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**NO.： WBY-YJY-CN2024081503-01-0HF**

# 48V30Ah

# Product Specification

# A0 Version

| Prepared By | Checked By | Approved By |
|---|---|---|
| | | |

| Customer Approved | Signature: |
|---|---|
| | Date: |
| | Company Name: （Company Stamp） |

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| Anhui Lvwo Energy Technology Co., Ltd. | Contract NO.： LW-YJY-CN2024081503-01-0HF |
|---|---|

## Description of changes to technical documents

**Changes to successive versions of this document are set out below：**

| NO. | Version NO. | Description of changes | Changing Time | Modifier |
|---|---|---|---|---|
| 1 | A0 | Initial version | 2024-8-15 | |
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# I. Scope of application

This specification sheet is suitable for the development of backup power 48V30A battery pack by Anhui Lvwo Energy Technology Co., Ltd. It describes the external dimensions, performance indicators, parameter settings of BMS, appearance identification of the battery pack, conditions for use and storage, as well as usage guidelines.

# II. Battery system design reference technical document

GB/T 191 Packaging Storage and Transportation Graphical Symbol

GB/T 2408-2008 Determination of Combustion Properties of Plastics Horizontal Method and

Vertical Method

GB/T 2829-2002 Periodic Inspection Count Sampling Procedure and Table (Suitable for Inspection of Process Stability)

GB/T 17626.2-2018 Electromagnetic Compatibility Test and Measurement Technology Electrostatic Discharge Immunity Test

GB/T 17626.5-2019 Electromagnetic Compatibility Test and Measurement Technology Surge

(Shock) Immunity Test

GB/T 20626.1-2006 Specifies General Technical Requirements for High Altitude Electrical and Electronic Products under Special Environmental Conditions.

GB 50689-2011 Communication Station Lightning Protection and Grounding Engineering Design Specification.

YD/T 983 Communication Power Equipment Electromagnetic Compatibility Limits and Measurement Methods

YD/T 1051-2018 General Technical Requirements for Power Supply System of Communication Bureau (Station)

YD/T 1363.3-2014 Communication Bureau (Station) Power Supply, Air Conditioning, and Environmental Centralized Monitoring and Management System Part 3: Front-end Intelligent

Device Protocol

YD/T 5040-2010 Engineering Installation and Design Specifications for Communication

Power Equipment

# III. Supply list

| No. | Version | Unit | Quantity | Notes |
|---|---|---|---|---|
| 1 | 48V30Ah battery | PCS | 1 | |
| 2 | Product Specification | PCS | 1 | |
| 3 | Mounting screw | PCS | 1 | |
| 4 | Product Qualification Certificate | PCS | 1 | |

### 3.1 Battery system usage requirements

The external operating temperature requirements for battery system: charging and discharging： charging -10℃～60℃, discharging -20℃～60℃;

External environmental humidity requirements for battery system operation: 10%≤humidity≤90%RH;

Battery system operation state should try to maintain more than 20% SOC;

When the battery system is not in use for a short period of time, it is required to maintain more than 60% SOC and be stored in a dry, clean and well-ventilated warehouse at 5℃～45℃.

During the loading process of the battery pack, it is required to carry and put it gently, and strictly prevent it from falling, rolling and impacting;

The battery pack shall not be placed upside down or lying down in the storage state; it is strictly prohibited to expose the battery pack to sunlight, rain or water for a long time;

Ensure that the battery system in the operation or storage state should be away from flammable and explosive substances, high temperature environment;

It is strictly prohibited to force the battery system to operate under the state of short circuit, overcharge and high temperature alarm;

Strictly prohibit customers from disassembling the battery system without permission;

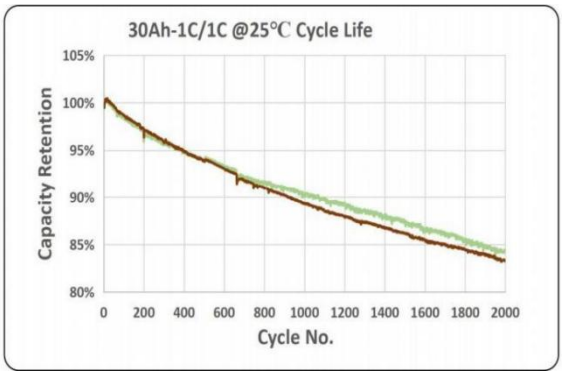
### 3.2 Battery pack performance technical specifications

Testing condition

If there is no special requirement, the experiment should be carried out in the environment of temperature: 25℃±2℃, relative humidity: 15~90 %RH, atmospheric pressure: 70kPa~106kPa

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## Basic performance

| No. | Items | Parameters | Notes |
|---|---|---|---|
| **Cell parameters** | | | |
| 1 | Battery type | Lithium iron phosphate battery | |
| 2 | Rated voltage/capacity | 3.2V30A | |
| 3 | Cell voltage range | 2.0V-3.65V | |
| 4 | Cell weight | 612±18g | |
| 5 | Dimension（Thickness*Width*Height） | 21.3*100.4*144.9（±0.5）mm | Containing terminal posts. |
| 6 | Operating temperature | Charging: 0～55℃; Discharging:-20℃-60℃ | |
| 7 | Charging retention capability | ≥95%（25℃,30days） | |
| 8 | Cycle times | >4000 cycles (1C cycle, room temperature, capacity retention rate: ≥95%) |  |

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| | | | | |
|---|---|---|---|---|
| 9 | Standard charging | 1/3I1 | Room temperature, from constant current to constant voltage, cutoff current 0.05I1 and cutoff voltage 3.65V | Recommended charging method. |
| 10 | Multiplier charging | Sustained 100A | Room temperature， SOC ＜80% | |
| 11 | Low temperature charging | ≤0.05I1 | -10℃ | |
| | | ≤0.1I1 | 0℃ | |
| | | ≤1/3I1 | 10℃ | |
| 12 | High temperature charging | ≤1/3I1 | 45℃ | |
| 13 | Standard discharging capacity | ≥100%C 0 | Room temperature，1/3I1，and cutoff voltage 2.5V | |
| 14 | Multiplier discharging | ≥97%C0 | Room temperature，1I1，and cutoff voltage 2.5V | |
| 15 | Low temperature discharging capacity | ≥70%$C_0$ | -20℃，0.1I1，and cutoff voltage 2.0V | |
| **Battery system parameters** | | | | |
| 1 | Rated voltage | 48V | | 15 series |
| 2 | Pack voltage range | 37.5～54V | | Per 2.5V-3.6V |
| 3 | Rated capacity | 30Ah | | |
| 4 | Total energy | 1440Wh | | |
| 5 | SOC range | 10%-100% | | |
| 6 | Charging and discharging capacity efficiency | ≥96% | | |
| 7 | Standard charging current（A） | ≤15 | | Recommended 0.5C and below |

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| | | | |
|---|---|---|---|
| 8 | Standard discharging current（A） | ≤30 | |

| | | | |
|---|---|---|---|
| 9 | Max. discharging current （A） | 30 | |
| 10 | Over-current protection | 30 | |
| 11 | Total weight | 22kg (Estimation) | |
| 12 | Ambient relative humidity | 10%-90% | |
| 13 | Shell material | Sheet metal | |
| 14 | Battery pack composition | 15S 1P | |
| 15 | Charging and discharging ambient temperature | Charging: -10℃～60℃,<br>Discharging: -20℃～60℃ | |
| 16 | Product dimension（mm） | 483*330*132mm(W*D*H) | Tolerance±2,including lugs. |
| 17 | Input/Output method | IF-6330-D-2-2-75A Through-type terminal blocks. | |
| 18 | Heating function | When the BMS detects that the temperature is below 0 ℃, the heating function will be turned on.<br>When the BMS detects that the temperature is below 5 ℃, the heating function will be turned on. | Heating function is optional. |

## Environmental characteristics

(Charging according to the standards, and after full charge, let stand for 0.5h to do the following tests.）

| **Ambient** | **Discharging** | **Battery capacity requirements** |
|---|---|---|

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| temp. | current | |
|---|---|---|
| 25℃ | 1.0I1A | The measured discharge capacity of the battery pack is not less than 100% of the nominal capacity, and the appearance is not deformed or burst. |
| 0℃ | 1.0I1A | The measured discharge capacity of the battery pack is not less than 90% of the nominal capacity, and the appearance is not deformed or burst. |
| -10℃ | 1.0I1A | The measured discharge capacity of the battery pack is not less than 75% of the nominal capacity, and the appearance is not deformed or burst |
| 55℃ | 1.0I1A | The measured discharge capacity of the battery pack is not less than 95% of the nominal capacity, and the appearance is not deformed or burst. |

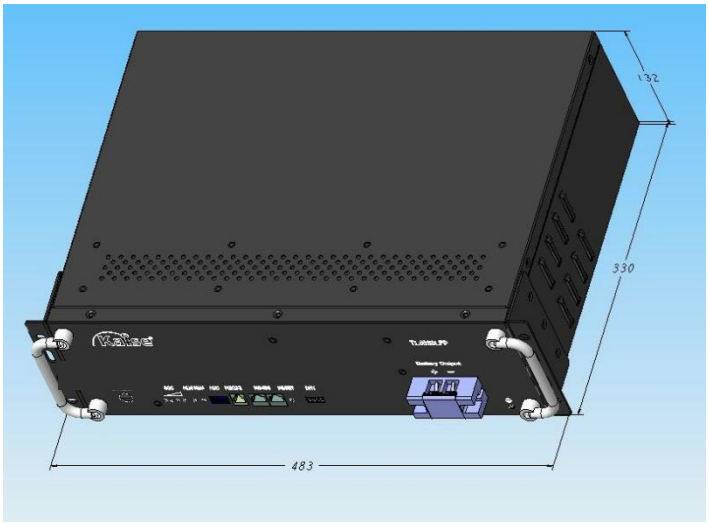
Safety characteristics

| Items | Specification parameters | Notes |
|---|---|---|
| Insulated electricity | ≥10MΩ | With insulation resistance tester DC 500V test voltage, the battery positive and negative terminal interface (terminal) are tested on the battery pack metal shell, insulation resistance value ≥ 10MΩ. |
| Dielectric strength | No breakdown and no flaring phenomenon | Battery positive and negative terminal interface respectively on the battery pack metal casing can withstand 50Hz, RMS 500V AC voltage (leakage current ≤ 10mA) or 710V DC voltage for 1min, there should be no breakdown and no flaring phenomenon. |
| Anti-immersion | No leaks, smoke, fire or explosion | Immerse the fully charged battery pack in 3.5% NaCl solution, the water depth should completely cover the battery pack, keep it for 2 hours, take it out, and place it in an environment with a temperature of 15℃～35℃, a relative humidity of 25%～85%, and an atmospheric pressure of 86kPa～106kPa for 4 hours. |

| | | |
|---|---|---|
| Anti-drop | There is no obvious damage, leakage, shell cracking, fire or explosion, and the battery pack and each camera position do not move when shaking up and down. | When the battery pack is fully charged, select any of the six angles and let it fall freely from the set highest point height (0.8m-1.8m) to the concrete floor once. |
| Constant humidity | There should be no obvious deformation, rust, smoke or explosion, and its capacity should not be less than 90% of the measured reference capacity. | After the battery pack is fully charged, put it in a constant temperature and humidity chamber at 60°C±2°C and relative humidity of 90%~95% for 12 hours when BMS is available, then take it out and let it stand at an ambient temperature of 25°C±2°C for 2 hours, visually inspect its appearance, and then discharge it at a current of 1.0I1A to the termination voltage. |
| Vibration test | No explosion, no fire, no deformation, no parts falling off, no abnormal voltage, no sharp change in discharge current | After the battery pack is fully charged, it is fixed on the vibration table in the direction of the large plane. The battery pack is subjected to an amplitude of 5mm, a maximum stroke of 10mm, and a vibration frequency of 10Hz~55Hz. The vibration test is carried out in the x, y, and z directions of the battery pack respectively. The test time of the frequency sweep cycle in each direction between 10Hz~55Hz is 90min±5min. After the test, it is left for 1h. |

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# VI. Product Dimensions Diagram




| Model | TL4830LFP | | | |
|---|---|---|---|---|
| Dimension（mm） | W | D | H | include the mounting ears, and do not include protrusions such as terminals |
| | 483 | 330 | 132 | |
| Specification | 48V 30Ah | | | |
| Maximum continuous charge and discharge current | 30A | | | |
| Charge and discharge voltage | Average charging voltage53.25V， Float charge voltage51V Discharge cut-off 37.5V | | | |
| Optimum operating/storage temperature | 15℃~35℃ | | | |

# V. Product panel illustratio




| No. | Description | No. | Description |
|---|---|---|---|
| 1 | LS506-100 folding handle | 7 | BothRS485 communication |
| 2 | Button switch M12 | 8 | RESET |
| 3 | Capacity indicator light | 9 | Dry Contact |
| 4 | Alarm and running indicator lights | 10 | IF-6330-D-2-2-75A Feed-through terminal blocks |
| 5 | 6-digit dialer | 11 | Grounding |
| 6 | RS232 commiuncation | | |

### 5.1 Installation Instructions

4.1 Open the cargo box and take out the battery pack;

4.2 Connect the battery pack to the DC output harness outside the box, and connect the output harness outside the box to the load;

4.3 Press the button switch to use the power;

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# VI. Routine maintenance

1)Check whether the power line is loose. If so, reinforce it in time. Check whether the cable is worn. If so, replace it in time.

2) Check the display screen regularly to see if it is working properly. If it is not working properly, please contact our after-sales service department.

3) When the battery pack is not used for a long time, please charge or half-charge the battery system and place it in a cool and dry environment. Reset the battery pack every three months and observe the battery pack power indicator. If the indicator shows that the battery power is 1 bar, please use a charger to charge the battery to half power, stop charging and place it in a cool and dry environment to prevent the battery pack from being unused for a long time and causing the battery pack to have a shorter service life.

Common faults and treatments

| No. | Fault phenomenon | Cause Analysis | Solution |
|---|---|---|---|
| 1 | Can't charge | Whether the cable connection is loose | Check the wiring |
| 2 | | The cell voltage is too high | Please check the alarm information and contact after-sales service department |
| 3 | | Total voltage is too high | Please check the alarm information and switch to float charge in time |
| 4 | | Temperature is too low/too high | Please check the alarm information and contact after-sales service department |
| 5 | | Charging circuit overcurrent | Please check the alarm information and contact after-sales service department |
| 6 | Can't discharge | The cable is not connected securely | Please check the line |
| 7 | | The cell voltage is too low | Please check the alarm information and contact after-sales service department |
| 8 | | Total voltage is too low | Please check the warning information and recharge the battery in time. |
| 9 | | Temperature is too low/too high | Please check the alarm information and contact after-sales service department |

| | | | |
|---|---|---|---|
| 10 | | Discharge circuit overcurrent | Please check the alarm information and contact after-sales service department |
| 11 | Discharge capacity is low | The charging voltage setting is unreasonable | Please check whether the charging voltage is set as required |
| 12 | | Battery failure | Please check the alarm information and contact after-sales service department |

Please send the fault information and related data to the professional technicians of the after-sales service department in time.

# VII. Packaging, transportation and storage

Packaging

Method: ☐ Neutral carton (domestic) ☑ UN carton (Export) Wood pallet (Bulk container export).Each battery pack should have an outer packaging and should be accompanied by a certificate of conformity. The packaged products should be placed in a dry, dustproof and moisture-proof packaging box. The product name, model, voltage, capacity, quantity, gross weight/net weight, LOGO, battery serial number, etc. should be marked on the outside of the hazardous goods packaging box. The neutral packaging box does not contain the above content. There should be necessary signs such as "handle with care", "afraid of moisture", "upward", "afraid of fire", etc.

Accompanying materials: Shipping inspection report, etc.

Shockproof and anti-pressure measures: The two sides (upper and lower) of the battery module need to be filled with shockproof materials.

Waterproof, anti-scattering, and handling: The battery module is covered with nylon bags, strapped and tightened, and palletized.

# VIII. Transportation

The battery pack should be packed into boxes for transportation. During transportation, it should be protected from severe vibration, impact or extrusion, and from exposure to sunlight and rain. It can be transported by cars, trains, ships, airplanes and other means of transportation.

# IX. Storage

The battery pack is usually stored at 20% to 40% of the charge state in a clean, dry, ventilated and rainproof room with an ambient temperature of -5℃ to 35℃ and a relative humidity of no more than 75%. It should be placed flat and elevated, no less than 100MM from the ground;

The battery cannot be stored with active chemicals or dust-generating items;

The battery cannot be subjected to any mechanical shock or heavy pressure;

The battery should be kept away from direct sunlight, away from fire, and no less than 2M from heat sources;

From the date of manufacture, the battery should be recharged at 0.2~0.5C current for 30~60min every 3 months of storage, and the temperature range should be 25℃±5℃.

# X. User responsibility letter

Users must use the battery in accordance with the instructions on the battery label or this battery specification sheet of Anhui lvwo Energy Technology Co., Ltd. If the power system overheats or even catches fire or explodes due to improper use by the user, the company will not bear any responsibility for the damage caused.

# XI. Dangerous matters

Failure to read the following carefully may cause battery leakage, explosion or fire.

Do not put the battery into water or get it wet;

Do not use or store the battery near a heat source (such as fire or heater);

Do not connect the positive and negative poles in reverse;

Do not connect the battery directly to a wall socket or a car cigarette lighter socket;

Do not throw the battery into fire or heat the battery;

Do not short-circuit the positive and negative poles of the battery with wires or other metal objects, and do not transport or store the battery with necklaces, hairpins or other metal objects;

Do not hit, throw or subject the battery to mechanical vibration;

Do not pierce the battery shell with nails or other sharp objects, and do not hammer or step on the battery;

It is forbidden to disassemble the battery in any way;

It is forbidden to charge the battery under fire or extremely hot conditions.

It is forbidden to put the battery in a microwave oven or pressure container;

It is forbidden to use it in combination with primary batteries (such as dry batteries) or batteries of different capacities, models, and varieties;

If the battery emits an odor, heats up, deforms, changes color, or has any other abnormal phenomenon, it must not be used; if the battery is being used or charged, it should be immediately removed from the electrical appliance or charging device and stopped using;

The battery should be kept out of the reach of children;

If the battery leaks or emits an odor, move it away from open flames immediately; leaking electrolyte may cause fire or explosion;

If the electrolyte enters your eyes after battery leakage, do not rub it, rinse with water and seek medical help immediately. If not treated in time, your eyes will be damaged.

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# XII. Precautions

Please strictly follow the instructions to use the lithium battery pack. If the battery leaks and the electrolyte get on your skin or clothes, wash the affected area immediately with running water, otherwise it may cause skin inflammation.

Read the instructions of the device using the battery and install and remove the battery correctly.

If the terminals of the battery pack become dirty, wipe them clean with a dry cloth before use. Otherwise, the battery pack will have poor contact, causing energy loss or failure to charge.

It is strictly forbidden to disassemble or repair the battery system without professional handling.

It must be charged with a charger specially matched for this battery system.

It is strictly forbidden to immerse the power system in water or salt water. Please keep the battery in a cool and dry environment when not in use.

If the power system emits an odor, heats up, changes color or deforms, or becomes abnormal in any way during charging or discharging, stop the operation immediately and find a professional to handle it.

When the battery catches fire, use dry sand or nitrogen fire extinguisher to put out the fire.

It is strictly forbidden to put the battery system into fire or heat source.

Please remove metal jewelry or other metal objects when installing or using the battery, and be careful when handling the battery, especially when placing it in a metal container.