

24V 49AH Battery User Manual



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24V 49Ah battery

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24V 49Ah battery

Our 24V 49Ah battery is designed for any application that requires the use of deep cycle batteries, such as heavy trucks, mining trucks, port cargo trucks, large machinery transfer carts, airport tractors, agricultural machinery, etc.

General characteristics of BMS

A battery management system (BMS) is designed to monitor the battery's charge, current, and temperature. When the BMS detects that the battery or cell exceeds the programmed threshold, the battery will enter the "Protection" state. In this state, the outer battery terminals are disconnected from the internal battery cell.

High voltage protection:

If the voltage of a single cell exceeds a specified threshold during charging, the BMS will prevent the charging current from continuing. Discharge is still allowed in this case.

Low voltage protection

If a single battery falls below a specified threshold during discharge, the BMS will prevent further discharge. Although the battery is in "low voltage disconnect" mode, charging is still allowed in this state.

The voltage on the outer positive terminal of a battery that is disconnected at low voltage is zero. Many chargers must detect voltages greater than 22V to charge the battery

High Temperature Protection:* (65°C | 55°C when charging)

When discharging, if the battery temperature exceeds 65°C, the battery BMS will enter protection mode. It will not allow for discharge currents. When charging, if the battery temperature exceeds 55°C, the battery BMS will enter protection mode. It does not allow charging current.

Low Temperature Protection: (-40°C | -40°C when charging)

During discharge, if the battery temperature is lower than -40°C, the battery BMS will enter protection mode. It will not allow for discharge currents. When charging, if the battery temperature is lower than -40°C, the battery BMS will enter protection mode. It does not allow charging current. Note: The charging current at -40°C is less than 10A.

High charge/discharge current protection

The BMS does not allow the charging or discharging current to exceed the thresholds specified by the BMS board. For specific details on current thresholds, please refer to the battery datasheet.

Installation

Care should be taken when connecting the battery terminals. Both the positive and negative terminals are labeled and color-coded (red for +, black for -). Do not connect the battery polarity against it, as this will damage the battery and the connected device.

Parallel

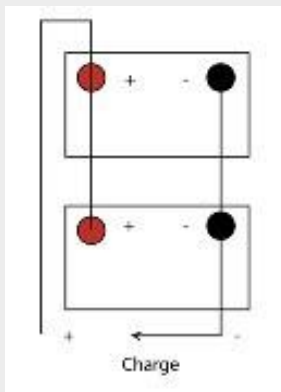
Batteries can be connected in parallel to increase the ampere-hour capacity of the system (we recommend using a busbar to interconnect the battery with the rest of the system.) The busbar must be able to withstand the DC capacity of all the batteries combined). When the cells are connected in parallel, the system voltage does not change, but the DC and ampere-hour values are added together. Thus, all components are protected from current spikes and short circuits. Batteries connected in parallel must be in the same state of charge (same voltage) before they can be connected. All cables and connections must be able to handle the high current provided by the battery. Proper fuses and circuit breakers are also required

To avoid excessive discharge currents from one battery to another, use a suitable lithium titanate battery charger to charge each set of batteries to ensure that they are all in the same state of charge or voltage.

To distribute the current evenly between the cells, use the diagram below:

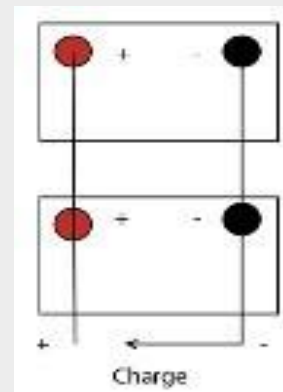
Installed correctly

The battery current is evenly distributed. All batteries contribute equally to the charging current.



Error during installation

The current distribution is uneven. The battery closest to the load contributes the most to the charge current, while the battery that is furthest from the load contributes the least. Batteries close to the load wear are more abrasive.



watertight

The battery is IP65 rated. It is equipped with a sheet metal case, outdoor protective spraying, which helps to maintain the waterproofness of the battery. It must be installed properly to avoid infiltration. Please note that there is still a sealant (epoxy/silicone) inside the connector to provide a safety barrier, but external protection is still essential and mandatory to maintain the warranty. If the battery is installed in a humid environment where condensation may form, or where the battery may get wet with rain, it is best to prevent the battery from excessive exposure to water for long periods of time.

Charge the battery

You can charge the lithium titanate battery after each use or after discharging to 20% (state of charge). If the BMS disconnects the battery due to low voltage (0% state of charge), charge it immediately.

For the first use, it is recommended to charge this product until it is fully charged.

Connect the positive wire of the load to the positive pole (red) of the product, and the negative wire to the negative pole (black) of the product, and fasten it with screws to charge the product.

Emergency start button: under-voltage protection or failure, the vehicle cannot be started. Short press the emergency start button, the light is on, the emergency backup function can be started, and the forced discharge delay is 30 seconds, which is used for ignition emergency start.

Battery charging settings

The following are the general charging parameters for 12V and 24V lithium batteries:

Charging parameters 13.8V	The voltage parameter is 13.8V
Batch voltage : 14.2V-14.6V	Low voltage cut-off 12V-12.1V
Absorption voltage : 14.2V-14.6V	High voltage cut-off 15.5V
Absorption time: 0-30 minutes	
Float charge voltage: 14.5V	

Charging parameters 24V	Voltage parameter 24V
Batch voltage : 28– 28.5V	Low voltage cut-off 22V
Absorption voltage : 28 – 28.5V	High voltage cut-off 31.5V
Absorption time: 0-30 minutes	
Float charge voltage : 28.5V	

Charge using the vehicle alternator:

To protect your battery and alternator, it is highly recommended to add a DC-to-DC voltage regulator between the alternator and battery.

Reserve

When the product is stored for a long time and not in use, please place it in a dry and ventilated place to avoid flammable and explosive materials; Charge and maintain the battery pack regularly every three months to ensure that the battery is in an optimal performance state.

Precautions

- 1) Do not dispose of this product in water.
- 2) It is forbidden to charge and use this product outside the temperature range specified by our company; Do not store, charge or use this product near fire or heat sources.
- 3) When this product emits peculiar smell or leaks, stop using or charging immediately, and move to an open and ventilated place, away from the fire source, and contact our company in time.
- 4) This product cannot be used in series or parallel. When the load is turned on, do not reverse the positive and negative poles.
- 5) Do not use metal conductors to short-circuit the positive and negative electrodes of this product.
- 6) Do not dispose of this product in fire or artificial heating.
- 7) It is strictly forbidden to artificially disassemble this product, it is strictly forbidden to pierce this product with nails or sharp objects, it is strictly forbidden to hit this product with a hammer or other external force, and it is strictly forbidden to step on and drop this product artificially.
- 8) It is strictly forbidden to put this product in a microwave oven or pressure vessel.
- 9) If there is any abnormal phenomenon during charging or use, please stop charging and using it immediately.
- 10) The optimal operating temperature for this product is $22\pm 5^{\circ}\text{C}$, and if the product is not within this temperature range during use, the discharge capacity will be reduced.
- 11) If there is a failure or abnormality during use, please contact our company, please do not disassemble this product without permission.
- 12) When it is not used for a long time in 3~6 months or overused (discharged) to the power is too low, the product will enter sleep, and the subsequent normal use must be woken up and replenished first.
- 13) Wake-up Processing: Charge to wake up.
- 14) The 24V battery of this product cannot be used in 12V vehicles, otherwise the vehicle's electrical system will be damaged.
- 15) The charging limit voltage of this product is less than 31.5V.
- 16) Do not connect the main switch harness with other wiring harnesses, the main switch wiring harness is the high-voltage part of the battery.
- 17) External harness wiring is defined by labels.