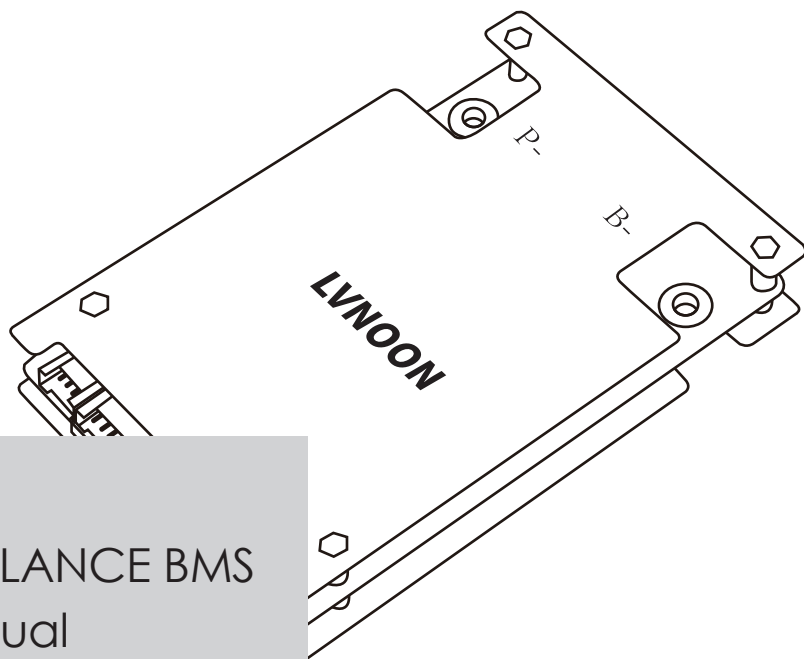


LVNOON



SMART ACTIVE BALANCE BMS User Manual

V1.4

Contents

Introduction	1
Product Features	1
Quick Startup Instructions	3
Electrical characteristics	4
Basic specification	4
Current parameter correspondence table	5
Functional diagram	7
Working parameters	8
LED working status indication	9
Capacity indication	9
BMS on/off instruction	9
Communication Description	10
RS485 protocol	10
CANBUS protocol	10
PB1A2A Series Inverter Communication Protocol List	11

Heating function interface	15
APP description	18
PC software description	18
LB04A series products specifications	19
LB06A series products specifications	25
LB1A series products specifications	33
LB2A series products specifications	40
Inverter BMS PB1A2A series products specifications	49
Welding instructions	54
Download and install APP method	55
Wiring instructions	56
APP operating instructions	57
Warranty	78
Special instructions	78
FAQs	79

Introduction

With the rapid growth of the renewable energy storage market, there is a growing demand for battery management systems(BMS). This LVNOON BMS is a smart active BMS for energy storage applications. It uses sophisticated detection techniques to achieve all in protection against overcharging, over discharge, over temperature and over current of the energy storage battery, ensuring safe and reliable operation of the energy storage system. At the same time, it integrates advanced active voltage balancing function. Allowing the voltage of each battery cell to be monitored in real time via your smartphone APP, improving battery life through active balance management. This product provides an intelligent battery protection solution for a wide range of energy storage applications.

Product Features

- Active Balance Function
- App Remote Operation
- Support PC Program (for inverter BMS only)
- Screen Display available
- High Precision Voltage Acquisition ($\leq 20\text{mV}$)
- High Precision Current Acquisition ($\leq 2\%@\text{FS}$)
- Isolated power circuit
- 4 NTC detection protection

- LED status indication
- OVP and OCP
- Low Power Consumption
- Support RS485/CAN/RS232/GPS/LCD display
- Integrate the third-generation active balancing function.
- Smart Integrated and string design, compatible with 4~24 strings.
- With 0.4A/0.6A/1A/2A balance current available & continuous charge/discharge current from 40A to 300A.
- Integrated Bluetooth function can use the APP quickly and easily view and set the parameters of BMS.
- Integrate the third-generation active balancing function.
- TOLL package MOS tube with low package resistance, low parasitic inductance and low thermal resistance is adopted to meet the application scenarios of high power and high current.
- Supports a variety of peripheral accessories to meet multiple application scenarios.
- The use of professional high-current wiring design and technology, withstand the impact of large current.
- With all in protection such as over charge protection, over discharge protection, over current protection, short circuit protection, MOS protection etc.
- With communication function, you can set parameters such as over charge, over discharge,
- Battery Capacity Estimation
- Precise Time Log Record
- Short circuit protection
- MOS Temperature Detection Protection

over current, equalization, over temperature, under-temperature, hibernation and capacity and so on via smartphone APP.

Quick Startup Instructions

1. Download app
2. Hardware connection & wire welding
3. Activate the BMS via the switch/LCD display switch
4. Open the APP and connect the device
5. Set the number of strings and battery type
6. Check the battery status

1. Connect the protection board and battery pack according to the wiring diagram, make sure that the last power wire is connected to the main positive pole. The total voltage of the battery pack should be total batteries voltage amount before starting up.
2. Use the switch or display activation button to activate the BMS.
3. Turn on GPS and Bluetooth on your smartphone.
4. Make sure your smartphone Bluetooth function is turned on, then click the APP, click on the top left corner of APP to search for devices, click on the device series number to connect to Bluetooth, the default password: 1234.
5. Parameters need to be set for the first start-up and setting requires a password, The default parameter set password is 123456, simply set the number of stings and battery type.

6. Once the parameters are set, go back to the real-time status page. check the battery status, no error message is prompted and normal operation, blue is the highest voltage, red is the lowest voltage.

For more detailed instructions, please read the whole user manual carefully.

Electrical characteristics

Basic specification

Index	Specification
Battery pack type	Li-ion (NCM)/Lifepo4(LFP)/LTO
Number of battery strings	Li-ion: 3~8S/7~17S/7~20S/7~24S
	Lifepo4: 4~8S/8~17S/8~20S/8~24S
	LTO: 6~8S/12~17S/12~20S/12~24S
Balance current	0.4A/0.6A/1A/2A
Continuous charge/discharge current	40A-300A
Cell sampling voltage range	1-5V
Operating voltage range	10V-100V
Balance method	Active Balance
Working power consumption	8mA@100V
Sleep current	≤0.025W
working temperature	-30°C ~ 70°C

Working light	See LED working status chart
Product weight	0.30-0.65KG
Product size	110*73*18mm
	116*83*18mm
	136*83*18mm
	153*126*18mm
	162*102*20mm

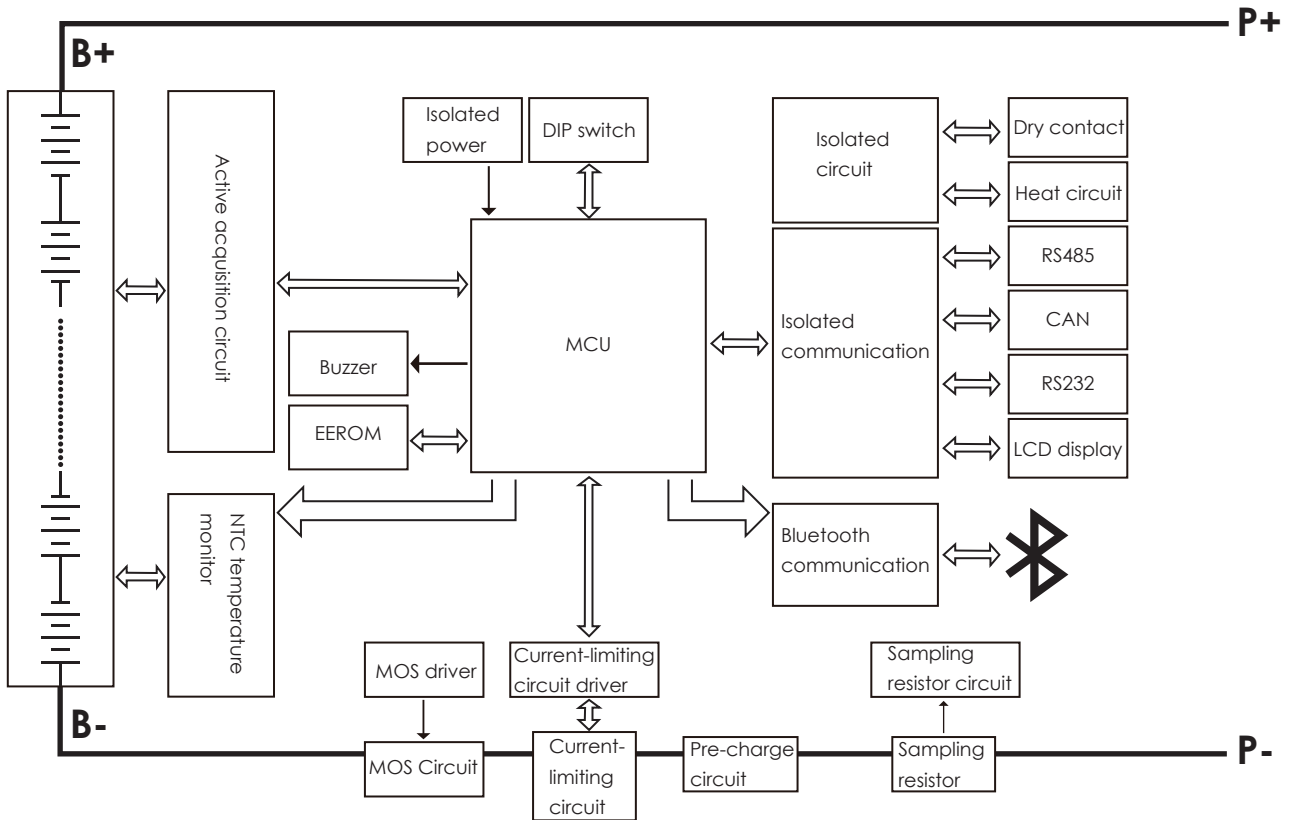
Current parameter correspondence table

**LVNOON Smart Active Balance BMS
Current Parameter Table**

Balance current	Model No.	Compatible Strings	Continuous Charge/ Discharge Current	Max Discharge current	Over charge Protection Current
1A (Inverter BMS)	PB1A16S100A	7S-16S	100A	200A	10-100A
	PB1A16S150A	7S-16S	150A	300A	10-150A
	PB1A16S200A	7S-16S	200A	350A	10-200A
2A (Inverter BMS)	PB2A16S150A	7S-16S	150A	300A	10-150A
	PB2A16S200A	7S-16S	200A	350A	10-200A
2A	LB2A8S200A	3S-8S	200A	350A	10-200A
	LB2A8S300A	3S-8S	300A	450A	10-300A
	LB2A20S200A	7S-20S	200A	350A	10-200A
	LB2A24S150A	7S-24S	150A	300A	10-150A
	LB2A24S200A	7S-24S	200A	350A	10-200A

1A	LB1A8S100A	3S-8S	100A	200A	10-100A
	LB1A8S200A	3S-8S	200A	350A	10-200A
	LB1A17S120A	7S-17S	120A	250A	10-120A
	LB1A20S120A	7S-20S	120A	250A	10-120A
	LB1A20S150A	7S-20S	120A	300A	10-120A
	LB1A24S150A	7S-24S	150A	300A	10-150A
0.6A	LB06A17S60A	7S-17S	60A	100A	10-60A
	LB06A17S80A	7S-17S	80A	150A	10-80A
	LB06A20S60A	7S-20S	60A	100A	10-60A
	LB06A20S80A	7S-20S	80A	150A	10-80A
	LB06A20S100A	7S-20S	100A	200A	10-100A
	LB06A20S120A	7S-20S	120A	250A	10-120A
	LB06A20S150A	7S-20S	150A	300A	10-150A
	LB06A24S60A	7S-24S	60A	100A	10-60A
	LB06A24S80A	7S-24S	80A	150A	10-80A
	LB06A24S100A	7S-24S	100A	200A	10-100A
	LB06A24S120A	7S-24S	120A	250A	10-120A
	LB06A24S150A	7S-24S	150A	300A	10-150A
0.4A	LB04A8S40A	3S-8S	40A	60A	10-40A
	LB04A17S40A	7S-17S	40A	60A	10-40A
	LB04A20S40A	7S-20S	40A	60A	10-40A
	LB04A24S40A	7S-24S	40A	60A	10-40A
	LB04A20S100A	7S-20S	100A	200A	10-100A
	LB04A24S100A	7S-24S	100A	200A	10-100A

Functional diagram



Working Parameters

NO	Content	Index items	Default parameters	Whether settable	Note
1	Strings	Support battery type	Lifepo4/Li-ion/LTO	YES	All parameters default are Lifepo4 parameters
		Support strings	3-24	YES	
2	OVP	Unit overcharge protection voltage	3600mV	YES	
		Unit overcharge protection recovery voltage	3550mV	YES	
3	OVDP	Unit under voltage protection voltage	2600mV	YES	
		Unit under voltage protection recovery voltage	2650mV	YES	
		Unit under voltage automatic shutdown voltage	2500mV	YES	
4	Active Balance	Balance trigger differential voltage	10mV	YES	
		Balance starting working voltage	3000mV	YES	
		Max balance current	1A	YES	
5	Overall overcharge protection	Max charging current	25A	YES	
		Charging over current delay	2s	YES	
		Charging over current alarm cleared	60s	YES	
		Charging over current limiting current	10A	YES	
6	Overall over discharge protection	Max discharging current	150A	YES	
		Discharge over current delay	300S	YES	
		Discharge over current alarm cleared	60S	YES	
7	Short circuit protection	Short circuit protection current	550A	YES	
		Short circuit protection delay	30us	YES	
		Short circuit protection released	60s	YES	
8	Temperature protection	Charging over temperature protection	70°C	YES	
		Charging over temperature recovery	60°C	YES	
		Discharge over temperature protection	70°C	YES	
		Discharge over temperature recovery	60°C	YES	
		Low temperature protection during charging	-20°C	YES	
		Low temperature recovery during charging	-10°C	YES	
		MOS Over temperature protection	100°C	YES	
		MOS Over temperature recovery	80°C	YES	
		Battery alarm temperature	60°C	YES	
Battery alarm recovery	50°C	YES			

LED working status indication

Status	Normal/Alarm/Protect	ON/OFF	RUN	ALM	Battery indicator LED
OFF	Normal	OFF	OFF	OFF	OFF
Balance	Normal	ON	ON	OFF	Based on battery level display
	Normal	ON	ON	OFF	Based on battery level display
Charge	Over current, over temperature, over voltage, charging failure	ON	ON	Blink	Based on battery level display
	Normal	ON	ON	OFF	Based on battery level display
Discharge	Over current, over temperature, over voltage, charging failure	ON	ON	Blink	Based on battery level display
	Normal	ON	ON	OFF	Based on battery level display
Others alarms	Password Not Modified Short Circuited Temperature Abnormal	ON	ON	Blink	Based on battery level display

Capacity indication

Status		Charging						Discharging					
Capacity indicator light		L6	L5	L4	L3	L2	L1	L6	L5	L4	L3	L2	L1
SOC%	0~16.6%	Off	Off	Off	Off	Off	On	Off	Off	Off	Off	Off	On
	16.6~33.2%	Off	Off	Off	Off	On	On	Off	Off	Off	Off	On	On
	33.2~49.8%	Off	Off	Off	On	On	On	Off	Off	Off	On	On	On
	49.8~66.4%	Off	Off	On	On	On	On	Off	Off	On	On	On	On
	66.4~83.0%	Off	On	On	On	On	On	Off	On	On	On	On	On
	83.0~100%	On	On	On	On	On	On	On	On	On	On	On	On

BMS On/off instruction

The BMS can be turned on/off via the switch or LCD display switch after finishing all the wires welding, press the switch or the LCD display switch button once will turn it on and hold it for around 3-5 seconds again will turn it off.

Communication Description

Communication protocol

RS485 Protocol




1. 000 - 4G-GPS Remote module protocol V4.2
2. 001 - JK BMS RS485 Modbus V1.0
3. 002 - NIU U SERIES
4. 003 - China tower shared battery cabinet V1.1
5. 004 - PACE_RS485 Modbus V1.3
6. 005 - PYLON low voltage Protocol RS485 V3.3
7. 006- Growatt BMS RS485 Protocol 1xSxxP_ESS Rev2.01
8. 007- Voltronic Inverter and BMS 485 communication protocol 20200325
9. 008 -Protocol 8
10. 009 -Protocol 9
11. 010 - Protocol 10









CANBUS Protocol

1. 000 - JK BMS CAN Protocol V2.0
2. 001 Deye Low-voltage hybrid inverter CAN communication protocol V1.0

3. 002 - PYLON-low-voltage-V1.2
4. 003 - Growatt BMS CAN-Bus-protocol -low-voltage Rev 05
5. 004 - Victron CANBUS BMS protocol 20170717
6. 005 - SEPLOS BMS CAN Protocol V1.0
7. 006 - Protocol 6
8. 007 - Protocol 7
9. 008 - Protocol 8
10. 009 - Protocol 9
11. 010 - Protocol 10

PB1A2A Series Inverter Communication Protocol List

Inverter Brands		Protocol name	Communication port	Machine test	Matched Model No.	Protocol in inverter code
Deye		Low-voltage hybrid inverter CAN communication protocol	CANBUS-500K	Yes	SUN-5K-SGO3LP1-EU	1. Battery Setup Menu->Lithium 2. Advanced Function->BMS_Err_Stop
PYLON		PYLON CANBUS Protocol V1.2	CANBUS-500K	No		
		PYLON low voltage RS485 Protocol				
Growatt		Growatt BMS CAN-Bus-protocol -low-voltage_Rev_05	CANBUS-500K	Yes	SPF 3000TL HVM-48	1. Set 05 to LI 2. If set 36 to 1 is for CAN communication
		Growatt xxSxxP ESS RS485 Protocol V2.01	RS485-9600	Yes	SPF 3000TL HVM-48	1. Set 05 to LI 2. If set 36 to 51 is for CAN communication

Victron	 victron energy	Victron CAB-BUS_BMS_Protocol_201707	CANBUS-500K	Yes	Cerbo GX	
Invent	 invt 英威腾	INVT BMS CAN Bus protocol V 1.02	CANBUS-500K	Yes	BD5KTL-RL1	
Good We	 GOODWE 固德威	GoodWe LV BMS Protocol (CAN) V 1.7 (For ES/EM/S-BP/BP Series)	CANBUS-500K	Yes	GW5000-ES-20	Battery type choose GoodWe->SECU-A.5.4L*1
SMA		SMA FSS-ConnectingBat-TI-en-10 Version 1.0	CANBUS-500K	No		
Voltronic	 Voltronic Power	Voltronic Power Inverter and BMS 485 communication protocol	RS485-9600	No		
SRNE		SRNE BMS Modbus Protocol for RS485	RS485-9600	Yes	HF2430S60-100	1. Set 39 to BMS 2. Set 32 to BMS 3. Set 33 to WOW
MUST	 MUST 美世乐					
Sofar	 SOFAR 首航新能源					

1. RS485

There are two RS485 communication interfaces, one of which outputs two interfaces in parallel for viewing battery pack information, with a default baud rate of 115200. By setting the DIP switch to set the communication address, it is possible to poll and query the data of all battery packs, with an address setting range of 0-15.

2. RS232

BMS can communicate with the upper computer through the RS232 interface, there by monitoring various battery information, including battery voltage, current, temperature status,

and battery production information, with a default baud rate of 9600bps.

3. CAN BUS

The default communication speed for CAN communication is 250K

4. DIP switch settings

When multiple battery packs are used in parallel, the battery packs need to be set to different addresses through the DIP switch for normal use. You can refer to following DIP switch address 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	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Interface definition

Definition of dry contact interface

Pin Num	Pin Definition	Note
1	COM1	S1 and COM1 conduct under alarm conditions
2	S1	
3	COM2	S2 and COM2 conduct under low battery conditions
4	S2	

CAN and RS485-1 interface definition

RS485-adopts 8P8C vertical RJ45 socket		CANBUS-adopts 8P8C vertical RJ45 socket	
Pin Number	Pin Definition	Pin Number	Pin Definition
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

RS232 Interface definition

RS232 adopts 6P6C vertical RJ11 socket		
Pin Number	Pin Definition	Note
1、 2、 6	NC	
3	RS232_TX	
4	RS232_RX	
5	GND	

RS485-2 Parallel interface definition

RS485-adopts 8P8C vertical RJ45 socket		RS485-adopts 8P8C vertical RJ45 socket	
Pin Number	Pin Definition	Pin Number	Pin Definition
1、 8	RS485-B2	9、 16	RS485-B2
2、 7	RS485-A2	10、 15	RS485-A2
3、 6	GND	11、 14	GND
4、 5	NC	12、 13	NC

Heating function interface

(Only a BMS equipped with heating function can use heating interface)

Description of heating function:

Battery temperature is below low temperature charge protection, turn off charging, turn on heating.

Battery temperature is higher than low temperature charge recovery temperature, turn on charging, turn off heating.

Cryogenic charge protection is a parameter that can be set via smartphone APP

The heating power depends on the battery voltage and the resistance value of the heating film.

Battery voltage U.

Heating resistance is R.

Power equals: U^2/R

Heating current $I=U/R$

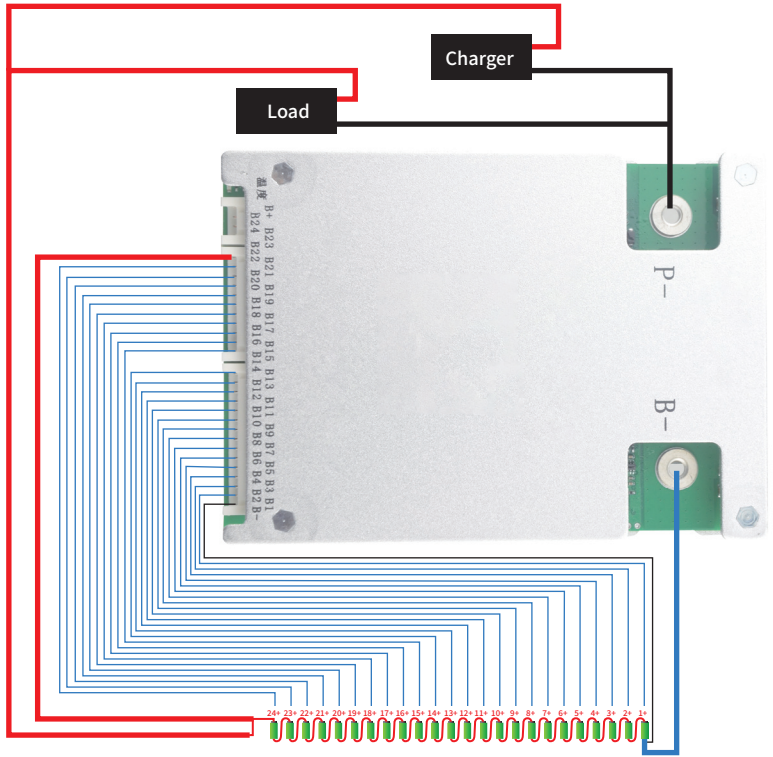
The maximum I (current) of the board design is 3A

MAX heating Power is 200W (100W of LB2A8S200A), this condition must be met.

Battery interface definition

Interface		Definition Description		
BAT+		Connected to the total positive pole of the battery cells PACK to supply power to the BMS board		
B-		Connect to battery cells PACK total negative pole		
P-		Connect to battery PACK charge and discharge negative pole		
Battery cell and temperature	NT1	Connect NTC temperature probe	B9	The 9th battery cell positive probe
	GND	Connect NTC1 temperature probe	B10	The 10th battery cell positive probe
	B0	The 1st battery cell negative probe	B11	The 11th battery cell positive probe
	B1	The 1st battery cell positive probe	B12	The 12th battery cell positive probe
	B2	The 2nd battery cell positive probe	B13	The 13th battery cell positive probe
	B3	The 3rd battery cell positive probe	B14	The 14th battery cell positive probe
	B4	The 4th battery cell positive probe	B15	The 15th battery cell positive probe
	NTC2	Connect NTC2 temperature probe	B16	The 16th battery cell positive probe
	GND	Connect NTC2 temperature probe	B17	The 17th battery cell positive probe
	B5	The 5th battery cell positive probe	B18	The 18th battery cell positive probe
	B6	The 6th battery cell positive probe	B19	The 19th battery cell positive probe
	B7	The 7th battery cell positive probe	B20	The 20th battery cell positive probe
	B8	The 8th battery cell positive probe	B21	The 21th battery cell positive probe
	NT3	Connect NTC3 temperature probe	B22	The 22th battery cell positive probe
GND	Connect NTC3 temperature probe	B23	The 23th battery cell positive probe	
NC	NC	B24	The 24th battery cell positive probe	

7S-24S wiring diagram



B+ total positive electrode

B- total negative pole

APP Description

Balance BMS APP function

- View SOC, remaining power, total voltage, current, MOS status, balance status.
- Battery single string voltage, highest and lowest position, battery number, software version number, SN number.
- Protection parameters, cell selection, and one-click parameter setting.
- BMS software upgrade, view BMS historical faults record
- Upload historical faults to the cloud platform/send to email.
- Change BMS password; Download method: Scan the QR code on the product manual and enclosure to get more information.





PC software Description

The functions of the PC host (only available for inverter BMS currently are mainly divided into six parts:

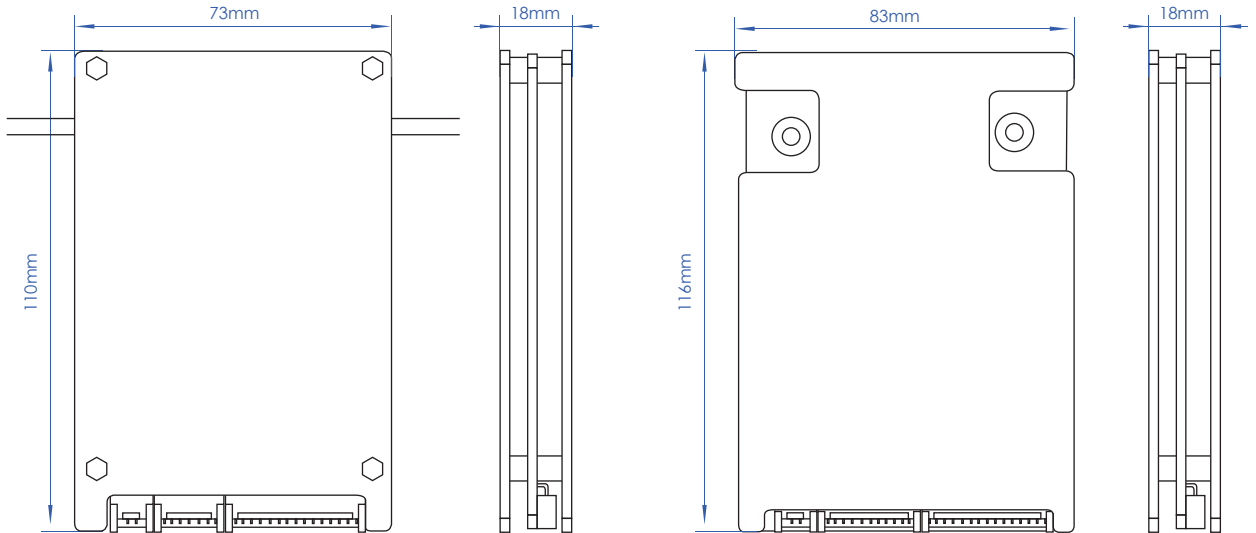
data monitoring, parameter setting, parameter reading, engineering mode, historical alarm and BMS upgrade.

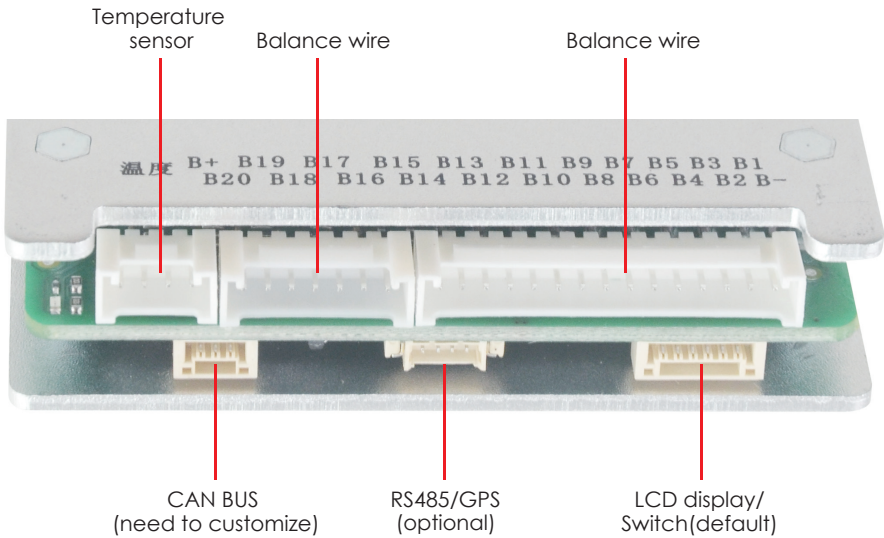
- Analyze the data sent by each module, and then display the voltage, temperature, configuration value etc.
- Configure information to each module through the PC host.
- Calibration of production parameters.
- BMS upgrade. Download method: Scan the QR code on the product manual and enclosure to get more information.

LB04A series Product Specifications

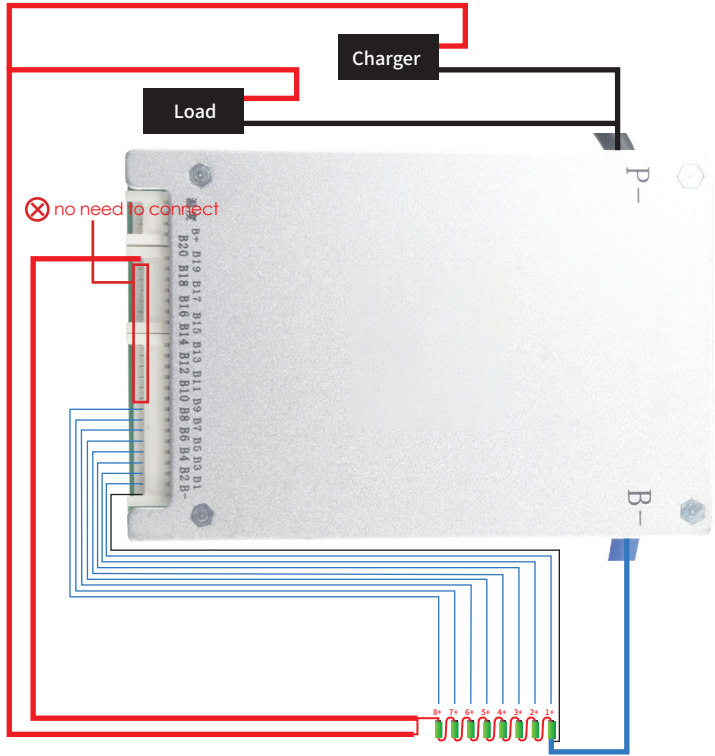
Product photo				
Technical Index	LB04A8S40A	LB04A17S40A	LB04A20S40A	LB04A24S40A
Number of Battery Strings (Li-ion)	3S-8S	7S-17S	7S-20S	7S-24S
Number of Battery Strings (Lifepo4)	4S-8S	8S-17S	8S-20S	8S-24S
Number of Battery Strings (LTO)	6S-8S	12S-17S	12S-20S	12S-24S
Balance Method	Active Balance(Full State On)			
Balance Current	0.4A	0.4A	0.4A	0.4A
Conductive Resistance in Main Circuit	2.8mΩ	2.8mΩ	2.8mΩ	2.8mΩ
Continuous Discharge Current	40A	40A	40A	40A
Continuous Charge Current	40A	40A	40A	40A
Maximum Discharge Current (MAX 2 min)	60A	60A	60A	60A
Over Charge Protection Current (Adjustable)	10-40A	10-40A	10-40A	10-40A
Other interfaces (Default)	RS485	RS485	RS485	RS485
Other interfaces (need customized)	CANBUS	CANBUS	CANBUS	CANBUS
Size/mm	110*73*18	110*73*18		116*83*18
Wiring Output	Common Port			
Single Cell Voltage Range	1-5V			
Voltage Acquisition Accuracy	±5mV			
Over Charge Protection Voltage	1.2-4.35V Adjustable			
Over Charge Release Voltage	1.2-4.35V Adjustable			
Over Current Detect Delay	2-120S Adjustable			
Over Discharge Protection Voltage	1.2-4.35V Adjustable			
Over Discharge Release Voltage	1.2-4.35V Adjustable			
Quantity of Temperature Detection	2Pcs			
Temp Protection	Yes			
Short Circuit protection	Yes			
Coulomb Counter	Yes			
App Function	Fit for Android/IOS smartphone			

Size (mm)





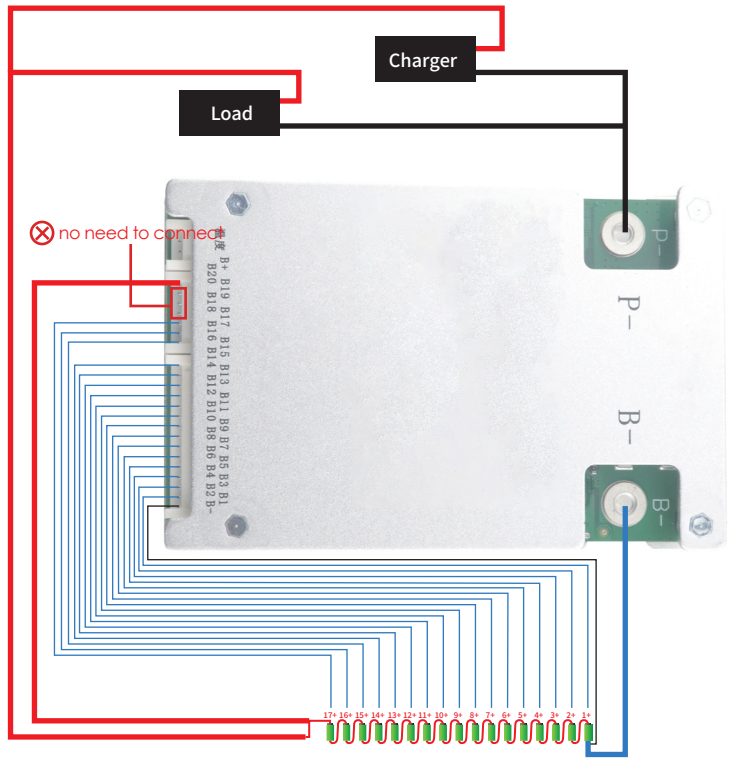
3S-8S wiring diagram



B+ total positive electrode

B- total negative pole

7S-17S wiring diagram



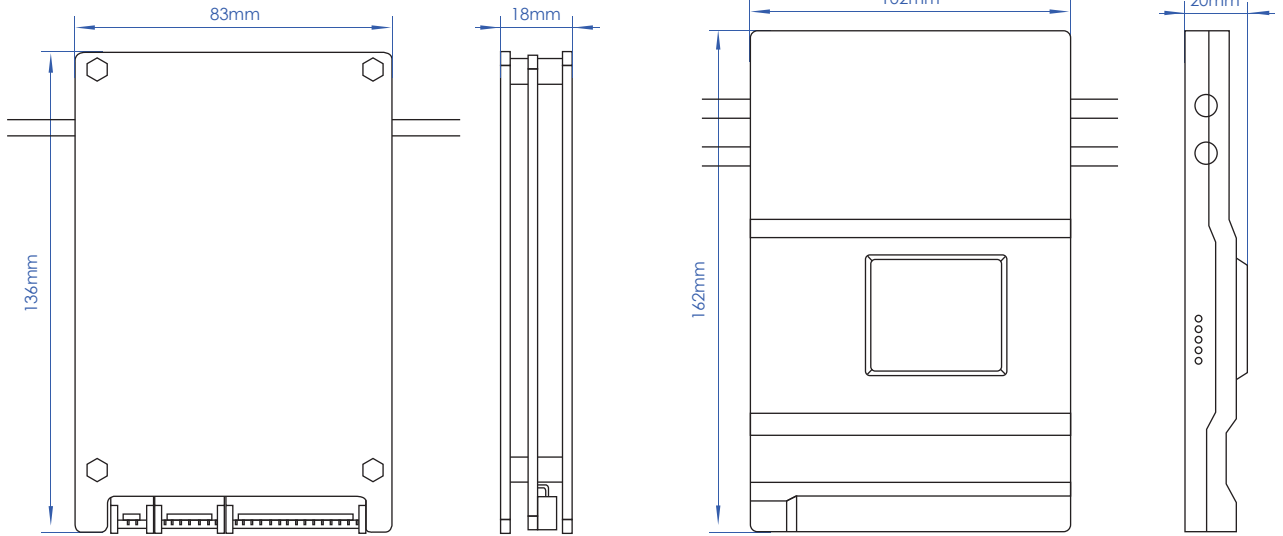
B+ total positive electrode

B- total negative pole

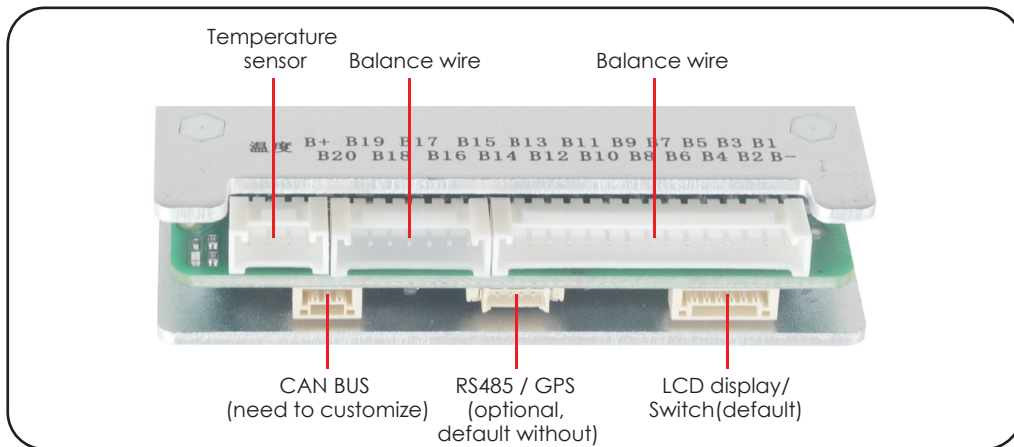
LB06A series Product Specifications

Product photo												
Technical Index	LB06A17560A	LB06A17580A	LB06A20560A	LB06A20580A	LB06A205100A	LB06A205120A	LB06A205150A	LB06A24560A	LB06A24580A	LB06A245100A	LB06A245120A	LB06A245150A
Number of Battery Strings (Li-Ion)	7S-17S	7S-17S	7S-20S	7S-20S	7S-20S	7S-20S	7S-20S	7S-24S	7S-24S	7S-24S	7S-24S	7S-24S
Number of Battery Strings (LiFePO4)	8S-17S	8S-17S	8S-20S	8S-20S	8S-20S	8S-20S	8S-20S	8S-24S	8S-24S	8S-24S	8S-24S	8S-24S
Number of Battery Strings (LiIO)	12S-17S	12S-17S	12S-20S	12S-20S	12S-20S	12S-20S	12S-20S	12S-24S	12S-24S	12S-24S	12S-24S	12S-24S
Balance Method	Active Balance (Full State On)											
Balance Current	0.6A	0.6A	0.6A	0.6A	0.6A	0.6A	0.6A	0.6A	0.6A	0.6A	0.6A	0.6A
Conductive Resistance in Main Circuit	1.53mΩ	1.2mΩ	1.53mΩ	1.2mΩ	1mΩ	1mΩ	0.65mΩ	1.53mΩ	1.2mΩ	1mΩ	1mΩ	0.65mΩ
Continuous Discharge Current	60A	80A	60A	80A	100A	120A	150A	60A	80A	100A	120A	150A
Continuous Charge Current	60A	80A	60A	80A	100A	120A	150A	60A	80A	100A	120A	150A
Maximum Discharge Current (MAX 2 min)	100A	150A	100A	150A	200A	250A	300A	100A	150A	200A	250A	300A
Over Charge Protection Current (Adjustable)	10-60A	10-80A	10-60A	10-80A	10-100A	10-120A	10-150A	10-60A	10-80A	10-100A	10-120A	10-150A
Other interfaces (Default)	RS485	RS485	RS485	RS485	RS485	RS485	RS485	RS485	RS485	RS485	RS485	RS485
Other interfaces (need customized)	CAN BUS	CAN BUS	CAN BUS	CAN BUS	CAN BUS/HEAT	CAN BUS/HEAT	CAN BUS/HEAT	CAN BUS	CAN BUS	CAN BUS/HEAT	CAN BUS/HEAT	CAN BUS/HEAT
Size/mm	136*83*18mm				162*102*20mm			136*83*18mm			162*102*20mm	
Wiring Output	Common Port											
Single Cell Voltage Range	1-5V											
Voltage Acquisition Accuracy	±5mV											
Over Charge Protection Voltage	1.2-4.35V Adjustable											
Over Charge Release Voltage	1.2-4.35V Adjustable											
Over Current Detect Delay	2-120S Adjustable											
Over Discharge Protection Voltage	1.2-4.35V Adjustable											
Over Discharge Release Voltage	1.2-4.35V Adjustable											
Quantity of Temperature Detection	4PCS											
Temp Protection	Yes											
Short Circuit protection	Yes											
Coulomb Counter	Yes											
App Function	Support for Android/iOS smartphone											

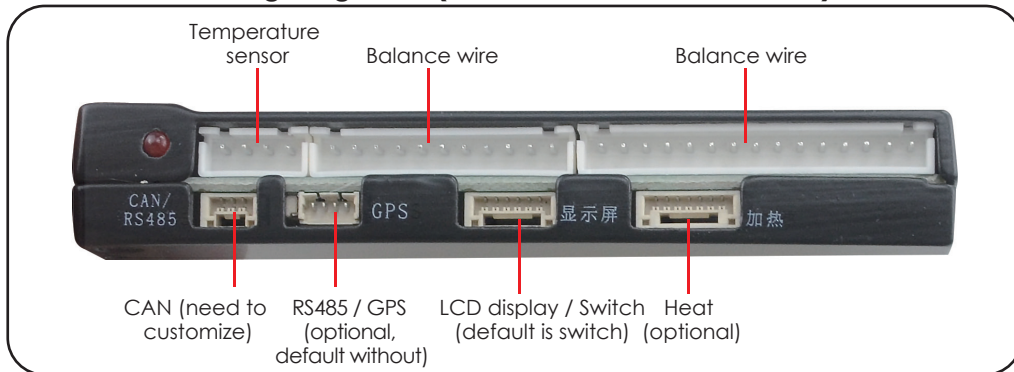
Size (mm)



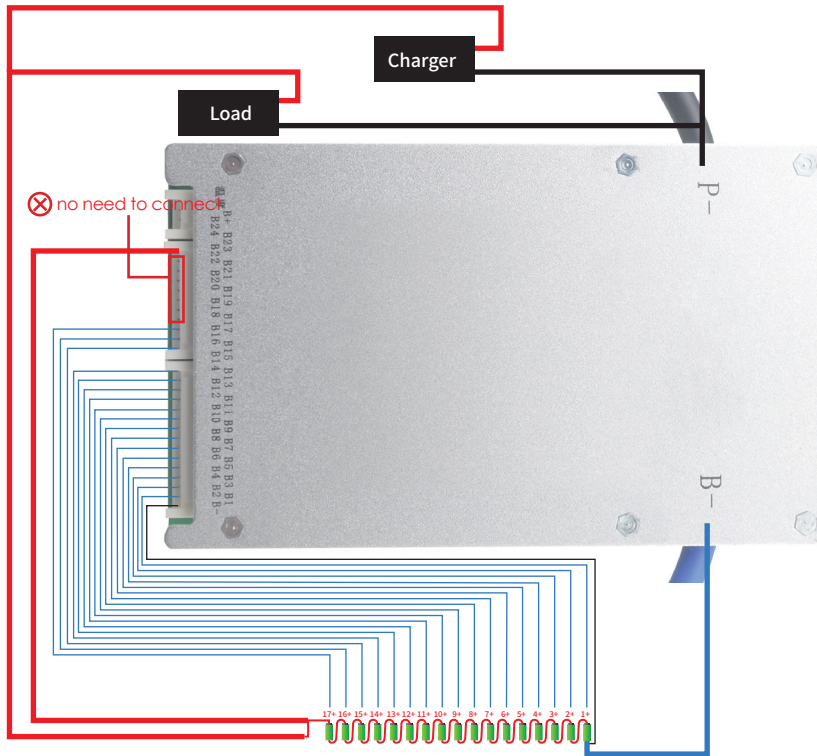
Wiring diagram 1 (for 60A & 80A series)



Wiring diagram 2 (for 100A,120A & 150A series)



7S-17S wiring diagram

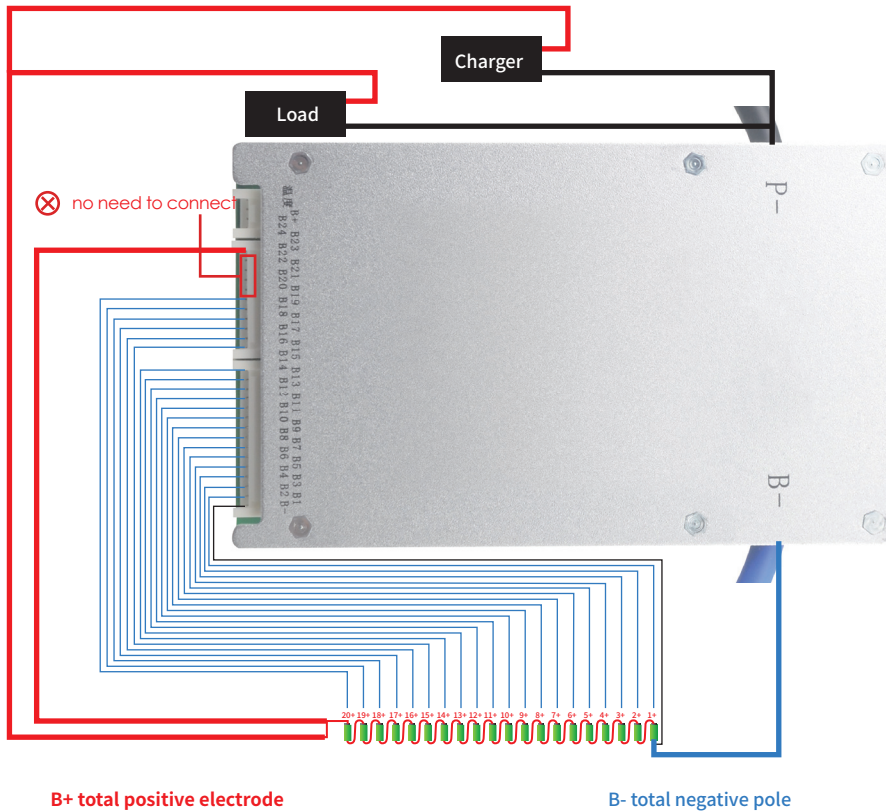


⊗ no need to connect

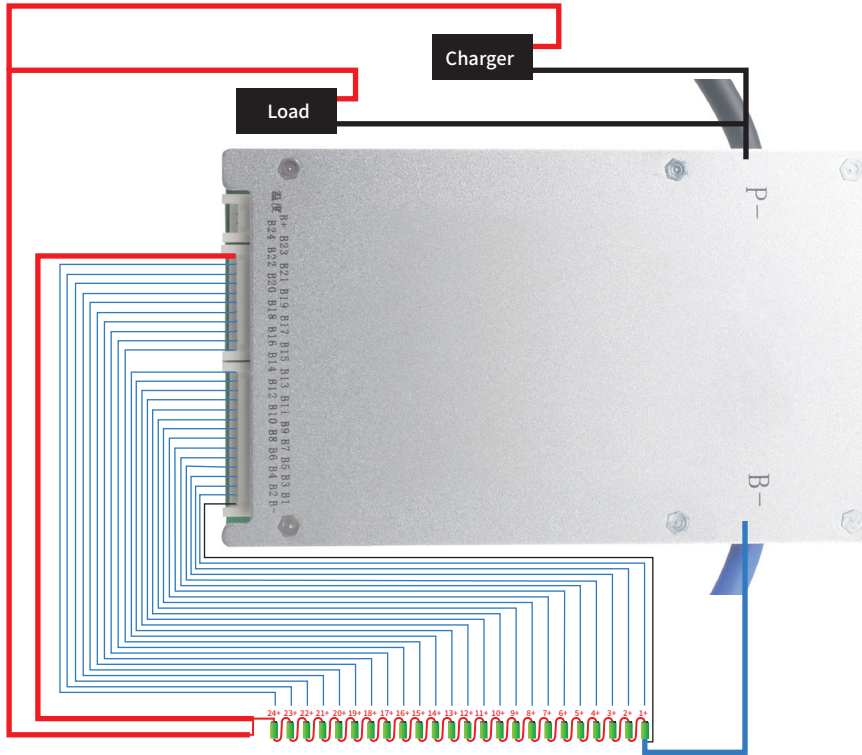
B+ total positive electrode

B- total negative pole

7S-20S wiring diagram



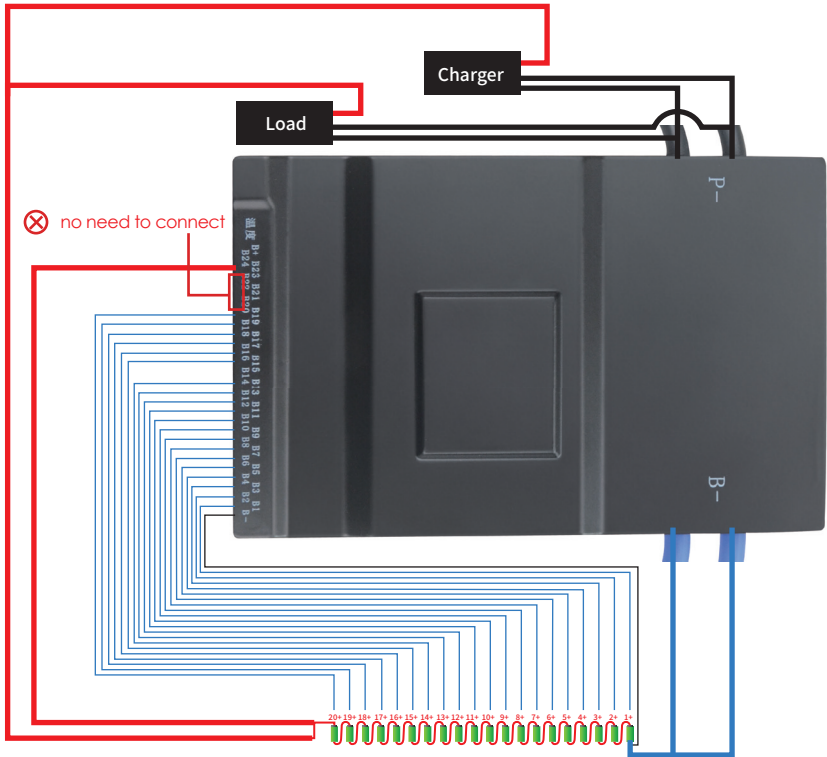
7S-24S wiring diagram



B+ total positive electrode

B- total negative pole

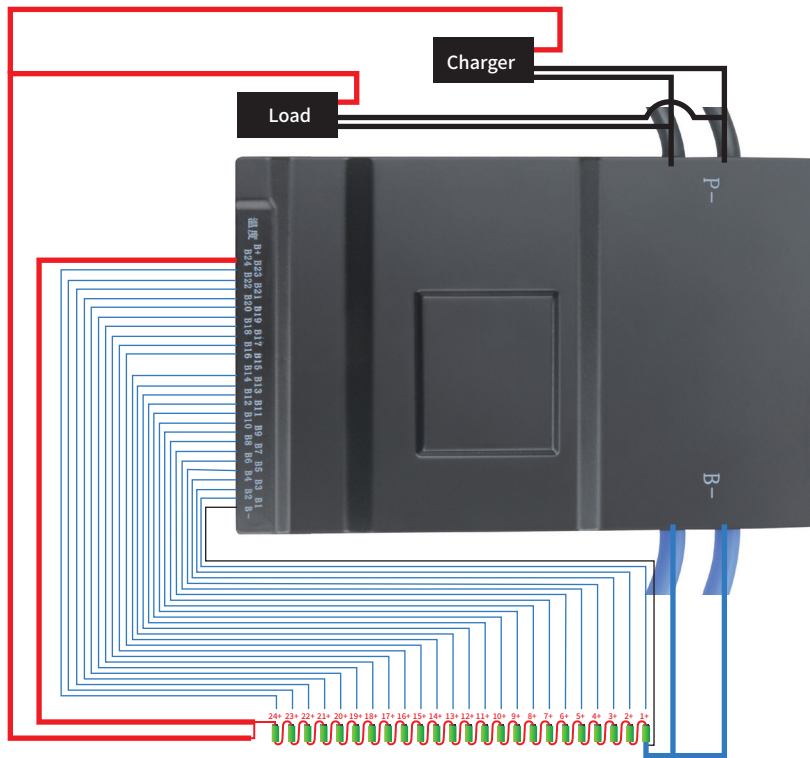
7S-20S wiring diagram



B+ total positive electrode

B- total negative pole







7S-24S wiring diagram



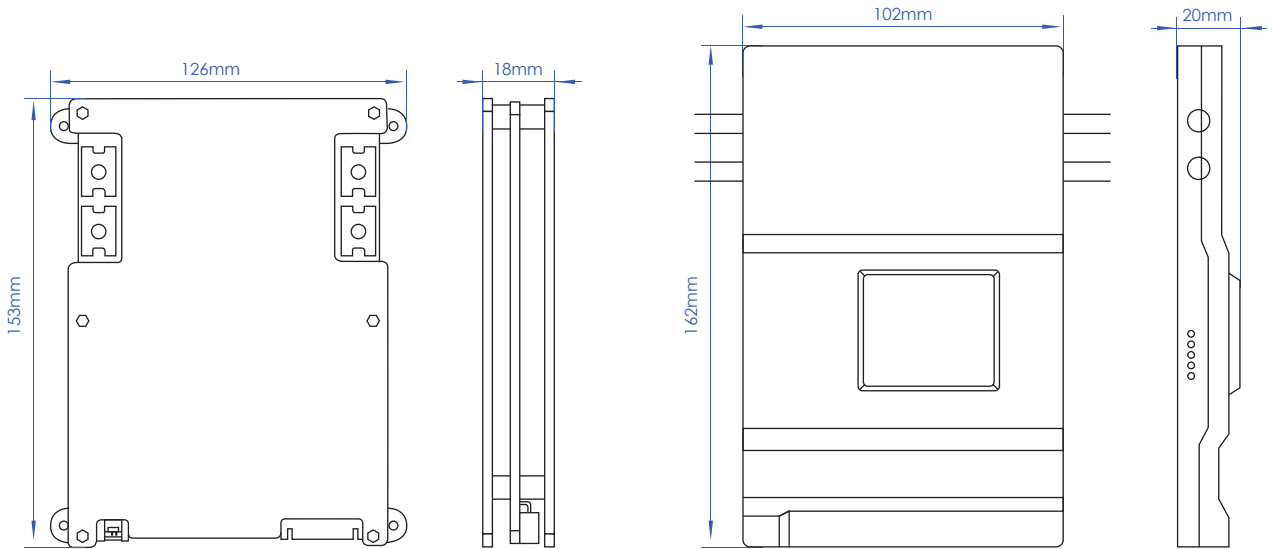
B+ total positive electrode

B- total negative pole

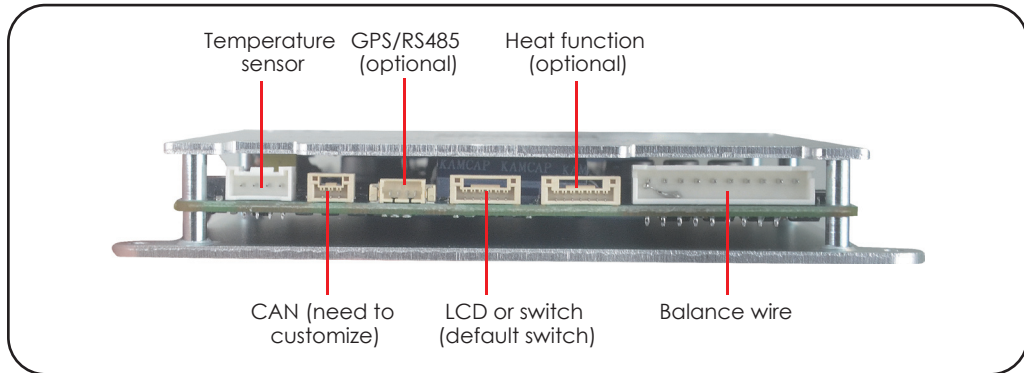
LB1A series Product Specifications

Product photo						
Technical Index	LB1A8S100A	LB1A8S200A	LB1A17S120A	LB1A20S120A	LB1A20S150A	LB1A24S150A
Number of Battery Strings (Li-ion)	3S-8S	3S-8S	7S-17S	7S-20S	7S-20S	7S-24S
Number of Battery Strings (Lifepo4)	4S-8S	4S-8S	8S-17S	8S-20S	8S-20S	8S-24S
Number of Battery Strings (LTO)	6S-8S	6S-8S	12S-17S	12S-20S	12S-20S	12S-24S
Balance Method	Active Balance(Full State On)					
Balance Current	1A	1A	1A	1A	1A	1A
Conductive Resistance in Main Circuit	0.3mΩ	0.47mΩ	0.65mΩ	0.65mΩ	0.65mΩ	0.65mΩ
Continuous Discharge Current	100A	200A	120A	120A	150A	150A
Continuous Charge Current	100A	200A	120A	120A	150A	150A
Maximum Discharge Current (MAX 2 min)	200A	350A	250A	250A	300A	300A
Over Charge Protection Current (Adjustable)	10-100A	10-200A	10-120A	10-120A	10-150A	10-150A
Other interfaces (Default)	RS485	RS485	RS485	RS485	RS485	RS485
Other interfaces (need customized)	CANBUS/HEAT	CANBUS/HEAT	CANBUS/HEAT	CANBUS/HEAT	CANBUS/HEAT	CANBUS/HEAT
Size/mm	153*126*18mm			162*102*20mm		
Wiring Output	Common Port					
Single Cell Voltage Range	1-5V					
Voltage Acquisition Accuracy	±5mV					
Over Charge Protection Voltage	1.2-4.35V Adjustable					
Over Charge Release Voltage	1.2-4.35V Adjustable					
Over Current Detect Delay	2-120S Adjustable					
Over Discharge Protection Voltage	1.2-4.35V Adjustable					
Over Discharge Release Voltage	1.2-4.35V Adjustable					
Quantity of Temperature Detection	4PCS					
Temp Protection	Yes					
Short Circuit protection	Yes					
Coulomb Counter	Yes					
App Function	Support for Android/IOS smartphone					

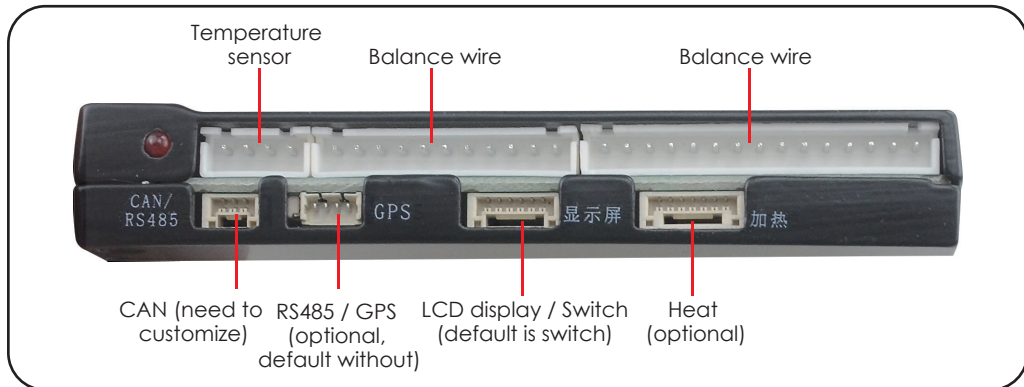
Size (mm)



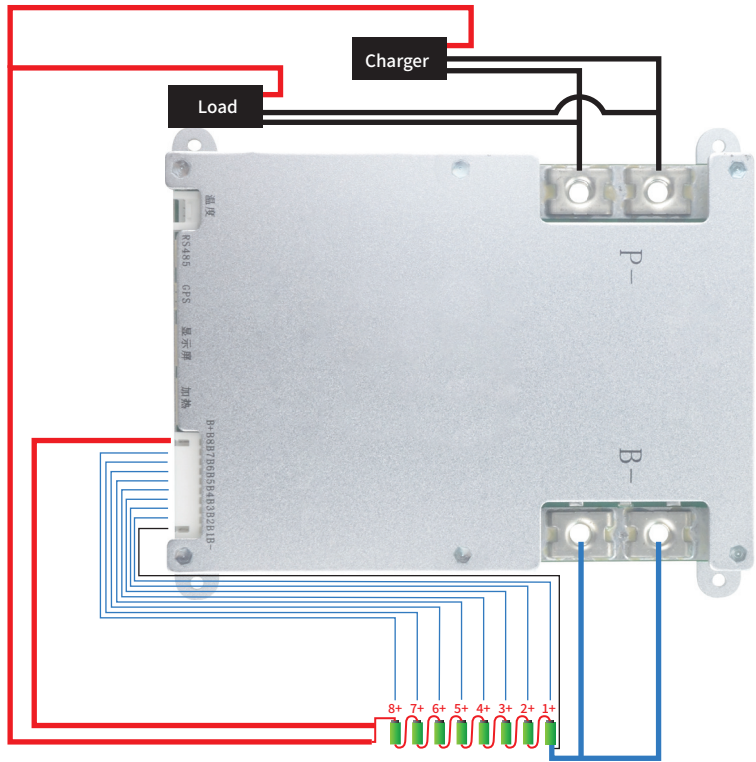
Wiring diagram 1(for 3-8S)



Wiring diagram 2(for 9-24S)



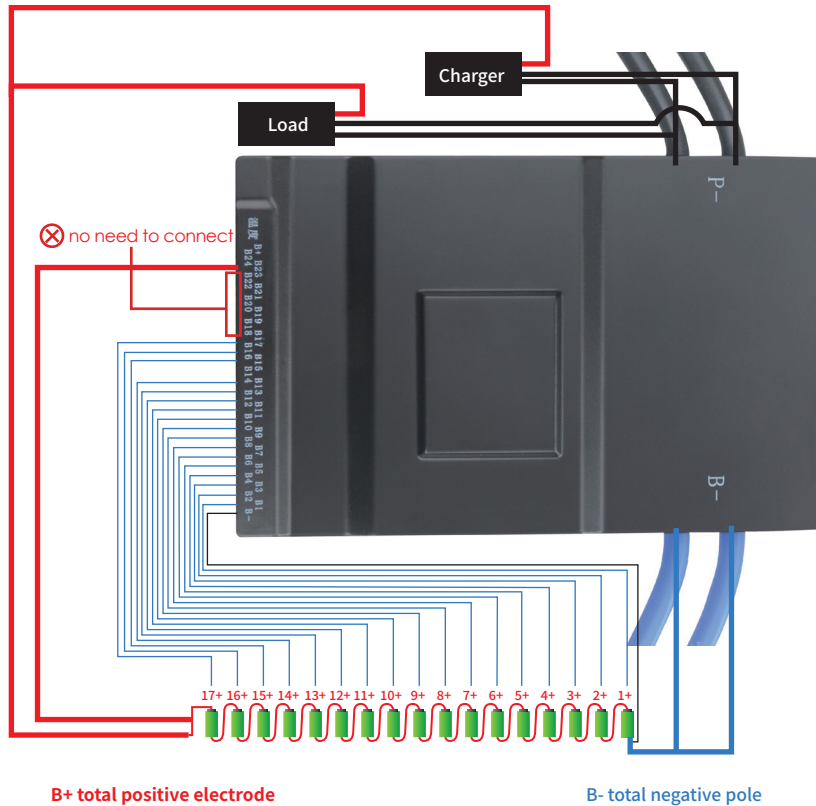
3S-8S wiring diagram



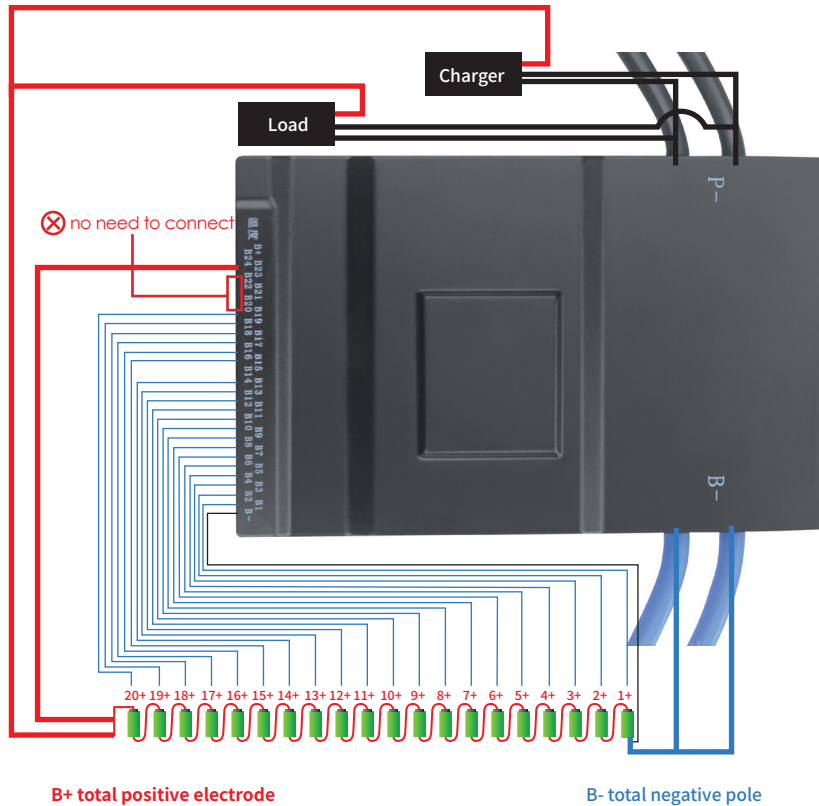
B+ total positive electrode

B- total negative pole

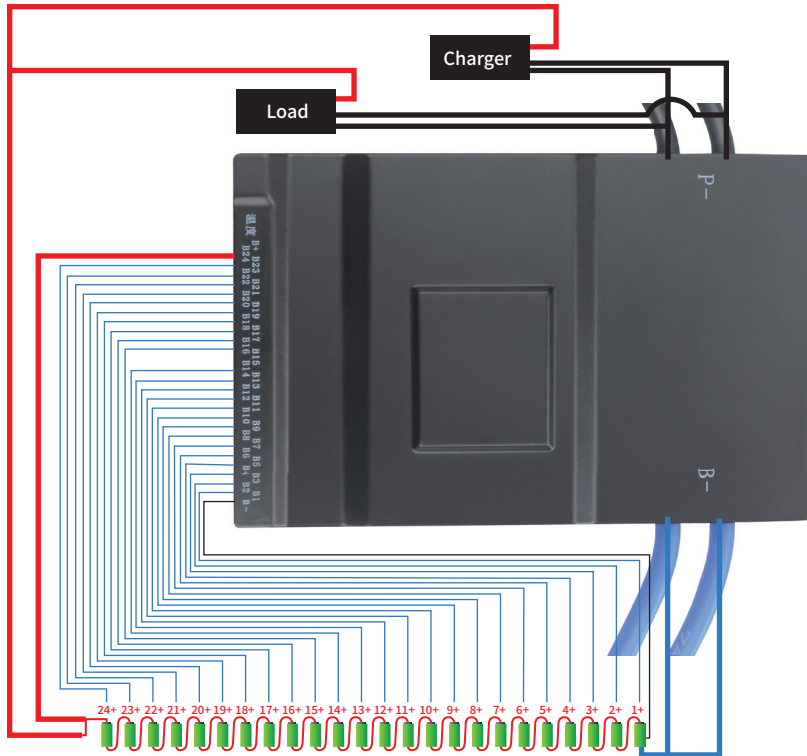
7S-17S wiring diagram



7S-20S wiring diagram



7S-24S wiring diagram



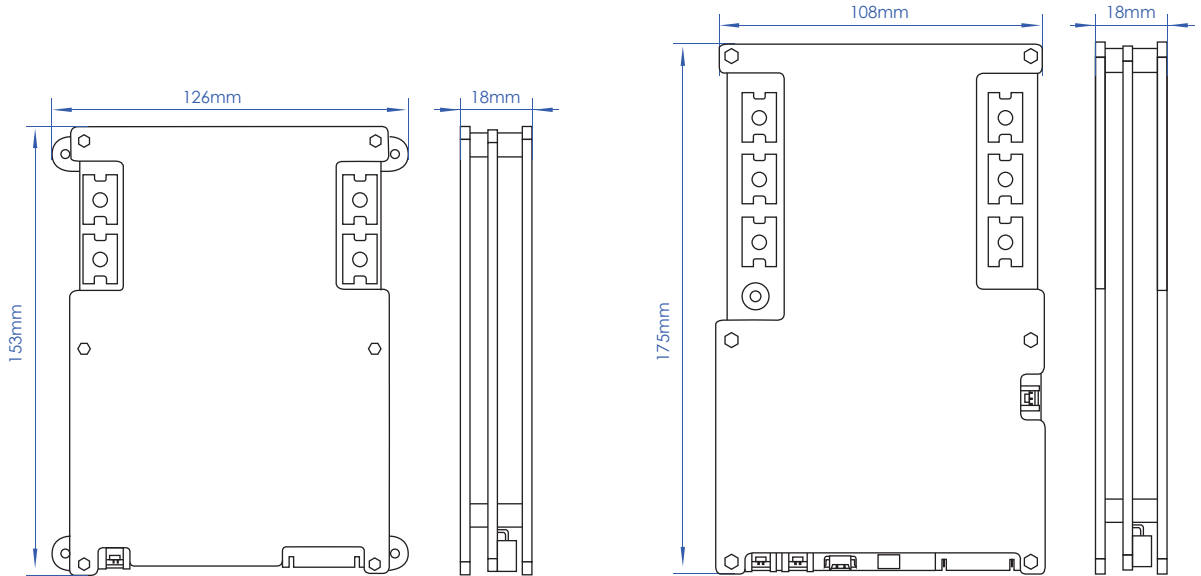
B+ total positive electrode

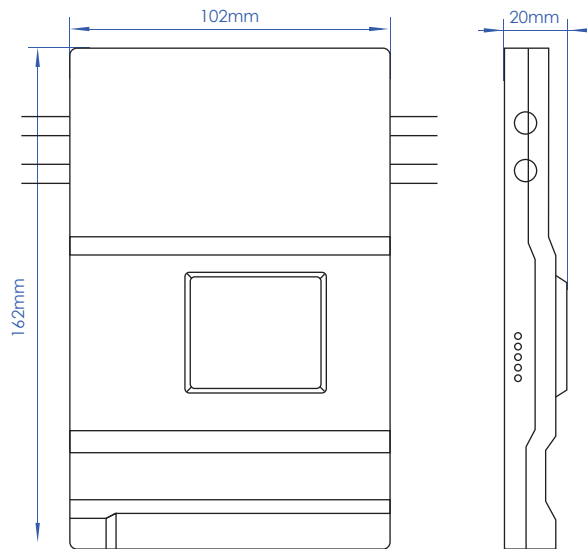
B- total negative pole

LB2A series Product Specifications

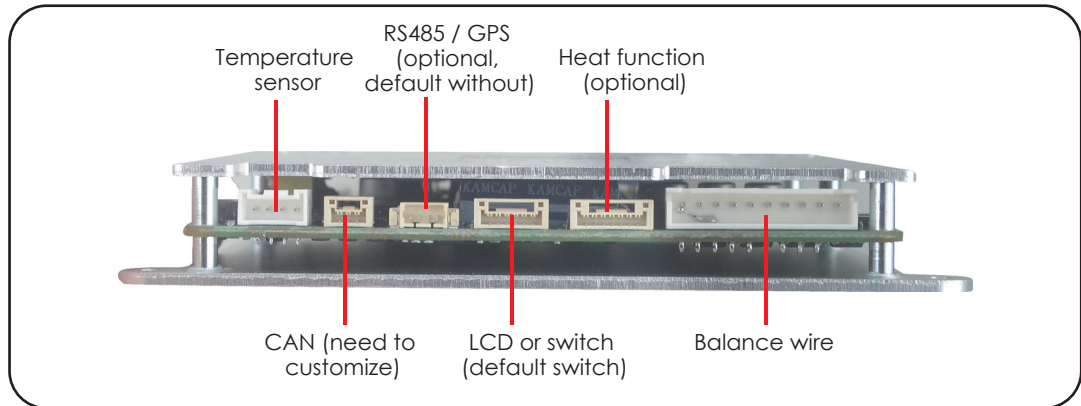
Product photo					
Technical Index	LB2A8S200A	LB2A8S300A	LB2A20S200A	LB2A24S150A	LB2A24S200A
Number of Battery Strings (Li-ion)	3S-8S	3S-8S	7S-20S	7S-24S	7S-24S
Number of Battery Strings (Lifepo4)	4S-8S	4S-8S	8S-20S	8S-24S	8S-24S
Number of Battery Strings (LTO)	6S-8S	6S-8S	12S-20S	12S-24S	12S-24S
Balance Method	Active Balance(Full State On)				
Balance Current	2A	2A	2A	2A	2A
Conductive Resistance in Main Circuit	0.47mΩ	0.3mΩ	0.47mΩ	0.47mΩ	0.47mΩ
Continuous Discharge Current	200A	300A	200A	150A	200A
Continuous Charge Current	200A	300A	200A	150A	200A
Maximum Discharge Current (MAX 2 min)	350A	450A	350A	300A	350A
Over Charge Protection Current (Adjustable)	10-200A	10-300A	10-200A	10-150A	10-200A
Other interfaces (Default)	RS485	RS485	RS485	RS485	RS485
Other interfaces (need customized)	CANBUS/HEAT	CANBUS/HEAT	CANBUS/HEAT	CANBUS/HEAT	CANBUS/HEAT
Size/mm	153*126*18mm	175*108*18mm	162*102*20mm		
Wiring Output	Common Port				
Single Cell Voltage Range	1-5V				
Voltage Acquisition Accuracy	±5mV				
Over Charge Protection Voltage	1.2-4.35V Adjustable				
Over Charge Release Voltage	1.2-4.35V Adjustable				
Over Current Detect Delay	2-120S Adjustable				
Over Discharge Protection Voltage	1.2-4.35V Adjustable				
Over Discharge Release Voltage	1.2-4.35V Adjustable				
Quantity of Temperature Detection	4Pcs				
Temp Protection	Yes				
Short Circuit protection	Yes				
Coulomb Counter	Yes				
App Function	Fit for Android/iOS smartphone				

Size (mm)

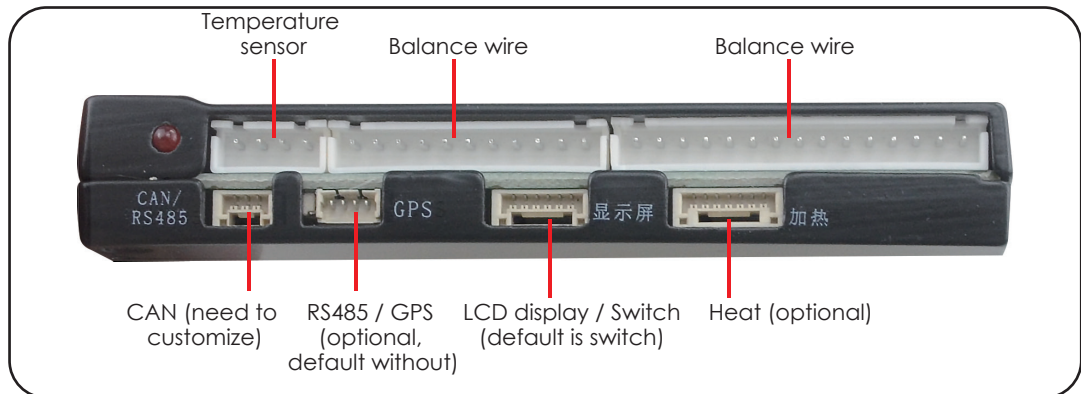




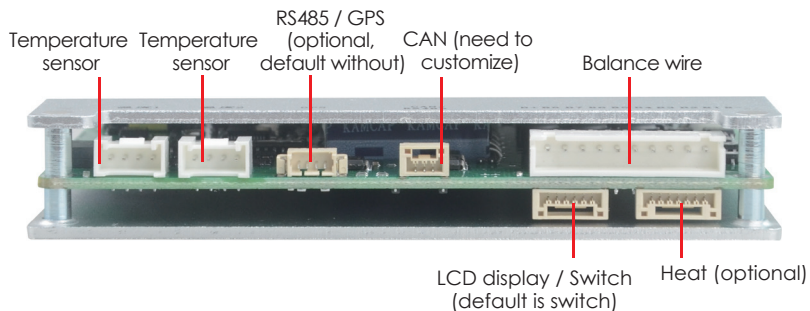
Wiring diagram 1(for 3-8S)



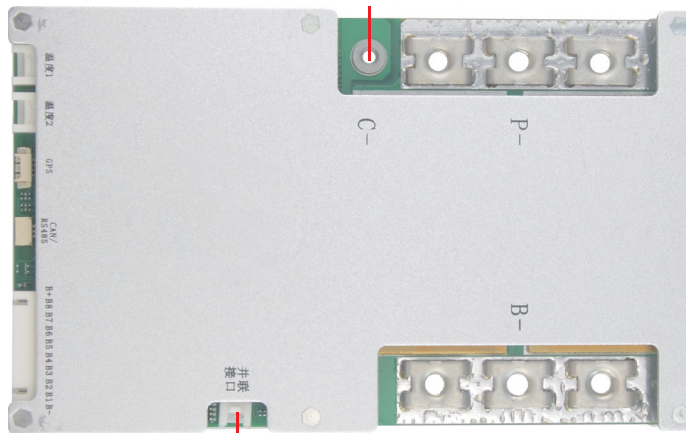
Wiring diagram 2(for 9-24S)



Wiring diagram 1(for 3-8S)

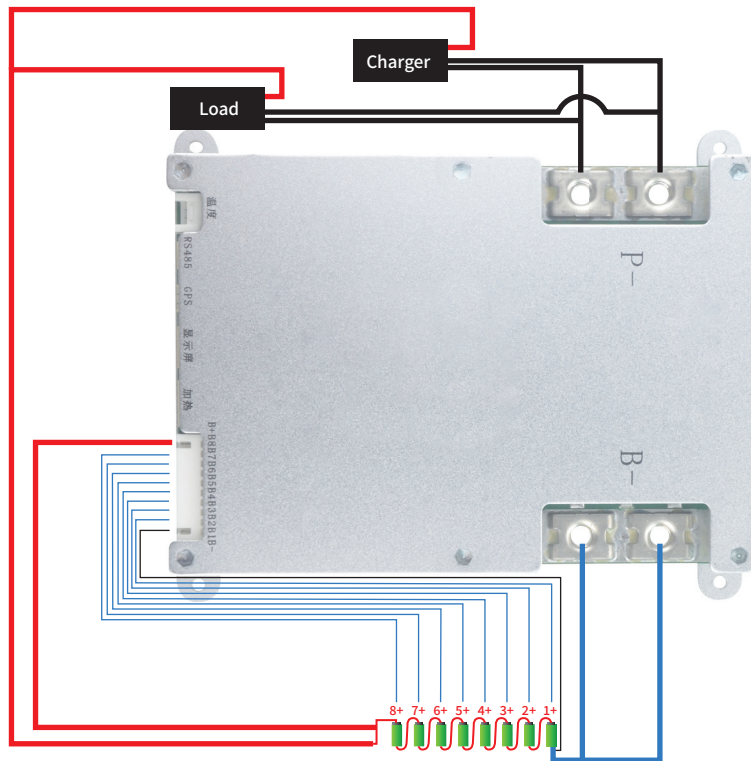


External load or charger negative pole



Parallel connection port (Need to add extra parallel model when making parallel connection.)

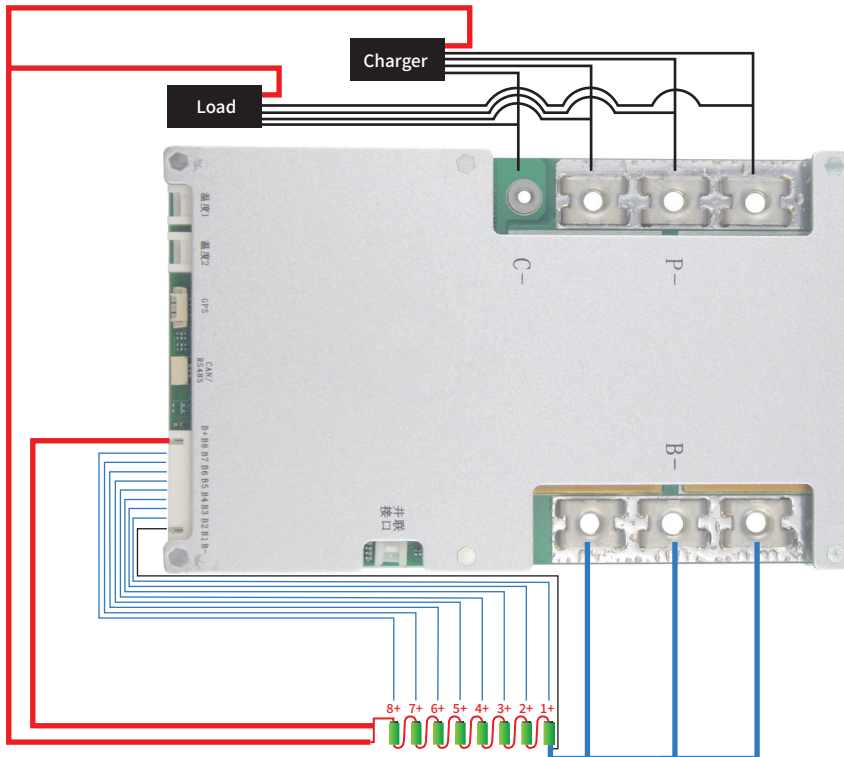
3S-8S wiring diagram



B+ total positive electrode

B- total negative pole

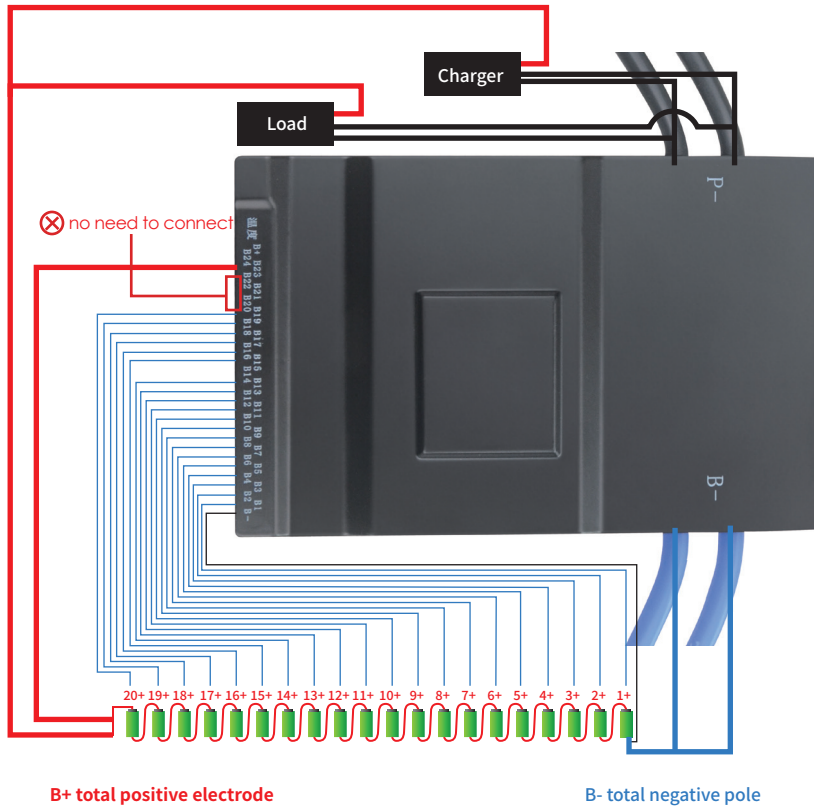
3S-8S wiring diagram



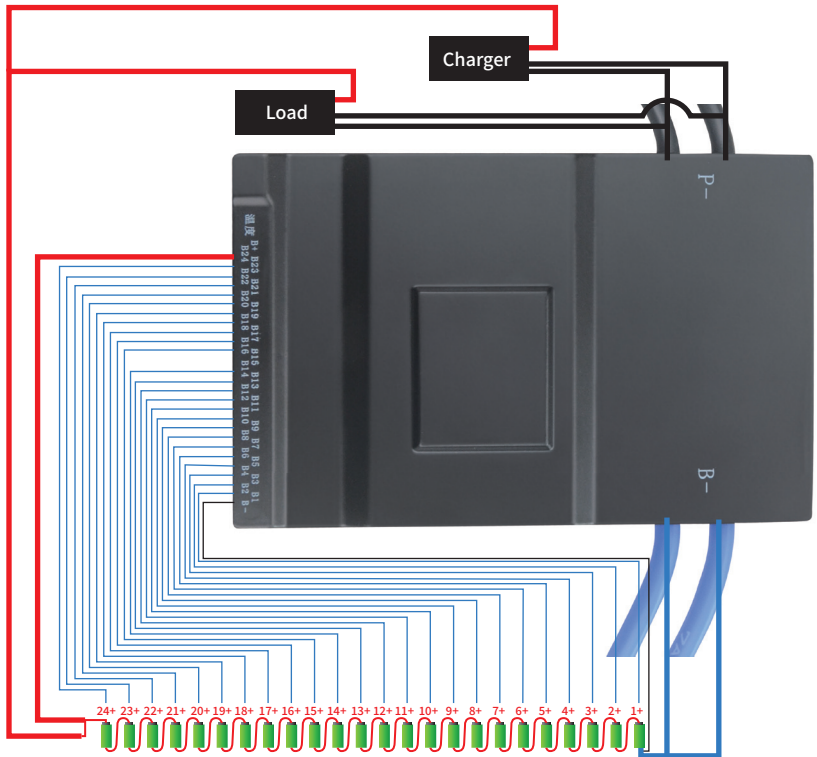
B+ total positive electrode

B- total negative pole

7S-20S wiring diagram








7S-24S wiring diagram



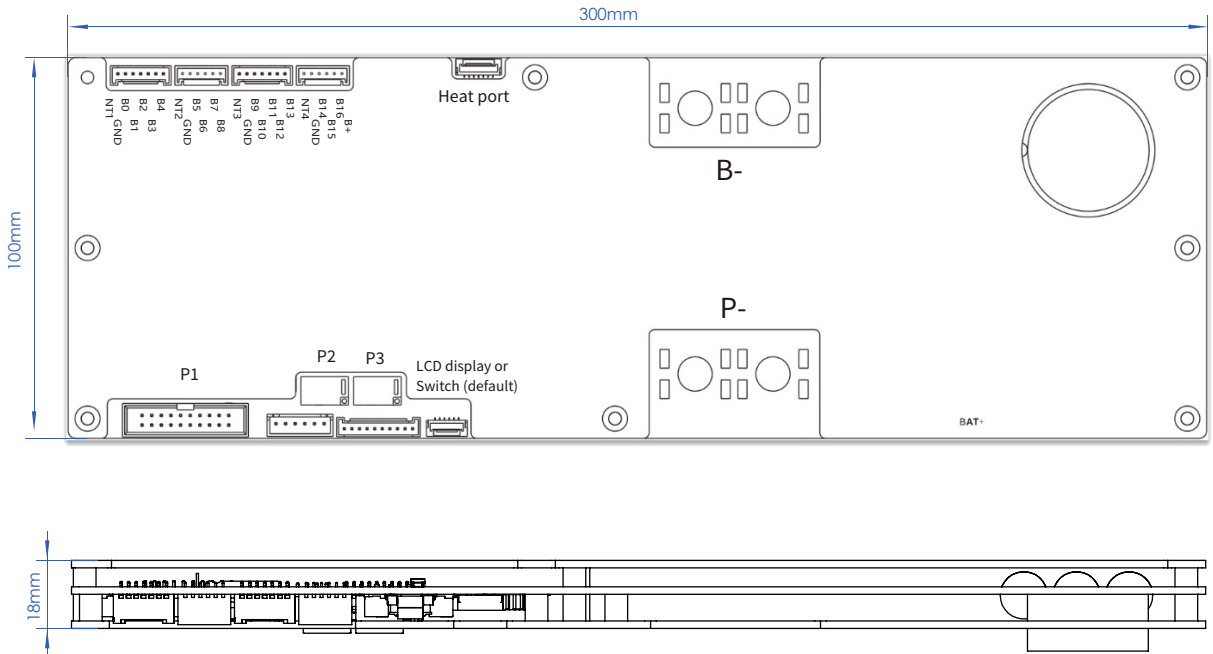
B+ total positive electrode

B- total negative pole

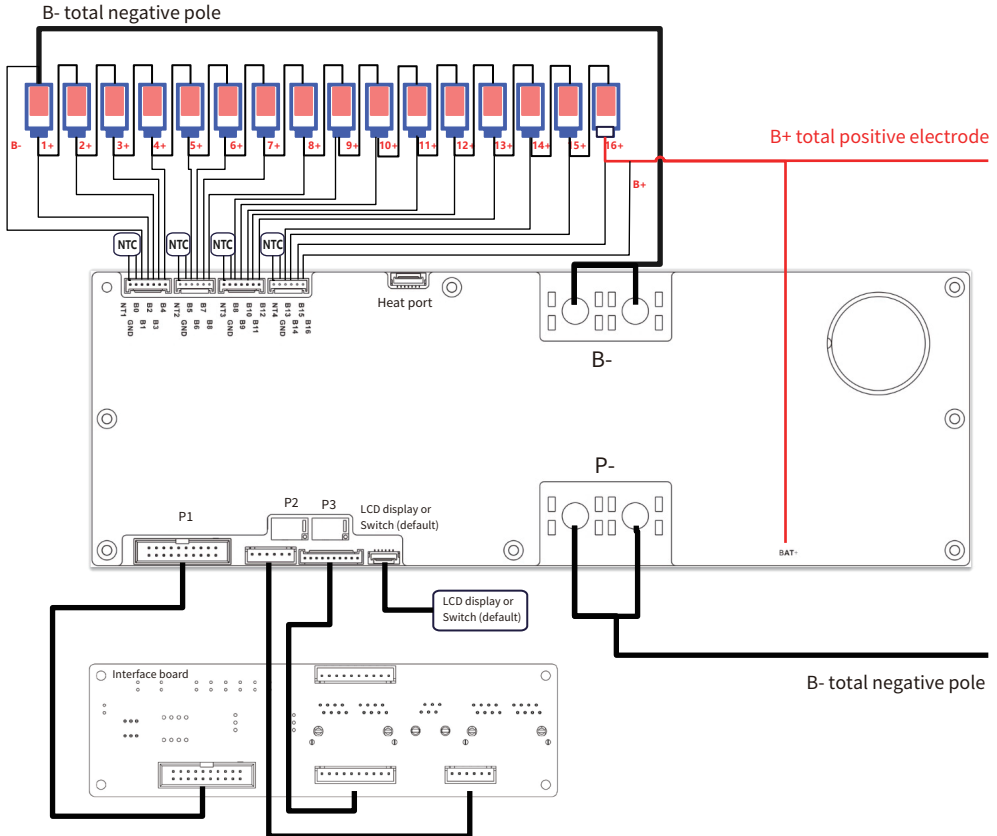
Inverter BMS PB1A2A series Product Specifications

Product photo					
Technical Index	PB1A16S100A	PB1A16S150A	PB1A16S200A	PB2A16S150A	PB2A16S200A
Number of Battery Strings (Li-ion)	7~16S	7~16S	7~16S	7~16S	7~16S
Number of Battery Strings (LifePo4)	8~16S	8~16S	8~16S	8~16S	8~16S
Number of Battery Strings (LTO)	12-16S	12-16S	12-16S	12-16S	12-16S
Balance Method	Active Balance(Full State On)				
Balance Current	1A	1A	1A	2A	2A
Conductive Resistance in Main Circuit	1.00mΩ	0.65mΩ	0.47mΩ	0.65mΩ	0.47mΩ
Continuous Discharge Current	100A	150A	200A	150A	200A
Continuous Charge Current	100A	150A	200A	150A	200A
Maximum Discharge Current (MAX 2 min)	200A	300A	350A	300A	350A
Over Charge Protection Current (Adjustable)	10A-100A(Adjustable)	10A-150A(Adjustable)	10A-200A(Adjustable)	10A-150A(Adjustable)	10A-200A(Adjustable)
Other interfaces (Default)	RS458/CAN/RS232				
Display interfaces	Yes				
Size/mm	300*100*18mm				
Wiring Output	Common Port				
Single Cell Voltage Range	1-5V				
Voltage Acquisition Accuracy	±5mV				
Over Charge Protection Voltage	1.2-4.35V Adjustable				
Over Charge Release Voltage	1.2-4.35V Adjustable				
Over Current Detect Delay	2-120S Adjustable				
Over Discharge Protection Voltage	1.2-4.35V Adjustable				
Over Discharge Release Voltage	1.2-4.35V Adjustable				
Quantity of Temperature Detection	4				
India standard	Support AIS-156 standard				
Temp Protection	Yes				
Short Circuit protection	Yes				
Coulometer	Yes				
Upgrade	Yes				
Operation, alarm, power indication	Yes				
App Function	Fit for Android/IOS/Harmony smartphone				
Parallel charging current limiting	10A				
DIP switch NO.	4				
Dry contact	2 groups				

Size (mm)



7S-16S wiring diagram



Interface definition description

Interface name	Pin	Label	Definition description
B-interface	/	B-	Battery negative, connect to battery negative
P-interface	/	P-	The charge and discharge negative terminal of the BMS is connected to the negative terminal of the charge and discharge
Sampling line interface PHB 2.0 with a buckle	1	B0	Connect to the negative terminal of the first battery
	2	B1+	Connect to the positive terminal of the first battery
	3	B2+	Connect to the positive terminal of the second battery
	Connect the positive terminal of the last battery
B+	1	B+	1 Connect the last positive battery terminal
Temperature interface 2pin	1	T1A	The first temperature sensor A pin
	2	T1B	The first temperature sensor B pin
	3	T2A	The second temperature sensor A pin
	4	T2B	The second temperature sensor B pin
CAN interface 3pin	1	D_N	CANL signal negative (optional function)
	2	D_P	CANH signal negative (optional function)
	3	GND	GND
GPS/RS485 interface 4pin	1	VGPS	Output, voltage is close to B+
	2	TX	UART_TX,3.3V
	3	RX	UART_RX,3.3V
	4	GND	Power supply /GND
LCD display / Switch interface 6Pin	1	VCC	Display power output
	2	A	Display RS485 signal positive
	3	B	Display RS485 signal negative
	4	GND	Negative of power supply
	5	K+	Activate signal positive
	6	K-	Activate signal negative

Heating interface (optional function)	1	HT-	Heating negative electrode
	2	HT-	Heating negative electrode
	3	HT-	Heating negative electrode
	4	HT-	Heating negative electrode
	5	HT-	Heating negative electrode
	6	CD+	Charging input positive
	7	CD-	Charging input negative

Welding Instructions

Welding

(1) Welding balance cable: Start with the thin black wire connecting battery B- (total negative pole), the second wire connects the positive electrode of the first string of batteries, and then connects the positive electrode of each string of batteries in turn; finally, weld the B+ wire on the last string (total positive pole). (Please refer to the wiring diagram in the user manual).

Note: Do not insert the BMS when welding the balance cable. Please weld according to the actual number of battery strings. When welding, always remember to weld from low number to high, for example, weld B0, then B1, B2, B3 in turn. The extra balance cable does not need to be welded. Please insulate them separately.

(2) Detection voltage: Use a multimeter or line sequence detection equipment to measure whether the voltage of each string of pin holes in the cable is within the normal range. If not, please check whether there are misconnections, false soldering, missing soldering, etc. in the wiring.

(3) Welding P- & B- cable: Screw the B- cable (blue one) and P- cable (black one) to the corresponding B- and P- nuts of the BMS; recommended torque 10N-m. And weld the B-cable to the total negative terminal of the battery.

Note: Please insulate the P-cable when welding the B-cable, and then remove it when connecting the output terminal.

(4) Connect the BMS accessories such as temperature sensor, power board, GPS, LCD display, etc., and then insert the balance cable into the BMS & use switch to activate it automatically.

Download and Install APP method

(1) Scan the QR code on the BMS.

(2) Search APP "LVNOON BMS" in the iOS APP store or Google play store.

(4) Contact with customer service of store.

Open the BT(Bluetooth) and smartphone location information and enter the APP, the APP will

automatically search for the Bluetooth serial number, check the series number on the protection board and click the serial number to enter the battery management interface.

Set parameters

When using BMS for the first time, the battery type and capacity need to be set in the APP (the factory default is LFP parameters). The capacity of the battery pack needs to be set according to the actual capacity of the battery pack. The battery needs to be filled to 100% for calibration at the first-time use. Other protection parameters can be set according to your specific needs. The factory default password for modifying parameters on the APP is 123456, and the password for modifying parameters on the PC host is 123456.

Wiring Instructions

Prepare and check before use

Before turning on the BMS, make sure that the balance wires are connected properly again, "P-/C-" (1st Cell Negative) and "B-" (B- Negative out from the BMS) are connected correctly. Check if the BMS is securely fixed to the cells, and make sure it is correct before it can be connected to the BMS. Otherwise, it may cause serious consequences such as abnormal operation or even failure.

Power on protection board

After confirming that the above conditions are correct, the BMS can be activated now.

You can activate the BMS using the switches or LCD switch that come with the BMS.

Another method (without switches or LCD screen) prior to connecting the assembled battery to the system is to connect the positive side of the 9 volts (max) to the negative end of the cells, the B- lead of the BMS. Then connect the negative side of the 9-volt battery to the C-/P- lead of the BMS for one second or until you hear a beep. It is very fast.

For he BMS has no power-on control switch and is designed for charging activation mode (charger voltage is 5V higher than battery voltage), that is, after the battery is assembled, you need to connect the charger to make the BMS work.

APP Operating Instructions

Equipment operation

Note:

1.For Android 12 and above systems, app needs to be allowed to obtain smartphone GPS permission, and it is always allowed.

(This is the setting of Android 12 system. BMS will not always read the user's data.)

2.It is recommended that the customer update the app in time. The app will repair the bug

within a week normally according to the customer's feedback, and it will also be updated according to the design reasons.

Device connection

First turn on the Bluetooth of the smartphone, and then turn on the app, the app requires access to location, as shown in Figure 1. Click the icon on the upper left corner to scan the device. After the scanning is completed, click the name of the device to be connected, such as "LB06A24S100A". During the first connection, the app will prompt you to enter a password. The default password of the device is "1234". After the device is connected, the app will automatically record the password. The next connection does not need to enter a password. After the app is opened, it will automatically connect.

The default BMS Password is "1234". The default BMS Password for internal configuration is "123456". The password input interface is shown in Figure 2.

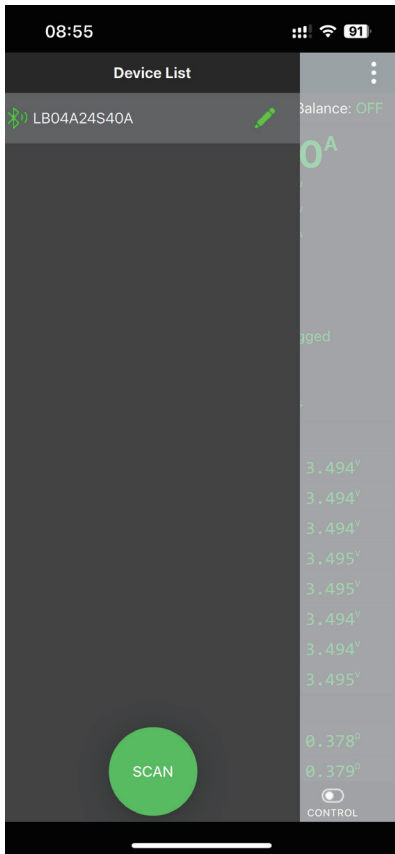


Figure 1 Device scanning

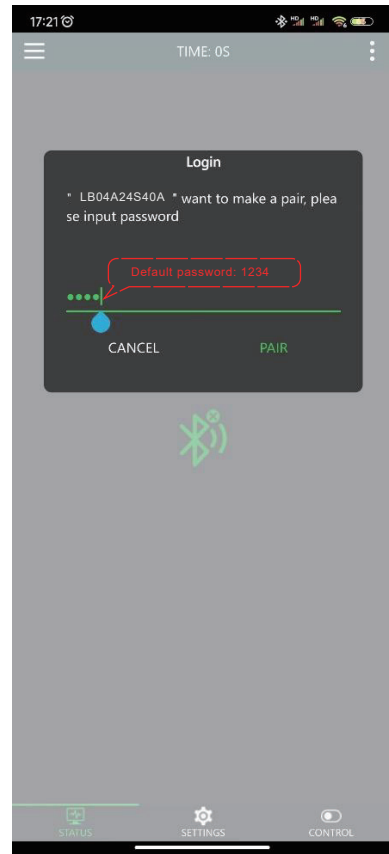


Figure 2 Password input

Modify password and name

You can change the device name and password by clicking the Pen icon on the right of the device list after the device is connected. Modify the device name interface as shown in Figure 3. Note that the device name only supports English or numbers.

Modify the password interface as shown in Figure 4 to change the password of the device, you must first enter the old password of the device, and only when the current password is correct then you can enter the option of entering a new password. After entering the new password twice, click OK to complete the device password change.

Note: please write down the new password on a notebook or somewhere else where is convenient for you to check later once you set it succeed.

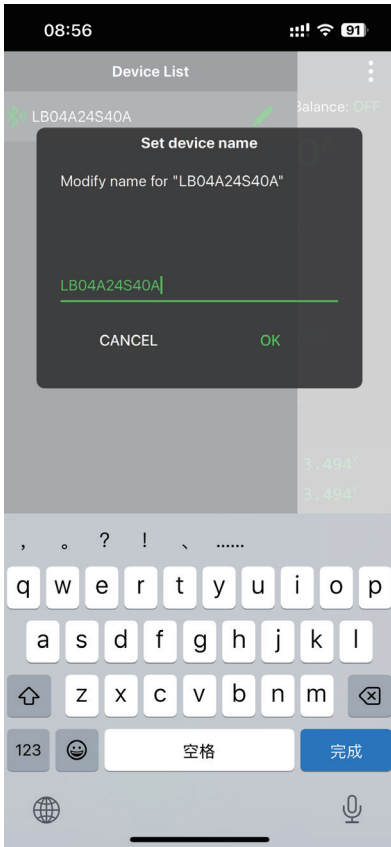


Figure 3 Name Modification

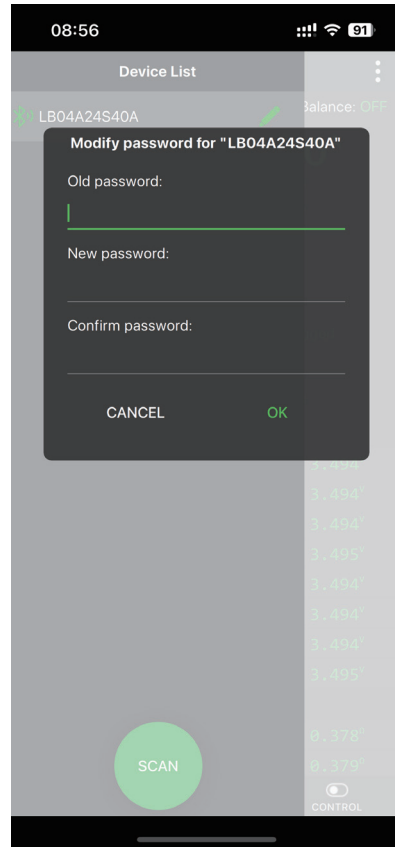


Figure 4 Password Modification

Status view

The real-time status interface is shown in Figure 5

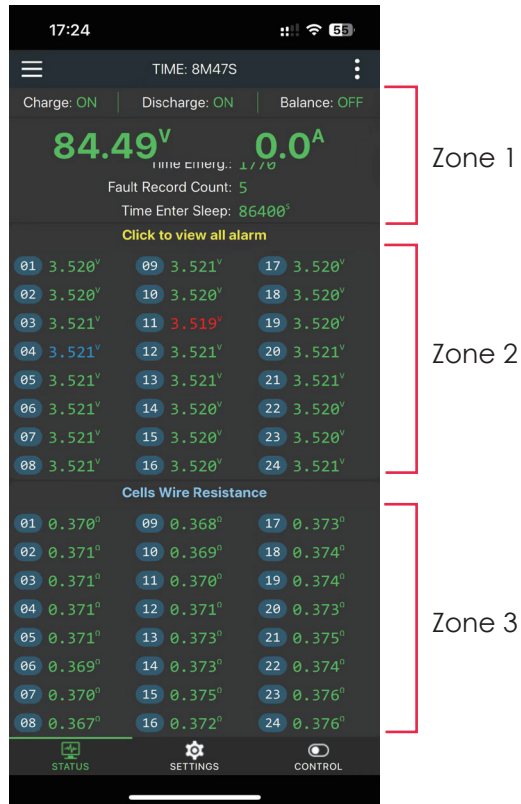


Figure 5 Real-time status display

Zone 1 in the picture is the battery comprehensive information bar.

The parameters are defined as follows:

A)Runtime

Running time represents the total running time from the first start of the BMS till now.

B)CHARGE

Indicates the current switch state of the BMS charging MOS. When "On" is displayed, it indicates that the current BMS charging MOS is on and the battery is allowed to charge. When "Off" is displayed, it indicates that the current BMS charging MOS is off and the battery is not allowed to charge.

C)DISCHARGE

Indicates the current switch state of the BMS discharge MOS. When "On" is displayed, it indicates that the current BMS discharge MOS is on and the battery is allowed to discharge. When "Off" is displayed, it indicates that the current BMS discharge MOS is off and the battery is not allowed to discharge.

D)BLANCE

Equilibrium represents the switching state of the current BMS active balancing switch.

When "On" is displayed, the BMS is automatically balancing when the balance trigger condition

is reached; When "Off" is displayed, it means balancing is shutdown, and the BMS will not balance the battery.

E)Voltage

The voltage region shows the total voltage of the current battery in real time.

The total voltage is the sum of all the individual battery cells..

F)Current

The current area shows the total current of the current battery in real time. The current is positive when the battery is charging and negative when the battery is discharging.

G)Power

Battery power represents the total power output or input of the current battery, which is the product of the absolute value of the current battery voltage and current.

H)Battery Capacity

Represents the actual battery capacity calculated by the current BMS with high precision SOC in Ah. (This value needs the battery to do a full discharge and charge cycle before it can be updated).

I)Remaining capacity

Remaining capacity refers to the remaining capacity of the current battery, unit: Ah.

J) Cycle capacity

Cycle capacity cycle capacity refers to the cumulative discharge capacity of the battery, in Ah units.

K) Number of cycles

The number of cycles indicates the number of charging saturation times of the current battery, unit: times

L) Monomer average

Indicates the average voltage of the current battery, unit: V.

M) Maximum differential pressure

The maximum voltage difference indicates the difference between the highest cell voltage and the lowest cell voltage of the current whole battery, unit: V.

N) Active current

When the BMS turns on the active balancing function and reaches the active balancing condition, the active balancing current display area displays the active balancing current in real time, unit: A.

When active balancing is in progress, the single voltage display area of the real-time state, with blue representing the highest voltage cell and red representing the lowest voltage cell. Pool balanced negative current indicates that the battery is discharging, blue flashes, positive current of balanced current indicates that the battery is charging, and red flashes. The BMS uses active balancing technology. The principle of balancing is to take power from high voltage cells, store them in the BMS, and then release them to low voltage cells.

O)MOS

Real time display of current BMS power MOS temperature, unit: $^{\circ}\text{C}$

P)Battery temperature 1

"NA" is displayed when the temperature sensor 1 is not installed, and the temperature of the temperature sensor 1 is displayed in real time when the temperature sensor is installed in units of $^{\circ}\text{C}$.

Q)Battery temperature 2

"NA" is displayed when the temperature sensor 2 is not installed, and the temperature of temperature sensor 2 is displayed in real time when the temperature sensor is installed in units of $^{\circ}\text{C}$. Zone 2 in the figure is a single voltage region. Real-time display of voltage data for each individual cell in the battery pack, where red indicates the lowest voltage monomer for each individual cell in the battery pack, where red indicates the lowest voltage monomer and blue indicates the

highest voltage monomer.

Zone 3 in the figure 5 is the sense/balancing lines resistance area. The sense/balancing lines resistance is the sense/balancing lines resistance obtained by the BMS self-test. This value is only a preliminary calculation to prevent misconnection or poor contact. When the sense/balancing lines resistance exceeds a certain value, it appears yellow, and active balancing cannot be turned on at this time.

Parameter setting

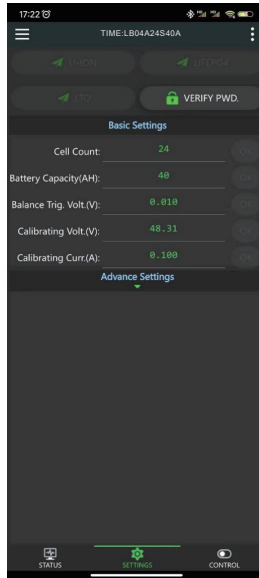


Figure 6 Setting page display

If you need to modify the working parameters of the protection panel, you must first click the authorization settings button and enter the parameter settings password. Set permissions to validate parameters. The parameter setting password factory defaults is "123456". The parameters of the BMS can only be modified after the parameters are entered correctly and the password is set. The parameter setting password and the device Bluetooth connection password are independent of each other.

a)One-click Lifepo4

One-click Lifepo4 button can change all working parameters of the BMS to Lifepo4 battery parameters. The default values of Lifepo4 parameters are listed in the appendix. Which can be adjusted for your specific battery cell specifications for proper operation.

b)One-click lithium iron

One-click lithium iron can modify all the working parameters of the BMS to triple battery parameters. The default values of triple lithium parameters are listed in the appendix. Which can be adjusted for your specific battery cell specifications for proper operation.

c)One-click Lithium Titanate

One-click Lithium Titanate, all working parameters of the BMS can be modified to the Lithium Titanate battery parameters. The default values of the Lithium Titanate parameters are listed in the appendix. Which can be adjusted for your specific battery cell specifications for proper operation.

d)Number of monomers

Number of units Indicates the number of cells in the current battery. Please set this value accurately before use, otherwise the BMS will not work properly.

e)Battery capacity

Battery capacity: This value is the designed capacity of the battery.

f) Trigger Balanced Voltage Differential

When the active balancing switch is turned on, and when the maximum voltage difference of the battery pack exceeds this value and the current monomer voltage exceeds the balancing start voltage, active balancing starts until the voltage difference is lower than this value or the monomer voltage is lower than the active balancing start voltage. For example, set the active balancing trigger pressure difference to 0.010V, start active balancing when the battery pack pressure difference is greater than 0.010V, and end active balancing when it is lower than 0.01V. (It is recommended to set the balance trigger pressure difference of 0.005V for batteries above 50Ah and 0.01V for batteries below 50Ah).

f)Voltage calibration

The voltage calibration function can be used to calibrate the accuracy of the BMS voltage collection. When errors are found between the total voltage collected by the BMS and the total voltage of the battery, the BMS can be calibrated using the voltage calibration function. The calibration method is to get the actual voltage from the battery terminals with charge /

discharge OFF status, then enter the "actual" total battery voltage and click on the settings button after the voltage calibration to complete the calibration. Remember to set charge/discharge back on.

g)Current calibration

The current calibration function can be used to calibrate the accuracy of current collection from the BMS. When errors are found between the total current collected by the BMS and the actual current of the battery, the current calibration function can be used to calibrate the BMS. The calibration method is to fill in the current measured total battery current and click on the settings button after the current calibration to complete the calibration.

h)Single Under-voltage Protection, Single Under-voltage Recovery"

"Single under-voltage protection" refers to the cut-off voltage of the cells. When any single cell within the battery pack is lower than this value, a "single under-voltage alarm" is generated, and the BMS turns off the discharging MOS. At this time, the battery cannot be discharged and can only be charged. When the alarm is generated, only after all the individual voltage values exceed the value of "single voltage recovery", the BMS removes the "single under-voltage alarm" and turns on the discharge MOS.

i)"Monomer overcharge voltage", "monomer overcharge recovery"

"Monomer overcharge voltage" refers to the saturation voltage of the battery cell. As long as the voltage of any monomer in the battery pack exceeds this value, a 'monomer overcharge alarm'

will be generated. At the same time, the protection board will turn off the charging MOS, and the battery can't be charged but can only be discharged. When the alarm is generated, only when the voltage value of all monomers is lower than the value of "monomer overcharge recovery", the protection board will release the "monomer overcharge alarm" and turn on the charging MOS at the same time.

j)Auto Shutdown Voltage

The automatic shut-off voltage indicates the lowest voltage at which the BMS operates. When the lowest cell voltage in the battery pack reaches this value, the BMS shuts down. This value must be lower than "Single under-voltage protection".

k)"Maximum Charging Current ", " charging Over-current Delay", " Charging Over-current Release "

When charging the battery pack, the current exceeds the "maximum charging current" and the duration exceeds the "charging Over-current delay", the BMS generates the "charging Over-current alarm" and turns off the charging MOS. After the alarm is generated, after the "charging Over-current relief" time, the BMS relieves the charging over-current alarm and turns on the charging MOS again.

For example, set the "maximum charging current" to 10A, "charging Over-current delay" to 10 seconds, and "charging over-current relief" to 50 seconds. When the charging current exceeds 10A continuously for 10 seconds during the charging process, the BMS will generate a 'charging Over-current alarm', turn off the charging MOS at the same time, remove the 'charging Over-

current alarm' 50 seconds after the alarm is generated, and turn on the charging MOS again.

l)"Maximum Discharge Current"," Discharge Over-current Delay"," Discharge Over-current Release"

When the battery pack is discharged, and the current exceeds the "maximum discharge current" and the duration exceeds the "discharge Over-current delay", the BMS generates a "discharge Over-current alarm" and turns off the discharging MOS. After the alarm is generated, after the time of "discharge Over-current relief", the BMS relieves the "discharge Over-current alarm" and turns on the discharge MOS again.

For examples, setting maximum discharge current to 100A,'discharge Over-current delay to 10 seconds, and discharge over-current relief' to 50 seconds. When the discharge current exceeds 100A continuously for 10 seconds during the discharge process, the BMS will produce a 'discharge over-current alarm', turn off the discharge MOS at the same time, remove the 'discharge over-current alarm' 50 seconds after the alarm is generated, and turn on the discharge MOS again.

m)Short circuit protection release

When the short-circuit protection occurs, the short-circuit protection is removed after the time set by 'Release of Short-Circuit Protection'.

n)Balancing Starting Voltage

The balancing starting voltage is used to control the voltage stage of balancing. Balancing will be triggered when the cell voltage exceeds this value and the maximum voltage difference of the battery pack exceeds the balancing trigger voltage difference.

o)Maximum balancing current

The balancing current represents the continuous current of high-voltage battery discharge and low-voltage battery charging during the process of energy transfer. The maximum balancing current refers to the maximum current in the process of energy transfer, and the maximum balancing current should not exceed 0.1 times of the battery current value. For example, 20Ah battery shall not exceed $20 \times 0.1 = 2A$.

p)"Charging over-temperature protection" and "charging over-temperature recovery"

During charging, when the battery temperature exceeds the value of "Charge Over Temperature Protection", the BMS generates a warning of "Charge Over Temperature Protection", and the BMS turns off the charging MOS. After the alarm is generated, and the temperature falls below "Charge Over Temperature Recovery", the BMS removes the warning of "Charge Over Temperature Protection" and turns on the charging MOS again.

q)"Charging low temperature protection" and "charging low temperature recovery"

During the charging process, when the battery temperature is below the value of "Charging Low Temperature Protection", the BMS generates a warning of "Charging Low Temperature Protection", and the BMS turns off the charging MOS. After the alarm is generated, and the temperature is higher than "Charging Low Temperature Recovery", the BMS removes the "Charging Low Temperature Protection" warning and restarts the charging MOS.

r)"MOS over-temperature protection" and "MOS over-temperature recovery"

r) "MOS over-temperature protection" and "MOS over-temperature recovery"

When the MOS temperature exceeds the value of "MOS over-temperature protection", the BMS generates a "MOS over-temperature alarm" and turns off the charging and discharging MOS at the same time, so the battery cannot be charged or discharged. After the alarm is generated, and the MOS temperature reaches lower than the value of "MOS Over Temperature Recovery", the BMS will release the "MOS Over Temperature Alarm" and turn on the charging and discharging MOS again (the MOS Over Temperature Protection Value is 75 degrees centigrade and the MOS Over Temperature Recovery Value is 65 degrees centigrade, (these are the factory default values and cannot be modified)).

Note: Any parameter modification, please refer to the instruction manual, inappropriate parameters may make the BMS not work properly, or even damage the BMS. After any parameter modification, you need to click on the Settings button after the parameter to complete the parameter issue. When the BMS successfully receives the parameter, it will make a "drop" sound.

Control page

The BMS control page is shown in Figure 7. The BMS control can switch the charging, discharging, and balancing functions of the BMS and restore the factory settings.

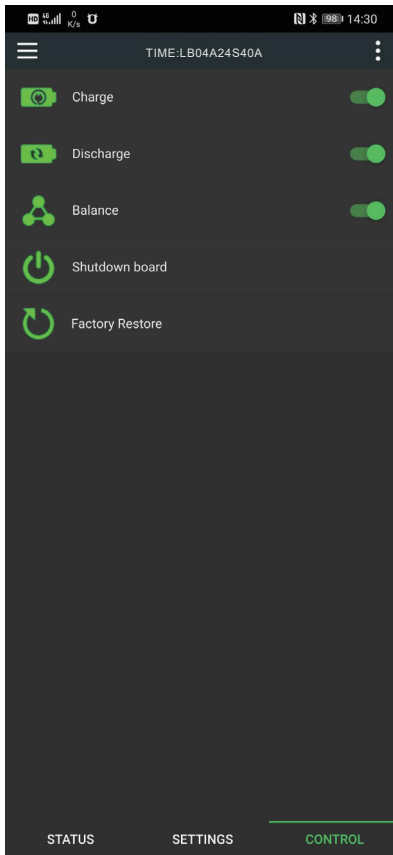


Figure 7 BMS control page

1. Safety protection measures and precautions

Please read the operation manual carefully before use and connecting the wires according to the wiring diagram of the corresponding string number, from the negative pole to the positive pole. After the balancing wire is connected, use a multi-meter again to confirm that it is correct before connecting the BMS.

The default password of the BMS is "1234". After the smartphone app is connected to the BMS, please modify the connection password in time to prevent others from connecting.

It is not allowed to refit the power line of the BMS without permission. Refitting the power line without permission will cause uneven Over-current of the BMS and damage the BMS.

2. Transportation and storage

2.1. Transportation

The packed product is not directly affected by rain or snow and is subject to severe bumps. It can be transported by normal means of transport. Corrosives such as acids and bases are not allowed to be kept together during transportation.

2.2. Store

The packed products should be stored in a permanent warehouse with a temperature ranging from 0 to 35 and a relative humidity not exceeding 80%. The warehouse should be free from acid and alkali, corrosive gases, strong mechanical vibration and impact, and strong magnetic field.

Appendix1 Default Parameters for Lithium-Ion, Lithium Iron Phosphate, Lithium Titanate

NUM	PARA	LI-ION/NCM	LIFEPO4/LFP	LTO	UNIT
1	Single under-voltage protection	2.9	2.7	1.8	V
2	Single under-voltage protection recovery	3.2	2.9	2	V
3	Monomer Overcharge Voltage	4.2	3.6	2.7	V
4	Monomer Overcharge Protection Recovery	4.1	3.5	2.4	V
5	Trigger Balanced Pressure Differential	0.01	0.01	0.01	V
6	Auto Shutdown Voltage	2.8	2.6	1.7	V
7	Charging Over-current Protection Delay	30	30	30	Second
8	Charging Over-current Protection Release Time	60	60	60	Second
9	Discharge Over-current Protection Delay	30	30	30	Second
10	Discharge Over-current Protection Release Time	60	60	60	Second
11	Release time of short circuit protection	60	60	60	Second
12	Charging Over-Temperature Protection Temperature	60	60	60	°C
13	Charging Over-Temperature Recovery Temperature	55	55	55	°C
14	Discharge Over-Temperature Protection	60	60	60	°C
15	Discharge Over-Temperature Recovery Temperature	55	55	55	°C
16	Charging Low Temperature Protection Temperature	-20	0	-20	°C
17	Charging Low Temperature Recovery	-10	5	-10	°C
18	MOS Over-Temperature protection	75	75	75	°C
19	MOS Over Temperature Protection Recovery	70	70	70	°C

Warranty

All BMS produced by our company has a one-year warranty, except for damage caused by human factors.

Special instructions

- (1) Cables from different manufacturers are not universal, please make sure to use LVNOON electronics company balance cables.
- (2) When testing, installing, contacting, and using the BMS, anti-static measures must be taken.
- (3) Do not let the heat dissipation surface of the BMS directly contact the battery cell, Otherwise the heat will be transmitted to the battery cell and affect the safety of the battery:
- (4) Do not disassemble or change the components of the BMS by yourself.
- (5) The enclosure of BMS will still conduct electricity's avoid contact with the battery cell and nickel strip during assembly operations due to the need for electrostatic protection design. The enclosure and the motherboard share the same ground, and it is normal to appear voltage during measurement.
- (6) All our products have undergone strict ex-factory inspection and testing to provide customers with the best quality products. Please make sure to use the BMS according to the

parameter instructions, and avoid using it in high temperature, ultra-low temperature environments (normal applicable temperature $-30^{\circ}\text{C} \sim 70^{\circ}\text{C}$) to prevent the failure of BMS.

FAQS

Do not turn on

1. Ensure that the last "B +" line of the cable has been connected to the positive pole of the battery.
2. Start up after charging and ensure that the charger voltage is greater than 4V of the battery pack voltage
3. Check whether the charger has voltage output

Inaccurate voltage

1. Measure the actual total voltage of the battery pack with a multimeter and fill the actual total voltage in the "voltage calibration" on the parameter setting page.

Inaccurate current

1. B - and P - of the protection board are two 7AWG wires, both of which need to be connected in parallel, otherwise it will lead to current error.

2. Measure the actual current of the battery pack with a clamp meter and fill the actual current into the "current calibration" on the parameter setting page; the larger the actual current, the higher the calibration accuracy.

Inaccurate capacity

1. An initial capacity estimated according to the single voltage when the protection board is powered on for the first time, which is inaccurate
2. After the protection board is discharged to the cut-off voltage and then fully charged, the capacity is calibrated, and the charging process cannot be interrupted.

The designed string number is inconsistent with the actual string number

1. Check whether the "unit quantity" in the parameter setting is set correctly.
2. If there is no voltage in two or more strings in the middle, check whether the collection cable falls off or weld well.



FR

Cet appareil
et ses accessoires
se recycle

À DÉPOSER
EN MAGASIN



OU

À DÉPOSER
EN DÉCHÈTERIE



Points de collecte sur www.quefairedemesdechets.fr
Privilégiez la réparation ou le don de votre appareil !



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ÉLÉMENTS D' EMBALLAGE
À SÉPARER ET À DÉPOSER
DANS LE BAC DE TRI



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