



产品规格书

product specification

产品型号 Product Model B48G01P200Ah

电芯类型 Chemistry 磷酸铁锂电池 Lithium iron phosphate battery

产品规格 Product Specification 48V200Ah

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1 适用范围 Scope

本规格书描述了锂离子电池组的型号、规格、参数、存储、注意事项等。适用于郑州比克重工股份有限公司生产的 B48G01P200Ah 锂离子电池组。

This specification describes the model, specifications, parameters, storage, precautions, etc. of lithium-ion battery packs. It is suitable for B48G01P200Ah lithium-ion battery pack produced by Zhengzhou BAK Heavy Industry Co. Ltd.

2 概述 Product overview

B48G01P200Ah 锂电池组由 30 只方形铝壳通过串并联方式组合而成，其具备过充、过放、过流、短路、等安全保护。

The B48G01P200Ah lithium battery pack is composed of 30 square aluminum shells combined in series and parallel, which has safety protection such as overcharge, overdischarge, overcurrent, short circuit, etc

3 引用标准 Applicable Standards

3.1 GB/T 31484-2015 《电动汽车用动力蓄电池循环寿命要求及试验方法》

GB/T 31484-2015 cycle life requirements and test methods for power cell for electric vehicles,

3.2 GB/T 31486-2015 《电动汽车用动力蓄电池电性能要求及试验方法》

GB/T 31486-2015 electrical performance requirements and test methods for power cell for electric vehicles,

3.3 GB 38031-2020 《电动汽车用动力蓄电池安全要求》

GB 38031-2020 safety requirements and test methods for power cell for electrical vehicles

3.4 GB/T36672-2018 《电动摩托车和电动轻便摩托车用锂离子蓄电池》

GB/T36672-2018Lithium Ion Batteries for Electric Motorcycles and Electric Mopeds

3.5 GB/T36972-2018 《电动自行车用锂离子蓄电池》

GB/T36672-2018Lithium ion battery for electric bicycle

3.6 GB 31241—2014 《便携式电子产品用锂离子电池和电池组安全要求》

GB 31241-2014Lithium ion cells and batteries used in portable electronic equipments safety requirements

3.7 IEC62619-2017、IEC 62133-2: 2017

在以上标准的基础上，结合我公司产品实际和试验条件，特制定《B48G01P200Ah 电池产品规格书》标准，并对试验方法、判定标准内容进行了阐述。

On the basis of the above standards, in combination with the actual product and test conditions of our company, the Standard of B48G01P200Ah Battery Product Specification is specially formulated, and the test methods and determination standards are described.

4 测试条件 Test conditions

除非另外特别说明，所有参数测试环境条件为：温度 $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ，相对湿度为 25%~75%，大气压力

为 86KPa~106kPa 。

unless otherwise specified, all parameters are tested under the following environmental conditions:
temperature $25 \pm 2 \text{ }^\circ\text{C}$, relative humidity 25% ~ 75%, atmospheric pressure 86kpa ~ 106kpa.

5 定义 Definition

5.1 标准充电 Standard Charge Method

在 $25 \pm 2 \text{ }^\circ\text{C}$ 下，电池以 0.33C (67A) 恒流充电至 82.8V 后，以 82.8V 恒压充电至电流小于等于 0.05C (10 A)，静置 30min。

At $25 \pm 2 \text{ }^\circ\text{C}$, the Battery is charged to 82.8V at constant current of 0.33C (67 A), then charged at constant voltage of 82.8V until the current tapers to $\leq 0.05\text{C}$ (10A) followed by resting for 30min.

5.2 标准放电 Standard Discharge Method

指在 $25 \pm 2 \text{ }^\circ\text{C}$ 环境下，以 1C (200A) 恒流放电至电池电压 57.5 V。

Under $25 \pm 2 \text{ }^\circ\text{C}$, the Battery is discharged to 57.5V at a constant current of 1C (200A).

5.3 标称容量 Nominal Capacity

电池标称容量以 Cap 表示，单位为安时 (Ah)，是指电池按标准充电方式充电后，按标准放电方式放电得到的容量。

Nominal capacity, signed as capacity and using Ah as unit, is obtained by discharging a Battery via standard discharge method after it is standard charged.

6 技术参数 Product specifications and parameters

6.1 锂电池组技术参数 Battery Technical Parameters

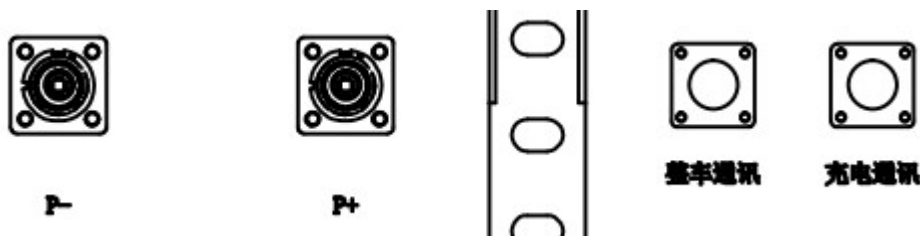
项目规格 Project Specifications	标准参数 Standard Parameters	备注 Remarks
电池规格 Battery model	48V200Ah	电芯 cell: 方形铝壳
电池类型 Battery Type	磷酸铁锂电池 Lithium iron phosphate battery	
标称电压 Nominal voltage (V)	48	
标称容量 Nominal capacity (Ah)	200	$25 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$, 0.33C 充电 0.33C 放电



		25℃±2℃,0.33C Charge 0.33C Discharge
最小容量 Minimum capacity(Ah)	198	
充电电压 Charging voltage (V)	54	
放电截止电压 Discharging cutoff voltage (V)	37.5	
标准充电电流 Standard charging current (A)	67	
最大充电电流 Maximum charging current (A)	120	此参数不支持循环 This parameter does not support loops
标准放电电流 Standard discharge Current (A)	200	
最大持续工作电流 Maximum continuous operating current (A)	250	
峰值放电电流 Peak discharge current (A)	350	持续时间 3 秒,此参数不支持循环 Duration 10second,This parameter does not support loops
外壳材料 Shell material	钣金外壳 SPCC	
重量 Weight (kg)	100±2	
内阻 Resistance (mΩ)	≤15	3 个月内新电池, 交流测试。 New battery within 3 months ACR.
月自放电率 Monthly self-discharge rate	≤4%	BMS 休眠 BMS hibernate
外形尺寸 Overall dimensions (mm)	(900±2) * (380±2) * (300±2)	长*宽*高(外箱尺寸, 不含提手, 端子) Length* Width*Height(Box size, without handle, terminal)
防水等级 Waterproof grade	IP 67	
出厂电压 Delivery voltage (V)	49 ~ 51	> 70%SOC
循环寿命 (次) Cycle Life (times) (25℃±2℃)	≥2000 容量保持率: ≥80% capacity retention: ≥80%	以 0.33C 恒流充电至 82.8V, 以 82.8V 恒压充电至电流小于 0.05C, 搁置 30min, 以 0.33C 恒流放电至 57.5V, 搁置 30min, 再进行下一次充放电循环 At a constant current of 0.5C charge to 82.8V, at a constant voltage of 82.8V charge to current less than 0.05C, shelved 30min, at a constant discharge of 0.33C to 57.5V, shelved 30min, and then into the next charge and discharge cycle,
通讯方式 Communication mode	CAN	与仪表通讯 Communicates with the instrument
充电温度范围 Charging temperature (℃)	0.2C	0~10℃
	0.4C	10~20℃

	0.5C	20~40℃
	0.2C	40~50℃
放电温度范围 Discharge temperature (℃)	-20 ~ 60	电芯表面温度不能超过 60℃ The surface temperature of the cell should not exceed 60℃
存储温度 (℃) Storage Temperature	-20~35℃	3 个月 3 month
	-10~25℃	6 个月 6 month
建议存储温度 (℃) Recommended Storage Temperature	20 ~ 30℃	如果电池储存在高温下，电池寿命将会缩短。the battery life would be reduced if battery is stored in high temperature.

6.2 充放电接口定义 Definition of charging and discharging interface



P- : FSP200180CW-UM8B2D;

P+ : FSP200180CZ-UM8A2D;

整车通讯插座: WS16K7Z

端子 PIN	定义 Definition	备注 Remarks
端子 PIN	定义 Definition	/
1	整车 CANH Vehicle CANH	
2	整车 CANL Vehicle CANL	
3	调试 CANH Debugging CANH	
4	调试 CANL Debugging CANL	
5	DCDC-	
6	BAT-	

充电通讯插座: WS16K4Z

端子 PIN	定义 Definition	备注 Remarks
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1	充电 12V+ Charge 12V+	充电时，需充电机输出 12V+和 12V-给 BMS，功率 $\leq 30W$ ，BMS 收到 12V 后，闭合继电器，开始充电。 When charging, the charger needs to output 12V+ and 12V- to the BMS, the power is $\leq 30W$, after the BMS receives 12V, close the relay and start charging.
2	充电 12V- Charge 12V-	
3	BAT+	
4	BAT-	

6.3 BMS 管理系统 BMS management system

功能 Function	项目 Test project	最小值 Min	典型值 Typical	最大值 Max	单位 unit
工作电压 Operation voltage	电压范围 Voltage range	37.5	48	54	V
工作电流 Operation current	充电电流 Charging current	/	30	100	A
	放电电流 Discharge current	/	100	250	A
过充保护 Over charge protection	充电器电压 Charger voltage (CC-CV)	/	/	54	V
	过充保护电压 Over charge protection voltage	3.62	3.65	3.68	V
	过充保护延时时间 Over charge protection delay time	2500	3000	3500	ms
	过充保护恢复电压 Over charge protection recovery voltage	/			
	过充保护释放条件 Overcharge protection release conditions	重启 Restart			
过放保护 Over Discharge protection	过放保护电压 Over discharge protection voltage	2.47	2.50	2.53	V
	过放保护延时时间 Over discharge protection delay time	2500	3000	3500	ms
	过放保护恢复电压 Over discharge protection recovery voltage	/			
	过放保护释放条件 Over discharge protection release conditions	重启 Restart			
充电过流保护 Over-current Charge	充电过流保护值 Charging overcurrent protection value	115	120	125	A
	充电过流延时 Over current charge delay	2.5	3	3.5	s



	充电过流释放条件 Over-current charge release conditions	重启 Restart			
放电过流保护 Over-current Discharge	级放电过流报警值 (Discharge overcurrent alarm value)	340	350	360	A
	放电过流保护延迟 (Discharge overcurrent alarm value delay)	2.5	3	3.5	s
	放电过流保护电流值 (Over-current Discharge)	390	400	410	A
	放电过流保护延迟 (Over-current Discharge delay)	8	10	12	s
	放电过流保护恢复条件 Over-current Discharge release	重启 Restart			
放电高温保护 Discharge high temperature protection	温度报警值 Temperature alarm value	/	55	/	
	温度报警延时 Temperature alarm value delay	2.5	3	3.5	s
	温度保护值 Temperature protection value	/	60	/	℃
	温度保护释放条件	重启 Restart			
放电低温保护 Discharge low temperature protection	温度报警值 Temperature alarm value	/	-15	/	
	温度报警延时 Temperature alarm value delay	2.5	3	3.5	s
	温度保护值 Temperature protection value	/	-20	/	℃
	温度保护释放条件	重启 Restart			
充电高温保护 Charge hightemperature protection	温度报警值 Temperature alarm value	/	50	/	
	温度报警延时 Temperature alarm value delay	2.5	3	3.5	s
	温度保护值 Temperature protection value	/	55	/	℃
	温度保护释放条件	重启 Restart			
充电低温保护 Charge low temperature protection	温度报警值 Temperature alarm value	/	3	/	
	温度报警延时 Temperature alarm value delay	2.5	3	3.5	s
	温度保护值 Temperature protection value	/	0	/	℃
	温度保护释放条件	重启			



		Restart	
工作温度 Operation temperature	正常工作范围 Normal operating range	-20 ~ 60	°C
存储温度 Storage temperature	湿度低于 70%，时间 ≤6 个月 Humidity below 70%，time ≤6month	-10 ~ 25	°C
充放电线路 Charge discharge circuit	充放电同口 Same port for charging and discharging		

6.5 保护功能说明 Protection function description

6.5.1 过充保护 电池组在充电时，电压不断升高，当 BMS 检测到任意一串电芯电压达到过充保护值时，BMS 会断开主继电器，此时充电截止，电池组不能再给进行充电。

Overcharge protection When the BMS detects that the voltage of any string of cells reaches the overcharge protection value, the BMS will disconnect the main relay, and the charging is cut off, and the battery pack can no longer be charged.

6.5.2 过放保护 电池组在放电时，电压不断下降，当 BMS 检测到任意一串电芯电压达到欠压保护值时，BMS 会断开主继电器，此时放电截止，电池组不能再进行放电。

Overdischarge protection When the BMS detects that the voltage of any string of cells reaches the under-voltage protection value, the BMS will disconnect the main relay, and the discharge will be cut off, and the battery pack can no longer be discharged.

6.5.3 过流保护 电池组在静置或者放电状态下，电流突然加大，当 BMS 检测到电流达到放电过流保护值时，BMS 会断开主继电器，此时放电截止，电池组能再进行放电；电池组在充电状态下，当 BMS 检测到充电电流值达到充电过流保护值时，BMS 会断开主继电器，此时充电截止，电池组不能再进行充电。

Over-current protection When the BMS detects that the current reaches the discharge overcurrent protection value, the BMS will disconnect the main relay, and the discharge will be cut off at this time, and the battery pack can be discharged again; When the battery pack is in the charging state, when the BMS detects that the charging current value reaches the charging overcurrent protection value, the BMS will disconnect the main relay, and the charging is cut off, and the battery pack can no longer be charged.;

6.5.4 短路保护 在负载异常或被短路情况下，电池包放电电流急剧变大，当 BMS 检测到电流值达到



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短路电流保护值时，BMS 会关断主继电器，此时放电截止，电池组不能再进行放电。

Short-circuit protection When the BMS detects that the current value reaches the short-circuit current protection value, the BMS will turn off the main relay, and the discharge will be cut off, and the battery pack can no longer be discharged

6.5.5 过温保护 电池组在放电过程中，当 BMS 检测到电芯表面温度达到放电过温保护值时，BMS 会断开主继电器，此时放电截止，电池组不能再进行放电；电池组进行充电时，当 BMS 检测到电芯表面温度达到充电过温保护值时，BMS 会断开主继电器，此时充电截止，电池组不能再进行充电。

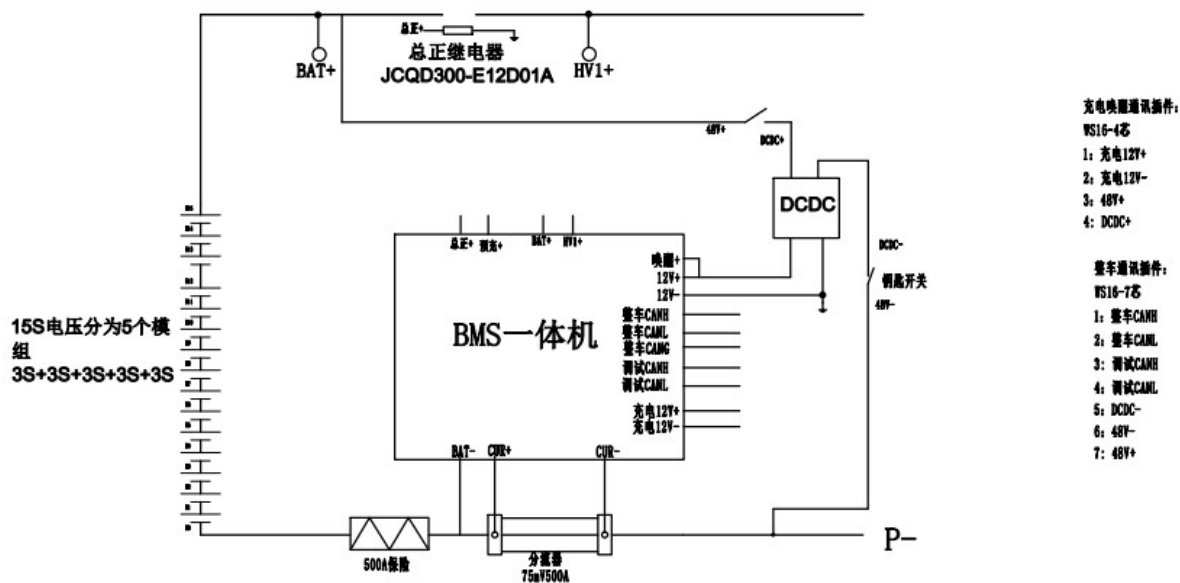
Over-temperature protection During the discharge process of the battery pack, when the BMS detects that the surface temperature of the battery cell reaches the discharge over-temperature protection value, the BMS will disconnect the main relay, and the battery pack can no longer be discharged when the discharge is cut off, and the battery pack can no longer be discharged;

6.5.6 低温保护 电池组在放电过程中，当 BMS 检测到电芯温度表面达到放电低温保护值时，BMS 会断开主继电器，此时放电截止，电池组不能再进行放电；电池组进行充电时，当 BMS 检测到电芯表面温度达到充电低温保护值时，BMS 会断开主继电器，此时充电截止，电池组不能再进行充电。

Low temperature protection During the discharge process of the battery pack, when the BMS detects that the temperature surface of the battery cell reaches the discharge low temperature protection value, the BMS will disconnect the main relay, and the discharge will be cut off at this time, and the battery pack can no longer be discharged; When the battery pack is charged, when the BMS detects that the surface temperature of the battery cell reaches the charging low temperature protection value, the BMS will disconnect the main relay, and the charging is cut off, and the battery pack can no longer be charged



6.6 BMS 参考电路 BMS reference circuit



7 电池外观及包装 Battery appearance and packaging

7.1 电池外观 Battery appearance

正面视图 Front view

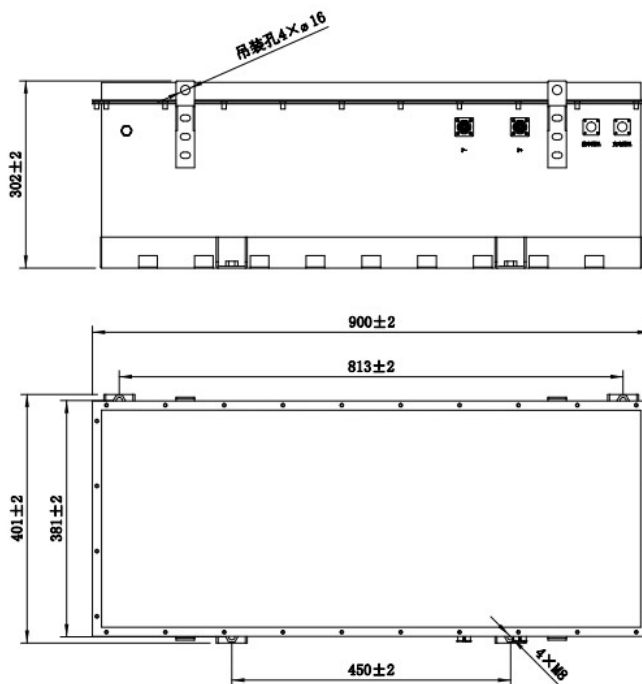


侧视图 Back view



成品图 Product map

尺寸图 Dimension drawing



7.2 电池标签信息 Battery label information

锂电池系统

产品名称	B48V球车电池包	产品型号	K1-48-200
电量	9.6KWh	质量	100±5Kg
零件号	BEV48V-GP001	材料体系	磷酸铁锂
额定电压	48V	额定容量	200Ah
生产日期	20xx.xx.xx	电池编号	B48Gxxxxxxxx
工厂地址	河南省郑州市中牟县汽车产业集聚区		



郑州比克新能源汽车有限公司

8 电池组安全性能 Battery pack safety performance

序号 No.	测试项目 Test Item	性能标准 Performance Standard	测试条件与方法 Performance conditions and method
1	过充测试 Overcharge test	电池组不起火、不爆炸	电池组以标准充电方式充满电,然后以0.5C充电至54V充电60min,之后搁置6h,观察外观。



		No fire, No explosion	The battery pack is fully charged in the standard charging method, then charged at 0.5C to 48V for 60min, and then left for 6h to observe the appearance.
2	强制放电 Forced discharge	电池组不起火、 不爆炸 No fire, No explosion	将电池组中的任何一个单体电池进行放电至终止电压，其余单体电池均为充满电状态，之后对电池组以 0.5C 恒流放电 60min,目检电池组外观。 Discharge any single cell in the battery pack to the termination voltage, and the rest of the single cells are fully charged, and then discharge the battery pack at 0.5C constant current for 60min to visually inspect the appearance of the battery pack.
3	挤压测试 Crush test	电池组不起火、 不爆炸 No fire, No explosion	电池组以标准充电方式充满电,按垂直于电池组中单体排列方向施压，挤压头为半径 75mm 的半圆柱体，半圆柱体长度(L)大于被挤压电池的尺寸(但不超过 1m)，挤压速度为 (5±1) mm/s,当挤压至电池组至原尺寸的 70%，或挤压力达到 30kN 时保持 5min，之后下载挤压力，观察 1h。 The battery pack is fully charged in the standard charging method, pressure is applied perpendicular to the arrangement of the cells in the battery pack, the extrusion head is a semi-cylinder with a radius of 75mm, the length of the semi-cylinder (L) is greater than the size of the squeezed battery (but not more than 1m), the extrusion speed is (5 ± 1)mm/s, when the extrusion to 70% of the original size of the battery pack, or the extrusion force reaches 30kN is maintained for 5min, and then the extrusion force is downloaded and observed for 1h.
4	过放测试 Over discharge test	电池组不起火、 不爆炸、不漏液 No fire, No explosion, No leaking	电池组按标准充电后，以 0.5C 电流放电至终止电压，之后再继续以 0.1C 恒流放电 24h,目检电池组外观。 After charging the battery pack according to the standard, it is discharged to the termination voltage with a current of 1C, and then continues to discharge at a constant current of 0.1C for 24h to visually inspect the appearance of the battery pack.
5	跌落测试 Drop Test	电池组不起火、不爆炸 No fire, No explosion	将电池组放置在高度（最低点高度）为 1 米的位置，以 X、Y、Z 三个方向自由跌落到水泥板面上各一次，测试结束后目检电池组外观。 The battery pack is dropped from a height of 1m by X, Y, Z, three directions into the cement floor for each time. Observe the appearance after testing. 电池重量超过 5KG,最低点高度为 0.6 米,只跌落 1 个方向 The battery weighs more than 5KG, and the lowest point



			is 0.6m high, falling in only one direction
6	温度循环 Thermal cycling	电池组不起火、不爆炸、不漏液 No fire, No explosion, No leaking	<p>电池组首先按标准制式充电，放入温度箱中，温度箱温度调节如下：</p> <ol style="list-style-type: none"> 1.在 $70^{\circ}\text{C}\pm 3^{\circ}\text{C}$ 的环境中保持 4h。 2.在 30min 内由 $70^{\circ}\text{C}\pm 3^{\circ}\text{C}$ 降温至 $20^{\circ}\text{C}\pm 3^{\circ}\text{C}$，保持 2h。 2.在 30min 内温度降至 $-20^{\circ}\text{C}\pm 3^{\circ}\text{C}$，保持 4h。 3.在 30min 内温度升至 $20^{\circ}\text{C}\pm 3^{\circ}\text{C}$，保持 2h。 4.循环以上步骤 5 次。 <p>上述循环后，将电池组放置在温度为 $20^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 的环境中 7 天，目检电池组外观。</p> <p>After fully charged according to the standard charge mode, put battery in an oven with condition as follows:</p> <ol style="list-style-type: none"> 1. $70^{\circ}\text{C}\pm 3^{\circ}\text{C}$ for 4h. 2. Decrease the chamber temperature from $70^{\circ}\text{C}\pm 3^{\circ}\text{C}$ to $-20^{\circ}\text{C}\pm 3^{\circ}\text{C}$, kept for 4h. 3. Raise the chamber temperature to $20^{\circ}\text{C}\pm 3^{\circ}\text{C}$, kept for 2h. 4. Repeat the test for 5 cycles. <p>Afterwards, put the battery pack into a chamber with $20^{\circ}\text{C}\pm 5^{\circ}\text{C}$ for 7 days. Observe battery pack appearance.</p>
7	低气压 Low air pressure	电池组不起火、不爆炸、不漏液 No fire, no explosion, no leaking	<p>将电池组放置在 $20\pm 3^{\circ}\text{C}$ 真空箱中，逐渐减小其内部气压至不大于 11.6 kPa（模拟 15420m 高度）并保持 6h，目检电池组外观。</p> <p>The battery pack was placed in an empty box at $20\pm 3^{\circ}\text{C}$, and the internal air pressure was gradually reduced to no more than 11.6 kPa (simulated height of 15420m) and kept for 6 hours. The appearance of the battery pack was visually examined.</p>
备注 Note	<p>除特殊说明，以上所有安全测试均应在 $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 通风橱中，且附带有保护装置的条件下进行。</p> <p>Unless otherwise specified, all safety tests above shall be conducted in ventilated environment at $25 \pm 2^{\circ}\text{C}$ and under protective equipment.</p>		

9 贮存与运输 Storage and shipping

9.1 贮存 Storage

电池组需长期贮存时，需保持 70% 的电量，放置于干燥、通风处；每 3 个月用充电器充电。



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When the battery pack needs to be stored for a long time, it should be kept at 70% of the electric capacity and placed in a dry and ventilated location. Use charger to charge every 3 months.

电池组与充电器应贮存在清洁、干燥、通风良好的仓库内，避免与腐蚀性物质接触，远离火源及热源。电池组不得倒置，避免机械冲击或其它重物的重压。

Battery pack and charger should be stored in a clean, dry, well-ventilated warehouse, avoid contact with corrosive substances, away from fire and heat sources. The battery pack must not be turned upside down and avoid mechanical shock or any other heavy load.

9.2 运输 Logistics

电池组运输过程中荷电状态应处于 30~65%，在运输中不得受剧烈机械冲撞、暴晒、雨淋、倒置。在装卸过程中，应轻搬轻放，严防摔掷、翻滚和重压。

The battery pack should be in 30-65% state of its capacity during logistics and should not be subjected to violent mechanical crash, exposure to the blazing sun, rain, or inversion during logistics. In the process of loading and unloading, the battery should be handled lightly, strictly prevent throwing, rolling and heavy load.

10 电池使用注意事项 Precautions for battery use

为防止电池可能发生泄漏、发热、爆炸，请注意以下预防措施：

To prevent possible leakage, heating, and explosion of the battery, please pay attention to the following precautions:

10.1 请将锂电池组置放在孩童无法够触的区域。

Place the li-ion battery out of children's reach.

10.2 严禁将电池组正负极短路，安装中请勿将正负极接错（红线为正极，黑线负极）。

Forbidden to short circuit the positive and negative poles. Connect the positive and negative poles right. (Red +, Black -).

10.3 电池组充电必须使用比克重工指定的专用充电器进行充电，若客户使用非指定的充电器，则充电器应符合比克重工的要求及国家相关标准要求，充电方式为先恒流后恒压，充电器上限电压不超过电池组的上限电压，充电电流不超过 0.5C。

If the customer uses a non-specified charger, the charger should meet the requirements of BAK Heavy



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Industry and the requirements of relevant national standards, the charging method is constant current first and then constant voltage, the upper limit voltage of the charger does not exceed the upper limit voltage of the battery pack, and the charging current does not exceed 0.5C.

10.4 请在环境温度-20℃~60℃内使用，在环境温度 0℃~50℃内对电池进行充电，严禁在 0℃以下进行充电。

Use it at ambient Temperature of -20℃~60℃, charge it at ambient Temperature of 0℃~50℃. It is strictly forbidden charging battery under 0℃.

10.5 当电压降至大于截止电压 5V 时，请及时充电，充电不得超过 12 小时。

Charge in time when the voltage drops to greater than cut-off voltage 5V. The charging time should not exceed 12h.

10.6 如果要长时间存放(超过 3 个月)，应存储在温度范围为 -10~25℃，低湿度和不含腐蚀性气体的环境中，建议每隔 3 个月充放电一次，SOC 保持在 40-75%之间。

In case of long period storage (more than 3 months), storage at temperature range of -10~25℃, low humidity, no corrosive gas atmosphere, and recommend to charge/discharge once every 3 months, and the SOC remains between 40-75%.

10.7 严禁控制器限流超过电池组最大放电电流使用，更换控制器请提前咨询。

Forbidden to use the controller current limit exceeding the nominal discharge current of the li-ion battery. Please consult BNP before changing controller.

10.8 请严格按照锂电池操作规范使用，选择通风开阔地点充电，并远离易燃易爆物品。

Please use the lithium battery strictly according to the operation rules, choose the ventilated open place to charge and keep away from inflammable and explosive materials.

10.9 电池组中有保护装置，请勿私自拆解或改变电池组结构，否则不予售后，后果自负。

There is protective device in the battery pack. Please do not disassemble or change the structure of the battery pack, otherwise afters-ales is responsible and the consequence is on user's own account.

10.10 电池仓体侧放/倒放而引起的进水损坏及电池组泡水，不提供质保。

No warranty is provided for the water damage caused by the side-up/down of the battery compartment and the soaking of the battery pack.



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10.11 电池组因接线错误而损坏，商务协商，付费维修。

If battery pack is damaged due to faulty wiring, the user should pay the bill of maintenance.

10.12 过流引起的保护板烧坏，商务协商，付费维修。

If BMS is damaged by over-current, the user should pay the bill of maintenance.

11 免责声明 Disclaimer

11.1 如果由于产品需求单位不按本规格书中的规定进行使用，造成的一切损失，供方将追究产品需求单位的责任。根据对供方造成的损失，产品需求单位可向供方提供赔偿。

If the customer does not use the product according to the provisions of this specification, causing all the related loss, the supplier will investigate the responsibility. If the responsibility is from supplier, the customer should provide compensation to the supplier.

11.2 质保期为出货日期起 12 个月，如使用不当而非质量问题，不在质保范围内。

The warranty period is 12 months from the date of shipment, and is not covered by the warranty if it is used improperly and not for quality problems.

11.3 比克重工保留对产品的规格及性能参数修改的权利。买方在订购比克重工产品前，需要与比克重工提前确认产品的最新状态。

BAK Heavy Industry reserves the right to modify the specifications and performance parameters of the product. Before ordering BAK Heavy Industry products, the buyer needs to confirm the latest status of the products with BAK Heavy Industry in advance.

11.4 产品需求单位可提出对电池组的需求并与比克重工沟通，如客户有一些特别的应用或者操作条件不同于此文件所描述的，比克重工可根据客户的特别要求进行产品的设计和生产。

The product demand unit can put forward the requirements for the battery pack and communicate with BAK Heavy Industrys, if the customer has some special applications or operating conditions different from those described in this document, BAK Heavy Industry can design and produce products according to the customer's special requirements.

11.5 英文规格释义仅供参考，请以中文版技术规格要求为准，我司进行工艺优化时不需另行通知。

English specifications are for reference only. Please refer to the technical specifications of the Chinese Version. We will carry out process optimization without prior notice.



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13 附录 Appendix