Outdoor Cabinet Air Conditioner

AirSafe CB

User Manual

Contenido

1 General Information

This user manual describes the important methods of using the cabinet air conditioner correctly. Read this user manual carefully before using the cabinet air conditioner, and follow the instructions and precautions in it to ensure that you can use the cabinet air conditioner

safely and correctly. Please keep this user manual safe after reading it for reference at any time.

2 Product Overview

This air conditioner is specially developed for industrial electrical cabinet cooling and self-developed refrigeration products, suitable for the cabinet internal heat, internal electronic equipment is sensitive to the ambient temperature, and the internal and external need to be completely isolated applications. This product is fully functional, with high reliability, simple installation, can work after power, without complex debugging features.

3 Handling and Testing the Air Conditioner

If the air conditioner has been in a horizontal position, be certain it is placed in an upright, vertical or mounting position for a minimum of five minutes before operating.

Test for functionality before mounting the air conditioner to the enclosure.

Refer to the nameplate for proper electrical current requirements and then wire the unit to a properly grounded power supply using copper conductors only. Power supply wiring should be restrained after field installation to ensure no contact with internal fan. Minimum circuit ampacity should be at least 125% of the amperage shown on the unit nameplate. No other equipment should be connected to this circuit to prevent overloading.

Immediately after applying power, the evaporator blower (enclosure air) should start running. Operate the air conditioner with the compressor running for five to ten minutes. You will need to set the cooling controller setpoint below the ambient temperature to operate the compressor. Condenser air temperatures should be warmer than normal room temperatures within a few minutes after the condenser impellers start.

4 Operation Mode

4.1 Operational Principle

After the air conditioner is powered on, the low-pressure steam of the refrigerant in the refrigeration system is inhaled by the compressor, compressed into high- pressure steam and then discharged to the condenser. At the same time, the air inhaled by the fan outside the cabinet flows through the condenser, taking away the heat released by the refrigerant, and condensing the high-pressure refrigerant steam into high-pressure liquid. The high-pressure liquid is injected into the evaporator after the throttling device and evaporates at the corresponding low pressure to absorb the surrounding heat. At the same time, the fan in the cabinet makes the air continue to exchange heat through the fins of the evaporator, and the air that becomes cold after heat release is sent to the cabinet. In this way, the air in the cabinet constantly circulates to achieve the purpose of reducing the temperature.

4.2 Cooling

When the indoor temperature reaches the[**Cooling setpoint**], the internal fan is turned on for 60 seconds, the compressor is turned on, and the cooling begins.

When the indoor temperature drops to[**Cooling setpoint**]- [**Cooling differential**], and the continuous operation time of the compressor is greater than or equal to 3 minutes, the refrigeration is terminated;

The air conditioner can be adjusted and set by the panel or background software: Cooling operating parameters

Parameter	Default value	Range	Unit
Cooling setpoint	35	20~60	℃
Cooling differential	5	3~10	℃

4.3 Heating

When the indoor temperature drops to [Heating setpoint], the internal fan is turned on for 60 seconds and start heating;

When the indoor temperature reaches the [Heating setpoint] +[Heating differential], stop heating.

Heating operating parameters

Parameter	Default value	Range	Unit
Heating setpoint	5	-42~20	℃
Heating differential	10	0~35	℃

4.4 Dehumidification Function (Optional)

Dehumidification mode can be divided into high temperature refrigeration dehumidification and low temperature heating dehumidification.

Refrigeration dehumidification with refrigeration mode: when the temperature is higher than the refrigeration starting point, the refrigeration dehumidification is opened.

Heating and dehumidification mode: Cooling stops, the humidity is higher than the dehumidification starting humidity, and the cabinet temperature is less than 5 degrees below the set temperature.

For details,refer to" 6.2 User Parameter Setting on page 11" .

4.5 Evaporator Impeller Standby Mode

In the standby state (non-cooling and heating operation state), the evaporator impeller can run in two modes according to the setting:

1. Normally closed mode: The evaporator impeller is always closed, and once the system needs to run cooling or heating, the evaporator impeller is turned on in advance;
2. Normally open mode: The evaporator impeller keeps running.

Evaporator impeller operating parameters

Parameter	Default value	Range	Unit
Standby mode	0	0~1	0-close 1-open

4.6 Self-checking Function

The controller provides power-on self-test and mandatory self-test functions (press [▲] and [▼] for 3 seconds at the same time). When the self-test function is enabled, the system clears all alarms and stops all components. The display panel blinks for 10 seconds, and the system starts to detect each component in turn. The self-test process is as follows:

Procedure	Description	Evap. impeller	Heater	Cond.	C mpessor	Time
1	Temp.sensor	ON	OFF	OFF	OFF	3S
2	Evap.impeller	ON	OFF	OFF	OFF	55S
3	Heater	ON	ON	OFF	OFF	15S
4	Cond.impeller	ON	OFF	ON	OFF	30S
5	Compressor	ON	OFF	ON	ON	60S

4.7 Alarm Output

The system is equipped with one dry contact switch (relay) to output alarms.

Customers can choose NO or NC as required.

5 Mounting

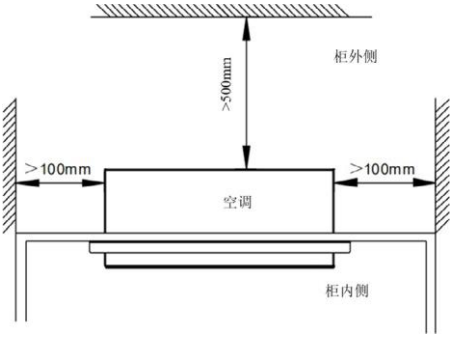
5.1 Installation Precautions

To ensure the normal operation of the cabinet air conditioner, comply with the following requirements:

1. To avoid condensate overflow, unit must be mounted within 3° of level;

2. When transporting or moving the equipment, handle it with care and avoid collision to avoid scratching the surface of the equipment;
3. After unpacking, check whether the air conditioner is in good appearance. If it is damaged or deformed, contact professionals to repair it ;
4. Check the accessories according to the accessories list, and prepare the installation tools;
5. The front of the unit requires a half meter clearance for proper airflow. Five centimeters is required on each side of the unit.
6. The mechanical installation and electrical installation of air conditioners must be

operated by professionals in strict reference to the relevant provisions of this user manual to prevent electric shock;



7. Check whether the air conditioner drain circuit is smooth to avoid blocking the air conditioner drain during installation;
8. In order to create an environmentally friendly and clean construction site, please recycle the packaging of the air conditioner after installation ;
9. For refrigeration units mounted in external cabinets, be sure to use additional stop-shift support during transport.

5.2 Mounting

1. Check the air conditioner, before installing the air conditioner to ensure that all functions are normal, refer to" 3 handling and Testing the Air Conditioner on page 4" .
2. Using the cutout dimension in the specification, prepare the enclosure ;
3. Need to remove the cover fistly,if the unit with covers,see Figure1;
4. Check whether sealing gasket is installed on the flange of the air conditioner, and then install the air conditioner into the corresponding cutout in the cabinet, as shown in Figure2.
5. Use screws and nuts to fix the air conditioner to the cabinet. If there is a protective cover, pay attention to the installation position of the protective cover, as shown in Figure 3.
6. When installing the air conditioner on the cabinet, do not damage the installation sealing strip. The sealing strip is the seal between the air conditioner and the cabinet. After the sealing

strip is installed on the air conditioner, do not drag the air conditioner on the cabinet. If the sealing strip is torn or damaged, the

water resistance may fail.

7. Connect the power cord to a well-grounded power supply according to the

electrical requirements on the nameplate. The circuit shall be equipped with a slow fuse or HACR circuit breaker.

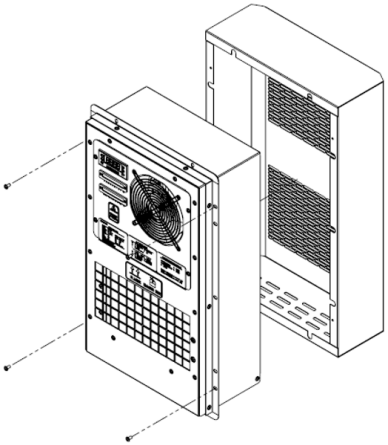


Figure 1

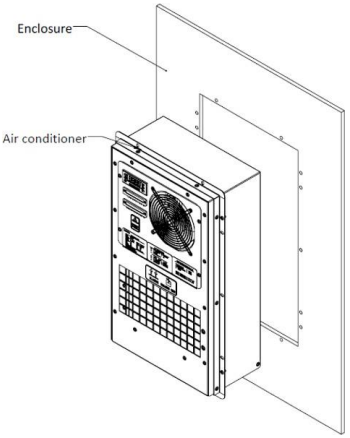


Figure 2

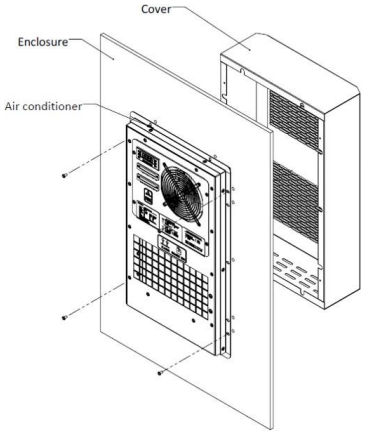
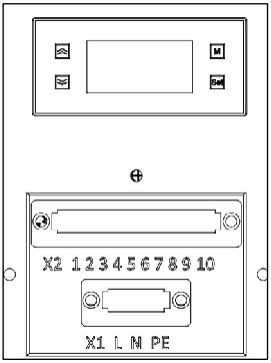


Figure 3

5.3 Electrical Installation

Electrical installation includes AC power input port, air conditioner alarm output port, RS485 communication port, and so on.



Terminal 1 (X1):

Port	Description	Comments
L	Live wire	Max. wire diameter:
N	Neutral wire	2.5mm²(<5KW)
PE	Gound wire	4mm²(>=5KW)

Terminal 2 (X2):

Port	Description	Comments
1	B-	RS485
2	A+	
3	NO	Normally open for alarm output
4	COM	Common for alarm output power
5	NC	Normally close for alarm output
6	COM	Common for high temperature alarm output
7	NC	Normally close for high temperature alarm output
8	COM	Common for input dry contact
9	NC	Normally close for input dry contact
10	--	NA

6 Controller Introduction

6.1 Displayer Introduction

Symbol	Description	Icon ON	Icon flashing
	Temperature	Setting	Self-check
	Cooling	Cooling	--
	Heating	Heating	--
	Dehumidifying	Dehumidifying	--
	Eond.impeller	Eond.impeller on	--
	Alarm	Alarm	--

6.2 User Parameter Setting

On the main screen, hold down the M key for 5 seconds. The system enters the parameter setting menu, and press the "▲▼" key to select the parameter code. Select a code and press the "Set" key to display the parameter value corresponding to the code. At this time, the parameter value can be set by the "▲▼" key (hold down the" ▲ " or " ▼ "key can be sent continuously); After the setting is complete, press the "Set" key and enter the password. After the password is correct, press the "Set" key again. The system saves the newly set parameter and displays End, and then returns to the state of displaying the parameter code; When setting parameters, press the "M" key to give up, and return to display the parameter code without changing the parameter value. When the parameter code is displayed, hold down the M key for 3 seconds to exit the parameter setting state.

The specific function code is as follows:

Parameter	Description	Range	Unit	Default	Comments
F01	Cooling setpoint	20~60	℃	35	--
F02	Cooling differential	3~10	℃	5	--
F03	Heating setpoint	-42~20	℃	5	--
F04	Heating differential	0~35	℃	10	--
F05	High Temperature Alarm	35~60	℃	55	--
F06	Low Temperature Alarm	-42~20	℃	-40	--
F07	Dehumidifying setpoint	60~100	/	85	--
F08	Dehumidifying differential	5~25	/	15	--
F14	Evap. impeller mode	0~1	℃	0	0-close 1-open
F65	Change password				-

During the setup process, if no key is pressed within 30 seconds, the controller will exit the system Settings menu.

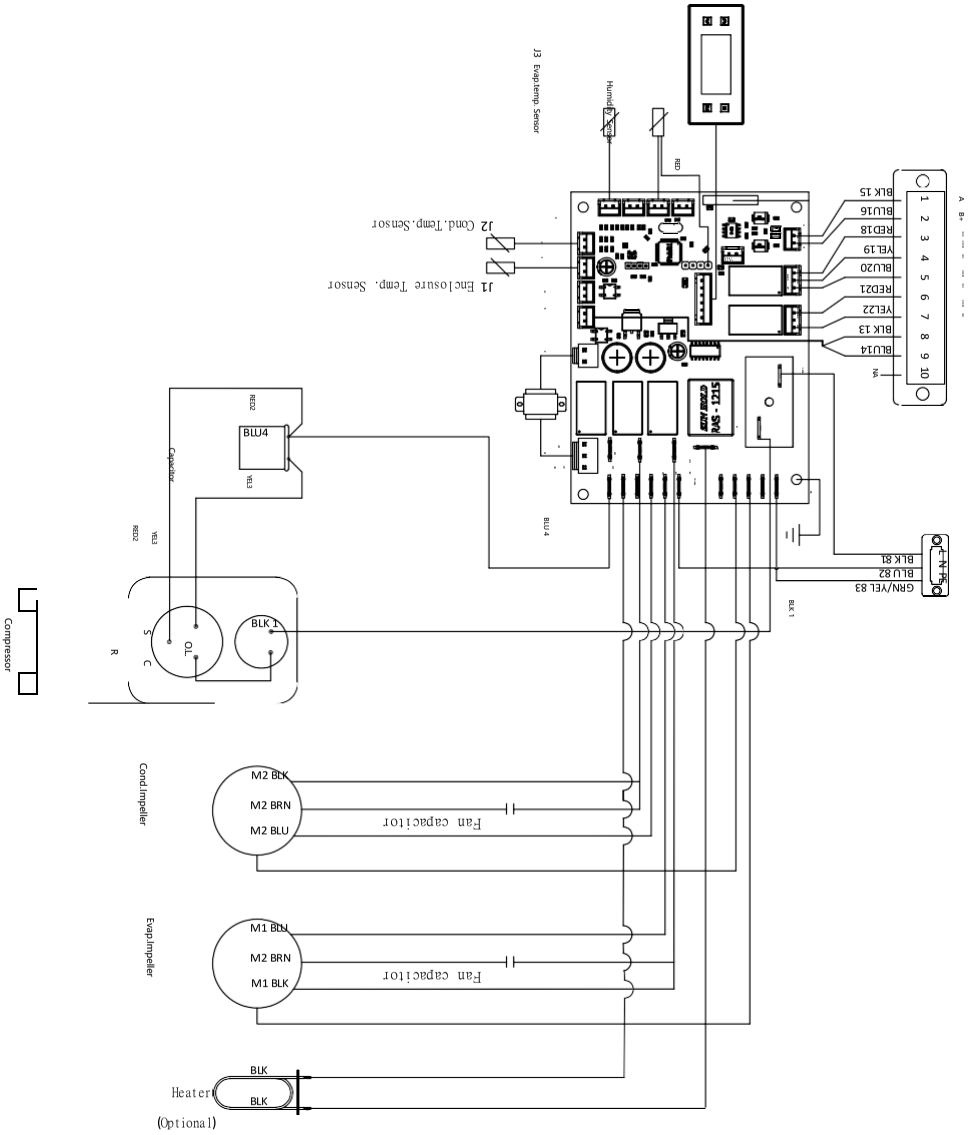
6.3 Alarm Code

If an alarm is generated, the current return-air temperature and the alarm code are alternately displayed on the display panel. The meanings of the alarm codes are as follows:

Mnemonic	Description	Heating condition	Cooling condition
E01	Air Inlet temp. sensor alarm	Close heating	Cooling 10 minuts per 5 m
E09	Evap.impeller alarm	Close heating	Close cooling
E10	Cond.impeller alarm	Close heating	Close cooling
E11	Condenser high temp. alarm	Keep heating	Close cooling
E12	Freezing alarm	Keep heating	Close cooling
E13	High temp. alarm	Close heating	Keep cooling
E14	Low temp. alarm	Keep heating	Close cooling

E21	High humidity alarm	Keep heating	Keep cooling
E22	Evap. temp. sensor alarm	Keep heating	Keep cooling

6.4 Wire Diagram



7 Trouble Shooting Check List

Symptom	Possible Cause
Unit won’ t cool Unit won’ t dehumidify	Clogged fins on coil(s)/Impeller(s) not running/Compressor not running/Loss of refrigerant
Compressor tries to start but won’ t run	Low line voltage at start. Should be +/-10% rated voltage Bad overload switch/ Compressor motor stuck/Bad capacitor
Unit blows breakers	Undersized breaker/fuse or not time delayed/Short in system
Getting water in enclosure	Drain plugged/ Drain tube kinked/ Enclosure not sealed/Gasket damage
Evaporator freezing	1. Internal air circulation short circuit; 2. The air in or out of the cabinet is not smooth; 3. Impeller not running; 4. The cooling system cannot be turned off; 5. The temperature sensor in the middle of the evaporator alarms incorrectly.
High humidity	1. High ambient humidity; 2. The dehumidification system is faulty; 3. The humidity sensor in the cabinet gives a false alarm.
Heating alarm	Heater failure
High temperature	1. Clogged fins on coil(s); 2. High ambient temperature; 3. The refrigeration system is faulty; 4. Equipment with greater heat generation is added to the cabinet; 5. The temperature setting is inappropriate; 6. The temperature sensor in the cabinet gives a false alarm.
Sensor alarm	The sensor is broken or short-circuited or damaged

8 Maintenance

8.1 Regular Inspection

1. Check whether the power cables and communication cables of the air conditioner in the cabinet are normal.
2. Check whether the cabinet air conditioner runs normally, and whether the temperature difference between the inlet and outlet inside and outside the cabinet is obvious when the refrigeration system starts;
3. Check whether the fan and compressor work normally when the system is running, and there is no obvious abnormal sound or jitter;
4. Check the mechanical structure for damage and deformation;
5. Check whether the air conditioner' s internal and external circulation inlet and outlet and the cabinet' s outer protective cover' s inlet and outlet screen are blocked;
6. According to the air quality of the actual use environment, arrange maintenance personnel to inspect the cabinet air conditioner every 3 to 6 months.

8.2 Scheduled Maintenance

When the air conditioner is running, dust will cover the fins of the heat exchanger, causing thermal resistance and affecting the heat exchange performance. In serious cases, the performance of the air conditioner will be reduced. It is recommended to clean and maintain the heat exchanger every 3-6 months. The maintenance interval depends on the degree of air pollution in different areas and the operating time.

9 Service and Maintenance

9.1 Warranty

The product is guaranteed for 12 months (from the start of operation of the product), up to 18 months (from the date of shipment of the product).

For special requirements, if the cabinet air conditioner is used correctly, the warranty period stipulated in the contract shall prevail.

9.2 Warranty Scope

Air conditioning in the warranty period, where the quality of the product itself caused by failure, the manufacturer will be free for you to repair, customer implementation of the warranty terms must provide the product number, but the failure caused by the following reasons do not belong to the scope of free maintenance:

1. The warranty period has expired;
2. Can not provide the product factory number;
3. Failure due to operation under abnormal conditions or environments, or due to improper installation, maintenance or other operations;
4. Faults not caused by the air conditioner itself, such as those caused by the user' s equipment, the user' s software, etc.;
5. Damage caused by replacement or disassembly of product parts by users themselves, or damage caused by disassembly and repair by unauthorized service providers;
6. Failure caused by irresistible forces such as fire, earthquake, flood, etc.

9.3 Disclaimer

The warranty is limited to the products sent and the air conditioning manufacturer is not responsible for any losses that may arise from equipment failure.

10 Scrapping and Recycling

If the product needs to be discarded, the user shall properly disassemble and recycle it according to local laws and regulations!

11 Signal Output Specification

Standard MODBUS RTU communication protocol is adopted. The default

communication address is 1.

Band rate is 9600 bps. 8

bits data.

no parity bit.

1 stop bit.