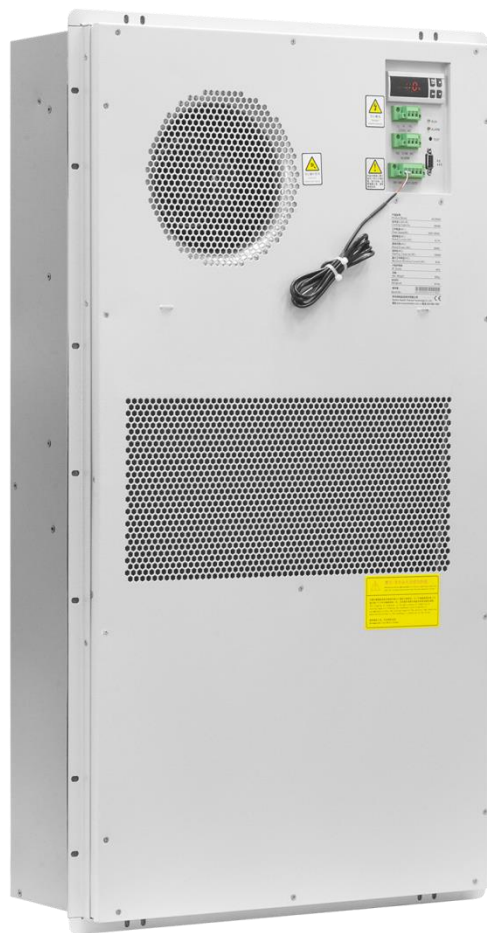

Кондиционер для установки в термошкаф, мощность по холоду 2500Вт

Руководство по эксплуатации



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1 Introduction

1.1 Preface

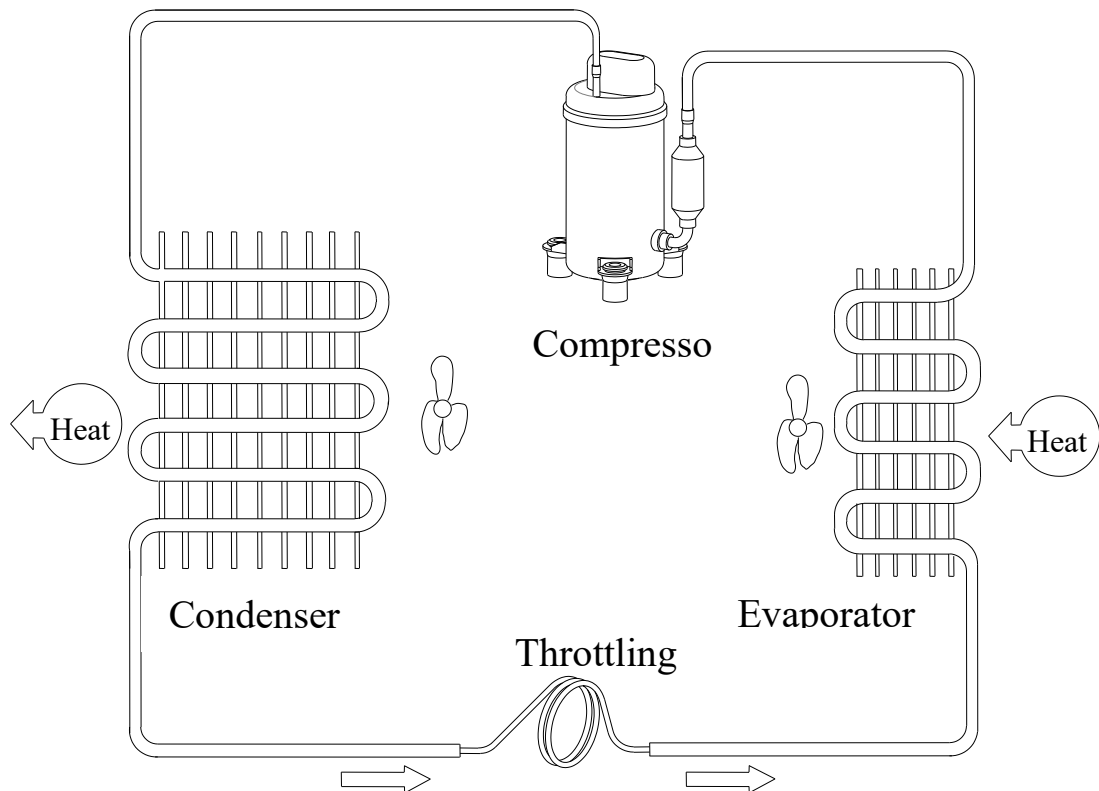
This manual introduces the important methods to use cabinet air conditioner. Please read carefully the manual before using and following the usage and note to make sure use the cabinet air conditioner safely and correctly. After reading, please keep the manual safe for reference at any time.

1.2 Product summary

The air conditioner is one kind of refrigeration product self-developed for communication cabinet. It is applicable in the place where the cabinet internal heat is very large, the internal electronic equipment is sensitive to the environment temperature and which should be isolated internally and externally completely. This product has multiple functions, high reliability, and has the feature that it can start to work without complex debugging after powering.

1.3 Working principle

After powering on, the low pressure steam from the refrigerant in the refrigeration system is inhaled by compressor, compressed into high pressure steam and then discharged to the condenser. Meanwhile, the air inhaled by external fan goes through condenser and takes away the heat given off by refrigerant and makes high pressure refrigerant steam condensed into high pressure liquid. High pressure liquid is sprayed into evaporator by throttle device and evaporated under the corresponding low pressure and absorbs the heat around. Meanwhile, the fan in cabinet makes air heat exchange by evaporator fins and sends the cooled air into cabinet. By so, the air in cabinet can cycle to achieve the purpose of lowering the temperature.



1.4 Standards

No.	Standard No.	Standard Name
01	GB 4208	Enclosure Protection Class
02	GB4706.1	Safety of household and similar electrical appliances
03	GB 9237-2001	Mechanical refrigerating systems Used for cooling and heating--Safety requirements
04	GB/T17626.8	Electromagnetic compatibility-Testing and measurement techniques--Power frequency magnetic field immunity test
05	GB/T 4798.1、 2、 3	Environmental conditions existing in application of electric

2 Product function

2.1 Cooling

Air conditioner can be set parameters by display or backend software: refrigeration starting temperature and refrigeration stopping temperature. When the temperature inside cabinet is higher than refrigeration starting temperature, it starts refrigerating; when the temperature inside cabinet is lower than refrigeration stopping temperature, it stops refrigerating.

Refrigerating Parameter Set

Parameter	Default value	Set Scope	Unit
Refrigeration starting temperature	35	[20~40]	°C
Refrigeration stopping temperature	30	[15~35]	°C

Note: Refrigeration starting temperature \geq Refrigeration stopping temperature + 3°C and above

2.2 Heating(match))

Air conditioner can be set parameters: heating starting temperature and heating stopping temperature. When the temperature inside cabinet is lower than heating starting temperature, it starts heating; when the temperature inside cabinet is higher than heating stopping temperature, it stops heating.

Heating Parameter Set

Parameter	Default value	Set Scope	Unit
Heating starting temperature	5	[-10~15]	°C
Heating stopping temperature	15	[0~20]	°C

Note: Heating starting temperature \leq Heating stopping temperature - 3°C and above

2.3 Air supply

Air conditioner can make the temperature inside cabinet uniform by air supply and avoid partial

overheating. When cabinet inside cabinet is lower refrigeration starting temperature, the air supply function starts automatically.

2.4 Emergency & hydrogen-expelling fan output:

The air conditioner could output hydrogen-expelling signal from the emergency & hydrogen-expelling fan port when it meets the time condition:

Hydrogen-expelling fan parameter setting

Parameter	Default value	Set range	Unit
Hydrogen-expelling period	24	[0~72]	h
Hydrogen-expelling time	5	[0~10]	min

When the air conditioner meets the following condition, it outputs working signal from the emergency & hydrogen-expelling fan port:

Starting condition: inside temperature \geq emergency fan working temperature;

Stopping condition: inside temperature \leq emergency fan stopping temperature;

Emergency fan parameter setting

Parameter	Default value	Set range	Unit
emergency fan working temperature	40	[28~50]	°C
emergency fan stopping temperature	37	[25~50]	°C

Note: emergency & hydrogen-expelling fan share one port

2.5 Self-inspection

Self check in two ways:

- 1 the first run on electricity
- 2 click control panel with the test button (see chapter sixth)

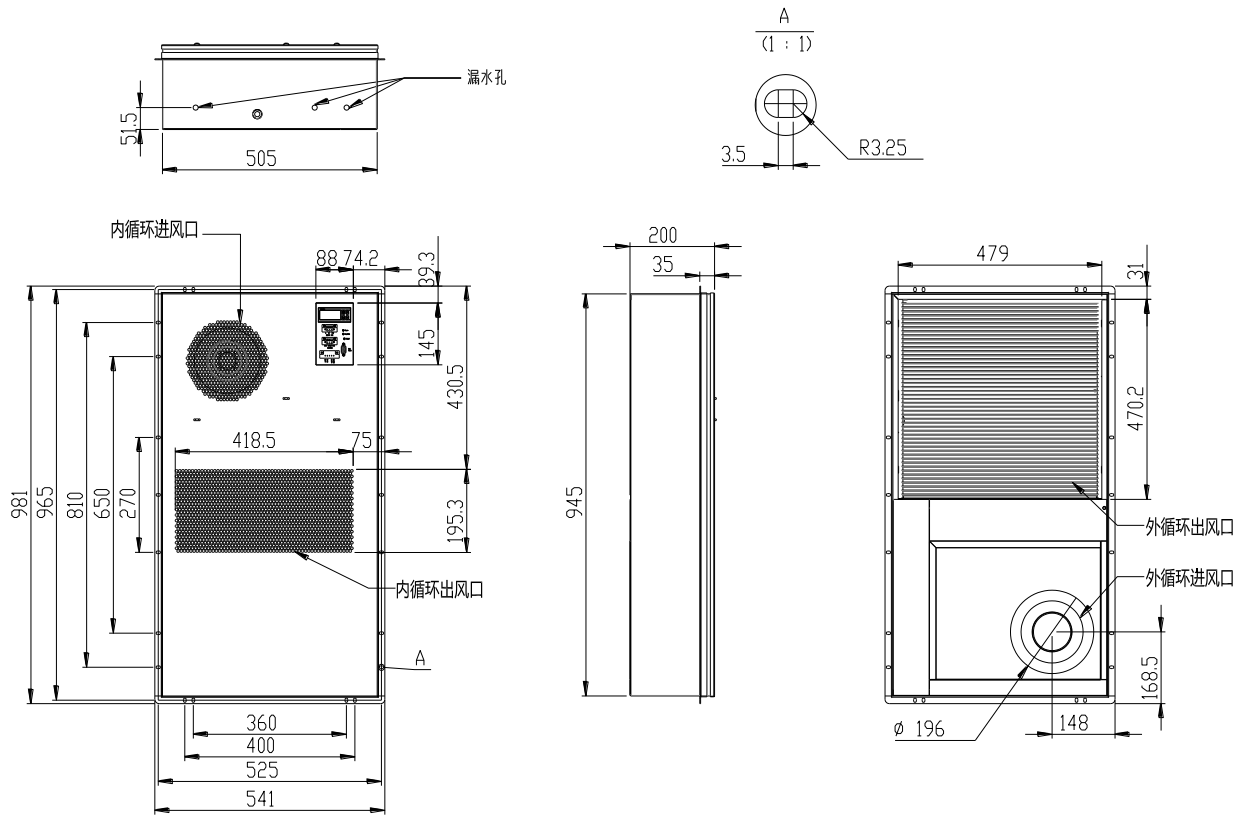
Self check program logic is as follows: LED lamp post 2 seconds, check whether the normal display, 2 seconds after the red light stop, green light 2Hz flash, a fan run 5S, then fan, compressor and fan operation, 30 seconds after the self inspection system is normal, the green light, if the red light indicates the system has fault alarm. 3 minutes after the compressor temperature based on logic to automatically determine whether operation.

3 Product parameters

3.1 Product technology parameters

Item	Unit	Parameter
Working environment temperature	℃	-40 ~ +55
Rated AC input voltage	VAC	220VAC~50HZ
Rated AC input power	W	2500
Rated AC input current	A	4.2
Refrigerating capacity(L35/L35)	W	920
Body outline dimension (width*height*depth)	mm	505*945*200
Outline dimension including flange(width*height*depth)	mm	541*981*200
Net weight	Kg	42
Installation method	—	Embedding slightly
The largest sound pressure level noise (1.5m far and 1.2m high from the air conditioner)	dB(A)	62
IP grade	—	IP55
Refrigerant	—	R134a/130g
Life	Years	>10
Surface treatment	—	Electrostatic coating

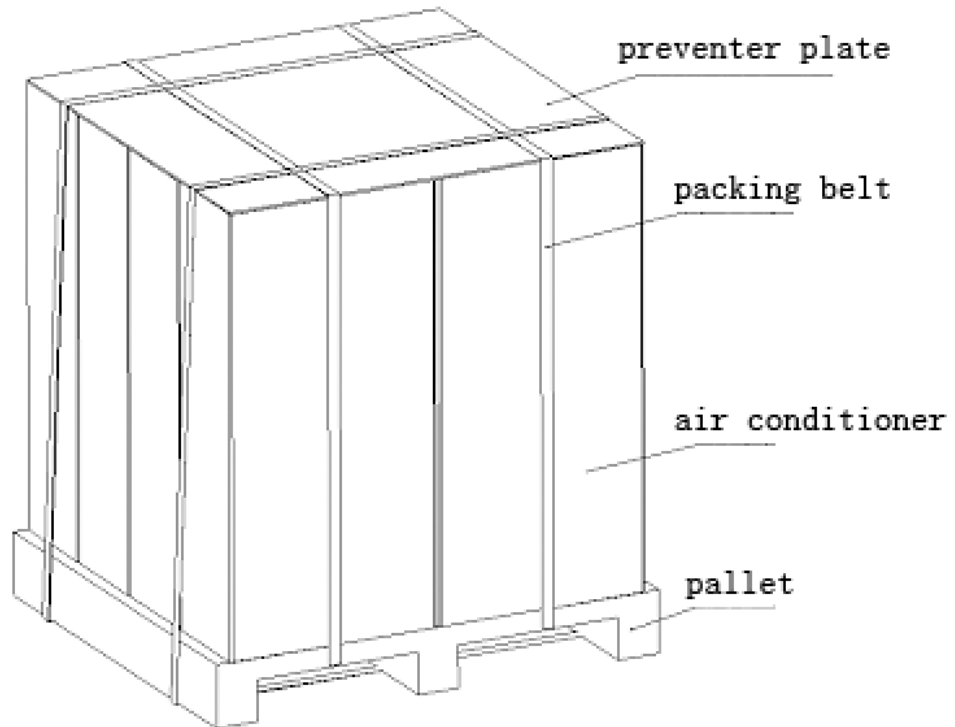
3.2 Product dimension drawing



4 Installation preparation

4.1 Packing diagram

The packing includes the bottom pallet, top protection plate, wrapping film and packing belt. The packing diagram is as following:



4.2 Disassemble packing and inspect

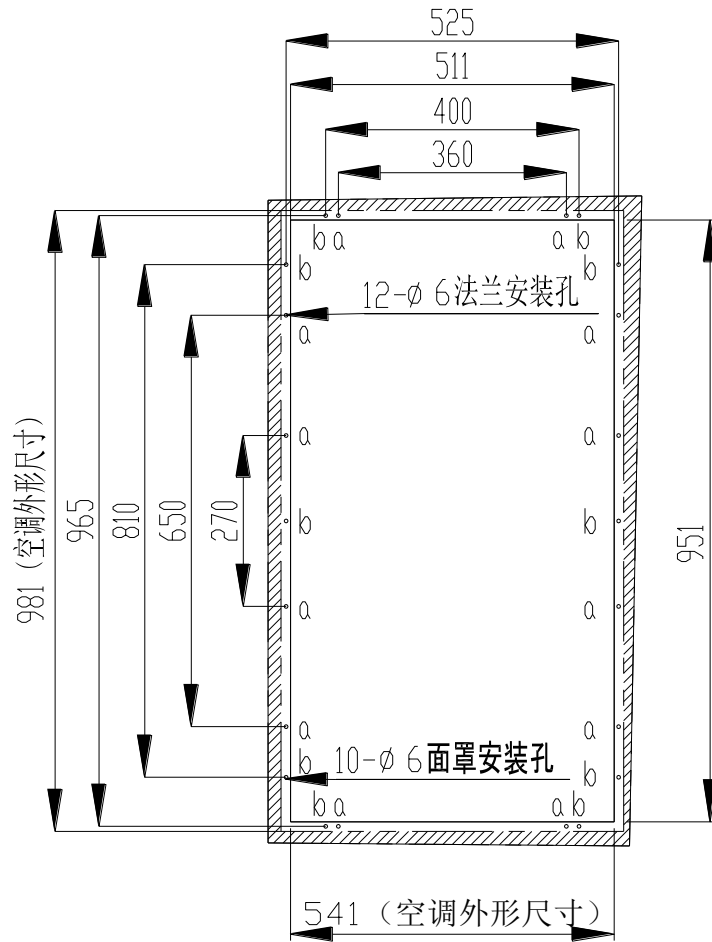
1. Prepare tools to disassemble: protective gloves, scissors and knives;
2. Wear protective gloves, remove wrapping film and packing belt;
3. Take air conditioner and make OBA: check whether the air conditioner model is right and the appendix is complete;
4. Please read carefully the 5.3 article-Preparation before installation in the manual in order to finish installation successfully.

4.3 Packing list

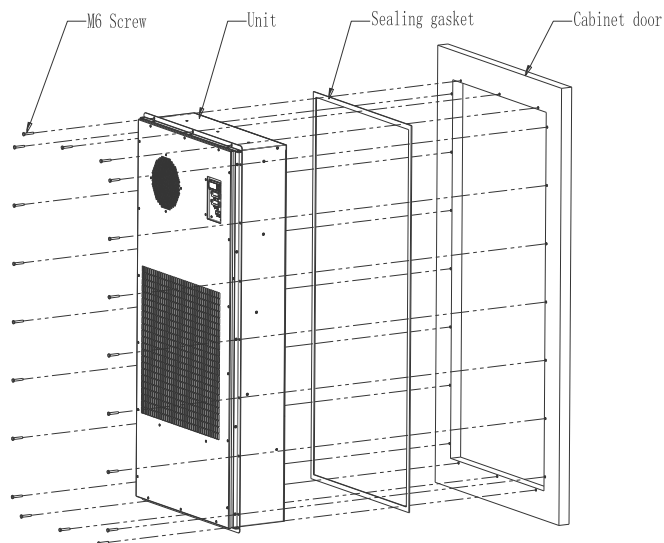
No.	Name	Qty	Note
1	Cabinet air conditioner	1	
2	Manual	1	
3	AC Power Cable	1	
4	Alarm Cable	1	
5	RS485 Cable	1	

5 Product installation cut size diagram

5.1 Installation diagram



5.2 Installation diagram



Note: the installation diagram is just for reference. It depends on the site condition to install.

5.3 Preparation before installation

a) Installation notes:

- Keep air conditioner vertical during installation, the inclination is less than 3°;
- When moving, handle with care and avoid collision in case of scratching the surface coating;
- After removing package, check whether the cosmetic is good, if damaged or deformed, please contact professional personnel to check and repair;
- Count the accessory according to the appendix list and prepare installation tools;
- When choosing installation place, make sure the ventilation is good, keep the distance from air-out side to equipments inside cabinet more than 30cm, otherwise, it may cause short circuit and bad heat exchange effect;
- The mechanical and electrical installation should be operated by professional person strictly referring the manual;
- Check whether air conditioner drainage loop is smooth, in case that drainage is blocked;
- To build clean and environmental installation site, please recycle the package after installation.

b) Preparation installation tools

No.	Name	Qty	Note
1	Cross screwdriver	1	M5
2	Slotted point screwdriver	1	M3
3	Multimeter	1	
4	Wire stripper	1	
5	Wire crimper	1	
6	Tape	1	

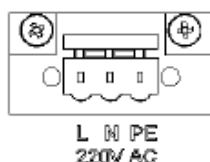
5.4 Mechanical installation

- Choose cut location on cabinet door according to cabinet cut size, remove the shadow area and make the corresponding air conditioner installation hole.
- Place air conditioner at the cut location as installation diagram, make air conditioner flange close to cabinet door, fix it with M5 stainless steel screwdriver.
- Check whether air conditioner is installed levelly, firmly and finish the mechanical installation.

5.5 Electrical installation

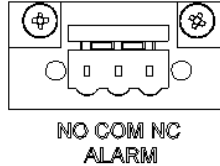
AC power supply input port, alarm terminal port, Temperature sensor and emergency & hydrogen-expelling fan output port, emergency fan port, DB9 port,

(1) AC power supply input port



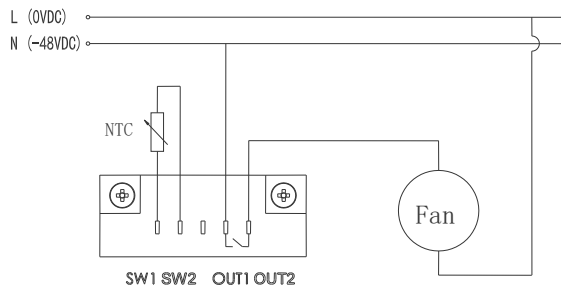
Port	Definition
L	L-AC220V
N	N-AC220V
PE	Earth wire

(2) Alarm terminal port



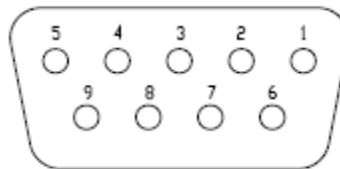
I/O port	Definition
NO	Dry contact output normally open port
COM	Dry contact output common port
NC	Dry contact output normally closed port

(3) Temperature sensor and emergency & hydrogen-expelling fan output port



No.	Port	Definition
1	SW1	Cabinet sensor(pre installation)
2	SW2	
3	/	/
4	OUT1	Emergency & hydrogen-expelling fan output, on-off without power (250VAC/3A or 60VDC/1.5A)
5	OUT2	

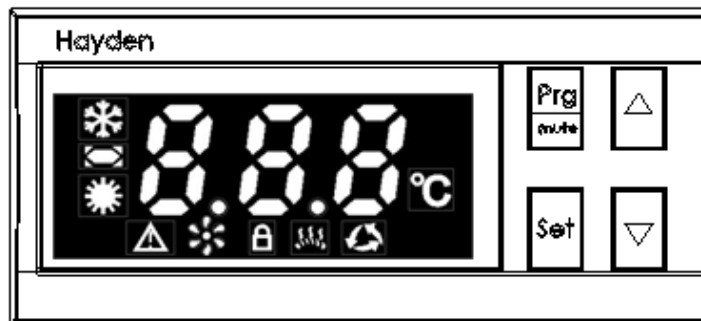
(4) DB9 communication port



No.	port	Definition
4	RS485 A	485+(A)
5	RS485 B	485-(B)

6 Interface

6.1 Interface diagram



No.	图标	Function	Function explanation
1	Prg/mute	Function key	Function selection key or backspace key (from low level menu to high level menu)
2	Set	enter key	Select function and enter parameter set
3	▲	Up key	Increase value, page up
4	▼	Down key	Decrease value, page down
5		Refrigerating running	Shows whether refrigerating runs
6		Starting running	Shows whether air conditioner is on or not
7		Alarming	Shows whether air conditioner alarms
8		Fan running	Shows whether fan runs
9		Heater running	Shows whether heater runs
10		Compressor running	Shows whether compressor runs

6.2 Operation instruction

Under standby status, no press any key for 1 minute to enter into power saving mode and turn off LED, show mark. Press any key to quit power saving mode and turn on LED.

Under running status, the '-8.8.8' in the main interface shows the temperature value outside cabinet. The unit is °C.

6.3 Self-inspection

Start self-inspection function by the below methods:


Function key : **Prg/mute** → **SET** Enter key: **Set**

6.4 Parameter set

Function key : **Prg/mute** → **SET** Enter key: **Set**

Code	Name	Value	Unit	Parameter	Definition
S1	Refrigeration starts	20~40	°C	35	Refrigeration starts setting value
S2	Refrigeration stops	15~35	°C	30	Refrigeration stops setting value
S3	Heating starts	-10~15	°C	5	Heating starts setting value
S4	Heating stops	0~20	°C	15	Heating stops setting value
S5	Interior high temperature alarming	30~60	°C	45	Interior high temperature alarming setting value
S6	Interior low temperature alarming	-45~10	°C	0	Interior low temperature alarming setting value
S7	emergency fan starts	30~60	°C	40	emergency fan starts setting value
S8	emergency fan stops	20~50	°C	37	emergency fan stops setting value

6.5 Fault alarm inquiry

When there is alarm, the mark  is on. The fault alarm can be inquired by follow methods:

Function key: **Prg/mute** → **FLA** Enter key: **Set** Up key: **▲** or Down key: **▼**

If several alarms one time, they will be shown successively at '8.8.8' area.

Fault code	Fault name	Fault code	Fault name
CF	Compressor fault	CS	Cabinet temperature sensor fault
HC	Temperature in cabinet is too high or too low	HF	Heater fault
HP	System high pressure alarm	LP	System low pressure alarm

7 Product running

7.1 Check before product running

- Check whether air conditioner is installed as direction in installation diagram and is not installed upside down;
- Check whether air conditioner structure is complete, installation is stable or not;
- Check whether air conditioner input power, dry contact alarm output and communication cable are

- installed as electrical installation requirement and whether connector is plugged wrong or loss;
- Check whether cabinet input power voltage and frequency meets the requirement of air conditioner.
 - After checking, prepare to run.

7.2 Product running

After air conditioner is powered on, it will start self inspection. Please refer to the 2.3 in the manual for the self inspection process. After self inspection, if there is no system alarm, air conditioner will automatically judge whether it meets the running logic according to the inspected internal recycling air outlet temperature. If there is alarm, please refer the 8.1 in the manual to judge the exact alarm and analyze and handle as the 8.2 in the manual. Then handle by self or contact vendor to repair.

8 Fault analysis and handling

8.1 Fault alarm content and actions

Fault status	Reset mode	Whether output from dry contact	Whether upload
Temperature sensor fault inside cabinet	Automatic	Yes	Yes
Temperature sensor fault in the middle part of evaporator	Automatic	Yes	Yes
Temperature sensor fault in the middle part of condenser	Automatic	Yes	Yes
Temperature in cabinet is too high	Automatic	Yes	Yes
Temperature in cabinet is too low	Automatic	Yes	Yes
System high pressure alarm	Automatic	Yes	Yes
Evaporator freezing up	Automatic	Yes	Yes
Internal fan fault	Automatic	No	No
External fan fault	Automatic	No	No
Heater fault	Automatic	Yes	Yes
Compressor fault	Automatic	Yes	Yes

8.2 Common fault analysis and handling

Fault status	Cause analysis	Fault handling
Temperature sensor fault inside cabinet	1. sensor fault broken down or short circuit; 2.Sensor damaged	1. Check sensor circuit; 2. Change sensor.
Temperature sensor fault in the middle part of evaporator	1. sensor fault broken down or short circuit; 2.Sensor damaged	1. Check sensor circuit; 2. Change sensor.

Temperature sensor fault in the middle part of condenser	<ol style="list-style-type: none"> 1. sensor fault broken down or short circuit; 2. Sensor damaged 	<ol style="list-style-type: none"> 1. Check sensor circuit; 2. Change sensor.
Temperature in cabinet is too high	<ol style="list-style-type: none"> 1. Condenser is jammed or scaled; 2. Working temperature is too high; 3. Refrigeration system fault; 4. New equipment with large heating capacity; 5. Temperature is set improperly; 6. False alarm by temperature sensor in cabinet 	<ol style="list-style-type: none"> 1. Regularly clean condenser heat exchanger; 2. Reduce working temperature properly, or add shading device;. 3. Ask professional personnel to inspect and repair; 4. Re-evaluate heating capacity and adjust; 5. Re-evaluate temperature set value and deviation; 6. Change temperature sensor
Temperature in cabinet is too low	<ol style="list-style-type: none"> 1. Temperature is set improperly; 2. Refrigeration system cannot be turned off; 3. False alarm by temperature sensor in cabinet 	<ol style="list-style-type: none"> 1. Re-evaluate temperature set value and deviation; 2. Check whether refrigeration system main control board and relay contact are adjoined; 3. Change temperature sensor
System high pressure alarm	<ol style="list-style-type: none"> 1. Condenser is jammed or scaled; 2. External fan fault; 3. external air recycling short circuit or shaded; 4. Add too much refrigerant when repairing; 5. Working temperature is too high; 6. False alarm by sensor in the middle part of condenser; 	<ol style="list-style-type: none"> 1. Regularly clean condenser heat exchanger; 2. Check/change condensing fan; 3. External cover air inlet and outlet should be separated well, make sure there is no shade at front; 4. Ask professional person to repair and add proper refrigerant by nameplate requirement; 5. Reduce working temperature properly, or add shading device;. 6. Change sensor in the middle part of condenser;
Evaporator freezing up	<ol style="list-style-type: none"> 1. Internal air recycling short circuit; 2. Air inlet and outlet is not smooth; 3. Internal fan fault; 4. refrigeration system cannot be turned off; 5. False alarm by sensor in the middle part of evaporator; 	<ol style="list-style-type: none"> 1. make sure there is some distance from internal recycling air inlet to equipments in cabinet and Add partition; 2. Make sure internal recycling air inlet and outlet smooth and no serious block; 3. Change internal fan;

		4. Check refrigeration system main control board and related electric; 5. Change temperature sensor
Internal fan fault	1. Internal fan stalls; 2. Internal fan damaged	Change internal fan
External fan fault	1. External fan stalls; 2. External fan damaged.	Change external fan
Heater fault	Heater damaged	Change heater
Compressor fault	1. Condenser is jammed or scaled; 2. Rough handling impact ;	1.Regularly clean condenser heat exchanger; 2. Move vertically and handle with care;

9 Check and maintenance

9.1 Regular inspection

- Check whether cabinet air conditioner power supply wire and communication wire is Ok or not;
- Check whether cabinet air conditioner running is normal, whether the air inlet and air outlet mouth temperature difference is obvious when starting refrigeration system;
- Check whether fan and compressor work normally and whether there is obvious noise or shake;
- Check whether mechanical structural parts are damaged or deformed;
- Check whether air conditioner inner and outer circulation air inlet and outlet, cabinet outer protective cover air inlet and outlet screen are jammed;
- According to the actual air quality, please arrange maintenance personnel to inspect cabinet air conditioner every 3-6 months;

9.2 Regular maintenance

During air conditioner running, dust may cover on the fins of heat exchanger, which may affect the heat exchange and even cause degradation of air conditioner performance seriously. It is suggested to clean and maintain heat exchanger each 3-6 months. The cleaning and maintaining interval depends on the air pollution and running time in different regions. When cleaning, do not use hot water or gasoline and other organic solvent

10 After-sale service and warranty

10.1 Warranty period

Under the condition using cabinet air conditioner correctly, the contracted warranty period shall prevail.

10.2 Warranty range

During warranty period, manufacture will repair for free the quality faults caused by product itself and customer should provide the S/N. But the faults under below conditions are out of warranty for free:

- Warranty period expire;
- S/N cannot be provided;
- Faults caused under abnormal condition or circumstance, or caused by improper installation, maintenance or other operations;
- Faults not caused by air conditioner itself, such as the user's equipment, software and others;
- Damaged caused by replacing or disassembling by user, or by unauthorized repairing service persons;
- Faults caused by majeure force such as fire, earthquake, flood and others.

10.3 Disclaimer

The warranty is only for the delivered products. Air conditioner manufacturer is responsible for any loss which is derived from equipment fault.

Appendix: Electrical Diagram

