

Shenzhen Zhian New Energy Technology Co., Ltd.

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ZAB1830-01 Smart Battery Specifications	ZAB1830-01	A3	2022-10-08	15

18S30Ah Smart Battery Specifications

型号 (Model)

ZAB1830-01

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制作 (PREPARED)	审核 (CHECKED)	批准 (APPROVED)
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Revision Log

Version	Date	Author	Change Details
A1	2022-5-27	Shihang Lian	Released
A2	2022-09-20	Sunny Li	Fast charging current changed from 3C to 4C, added OTG upgrade support, and enhanced battery feature detection
A3	2022-10-08	Jason Yang	Added packaging diagram

Customer Confirmation Form

Project	Signature & Stamp Confirmation	Date
Function Confirmation		
Structural Dimensions Confirmation		

*This specification serves as a key technical reference. Please review and verify all data before signing and stamping for confirmation. Production will proceed based on this document.

1. Overview

ZAB1830-01 Smart Battery features 18 series cells. Maximum charging voltage is 78.3V. Charge and discharge use the same port, with a dedicated connector. It supports continuous discharge current up to 240A. Built-in high-precision voltage, current, and temperature monitoring. Utilizes a proprietary algorithm to estimate the capacity and charge of each cell in series. While in use, the battery learns cell parameters and activates balancing according to status, ensuring optimal operation and storage, and extending battery life. Key features of this smart battery include:

- 1) Safe, reliable, and stable operation
- 2) High-precision measurement of individual cell voltage and overall current
- 3) Low operating power consumption helps the battery conserve energy efficiently.
- 4) Minimal differences in static power usage among individual cells.
- 5) Features undervoltage sleep mode, which further reduces power consumption when activated.
- 6) Uses a proprietary algorithm to accurately determine remaining battery charge.
- 7) Equipped with a button that lets you check battery information at a glance.
- 8) Includes status indicator lights to show battery level and alert to any faults.
- 9) Cell balancing based on individual cell's remaining capacity
- 10) Comes with a CAN communication port for external connections and supports OTG upgrades
- 11) Maximum continuous discharge current: 240A
- 12) A dedicated charger is required. After charging or use, disconnect the battery from the device or charger, otherwise it may lead to over-discharge.

2. Intelligent Battery Pack Specifications

No.	Test Item	Parameter
1	Cell Assembly Specifications	(3.8V30Ah) 18S1P T12105212-30Ah
2	Nominal Voltage	68.4V
3	Nominal Capacity	30000mAh @0.5C Discharge (Typical)
4	Minimum Capacity	29500mAh
5	Energy	2018Wh
6	Battery Weight	Approx:13.5KG
7	Battery Dimensions	With case: 175*275*309mm
8	Battery Shipping Voltage	64.8V~68.4V (Capacity 50%)
9	Charging Voltage	DC 78.3V
10	Charging Current	Standard charging: 0.5C, about 2.5 hours Rapid charging: 4C, around 15 minutes
11	Standard Charging Method	0.5C constant current charging up to 78.3V, then switch to constant voltage (78.3V) until the charging current drops to $\leq 0.05C$.
12	Quick Charge	Slow charge: 78.3V, cut-off at 0.05C. Fast charge: 78.3V, cut-off at 0.4C.
13	Maximum Charging Current	120A
14	Maximum Discharge Current	240A
17	Operating Temperature	Charging temperature: 5–65°C (battery temperature) / Discharge temperature: 0–60°C (from 0°C to -5°C, battery discharge capacity drops by 10%)
18	Storage Temperature	-10°C ~ +30°C

19	Protection Rating	IP54
20	Warranty Period	Warranty is valid for one year or up to 650 cycles, whichever comes first.
21	Cycle Life	<p>≥650 cycles 80%</p> <p>Test Conditions: Ambient temperature 25±5°C; 120A (4C) charge up to 78.3V, 0.5CmA cut-off; Under working conditions, starting current 200A (full load) to 100A (no load), discharge down to 61.2V cut-off;</p> <p>Discharge capacity not less than 80% of initial capacity.</p>

3. BMS Operating Status & Protection Board Parameters

3.1 Operating Status Description

Operating Mode: This is the state when the battery is in use. The LED displays normally, the buttons respond, and communication is active.

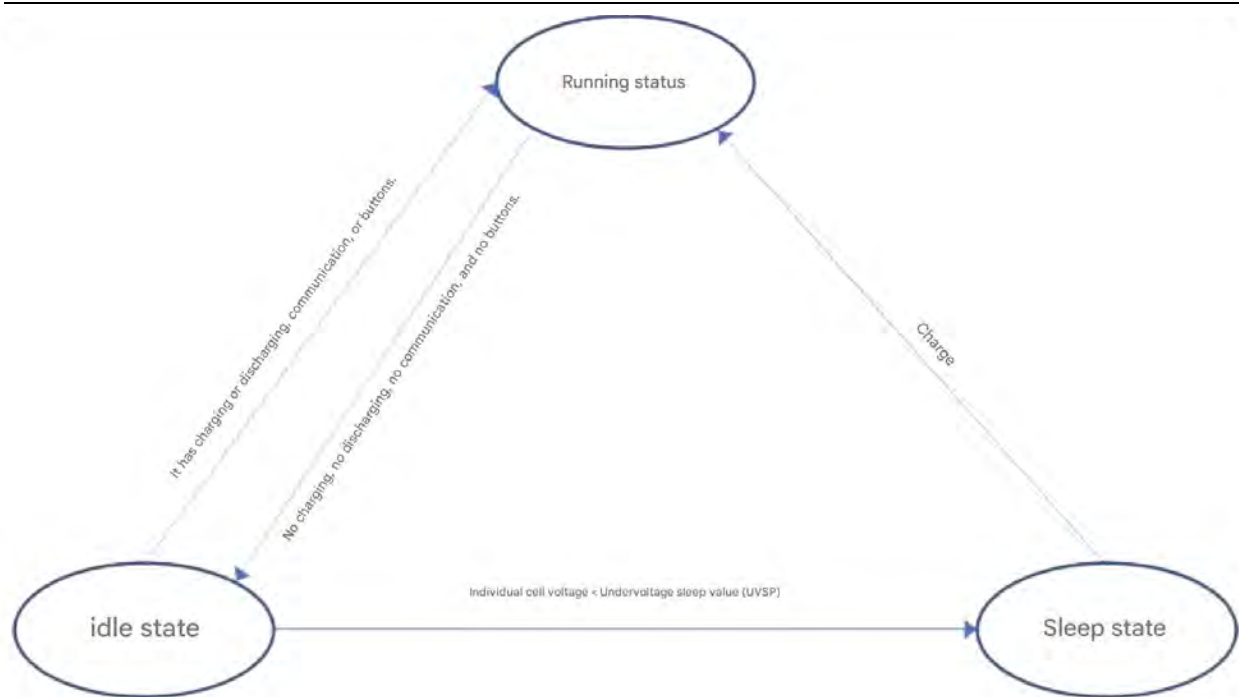
Idle Mode: This is the state when the battery is at rest. The LED is off, but the buttons and communication still respond.

In this mode, the battery can be stored for extended periods. Once self-discharge conditions are met, it will automatically start self-discharging.

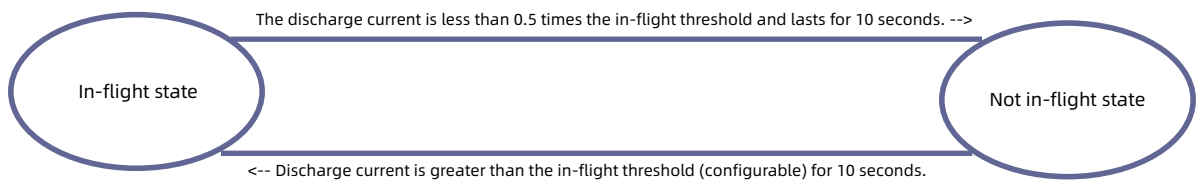
If you power off with the button, or the battery sits unused in operating mode for more than 20minutes, it will switch to idle mode.

In this state, it's recommended to recharge the battery at least once every six months.

Sleep Mode: This is the state after the battery has been over-discharged. The LED is off, the buttons and communication do not respond, and it can only be reactivated by charging.



Operating modes for unmanned flight scenarios are divided into flight and non-flight states. While in flight, the battery does not provide any discharge protection (such as undervoltage or high discharge temperature); only warnings are reported. Once flight mode ends, if these issues persist, battery protection activates immediately. Note: During flight, the short press + long press shutdown feature is disabled.



3.2 Protection Board Specifications

Category	Item	Specification (Typical)	Remarks
Charging Parameters	Maximum Charging Voltage	78.3V	
	Maximum Charging Current	120A	
	Operating Temperature (Charging)	5~68°C	
Discharge Specifications	Continuous Working Current	240A	
	Peak Current	Not in-flight: 880A/64μS In-flight: 1000A/10S	
	Operating Temperature (Discharge)	-20~90°C	
Measurement Accuracy	Number of Series Collected	18	
	Sampling Rate	10Hz	
	Single Cell Voltage Accuracy (across temperature range)	10mV	
	Total Voltage Accuracy (across temperature range)	1%	
	Current Measurement Accuracy (across temperature range)	1%	

	Temperature Measurement Accuracy	±3°C	
Balancing Function	Balancing Method	Passive	
	Cell Voltage Balance Start Threshold	3800	
	Balancing Current	70mA	
	Cell Voltage Difference Balance Start Threshold	30mV	
	Cell Voltage Difference Balance Stop Threshold	15mV	
SOC	SOC Capacity Estimation Error	10%	Room temperature, standard conditions (3C charge / 6C discharge)
	SOC Low Warning Value	20%	
Power Consumption Parameters	Operating Mode	<15mA	Recommended Storage Voltage: 64.8V~68.8V Storage temperature must be at -10 °C ~30°C range.
	Idle Mode	<2mA	
	Sleep Mode	Less than 100uA	
Protection Parameters	Cell Overvoltage Warning Threshold	4350mV	
	Cell Overvoltage Warning Release Voltage	4200mV	
	Cell Overvoltage Protection Voltage	4350mV	
	Cell Overvoltage Protection Release Voltage	4200mV	
	Cell Overvoltage Protection (Warning) Delay	1 second	
	Cell Undervoltage Warning Threshold	3100mV / 3400mV	3400mV (only when discharge current is less than 10A)
	Cell Undervoltage Warning Release Voltage	3500mV	
	Cell Undervoltage Protection Voltage	3300mV	For discharge currents < 10A
	Cell Undervoltage Protection Release Voltage	3500mV	
	Cell Undervoltage Protection (Warning) Delay	1 second	
	Self-discharge Start Voltage Threshold	>3800mV	
	Self-discharge Stop Voltage Threshold	≤3800mV	
	Self-discharge Start Time Limit	7 days	
	Cell Undervoltage Sleep	2900mV	No charge/discharge operation
	Number of Temperature Sensing Channels	7	6 cells, 1 PCB
	Temperature Sensor Type	NTC	
	Short Circuit Protection Trigger Value	880A	
	Charge Saturation Voltage	4335mV	
	Charge Overcurrent Warning	>105% of rated value	Dynamic, varies with temperature
	Charge Overcurrent Warning Release	≤100% of rated value	Dynamic, varies with temperature
	Charge Overcurrent Protection	>110% of rated value	
	Charge Overcurrent Protection Release	Stop charging or discharging	
	Charge Overcurrent Protection (Warning) Delay	1 second	
	Discharge Overcurrent Warning	250A	
	Discharge Overcurrent Warning Release	240A	
	Discharge Overcurrent Protection (Warning) Delay	1 second	
	Discharge Overcurrent Protection	/	
	Discharge Overcurrent Protection Release	/	
	Charge High Temperature Warning Value	66°C	
	Charge High Temperature Warning Release Value	65°C	
	Charge High Temperature Protection Value	68°C	

	Charging High-Temperature Protection Release Point	65°C	
	Charging High-Temperature Protection (Warning) Delay	1 second	
	Charging Low-Temperature Warning Threshold	10°C	
	Charging Low-Temperature Warning Release Point	11°C	
	Charging Low-Temperature Protection Threshold	5°C	
	Charging Low-Temperature Protection Release Point	10°C	
	Charging Low-Temperature Protection (Warning) Delay	1 second	
	Discharging High-Temperature Warning Threshold	85°C	
	Discharging High-Temperature Warning Release Point	80°C	
	Discharging High-Temperature Protection Threshold	90°C	
	Discharge High Temperature Protection Release Point	80°C	
	Discharge High Temperature Protection (Alarm) Delay	1 second	
	Discharge Low Temperature Warning Threshold	-12°C	
	Discharge Low Temperature Warning Release Point	-10°C	
	Discharge Low Temperature Protection Threshold	-20°C	
	Discharge Low Temperature Protection Release Point	-10°C	
	Discharge Low Temperature Protection (Alarm) Delay	1 second	
Data Storage	Charge History Data Storage Interval	Variable Interval	Record an entry when individual cell voltage fluctuates by +30mV or -200mV; also log when charging turns on or off
	Discharge History Data Storage Interval	Variable Interval	Log an entry if a single cell voltage shifts by +200mV or -30mV; also capture when discharging starts or stops
	Other Historical Data Storage Interval	Variable Interval	Record each time individual cell voltage changes by +200mV or -200mV
	Maximum Number or Duration of Stored Historical Data	Full Cycle	

4.Charging Current

Temperature Range	Required Charging Current
5~10	0.5C
11~15	1C
16~65	4C
66	2C
67~68	0.5C

5.Battery Performance Testing

Unless otherwise specified, all tests in this specification are conducted under the following environmental conditions:

Temperature: 25°C ± 5°C; Humidity: 65 ± 20%RH;

No.	Test Item	Testing Method & Conditions	Condition
1	Discharge Characteristics at Different Temperatures	High Temperature: After standard charging, store at 60±2°C for 2 hours, then discharge at 0.5C;	Remaining capacity must not be less than 80% of the initial value; restored capacity must not be less than 90% of the initial value.
		Room Temperature: After standard charging, store at 20±2°C for 2 hours, then discharge at 0.5C;	Minimum 94% of initial capacity; restored capacity at least 96%.
		Low Temperature: After standard charging, store at -0±2°C for 4 hours, then discharge at 0.2C; ambient temperature 25±5°C;	Discharge capacity should not be less than 60% of the initial capacity.
2	Cycle Life	Charge at 120A (4C) to 78.3V, end at 0.5CmA; start discharge current at 200A (full load) to 100A (no load), discharge until 61.2V; discharge capacity no less than 80% of initial.	Cycle life: ≥600 cycles
3	High Temperature Storage Characteristics	After full charge, store at 60°C for 4h, then discharge at 0.5C, cutoff voltage: 59.4V, then perform 2 standard charge/discharge cycles and record the maximum capacity recovery value;	Restored capacity ≥ 95% (of original capacity)

6. Fault Indicator Light Descriptions

Item	Indicator Light	Start Condition	End Condition
Charging	Show Battery Level	Charging	Stop Charging
Discharging	Show Battery Level	Discharging	Stop Discharging
Button Trigger	Show Battery Level	Button	Show 5S Complete
Upgrade	LED Progress Display	Start Upgrade	Upgrade Complete
High Temperature Charging Alert	LED 4 blinks 3 times per second	Charging and temperature > OCTA	Stops charging or temperature < OCTR
Charging Over Current Alert	LED 2 blinks 2 times per second	Charging current > OCCA	Charging current < OCCR
Discharge Low Voltage Alert	LED 3 blinks 2 times per second	Discharging and voltage < UVA	Stops discharging or voltage > UVR
Charging Over Voltage Alert	LED 3 blinks 3 times per second	Charging and voltage > OVA	Stops charging or voltage < OVR
Charging Low Temperature Alert	LED 4 blinks 2 times per second	Charging and temperature < UCTA	Stops charging or temperature > UCTR

Output Short Circuit (Over Current)	LED 2 flashes 3 times per second	Output Short Circuit / Over Current	One minute after load removal
Battery Fault	Power On LED 5 stays on	Vmin<1.5V, or Vmin>3.2V and δV>1V	

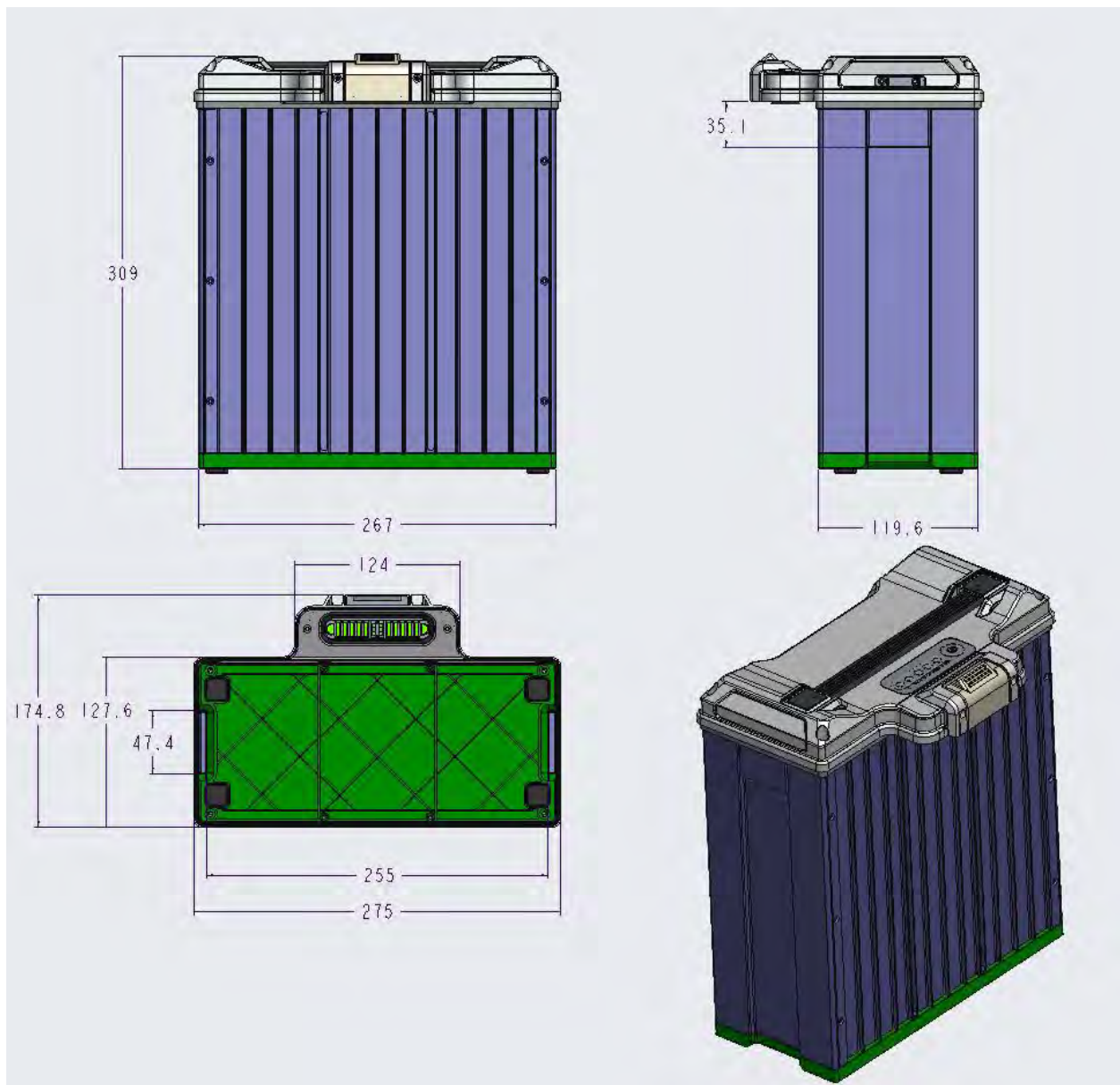
7.Button or Discharge Power Display

LED5	LED1	LED2	LED3	LED4	SOC
○	●	●	●	●	95%-100%
○	●	●	●	⊙	90%-94%
○	●	●	●	○	80%-89%
○	●	●	⊙	○	70%-79%
○	●	●	○	○	60%-69%
○	●	⊙	○	○	50%-59%
○	●	○	○	○	40%-49%
○	⊙	○	○	○	20%-39%
⊙	⊙	○	○	○	<20%

8.Charging LED Indicator

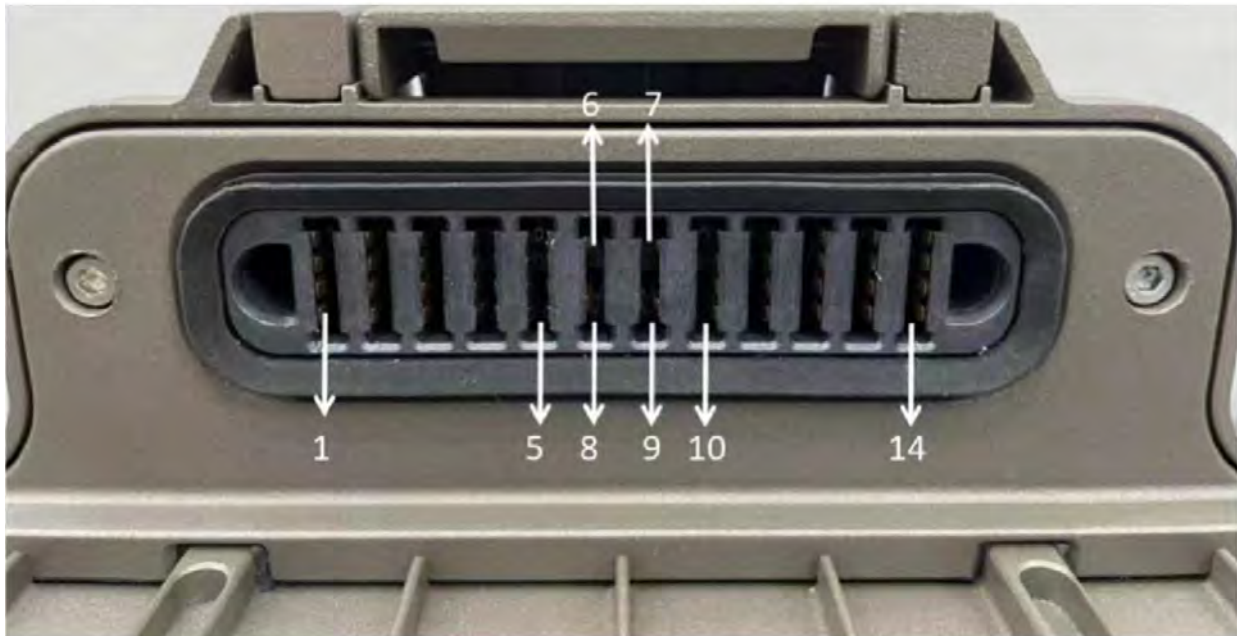
LED1	LED2	LED3	LED4	SOC
⊙	⊙	○	○	0-59%
⊙	⊙	⊙	○	60%-79%
⊙	⊙	⊙	⊙	80%-94%
●	●	●	●	95%-100%

9.Product Images, Dimensions, and Structure



10. Battery Interface Specifications

Plug Model: CP590002



PIN #	Thread Color	Name	Remark
1 / 2 / 3 / 4 / 5	Red	Battery Power +	
6		CAN H	CAN Positive
7		CAN L	CAN Negative
8 / 9		Pre Charge Detection	Aircraft Terminal Short Circuit
10 / 11 / 12 / 13 / 14	Black	Battery Power -	

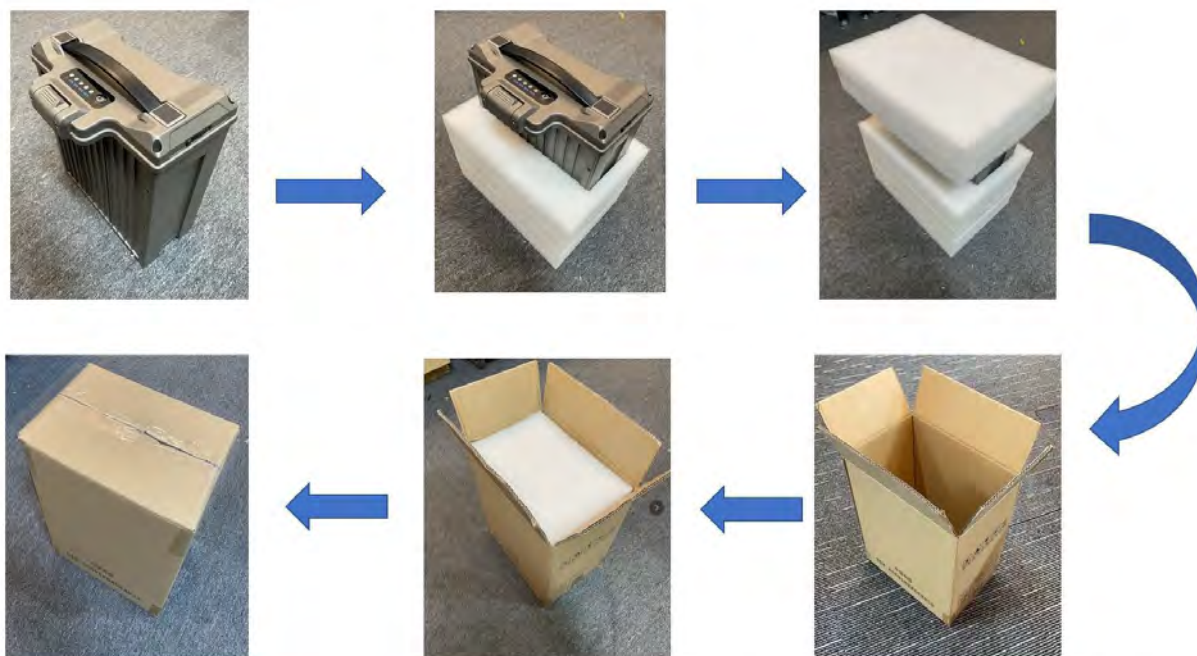
11. Smart Battery Features Table

No.	Feature	Description	Notes
1	Battery Short Circuit Feature	Short circuit protection for battery input,350Afuse	Included
2	Battery Overcharge Protection	Individual cell overcharge protection	Included
3	Battery Charge Over Current Protection	Segmented charge over current protection	Included
4	Battery Failure (Voltage Disconnected)	Vmin<1.5V, or Vmin>3.2V and δV>1V	Included
5	No Power-Cut During Flight	If discharge current exceeds the set value, discharge protection does not activate	Included
6	Over-discharge Protection	If battery discharge current is lower than the set value, under-voltage protection works as expected.	Yes

7	Charging Temperature Protection	Charging is not allowed outside the safe temperature range	Yes
8	Battery Data Logging	Records any abnormal data during battery operation	Yes
9	Temperature sensor error(temperature disconnected)	$T_{max} - T_{min} > 30^{\circ}\text{C}$	Yes

12.Smart Battery Packaging Diagram

Name	B1830Smart Battery
Model	ZAB1830-01
Quantity	1 pc
Weight	14 kg
Dimensions	325 × 225 × 385 mm



Product Usage, Warnings, and Precautions

1. How to Use the Battery:

1.1. Powering On

1. 1.1: When the battery is unprotected, press and hold the power button to turn it on.

1.2. Shutdown Method ①: After the aircraft lands safely, simply remove the battery. With no communications or load, the battery will power off automatically after 20 minutes.

Important: Do not reinstall this battery in the aircraft while waiting for it to shut down, as this could cause severe sparking.

It is recommended that after the aircraft lands, while the battery is still installed, press the button briefly and then hold it down. Once all indicator lights turn off, the battery has been forcibly shut down and can be safely removed.

2. Never disassemble the battery cells under any circumstances. Doing so may cause internal short circuits, leading to swelling, fire, or other hazards. Electrolyte is harmful—although lithium polymer batteries theoretically contain no free-flowing electrolyte, if a leak occurs and it comes into contact with your skin, eyes, or body, immediately rinse with water and seek medical attention.
3. Never throw battery cells into fire or attempt to burn them under any circumstances—this can cause the cells to ignite, which is extremely dangerous and strictly forbidden. Do not immerse battery cells in any liquid, including fresh water, seawater, or beverages such as juice or coffee.

4. Battery Cell Replacement

Battery cell replacement should only be carried out by the cell supplier or equipment provider. Do not attempt to replace the cell yourself.

5. Do Not Use Damaged Cells

Battery cells can be damaged during transport due to impacts or other reasons. If you notice any unusual signs, such as damaged plastic edges, a cracked casing, a smell of electrolyte, or signs of leaking, do not use the cell. Batteries that are leaking or emitting electrolyte fumes should be kept away from open flames to reduce the risk of fire.

6. Recommended storage voltage:

64.8V~68.8V

The battery pack should be stored at a temperature between -10°C ~ 30°C.