Outdoor Cabinet User Manual V1.1

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1. Product Overview

1.1 Overview of outdoor integrated cabinet

The battery cabinet is assembled by SGCC metal frame and 20mm aluminum foil with adhesive backed insulation cotton, which is dust / rain & corrosion-resistant. Its interior can be equipped with 19 inch equipment, iron lithium batteries, inverters, and other supporting equipment, which can provide reliable mechanical and environmental protection for the normal operation of internal equipment.

1.2 Structure Overview

1.2.1 Single-cabin Cabinet

The outer panel of the cabinet is made of high-quality galvanized steel sheet, and the thermal insulation layer is 20mm with aluminum foil adhesive insulation material. Suitable for 10pcs batteries installation.

Dimension H*W*D: 1350×1570×800mm mm;

Front view of cabinet: As shown in Figure 1-1

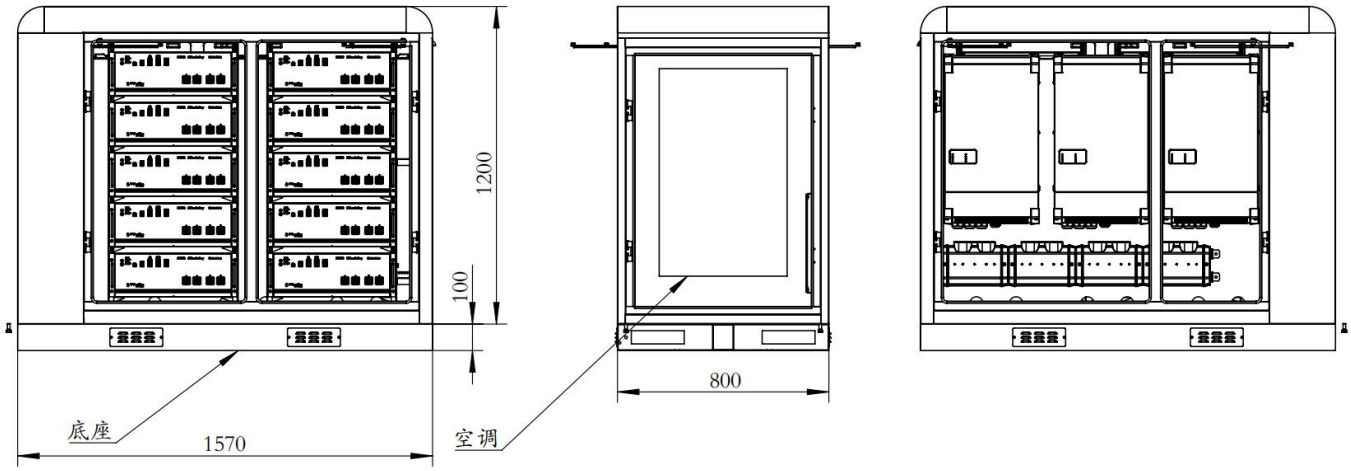


Figure 1-1

Internal cabinet structure: As shown in Figure 1-2

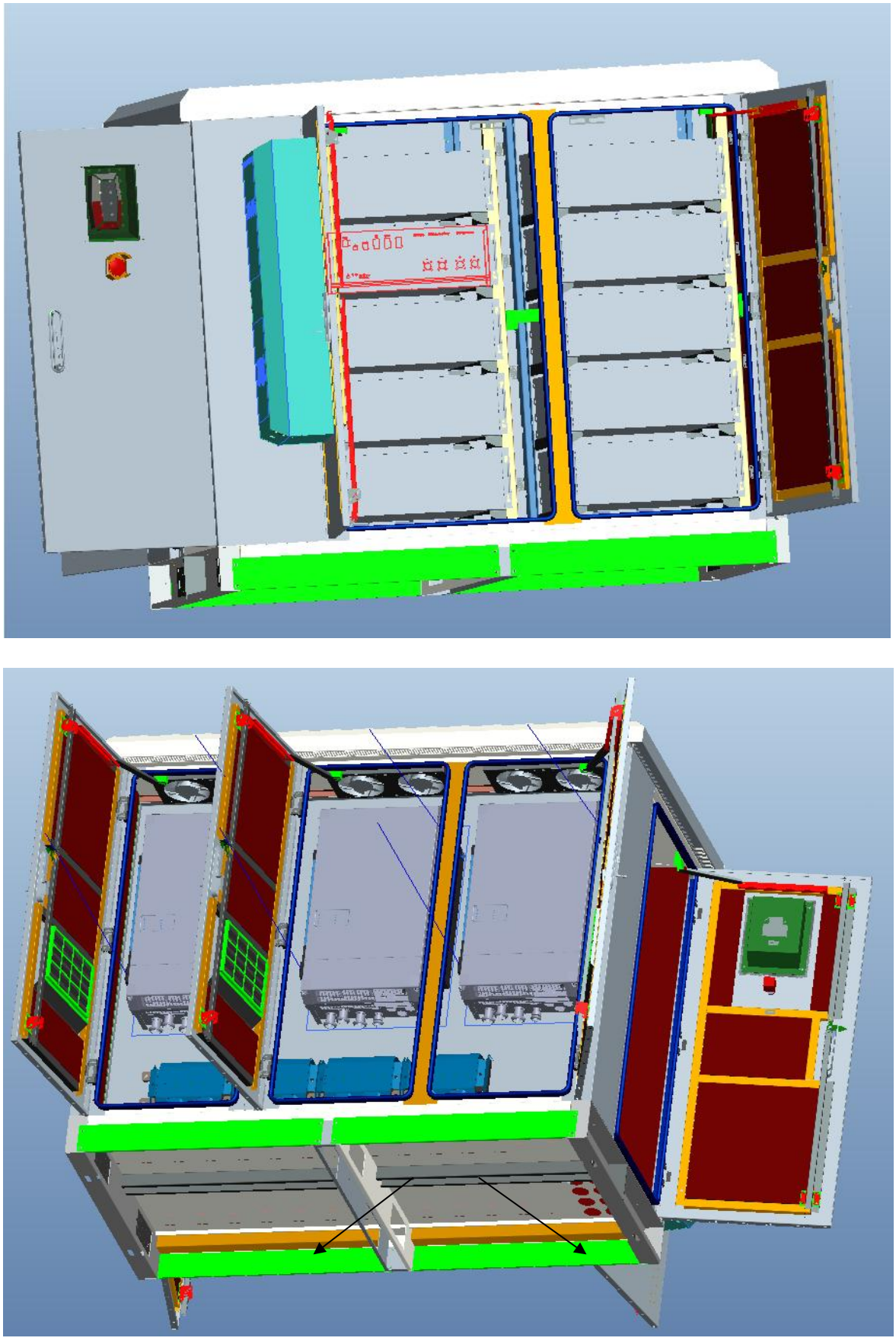


Figure 1-2

1.3 Cabinet characteristics

- Embedded structural design effectively ensures that the cabinet door won't be forced open.
- IP55, effectively preventing rainwater leakage.
- The cabinet is designed with a assembled structure to effectively meet the requirements of packaged shipment.
- The door lock adopts a special mechanical lock for outdoor cabinets, with a three-point locking structure, providing reliable safety protection for the cabinet.
- floor mounted.

1.4 Main Specifications

1.4.1 Technical parameters inside the cabinet

Item	Types	Parameters
Cabinet	Size	Dimensions H*W*D：1350*1570*800mm
	Layout	Single cabins + 19 inch rack + 10pairs L-shape rack + Installation plate for inverter
	Installation	Floor mounted
	Door	Front 2 doors opening + back 3 doors opening + left side door opening ,Special lock for outdoor cabinet (supporting padlock)
	Material	SGCC
	Thermal insulation layer	20mm PEF insulation cotton
	Overall structure	Welding assembly
	IP Rating	IP55
	Accessories	Emergency stop switch, sound and light alarm
Temp. control	Cooling	1500W AC220V Air-conditioner *1pc + DC fans*6pcs
Power supply	Single phase	AC220V

1.4.2 Environmental Requirements

- External ambient temperature：-40℃ ～ +55℃
- Storage temperature： -50℃～+70℃
- Relative humidity： 5%～95%RH
- Atmospheric pressure：62kPa ～101kPa（approximately 0m~5000m above sea level）
- Total solar radiation intensity：≤1120×（1±10%）W/m2

1.4.3 Rated voltage

- AC 220-240V～50Hz

2. Cabinet installation and fixation

Fixed mounting hole positions of the cabinet base: As shown in Figure 2-1.

4pcs waist shaped holes are connected to the cement base through expansion bolts (M10 * 100)

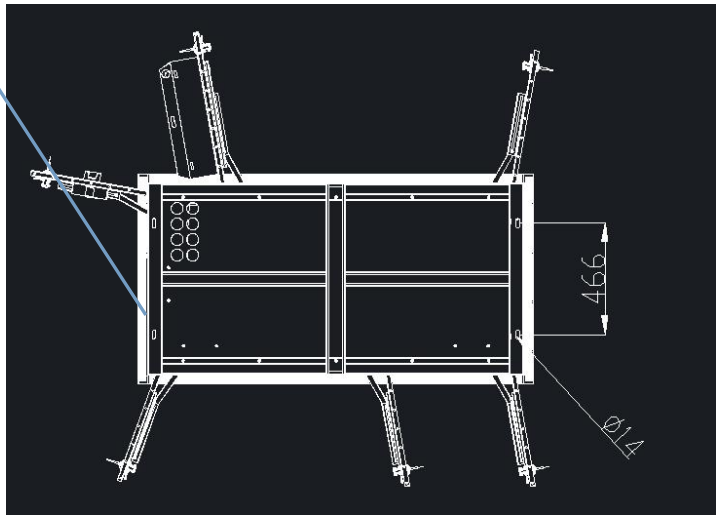


Figure 2-1

3. Use and layout of cabinet

3.1 Use of cabinet

3.1.1 Use of Door limit lever

When opening the cabinet door, the door limit device automatically triggered. When closing the door, please slightly lift the limit device by hand to cancel the limit function.



When the door is opened to the maximum extent, it will sink into the card slot, preventing suddenly closing of the door (such as strong winds and accidental collisions), and protecting the safety of installation and maintenance personnel.

Figure 3-1

3.1.2 Use of cabinet door locks

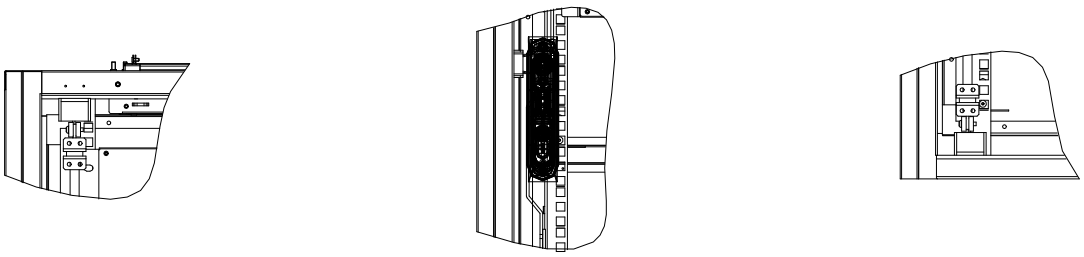
3.1.2.1 Door lock anti-theft design

A. The anti-theft lock is adopted, and its destructive resistance meets the requirements of Class B in GA/T 73-1994 "Mechanical anti-theft locks", as shown in figure 3-2



Figure 3-2

B、Three point anti-theft lock



Top **Left** **Bottom**

Figure 3-3

3.1.3 Use and maintenance of heat dissipation equipment

The heat dissipation equipment configured for the outdoor integrated cabinet is a 600W AC compressor air conditioner. Please refer to the air conditioner manual for specific usage precautions.

3.2 Cabinet grounding

The grounding of equipment in the cabinet are concentrated in grounding bars. The cabinet is equipped with 3pcs grounding bar (as shown in Figure 3-4). The grounding bar is made of copper bars

with anti-corrosion coating.



Figure 3-4

3.3 Cabinet Layout

- Physical picture of cabinet appearance:. As shown in Figure 3-5
- Picture of cabinet internal layout: as shown in Figure 3-6







Figure 3-5





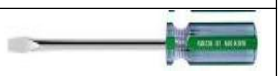
Figure 3-6

4. Packing & Shipping

The product after package can be transported by car, train or sea etc. During transportation, collision, falling, direct rain & snow and sunlight exposure should be avoided.

The product should be stored in a well ventilated and dry warehouse without corrosive gases around it, and the storage temperature should be - 40 ℃ to+70 ℃.

5、List of Spare Parts and Special Tools Required for Cabinet Maintenance

No.	Item	Quantity	
1	Electric hand drill（12V） with battery and cross screwdriver	1	
2	Large cross screwdriver	1	
3	Small flathead screwdriver	1	
4	Wire stripper	1	
5	Pointed-nose pliers	1	
6	Multimeter	1	

6、Attachment 1: User Manual for 1500W Air Conditioner

Air Conditioner User Manual

MODEL: MCA1500 /A1

- Before using the product, please be sure to read the manual carefully
- Be sure to keep this manual properly so that you can access it at any time in the future.
- On the basis of fully understanding the content, please use it correctly.

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1. Introduction

1.1 Preface

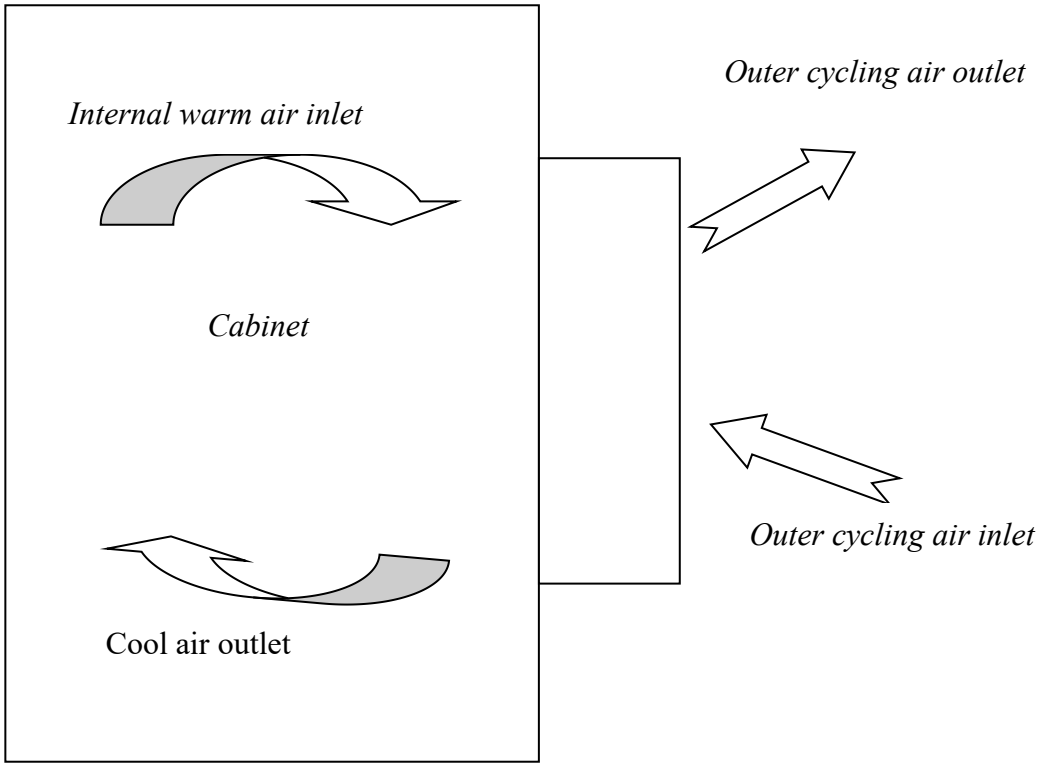
This manual introduces the guide for the installation, operation, function and routine maintenance of the cabinet air conditioner. Please read carefully the manual before using and follow the usage and note.

Note: All the operations of this product shall be performed by professional engineers.

1.2 Product introduction

The air conditioner is one kind of refrigeration product self-developed for 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.

The fan in the internal cycle air path absorbs the hot air from the upside to make air heat exchange by evaporator fins, and sends the cooled air from the downside of the air conditioner. By so, the air in cabinet can cycle to achieve the purpose of lowering the temperature. Meanwhile, The fan in the external cycle air path absorbs the external cold air from the downside, and discharges the hot air from the upside after heat exchange.



1.3 Standards

NO.	Standard No.	Standard Name
01	GB 4208	Enclosure Protection Class
02	GB/T 4857.5、9、10、11、16	Packaging-Basic tests for transport packages
03	GB/T 2423.1、2、3、8、10、17、38	Electrical and electronic products environmental test
04	GB9254-1998	Information technology equipment-Radio disturbance characteristics-Limits and methods of measurement
05	GJB150-86	Environmental test methods for military equipments
06	GB/T17626.8	Electromagnetic compatibility-Testing and measurement techniques--Power frequency magnetic field immunity test
07	YD/T 2768-2014	The temperature controlling devices for Communication outdoor room 1st parts: Embedded temperature controlling devices
08	EN 55022:2006+A1:2007	Conducted Emission and radiation test
09	EN 61000-3-2:2006+A2:2009	Harmonic Current
10	EN 61000-3-3:2008	Voltage Fluctuation and Flicker
11	EN 61000-4-2:2009	ESD
12	EN 61000-4-3:2006	Radiation disturbance Immunity Test
13	EN 61000-4-4:2004	Electrical Fast Transient Burst
14	EN 61000-4-5:2006	Surge
15	EN 61000-4-6:2009	Conduction disturbance Immunity Test
16	EN 61000-4-11:2004	Voltage dips and short interruptions

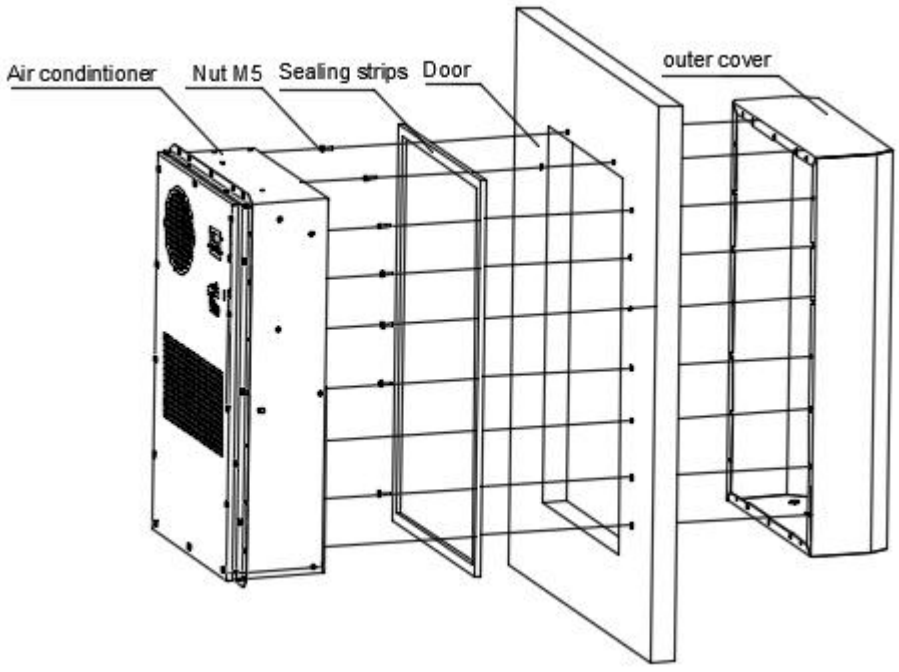
2. Product parameter

2.1 Product technology parameters

Item	Name	Unit	Parameter
Dimension and installation	Body outline dimension (height*width* depth)	mm	750*450*200
	Outline dimension including flange(height*width* depth)	mm	784*484*200
	Weight	Kg	24
	Installation method	Door Mounted	

	Installation method	Outdoor	
Environment and protection	Working environment temperature	℃	-40 to +55
	Noise	dB(A)	65
	Life expectancy	Years	>10
	IP grade	IP55	
	Refrigerant	R134a	
	ROHS certification	yes	
Performance	Input voltage range	220±15%VAC~50Hz	
	Refrigerating capacity(L35/L35)	W	1500
	Rated Refrigerating input power(L35/L35)	W	580
	Rated Refrigerating current (L35/L35)	A	2.6
	Maximum Refrigerating current	A	4.0
	Heat capacity(optional)	W	/
	Air Volume of Inner Circulation	m^3/h	320

2.2 Installation diagram



Note: the installation diagram is just for reference, the specific installation scheme should be determined according to the environment of the actual usage.

3. Preparation and installation

3.1 Removing package and checking

1. Please prepare installation tools: knife and scissors, and wear protective gloves.
2. Please remove wrapping film and packing belt, then remove the carton, take out the air conditioner.
3. Please check the attachment list and accessory bags in the carton, check whether the air conditioner model is right .

Notes:

1. After removing the outer package, please make sure that the air conditioner is placed upright , and not placed horizontally or upside down.
2. After removing the outer package, please check carefully whether the appearance of the air conditioner is damaged or oil polluted, if the appearance of the air conditioner has obvious deformation or oil stain, please contact the manufacturer in time.
3. If there is no need to install the product immediately or it needs to be transported to other place, please repack the air conditioner after the checking.
4. It is recommended to recycle the unpacking materials.

3.2 Mechanical installation

Installation tool: Phillips screwdriver

Installation Steps：

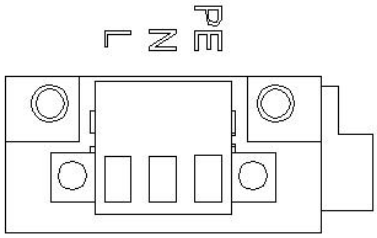
1) Choose cut location on the cabinet according to the holing diagram, remove the shadow area and make the installation hole.
2) Make air conditioner flange close to cabinet door, Fix the air conditioner on the installation surface of the cabinet firmly with M5 screws.
3) Check whether air conditioner is installed levelly and firmly.

Notes:

1) Check whether air conditioner drainage loop is smooth, in case that drainage is blocked.
2) When determine the location of the installation hole in the cabinet, you should avoid the inlet and outlet air ports inside the cabinet are not blocked by any components inside the cabinet, and the two should be kept a horizontal distance of more than 150mm; otherwise, it is prone to lead to r short circuit of the return air, and poor cooling effect, etc.;
3) carrying or moving the air conditioner should be careful to avoid colliding it and scratching its surface coating;

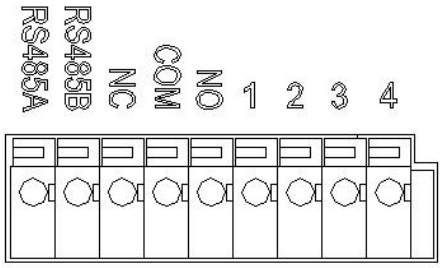
3.3 Electrical installation

（1） Power input port



Item	Port	Definition
Live	L	power input cable L
Null	N	power input cable N
Earth	PE	Earth line

（2） Alarm output and signal input port



Item	Port	Definition
+ RS485 communication interface	RS485A	RS485 communication ports (+)
- RS485 communication interface	RS485B	RS485 communication ports (-)
The public alarm dry nod (NO)	NO	It is normally open if no alarm
The public alarm dry nod (COM)	COM	common port
The public alarm dry nod (NC)	NC	It is normally close if no alarm
Hydrogen discharge / emergency fan dry contact (NO) (Optional)	1	It is normally open if no output
Hydrogen discharge / emergency fan dry contact COM (Optional)	2	Hydrogen discharge / emergency fan dry contact COM

4. Product function

4.1 Cooling

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.

User parameter setting point

Parameter	Default value	Setting range	Unit	Note
Refrigeration starting temperature	35	[20～40]	℃	Refrigeration stopping temperature =Refrigeration starting temperature- Refrigeration return difference
Refrigeration return difference	6	[3～10]	℃	

4.2 Heating（Optional）

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.

User parameter setting point

Parameter	Default value	Setting range	Unit	Note
Heating starting temperature	5	[-10～15]	℃	Heating stopping temperature= Heating starting temperature+ Heating return difference
Heating return difference	10	[3～15]	℃	

4.3 Remote monitor

Air conditioner has an RS485 communication interface, supporting MODBUS- RTU communication protocol。The air conditioner communicates with the upper monitor through the RS485 communication interface. Or users can check the air conditioner's running state by viewing the display screen directly and change its running parameters.

4.4 The control of external fan (Optional)

According to the optional requirement, the external fan (Hydrogen discharge / emergency fan) automatically realizes cycle hydrogen discharging and emergency ventilation function.

Hydrogen discharge function(Optional)：When hydrogen discharge cycle comes, air conditioner start the hydrogen discharge fan, the control switch closes.

hydrogen discharging function

parameter	Default value	Setting range	Unit
cycle	24	[0～72]	h
discharging time	5	[0～10]	Min

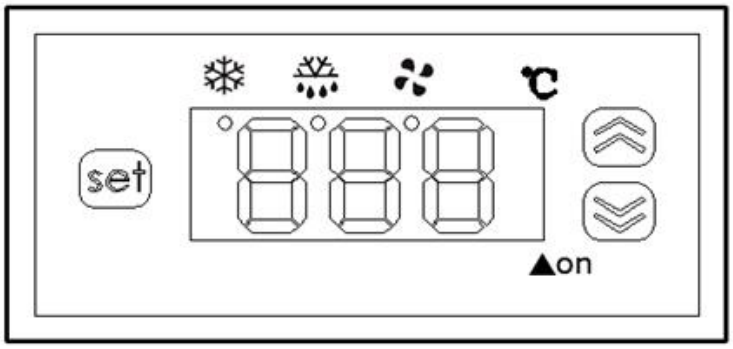
Emergency ventilation function (Optional): When the temperature inside cabinet is higher than Emergency ventilation starting temperature, emergency ventilation fans run; when the temperature inside cabinet is lower than Emergency ventilation stopping temperature, emergency ventilation fans stop.

Emergency ventilation function

parameter	Default value	Setting range	Unit
starting temperature	45	[28～50]	℃
stopping temperature	42	[25～50]	℃

5. Display screen

5.1 Display interface



NO.	Icon	Function	Function explanation
1	❄	Refrigerating running	Indicate whether refrigerating runs or not
2	❄	Heater running	Indicate whether heater runs or not
3		Fan running	Indicate whether fan runs or not
4	SET	Set key	Select function and enter parameter set
5	▲	Up key	Increase value, page up
6	▼	Down key	Decrease value, page down

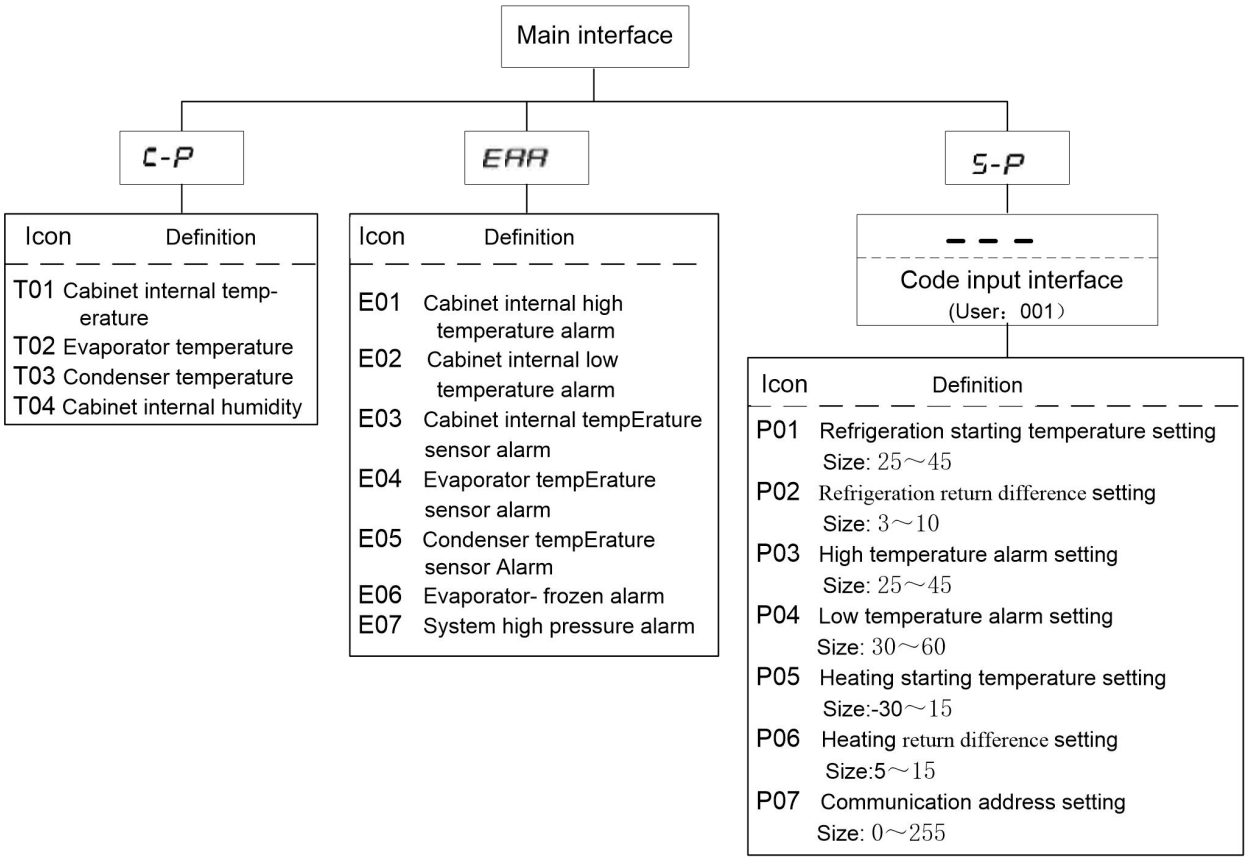
5.2 Menu structures

Pressing ▲ or ▼, it will show C-E, EAA and S-P in turn, Enter to the main interface if pressing SET again ; Be back to the main interface if pressing ESC again.

S -P: parameter setting. In the interface, press SET to enter the password input interface, and after that the password is entered correctly, it will display the parameter code, the default is P01. Press ▲ and ▼ to adjust the addition and subtraction of the parameter code. After the selection of the parameters of the code, press SET to confirm, and then enter the parameters interface, and Press ▲ and ▼ to adjust the addition and subtraction of the parameters value. And then press SET, to confirm the parameter values changes, if don't need to save adjusted parameters, please press ESC.

C-P: Check the parameters. Pressing ▲ or ▼, it will show T01、T02、T03、T04 in turn , and the parameters can be shown several seconds later.

EAA: Show the alarms. Fault alarm code will be shown in the display screen. They will be shown successively, if there are several alarms one time.



5.3 Display

Under running, the main interface *8.8.8* displays real temperature value in cabinet

After boot, in any interface, if there has no keyboard operation in the continuous 60s, automatically return to the main interface

5.4 Start self-test

In the running states, the self-checking function can be activated by continuous pressing SET for 3 seconds.

When Self-check, the screen will be full display for 1S, and then will normally display cabinet temperature, while the boot icon will blink.

6. Running

6.1 Check before start running

1) There are not obvious blockages near the internal cycle air inlet and outlet of the air conditioner.
2) The input power cables and other signal cables have been connected reliably and correctly.
3) The input voltage and frequency should meet the requirement of air conditioner.
4) The fans can turn freely without abnormal noise

6.2 Start running

1) Close the input power switch, it will start self-test, complying with the standard in section4.3. After self testing, The internal cycle fan of the air conditioner will be started. If the internal cycle temperature meets the running condition, the cooling system will be started.
2) Operating parameters have the default settings, and it is Ok to confirm normal after running; if you need to change the parameters, please refer to the 5th section.

7. Faults and treatment

7.1 Alarm information

Item	Alarm conditions	Reset	output from dry contact
High temperature alarm	Temperature inside the cabinet is higher than the setting	Automatic	Yes

Low temperature alarm	Temperature inside the cabinet is lower than the setting	Automatic	No
T1 temperature sensor alarm	There is short or open circuit on the cabinet internal temperature sensor cable	Automatic	No
T2 temperature sensor alarm	There is short or open circuit on the Evaporator temperature sensor cable	Automatic	No
T3 temperature sensor alarm	There is short or open circuit on the Condenser temperature sensor cable	Automatic	No
Evaporator-frozen alarm	Evaporator temperature is lower than 0℃	Automatic	Yes
Frequent high system pressure alarm	System pressure is higher frequently than the setting	Automatic	Yes
Controller power failure alarm	No power is be input for controller	Automatic	Yes

7.2 Faults and treatment

Item	**Possible reasons**	**Fault handling**
Temp. sensor failures	The sensor has not been connected correctly	Check the circuit connectors， and connect it again
	The sensor is damaged	Change the sensor
high Temperature alarm	The condenser or evaporator is dirty and blocked	Clean the condenser or evaporator
	Refrigerating capacity isn’t enough	Please consult usability professional
	The temperature setting is fault	Set the temperature again
Frequent high system pressure alarm	The condenser or evaporator is dirty and blocked	Clean the condenser or evaporator
	External fan is fault	Change the fan
	Condenser temperature sensor wrongly sends alarm	Change the condenser temperature sensor
Evaporator-frozen alarm	Internal cycling path is blocked	Check if there are block to stick the internal cycling path
	Internal fan is fault	Maintain or change it
	Refrigerating system can’t stop	Check if the air-conditioner reaches the refrigeration stop conditions but the actual status doesn't stop, if yes, inform the AC maker to deal with it.
	Evaporator temperature sensor wrongly sends alarm	Change the evaporator temperature sensor
Compressor can’t run	There is no cooling demand	Check if refrigeration is not needed
	Within shutdown delay	Check if compressor is protected
	Compressor line has not been connected correctly	Check the compressor line， and connect it again

	Compressor protect switch or motor is fault	Check if compressor protect switch is ok, and change compressor protect switch if fault; if motor is fault, change the compressor
Internal fan can't run	Internal fan is fault	Change the fan
	Internal fan line has not been connected correctly	Check the Internal fan line， and connect it again
	External fan is stuck	Check if there are block to stick the fan or not, and clear the block
External fan can't run	External fan is fault	Change the external fan
	The operating condition has not been satisfied	Check if the operating condition is satisfied
	External fan line has not been connected correctly	Check the external fan line， and connect it again
	External fan is stuck	Check if there are block to stick the fan, and clear the block
Fan makes abnormal noise	Fan blades are damaged or the bearing of fan wears	Change the damaged fan
	The blades of fan scratch other objects	Check and fix it again
Heater can't run	The heater is fault	Change the heater
	The heater lines has not been connected correctly	Check the external fan line， and connect it again
	The operating condition has not been satisfied	Check if the operating condition is satisfied

8. Maintenance

Maintaining air conditioner very closely can keep it having a good performance and normal life, the following works should be done:

No.	Check/Maintain	Cycle
1	Check whether there are alarm information or not	6 months
2	Check whether fans can rotate normally or not	6 months
3	Check whether compressor can rotate normally or not	6 months
4	Check whether there is obvious noise or shake or not	6 months
5	Clean the inner and outer circulation air inlet and outlet of the air conditioner	6 months
6	Clean heat exchangers	1year
7	Check whether air conditioner power supply wire and communication wire is Ok or not	1year

7. Attachment 2： Sound and Light Alarm Device User Manual

1. Overview

The CNS89 fire sound and light alarm (hereinafter referred to as the alarm) is installed on site to use in the event of a fire, reminding on-site personnel to pay attention and evacuate during a fire.

The alarm can work independently (by connecting to a DC24V power supply, it can emit sound and light alarm signals) and can also be connected to the bus based fire automatic alarm system through an encoded linkage control module to participate in system linkage control.

2. Technical Parameters

Rater Working Voltage	DC24V
Alarm Current	≤50mA
Sound Pressure Level (SPL)	75dB~115dB
Modulation Period	2S~5S
Flash Frequency	1.1HZ~1.6HZ
Shell Material & Color	ABS, Red
Dimensions (L*W*H)	134*114*50mm
Weight	138g
Operation Standard	GB26851-2011, EN50130-4:2011/A 1:2014, EN IEC 61000-6-3:2021
Using Environment	Temperature: -10~+50℃
	Humidity: ≤95%, no Condensation

3. Structural features and working principle

3.1 The appearance & dimension diagram is as following:

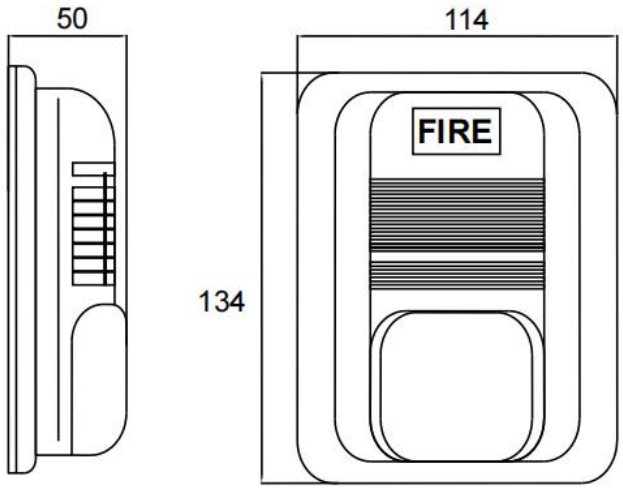


Figure 1

3.2 Working Principle

The alarm adopts a sound effect chip design, and the signal output of the sound effect chip is amplified by a three-level transistor and transformer to drive the buzzer to emit sound. The flash uses 6 high brightness light-emitting diodes, and its flashing frequency is controlled by a timer circuit. The alarm can be directly activated by applying DC24V.

4. Installation & Layout

Warning: Before installing the device, please cut off the power and confirm that the polarity of the alarm's connecting wire is correct and secure.

4.1 The installation size is as following:

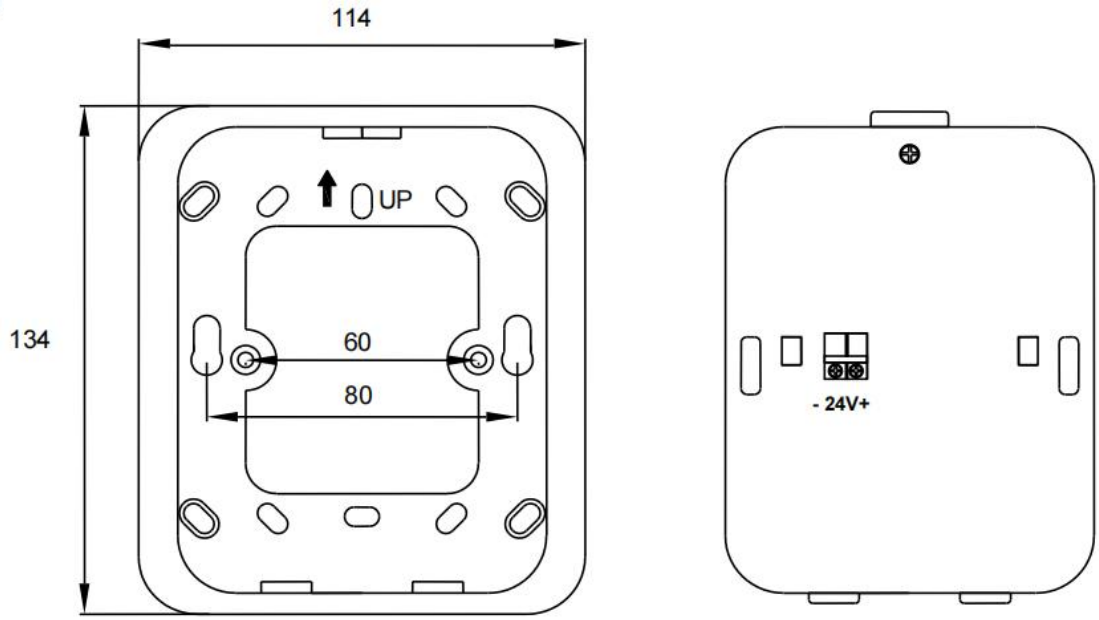


Figure 2

4.2 Installation method

The installation base of the alarm and the alarm are separate. The base only serves as a fixing function, and can be installed on the embedded box in a visible manner. Under normal spatial conditions, it is advisable to install the alarm at a distance of 0.2 meters from the ceiling. When installing, pay attention to the direction indication on the base and install in the correct direction.

4.3 Terminal block

Connect DC24V according to the correct terminal identification instructions, paying attention to distinguishing polarity. The terminals are shown in Figure 2.

4.4 Wiring requirement

Recommend to use BV cable with diameter ≥1.5mm^2 .

4.5 Installation

After the alarm wiring is completed, simply buckle it into the base.

5. Test

Warning: Before testing, it's suggested to inform the relative management departments that the system will be under maintenance testing and will result in temporary work shutdown. Surrounding people should be notified in advance to avoid unnecessary panic.

5.1 Detection period

The device should be detection once a year after putting into usage.

5.2 Testing check

Check if the alarm flashes and sounds normally.

5.3 Measure after testing

It's suggested to inform the relative management departments and restart the system after testing.

5.4 Defective product handling

If any unqualified alarm is found during the testing process, it should be returned back to the factory for repair or replacement.

6. Maintenance

6.1 When the alarm needs maintenance or repair, disassemble the alarm as shown in Figure 3.

6.2 Disassembly method

Using a flat head screwdriver, insert it along the middle of the top of the alarm, and then lift the screwdriver handle upwards to detach the alarm from the base.

6.3

Disconnect the connection wire of the alarm, note that the disconnected circuit wire needs to be wrapped with electrical insulation tape to avoid exposing the wire core outside.

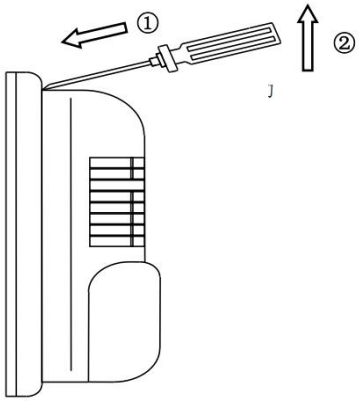


Figure 3