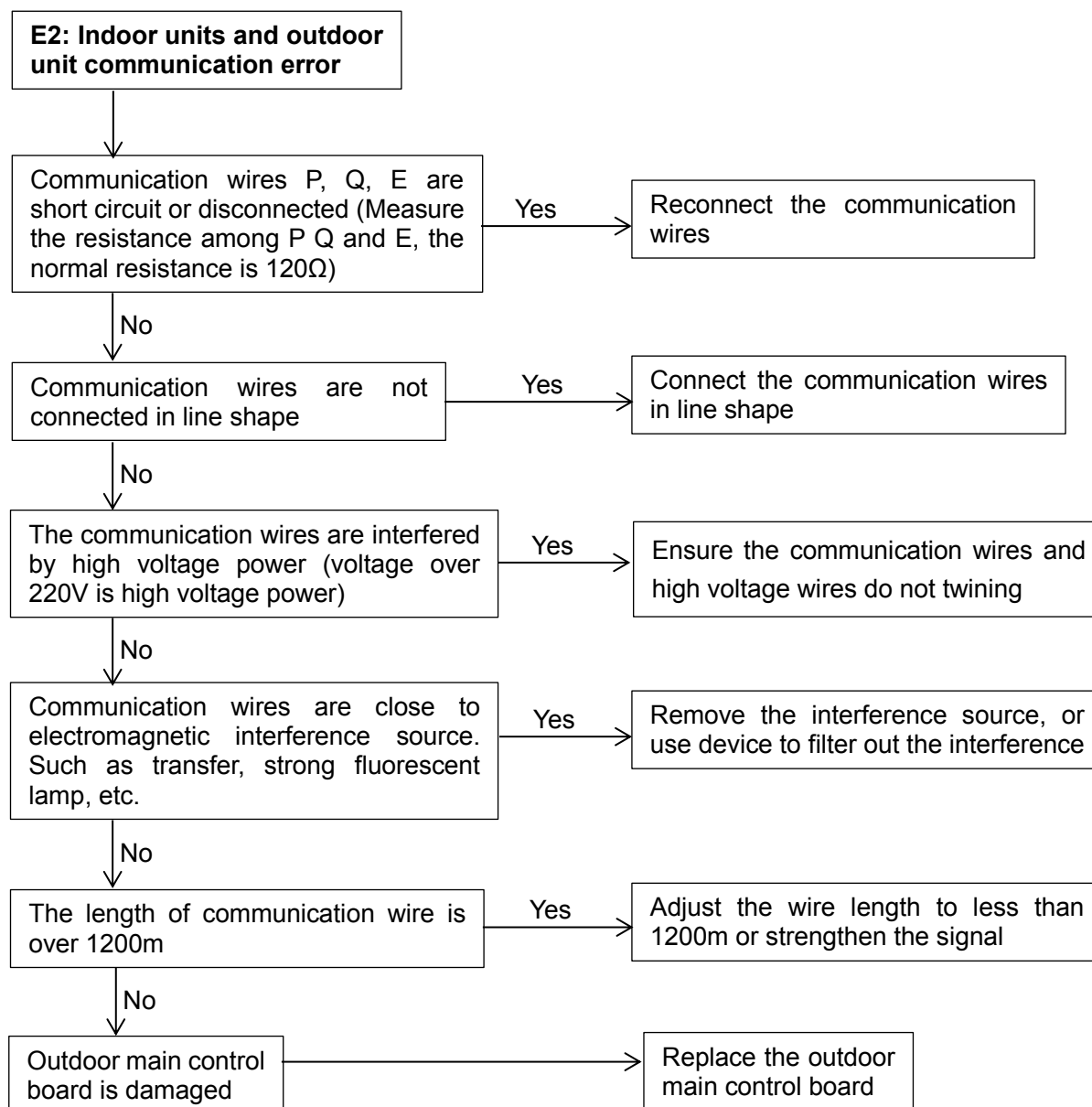
4.1 E1: Phase sequence error



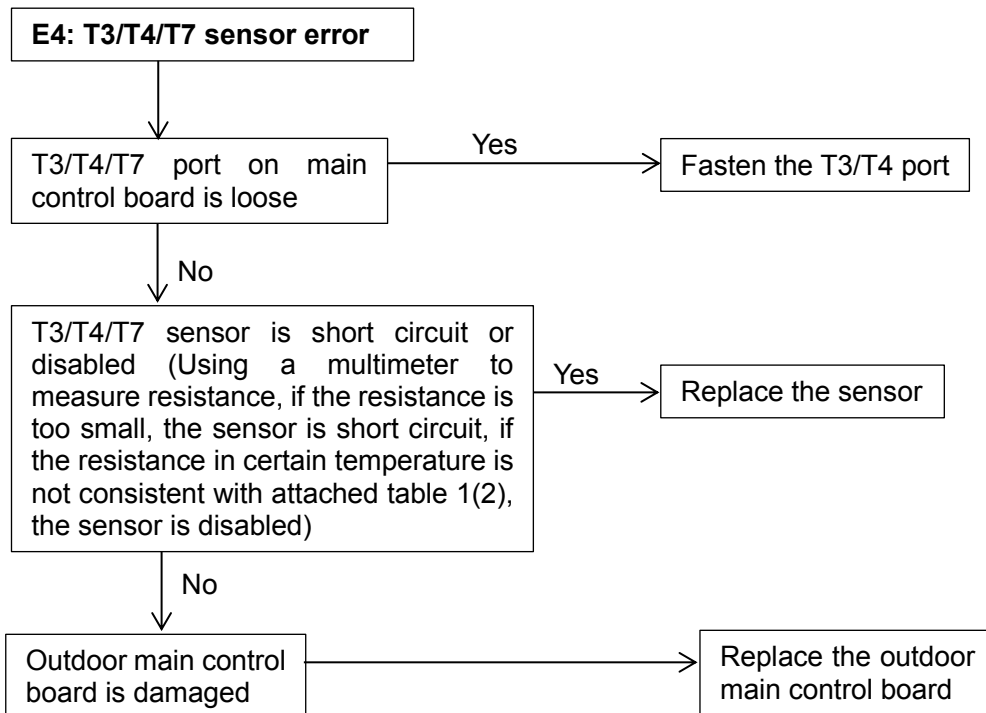
Note:

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.

4.2 E2: Indoor units and outdoor unit communication error



4.3 E4: Pipe temp T3/ambient temp T4 sensor error; E7: Discharge temp sensor T7 error



Case: There is no display on main control board, and the problem still exists after replacing main control 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:

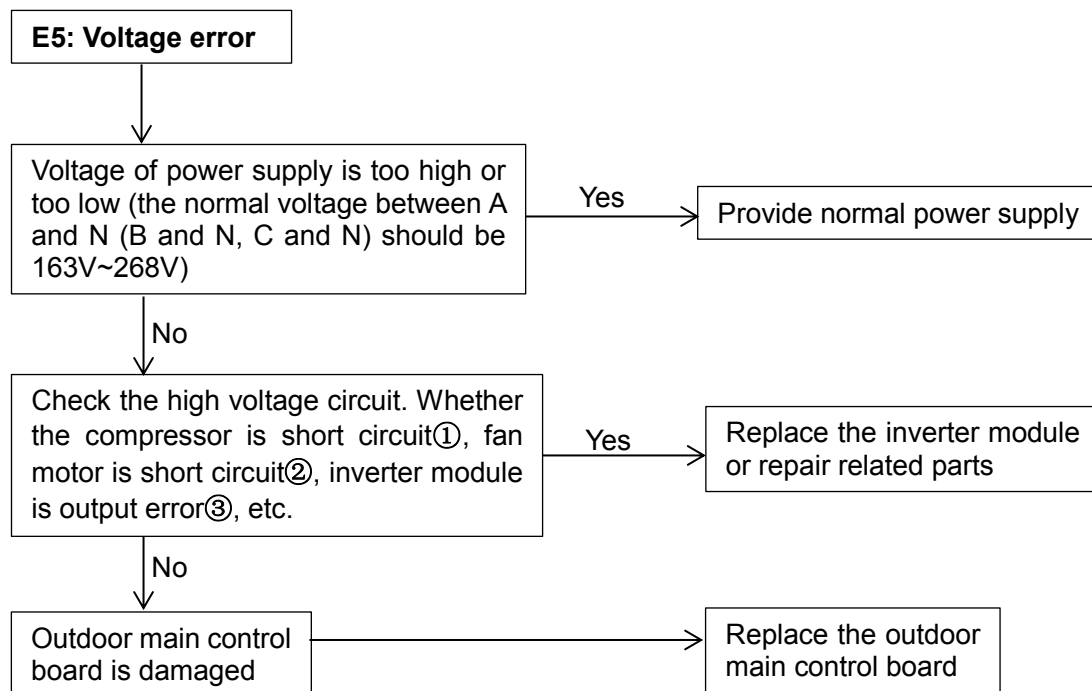


T4 sensor is worn out and connected with sheet metal



After being reconnected, the system becomes normal

4.4 E5: Voltage error



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.

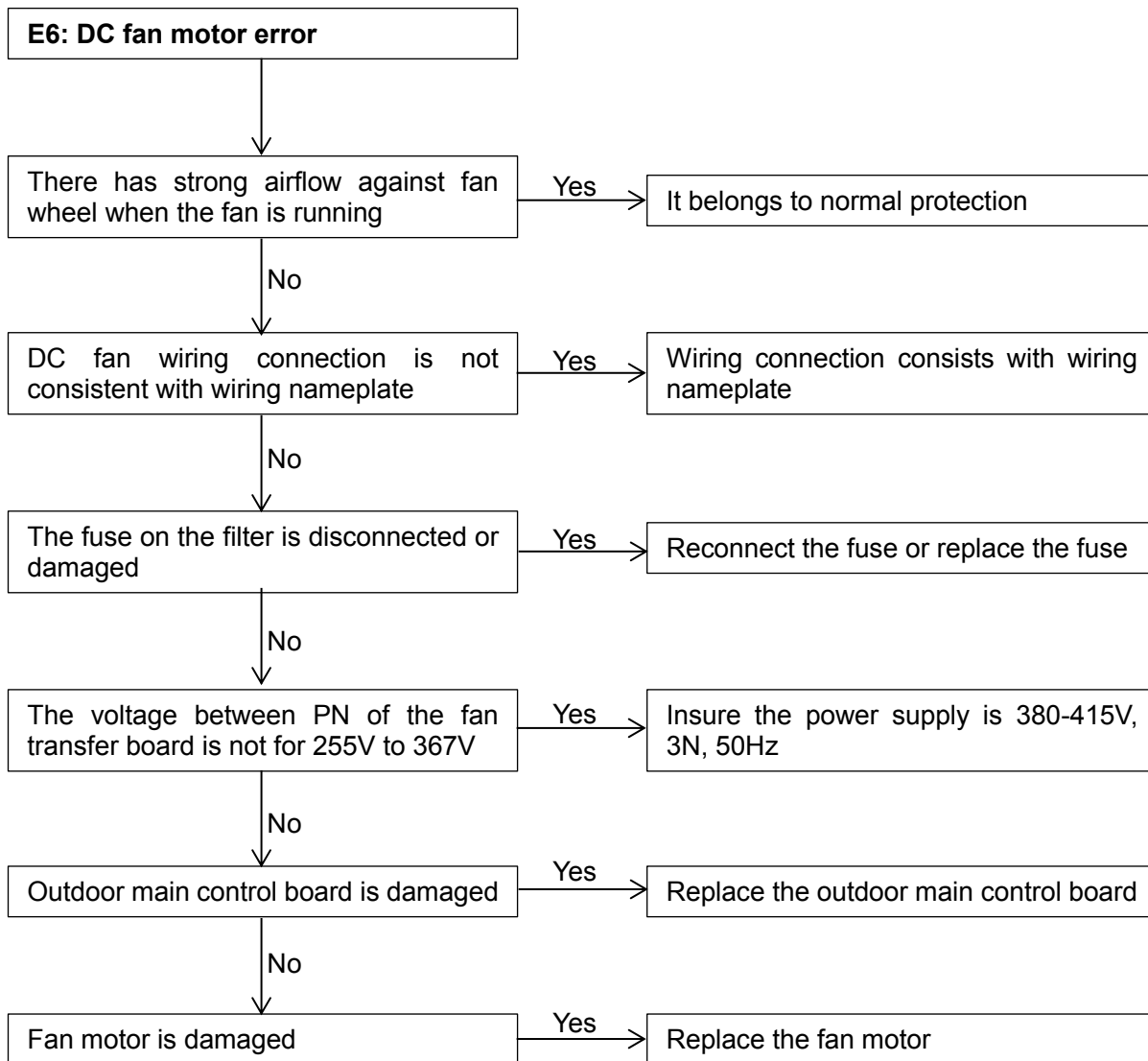
2. How to check whether the fan motor is short circuit②:

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:

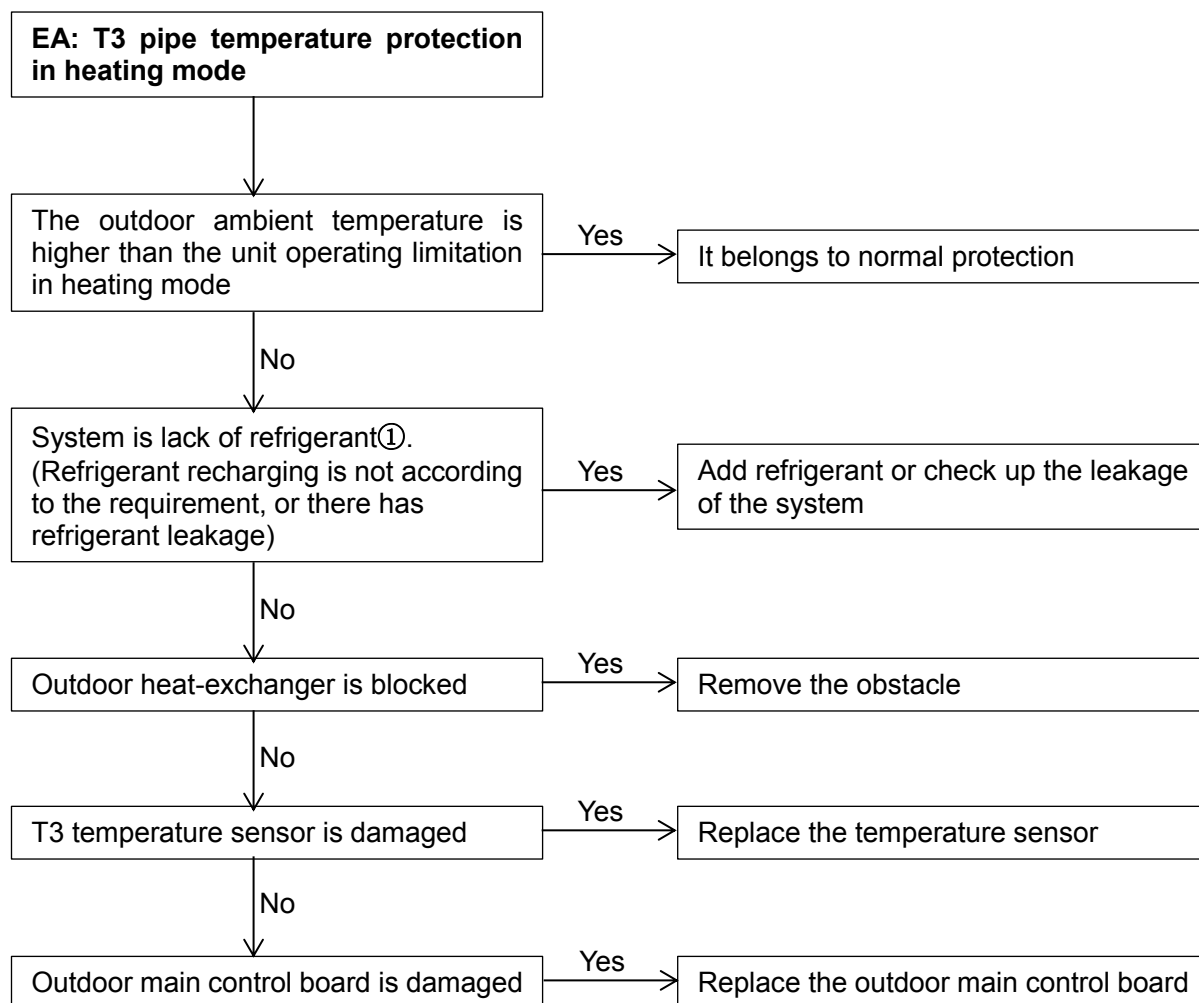
Dial the multimeter to diode file, black pen on P and red pen respectively on U,V,W, if the multimeter displays 0.4~0.7 V, it is normal; Red pen on N, black pen respectively on U,V,W, if the multimeter displays 0.4~0.7 V, it is normal. Satisfying the above two conditions at the same time indicates that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

4.5 E6: DC fan motor error; EB: E6 protection appears twice in 10 minutes



4.6 EA: T3 pipe temperature protection in heating mode

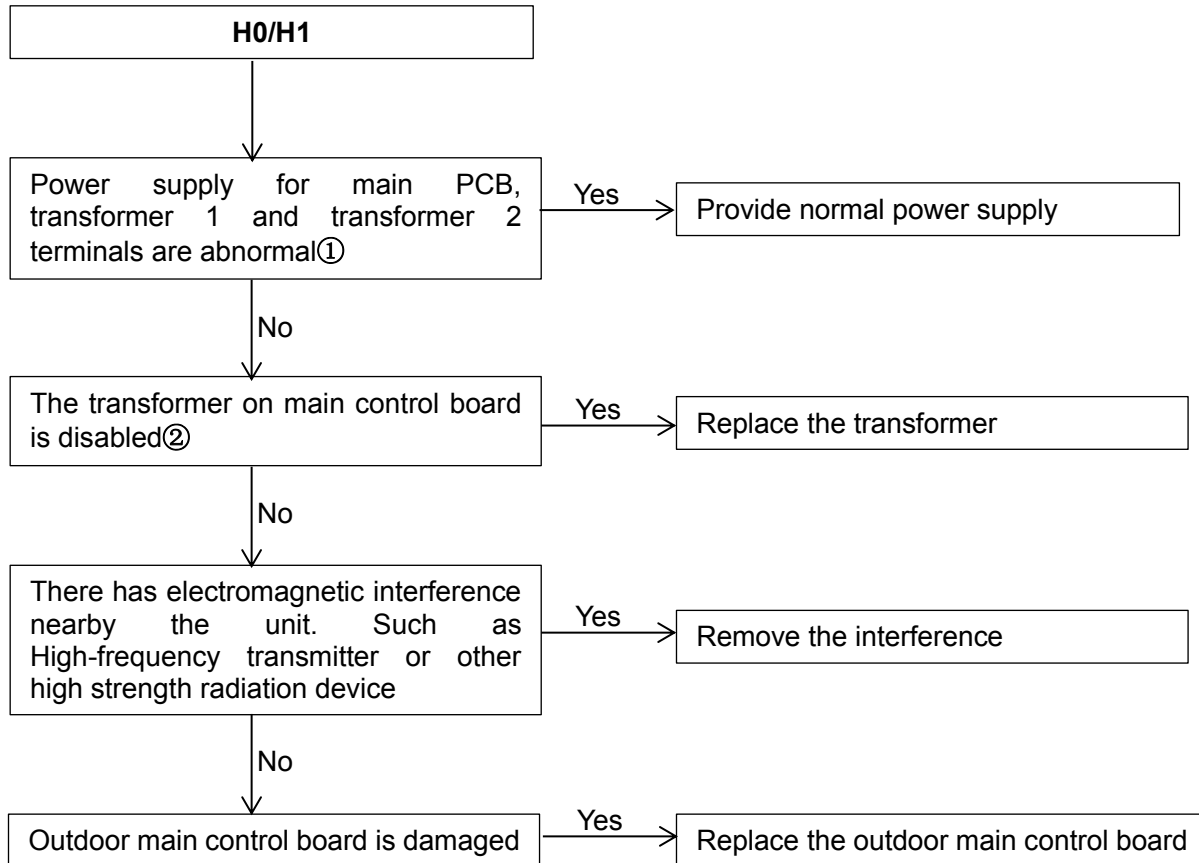
When T3 pipe temperature exceeds 27°C lasting for five minutes in heating mode, the unit will display EA error.



1. 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.

4.7 H0: Communication error between main control chip and module chip; H1: Communication error between main control chip and communication chip



Note:

1. How to check whether power supply of main PCB, transformer 1 and transformer 1 terminals are abnormal①

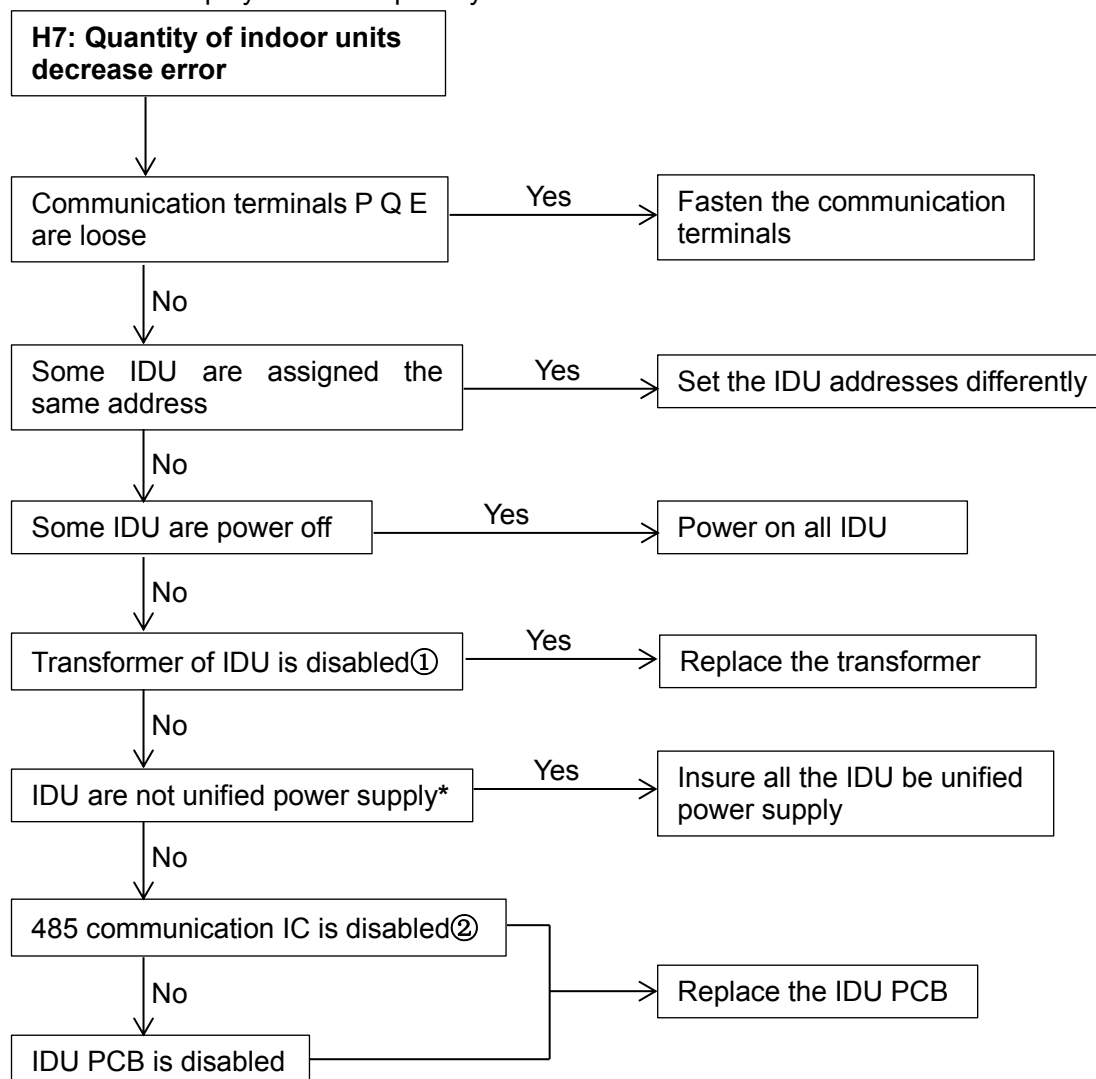
The voltage of power supply for transformer 1 and transformer 1 terminals are both 220V, the voltage between “GND” and “+5V” terminals of Power supply for main PCB ports is 5V, and between “GND” and “+12V” terminals of Power supply for main PCB ports is 12V.

2. How to check whether the transformer on main control board is disabled②

The voltage of power supply for transformer 1 and transformer 2 terminals are both 220V, the voltage of transformer 1 output terminals is AC9V (between left two pins) and AC13.5V (between rights two pins); the voltage of transformer 2 output terminal is AC14.5V (between left two pins) and AC 14.5V (between rights two pins). If the voltage is out of the range, the transformer is disabled.

4.8 H7: Quantity of indoor units decrease error

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



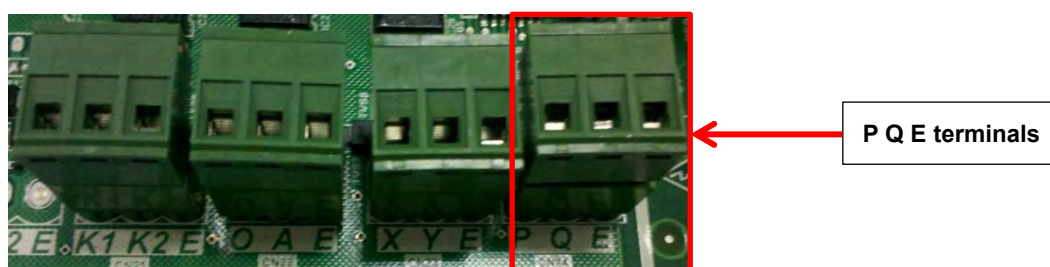
Note:

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

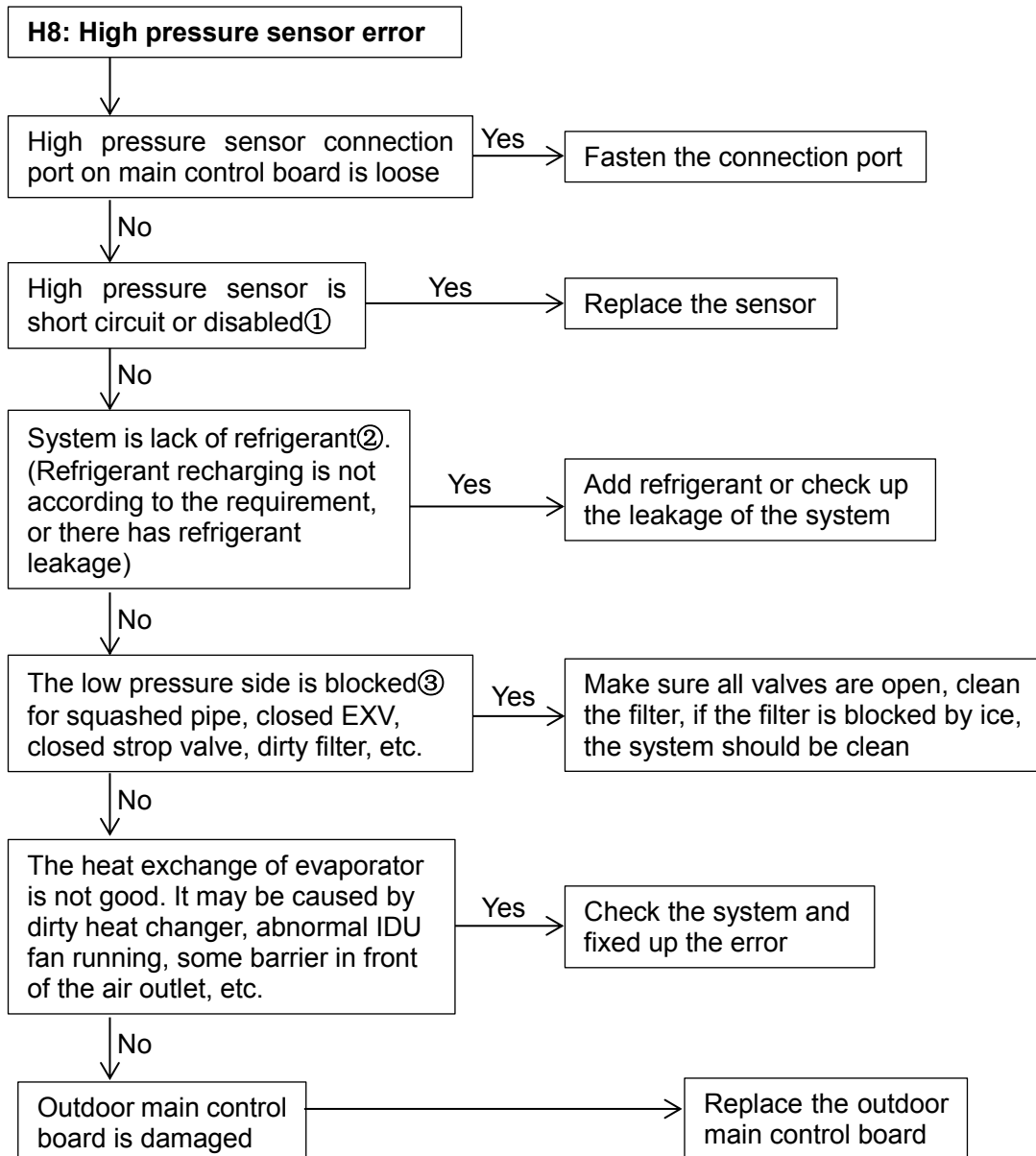
The normal voltage between “P” and “GND” is DC2.5~2.7V, between “Q” and “GND” is DC2.5~2.7V. If the voltage is out of the normal range, the 485 communication IC is disabled.



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

4.9 H8: High pressure sensor error

When the discharge pressure is lower than 0.3MPa, the system will display H8 error, the ODU in standby. When the discharge pressure is back to normal, H8 disappears and normal operation resumes.



Note:

1. How to check whether the high pressure sensor is short circuit or disabled①

Measure the resistance among the three terminals of the pressure sensor, if the resistance value is megohm or infinite, the pressure sensor is disabled, otherwise, it may be normal.

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.

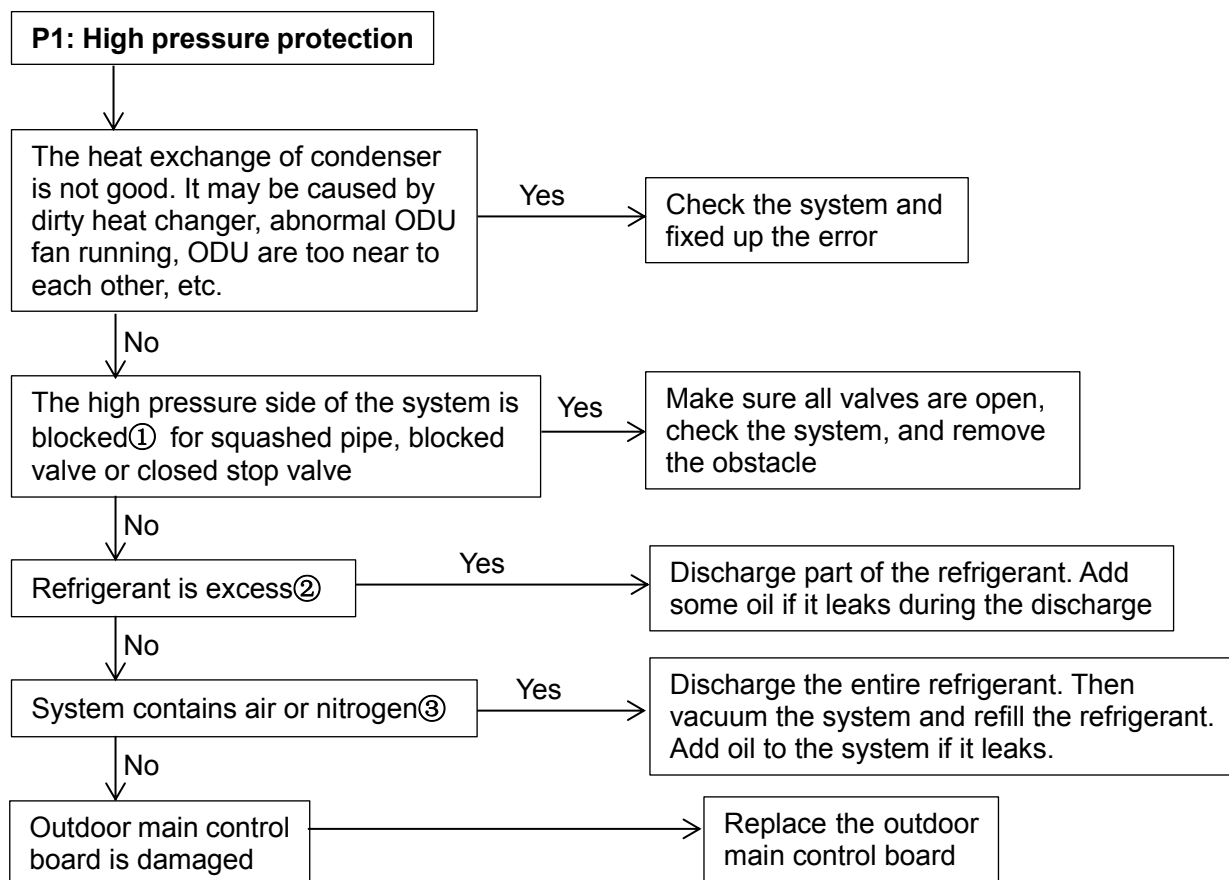
3. The phenomenon of the low pressure side is blocked③:

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.

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

4.10 P1: High pressure protection

When the pressure is over 4.4MPa, the system will display P1 protection, 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.

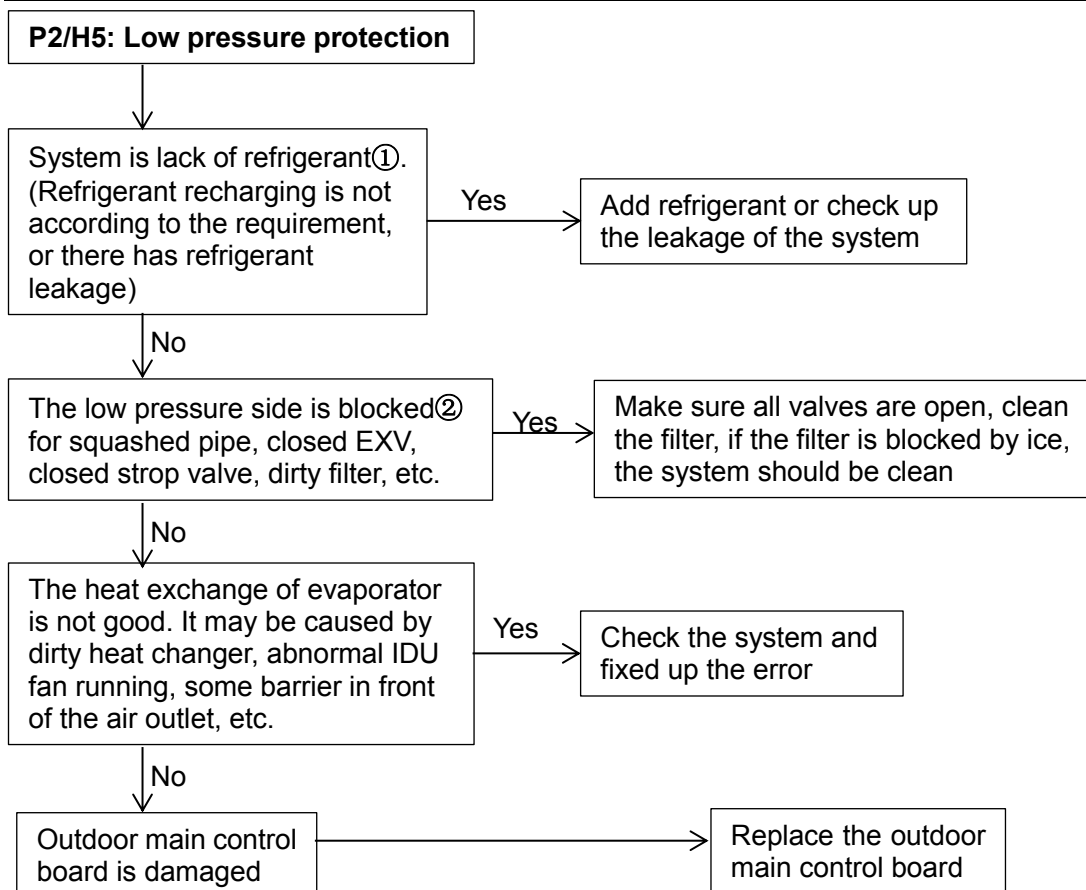
*If the system install three-phase protector, and the three-phase protector connect with high pressure switch in series connection, the system will display P1 protection when fist power on, and P1 protection will disappear after system is steady.

*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.

4.11 P2/H5: Low pressure protection

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

H5 error will display when system appear 3 times P2 protection in 60 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.

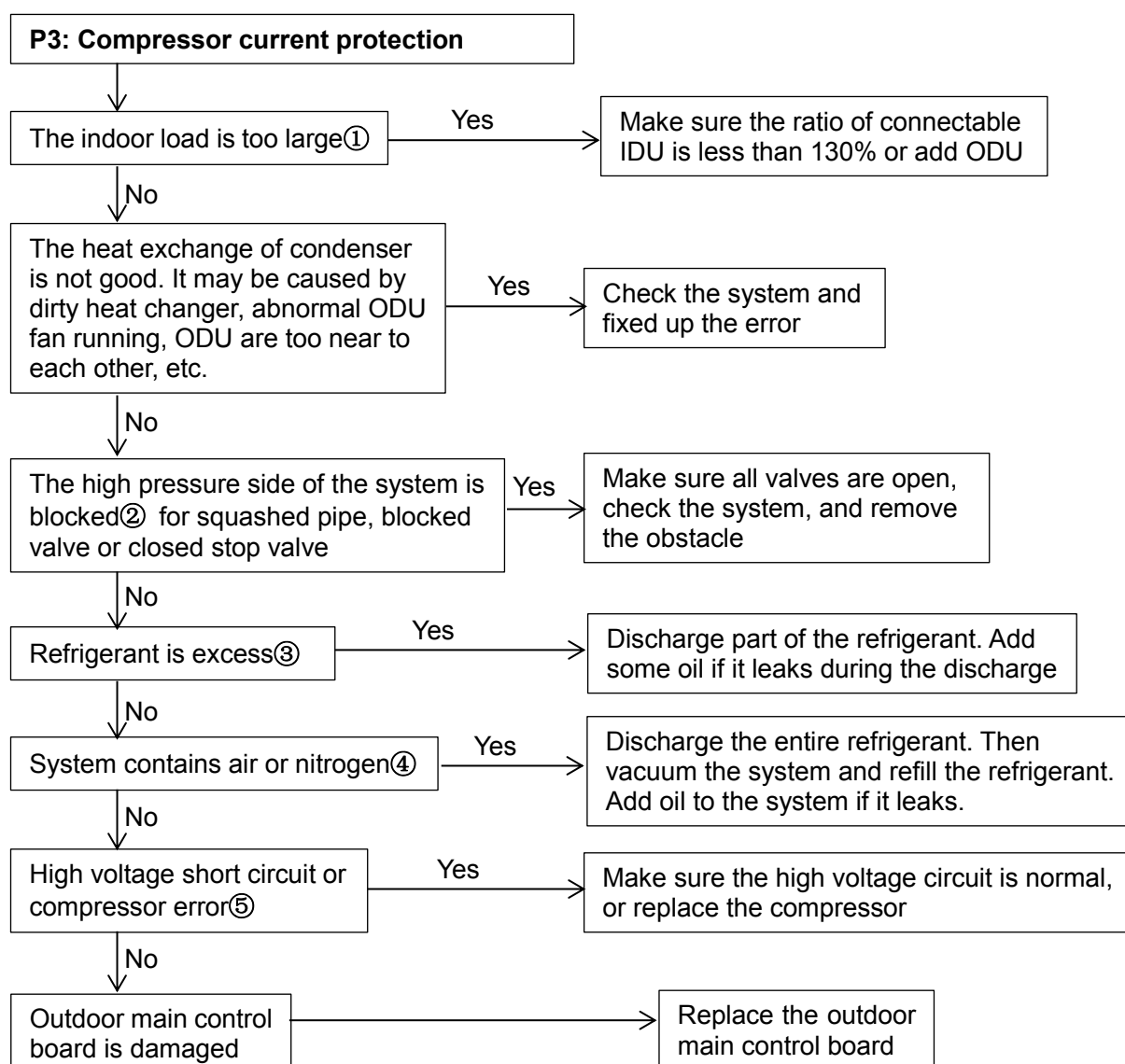
*The normal system running parameters please refer to attached table 3.

*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.

4.12 P3: Current protection of inverter compressor

P3: When the current of inverter compressor is over 12A, the system will display P3 protection, the ODU in standby. When the current goes back to normal range, P3 disappears 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.

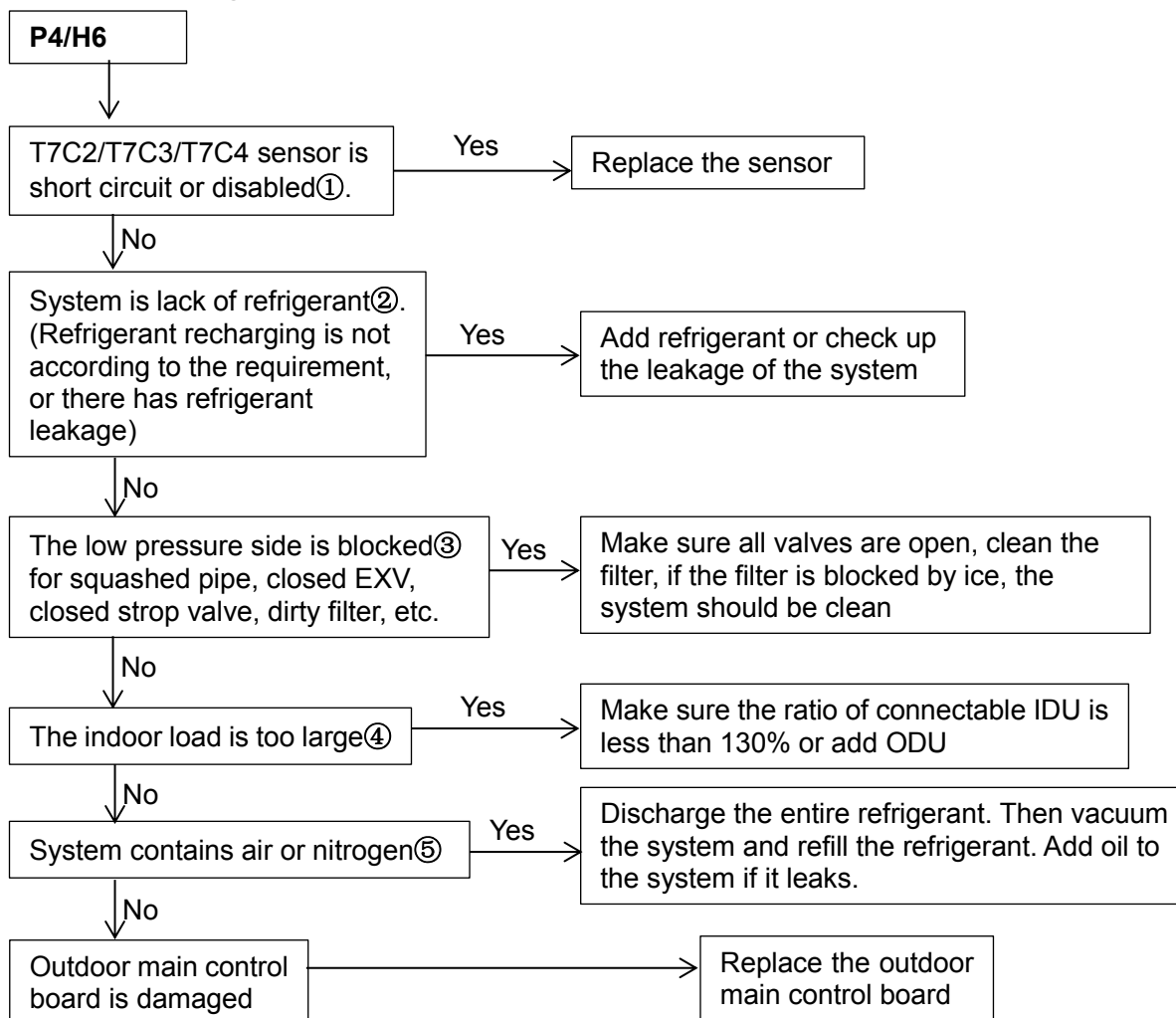
5. How to check whether compressor is error⑤:

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.

4.13 P4: Discharge temperature protection; H6: P4 protection appears three times in 100 minutes



Note:

H6 error cannot resume automatically, and it can resume only by restarting the machine.

1. How to check whether the T7C2/T7C3/T7C4 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:

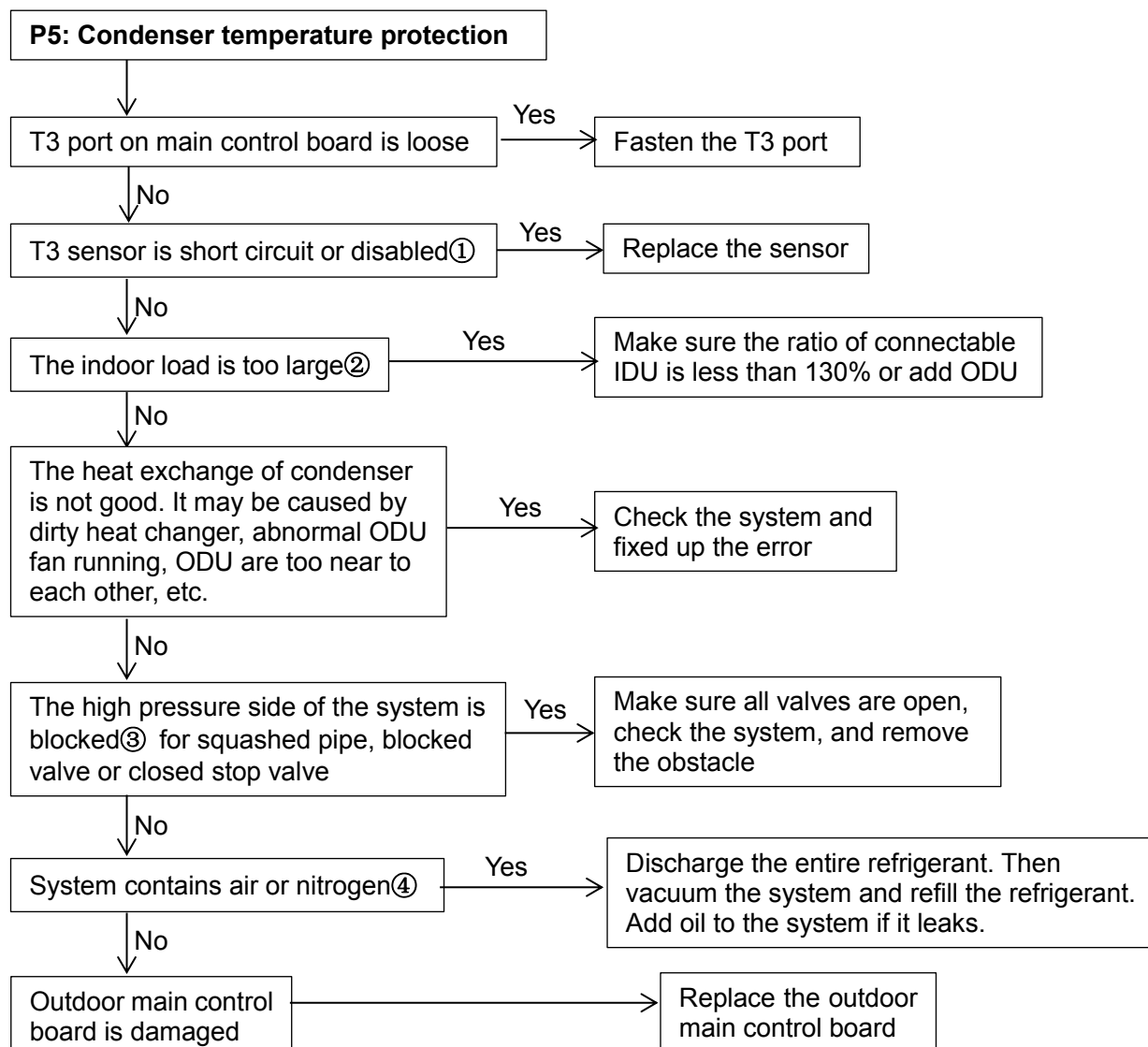
The high pressure is higher than normal value, current is larger than normal value, discharge temperature is higher than normal value, compressor makes noise, pressure meter do not display steady.

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

4.14 P5: Condenser temperature protection

When condenser temperature is over 65℃, the system will display P5 protection, 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.

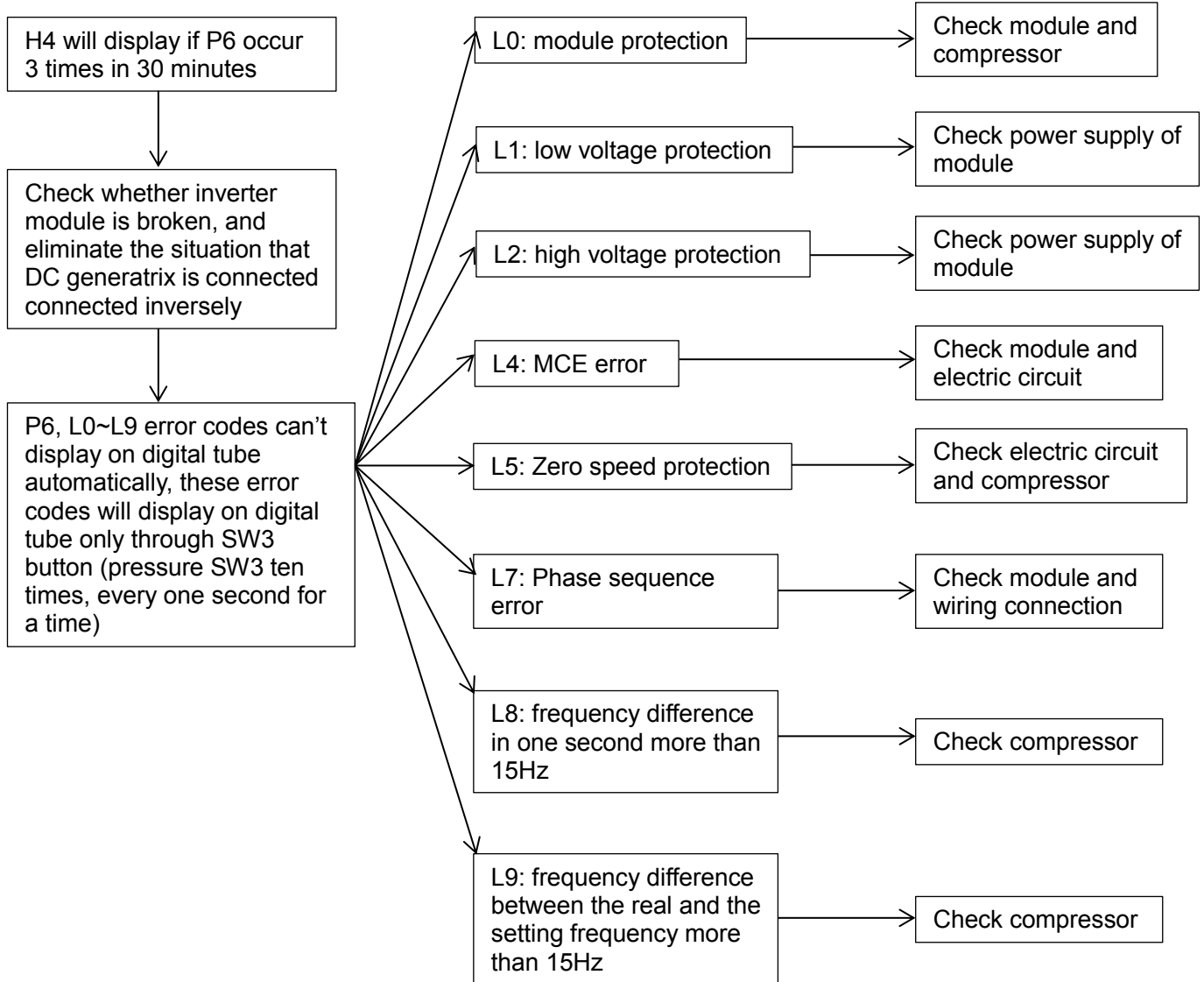
4. The phenomenon of the system contains air or nitrogen④:

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.

4.15 P6/H4: Module protection

P6, L0~L9 error codes can't display on digital tube automatically, these error codes will display on digital tube only through SW3 button (pressure SW3 ten times, every one second for a time)

If the system display three times P6 protection in 60 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.



1) L0 troubleshooting

Step 1: Compressor check

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



Fig. A



Fig.B

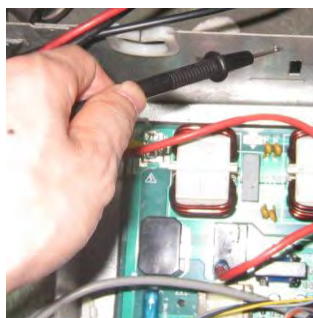


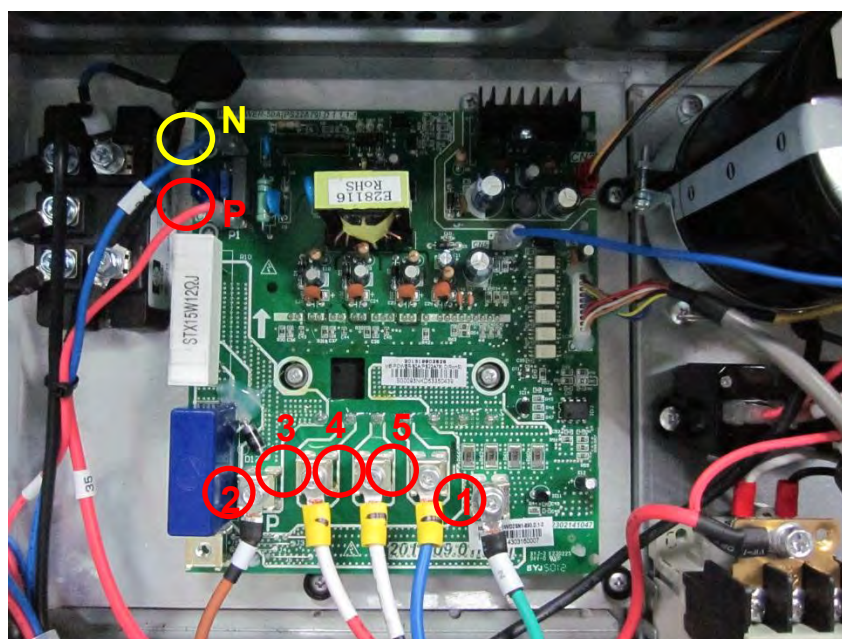
Fig.C



Fig.D

If the resistance value are normal, then go to step 2.

Step 2: Module check

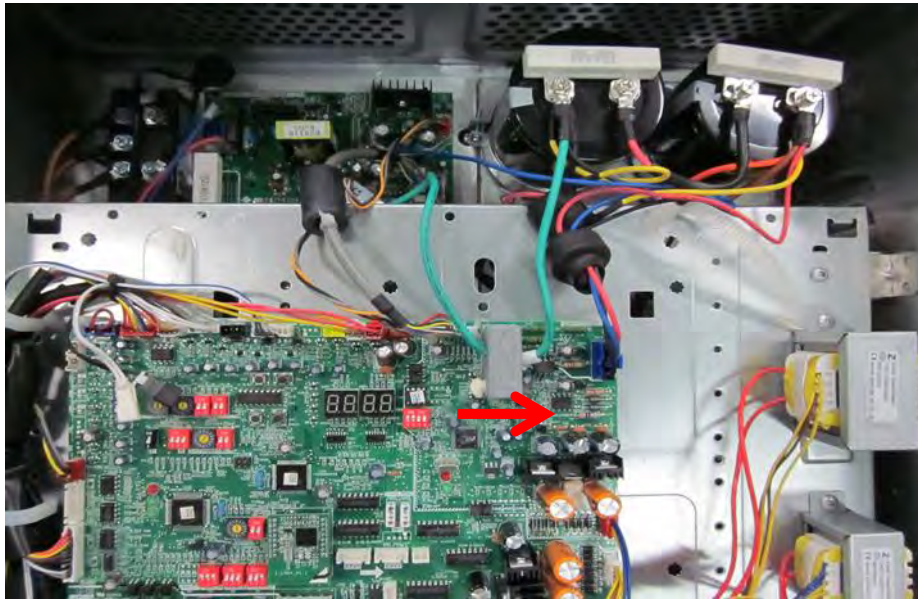


- 1) DC voltage between terminal P and terminal N should be 1.41 times of the local power supply voltage.
- 2) DC voltage between terminal 1 and 2 should be 510V~580V.
- 3) Disconnect the terminal 3, 4, and 5 from inverter compressor. Measure the resistance between any two terminals among terminal 1, 2, 3, 4, 5. All the values should be infinity. If any of the value approximates to 0, the inverter module is damaged and should be replaced.

After replaced the inverter module, if the system is still abnormal, then go to step 3.

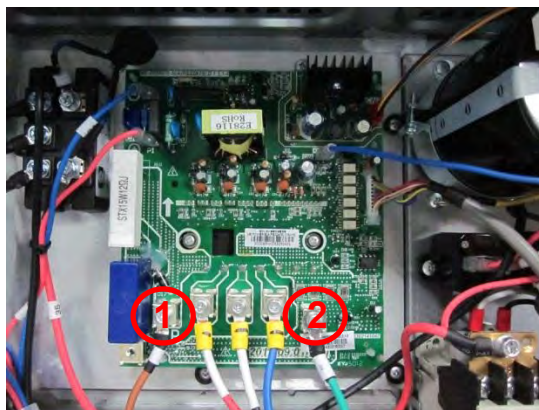
Step 3: DC generatrix check

Direction of the current in DC supply wire which is running through the inductor should be the same as the direction of arrow marked on the inductor.

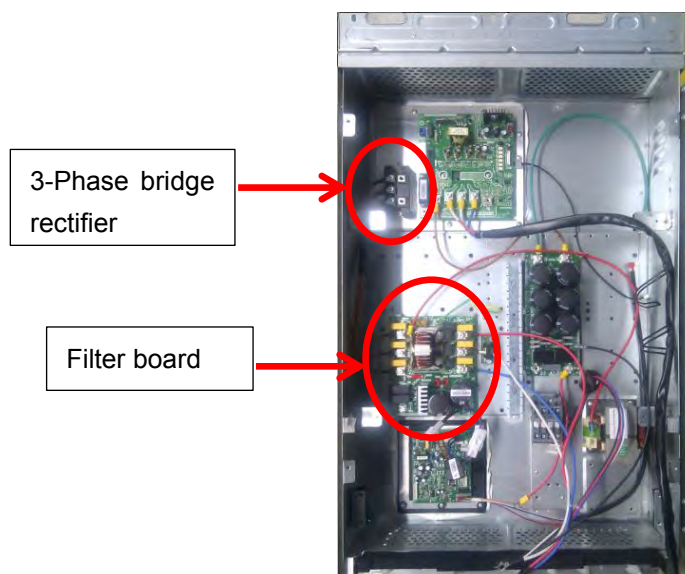


2) L1/L4 troubleshooting

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



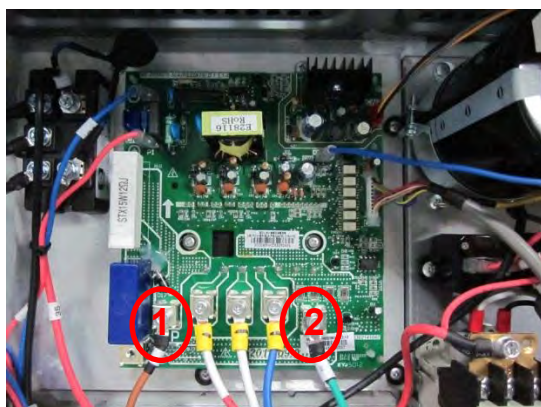
Step 2: Check whether the wires of rectifier circuit are loose or not. If wires are loosen, fasten the wires. If wires are OK, replace the main PCB.



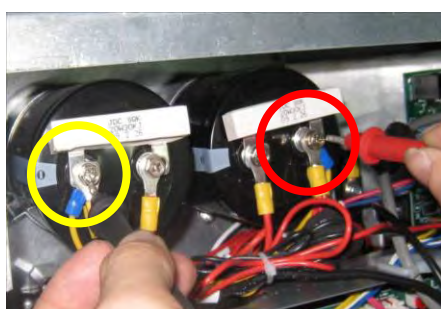
3) L2 troubleshooting

Step 1: Check the DC voltage between 1 and 2 terminal, the normal value should be 510V~580V, if the voltage

is higher than 580V, go to step 2.



Step 2: Check the voltage between the two electrolytic capacitors, the normal value should be 510V~580V.



Turn the measure range of the meter to 1kV, measure the voltage between two electrolytic capacitors



If the value is not in the range, that means the power supply for electrolytic capacitors has problem, you should check the power supply, whether the voltage is too high and whether the voltage is stable.
If the voltage value is normal, then the main PCB has malfunction, it needs to be replaced.

4) L8/L9 troubleshooting

Step 1: Compressor check

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



Fig. A



Fig. B

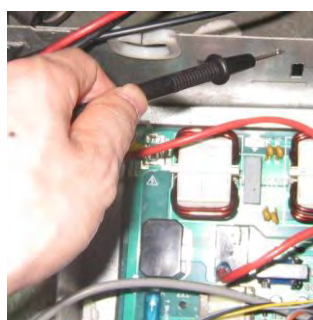


Fig. C



Fig. D

If the resistance value are normal, then go to step 2.

Step 2: Disconnect the power wiring from the compressor(named compressor A) of the faulted system(named system A).

If there is a system running normally nearby(named system B):

Extend the power line of the inverter compressor of system B, connect compressor A to the control box of system B, make sure that the U, V, W terminals are connected in right order, then start system B.

If compressor A can start normally, that means compressor is OK, the control box of system A is malfunction, then replace the main PCB of system A with correct wire connection.

If compressor A can not start normally, that means compressor A is damaged, needs to be replaced.

If there is no normal system nearby:

Replace the main PCB of system A with correct connection, if compressor A can start normally, it means the main PCB which is replaced is damaged. If compressor A still can't start normally, replace the compressor.

5) Guide for compressor replacement

Step 1: Take out the compressor from the faulty outdoor unit, pour out the oil from the compressor according to the method illustrated. Normally the oil will outflow from the discharge pipe of the compressor.



Step 2: check the oil of the system

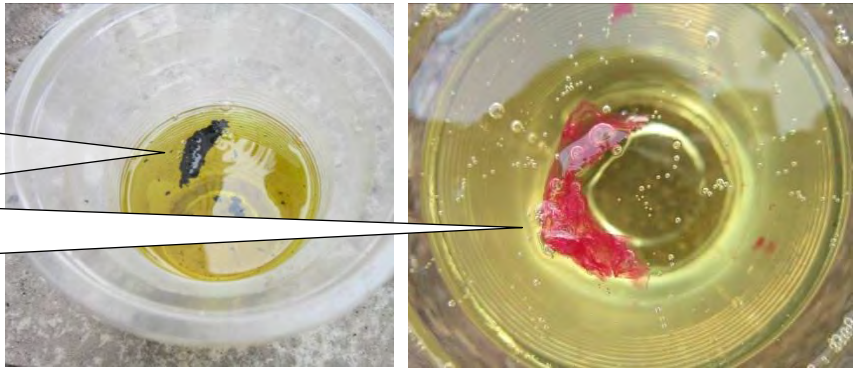
Normally the oil is clear and transparent, if it is a little yellowing, it is also OK. However, if the oil is become black, feculent, or even there is impurity in the oil, that means the system has problems and the oil has gone bad, the oil need to be replaced.

The oil is black, it has been carbonized

The oil is a little yellowing, but it is clear and transparent, the quality is OK

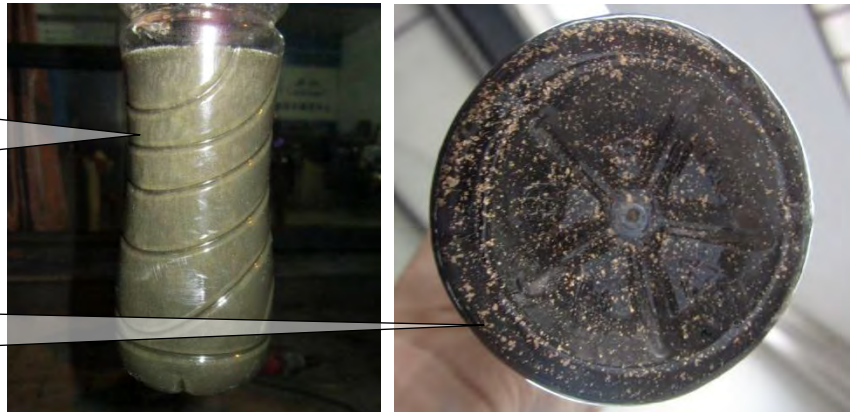


The oil is still transparent, but there is impurity in the oil, the impurity may clog the filter

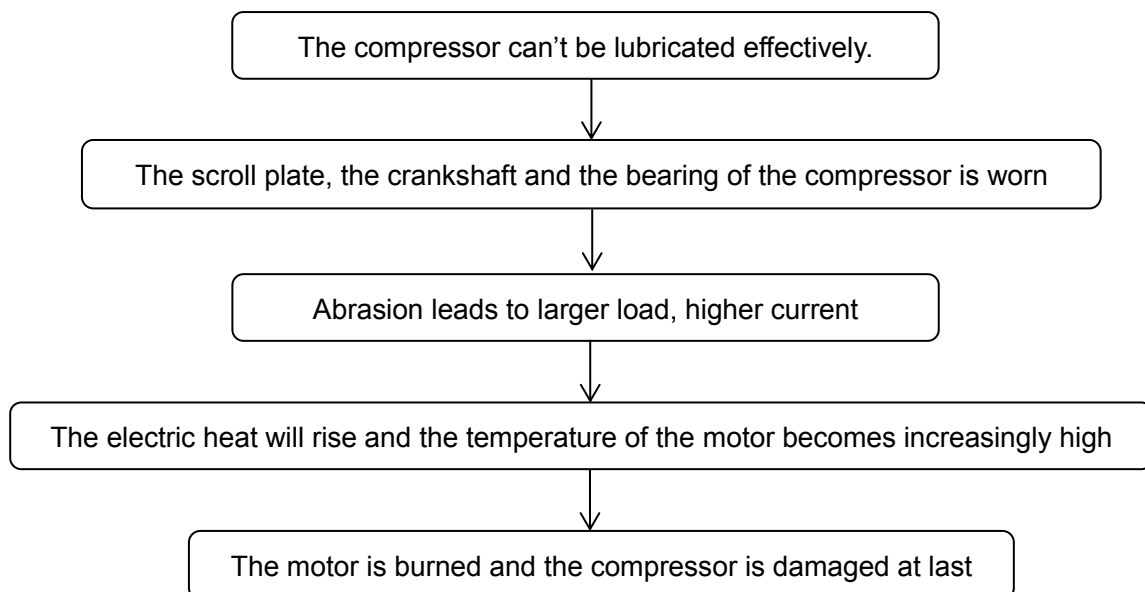


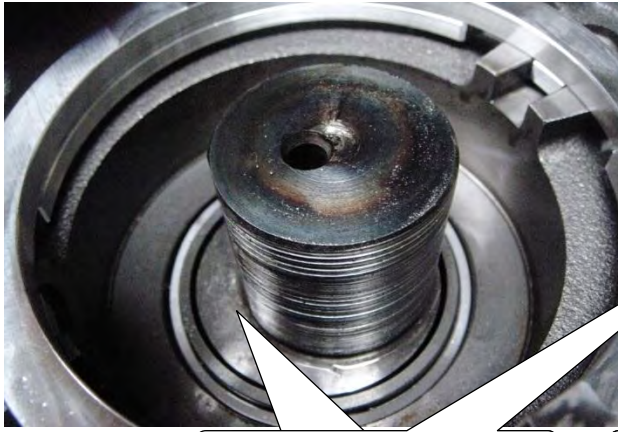
The oil becomes cloudy and gray

The oil contains a lot of copper scrap



If the oil has gone bad:

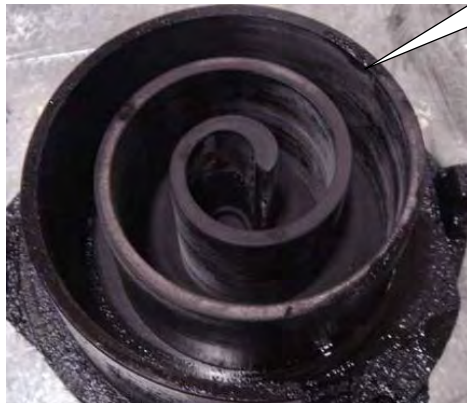




The crankshaft is worn.



The scroll plate is worn.



A normal bearing of the compressor



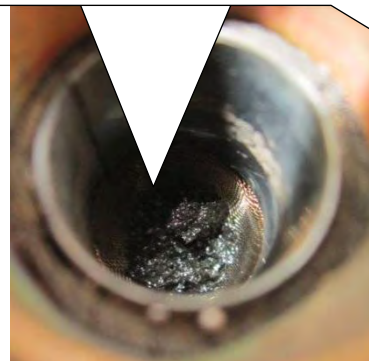
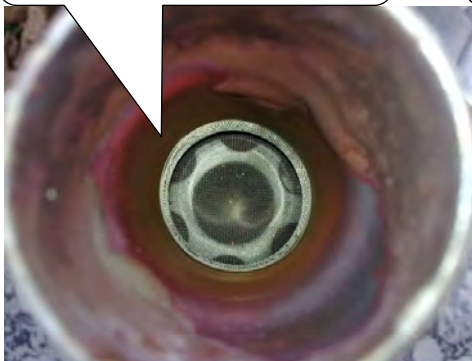
The bearing is worn seriously, it is damaged completely



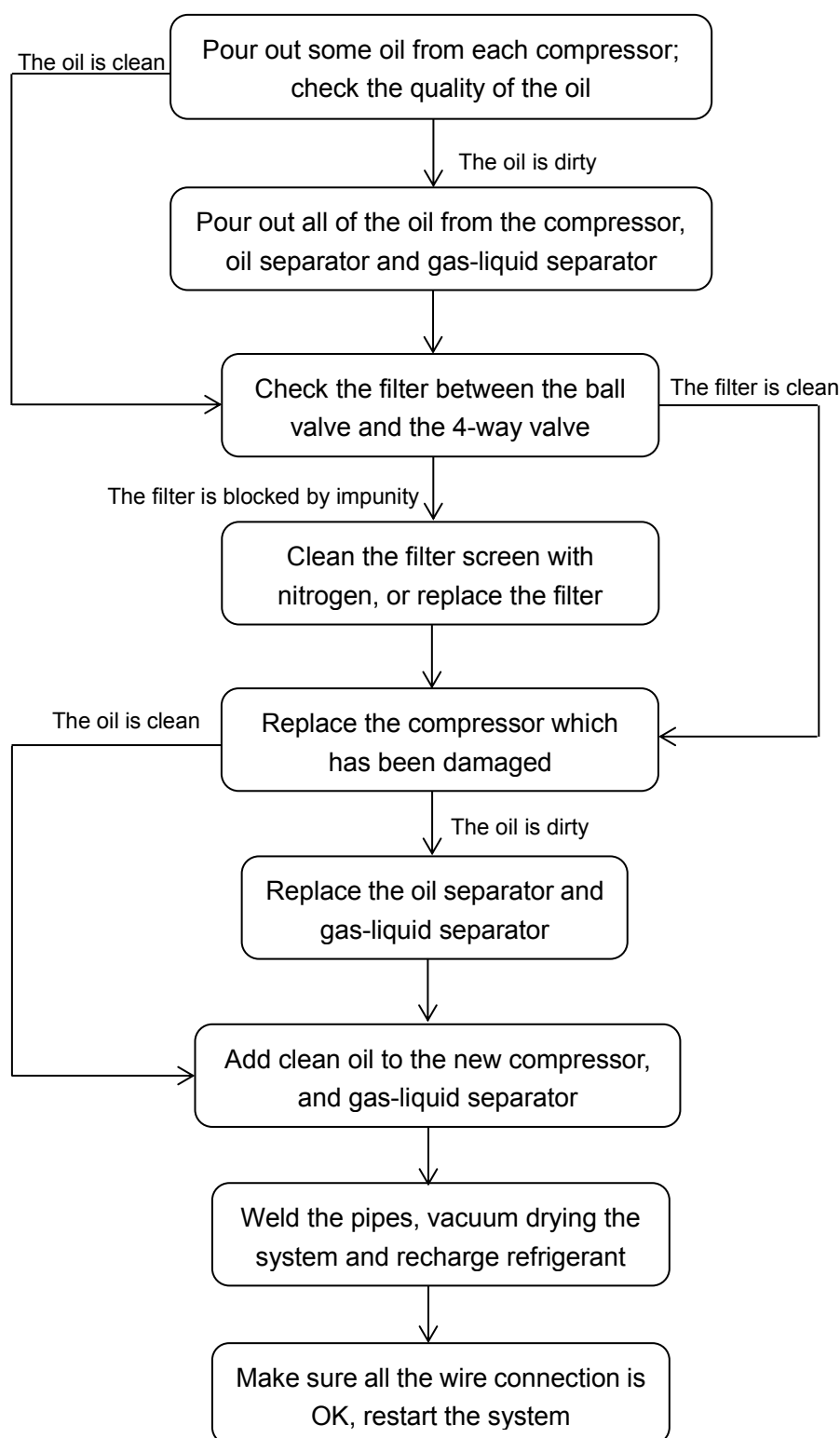
A clean filter (on the suction pipe of the system)



The filter is blocked by impurity, the suction of the compressor will be abnormal



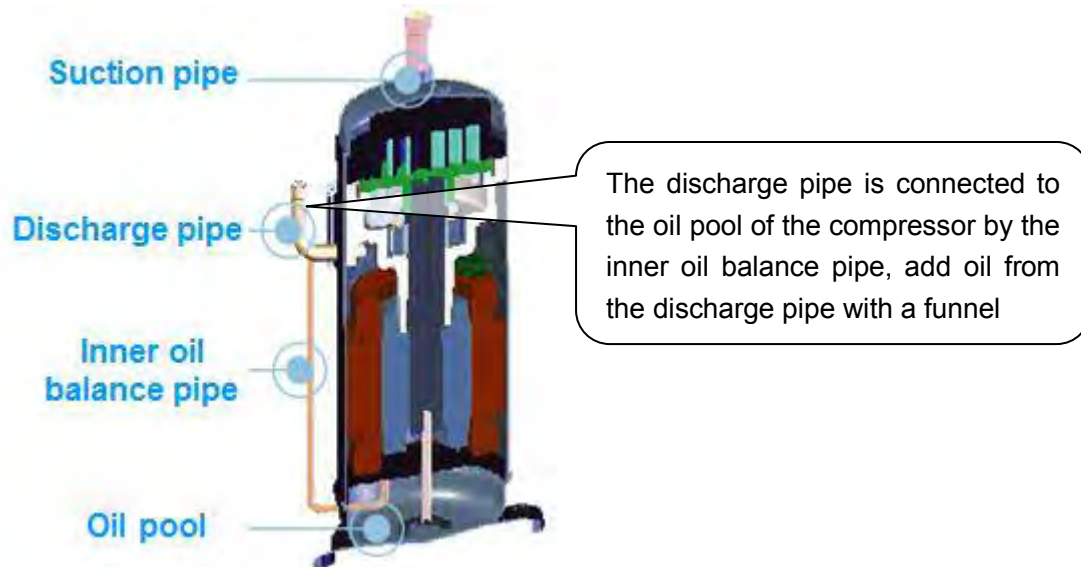
Step 3: Replace the compressor



Note:

1. Before pouring out the oil, shake the compressor, oil separator and gas-liquid separator first, because impurity may deposit at the bottom of the tank.
2. If the oil of one compressor is clean, there's no need to check the oil of the other compressor. If the oil of one compressor has gone bad, check the oil of the other compressor is necessary. If all the oil of an outdoor unit needs to be replaced, after adding oil to the compressors, the rest oil should be charged to the gas-liquid separator.

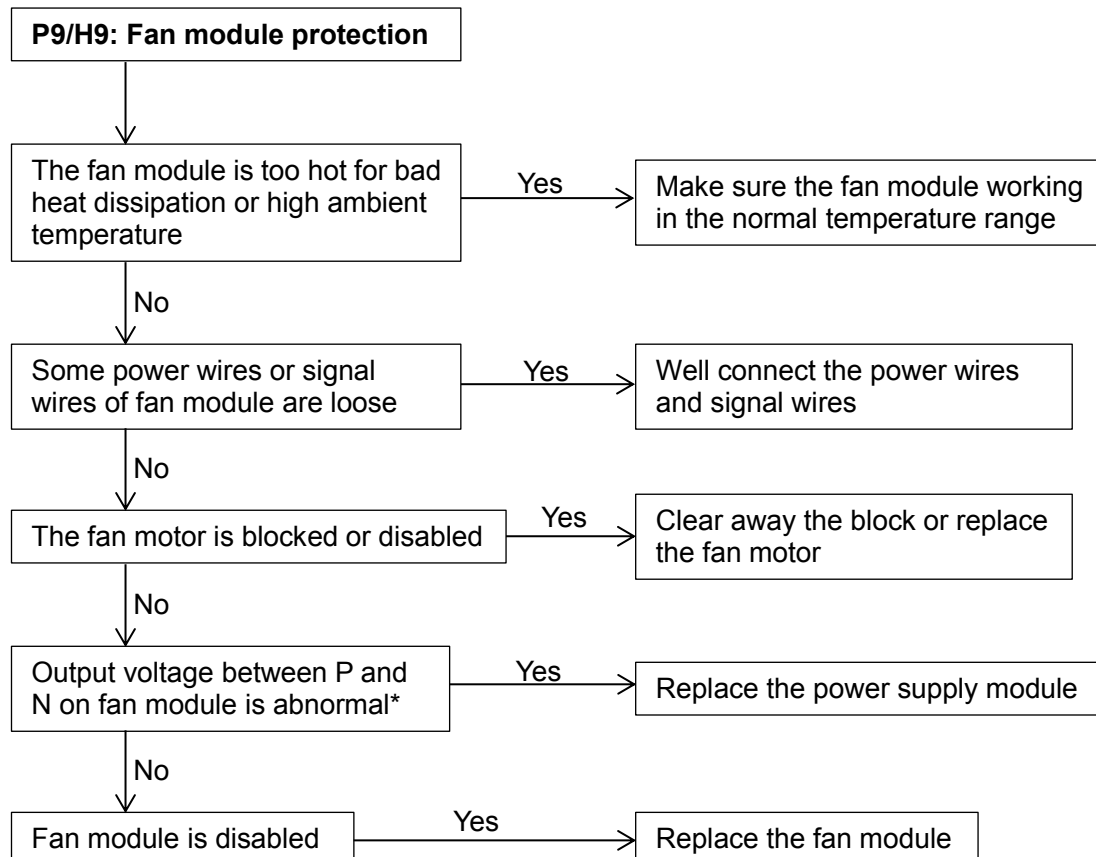
3. Add oil to the compressor from the discharge pipe.



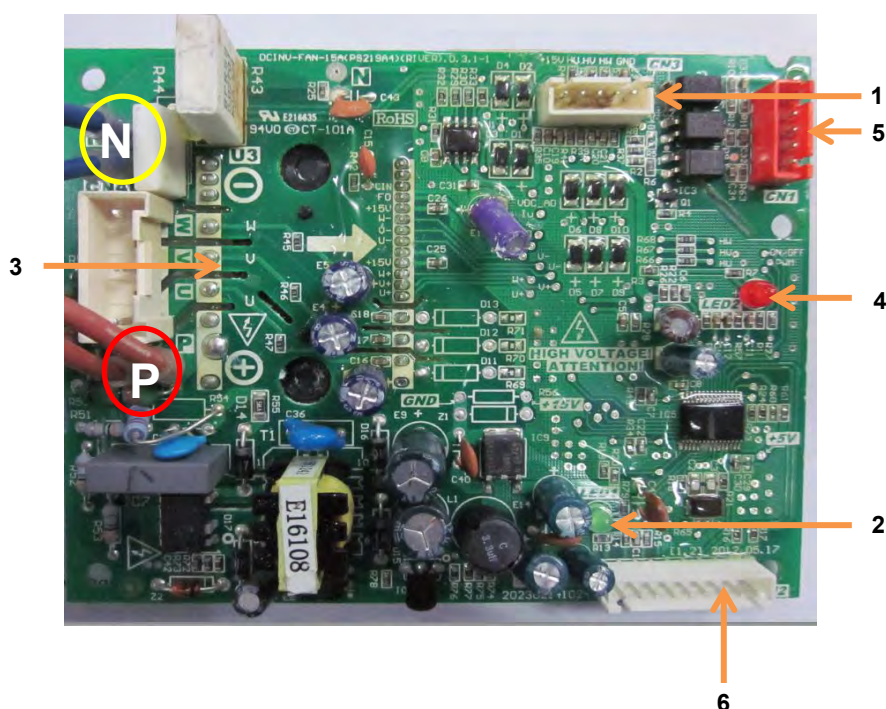
4. The type of the oil is FVC-68D, make sure the type of the oil is right because different compressor need different type of oil, if the type is wrong there will be various kinds of problems.

4.16 P9/H9: DC fan module protection

If the system display three times P9 protection in 60 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

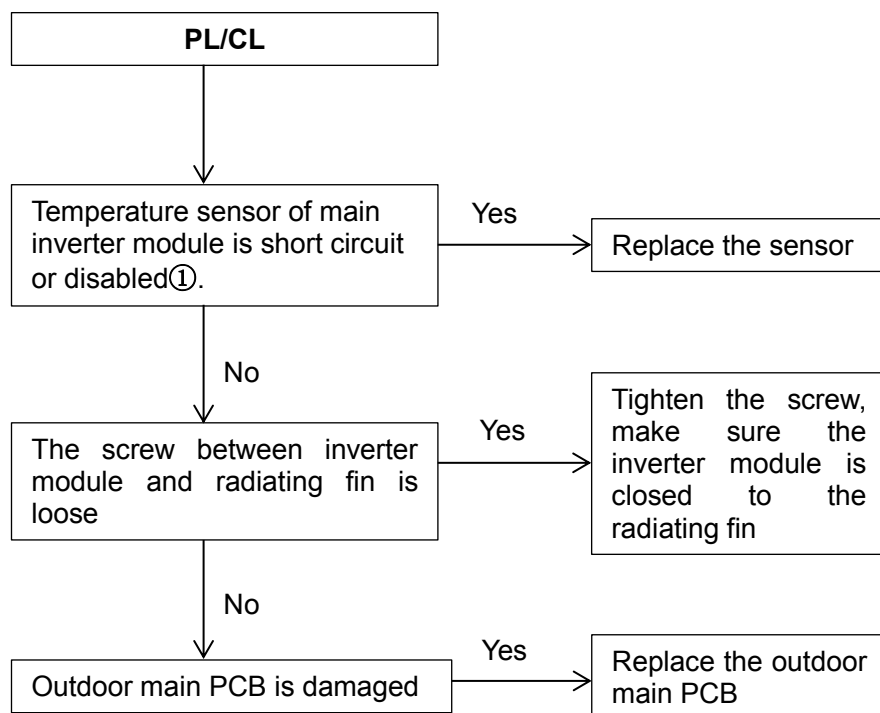
Conditions	Fault indicator lamp of fan module	Power supply indicator lamp of fan module	Digital tube display	Malfunction analysis
Power on	Off	Off	Quantity of IDU or "0"	Check the power supply circuit for fan module. Check whether there has power supply for lightning protection plate, whether the protective 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 main control board.

4.17 PL/C7: Temperature protection of main inverter module

When the temperature of inverter module is over 80°C, it will display PL protection.

If the system display three times PL protection in 100 minutes, the system will stop and display C7 error code.

When the system displays C7 error code, the system can resume only by restarting the machine.



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

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 disabled

Attached table 1: Resistance value of ambient temperature 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 table 2: 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 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°C. When ambient temperature is low, operate the system in heating mode and set the temperature 30°C. Then get the parameters after system running normally more than 30 minutes.

Outdoor unit cooling parameters table

Ambient temperature (T4)	°C	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)	°C	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	°C	8-9	12-15	16-17	20

Outdoor unit heating parameters table

Ambient temperature (T4)	°C	-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)	°C	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	°C	33	33-40	46-50	39-41



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TRUST AIR-CONDITIONING EQUIPMENT CO.

Shiraz office: 8 th floor, Alvand Bldg., 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

Fax.: +98-61-32230647

E-mail: info@trustacs.com

Web site: <http://www.trustacs.com>

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