Haier SERVICE MANUAL

Packaged Type

DC Inverter

Model No.1U71REAFRA
1U24REAFRA

⚠WARNING

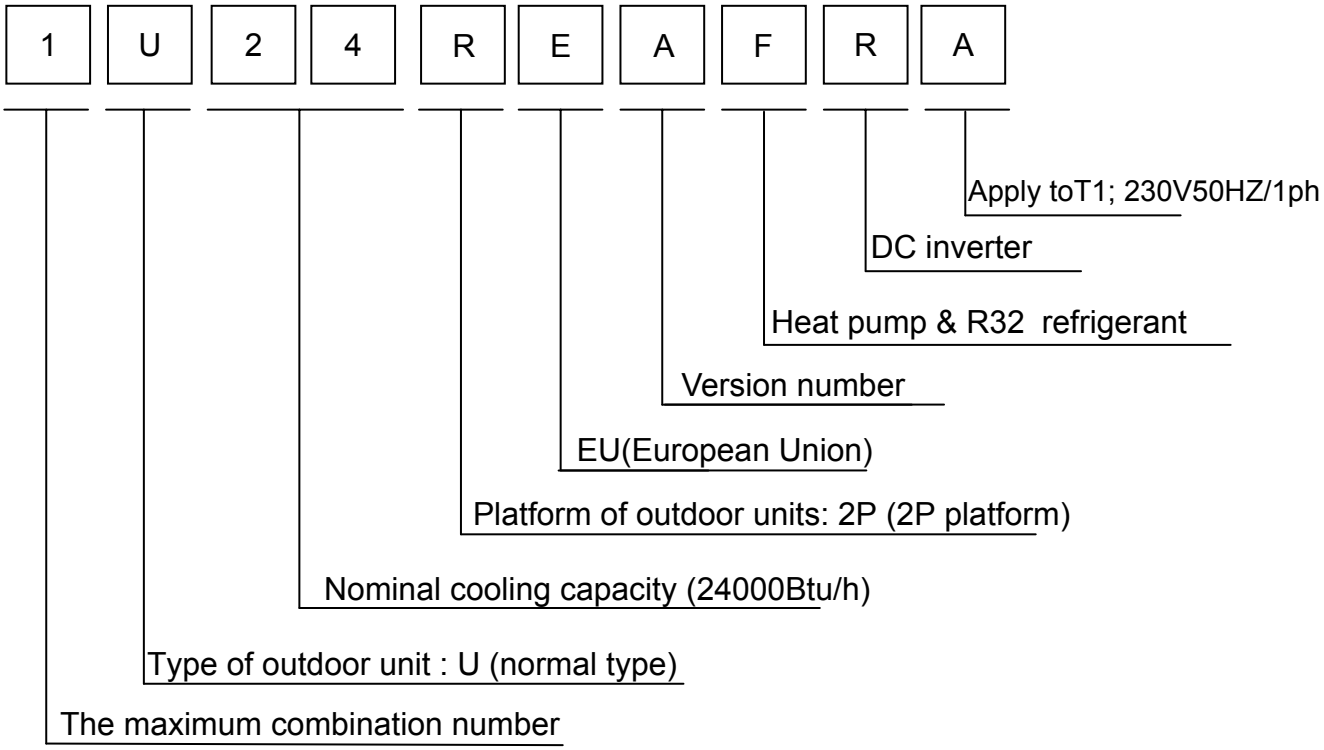
This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or Repair the product or products dealt with in this service information by anyone else could result in serious injury or death

Haier Group **Version：V1** **Date：2019-4-10**

Contents

1 Introduction

1.1 Model name explanation



1.2 Safety Cautions

Be sure to read the following safety cautions before conducting repair work.

The caution items are classified into “Warning” and “Caution”. The “Warning” items are especially important since they can lead to death or serious injury if they are not followed closely. The “Caution” items can also lead

to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety

caution items described below.

About the pictograms

△ This symbol indicates an item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.

○ This symbol indicates a prohibited action.
The prohibited item or action is shown inside or near the symbol.

● This symbol indicates an action that must be taken, or an instruction.
The instruction is shown inside or near the symbol.

After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates Normally, and explain the cautions for operating the product to the customer.

1.2.1 Caution in Repair

Warning	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shook. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas .The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor , the refrigerant gas or cooling machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work . A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	

Warning	
Do not repair the electrical components with wet hands . Working on the equipment with wet hands can cause an electrical shock	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shock.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the cooling cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the cooling cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.2.2 Cautions Regarding Products after Repair

Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only

Warning	
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-410A / R22) in the refrigerant system. If air enters the cooling system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	. 
When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	

Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	

1.2.3 Inspection after Repair

Warning	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.	

Warning	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances since it can cause an electrical shock, excessive heat generation or fire.	

Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	

Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 M ohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.2.4 Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

1.2.5 Using Icons List

Icon	Type of Information	Description
 Note	Note	A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
 Caution	Caution	A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
 Warning	Warning	A “warning” is used when there is danger of personal injury.
	Reference	A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

2 Specifications

NOMINAL DISTRIBUTION SYSTEM VOLTAGE		
Phase	/	1
Frequency	Hz	50
Voltage	V	230

NOMINAL CAPACITY and NOMINAL INPUT			
		cooling	heating
Capacity rated	KW	7.2	9
	Btu/h	24572	30710
Power Consumption(Rated)	KW	2.23	2.43
SEER/SCOP	W/W	7.0/A++	4.0/A+
Annual energy consumption	KWh	360	1925
Moisture Removal	m^3/h	$1.2*10^{-3}$	

TECHNICAL SPECIFICATIONS-UNIT			
Dimensions	H*W*D	mm	697×890×353
Packaged Dimensions	H*W*D	mm	780×1046×460
Net Weight	/	KG	47
Gross weight	/	KG	52
Sound level	Sound pressure	dB	/
	Sound power	dB(A)	69

ELECTRICAL SPECIFICATIONS			
		cooling	heating
Nominal running current	A	9.7	10.6
Maximum running current	A	14.5	16.5
Starting current	A	0.6	0.85

TECHNICAL SPECIFICATIONS-PARTS				
			cooling	heating
Compressor	Type		Rotary Compressor	
	Model		SVB200FKMMC	
	Motor output	W	1200	
	Oil type		FW68S	
	Oil charge volume	L	0.4±15ml	
Fan	Type		Axial fan	
	Motor output	W	90	
	Air flow rate(high)	m^3/h	-	
	Speed(high)	rpm	950	
Heat exchanger	Type		ML fin- 7HI-HX	
	Row*stage*fitch		tube 2.5*45*1.4	

TECHNICAL SPECIFICATIONS-OTHERS				
Refrigerant circuit	Refrigerant type			R32
	Refrigerant charge		KG	1.6
	Maximum allowable distance between indoor an outdoor		m	20
	Maximum allowable level difference		m	10
	Refrigerant control		Electrical expansion valve	
Piping connections (external diameter)		liquid	mm	Φ6
		gas	mm	Φ12
		drain	mm	Φ13
Heat insulation type			Both liquid and Gas pipes	
Max. piping Length			m	20
Max. Level Difference			m	10
Chargeless			m	10
Amount of Additional Charge of Refrigerant			g/m	20
International Protection degree			IP X4	

Note: the data are based on the conditions shown in the table below

cooling	heating	Piping length
Indoor: 27℃DB/19℃WB Outdoor: 35℃DB/24℃WB	Indoor:20℃DB/-℃WB Outdoor: 7℃DB/6℃WB	4m

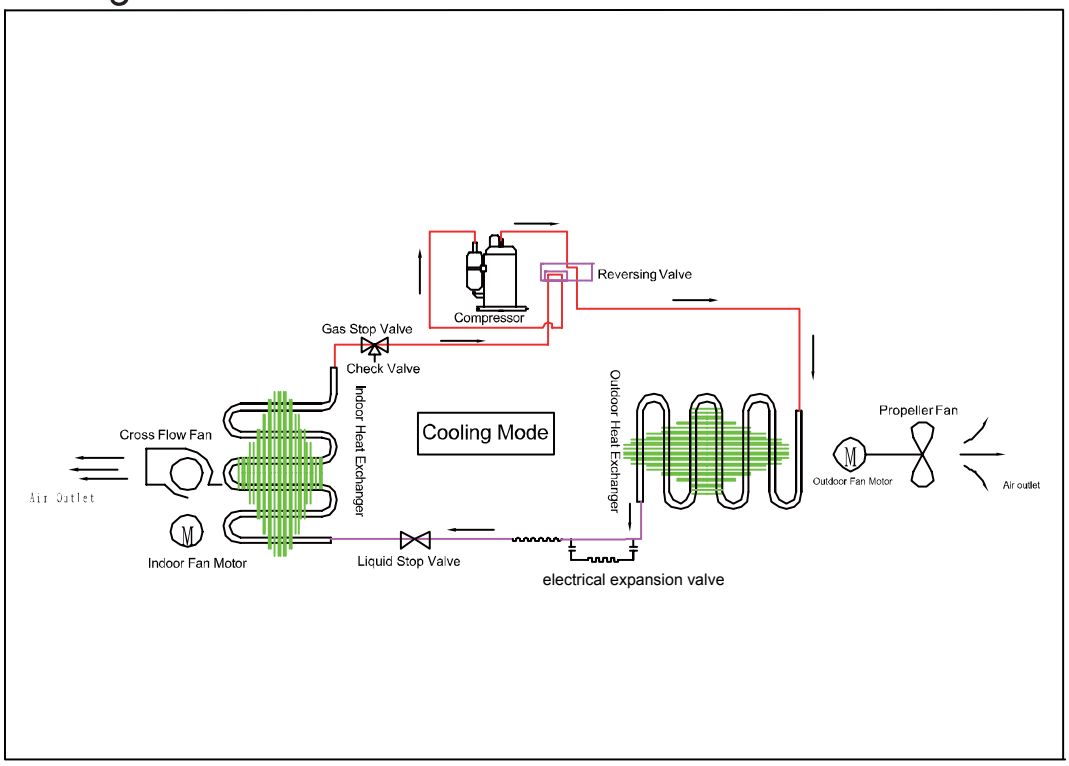
Conversation formulae
Kcal/h= KW×860
Btu/h= KW×3414
cfm=m³/min×35.3

3. Sensors list

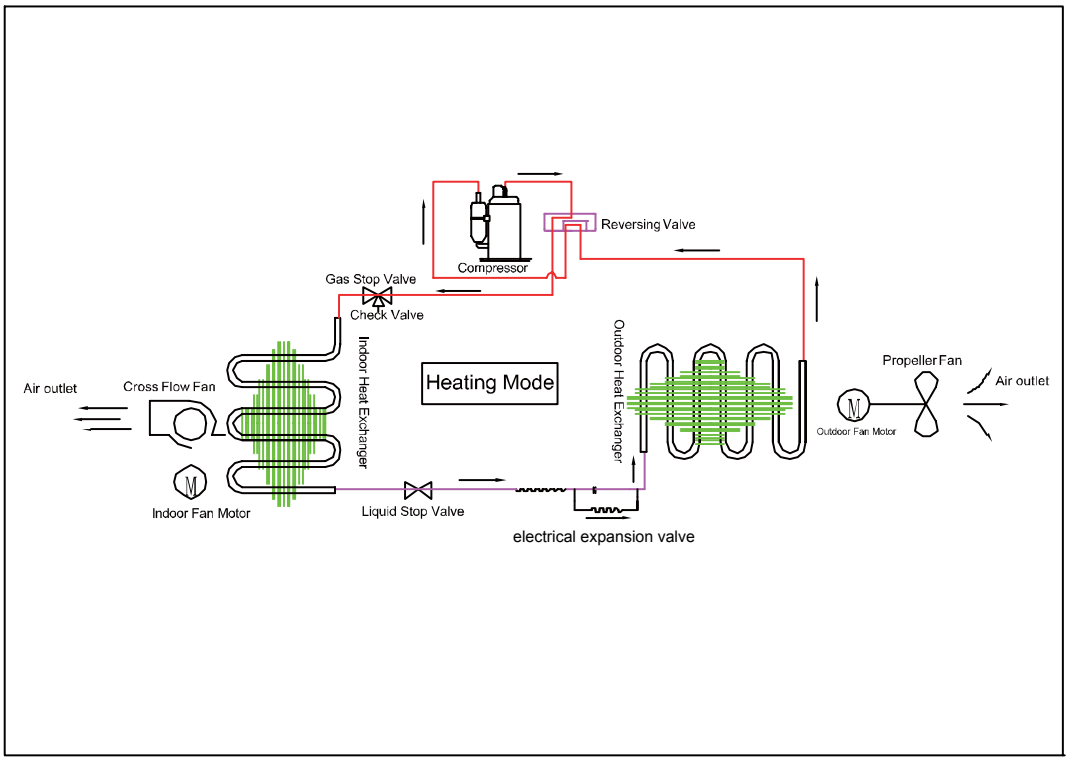
type	Description	Qty
Ambient sensor	Its used for detecting temperature of outdoor side	1
Defrosting sensor	Its used for controlling outdoor defrosting at heating mode	
Discharging sensor	Its used for compressor in case of over-heat	
Suction sensor	Its used for detecting suction pipe temperature of compressor to adjust gas flowing	1

4. Pinping diagrams

Cooling mode

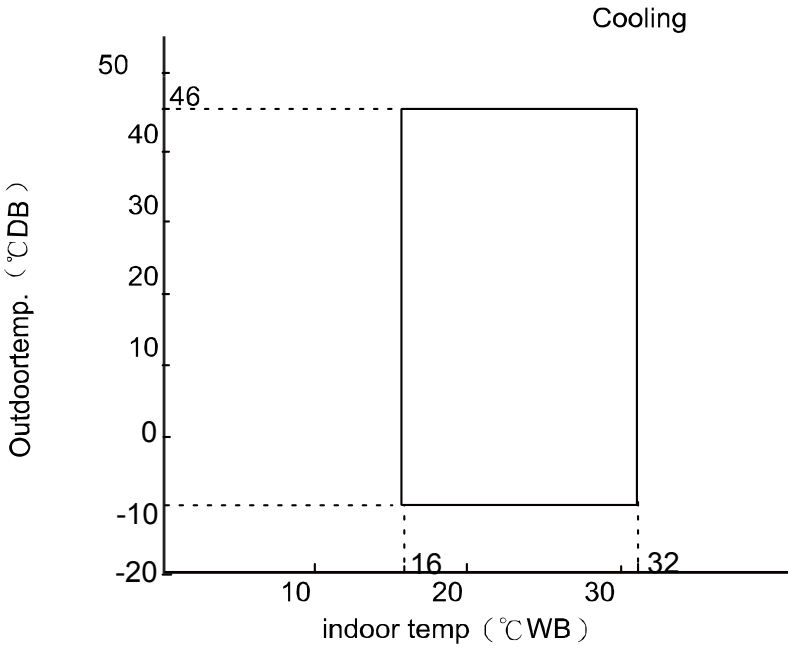


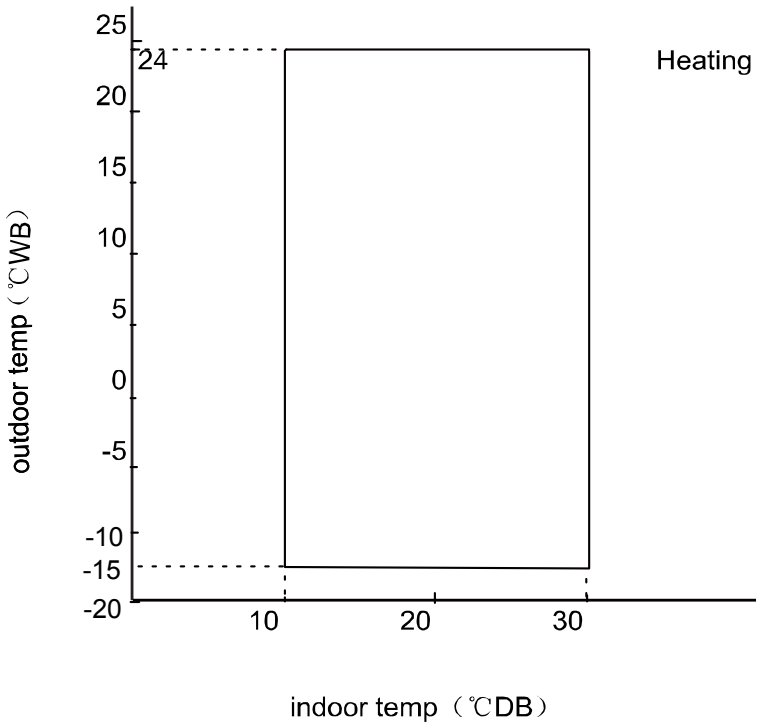
Heating mode



5. Operation range

The name of parts





Notes：

The graphs are based on the following condition：

Equivalent piping length	5m
Level difference	0m
Air flow rate	high

6.PCB Diagram

Connectors

PCB (1) (Outdoor Control PCB)

1) CN1, CN2 Connectors for power N and L
2) CN3 Connector for ground
3) CN22,CN23 Connectors to the module board CN10,CN11
4) CN9, CN8 Connectors for CN1,CN2 on the module board
5) CN10 Connector for four way valve coil
6) CN18,CN20 Connectors for thermistors
7) CN26, CN24 Connectors to P and N of the module board
8) CN4 Connector for communicate between indoor and outdoor unit
9) CN16 Connector for electric expansion valves
10) CN21 Connector for DC FAN

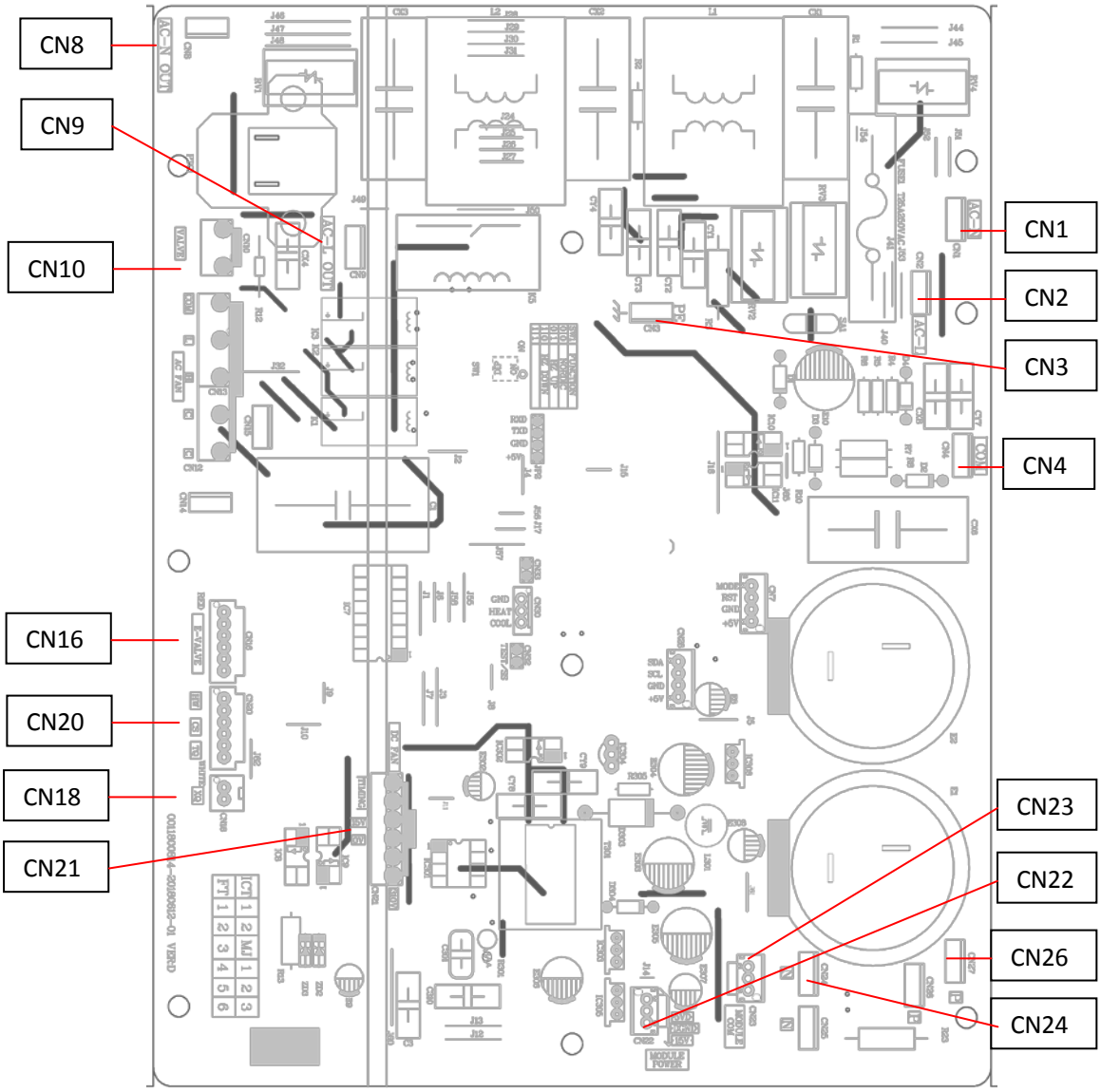
Other Designations

1) FUSE 1, (20/25A, 250VAC)
2) LED 1 Keep light representative normal, if keep flash interval representative trouble Alarm
3) RV4, RV2, RV3 Varistor

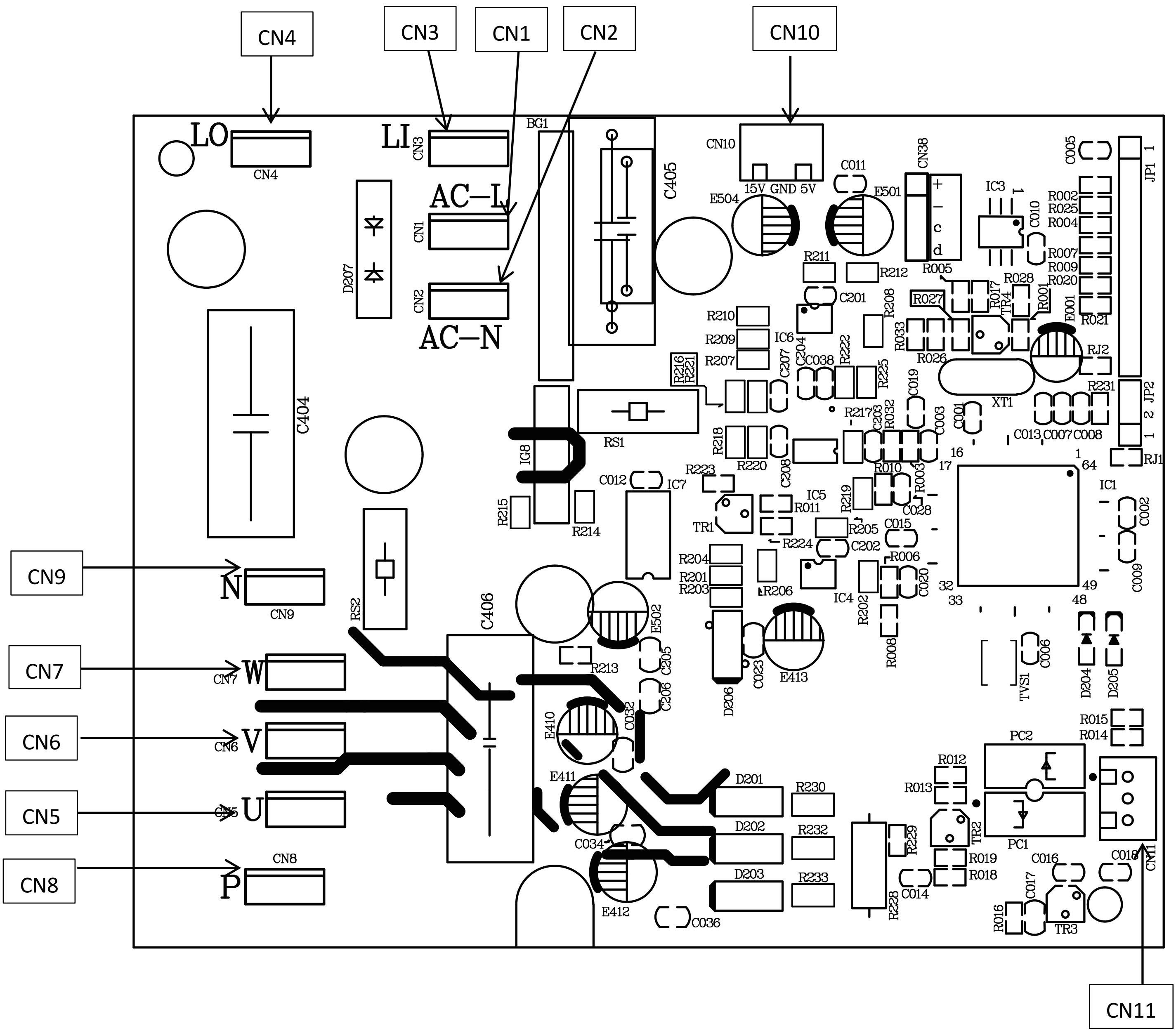
PCB (2) (Module PCB)

CN10 Connector for the DC power 5V and 15V form the control PCB
CN11 Connector for communicate between the control board and the module board
P (CN8), N (CN9) Connector for capacitance board
LI (CN3), LO (CN4) Connector for reactor
CN5, CN6, CN7Connector for the U, V, W wire of the compressor

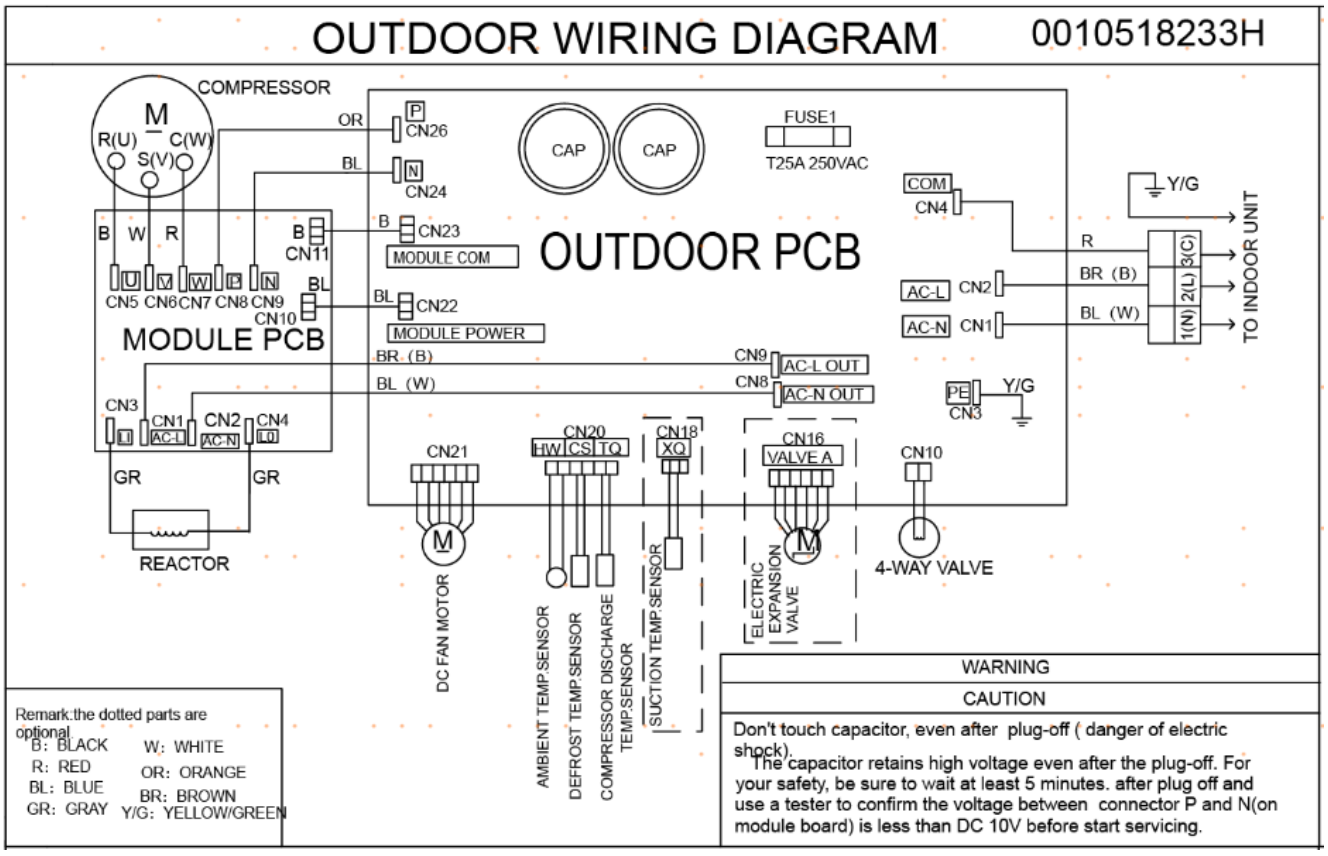
PCB (1)


CN8
CN9
CN10
CN16
CN20
CN18
CN21
CN1
CN2
CN3
CN4
CN23
CN22
CN26
CN24

PCB (2)


CN4
CN3
CN1
CN2
CN10
CN9
CN7
CN6
CN5
CN8
CN11
LO
LI
AC–L
AC–N
N
W
V
U
P
15V GND 5V
C404
C405
C406
BG1
RS1
RS2
IC1
IC3
IC4
IC5
IC6
IC7
XT1
PC1
PC2
TR1
TR2
TR3
TR4
JP1
JP2
RJ1
RJ2
D207
D201
D202
D203
D204
D205
D206
E410
E411
E412
E413
E501
E502
E504

Wiring diagrams



7. Functions and Control

7.1 Main functions and control specification

7.1.1 The operation frequency of outdoor unit and its control

7.1.1.1 The operation frequency control of compressor

The operation frequency scope of compressor：

Mode	Minimun operation frequency	Maximun operation frequency
Heating	17Hz	118Hz
Refrigeration	17Hz	90Hz

7.1.1.2 The starting of compressor

When the compressor is started for the first time, it must be kept under the conditions of 58Hz,88Hz for one minute (the overheating protection of the outdoor unit air-blowing temperature, immediately decrease the frequency when the compressor is overflowing and releasing the pressure)，then it can be operated towards the target frequency. When the machine runs normally, there's no such process. After starting the compressor for operation, the compressor should run according to the calculated frequency, and every determined frequency for protection should be prior to the calculated frequency.

7.1.1.3 The speeds of increasing or decreasing the frequency of the compressor

The speed of increasing or decreasing the frequency rapidly 1 ----------1HZ/second
The speed of increasing or decreasing the frequency slowly 2 ----------1HZ/10seconds

7.1.1.4 The calculation of the compressor's frequency

1)、The minimum/maximum frequency limitation

A. While refrigerating: F－MAX－r is the maximum operation frequency of the compressor; F－MIN－r is the minimum operation frequency of the compressor.

B. While heating: F－MAX－d is the maximum operation frequency of the compressor; F－MIN－d is the minimum operation frequency of the compressor.

1)、The frequency limitation which is affected by the environment temperature.

Heating mode:

Serial No.	Temperature scope	Frequency limitation
1	Wh_c<-12	Max_hz8 117 HZ
2	Wh_c<-8	Max_hz7 117 HZ
3	Wh_c<-2	Max_hz4 117 HZ
4	Wh_c<5	Max_hz5 99 HZ
5	Wh_c<10	Max_hz1 90 HZ
6	Wh_c<17	Max_hz2 72 HZ
7	Wh_c<20	Max_hz2 62 HZ
8	Wh_c≥20	Max_hz6 45 HZ

Remarks: the above are the maximum frequency limitations of the complete appliance which are affected by the environment, and they have nothing to do with the ability of the indoor unit.

Refrigeration/dehumidification mode::

Serial No.	Temperature scope	Frequency limitation
1	Wh_c<16	Max_hz1 38 HZ
1	Wh_c<22	Max_hz1 44 HZ
1	Wh_c<28	Max_hz1 55 HZ

2	Wh_c<32	Max_hz2 74 HZ
3	Wh_c≥40	Max_hz3 90 HZ
4	Wh_c<48	Max_hz4 68 HZ
5	Wh_c≥48	Max_hz5 60 HZ

Remarks: the above are not only the maximum frequency limitations of the complete appliance which are affected by the environment, but also the maximum ability limitation of the system. When the starting ability is not the maximum, its maximum frequency limitation is calculated by the following equations:

The frequency limitation which is affected by the temperature and under the condition of actual ability＝the actural running system ability*the maximum frequency which is limited by the temperature and under the condition of maximum ability/the maximum designing ability of the system

ΔT=∑（ΔTi*Pi）/∑Pi （ΔTi=|Tst_i-Tnh_i the indoor environment temperature| ;Pi＝i the ability of the indoor unit)

Refrigeration/dehumidification:

ΔT	<1	＝1	＝2	＝3	≥4
The percentage of the rated frequency P	70%	80%	85%	90%	100%

Heating mode：

ΔT	<1	＝1	＝2	＝3	≥4
The percentage of the rated frequency P	70%	80%	85%	90%	100%

K=∑Ki/the number of running machines

The indoor set airflow speed	Low	Medium	High	Strong	Quiet	Healthy airflow
The percentage of the rated frequency Ki	80%	90%	100%	110%	70%	65%

The calculation of the actual output frequency: when there is no healthy airflow: F =F-ED-*×P×K

When the healthy airflow has been set: F =F-ED-*×P×K（airflow speed）×K（healthy airflow）

When refrigerating, it is needed to satisfy F－MIN－d < F< F－MAX－d

When heating, it is needed to satisfy F－MIN－r< F< F－MAX－r

7.1.2：The outdoor fan control (exchange fan)

When the fan is changed among every airflow speed (including stop blowing), in order to avoid the airflow speed from skipping frequently, it must be kept under each mode for over 30 seconds, and then it can be changed to another mode (when refrigerating, the time is changed to 15 seconds).

7.1.2.1： The outdoor fan control when refrigerating or dehumidifying

During the compressor is started for 3 seconds, the outdoor fan is controlled the airflow speed according to the temperature conditions of the outdoor environment.

Tao（℃）	Tao <22℃	22℃5< Tao <29℃5	Tao≥29℃5
Cool/Dry	Level 3	Level 5	Level 7
Tao（℃）	Tao <10℃	10℃< Tao <16℃	Tao≥16℃
Heat	Level 7	Level 5	Level 3

After the compressor is started for 3 seconds, the outdoor fan is controlled the airflow speed according to the temperature conditions of the outdoor environment and frequency of compressor.

Frequency of cooling mode（Hz）		<51	51∽70	≥70
Tao（℃）	≤22	Level 3	Level 5	Level 6
	22∽29	Level 4	Level 6	Level 7
	≥29	Level 7		

Frequency of heat mode（Hz）		<51	51∽90	≥90
Tao（℃）	≤10	Level 5	Level 7	Level 7
	10∽16	Level 4	Level 5	Level 5
	>16	Level 2		

7.1.3：The control of the outdoor electronic expansion valve

When starting the compressor: the opening size of the valve must be guaranteed to have entered into the standard opening size, and then the compressor can be started.

When refrigeration is in vain (the machine is shut down or is in the state of retrograde operation), the opening size of the expansion valve of the indoor unit is 5 steps;

When heating is in vain, the opening size of the expansion valve of the indoor unit is 55 steps;

When the outdoor unit is shut down, the valve is opened completely for 2 minutes, and then begin initialization.

The scope of refrigerationg valve 90-----480 steps

The scope of heating valve 60-----480 steps

The valves are adjusted according to the degree of superheat —SHa，△SHa.

7.1.4：Four way control

For the details of defrosting four-way valve control, see the defrosting process.

Four way working in other ways:

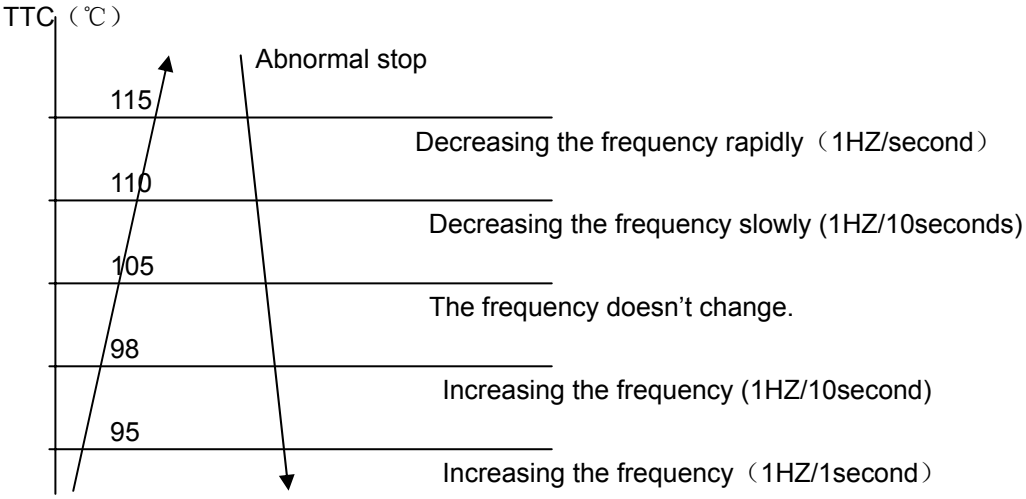
Under the mode of heating, open the four-way valve, when the compressor is not started or changed to non-heating mode, make sure the compressor is stoped for 2 minutes, and then close the four-way valve.

7.1.5 ： Protection function

7.1.5.1： TTC high temperature-preventing protection

Once the machine is started, it can run TTC overheating protection of air-blowing, but air-blowing sensor malfunction must alarm after 4 minutes during which the compressor is started (during the course of self-detection, there's no such limitation)

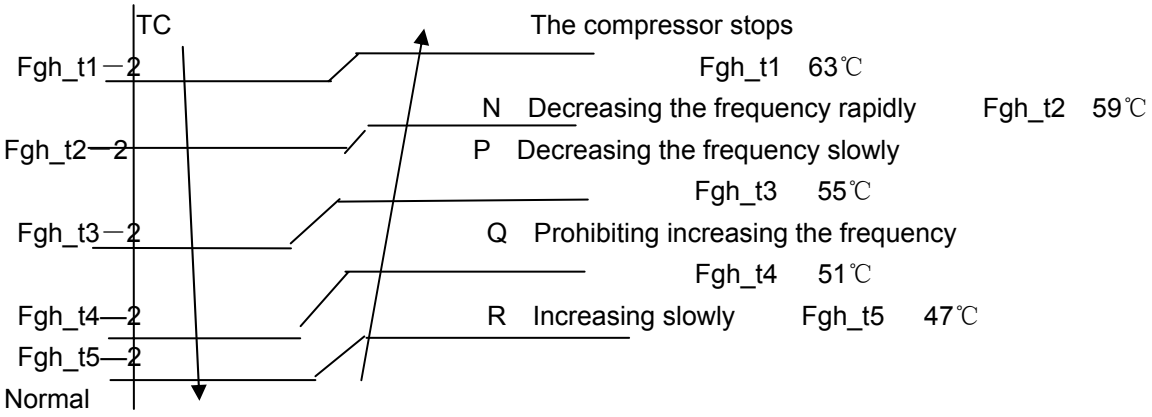
Sensor detection methods: 100 times (one cycle of procedure run is one time, and about 5ms, detection method for each time: continuously sampling for 8 times, then order them and take the mean value of the middle 2 values), take the mean value.



TTC>=115℃ lasts for 20 seconds. Overheating protection of air-blowing, alarm malfunction to the indoor, others don't last.

7.1.5.2： TC high temperature-preventing control of the indoor heating unit

Tpg_indoor is the highest value of the effective indoor unit (start it and it is in accord with the running state). The indoor heat exchanger sensor tests the temperature of the indoor heat exchanger. If the temperature is higher than 48℃, decrease the rotate speed of the compressor and do the high temperature-preventing protection of the indoor heat exchanger; if the temperature of the indoor heat exchanger is lower than 45℃, recover to the normal control.



N：Decreasing at the speed of 1HZ/1second

P：Decreasing at the speed of 1Hz/10seconds

Q： Continue to keep the last-time instruction cycle

R： I ncreasing at the speed of 1Hz/10seconds

Remarks: the outdoor unit

7.1.5.3：The protection function of AC current:

During the starting process of the compressor, if the AC current is greater than 12A, the frequency of the compressor decreases at the speed of 1HZ/second.

During the starting process of the compressor, if the AC current is greater than 11A, the frequency of the compressor decreases at the speed of 0.1HZ/second.

During the starting process of the compressor, if the AC current is greater than 10A, the frequency of the compressor increases at the prohibited speed.

During the starting process of the compressor, if the AC current is greater than 9A, the frequency of the compressor increases at the speed of no faster than 0.1HZ/second.

Remarks: when the outdoor temperature is high, there's compensation for AC current protection.

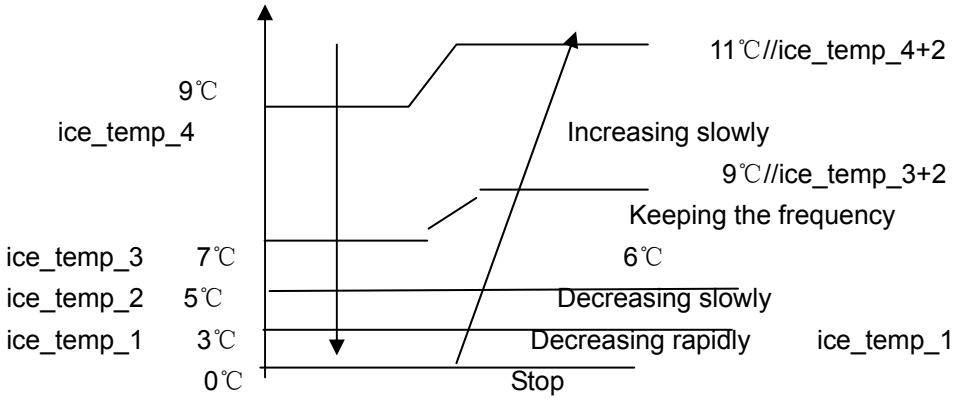
⑴When the outdoor environment temperature is higher than 40℃, AC current protection value decreases by 1.5A

⑵When the outdoor environment temperature is higher than 50℃,AC current protection value decreases by 3.5A

7.1.5.4：Antifreezing protection of the indoor heat exchanger

When refrigerating/heating, prevent freezing.

Tpg_indoor is the minimum value of the effective indoor unit (start it and it is in accord with the running state).



When Tpg_indoor 〈 ice_temp_1℃, the frequency of the compressor decreases at the speed of 1HZ/1second.

When Tpg_indoor 〈 ice_temp_2℃, the frequency of the compressor decreases at the speed of 1HZ/10seconds.

When Tpg_indoor begins to rise again, and ice_temp_2≤Tpg_indoor≤ ice_temp_3℃, the frequency of thecompressor doesn't change.

When ice_temp_3〈Tpg_indoor〈ice_temp_4℃, the frequency of the compressor increases at the speed of 1HZ/10seconds.

For example, Tpg_indoor≤0℃， last for 2 minutes, and then the outdoor unit will stop, and report underload malfunction, but don't send malfunction report to the indoor.

The compressor stops for more than 3 minutes, Tpg_indoor> ice_temp_4℃, the compressor recovers.

7.1.5.5：Temperature protection of the outdoor refrigerating coil

When the defrosting temperature and the sensor's temperature are higher than 68℃, the frequency of the compressor decreases 1hz/10seconds. Keep the frequency until it decreases to the lowest frequency. When the temperatures are lower than 68℃ and higher than 61℃, keep the frequency of the compressor. When the temperatures are lower than 61℃, relieve the defrosting temperature protection.

7.2 Value of Thermistor

7.2.1 Outdoor Unit

Ambient Sensor, Defrosting Sensor, Pipe sensor

R25℃=10KΩ±3% B25℃/50℃=3700K±3%

Temp.(℃)	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(℃)	
-30	165.2170	147.9497	132.3678	-1.94	1.75
-29	155.5754	139.5600	125.0806	-1.93	1.74
-28	146.5609	131.7022	118.2434	-1.91	1.73
-27	138.1285	124.3392	111.8256	-1.89	1.71

-26	130.2371	117.4366	105.7989	-1.87	1.70
-25	122.8484	110.9627	100.1367	-1.85	1.69
-24	115.9272	104.8882	94.8149	-1.83	1.67
-23	109.4410	99.1858	89.8106	-1.81	1.66
-22	103.3598	93.8305	85.1031	-1.80	1.64
-21	97.6556	88.7989	80.6728	-1.78	1.63
-20	92.3028	84.0695	76.5017	-1.76	1.62
-19	87.2775	79.6222	72.5729	-1.74	1.60
-18	82.5577	75.4384	68.8710	-1.72	1.59
-17	78.1230	71.5010	65.3815	-1.70	1.57
-16	73.9543	67.7939	62.0907	-1.68	1.55
-15	70.0342	64.3023	58.9863	-1.66	1.54
-14	66.3463	61.0123	56.0565	-1.64	1.52
-13	62.8755	57.9110	53.2905	-1.62	1.51
-12	59.6076	54.9866	50.6781	-1.60	1.49
-11	56.5296	52.2278	48.2099	-1.58	1.47
-10	53.6294	49.6244	45.8771	-1.56	1.46
-9	50.8956	47.1666	43.6714	-1.54	1.44
-8	48.3178	44.8454	41.5851	-1.51	1.42
-7	45.8860	42.6525	39.6112	-1.49	1.40
-6	43.5912	40.5800	37.7429	-1.47	1.39
-5	41.4249	38.6207	35.9739	-1.45	1.37
-4	39.3792	36.7676	34.2983	-1.43	1.35
-3	37.4465	35.0144	32.7108	-1.41	1.33
-2	35.6202	33.3552	31.2062	-1.38	1.31
-1	33.8936	31.7844	29.7796	-1.36	1.29
0	32.2608	30.2968	28.4267	-1.34	1.28
1	30.7162	28.8875	27.1431	-1.32	1.26
2	29.2545	27.5519	25.9250	-1.29	1.24
3	27.8708	26.2858	24.7686	-1.27	1.22
4	26.5605	25.0851	23.6704	-1.25	1.20
5	25.3193	23.9462	22.6273	-1.23	1.18
6	24.1432	22.8656	21.6361	-1.20	1.16
7	23.0284	21.8398	20.6939	-1.18	1.14
8	21.9714	20.8659	19.7982	-1.15	1.12
9	20.9688	19.9409	18.9463	-1.13	1.09
10	20.0176	19.0621	18.1358	-1.11	1.07
11	19.1149	18.2270	17.3646	-1.08	1.05
12	18.2580	17.4331	16.6305	-1.06	1.03
13	17.4442	16.6782	15.9315	-1.03	1.01
14	16.6711	15.9601	15.2657	-1.01	0.99
15	15.9366	15.2770	14.6315	-0.98	0.96
16	15.2385	14.6268	14.0271	-0.96	0.94
17	14.5748	14.0079	13.4510	-0.93	0.92
18	13.9436	13.4185	12.9017	-0.91	0.90

19	13.3431	12.8572	12.3778	-0.88	0.87
20	12.7718	12.3223	11.8780	-0.86	0.85
21	12.2280	11.8126	11.4011	-0.83	0.83
22	11.7102	11.3267	10.9459	-0.81	0.80
23	11.2172	10.8634	10.5114	-0.78	0.78
24	10.7475	10.4216	10.0964	-0.75	0.75
25	10.3000	10.0000	9.7000	-0.75	0.75
26	9.8975	9.5974	9.2980	-0.76	0.76
27	9.5129	9.2132	8.9148	-0.80	0.80
28	9.1454	8.8465	8.5496	-0.84	0.83
29	8.7942	8.4964	8.2013	-0.87	0.86
30	8.4583	8.1621	7.8691	-0.91	0.90
31	8.1371	7.8428	7.5522	-0.95	0.93
32	7.8299	7.5377	7.2498	-0.98	0.97
33	7.5359	7.2461	6.9611	-1.02	1.00
34	7.2546	6.9673	6.6854	-1.06	1.04
35	6.9852	6.7008	6.4222	-1.10	1.07
36	6.7273	6.4459	6.1707	-1.13	1.11
37	6.4803	6.2021	5.9304	-1.17	1.14
38	6.2437	5.9687	5.7007	-1.21	1.18
39	6.0170	5.7454	5.4812	-1.25	1.22
40	5.7997	5.5316	5.2712	-1.29	1.25
41	5.5914	5.3269	5.0704	-1.33	1.29
42	5.3916	5.1308	4.8783	-1.37	1.33
43	5.2001	4.9430	4.6944	-1.41	1.36
44	5.0163	4.7630	4.5185	-1.45	1.40
45	4.8400	4.5905	4.3500	-1.49	1.44
46	4.6708	4.4252	4.1887	-1.53	1.47
47	4.5083	4.2666	4.0342	-1.57	1.51
48	4.3524	4.1145	3.8862	-1.61	1.55
49	4.2026	3.9686	3.7443	-1.65	1.59
50	4.0588	3.8287	3.6084	-1.70	1.62
51	3.9206	3.6943	3.4780	-1.74	1.66
52	3.7878	3.5654	3.3531	-1.78	1.70
53	3.6601	3.4416	3.2332	-1.82	1.74
54	3.5374	3.3227	3.1183	-1.87	1.78
55	3.4195	3.2085	3.0079	-1.91	1.82
56	3.3060	3.0989	2.9021	-1.95	1.85
57	3.1969	2.9935	2.8005	-2.00	1.89
58	3.0919	2.8922	2.7029	-2.04	1.93
59	2.9909	2.7948	2.6092	-2.08	1.97
60	2.8936	2.7012	2.5193	-2.13	2.01
61	2.8000	2.6112	2.4328	-2.17	2.05
62	2.7099	2.5246	2.3498	-2.22	2.09
63	2.6232	2.4413	2.2700	-2.26	2.13

64	2.5396	2.3611	2.1932	-2.31	2.17
65	2.4591	2.2840	2.1195	-2.36	2.21
66	2.3815	2.2098	2.0486	-2.40	2.25
67	2.3068	2.1383	1.9803	-2.45	2.29
68	2.2347	2.0695	1.9147	-2.49	2.34
69	2.1652	2.0032	1.8516	-2.54	2.38
70	2.0983	1.9393	1.7908	-2.59	2.42
71	2.0337	1.8778	1.7324	-2.63	2.46
72	1.9714	1.8186	1.6761	-2.68	2.50
73	1.9113	1.7614	1.6219	-2.73	2.54
74	1.8533	1.7064	1.5697	-2.78	2.58
75	1.7974	1.6533	1.5194	-2.83	2.63
76	1.7434	1.6021	1.4710	-2.88	2.67
77	1.6913	1.5528	1.4243	-2.92	2.71
78	1.6409	1.5051	1.3794	-2.97	2.75
79	1.5923	1.4592	1.3360	-3.02	2.80
80	1.5454	1.4149	1.2942	-3.07	2.84
81	1.5000	1.3721	1.2540	-3.12	2.88
82	1.4562	1.3308	1.2151	-3.17	2.93
83	1.4139	1.2910	1.1776	-3.22	2.97
84	1.3730	1.2525	1.1415	-3.27	3.01
85	1.3335	1.2153	1.1066	-3.32	3.06
86	1.2953	1.1794	1.0730	-3.38	3.10
87	1.2583	1.1448	1.0405	-3.43	3.15
88	1.2226	1.1113	1.0092	-3.48	3.19
89	1.1880	1.0789	0.9789	-3.53	3.24
90	1.1546	1.0476	0.9497	-3.58	3.28
91	1.1223	1.0174	0.9215	-3.64	3.33
92	1.0910	0.9882	0.8942	-3.69	3.37
93	1.0607	0.9599	0.8679	-3.74	3.42
94	1.0314	0.9326	0.8424	-3.80	3.46
95	1.0030	0.9061	0.8179	-3.85	3.51
96	0.9756	0.8806	0.7941	-3.90	3.55
97	0.9490	0.8558	0.7711	-3.96	3.60
98	0.9232	0.8319	0.7489	-4.01	3.64
99	0.8983	0.8088	0.7275	-4.07	3.69
100	0.8741	0.7863	0.7067	-4.12	3.74
101	0.8507	0.7646	0.6867	-4.18	3.78
102	0.8281	0.7436	0.6672	-4.23	3.83
103	0.8061	0.7233	0.6484	-4.29	3.88
104	0.7848	0.7036	0.6303	-4.34	3.92
105	0.7641	0.6845	0.6127	-4.40	3.97
106	0.7441	0.6661	0.5957	-4.46	4.02
107	0.7247	0.6482	0.5792	-4.51	4.07
108	0.7059	0.6308	0.5632	-4.57	4.12

109	0.6877	0.6140	0.5478	-4.63	4.16
110	0.6700	0.5977	0.5328	-4.69	4.21
111	0.6528	0.5820	0.5183	-4.74	4.26
112	0.6361	0.5667	0.5043	-4.80	4.31
113	0.6200	0.5518	0.4907	-4.86	4.36
114	0.6043	0.5374	0.4775	-4.92	4.41
115	0.5891	0.5235	0.4648	-4.98	4.45
116	0.5743	0.5100	0.4524	-5.04	4.50
117	0.5600	0.4968	0.4404	-5.10	4.55
118	0.5460	0.4841	0.4288	-5.16	4.60
119	0.5325	0.4717	0.4175	-5.22	4.65
120	0.5194	0.4597	0.4066	-5.28	4.70

Discharging Sensor

R80℃=50KΩ ±3%

B25/80℃=4450K±3%

Temp.((℃))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(℃)	
-30	14646.0505	12061.7438	9924.4999	-2.96	2.45
-29	13654.1707	11267.8730	9290.2526	-2.95	2.44
-28	12735.8378	10531.3695	8700.6388	-2.93	2.44
-27	11885.1336	9847.7240	8152.2338	-2.92	2.43
-26	11096.6531	9212.8101	7641.8972	-2.91	2.42
-25	10365.4565	8622.8491	7166.7474	-2.90	2.42
-24	9687.0270	8074.3787	6724.1389	-2.88	2.41
-23	9057.2314	7564.2244	6311.6413	-2.87	2.41
-22	8472.2852	7089.4741	5927.0206	-2.86	2.40
-21	7928.7217	6647.4547	5568.2222	-2.84	2.39
-20	7423.3626	6235.7109	5233.3554	-2.83	2.39
-19	6953.2930	5851.9864	4920.6791	-2.82	2.38
-18	6515.8375	5494.2064	4628.5894	-2.80	2.37
-17	6108.5393	5160.4621	4355.6078	-2.79	2.37
-16	5729.1413	4848.9963	4100.3708	-2.77	2.36
-15	5375.5683	4558.1906	3861.6201	-2.76	2.35
-14	5045.9114	4286.5535	3638.1938	-2.75	2.34
-13	4738.4141	4032.7098	3429.0191	-2.73	2.34
-12	4451.4586	3795.3910	3233.1039	-2.72	2.33
-11	4183.5548	3573.4260	3049.5312	-2.70	2.32
-10	3933.3289	3365.7336	2877.4527	-2.69	2.31
-9	3699.5139	3171.3148	2716.0828	-2.67	2.30
-8	3480.9407	2989.2460	2564.6945	-2.66	2.29
-7	3276.5302	2818.6731	2422.6139	-2.64	2.28
-6	3085.2854	2658.8058	2289.2164	-2.63	2.28
-5	2906.2851	2508.9126	2163.9230	-2.61	2.27
-4	2738.6777	2368.3158	2046.1961	-2.60	2.26
-3	2581.6752	2236.3876	1935.5371	-2.58	2.25

-2	2434.5487	2112.5459	1831.4826	-2.56	2.24
-1	2296.6230	1996.2509	1733.6024	-2.55	2.23
0	2167.2730	1887.0018	1641.4966	-2.53	2.22
1	2045.9191	1784.3336	1554.7931	-2.52	2.21
2	1932.0242	1687.8144	1473.1460	-2.50	2.20
3	1825.0899	1597.0431	1396.2333	-2.48	2.19
4	1724.6540	1511.6468	1323.7551	-2.47	2.17
5	1630.2870	1431.2787	1255.4324	-2.45	2.16
6	1541.5904	1355.6163	1191.0048	-2.43	2.15
7	1458.1938	1284.3593	1130.2298	-2.41	2.14
8	1379.7528	1217.2282	1072.8813	-2.40	2.13
9	1305.9472	1153.9626	1018.7481	-2.38	2.12
10	1236.4792	1094.3200	967.6334	-2.36	2.11
11	1171.0715	1038.0743	919.3533	-2.35	2.09
12	1109.4661	985.0146	873.7359	-2.33	2.08
13	1051.4226	934.9440	830.6210	-2.31	2.07
14	996.7169	887.6792	789.8583	-2.29	2.06
15	945.1404	843.0486	751.3077	-2.27	2.04
16	896.4981	800.8922	714.8380	-2.26	2.03
17	850.6086	761.0603	680.3265	-2.24	2.02
18	807.3024	723.4134	647.6580	-2.22	2.00
19	766.4212	687.8205	616.7252	-2.20	1.99
20	727.8172	654.1596	587.4271	-2.18	1.98
21	691.3524	622.3161	559.6694	-2.16	1.96
22	656.8979	592.1831	533.3634	-2.14	1.95
23	624.3328	563.6604	508.4261	-2.12	1.93
24	593.5446	536.6540	484.7796	-2.10	1.92
25	564.4275	511.0760	462.3510	-2.09	1.90
26	536.9865	486.9352	441.1516	-2.07	1.89
27	511.0105	464.0500	421.0258	-2.05	1.87
28	486.4151	442.3499	401.9146	-2.03	1.86
29	463.1208	421.7683	383.7626	-2.01	1.84
30	441.0535	402.2430	366.5175	-1.99	1.83
31	420.1431	383.7151	350.1301	-1.97	1.81
32	400.3242	366.1295	334.5542	-1.95	1.80
33	381.5350	349.4341	319.7460	-1.93	1.78
34	363.7176	333.5801	305.6645	-1.90	1.76
35	346.8176	318.5216	292.2709	-1.88	1.75
36	330.7839	304.2151	279.5286	-1.86	1.73
37	315.5682	290.6199	267.4031	-1.84	1.71
38	301.1254	277.6976	255.8620	-1.82	1.70
39	287.4128	265.4119	244.8745	-1.80	1.68
40	274.3905	253.7288	234.4118	-1.78	1.66
41	262.0206	242.6161	224.4465	-1.76	1.64
42	250.2676	232.0436	214.9529	-1.74	1.63

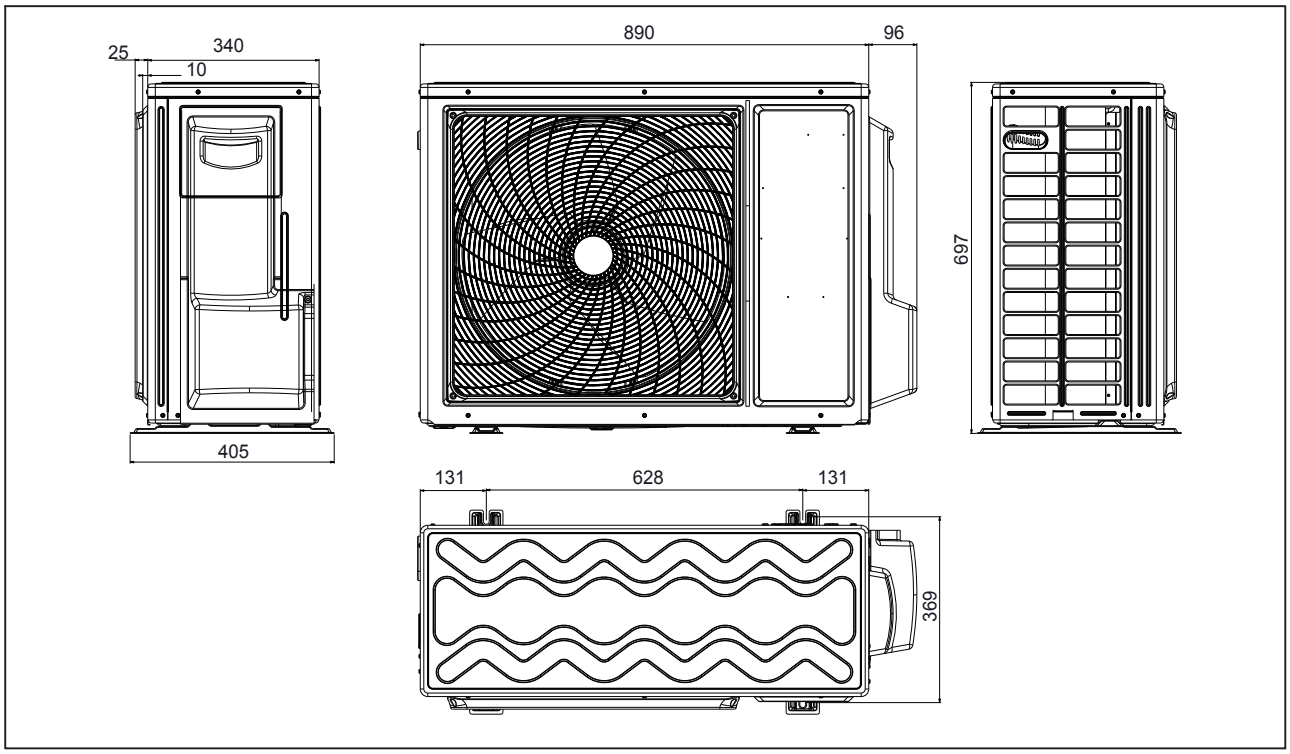
43	239.0983	221.9825	205.9065	-1.71	1.61
44	228.4809	212.4060	197.2844	-1.69	1.59
45	218.3860	203.2887	189.0648	-1.67	1.57
46	208.7855	194.6066	181.2273	-1.65	1.55
47	199.6531	186.3369	173.7524	-1.63	1.54
48	190.9639	178.4584	166.6217	-1.60	1.52
49	182.6945	170.9508	159.8181	-1.58	1.50
50	174.8228	163.7951	153.3249	-1.56	1.48
51	167.3280	156.9733	147.1268	-1.53	1.46
52	160.1904	150.4683	141.2090	-1.51	1.44
53	153.3914	144.2641	135.5577	-1.49	1.42
54	146.9136	138.3454	130.1598	-1.47	1.40
55	140.7403	132.6980	125.0027	-1.44	1.38
56	134.8559	127.3081	120.0746	-1.42	1.36
57	129.2457	122.1630	115.3645	-1.40	1.34
58	123.8956	117.2504	110.8618	-1.37	1.32
59	118.7926	112.5589	106.5564	-1.35	1.30
60	113.9241	108.0776	102.4388	-1.32	1.28
61	109.2784	103.7961	98.5000	-1.30	1.26
62	104.8443	99.7046	94.7315	-1.28	1.23
63	100.6112	95.7939	91.1253	-1.25	1.21
64	96.5692	92.0553	87.6735	-1.23	1.19
65	92.7088	88.4805	84.3690	-1.20	1.17
66	89.0211	85.0614	81.2048	-1.18	1.15
67	85.4976	81.7908	78.1744	-1.15	1.12
68	82.1303	78.6615	75.2715	-1.13	1.10
69	78.9116	75.6668	72.4902	-1.10	1.08
70	75.8343	72.8004	69.8249	-1.08	1.06
71	72.8916	70.0561	67.2703	-1.05	1.03
72	70.0770	67.4283	64.8213	-1.03	1.01
73	67.3844	64.9115	62.4731	-1.00	0.99
74	64.8080	62.5006	60.2211	-0.98	0.96
75	62.3423	60.1906	58.0609	-0.95	0.94
76	59.9821	57.9770	55.9885	-0.92	0.92
77	57.7223	55.8552	53.9998	-0.90	0.89
78	55.5583	53.8210	52.0912	-0.87	0.87
79	53.4856	51.8706	50.2591	-0.85	0.84
80	51.5000	50.0000	48.5000	-0.85	0.84
81	49.7063	48.2057	46.7083	-0.85	0.85
82	47.9835	46.4842	44.9911	-0.89	0.89
83	46.3286	44.8323	43.3452	-0.93	0.92
84	44.7385	43.2468	41.7672	-0.96	0.95
85	43.2105	41.7248	40.2540	-1.00	0.99
86	41.7386	40.2604	38.7996	-1.03	1.02
87	40.3241	38.8545	37.4048	-1.07	1.06

88	38.9643	37.5045	36.0668	-1.11	1.09
89	37.6569	36.2078	34.7831	-1.14	1.13
90	36.3996	34.9622	33.5513	-1.18	1.16
91	35.1903	33.7653	32.3689	-1.22	1.19
92	34.0269	32.6151	31.2338	-1.26	1.23
93	32.9075	31.5096	30.1438	-1.30	1.27
94	31.8302	30.4467	29.0970	-1.33	1.30
95	30.7933	29.4246	28.0915	-1.37	1.34
96	29.7950	28.4417	27.1254	-1.41	1.37
97	28.8337	27.4961	26.1970	-1.45	1.41
98	27.9078	26.5864	25.3048	-1.49	1.44
99	27.0160	25.7110	24.4470	-1.53	1.48
100	26.1569	24.8685	23.6222	-1.57	1.52
101	25.3290	24.0574	22.8291	-1.61	1.55
102	24.5311	23.2765	22.0662	-1.65	1.59
103	23.7620	22.5245	21.3323	-1.69	1.63
104	23.0205	21.8002	20.6261	-1.73	1.66
105	22.3055	21.1025	19.9465	-1.77	1.70
106	21.6159	20.4303	19.2924	-1.81	1.74
107	20.9508	19.7825	18.6626	-1.85	1.77
108	20.3091	19.1582	18.0563	-1.89	1.81
109	19.6899	18.5564	17.4723	-1.93	1.85
110	19.0924	17.9761	16.9098	-1.98	1.89
111	18.5157	17.4166	16.3680	-2.02	1.93
112	17.9590	16.8769	15.8458	-2.06	1.96
113	17.4214	16.3564	15.3427	-2.10	2.00
114	16.9023	15.8542	14.8577	-2.15	2.04
115	16.4010	15.3696	14.3902	-2.19	2.08
116	15.9167	14.9020	13.9394	-2.23	2.12
117	15.4489	14.4506	13.5047	-2.27	2.16
118	14.9968	14.0149	13.0855	-2.32	2.19
119	14.5599	13.5942	12.6811	-2.36	2.23
120	14.1376	13.1879	12.2909	-2.41	2.27
121	13.7294	12.7955	11.9144	-2.45	2.31
122	13.3347	12.4165	11.5510	-2.50	2.35
123	12.9531	12.0503	11.2003	-2.54	2.39
124	12.5840	11.6965	10.8617	-2.58	2.43
125	12.2270	11.3545	10.5348	-2.63	2.47
126	11.8817	11.0240	10.2191	-2.68	2.51
127	11.5475	10.7046	9.9142	-2.72	2.55
128	11.2242	10.3957	9.6197	-2.77	2.59
129	10.9112	10.0970	9.3352	-2.81	2.63
130	10.6084	9.8082	9.0602	-2.86	2.67
131	10.3151	9.5288	8.7945	-2.91	2.71
132	10.0312	9.2586	8.5378	-2.95	2.75

133	9.7563	8.9971	8.2895	-3.00	2.80
134	9.4901	8.7441	8.0495	-3.05	2.84
135	9.2322	8.4993	7.8175	-3.09	2.88
136	8.9824	8.2623	7.5931	-3.14	2.92
137	8.7404	8.0329	7.3760	-3.19	2.96
138	8.5059	7.8108	7.1660	-3.24	3.00
139	8.2787	7.5958	6.9629	-3.29	3.04
140	8.0584	7.3875	6.7664	-3.33	3.09

8.Dimensional drawin

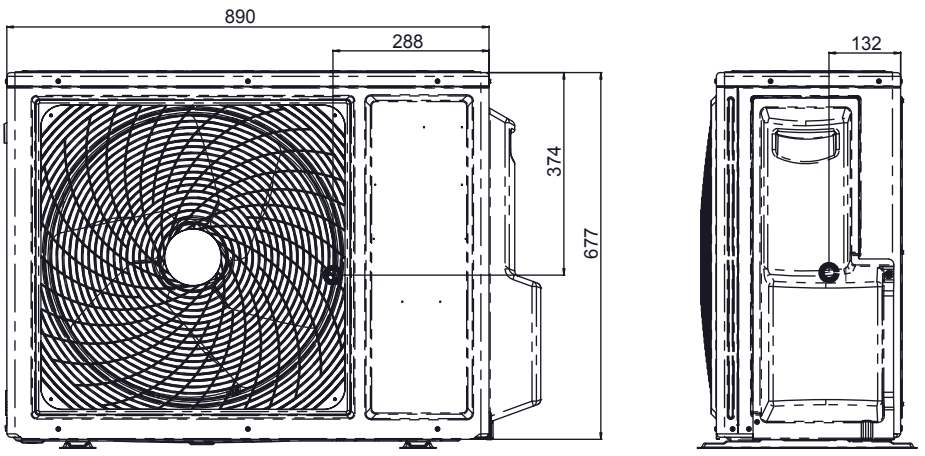
unit:mm



9.Center of gravity

unit:mm

Outdoor unit



10.Service Diagnosis

10.1.1 Caution for Diagnosis

The operation lamp flashes when any of the following errors is detected.

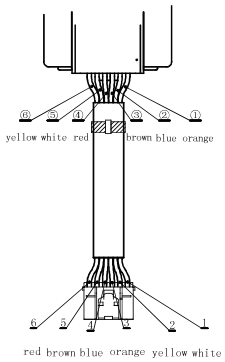
1.When a protection device of the indoor or outdoor unit is activated or when the thermistor malfunctions, disabling equipment operation.

2.When a signal transmission error occurs between the indoor and outdoor units.In either case, conduct the diagnostic procedure described in the following pages.

10.1.2 Problem Symptoms and Measures

Symptom	Check Item	Details of Measure
None of the units operates	Check the power supply.	Check to make sure that the rated voltage is supplied.
	Check the indoor PCB	Check to make sure that the indoor PCB is broken
Operation sometimes stops.	Check the power supply.	A power failure of 2 to 10 cycles can stop air conditioner operation.
Equipment operates but does not cool, or does not heat (only for heat pump)	Check for faulty operation of the electronic expansion valve.	Set the units to cooling operation, and compare the temperatures of the liquid side connection pipes of the connection section among rooms to check the opening and closing operation of the electronic expansion valves of the individual units.
	Diagnosis by service port pressure and operating current.	Check for insufficient gas.
Large operating noise and vibrations	Check the installation condition.	Check to make sure that the required spaces for installation (specified in the Technical Guide, etc.) are provided.

10.2 Parameter of primary electronic appliance

NO	Name	Parameter	Picture
1	ELECTRIC EXPANSION VALVE	Rated voltage:12V Valve orifice ：Φ1.8mm Coil resistance 46±3.7Ω	

10.3 Error Codes and Description indoor display

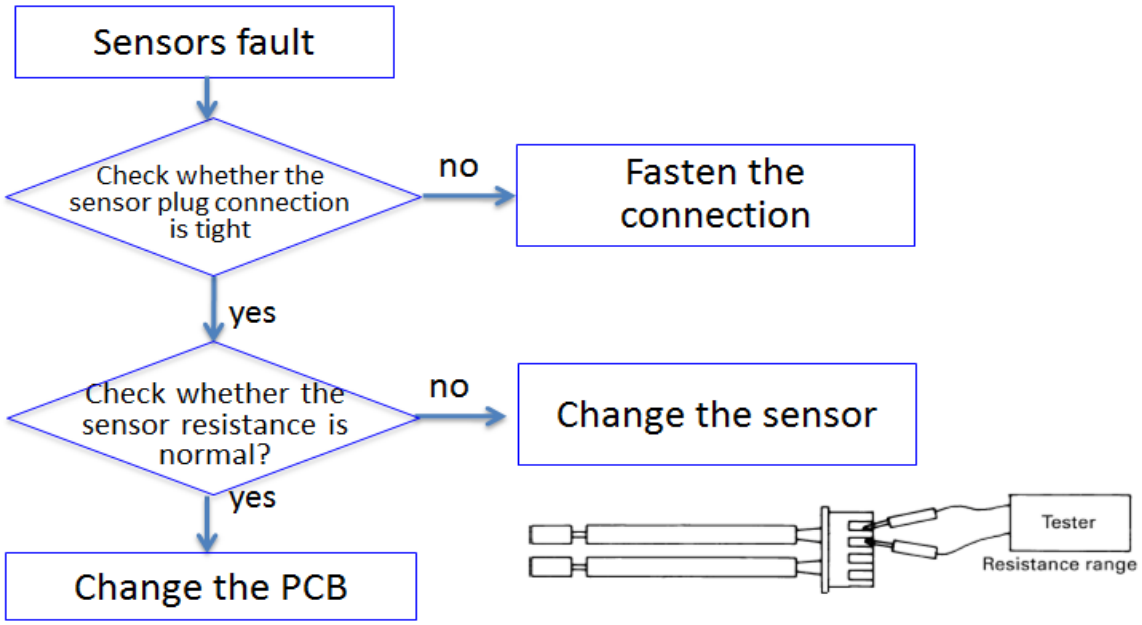
	Code indication		fault description
	Display Code	Outdoor (LED1 flash times)	
Indoor and Outdoor	E7	15	Communication fault between indoor and outdoor units
Indoor Malfunction	E1	--	Room temperature sensor failure
	E2	--	Heat-exchange sensor failure
	E4	--	Indoor EEPROM error
	E14	--	Indoor fan motor malfunction
Outdoor Malfunction	F12	1	Outdoor EEPROM error
	F1	2	The protection of IPM
	F22	3	Overcurrent protection of AC electricity for the outdoor model
	F3	4	Communication fault between the IPM and outdoor PCB
	F20	5	Compressor overload
	F19	6	Power voltage is too high or low
	F27	7	Compressor blocked
	F4	8	Overheat protection for Discharge temperature
	F8	9	Outdoor DC fan motor fault
	F21	10	Defrost temperature sensor failure
	F7	11	Suction temperature sensor failure
	F6	12	Ambient temperature sensor failure
	F25	13	Discharge temperature sensor failure
	F30	14	Suction temp of compressor is too high
	F13	16	Less gas charge
	F14	17	4-way-valve fault
	F11	18	deviate from the normal for the compressor
	F28	19	Loop of the station detect error
	F2	24	Overcurrent of the compressor
	F23	25	Overcurrent protection for single-phase of the compressor

10.3.1 Thermistor or Related Abnormality

Indoor display E1: Room temperature sensor failure
E2: Indoor pipe sensor failure

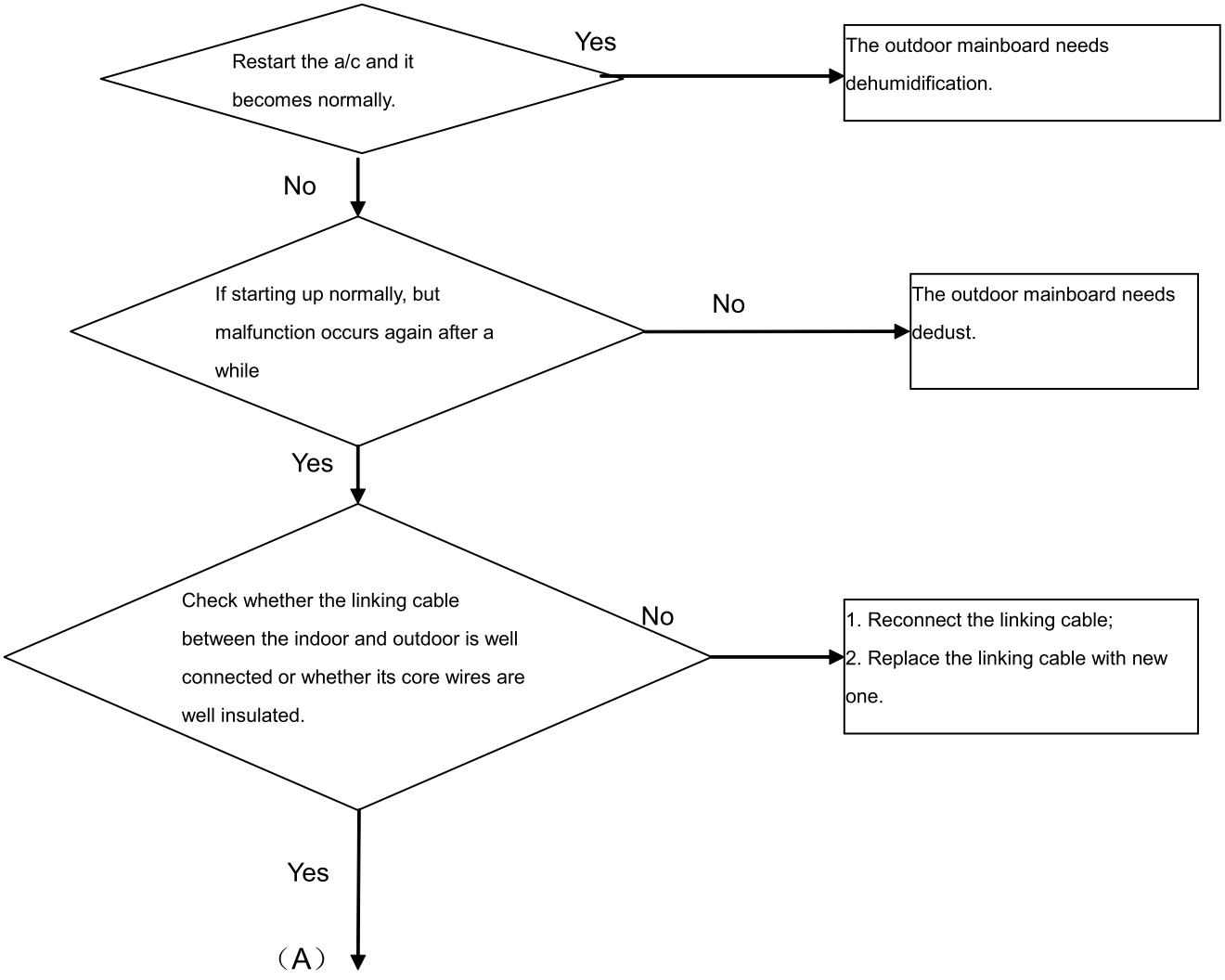
outdoor display
LED1 flash 10 times：Defrost temperature sensor failure
LED1 flash 11 times：Suction temperature sensor failure
LED1 flash 12 times：Ambient temperature sensor failure
LED1 flash 13 times：Discharge temperature sensor failure

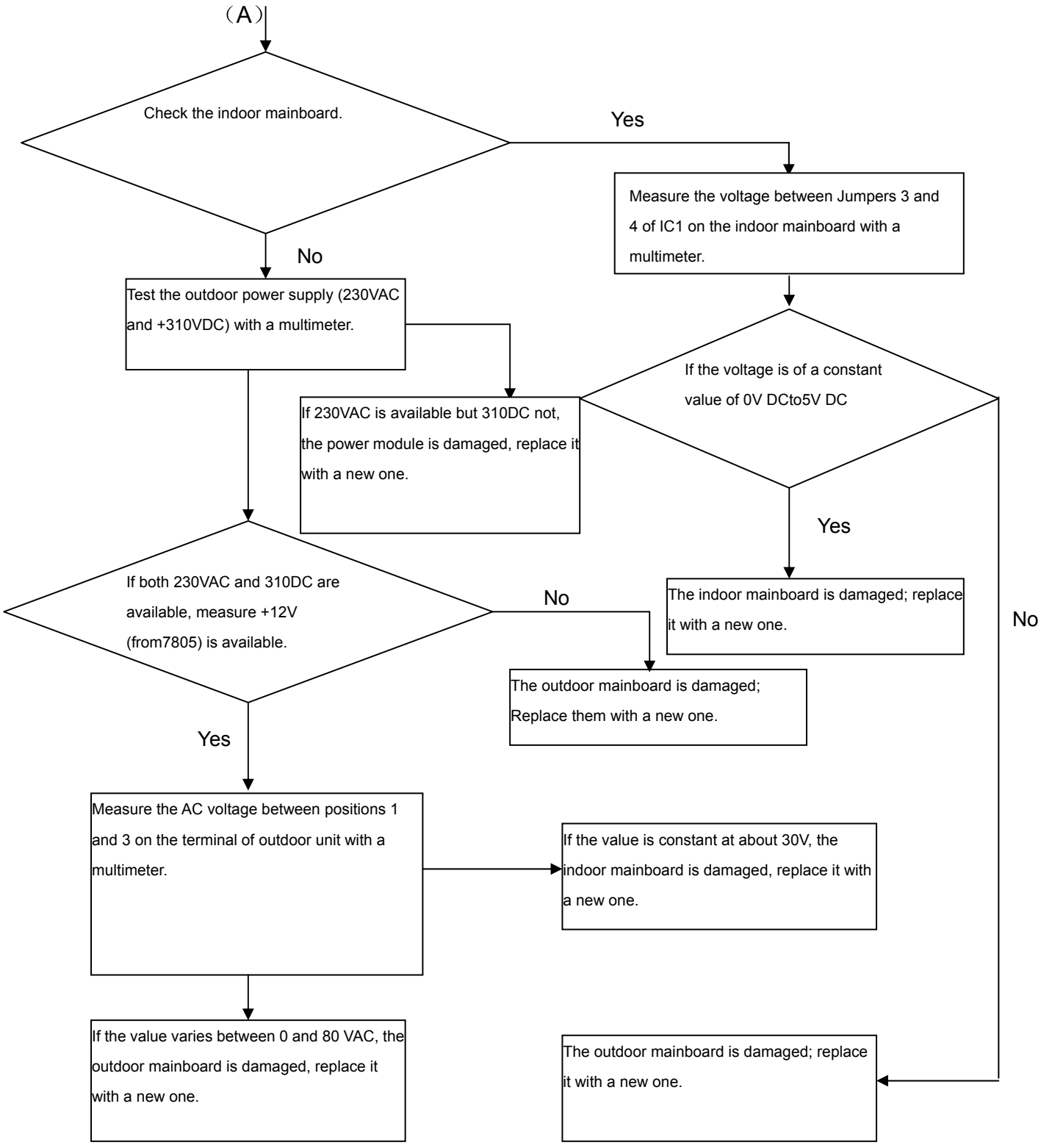
Spare parts:
Sensors



10.3.2 The communitcation falut between indoor and outdoor

Indoor display Outdoor display	E7 LED1 flash 15 times
Method of malfunction detection	Communication is detected by checking the indoor PCB and the outdoor PCB
Malfunction detection conditions	■ The outdoor PCB broken leads to communication fault ■ The indoor PCB broken leads to communication fault
Supposed causes	■ Communication wiring disconnected ■ The indoor PCB is broken ■ The outdoor PCB is broken ■ The Module PCB is broken
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.




(A)
Check the indoor mainboard.
Yes
No
Measure the voltage between Jumpers 3 and 4 of IC1 on the indoor mainboard with a multimeter.
Test the outdoor power supply (230VAC and +310VDC) with a multimeter.
If the voltage is of a constant value of 0V DCto5V DC
If 230VAC is available but 310DC not, the power module is damaged, replace it with a new one.
Yes
No
The indoor mainboard is damaged; replace it with a new one.
If both 230VAC and 310DC are available, measure +12V (from7805) is available.
No
The outdoor mainboard is damaged; Replace them with a new one.
Yes
Measure the AC voltage between positions 1 and 3 on the terminal of outdoor unit with a multimeter.
If the value is constant at about 30V, the indoor mainboard is damaged, replace it with a new one.
If the value varies between 0 and 80 VAC, the outdoor mainboard is damaged, replace it with a new one.
The outdoor mainboard is damaged; replace it with a new one.

10.3.3 EEPROM abnormal

Indoor Display E4: indoor EEPROM error
Outdoor display F12: Outdoor EEPROM error; Outdoor LED1 flash 1 times

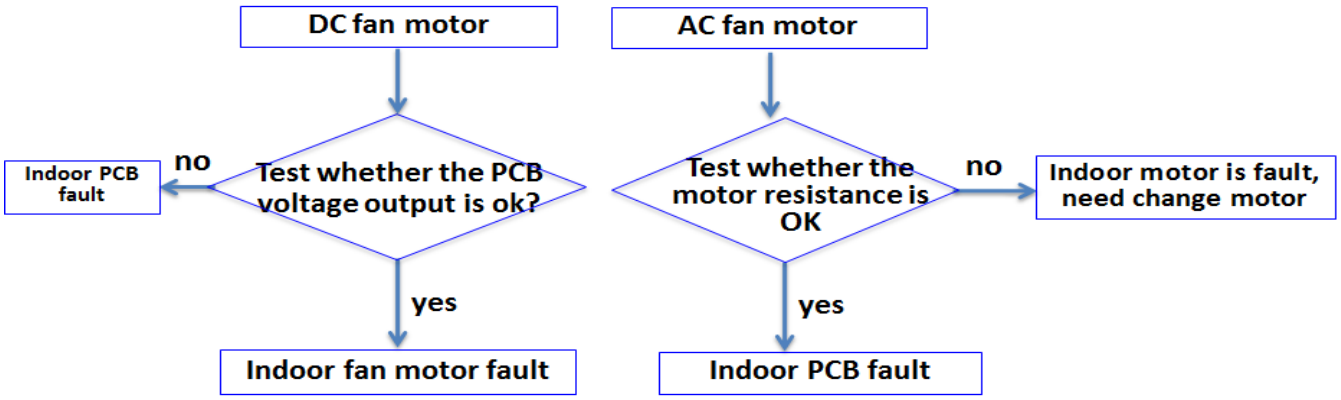
Spare parts:
Indoor PCB
Outdoor PCB

Replace the indoor or outdoor PCB

10.3.4 Indoor AC fan motor malfunction

Indoor display E14
This is caused by indoor motor or indoor PCB fault

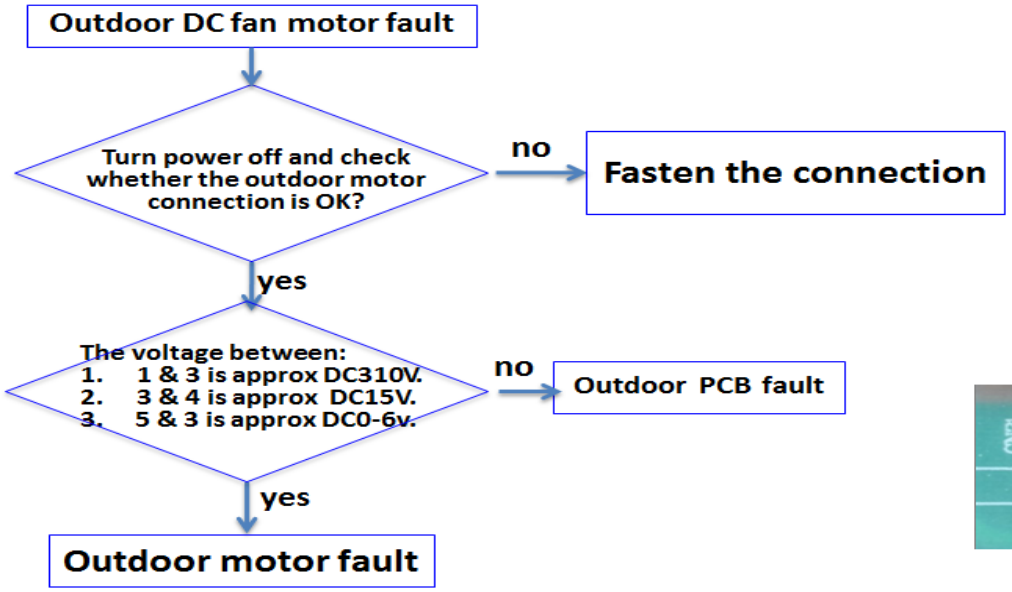
Spare parts:
Indoor PCB
Indoor motor

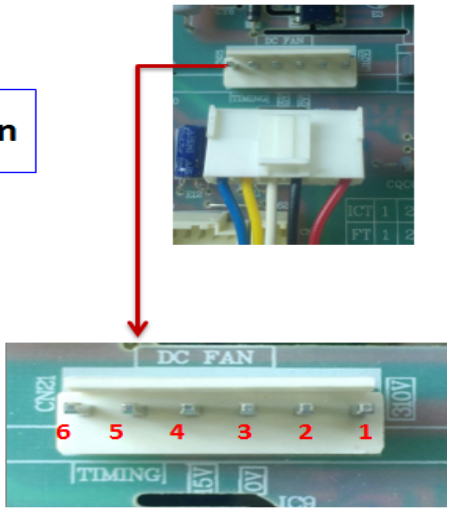


10.3.5 Outdoor DC fan motor fault

Outdoor display F8 LED1 flash 9 times

Spare parts:
outdoor PCB
outdoor motor

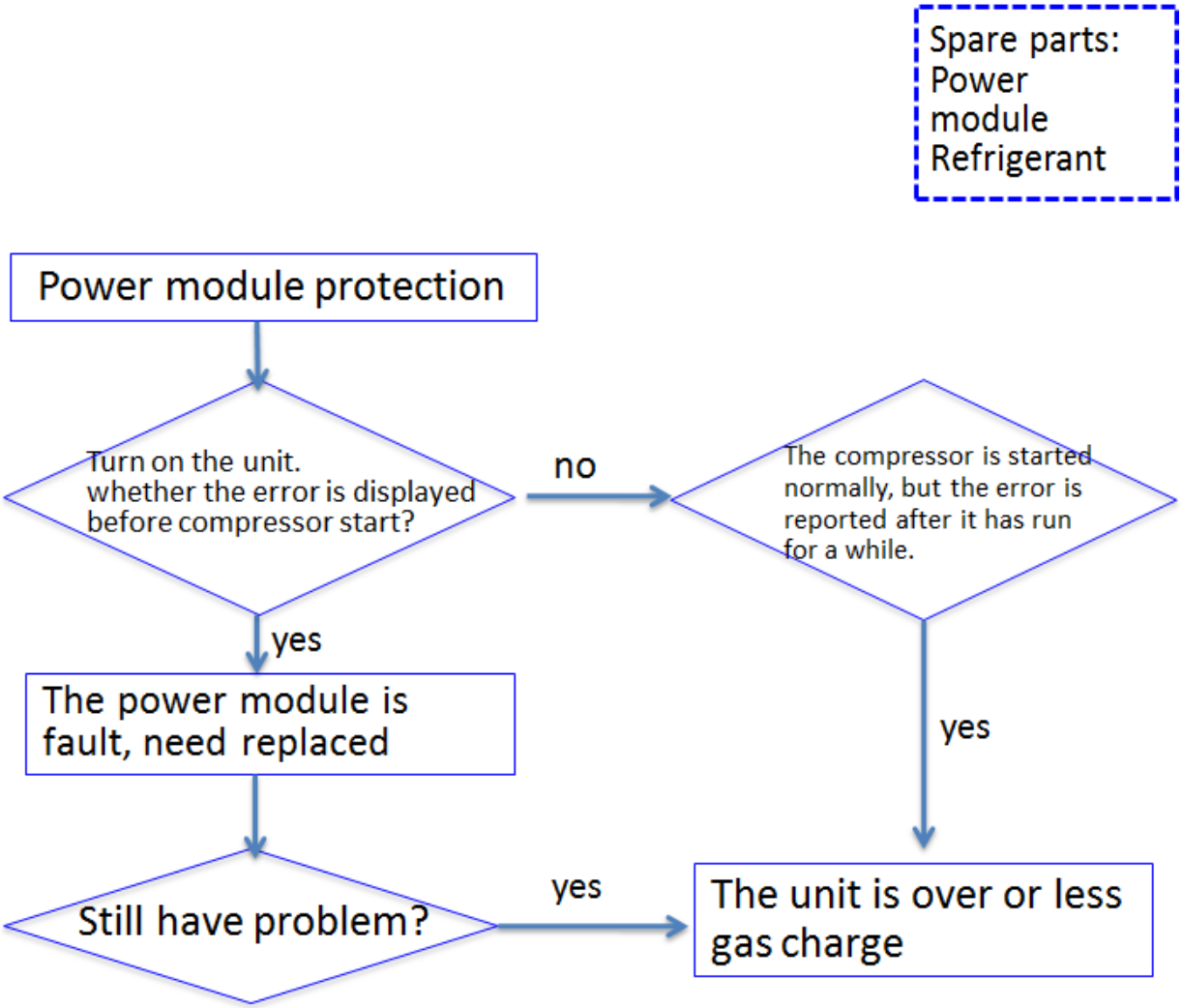




10.3.6 IPM protection

Outdoor display	F1 LED1 flash 2 times; F22 LED1 flash 3 times

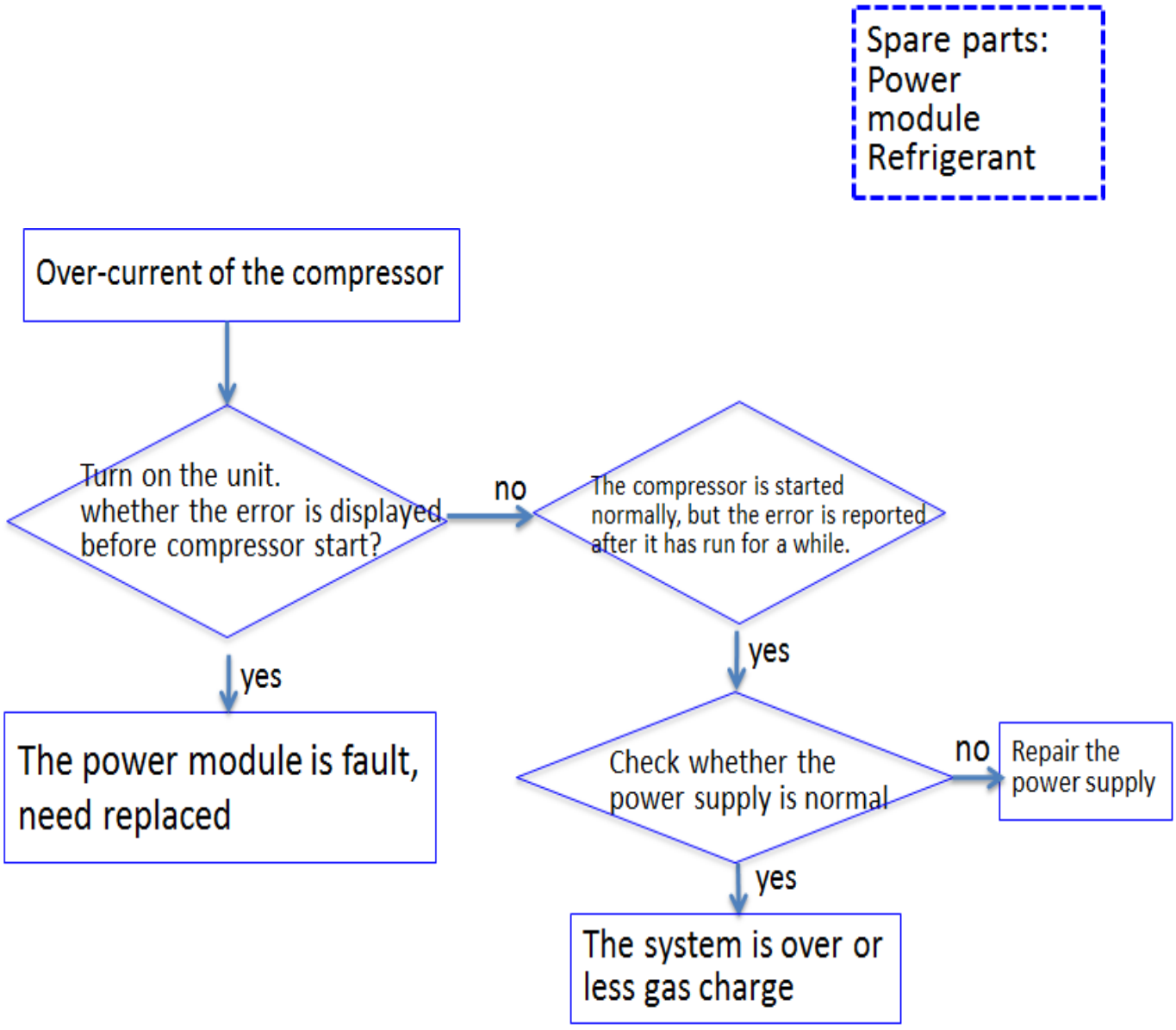
Under this error, please ensure the refrigerating system pressure is normal, and no block, then replace power module



10.3.7 Over-current of the compressor

Outdoor Display

F2, F23 LED1 flash 24 or 25 times



10.3.8 The communication fault between IPM and outdoor PCB

Outdoor display: F3 LED1 flash 4 times

The communication fault between Power module and outdoor PCB

Spare parts:
Power module
Outdoor PCB

1) Check whether plug of MODULE COM and MODULE POWER on the outdoor PCB and Power module is tight connected
2) Check whether the connection of P & N wire between Power module and outdoor is tight

Is the connection OK?

no → Fasten the connection

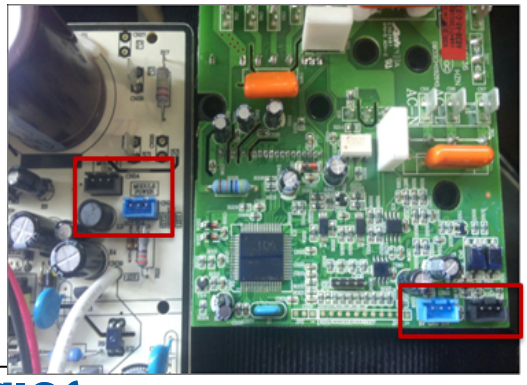
yes

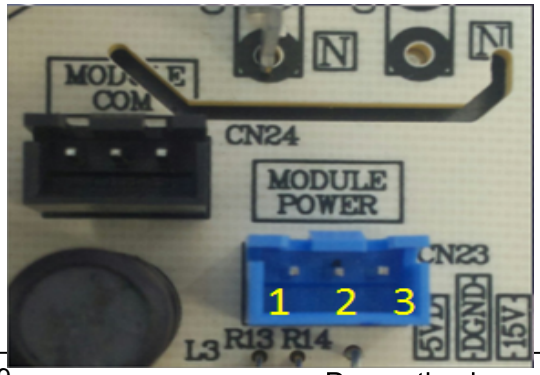
The voltage of Module Power socket between:
1. 1 & 2 is approx DC5V,
2. 2 & 3 is approx DC15V,

no → Replace outdoor PCB

yes

Replace power module

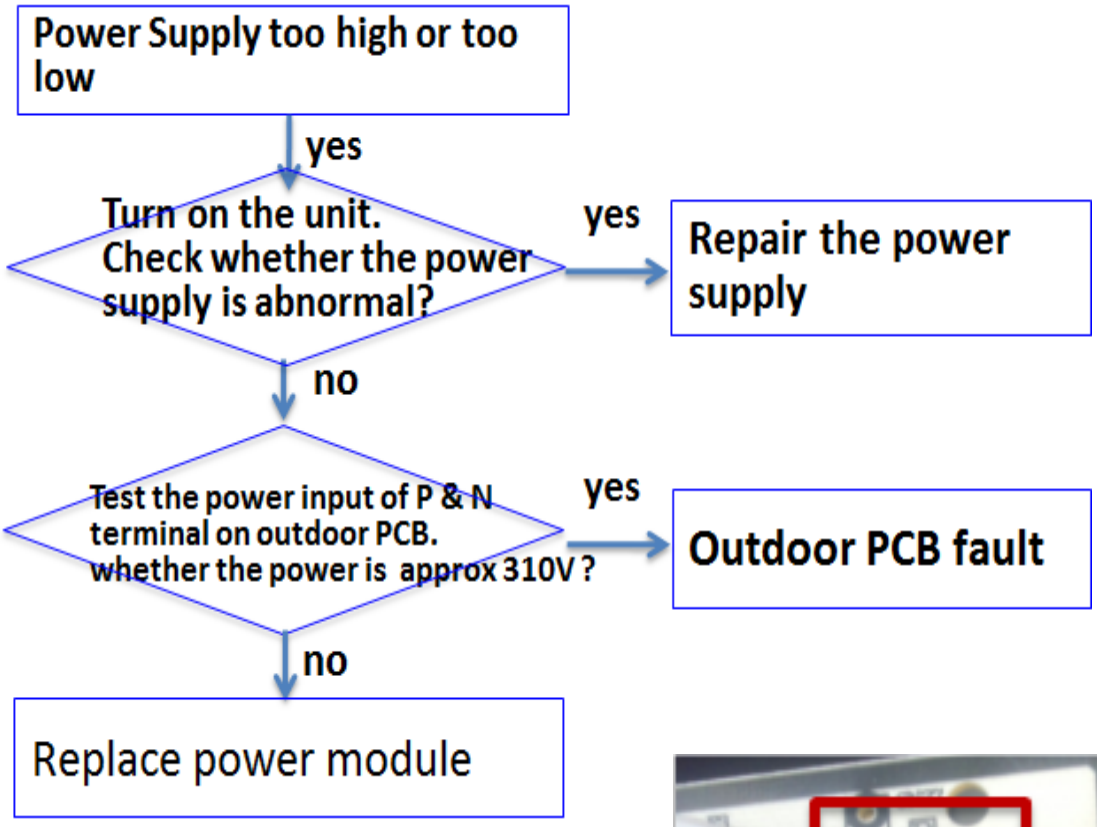




10.3.9 Power Supply Over or under voltage fault

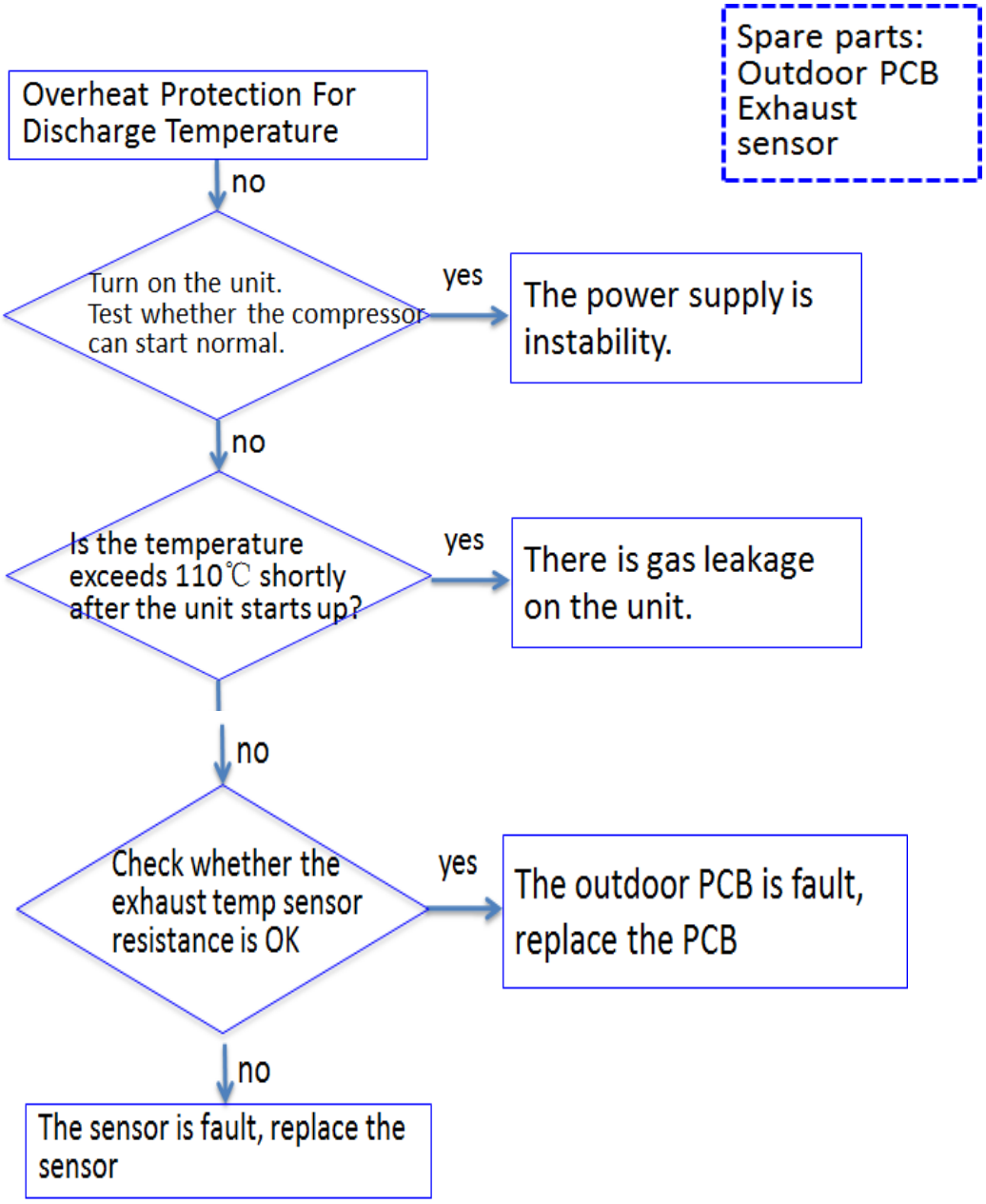
Outdoor display: F19 LED1 flash 6 times

Spare parts: Power module



10.3.10 Overheat Protection For Discharge Temperature

Outdoor display: F4 LED1 flash 8 times



10.3.11 Compressor loss of synchronism detection

Outdoor Display	F11 LED1 flash 18 times

The fault phenomenon is the compressor rotor demagnetization and couldn't reach the request frequency.

It is caused by the high exhaust temp or high running current.
In this fault we suggest change the compressor.

Spare parts:
Compressor

10.3.12 Compressor position detection circuit fault

Outdoor Display	F28 LED1 flash 19 times

This is caused by the compressor position detection circuit fault, this circuit is located on the power module.

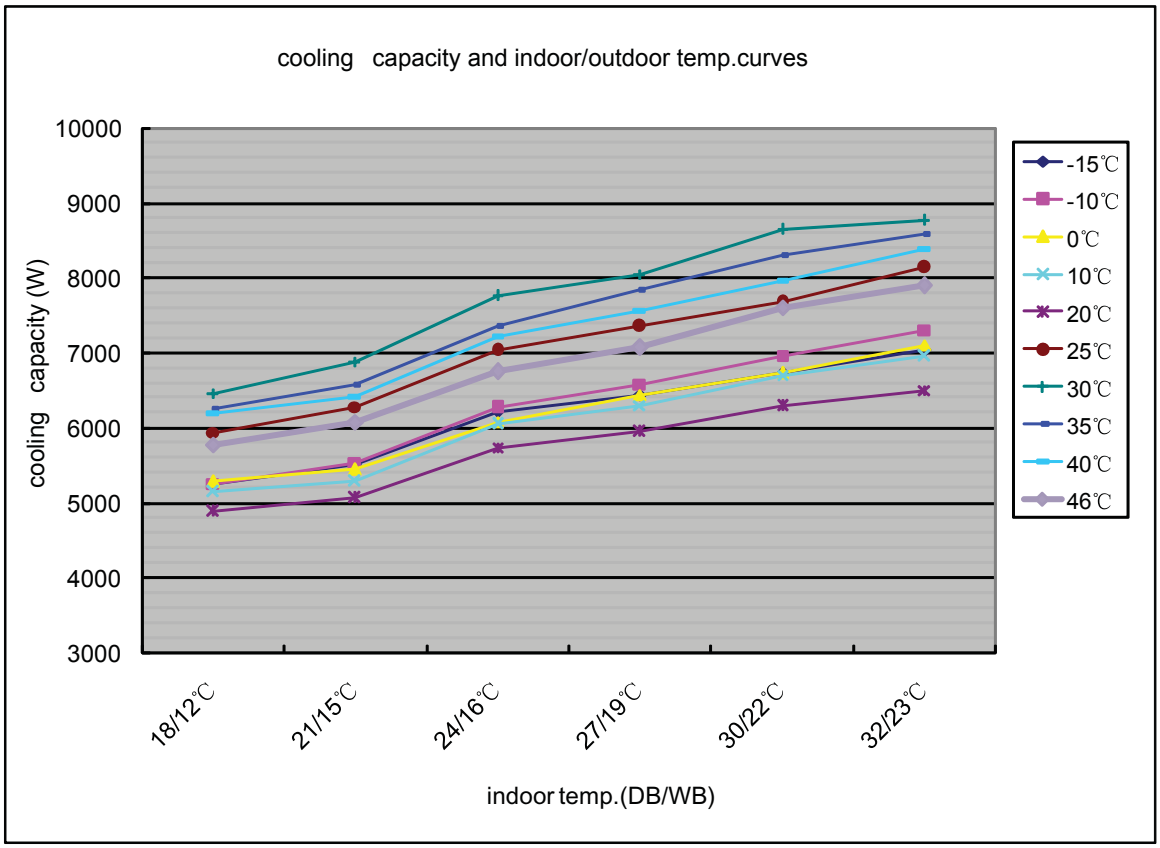
This fault should change the power module.

Spare parts:
Power module

11 Performance and curves diagrams

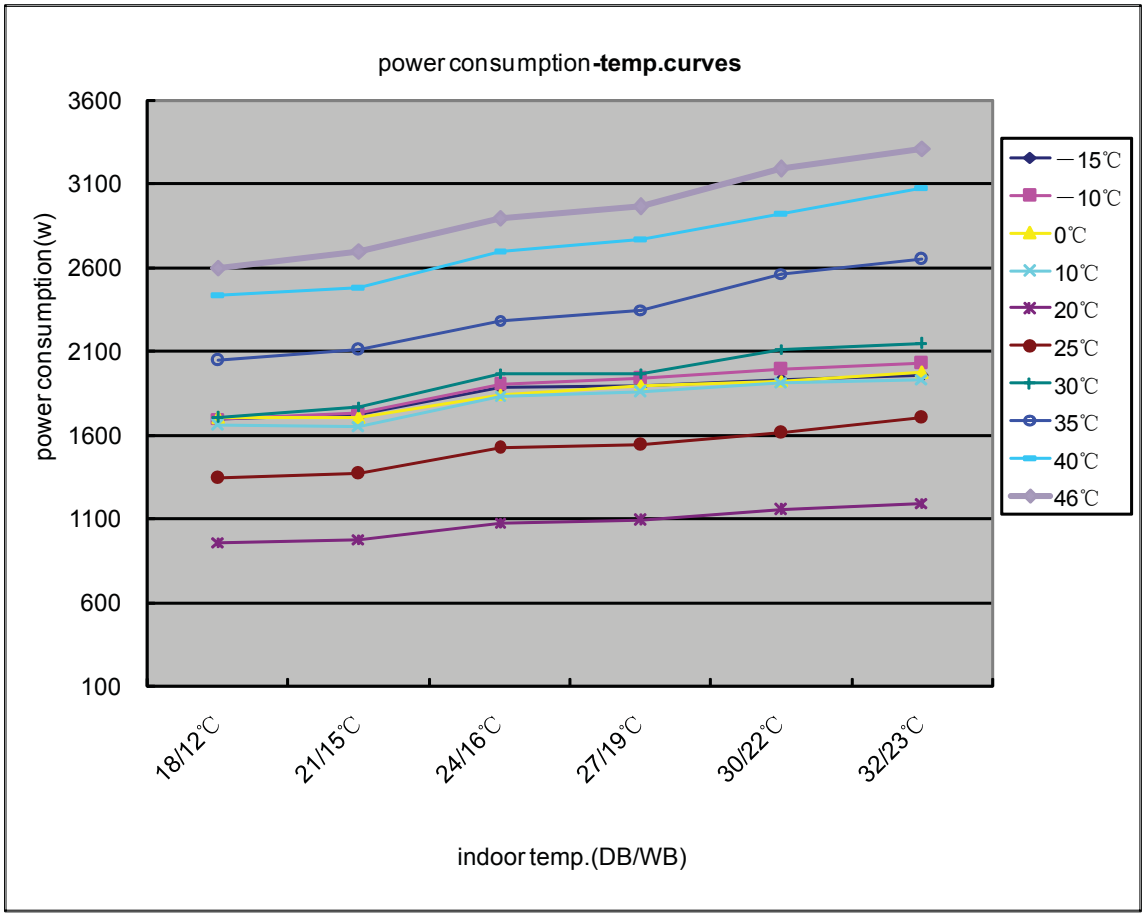
11.1 Cooling capacity temperature curves

performance curves										
cooling value-temerature table										
indoor temp.										
DB/WB	-15℃	-10℃	0℃	10℃	20℃	25℃	30℃	35℃	40℃	46℃
18/12℃	5244	5258	5281	5139	4877	5941	6463	6249	6190	5772
21/15℃	5506	5534	5451	5287	5064	6278	6881	6571	6419	6076
24/16℃	6217	6265	6078	6045	5735	7029	7757	7354	7214	6750
27/19℃	6440	6580	6440	6300	5950	7350	8050	7840	7560	7070
30/22℃	6744	6961	6732	6701	6291	7681	8639	8299	7961	7606
32/23℃	7034	7305	7101	6954	6502	8135	8761	8585	8393	7893



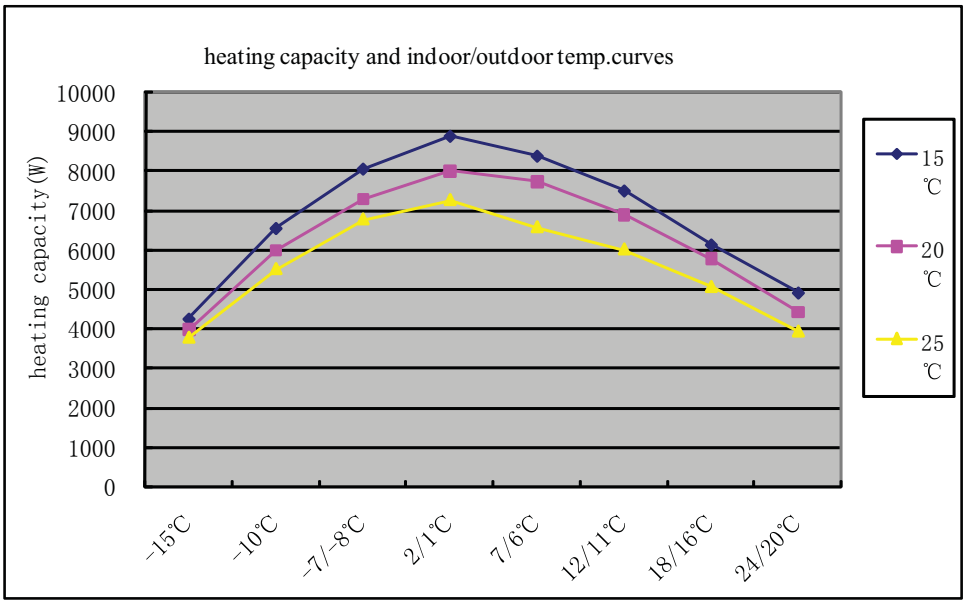
11.2 Power consumption temperature curves

performance curves										
power consumption value-temp.table										
indoor temp.										
DB/WB	−15℃	−10℃	0℃	10℃	20℃	25℃	30℃	35℃	40℃	46℃
18/12℃	1692	1696	1704	1658	960	1342	1703	2046	2435	2599
21/15℃	1721	1729	1703	1652	977	1369	1768	2110	2477	2697
24/16℃	1884	1899	1842	1832	1076	1519	1968	2284	2694	2892
27/19℃	1894	1935	1894	1853	1091	1540	1967	2346	2771	2962
30/22℃	1927	1989	1923	1914	1153	1609	2111	2562	2918	3186
32/23℃	1954	2029	1972	1932	1192	1704	2141	2650	3076	3307



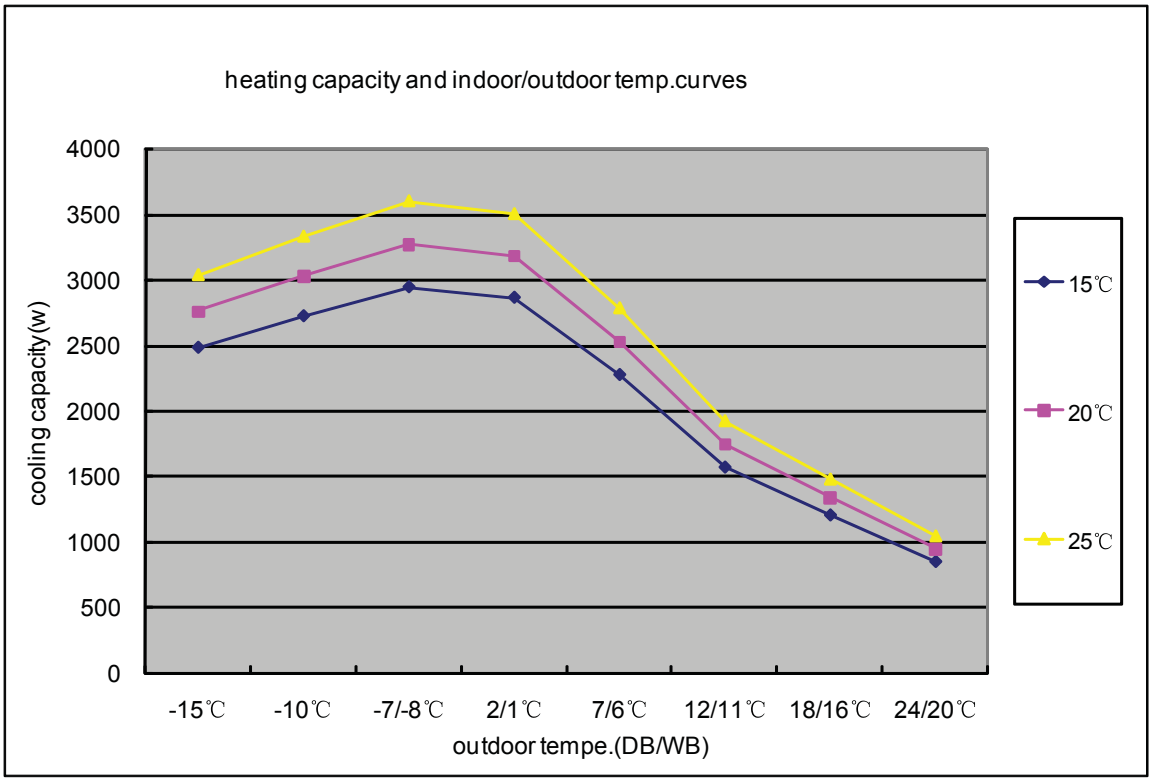
11.3 Heating capacity temperature curves

performance curves			
heating capacity and indoor/outdoor temp.table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	15℃	20℃	25℃
-25℃	3555	3225	3160
-20℃	3950	3600	3555
-15℃	4266	3975	3792
-10℃	6556	5995	5530
-7/-8℃	8057	7305	6789
2/1℃	8886	8024	7276
7/6℃	8383	7742	6589
12/11℃	7504	6913	6027
18/16℃	6140	5789	5076
24/20℃	4926	4427	3948



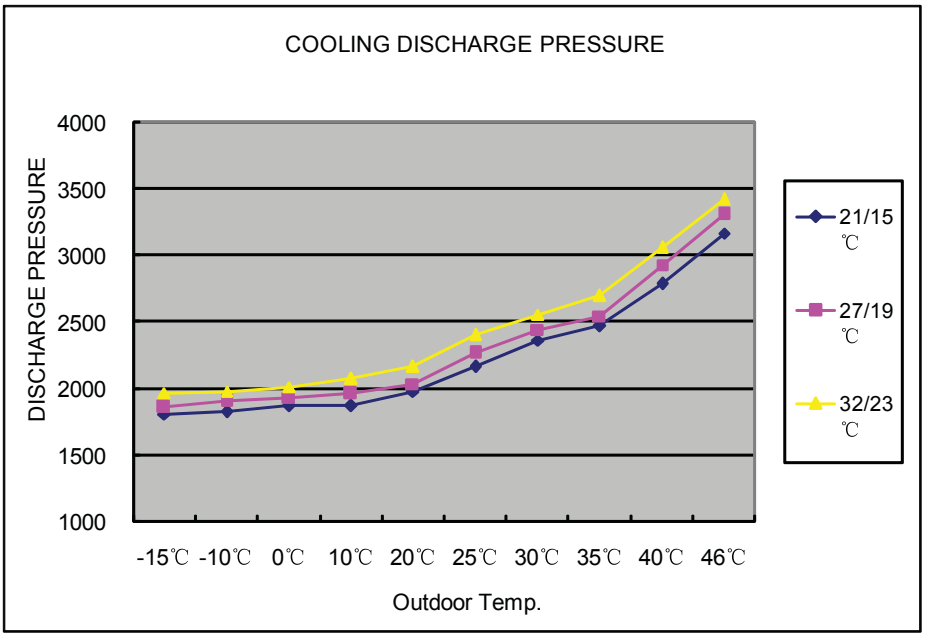
11.4 Power consumption value -temperature curves

performance curves			
power consumption value-temp.table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	15℃	20℃	25℃
-25℃	2012	2236	2459
-20℃	2246	2496	2745
-15℃	2480	2756	3031
-10℃	2720	3023	3325
-7/-8℃	2941	3268	3594
2/1℃	2861	3179	3497
7/6℃	2273	2526	2778
12/11℃	1569	1743	1917
18/16℃	1204	1338	1472
24/20℃	850	944	1039



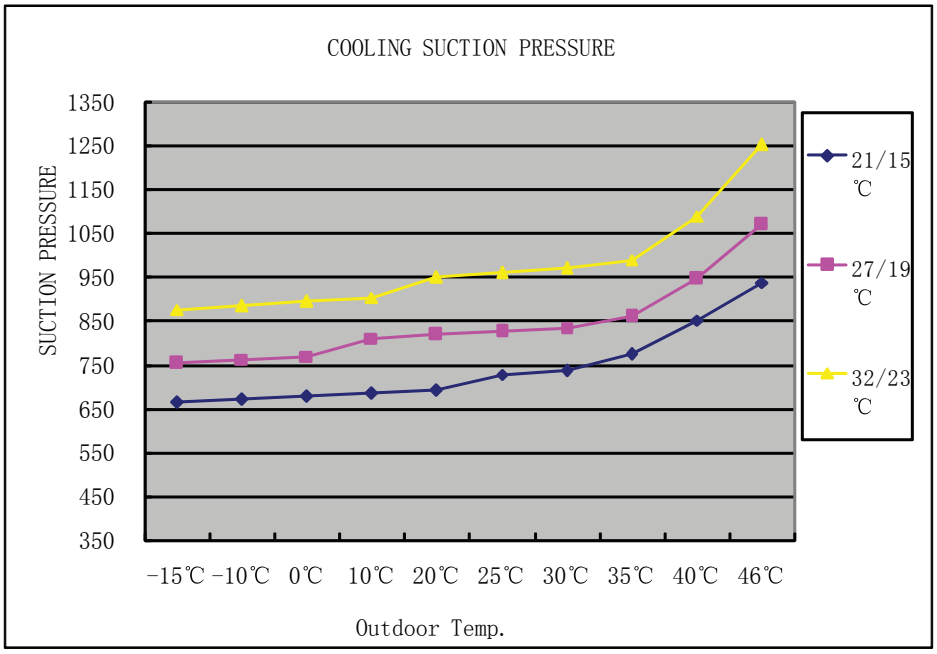
11.5 Cooling discharge pressure curves

performance curves			
cooling discharge pressure.table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	21/15℃	27/19℃	32/23℃
-15℃	1811	1862	1971
-10℃	1827	1913	1984
0℃	1876	1938	2016
10℃	1877	1964	2077
20℃	1981	2040	2172
25℃	2169	2270	2406
30℃	2366	2448	2560
35℃	2477	2550	2698
40℃	2794	2933	3060
46℃	3173	3315	3423



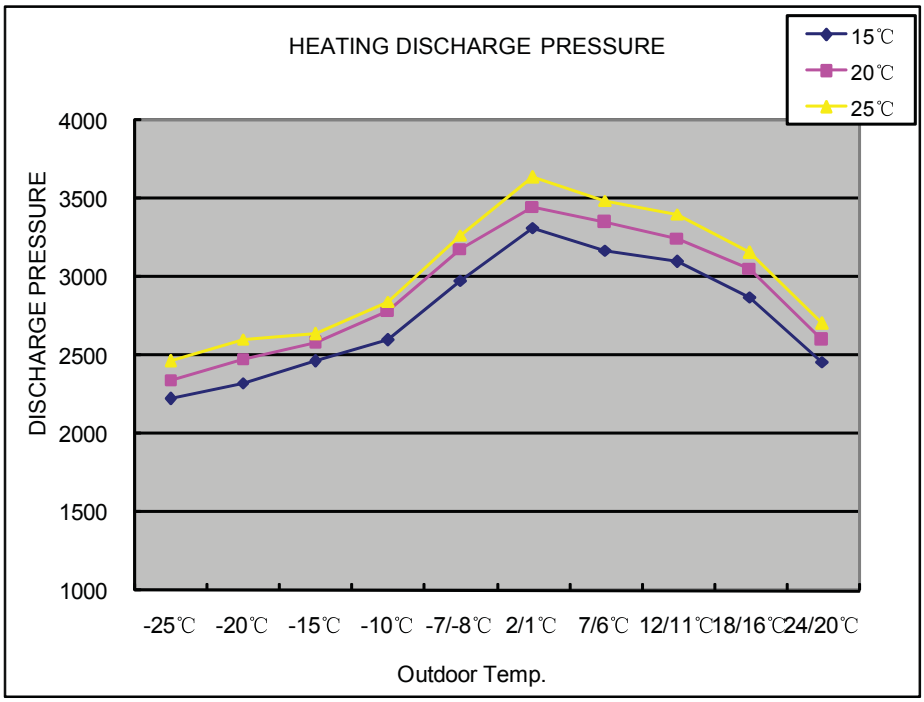
11.6 Cooling suction pressure curves

performance curves			
cooling suction pressure.table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	21/15℃	27/19℃	32/23℃
-15℃	664	754	876
-10℃	671	761	884
0℃	678	769	893
10℃	685	809	902
20℃	692	818	950
25℃	728	826	960
30℃	735	834	969
35℃	774	860	989
40℃	851	946	1088
46℃	937	1069	1251



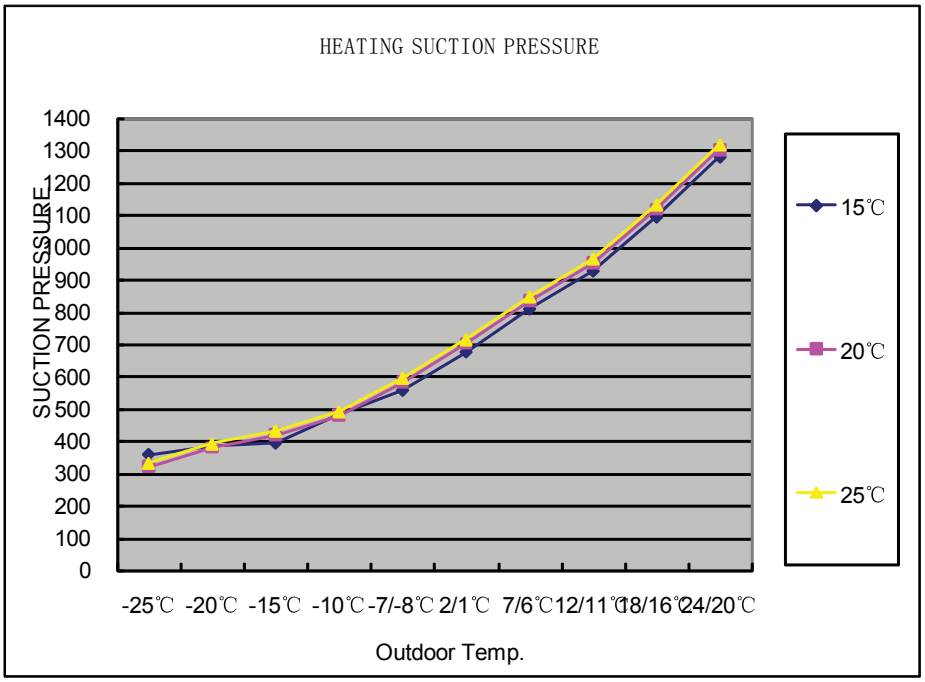
11.7 Heating discharge pressure curves

performance curves			
Heating discharge pressure.table			
outdoor temp	indoor temp.		
DB/WB	15℃	20℃	25℃
-25℃	2223	2345	2466
-20℃	2326	2479	2604
-15℃	2467	2580	2641
-10℃	2600	2781	2845
-7/-8℃	2978	3183	3267
2/1℃	3317	3451	3639
7/6℃	3173	3350	3490
12/11℃	3098	3250	3404
18/16℃	2872	3055	3155
24/20℃	2460	2596	2703



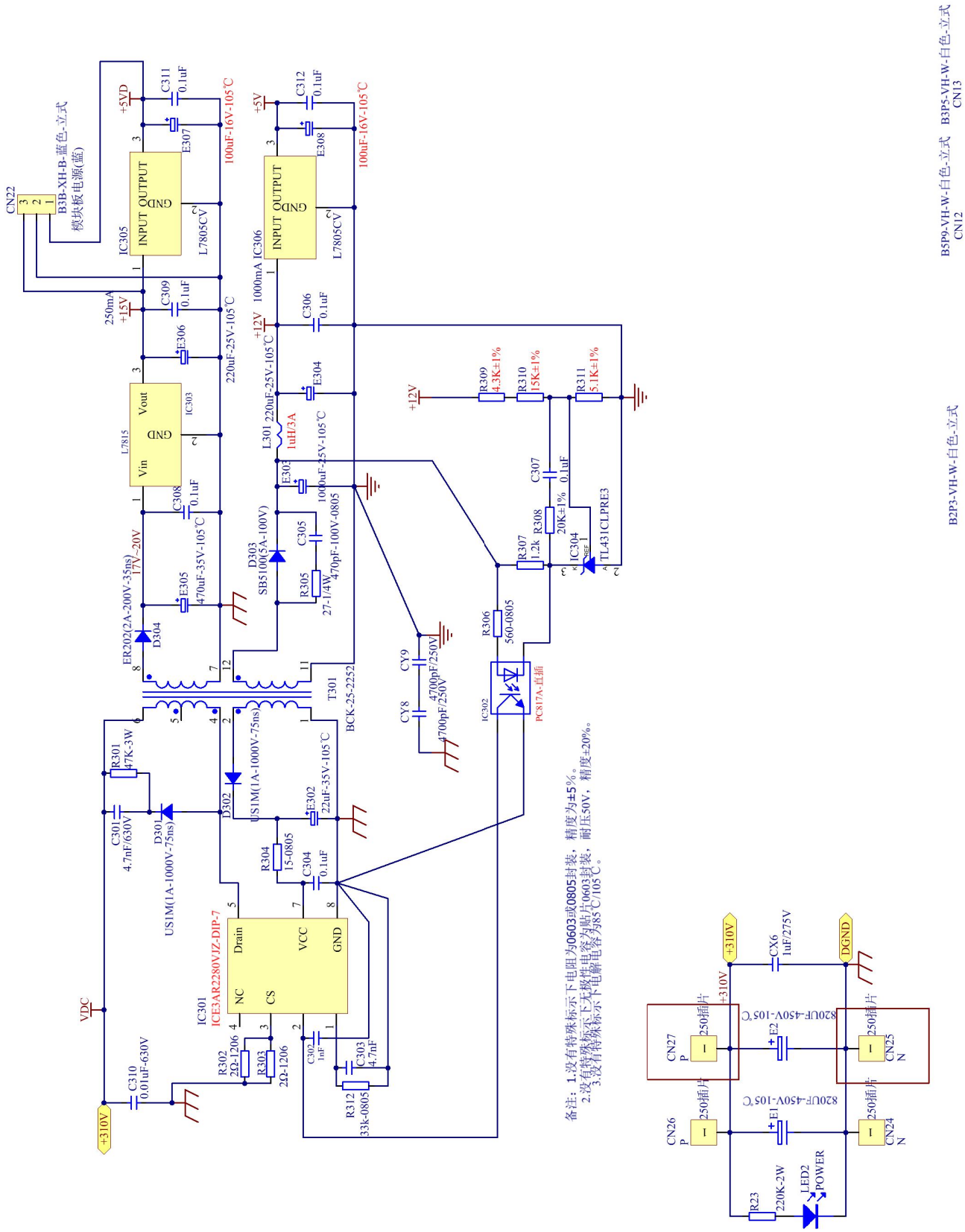
11.8 Heating suction pressure curves

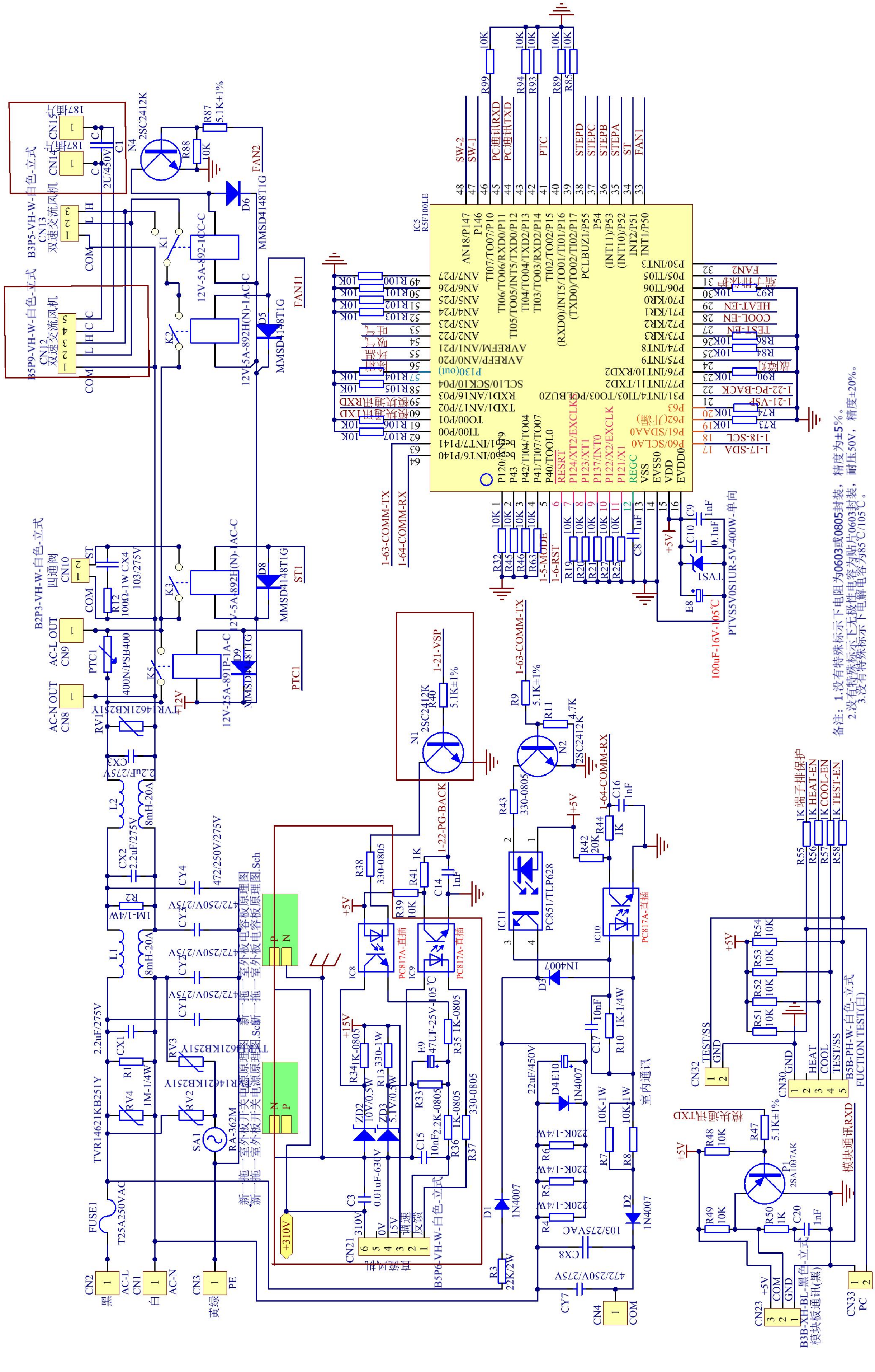
performance curves			
heating discharge pressure.table			
outdoor temp	indoor temp.		
DB/WB	15℃	20℃	25℃
-25℃	358	319	332
-20℃	385	379	392
-15℃	393	419	432
-10℃	485	479	492
-7/-8℃	557	583	596
2/1℃	676	702	715
7/6℃	809	835	848
12/11℃	926	952	965
18/16℃	1093	1119	1132
24/20℃	1279	1305	1318

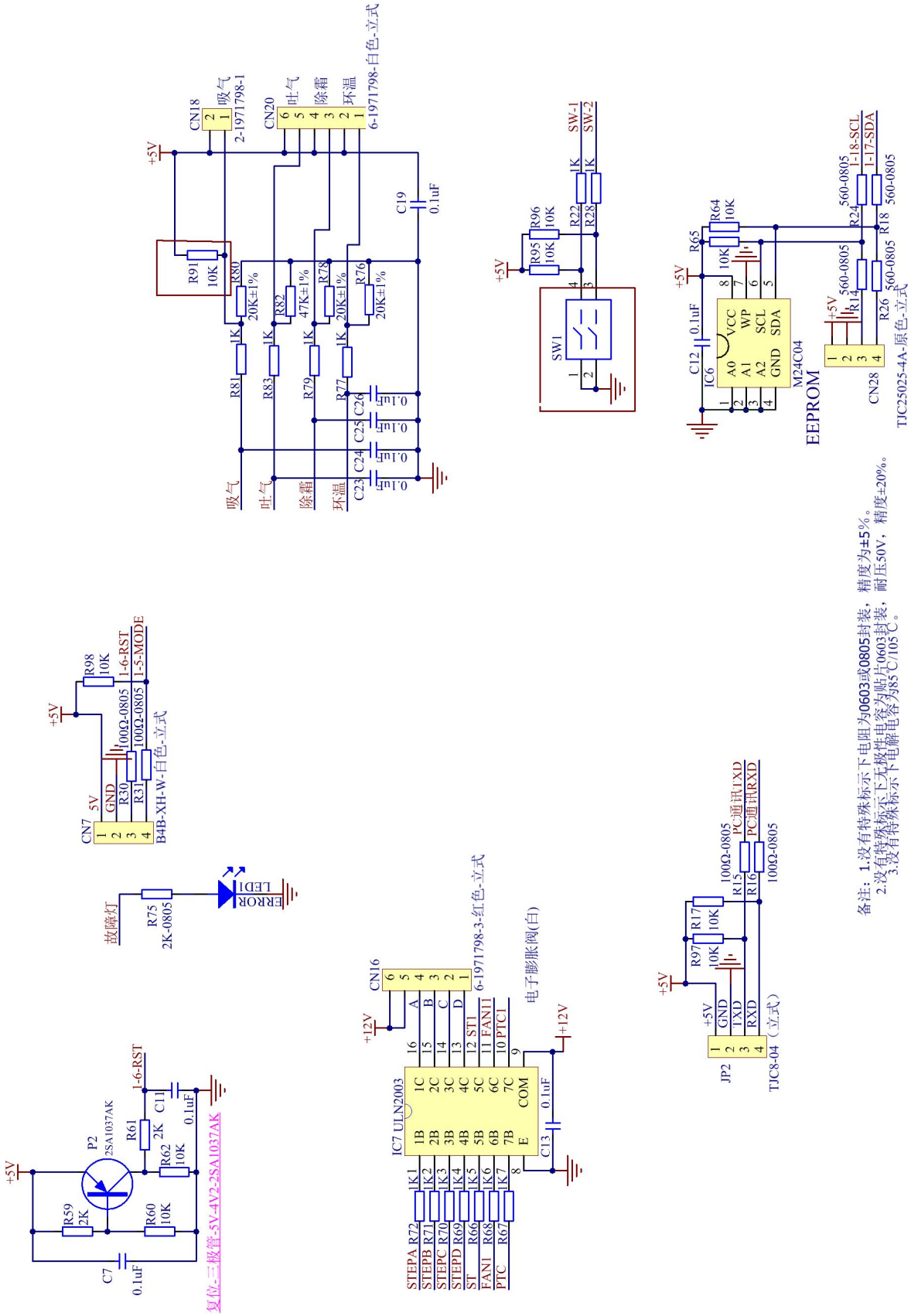


12 Circuit diagrams

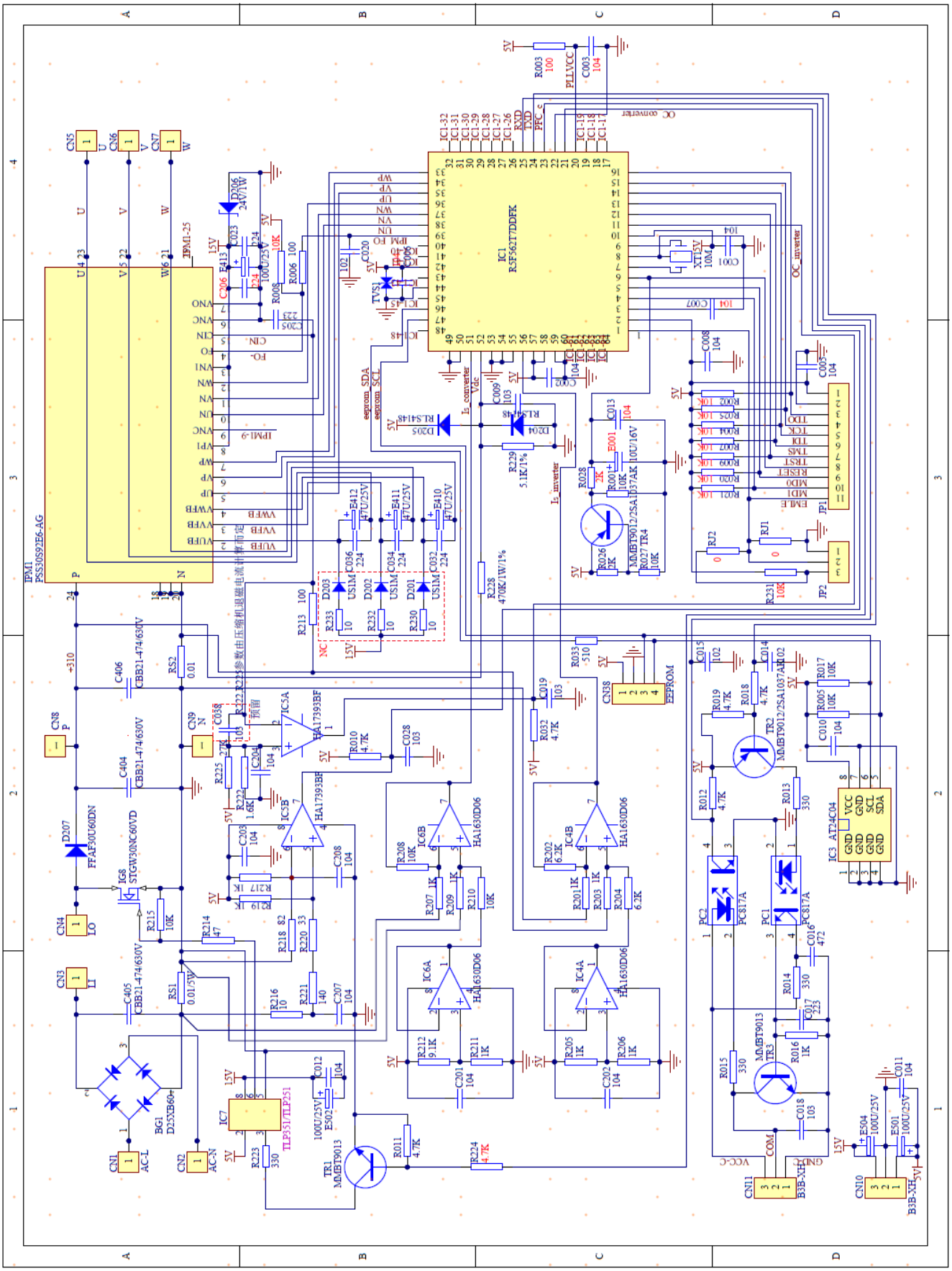
12.1 Outdoor unit control board Circuit Diagrams




IC5 R5F100LE
SW-2
SW-1
PC通讯RXD
PC通讯TXD
PTC
STEPD
STEPC
STEPB
STEPA
ST
FAN1
FAN2
HEAT-EN
COOL-EN
TEST-EN
1-22-PG-BACK
1-21-VSP
1-18-SCL
1-17-SDA
1-63-COMM-TX
1-64-COMM-RX
1-5-MODE
1-6-RST
B3P5-VH-W-白色-立式 CN13 双速交流风机
B5P9-VH-W-白色-立式 CN12 双速交流风机
B2P3-VH-W-白色-立式 CN10 四通阀
AC-L OUT CN9
AC-N OUT CN8
CN2 AC-L 黑
CN1 AC-N 白
CN3 PE 黄绿
FUSE1 T25A250VAC
CN21 B5P6-VH-W-白色-立式 直流风机
CN4 COM
室内通讯
CN32 TEST/SS GND
CN30 B5B-PH-W-白色-立式 FUCTION TEST(白)
CN23 B3B-XH-BL-黑色-立式 模块板通讯(黑)
CN33 PC
模块通讯TXD
模块通讯RXD
新一拖一室外板电容板原理图
新一拖一室外板开关电源原理图.Sch
备注：1.没有特殊标示下电阻为0603或0805封装，精度为±5%。
2.没有特殊标示下无极性电容为贴片0603封装，耐压50V，精度±20%。
3.没有特殊标示下电解电容为85℃/105℃。


CN18
吸气
2-1971798-1
CN20
吐气
除霜
环温
6-1971798-白色-立式
+5V
R91 10K
R80 20K±1%
R82 47K±1%
R78 20K±1%
R76 20K±1%
R81 1K
R83 1K
R79 1K
R77 1K
C19 0.1uF
C26 0.1uF
C25 0.1uF
C24 0.1uF
C23 0.1uF
吸气
吐气
除霜
环温
SW1
SW-1
SW-2
R96 10K
R95 10K
R22 1K
R28 1K
EEPROM
M24C04
IC6
C12 0.1uF
R65
R64 10K
A0
A1
A2
GND
VCC
WP
SCL
SDA
CN28
TJC25025-4A-原色-立式
R24 560-0805
R14 560-0805
R26 560-0805
R18 560-0805
1-18-SCL
1-17-SDA
备注：1.没有特殊标示下电阻为0603或0805封装，精度为±5%。
2.没有特殊标示下无极性电容为贴片0603封装，耐压50V，精度±20%。
3.没有特殊标示下电解电容为85℃/105℃。
CN7
B4B-XH-W-白色-立式
R98 10K
1-6-RST
1-5-MODE
100Ω-0805
R30
R31
故障灯
R75 2K-0805
LED1
ERROR
CN16
6-1971798-3-红色-立式
IC7 ULN2003
1B
2B
3B
4B
5B
6B
7B
1C
2C
3C
4C
5C
6C
7C
COM
STEPA R72
STEPB R71
STEPC R70
STEPD R69
ST R66
FAN1 R68
PTC R67
电子膨胀阀(白)
+12V
C13 0.1uF
P2
2SA1037AK
R61 2K
R62 2K
R59 2K
R60 10K
C11 0.1uF
C7 0.1uF
复位-二极管-5V-4V2-2SA1037AK
R97 10K
R17 10K
R15 100Ω-0805
R16 100Ω-0805
PC通讯TXD
PC通讯RXD
JP2
TJC8-04（立式）
GND
TXD
RXD

12.2 Module board Circuit Diagram



Haier REMOVAL PROCEDURE

Wall mounted Type

MODEL:1U71REAFRA

1U24REAFRA

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or Repair the product or products dealt with in this service information by anyone else could result in serious injury or death

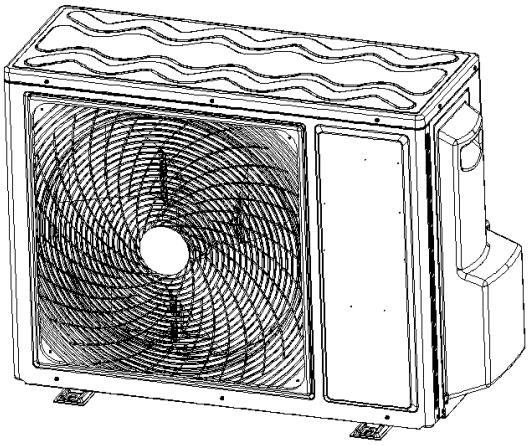
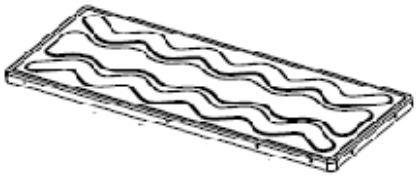
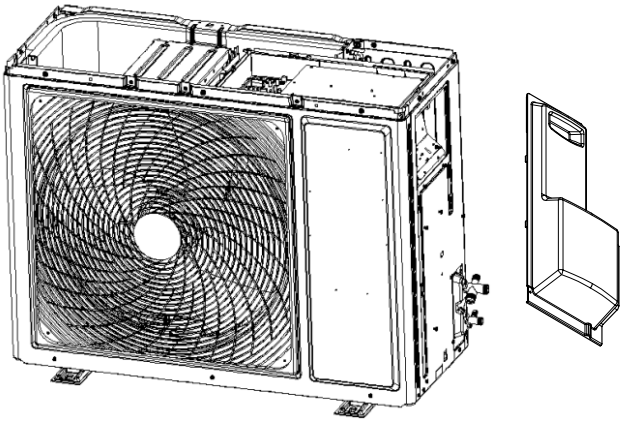
Haier Group

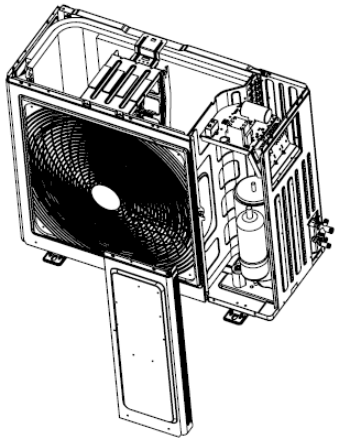
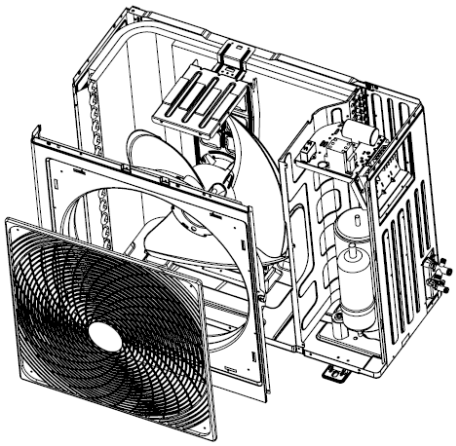
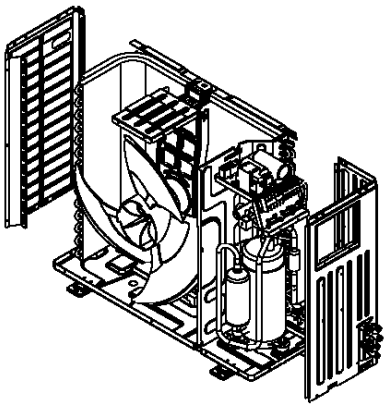
Version：V1 Date：2 019-4-10

1.Removal of Outdoor panel

Procedure

Warning Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work

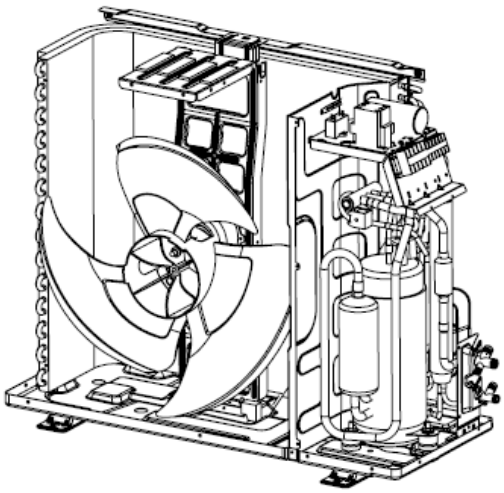
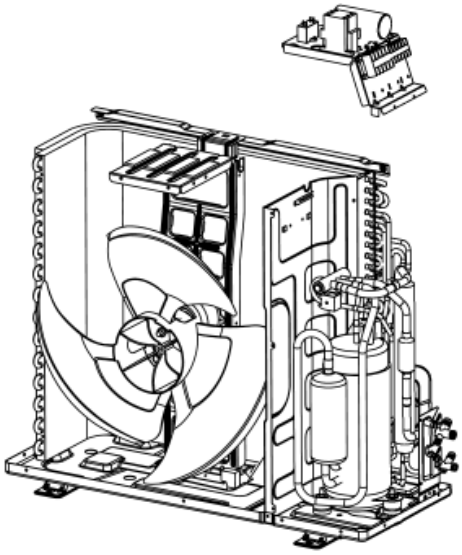
Step		Procedure	Points
1.Remove the panels			
1	Loosen the screws and lift the top panel and remove the handle.	  	

Step		Procedure	Points
2	Loosen the screws of the panel, pull and remove the front panel.	  	

2.Removal of Electrical Box

Procedure

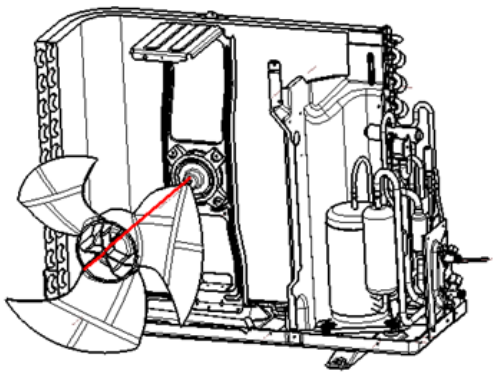
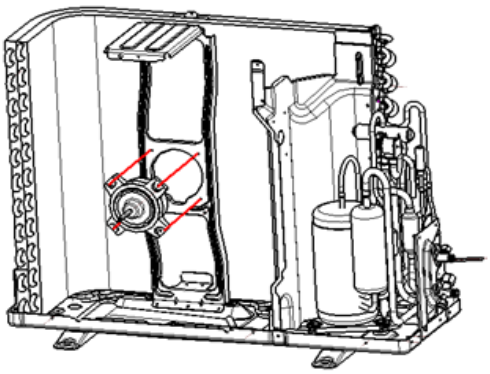
Warning Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work

Step		Procedure	Points
1	Remove the fixing screws, Than lift the electrical box.	 	

3.Removal of Fan and Fan Motor

Procedure

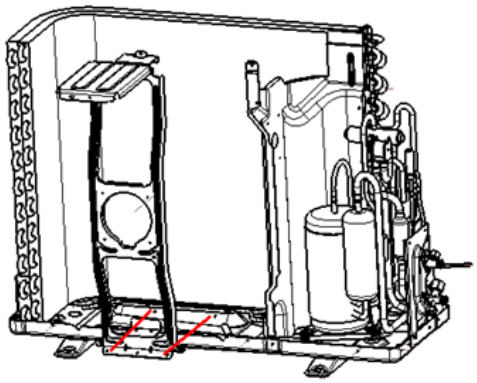
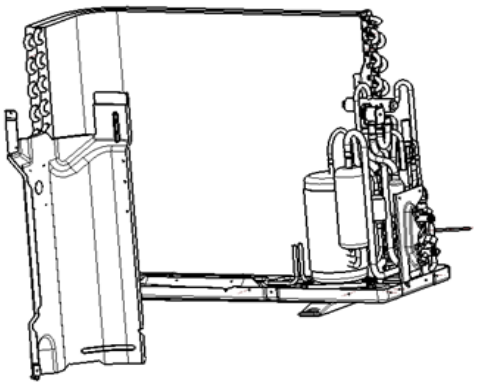
Warning Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure		Points
1	Loosen the fixing screws. Remove the fan and motor.	 	

4.Removal of Fan Motor Bracket and Partition

Procedure

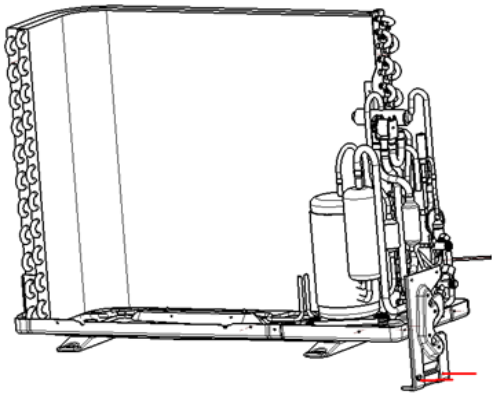
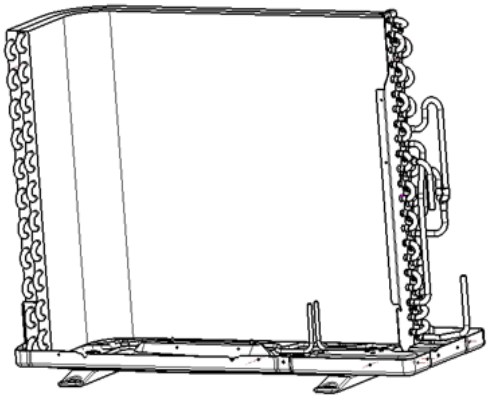
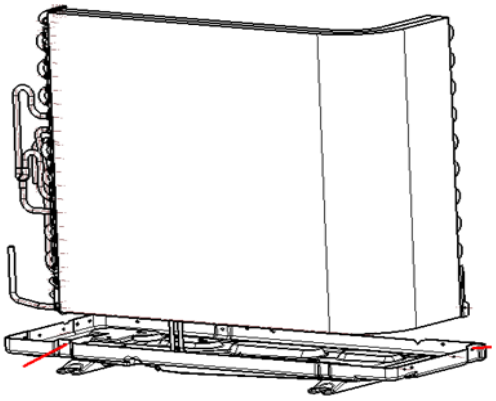
Warning Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure		Points
1	Loosen the fixing screws and lift the fan motor bracket. Remove the partition	 	

5.Removal of Compressor and Heat Exchanger

Procedure

Warning Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure		Points
1	Remove the valve plate.		
2	Remove the valves and the compressor.		
3	Loosen the screws and remove the heat exchanger.		

Sincere Forever

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