

Product Specification

Customer's Name:

客户名称:

Spec.No. : File. No.:

Ver: A/0

Date: 2023. 1. 1

LiitoKala Power Co., Ltd.

深圳市鑫盛力电源有限公司

Specification For Approval 客户承认书

Model : XSL-12.8V100A

型 号: XSL-12.8V100A

Type : 4S1P-12.8V100Ah(储能)

类 型: 4S1P-12.8V100Ah(储能)

Draft	Checked	Approval
Customer Approval		

Product Specification

History of specification

规格书修订记录

Date	Contents	Remarks

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1. Scope (适用范围)

This specification applies to 12.8V100Ah LiFePO4 rechargeable batteries produced by LiitoKala Power Co., Ltd.

本规格书适用于深圳市鑫盛力电源有限公司生产的 12.8V100Ah 磷酸铁锂可充电电池。

2. Battery Cell Specification (电芯技术参数)

No. (序号)	Item (项目)	General Parameter (常规参数)		Remark (备注)
		Typical (标称容量)	Minimum (最小容量)	
1	Rated Capacity (额定容量)	100Ah		
		90Ah		
2	Nominal Voltage (正常电压)	3.2V		Mean Operation Voltage (即工作电压)
3	Internal Impedance (内阻)	≤1mΩ		Internal resistance measured at AC 1KHz after 50% charge (半电态下用交流法测量内阻) The measure must uses the new batteries that within one week after shipment and cycles less than 5 times (使用出货后不到一个星期及循环次数少于 5 次的新电池测量)
4	Dimension (尺寸)	Thickness/厚度:Max 33mm		Initial Dimension (初始尺寸)
		Width/宽度: Max 175mm		
		Height/高度: Max 195mm		
5	Weight (重量)	2.2±0.15kg		N.A
6	Standard charge (标准充电)	0.5C		25±2°C
7	Standard charge voltage 标准充电模式	0.5C 恒流持续充电至单体电压最大 3.65V, 然后在常压 3.65V 下恒压持续充电直至电流下限 0.05C。 0.5C constant current charge to 3.65V, then continue charge with the voltage of 3.65V, until the current decrease to 0.05C		
8	Standard discharge (标准放电)	0.5C		25±2°C
9	Maximum discharge current 最大放电持续电流	1C		N.A
10	Typical Energy (标准能量)	320Wh		25±2°C, 0.5C/0.5C, 新电池状态 25±2°C, 0.5C/0.5C, discharge, fresh cell

Cell
单体电
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3. Battery Pack Specification (电池组技术参数)

No. (序号)	Item (项目)	General Parameter (常规参数)		Remark (备注)
1	Combination method (组合方式)	4S1P		
2	Rated Capacity (额定容量)	Typical (标称容量)	100Ah	Standard discharge after Standard charge (package) (标准充电后标准放电 (针对电池组))
		Minimum (最小容量)	90Ah	
3	Factory Voltage (出厂电压)	12.8V-12V		Mean Operation Voltage (即工作电压)
4	Voltage at end of Discharge (放电终止电压)	8-10.8V		Discharge Cut-off Voltage (放电截止电压)
5	Charging Voltage (充电电压)	14.6V		
6	Internal Impedance (内阻)	≤80mΩ		Internal resistance measured at AC 1KHz after 50% charge (半电态下用交流法测量内阻) The measure must uses the new batteries that within one week after shipment and cycles less than 5 times (使用出货后不到一个星期及循环次数少于 5 次的新电池测量)
7	Standard charge (标准充电)	Constant Current 20A Constant Voltage see No.5 0.02CA cut-off (持续电流: 20A 持续电压: 见序号 5 截止电流: 0.02CA)		
	Limiting current (限流充电)	20A		
8	Standard discharge (标准放电)	Constant current: 100A end voltage see NO.4 (持续电流: 100A 截止电压: 见序号 4)		
9	Maximum Continuous Charge Current (最大充电持续电流)	20A		
10	Maximum Continuous Discharge Current (最大放电持续电流)	100A		100A when 0°C > T ≥ -10°C 50A when -10°C > T ≥ -20°C
11	Operation Temperature Range (工作温度范围)	Charge (充电): 0~45°C		60±25%R.H. Bare Cell (单体电池储存湿度范围)
		Discharge (放电): -20~55°C		
12	Storage Temperature Range (储存温度范围)	Less than 12 months: -10~35°C (小于 12 月: -10~35°C)		60±25%R.H. at the shipment state (出货状态时的湿度范围)
		less than 3 months: -10~45°C (小于 3 个月: -10~45°C)		
		Less than 7 day: -20~65°C (小于 7 天: -20~65°C)		
13	Dimensions (尺寸)	330*170*220mm		Include case
14	Weight (重量)	约10kg		Include case

4. Battery Testing Equipment and Conditions (电池测试设备及要求)

4.1 Appearance (外观和结构)

There shall be no such defect as 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 having inner impedance not less than 10 K Ω /V.

国家标准或更灵敏等级,内阻不小于 10 K Ω /V.

(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 0.01 Ω .

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 0.01 Ω .

(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 \pm 2 $^{\circ}$ C and relative humidity of less 75%,air 86Kpa~106Kpa.

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 \pm 2 $^{\circ}$ C，相对湿度 \leq 75%，气压 86Kpa~106Kpa。

4.4 Rest Period (搁置时间)

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

如无特殊要求，电池充放电间隔为 30min。

5.Storage and Others (贮存及其它事项)

5.1 Long Time Storage (长期贮存)

If stored for a long time(don't used, exceed three months), the cell should be stored in drying and cooling place. The cell's storage voltage should be 25.6V-26V and the cell is to be stored in a condition that the temperature of 23 \pm 2 $^{\circ}$ C and the humidity Of 45%- 75%. Long-term use of unused batteries to recharge every 3 months.Ensure that the battery voltage is within the above range.

长期贮存的电池（未使用,超过 3 个月）须置于干燥、凉爽处。贮存电压为 25.6V-26V。储存于 23 \pm 2 $^{\circ}$ C，湿度为 45%-75%的洁净环境。长期搁置未使用电池每 3 个月补电一次，确保电池电压在上述范围内。

5.2 Others (其它事项)

Any matters not mentioned in this specification must be negotiated by both parties

任何本规格书中未提及的事项，须经双方协商确定

6. Battery Management System (电池管理系统)

6.1 BMS Specification (电池管理系统说明)

1): The BMS is designed for 4 series lithium battery. (BMS 为4 串锂离子电池设计)

2): The BMS have all functions which are : (该 BMS 系统具有以下一些功能)

- ◆ overcharge detection function (过充电保护功能)
- ◆ over discharge detection function (过放电保护功能)
- ◆ over current detection function (过电流保护功能)
- ◆ short detection function (短路保护功能)
- ◆ Temperature detection function (温度保护功能)
- ◆ balance function (均衡功能)

6.2 BMS Protect parameter (电池管理系统保护参数)

12V 4S 磷酸铁锂保护线路模块设定 Typical value specifications

Items	Details	Standard
Cell overcharge protection	Overcharge detection voltage	3.65±0.025V
	Overcharge detection delay time	Typical:1.0s
	Overcharge release voltage	3.38±0.02V
Cell over-discharge protection	Over-discharge detection voltage	2.5±0.02V
	Over-discharge detection delay time	Typical:1.0s
	Over-discharge release voltage	2.8±0.02V or charge release
Over-current protection	discharge Over-current protection current1	200±1A
	discharge Over-current detection delay time 1	1S
	discharge Over-current protection current2	100±1A
	discharge Over-current detection delay time2	≤100m±50ms
	Charge OC protection current	50±1A
Short protection	Short protection current	200±1A
	Protection condition	Load short
Temperature(T) protection	Detection delay time	≤200us
	Protection release condition	Charging release
	Charge high T protection	55±3℃
	Charge high T recover	50±5℃
	Discharge high T protection	65±5℃7/1

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磷酸铁锂充电电池操作指示及注意事项

Preface 前言

This document "Operation Instructions and Precautions for LiFePO4 Rechargeable Battery" is only applicable to batteries produced by LiitoKala Power Co., Ltd.

本档“磷酸铁锂充电电池操作指示及注意事项”仅适用于深圳市鑫盛力电源有限公司生产电池。

Note (1) : 声明一

The customer is requested to contact LiitoKala Power 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，应事先联系深圳市鑫盛力电源有限公司，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

LiitoKala Power Co., Ltd. will take no responsibility for any accident when the cell 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，深圳市鑫盛力电源有限公司概不负责。

Note (3) : 声明三

If necessary, LiitoKala Power Co., Ltd. will inform customers in writing of the improvement measures for correct operation and use of batteries.

如有必要，深圳市鑫盛力电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。**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；
 - Please use a dedicated charger!
 - 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
-