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湖南久森新能源有限公司

久森新能源 Joysun New Energy

Hunan Joysun New Energy Co., Ltd.

Specification For Approval

Model 型号 ： LU25.6-105

Type 类型 ： $LiFePO_4$

Approval 批准	Checked 审核	ME/EE Draft 制定
Customer Approval 客户回签		

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History of specification

规格书修订记录

Date 日期	Contents 内容	Remarks 备注

Contents 目录

1.Scope 适用范围

The specification shall be applied to $LiFePO_4$ rechargeable battery pack of LU25.6-105（8S1P） which is manufactured by Hunan Joysun New Energy Co., Ltd. The products satisfy ROHS requirements.

本规格书适用于湖南久森新能源有限公司生产的 LU25.6-105（8S1P）可充电铁锂电池包，产品满足 ROHS 要求。

2.Specification 主要技术参数

NO	Items	Criteria	Remarks
2.1	Initial Typical Capacity 初始典型容量	105Ah	25±2℃, 0.2C charge, 0.2C discharge. 25±2℃，0.2C 充电，0.2C 放电。
	Initial Minimum Capacity 初始最小容量	103Ah	
2.2	Nominal Voltage 标称电压	25.6V	Cell 3.20V
2.3	Open Circuit Voltage 出厂电压	25.2~26.8V	Cell 3.15~3.35V （电池组 45%＜SOC＜55%）
2.4	Cell Impedance Resistance 电芯内阻	≤0.6 mΩ	Internal resistance measured at AC 1KHZ after 50% charge 半电状态下用交流法测量内阻
	PACK Resistance PACK 内阻	40 mΩ	
2.5	Charge Cut-off Voltage 充电截止电压	29.2V	
2.6	Standard Charge Current 标准充电电流	50A	
2.7	Max. Charge Current 最大充电电流	105A	1C
2.8	Standard Discharge Current 标准放电电流	50A	
2.9	Max. Discharge Current 最大放电电流	105A	1C
2.10	Discharge Cut-off Voltage 放电截止电压	20V	Cell 2.50V
2.11	Operating Temperature 工作温度	0℃~+55℃	Charging 充电
		-10℃~+60℃	Discharging 放电
2.12	Storage Temperature 贮存温度	10℃~35℃	
2.13	Weight 重量	Approx 28Kg	
2.14	Waterproofing grade 防水等级	IP21	GB4208-2017
2.15	电芯模组串并数 Battery Module series-parallel connection	8S1P	

2.16	原厂电芯未 Pack 前的循环次数 Cycle Life of cell before PACK	4000 cycles, 80% SOH, 25℃, 0.5C/0.5C.	PHYLION

3.Battery configuration 电池组成

NO	Item	Criteria	Remarks
3.1	**Cell 电芯**	105Ah	8pcs
3.2	**BMS 保护板**	8S100A 软件版	1pc
3.3	**外壳**	/	/

4.Battery Performance Criteria 电池性能检查及测试

4.1 Appearance 外观和结构

There shall be no scratch, bur and other mechanical scratch, and the connector should be no rust dirt. The structure and dimensions see attached drawing of the battery.

电池的表面应无明显的划痕毛刺及其它机械划伤，外露的金属端子应无锈蚀污垢。结构尺寸见电池的外形尺寸图；

4.2 Measurement Apparatus 测试设备要求

(1) Dimension Measuring Instrument 尺寸测量设备

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

测量尺寸的仪器的精度应不小于 0.01mm

(2)Voltmeter 电压表

Standard class specified in the national standard or more sensitive class, impedance not less than 10 KΩ/V.

国家标准或更灵敏等级,内阻不小于 10 MΩ

(3) Ammeter 电流表

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01Ω.

国家标准或更灵敏等级，外部总体内阻包括电流表和导线应小于 0.01Ω.

(4) Impedance Meter 内阻测试仪

Impedance shall be measured by a sinusoidal alternating current method (AC 1kHz LCR meter).

内阻测试仪测试方法为交流阻抗法(AC 1kHz LCR).

4.3 Standard Test Condition 标准的测试条件

Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of 23±2℃ and relative humidity of 75% or less.

测试电池必须是本公司出厂时间不超过一个月的新电池，且电池未进行过五次以上充放电循环。除非其它特殊要求，本产品规格书规定的测试的环境条件为：温度 23±2℃，相对湿度≤75%。

4.4 Common Performance 产品的常规性能

No	Items/项目	Testing method and determinant standard /测试方法和判定标准
1	Charge Mode（Full charge）充电模式（充满电）	①Standard charge mode: 23±2℃, 0.2C (CC) charge the battery until its voltage reaches 29.2V, then changed at 29.2V (CV) while tapering the charge current 0.05C. ①标准充电模式：23±2℃，0.2C 恒流充电到 29.2V 后，转 29.2V 恒压充电直到充电电流小于或等于 0.05C 时停止充电。
2	Discharge Performance 放电性能	Within 0.5h after fully charge, discharge at 0.2C continuously down to 20V The discharge capacity is required ≥103Ah. 电池充满电后，开路搁置 0.5h，再以 0.2C 放电至 20V，要求放电容量≥103Ah。
3	Charged Storage Characteristics 荷电保持能力	Within 28 days at 25±2℃ after standard charge, at 25±2℃, then discharge at 0.2C to 20V. The discharge capacity is required ≥94Ah. 电芯充满电后，将电芯开路放置在 25±2℃条件下 28 天后，在 25±2℃条件下以 0.2C 放电至 20V，要求放电容量≥94Ah。
4	Storage Characteristics 存放性能	Use standard charge mode: The battery is fresh (not exceed 3 months), within 10 months at 20±5℃ and humidity of 45～75%, charge battery to 40～45% capacity. Use standard charge after, at 23±2℃, discharge at 0.2C to 20V. Charging and discharging experiments can be loop five times. The discharge time is required ≥4h. 采用标准模式: 将生产日期到实验日期不足 3 个月的电池充入 40～45%容量后，放置在 20±5℃、湿度为 45～75%的环境中 10 个月。采用标准充电后，在 23±2℃条件下,再以 0.2C 放电至 20V，充放电实验可以循环 5 次，要求放电时间≥4h。
5	Constant Humidity and Temperature Characteristics 恒定湿热性能	After fully charge, leave the battery in Constant Temperature & Constant Humidity Box with 60±2℃ and 90～95% for 12h, Then take out the battery in 25±2℃ for 2h, Visual battery appearance, and discharge with 1C to 20V. It is required that the appearance of the battery should be free from obvious deformation, rust, smoke or explosion, and its capacity should be no less than 90% of the measured benchmark capacity. 电池充满电后，放入 60±2℃，湿度 90～95%的恒温恒湿箱内 12h 将电池取出搁置在 25±2℃温度下 2h，目测电池外观，然后以 1C 放电至 20V。要求电池外观应无明显变形、锈蚀、冒烟或爆炸，其容量应不低于实测基准容量的 90%。
6	Low Temperature Performance Test 低温放电性能	After cell full charging in 0.2C, put it into box with low temperature of -10℃+2℃ for 16-24H, then discharge with current of 0.2C to the cut-off voltage. The discharge time is required ≥3.0H.The cell will be no deformation or no rupture. 0.2C 标准充满电后，在-10℃±2℃的低温箱中放置 16-24h,然后以 0.2C 电流放电至终止电压 ， 放电时间≥3.0H,电芯应无变形、无爆裂.

5. Safety Performance 产品可靠性

Item 项目	Measuring Procedure 内容	Requirements 备注
热冲击测试 Thermal shock test	单只电芯放置于高温箱中，调节高温箱温度以（5℃±2℃）/min 上升至 130℃±2℃，保持 30mins。 Regular the temperature to 130℃ （5℃±2℃）/min after placing single cell to high temperature chamber and keep it fo 30 mins.	不爆炸，不起火 No explosion, no fire

过充电测试 Charging test	单只电芯充满电后，在无 BMS 时，将电芯放置于通风厨中，将恒流恒压源电压设定为 6V，以 0.2I1A 电流给电芯充电，试验过程中用具有连续记录功能的点温计监 测电芯温度变化，当电芯温度达到稳态或降至环境温度时结束试验。 After a single battery cell is fully charged, without BMS, place the battery cell in a ventilated bos, set the constant current and constant voltage original voltage to 6V, and charge the battery cell with a current of 0.2I1A. During the test, use a thermometer with continuous recording function to monitor the temperature changes of the battery cell. The test ends when the battery cell temperature reaches steady state or drops to ambient temperature.	不爆炸，不起火 No explosion, no fire.
过放电测试 Over discharging test	单只电芯充满电后，在无 BMS 时，以 0.2I1 电流放电至 0.1V，用 40Ω 电阻短接 24h，再用充电电压 3.6V 限流 0.02I1 充电 48h，构成一个循环，连续进行五次循环后，以 0.2I1 电流放电至单体电芯终止电压 2.7V。 After a single battery cell is fully charged, discharge it with a current of 0.2I1 to 0.1V without BMS, short-circuit it with a 40 Ω resistor for 24 hours, and then charge it with a charging voltage of 3.6V and a current limit of 0.02I1 for 48 hours, forming a cycle. After five consecutive cycles, discharge it with a current of 0.2I1 to the terminal voltage of the single battery cell of 2.7V.	不爆炸，不起火，其容量不低于实测基准容量的 98%。 It will not explode or catch fire, and its capacity is not less than 98% of the measured benchmark capacity.
防浸泡 Anti Soaking	将充满电的电池组浸入室温下的水槽中，深度浸没电池表面为准，保持 24 小时，取出后，在环境温度 15℃～35℃，相对湿度 25%～85%，大气气压 86kPa～106kPa 下放置 4 小时。 Immerse the fully charged battery pack into a water tank at ambient temperature, with the depth of immersion on the surface of the battery as the standard, and maintain it for 24 hours. After removal, place it in an ambient temperature of 15 ℃~35 ℃, relative humidity of 25%~85%, and atmospheric pressure of 86kPa~106kPa for 4 hours.	电池应不泄露、不冒烟、不着火或不爆炸（符合 GB4208-2008 中浸水要求）。 The battery should not leak, smoke, catch fire or explode (comply with the water immersion requirements in GB4208-2008).

耐振动 Vibration Resistance	电池组充满电后，以大平面方向固定在振动台上，对电池组施以振幅为 2mm，频率为 16.7Hz，时间为 1h 的垂直振动，应符合 QB/T 2947.3-2008 中耐振动要求： （1）外壳不变形，不超过规定的外形尺寸范围； （2）由 n 只电池串联组成的电池电压，试验前后开路电压变化不超过±（0.2×n）V； After the battery pack is fully charged, it is fixed on the vibration table in a large plane direction and subjected to vibration The vertical vibration with an amplitude of 2mm, a frequency of 16.7Hz, and a time of 1h should comply with QB/T Vibration resistance requirements in 2947.3-2008: (1) The shell does not deform and does not exceed the specified range of external dimensions; (2) The voltage of a battery composed of n batteries connected in series shall not change by more than ± (0.2 × n) V in open circuit voltage before and after the test;	电池不泄露、不起火、不爆炸。 The battery will not leak, catch fire or explode.
盐雾等级 Salt spray level	电池组放入盐雾箱，在 15℃～35℃下喷盐雾 2 小时，喷雾结束后，将测试对象转移到湿热箱中贮存 20 小时～22 小时，温度为（40±2）℃，相对湿度为（93±3）%，组成一个循环。将这一循环再重复三次，然后在试验标准大气条件（温度为（23±2）℃，相对湿度为 45%～55%）下贮存 3 天，组成一个周期。重复进行 4 个周期试验。 The battery pack is put into the salt spray box and sprayed with salt spray at 15 ℃~35 ℃ for 2 hours. After the spray, the test object is transferred to the damp heat box and stored for 20 hours~22 hours. The temperature is (40 ± 2) ℃ and the relative humidity is (93 ± 3)%, forming a cycle. Repeat this cycle three more times and store for three days under standard atmospheric conditions (temperature of (23 ± 2) ℃, relative humidity of 45% to 55%) to form one cycle. Repeat the experiment for 4 cycles.	电池组应不漏液，外壳不破裂，不起火，不爆炸。 The battery pack should not leak, the shell should not crack, and there should be no fire or explosion.
恒定湿热 Steady damp-heat	电池组充满电后，在有 BMS 时，将其放入 60℃±2℃、相对湿度为 90%～95%的恒温恒湿箱中静置 12h 后，再将其取出在环境温度 25℃ ±2℃的条件下静置 2h，目测其外观，再以 1.0I1A 电流放电至终止电压。 After the battery pack is fully charged, place it in a constant temperature and humidity chamber with a BMS at 60 ℃± 2 ℃ and a relative humidity of 90% to 95% for 12 hours, then remove it and let it stand for 2 hours at an ambient temperature of 25 ℃± 2 ℃. Visually inspect its appearance, and discharge it with a current of 1.0I1A to the termination voltage.	电池组外观应无明显变形、锈蚀、冒烟或爆炸，其容量应不低于实测基准容量的 90%。 The battery pack should have no obvious deformation, rust, smoke or explosion on its appearance, and its capacity should not be less than 90% of the measured benchmark capacity.

抗跌落 Anti Fall	电池组以实际维修或者安装过程中最可能跌落的方向，若无法确定最可能跌落的方向，则沿 Z 轴方向，从 1m 的高度处自由跌落到水泥地面上，观察 2 小时。 The battery pack should be dropped in the most likely direction during actual maintenance or installation. If the most likely direction cannot be determined, it should be freely dropped from a height of 1m along the Z-axis onto a cement floor and observed for 2 hours.	电池组应不漏液、不起火、不爆炸。 The battery pack should not leak, catch fire or explode.
抗翻转 Flipping	电池组绕 Y 轴先以 90°/15 秒速度转动 360°，然后以 90°增量旋转，每隔 90°增量保持 1 小时，旋转 360°停止，观察 2 小时。 The battery pack first rotates 360 ° around the Y-axis at a speed of 90 °/15 seconds, and then rotates in increments of 90 °, holding every 90 ° increment for 1 hour. The rotation stops at 360 ° and is observed for 2 hours.	电池组应无泄漏、外壳破裂、着火、或爆炸等现象，并保持连接可靠、结构完好，试验后的直流电阻值不小于 100Ω/V。 The battery pack should not leak, have shell rupture, catch fire, or explode, and should maintain reliable connections and good structure. The DC resistance after the test should not be less than 100Ω/V.
抗碰撞	电池组充满电后，在有 BMS 时承受 x、y、z 三个方向的碰撞试验。初始 3ms 内平均加速度应不小于 75g，峰值加速度在 125g～175g 之间，碰撞次数为 1000 次±10 次。 After the battery pack is fully charged, it undergoes collision tests in the x, y, and z directions with BMS present. The average acceleration within the initial 3ms should not be less than 75g, the peak acceleration should be between 125g and 175g, and the number of collisions should be 1000 times ± 10 times.	电池组外观应无明显损伤、漏液、冒烟或爆炸，并能正常工作。 The battery pack should have no obvious damage, leakage, smoke or explosion, and should be able to work normally.
抗电强度	电池组正、负极接口分别对电池组外壳能够承受 50Hz、有效值为 500V 的交流电压（漏电流≤10mA）或 710V 的直流电压 1min。 The positive and negative interfaces of the battery pack can withstand an AC voltage of 50Hz with an effective value of 500V (leakage current ≤ 10mA) or a DC voltage of 710V for 1 minute on the battery pack casing.	应无击穿、无飞弧现象。 There should be no breakdown or arcing.
绝缘电阻	电池组正、负极接口分别对电池组外壳的绝缘电阻。 The insulation resistance of the positive and negative terminals of the battery pack to the battery pack casing respectively.	不小于 20MΩ。 Not less than 20MΩ.

Rest Period 搁置时间

Unless otherwise defined, 30mins, rest period after charge, 30mins, rest period after discharge.

如无特殊要求，电池充放电间隔为 30mins.

6.PCB 保护板资料

6.1 PCM parameter PCM 参数

No	Item	Condition	Specification
1	过充电 Overcharge	保护电压/Detection voltage	3.65V
		恢复电压/ Release voltage	3.38V
		保护延迟时间/ Detection delay time	1S
2	过放电 Over discharge	保护电压/Detection voltage	2.50V
		恢复电压/ Release voltage	2.70V
		保护延迟时间/ Detection delay time	1S
3	放电过流 Over discharge current	放电一级过流保护电流/Over current	110A
		放电过流保护延时/delay time	1S
		放电二级过流保护电流/Over current	150A
		放电过流保护延时/delay time	500mS
4	充电过流 Over charge current	充电过流保护电流/Over current	110A
		充电过流保护延时/delay time	1S
5	短路保护 Short circuit protection	短路保护功能/ Short detection function	有
		恢复条件/Release Conditions	移除负载自动解除
6	充电温度保护(电芯) Charging temperature protection	充电高温保护温度/ Charging high temperature protection temperature	55.0±5℃
		充电低温保护温度/ Charging low temperature protection temperature	0±5℃
7	放电温度保护（电芯） Discharge temperature protection	放电高温保护温度/ Discharge high temperature protection temperature	60.0±5℃
		放电低温保护温度/ Discharge low temperature protection temperature	-10±5℃
8	建议工作条件 Suggest working conditions	建议最大充电电流 max continuous charge current	50A
		建议最大放电电流 max continuous discharge current	50A

		建议工作温度/suggest working temperature	0℃～+50℃

6.2 状态指示 Status indicator

状态	正常/告警/保护	ON/OFF	RUN	ALM	电量指示 LED						说明
					L6	L5	L4	L3	L2	L1	
		●	●	●	●	●	●	●	●	●	
关机	休眠	灭	灭	灭	灭	灭	灭	灭	灭	灭	全灭
待机	正常	常亮	闪1	灭	依据电量指示						待机状态
	告警	常亮	闪1	闪3							模块低压
充电	正常	常亮	常亮	灭	依据电量指示 (电量指示最高 LED 闪2)						最高电量 LED 闪动（闪2），过充告警时 ALM 不闪烁
	告警	常亮	常亮	闪3							
	过充保护	常亮	常亮	灭	常亮	常亮	常亮	常亮	常亮	常亮	若无市电，指示灯转为待机状态
	温度、过流、失效保护	常亮	灭	常亮	灭	灭	灭	灭	灭	灭	停止充电
放电	正常	常亮	闪3	灭	依据电量指示						
	告警	常亮	闪3	闪3							
	欠压保护	常亮	灭	灭	灭	灭	灭	灭	灭	灭	停止放电
	温度、过流、短路、反接、失效保护	常亮	灭	常亮	灭	灭	灭	灭	灭	灭	停止放电
失效		灭	灭	常亮	灭	灭	灭	灭	灭	灭	停止充、放电

6.3 容量指示 SOC indicator

状态		充电						放电					
容量指示灯		L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●	L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●
电量（%）	0%～17%	灭	灭	灭	灭	灭	闪2	灭	灭	灭	灭	灭	常亮
	18%～33%	灭	灭	灭	灭	闪2	常亮	灭	灭	灭	灭	常亮	常亮
	34%～50%	灭	灭	灭	闪2	常亮	常亮	灭	灭	灭	常亮	常亮	常亮
	51%～66%	灭	灭	闪2	常亮	常亮	常亮	灭	灭	常亮	常亮	常亮	常亮
	67%～83%	灭	闪2	常亮	常亮	常亮	常亮	灭	常亮	常亮	常亮	常亮	常亮
	84%～100%	闪2	常亮	常亮	常亮	常亮	常亮	常亮	常亮	常亮	常亮	常亮	常亮
运行指示灯 ●		常亮						闪烁(闪3)					

6.4 指示灯闪烁说明 Flashing indicator light indication

闪动方式 Flashing method	亮 ON	灭 OFF
Flashing 1	0.25S	3.75S
Flashing 2	0.5S	0.5S
Flashing 3	0.5S	1.5S

备注：可通过上位机使能或禁止 LED 指示灯告警，出厂默认为使能的。

Note: The LED indicator light alarm can be enabled or disabled through the upper computer, and it is enabled by default at the factory.

6.5 蜂鸣器动作说明 Buzzer Action Description

故障时，每 1S 鸣叫 0.25S；

保护时，每 2S 鸣叫 0.25S（过压保护除外）；

告警时，每 3S 鸣叫 0.25S（过压告警除外）；

蜂鸣器功能可通过上位机使能或禁止，出厂默认是禁止的。

When there is a malfunction, it will beep for 0.25 seconds every 1 second;

During protection, beep every 2 seconds for 0.25 seconds (except for overvoltage protection);

When an alarm is triggered, it will beep for 0.25 seconds every 3 seconds (except for overvoltage alarms);

The buzzer function can be enabled or disabled through the upper computer, and it is disabled by default at the factory.

6.6 按键说明 RESET Button

BMS 处于休眠状态时，按下按键（3~6S）后松开，保护板被激活，LED 指示灯从“RUN”开始依次点亮 0.5 秒。

BMS 处于激活状态时，按下按键（3~6S）后松开，保护板被休眠，LED 指示灯从最低电量灯开始依次点亮 0.5 秒。

BMS 处于激活状态时，按下按键（6~10S）后松开，保护板被复位，LED 灯全部同时点亮 1.5 秒。

When the BMS is in sleep mode, press the button (3-6S) and release it to activate the protection board. The LED indicator lights will light up sequentially from "RUN" for 0.5 seconds.

When the BMS is in the active state, press the button (3-6S) and release it, the protection board will enter sleep mode, and the LED indicator lights will light up sequentially for 0.5 seconds starting from the lowest battery level light.

When the BMS is in the active state, press the button (6-10 seconds) and release it, the protection board is reset, and all LED lights are lit simultaneously for 1.5 seconds.

7.通讯 Communication

7.1 RS232 通信

BMS 可以通过 RS232 接口与上位机进行通讯，从而可通过上位机监控电池的各种信息，包括电池电压、电流、温度、状态及电池生产信息等，默认波特率为 9600bps。

BMS can communicate with the upper computer through RS232 interface, so as to monitor various information of the battery, including battery voltage, current, and temperature, through the upper computer

The default baud rate for degree, status, and battery production information is 9600bps.

7.2 CAN 通信

默认波特率 500K，此接口用于与逆变器通信，当此电池为主机时，可汇总从机数据与逆变器通信。

The default baud rate is 500K, and this interface is used for communication with the inverter. When the battery is the host, it can summarize data from the slave and communicate with the inverter.

7.3 RS485 通信

可以查看 PACK 的信息，默认波特率为 9600bps。如需通过 RS485 与监控设备通信，监控设备作为主机，

依据地址轮 询数据，地址设置范围为 2~15。

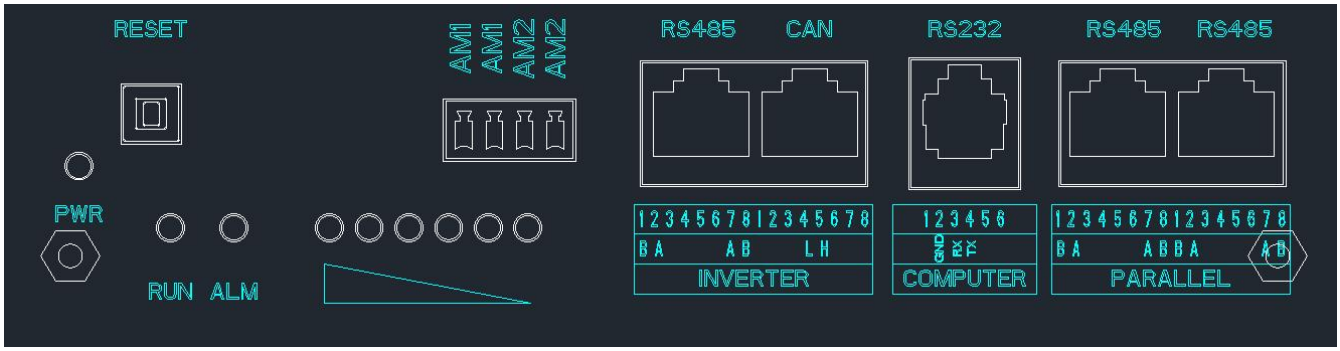
You can view the information of PACK, and the default baud rate is 9600bps. If communication with monitoring equipment is required through RS485, the monitoring equipment acts as the host and polls data based on the address, with an address setting range of 2-15.

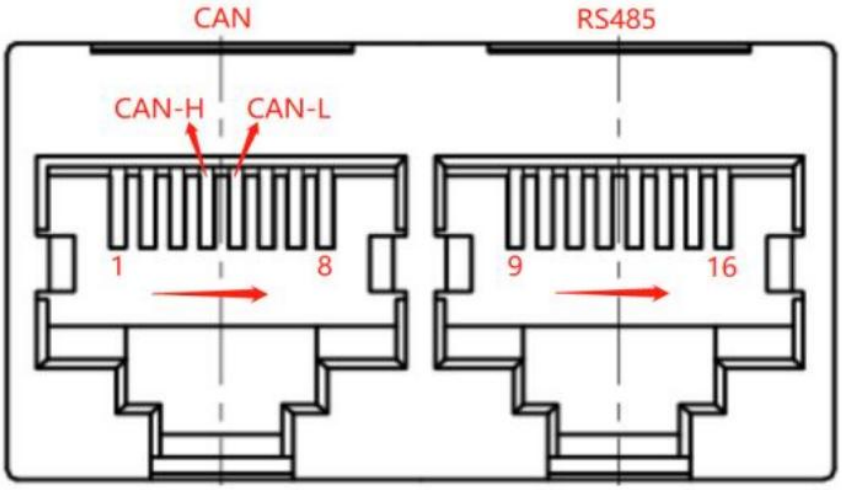
7.4 并机自动编码 Parallel automatically encode

通讯并机线路接好后，系统主机开机后进行自动编码（无所谓主从机开机顺序，主机开机后会一直自动编码）。编码失败，则相应单机所有指示灯一起闪烁。

After the communication parallel line is connected, the system host will automatically encode after booting up (there is no matter the order of master-slave boot up, the host will continue to encode automatically after booting up). If the encoding fails, all indicator lights of the corresponding single machine will flash together.

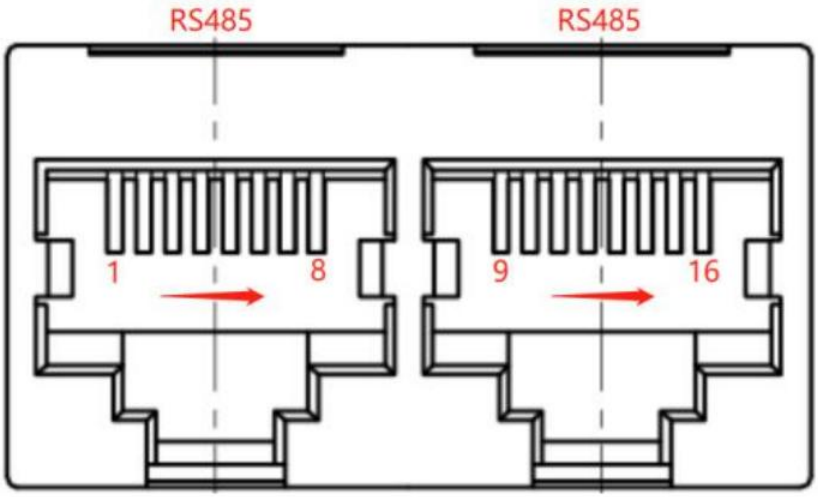
7.5 接口定义 Interface definition





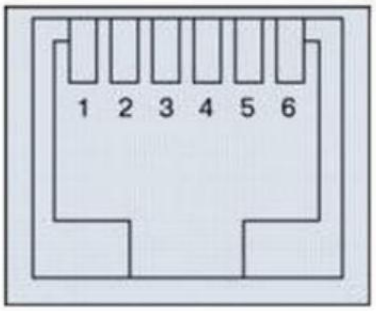
CAN 和 RS485 接口

CAN--采用 8P8C 立式 RJ45 插座		RS485--采用 8P8C 立式 RJ45 插座	
RJ45 引脚	定义说明	RJ45 引脚	定义说明
1、3、6、7、8	NC	9、16	RS485-B1
4	CAN-H	10、15	RS485-A1
5	CAN-L	11、14	GND
2	GND	12、13	NC



并联通讯端口

RS485--采用 8P8C 立式 RJ45 插座		RS485--采用 8P8C 立式 RJ45 插座	
RJ45 引脚	定义说明	RJ45 引脚	定义说明
1、8	RS485-B	9、16	RS485-B
2、7	RS485-A	10、15	RS485-A
3、6	GND	11、14	GND
4	GND	13	UP_IN
5	DN_OP+	12	GND



RS232 通讯接口

RS232--采用 6P6C 立式 RJ11 插座	
RJ11 引脚	定义说明
1、2、6	NC
3	TX（单板）
4	RX（单板）
5	GND

1 2 3 4

干接点

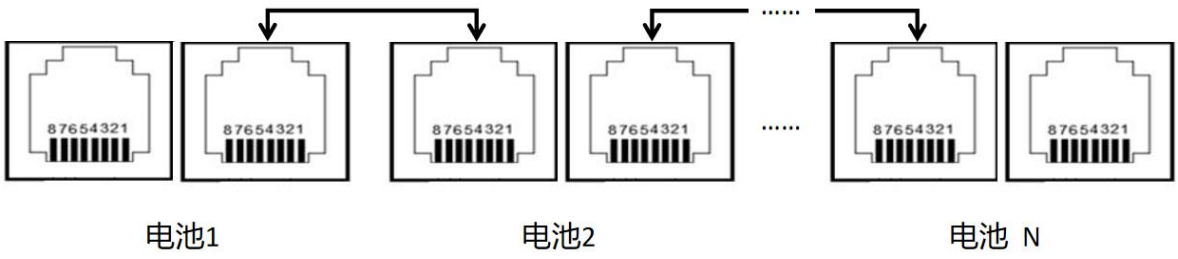
干接点 1-PIN1 to PIN2:常开，故障保护时闭合;

干接点 2-PIN3 to PIN4:常开，低电量告警闭合。

Dry contact 1-PIN1 to PIN2: normally open, closed during fault protection;

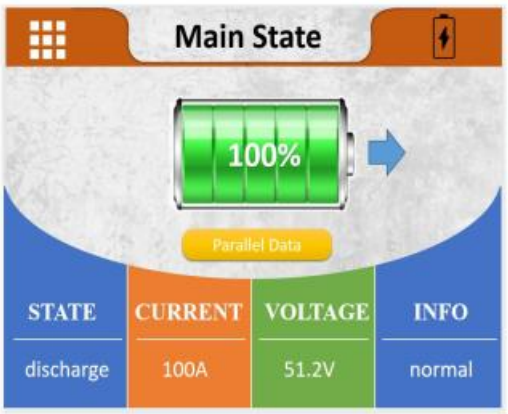
Dry contact 2-PIN3 to PIN4: normally open, low battery alarm closed.

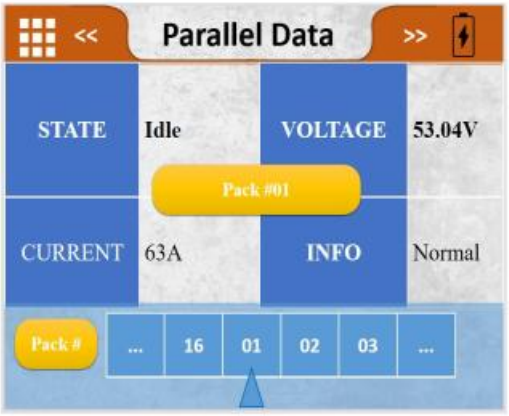
7.6 并机连接方式 Parallel connect method



8.触摸屏功能说明 Touch Screen Function Description

8.1 主状态页面 Main State Page

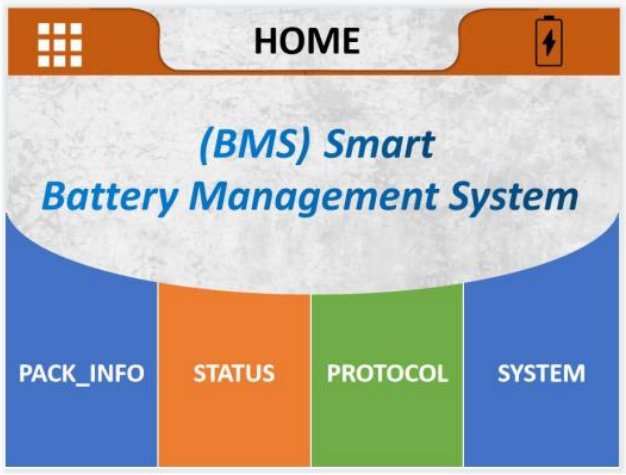




图标说明：Icon description

	**主菜单图标，点击进入主菜单主页界面** **Main menu icon, Click on to enter the Main Menu interface**
	**主状态图标，点击进入主状态 Main State 界面** **Main state icon, Click on to enter Main State interface**
	**并机数据图标，点击进入并机数据 Parallel Data 界面** **Parallel Data icon, Click on the enter Parallel Data interface**

8.2 HOME 页面



8.3 菜单结构：Menu Structure

Menu

main state page （主状态界面）

- SOC(Total)
- Current
- Voltage
- BMS INFO
- Warranty
- Parral data

SOC(each pack)

Current

Voltage

BMS INFO

HOME （主页）

- PACK Info （pack 电芯数据）

Voltage

Cell01 voltage

Cell02 voltage

.....

Cell16 voltage

Temperature

NT1

NT2

NT3

NT4

Mos_T

ENV_T

.....

- BMS Status
  - Warning
  - Protect
  - Fault
  - Record
- PROTOCOL(协议选择)
  - CAN
    - GOOD WE PROTOCOL
    - LV BMS Protocol(CAN) for Solar Inverter Family EN_V 1.5
    - PYLON PROTOCOL 2.0
    - Pylon CAN bus protocol V 2.0.420211122
    - SMA PROTOCOL
    - SMAF SS-Connecting Bat-TI-en-20W
    - GROW ATT_PROTOCOL
    - Growatt BMS CAN-Bus-protocol-low-voltage
  - RS485
    - USER_485_VOLTRON
    - Voltronic Inverter and BMS 485 communication protocol 20200325(1)
    - PYLON
    - RS 485-protocol-pylon-low-voltag
    - Luxpowertek Battery Protocol RS 485_V 01
- SYSTEM
  - （Language select）
    - English
    - 中文
    - (繁体中文)
  - PACK SN
  - （BLUETOOTH SN）

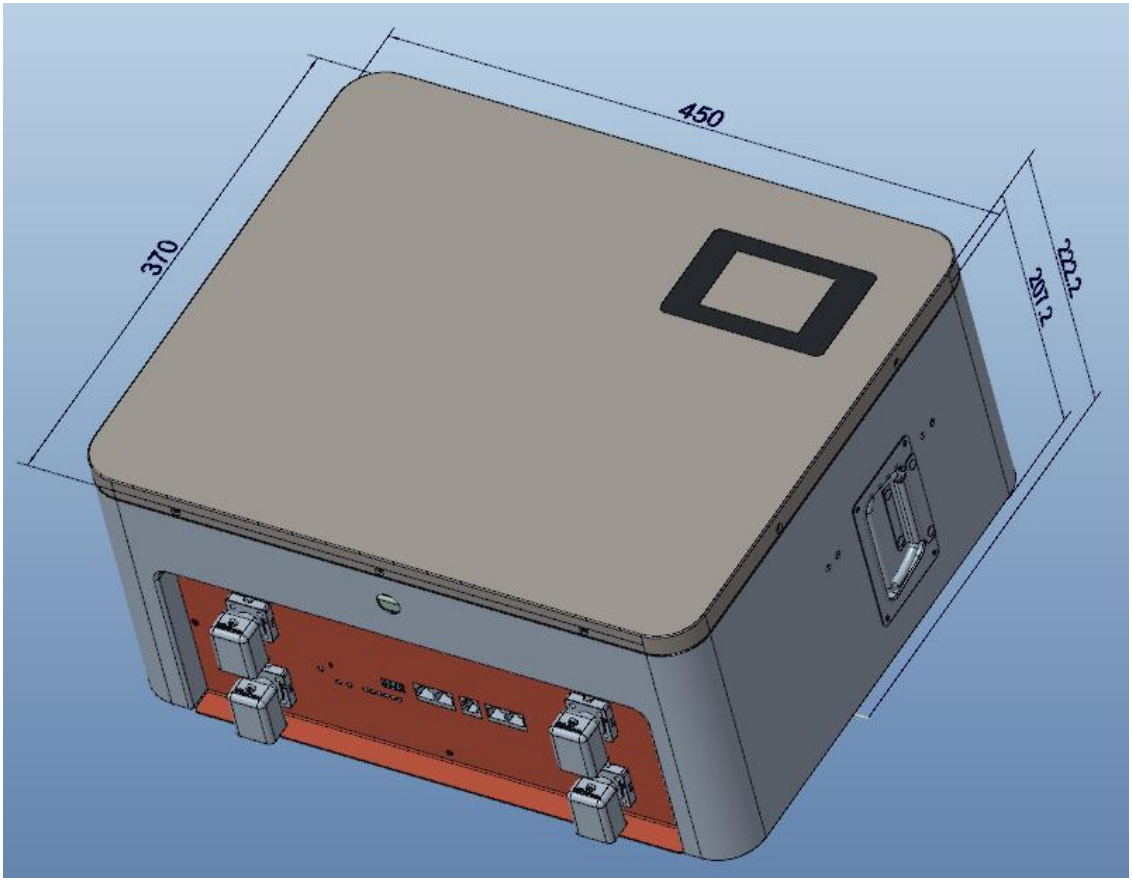
9.休眠/关机 Sleep/Shut down

在正常运行状态下， 无按键操作 3 分钟以后， 系统将进入休眠/关机状态。 在关机/休眠状态下，点击彩屏任一位置， 显示屏将会激活， 并进入息屏前的状态界面。

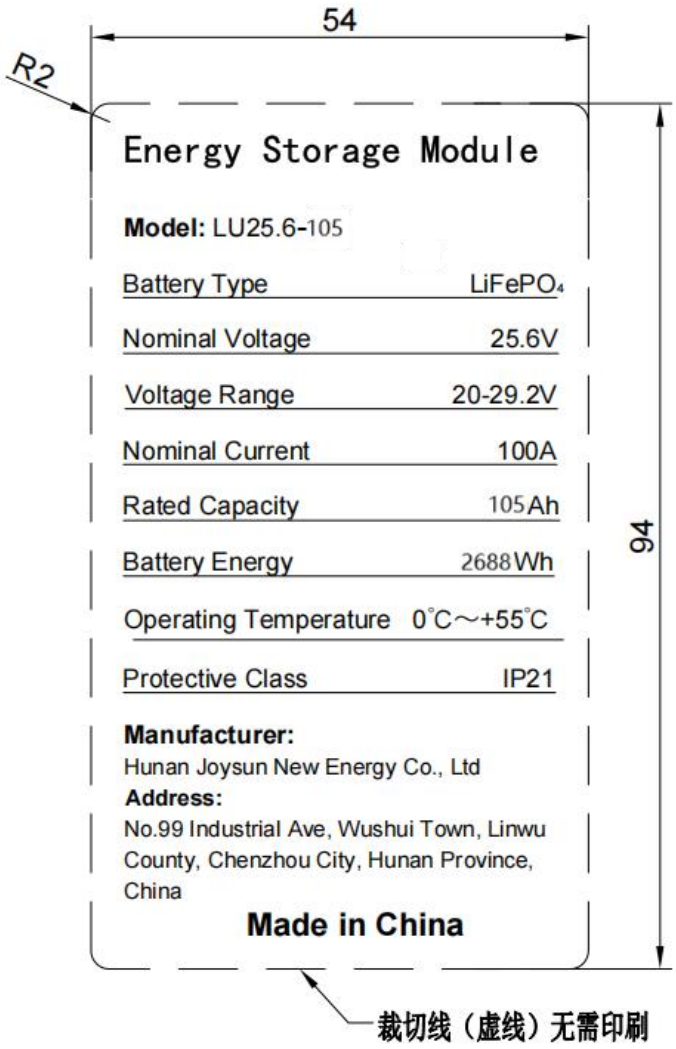
After 3 minutes of no button operation in normal operation, the system will enter sleep/shutdown mode. When in shutdown/sleep mode, clicking on any position on the color screen will activate the display screen and enter the state interface before turning off the screen.

10. Drawing of Pack 成品规格图纸

Unit 单位: mm



11.Drawing of Label 标贴图

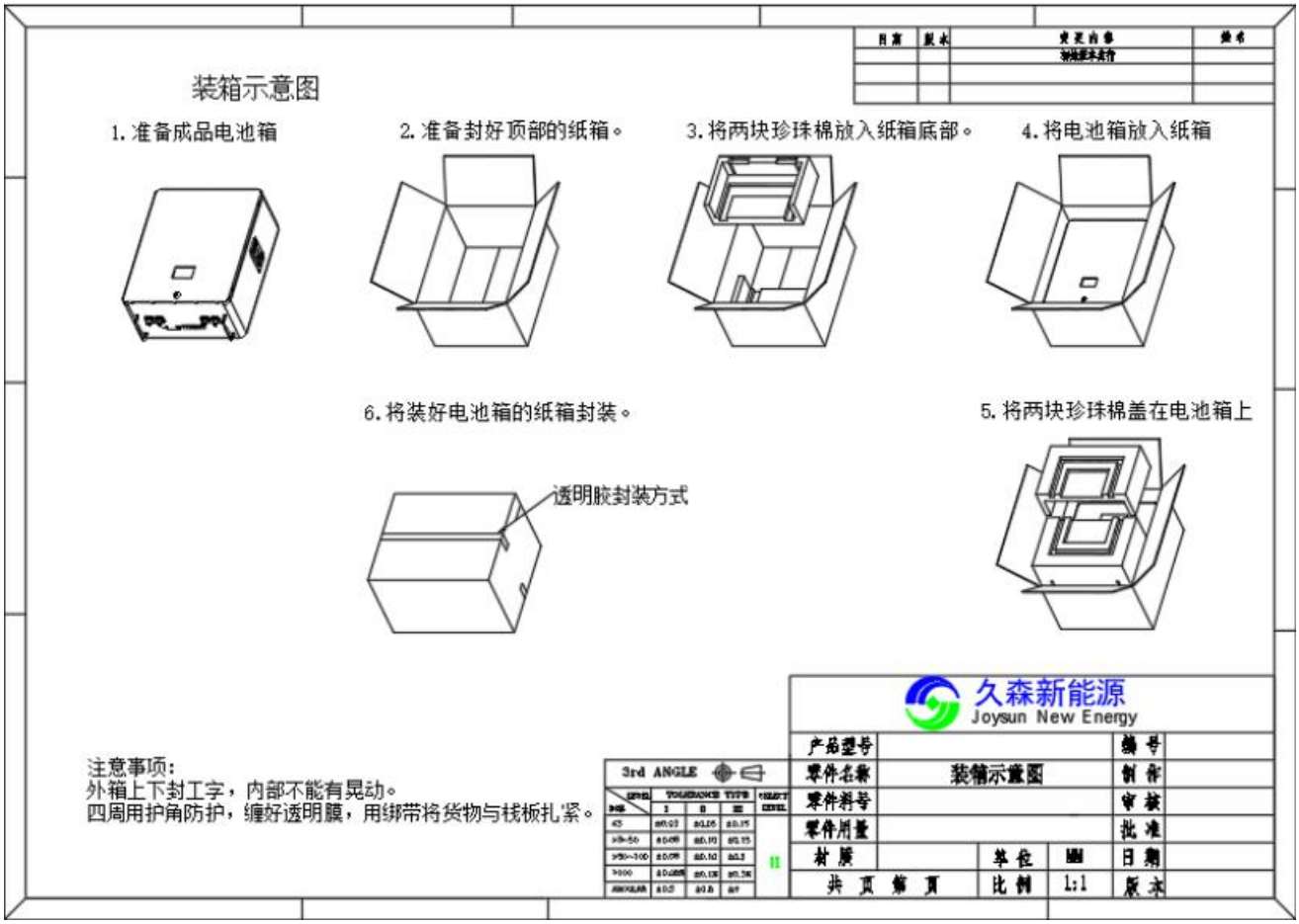


12.Pack List 包装清单

序号 No.	名称 Name	规格 Specification	数量 Quantity
1	电池组 Battery Pack	LU25.6-105	1PC
2	负极连接线 Negative wire	Black, 2 sides of SC25-6 head, 1.5M	1PC
3	正极连接线 Positive wire	Orange, 2 sides of SC25-6 head, 1.5M	1PC
4	网线 Network cable	2 sides of RJ45 Crystal head, 2.0M	1PC
5	膨胀螺丝 Expansion screw	M8*50 304Stainless steel	4PCS
6	P+ P-螺丝 P+ P- screw	M6*12 Stainless steel	4PCS
7	安装背架 Installation back frame		1PC

8	说明书 User Manual		1PC
9	合格证 Quality Certificate		1PC

13.Drawing of Packing 包装示意图



Appendix 附录

Handling Precautions and Guideline For $LiFePO_4$ Rechargeable Batteries 铁锂充电电池操作指示及注意事项

Preface 前言

This document of 'Handling Precautions and Guideline $LiFePO_4$ Rechargeable Batteries' shall be applied to the battery manufactured by Hunan Joysun New Energy Co., Ltd.

本档“铁锂充电电池操作指示及注意事项”仅适用于湖南久森新能源有限公司生产电池。

Note (1) ：声明一

The customer is requested to contact Hunan Joysun New Energy Co., Ltd. in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

客户若需要将电池用于超出本规格书规定以外的设备，或在本规格书规定以外的使用条件下使用电池，应事先联系湖南久森新能源有限公司，因为需要进行特定的实验测试以核实电池在该使用条件下的性能及安全性。

Note (2) ：声明二

Hunan Joysun New Energy Co., Ltd. will take no responsibility for any accident when the battery is used under other conditions than those described in this document.

对于在超出本规格书规定以外的条件下使用电池而造成的任何意外事故，湖南久森新能源有限公司概不负责。

Note (3)：声明三

Hunan Joysun New Energy Co., Ltd. will inform, in a written form, the customer of improvement(s) regarding proper use and handling of the battery, if it is deemed necessary.

如有必要，湖南久森新能源有限公司会以书面形式告知客户有关正确操作使用电池的改进措施。

1. Charging 充电

1.1 Charging current 充电电流

Charging current should be less than maximum charge current specified in the product specification. Charging with higher current than recommended value may cause damage to battery electrical，mechanical, and safety performance and could lead to heat generation or leakage.

充电电流不得超过本规格书中规定的最大充电电流。使用高于推荐值电流充电将可能引起电池的充放电性能、机械性能和安全性能的问题，并可能会导致发热或泄漏。

1.2 Charging voltage 充电电压

Charging shall be done by voltage less than that specified in the product specification (29.2V/battery). Charging beyond 29.2V, which is the absolute maximum voltage, must be strictly prohibited. The charger shall be designed to comply with this condition.

充电电压不得超过本规格书刊号中规定的额定电压（29.2V/电池）。29.2V 为充电电压最高极限，充电器的设计应满足此条件。

It is very dangerous that charging with higher voltage than maximum voltage may cause damage to the battery electrical, mechanical safety performance and could lead to heat generation or leakage.

电池电压高于额定电压值时，将可能引起电池的充放电性能、机械性能和安全性能的问题，可能会导致发热或泄漏。电池电压高于额定电压值时，将可能引起电池的充放电性能、机械性能和安全性能的问题，可能会导致发热或泄漏。

1.3 Charging temperature 充电温度

The battery shall be charged within the range in the product specification.

电池必须在本规格书要求的环境温度范围内进行充电。

1.4 Prohibition of reverse charging 禁止反向充电

Reverse charging is prohibited. The battery shall be connected correctly. The polarity has to be confirmed before wiring. In case of the battery is connected improperly, the battery cannot be charged. Simultaneously, the reverse charging may cause damaging to the battery which may lead to degradation of battery performance and damage the battery safety, and could cause heat generation or leakage.

正确连接电池的正负极，严禁反向充电。若电池正负极接反，将无法对电池进行充电。同时，反向充电会降低电池的充放电性能、安全性，并会导致发热、泄漏。

2. Discharging 放电

2.1 Discharging current 放电电流

The battery shall be discharged at less than the maximum discharge current specified in the product specification. High discharging current may reduce the discharging capacity significantly or cause over-heat.

放电电流不得超过本规格书规定的最大放电电流，大电流放电会导致电池容量剧减并导致过热。

2.2 Discharging temperature 放电温度

The battery shall be discharged within the range specified in the product specification.

电池必须在本规格书要求的环境温度范围内进行放电。

2.3 Over-discharging 过放电

Over-discharging may causes loss of battery performance, characteristics, or battery functions.

过放电会导致电池性能、电池功能的丧失。

The charger shall be equipped with a device to prevent further discharging exceeding a cut-off voyage specified in the product specification. Also the charger shall be equipped with a device to control the recharging procedures as follows: The battery pack shall start with a low current (0.1C) for 15 - 30 minutes, i.e. pre-charging, before rapid charging starts. The rapid charging shall be started after the （individual）battery voltage has been reached above 24V within 15 - 30 minutes that can be determined with the use of an appropriate timer for pre-charging. In case the (individual) battery voltage does not rise to 24V within the pre-charging time, then the charger shall have functions to stop further charging and display the battery/pack is at abnormal state.

充电器应有装置来防止电池放电至低于本规格书规定的截止电压。此外，充电器还应有装置以防止重复充电，步骤如下：电池在快速充电之前，应先以一小电流（0.1C）预充电 15~30 分钟，以使电芯的电压达到 24V 以上，再进行快速充电。可用一记时器来实现该预充电步骤。如果在预充电规定时间内，电池的电压仍未升到 24V 以上，充电器应能够停止下一步快速充电，并显示该电池/电池正处于非正常状态。

3. Storage 贮存

If the battery has to be storied for a long time, the environmental condition should be: Temperature:23±2℃,Humidity: 65±20％RH

长期存储电池须置于温度为 23±2℃、湿度为 65±20％RH 的环境中。

The voltage for a long time storage shall be 26.4~28.4V range.

贮存电压为 26.4~28.4V。

We recommend that batteries be charged about once per three months to prevent over discharge.

如长时间储存，建议每三个月充一次电以防止电池过放电。

4. Handling Instructions 电池的注意事项

Read and observe the following warnings and precautions to ensure correct and safe use of $LiFePO_4$ batteries.

认真阅读下面的注意事项，确保正确使用铁锂电池。湖南久森新能源有限公司对违反下述注意事项而产生的任何问题不予负责。

Danger!

危险！

- Do not immerse the battery in water or allow it to get wet.
- 勿将电池投入水中或将其弄湿！
- Do not use or store the battery near sources of heat such as a fire or heater.
- 禁止在火源或极热条件下给电池充电！勿在热源（如火或加热器）附近使用或贮存电池！如果电池泄漏或发出异味，应立即将其从接近明火处移开；
- Do not use any chargers other than those recommended.
- 请使用专用充电器！
- Do not reverse the positive (+) and negative (-) terminals.

- 勿将正负极接反！
- Do not connect the battery directly to wall outlets or car cigarette-lighter sockets.
- 勿将电池直接连接到墙上插座或车载点烟式插座上！
- Do not put the battery into a fire or apply direct heat to it.
- 勿将电池投入火中或给电池加热！
- Do not short-circuit the battery by connecting wires or other metal objects to the positive (+) and negative (-) terminals.
- 禁止用导线或其它金属物体将电池正负极短路，禁止将电池与项链、发夹或其它金属物体一起运输或贮存！
- Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
- 禁止用钉子或其它尖锐物体刺穿电池壳体，禁止锤击或脚踏电池！
- Do not strike, throw or subject the battery to sever physical shock.
- 禁止撞击、投掷或者使电池受到机械震动！
- Do not directly solder the battery terminals.
- 禁止直接焊接电池端子！
- Do not attempt to disassemble or modify the battery in any way.
- 禁止以任何方式分解电池！
- Do not place the battery in a microwave oven or pressurized container.
- 禁止将电池置入微波炉或压力容器中！
- Do not use the battery in combination with primary batteries (such as dry-battery batteries) or batteries of different capacity, type or brand.
- 禁止与一次电池（如干电池）或不同容量、型号、品种电池组合使用！
- Do not use the battery if it gives off an odor, generates heat, becomes discolored or deformed, or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charger immediately and discontinue use.
- 如果电池发出异味、发热、变形、变色或出现其它任何异常现象时不得使用；如果电池正在使用或充电，应立即从用电器中或充电器上取出并停止使用！

Caution!

注意！

Do not use or store the battery where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the battery may be overheated. This can also reduce battery performance and/or shorten service life.

不要使用处于极热环境中的电池，如阳光直射或热天的车内。否则，电池会过热，可能着火（点燃），这样就会影响电池的性能、缩短电池的使用寿命。

If the battery leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean running water and immediately seek medical attention. If left as is, electrolyte can cause eye injury.

如果电池漏液后电解液进入眼睛，不要擦，应用水冲洗，立即寻求医疗救助。如不及时处理，眼睛将会受到伤害。

5.Amendment of this Specification 产品规格书的修订

This specification is subject to change with prior notice. Any matters that this specification does not cover should be conferred between the customer and Joysun.

本公司有权对本产品规格书进行修订，在对产品规格书修订后湖南久森新能源有限公司将会通知客户。本说明书中未提及的事项，需经双方协商确定。