

# **Operation and Maintenance Manual**

**Lithium Iron Phosphate Battery Pack  
for Telecom**

# Catalogue

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## 1 Applicable Scope

In order for you to use, store, and maintain our series of battery pack products correctly, please read this manual carefully before use.

## 2 Function

2.1 Online charging

2.2 The battery pack has the function of BMS.

Battery pack over voltage protection, cell over voltage protection, charging over current protection, battery pack under voltage protection, cell under voltage protection, discharge over current protection, temperature protection, short circuit protection, and reverse connection protection.

2.3 RS485 communication function

2.4 LED display

## 3 Product Parameters

### 3.1 Basic Parameters of Battery Pack

Item	Standards	
Model NO.	ZTT4850	ZTT48100
Nominal Voltage (V)	51.2	
Average Charging Voltage (V)	56.8±0.2	

Float Charging Voltage (V)	54.4±0.2	
Standard Charge Current (A)	10	20
Maximum Charging Current (A)	25	50
Standard Discharge Current (A)	25	50
Maximum Discharge Current (A)	50	100
Storage Temperature Range (°C)	-20~65	
Storage Environment Humidity (RH)	5%~95%	
Working Environment Humidity (RH)	≤95%	

### 3.2 Switch Power Supply Parameter Settings

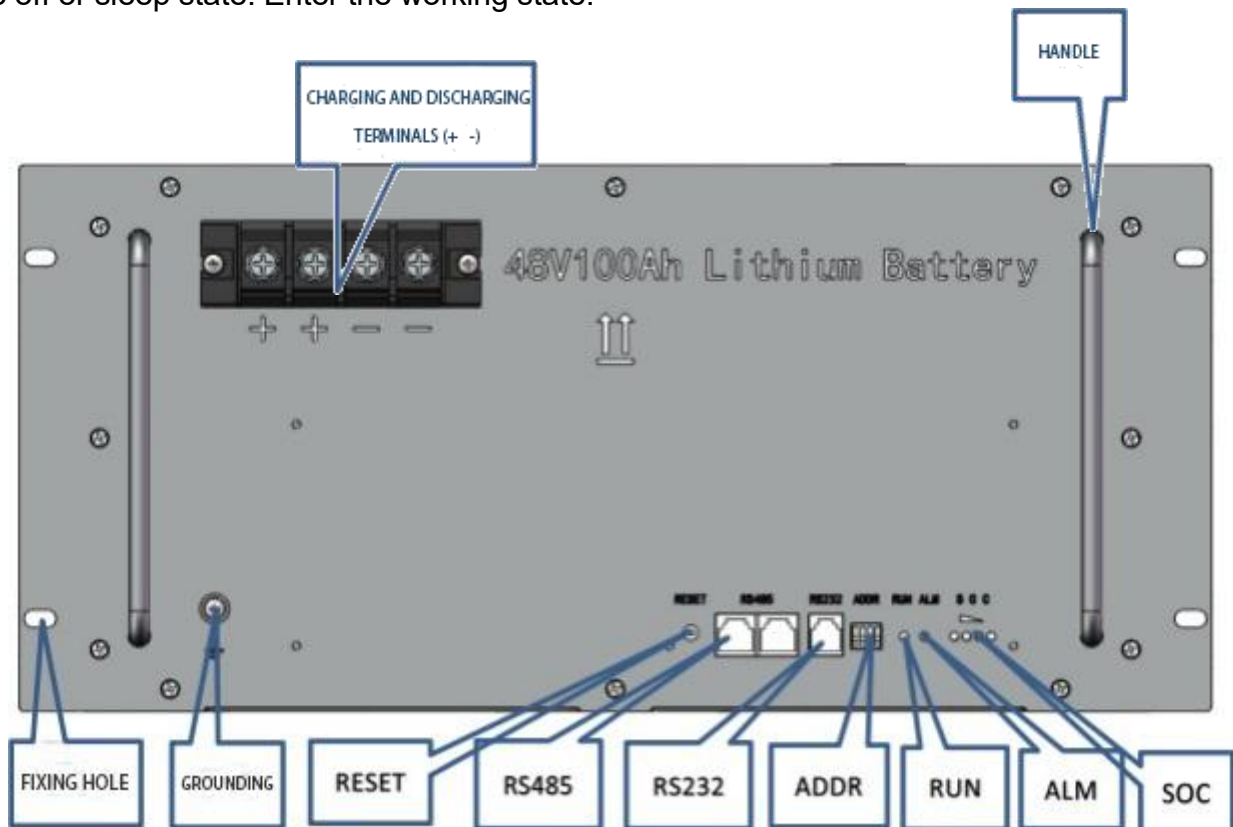
NO.	Setting Items	Battery Allowable Range	Switch Power Settings
1	Average Charging Voltage	56.0V~57.6V	56.8V
2	Float Charging Voltage	54V~56.4V	54.4V
3	Charging Current Limiting	0.1C~0.2C	0.1C
4	One Power Down (recommended value)	49V	49V
5	Secondary Power Down (recommended value)	44V	44V

## 4 Operating Instructions

### 4.1 Hardware Operation Instructions

#### 4.1.1 Starting Or Resetting The Battery

Turn on the main switch of the battery or charge the battery pack, and the battery will enter from the off or sleep state. Enter the working state.



The pictures are for reference only

NO.	Item	Description	Notes
1	SOC	Battery capacity status	
2	ALM	Fault status, indicated by a red light, illuminated when there is a fault	

3	RUN	Operating status of the device	
4	ADDR	System communication address	
5	RS232	RS232 interface	Battery host communication
6	RS485	RJ45, RS-485 Interface	Battery cascade communication
7	RESET	Reset	
8	Charging and discharging terminals	Power interface	

### 4. 1. 2 Battery Voltage

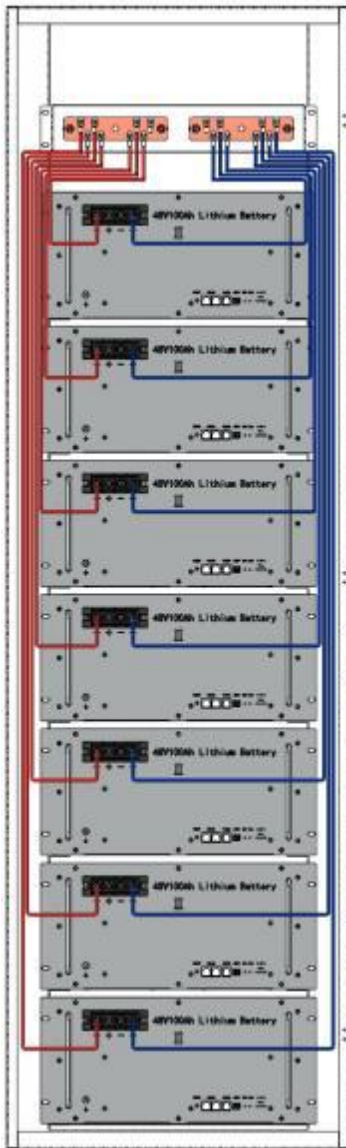
When the battery is in the off/sleep state, measure the voltage of the battery pack with a multimeter to be around 24V, which is the virtual voltage;

When the battery is in working condition, measure the voltage of the battery pack with a multimeter to be 48-57.6V, which is the normal working voltage.

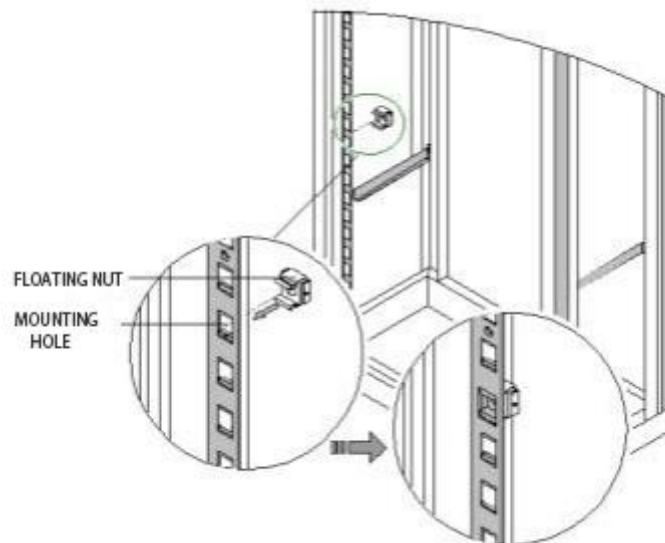
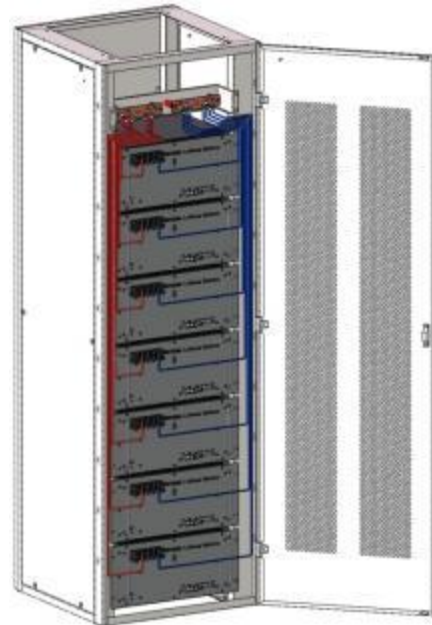
### 4. 1. 3 Battery Connection

Turn off the battery, determine the positive and negative input terminals of the load device or switch power supply, connect the positive and negative terminals of the battery pack to the corresponding positive and negative input terminals of the load device or switch power supply, and confirm again that the positive and negative terminals are connected correctly before turning on the battery switch.

## 1、 Parallel Connection



Installation diagram of battery pack



Installation diagram of circlip nut

- (1) Install the clamp nut into the installation hole of the cabinet column;
- (2) Place the lithium iron phosphate battery pack on the bracket and fasten the battery pack to the Inside the cabinet;

(3)Layout of battery packs in the cabinet:

Model	4850		48100	
Cabinet model	1.2m Cabinet	2m Cabinet	1.2m Cabinet	2m Cabinet
Number of battery packs that can be placed in the cabinet (set)	6	12	4	7

(4)Connect the lithium iron phosphate battery pack in parallel to the upper busbar of the cabinet using a parallel wiring harness, and connect the battery pack to the machine using a communication cable;

(5)Connect the total positive and negative wiring harnesses to the busbar and lead them out through the feeder window on the top of the cabinet together with the total communication line;

## 2、 Specification Requirements for Accessories

Power cable: The discharge overcurrent limit of the battery pack is 1C, so selecting a parallel line between batteries requires a comprehensive consideration of the load and the maximum current value of the battery;

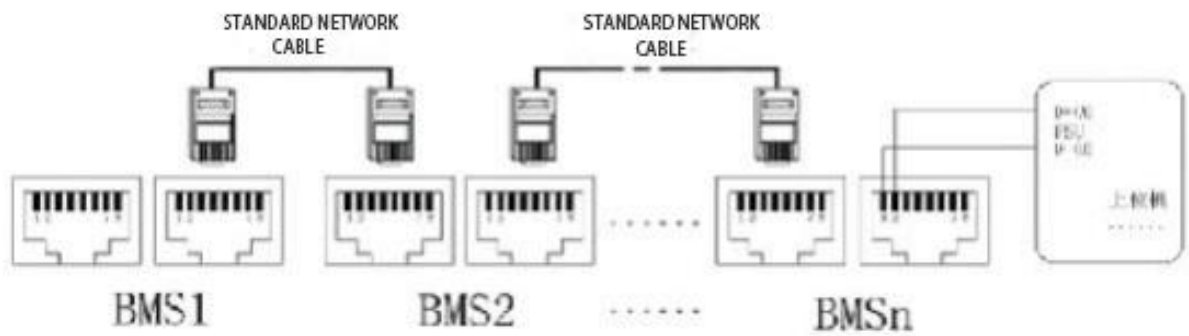
Copper nose: Battery terminals are mostly in the form of terminal posts, and when selecting the connecting wire copper nose, the wire diameter and terminal diameter should be considered;

## 3、 Parallel Communication

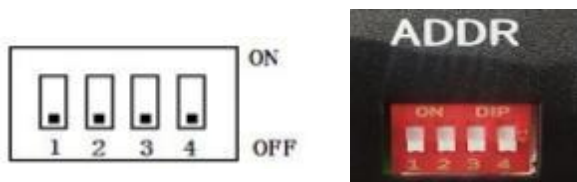
PIN	DESCRIPTION
1、 8	RS485-B
2、 7	RS485-A
3、 6	GROUNDING
4、 5	NC (HANG IN THE AIR)



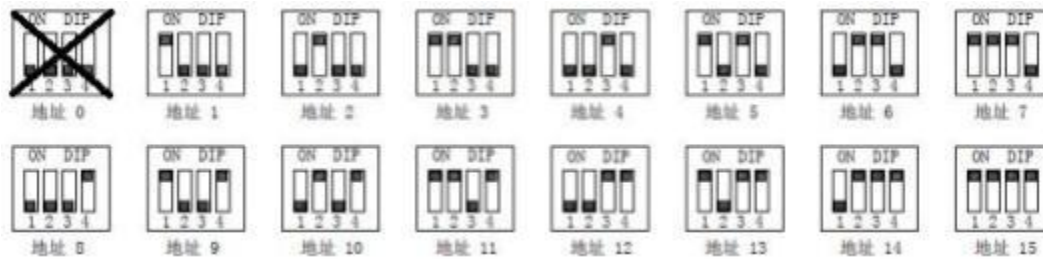




#### 4、Dialing Standard



Address	Dial Switch Position				Description
	#1	#2	#3	#4	
0	OFF	OFF	OFF	OFF	Set to PACK0 (cannot be used)
1	ON	OFF	OFF	OFF	Set to PACK1 (Use RS485 as the host and set the host to "Address 1")
2	OFF	ON	OFF	OFF	Set to PACK2
3	ON	ON	OFF	OFF	Set to PACK3
4	OFF	OFF	ON	OFF	Set to PACK4
5	ON	OFF	ON	OFF	Set to PACK5
6	OFF	ON	ON	OFF	Set to PACK6
7	ON	ON	ON	OFF	Set to PACK7
8	OFF	OFF	OFF	ON	Set to PACK8
9	ON	OFF	OFF	ON	Set to PACK9
10	OFF	ON	OFF	ON	Set to PACK10
11	ON	ON	OFF	ON	Set to PACK11
12	OFF	OFF	ON	ON	Set to PACK12
13	ON	OFF	ON	ON	Set to PACK13
14	OFF	ON	ON	ON	Set to PACK14
15	ON	ON	ON	ON	Set to PACK15



Note: Only use RS485 for parallel connection: Starting from "address 1", connect all battery packs one by one through the RS485 port using a network cable. This method can connect up to 15 battery packs simultaneously.

## 5 、 Maintenance and upkeep of batteries

(1)After completing the installation of the battery according to the installation manual, the battery should be fully charged before use before the first discharge.

(2)When the battery is low, it should be charged in a timely manner, which will be beneficial for extending the battery life. If the battery is not charged in a timely manner, leaving it in a state of power shortage for a long time will affect its service life. If the battery needs to be left unused for a long time, it is best to keep it in a half charged state and charge it every 2 months with a current of 0.2C for 2-3 hours.

(3)The battery should be installed in a well ventilated, dry, and clean environment; When charging, avoid sources of ignition and flammable materials from approaching and disconnect the load (turn off electrical equipment).

(4)The working environment temperature of the battery is  $-10\sim 60\text{ }^{\circ}\text{C}$  (the optimal working environment temperature is  $15\sim 35\text{ }^{\circ}\text{C}$ ). If it is outside this temperature range, the performance of the battery may change, which is a normal phenomenon manifested by changes in battery capacity or equipment operating time.

(5)Organic solvents cannot be used to clean the battery casing. When there is an accidental fire on the battery, carbon dioxide should not be used to extinguish the fire, but rather fire extinguishing equipment such as carbon tetrachloride or sand should be used to extinguish the fire.

(6)Batteries are consumables, and their lifespan is limited. Please replace the battery promptly when the battery capacity performance is below 80% of the rated capacity.

## 6 、 Common Fault Diagnosis

Solution to General Faults of Lithium Iron Phosphate Batteries for Communication:

<b>Fault Phenomenon</b>	<b>Fault Conditions</b>	<b>Cause Analysis</b>	<b>Solution</b>
The battery cannot be turned on and the indicator light is not on;	The multimeter measures the positive and negative poles without voltage;	1. BMS protection status, battery cannot be activated; 2. The total positive and negative wires inside the battery come off;	Returning to the factory for maintenance;
	The multimeter measures the positive and negative poles with voltage;	1. BMS power supply line falls off; 2. The internal wiring harness of the battery has fallen off;	Returning to the factory for maintenance;
The battery is turned on with a long red light;	Battery failure protection;	1. The positive and negative poles of the battery connected to the switch power supply are installed incorrectly; 2. Internal battery failure;	After disconnecting the fuse and positive wire harness, restart the battery. If the ALM light fault is not eliminated, return to the factory for repair;
	Cell undervoltage protection;	1. False soldering inside the battery; 2. 2. Poor consistency of battery cells; 3. BMS malfunction;	Returning to the factory for maintenance;
Battery on red light Flashing;	Low voltage or overcharge Alarm;	Low voltage or overcharge alarm;	Returning to the factory for maintenance;

## 7、 Precautions For Battery Use

In order to prevent accidents such as leakage, abnormal heating, ignition, performance degradation, and explosion of the battery, please use the battery correctly according to the following specifications. Our company is not responsible for any accidents caused by not following the instructions in this manual.

- (1) Handle gently to avoid severe vibration;
- (2) Do not reverse the positive and negative poles to prevent short circuits;
- (3) Do not immerse the battery pack in water or soak it;
- (4) It is strictly prohibited to charge the battery pack under fire or extremely hot conditions! Do not use or store battery packs near heat sources such as fires or heaters;
- (5) It is strictly prohibited to pierce the battery pack casing with nails or other sharp objects, and it is prohibited to hammer or step on the battery pack;
- (6) It is strictly prohibited to disassemble battery packs and batteries in any way;
- (7) If the battery pack emits odor, heat, deformation, discoloration, or any other abnormal phenomenon, it should be immediately removed from the appliance or charger and stopped from use;
- (8) If the electrolyte accidentally splashes into the eyes after the battery leaks, please do not wipe it. It should be immediately rinsed with water, and in severe cases, seek medical assistance in a timely manner;
- (9) The ambient temperature will affect the discharge capacity. When the ambient temperature exceeds the standard environment ( $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ ), the discharge capacity will slightly decrease;
- (10) If there is any odor or abnormal noise during the charging process of the battery pack, please stop charging immediately;
- (11) If there is any odor or abnormal noise during the discharge process of the battery pack, please immediately stop discharging;
- (12) If the above phenomenon occurs, please contact the manufacturer and do not disassemble without permission.

## 8 、 Transportation precautions

- (1) To ensure safety during transportation, transportation vehicles must be able to ensure rain, sun, and anti-theft protection. According to the characteristics of lithium battery products, corresponding measures such as shading, insulation, fire prevention, shock resistance, leakage prevention, and displacement prevention should be taken by the carrier vehicles;
- (2) Professional equipment and tools should be used for handling and placing lithium battery packaging boxes, such as electric forklifts, hand forklifts with suitable carrying capacity, etc., to avoid damage to the battery during handling. It should be handled with care and rough operations such as falling, touching, hitting, dragging, rolling, etc. are strictly prohibited;
- (3) Batteries must not be transported in the same vehicle as self igniting flammable materials. Vehicles transporting batteries are prohibited from carrying unrelated personnel, and overloading, exceeding limits, and fireworks are strictly prohibited;
- (4) Transport vehicles should be equipped with fire extinguishers. If there is an emergency brake or a large angle turn, the accompanying personnel should immediately check whether the vehicle battery is intact and undamaged;
- (5) If the vehicle transporting batteries needs to carry out loading and unloading operations or temporary parking in densely populated or important areas, a dedicated person should be assigned to be responsible for on-site operation safety supervision;
- (6) Strictly follow the arrow on the packaging label for loading, do not invert or place on the side;
- (7) All transportation vehicles need to check the flatness of the carriages before loading, and the floor of the carriages must not be uneven Over 1cm; During the loading process, there should be no gap of more than 1cm between the product and the floor of the carriage. If any gaps are found, they need to be filled to ensure the stability of the product during transportation.

## 9、 Storage

- (1) Lithium batteries should not be stored outdoors and should be avoided from being stored or displayed in direct sunlight or areas that may be exposed to rain;
- (2) Lithium batteries are required to be stored in effectively isolated storage areas and not mixed with other materials; The storage area should have 24-hour video surveillance, and sufficient fire extinguishers should be equipped within the storage area; Conditionally configurable smoke alarm devices;
- (3) Warehouse entrance: It is required to have sufficient width and height, and obstacles cannot be set or stacked to avoid damage to lithium batteries caused by collisions during battery module handling;
- (4) Warehouse roof and walls: It is required that the warehouse roof and walls be waterproof and kept dry to avoid high temperature or water leakage that may affect battery performance and safety;
- (5) Warehouse cleaning: It is required that the warehouse be kept clean and free from dust and debris, especially conductive dust such as metal shavings, to avoid affecting the performance of lithium batteries or potential safety hazards due to leakage;
- (6) When handling materials, consideration should be given to issues such as load, stacking, and directionality. The height of stacking layers should not exceed the limit of stacking layers in the product packaging design.

## 10、 Product Liability

- (1) Our company shall not be responsible for any accidents caused by violating the provisions of this manual;
- (2) The content of this manual is subject to change without prior notice due to improving product quality or upgrading relevant technical parameters. For the latest product information, please contact our company to obtain it.