8. Warranty Service

Under the guidance of our company, customers return our products so that our company can provide repair services or replace products of equal value. Customers need to pay the necessary shipping costs and other related expenses.
Any replacement or repair of the product will cover the remaining warranty period of the product. During the warranty period, if the product or any part of the product is replaced by our company, all rights and interests of the replaced product or part belong to our company.

The product warranty service does not include damage caused by the following reasons:

- Damage during equipment transportation (but excluding goods transported by our company)
- Damage caused by improper installation or commissioning
- Damage caused by failure to comply with the operating manual, installation manual or maintenance instructions
- Damage caused by self-modification, alteration or repair of the product
- Damage caused by improper use or operation
- Damage caused by insufficient equipment ventilation
- Damage caused by failure to comply with applicable safety standards or relevant regulations
- Damage caused by natural disasters or force majeure (flood, lightning, overvoltage, storm, snow, fire, etc.)

Furthermore, normal wear and tear or any other malfunction will not affect the basic operation of the product. Any external scratches, stains or natural mechanical wear and tear will not indicate a defect in the product.

Thank you for reading!

BE SERIES

Lithium iron phosphate battery

USER MANUAL

Version 1.0

Please strictly adhere to the warnings and operating instructions in this manual. Keep this manual properly and carefully read the following instructions before installing the device.

Attention

1.Batteries should be installed in a ventilated and dry environment. Considering that the batteries use natural air cooling, they should not be placed too close to heat sources to ensure the ambient temperature around the batteries and maintenance space.
2.It is forbidden to place the batteries in any of the following environments.

High temperature | Rain exposure | Fire source | Corrosion | Slope

3.If it is necessary to use the batteries with inverters from other manufacturers, please must communicate with our company's engineers in advance.
4.During maintenance, metal items such as rings and watches on your hands must be removed. Use tools with insulated handles.

Warning

1. This product only supports long-term maximum 0.5C charging and discharging. Please refer to the product specification for the maximum charging and discharging current of a single battery pack.
2.For parallel operation of more than 2 battery packs, a battery busbar box shall be added according to the load current! The system with the added busbar box must be wired strictly in accordance with the corresponding wiring standards.
3. Try to avoid deep discharge of the battery as much as possible, and recommend referring to the product specification for the cut-off discharge voltage.
4.If the lithium battery pack is stationary for 3 months (when the equipment is not installed), it shall be regularly recharged. When using the battery pack for the first time, charge the battery first before use.

Catalogue

1. Installation instructions

1.1 Moving

During the handling or moving of lithium batteries, inverted or sideways transportation should be avoided. They should be handled with care, placed gently, and protected from collisions.

1.2 Unboxing Inspection

Inspect the batteries for any damage incurred during transit.
Check the included accessories: (Subject to the actual accessory list.)

NO.	Accessory Name	Color/ Material/ Specification	
1	RJ45 Communication Cable	For battery parallel communication inverter communication	
2	Battery Positive and Negative Cables	4AWG	
3	User Manual	User Manual	
4	Accessory List		
5	Expansion Screw	M6*100	
6	Battery Bracket		
7	White Button Cap		

1.3 Install

1.3.1 Preparation before installation
Determine the installation environment and placement location to lay connecting wires.
Installation tool:

Insulating gloves	Flathead screwdriver	Phillips screwdriver	Insulated torque wrench	Hexagon wrench	Multimeter
					

1.3.2 Installation Environment and Location

Batteries must be installed in a ventilated and dry environment. Considering that the batteries use natural air cooling, they should not be placed too close to heat sources to ensure the ambient temperature around the batteries and sufficient maintenance space.
It is strictly prohibited to place the batteries in any of the following environments:

High temperature | Rain exposure | Fire source | Corrosion | Slope

2. Product Introduction

This product is composed of high-quality lithium iron phosphate (LFP) cells (connected in series and parallel) and an advanced BMS (Battery Management System). It can be used as an independent DC power supply or as a "basic unit" to form energy storage lithium battery power systems of various specifications, featuring high reliability and ultra-long service life. It is suitable for applications such as backup power for communication base stations, data centers, household energy storage, and industrial energy storage.

2.1 Product Specification

Model: WKC	F01-51.2100	F01-51.2200	F01-51.2200-B
Nominal Voltage (V)	51.2		
Cell Specification (Ah)	100		
Nominal Capacity (Ah)	100	200	
Nominal Energy (kWh)	5.12	10.24	
Operating Voltage Range (V)	44.8-58.4		
Recommended Charging Voltage (V)	56.8		
Recommended Discharge Cut-off Voltage (V)	44.8		
Maximum Charging Current (A)	50	100	
Maximum Discharge Current (A)	50	100	
Cycle Life	6000 times(0.5C,90%DOD,25°C)		
Cabinet Dimensions (W×D×H) mm	380*148*615	430*240*630	550*148*780
Weight (kg)	46	85	83
Communication Method	CAN/RS485/Bluetooth/WIFI		
Number of Parallel Units	20 units		

Allowed Humidity Range (%RH)	15~85
Storage Ambient Temperature (°C)	-20-60(recommended 10-35)
Charging Ambient Temperature (°C)	0-50(recommended 10-35)
Discharging Ambient Temperature (°C)	-10-60(recommended 10-35)
Altitude (m)	＜3000
Protection Level / IP Rating	IP20
Cooling Method	Natural air cooling
Operating Conditions	Indoor
Protection Methods	Overvoltage, undervoltage, differential voltage, overtemperature, capacity, short circuit, communication failure, etc
Certifications	UN38.3,MSDS,CE

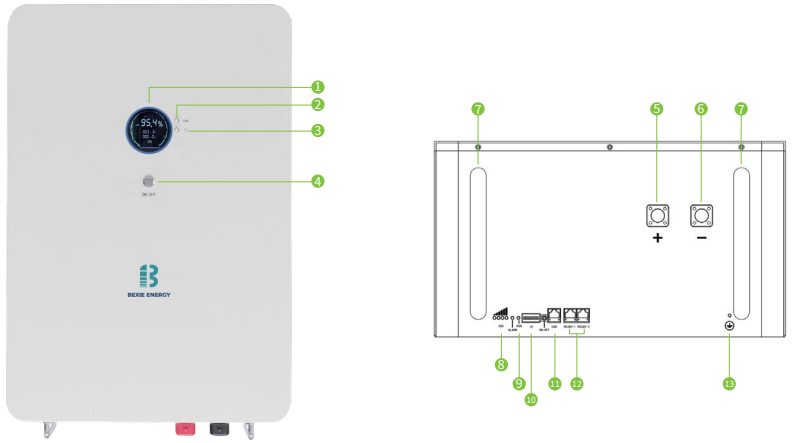
2.2 Suggested setting

Lithium battery packs are different from lead-acid batteries. Therefore, for devices connected to the battery pack for charging or discharging, such as inverters, MPPT charger controllers, and UPS systems, the following recommended pre-settings are required before startup.

Configuration	Maximum charging voltage	Float charge voltage	Maximum charge and discharge current	Cut-off voltage
WKC-F01-51.2N00	56.8	56.8	0.5C	44.8

Note: The specific value of the battery capacity set in the inverter shall be subject to the actual battery model,N00 in the table represents the actual capacity of the battery pack.

2.3 Product Illustrations and Introduction



2. Product Introduction

2.3 Product Illustrations and Introduction

1	Display screen: Displays the operating status and data of the battery.
2	CAN button: Press to select the battery communication protocol.
3	Power button: Press to light up the screen and display various data.
4	On/off button: Used to turn on/off the standby status of the entire Battery Management System (BMS).
5	Positive Output
6	Negative Output
7	Handle: For moving the battery.
8	SOC: Indicates charging/discharging status via four LED lights. From left to right, the LEDs represent 25%, 50%, 75%, and 100% charge levels respectively.
9	Operation Indicator: Green LED showing normal battery operation.Alarm Light: Red LED indicating an alarm trigger or protective state activation.
10	DIP Switch: Manually sets the battery address.
11	CAN Communication Port: Enables communication with the inverter, supporting both CAN (Baud rate: 500kbps) and RS485 (Baud rate: 9600bps) protocols.
12	RS485 Communication Port: Facilitates internal communication between batteries when multiple units are connected in parallel.
13	Battery Grounding Point

3. Installation steps and wiring

3.1 Install

The following points must be considered when choosing the installation location:
① Do not install the battery on flammable building materials.
② Install it on a fixed surface, ensuring that the installation surface is flat and perpendicular to the ground.
③ To allow for air circulation for heat dissipation, leave a 20 - centimeter space on the sides of the product, a 30 - centimeter space above and below it.
④ The ambient temperature should be between 10°C and 35°C to ensure optimal operation.

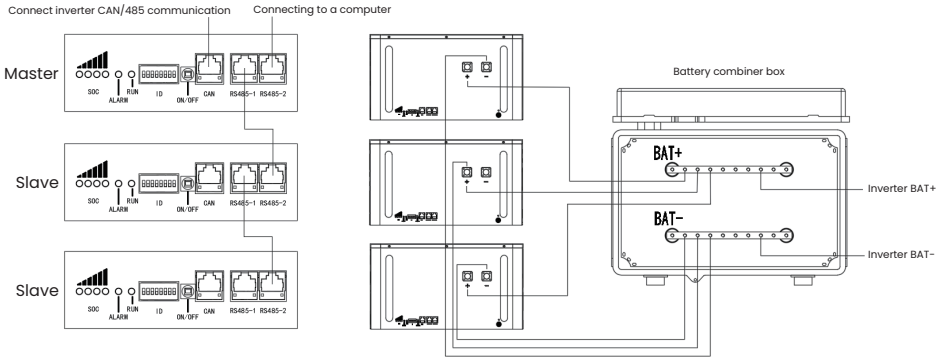
3. Installation steps and wiring

3.2 Termination

Please follow these steps to connect the battery:
1. Ensure that the battery is not powered on when making the wiring connections.
2.Use the cables and terminals provided with the product or recommended by the manufacturer to connect the battery output to the battery input of the inverter.

3.3 Connection in Parallel Operation Mode

This product supports parallel expansion and can adapt without the need for dialing. The following is the parallel wiring diagram (taking the three rack model as an example), and the parallel communication line adopts a diagonal connection method. Please refer to the partial diagram for details:



After completing the above wiring, select the positive and negative poles of any battery as the host output, connect them to the inverter/controller, confirm that the inverter, controller, and battery are connected correctly, and then turn on the battery host switch for one click power on.
Note: If two or more battery packs are combined, a battery combiner box should be added according to the load current situation! The system with added combiner boxes shall be wired strictly in accordance with the corresponding wiring standards.

4. Instructions

4.1 Power on/off

NO.	Function	Definition
1	Power on Power Start	When the battery is in hibernation, pressing the power-on button will start the battery. After the LED indicator lights flash in sequence, it will switch to normal working status.
2	Power off Shut down	When the battery is in standby or discharge status, pressing this button will put the battery into hibernation. After the LED indicator lights flash in sequence, it will switch to hibernation status. The battery consumes no power in hibernation.

4.2 LED Light Indication Instructions

LED light sequence: 1 running light, 1 alarm light, 4 capacity indicator lights.

SOC				ALARM	RUN
●	●	●	●	●	●

Capacity indicator								
STATE	Charge				Discharge			
Capacity indicator light	L4 ●	L3 ●	L2 ●	L1 ●	L4 ●	L3 ●	L2 ●	L1 ●
0~25%	Off	Off	Off	Flashing	Off	Off	Off	On
25~50%	Off	Off	Flashing	On	Off	Off	On	On
50~75%	Off	Flashing	On	On	Off	On	On	On
≥75%	Flashing	On	On	On	On	On	On	On
Running indicator light ●	On				Flashing			

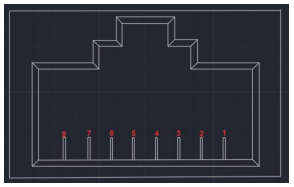
Flashing Description		
Flashing mode	ON	OFF
Flash 1	0.25s	3.75s
Flash 2	0.5s	0.5s
Flash 3	0.5s	1.5s

Status Indicator								
System Status	Running status	RUN	ALM	SOC				Illustrate
		●	●	●	●	●	●	
Shutdown	Sleep	Off	Off	Off	Off	Off	Off	All off
Standby	Normal	Flash 1	Off	Off	Off	Off	Off	Standby mode
Charge	Normal	On	Off	According to the battery indicator				Maximum LED flashes 2 times
	Overcurrent alarm	On	Flash 2	According to the battery indicator				Maximum LED flashes 2 times
	Overvoltage protection	Flash 1	Off	Off	Off	Off	Off	
	Temperature, overcurrent protection	Flash 1	Flash 1	Off	Off	Off	Off	
Discharge	Normal	Flash 3	Off	According to the battery indicator				According to the constant light indicator
	Alarm	Flash 3	Flash 3					
	Temperature, overcurrent, short circuit and other protections	Off	Still on	Off	Off	Off	Off	Stop discharging, when the mains is offline, it will be forced to sleep after 48 hours without any action
	Undervoltage protection	Off	Off	Off	Off	Off	Off	Stop discharge

5. Communication Instructions

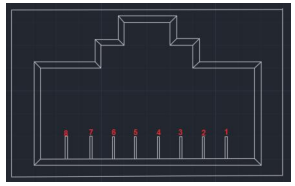
5.1 External communication CAN

The CAN port on the front panel of the battery is used for external communication between the battery and the inverter. The pin definitions are as follows:

Image	Pin	Definition
 8 1	1、8	RM485-B
	2、7	RM485-A
	4	CAN-H
	5	CAN-L
	3、6	GND

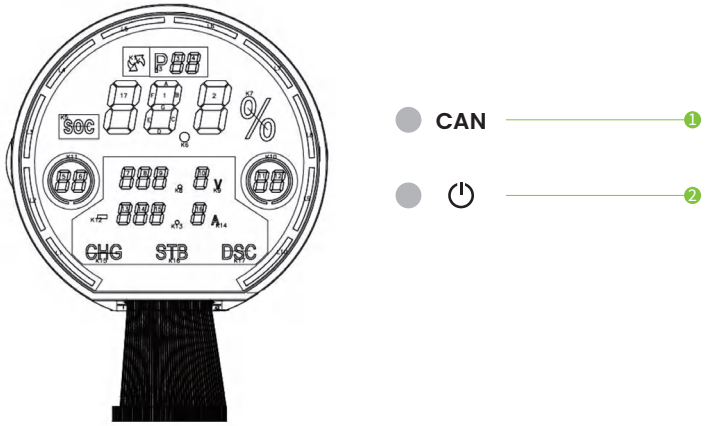
5.2 RS485 communication (parallel communication)

RS485-1 and RS485-2 on the battery front panel are for internal battery communication and are used for parallel communication wiring of multiple units. The pin definitions are as follows:

Image	Pin	Definition
 8 1	1、8	RS485-B
	2、7	RS485-A
	3、6	GND
	4、5	NC (悬空)

6. Display Introduction

The wall-mounted version of this product is equipped with a standard display screen, and the rack-mounted version is equipped with an optional display screen. The display screen displays the following information:



Serial number	Functional Description
1	Each time the button is pressed, the protocol will add 1 to the current value, and the maximum value can only be 6. When the LCD shows 6, pressing the button again will switch to 1.
2	Press once to light up the backlight and display various parameters.

6.1 Main page introduction

After power-on activation, the battery management interface will be displayed. Press the ENTER key to enter the main page. As shown below:

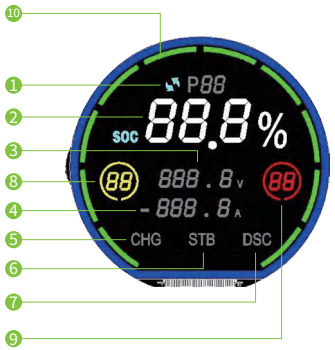


Image	NO.	Illustrate
	1	Protocol type
	2	Battery remaining capacity
	3	Battery voltage
	4	Current
	5	Charging status
	6	Standby status
	7	Discharging status
	8	Current alarm number
	9	Current protection number
	10	Battery indicator

6.2 Protocol Introduction

Press the button to switch the current inverter CAN protocol

Serial number	P01	P02	P03	P04	P05	P06
Protocol type	PN-GDLT	GRWT	VCTR	SMA-SF	GINL	STUD

7. Maintenance and Troubleshooting

7.1 Daily maintenance

A. Clean the battery dust regularly (1 month) and check whether the battery connection wires are loose.
B. If the battery is not used for a long time, it is recommended to charge and discharge the battery manually every 3 months.
C. If the battery is found to be bad, the entire battery pack should be replaced in time.
Try to avoid deep discharge of the battery. The recommended cut-off discharge voltage refers to the product parameter table.
Note: When maintaining, metal objects such as rings and watches must be taken off. Use tools with insulated handles.

7.2 Precautions

A. The battery management system cannot be used in series.
B. When using the battery management system, you cannot use a charging and discharging cabinet with a voltage of more than 100V for charging and discharging cycles.
C. During use, pay attention to anti-static, moisture-proof, and waterproof.
D. During use, please follow the design parameters and usage conditions, and do not exceed the values in this specification, otherwise the protection board may be damaged.
E. Please check whether the charging configuration such as PV or wind energy meets the requirements of lithium battery capacity and output load. If the configuration is improper, the lithium battery cannot be fully charged, and you need to pay attention to the low protection of the battery cell;
F. If the lithium battery is not charged for 4-7 days, please check the working voltage of the battery cell in time when working with load to avoid serious low voltage of the battery cell;
G. If the lithium battery is not used temporarily and is in standby for a long time, please turn off the lithium battery switch to avoid self-consumption or empty consumption causing serious low voltage of the lithium battery cell.
H. If the lithium battery cell is under low voltage protection, please check whether the total voltage of the lithium battery and the voltage of each lithium battery pack are within the normal range, and check the voltage of each single battery cell. If abnormal, please recharge in time.
I. Regularly observe whether the parameters of lithium battery charging voltage, current and lithium battery SOC are within the normal range. If any abnormality is found, please handle it in time to avoid abnormal operation of lithium battery.
J. Conventional battery packs are prohibited from turning on the 1C function switch, and only support long-term maximum 0.5C charging and discharging. If the battery pack needs long-term 1C charging and discharging, you must communicate with our engineers. This battery pack needs to be customized to add the functional accessories required for the 1C battery pack.

If you need to use it with inverters from other manufacturers please be sure to communicate with our engineers in advance