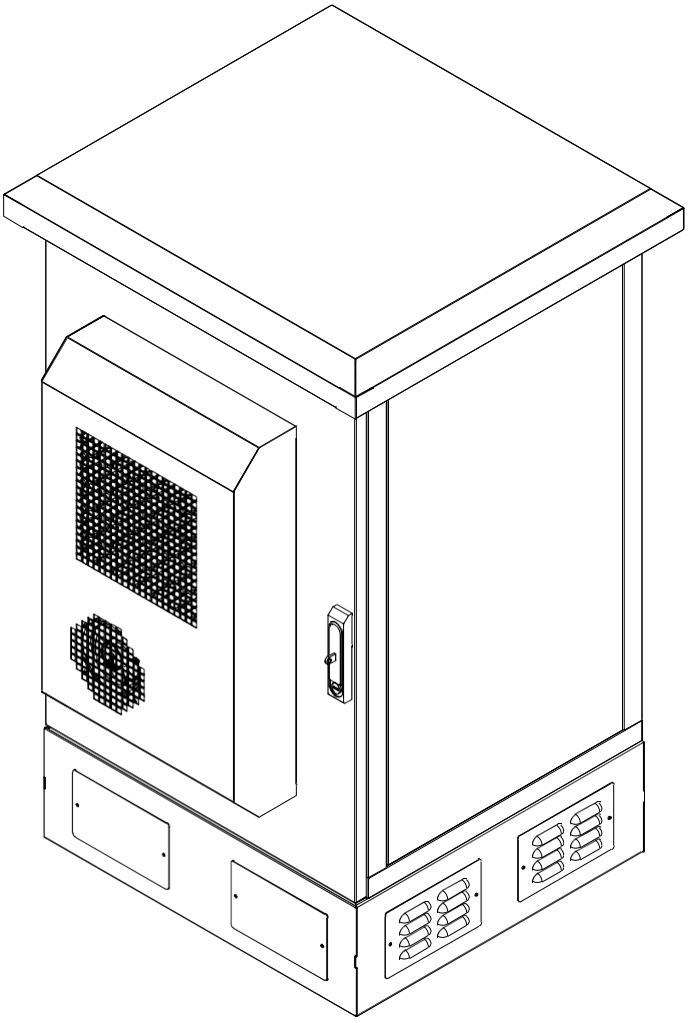
IP Rated Air-Conditioner AC Power Type

Outdoor Cabinet Manual



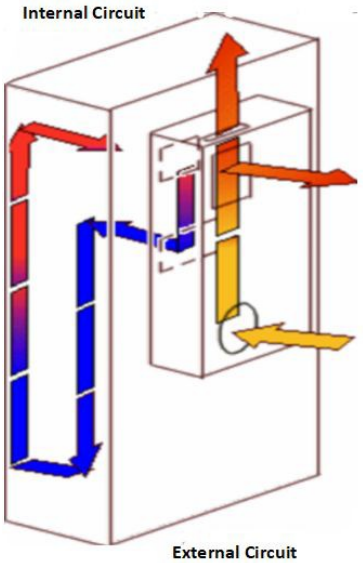
Thank you for buying our air-con. outdoor cabinet,this manual introduces important methods to use cabinet air conditioner,please read carefully the manual before using and following the usage/note to make sure use air conditioner safely and correctly. After reading, please keep the manual safe for reference at any time.

Contents

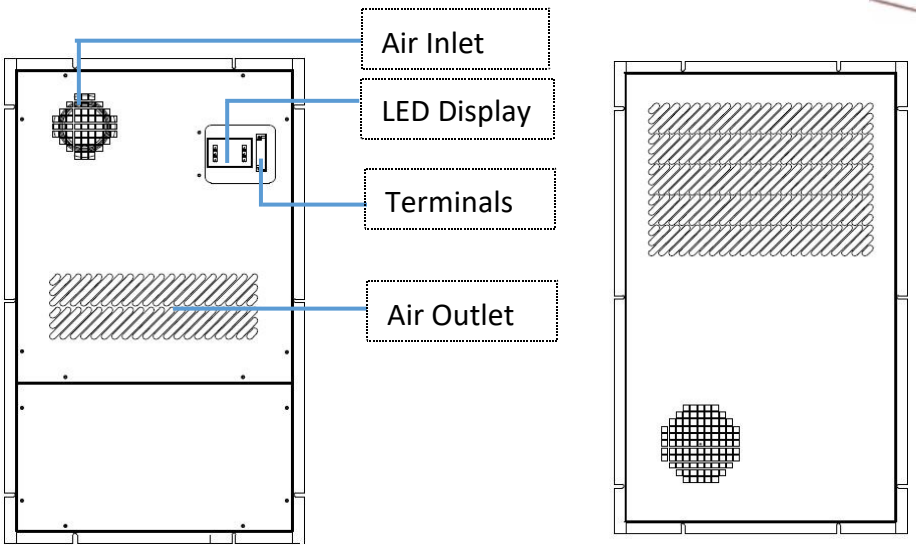
Introduction

Different from the traditional commercial and household air conditioner, outdoor cabinet air conditioner is a full automation temperature control product, it used intelligent controller to control the whole system of the air conditioner and widely deployed in telecommunication outdoor base stations, power station outdoor cabinet, outdoor LED screen, where require the temperature level below than 35℃ situation.

Feature



- This series of products can be widely used for outdoor communication cabinets, battery cabinets, electric cabinets and industry control cabinets etc.
- The protective level of internal and external circulation is IP55, which can protect cabinet to avoid moisture, dust, water. The air conditioner can also be indoor or outdoor installed.
- R134a system.
- R134a system fits working conditions of high/low temperature 55℃/-5℃.
- Digital temperature controller and high precision of temperature control.



Front View　　Back View

(The image shown above is of the 1500W air conditioner)

Air Conditioner Specification

Cooling Option	AC 300W	AC 400W	AC 500W	AC 600W	AC 800W	AC 1000W	AC 1200W	AC 1500W
Cooling capacity (L35/L35) (W)	300	400	500	600	800	1000	1200	1500
Voltage	110~120V AC ± 15%, 60Hz / 220~240V AC ± 15% ,50Hz							
Rated Power (L35/L35) (W)	220	240	320	360	410	426	485	605
Refrigerant	R134a							
Working Temperature	-5～55℃ -40～55℃ (with heater)							
Heater Power (Optional Function)	300W			400W		800W		
Noise (dB)	55	55	55	56	58	60	62	63
IP Grade	IP55 Rated							
Dimension (W×D×H) (mm)	353×165×583			455×155×692		491×187×751		

Model	AC 2000W	AC 2500W	AC 3000W
Cooling capacity (L35/L35) (W)	2000	2500	3000
Voltage	110~120V AC ± 15%, 60Hz / 220~240V AC ± 15% ,50Hz		
Rated Power (L35/L35) (W)	745	900	1240
Refrigerant	R134a		
Working Temperature	-5～55℃ -40～55℃ (with heater)		
Heater Power (Optional Function)	800W		1000W
Noise (dB)	68	68	70
IP Grade	IP55 Rated		
Dimension (W×D×H) (mm)	460x188x1100		569×220×1308

Note:

1, Above model are powered by AC power, if you need DC powered or other parameter, please contact the representative or other distributors from whom you purchased your product.

2, Heating function is optional, and the heater power is manufacturer's default (heater power capacity also can be customized), please consult the representative or other distributors from whom you purchased your product.

Air Conditioner Parameter Selection Method

Formula:

Qt = (Qi + Qr) ×1.2

Qt: Heat released by the cabinet (W)
Qi: Heat released by the inner cabinet (W)
Qr: Heat spreads from outside to the inside of cabinet (W)
Qi: Heat released by the inside of the cabinet (W)

The calculation of the heat released by the components in the cabinet is based on the following (related to the components installation)：

(1) Heating of variable-frequency drive, transformer, drive and servo amplifier etc.If the equipment is rated power 1K, it will generate approx. 30~50W heat (depending on the load and divided by fan pump load and mechanical load);
(2) PLC is about 35~50W heating(group as a unit), heat of industrial personal computer is controlled by its size. All calculated of 300W/ unit;
(3) Heat of contact components: rated power 1KW is about 5~20W heat, can be ignored compared with large power components;
(4) Heat of common server is about 280-500W. Heat of UPS is 20% of its power; When the variable-frequency drive is working with load, its loss (transformed into heating) is about 3%~5% of system rated power, which can be calculated. When the variable-frequency drive is of 1KW, the loss maybe 30W to 50W;
(5) Heat of SCR: 2W/A,1KW DC Drive is about 7W~10W.

Qr =k×A×ΔT

k---Heat transfer coefficient

k=5.5W/ m2 Steel cabinet
k=12.0W/ m2 Aluminum-magnesium alloy enclosure
k=0.2W/ m2 Plastic material cabinet

A ---Surface area of the cabinet（unit---m2）

ΔT=T1 - T2 （unit---℃）

T1---maximum temperature of outside cabinet
T2---controlled temperature of inside cabinet

The air-con. outdoor cabinet cooling requirement:

Steel cabinet dimension(L×H×D)：1500×2000×800 mm

Heat of the inside element is 1000W,controlled temperature inside cabinet is 28 ℃, outside temperature is 35 ℃.

The calculation process of air conditioner parameter :

Surface area of the cabinet---A=1.5×2×2+0.8×2×2+ 1.5×0.8=10.4 m2.
Heat rumored from out to inside of cabinet---Qr = k ×A×Δ T = 5.5×10.4×(35-28) =400.4 W
Total heat produced by the cabinet---Qt =(Qi + Qr) ×1.2=(1000+400.4)×1.2 = 1680.48 W

So choose the cabinet air conditioner with cooling capacity of 2000W.

Installation Instruction

Terms of Usage(Important ! Suggest to read carefully before operation)

Important Safety Information

Read the instructions carefully to become familiar with the equipment before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

Installation instruction

- ✧ Please do not use this equipment in hot, dusty, moist or corrosive environment. The ambient temperature should not be higher than 45℃ and also should not be less than 0℃. The humidity should not be more than 85%. Starting voltage should not be higher or lower than 10% of the rated voltage.
- ✧ Follow the instruction, otherwise inappropriate installation will cause leakage、electric shock、fire and equipment loosening etc.
- ✧ The air conditioner should not be pressed or heat. Never pull the power cable or the drainpipe heavily.
- ✧ the ground wire cannot be connected to gas pipe, water pipe, lightning rods and telephone line etc.
- ✧ Use screws to fix the air conditioner on the cabinet.
- ✧ The drainpipe of the cabinet air conditioner should not be warped or pressed heavily. After the installation, please make sure the drainpipe can drain water smoothly.

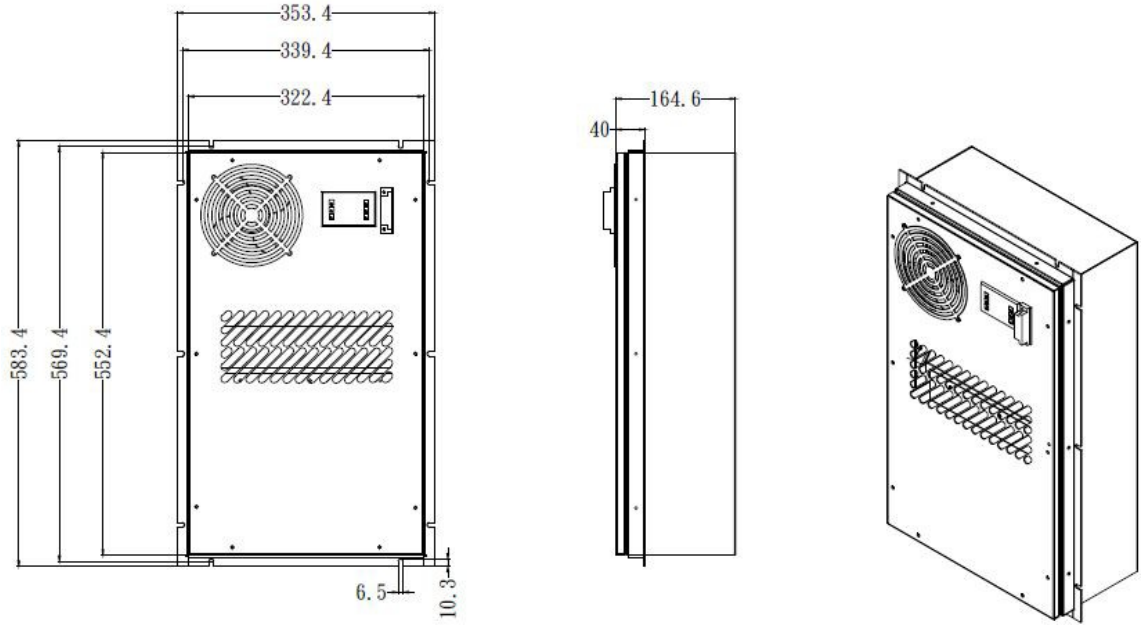
Note

- ✧ Please keep the right side up. Do not tilt or collide.
- ✧ The installation and circuit connection must be operated by the professionals according to the instructions strictly.

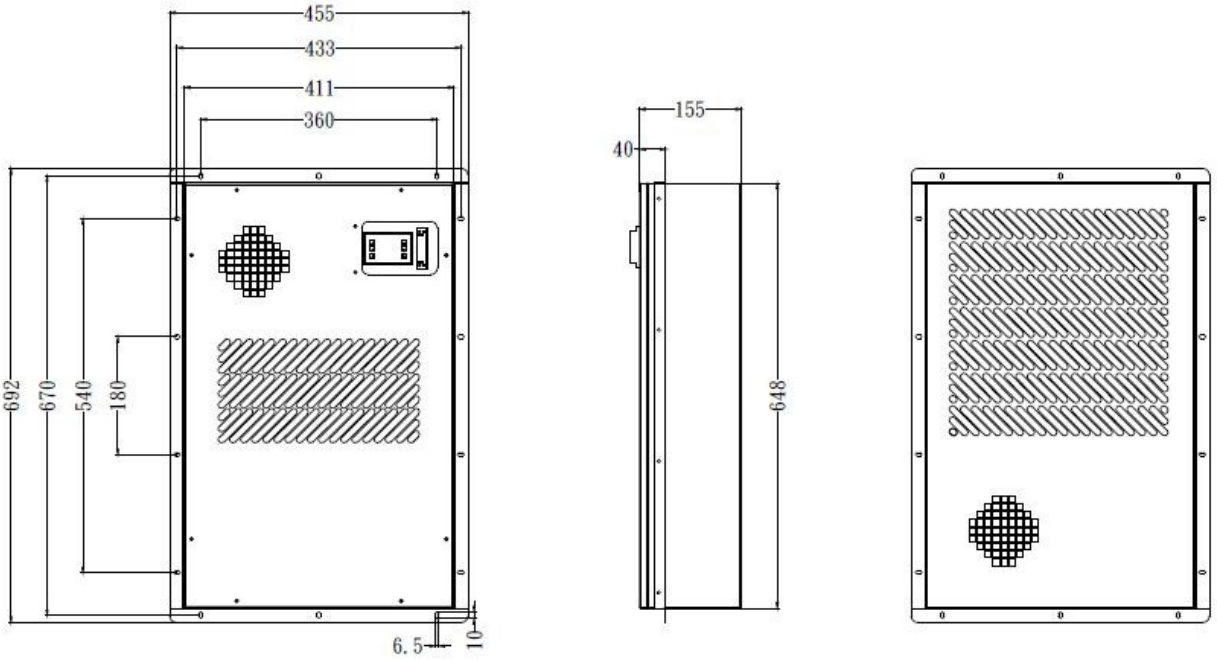
Security Alarms

- ✧ Putting goods on the air conditioner is strictly prohibited. No pressing.
- ✧ Please cut off the power before cleaning, dis-assembly or maintenance in case of electric shock accident.
- ✧ Installation or usage is strictly prohibited when there is flammable gas, aggressive gas, oil mist or electrically conductive powder in the air.
- ✧ If smoke, abnormal noise or not work long time after starting up, cut off the power ,stop unit running and turn to the professionals for examine and fix.

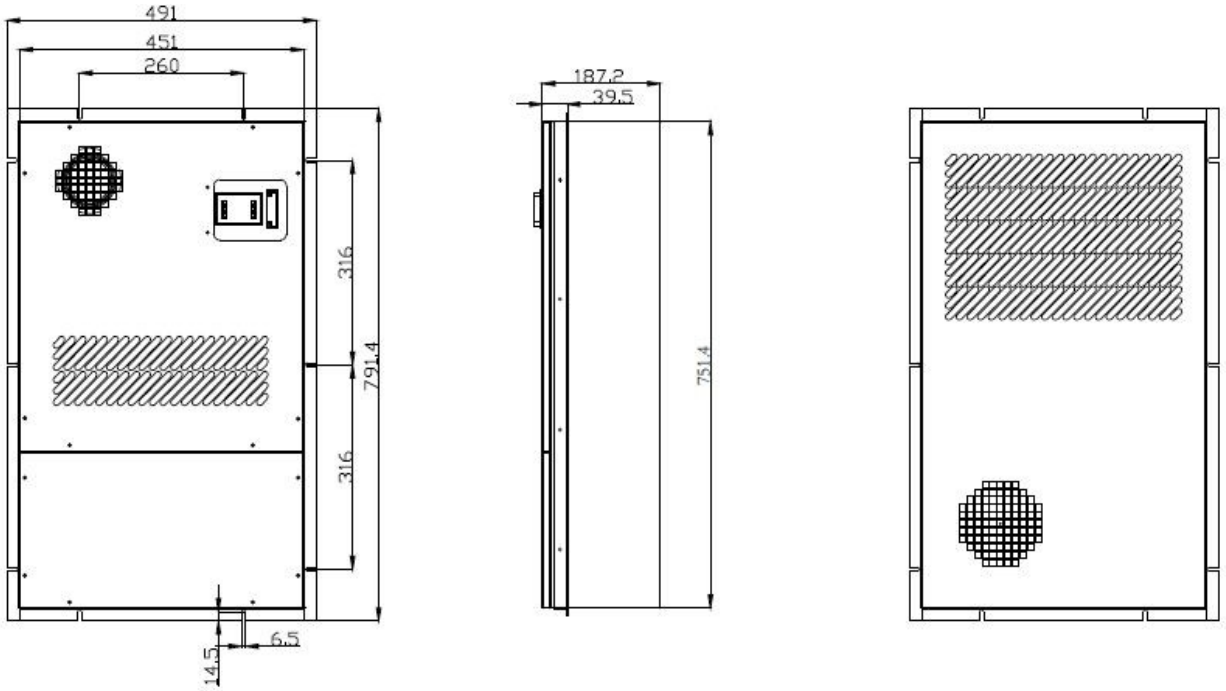
Installation Drawing



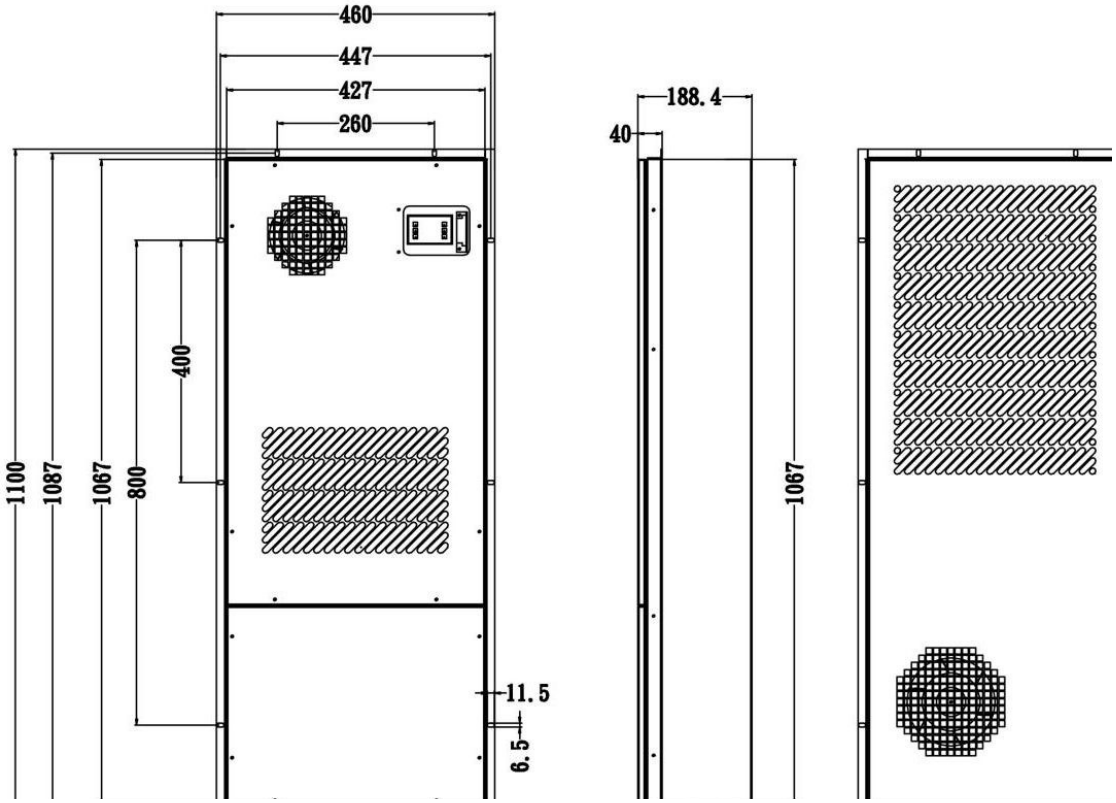
AC 300W/AC 400W/AC 500W



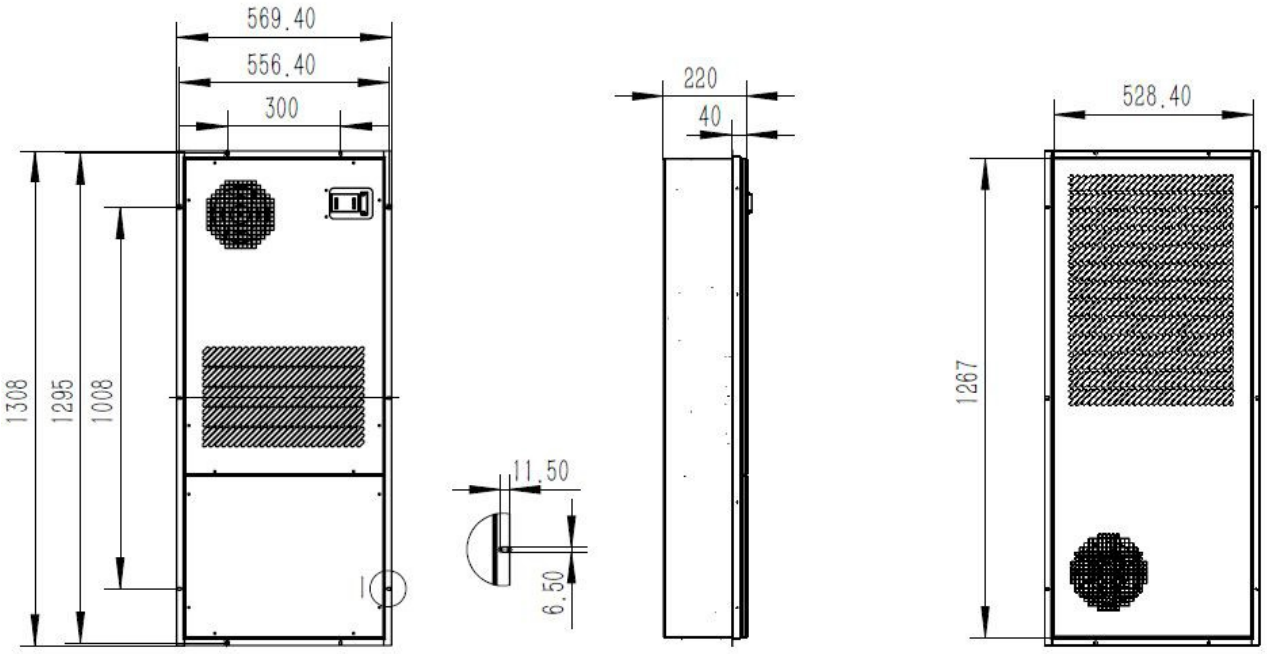
AC 600W/AC 800W



AC 1000W/AC 1200W/AC 1500W



AC 2000W/AC 2500W



AC 3000W

Installation Steps

a. Dig square holes on the installation place (the oblique part) of the base metal (usually control box) according to the dimension of the air conditioner. Please check the dimension before digging.
b. Drilling M6 holes next to the square hold according to the dimension of the flange (door mounted) and cover (side mounted).
c. Label sponge on the edge of the square holes.
d. Push the air conditioner by its positive side through the inside of the square holes and then fix it with bolt.
e. Connect the power (according to the following terminals)

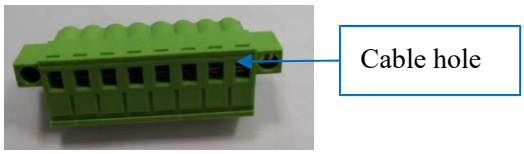
1	L	AC110V
2	N	
3	PE	
4	A	RS485
5	B	
6	NC	Alarm
7	COM	
8	NO	

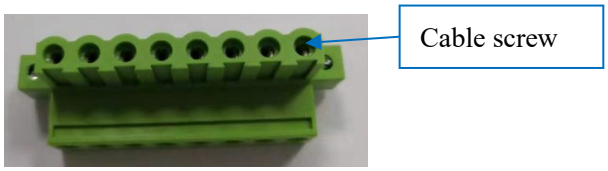
1	L	AC220V
2	N	
3	PE	
4	A	RS485
5	B	
6	NC	Alarm
7	COM	
8	NO	

L — live wire
N — zero wire
E — ground wire
NC/COM/NO — alarm
AB — RS485

Fixed Terminal

Removal Terminal





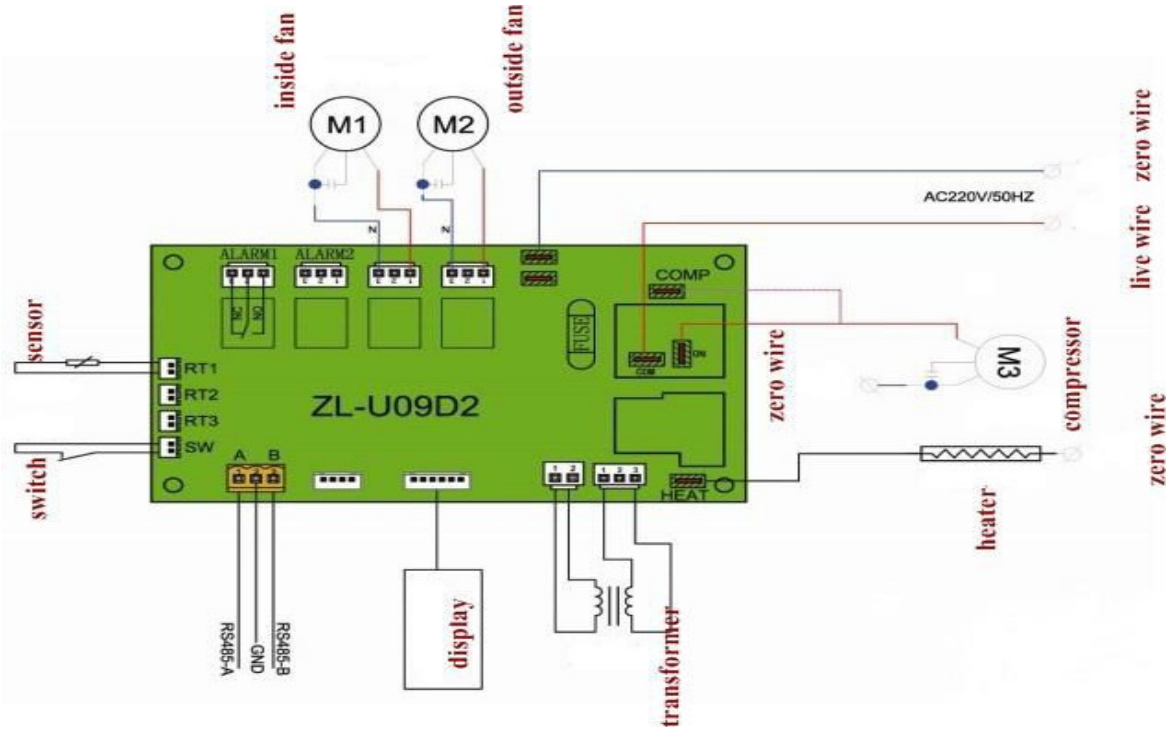
a. After stripping 7mm plastic insulation of power cable, insert it into the cable hole, use a screwdriver to tighten the screw thread (same way to sensor).
b. Fix the mobile terminal into the fixed terminal with a flat-head screwdriver
c. Finishing power cable and ensure their safety and aesthetics.

Note: The power must be shut off before installation. Choose appropriate cables and circuit protection device according to the nameplate.

Connect the Water Tube

Screw the water tube to the bottom of the drain, connect the drain with the water tube and tighten them with a hoop (install the drain at a proper position, not exceed the bottom of the air conditioner).

Electrical Diagram



Instruction of Control System

Function Button

“1”	Set turn on or turn off temperature of cooling function.
“2”	Set turn on or turn off temperature of heating function.（heating function is optional）.
“A”	Set alarm of high and low temperature.
“+”	Increase setting parameter.
“-”	Reduce setting parameter.
⏻	Power switch.

Indicator lights — L1, L2, L3 L4

Introduction of LED lights on control plate.

Name	Light	On	Off	Flash
Compressor Light	L1	Start	Stop	On time-lapse protection
Heater Light	L2	Start	Stop	

Control System Operation

When power on, the screen displays “OFF”， press “  ” （Power key）for 2 seconds and then it will display ambient temperature the sensor tests.

a. Set up of cooling

Under the state of power on, press Key [1] for 3 seconds, after the screen displays “C1”, then enter the state of cooling settings.

Press Key [+] or [-] to adjust setting options and setting parameters.

Press Key [A] to switch setting options and setting parameter.

Press the Power Key to exit cooling setting.

After finish the settings, press Key [1] for a long time to confirm and then exit settings.

b. Set up of heating

Under the state of power on, press Key [2] for 3 seconds, after the screen displays “H1”, then enter the state of heating settings.

Press Key [+] or [-] to adjust setting options and setting parameters.

Press Key [A] to switch setting options and setting parameter.

Press the Power Key to exit heating settings.

After finish the settings, press Key [2] for a long time to confirm and then exit settings.

c. Enter parameter settings

Use a set of pass word to enter parameter settings. Control parameter setting user password: “11”.

Under the state of displaying present temperature, press Key [A] for 3 seconds, the screen will display『--』.Then press Key [+] or [-] to input pass word. Finally press [A] to confirm.

If input pass word is not correct, the screen will display 『 Er 』 and then it will return the state of temperature testing.

If input pass word is correct, the screen will display『A1』and then it enter the state of parameter settings. Press Key [+] or [-] to choose parameter code. When choose a parameter, press Key [A], it will display the setting data of the parameter, then press Key [+] or [-] to adjust the parameter settings.

After finish the settings, press Key [A] to return the state of displaying parameter code.

d. Exit parameter settings

After finish the settings, you must press Key [A] for 3 seconds to exit parameter settings. It will return the state of temperature testing and store the setting parameters of this time.

If not press any key in 60 seconds, it will exit parameter settings automatically. And the setting parameters of this time are invalid. The controller will still run according to original setting data.

Introduction of parameter code and settings

No.	Parameter Code	Setting Option	Original Data	Setting Range	Unit	Remark
000	A1	Start temperature of cooling function	30	21～50	℃	
001	A2	Stop temperature of cooling function	25	20～50	℃	
002	A3	Start temperature of heating function	-5	-9～19	℃	
003	A4	Stop temperature of heating function	5	-9～19	℃	
006	A7	High temperature alarm	45	25～70	℃	
007	A8	Low temperature alarm	-5	-9～19	℃	
008	A9	Start temperature of Dehumidification	75	25～70	℃	Unavailable temporarily
009	AA		45	25～70	℃	Unavailable temporarily
010	AB	Calibration temperature of RT1	0	-9～+9	℃	
011	AC	Calibration temperature of RT2	0	-9～+9	℃	
012	B1	Open & Close setting of pressure alarm	2	0 ～ 2		0:Forbidden 1:Open 2:Close
013	B2	Make RT1 be set	1	0 ～ 1		0:Forbidden, 1:Start
014	B3	Make RT2 be set	0	0 ～ 1		
015	B4	Make humidity sensor be set	0	0 ～ 1		
016	B5	Setting of compressor mode	0	0 ～ 2		0:Normal control 1:Force start 2:Force stop
017	B6	Setting of heater model	0	0 ～ 2		
018	B7	Setting of inside fan	0	0 ～ 2		
019	B8	Setting of outside fan	0	0 ～ 2		
020	C1	Setting of RT1 failure	1	0 ～ 1		0:Forbidden, not test failure alarm of RT1
021	C2	Setting of RT2 failure	0	0 ～ 1		0: :Forbidden, not test failure alarm of RT2
022	C3	Setting of temperature sensor failure	0	0 ～ 1		0: :Forbidden, not test failure alarm of temperature sensor
023	C4	Setting of high temperature alarm failure	1	0 ～ 1		0: Forbidden, not test failure alarm of high temperature
024	C5	Setting of low temperature alarm failure	1	0 ～ 1		0: Forbidden, not test failure alarm of low temperature
025	C6	Setting of pressure alarm failure	1	0 ～ 1		0: Forbidden, not test failure alarm of pressure
026	Pr	System(controller) start & stop	0	0 ～ 1		0:Stop 1:Start
027	P1	Pass word	11	0 ～ 99		
028	P2	Equipment address	1	1 ～ 99		
029	P3	RS485 bps	3	0 ～ 3		0: 2400bps, 1:4800bps, 2:9600bps, 3:19200bps
030	Ed	Exit parameter settings.				

Note: The air conditioner has function of starting automatically if power is on, don't need to operate power Key frequently.

Cooling System

Basic Components

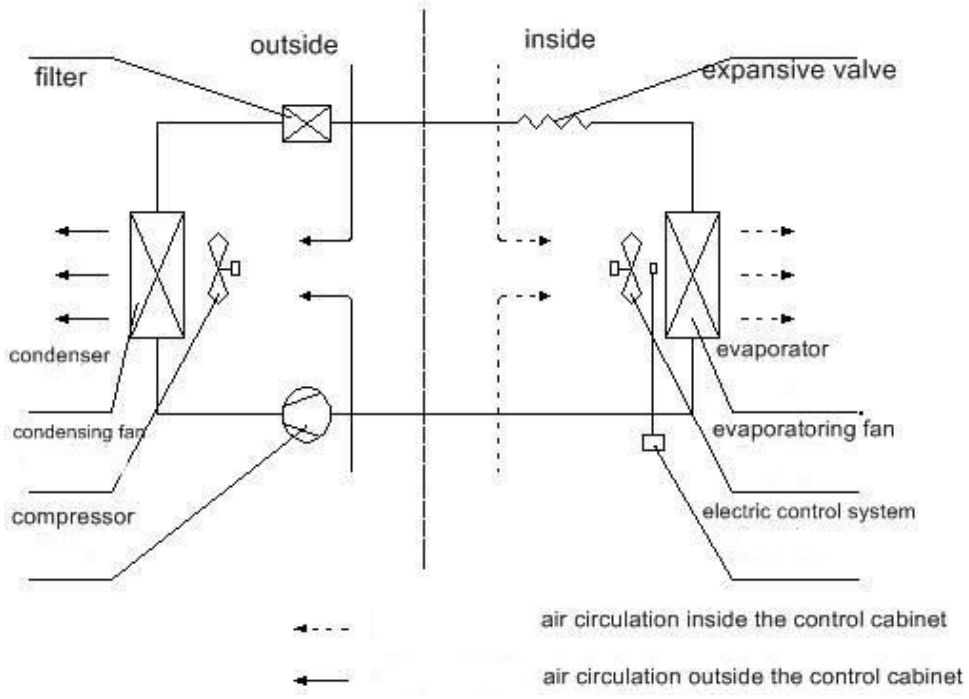
Air conditioner is composed of compressor, condenser, evaporator, electric control system, expansion valve and capillary tube, dry filter and fans etc.

Cooling Theory

A. The compressor takes in the gas refrigerant from the evaporator and compresses it into high temperature and high pressure then sends it into the condenser. The refrigerant will release heating in the condenser and then the cold high pressure liquid goes through capillary throttling and turns into low temperature and low pressure and then flows in to the evaporator. The refrigerant will absorb heat and then turns into gas in the evaporator. Thus forms the cooling cycle system.

B. The condenser and evaporator has circulation fan to enhance air convection and heat exchange efficiency. The heat exchange between condenser and air is outside the control box and that of evaporator and air is inside the control box.

C. The electrical system is mainly monitoring the temperature of the cooled closed cabinet and controls the cooling circulation by setting temperature.



Drawing of cooling theory

Air Conditioner Operation

Check before Operation

Please check the following after the electrical and air conditioner installation:

a. No barrier before air inlet and outlet.

b. The air conditioner is installed vertically, and all mounting screws have been tightened.

c. Air conditioner drain has been securely mounted and connected with the drain line cabinet (optional).

d. Connecting power cord has been connected reliably.
e. Fans can freely rotate with no strange noise.
f. AC input voltage matches with the contents of the nameplate parameters

Start to Operate

a. Turn on the power breaker and start running.
b. AC input power closed, the inside fan runs. If the inside temperature reaches the operation conditions, the cooling and heating systems start to operate. When the cooling system starts to operate, the outside circulation fan is controlled by condenser thus it will start after the compressor.

Fault Analysis & Handling

Error	Cause Analysis & Handling
E1: failure of Sensor 1.	The sensor of RT1 is damaged or loose.
E2: failure of Sensor 2.	The sensor of RT2 is damaged or loose.
Hi: high temperature alarm	Temperature exceeds setting alarm temperature.
Lo: low temperature alarm	Temperature is below setting alarm temperature.
HP: pressure protection	Alarm of switch open or close.
EE: data storage failure.	The function of data storage failure.
After power on, the cabinet temperature is higher than setting temperature and the air conditioner doesn't work.	1.Check the power supply and circuit. 2.Contact professional people for help.
The air conditioner runs normally but the cooling effect is not ideal.	1. Choose another air conditioner or correct cooling capacity according to the heat loading. 2. Make sure the air conditioner works within its normal working temperature range. 3. Contact professional people for help.
The air conditioner runs normally, it suddenly stops cooling and no electrical control system failures.	1.Normal phenomenon. It monitor the temperature inside the cabinet temperature and then decides whether star or stop cooling according it. 2.Contact professional people for help.
The air conditioner runs normally, it suddenly stops running with no electrical control system failures.	1. Check the power supply. 2. Contact professional people for help.

Notes :

- Please install leakage circuit breaker
- Do not put your fingers or objects in the air outlet because the running air conditioner will cause injury to human beings or damage to the air conditioner.
- Do not repair without professionals.
- The air conditioner can not be inverted in any case, otherwise it may cause damage to the machine.
- Try to remain stable during handling process. The tilt angle should not exceed 45 degrees.

Check and Maintenance

Regular Inspection

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

Regular Maintenance

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

After-sale Service and Warranty

Warranty Period- One Year
Under the condition using cabinet air conditioner correctly, the contracted warranty period shall prevail. During warranty period ,the electronic components are free of charge for replacing if damaged occur.

Warranty Range

During warranty period, the manufacturer 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:

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

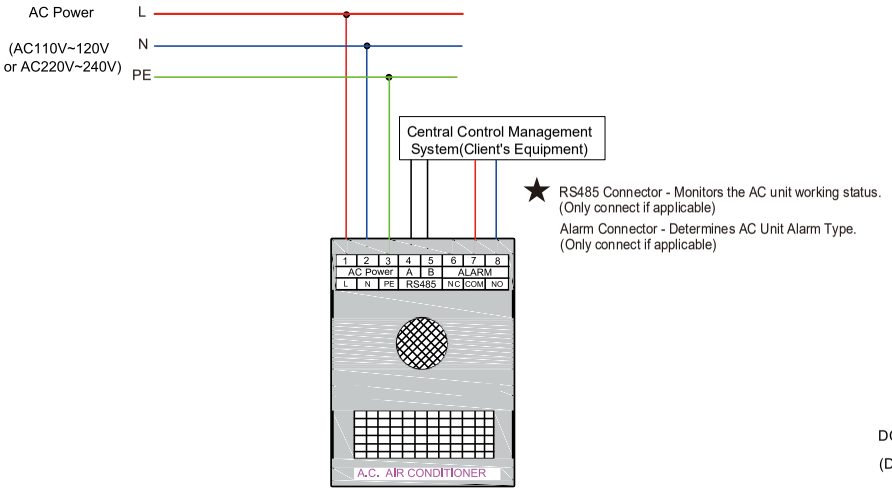
Disclaimer

The warranty is only for the delivered products. Air conditioner manufacturer is not responsible for any loss which is derived from equipment fault.

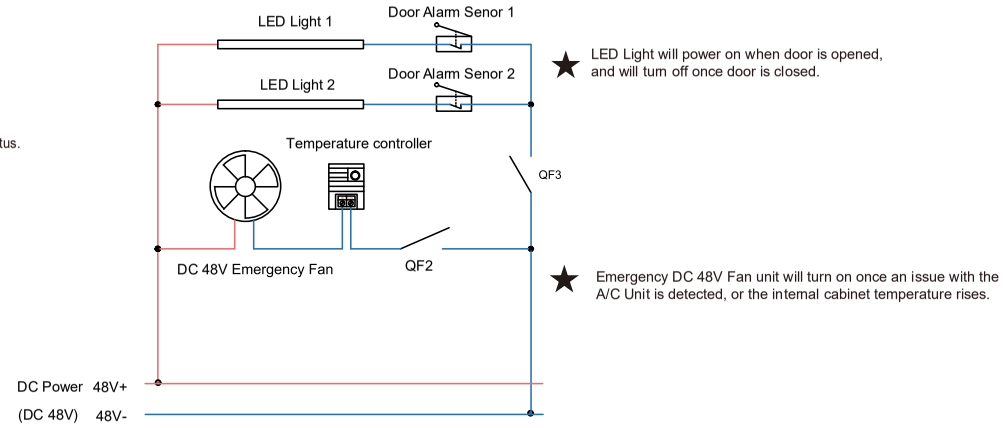
For information on how to obtain local customer support, contact the representative or other distributors from whom you purchased your product.

Wiring Diagram for A/C Unit and Sensors

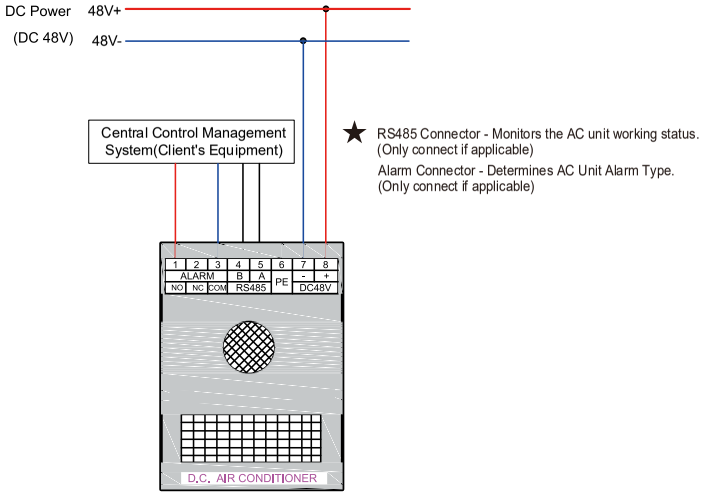
WARNING: PROFESSIONAL INSTALLATION REQUIRED



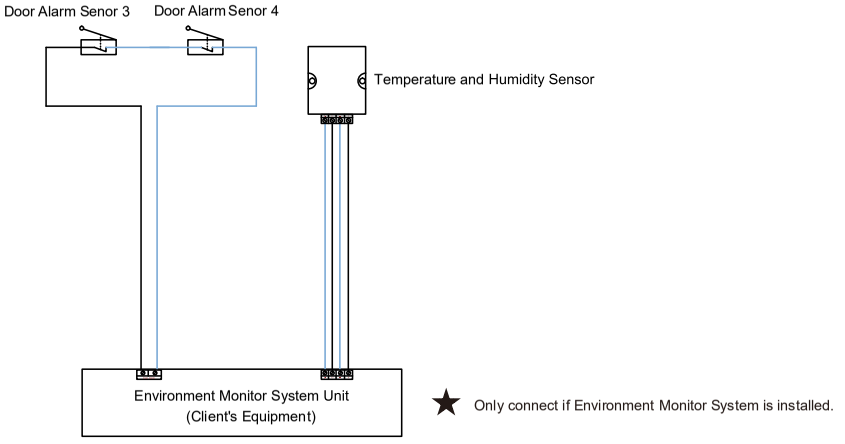
Wiring Diagram for AC Power Air Conditioner



Wiring Diagram for Emergency Fan Unit and LED Lighting



Wiring Diagram for DC Power Air Conditioner



Wiring Diagram for Door Alarm/Temperature/Humidity Sensors

CAUTION: Please read the complete operation manual prior to use to avoid accidents and injury.