TKRB&TKRB-T Series
LiFePO4 Battery with wheels

User Manual

SHENZHEN TAICO TECHNOLOGY CO.,LTD

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Respected user:

Thank you for using Taico Energy Storage Battery. In order to facilitate the correct operation of this battery, please read this manual carefully before use. Please be sure to read Chapter 1 "Safe Use Precautions"

(Specifications are subeject to change without notice)

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1. Precautions for safe use

⚠ Attention!

（1）Before installing or using the battery, it is very important and necessary to read the user manual (accessory) carefully. The safety precautions mentioned in this manual do not represent all the safety matters that should be observed, but are only a supplement to all safety precautions;
(2) Local safety laws and regulations should be followed when installing, operating, and maintaining equipment;
(3) When installing, operating, and maintaining equipment, do not wear any conductive objects, such as watches, bracelets, bracelets, and rings;
(4) If the battery is stored for too long, it needs to be charged and discharged every three months, and the battery charge must not be less than 70%;
(5) After the battery is completely discharged, it needs to be charged within 12 hours;
(6) Before maintenance, the battery and equipment need to be powered off;
(7) Do not use cleaning solvents to clean the battery;
(8) Do not expose batteries to flammable or irritating chemicals or vapors;
(9) Do not directly connect batteries to photovoltaic solar wires;
(10) Our company does not assume any liability for losses caused by violation of general safe operation requirements or violation of safety standards for design, production and use of equipment.

⚠ Warning!

1.1 Before installation

(1) After unpacking, please check the product and packaging list first. If the product is damaged or missing parts, please contact the local retailer;
(2) Before installation, cut off the power grid and ensure that the battery is turned off;
(3) The wiring must be correct, do not mistake the positive and negative cables, and ensure that there is no short circuit with external devices;
(4) It is prohibited to directly connect the battery and AC power supply;
(5) The internal protection system of the battery is designed for 48VDC, and series connection is prohibited;
(6) Please ensure that the electrical parameters of the battery system are compatible with related equipment;
(7) Keep batteries away from water and fire.

1.2 When using

(1) If the battery system needs to be moved or repaired, the power supply must be cut off and the battery will completely stop working;
(2) It is prohibited to connect batteries with batteries of different types;
(3) It is prohibited to connect the battery to faulty or incompatible equipment;
(4) In the event of a fire, only dry powder fire extinguishers can be used, and liquid fire extinguishers are prohibited;
(5) It is prohibited to disassemble the battery without permission;

2. Product introduction

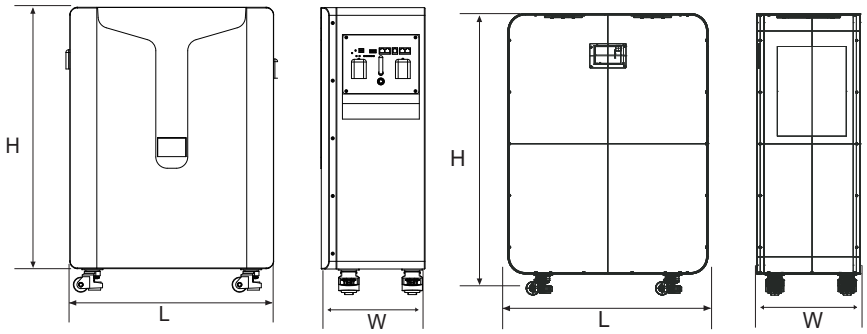
TKRB-T series battery is a new type of energy storage product that can be used to provide reliable power for various devices and systems. It is especially suitable for applications with high power, limited installation space, limited load-bearing capacity and long service life. The intelligent BMS battery management system built into the battery can manage and monitor battery voltage, current, temperature and other information. In addition, the battery pack can balance the charge and discharge of the cells to extend cycle life. Multiple battery packs can be connected in parallel to expand capacity and power, and parallel expansion of capacity and longer power support time requirements are required.

3. Product characteristics

As a new energy storage product, TKRB-T series batteries have the following product characteristics:

● Environmentally friendly and pollution-free: the materials used in the entire module are non-toxic and pollution-free;
● Long safe life: The positive electrode material of the battery module is made of LiFeOP4, which has good safety performance and long service life;
● Protection function: The battery management system can protect the battery module from over-discharge, over-charge, over-current and high/low temperature;
● Balancing function: The battery management system comes with passive balancing, which can balance each single string of cells in the battery module;
● Capacity expansion: Flexible configuration, multiple battery modules can be connected in parallel to expand capacity, suitable for different backup time requirements;
● Low power consumption: The battery has an automatic sleep function. When not connected to any powered device, it can enter a low power consumption state to reduce self-loss;
● No memory: no memory effect, excellent shallow charge and discharge performance;
●Wide temperature range: operating temperature range -20℃ ~ 60℃, charging 0℃ ~ 45℃, discharging -20℃ ~ 60℃, with good discharge performance and cycle life,
● Portability: small size, light weight, standard embedded modules are more convenient to install and maintain

4.1 Dimensions



Size H×L×W(mm)

TKRB-T1500 51.2V 300AH:680*530*270
TKRB-T1600 51.2V 314AH:680*530*270
TKRB-T2000 51.2V 400AH:755*640*380
TKRB-T2400 51.2V 460AH:755*640*390
TKRB-T2800 51.2V 560AH:755*790*400
TKRB-T3000 51.2V 600AH:755*790*380
TKRB-T3200 51.2V 628AH:755*790*400

TKRB-1000 51.2V 200AH:555*530*250
TKRB-1500 51.2V 300AH:680*530*250
TKRB-1800 51.2V 350AH:755*580*300
TKRB-2000 51.2V 400AH:755*640*380
TKRB-1500 51.2V 300AH:680*530*250
TKRB-2000 51.2V 314AH:755*640*380
TKRB-2800 51.2V 560AH:755*640*380
TKRB-TS1500 51.2V 300AH:680*530*270

4.2 Battery parameters

Item	Parameter								
Model	TKRB-1500 TKRB-T1500 TKRB-TS1500	TKRB-T1600	TKRB-2000 TKRB-T2000	TKRB-T2400	TKRB-2800 TKRB-T2800	TKRB-T3000	TKRB-T3200	TKRB-1000	TKRB-1800
Nominal Voltage	51.2V								
Nominal Capacity	300AH	314AH	400AH	460AH	560AH	600AH	628AH	200AH	350AH
Working Voltage	43.2-57.6V								
Charging Voltage	58.4V								
Charging Current Limit	10A(The default charging current is greater Than 55A, and the current limiting is on)								
Standard Charging Current	100A								
Maximum Continuous Charging Current	100A								
Standard Discharge Current	150A							100A	150A
Maximum Continuous Discharge Current	200A								
Operating Temperature	Charge :0~45℃								
	Discharge:-20~60℃								
Monitor Communications	RS485/CAN/RS232								
Working Environment	Temperature: ≤95%; Altitude : ≤4000m								

4.3 Interface definition

4.3.1 RST: Reset button

When the BMS is in sleep state, press the button for 3 seconds and then release it. The smart BMS will be activated, and the LED indicators will light up sequentially starting from "RUN" for 0.5 seconds.

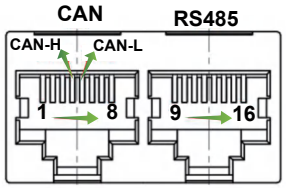
When the BMS is activated, press the button for 3 seconds and then release it. The smart BMS will be put into sleep state, and the LED indicators will light up sequentially for 0.5 seconds starting from the lowest battery level light.

When the BMS is activated, press the button for 6 seconds and then release it, the protection board will be reset, and all LED lights will light up at the same time for 1.5 seconds.

After the BMS is reset, the parameters and functions set through the BMS SOFTWARE will still be retained. If you need to restore the initial parameters, you can use the "Restore Default Values" of the BMS SOFTWARE to achieve it, but the relevant operating records and storage data will remain unchanged (such as battery power, number of cycles , protecting records, etc.)

4.3.2 RS485-1/CAN

Dual RJ45 interfaces, one is RS485 communication interface and the other is CAN communication interface, used for communication between battery pack and external equipment, such as inverter, etc

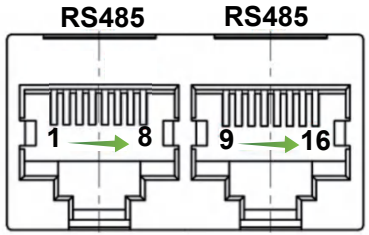


X2(Dual RJ45)Interface

Interface	Definition			Definition		
X1 Communication port definition	A part CAN Interface	PIN 1	NC	B part BRS-485-1 Interface	PIN 9	RS485-B1
		PIN 2	CGND		PIN 10	RS485-A1
		PIN 3	NC		PIN 11	GND
		PIN 4	CAN-H		PIN 12	NC
		PIN 5	CAN-L		PIN 13	NC
		PIN 6	NC		PIN 14	GND
		PIN 7	NC		PIN 15	RS485-A1
		PIN 8	NC		PIN 16	RS485-B1

4.3.3 RS485-2

Dual RS485 communication interfaces, with a default baud rate of 9600 bps, are used to connect computer BMS SOFTWARE and communication interconnection when battery packs are connected in parallel;



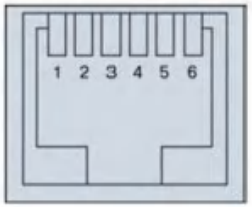
X2(Dual RJ45)Interface

Interface	Definition			Definition		
X2 Communication port definition	A part BRS-485-2 Interface	PIN 1	RS485-B	B part BRS-485-2 Interface	PIN 9	RS485-B
		PIN 2	RS485-A		PIN 10	RS485-A
		PIN 3	GND		PIN 11	GND
		PIN 4	NC		PIN 12	NC
		PIN 5	NC		PIN 13	NC
		PIN 6	GND		PIN 14	GND
		PIN 7	RS485-A		PIN 15	RS485-A
		PIN 8	RS485-B		PIN 16	RS485-B

4.3.4 RS232

RJ11 interface and RS232 communication port can be used to connect the battery to the BMS software, set and modify parameters, and upgrade the battery;

RS232--Adopt 6P6C vertical RJ11 socket	
RJ11 Pin	Definition
2	NC
3	TX(Single)
4	RX(Single)
5	GND



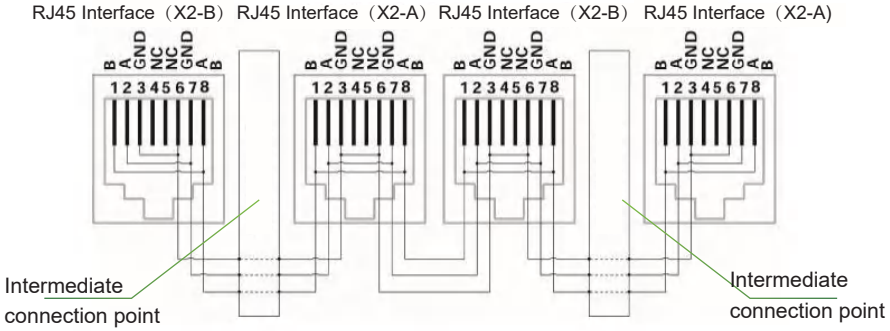
4.3.5 ADD

When the PACK is used in parallel, different addresses can be distinguished by the dial switch on the BMS. To avoid setting the address to the same PACK, the definition of the dial switch is referred to the table below.

Addres	Dial switch position			
	#1	#2	#3	#4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

4.3.6 Battery pack parallel (cascade) function

When battery packs are cascaded, the one with the communication address 0000 is called the master battery pack, and the other communication addresses are called the slave battery packs. The slave battery pack can communicate with the master battery pack through the RS485 communication interface. The master battery pack centrally packages and manages the data of each battery pack in the cascade system.When battery packs are cascaded, only the main battery pack can communicate with the BMS software, upload the data, status and information of all battery packs in the cascade system, integrate monitoring and management, and realize remote monitoring.



RS485 Parallel Connection Diagram

When performing parallel communication operations with multiple batteries, the dial address of each PACK needs to be configured first. The dialing code adopts BCD code format, and the address 0 is defined as （Black dots are OFF state, blank spaces are ON state, the same below）, Address 1 is defined as , Address 2 is defined as , Other addresses can be deduced by analogy.

4.3.7 LED Working status indicators

Table 1 LED Working status indicators

Status	Normal/alert /protection	RUN	ALM	Electricity indicator LED						Note
		●	●	●	●	●	●	●	●	
Shut down	Sleep	Elimination	Elimination	Elimination	Elimination	Elimination	Elimination	Elimination	Elimination	Total extinction
Stand by	Normal	1 Flashes	Elimination	According to the electricity indicator						Standby status
	Alarm	1 Flashes	3 Flashes							Module Low Voltage
Charge	Normal	Always bright	Elimination	According to the electricity indicator (power indicator maximum LED flash 2)						Maximum power LED flash (flash 2), overcharge alarm ALM no flicker
	Alarm	Always bright	3 Flashes							
	Overcharge protection	Always bright	Elimination	Always bright	Always bright	Always bright	Always bright	Always bright	Always bright	If there is no electricity, the indicator is in standby state
	Temperature, overcurrent, short circuit, reverse connection, failure protection	Elimination	Always bright	Elimination	Elimination	Elimination	Elimination	Elimination	Elimination	Stop discharge
Discharge	Mormal	3 Flashes	Elimination	According to the electricity indicator						
	Alarm	3 Flashes	3 Flashes							
	Undercurrent protection	Elimination	Elimination	Elimination	Elimination	Elimination	Elimination	Elimination	Elimination	Stop charging
	Temperature, overcurrent, short circuit, reverse connection, failure protection	Elimination	Always bright	Elimination	Elimination	Elimination	Elimination	Elimination	Elimination	Stop discharge
Failure		Elimination	Always bright	Elimination	Elimination	Elimination	Elimination	Elimination	Elimination	Stop charging and discharging

List 2 Capacity instructions

State		Charge						Discharge					
Capacity indicator		L6●	L5●	L4●	L3●	L2●	L1●	L6●	L5●	L4●	L3●	L2●	L1●
Battery power（%）	0～16.6%	Elimination	Elimination	Elimination	Elimination	Elimination	2 Flashes	Elimination	Elimination	Elimination	Elimination	Elimination	Always bright
	16.6～33.2%	Elimination	Elimination	Elimination	Elimination	2 Flashes	Always bright	Elimination	Elimination	Elimination	Elimination	Always bright	Always bright
	33.2～49.8%	Elimination	Elimination	Elimination	2 Flashes	Always bright	Always bright	Elimination	Elimination	Elimination	Always bright	Always bright	Always bright
	49.8～66.4%	Elimination	Elimination	2 Flashes	Always bright	Always bright	Always bright	Elimination	Elimination	Always bright	Always bright	Always bright	Always bright
	66.4～83.0%	Elimination	2 Flashes	Always bright	Always bright	Always bright	Always bright	Elimination	Always bright	Always bright	Always bright	Always bright	Always bright
	83.0～100%	2 Flashes	Always bright	Always bright	Always bright	Always bright	Always bright	Always bright	Always bright	Always bright	Always bright	Always bright	Always bright
Running indicator light ●		Always bright						Flashing (3 flashes)					

4.4 Screen system description

A:Touch screen information

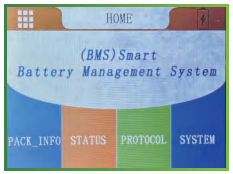
Product name: BMS touch colorful Product model: TPMUZN-1.2

Product size: 3.5 inches

Screen system interface introduction:

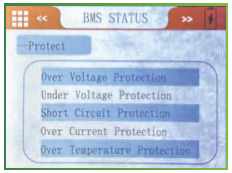
1.Turn on welcome interface:

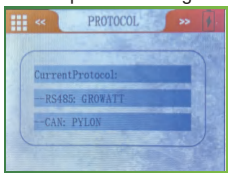
Within 5 seconds after powering on, the welcome interface will be displayed. As shown below:



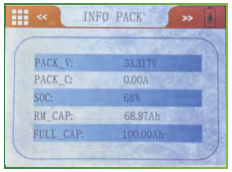
2.System setting interface:

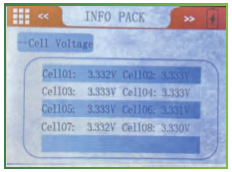
The user can select the default communication protocol through the display;





3.Battery parameter collection interface:



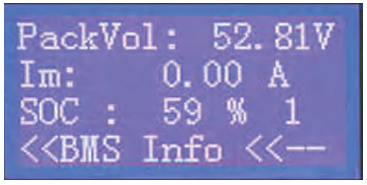


B:Basic screen information

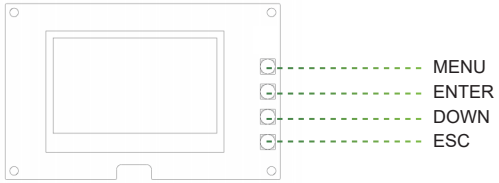
Product name: Digital liquid crystal display Product size: 3.0 inches

Screen system interface introduction:

1.Screen interface display:



2.Interface component details：

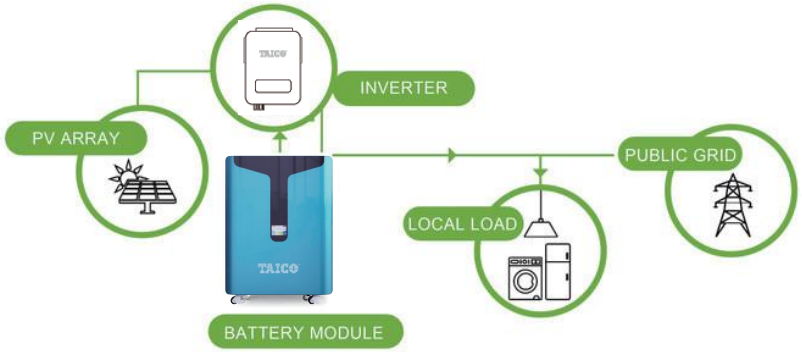


4.Hibernation/turn off :

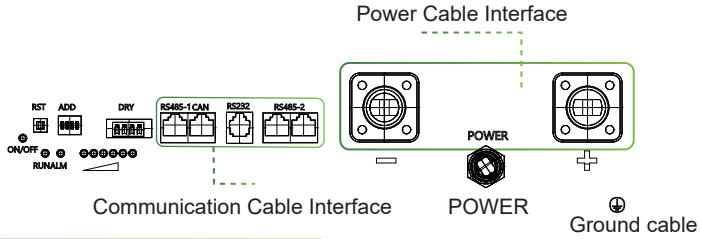
Under normal operating conditions, the system will enter sleep mode after 1 minute of no key operation. exist In sleep mode, touch the screen and the display will activate. To power on/off, click the power button.

5.0 Lithium battery safety operation guide

5.1 Application diagram



Connection interface description:



6.0 Maintenance precautions

After installation and use, simple maintenance and inspection can be carried out on the lithium iron phosphate battery. Because of its maintenance-free characteristics, the maintenance cycle can be extended, such as once every 3 months.

- Check whether the poles and connecting wires of the lithium iron phosphate battery are loose, damaged, deformed or corroded, and whether the battery shell is damaged or deformed;
- Observe the status of the battery pack running indicator light. Under normal conditions, the green light is on. When only the last CAPACITY light of the battery pack flashes, it indicates that the battery power is low and the battery is about to drain and shut down the output;
- If a fault occurs and the ALM red light of the battery pack flashes and an alarm is issued, please check whether the battery connection is correct or whether there is an overcurrent condition; then press the RST reset button and restart the battery to see if the fault is eliminated. If it cannot be eliminated, please contact the manufacturer. Please do not open the battery pack box without authorization;

- For application scenarios where multiple battery packs are connected in parallel, if one of the batteries fails and needs to be replaced, please ensure that the voltage difference between the newly replaced battery pack and the voltage of other battery packs to be connected in parallel is within 2V. If the voltage difference is large, it will A battery pack with a high voltage charges a battery pack with a low voltage with a large current, and the battery pack with a low voltage undergoes charging overcurrent protection, resulting in the inability to charge;
- Record the time and number of power outages and make detailed statistics on battery power supply time

7.0 Analysis and solutions to common problems

7.1 Under voltage alarm

Phenomenon: The ALM alarm indicator flashes and the RUN indicator turns off.
Cause Analysis:
(1) The load current is too large and exceeds the battery discharge protection value.
(2) The battery protection board is faulty.
Solution: After the protection board enters the overcurrent state, it will lock the state until a charger is added to the charging input to activate it.

7.2 Discharge overcurrent protection

Phenomenon: The ALM alarm indicator flashes and the RUN indicator turns off.
Cause Analysis:
(1) The load current is too large and exceeds the battery discharge protection value.
(2) The battery protection board is faulty.
Solution: After the protection board enters the overcurrent state, it will lock the state until a charger is added to the charging input to activate it.

7.3 Temperature protection

Phenomenon: The ALM alarm indicator flashes and the RUN indicator turns off.
Cause analysis: The ambient temperature may be too high or too low
Solution: When the temperature at the NTC end returns to the normal value, the protection board recovers from the temperature protection state and the red ALM light goes out.

7.4 No voltage output from battery

Phenomenon: The battery indicator light goes off, and the voltage measured at both ends of the battery is 0V.
Cause analysis: The battery is not activated or the battery management system is abnormal.
Solution: Activate the battery or reset the battery through the reset button "RST" on the battery panel in the activated state. If there is still no voltage output, contact the manufacturer's professionals for help.

8.0 Maintenance service guarantee

If there is any problem with the product, please contact our company's authorized maintenance outlet or customer service center

1.TKRB&TKRB-T series energy storage batteries warranty is 5 years.

1.The starting date of the warranty period is based on the product invoice date.

2.One of the following situations does not fall within the scope of maintenance:

■Damage caused by consumers due to improper use, storage and maintenance.

■Damage caused by self-assembly, disassembly and repair by someone other than the company's designated maintenance department.

■No valid invoice.

■Damage caused by force majeure.

3.Only issue an invoice and warranty card at the same time to guarantee the warranty

4.For products that are not within the scope of repair, our customer service center will still serve you.

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