Roller Type Mobile ESS Battery

TW-MB51400-200A-HWB

Feature

◆ Using lithium iron phosphate core technology, higher safety, 80% DOD charging and discharging under standard conditions, more than 6000 cycles.

◆ High integrated analog front end, isolated power circuit.

◆ Integrated serial port IC, high voltage accuracy ($\leqslant$ 20mV), high current accuracy ($\leqslant$ 2% @ FS).

◆ 4-way battery temperature detection ($\leqslant$ 2 ℃), SOC estimation function, SOH estimation function.

◆ Short circuit protection function, adjustable overcurrent protection, multiple sleep and wake-up modes, low power consumption.

◆ Dual RS485 communication, parameter adjustable setting, buzzer alarm function, LED status indication function, charging equalization function.

◆ Temperature range of battery: - 20 ℃~60 ℃.

◆ Support parallel (up to 15 groups) application expansion.

Application

Standby power supply and household energy storage.
Solar and wind energy systems.

Catalogue

1 Safety tips

1.1 Preface

Thanks for choosing Teway New Energy power wall battery. In order to make you better use and maintain this product, please read the user manual carefully before use.

The features of this product are as follows:

1. Adopt brand new lithium iron phosphate cell; Higher security; In the standard state, 80% DOD charge-discharge ≥6000 times cycle；
2. Highly integrated analog front end; Isolating power supply circuit;
3. Integrated serial port IC, high voltage accuracy (≤20mV), high current accuracy (≤2%@FS);
4. Four-channel battery temperature detection (≤2℃), SOC estimation function, SOH estimation function;
5. Short-circuit protection function, adjustable overcurrent protection, a variety of sleep and wake up mode, low power consumption;
6. Dual-port RS485 communication, parameter adjustable setting, buzzer alarm function, LED status indicator function, with charge balance power;
7. Wide temperature range: -20℃~60℃;
8. Parallel connection (up to 15 groups) application expansion is supported, but serial connection is not recommended.

1.2 Safety disclaimer

When installing, using and maintaining this product, users must read this chapter carefully and follow the safety precautions required in this chapter. Any injuries and losses caused by illegal operation are not related to our company.

➢ **NOTE：** **It is strictly forbidden to dismantle the case if**

Non-professionals, and no warranty service will be provided after.

1.3 Description of safety matters

1. Keep the battery out of the reach of children and babies;
2. Do not put the battery in the oven or other similar equipment;
3. Do not remove the product label;
4. Do not try to open the battery pack;
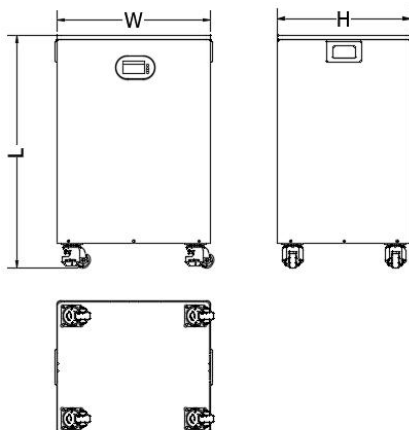5. Do not be exposed to the environment above 60℃(300F);

6. Do not short-circuit the positive and negative terminals of the battery with wires or other metal objects. Do not transport or store batteries with metal objects;
7. Do not expose the battery to direct heat or flame. Do not use or store batteries near fire or high temperature;
8. Do not immerse the battery in water, salt water or any other liquid or make it wet;
9. Do not pierce the battery with any sharp object, knock it with a hammer or similar device, step on it, fall it or get strong vibration;
10. Do not use the battery if it is damaged or deformed;
11. If the battery produces odor, smoke or abnormal heat, please stop using it immediately;
12. If the battery liquid leaks and comes into contact with your eyes, please don't rub your eyes, and immediately rinse them with plenty of water before seeking medical assistance.

2 Product description

2.1 Product dimension

Model	Size（L*W*H）
TW-MB51400-200A-HWB	785*520*450mm

2.2 Product details

Display

Positive and negative connection ports

Balance Switch
Optional Functions

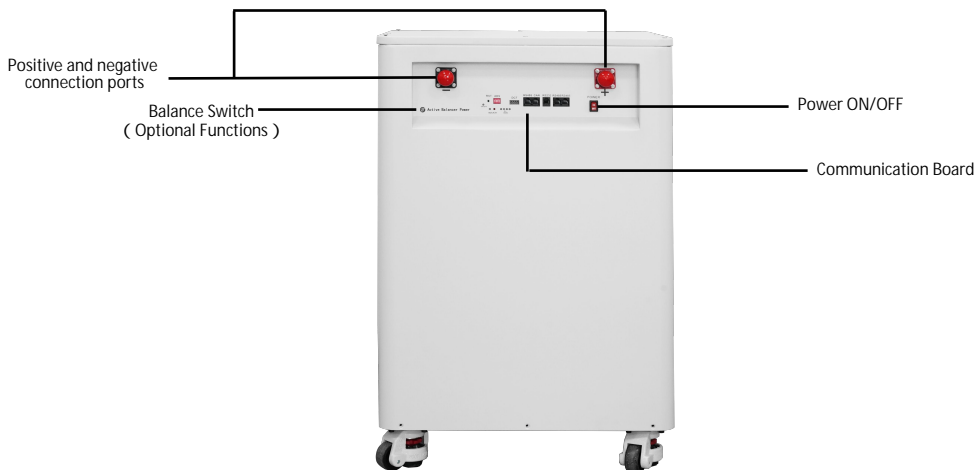Power ON/OFF

Communication Board

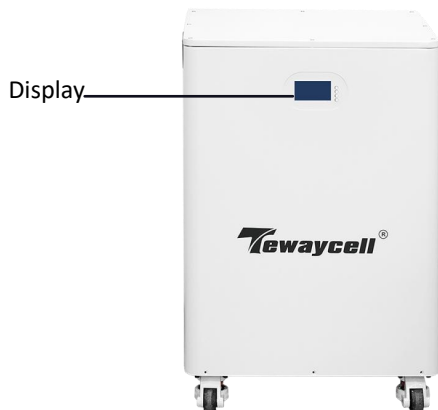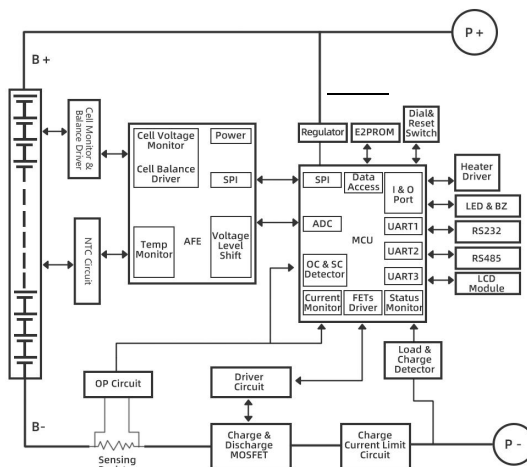
Add: Building A, Xinida Industrial Park, Junzibu Village,Guanlan Stree, Longhua District ,Shenzhen, Guangdong
TEL :0755-23225527   FAX:0755-23225537

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2.3 Electrical schematic diagram

picture1 Electrical schematic diagram

3 Technical specifications

Table 1 Technical specification table

No.	Project	
1	Model	TW-MB51400-200A-HWB
2	Nominal capacity	400AH
3	Nominal voltage	51.2V
4	Charging voltage	56.8-57.6V
5	Operating voltage	43.2V~58.4V
6	Charging Standard Current	0.2C 80A
	Maximum Charging Current	180A
7	Standard charging mode	At a temperature of 25°C, charge to 58.4V with a constant current of 0.2C5A, and then change continuously with a

		constant voltage of 58.4V until the current is not greater than 0.02C5A.
8	Maximum discharge current	200A
9	Charging temperature	0°C to 45°C (32°F to 113°F) @60±25% relative humidity
10	Discharge temperature	-20°C to 60°C (-4°F to 140°F) @60±25% relative humidity
11	Storage temperature	-20°C to 60°C (-4°F to 140°F) @60±25% relative humidity
12	Line joint	250A Self-Locking Fitting Quick Release Connector
14	Net Weight Approx.	208KG
15	Communication protocol	RS485、RS232、CAN
16	Support inverter brand	Growatt、Deye、Goodwe、Voltronic power、Sofar、VICTRON、Solis、Megarevo、SRNE

4 BMS characteristics

4.1 Instructions for LED lights
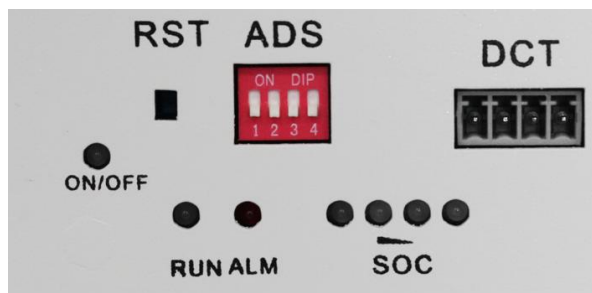
Picture 3 Battery indicator lamp

Four green capacity indicators, a red alarm indicator, a green running indicator and a switch indicator.

4.1.1 SOC capacity indicator

Table 2 SOC indicator status table

Condition		Charge				Discharge			
Capacity indicator lamp		L1	L2	L3	L4	L1	L2	L3	L4
power （%）	0~25%	Flash 2	OFF	OFF	OFF	ON	OFF	OFF	OFF
	25~50%	ON	Flash 2	OFF	OFF	ON	ON	OFF	OFF
	50~75%	ON	ON	Flash 2	OFF	ON	ON	ON	OFF
	75~100~	ON	ON	ON	Flash 2	ON	ON	ON	ON
Running indicator light		ON				Flash 3			

4.1.2 Status indicator

Table 3 Status indicator status table

Status	Warning/Normal/ Protection	ON/ OFF •	Run •	Alert •	LED Battery Level Indicator				Explain
					•	•	•	•	
Shut down	Sleep mode	ON	OFF	OFF	OFF	OFF	OFF	OFF	Light off
Standby	Normal	ON	Flash 1	OFF	According to the electricity indication				Standby mode
	Warning	ON	Flash 1	Flash 3					Module low voltage
charge	Normal	ON	ON	OFF	According to the power indicator (the maximum LED of the power indicator flashes 2)				The maximum power LED flashes (flash 2),and the ALM does not flash during the overshoot.
	Warning	ON	ON	Flash 3					
	Overcharge Protection	ON	ON	OFF	ON	ON	ON	ON	If there is no mains supply,the indicator turns to standby
	Temperature,over current,failure, protection	ON	OFF	ON	OFF	OFF	OFF	OFF	Stop charging

discharge	Normal	ON	Flash 3	OFF	According to the electricity indication				
	Warning	ON	Flash 3	Flash 3					
	UVLO	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharge
	Temperature, over current, short out, reversed polarity ,FAIL-SAFE	ON	OFF	ON	OFF	OFF	OFF	OFF	Stop discharge
Invalid		OFF	OFF	ON	OFF	OFF	OFF	OFF	Stop charging and discharging

Table 4 LED flashing description

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

4.2 Boot and sleep mode

Sleep mode: the battery will be in sleep mode if any of the following conditions are met

1) The battery or battery pack over discharge protection lasts for 30 seconds and is not released.

2) Press the power on / off button for 3 seconds and release.

3) The minimum voltage of the battery is lower than the "sleep voltage" setting in the setting, without charging and discharging.

4) Standby for more than 24 hours without charging and discharging.

5) Switch to the upper computer for sleep manually.

Wake up: the battery will exit sleep mode if any of the following conditions are met

1) Charger is plugged in; The charger voltage is greater than 48V.

2) Press the power on / off button for 3 seconds and release.

3) Plug in the communication cable and open the upper computer software (not available if it is under over discharge protection).

Note: if over discharge protection is enabled, the battery will be in sleep mode. The battery will wake up automatically every 4 hours and turn on the charge / discharge MOS. If charging is available, the battery will be charged, otherwise it will return to sleep mode. If it has been awakened 10 times but cannot be charged, the battery will not wake up again automatically.
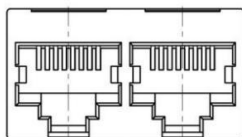
4.3 Communication area
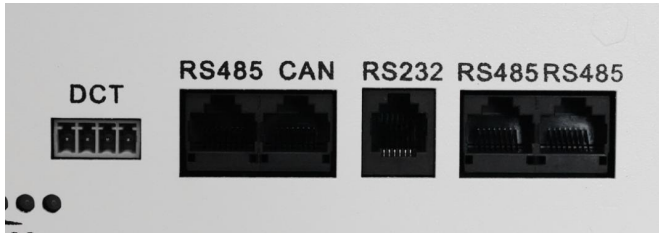
Picture 4 Communication interface diagram

1. RS232: BMS can communicate with upper computer through RS232 interface, so as to monitor various information of battery, including battery voltage, current,temperature, status and battery production information, etc. the default baud rate is 9600bps.
2. RS485: with dual RS485 interface, you can view the information of pack. The default baud rate is 9600bps.If it is necessary to communicate with the monitoring equipment through RS485, the monitoring equipment is used as the host, polling data according to the address, and the address setting range is 1 ~ 15.
3. CAN: CAN communication, baud rate 9600bps.
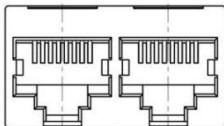4. DCT：dry contact interface.
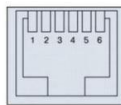5. Rst: reset button.
6. ADS: dial switch
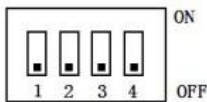
7. Interface diagram

CAN and RS485 interface

Dry contact

Parallel communication port

communication interface

8. Definition of electrical interface

RS232 -- 6P6C vertical RJ11 plug	
RJ11 pin	Definition Description
2	NC
3	TX(Single board)
4	RX(Single board)
5	GND

RS485 - 8P8C vertical RJ45 socket		CAN - 8P8C vertical RJ45 socket	
RJ45 pin	Definition Description	RJ45 pin	Definition Description
1、8	RS485-B1	9、10、11、14、16	NC
2、7	RS485-A1	12	CANL
3、6	GND	13	CANH
4、5	NC	15	GND

Table 1 RS485 and CAN Interface

RS485 - 8P8C vertical RJ45 socket		RS485 - 8P8C vertical RJ45 socket	
RJ45 pin	Definition Description	RJ45 pin	Definition Description
1、8	RS485-B	9、16	RS485-B
2、7	RS485-A	10、15	RS485-A
3、6	GND	11、14	GND
4、5	NC	12、13	NC

Table 2 Parallel communication port
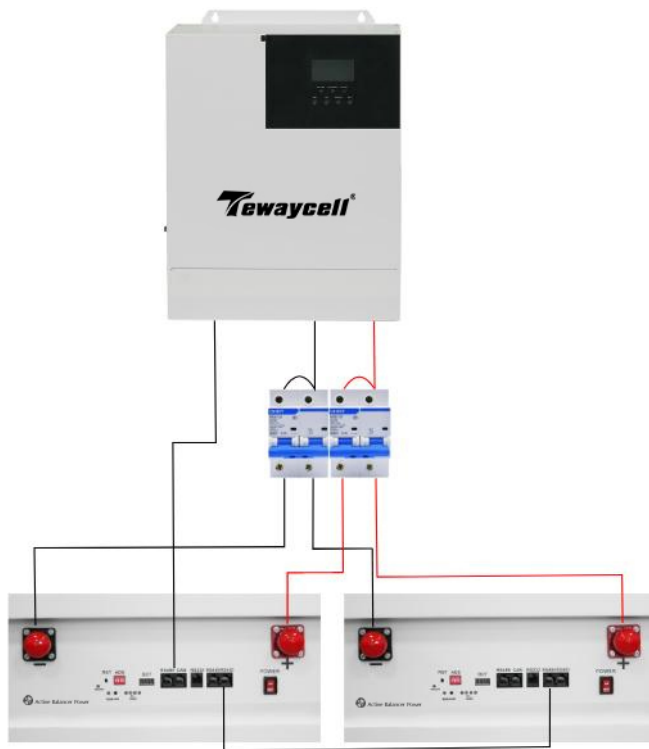
5 Description of parallel connection

5.1 Parallel connection diagram

If parallel batteries are required, connect the wires according to the diagram，maximum support for 15 batteries in parallel

5.2 Description of parallel connection

The signal line connected to the inverter should use RS485 communication line or CAN communication line. If it is necessary to use batteries in parallel:

① RS485 cable shall be used to connect the parallel communication port. Refer to the communication line parallel diagram;

② The address of the battery needs to be set. Refer to the dial switch setting table for address setting,

Table 4 The Dial Switch Setting Table

Address	Dial switch position			
	#1	#2	#3	#4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	ON	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
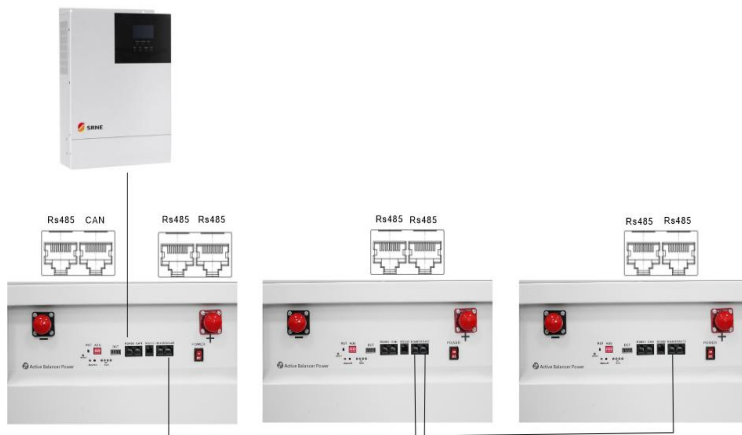
Communication line parallel diagram

6 Operating instructions

6.1 Operating instructions of the display screen

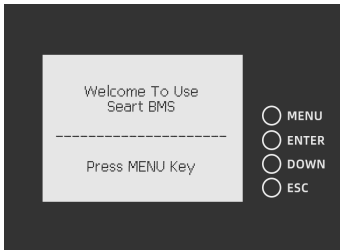### 6.1.1 Introduction of LCD .

Button Description:
MENU: enter the management system.
Enter: enter the submenu.
Down: moves the cursor down or to the next page.
ESC: returns to the previous one.

6.1.2 Boot screen

Battery protection status:
Overvoltage: OV
Low voltage: LV
Overtemperature: OT
Low temperature: IT
Over current: OC
Short circuit: SC
Note:when the battery is protected,the corresponding protection status will be displayed; otherwise,the protection status will not be displayed as the protection state.

① Press "MENU" to enter the main menu.

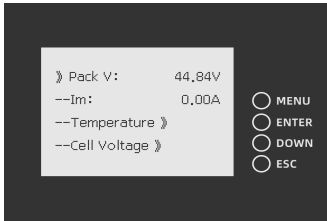Note:"》"indicates that there is a submenu. Press"ENTER" to enter the submenu
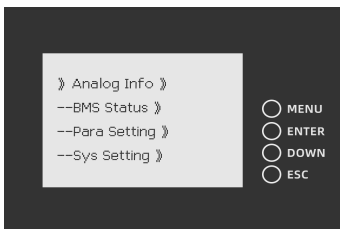
Analog Info	》
BMS Status	》
Para Setting	》
Sys Setting	》

② Move the cursor to "Analog info" and press "Enter"

Pack V	
Im	
Temperature	》
Cell Voltage	》

Move the cursor to "Temperature" and press "Enter" to check the battery temperature information, then press "DOWN" to turn the page
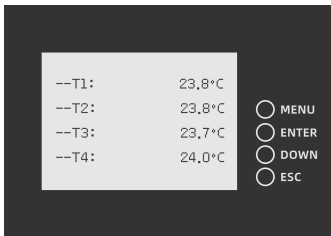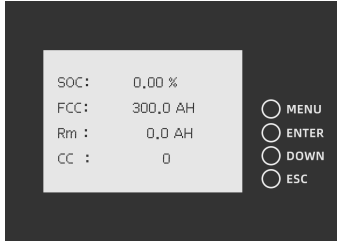
T1	XX℃
T2	XX℃
T3	XX℃
T4	XX℃
PCB-T	XX℃
ENV-T	XX℃

Move the cursor to "Cell Voltage" and press "Enter" to check the battery voltage information, then press "Down" to turn the page

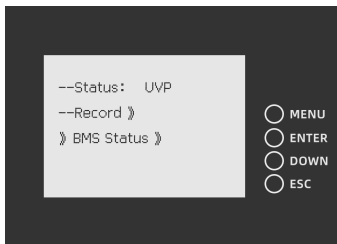| Cell 01	xxxxmV
Cell 02	xxxxmV
Cell 03	xxxxmV
Cell 04	xxxxmV
Cell 05	xxxxmV
Cell 06	xxxxmV
Cell 07	xxxxmV
Cell 08	xxxxmV
Cell 09	xxxxmV
Cell 10	xxxxmV
Cell 11	xxxxmV
Cell 12	xxxxmV
Cell 13	xxxxmV
Cell 14	xxxxmV
Cell 15	xxxxmV

Move the cursor to "CellCapacity" and press "Enter" to check the battery capacity information

SOC	X%
FCC	XAH
Rm	XAH
CC	0

```
SOC:    0.00 %
FCC:    300.0 AH      ○ MENU
Rm :    0.0 AH        ○ ENTER
CC :    0             ○ DOWN
                      ○ ESC
```

③ Move the cursor to "BMS Status", press "Enter" to check the battery status, and press "▼" to turn the page

```
--Status:  UVP
--Record 》              ○ MENU
》 BMS Status 》          ○ ENTER
                        ○ DOWN
                        ○ ESC
```
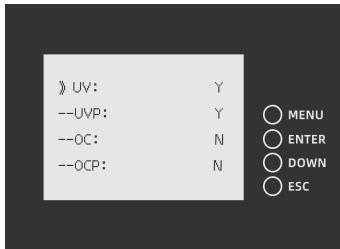
Status	
Record	》
BMS Status	》

Move the cursor to "Record", then press "Enter" to check the battery alarm information, then press "DOWN" to turn the page.
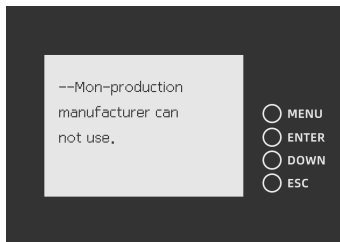
```
》 SCP:       2
--0/UTP:     0          ○ MENU
--OCP:       0          ○ ENTER
--UVP:       3          ○ DOWN
                        ○ ESC
```
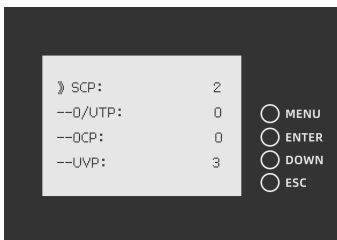
SCP	
0/UTP	
0CP	
UVP	
0VP	

Move the cursor to "BMS Status", then press "Enter" to check the battery protection information, and then press "DOWN" to turn the page.
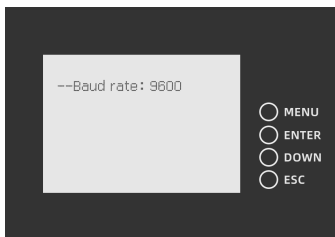
UV	Y/N
UVP	Y/N
OC	Y/N
OCP	Y/N
OT	Y/N
OTP	Y/N
OV	Y/N
OVP	Y/N
SCP	Y/N
Failure	Y/N

④ Move the cursor to "Para Setting" and press "Enter"to check the gyroscope information, then press "▼" to turn the page.

⑤ Move the cursor to "Sys Setting", then press "Enter" to check the version information, and then press "▼" to turn the page.
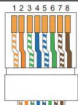
⑥ Hibernation and activation functions

After 1 minute of button-free operation in normal operation, the display will turn off (backlight only), and pressing any button while the screen is off will allow the screen to light up and function normally.

7 Product list and tools

7.1 Product packing lists

Home energy storage system series power supply has been strictly inspected before delivery, but may be damaged in transit, therefore, after unpacking the box, please check whether the following items are complete, confirm the model, capacity, input voltage and output voltage, and whether the specified content when ordering; If anything abnormal or inconsistent occurs, please contact the distributor as soon as possible.

		Picture		Description		Qty
Home energy storage battery						1 pieces
Product manual						1 pieces
Positive/negative connector plug(with 1000mm wire and copper terminal)						Positive/negative each one
Signal line(Optional)	CAN	Connect inverter	RJ45			4-CAN-H 5-CAN-L
	RS485	Connect other battery	RJ45			1、8-RS485-B 2、7-RS485-A

8 Instruction manual

1. Place the battery in an appropriate position, plug the positive/negative connector into the positive/negative socket.
2. Connect the other end of the positive and negative lead to the inverter.
3. Turn on the Rocker switch and the Air Switch.

9. Active Equilibrium Function

9.1 Overview

Because the battery capacity, internal resistance, voltage and other parameter values are not completely consistent, this difference causes the battery with the smallest capacity to be easily overcharged and discharged during charging, and the smallest battery capacity becomes smaller after damage, entering a vicious cycle. The performance of single battery directly affects the charge and discharge characteristics of the whole battery and the reduction of battery capacity. BMS without balance function is just a data collector, which is hardly a management system. BMS active equalization function can realize the maximum continuous 1A equalization current. Transfer the high-energy single battery to the low-energy single battery, or use the whole group of energy to supplement the lowest single battery. During the implementation process, the energy is redistributed through the energy storage link, so as to ensure the battery consistency to the greatest extent, improve the battery life mileage and delay the battery aging.

9.2 Technical indicators of the main parameters

Qualification	Data specification
Balance current	0.5~1A
Balance mode	Active equilibrium
Balance on condition	Reach the user-defined opening voltage and differential pressure Minimum voltage of single unit≥3.2V (factory default) and equalizing opening differential pressure: ≥50mV (factory default)
Balance closing condition	Closing voltage and differential pressure reaching the user-defined setting Minimum voltage of single unit＜3.2V (factory default) and equalizing differential pressure: ＜50mV (factory default)
Working power consumption	<11mA
Sleep current	300uA
Working temperature	-20℃～60℃