

Intelligent DC frequency conversion car air conditioning system



WARNING

The following services can be provided for product performance failures that are not artificially damaged during the warranty period

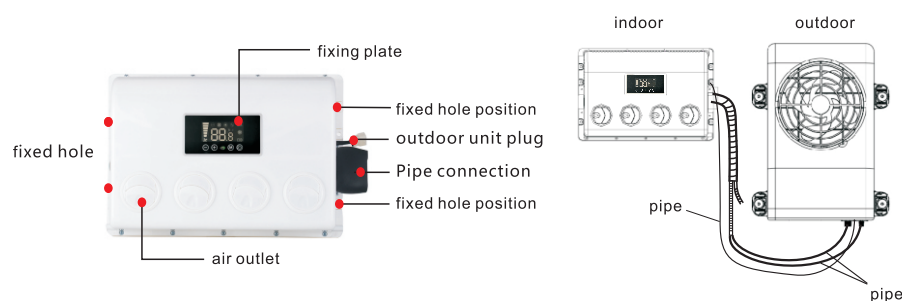
The warranty period for all parts is one year from the date of purchase (the used whole machine cannot not be returned);

If there is a product performance failure, please contact the distributor or manufacturer.

Installation instructions and manual

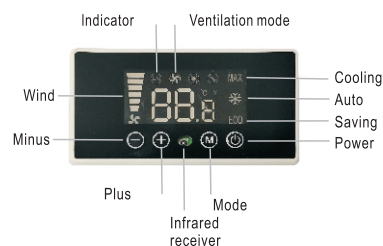
The intelligent variable frequency parking air conditioner does not need engine, just connect the positive and negative poles of the battery. It adopts scroll-type electric compressors and rotor-type two-cylinder compressors with stable performance and low energy consumption. It has no pollution and is equipped with an intelligent electronic control system. It can automatically adjust the displacement of the compressor according to the temperature set by the user. And the air volume of the condensing fan can achieve the purpose of frequency conversion and energy saving. There are three working modes: manual, automatic and energy saving, which can adapt to different environments. Choose the corresponding working mode to maximize the energy efficiency ratio. It can automatically identify the minimum starting voltage of the vehicle during work (the lower limit of the voltage is manually adjustable) to ensure the normal starting of the vehicle. It is widely used in commercial trucks, engineering vehicles, electric vehicles, refrigerated vehicles, RVs, ships, special vehicles and other fields.

Introduction of the new digital evaporator assembly system

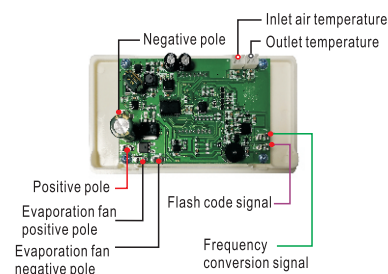


Connection diagram

Digital display



Wiring diagram



Function Introduction

Power: Push power button to start, push again to shut down the AC unit.

Wind speed gear: When press the M button in standby mode, the wind speed gear icon will flash.

Short press - once to decrease the air volume by one level, short press + to increase the air volume by one level.

Mode function: Max cooling, energy saving ECU and Ventilation mode (In ventilation mode, the compressor does not work, only the internal fan delivers air), The mode indicator light on the digital tube is on the corresponding working mode.

Temperature setting: Press + or - to adjust the temperature. The set temperature range is 5-40 °C, the system defaults the inlet air temperature frequency conversion, the best set temperature is 26°C Inlet and outlet air temperature query

In the power-on state, press the M button to display the temperature as the outlet air temperature; in the standby state, the temperature as the inlet air temperature.

Battery voltage query: In the boot state, press the M button to display the battery voltage;

Frequency conversion indicator A/C: When the air conditioner is turned on and the set temperature is higher than the inlet air temperature, this line has voltage output to the controller. This A/C light is on and the green light indicates that the frequency conversion line has voltage

Battery low voltage setting:

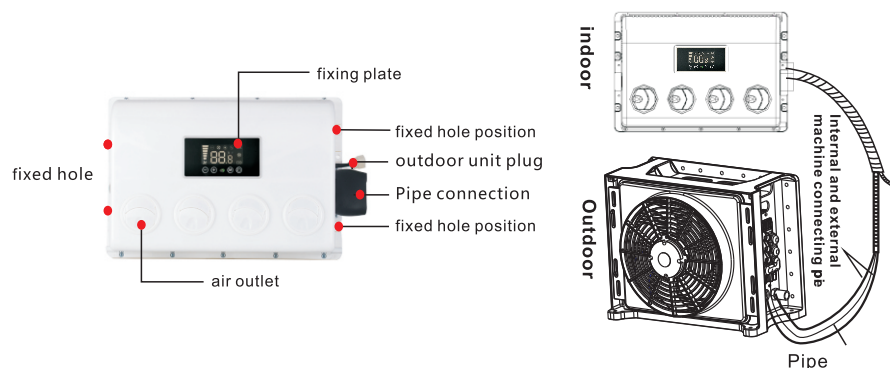
The undervoltage voltage value can be adjusted, and the adjustment range is between 9-28V. When the battery voltage is lower than the undervoltage protection voltage value, the entire air conditioning system stops working, and the panel will display the character "LU". After turning off and on, the undervoltage alarm is cleared. Steps to adjust the undervoltage protection value: in the standby state, press the M button 3 times to display the low voltage number, to adjust the low voltage protection number just press + or -, Each press adds or subtracts 0.1v voltage, when the setting is completed, press M to exit.

Fault list

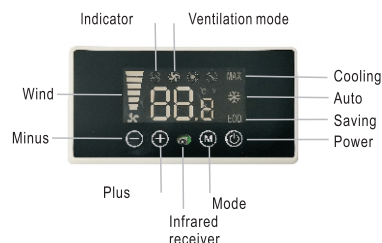
Code	Error	Solution
E2	Current protection	Check the pressure, the condenser is blocked, the heat dissipation, the fan, the refrigerant, the compressor
E3	Stall protection	Insufficient power or excessive pressure, pipeline blockage, compressor problem
E4\LU	Undervoltage protection	The battery is too low and needs to be charged
E6	Condensing fan failure	Condensing motor short circuit, poor plug contact
E7	Motor phase loss	The compressor terminal is burned out or the compressor is short-circuited, and the compressor is damaged
E9\PER	Pressure protection	Whether the pressure is normal or the switch is damaged
OPE	Temperature sensor open circuit	Check that the temperature sensor plug is off or the wire is broken
SHr	Temperature sensor short circuit	Replace temperature sensor
AC	Cooling failure	Check whether the refrigerant is lacking and whether the compressor electronic fan works
CS	Defrost protection	Increase the temperature or increase the air volume, change the position of the temperature sensor

Note: Refrigeration failure means that the temperature difference between the air inlet and the air outlet is less than 5. c And more than 3 minutes, the air conditioning refrigeration has no effect, at this time, turn off the compressor and evaporating fan. Clear this fault after rebooting. Defrost temperature: stop the compressor when the air outlet temperature is lower than 2 degrees, and exit defrost if the temperature is above 6 degrees, and work in normal working mode

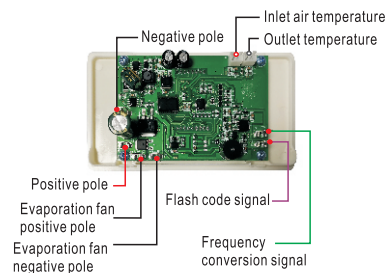
Fault list



Digital display



Wiring diagram



LCD panel operating instructions

Indicator lights and button functions are shown in the figure:

Push power button to turn on/off, please note that once pushed, no button operation is allowed in the first 5 seconds.

Press the M key to switch between high, medium and low winds. The display shows EF1 (low gear)-EF2 (medium gear)-EF3 (high gear), and the air volume is switched cyclically.

3. Short press the "M" key, the working mode will switch between automatic energy saving and manual mode, automatic and energy saving have corresponding indicator lights, and the indicator light is not on, it is manual mode. In manual mode, the air volume is adjusted manually, and the air volume is not

automatically adjusted according to the temperature difference. Long press the M key for 3 seconds to view the operating voltage. The voltage indicator light is on, and the voltage displayed on the display is the supply voltage.

4. Short press the "A/C" button to start or stop the compressor. When the refrigeration indicator light is on, the compressor is on, and when it is off, it is off.

Setting method of low voltage protection

Long press the M button for 3 seconds, the display will flash, enter the password input interface, enter the password, press the button to confirm the input password 38, after the password is entered correctly, enter the low voltage setting interface. At this time, press the key to set the low voltage alarm point. After the setting is completed, press the key to save the setting.

Precautions for refrigerant charging

It is necessary to use pure 134a refrigerant and air-conditioning pipes, connect the high and low pressure meters at the same time during vacuuming and pressure leak test, and simultaneously vacuum (only open the high pressure meter valve for pressure leak test). The vacuum time cannot be less than 10 minutes to ensure the system. The water is pumped clean, the refrigerant charge is 500-600 grams, and the normal working pressure: high pressure 1.1-1.5Mpa, low pressure 0.1-0.3Mpa, the higher the temperature, the higher the high pressure and the low pressure. When pumping a vacuum, the host with a shut-off valve must use an M5 Allen key to turn it counterclockwise to open the shut-off valve. If the host has been filled with refrigerant, vacuum first, close the meter valve after pumping, and open the shut-off valve counterclockwise. When the refrigerant needs to be recovered into the main engine, first use an M5 Allen key to turn clockwise to close the high pressure shutoff valve, and then close the low pressure shutoff valve after 3-5 minutes.

Failure analysis

When a fault occurs, first observe the host indicator and the evaporator display status. The most common is the yellow indicator light flashes 4 times and the evaporator fault light turns on to display the fault code: LU (low voltage fault), or PEr (pipe pressure too high, too low.)

Host indicator light (yellow light) indicates:

Light on for 1 second, pause for 1 second-normal standby state.

Fast flashing twice and pause for 1 second-over current protection, motor phase line short circuit

Fast flashing 3 times and pause for 1 second-locked rotor protection or undervoltage protection

Fast flashing 4 times, pause for 1 second-motor phase loss, motor wire off or poor contact

Fast flashing 5 times, pause for 1 second-motor phase loss, motor wire off or poor contact

Fast flash 10 times and pause for 1 second-compressor high temperature protection

Common troubleshooting

The outdoor unit is not working properly (the internal unit has no fault code displayed)

The set temperature of the indoor unit is lower than the ambient temperature, and the display panel has A/C light on (A/C)

Indoor unit control frequency conversion green wire measuring voltage is 4.5-19V voltage, no voltage control panel circuit failure or poor panel plug-in contact.

The outdoor unit controller power supply, the frequency conversion line voltage is normal, the condensing fan\compressor does not work, replace the outdoor unit controller assembly
The outdoor unit controller power supply, the frequency conversion line voltage is normal, the condensing fan works normally, and the compressor does not respond. Check whether the compressor plug has poor water contact or the compressor is damaged.

The internal machine displays E2 fault (compressor overcurrent protection)

Turn on the device after cooling down. If the compressor does not respond when turning on, it means malfunction. Check the power line and the connection plug for heat and poor contact. If the line is normal. Replace the controller board.

Turn on the compressor, if the condensing fan is not working properly. Measure whether the output voltage of the fan of the controller is normal and the voltage is normal, replace the fan, if no voltage output, replace the controller.

After starting up for a period of time, the condensing fan works normally. Check whether the heat dissipation is normal, the condenser is blocked or full of dust or the refrigerant is overwashed. Clean the condenser or remove the excess refrigerant. Observe whether the compressor is overheated under normal conditions.

Display fault E7 (compressor phase loss)

Check whether the compressor plug is in bad contact and burned out, if the compressor motor is damaged, replace the compressor.

E4 or LU failure occurs (undervoltage protection)

Display the E4 fault code, check whether the battery power is sufficient, check whether the power cord has bad contact or the controller is broken

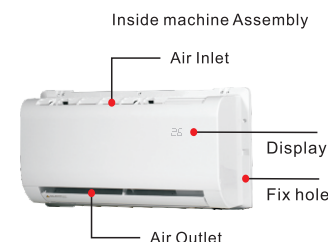
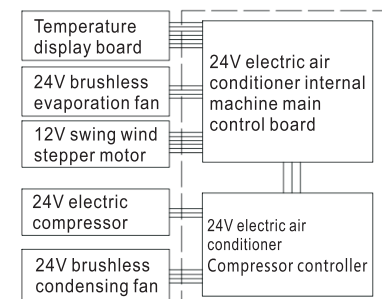
Display the LU fault code, check whether the battery power is sufficient, check the power cord for bad contact, turn down the low voltage protection of the panel switch by 0.5V and try again, and debug the low voltage refer to the low voltage setting method.

Inside machine evaporator introduction

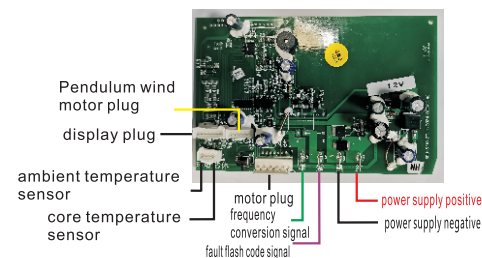
Parking cooler Introduction

The electric air-conditioning control system consists of a main control board and a compressor stepless inverter controller. This system adopts the self-developed stepless frequency conversion control technology. Through the use of the stepless frequency conversion main control board and the compressor stepless frequency conversion controller, the compressor and the condensing fan will finalize are automatic stepless frequency conversion according to the set temperature and the ambient temperature, which avoids the disadvantages of frequent start and stop of the compressor in the traditional system. The use of stepless frequency conversion control technology can make the air conditioning system more energy-saving, higher power utilization, and better user experience.

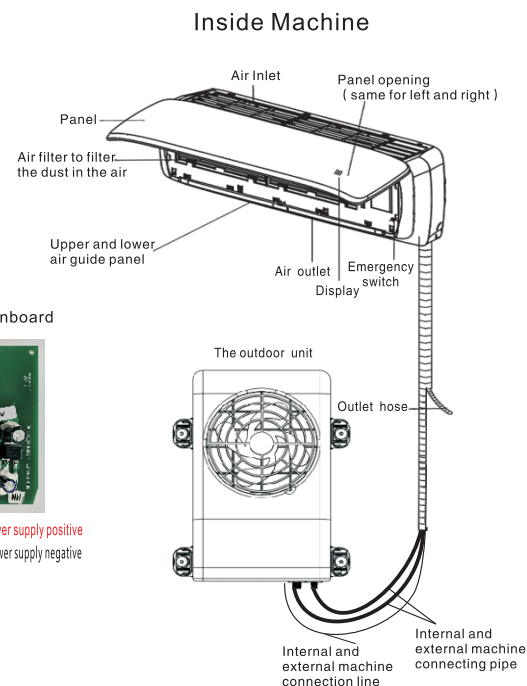
Parking cooler wiring diagram



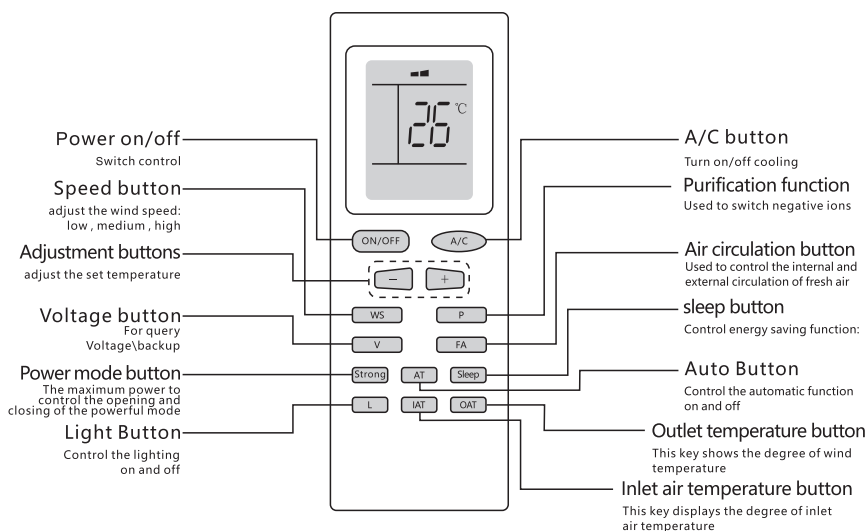
Evaporator frequency conversion mainboard



display screen



Schematic diagram of inside and outside machine connection



Electrical parameter description:

The frequency conversion main control board has 2 temperature control inputs, one swing wind stepper motor control interface, one brushless motor drive interface, one LED display and infrared remote control interface, and one frequency conversion signal output interface.

Electrical parameter table

parameter	Description
Input Voltage	DC Max 35
Display	LED
Speed mode	Analog voltage speed regulation
Speed Control Way	Three Gear Control
Fan	Brushless speed regulating fan
Remote Way	Infrared
Under/over voltage setting	21.5V/32V
Adjustable range of undervoltage value	21.5V
Power connection protection	DC input terminal has reverse connection protection circuit
Surge protection	DC input terminal is equipped with high-power TVS for surge protection

Work mode description

Panel working mode:

According to the temperature of the air inlet, the PID adjusts the output, and the three-speed control mode interface (SP) outputs a varying 9V-19V voltage signal to control the frequency conversion operation of the compressor. At the same time, it detects the temperature of the core and has a defrost protection function.

The brushless fan interface receives the feedback signal of the brushless motor and outputs the analog voltage speed control signal. After starting up, you can adjust the current internal fan speed by pressing the wind speed key. The stepper motor interface is connected to the air conditioner's swing motor, and the remote control wind direction button can be pressed to control the operation and shutdown of the swing motor.

The LED display interface can control the LED broken code screen display according to customer needs.

Temperature input 1 is connected to the air outlet/core temperature probe, if the probe is loose and dropped, EC will be displayed.

Temperature input 2 is connected to the air outlet/ambient temperature probe, if the probe is loose and dropped, EC will be displayed.

Panel function and button description:

1、A/C button description

The panel has two control modes:

1) A/C on mode: In this mode, the current set temperature is displayed, and three-speed frequency conversion speed control is performed according to the ambient temperature and the temperature difference between the set temperature. The snowflake symbol lights up when the external machine start signal is output.

2) the internal machine blows air.

2、Wind speed button description:

There are four wind speed settings on the panel: Speed 3: 1250rpm, Speed 2: 1100rpm, Speed 1: 950rpm.

3、Timing button description:

Press the timing button in the power-on state to set the timer shutdown time, the timing + button will increase by 0.5 hours each time you press, and the timing -button will decrease by 0.5 hours each time you press it.

4、Energy-saving button description:

After pressing the energy-saving key, the system will switch to ECO mode operation, and the maximum output power of the outdoor unit will not exceed 70%.

5、Super button description:

After pressing the super button, the system will switch to strong mode operation, and the maximum output power of the outdoor unit can reach 100%.

6、Automatic button description

The system will switch to automatic mode operation after pressing the automatic button.

7、Description of up and down wind buttons:

The upper and lower swing wind buttons control the start and stop of the swing wind motor.

8、Description of temperature increase and decrease buttons:

The temperature increase and decrease buttons can be set between 5-30 degrees.

Fault indication instructions and troubleshooting methods

The motherboard has voltage protection and fault detection functions.

When a fault is detected in the system, the fault code can be displayed through LEDs.

The meaning of the code is as follows:

error code	Failure description	Troubleshooting method
E0	Compressor phase protection	Check whether the compressor 3-phase line connector is firmly connected
E1	Undervoltage protection	Charge the battery and try again. Or lower the low voltage protection
E2	Overcurrent protection	Whether the heat dissipation is normal, the refrigerant is charged too much, the controller and the compressor are faulty
E3	Stall protection	Whether the power supply is normal, the line is in poor contact, the air conditioning system is blocked, and the compressor is stuck.
E4	Controller undervoltage protection (system voltage is lower than 18V)	Check if the power cord is in good contact, controller problem
E5	The controller is damaged or the phase line is short-circuited	Replace the controller
E6	Controller overvoltage protection (system voltage is higher than 32V)	Check whether the car generator generates too much power, replace the generator
E8	Outdoor fan failure	Short circuit, open circuit of external fan, or no carbon brush
EA	Fluorine deficiency failure	The air conditioning system has no refrigerant gas, check the sealing ring of each connector
EC	Environmental or core temperature probe failure	The temperature sensor is short-circuited or the plug is off
EE	Compressor start green wire is not connected	Whether the compressor signal line is open circuit or no signal output
EF	Indoor fan failure	Indoor fan short circuit or open circuit

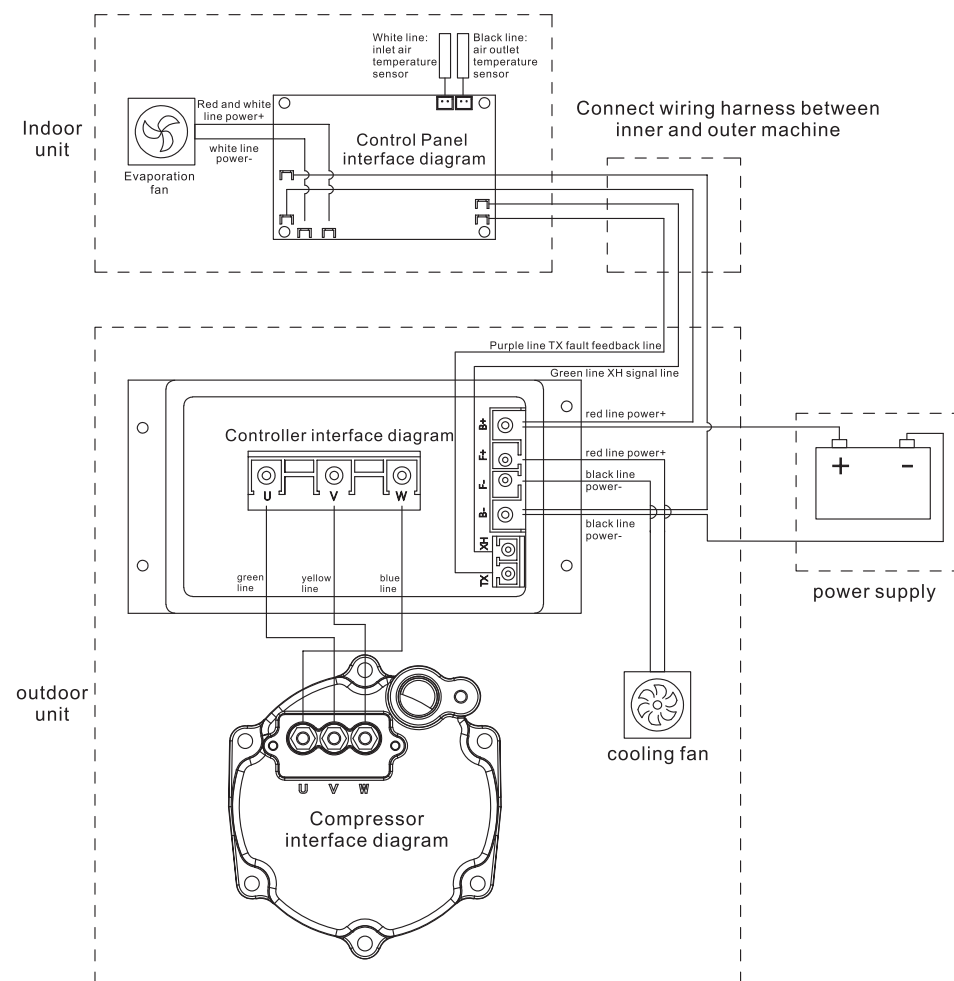
Air conditioner low voltage protection setting method:

- 1、 Turn on the air conditioner to adjust the air supply mode (cooling mode cannot enter the setting menu)
- 2、 Press the wind direction button of the remote control 5 times continuously, the voltage that appears at this time is the low voltage protection value
- 3、 Press the voltage key again, and the value will change every time you press the voltage key. The screen displays a cycle of 19V, 20V, 21V, and the value does not change. When it is increased by 0.5V, the last stop voltage is the current set low voltage protection value

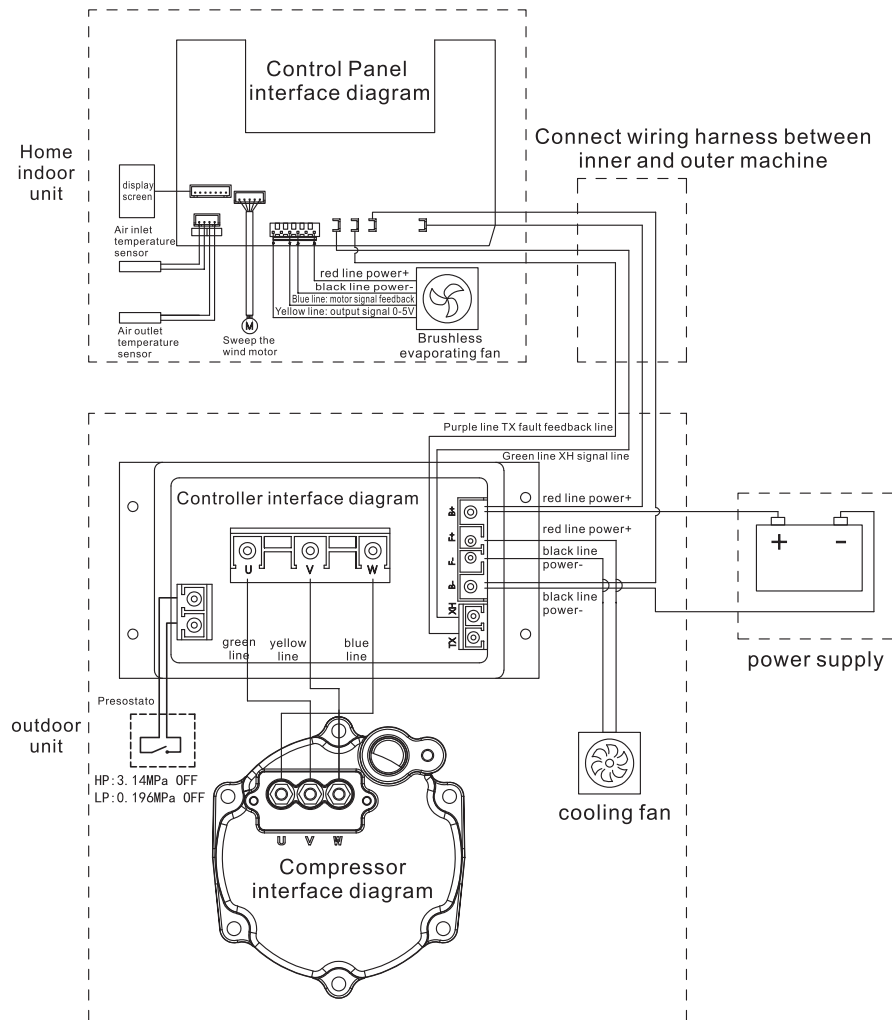
The air conditioning work not effectively, please check the following points:

1. The installation location of the host is incorrect, poor ventilation or close to the heat source
2. The air-conditioning pipeline is too long or the pipe head is crimped too heavily, and the inner diameter of the pipe becomes smaller
3. The power cord is too long/too thin and poor contact
4. The evaporator or condenser is too dirty or blocked
5. No refrigerant gas or insufficient refrigerant gas
6. Energy-saving mode is used
7. The compressor or condensing fan does not work

The principle diagram of the 1600



The principle diagram of the 1800



Product size and parameters



AC.161.071 outdoor unit

Item	12V	24V
Voltage	12V	24V
Rated current	65A	45A
Rated cooling power	1500W	2600W
Refrigerant injection volume	600 ± 50	600 ± 50
Refrigerant gas	R134A	R134A
Oil	RH68	RH68
Applicable climate type	T1	T1

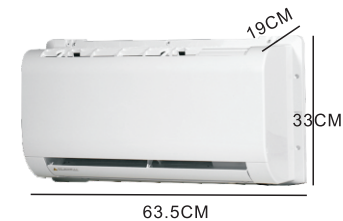
Fully injection mold molding, small size, light weight, multiple fixing methods



AC.161.066/067 outdoor unit

Item	12V	24V
Voltage	12V	24V
Rated current	65A	45A
Rated cooling power	1800W	2800W
Refrigerant injection volume	600 ± 50	600 ± 50
Refrigerant gas	R134a	R134A
Oil	RH68	RH68
Applicable climate type	T1	T1

Fully injection mold molding, small size, light weight, ultra-thin size, reinforced plastic foot pads, reduce resonance, prevent water leakage, and recycle refrigerant



Home indoor unit

Item	12V	24V
Voltage	12V	24V
Rated cooling power	1800W	2800W
Air Volume	400m³/h	450m³/h
Current	2.5-6	1.5-4A
Refrigerant gas	R134a	R134a

Power saving, silent and strong cooling

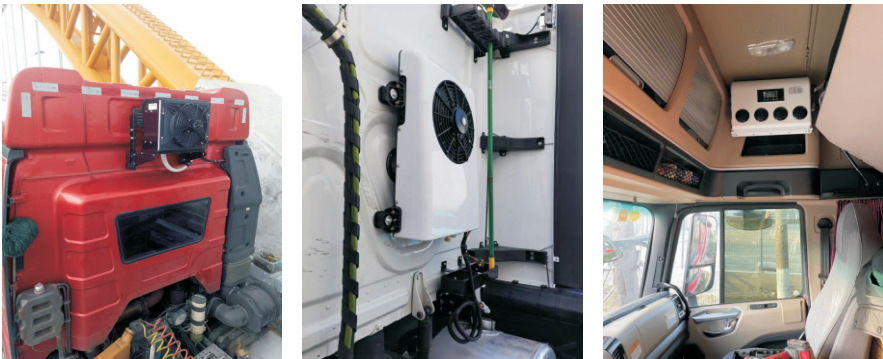


Indoor unit

Item	12V	24V
Voltage	12V	24V
Rated cooling power	1800W	2800W
Air Volume	450m³/h	550m³/h
Current	4.5-8A	2.5-6A
Refrigerant gas	R134a	R134a

Small size, easy installation, fast cooling, large air volume

Installation icon



After-sales warranty

Distributor		Year Month Day	
Username		Contact number	
Item No.		Installation location	
License plate number		installation time	
Car model		Installer	
Repair time	Maintenance project		

Distributor		Year Month Day	
Username		Contact number	
Item No.		Installation location	
License plate number		installation time	
Car model		Installer	
Repair time	Maintenance project		

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