

# Lithium-ion Battery Product Specification Sheet

**Product model: DL-48100SK**

**Product specification: 51.2V100Ah**

**Date: 2024.09.09**

Prepared By	Checked By	Approved By

Customer confirmation:

Confirm opinion:	
date	Signature of customer:

Note: After receiving the samples and specifications from the customer, please reply in time. If there is no reply within 7 days, our company will accept the parameters in the specification and the samples sent by the customer.

DL-48100SK



# 51.2V100Ah LFP Stacked Energy Storage

● ● ● (Color is customizable)

Rev:1.0

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## 1. Instructions

### 1.1 Overview

This manual will provide detailed product information and installation instructions for users using the DLNRG51.2 V100Ah series. Please read this manual carefully before using this product and store it in a place easy for installation, operation and maintenance personnel. Any modification of this manual will not be notified by the company.

## 2. Safety instructions

### 2.1 Safety overview

- Please read this manual carefully before installation. If the equipment is damaged according to the instructions in this manual, the company has the right not to conduct quality assurance.
- All operations and wiring must be performed by well-trained professional electrical technicians.
- When installation, do not touch the chassis except the terminal.
- All electrical connections must comply with the local electrical safety standards.
- If this equipment needs required, please contact the local designated system installation and maintenance personnel.
- Please use the charger equipped with the product for charging. If the product is damaged, the company has the right to refuse maintenance.

### 2.2 Handling process



#### Note

- Ensure that the energy storage battery system is not damaged during transportation and storage.
- Be careful and consider the weight when lifting the battery.
- Do not impact, pull, drag or press the equipment, or put irrelevant items into any part of the battery system.
- Transport must be performed by a trained professional, and operations in the process must be recorded.
- Ensure that the equipment is placed firmly, and is not tilted, and the equipment dumping may cause equipment damage and personal injury.
- Please ensure CO<sub>2</sub>, Novac1230 or FM-200 fire extinguishers nearby.
- When extinguishing a fire, please use the recommended fire extinguisher without water or ABC dry powder fire extinguisher; fire fighters shall wear protective clothing and self-contained breathing apparatus.
- The battery risks exploding when the ambient temperature exceeds 150°C.
- When installing and maintaining heavy equipment, use appropriate tools and take protective measures. Improper operation can lead to personal injury.
- The use of the cable in a high temperature environment may cause the aging and damage of the insulation layer, and the distance between the cable and the periphery of the heating device or heat source area should be at least 100mm.

- Similar cables should be tied together, and different types of cables should be placed at least 30mm apart, without mutual winding or cross-laying.

## 2.3 Installation



### Note

- Please read this manual carefully before installation. It is entitled to avoid quality assurance.



### Danger

- Before installation, make sure that the energy storage battery has no electrical connections.



### Warn

- Installation conditions, environment, spacing, etc., please follow the contents of this manual.
- See this manual for the installation steps. Please read them carefully before installation.

## 2.4 Electrical connection



### Danger

- Before making an electrical connection, make sure that the battery switch is in "OFF" and disconnect the power switch.
- It must be conducted by trained professional electrical technicians and comply with this manual and relevant local regulations.
- Do not place inflammable and explosive items around the battery.



### Warn

- Install the battery in a dry position, otherwise it may affect the battery operation.
- See this manual for the installation steps. Please read them carefully before installation.

## 2.5 Limit of Liability version

V1.0 version 2024-08-05 Initial release

The equipment manufacturer will not bear any direct or indirect liability for the battery system damage or property damage caused by the following circumstances.

- The battery system has been modified, modified or replaced without the authorization of the equipment manufacturer.
- Non-equipment manufacturer technical personnel to change and clear the battery system serial number.
- The system design and installation of other equipment do not meet the standards, safety regulations and other related requirements.
- Damage to the equipment caused by not complying with the relevant requirements of the battery system user manual.
- Damage caused to improper use or misuse of the battery system.
- Damage caused by insufficient ventilation of the battery system.
- Maintenance procedures regarding the battery system did not follow acceptable standards
- Equipment damage caused by force majeure, such as earthquake, storm, lightning, over-voltage, fire, etc.
- Equipment damage caused by any external factors.

### 3. Product introduction

#### 3.1 Battery parameters

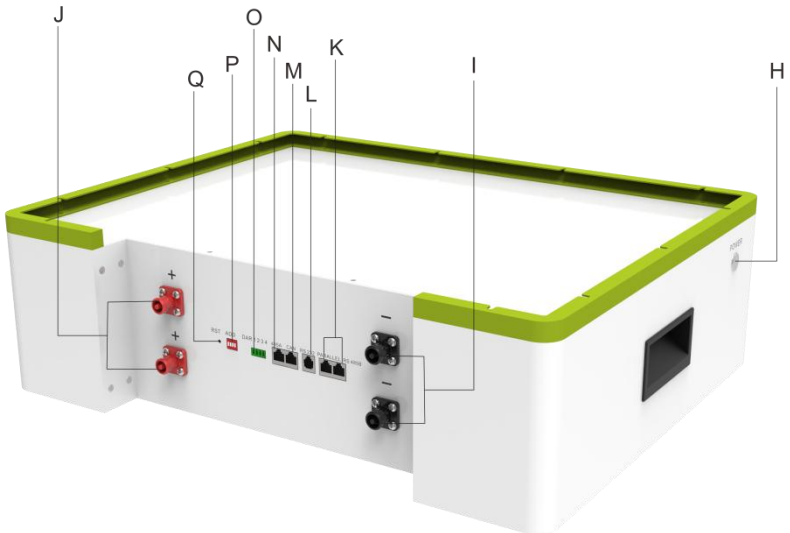
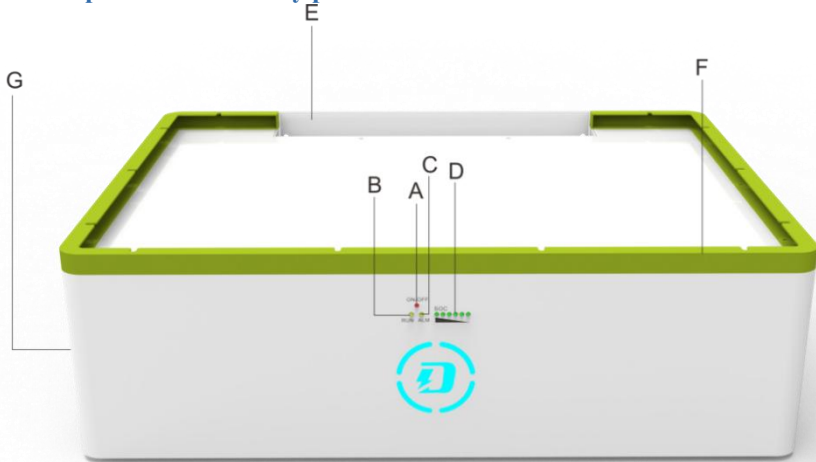
Items	Commonly used parameters	
Battery type	LFP battery	
Nominal capacity	100Ah	
Rated voltage	51.2V	
Nominal energy	5120Wh	
Internal resistance	≤60mΩ	
Maximum charging voltage	58.4V	
Discharge cut-off voltage	46V	
Standard charging current	20A	
Standard discharge current	50A	
Maximum continuous charging current	100A	
Operating temperature (CC / CV)	Standard	0°C~45°C
	Discharge	-20°C~55°C
	Keep in storage	-20°C~45°C
Transportation of electricity	20-50%	

### 3.2 Product composition



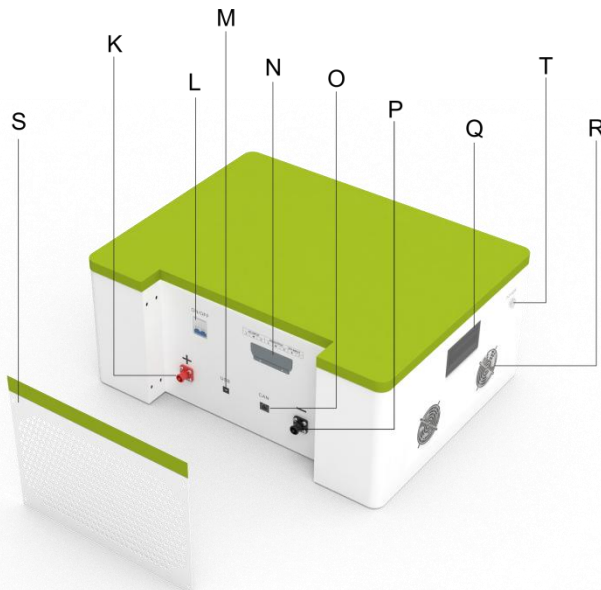
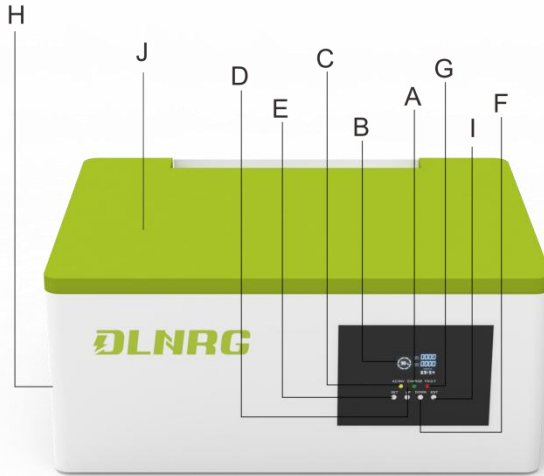


### 3.3 Description of the battery parts



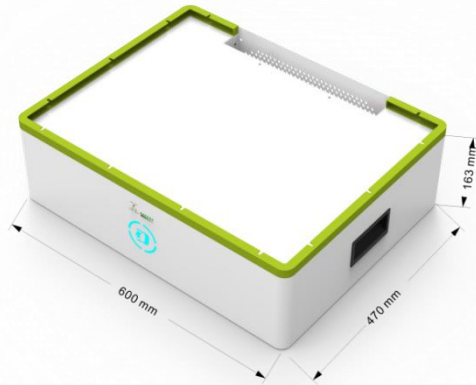
<b>A</b>	<b>Power</b>
<b>B</b>	RUN pilot lamp
<b>C</b>	ALM pilot lamp
<b>D</b>	SOC power indicator
<b>E</b>	Rear cover
<b>F</b>	Stacking card bar
<b>G</b>	Battery shell
<b>H</b>	Switch
<b>I</b>	Negative electrode interface
<b>J</b>	Positive electrode interface
<b>K</b>	RS485 parallel communication
<b>L</b>	RS232 Communications
<b>M</b>	CAN communication
<b>N</b>	External to the RS485-A communication
<b>O</b>	Dry contact point
<b>P</b>	Dial switch
<b>Q</b>	RST switch

### 3.4 Description of the inverter parts

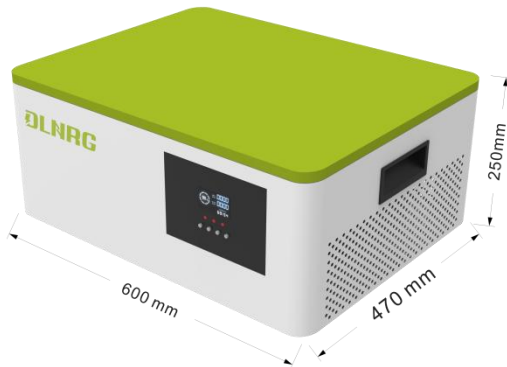


<b>A</b>	Charger pilot lamp
<b>B</b>	Display
<b>C</b>	AC/INV pilot lamp
<b>D</b>	Up pilot lamp
<b>E</b>	Set pilot lamp
<b>F</b>	DOWN pilot lamp
<b>G</b>	FAULT pilot lamp
<b>H</b>	Shell
<b>I</b>	ENT pilot lamp
<b>J</b>	Cover
<b>K</b>	Positive electrode interface
<b>L</b>	Wiring switch
<b>M</b>	USB communication interface
<b>N</b>	AC input/output PV input
<b>O</b>	CAN communication interface
<b>P</b>	Negative pole interface
<b>Q</b>	Handle
<b>R</b>	Cooling fan
<b>S</b>	Back cover
<b>T</b>	Switch

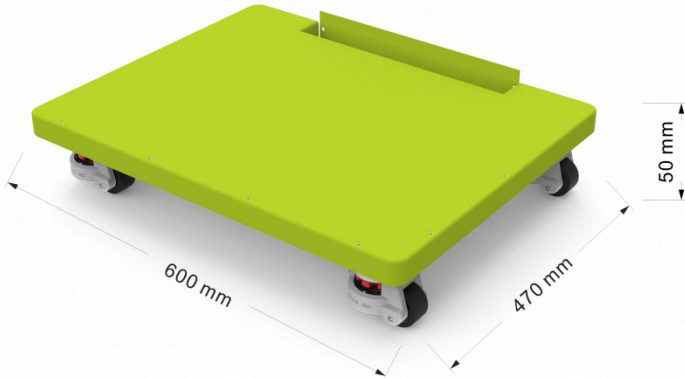
### 3.5 Description of product dimensions



Battery size



Inverter Size



Name	Size	Weight
Battery	600 x470 x163mm(L*W*H)	About 50 KG
Inverter	600 x470 x250mm(L*W*H)	About 35 KG
Pallet	600x470x50mm(L*W*H)	About 5 KG

## 4. Storage and packaging









### 4.1 Storage environment

If the device is not immediately installed, confirm that the storage environment meets the following conditions:

- The equipment shall be packed in packing boxes and sealed after desiccant placement in the packing box.
- If the installation is not conducted within 3 days after unpacking, it is recommended to put the equipment in the packing box.
- Storage SOC: 25 ~ 50% SOC, and one charge and discharge cycle is required for every 3 months of storage.
- Storage temperature range: -20°C ~40°C no more than 1 month; 0-35°C no more than 1 year.
- Humidity range: 0~95% without condensation. The battery interface cannot be installed when there is wet condensation phenomenon.
- The equipment shall be stored in a shade to avoid direct sunlight.
- Equipment storage should be far away from flammable, explosive, corrosive and other items.
- Equipment is prohibited from rain.

### 4.2 Packaging list

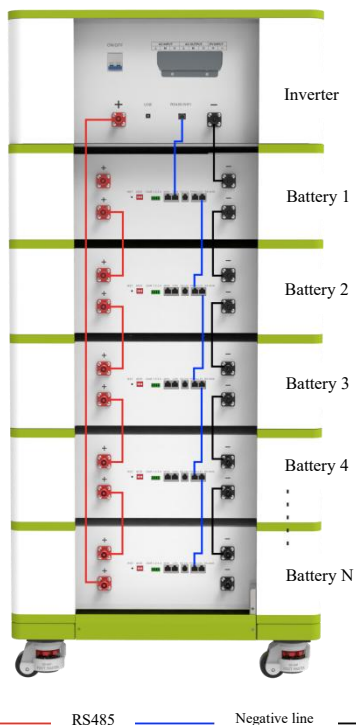
- Before unpacking the battery, check the damage and check the battery model. If there is any abnormality, do not open the packing box, and contact the after-sales service center as soon as possible.
- After unpacking the battery packaging, please check the product delivery according to the packaging information. If there is any abnormality, please contact the after-sales service center as soon as possible.

			
cell xN	Inverter x 1	Stack the card strips x N	Base tray x 1
			
Positive electrode power line Material: special soft silicone wire Cross-sectional area: 25mm <sup>2</sup> Length: 1.2 mx N	Negative electrode power line Material: special soft silicone wire Cross-sectional area: 25mm <sup>2</sup> Length: 1.2 mx N	RS485, parallel machine communication line xN	The CAN communication line x N

## 5. System installation

- The battery system shall be installed in a plane with sufficient gravity bearing force and flatness; if the plane does not have sufficient supporting force and flatness, other means should be ensured (such as making foundation, adding load-bearing plate, etc.).
- The battery works best at a temperature of 20-40°C.
- Avoid installing in a direct hot, rainy environment.
- Avoid installation near the high temperature heat source or low temperature cold source environment.
- Avoid installation in areas with extreme changes in ambient temperature;
- Avoid installation in a strong interference environment.
- Avoid installation in sites where children can access.
- Avoid installation in water-prone areas.
- Do not place inflammable and explosive items around the equipment.

### 5.1 Battery wiring overview diagram



Note: For operating safety and compliance, independent DC overload protector or disconnection device should be installed between battery and inverter.

warn! All wiring must be performed by a professional person. Using the appropriate cable to connect the battery is very important for the safe and efficient operation of the system. To reduce the risk, please use the equipped cable, or the cable specifications recommended by us.



Maximum discharge current of Max discharge current	Recommended cable specification is Recommend wire
100A	25mm <sup>2</sup> / 1 * 4 AWG (not less than No less than)

## 5.2 Connect with the power line

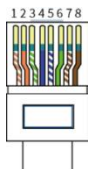
- Red power line pressure corresponds to red outer wire harness, black power line corresponds to black outer wire harness, harness cross-sectional area .Wire materials shall meet the standards for outdoor use.
- Pressure resistance grade is DC1500V, and temperature resistance is-40°C ~200°C.
- When using a single machine, two power interfaces are connected to one other, and the other power interface should be covered with a protective cover.
- When used in parallel, the power interface between the battery is connected to the positive electrode, the negative electrode connects to the negative electrode, and the last battery advance
- The remaining one-road power interface should be covered with a protective cover.
- For the installation connection, the parallel power line between the batteries is as short as possible.



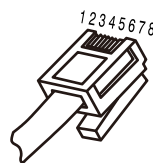
Attention ! Do not place any items at the output of the battery, otherwise it may cause short circuit or heat  
 Attention ! Make sure that the positive and negative electrode connector is installed in place, otherwise the battery may overheat;  
 Attention ! Before connection, ensure that the circuit breaker or separator between the inverter and the battery is disconnected, ensure that the battery positive (+) must be connected to the inverter positive (+) and the battery negative (-) must be connected to the inverter negative (-).

## 5.3 Communication line connection

The product has RS485 and CAN communication external communication function, the communication interface is 8P8C vertical RJ 45 socket, in the communication connection needs to ensure the correct wiring.



RS485 communication Interface



CAN communication interface

PIN	Definition
4	CAN_H
5	CAN_L
1,2,3,6,7,8	N/A

PIN	Definition
1	RS485B
2	RS485A
3,4,5,6,7,8	N/A

## 5.4 Code switch setting

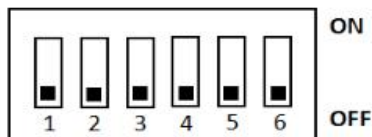


Set the dial address to "1" when the product communicates with the inverter.

Add.	Dial switch position			
	#1	#2	#3	#4
1	ON	OFF	OFF	OFF

## 5.5 Parallel dip switch Settings

When the battery needs to be used together, the battery address needs to be set according to the following rules.



Add.	Dial switch position						Explain
	K1	K2	K3	K4	K5	K6	
0	OFF	OFF	OFF	OFF	OFF	OFF	Uncascade, single machine use
1	ON	OFF	OFF	OFF	OFF	OFF	Set to Pack 1 (Master)
2	OFF	ON	OFF	OFF	OFF	OFF	Set it to Pack 2
3	ON	ON	OFF	OFF	OFF	OFF	Set it to Pack 3
4	OFF	OFF	ON	OFF	OFF	OFF	Set it to Pack 4
5	ON	OFF	ON	OFF	OFF	OFF	Set it to Pack 5
6	OFF	ON	ON	OFF	OFF	OFF	Set it to Pack 6
7	ON	ON	ON	OFF	OFF	OFF	Set it to Pack 7
8	OFF	OFF	OFF	ON	OFF	OFF	Set it to Pack 8
9	ON	OFF	OFF	ON	OFF	OFF	Set it to Pack 9
10	OFF	ON	OFF	ON	OFF	OFF	Set to Pack10
11	ON	ON	OFF	ON	OFF	OFF	Set to Pack11
12	OFF	OFF	ON	ON	OFF	OFF	Set to Pack12
13	ON	OFF	ON	ON	OFF	OFF	Set to Pack13
14	OFF	ON	ON	ON	OFF	OFF	Set to Pack14
15	ON	ON	ON	ON	OFF	OFF	Set to Pack15
16	OFF	OFF	OFF	OFF	ON	OFF	Set to Pack16

When the battery pack is used in parallel, different PACKs can be distinguished by the hardware address, and the hardware address of each PACK in the whole battery stack is unique, and the hardware address can be set successively through the dial switch on the board, and the dial code is 1,2,3,4,5,6. Reference definition table.

## 5.6 LED indicator instructions

Button indicator light	State
Green light	Standby, work, warning
Red lantern	hitch

Status	Normal/Alerts/Protection	RUN1	RUN2	ALM	Power indicator LED						Description	
		●	●	●	●	●	●	●	●	●		
shutdown	Dormancy	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	All extinguished
Standby	Normal	ON	Flash 1	Off	Show current SOC						Standby status	
	Alerts	ON	Flash 1	Flash 3	Show current SOC						Modular low voltage	
Charging	Normal	ON	ON	Off	Show current SOC (Power indicator highest LED flashing 2)						(Power indicator highest LED flashing 2); Overcharge alarm ALM does not flash	
	Alerts	ON	ON	Off	Show current SOC (Power indicator highest LED flashing 2)						If there is no utility power, the indicator is in standby mode	
	Ov protection	ON	ON	Off	ON	ON	ON	ON	ON	ON	ON	If there is no utility power, the indicator is in standby mode
	TP、OC、Failure	ON	Off	ON	Off	Off	Off	Off	Off	Off	Off	Stop charging
Discharge	Normal	ON	Flash 3	Off	Show current SOC						/	
	Alerts	ON	Flash 3	Flash 3	Show current SOC						/	
	Undervoltage protection	ON	Off	Off	Off	Off	Off	Off	Off	Off	Off	Stop Discharge
	TP、OC、SC、RC、Failure	ON	Off	ON	Off	Off	Off	Off	Off	Off	Off	Stop Discharge
Failure	TP、Voltage Protection	Off	Off	ON	off	off	off	off	off	off	off	Stop charging and discharging

## 5.7 Capacity indication instructions

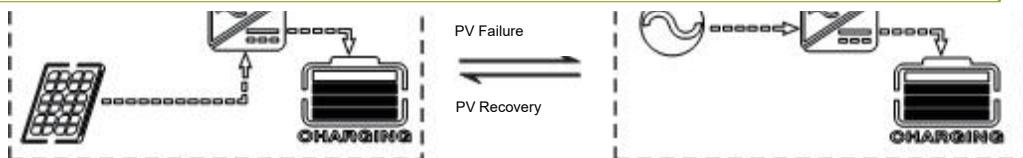
Capacity indicator LED	Status	Charging					Discharge						
		L6●	L5●	L4●	L3●	L2●	L1●	L6●	L5●	L4●	L3●	L2●	L1●
SOC(%)	0~16.6%	OFF	OFF	OFF	OFF	Flash 2	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	16.6~32.2%	OFF	OFF	OFF	Flash 2	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	32.2~49.8%	OFF	OFF	OFF	Flash 2	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	49.8~66.4%	OFF	OFF	Flash 2	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	66.4~83.0%	OFF	Flash 2	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	83.0~100%	Flash 2	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Running indicatorRUN1●		ON					OFF						
Running indicatorRUN2●		ON					Flash 3						

## 6. Working mode

### 6.1 Charging mode

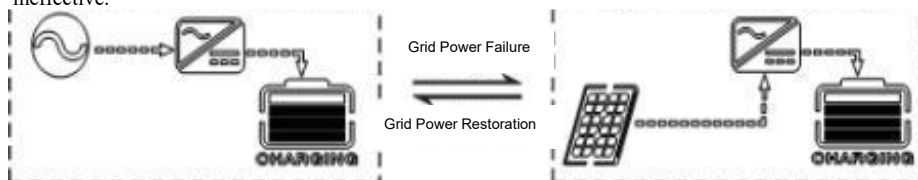
#### PV priority:

PV charging is a priority, and mains charging is only started when the pv fails. Making full use of solar power during the day and switching to municipal power at night can maintain the battery power and be used in areas where the power grid is relatively stable and the electricity price is more expensive.



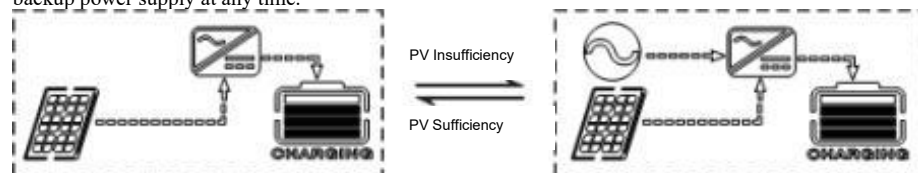
### Municipal power priority:

mains gives priority to charging batteries, and photovoltaic charging is only started when the mains is ineffective.



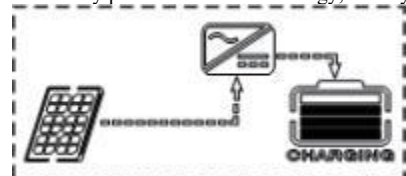
### Hybrid charging:

Photovoltaic and mains mixed charging, priority photovoltaic MPPT charging, photovoltaic energy is insufficient, the mains power supplement. When the photovoltaic energy is sufficient, the mains power stops charging. This way is the fastest charging, suitable for unstable power grid areas, and can provide sufficient backup power supply at any time.



### Photovoltaic Charging only (Only Solar):

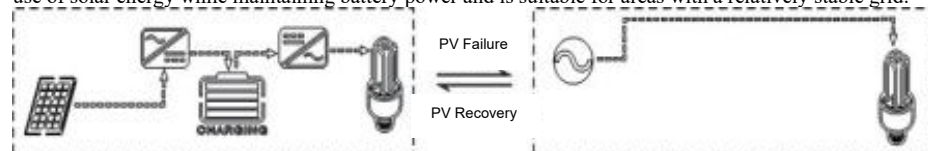
Only photovoltaic charging, do not start the mains charging. This way is the most energy efficient way, the battery power is from solar energy, usually used in areas with good light conditions.



## 6.2 Output mode

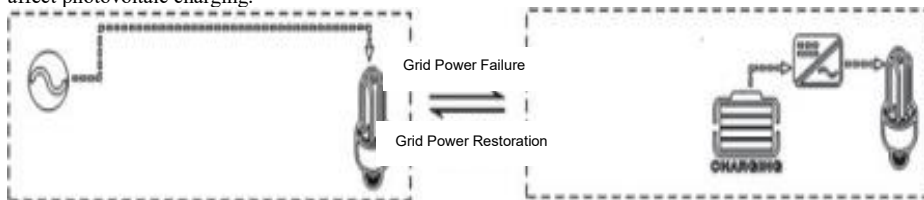
### PV Priority Mode:

When the photovoltaic is invalid, switch to the mains power supply and charging. The mode maximizes the use of solar energy while maintaining battery power and is suitable for areas with a relatively stable grid.



### Us priority mode:

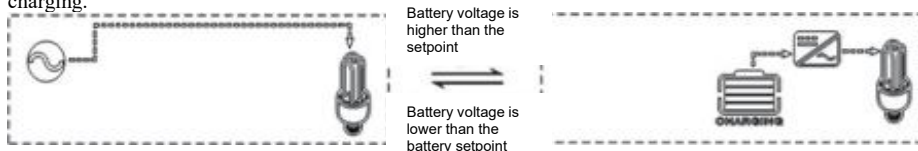
Only switch to inverter power supply when there is no city power supply, and switch to city power charge and power supply. The equipment is equivalent to a backup UPS for unstable grid areas. Switching does not affect photovoltaic charging.



### Inverter-priority mode:

Only when the battery discharge is low and below the setting point (04 setting item), the city charge battery is higher than (05

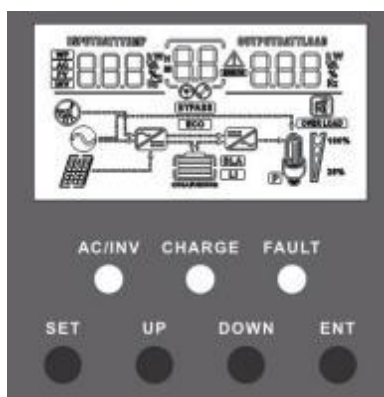
Set item) switch the set point to the battery discharge mode, and cycle the battery charge and discharge. This model uses maximum DC energy for stable areas of the grid. Switching does not affect photovoltaic charging.



## 7. LCD screen operation instructions

### 7.1 Operation and display panel

The operation and display panel is shown below, including 1 LCD screen, 3 indicators and 4 operation keys.

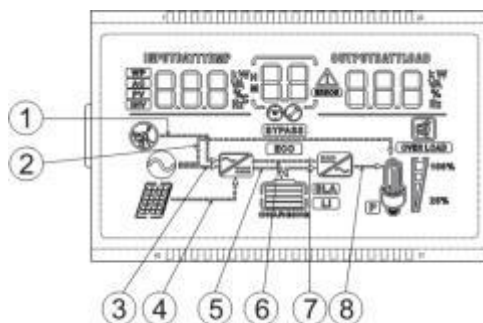


### Introduction to operation keys

Function key	Description
SET	Enter / exit the Settings menu
UP	Last choice
DOWN	Next choice
ENT	Under the Settings menu, determine / enter the options

### Instruction light introduction

Pilot lamp	Pigment	Description
AC/INV	Yellow	ON: the mains electricity output Flicker: inverter output
CHARGE	Green	Flicker: The battery is charging ON: Charging is complete
FAULT	Red	ON: the fault state



### LCD screen introduction

Icon	Function	Icon	Function
	Indicates that the AC input side is connected to the AC input source		Indicates that the inverter discharge circuit is working
	The icon indicates a wide voltage AC input mode (APL pattern)		Indicates that the machine is in the mains power bypass (Bypass) operating mode
	Indicates that the PV input is connected to the solar panel		Indicates that the AC output is in an overloaded state
	Indicates that the machine is connected to the storage battery, Indicates 0% to 24%, Indicates that 25% to 49% of the battery power remaining, Indicates 50% to 74%,		Indicates the percentage of the AC output load, Indicates a percent load ranging from 0% to 24%,
			Represents the load percentage of 25% to 49%,

	Represents the battery remaining power of 75%~100%		Represents the load percentage of 50% to 74%, 75%
	Indicates that the current battery type is lithium battery		Indicates that the buzzer is not enabled
	Indicates that the current battery type is a lead-acid battery		Indicates the alarm occurrence of the machine
	Indicates that the current battery type is lithium battery		Indicates that the machine is in a fault state
	Indicates that the AC / PV charging circuit is working		Indicates that the machine is in the setting mode
	Indicates an AC voltage output at the AC output end		Middle-screen parameters display, 1、 In the unset mode, display the alarm or fault code; 2. In the setting mode, display the parameter item code of the current setting

### The left side of the screen shows: input parameters

	Indicates the AC input
	Indicates the PV input
	Indicate the inverter circuit
	The icon is not shown
	Display battery voltage, battery total charge current, mains charge power, AC input voltage, AC input frequency, PV input voltage, internal radiator temperature, software version

### Parameter display on the right side of the screen: output parameter

	Indicate output voltage, output current, output active power, output dependent power, battery discharge current, software version; in set mode, display the current set parameters under the parameter item code
--	--

### Arrows are shown

①	The arrow is not shown	⑤	Indicates the charging circuit to charge to the battery end
②	Indicates the grid to supply power to the load	⑥	The arrow is not shown
③	Indicates the grid to supply power to the charging circuit	⑦	Indicate the battery end to supply power to the inverter circuit



④

Indicates the PV to supply to the charging circuit

⑧

Indicates the inverter circuit for supplying power to the load

### Real-time data viewing method

In the LCD main screen, press the "UP", "DOWN" button to turn the page to view the real-time data of the machine.

Page NO.	The left side of the screen parameter	In the middle of the screen parameters	The right side of the screen parameter
1	INPUT BATT V (Battery input voltage)	Fault code (Fault code)	OUTPUT LOAD V (AC output voltage)
2	PV TEMP °C (Solar charging radiator temperature)		PV OUTPUT KW (Solar charging output power)
3	PV INPUT V (Solar energy input voltage)		PV OUTPUT A (Solar energy charging output current)
4	INPUT BATT A (Input battery current)		OUTPUT BATT A (Battery output current)
5	INPUT BATT KW (Input battery power)		OUTPUT BATT KW (Battery output power)
6	AC INPUT Hz (AC input frequency)		AC OUTPUT LOAD Hz (AC output frequency)
7	AC INPUT V (AC input voltage)	Fault code (Fault code)	AC OUTPUT LOAD A (AC output load current)
8	PINPUT V (Inverter maintenance parameters display)		OUTPUT LOAD KVA (Load apparent power)
9	INV TEMP °C (AC charging or battery discharge radiator temperature)		PINV OUTPUT LOAD KW (Load active power)
10	APP software release		Bootloader software release
11	Model of battery voltage level		Model output power level
12	Model-type PV voltage level		Model PV charging current level

## 7.2 Description of the setting parameters

### Key operation description:

To enter the Settings menu and exit the Settings menu, press SET. After entering the Settings menu, the parameter number [00] will flash. At this time, you can press "UP" and "DOWN" keys to select the parameter item code to be set. Then press "ENT" key to enter the parameter editing state, then the value of the parameter is flashing, adjust the value of the parameter through "UP" and "DOWN" button, and finally press "ENT" button to edit the parameter and return to the parameter selection state.

Parameter NO.	The parameter name	Set options	Explain
---------------	--------------------	-------------	---------

00	Withdraw from	[00] ESC	Exit Setup Menu
01	Work priority mode	[01] SOL	Photovoltaic priority mode, switch to mains when the PV is invalid or the battery is below the set value of parameter [04].
		[01] The UTI defaults	mains priority mode, only switch to inverter when the mains is invalid.
		[01] SBU	Inverter priority mode, switch to mains only when the battery is under voltage or below the parameter [04] set value.
02	Output frequency	[02] 50.0	In addition, the frequency and the output frequency can be set through the menu.230V, machine default 50 HZ and 120V machine default 60 HZ.
		[02] 60.0	
03	The AC-input voltage range	[03] APL	230V machine wide range input city power voltage range 90~280V 120V machine mains power input range: 90~140V
		[03] The UPS defaults	230V machine narrow range input municipal power voltage range 170~280V 120V machine municipal power input range: 90~140V
04	Battery to market electricity	[04] 43.6 Default	For parameter [01] = SOL / SBU, the battery voltage is lower than the set value, and the output switches from inverter to mains power, with the set range 44V~52V。 The ([14] setting item cannot be exceeded.
05	Used to battery	[05] 57.6V Default	The parameter [01] = SOL / SBU, the battery voltage is higher than the set value, the output switches from mains to inverter, the set range 48V~60V。 Cannot be below ([04] and [35] setting items.
06	Charging mode	[06] CSO	Photovoltaic charging is given priority, and mains charging is started only when photovoltaic is invalid
		[06] CUB	mains has priority to charging, and photovoltaic charging is started only started when mains is invalid
		[06] The SNU defaults	Photovoltaic and mains hybrid charging, priority photovoltaic charging, photovoltaic energy is insufficient, municipal power charging supplement. When the photovoltaic energy is sufficient, the mains power stops charging. Note: Only the municipal mains bypass output with the time load and the municipal mains can be charged at the same time. When the inverter is working, the photovoltaic charging can only be started.
		[06] OSO	Only photovoltaic charging, do not start the mains charging.
07	Maximum charging current	[07] 80A is by default	230 Vac setting range 0-120 A;
			120 Vac setting range 0-100 A;
08	Battery type	[08] LF16	give tacit consent to
09	Increase charging voltage	[09] 57.6V	give tacit consent to
10	Increase the maximum charging time	[10] 120	give tacit consent to

11	floating charge voltage	[11] 55.2V	give tacit consent to
12	Over and over voltage	[12] 42V	give tacit consent to
13	Over time delay time	[13] 5S	give tacit consent to
14	Battery undervoltage alarm point	[14] 44V	give tacit consent to
15	Battery discharge limit voltage	[15] 40V	give tacit consent to
16	Equalizing charge	[16] DIS	Balanced charging is prohibited
		[16] ENA	give tacit consent to
17	Balanced charging voltage	[17] 58.4V	give tacit consent to
18	Balanced charging time	[18] 120	give tacit consent to
19	Balanced charging delay	[19] 120	give tacit consent to
20	Balanced charging reduction time	[20] 30	give tacit consent to
21	Balanced charging enables	[21] DIS	Stop the balanced charging immediately.
		[21] ENA defaults	Start the balanced charge immediately.
22	Energy saving mode	[22] DIS defaults	No energy saving mode
		[22] ENA	After the energy saving mode, if the load is empty or less than 50W, the inverter output after delay period; when the load is greater than 50W, the inverter will start automatically.
23	Overload automatically to restart	[23] DIS	Overload automatic restart is prohibited. If the overload shutdown output occurs, the machine will no longer resume the boot.
		[23] ENA defaults	Enable overload automatic restart. If overload shutdown output occurs, the machine will restart the output after a delay of 3 minutes. After 5 cumulative times, the boot is no longer resumed.
24	Over-temperature automatic restart	[24] DIS	The automatic restart at over temperature is prohibited. If over temperature occurs, the output machine will not turn on the output.
		[24] ENA defaults	Enables overtemperature automatic restart, if overtemperature shutdown output occurs. When the temperature drops, the open output is restarted.
25	Buzzer warning	[25] DIS	No alarm

		[25] ENA defaults	Make the alarm
26	Mode conversion reminder	[26] DIS	No alarm warning when the state of the main input source changes
		[26] ENA defaults	To enable an alarm prompt when the state of the main input source changes
27	Inverse overload to bypass	[27] DIS	Automatic power cutting is prohibited when the inverter is overloaded
		[27] ENA defaults	Automatically switch to mains during inverter overload
28	AC charge maximum current	[28] 60A defaults	AC output 230 Vac settings range 0 to 60 A
		[28] 40A defaults	AC output 120 Vac settings range 0 to 40 A
29	Output phase separation function	[29] DIS	This function is prohibited
		[29] ENA defaults	Enable to output with power frequency transformer
30	Model ID setting	[31] 1 defaults	Set the range of 1-6
31	AC output mode (Only available in standby mode)	[31] SIG	Single-alone use setting item
32	RS485-1 communication function	[32] SLA	RS485-2 Our PC and remote monitoring protocol
		[32] BMS	RS485-2 BMS communication function
33	BMS communication	When [32] sets the item = BMS, select the corresponding lithium battery manufacturer brand for communication (WOW)	
34	Battery underpressure recovery	[35] 52V defaults	When the battery is undervoltage, the battery voltage needs to be greater than this set value to restore the battery inverter AC output
35	PV maximum charging current	[36] 60A defaults	Maximum solar energy charging current is set: 0-60A
36	Battery charge full recharge recovery point	[37] 52V defaults	When the battery is undervoltage, the battery voltage needs to be greater than this set value to restore the battery inverter AC output
38	AC output voltage gear setting (Only only in standby	The [38] 120 Vac defaults	U series model: 100 / 105 / 110 / 120 Vac, default 120 Vac. AC output power = rated power * (set voltage / 120)

	mode)	The [38] 230 Vac defaults	S series model: 200 / 208 / 220 / 230 / 240 Vac, default 230 Vac. AC output power = rated power * (set voltage / 230)
39	Stop charging current	[57]	give tacit consent to
40	Discharge alarm SOC	[58] 5%	If the SOC value reaches the set value, 30 faults are reported. If the SOC value exceeds the set value, the fault disappears.
41	Discharge cutoff for the SOC	[59] 10%	When the SOC value reaches the setting value, it will report a 32 fault and close the inverter. The SOC value exceeds this setting value, and the fault disappears.
42	Charge off SOC	[60] 100%	The SOC value reaching this setting value stops charging.
43	Switch over the mains SOC	[61] SBU	The SOC value reaches the set value will switch the mains.
44	Switch over the inverter SOC	[62] SBU	The SOC value reaches the set value will switch the mains.

## 8. Other functions

### 8.1 Dry node Function

#### operational principle:

This dry node controls the diesel generator switch to charge the battery.

① Under normal circumstances, this terminal is NC-C closed and NO-C disconnected;

② When the battery voltage reaches the low voltage off voltage point, the relay coil is energized and the NO-C point closes and the NC-C point is closed. The NO-C point can drive the resistance load 125VAC / 1A, 230VAC / 1A and 30VDC / 1A.



### 8.2 RS485 communication function

This port is the RS485 communication port.

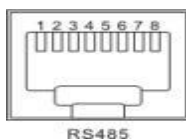
#### The RS485 / WIFI communication port, with 2 functions:

① You can directly communicate with the computer computer RS485 through this port, monitor the battery running state and set some parameters on the computer;

② This port can also be connected with the optional RS485 to WiFi / GPRS communication module. After selecting this module, it can be connected to the all-in-one machine through the mobile phone WiFi / GPRS APP, and the operating parameters and status of the all-in-one machine can be viewed through the mobile phone APP (some models only have this function).

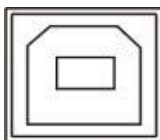
#### Pin definition, as shown below:

4 / 5 feet are NC suspended, 3 / 6 feet GND, 2 / 7 feet RS485-A, and 1 / 8 feet RS485-B.



### 8.3 USB communication function

This port is a USB communication port, which can communicate with the optional upper computer software through this port. Using this port, you need to install the corresponding "USB turn serial port chip CH340T driver" in the computer.



## 9. Protect

### 9.1 Protection function

NO.	Defensive function	Explain
1	PV current / power protection	When the configured photovoltaic array charging current exceeds the PV rated current, it will be charged with the rated current.
2	PV night anti-charge protection	At night, because the battery voltage is greater than the voltage of the PV assembly, prevent the battery from discharging through the PV assembly.
3	Is input overvoltage protection	When the city voltage exceeds 280V (230V) or 140V (120V), the city charge will be stopped and the inverter output.
4	Municipal voltage input undervoltage protection	When the mains voltage is below 170V (230V model / UPS mode) or 90V (120V model or APL mode), the mains charge is stopped and the inverter output turns.
5	Battery overpressure protection	When the battery voltage reaches the overvoltage break voltage point, the PV and mains will automatically stop charging the battery to prevent the damage from overcharging the battery.
6	Battery underpressure protection	When the battery voltage reaches the low voltage off voltage point, it will automatically stop discharging the battery to prevent excessive discharge of the battery and damage.
7	Load output for short-circuit protection	When the short circuit fault of the load output exceeds 1S, the output AC voltage will be turned off immediately.
8	Radiator over-temperature protection	When the internal temperature of the system is too high, the system will stop charge and discharge; when the temperature returns to normal, the system will resume charge and discharge.
9	overload protection	Output again for 3 minutes after overload protection, and turn off output for 5 consecutive times until the machine is repowered on. Please refer to the technical parameter table for specific overload level and duration.
10	PV anti-anti-protection	Then the machine will not be damaged.
11	Exchange anti-irrigation protection	Prevent the battery inverter AC current from backflooding to the bypass AC input.
12	Next to the flow protection	Built-in AC input overcurrent protection circuit breaker.
13	Battery input for overcurrent protection	When the battery discharge output current is greater than the maximum value and lasts for 1 minute, turn to the AC input with load.
14	Battery input protection	When the battery is reverse connected or the inverter is short circuit, the battery input fuse inside the inverter will be fused to prevent battery damage or fire caused.
15	Charging short circuit protection	When the PV or AC is charged and the external battery port is short circuit, the inverter will protect and stop the output current.

## 9.2 Meaning of the fault code

Fault code	Fault display	Does it affect output	Explain
[01]	BatVoltLow	yes	Battery voltage is a low alarm
[02]	BatOverCurrSw	yes	Battery discharge average current over software protection
[03]	BatOpen	yes	The Battery is not connected to the alarm
[04]	BatLowEod	yes	Battery voltage low stop discharge alarm
[05]	BatOverCurrHw	yes	Battery overcurrent hardware protection
[06]	BatOverVolt	yes	Charge overpressure protection
[07]	BusOverVoltHw	yes	Internal battery booster circuit overvoltage hardware protection
[08]	BusOverVoltSw	yes	Internal battery boost circuit overvoltage software protection
[09]	PvVoltHigh	deny	Solar energy input voltage overvoltage protection
[10]	PvBuckOCSw	deny	Solar energy charging overcurrent software protection
[11]	PvBuckOCHw	deny	Solar energy charging overcurrent hardware protection
[12]	bLineLoss	deny	UPDATE
[13]	OverloadBypass	yes	Bypass AC output for overload protection
[14]	OverloadInverter	yes	Inverter AC output for overload protection
[15]	AcOverCurrHw	yes	Inverter AC output overcurrent hardware protection
[16]	-	-	-
[17]	InvShort	yes	Inverter AC output for short-circuit protection
[18]	-	-	-
[19]	OverTemperMppt	deny	Solar energy charging radiator for over-temperature protection
[20]	OverTemperInv	yes	Inverter AC output with load or AC charging radiator overtemperature protection
[21]	FanFail	yes	Fan to block turn or failure fault
[22]	EEPROM	yes	Memory failure
[23]	ModelNumErr	yes	Model setting error
[24]	-	-	-
[25]	-	-	-
[26]	RlyShort	yes	The inverter AC output is back to the bypass AC input
[27]	-	-	-
[28]	-	-	-
[29]	BusShort	yes	Internal battery boost circuit fault
[30]	BatCapacityLow1	deny	Battery capacity rate below 10% alarm (set up BMS to enable effective)
[31]	BatCapacityLow2	deny	Battery capacity rate below 5% alarm (set BMS enabled)
[32]	BatCapacityLowStop	yes	Battery low capacity shutdown (set BMS for efficient)
[33]	CanCommFault	yes	Parated can communication fault
[34]	ParaAddrErr	yes	Erparallel ID is set
[35]	-	-	-
[36]	ParaShareCurrErr	yes	And the machine flow fault
[37]	ParaBattVoltDiff	yes	Parallel machine mode, the battery voltage difference is large
[38]	ParaAcSrcDiff	yes	In the parallel mode, the mains input source is inconsistent

【39】	ParaHwSynErr	yes	Parated mode, hardware synchronization signal failure
【40】	InvDcVoltErr	yes	The inverter voltage and DC component is abnormal
【41】	SysFwVersionDiff	yes	The parallel program version is inconsistent
【42】	ParaLineContErr	yes	And machine wiring fault
【43】	Serial number error	yes	No serial number is set factory
【44】	Phase merging machine set error	yes	[31] Set item set error
【45】	A BMS communication error	deny	Check whether the communication line is correctly connected and whether [33] is set to the corresponding lithium battery communication protocol
【46】	BMS report an emergency	deny	After checking the fault type of lithium battery BMS fault, clear the lithium battery fault
【47】	The BMS battery has a low-temperature alarm	deny	Lithium-ion battery BMS low-temperature alarm
【48】	The BMS battery has an over-temperature alarm	deny	Lithium battery BMS over-temperature alarm
【49】	The BMS battery overcurrent alarm	deny	Lithium battery BMS battery overcurrent alarm
【50】	The BMS battery undervoltage alarm	deny	Lithium battery BMS battery undervoltage alarm
【51】	The BMS battery overvoltage alarm	deny	Lithium battery BMS battery overvoltage alarm

### 9.3 Some troubleshooting measures

Fault code	Hitch	Measure
Display	The screen is not displayed	Check whether the blank or PV is closed; whether the switch is in "ON" state; press any button on the screen to exit the screen sleep mode.
【06】	Charging battery overvoltage protection	Check if the battery voltage exceeds the protection value. After that, the battery needs to be discharged until the voltage is below the battery overvoltage recovery point.
【01】 【04】	Battery underpressure protection	When the battery is restored to low voltage off recovery voltage.
【21】	Fan fault	Check if the fan does not turn or is blocked by something else.
【19】 【20】	Radiator over-temperature protection	When the equipment cools to the overtemperature, resume normal charging and discharge control.
【13】 【14】	Bypass overload protection, inverter overload protection	① Reduce electrical equipment; ② Restart the all-in-one machine and load restore the output.
【17】	Inverse short circuit protection	① Carefully check the load connection situation, and clear the short-circuit fault point; ② Power on again, and the load to restore the output.
【19】	PV overvoltage	Check whether the PV input voltage exceeds the maximum allowable input voltage with a multimeter.
【03】	The battery was not alerted	Check whether the battery is not connected or whether the battery side circuit breaker is not closed.



## 10. System operation

### 10.1 Power-on

Note: Please check the power again before the startup, and the communication line is connected correctly!

1. Press RST for several seconds, the SOC power light and RUN lights are on, and then the host is activated.
2. Press the metal button on the battery side and observe the indicator ON / OFF light on and the battery is in normally.

### 10.2 Standby unit

Press the battery side metal switch, the ON / OFF light goes off, and the battery enters the standby state.

### 10.3 Close the battery

Press RST for several seconds with all lights off and the battery off for use.

## 11. Maintenance

Maintenance items	Maintenance cycle
If the battery is not in use, the battery should be fully charged and charged to 25~50%.	Once every 3 months
Check whether the battery is loose, if please tighten the corresponding position.	Once every 6 months
Check whether the shell is damaged, please paint or contact the after-sales service center.	Once every 6 months
Check the exposed wire for wear, if, please replace the corresponding cable or contact the after-sales service center	Once every 6 months
Check whether there is debris accumulation around the battery. If so, please clean up, so as not to affect the heat dissipation of the battery.	Once every 6 months
Check for water or pests to avoid long-term battery intrusion.	Once every 6 months



- If you find any problem affecting the battery system, please contact the after-sales personnel and never dismantle it without permission.
- If the internal copper wire is exposed, no touch, high pressure danger, please contact the after-sales personnel, no disassembly without permission.
- In case of other emergencies, please immediately contact the after-sales personnel to operate under the guidance of the after-sales personnel, or wait for the after-sales personnel for on-site operation.