



Lithium Golf

51.2v67Ah-C648

Operation Instructions

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1 Product introduction

1.1 Introduction to lithium battery system

1. The main components of the battery system are: battery circuit, protection system and lithium iron phosphate battery.
2. Battery circuit: when the battery is working, its internal current running route.
3. Protection system: the protection function is achieved by collecting and processing data and controlling the on-off of the circuit. The rated voltage of single cell is 3.2V, the cut-off voltage of charging is 3.65v, and the cut-off voltage of discharging is 2.5V.
4. LiFePO₄ battery: a kind of lithium-ion battery using LiFePO₄ as cathode material and carbon as anode material. When the battery is charged, lithium ions migrate from LiFePO₄ crystal to the crystal surface, enter the electrolyte under the action of electric field force, then pass through the diaphragm, and then migrate to the surface of graphite crystal through the electrolyte, and then embed into the graphite lattice. When the battery is discharged, the lithium ions are separated from the graphite crystal, enter the electrolyte, then pass through the diaphragm, migrate to the surface of LiFePO₄ crystal through the electrolyte, and then re embed into the lattice of LiFePO₄. LiFePO₄ battery has the advantages of high working voltage, high energy density, long cycle life, good safety performance, low self discharge rate and no memory effect.

1.2 Battery Specification and model

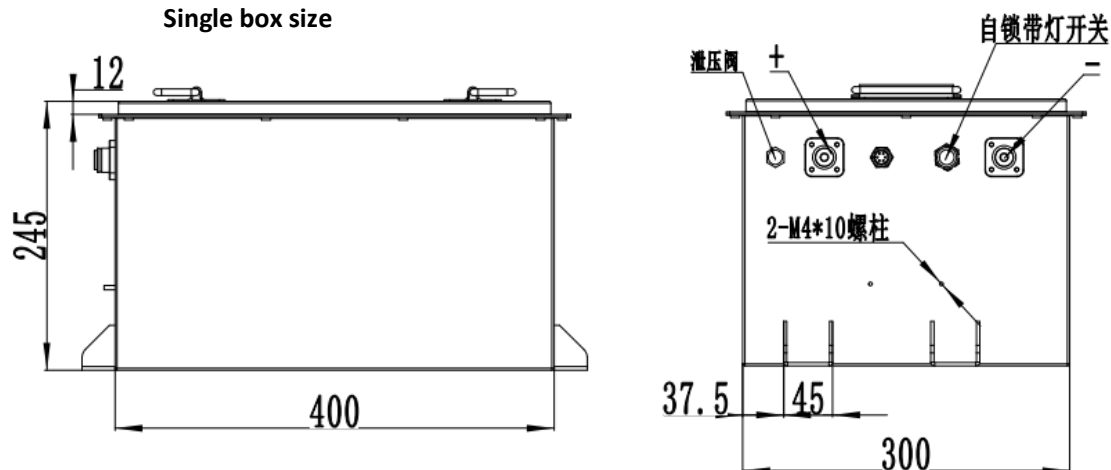
Battery structure	1P16S	Monomer overcharge voltage	3.65V
Nominal voltage	51.2V	Monomer overcharge release voltage	3.60V
Rated capacity	67Ah	Monomer over discharge voltage	2.5V
Maximum charging voltage	58.4V	Monomer over discharge release voltage	2.8V
Total weight	41kg	Maximum service temperature	-20°C~60°C
Charger type	External	Continuous discharge current	150A
Recommended Charger Current	7.5A-15A	Peak Discharge Current	500A(3-5s) 450A(30s)

1. When the current is less than 2a, sleep for 1 hour.

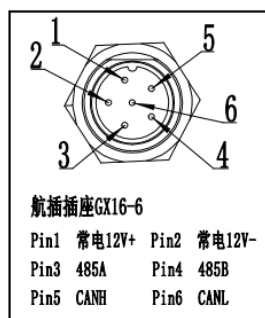
2. After the battery is dormant, it needs to be charged or discharged for activation.

1.3 Appearance diagram

Single box size



Low voltage plug-in



Product renderings



1.4 Control strategy:

- 1.4.1 Turn off key K1 and the system will be powered on for self inspection. When it is normal, turn off the precharge relay. After 2 seconds of precharge, close the discharge relay, precharge is closed, and the battery is powered on (the battery does not use K1 key for a long time to prevent over discharge of the battery) .
- 1.4.2 When the charger is connected, the 12V auxiliary power supply of the charger supplies power to the system. After the self-test information exchange of the system is normal, close the charging relay and start charging. When fully charged, disconnect the charging device and calibrate the SOC to 100%. Implement charge discharge mutual exclusion and charge priority strategy (Guosheng charging communication protocol)
- 1.4.3 Vehicle customer supply agreement.
- 1.4.4 The can of the whole vehicle and charging is the same.

2 Safe use

2.1 Discharge

- 2.1.1 When discharging to operate the battery, you need to wear rubber gloves for insulation protection.;
- 2.1.2 before operation, check that there is no foreign matter or water stain in the vehicle connector and battery connector to avoid battery damage caused by poor contact during discharge.
- 2.1.3 ore use, check whether the battery wiring is in good contact, including high voltage and low voltage, and check whether the wiring harness is aging and damaged. If any, inform the professional personnel for maintenance in time.
- 2.1.4 he actual polarity wiring mode of the battery connector is different according to different plug-ins or customer requirements. Before use, please pay attention to confirm whether the polarity of the battery end and the load end is consistent, and whether the plug-in model matches, otherwise it will lead to abnormal use.;
- 2.1.5 Power off the battery when not in use.

2.2 Charge

- 2.2.1 When the battery power is low, it should be charged in time to avoid long-time low-power operation. Special charger must be used when charging. Different types of chargers cannot be mixed. Before connecting the charger to the external power supply, confirm whether the grid voltage and frequency match the charger;
- 2.2.2 When charging and operating the battery, you need to wear rubber gloves for insulation protection.;
- 2.2.3Make sure there is no foreign matter or water stain in the charger connector and battery connector before operation.;
- 2.2.4When the battery is connected with the charger, if it cannot be connected normally, it is necessary to confirm that the problem is eliminated before operation. Violent connection is strictly prohibited;
- 2.2.5When charging starts, check to make sure that the battery is charging normally;
- 2.2.6When the battery is fully charged, it should stop charging in time. It is recommended not to charge the battery for a long time when there is no one.

3 Transportation

- 3.1 during loading and unloading and transportation, it is necessary to avoid violent vibration and large external force impact, and it is forbidden to roll, invert, squeeze and stack too high.
- 3.2 rain shall be prevented during transportation.
- 3.3 before transportation, ensure that the battery or battery pack is disconnected from the load or charging equipment, and there is no charge and discharge behavior of any kind.
- 3.4 Before transportation, the high-voltage and low-voltage wiring harness should be fixed and protected to avoid wire harness damage or even short circuit caused by wire harness pulling during transportation.
- 3.5 if falling, water inflow and other damage occur during transportation, they shall be placed separately and inspected by professional personnel.

4 Storage

- 4.1 When the battery is stored, it is charged about 50%.
- 4.2 It is forbidden to store in the state of connected load or hidden load, that is, it is forbidden to discharge in any form during storage.
- 4.3 It is forbidden to invert the battery and avoid mechanical impact and heavy pressure.
- 4.4 When the battery is stored, other items shall not be stacked above the battery.
- 4.5 The self discharge of lithium-ion battery is affected by the ambient temperature and humidity. High temperature and humidity will accelerate the self discharge of the battery. The storage environment temperature should be 5 °C ~ 45 °C in a clean, dry and ventilated room, avoid water drenching, avoid contact with corrosive substances, and keep away from fire and heat sources.
- 4.6 when it is not used for a long time, the battery voltage shall be confirmed every week. When the total voltage is lower than the rated voltage, charging maintenance shall be carried out.

5 Common problems handling

According to the tips in this manual, organize professional engineering and technical personnel to carry out necessary treatment. If the abnormal state cannot be eliminated, please contact the relevant technical department or after-sales service department of the company in time to obtain professional technical support.

5.1 charging failure

- 5.1.1 disconnect the plug of the battery and charger, visually check whether the connecting plug-in between the battery and the charger is loose, and whether the pin of the plug terminal is retracted. If it is found that there is loosening or needle withdrawal, try to install it in place first. If the terminal has needle withdrawal phenomenon repeatedly, please contact our after-sales technical personnel.
- 5.1.2 use a multimeter to measure whether the voltage at both ends of the positive and negative poles of the battery harness is normal; If the voltage is abnormal, please contact our after-sales technicians.
- 5.1.3 if there is a charging 12V power supply, confirm that the 12V power supply of the charger is normal.

5.2 discharge failure

- 5.2.1 Confirm whether the remaining power of the battery is normal. If the remaining power is

insufficient, it needs to be charged before reuse.

- 5.2.2 Check whether the plug between the battery and the whole vehicle is loose and whether the plug terminal is retracted. If any looseness or needle pulling is found, try to install it in place first. If the pin is pulled out repeatedly at the plug end, please contact our after-sales technicians.
- 5.2.3 After the switch is powered off, unplug the plug-in, and use a multimeter to measure whether the voltage comparison of the discharge port when the power lock is opened and closed is consistent. If so, please contact our after-sales.
- 5.2.4 incorrect SOC of BMS management system: use the supporting charger to charge / discharge the battery. The battery system will calibrate the SOC. If the abnormality is not eliminated, please contact our after-sales technicians

6.Maintenance

- 6.1 If there is a lot of dust, metal shavings or other debris on the battery pack, use compressed air to clean it in time, and avoid using water or water-soaked objects for cleaning.
- 6.2 during charging and discharging, try to avoid water or other conductive objects splashing on the upper cover and pole of the battery; Avoid drenching or soaking a lot of water during use, such as exposure to rain;
- 6.3 Estimate the charging time and discharging time of the battery according to the actual use state of the battery or battery pack. Pay attention to observe whether the battery or battery pack is abnormal at the end of charging and discharging, such as the voltage difference of the battery.
- 6.4 Check whether the power line, low-voltage acquisition terminal and other nodes are loose, falling off, rusty or deformed to ensure that the series parallel wiring harness used by the battery pack is firm and reliable.
- 6.5 Check the battery shell for cracks, deformation, pole looseness and other abnormal conditions.
- 6.6 Check the insulation resistance of the battery pack and the car body to ensure that there is no leakage of the battery.
- 6.7 When carrying out professional maintenance, you can contact the relevant technical department or after-sales service department of the company for professional technical support.
- 6.8 Perform standard discharge and charge maintenance on the battery every three months .

7.Precautions

- 7.1 Before using the battery pack, please read the operation manual carefully to understand the operation method and precautions.
- 7.2 Keep the battery or battery pack away from dangerous goods or materials, such as corrosive chemicals, dangerous mechanical equipment, high temperature environment, etc.
- 7.3 Non professionals are not allowed to dismantle the battery without authorization.
- 7.4 Be sure to use the original special charger or the charger agreed by both parties.
- 7.5 When the battery pack is exhausted, it must be charged in time. When not in use, be sure to turn off the power lock; When not in use for a long time, the battery must be charged regularly according to the remaining power and voltage of the battery to avoid excessive discharge of the battery pack.
- 7.6 Avoid squeezing and piercing the battery, avoid placing the battery in a high temperature environment or baking, and avoid exposing the battery to excessive vibration and external impact.

7.7 It is forbidden to directly short circuit the positive and negative poles of the battery. avoid any metal or other conductive objects contacting with the positive and negative poles of the battery. illegal operation may cause personal injury or property loss.

7.8 It is forbidden to use this series of products in series or parallel with other models or types of batteries.

7.9 Do not flush, rain or soak the battery.

Any damage to the battery pack caused by abnormal use or natural disasters above is not within the scope of warranty