

## Battery Cover Function Guide

### 1、Battery charging port :



### 2、Battery SOC, voltage display :



3、 Batteryactivationbutton :



4、 Batterydischargeport :



5、Communicationport :



## Battery power-on

1、 Let's look at the battery case with a round button, which has two functional versions:

(1) Figure 1: The round head self-reset switch, this switch only has the function of activating the BMS;

(2) Figure 2: High-head self-locking switch, this switch can activate the BMS, and can also control the discharge MOS to turn on and off, press the button, the discharge MOS to turn on, the button to reset, and the discharge MOS to turn off.



Figure 1: Round head self-reset switch



Figure 2: High-head self-locking switch

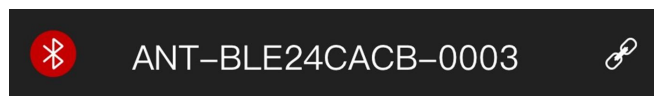
2、 Download EWATT on Android (Google Search) and download EWATT on Apple (APP Store);



3、 Email registration APP;

4、 Turn on the phone Bluetooth to ensure that the phone Bluetooth is on;

5、 Search for ANT type battery code, click Connect, and you can view the battery status through the APP.



## How to power up and down the battery

Vehicle power-on operation steps:

1. Load the battery in the vehicle;
2. Ensure that the battery discharge MOS is in the off state at this time:

(1) The housing is a circular reset switch, and the APP needs to be turned on, the battery needs to be connected, and the discharge MOS needs to be turned off manually;



(2) The housing is a high-head self-locking switch, so this switch needs to be in a bounce state.



3. Connect the vehicle discharge terminal to the battery terminal to ensure good contact;



4. Connect the vehicle communication terminal to the battery communication terminal to ensure the connection is in place;

5. Press the high-head self-locking switch;

6. Open the vehicle door lock and power on normally (if the battery is short-circuit protection or pre-charge fails, you need to follow the above steps to recover).

Vehicle power-off operation steps:

1. Close the vehicle electric door lock;

2. Ensure that the battery discharge MOS is in the off state at this time:

(1)The housing is a circular reset switch, and the APP needs to be turned on, the battery needs to be connected, and the discharge MOS needs to be turned off manually;

(2)The housing is a high-head self-locking switch, so this switch needs to be in a bounce state.

3. Disconnect the vehicle communication terminal from the battery communication terminal;

4. Disconnect the vehicle discharge terminal from the battery terminal. At this time, the power-off operation has been completed and the battery can be removed from the battery compartment.

## Precautions before loading batteries!!!

Bike power-on operation steps:

1. When the battery is installed in the bike, do not connect the battery directly to the bike, the following operations are required.
2. In order to prevent the discharge terminal from sparking, we need to confirm that the battery discharge MOS is in the closed state before we can connect the bike harness to the battery.



At this time, we need to perform the following operations to confirm the discharge MOS status:

- (1) Touch the screen above the battery cover, and the screen cannot be lit, indicating that the discharge MOS is in a closed state.
- (2) The housing is a high-head self-locking switch, so this switch needs to be in a bounce state, indicating that the discharge MOS is in a closed state.



3. Then connect the bike discharge terminal to the battery terminal to ensure good contact;
4. Connect the bike communication terminal to the battery communication terminal to ensure the connection is in place (This step can be skipped if there is

no communication harness) ;

5. Press the high-head self-locking switch;

6. Open the bike door lock and power on normally (if the battery is short-circuit protection or pre-charge fails, you need to follow the above steps to recover).

It is recommended to install a fuse or air switch in the middle of the battery discharge wiring harness to effectively protect the battery and controller and avoid the use of abnormal battery BMS.

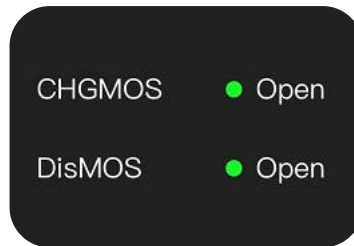
## **Battery charge**

### Battery charging operation

1. Ensure that there is no load connection outside the battery;
2. Take out the original matching charger and insert the charger into the battery charging terminal to ensure good connection;
3. Insert the AC power supply, the charger fan is started at this time, and the indicator lights are red and green lights flash alternately, and it is a charging state at this time;
4. The indicator light turns evergreen, and the battery is in full power at this time.
5. Note: This charger has the function of detecting battery, and the detection time is about 15S. If the charger is connected to the AC terminal for a long time and there is no battery inserted at the output terminal, the indicator light will turn to evergreen state. At this time, the charging operation cannot be performed. The AC terminal must be disconnected. After the indicator light goes out, repeat the above steps and the charger will return to normal state.

## The battery cannot be discharged

- 1、 Connect Bluetooth to see if the charging MOS and discharge MOS are open;



- 2、 Check whether the system log has triggered related protection information. If there is no trigger protection, the charging MOS is turned on and cannot be charged, so it is not a problem with the protection board;



- 3、 Please check whether the positive and negative electrode wiring of the load is incorrectly connected, whether the controller and motor are damaged, resulting in the inability to discharge, whether there are any problems with the electric door lock, electric vehicle handle, empty opening, etc. It is necessary to check one by one.

## Battery voltage difference is large

1、 The larger the battery voltage difference, the smaller the battery capacity will be used for the entire battery.

Single Section	Single Section	Differential Pressure
Highest	Lowest	0.009V
3.717V	3.708V	

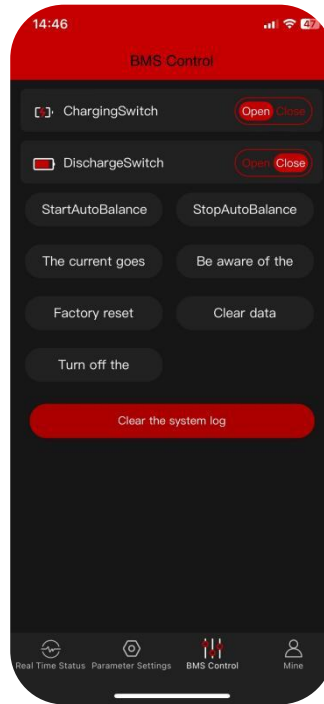
2、 Lithium battery has different voltage differences in different voltage periods.

Generally, the voltage difference is too large at low voltage, and the voltage difference will become smaller when fully charged, and low temperature will also have a certain impact on the voltage difference.

3、 Therefore, the balance function of the protection board is often the best effect when the battery is about to be fully charged or fully charged; if the voltage difference is equalized to the same when the battery voltage is low, the voltage difference will become large again after full charge, and the effect will not be reversed.

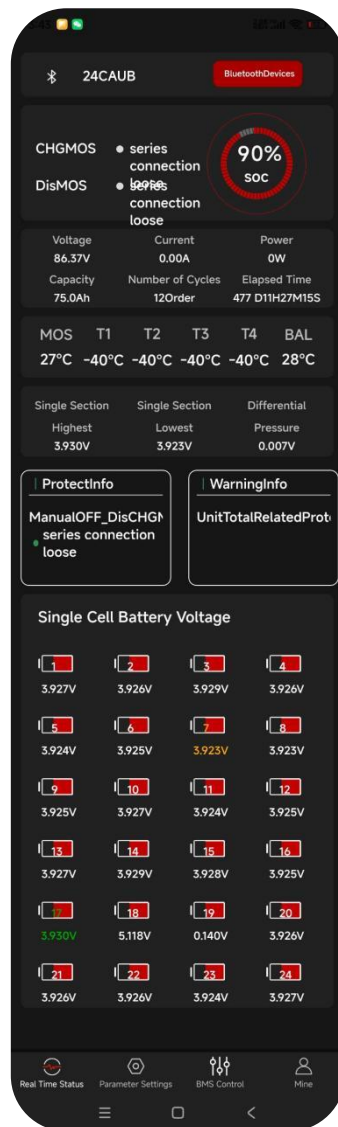
4、 As long as the voltage difference is within a reasonable range and does not affect the use of the entire battery, it is normal. Generally, there is a voltage difference of about 0.1V. Of course, the smaller the voltage difference, the better. Many new batteries have a voltage difference of more than 0.005 V. can be connected to Bluetooth. Click [Open Automatic Equalization] on the [BMS Control] page to slow equalization. The protection board must retain a small passive equalization current, because this is the only channel to repair the extremely small unbalanced battery cell.

will turn on automatic equalization for several hours each time it is fully charged, so that the voltage difference can be kept within a reasonable range for a long time.



## Series connection loose

1. Definition: It means that the pressure difference exceeds 1V.
2. Solution: Send APP screenshots and system logs to the dealer to facilitate after-sales service of this battery.
3. Identification method: For example, when the second string equalization line falls off the string, the second string voltage will show that the voltage is 0V or 0.0x V, and the voltage of the first string or the third string will be higher than 5V.



## **Unit over voltage protection**

1. Definition: When the BMS detects that any series of voltages exceed the set value of 4.2V, the IC will send a command to control the charging MOS tube to turn off. At this time, the battery pack cannot be charged through the BMS, which will not affect the discharge use.

2. Single-unit over voltage recovery: After the BMS detects the single-unit over voltage protection, when the single-unit voltage drops below 4.1V, the IC will send a command to control the charging MOS tube to turn on, and then the charger can be used to charge the lithium battery.

3. Monomeric over voltage protection is divided into two cases: "dynamic" and "static":

static: (BMS shows single over voltage protection when uncharged)

is likely to use a ternary lithium battery to mis-set the parameters such as iron lithium and titanium lithium, which trigger the over voltage protection of the monomer.

Dynamics: (BMS displays single over voltage protection during charging)

The charger has a single over voltage protection when charging the protective board, and then the charger stops charging the battery, which is a normal phenomenon, indicating that the battery is fully charged.



LA4028

BluetoothDevices

CHGMOS ● overV

DisMOS ● Open



Voltage	Current	Power
82.41V	0.00A	0W
Capacity	Number of Cycles	Elapsed Time
42.0Ah	5Order	305 D4H28M57S

MOS	T1	T2	T3	T4	BAL
39°C	30°C	29°C	28°C	28°C	53°C

Single Section	Single Section	Differential
Highest	Lowest	Pressure
4.127V	4.093V	0.034V

ProtectInfo

- UnitOverVProtect

WarningInfo

- BatteryFull
- DischargeMosOn
- BalanceLimit

## **Unit low voltage protection**

1. Definition: When the BMS detects that any series of voltages are lower than the set value of 2.75V, the IC will send a command to control the discharge MOS tube to be turned off. At this time, the battery pack cannot be discharged through the BMS, which will not affect charging use.

2. Single-unit low voltage recovery: After the BMS detects the single-unit low voltage protection, when the single-unit voltage returns to above 3.0V, the IC will send a command to control the discharge MOS tube to be turned on, and the battery discharge can be restored.

3. Solution: Send APP screenshots and system logs to the dealer to facilitate after-sales service of this battery.

4. Note: If the battery has low voltage protection, please try to recharge the battery. If the battery cannot be recharged, please contact the dealer as soon as possible, because the battery is in low voltage state for a long time, which will cause great harm to the battery.

5. If a single unit low voltage occurs during the vehicle driving, it will cause the electric vehicle to be abnormally powered off.

BluetoothDevices

CHGMOS  Open

DisMOS  UnitLowV

0% SOC

Voltage	Current	Power
73.93V	0.00A	0W
Capacity	Number of Cycles	Elapsed Time
45.0Ah	3Order	74 D16H4M46S

MOS	T1	T2	T3	T4	BAL
42°C	37°C	38°C	37°C	37°C	45°C

Single Section	Single Section	Differential
Highest	Lowest	Pressure
2.81V	2.75V	0.006V

ProtectInfo

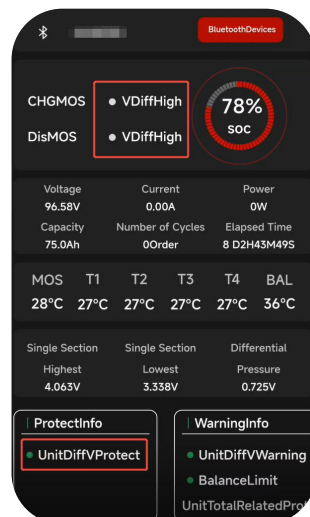
- UnitLowVProtect

WarningInfo

- SOC\_LowLv1Warning
- SOC\_LowLv2Warning
- ChargeMosOn

## Single unit voltage difference protection

1. Definition: When the voltage difference between single unit voltages is higher than 0.5V, the IC will send the control charging and discharge MOS tube to close and display the single unit voltage difference protection, prohibiting the charge and discharge current from passing through the BMS.
2. Single unit pressure difference recovery: When the voltage difference between single unit voltages is less than 0.3V, the IC will send the control charging and discharge MOS tube to open.
3. Solution: Send APP screenshots and system logs to the dealer to facilitate after-sales service of this battery.
4. Note: Frequently keeping the battery power below 20% may cause the battery cell pressure difference to continue to expand to permanent damage to the battery.



## Short circuit protection

1. Definition: The instantaneous current of BMS detection is higher than the protection set value, and the discharge MOS state shows short-circuit protection.

2. Reason:

- The discharge wiring harness has not been opened by air, and the controller is directly connected to the battery;
- The controller has abnormal current;
- The battery has a short circuit with a positive and negative pole.

3. Check: Please check whether the positive and negative pole wiring of the load is incorrectly connected and whether the controller is damaged.

4. Solution:

- The battery temperature rises abnormally when the short circuit occurs. Please move the battery to an open place immediately to avoid personal safety and property damage;
- If you check that the entire vehicle line is not abnormal, disconnect the battery from the load, open the APP interface on the mobile phone, control the BMS, and manually turn on the discharge MOS. At this time, the short-circuit protection state is released.

## **Discharge MOS abnormality**

1. Definition: refers to some MOS tubes or all MOS are damaged, and the protection board will continuously emit Didi alarm sounds.

Before connecting to the load for the first time, you can connect Bluetooth to manually turn off the discharge MOS in the [BMS Control] page, then connect the load, and manually turn on the discharge MOS after turning on the load.

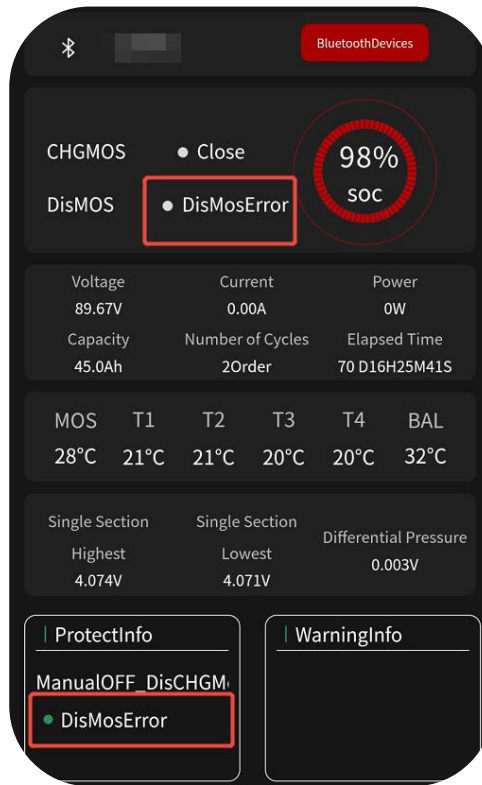
This can effectively avoid the ignition phenomenon at the moment of power-on, and reduce the possibility of the MOS being broken down.

2. Reason:

The moment when the load is turned on, the high current short circuit may cause a large current short circuit, or the positive and negative pole short circuit may cause MOS damage or pipe blow-up.

Discharge MOS abnormality occurs during normal driving of the vehicle, which may be caused by the damage to the controller, causing the short circuit to cause the protection plate MOS blow-up.

3. Solution: Send APP screenshots and system logs to the dealer to facilitate after-sales service of this battery.



## **Pre-charge failed**

1. Definition: Some reason causes discharge shutdown (including all the fault problem protection mentioned above). After the protection is lifted, the load is caused by continuous power consumption of the equipment during the discharge process.

2. The purpose of pre-charge is to charge the capacitor in the load to the same voltage as the battery, so that the load can be started more easily. If there is a load that consumes power continuously, the protection board will charge the capacitor, and the load will discharge the capacitor at the same time, so that it will never be fully charged. Under normal circumstances, if the load has only capacitors, there is no current consumption. If a load continues to consume power and is greater than the pre-charge speed, then the charging will never be full. The pre-charge detection time of the protection board is 3 seconds. If it does not pre-charge within 3 seconds, it will prompt that the pre-charge failed.

3. Solution:

The protection board will try to precharge again after one minute. The discharge MOS tube will be turned on only after the precharge is successful. If the precharge is not successful for 3 consecutive times, the precharge will not be tried again. After confirming that there is no continuous power consumption device, you can connect Bluetooth to the BMS control and manually turn on the

MOS to turn on the discharge (presumably, you need to figure out what causes the precharge failure). If you do not precharge, turn on the discharge directly, the instantaneous impact current is very large, which is easy to burn out the MOS tube.

#### 4. Reasons for pre-charge failure inspection:

① Connect Bluetooth to find the reason for the power outage in the system log.

If it is the related fault problem introduced earlier, please check the corresponding fault problem and solve it. If the parameter settings are unreasonable, the correct parameters need to be reset (you can contact the dealer to assist in the analysis).

② If the battery has sufficient power, and other reasons cause the discharge to be turned off and then resumed, if you want to restore the discharge function, you need to check the switches of all the continuous power-consuming equipment and turn them off. If the power lock is directly closed on the car and wait for one minute to pre-charge, you will try to turn on the discharge again. If you have more than 3 pre-charges, you can connect to Bluetooth and manually click to turn on the discharge MOS on the [BMS Control] page.

