PRODUCT SPECIFICATIONS

MASON 280L-N 51.2 V 280Ah Li-ion Battery System

Project Name	Configuration
External switch function	have
Current limiting function	have
Display	have
Storage function	have
Pre-charge function	have
Communication Function	CAN
Secondary protection	none
Bluetooth	have

Update Record

Version	describe	date	state
A	First edition released	2023.02.16	controlled
B	Upgrade 3.0BMS to add active balancing	2023.08.22	

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1. Basic Introduction

This battery system is suitable for household energy storage and small and medium-sized commercial storage . It uses 3.2 V 280Ah The lithium battery cells form a 1-in- 1 6 -in- 1 battery module and an intelligent BMS to form a 51.2V280Ah lithium battery system. The system supports up to 16 groups of batteries in parallel. The system is prohibited from being used in series and mixed with other batteries of different brands and models.

2. Function Introduction

● Battery voltage calculation: 16 battery voltage sampling test, deviation ±20mV.

● Battery and ambient temperature detection: 4 battery temperature sensors, 1 ambient temperature sensor, 1 MOS temperature sensor, with a deviation of ±2° C.

● Battery Capacity and Cycle Count: Complete a full charge/discharge cycle to set the actual capacity. Monitor the remaining capacity of the battery with a capacity estimation accuracy within 5% deviation. In addition, the charge and discharge cycle time and the complete charge and discharge cycle time can be configured.

● Intelligent cell balancing: Charging and static balancing strategies can be flexibly set to effectively extend the service life.

● Communication interface: PC or intelligent front end can monitor battery pack data, control operation and set parameters through telemetry, telesignaling, teleadjustment, remote control and other commands. The communication protocol complies with the requirements of YD/T 1363.3 and realizes cascade communication.

● Historical data recording, saving, and reading: When the battery is abnormal, the real-time battery status and alarm information are recorded and saved. Currently, up to 500 historical fault data can be stored.

● Battery management system parameter settings: Battery management system parameters, including cell battery overvoltage/undervoltage, battery total voltage overvoltage/undervoltage, charge and discharge overcurrent, battery high/low temperature, battery capacity, working mode, charge and discharge limit current, etc., can be set in the battery monitoring system.

● Working mode: The monitoring system can be set to have charging and discharging current limiting, constant voltage output, direct output and other working modes.

- Multiple protection functions: hardware protection, battery protection, high and low temperature protection, output short circuit protection, etc.

## 3. Product Details

## 3.1 Dimensions and interface diagram
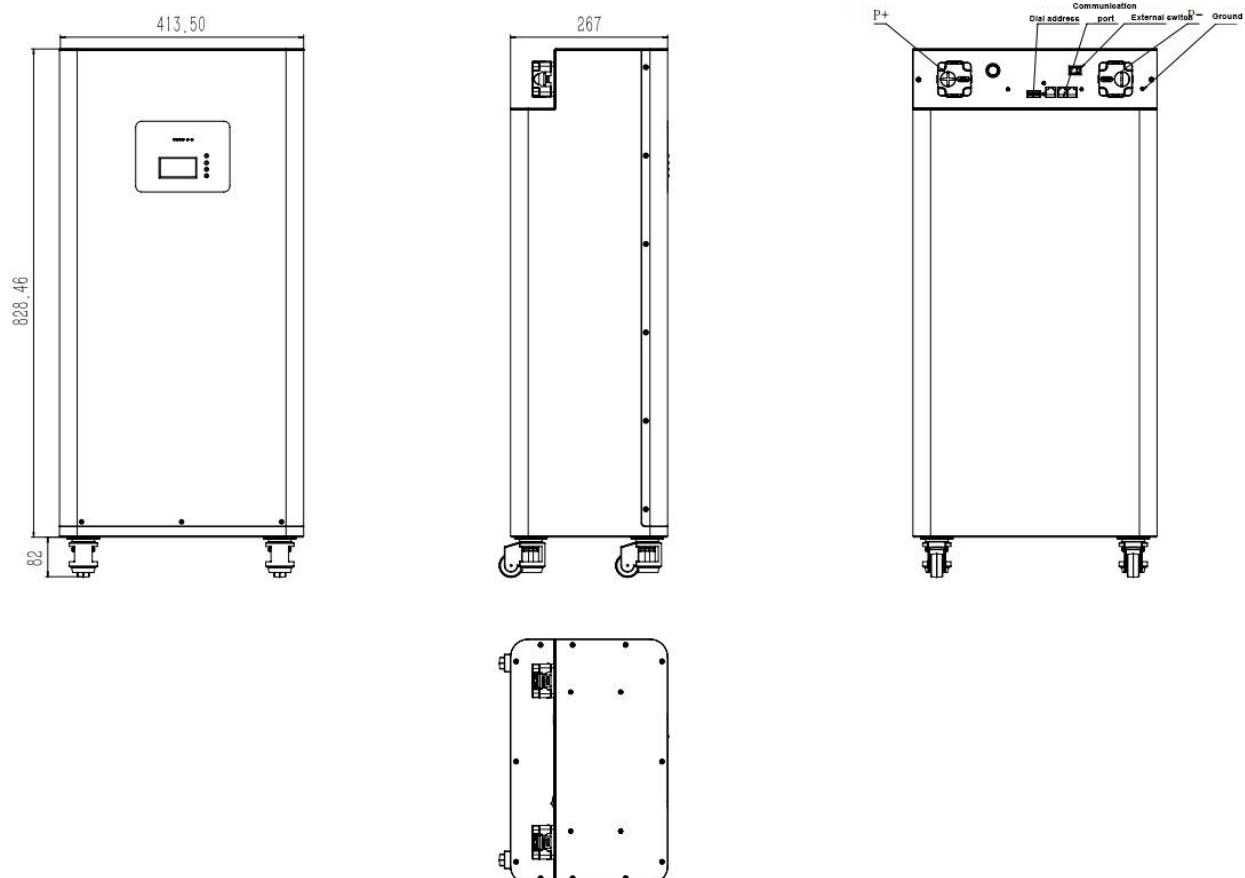
3.2 Electrical Schematic Diagram
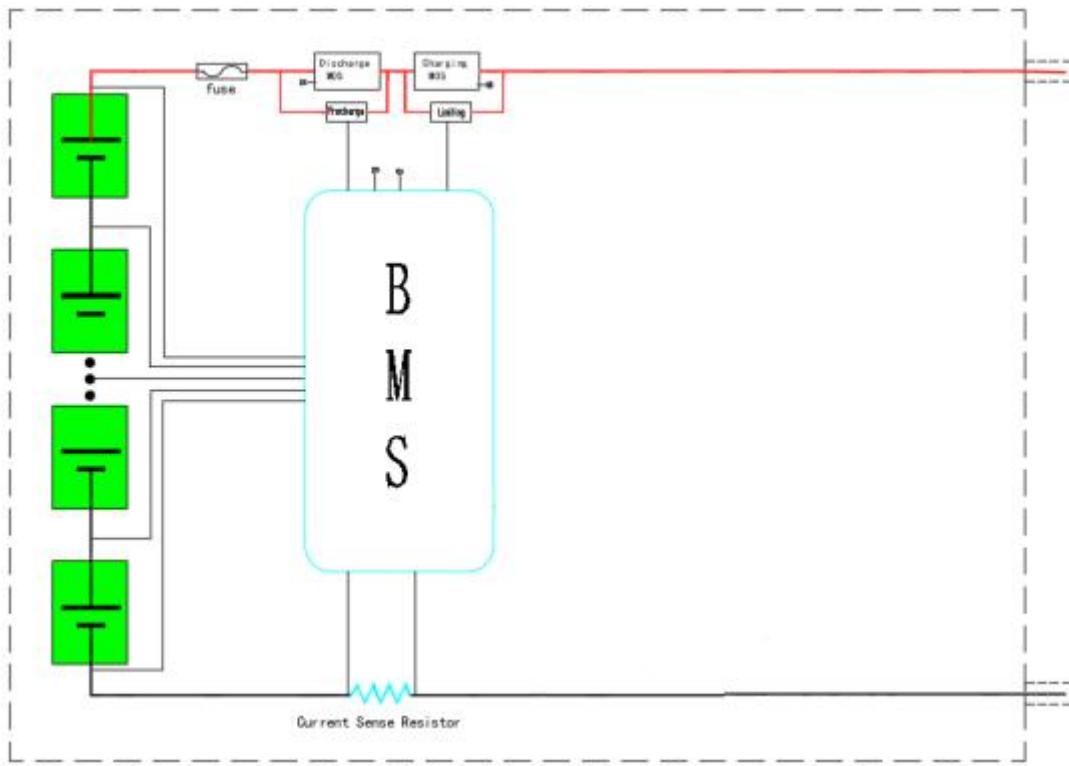
3.3 Active balancing board

3.3.1 Dimensional drawing
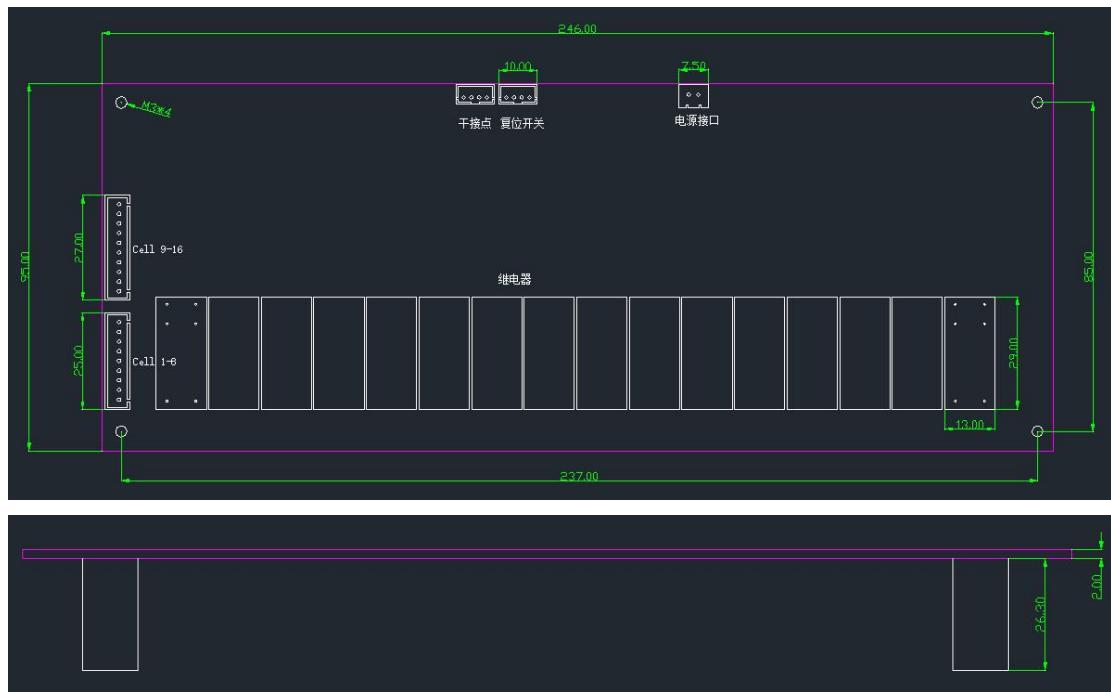
3.3.2 Installation method
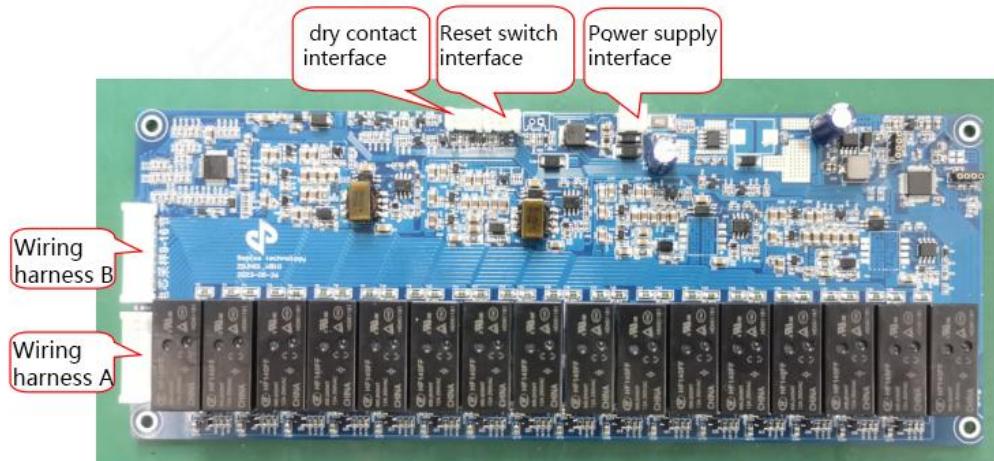
3.3.3. Harness Definition

Wiring harness A（1-8 cells）		
Serial number	balancing board wiring	Cell Wiring Definition
1	CELL1-	Connect the negative terminal of the first battery
2	CELL1+	Connect the positive terminal of the first battery
3	CELL2+	Connect the positive terminal of the second battery
4	CELL3+	Connect to the positive terminal of the third battery
5	CELL4+	Connect to the positive terminal of the fourth battery
6	CELL5+	Connect to the positive terminal of the fifth battery
7	CELL6+	Connect to the positive terminal of the sixth battery
8	CELL7+	Connect to the positive terminal of the seventh battery
9	CELL8+	Connect to the positive terminal of the eighth battery

Wiring harness B（9-16 cells）		
Serial number	balancing board wiring	Cell Wiring Definition
1	CELL9-	Connect to the negative terminal of the ninth battery
2	CELL9+	Connect to the positive terminal of the ninth battery
3	CELL10+	Connect to the positive terminal of the tenth battery
4	CELL11+	Connect to the positive terminal of the eleventh battery
5	CELL12+	Connect to the positive terminal of the twelfth battery
6	CELL13+	Connect to the positive terminal of the 13th battery
7	CELL14+	Connect to the positive terminal of the 14th battery
8	CELL15+	Connect to the positive terminal of the fifteenth battery
9	CELL16+	Connect to the positive terminal of the sixteenth battery
10	NC	NC

Power supply line (2PIN header)		
Serial number	Definition of balancing board wiring	Cell Wiring Definition
1	B-	the battery negative
2	B+	Connect to the battery positive
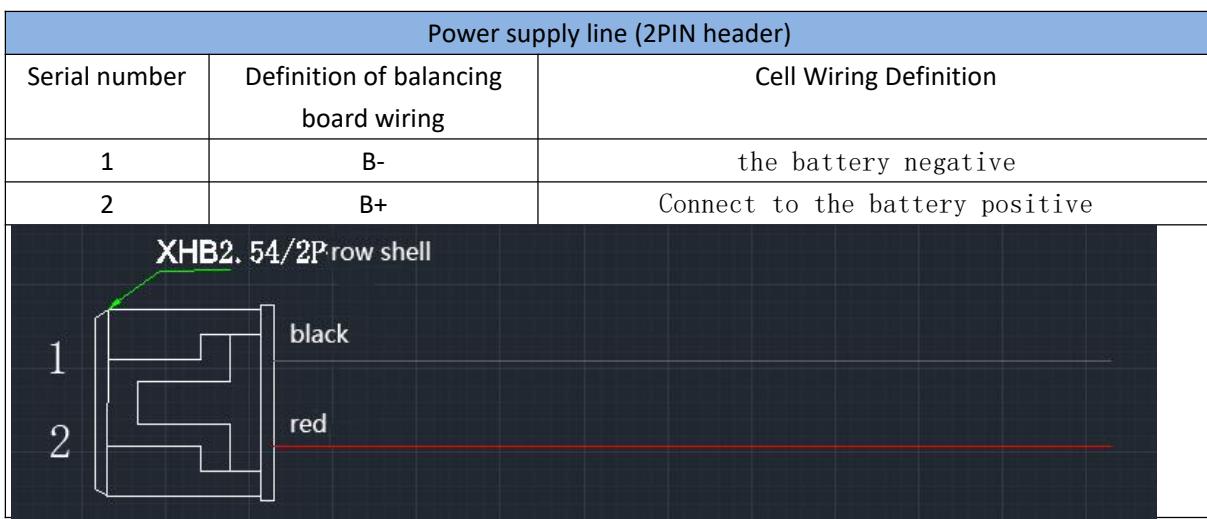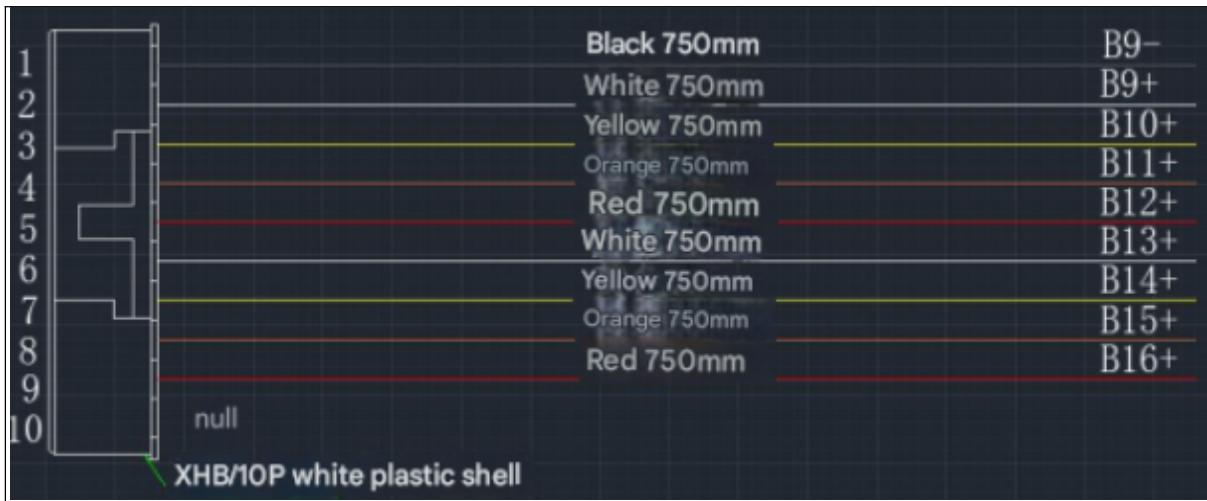
3.3.4 Differences between active and passive balancing

Passive balancing: discharges the battery with higher voltage through resistance discharge, releasing electricity in the form of heat. The advantages are low cost and simple circuit design; the disadvantages are that balancing is based on the lowest battery residual amount, which cannot increase the capacity of the battery with less residual amount, and 100% of the balanced electricity is wasted in the form of heat. If the balancing current is small, the efficiency of the electricity balancing effect in a large-capacity battery pack with large electricity differences is very low, and it takes a long time to achieve balance, which feels like scratching an itch in the application.

Active balancing: Balancing is performed by transferring electricity, which is highly efficient and has low losses. Regardless of whether the battery is charging, discharging, or static, as long as the voltage difference is greater than the set value, balancing will begin. Therefore, as long as there is a voltage difference, active balancing should be performed 24 hours a day until the voltage difference is less than the set range. Since active balancing is not limited by charging time, the balancing time is longer and the balancing current is larger, so it is more suitable for use in large-capacity battery packs.

3.3.5 Software internal setting parameters

number			
1	Single cell undervoltage protection	2800mV	If any cell reaches the undervoltage protection value, the balancing board will shut down after 1 minute.
2	Balanced minimum starting voltage	3000mV	In order to balance the cells in all states, such as standby, charging and discharging, a minimum start-up balancing voltage is set to prohibit balancing when the cells are low in energy and lack of energy.
3	Balanced minimum maintenance voltage	2900mV	
4	Balanced start pressure difference	50mV	Active balancing is enabled when the cell voltage difference is greater than 50mV
5	Equalize closing pressure difference	30mV	After equalization, the voltage difference is less than 30mV and the active equalization is stopped.
6	Balanced single duration	60S	Actively balance the opening and closing of the relay for 60 seconds, and balance the opening interval for 3 seconds; monitor the cell voltage in real time to see if it meets the opening condition
7	Balanced interval time	3S	
8	Balanced working hours	24h	If the balancing time exceeds 24 hours, the balancing will be turned off.
9	Balanced over-temperatureprotection	70℃	The balancing board detects that the temperature has reached the protection value and turns off the balancing. The balancing board can only be turned on when the temperature reaches the recovery value.
10	Balanced over-temperature protection	90℃	
11	Standby time	10h	The standby state is not balanced and the shutdown is executed after more than 10 hours.
12	Balance current	2A	The balancing board can achieve a balancing current of 2A.
13	Power consumption	15mA	Power consumption in standby mode is less than 15mA

3.3.6 Reset button LED indicator

Standby	The LED light of the active balance board flashes in standby mode
Turn on Balance	The LED light of the active balancing board is always on in the balancing
	state.
Power on	Press the reset button and the LED light flashes once to turn on the balance board
Shutdown	Press the reset button, the LED light flashes 6 times, then the LED light goes out and the machine shuts down.
Stop balancing	In the balancing state, press the reset button and the LED light flashes 4 times to stop balancing. Press the reset button and the LED light flashes 4 times to start balancing.

3.3.7 Active balancing logic

Active balancing takes the total power of the battery. After turning on balancing, the total power of the battery is converted into a charging voltage to charge the battery cell. The balancing board can simultaneously start charging balancing of up to 3 battery cells, monitor in real time which battery cell has the lowest current, and charge the lowest battery cell with 2A current.

3.3.8 Operation Instructions

In order to avoid the disadvantage of reducing battery life by frequently correcting the remaining capacity of the battery cell with large current, press the equalization function switch to turn on the active equalization function. The equalization state refers to 3.3.6, and the single equalization time is ≤24h.

It is recommended to enable active balancing once a month

3.4 Battery performance parameters

Serial number	project	Specification
1	Battery Configuration	1 P1 6 S
2	Rated voltage	51.2 V
3	Operating voltage range	42V ~ 58.4V
4	Rated capacity	280Ah
5	Rated	14.336KWh
6	Standard charge/discharge current	100A @ 25 $\pm2℃$
7	Maximum charging current	200A @ 25 ±2 ℃
8	Maximum discharge current	200A @ 25 $\pm2℃$
9	Operating temperature	0~ 40 ℃(Charge) - 2 0~ 40 ℃(Discharge)
10	Storage temperature and humidity	-10 ℃ ~35 ℃ (stored within one month) 2 5 $\pm$ 2 ℃ (storage within three months)
11	Dimensions (L x W x H)	(828) × (415) × (267) mm
12	weight	113 K g$\pm$3kg
13	Cycle life	8000 cycles @25℃ 100A charge and discharge current 80% DOD
18	IP Rating	IP 20
19	Communication	CAN&RS485
20	Altitude	0- 3 000 m
twenty one	Humidity range	5~ 80 %

3.5 Battery protection parameters

Function Name	Function settings	Project List	Setting Value	Setting Range
Single cell voltage alarm	Open	Single high voltage alarm	3500 mV	Single-cell high-voltage recovery~Single-cell overvoltage protection
		Single high voltage recovery	3400 mV	3000mV~ Single high voltage
	Open	Single cell low voltage alarm	2900 mV	Single cell undervoltage protection~ Single cell low voltage recovery
		Single low pressure recovery	3000 mV	Single cell low voltage alarm ~ 3300mV
Single overvoltage protection	Open	Single overvoltage protection	3650 mV	Single high voltage alarm ~4500mV
		Single overvoltage recovery	3400 mV	Single high voltage recovery ~ Single overvoltage voltage
		Overvoltage recovery conditions	1. The single cell voltage drops to the overvoltage recovery point 2. The remaining capacity is lower than 96% of the intermittent charging capacity Two conditions must be met to restore	
			The battery discharge current is detected to be $\geq$ 1A	
Single cell undervoltage protection	Open	Undervoltage protection voltage	2700 mV	1500mV~ Single cell undervoltage recovery

		Undervoltage recovery voltage	2900 mV	Single cell undervoltage protection ~ Single cell low voltage alarm
		Single unit undervoltage shutdown	After undervoltage protection, shut down and maintain communication for 1 minute	
		Undervoltage recovery conditions	Charging current detected ($\geq$ 1A)	
Battery total pressure alarm	Open	Total pressure high pressure alarm	56.0 V	Total pressure high pressure recovery ~ total pressure overpressure protection
		Total pressure high pressure recovery	54.0V	5 3.0V ~Total high voltage
	Open	Total pressure low pressure alarm	46.4 V	Total voltage undervoltage protection~total voltage low voltage recovery
		Total pressure low pressure recovery	48.0V	Total voltage low voltage alarm ~ 55.0V
Total pressure overvoltage protection	Open	Total pressure overvoltage protection	57.6 V	Total voltage high voltage alarm ~ 60.0V
		Total pressure overpressure recovery	54.0 V	Total pressure high voltage recovery ~ total pressure overvoltage voltage

		Overvoltage recovery conditions	1. The single cell voltage drops to the overvoltage recovery point 2. The remaining capacity is lower than 96% of the intermittent charging capacity <mark>Two conditions must be met to restore</mark>	
			The battery discharge current is detected to be $\geq$ 1A	
Total voltage undervoltage protection	<mark>Open</mark>	Total voltage undervoltage protection	41.6 V	36.0V ~Total voltage undervoltage recovery
		Total voltage undervoltage recovery	46.0 V	Total voltage undervoltage protection ~ total voltage low voltage alarm
		Total voltage undervoltage shutdown	After undervoltage protection, shut down and maintain communication for 1 minute	
		Undervoltage recovery conditions	Charging current detected ($\geq$ 1A)	
Battery temperature prohibits charging	<mark>Open</mark>	Charging high temperature warning	50 ℃	Charging high temperature recovery ~ charging over-temperature protection
		Charging high temperature recovery	47 ℃	35℃~ Charging high temperature alarm
		Charging over-temperature protection	55 ℃	Charging over-temperature recovery ~80℃
		Charging over temperature recovery	50 ℃	Charging high temperature recovery ~ charging over-temperature protection

		Charging low temperature warning	2 ℃	Charging under-temperature protection ~ charging low temperature recovery
		Charging low temperature recovery	5 ℃	Charging low temperature warning ~10℃
		Charging under-temperature protection	-10 ℃	-20℃~ Charge under-temperature recovery
		Charging under-temperature recovery	0 ℃	Charging under-temperature protection ~ charging low temperature recovery
Battery core temperature is prohibited	<mark>Open</mark>	Discharge high temperature alarm	52 ℃	Discharge high temperature recovery ~ discharge over-temperature protection
		Discharge high temperature recovery	47 ℃	35℃~ Discharge high temperature alarm
		Discharge over temperature protection	55 ℃	Discharge over-temperature recovery ~80℃
		Discharge over temperature recovery	50 ℃	Discharge high temperature recovery ~ discharge over-temperature protection
		Discharge low temperature alarm	-10 ℃	Discharge under-temperature protection ~ discharge low-temperature recovery

		Discharge low temperature recovery	3 ℃	Discharge low temperature alarm ~10℃
		Discharge under-temperature protection	- 15 ℃	- 3 0℃~ Discharge under-temperature recovery
		Discharge under-temperature recovery	0 ℃	Discharge under-temperature protection ~ discharge low-temperature recovery
Ambient temperature protection	Open	Ambient high temperature alarm	50 ℃	Ambient high temperature recovery ~ Ambient over-temperature protection
		Environmental high temperature recovery	47 ℃	-20 ℃~ Ambient high temperature alarm
		Ambient over temperature protection	60 ℃	Ambient over temperature recovery ~80℃
		Ambient over temperature recovery	55 ℃	Environmental high temperature recovery ~ Ambient over temperature protection
		Low ambient temperature alarm	0 ℃	Environmental under-temperature protection Low temperature recovery
		Low temperature recovery	3 ℃	Low ambient temperature alarm ~ 6 0℃

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		Ambient under-temperature protection	-10℃	-30℃ ~ Ambient undertemperature recovery
		Ambient undertemperature recovery	0℃	Ambient under-temperature protection ~ Ambient low-temperature recovery
Power temperature protection	Open	Power high temperature alarm	90 ℃	Power high temperature recovery ~ power over temperature protection
		Power high temperature recovery	85 ℃	6 0℃ ~Power high temperature alarm
		Power over temperature protection	100 ℃	Power high temperature alarm ~120 ℃
		Power over temperature recovery	85 ℃	Power high temperature recovery ~ power over temperature protection
Charging current limit	closure	Active current limiting	10A	When the charger current is greater than 10A, turn on current limiting
	Open	Passive current limiting		The charger current is greater than the charging overcurrent alarm (the value can be set) , and the current limit is turned on

		Charging current limit delay	5 minutes	After the current limit is turned on, recheck whether the current limit is turned on after 5 minutes
Charging overcurrent alarm	Open	Charging overcurrent alarm	200A	Charge overcurrent recovery ~ Charge overcurrent protection
		Charge overcurrent recovery	195A	0A~ Charging overcurrent alarm
Charging overcurrent protection	Open	Charging overcurrent protection	210A	0A ~ 150A
		Charge overcurrent delay	10 S	Can be set
		Overcurrent recovery conditions	Discharge is restored immediately, or automatically after 60 seconds	
Effective charging current	Charging current	1000mA		
	Charge exit current	700mA		
Discharge overcurrent alarm	Open	Discharge overcurrent alarm	-205A	Discharge overcurrent protection ~ discharge overcurrent recovery
		To overcurrent recovery	-203A	Discharge overcurrent alarm ~0A
Discharge overcurrent protection	Open	Discharge overcurrent protection	-210A	Transient overcurrent protection ~0A

		Discharge overcurrent delay	10 S	Can be set
		Overcurrent recovery conditions	Charging resumes immediately or automatically after 60 seconds	
Transient overcurrent protection	<mark>Open</mark>	Transient overcurrent protection	-300A	Discharge overcurrent protection value to 300A
		Transient overcurrent delay	30 mS	Can be set
		Transient overcurrent recovery	Charging resumes immediately or automatically after 60 seconds	
	<mark>closure</mark>	Transient overcurrent lockout	Continuous secondary overcurrent, exceeding the overcurrent lock times	
		Overcurrent lock times	5 times	
		Momentary lock release	Connect the charger	
Output short circuit protection	<mark>Open (Currently does not support the shutdown setting)</mark>	Short circuit protection current and delay	Write program <mark>(not configurable)</mark>	
		Short circuit protection recovery	Charging resumes immediately or automatically after 60 seconds	
	<mark>Open</mark>	Short circuit protection lock	Continuous output short circuit, exceeding the overcurrent lock times	
		Short circuit lock times	5 times	
		Short circuit lock release	Connect the charger	
Effective discharge current	Discharge entry current		-1000mA	
	Discharge exit current		-700mA	

Cell balancing function	Open	Standby Balance	No charge and discharge state, start balancing	
		Standby balance time	10 hours	Can be set
	Open	Charge equalization	Enable balancing in charging and floating charging states	
	Turn on voltage condition	Balanced start voltage	3350 mV	Can be set
		Balanced opening pressure difference	30 mV	
		Equalization end pressure difference	20mV	
	Open	Balanced temperature limit	Balanced shutdown temperature range according to (ambient alarm temperature determination)	
		Balanced high temperature prohibition	50 ℃	Can be set
		Balanced low temperature prohibition	0 ℃	
Battery failure alarm	Open	Cell failure voltage difference	500mV	Can be set
		Cell recovery voltage difference	300mV	
Battery capacity setting		Battery rated capacity	280Ah	5Ah to 280Ah
		Remaining battery capacity	Estimated based on cell voltage	Can be set
		Cycle cumulative capacity	20%	Number of cycles (adjustable)
	Open	Remaining capacity warning	10%	

	closure	Remaining capacity protection	2%	Turning off output
Reset button		Power on/activation	The BMS is in sleep mode. Press the reset button for 1 second, the BMS is activated, and the LED indicators light up in sequence, and then it enters normal working mode.	
		Shutdown/Hibernation	When the BMS is in standby or working state (except charging), press the reset button for 3S, the BMS will be put into sleep mode, and the LED indicators will light up in sequence, and then enter the sleep mode;	
Pre-charge function	2000ms	0~5000ms can be set	BMS starts pre-charging function instantly	
BMS power management	Open	Maximum standby time	48h (charger is not present and there is no effective discharge current)	
Low temperature heating of battery cells	closure	Low temperature heating of battery cells	0℃	Can be set
		Cell heating recovery	10℃	
		Heating start logic	When the charger is online and the battery cell temperature reaches the start-up condition, heating is turned on. No heating is performed in standby and discharge states.	
External switch	closure	When the BMS is in standby mode, the external switch can be operated to turn the BMS off and on		
LCD screen	Open	Simplified monitoring software to view data such as battery cells, temperature, current, etc.		
Manual charging activation	Open	1 point	After undervoltage protection, the BMS shuts down. Press the button manually to activate and clear the undervoltage protection to force output.	Can be set

Compensation impedance	Connected fault impedance	10m Ω	Default is between 8 and 9	Battery connection line impedance compensation
	Compensation point 1	0m Ω	9	Can be set
	Compensation point 2	0m Ω	13	

4. Communication Description

4.1 CAN communication

BMS has the function of uploading battery pack to CAN communication, with a baud rate of 500K . The CAN communication interface uses an 8P8C network cable interface. It can communicate with the inverter or CAN TEST through the CAN interface. When the battery pack is connected, it is connected through RS485 communication, and finally the battery pack data, status, and information are uploaded to the PCS through CAN communication.
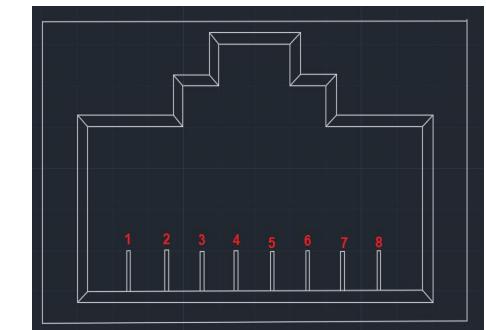
CAN communication interface definition:

1, 2, 7, 8	NC
4	CAN- H
5	CAN- L
3, 6	land

4.2 RS485 Communication

BMS has RS485 communication for battery group connection, with a baud rate of 19200bps . The RS485 communication interface uses an 8P8C network cable interface.

RS485 communication interface definition:
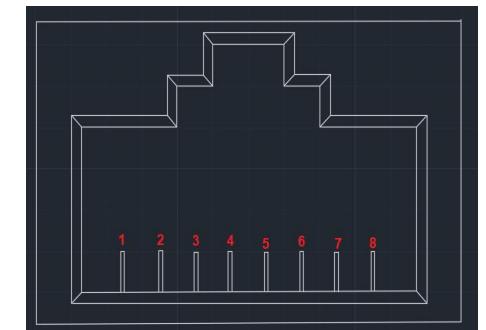
Pinout	Definition
1, 8	RS485-B
2, 7	RS485-A
3, 6	land

4, 5	NC (unconnected)

4.3   Parallel communication

When multiple machines are connected in parallel, the RS485 interface is used as the parallel communication interface, and the CAN interface is used as the upper communication interface. The terminal device can read the total battery data of all parallel PACKs through the CAN interface. When multiple machines are connected in parallel, the RS485 interface connection is shown in the figure below:
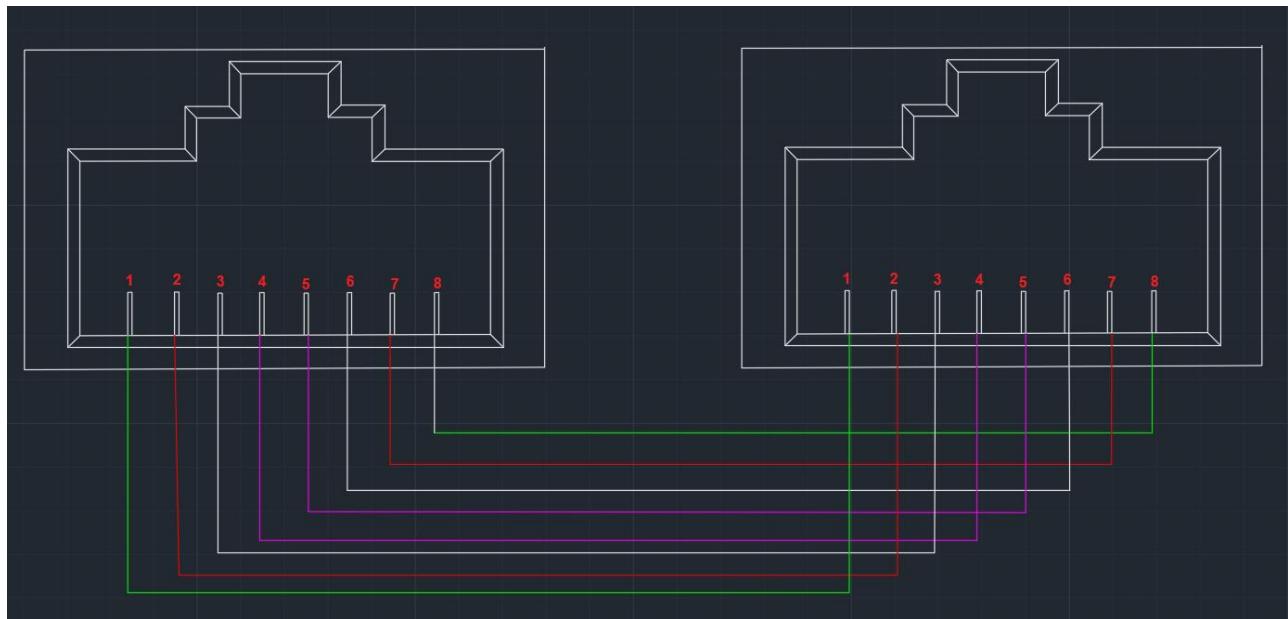
5 Basic working modes

5.1 Charging Mode

When the BMS detects that the charger is connected and the external charging voltage is greater than the internal battery voltage by more than 0.5V, it turns on the charging MOSFET for charging. When the charging current reaches the effective charging current, it enters the charging mode. In the charging mode, both the charging and discharging MOSFETs are closed.

5.2 Discharge Mode

The BMS enters the discharge mode when it detects that the load is connected and the discharge current reaches the effective discharge current.

5.3 Standby Mode

When neither of the above two modes is satisfied, it enters the standby mode.

5.4 Shutdown Mode

The BMS enters shutdown mode after 48 hours of normal standby, battery undervoltage protection, key shutdown or external switch shutdown.
Wake-up conditions from shutdown mode: 1. Charging activation; 2. 48V voltage activation; 3. Press button to turn on.

6. LED light indication

6.1 LED light sequence

1 running light, 1 warning light, 4 capacity indicator lights

🟢	🟢	🟢	🟢	🔴		🟢
SOC				ALARM		RUN

6.2 Capacity indication

state		Charge				Discharge			
		L4 🟢	L3 🟢	L2 🟢	L1 🟢	L4 🟢	L3 🟢	L2 🟢	L1 🟢
Capacity indicator light	0～25%	Destroy	Destroy	Destroy	Flash	Destroy	Destroy	Destroy	Always on
	25～50%	Destroy	Destroy	Flash	Always on	Destroy	Destroy	Always on	Always on
	50～75%	Destroy	Flash	Always on	Always on	Destroy	Always on	Always on	Always on
	≥75%	Flash	Always on	Always on	Always on	Always on	Always on	Always on	Always on
Running indicator light		Changliang				Flash			

6.3 Flashing instructions

Flashing mode	Bright	Destroy
Flash 1	0.25s	3.75s
Flash 2	0.5s	0.5s
Flash 3	0.5s	1.5s

6.4 Status Indication

System Status	Running status	RUN 🟢	ALM 🔴	SOC 🟢	🟢	🟢	🟢	illustrate
Shutdown	Hibernation	Destroy	Destroy	Destroy	Destroy	Destroy	Destroy	Total destruction
Standby	normal	Flash	Destroy	Destroy	Destroy	Destroy	Destroy	Standby mode
Charge	normal	Always on	Destroy	According to the power indicator				Maximum LED flash 2
	Overcurrent alarm	Always on	Flash 2	According to the power indicator				Maximum LED flash 2
	Overvoltage protection	Flash 1	Destroy	Destroy	Destroy	Destroy	Destroy	
	Temperature and overcurrent protection	Flash 1	Destroy	Destroy	Destroy	Destroy	Destroy	
Discharge	normal	Flash 3	Destroy	According to the power indicator				According to the constant light indicator
	Alerts	Flash 3	Flash 3					
	Temperature, over current, short circuit, etc. protection	Destroy	Always on	Destroy	Destroy	Destroy	Destroy	Stop discharging, when the mains is offline, it will be forced to sleep after 48 hours without any action
	Undervoltage protection	Destroy	Destroy	Destroy	Destroy	Destroy	Destroy	Stop discharge

7Installation and debugging

7.1 List of Goods

Serial number	name	quantity	picture
1.	Battery Pack	1 PCS	

7.2 Installation Instructions

7.2.1 Check the battery status before installation

7.2.2 Choose a suitable installation location

● Do not place batteries on flammable building materials

● The temperature should be between 10℃ and 30℃ to maintain optimal operation.

● It is recommended to place the battery on a level surface.

● There should be some free space around the battery to dissipate heat (as shown in the figure below)

Suitable for placement on concrete or other non-flammable surfaces

7.2.3 Wiring connection

The battery should be powered off before connecting.
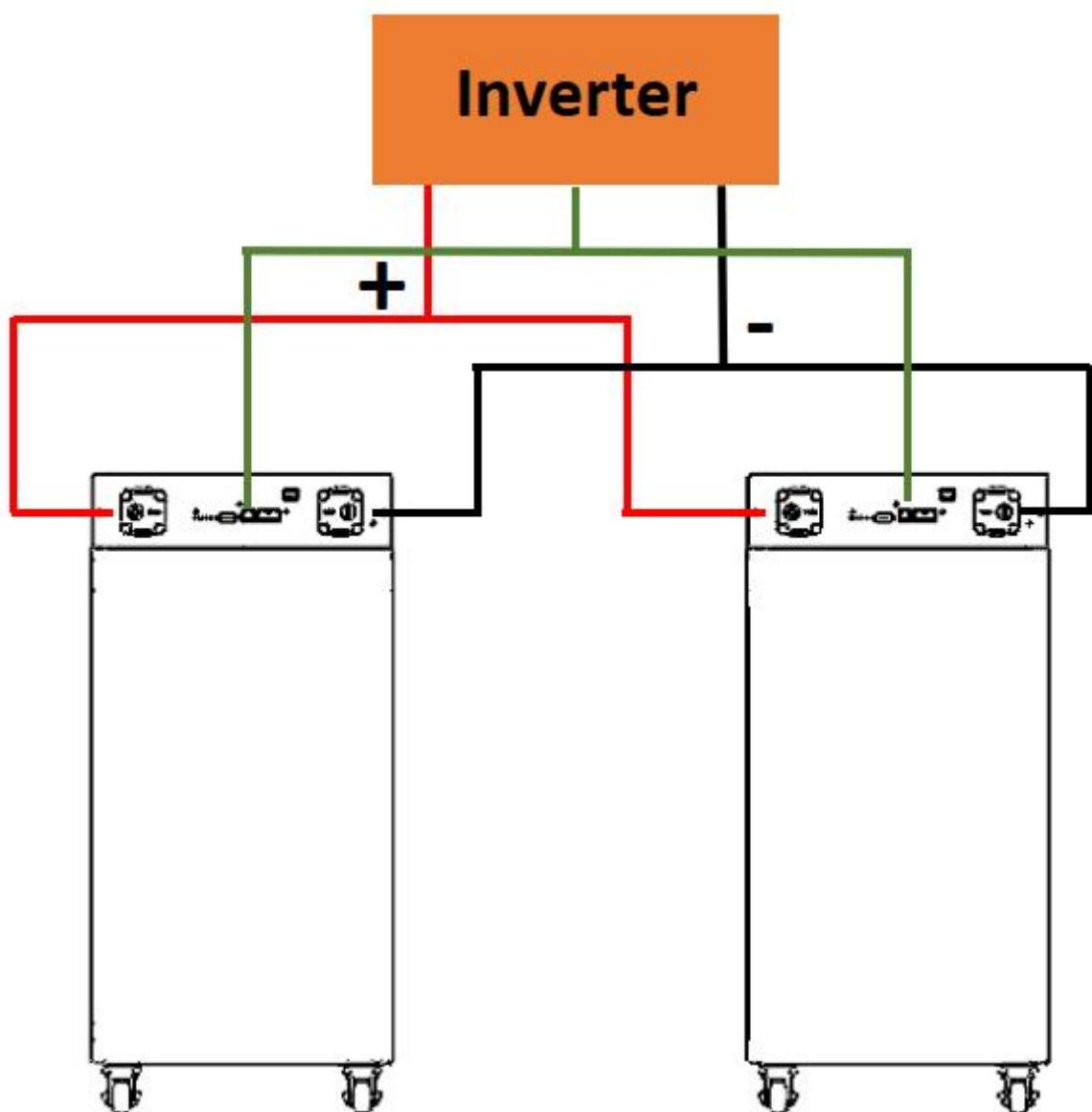
8. Packaging

Packed in a dry, dust and moisture proof packaging box. Packed in plastic film/EPE, packed in cartons.
Specifications: L 97cm*W50cm*H 36cm Packing quantity 1 unit Weight: 113kg
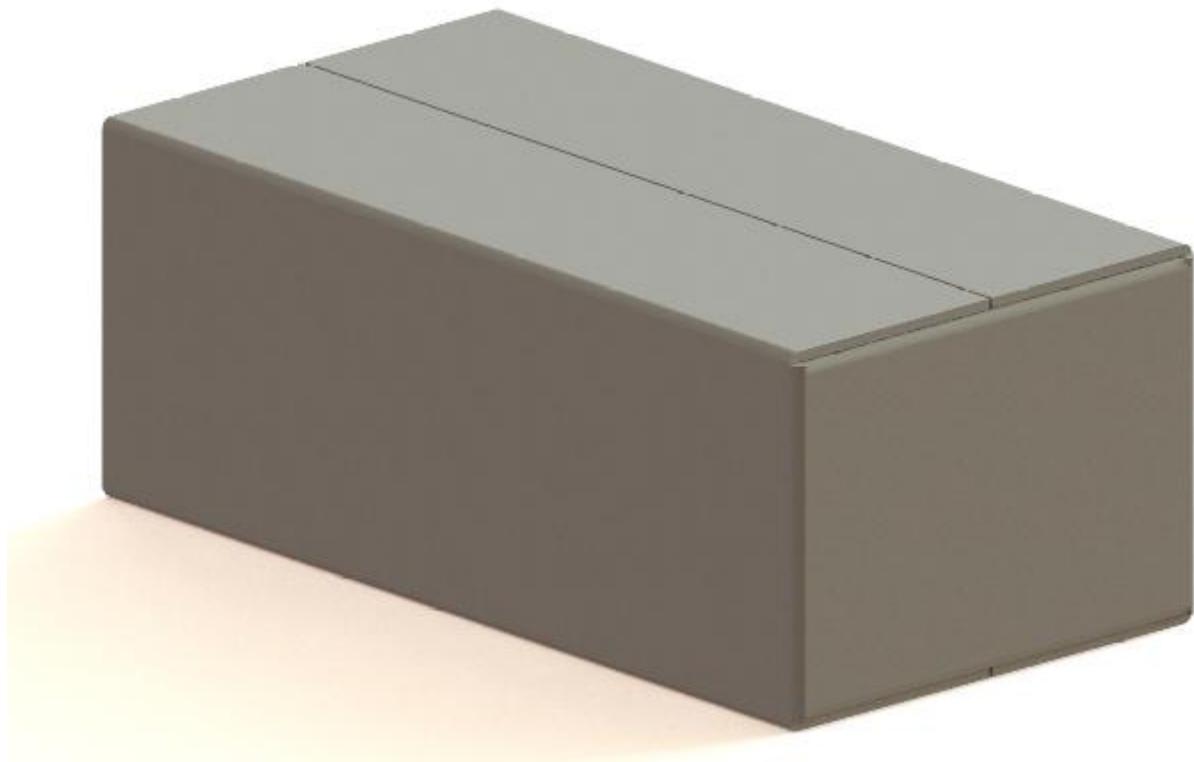
9. Notes

- Do not use the battery if it is significantly impacted or deformed.
- Do not install batteries in multiple layers.
- the polarity of the power supply and the input terminal .
- Ensure good equipment insulation and use tools and instruments correctly.
- The battery installation site should be away from fire sources and flammable objects, and the installation site should be kept ventilated and dry.
- It is strictly forbidden to plug or unplug the plug-in while the product is running.
- Non-professional technical personnel of our company are strictly prohibited from opening various functional modules, and the consequences are at their own risk.
- Before using a new battery or using the battery for a long time, fully charge the battery with a dedicated charger.
- Do not disassemble, open, crush, bend, deform, puncture or break the product.
- Do not modify or insert any foreign objects into the battery. Do not immerse or expose the product to water or other liquids such as fresh water, sea water, or beverages (coffee, juice, etc.). Keep away from fire, explosive substances or other hazards.
- Do not short-circuit the battery and do not allow metal or other conductors to come into contact with the battery contact terminals.
- Do not drop the battery. If this does happen (especially on a hard surface), contact a service center.
- If electrolyte leaks, do not allow the battery to come into contact with your skin or eyes. If it does occur, wash the contact area with plenty of water or seek medical help.
- Do not disassemble the battery under any circumstances. This may cause an internal short circuit, or even lead to fire or other problems.
- Do not burn the battery or dispose of it in fire under any circumstances. Otherwise, the battery may burn .