

Lithium NMC Battery with BMS 60V160Ah

TUFAN BRAND ELECTRIC VEHICLE (EV) THREE WHEELER



User Manual OF TUFAN Brand Electric Vehicles Three Wheeler

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Foreword

Dear valued client,

Thanks for your trust to our products.

Our Electric Vehicle (EV) Three Wheeler is an excellent product with fashionable design, advanced technology, excellent performance, safe and comfortable, zero carbon emission, environment friendly, energy-saving and economical. In order to help you familiarize yourself with the operation of the Electric vehicle three wheeler, please read this manual carefully before driving. Please do not use it before you understand the characteristics of the Electric Vehicle three wheeler. If the power supply is damaged or the charging system is out of order, please replace or repair it at the maintenance shop designated by our partner company in Bangladesh.

All the information in this book is the latest information before it is delivered to print. In view of the fact that the company will continue to innovate and improve the products to better meet the needs of users, the subsequent changes are subject to change without prior notice. If you have any questions about the product, please contact us directly, we will wholeheartedly provide help for you.

We sincerely wish you a happy ride!

Important Tips

Some pictures in this book are schematic diagrams, which are for reference only. If they are not completely consistent with the actual objects, the actual ones shall prevail.

Please place this manual in your Electric Vehicle three wheeler so that you can find it when you need it. Because this book is an important part of the Electric Vehicle three wheeler, please hand it over to the new owner while resell.

This manual only provides basic maintenance instructions. If there is a problem with the Electric Vehicle three wheeler during use, please do not disassemble the vehicle without authorization. Seek professional help. The loss caused by unauthorized removal of the vehicle shall be borne by the user.

When replacing parts and components of vehicles, the genuine parts and components produced by the company's special suppliers shall be used. If the company's parts and components other than the company's special suppliers are used, the company's warranty service will not be enjoyed, and the consequences will be caused by the users themselves.

Please properly keep this manual, warranty card, purchase invoice and other accompanying documents, so as to ensure you enjoy the perfect after-sales service provided by our company.

Note: If you have any doubts during the use of this book, the company and our special service station will be happy to provide you with instructions, and you are welcome to give us your valuable comments.

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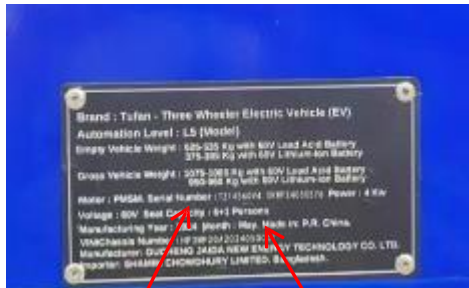
Introduction of the Electric Vehicle (EV) Three Wheeler

Nameplate, vehicle identification code, motor number

The nameplate of this Electric Vehicle (EV) Three Wheeler: the middle position of the front seat.

Vehicle identification code (VIN code) : The front fork stand pipe supports the inclined beam (behind the middle position of the vertical plate of the front wheel package).

Motor No.: Motor outer surface housing.



VIN



Motor No.

Vehicle documentation

The vehicle documentation includes vehicle number information, vehicle maintenance, etc., so be sure to keep them in a safe place. The vehicle documentation contains the user manual.

Power master switch



The main power switch is located under the main driving seat and in front of the decoration board of the seat box.

Plug in the key to turn on the power to turn it ON, and turn the key to OFF to turn it off

Power off, or stop for a long time, not frequent operation.

Combination dashboard overview



1. Warning battery capacity: Displays the existing capacity of the battery.

2. Voltage: Displays the existing capacity of the battery

3. Speed meter: Displays the current speed of the vehicle in kilometers per hour (km/h), which can be displayed normally when the vehicle is running

Combination instrument

Light combination switch



The light combination switch is located under the steering wheel and at the left of the column tube. The light combination switch controls the following operations:

● **lighting switch operation**

Switch the light by rotating the knob at the end of the control lever.

There are three gears on the rotary knob:

- Shift At this time, the front and back position lights, license plate lights, instrument lights are turned on.
- Shift At this time, the front and back position lights, license plate lights, headlights, instrument lights are turned on.
- When the headlight is on, push down the control lever to switch to the far light (far beam) in the near light state. When the far light (far beam) is on, the far light indicator on the dashboard will be on.
- If you need to briefly start the far light (far beam) as a pass signal, pull the light lever up in the near light and let go after the signal is sent.

● **Steering signal switch**

Pull the light combination switch upward, the right turn light of the front and rear combination light flashes, and the right turn indicator on the combination instrument flashes at the same time; Pull down the light combination switch, the left turn signal of the front and rear combination light flashes, and the left turn indicator on the combination instrument flashes.

Wiper combination switch



The wiper combination switch is located under the steering wheel and at the right of the column tube. The wiper combination switch controls the following operations:

- **Front windshield glass wiper:**

Turn the control handle clockwise to control the front windshield wiper.

⏻ : Turn the control lever to this gear to turn Off the wiper.

🌧️ : Turn the control lever to this gear to turn ON the wiper.

⚠️ Warning

- When the windscreen freezes in cold weather remove snow and frost from the windscreen before using the wiper.
- Do not use a wiper to remove dust for the dry windshield, it will scratch the glass and damage the blade.
- Spray the detergent before use the wiper. Do not use a washer without detergent.
- Before driving, check the wiper and scrubber system works normally.
- Antifreeze detergent should be used when the ambient temperature is below 0°C.

Steering wheel/horn switch



Horn


The horn keys are located on the left and right of the steering wheel. After starting the switch, press the horn button and the horn sounds.


Warning

It is forbidden to press the horn switch for a long time, and the time of pressing the horn switch for a single time is not more than 5 seconds.

Warning switch



 Turn the warning light off.

 Turn the warning light on

Gear shift



3 Gear Model

The shift switch is on the right side of the dashboard. There are three shifts:

- 1: Turn the switch to "1" to indicate that it is in low speed model.
- 2: Turn the switch to "2" gear and the vehicle enters the medium speed.
- 3: Turn the switch to "3" gear and the vehicle enters highest speed.

⚠ Attention

Do not change the gear of the other direction immediately when the vehicle is running in one direction. It is necessary to stop the vehicle for 2 seconds before hanging the gear of the other direction, otherwise the motor may be damaged.

Pedal



⚠ Warning

Do not step on the brake pedal and acceleration pedal at the same time.

The left pedal on the right front floor of the car is the brake pedal, which can be braked after being pressed.

The right pedal on the right front floor of the car is the acceleration pedal. The vehicle accelerates slowly after stepping down and cancels acceleration after lifting.

Parking brake



The parking brake handle is located on the right floor of the main driving seat.

Pull up the parking brake handle and brake the rear wheel of the vehicle.

When releasing the parking brake handle, first gently pull the parking handle upward, then press the unlock button at the top of the brake handle with thumb, and then push the control handle downward to release the rear wheel brake.



Warning

When leaving the vehicle after parking, parking brake must be used.

When the vehicle is in parking braking state, do not run the vehicle, otherwise it will cause irreparable damage to the braking system.

If the parking brake cannot be reliably locked or completely unlocked, the vehicle should be repaired or contacted with the company's after-sales service center.

External rearview mirror

Adjust the angle of the external rearview lens to the ideal position so as to see the situation on both sides of the road behind the vehicle. The external rearview mirror is a convex mirror, which allows you to see the rear of the car more broadly, while the objects in the mirror are closer to the reality.

Attention

The improper adjustment of the rearview mirror will affect the sight and increase the possibility of accidents. So before driving, please adjust the angle of rearview mirror and check whether the mirror is damaged.

Multi-Media



The multimedia control panel is located in the middle of the upper part of the dashboard.

1. Power button: Start/close multimedia.
2. The volume of '+' increases gradually with each press and decreases gradually with each press.

Radio Search

- In the radio state, short step by step increases the audio rate, while short step by step decreases the audio rate.
- In MP3 playback mode, click "select" to select the track, and click "select" to select the track.
- In the radio state, long press "down" to search the radio station, long press "up" to search the radio station.
- In the state of MP3 playback, long press "track fast forward" and long press "play track fast backward".

Driving method

1. "Mode" button mode switch key: used to change the working status of radio and external devices, the order of conversion is radio/USB/working mode. If there is no U disk, the prompt information will appear and the working status of the voice will be returned. The current track information will be displayed when reading and playing normally.
2. USB socket: It can be used to access U disk and play audio in U disk with multimedia.

Running-in instructions

New Electric Vehicle three wheeler running-in refers to the new car in the early stage of use, to run under a smaller load, lower speed, so that parts of the coordination of a stage of running-in. Running-in effect at the initial stage of vehicle use will have a great impact on the service life, working reliability and economy of the vehicle, so please implement the Running-in Regulations when using the new car to ensure the performance and life of the vehicle.

Running-in Regulations for New Vehicles:

- Service range running-in mileage: 1000-1500 km.
- Do not drive at the highest speed and avoid high-speed motor operation. It is recommended that the speed should not exceed 60 km/h.
- Start slowly and avoid sudden acceleration and braking.
- Avoid overloading.
- Don't drive in while drunk.
- Check the temperature of hub and brake drum frequently and adjust it if necessary.
- Check the condition of fasteners and connectors frequently to prevent loosening.
- The gear oil should be replaced when the rear axle is first maintained.

Driving Inspection

Correct use of Electric Vehicle three wheeler and good driving habits are very important for improving the service life of vehicles and ensuring the safety of drivers. Before each driving trip, check the condition of the important parts of the whole vehicle:

- Check carefully whether the steering system, braking system, accelerating pedal and parking brake handle are flexible in operation, whether they have good return, whether there are jams and heavy phenomena. Once abnormal is found, repair and eliminate them in time.
- Check whether the connecting parts and fasteners are loose and fall off, whether they are firm and reliable, and whether there are cracks and de-welding in the welding parts.
- Check the tire pressure and appearance damage and wear, timely inflation or replacement.
- Verify that the function indicator lights, lights, horns are normal, if not properly troubleshooting before driving.
- Check the electricity situation. When the start switch is turned on, if the electricity quantity indicated by the meter is less than 20%, the driver cannot travel at this time, so as not to run out of power and stop running, the vehicle must be charged immediately.

Electric Vehicle three wheeler Start

Before preparing for driving, the vehicle should be inspected. After confirming that the vehicle is in good condition, the seat should be adjusted and the start switch should be pressed to drive. Process operations:

1. Press the unlock key of the central control key.
2. Press the startup switch on the dashboard to check the remaining power of the vehicle and the state of the vehicle.
3. Rotate the shift switch on the right side of the dashboard to keep it in the "N" position.
4. Release the parking brake, slow down the acceleration pedal, and the vehicle begins to move forward.
5. Vehicle speed is controlled by acceleration pedal, acceleration is accelerated by downward acceleration pedal, and acceleration is cancelled by loosening acceleration pedal.
6. If you want to start on the half slope, please step on the brake pedal or pull up the parking brake. While loosening the brake pedal and parking brake, step on the accelerating pedal to climb the slope.



Attention

- Do not drive after taking alcohol or narcotics to ensure safety for yourself and others
- Avoid driving under fatigue, illness, emotional excitement or excessive stress.



Attention

- When a vehicle is moving forward, it is not allowed to change suddenly to reverse gear. Only when the vehicle has completely stopped can it enter reverse gear.
- When shifting, the acceleration pedal must be loosened. After shifting, the acceleration pedal can be pushed down.

Turn direction

When turning, slow down and turn at a speed not exceeding 10 Km/h. Turn on the turning lights to turn into the direction, look at the rearview mirror, observe the vehicles in the two directions of the lane from left to right, properly whistle, turn the direction with both hands, and drive slowly into the lane to turn into the direction.

Multi-mode driving

Energy-saving driving

- Avoid unnecessary parking because acceleration after deceleration will consume more electricity.
- Without special circumstances, speed up as slowly as possible, avoid rapid acceleration and consume more electric energy.
- Keep a steady cruise speed.
- Avoid high-speed driving; the highest speed will dramatically consume electricity.

- Keep the load as small as possible; reduce the weight of the car and save electricity.
- Maintain normal tire pressure and reduce driving resistance.
- If not, try to turn off the air conditioning system.

High Speed Driving

- The higher the speed of the vehicle, the longer the braking distance. Please control the braking pedal according to the speed and the required braking distance.
- When high speed passes through a mountain pass, over a large vehicle or through a tunnel entrance, it will be affected by the cross wind, so the speed of the vehicle should be reduced to avoid accidents.
- Driving at the lowest speed in rainy and snowy days, because of low visibility, wet and slippery road surface, it is easy to slip, leading to steering and braking out of control.

Multi-mode driving

Vehicle Load Driving

Control the vehicle load within the standard requirements, in order to avoid accidents in vehicle driving.

Driving on wet and slippery road

When a vehicle travels on wet or wet road surface or snow-covered road surface, the adhesion between tire and ground decreases. Vehicle speed should be reduced to avoid rapid start, acceleration, steering and braking. Brake should be used as little as possible and decelerated in advance.



Attention

- When driving on snow in winter, it is necessary to change the snow tires or install anti-skid chain on the ordinary tires according to the situation.
- Snow tires are specially designed for driving on ice and snow roads. When changing, snow tires with the same size as the standard tires should be used. Keep in mind that the direction of rotation of the tires should not be mistaken. The same tires (trademarks, specifications and tread patterns) should be installed on the two rear axles to ensure the maximum safety of driving and braking. In addition, do not use in normal environment without ice and snow, its performance will not be as good as standard ordinary tires.
- The use of skid-proof chains in snow must follow the relevant laws and regulations, and only be installed on the driving wheels of vehicles. The maximum height of the protruding tire contour is about 10 mm by using the anti-skid chain with smaller contour section. When driving, please try to keep driving at a low speed, do not drive on snow-free roads for a long time, so as not to cause damage to vehicles and roadbed.

Braking, stopping and parking

When parking, first loosen the acceleration pedal, and then slowly step down the brake pedal, the vehicle will stop gradually.

After parking, pull up the parking brake handle, break the vehicle to prevent slipping, and then put the shift switch in the "N" gear position. Emergency parking is a compulsory braking measure in case of danger in driving. At this time, the direction handle should be grasped steadily, the acceleration handle should be loosened first, then the brake pedal should be depressed,

and the parking brake handle should be pulled up to stop the electric vehicle rapidly. Emergency parking is used in special unexpected situations.

It should not be used frequently in order to avoid premature damage to tires and related components.



Attention

- If there is often a whistle when braking, it should be checked at our after-sales service station.
- Do not brake continuously for a long time or rest your foot on the brake pedal while driving. This will cause overheating or permanent damage to the brake.
- When water, sediment and dust enter the brake, the brake efficiency will be reduced. The brake should be cleaned and kept dry.

Vehicle parking

If the vehicle is idle for a long time and lasts more than one month, please follow the following precautions:

- Place the vehicle in a covered flat area. The site should be dry and ventilated.
- Check to ensure that the parking brake handle is tightened.
- Cut off the power supply of the high voltage system through the main switch of the power supply.
- Check its power consumption once a month and charge it in time.

- Protective wax should be used to clean and protect the painted parts on the body.
- Sprinkle talc powder on the rubber sheet of the glass wiper and don't keep it close to the glass.
- Open a slight gap in the window to ensure ventilation.
- Cover the vehicle with a sleeve made of fabric or porous plastic cloth. Do not use the sleeve made of sealed plastic cloth to prevent the evaporation of moisture on the surface of the car.
- Pressure the tire inflation to 50 Kpa higher than the conventional inflation pressure, and check the tire pressure regularly.

Emergency management

In case of dangerous emergencies during driving, please press the danger alarm light switch immediately, stop the vehicle after driving into the safety zone, and place a triangular warning sign at the distance of the coming direction meeting the requirements of the regulations. The reflecting surface is directly in the direction of the coming vehicle.

Take steps

Once an accident occurs, we must keep calm, and then choose the appropriate treatment according to the situation.

- If you are not directly involved, stop at least 10 meters away from the scene of the accident.
- Stop on the highway and don't block the emergency passage.
- Pull out the start key of the accident vehicle and turn on the danger warning signal.
- At night, headlights are used to illuminate the scene of the accident.
- If the door is blocked, do not try to break the front windshield out, because it is difficult to break, side windows and rear windows are easier to break.
- A red triangle warning sign is placed at a clear distance to show the accident.

- Call the emergency organization and report as accurate information as possible.
- When rear-end collision occurs on the highway, especially in the case of low visibility, the risk of collision by subsequent vehicles is very high, so it is necessary to leave the vehicle immediately and withdraw to the safety zone outside the guardrail.
- If you smell fuel or other chemicals, don't smoke or light a fire and stay away from the area.
- When a fire breaks out, use fire extinguishers, blankets or sand to extinguish it even if it is very small. Never use water.
- Contact the local traffic management department in time to seek help.

Emergency management

Treatment of wounded

If someone is injured, never abandon the injured person, even if it is not directly related to the accident, but also to provide help.

- Don't look around at the injured.
- Contact professional assistance and stay nearby to comfort the injured so that they do not panic.
- Release or cut the seat belt that restricts the injured.
- Do not give the injured anything to drink, so as not to aggravate the internal injury.
- Do not move the injured person except under special circumstances.
- The injured person can only be removed from the vehicle in case of fire, submergence, falling off a cliff or similar emergency danger. When removing the injured person, do not pull the limbs or bend the head, try to keep the body flat.

Electric Vehicle three wheeler Maintenance

Maintenance of Parts and Components

After a long period of driving, the friction surface of moving parts will wear and tear, and the working state of each system and component will change. In order to ensure that the vehicle is in good working condition and prolong the service life of the vehicle, regular maintenance must be carried out according to the regulations. Inspection, adjustment, lubrication and other maintenance items are specified in the regular maintenance table. The maintenance cycle is counted by mileage or months of the vehicle. If the vehicle is often used in harsh conditions (such as heavy load, high-speed driving, etc.), the maintenance cycle must be shortened accordingly.

For the items listed in the regular maintenance table, it is recommended to go to the professional maintenance point for maintenance; for the other simple items, you can refer to the method described in this manual for maintenance.



Attention

- If you don't know much about the vehicle, the maintenance of the vehicle may cause damage to your vehicle.
- When inspecting and maintaining electrical components, it must be carried out in case of power failure in order to avoid accidents.
- When jacking up a vehicle with an onboard jack, it is not allowed to enter the lower part of the vehicle.
- Do not touch the positive and negative poles of the battery at will, in order to avoid the accident of short circuit.
 - Whether the motor is running or not, please do not disassemble the electrical components or batteries when the switch is started.

Battery

This vehicle is equipped with a lithium battery for the power the power battery is a ternary lithium battery, located under the seat cushion; battery has BMS system. .

The using methods

Battery Charging.

- ◇ Standard charging: the Electric Vehicle three wheeler charger is used for charging, 180V-220V ac, the charging time is about 5-6 hours until the meter shows 100% .
- ◇ Low temperature charge: below 0 °C charging, can affect the service life of the battery, please try to avoid charging at low temperature.
- ◇ High temperature charging: in summer, please place the battery pack in a cool and ventilated place to avoid direct sunlight. More than 55 °C charging, it will affect the service life of the battery pack, please note.

Attention

Notes of charging :

- Total switching button and assist switching button need to be open.
- When charging, unplug the start switch key and pull the parking brake.
- In the process of charging, if you smell a bad smell or the temperature is too high, please stop charging immediately and send to the agency for maintenance.
- Try to use the battery pack after it is fully charged. Otherwise, it will lead to insufficient driving range and battery life reduction.
- After driving our vehicle in winter, you need charge soon. After the battery discharge, system working temperature above 0 °C, can reduce the impact of low-temperature charging the battery life.

Battery

➤ The battery discharge

It is forbidden to over discharge the battery, which will do great harm to the service life of the battery.

In the process of discharging the battery pack, try to make the battery pack in the state of small current discharge, which can extend the driving range and battery life.

➤ Battery storage and recharge

Battery storage environment temperature is 20 ~ 45 °C, the optimal storage temperature is 0 ~ 25 °C. In the process of storage and transportation capacity will be a loss, battery before use, please use the standard charging manner for electricity.



Attention

- Precautions for use:
- Don't open the inside battery privacy as the high voltage may do harm to you.
- The connection of the battery can't be any short circuit.
Do not put the battery into the liquid, such as water, gasoline, drinks, etc., also cannot be put in a damp place or water.
- Do not apply external force to the battery or make it fall from high altitude.
- When the battery is not in use, it should be stored in a dry and cool place after being fully charged, insulated to prevent heavy pressure and contact with children, and fully charged every 1 month.
- Please do not discard the scrapped battery, please return the scrapped battery to the dealer

Battery Charger

Our vehicle has smart charger, the charger is under the driver's seat there is a charging indicator on the left side of the decoration board of the main driver's seat. When the vehicle is charging, the indicator light will be on to show the current charging status of the power battery. 48V/60V 20A output. Purpose of use: For Electric Vehicles Three Wheeler.



Charger safety guide

- Since the charger has many automatic protection functions, there is no need for special care when charging. When the battery is fully charged, the charger will automatically stop charging.
- It is strictly prohibited to disassemble the machine for repair or debugging. If it has any problems, please go to the repair station of our company.
- It is strictly prohibited to disassemble the machine for repair or debugging.
- AC power supply above 15A specification, requires the three core cable with grounding and correct grounding, wire diameter area not less than 3 square mm.
- The charger is strictly prohibited to be used in the environment with high humidity and heat. Avoid blocking the inlet and outlet of the charger.
- If there is abnormal sound, smell, spark, smoke and other phenomena in the charging process, please immediately cut off the power supply and check the problem.
- The input voltage of the charger is only limited to the 220V power frequency voltage of the municipal power supply, which is higher than the municipal power supply and higher than the power frequency voltage.

The controller

The Electric Vehicle (EV) Three Wheeler's controller is installed in the rear seat back and inside the EV Three Wheeler body rear decorative panel. Electronic controller devices should be inspected every three months. After the power is turned off, the filter capacitor in the controller unit should be discharged for several minutes. Do not flush the electrical parts with water. Clean brush or high pressure gas can be used to remove dust. The inspection contents are as follows:

- Check the connection of battery, motor, motor controller and contactor.
- Check and keep battery, motor, motor controller and contactor clean.

Brake System

Check and replace brake pads regularly and fill brake hub bearing

Lubricating oil.

The brake fluid

The brake oil cup of this car is located in the front cabin, the brake fluid is DOT3 type brake fluid, and the level of the brake oil cup should be between the upper and lower cutting lines. If the liquid level is lower than the bottom line, the same type of brake fluid should be added, and mixed use of different brands of brake fluid is prohibited.

The brake pedal

When the brake pedal is pressed to the bottom, the vertical distance between the pedal and the front wall plate shall not be less than 19mm, and the brake force of the pedal is about 278N. When the brake pedal is pressed to the bottom, the following situations should be timely checked:

Insufficient braking force; Unstable braking force; Pedal stroke is too large; Pedal block; Brake noise; The pedals beat.

Parking brake handle

When the parking brake handle is stuck on a tooth between 4-7 ratchet teeth, the wheels should be able to effectively lock. In this range, if the parking brake cannot lock the vehicle, or unlock cannot be completely unlocked, should contact the after-sales service station maintenance personnel for inspection and maintenance.



Attention

- Because of the rear disc brake, once the brake friction wear, brake level will gradually decline.
- If the brake fluid in the brake oil cup is lower than the lower limit, the corresponding type of brake fluid should be added in time. If the brake fluid frequently appears below the lower limit, the brake system should be checked.
- Check brake should be in the motor stop state, at the same time release parking brake for inspection.
- Do not use brake fluid that is not of the specified model or mixed with different models. Do not use brake fluid that has been stored for a long time or in a container with no cover.
- In order to prevent the potential safety hazard caused by the unsmooth movement of the brake pedal, the user shall not install a dust mat under the brake pedal.

Tires

- Low tire pressure will make the tire overheating, faster wear and tear, difficult driving, and power consumption.
 - When the tire pressure is too high, the vehicle vibrates seriously and the balance drops, which make the tire, wear seriously.
 - The tire must be replaced when the tread wear reaches or exceeds 1.8 mm.
 - When using tires, be careful not to hit kerbs , potholes, or other obstacles. Driving long distances on bumpy roads can damage tires.
 - Check the side wall of the tire regularly for cut marks, abnormal expansion or irregular wear of the tire.
 - Avoid overload when driving, in case of serious damage to tires and affect vehicle performance.
 - If a tire is punctured, stop and replace it immediately to avoid damage to the tire, rim, suspension, and steering system.
 - Rubber tires can develop cracks, a sign of aging, even when they are infrequently used. In any case, tires that have been in service for more than 6 years should be professionally tested for continued use.
 - The tire pressure check needs to be done after the tire has cooled, otherwise an incorrect reading will be obtained.
 - When the tire is inflated, it should be slowly inflated while checking the tire pressure until it reaches the specified value of 50KPa for rear and 45KPa for the front tire.
 - Changing tires of different sizes will result in wrong speed and mileage readings.
- The impact of foreign matter on the road surface and the objects passing over the road surface will affect the normal positioning Angle of the wheel, which needs to be corrected by the authorized maintenance center of our company.
 - Please use our tires to ensure the performance and driving safety.

Maintenance Booklet

Tires: TUFAN brand Electric Vehicle Three Wheeled.(EV)

Tire replacement

- Use the wheel wrench to loosen the nut for replacing the tires, but don't take it off.
- Lift the vehicle with a power jack.
- Remove the wheel nuts and tires.
- Install the new tire, then tighten the wheel nut by hand and fix the rim.

- Drop the jack and tighten the wheel nuts in the order of crossing by using the wheel wrench with the specified moment (70+-5n.m).

Vehicle Corrosion Protection

The paint layer on the body surface is easily damaged by dirt, such as salt, chemicals, tar, tree sap, animal excrement, industrial pollution and dust, which may corrode the paint layer. They should be removed as soon as possible and re-paint.

Natural detergents can be used for cleaning, **acid and alkaline detergents are strictly prohibited**. Mix the detergent with clean water. If the surface of your EV is damaged or the paint layer falls off, it should be repaired immediately. Do not expose the metal in the air. Moisture, dust and soil under the mattress in the EV cabin may accelerate corrosion. Check regularly to ensure that the interior is clean and dry. Don't park your EV in damp or poorly ventilated places. Don't clean your car in the garage.

Interior Maintenance:

Vehicle interior decoration adopts different maintenance methods according to different materials:

- Seats and ceiling can be cleaned with soft cloth stained with natural cleaning agent.
- Dashboard, side panel and other plastic accessories, you can use water plus a small amount of soap or gentle cleaning agent, with a sponge or soft cloth immersed in the solution, gently wipe, a few minutes later, then use a clean soft cloth dipped in water repeatedly wipe, until clean.
- Dust and sundries on the floor can be cleaned with a vacuum cleaner, and then wipe the dirty place with a clean soft cloth soaked with soap or cleaning agent, and then clean it with clean water.



Attention

- When cleaning the vehicle, do not use flammable materials such as thinner, benzene, or use alkaline or acidic household cleaners.
- When cleaning the inside of the EV, need to prevent the cleaning agent or water from flowing into the gap of the electrical device to prevent short circuit of the electrical device.

Body of the EV:

Cleaning Methods

- Use high-pressure water to wash sediment and debris from EV floor and wheels.
- When washing the outer surface, wipe it with soft cloth, not with hard objects, so as not to damage the surface.
- Use soft cloth to dip in natural detergent, wipe the surface lightly **and do not use strong acid and alkaline detergent.**
- Once the dirt is removed, wash EV immediately with clean water.
- After washing, use a soft cloth to wipe off the droplets on the surface of the vehicle and dry it naturally.
- Carefully inspect the paint layer on the vehicle surface. If there are scratches, please follow the following steps to repair: clean and dry the damaged surface; gently brush the wound with a small brush with the same color paint; completely natural shade dry.

Film Maintenance

- Please use a special wipe cloth to clean.
- Avoid contact with strong acid and alkali.
- Avoid long-term contact with gasoline, oil and other volatiles. If there is a small amount of contact, please immediately use a special wipe cloth to wipe clean.
- Avoid hard objects touching the surface of the paint film to avoid scratches.

Waxing

It is recommended that you apply wax and polish once or twice a year to protect the body paint and beautify your EV. Please use good quality automobile wax and polishing agent, and pay attention to the manufacturer's instructions.

Common trouble shooting causes:

Item	Fault phenomenon	Fault analysis	Elimination method
Vehicles can't run properly	Voltmeter indication has	Shifter Damage	Replacement Shifter
		Controller damage	Replacement Controller
		Accelerator damage	Replacement Accelerator
	Only Forward	Shifter Damage	Replacement Shifter
		Controller damage	Replacement Controller
	Only Reverse	Shifter Damage	Replacement Shifter
		Controller damage	Replacement Controller
	Charging system	Charging Light is not bright	Charger and battery connection not connected properly
Charging cable not connected properly			Re-insert charging cable
Charger damage			Replacement

Common trouble shooting causes:

Item	Fault phenomenon	Fault analysis	Elimination method
Charging system	Battery charging is unsatisfactory	The output cable is too long or too thin, resulting in excessive voltage drop.	Restore output cable to standard length
	When the power is turned on, the light is full.	Check whether the charger and battery connection is loose or falling off	Normal connection
Brake failure	Braking weakness	Brake Pipeline Leakage	Repair or replacement
		Gas in brake line	Exhaust gas
		Failure of Rubber Piston of Brake Master Pump	Replacement
		Failure of piston of brake pump	Replacement
	Bad parking of parking brake	Loose Brake Wire	Adjustment
		Brake tie-in	Repair or replacement
	Strange noise on the rear axle.	Damage of rear axle inner gear	Replacement

Specification of the EV

Vehicle Variants	Electric Vehicle Three Wheeler	Empty Vehicle weight	525-535 KG WITH 60V LEAD ACID BATTERY. 375-385 KG WITH 60V LITHIUM-ION BATTERY
Model	L5	Chassis Type	Tubular Ladder type Carbon Steel 160 mm thickness
Vehicle Model	TUFAN	Front Tire	4.00 - 12 6 PR
Motor Power (W)	4000W	Rear Tire	4.00 - 12 6 PR
Motor Rating (V)	60V	Wheelbase	2260 mm
Motor Type	PMSM	Wheel Track	1120 mm
Max Torque	64 N-m	Overall Length	3000 mm
Controller	60V PMSM	Overall Width	1300 mm
Gear Box	- High and Low and Reverse - 3 Speed Plus Gear	Overall Height	1800 mm
Gradeability (%)	7°- 20°	Ground Clearance	200 mm
Max Speed (Km/h)	50-55 Km / hr	Steering Mode	Handle Bar
Mileage Km per charge	160-180 Km	Suspension (Front)	Helical spring dampener hydraulic shock absorber
Fuel Type	Lithium NMC Battery	Suspension (Rear) spring	Rigid axle with leaf spring

Battery Voltage	60V	Brakes	Front: Drum Brake Rear: Hydraulic Disc Brake.
Battery Type: Lithium NMC 60V160AH Fast Charger		Parking Brakes	Mechanical Lever type
Seating Capacity	6+1 Persons	Windscreen and Wiping System with motor	Yes
Gross Vehicle Weight	1075-1085 KG WITH 60V LEAD ACID BATTERY 950-960 KG WITH 60V LITHIUM-ION BATTERY	Spare wheel provision	Yes
Payload	550-560 Kg	Driving Mode: FNR (Forward-Neutral-Reverse)	Yes
Dash Board	All the Features with matching with BMS	Audio Sound system, Bluetooth, Room Light	Yes

Manufacturer: Gucheng Jida New Energy Technology Co., Ltd. Address: No.6,Jinxin Street,Economic Development Zone,Gucheng,Hengshui,Hebei Province, P.R. of China

Importer: Shamim Chowdhury Limited, Adress: Fare Complex 2nd Floor, 11/8/E Free School Street, Panthapath, Dhaka-1205, Bangladesh.

4000 Watt PMSM Setup Specifications:



Voltage (V): 60	No load current (A): 8	Rated current (A): 74	Rated speed (RPM): 3000
Rated torque (Nm): 12.7	Maximum output torque (Nm): 70	Rated power (W): 4000	Maximum power output (W): 8000
Efficiency (η): >92%	Number of poles: 4	Insulation Grade: F	

The controller specifications are as follows:-



Voltage rating: 60/72 universal	Peak protection current: 150A	Rated power: 4000W
Throttle voltage: 0.8V to 3.8V	Phase change angle: 120 degrees	Brake power-off: High
Heat dissipation: Natural cooling	Under voltage protection: 53/63V	Maximum power output (W): 8000



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Lithium-battery user manual

CATALOGUE

1. Instrument panel

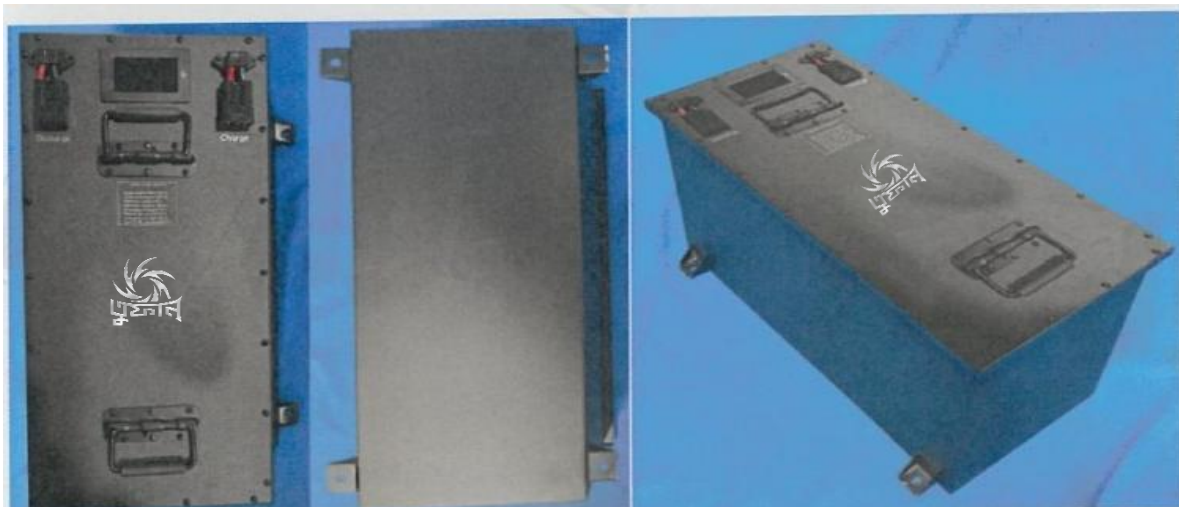
2. APP Operation

3. Method of using products

4. Notice for battery use

5 .Lithium-battery storage and transportation instructions

6 . Quality assurance

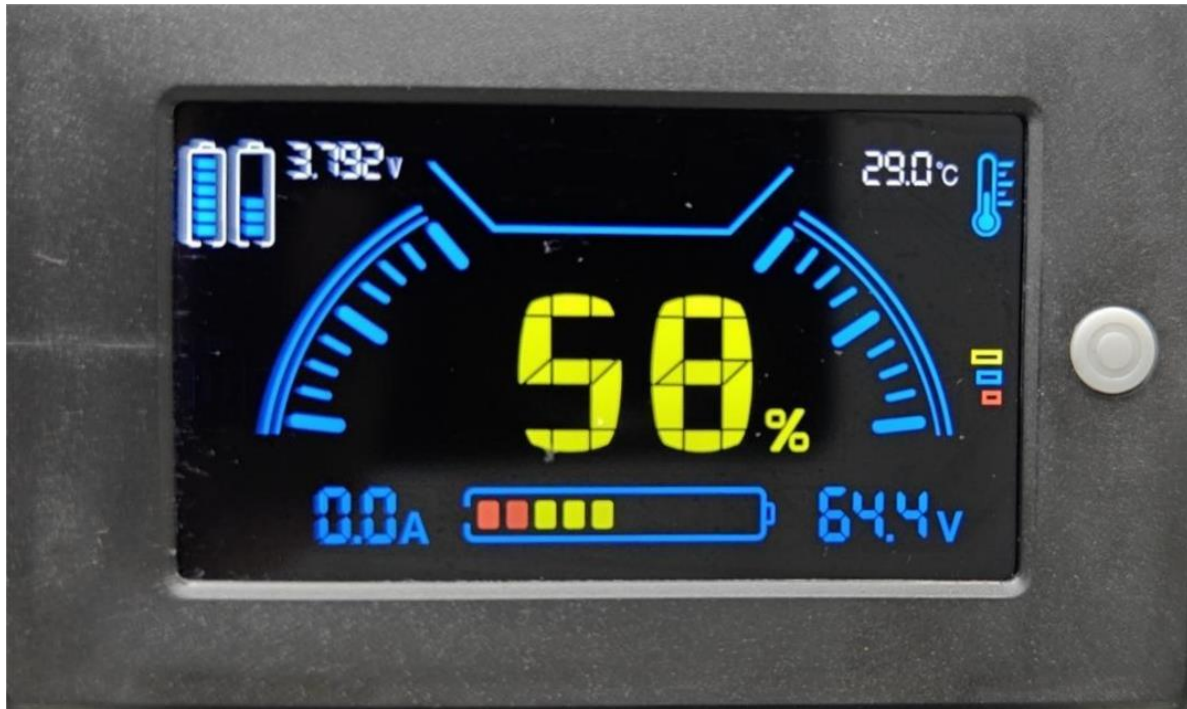




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1. Instrument panel

1) Instrument appearance



2) Operation and display instructions

2.1 Button operation

Light screen: when the display button is pressed, the screen will be switched. If the key is illuminated before the screen is pressed; if the key is pressed, the screen will be illuminated after the button

Turn on: After wiring, press the white button on the right side of the display screen for 1~2 seconds to control the protection plate

Turn off: in the boot state, long press the white button on the right side of the display screen for about 5 seconds to control the protection plate shutdown



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2.2 Display content description

Area 1: The fault code shows that when the icon is lit, the number displayed below is the fault code, and the current fault code is 8. If there are multiple fault information, it will scroll through. The fault code is shown in the comparison table below.

Fault code	The alarm content	Fault code	The alarm content
1	Single over-release alarm	6	Short circuit alarm
2	Single overcharge alarm	7	Internal communication abnormal alarm
3	Overflow alarm	8	The balance line has too large resistance to alarm
4	The MOS overtemperature alarm	9	Drop string
5	Battery overtemperature alarm		



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Area 2: it is often indicated that when the icon is lit, there is an abnormal warning.

Area 3: Power display area, current display value of 58%.

Area 4: the charge-discharge current shows, the far left "-" indicates the negative value of the value discharge current; if not "-", the current is positive, and the current is the charging current.

Area 5: Total battery voltage display.

Area 6: Battery pack average voltage display.

Area 7: Battery internal temperature.

2.3 The logic of the screen displays

To reduce the power consumption, the following logic is specifically defined:

Static: no current, no operation button, charging, after 10 seconds;

Discharge: when the discharge current is greater than 0, the display screen is always bright;

Key: When the display button is pressed, the display screen will extinguish before the key and the key; if the key is pressed, the screen will illuminate after the key;

3) Charge and Discharge



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3.1 Operation instruction

Area 1: Discharge plug. After the main switch of the vehicle is turned off, insert the corresponding 50A Anderson plug into the Discharge port to confirm that the positive and negative polarity is correct, red is positive and black is negative. Turn on the master switch to power the vehicle.

Area 2: Charging plug. It must be confirmed that the output voltage displayed on the charger nameplate is consistent with the charging voltage, with the nominal battery charging voltage of 48V is 58.8V and the nominal voltage of 60V is 71.4V. A mismatched charger can damage the battery and may even have serious consequences.

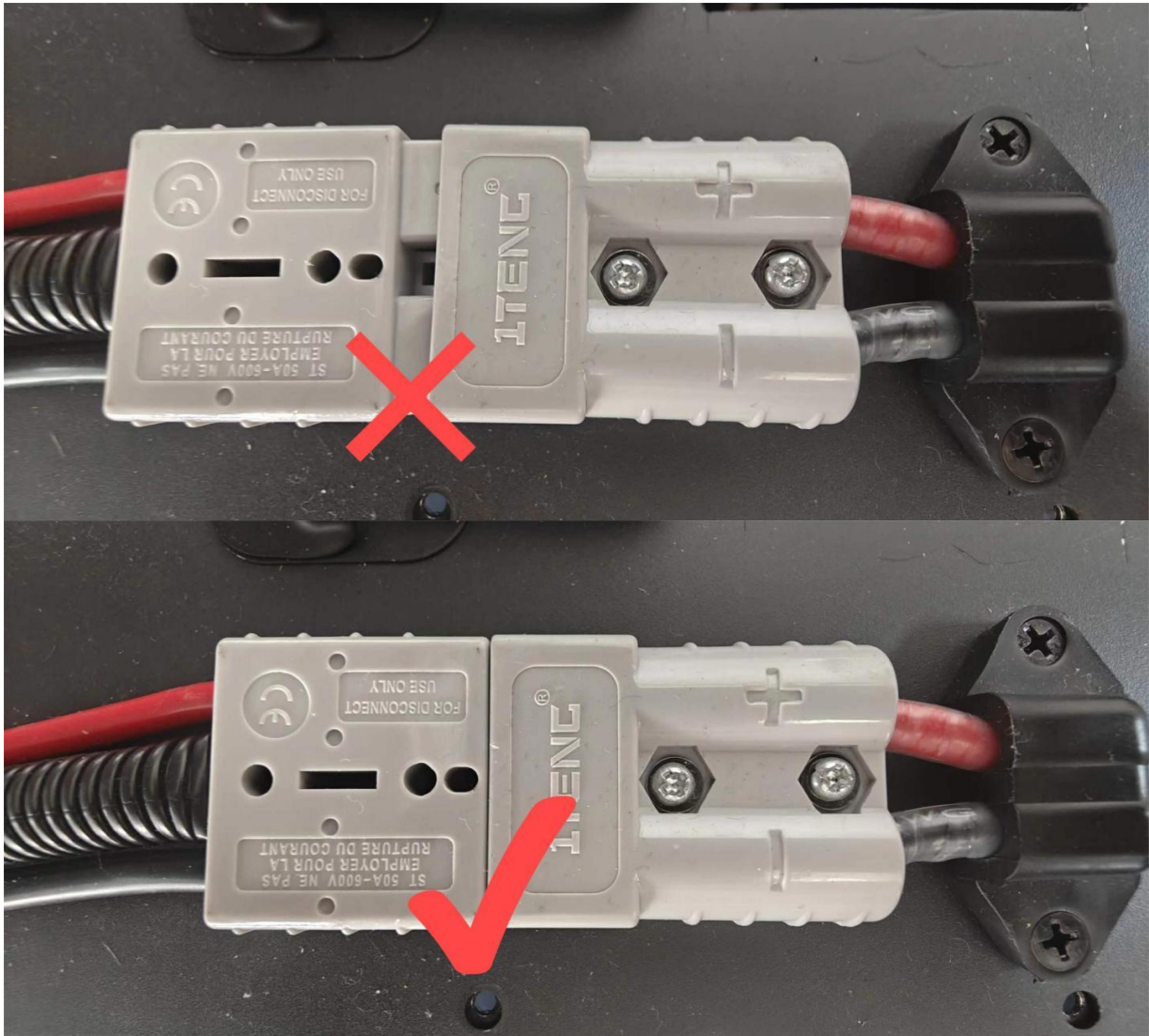


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After confirmation. Insert the charger with 50A Anderson plug into the Charge port. The charger red light is charging and the charger green light is full.

3.2 Plug instructions

Charge and discharge plug should be inserted to the end, red (positive) black (negative) cable one by one correspondence.





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2. APP Operation

2.1.APP (APP installation)

Download the mobile APP by scanning the QR code in the figure below.



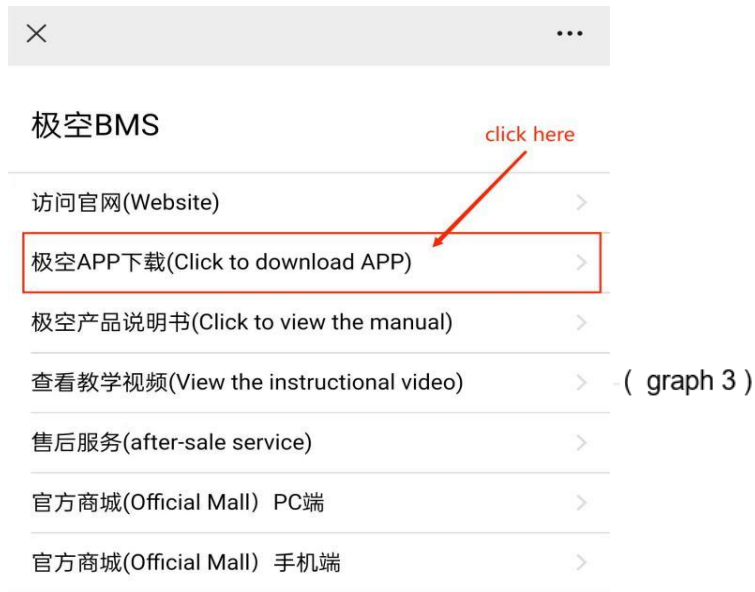
(graph 1)



(graph 2)



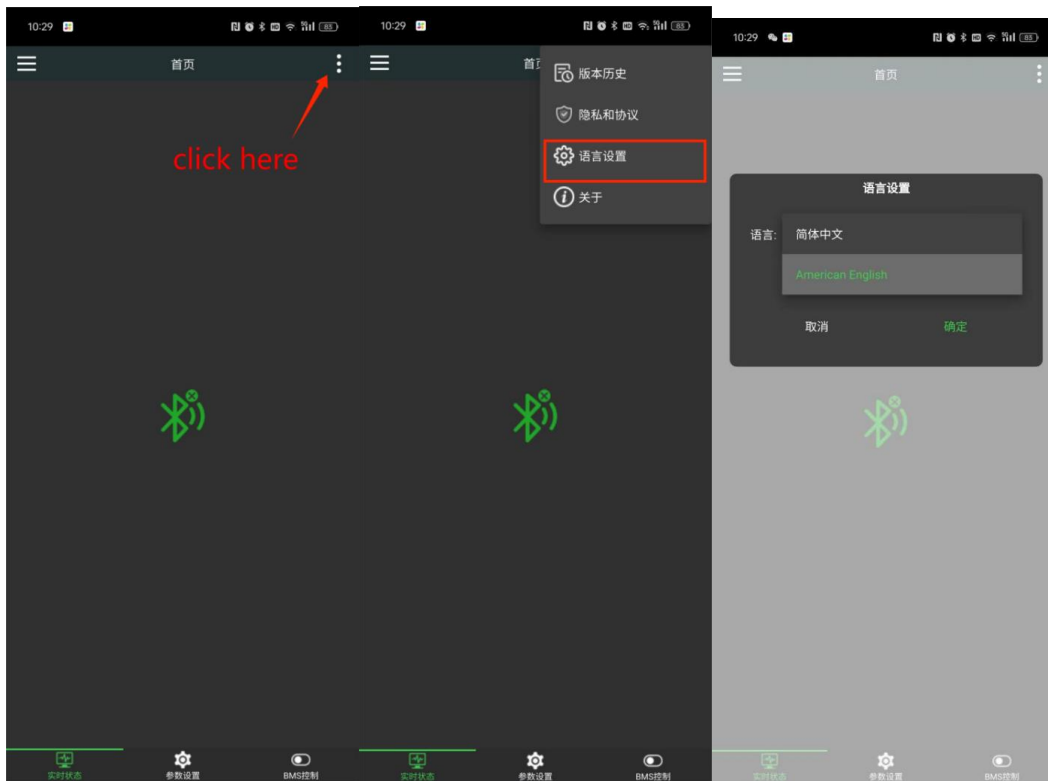
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2.2 APP operation declaration

2.2.1 Equipment operation –device attachment

First turn on the mobile phone Bluetooth, and then open the APP, as shown in graph 4.



(graph4)

(graph5)

(graph6)



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If you want to change the language, click 3 points in the upper right corner, select Language Settings, select American English, click the OK button, and prompt you to exit the APP to re-enter.

Click the upper left corner icon to scan the device, wait for the scan to complete, and click the name of the device needed to be connected, such as "JK-B1A24S". During the first connection, the APP will prompt you to enter the password, and the default password of the device is "1234". After the device is connected, the APP will automatically record the password. The next connection is made, and there will be no need to enter the password. The password entry interface is shown in graph 8.



(graph7)



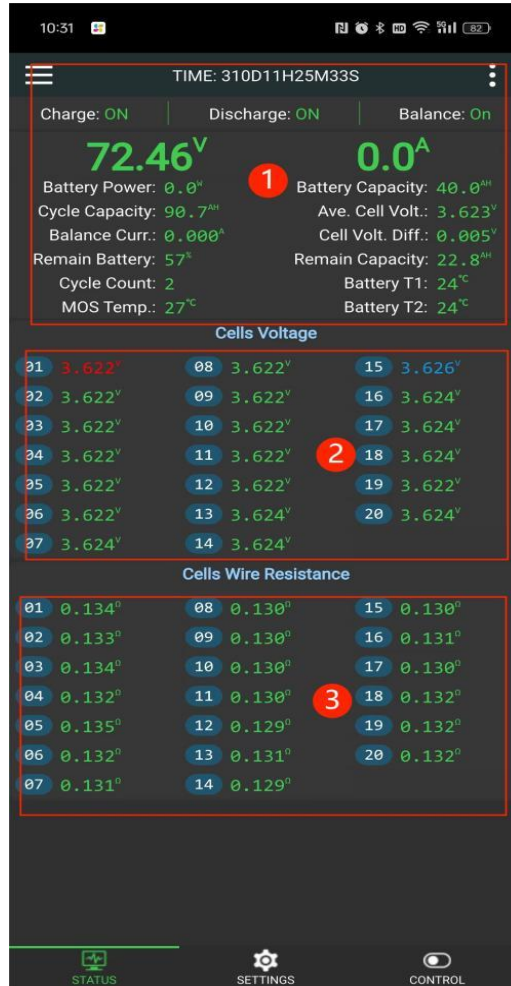
(graph8)



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2.2.1 Status view

The real-time state interface is shown in graph 10.



(graph 10)

The real-time status page is divided into 3 regions.

Area 1 in the figure is the battery comprehensive information bar. The parameters are defined as follows:

a) Runtime

The running time represents the total running time from the first start of the protection board.



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b) Charge

Indicates the switch status of the current protection board charging MOS. When "ON" appears, the current board charging MOS is open and the battery is allowed to charge; when "OFF" appears, the current board charging MOS is off and the battery is not allowed to charge.

c) Discharge

Indicates the switch status of the current protection board discharge MOS. When On, the current protective board discharge MOS is on and the battery is allowed to discharge; when Off, the current protective board discharge MOS is off and the battery is not allowed to discharge.

d) Balance

Indicates the switching state of the current protection board equalization switch. When playing On, protect the protection plate when the equilibrium trigger condition is reached Automatic equalization; when "off" is displayed, the equalization is closed and the protection board will not balance the battery.

e) Voltage

The voltage area displays the total voltage of the current battery in real time, and the total voltage is the sum of all single voltages.

f) Current

The current area displays the total current of the current battery in real time. The current is positive when the battery is charged and negative when the battery is discharged.

g) Battery power

It represents the total output power of the current battery or the input, whose value is the absolute product of the current battery voltage and the battery current.

h) Remain Battery



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Represents the percentage of the current battery.

i) Battery capacity

It represents the actual capacity of the battery calculated by the current protection board through the high-precision SOC, in unit: AH. (This value requires a complete discharge and charge cycle before updating).

j) Remain capacity

The remaining capacity represents the remaining capacity of the current battery in AH.

k) Cycle capacity

The cycle capacity represents the cumulative discharge capacity of the battery in AH.

l) Cycle count

The number of cycles represents the number of times the current battery. Unit is: times.

m) Ave. Cell volt

It represents the average voltage of the current cell in V.

n) cell volt. Diff

The maximum pressure difference represents the difference between the highest cell voltage and the lowest cell voltage of the current battery, unit: V.

o) Balance curr

When the protection plate opens the equalization function and reaches the equilibrium condition, the equilibrium current display area displays the equilibrium current in real time, unit: A. When equalization proceeds, the monomer voltage of the real-time state displays the area, blue represents the discharged battery and red represents the charged battery. Equilibrium current negative



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current means that the battery is discharging, blue is flashing, positive current means that the battery is charging, and red is flashing. The protection board adopts active balancing technology. The principle of equalization is to take power from the high voltage cell, store it to the protection board, and then put it to the low voltage cell.

p) MOS temperature (power temperature)

Display the temperature of the current protection board power MOS in °C.

q) battery T1

Display "NA" without the installation of the temperature sensor 1, and display the temperature of the temperature sensor 1 in °C.

r) Battery T2

Display "NA" without installing the temperature sensor 2, and display the temperature of the temperature sensor 2 in °C.

Area 2 -The monomer voltage region in this area of Fig. The voltage data for each monomer in the cell pack are displayed in real time, where red indicates the monomer with the lowest voltage and blue indicates the monomer with the highest voltage.

Area 3 is the equalizing line resistance area. The equalizing line resistance is the equalizing line resistance obtained by the protection board self-test. This value is only a rough calculation to prevent wrong wiring or poor contact. When the equalizing line resistance exceeds a certain value, it will be displayed in yellow and the equalization cannot be turned on at this time.

3. Method of using products

3.1. Method of using products



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3.1.1 Battery charging

After the electric vehicle operation is stopped, the battery should be charged in time. **The company's lithium battery must be used with our company charger. Do not use a modified or damaged charger. It is strictly prohibited to use a lead-acid battery charger to charge the lithium batteries.** When charging, plug in the power supply and then plug in the battery. Charge for 6 to 7 hours until the charger indicates the red light to green light. After charging, remove the battery before unplug the power supply. Unplug the charger in time after the charging is completed to avoid long-term charging.

The original bicycle is a three-hole character need to use the matching wire connection.

Indoor charging is strictly prohibited

Try to turn off most of the functions of the electric vehicle when charging, in order to reduce the battery load.

Avoid charging electric vehicles in high-temperature or humid environments.

The battery must be charged within an ambient temperature range of 0°C to 45°C.

3.1.2 Battery discharge

The electric vehicle controller current shall not exceed the maximum discharge current specified by the battery.

Prohibit the battery positive and negative extreme short connection!

It is strictly prohibited to connect the positive and negative electrodes of the load equipment!

The vehicle must be matched with suitable air switches to ensure that the air switch works effectively.

The battery must be discharged within an ambient temperature range of -20°C to 45°C.

4. Notice for battery use

A. Do not soak the battery in water!

B. Do not charge the battery under the fire source or extremely hot conditions! Do not use or store batteries near a heat source (such as a fire or a heater)!



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- C. Do not connect the battery directly to the wall socket or car smoke lighting socket!
- D. Do not put the battery into the fire or heat the battery!
- E. It is strictly prohibited to use wires or other metal objects to short circuit the positive and negative electrodes of the battery. It is strictly prohibited to transport or store the battery together with other metal objects!
- F. Do not use sharp objects to puncture the battery shell, do not hammer or pedal battery!
- G. It is strictly prohibited to hit or throw the battery, and to fall the battery from high altitude;
- H. It is strictly prohibited to decompose the battery in any way, and it is strictly prohibited to dismantle or refit the battery without authorization!
- I. Never put the battery into the pressure vessel!
- J. It is strictly prohibited to use in parallel with other batteries or batteries of different capacity, models and varieties!
- K. If the battery smells, heat, deformation, discoloration, or any other abnormal phenomenon, if the battery is in use or charged, disconnect the load output or the charging input immediately!
- L. Lithium battery to avoid the use in direct sunlight, storage, charging;
- M. Must use the original factory charger for charging, and it is strictly prohibited to use the lead-acid charger to charge;
- N. When the battery is not in use, make insulation to prevent the contact with children and operate according to the storage instructions;
- O. It is used below 2,000 meters above sea level.

5. Lithium battery storage and transportation instructions

5.1 Lithium-ion batteries should be stored in a cool, dry, ventilated environment, far away from fire and high temperatures. The battery storage temperature must be in the range of $-10^{\circ}\text{C} \sim 45^{\circ}\text{C}$, and the long-term storage battery (over 3 months) must be placed at a temperature of $23 \pm 5^{\circ}\text{C}$ and a humidity of $65 \pm 20\%$ RH.



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5.2 Storage voltage: The voltage ranges from 63 V to 68 V (60V battery pack)

5.3 The battery shall be stored according to the storage requirements, and shall be replenished to 63V~68V after 3 months. (60V battery pack)

5.4 Do not transport batteries at ambient temperatures above 55°C

6. Quality assurance

6.1 If any damage is found after unpacking, contact the dealer or manufacturer in time.

6.2 Warranty period: 2years from the date of factory

6.3 Notes without warranty

6.3.1. Over the warranty period;

6.3.2 Without a warranty certificate or a valid bill;

6.3.3 The contents on the warranty certificate are inconsistent with the physical mark of the goods or have been altered;

6.3.4 According to the requirements of the product;

6.3.5 The product is dismantled or damaged itself;

6.3.6 Damage caused by force majeure;

6.3.7 The use of services is only limited to the battery itself, and other losses caused by the battery failure do not fall within the scope of warranty liability;



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Warranty voucher

Dealer _____

Dealer address _____

Dealer phone number _____

Date of sale _____

Invoice number _____

Battery model number _____

Battery serial number _____

Consumer name _____

Consumer phone _____



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Instructions for the lithium-ion battery charger

operating instruction:

1. Check the charger type model, whether it matches the battery type model to be charged, any mismatch can not be used! Mismatch can cause serious consequences!
2. When charging, place the charger in a place with good ventilation and heat dissipation to avoid direct sunlight and rain, insert the charger output line plug into the charging port of the electric vehicle to ensure reliable connection; then connect the charger to the 220v power supply; when the charger starts to work, the indicator becomes red. When the charging indicator becomes green, the charging is complete, the power can be turned off and unplug the plug;

matters need attention:

1. Please read the instructions before you use them;
2. The input voltage of the power supply end is AC160-260V50-60Hz, and too high and too low input voltage may lead to damage to the charger.
3. Regularly check whether the charger is damaged, especially whether the wires and plug are damaged. If there is any damage, stop using it immediately to avoid accidental damage caused by electricity leakage.
4. Before connecting or disconnecting the battery charger and the battery, disconnect the power supply;
5. Do not plug the power cord with wet hand;



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6. During the charging process, please ensure ventilation and stay away from the heat source / flammable and explosive items / gas.
7. although this product is waterproof and seismic, but limited to the product is not damaged, and can not ensure that the wet water leakage, often with the car please often check whether the line is wear and bare. If any, stop the use! If it is wet during use, please stop use immediately if there is water. If the product is water or wet, please dry for use. Ensure the safety of electricity use!!!
8. Do not charge the non-rechargeable batteries;
- 9, not in the wet, water, thunderstorm days to use;
10. Do not open the shell, there is high voltage, will lead to life safety accidents,
11. Avoid minors' contact with the product

化学品安全技术说明书 (MSDS)

委托方 Client	镇江市万锂新能源有限公司 Zhenjiang Wanli New Energy Co.,Ltd.
委托方地址 Add. of Client	镇江市扬中市新坝镇江城路 66 号 66 Zhenjiangcheng Road, Xinba, Yangzhong, Zhenjiang
样品名称 Description	三元锂离子电池组 NCM Li-ion Battery
型号规格 Model/Type	60V160Ah
标称电压 Nominal Voltage	60V
额定容量 Rated Capacity	160Ah
额定能量 Rated Energy	9.6KWh
品牌名 Trade Name	/
制造厂 Manufacturer	镇江市万锂新能源有限公司 Zhenjiang Wanli New Energy Co.,Ltd.
制造厂地址 Add. Of Manufacturer	镇江市扬中市新坝镇江城路 66 号 66 Zhenjiangcheng Road, Xinba, Yangzhong, Zhenjiang
技术依据 Reference documents	ISO 11014:2009 化学品安全技术说明书—内容和项目顺序 ISO 11014:2009 Safety data sheet for chemical products-Content and order of sections GB/T 16483-2008 化学品安全技术说明书 内容和项目顺序 GB/T 16483-2008 Safety data sheet for chemical products-Content and order of sections 国际航空运输协会《危险品规则》(第 65 版) IATA Dangerous Goods Regulation (65 th) 国际海事组织《国际海运危险货物规则》(第 41-22 版) IMO International Maritime Dangerous Goods Code (41-22 edition)

出版日期 Date of Receipt	2024 年 05 月 06 号
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编写:



审核:



一. 样品信息 Sample information

样品名称 Sample Name	三元锂离子电池组 NCM Li-ion Battery	样品型号 Type	60V160Ah
标称电压 Nominal voltage	60V	额定容量 Rated capacity	160Ah
样品外观 Shape	棱柱形 Prismatic		

二. 内容与说明 Content and instructions**1. 化学品及企业标识 Chemical product and company identification**

化学品的名称 Name of chemical product	三元锂离子电池组 NCM Li-ion Battery	
制造商 Manufacturer	名称 Name	镇江市万锂新能源有限公司 Zhenjiang Wanli New Energy Co.,Ltd.
	地址 Address	镇江市扬中市新坝镇江城路 66 号 66 Zhenjiangcheng Road, Xinba, Yangzhong, Zhenjiang
	电话 Telephone number	+86-18651924300
	应急电话 Emergency telephone number	+86-18651924300
	电子邮件 E-mail address	3085666868@qq.com

这份 MSDS 报告由东莞市中认联科检测技术有限公司签发;

This MSDS was prepared by Dongguan ZRLK Testing Technology Co., Ltd.

Building 2, No.1, Technology 10th Road, Songshan Lake Park, Dongguan, Guangdong, China

2. 危险性概述 Hazards identification

1) 主要的物理及化学危险性 Important Physical and chemical hazards

在强压变形、拆解、短路时有起火爆炸与化学烧伤等危险，在高温环境或放置于火焰环境中、超负荷使用时有起火爆炸危险。

When the battery is in extreme pressure deformation, high-temperature environment, overload, short-circuit condition, or disassemble the battery, an explosion of fire and chemical burn hazards may occur.

2) 对人体健康影响 Effects of the human health.

眼睛 Eyes

正常使用下无危害性，但在拆解、弯曲、短路可能会引起电池起火爆炸伤害眼睛。破损时挥发出气体会对眼睛产生刺激。

In normal condition, contact between the battery and eyes will not cause any harms. However, the gas Volatilize from a damaged battery may be harmful to eyes.

皮肤 Skin

正常情况下接触无对皮肤危害性。在电池破损情况下接触有可能引起化学烧伤或皮肤过敏发炎症状。

In normal condition, contact between the battery and skin will not cause any harms. Contact with a damaged battery may cause skin allergies or chemical burns.

吸入 Inhalation

完好电池并无挥发出可供吸入气体情况。破损时会挥发出微量气体会刺激呼吸道，严重者可能引起过敏反应。

A battery volatilizes no gas unless it was damaged. Damaged battery will volatilize little gas that may stimulate the respiratory tract or cause an anaphylaxis in serious condition.

食入 Ingestion

食入会对呼吸道产生伤害、对肠胃产生烧伤，严重会造成永久性损害

Swallowing battery will be damaged to the respiratory tract and cause chemical burns to the stomach; in serious conditions it will cause Permanent damage.

3. 成分/组成信息 Composition/information on ingredients

Hazardous Ingredients (Chemical Name)	Concentration or concentration ranges (%)	CAS Number
Lithium oxido(oxo)nickel	16	12031-65-1
Lithium cobaltite	6.4	12190-79-3
Lithium manganate	9.6	12057-17-9
Graphite	17	7782-42-5
Lithium hexafluorophosphate	2	21324-40-3



Ethylene carbonate	4	96-49-1
Ethyl methyl carbonate	7	623-53-0
Propylene carbonate	1	108-32-7
Nickel	2	7440-02-0
Aluminum	12	7429-90-5
Copper	8	7440-50-8
Carbon	2	7440-44-0
1.1-Difluoroethylene polymer	4	24937-79-9
Polyethylene	3	9002-88-4
Poly(ethylene terephthalate)	6	25038-59-9

4. 急救措施 First-aid measures

眼睛 Eyes

如有接触损坏电池，立即用清水清洗眼睛 15 分钟以上直至刺痛/刺激感消失为止，并及时去就医。

If your eyes contact with a damaged battery, flush with copious amount of water for at least 15 minutes until the stinging and irritation subside, and seek immediate medical attention.

皮肤 Skin

如有接触，立即脱下被污染衣服并用大量清水冲洗皮肤或淋浴，如灼伤感持续立刻去就医。

If your skin contact with a damaged battery, immediately take off contaminated clothing and flush your skin with copious amount of water or have a shower. Seek immediate medical attention if burning sensation continues.

吸入 Inhalation

立刻转移到空气新鲜环境下呼吸新鲜空气，休息。如出现呼吸困难或头晕头痛等症状立刻请人陪同去就医。

Remove to fresh air immediately and have a rest, If you feel dyspnea, dizziness or headache, seek immediate medical attention.

食入 Ingestion

如果食入电池，不要催吐且不要再吃下食物或喝饮料，立刻就医

If battery or open battery is ingested, do not induce vomiting or give food or drink. Seek medical attention immediately.

5. 消防措施 Fire-fighting measures

此产品在强压弯曲或短路等情况下容易起火并冒出大量烟雾，应正确使用并置于阴凉环境下，避免放置于高温、日光照射及受重压的地方。如发生起火，戴上防毒面具在条件允许情况下洒水或用灭火器让毗邻的未起火电池降温避免火势蔓延并用工具把起火电池和其他电池分离，让其自然熄灭；或用大量的水灭火，但起火电池一般都会在内部化学物质反应完后火才熄灭下来。如果有电池起火火势较大，立刻报火警并疏

散人员到安全地方。

This battery can get fire easily and made a lot of smoke under the forced bending and short-circuit condition, so it should be properly used and placed in a cool environment and Avoid placing the battery package under heat, pressure and direct sunlight. In the event of fire, wear gas masks and cool the adjacent batteries and control the spread of fire with water or extinguishers, separate the fire batteries with other batteries as conditions permit, let the fire naturally extinguished, otherwise put out the fire with lots of water. In normal condition the fire is not extinguished until the reactions that between the chemicals contained in the battery are completed. In the event of a big fire, report the fire immediately and evacuate to a safe place.

6. 泄漏应急处理 Accidental release measures

将溢漏物与电池清扫，并放进干燥可密闭的金属容器或材质不易燃的容器中，交由电池回收企业进行环保处理。避免电池弃扔到自然环境中。

Clean the spills and batteries, place them in a dry sealed metal container or nonflammable material container, and bring them to battery recycling companies to deal with environmental protection. Do not throw away the damaged batteries or waste batteries.

7. 操作处置与储存 Handling and storage

操作 Handling

不能擅自组装拆解电池或短路，不能让电池接近火源。运输电池应避免暴力装卸电池货物、避免电池受到挤压或剧烈振动。

Do not assemble and disassemble a battery, battery short-circuit is not allowed too. Keep the battery away from the fire. When transporting these batteries, the battery should be careful handling to avoid the battery being squeezed or excessive vibration.

储存 Storage

长时间存储前先充满电。电池应储存于阴凉环境中。

The battery should be fully charged before long term storage. The battery should be stored in a cool environment.

8. 接触控制和个体防护 Exposure controls/Personal Protection

工程控制 Engineering control

选择合理的通风设备，足够量的防毒面具灭火器及水源，配备存放泄漏电池的金属容器。配备洗浴设备。

Choose the suitable ventilation equipment; provide sufficient quantity of fire extinguishers, gas mask and water; equip with metal storage containers and bathing equipments.

呼吸系统防护 Respiratory protection

正常情况下无必要作防护 Normally there is no need to do protection.

眼睛防护 Eye protection

正常情况下无必要作防护 Normally there is no need to do protection.

身体和皮肤防护 The body and skin protection

正常情况下无必要作防护 Normally there is no need to do protection.

9. 理化特性 Physical and chemical properties

物品外观与形状 Object appearance and shape

棱柱形 Prismatic

气味 Odour

无 None

10. 稳定性和反应性 Stability and reactivity

稳定性 Stability

正常环境下稳定。 Stable under the regular environment.

应避免的条件 Should avoid conditions

高温或过湿环境, 撞击震动或受挤压, 正负极反接使用。

High temperature, wet environment, mechanical shock, vibration, crush, reverse polarity used should be avoided.

不相容物质 Incompatible materials

无 None

危险的分解产物 Hazardous decomposition products

在起火时会释放出刺鼻的浓烟雾。

When the battery catches fire, it will release pungent thick smoke.

11. 毒理学信息 Toxicological information

正常情况下接触电池无毒性作用。

In normal condition, contact with the battery is non-toxic.

12. 生态学信息 Ecological information

正常处理电池不会对生态环境产生影响。

Proper disposal of battery does not present ecological hazard.

13. 废弃处置 Disposal considerations

交由电池回收企业进行回收处置, 不能随意丢弃于环境中。具体参照有关国家相关法规。

It needs to be referred to the waste battery recycling companies for recycling disposal, cannot arbitrarily discarded in the environment. Specific conditions reference to the relevant national laws and regulations.

14. 运输信息 Transport information

该电池样品为三元锂离子电池组, 该电池型号已通过 UN38.3 测试。

This battery sample is NCM Li-ion Battery and This battery type is proved to meet the Requirements tests in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3.

UN No. UN 编号	Proper shipping name/Description (technical name) 运输专用名称	Class or Div.(Sub Hazard)危险类别	Packing Instruction 包装说明	Remark 备注
UN3480	Lithium ion batteries 锂离子电池	9	Section IA of PI 965 包装说明 PI965 的第 IA 部分	Lithium-ion cells and batteries must be transported in a state of SoC not exceeding 30% of their rated capacity; 锂离子电池芯和电池必须在荷电状态 (SoC) 不超过其额定容量的 30% 状态下进行运输;
UN3481	Lithium ion batteries packed with equipment 锂离子电池与设备包装在一起 Lithium ion batteries contained in equipment 锂离子电池安装在设备中	9	Section I of PI 966 包装说明 PI966 的第 I 部分 Section I of PI 967 包装说明 PI967 的第 I 部分	/

可按 IATA 国际航空运输协会《危险品规则》(第 65 版) 中包装说明 PI965~PI967 相关规定进行包装空运。
Can be transport by air according to the Packing Instructions 965, 966 and 967 of IATA Dangerous Goods Regulations relevant regulations (65th).

可按 IMDG《国际海运危险货物规则》2022 Edition (Amdt.41-22) 特殊规定第 188 条相关规定进行包装海运。
Can be transport by sea according to the special provision 188 of IMO *International Maritime Dangerous Goods Code* relevant regulations.

15. 法规信息 Regulatory Information

《危险品规则》 Dangerous Goods Regulations

《国际海运危险货物规则》 IMO International Maritime Dangerous Goods Code relevant regulations.

参照联合国, 国家, 地方性法规。

Refer to U. N., national, local regulations.

16. 其他信息 Other information

上述信息是基于现有的数据信息, 是我们目前所掌握的最佳资料。然而, 不对此类信息做出适当性担保或任何其他明示或默示担保, 我们也不承担使用此类信息所产生的任何责任。用户应自行调查, 以确定信息是否适合其特定目的。虽然在编制本报告所载的数据时采取了合理的预防措施, 但仅供你参考、考虑和调查。这份材料安全数据表为安全处理和使用本产品提供了指导方针; 它没有也不能就所有可能的情况提出建议; 因此, 应该评估你对本产品的具体使用情况, 以确定是否需要采取额外的预防措施。

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The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

UN38.3 检测报告

UN38.3 Test Report

Client 委托方	Zhenjiang Wanli New Energy Co., Ltd. 镇江市万锂新能源有限公司
Add. of Client 委托方地址	66 Zhenjiangcheng Road, Xinba, Yangzhong, Zhenjiang 镇江市扬中市新坝镇江城路 66 号
Samples Description 样品名称	NCM Li-ion Battery 三元锂离子电池组
Model/Type 型号规格	60V160Ah
Testing Laboratory 测试机构	Shenzhen NCT Testing Technology Co., Ltd. 深圳诺测检测技术有限公司 B2A101/B2A201/B2A202, Fuqiao 6th Area, Xintian, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China 广东省深圳市宝安区福海街道新田社区富桥六区 B2A101, B2A201, B2A202 Phone number 电话号码: +86-755-23218380 Email 邮箱: sales@nct-testing.com Website 网址: http://www.ncttesting.cn
Report No. 报告编号	NCT24019109XB1-1
Issued Date 发行日期	2024.05.07
Test Conclusion 测试结论: Shown in the Conclusion of test report. 见检测报告结论页.	

Tested by 主检人:

Michael Lei

Michael Lei

Approved by 批准人:

Boris Lin

Boris Lin

Inspected by 审核人:

Miya Li

Miya Li

Seal of NCT 报告单位 (盖章)

2008 Date of Issue 签发日期: 2024.05.07



I、Sample Description 样品描述

Product Name 产品名称	NCM Li-ion Battery 三元锂离子电池组		Sample Model 样品型号	60V160Ah	
Manufacturer 制造商	Zhenjiang Wanli New Energy Co., Ltd. 镇江市万锂新能源有限公司				
Manufacturer's Address 制造商地址	66 Zhenjiangcheng Road, Xinba, Yangzhong, Zhenjiang 镇江市扬中市新坝镇江城路 66 号				
Factory 工厂	Zhenjiang Wanli New Energy Co., Ltd. 镇江市万锂新能源有限公司				
Address 地址	66 Zhenjiangcheng Road, Xinba, Yangzhong, Zhenjiang 镇江市扬中市新坝镇江城路 66 号				
Manufacturer's contact information 制造商联系信息	Phone number 电话号码		E-mail address 电子邮箱地址		Website 网址
	+86-18651924300		3085666868@qq.com		---
Trade Mark 商标	---	Cell Shape 电芯形状	Prismatic 棱柱形	Battery Size 电池尺寸 (L×W×T)	(550 X 310 X 230)mm
Nominal Voltage 标称电压	60V	Rated Capacity 额定容量	160Ah 9.6kWh	Limited Charge Voltage 充电限制电压	71.4V
Standard Charge Current 标准充电电流	20A	Maximum Continuous Charge Current 最大持续充电电流	60A	End Charge Current 结束充电电流	0.5A
Cut-off Voltage 放电截止电压	47.6V	Standard Discharge Current 标准放电电流	30A	Maximum Discharge Current 最大放电电流	60A
Cell Number 组成电芯数量	17PCS		Cell Model 电芯型号	M32	
Sample Mass 样品重量	51201g		Sample Physical description 样品物理形态	Approximate Black Cuboid 黑色近长方体	
Receiving Date 接收日期	2024.04.07		Completing Date 完成日期	2024.05.07	

II、Standard 标准

UNITED NATIONS "Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.7+Amend.1 Section 38.3)

联合国《试验和标准手册》第七修订版及修正 1 第 38.3 节。

III、Test Item 测试项目

- | | |
|---|---|
| T.1. <input checked="" type="checkbox"/> Altitude simulation 高度模拟 | T.5. <input checked="" type="checkbox"/> External short circuit 外部短路 |
| T.2. <input checked="" type="checkbox"/> Thermal test 温度试验 | T.6. <input type="checkbox"/> Impact 撞击/ <input checked="" type="checkbox"/> Crush 挤压 |
| T.3. <input checked="" type="checkbox"/> Vibration 振动 | T.7. <input checked="" type="checkbox"/> Overcharge 过充电 |
| T.4. <input checked="" type="checkbox"/> Shock 冲击 | T.8. <input checked="" type="checkbox"/> Forced discharge 强制放电 |

IV、Test Method and Requirement 测试方法和要求

Tests T.1 to T.5 shall be conducted in sequence on the same cell or battery. Tests T.6 and T.8 shall be conducted using not otherwise tested cells. Test T.7 may be conducted using undamaged batteries previously used in tests T.1 to T.5 for purposes of testing on cycled batteries.

用相同的电芯或电池按照顺序进行试验 T.1 至 T.5。试验 T.6 至 T.8 用没有进行其他试验的电芯。试验 T7 可以使用原先在试验 T1 至 T5 中使用过的未损坏的电池进行，以便测试交替充电放电的电池。

Batteries of B1#~B2#、B5#~B6# are full charged after one cycle;

Batteries of B3#~B4#、B7#~B8# are full charged after twenty-five cycles;

Component cells of C1#~C5# are 50% charged after one cycle;

Component cells of C6#~C10# are 50% charged after twenty-five cycles;

Component cells of C11#~C20# are full discharged after one cycle;

Component cells of C21#~C30# are full discharged after twenty-five cycles;

Test environment condition: ambient temperature: 15-25°C, ambient humidity: 40-70%

电池 B1#~B2#、B5#~B6#为 1 次循环满电状态;

电池 B3#~B4#、B7#~B8#为 25 次循环满电状态;

组成电芯 C1#~C5#为 1 次循环后 50%充电状态;

组成电芯 C6#~C10#为 25 次循环后 50%充电状态;

组成电芯 C11#~C20#为 1 次循环完全放电状态;

组成电芯 C21#~C30#为 25 次循环完全放电状态;

试验环境条件: 环境温度: 15-25°C, 环境湿度: 40-70%

In order to quantify the mass loss, the following procedure is provided:

$$\text{Mass loss (\%)} = (M1-M2)/M1 \times 100$$

质量损失的量化值, 可用以下公式计算:

$$\text{质量损失(\%)}=(M1-M2)/M1 \times 100$$

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in Table below, it shall be considered as "no mass loss".

式中: M1 是试验前的质量, M2 是试验后的质量。如果质量损失不超过下表所列的数值, 应视为“无质量损失”。

Mass M of cell or battery 电芯或电池的质量	Mass loss limit 质量损失限值
M < 1g	0.5%
1g ≤ M ≤ 75g	0.2%
M > 75g	0.1%

Leakage means the visible escape of electrolyte or other material from a cell or battery or the loss of material (except battery casing, handling devices or labels) from a cell or battery such that the loss of mass exceeds the values in Table above.

渗漏系指可以看到的电解液或者其他物质从电芯或者电池中漏出，或电芯或电池中的物质损失（不包括电池外壳、搬运装置、或标签），失去的质量超过上表所列的数值。

In test T.1 to T.4, cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

在测试 T.1 至 T.4 中，电芯和电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.1. Altitude simulation 高度模拟

Test method 测试方法

Test cells and batteries are stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20±5°C).

试验电芯和电池被放置在压力等于或低于 11.6 kPa 和环境温度(20±5°C)下存放至少 6 小时。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.2. Thermal test 温度试验

Test method 测试方法

Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2°C, followed by storage for at least six hours at a test temperature equal to -40±2°C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20± 5°C). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

试验电芯和电池放置在试验温度等于 72±2°C 的条件下存放至少 6 小时，接着再在试验温度等于-40±2°C 的条件下存放至少 6 小时。两个极端试验温度之间的最大时间间隔为 30 分钟。此程序重复进行，共完成 10 次循环，接着将所有试验电芯和电池在环境温度(20±5°C)下存放 24 小时。对于大型电芯和电池，暴露于极端试验温度的时间至少应为 12 小时。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.3. Vibration 振动

Test method 测试方法

Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.

电芯和电池紧固于振动台面，但不得造成电芯变形，并能准确可靠地传播振动。振动应是正弦波形，对数扫描频率在 7 Hz 和 200 Hz 之间，再回到 7 Hz，跨度为 15 分钟。这一振动过程须对三个互相垂直的电芯安装方位的每一方向重复进行 12 次，总共为时 3 小时。其中一个振动方向必须与端面垂直。

The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (large batteries).

作对数式频率扫描，对电芯和总质量不超过 12 千克的电池（电芯和小型电池），和对质量超过 12 千克的电池（大型电池）有所不同。

For cells and small batteries : from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.

对电芯和小型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 8 gn（频率约为 50 Hz）。将峰值加速度保持在 8 gn 直到频率增加到 200 Hz。

For large batteries : from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the frequency is increased to 200 Hz.

对大型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 2 gn（频率约为 25Hz）。将峰值加速度保持在 2 gn 直到频率增加到 200 Hz。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.4. Shock 冲击

Test method 测试方法

Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.

试验电芯和电池用刚性支架紧固在试验装置上，支架支撑着每个试验电池的所有安装面。

Each cell shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Alternatively, large cells may be subjects to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds.

每个电芯须经受峰值加速度 150 gn 和脉冲持续时间 6 ms 的半正弦波冲击。不过，大型电芯须经受峰值加速度 50 gn 和脉冲持续时间 11 ms 的半正弦波冲击。

Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the battery. The pulse duration shall be 6 milliseconds for small batteries and 11 milliseconds for large batteries. The formulas below are provided to calculate the appropriate minimum peak accelerations.

每个电池须经受半正弦波冲击，峰值加速度需要根据电池的重量来决定。小型电池的脉冲持续时间为 6 ms，大型电池的脉冲持续时间为 11ms。下面的公式是用来计算合适的最小峰值加速度。

Battery	Minimum peak acceleration	Pulse duration
Small batteries	150 g _n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{100850}{mass^*}\right)}$ whichever is smaller	6 ms
Large batteries	50 g _n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{30000}{mass^*}\right)}$ whichever is smaller	11 ms

* Mass is expressed in kilograms.

电池	最小峰值加速度	脉冲持续时间
小型电池	150 gn 或计算结果中取最小的值 加速度 (gn) = $\sqrt{\left(\frac{100850}{mass}\right)}$	6ms
大型电池	50 gn 或计算结果中取最小的值 加速度 (gn) = $\sqrt{\left(\frac{30000}{mass}\right)}$	11 ms

Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.

每个电芯或电池须在三个互相垂直的电芯或电池安装方位的正方向经受三次冲击，接着在反方向经受三次冲击，总共经受 18 次冲击。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.5. External short circuit 外部短路

Test method 测试方法

The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57±4°C, measured on the external case. This period of time depends on the size and design of the cell or battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. Then the cell or battery at 57± 4°C shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

试验电芯或电池需要加热一段时间，以使其外壳温度均匀稳定地达到 57±4°C。加热时间的长短是由电芯或电池的尺寸和设计来决定的，这个加热时间需要评估并记录。如果这个加热时间不好评估的话，对于小电芯和小电池需要在此温度下放置至少 6 个小时，对于大电芯和大电池至少放置 12 个小时。然后使电芯或

电池在 $57\pm 4^{\circ}\text{C}$ 下经受总外电阻小于 0.1Ω 的短路条件。

This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to $57\pm 4^{\circ}\text{C}$, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value.

短路测试持续到电芯或电池外壳温度回到 $57\pm 4^{\circ}\text{C}$ 后至少持续 1 小时，针对大电池，外壳温度需要下降到测试过程中监控到的最大温度的一半以下。

The short circuit and cooling down phases shall be conducted at least at ambient temperature.

短路测试和冷却阶段至少应该在环境温度下进行。

Requirement 要求

Cells and batteries meet this requirement if their external temperature does not exceed 170°C and there is no disassembly, no rupture and no fire during the test and within six hours after test.

电芯和电池外壳温度不超过 170°C ，并且在试验过程中及试验后 6 小时内无解体、无破裂，无起火。

T.6. Impact / Crush 撞击/挤压

Test procedure – Impact (applicable to cylindrical cells not less than 18.0 mm in diameter)

测试步骤 – 撞击（适用于直径大于等于 18.0 毫米以上的圆柱形电芯）

The test sample cell or component cell is to be placed on a flat smooth surface. A $15.8\text{ mm} \pm 0.1\text{ mm}$ diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A $9.1\text{ kg} \pm 0.1\text{ kg}$ mass is to be dropped from a height of $61 \pm 2.5\text{ cm}$ at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.

试样电芯或电芯组件放在平坦光滑表面上，一根 316 型不锈钢棒横放在试样中心，钢棒直径 $15.8\text{ mm} \pm 0.1\text{ mm}$ ，长度至少 6 厘米，或电芯最长端的尺度，取二者之长者。将一块 $9.1\text{ kg} \pm 0.1\text{ kg}$ 的重锤从 $61 \pm 2.5\text{ cm}$ 高度跌落到钢棒和试样交叉处，使用一个几乎没有摩擦的、对落体重锤阻力最小的垂直轨道或管道加以控制。垂直轨道或管道用于引导落锤沿与水平支撑表面呈 90° 度落下。

The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the $15.8\text{ mm} \pm 0.1\text{ mm}$ diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

受撞击的试样，纵轴应与平坦表面平行并与横放在试样中心的直径 $15.8 \pm 0.1\text{ mm}$ 弯曲表面的纵轴垂直。每一试样只经受一次撞击。

Test procedure – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter)

测试步骤 – 挤压（适用于棱柱形，袋状，硬币/纽扣电芯和圆柱形电芯直径小于 18.0 毫米）

A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.

将电芯或电芯组件放在两个平面之间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约为 1.5 cm/s 。挤压持续进行，直到出现以下三种情况之一：

- (a) The applied force reaches $13\text{ kN} \pm 0.78\text{ kN}$;
 - (b) The voltage of the cell drops by at least 100 mV ;
 - (c) The cell is deformed by 50% or more of its original thickness.
- (a) 施加的力达到 $13\text{ kN} \pm 0.78\text{ kN}$;
- (b) 电芯的电压下降至少 100 mV ;
- (c) 电芯形变达到原始厚度的 50% 或更多。

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.

一旦达到最大压力、电压下降 100mV 或更多，或电芯形变至少达到原始厚度的 50%，即可解除压力。

A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis.

棱柱形或袋装电芯须从最宽的面施压。纽扣/硬币形电芯应从其平坦表面施压。圆柱形电芯应从与纵轴垂直的方向施压。

Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.

每个试样电芯或电芯组件只做一次挤压试验。试样须继续观察 6 小时。试验须使用之前未做过其他试验的试样电芯或电芯组件进行。

Requirement 要求

Cell and component cells meet this requirement if their external temperature does not exceed 170°C and there is no disassembly and no fire during the test and within six hours after test.

电芯和电芯组件外壳温度不超过 170°C，并且在试验过程中及试验后 6 小时内无解体，无起火。

T.7. Overcharge 过充电

Test method 测试方法

The charge current shall be twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows:

充电电流为制造商推荐的最大持续充电电流的两倍。试验的最小电压如下：

(a) When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V.

(b) When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of

the test shall be 1.2 times the maximum charge voltage.

(a) 制造商推荐的充电电压不大于 18 伏时，试验的最小电压应是电池最大充电电压的两倍或 22 伏两者中的较小者。

(b) 制造商推荐的充电电压大于 18 伏时，试验的最小电压应是电池最大充电电压的 1.2 倍。

Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.

试验应在环境温度下进行。进行试验的时间应为 24 小时。

Requirement 要求

Rechargeable batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

充电电池应在试验过程中和试验后 7 天内无解体，无起火。

T.8. Forced discharge 强制放电

Test method 测试方法

Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer.

每个电芯在环境温度下与 12V 直流电电源串联在起始电流等于制造商给定的最大放电电流的条件下强制放电。

The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell is forced discharged for a time interval (in hours) equal to its

rated capacity divided by the initial test current (in ampere).

试样电芯与一个适当大小的电阻负载串联以调节到规定大小的放电电流。每个电芯的放电时间（单位为 h）等于电芯的额定容量除以试验初始放电电流（单位 A）。

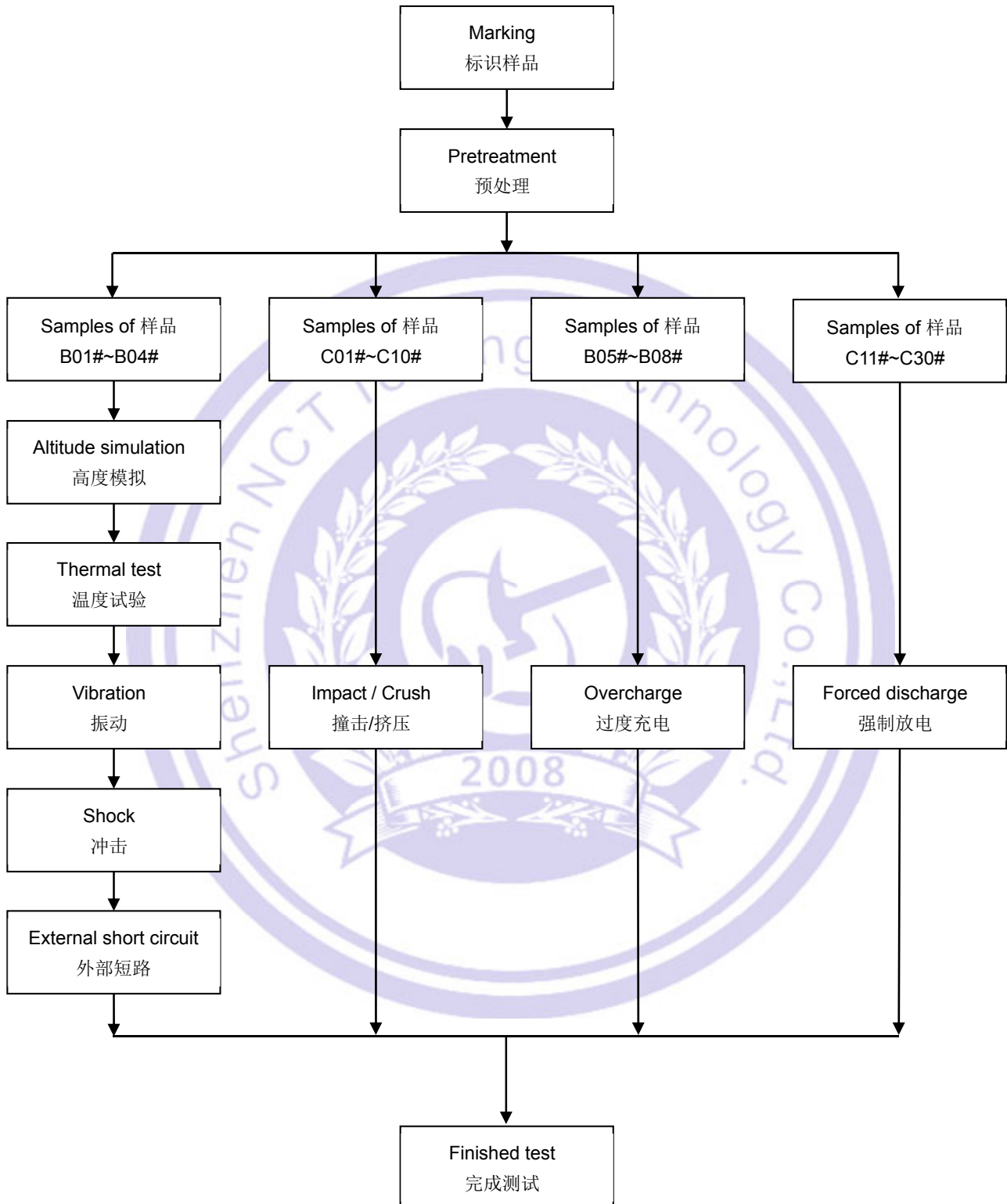
Requirement 要求

Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

原电芯或充电电芯应在试验过程中和试验后 7 天内无解体，无起火。



V、Test Procedure 测试流程



VI、Test Data 测试数据

T.1 Altitude simulation 高度模拟

No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
	Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
B01	51163	71.239	51160	71.226	0.006	99.982	Pass 合格
B02	51201	71.183	51199	71.145	0.004	99.947	Pass 合格
B03	51193	71.185	51188	71.140	0.010	99.937	Pass 合格
B04	51199	71.147	51195	71.118	0.008	99.959	Pass 合格

No. B01-B02: At first cycle, in fully charged states
 编号 B01-B02: 第 1 个充电周期，完全充电状态

No. B03-B04: After 25 cycles ending in fully charged states
 编号 B03-B04: 第 25 个充电周期，完全充电状态

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{Pa}$, Ambient temperature 环境温度: $23.3 \text{ }^\circ\text{C}$
 After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
 测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.2 Thermal test 温度试验

No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
	Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
B01	51160	71.226	51137	70.191	0.045	98.547	Pass 合格
B02	51199	71.145	51175	70.142	0.047	98.590	Pass 合格
B03	51188	71.140	51166	70.183	0.043	98.655	Pass 合格
B04	51195	71.118	51173	70.090	0.043	98.555	Pass 合格

No. B01-B02: At first cycle, in fully charged states

编号 B01-B02: 第 1 个充电周期, 完全充电状态

No. B03-B04: After 25 cycles ending in fully charged states

编号 B03-B04: 第 25 个充电周期, 完全充电状态

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{Pa}$, Ambient temperature 环境温度: $23.6 \text{ }^\circ\text{C}$

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。

T.3 Vibration 振动

No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
	Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
B01	51137	70.191	51130	70.128	0.014	99.910	Pass 合格
B02	51175	70.142	51164	70.035	0.021	99.847	Pass 合格
B03	51166	70.183	51155	70.064	0.021	99.830	Pass 合格
B04	51173	70.090	51166	70.051	0.014	99.944	Pass 合格

No. B01-B02: At first cycle, in fully charged states

编号 B01-B02: 第 1 个充电周期, 完全充电状态

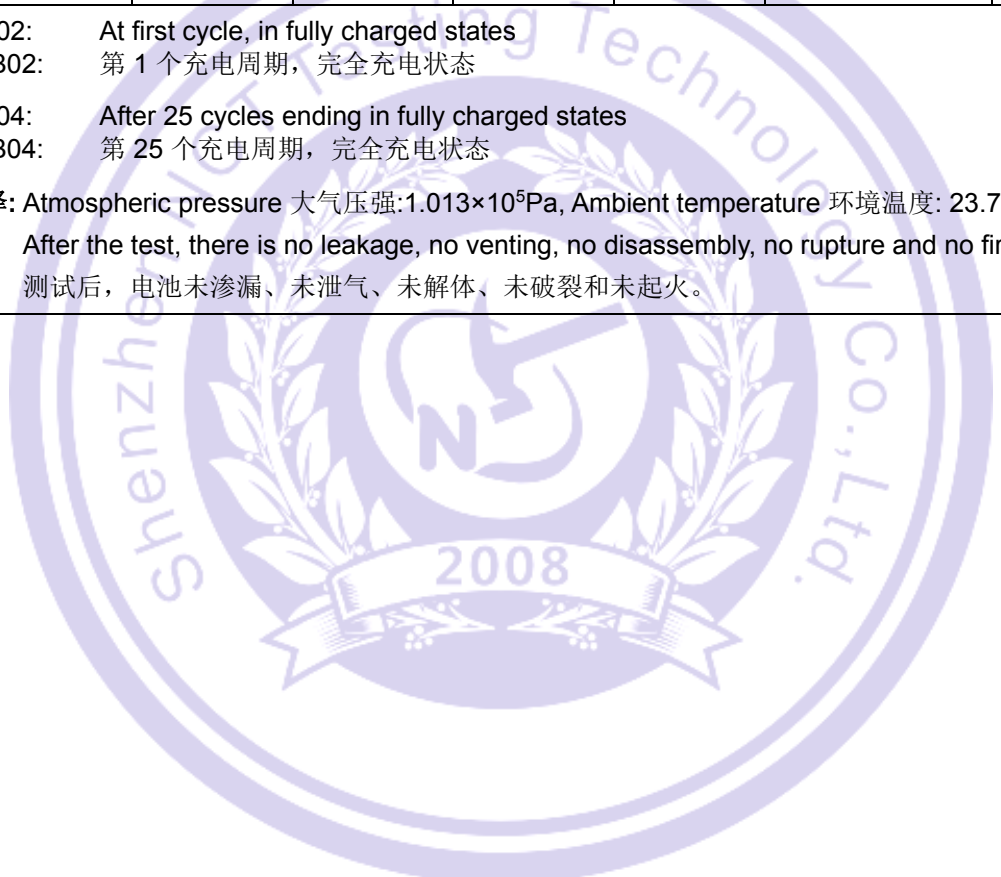
No. B03-B04: After 25 cycles ending in fully charged states

编号 B03-B04: 第 25 个充电周期, 完全充电状态

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{Pa}$, Ambient temperature 环境温度: 23.7°C

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。



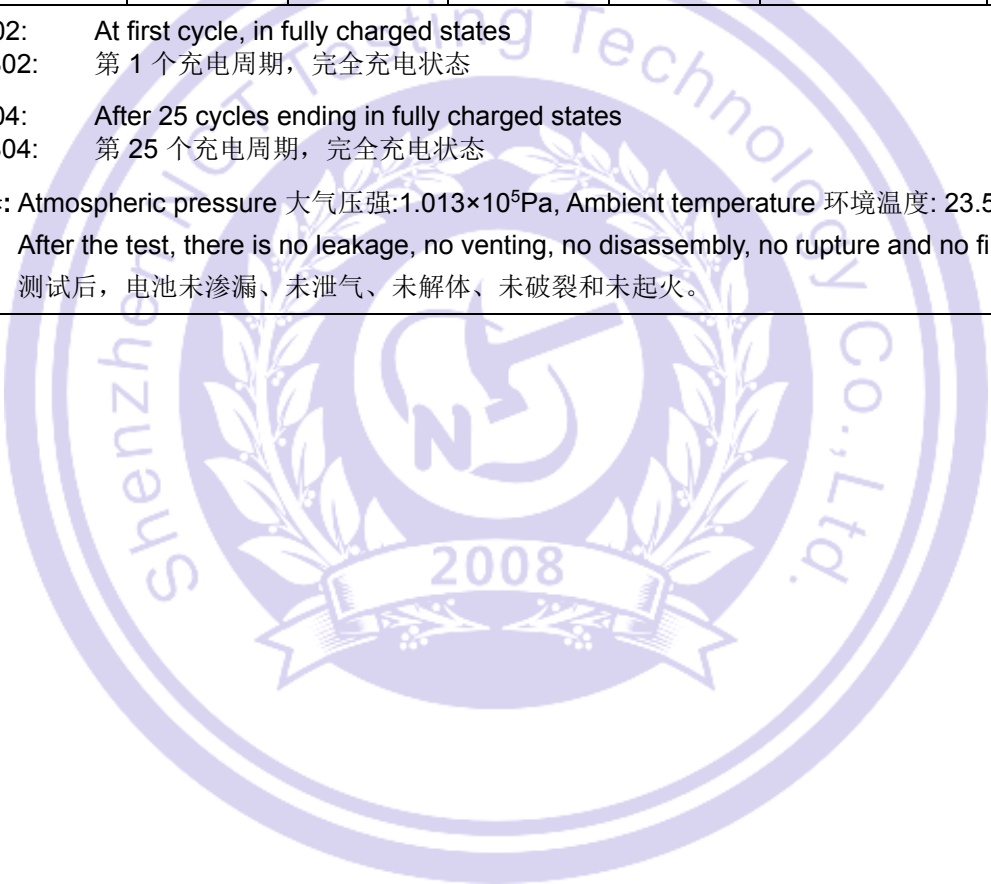
T.4 Shock 冲击

No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
	Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
B01	51130	70.128	51125	70.101	0.010	99.961	Pass 合格
B02	51164	70.035	51162	69.993	0.004	99.940	Pass 合格
B03	51155	70.064	51153	69.989	0.004	99.893	Pass 合格
B04	51166	70.051	51162	70.027	0.008	99.966	Pass 合格

No. B01-B02: At first cycle, in fully charged states
 编号 B01-B02: 第 1 个充电周期, 完全充电状态

No. B03-B04: After 25 cycles ending in fully charged states
 编号 B03-B04: 第 25 个充电周期, 完全充电状态

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{Pa}$, Ambient temperature 环境温度: $23.5 \text{ }^\circ\text{C}$
 After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
 测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。



T.5 External short circuit 外部短路

No. 编号	Max. External Temperature 样品表面最高温度(°C)	Status 结果
B01	58.0	Pass 合格
B02	57.0	Pass 合格
B03	58.1	Pass 合格
B04	58.2	Pass 合格

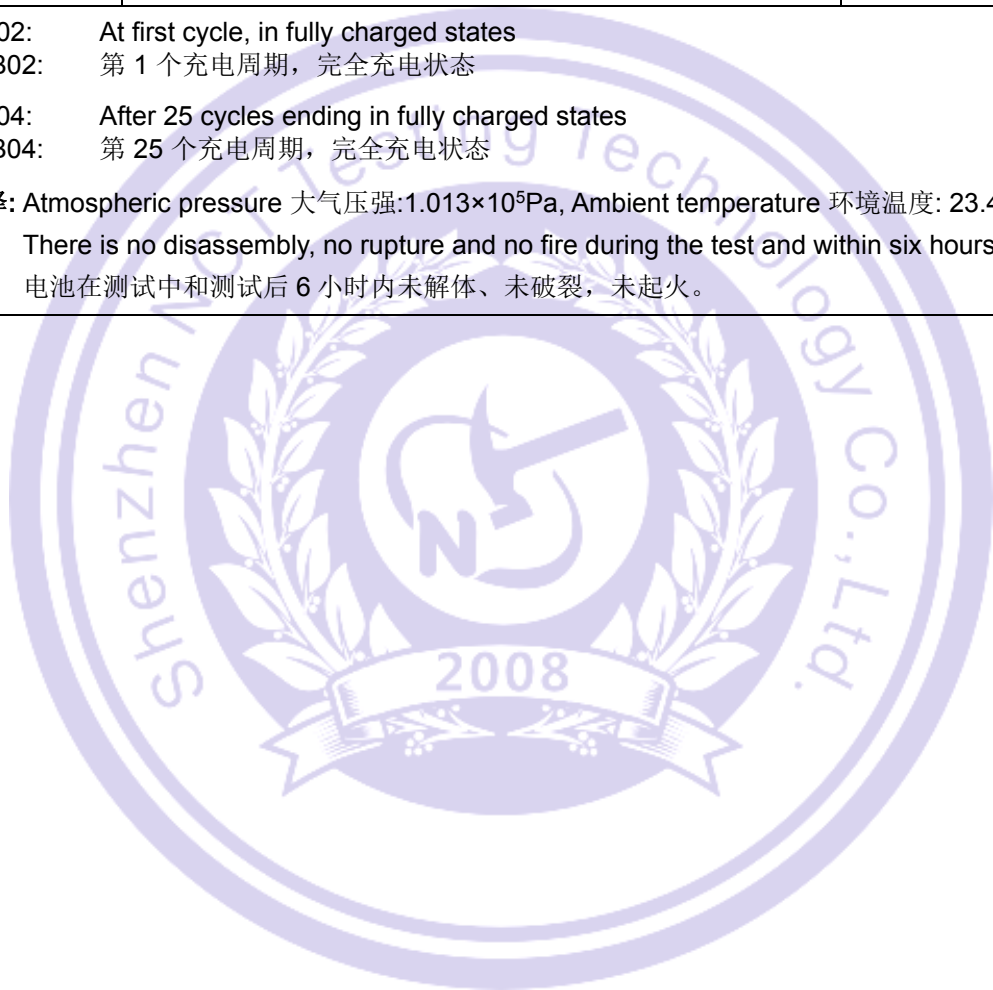
No. B01-B02: At first cycle, in fully charged states
编号 B01-B02: 第 1 个充电周期, 完全充电状态

No. B03-B04: After 25 cycles ending in fully charged states
编号 B03-B04: 第 25 个充电周期, 完全充电状态

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{Pa}$, Ambient temperature 环境温度: $23.4 \text{ }^\circ\text{C}$

There is no disassembly, no rupture and no fire during the test and within six hours after test.

电池在测试中和测试后 6 小时内未解体、未破裂, 未起火。



T.6 Crush 挤压

No. 编号	Max. External Temperature 样品表面最高温度(°C)	Status 结果
C01	22.2	Pass 合格
C02	22.7	Pass 合格
C03	23.7	Pass 合格
C04	22.4	Pass 合格
C05	22.9	Pass 合格
C06	23.2	Pass 合格
C07	23.9	Pass 合格
C08	22.3	Pass 合格
C09	22.8	Pass 合格
C10	22.5	Pass 合格
<p>No. C01-C05: At first cycle at 50% of the design rated capacity 编号 C01-C05: 第 1 个充放电周期 50%设计额定容量状态</p> <p>No. C06-C10: After 25 cycle at 50% of the design rated capacity 编号 C06-C10: 第 25 个充放电周期 50%设计额定容量状态</p> <p>Notes 注释: Atmospheric pressure 大气压强:1.013×10⁵Pa, Ambient temperature 环境温度: 22.2 °C There is no disassembly and no fire during the test and within six hours after test. 电芯在测试中和测试后 6 小时内未解体、未起火。</p>		

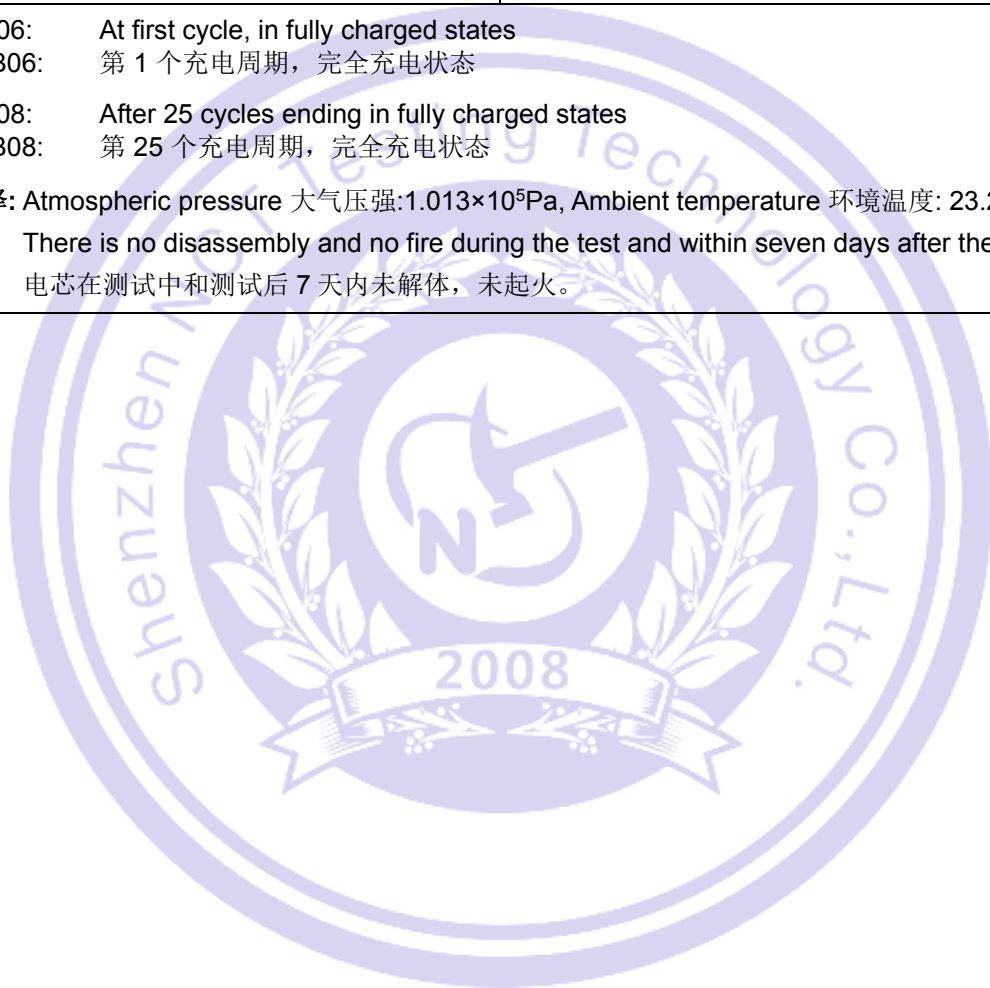
T.7 Overcharge 过度充电

No. 编号	Status 结果
B05	Pass 合格
B06	Pass 合格
B07	Pass 合格
B08	Pass 合格

No. B05-B06: At first cycle, in fully charged states
编号 B05-B06: 第 1 个充电周期, 完全充电状态

No. B07-B08: After 25 cycles ending in fully charged states
编号 B07-B08: 第 25 个充电周期, 完全充电状态

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{Pa}$, Ambient temperature 环境温度: $23.2 \text{ }^\circ\text{C}$
There is no disassembly and no fire during the test and within seven days after the test.
电芯在测试中和测试后 7 天内未解体, 未起火。



T.8 Forced discharge 强制放电

No. 编号	Status 结果
C11	Pass 合格
C12	Pass 合格
C13	Pass 合格
C14	Pass 合格
C15	Pass 合格
C16	Pass 合格
C17	Pass 合格
C18	Pass 合格
C19	Pass 合格
C20	Pass 合格
C21	Pass 合格
C22	Pass 合格
C23	Pass 合格
C24	Pass 合格
C25	Pass 合格
C26	Pass 合格
C27	Pass 合格
C28	Pass 合格
C29	Pass 合格
C30	Pass 合格

No. C11-C20: At first cycle in fully discharged states

编号 C11-C20: 第 1 个充放电周期，完全放电状态

No. C21-C30: After 25 cycles ending in fully discharged states

编号 C21-C30: 第 25 个充放电周期，完全放电状态

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{Pa}$, Ambient temperature 环境温度: $23.6 \text{ }^\circ\text{C}$

There is no disassembly and no fire during the test and within seven days after the test.

电芯在测试中和测试后 7 天内未解体，未起火。

VII、Conclusion 结论

No. 编号	Test item 测试项目	Sample number 样品数量	Test reference 测试参考	Conclusion 结论
1	Altitude simulation 高度模拟	B01#~B04#	UN Manual of Test and Criteria, part III, subsection 38.3.4.1 UN 试验和标准手册,第III部分,第38.3.4.1节	Pass 合格
2	Thermal test 温度试验		UN Manual of Test and Criteria, part III, subsection 38.3.4.2 UN 试验和标准手册,第III部分,第38.3.4.2节	Pass 合格
3	Vibration 振动		UN Manual of Test and Criteria, part III, subsection 38.3.4.3 UN 试验和标准手册,第III部分,第38.3.4.3节	Pass 合格
4	Shock 冲击		UN Manual of Test and Criteria, part III, subsection 38.3.4.4 UN 试验和标准手册,第III部分,第38.3.4.4节	Pass 合格
5	External short circuit 外部短路		UN Manual of Test and Criteria, part III, subsection 38.3.4.5 UN 试验和标准手册,第III部分,第38.3.4.5节	Pass 合格
6	Impact/Crush 撞击/挤压	C01#~C10#	UN Manual of Test and Criteria, part III, subsection 38.3.4.6 UN 试验和标准手册,第III部分,第38.3.4.6节	Pass 合格
7	Overcharge 过度充电	B05#~B08#	UN Manual of Test and Criteria, part III, subsection 38.3.4.7 UN 试验和标准手册,第III部分,第38.3.4.7节	Pass 合格
8	Forced discharge 强制放电	C11#~C30#	UN Manual of Test and Criteria, part III, subsection 38.3.4.8 UN 试验和标准手册,第III部分,第38.3.4.8节	Pass 合格

The submitted samples were complied with the stated requirements of UN manual of test and criteria, part III, subsection 38.3, the test result is qualified.

经检测，提交的测试样品均符合 UN38.3 的要求，测试结论为合格。

VIII、Photo of The Sample 样品图片

Model 型号: 60V160Ah

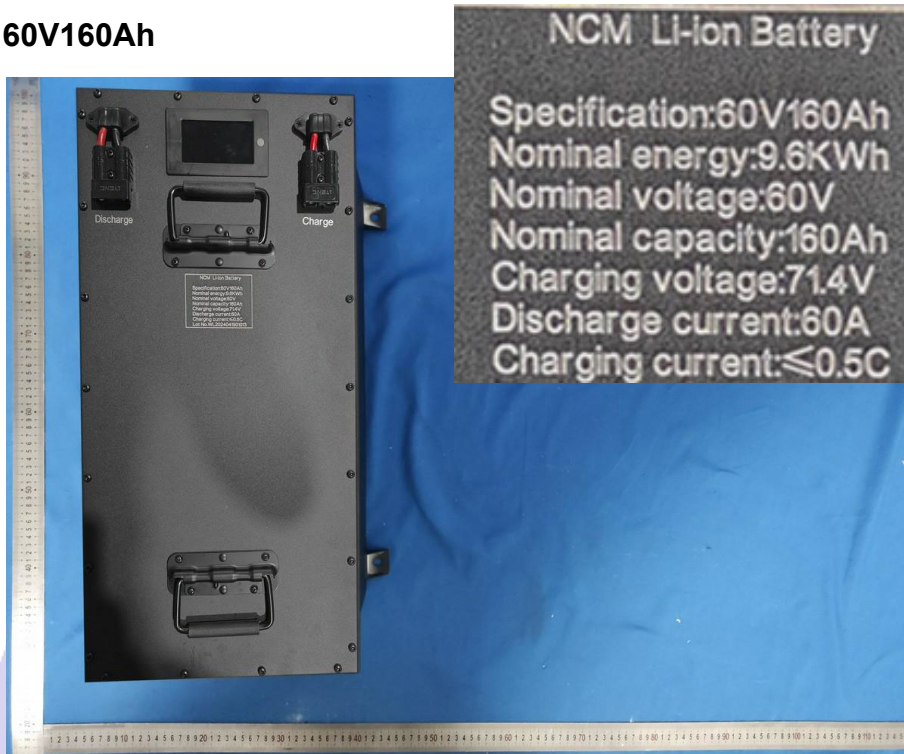


Photo 1 Front 正面

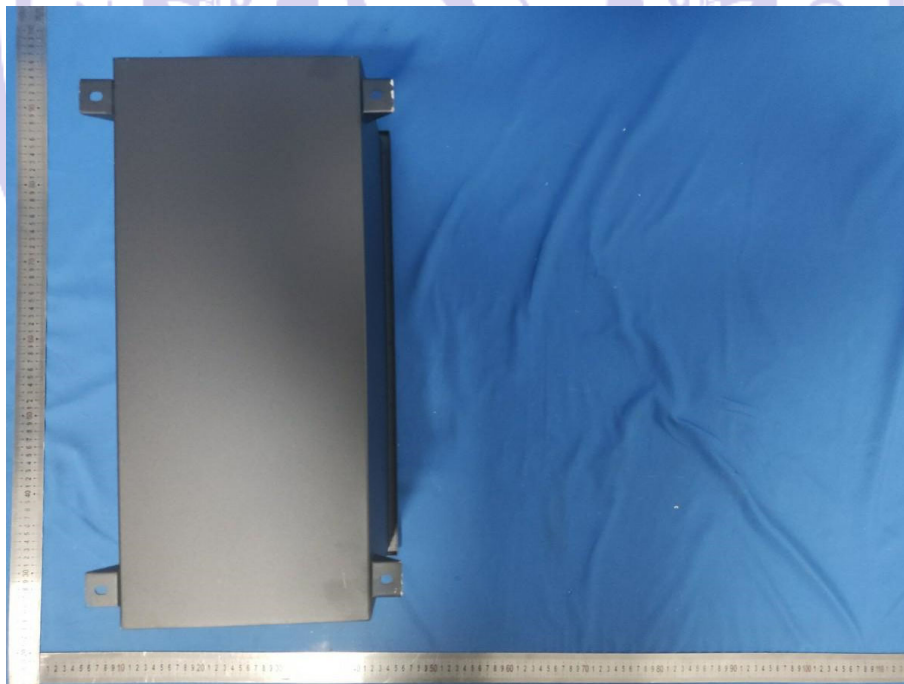


Photo 2 Rear 反面

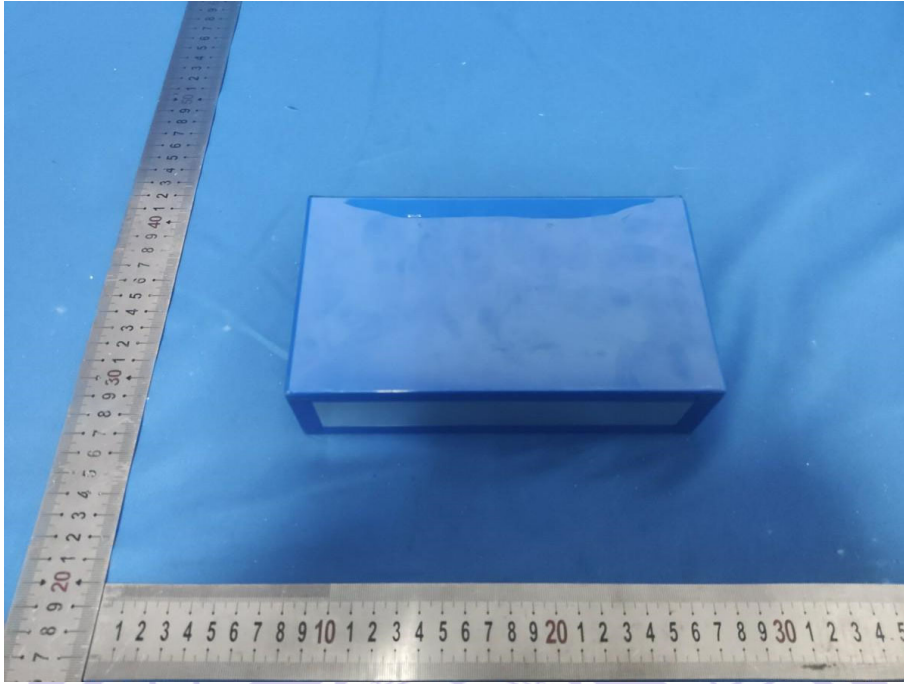


Photo 3 Internal Cell 内部电芯

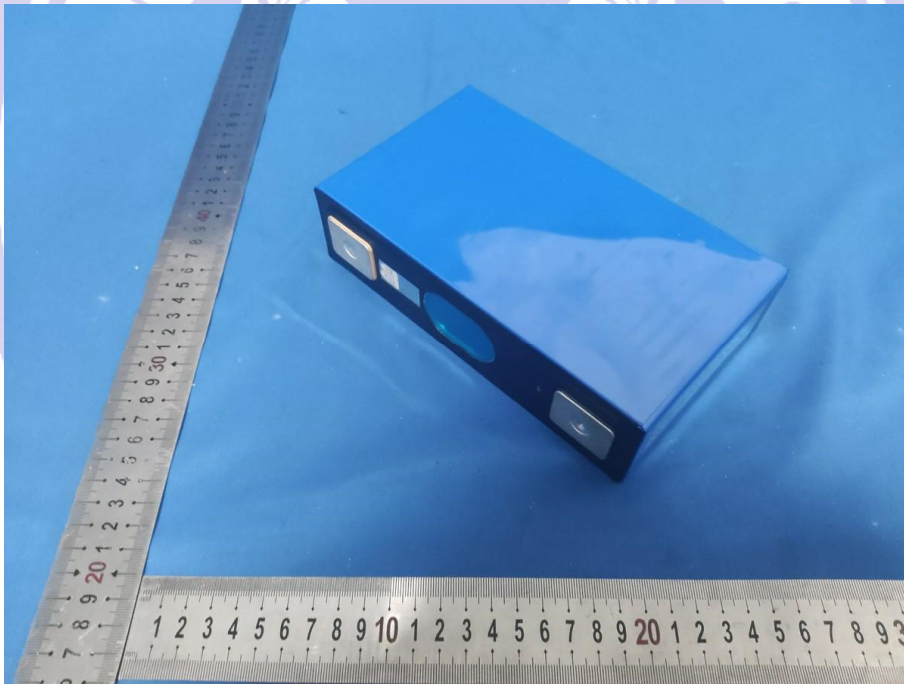


Photo 4 Internal Cell 内部电芯

注意事项

Important Notice

1. The test report is invalid without the official stamp of NCT.
本报告书无 NCT 盖章无效。
2. Nobody is allowed to photocopy or partly photocopy this test report without written permission of NCT.
未经 NCT 书面同意，不得部分地复制本报告书。
3. The test report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.
本报告书无批准人、审核人、及主检人签名无效。
4. The report is invalid when anything of following happens – illegal transfer, reproduce, embezzlement, imposture, modification or tampering in any media form.
私自转让、复制、盗用、冒用、涂改、或以任何媒体形式篡改的报告书无效。
5. Objections to the test report must be submitted to NCT within 15 days.
对报告书若有异议，应于收到报告之日起 15 天内向本公司提出。
6. The test report is valid for the tested samples only.
本报告仅对测试样品有效。
7. The Chinese contents in this report are only for reference.
本报告中的中文内容仅供参考。

*****End of Report 报告结束*****



镇江市万锂新能源有限公司

Zhenjiang WANLI New Energy Co., LTD

电动车用锂电池使用说明书

**THE TECHNICAL MANUUAL OF LITHIUM
BATTERY FOR ELECTRIC TRICYCLE**

镇江市万锂新能源有限公司

ZHENJIANG WANLI NEW ENERGY CO., LTD



镇江市万锂新能源有限公司

Zhenjiang WANLI New Energy Co., LTD

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1. 产品使用方法 Method of using products

1.1 电池充电 Battery charging

电动车运行停止后，应对电池进行及时充电。本公司锂电池必须与本公司充电器配套使用。严禁使用被改装过的或者损坏的充电器。严禁使用铅酸电池充电器给锂电池充电。充电时先插入电源再插入电池，充电 6~7 小时至充电器指示红灯转换成绿灯即可。充电完成后先拔掉电池再拔掉电源。充电完成后及时拔掉充电器，避免长时间充电。

After the electric vehicle operation is stopped, the battery should be charged in time. **The company's lithium battery must be used with our company charger. Do not use a modified or damaged charger. It is strictly prohibited to use a lead-acid battery charger to charge the lithium batteries.** When charging, plug in the power supply and then plug in the battery. Charge for 6 to 7 hours until the charger indicates the red light to green light. After charging, remove the battery before unplug the power supply. Unplug the charger in time after the charging is completed to avoid long-term charging.

原车是三孔品字头需使用配套的转接线转接。

The original bicycle is a three-hole character need to use the matching wire connection.

严禁室内充电！

Indoor charging is strictly prohibited

在充电时尽量关闭电动车的大部分功能，以减少电池的负载。

Try to turn off most of the functions of the electric vehicle when charging, in order to reduce the battery load.

避免在高温或潮湿的环境中为电动车充电。

Avoid charging electric vehicles in high-temperature or humid environments.

电池必须在 0℃~45℃ 的环境温度范围内进行充电。

The battery must be charged within an ambient temperature range of 0°C to 45°C.



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1.2 电池放电 Battery discharge

电动车控制器电流不得超过电池所标注的最大放电电流。

The electric vehicle controller current shall not exceed the maximum discharge current specified by the battery.

严禁电池正负极短接！

Prohibit the battery positive and negative extreme short connection!

严禁电池与负载设备的正负极反接！

It is strictly prohibited to connect the positive and negative electrodes of the load equipment!

车辆必须匹配相适应的空气开关，确保空气开关能有效工作。

The vehicle must be matched with suitable air switches to ensure that the air switch works effectively.

电池必须在 -20°C ~ 45°C 的环境温度范围内进行放电。

The battery must be discharged within an ambient temperature range of -20°C to 45°C .

2. 电池使用注意事项 Note for battery use

1、请勿将电池浸泡在水中！

Do not soak the battery in water!

2、严禁在火源或极热条件下给电池充电！勿在热源（如火或加热器）附近使用或贮存电池！

Do not charge the battery under the fire source or extremely hot conditions! Do not use or store batteries near a heat source (such as a fire or a heater)!

3、严禁将电池直接连接到墙上插座或车载点烟式插座上！

Do not connect the battery directly to the wall socket or car smoke lighting socket!

4、严禁将电池投入火中或给电池加热！



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Do not put the battery into the fire or heat the battery!

5、严禁用导线或其它金属物体将电池正负极短路，严禁将电池与其它金属物体一起运输或贮存！

It is strictly prohibited to use wires or other metal objects to short circuit the positive and negative electrodes of the battery. It is strictly prohibited to transport or store the battery together with other metal objects!

6、严禁使用尖锐物体刺穿电池壳体，严禁锤击或脚踏电池！

Do not use sharp objects to puncture the battery shell, do not hammer or pedal battery!

7、严禁撞击、抛摔投掷电池，严禁将电池从高空坠落；

It is strictly prohibited to hit or throw the battery, and to fall the battery from high altitude;

8、严禁以任何方式分解电池，严禁随意拆卸或擅自改装电池！

It is strictly prohibited to decompose the battery in any way, and it is strictly prohibited to dismantle or refit the battery without authorization!

9、严禁将电池置入压力容器中！

Never put the battery into the pressure vessel!

10、严禁与其他电池或不同容量、型号、品种电池组合串联并联使用！

It is strictly prohibited to use in parallel with other batteries or batteries of different capacity, models and varieties!

11、如果电池发出异味、发热、变形、变色或出现其它任何异常现象时不得使用，如果电池正在使用或充电，应立即断开负载输出或立即断开充电输入！

If the battery smells, heat, deformation, discoloration, or any other abnormal phenomenon, if the battery is in use or charged, disconnect the load output or the charging input immediately!

12、锂电池避免在阳光直射下使用，存放，充电；

Lithium battery to avoid the use in direct sunlight, storage, charging;

13、必须使用原厂充电器进行充电，严禁使用铅酸充电器充电；

Must use the original factory charger for charging, and it is strictly prohibited to use the lead-acid charger to charge;



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14、电池不使用时，做好绝缘，防止重压和儿童接触，按存储说明操作；

When the battery is not in use, make insulation to prevent the contact with children and operate according to the storage instructions;

15、在海拔 2000 米以下地区使用。

It is used below 2,000 meters above sea level.

3. 锂电池存储运输说明 Lithium battery storage and transportation instructions

1、锂离子电池应被储存于比较阴凉，干燥，通风的环境中，应远离火源和高温的地方。

电池储存温度必须在 $-10^{\circ}\text{C}\sim 45^{\circ}\text{C}$ 的范围内，长期存储电池（超过 3 个月）须置于温度为 $23\pm 5^{\circ}\text{C}$ 、湿度为 $65\pm 20\%\text{RH}$ 。

Lithium-ion batteries should be stored in a cool, dry, ventilated environment, far away from fire and high temperatures. The battery storage temperature must be in the range of $-10^{\circ}\text{C} \sim 45^{\circ}\text{C}$, and the long-term storage battery (over 3 months) must be placed at a temperature of $23 \pm 5^{\circ}\text{C}$ and a humidity of $65 \pm 20\% \text{RH}$.

2、存储电压：电压为 63V~68V（60V 电池组）

Storage voltage: The voltage ranges from 63 V to 68 V（60V battery pack）

3、电池应按储存要求存放，超过 3 个月应补电至 63V~68V。（60V 电池组）

The battery shall be stored according to the storage requirements, and shall be replenished to 63V~68V after 3 months.（60V battery pack）

4、不要在环境温度高于 55°C 时运输电池。

Do not transport batteries at ambient temperatures above 55°C .



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4. 质量保证 Quality assurance

1、开箱后如发现损坏，应查明后及时与经销商或制造商联系。

If any damage is found after unpacking, contact the dealer or manufacturer in time.

2、保修期：自出厂之日起 2 年。

Warranty period: 2years from the date of factory

3、不实行保修的注意事项：

Notes without warranty:

1. 超过保修有效期；

Over the warranty period;

2. 无保修凭证及有效票据的；

Without a warranty certificate or a valid bill;

3. 保修凭证上的内容与商品实物标识不符或经涂改的；

The contents on the warranty certificate are inconsistent with the physical mark of the goods or have been altered;

4. 未按本产品使用说明要求而造成损坏的；

According to the requirements of the product;

5. 对本产品自进行拆动或损坏的；

The product is dismantled or damaged itself;

6. 因不可抗力力造成损坏的；

Damage caused by force majeure;

7. 使用服务仅限电池本身，因电池失效产生的其它损失不属于保用责任范围；

The use of services is only limited to the battery itself, and other losses caused by the battery failure do not fall within the scope of warranty liability;



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保修凭证

Warranty voucher

经销商 Dealer _____

经销商地址 Dealer address _____

经销商电话 Dealer phone number _____

售货日期 Date of sale _____

发票号 invoice number _____

电池型号 Battery model number _____

电池编号 Battery serial number _____

消费者姓名 Consumer name _____

消费者电话 Consumer phone _____