深圳市万利兴科电子有限公司
SHENZHEN MANLY BATTERY CO.,LTD

Product specification
产品规格书

Product 产品	:	Rechargeable lithium iron phosphate battery pack 可充磷酸锂铁($LiFePO_4$) 电池组
Model 型号	:	12.8V-120Ah 1536Wh
Specification Number 规格书编码	:	

Manufacturer approved 制造商批准

Prepared by 编制	Review 审核	Approve 批准

Client confirmation 客户承认

Signature 签字	Date 日期

版本记录 Version record

Version 版本	Date 日期	Prepared by 编制	Version description 更改描述
V01	2023.02.09	B.P.	首版 First edition

Contents 目录

1. Scope 概要

This specification describes the characteristics and performance of rechargeable lithium iron phosphate batteries manufactured by Shenzhen Manly Battery Co., Ltd. All tests, applications and treatments must be carried out according to specifications, conditions and guidelines. For any questions, please contact Manly.

此规格书注明和描述深圳市万利兴科电子有限公司的可充磷酸锂铁电池之特性和性能. 所有测试, 应用和处理必须按规格参数, 条件和指引进行. 有任何疑问, 请联系万利兴科.

2. Reference standard 参考标准

此规格书符合之标准包括 GB/T18287-2013, UL1642, UL2054 and CE61960.

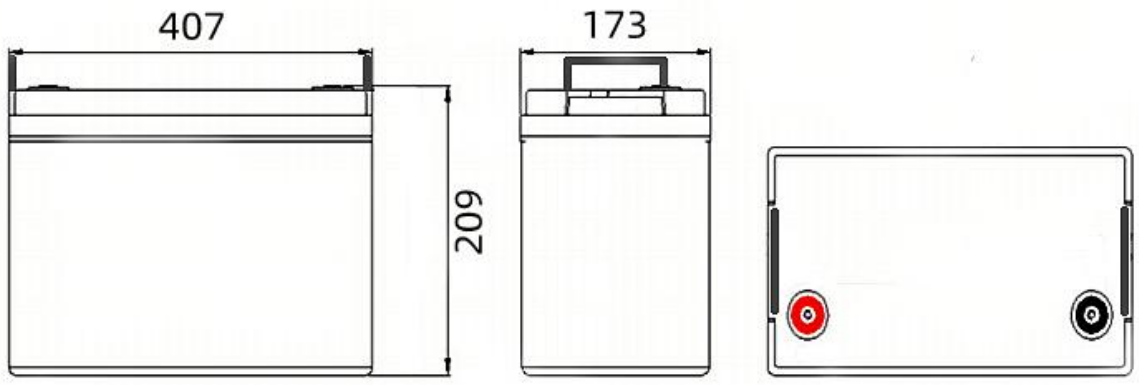
The standard reference GB/T18287-2013, UL1642 and CE61960 technology standards compiled.

3. Characteristics 特性

Characteristics 特性	Parameter 参数	Condition 条件
1. Nominal Capacity 额定容量	120Ah	Minimum capacity 116.0Ah
2. Nominal Voltage 额定电压	12.8V	
3. Max charge voltage 最大充电电压	14.6V	
4. Discharge Cut-off Voltage 放电终止电压	10.0V	
5. Standard Charge Current 标准充电电流	24A	
6. Standard Discharge Current 标准放电电流	24A	
7. Max continuous charge current 最大连续充电电流	120A	
8. Max continuous discharge current 最大连续放电电流	120A	
9. Cycle life 循环寿命	≥5,000	80%DOD@ 0.2C
10. Weight 重量	Approx:15.5KG	
11. Operating Temperature 工作温度	Charge, 0℃ ~ 45℃	
	Discharge, -20℃ ~ 75℃	
12. Storage Temperature 贮存温度	-20 ~ 45℃	≤1 个月 one month
	-20 ~ 35℃	≤ 3 个月 3months
	-20 ~ 25℃	≤ 12 个月 12months
	25℃	>12 个月 12months

4. Structure 结构和组合方式

包装 Packing	ABS plastic shell
结构尺寸 Structure size	407(L)*173(W)*209(H)mm
出线及插头 Wire and Connector	Metal terminal
备注 Remark	/



Unit:mm

Structural dimension drawing

Product picture

5. Material list 材料清单

NO. 项	Part number 部件号码	Part Name 部件名称	Describe 描述	Unit 单位	Quantity 数量
1		Cell 电芯	Lithium Iron Phosphate Cell 磷酸铁锂电芯	pcs	/
2		PCM 保护板	4 series iron lithium protection board,Maximum current 130A 4 串铁锂保护板，最大电流 130A	pcs	1
3		Connector 连接器	Metal terminal	pcs	2
4		Shell	ABS plastic shell	pcs	1

6. General performance testing 一般性能测试

Testing 测试	Condition&method 条件和方法	Testing tools 测试工具	Result&performance 结果和性能表现
Capacity 电池容量	Charge by standard charging, constant current 0.2C5A, when the voltage is charged to the maximum charging voltage, switch to constant voltage charging, stop charging when the current drops to 0.05C5A. Then discharge to the end voltage by standard, measure the battery capacity. 以标准充电方式充电，恒流电流 0.2C_5A，当电压充至最大充电电压，转换到恒压电压充电，电流下降到 0.05C_5A 停止充电.然后以标准放电至终止电压，量度电池容量。	Secondary batteries testing equipment 二次电池检测设备	Capacity ≥ 95%nominal capacity 电池容量 ≥ 额定容量 95%
Cycle life 循环寿命	Under the condition of 25±5℃, charge in the standard way, set aside for 30min. Then discharge in the standard way, measure and record the discharge capacity, cycle 2000 times 在 25±5℃条件下，标准方式充电，搁置 30min.然后以标准方式放电，量度和记录放电容量，循环 2000 次	Secondary batteries testing equipment 二次电池检测设备	Checking capacity ≥Initial capacity 70% 量度容量 ≥ 初始容量 80%
Self-discharge 自放电	After standard charging, store at 25±5℃ for 28 days, then discharge in standard way, measure and record the discharge capacity. 标准充电后，在 25±5℃条件下贮存 28 天，再以标准方式放电，量度和记录放电容量	Secondary batteries testing equipment 二次电池检测设备	Checking capacity ≥Nominal capacity 95% 量度容量 ≥ 额定容量的 95%, Self-discharge≤ 5% 自放电 ≤ 5%
Temperature Characteristics 温度特性	Under the condition of 25±5℃, after charging in the standard way, discharge at 25±5℃, -10℃, 60℃ respectively, measure and record the battery capacity, and calculate the percentage based on the discharge capacity at 25℃. 在 25±5℃条件下，标准方式充电后，分别在 25±5℃，-10℃， 60℃温度条件下放电， 量度和记录电池容量，以 25℃时放电容量为基准计算百分比。	Secondary batteries testing equipment 二次电池检测设备	25±5℃, 100% -10℃，≥60% 60℃，≥85%

7. Mechanical characteristics testing 机械性能测试

Testing 测试	Condition&method 条件和方法	Testing tools 测试工具	Result&performance 结果和性能表现
Drop 跌落	At 25 ± 5 ° C, after standard charging, the battery dropped from a height of 75 cm onto the hardwood, and the X, Y, and Z faces each time. 在 25±5℃条件下，标准充电后，电池从 75cm 高处跌落到硬木上，X、Y、Z 面各跌落下一次。		No fire, No explosion. 不起火， 不爆炸
Vibration Test 振动	Under the condition of 25±5℃, after standard charging, vibrate according to the following conditions: Vibration wave: sine wave Vibration frequency: 16.7Hz Vibration time: 1 hour Vibration direction: any Amplitude: 1mm After vibration, the battery is charged in a standard way and discharged in a standard way. 在 25±5℃条件下，标准充电后，按以下条件振动： 振动波：正弦波 振动频率：16.7Hz 振动时间：1 小时 振动方向：任意 振幅：1mm 振动后，电池进行标准充电，以标准方式放电.	Secondary batteries test equipment 二次电池检测设备 Vibration platform 振动台	No fire No smoke No explosion 无变形、破裂、发火； 可继续充放电

8. Safety Characteristic testing 安全性能测试

Testing 测试	Condition&method 条件和方法	Testing tools 测试工具	Result&performance 结果和性能表现
Over current protection 过流保护	After the standard charge, when the current exceeds the protection current value 标准充电后，电流超过保护电流值时。	Secondary batteries test equipment 二次电池检测设备	When the battery pack discharge current reaches the overload protection current value, the circuit alarm should be cut off. The battery pack should not leak, smoke, catch fire or explode. After troubleshooting, it should be able to resume work automatically 电池组放电电流达到过载保护电流值时. 应切断电路井告苦。电池组应不漏液、冒烟、起火或爆炸。故障排除后. 应能自动恢复工作
Over charge protection 过充保护	After standard charging, discharge at 1 C current, record the protection operating voltage, and discharge the battery pack to the end voltage. 标准充电后，以 1 C 电流放电，记录保护动作电压，电池组放电至终止电压后	Secondary batteries test equipment 二次电池检测设备	When the battery pack is in an overcharged state, the charging circuit should be cut off and an alarm should be issued. The battery pack should not leak, smoke, catch fire or explode. 电池组处于过充电状态时，应切断充电电路并告警，电池组应不漏液、冒烟、起火或爆炸。
Over discharge protection 过放保护	Standard charging, discharge 10H with a current of 2A to set the discharge voltage to 0V. 标准充电后，用 2A 电流放电 10H，设定放电电压 0V。	Secondary batteries test equipment 二次电池检测设备	The discharge circuit should be cut off and an alarm should be issued. The battery pack should not leak, smoke, catch fire or explode. 应切断放电电路并告警，电池组应不漏液、冒烟、起火或爆炸。

9. Safety precaution and prohibitions 安全预防措施和禁律

To avoid battery leakage, overheating, fire, function or life reduction, you must follow the specified battery test or usage guidelines.

为避免电池漏液，过热，起火, 功能或寿命削减，必须按规定的电池测试或使用指引.

10. Storage 贮存

Must be treated according to the specified battery storage temperature. The battery storage place must be away from high temperature, humid place, so as not to cause the battery to overheat and cause fire.The battery pack must be powered up every 3-6 months, otherwise the service life of the battery pack will be shortened. In serious cases, a micro short circuit will occur inside the battery cell, resulting in the battery pack being unable to use.

必须按规定的电池贮存温度处理. 电池贮存地方必须远离高温，潮湿的地方，以免电池过热引致起火. 电池组每 3-6 个月必须补电，否则电池组寿命会缩短，严重情况下电芯内部会发生微短路，导致电池组无法使用。

11. Warranty 保质期

The shelf life of the battery is two years. Any non-manufacturing related reasons, such as handling, storage, application, etc., do not meet the requirements, and the shelf life is invalid.

电池保质期为两年. 任何非制造相关原因，例如处理, 贮存, 应用等不符合规定, 保质期一律无效.

12. PCM 保护板

Function 功能	Test items 测试项目	Parameter 参数			Unit 单位
		Minimum value 最小值	Typical value 典型值	Maximum value 最大值	
Operating voltage 工作电压	Voltage range 电压范围	10		14.6	V
Operating current 工作电流	Charging current 充电电流	-	130	150	A
	Discharge current 放电电流	-	130	150	A
Cell overcharge protection 单体过充保护	Protection voltage 保护电压	3.6	3.65	3.7	V
	Protection delay time 保护延时时间	1000	2000	3000	ms
	Recovery voltage 恢复电压	3.45	3.5	3.55	V
Cell over-discharge protection 电芯过放保护	Protection voltage 保护电压	2.45	2.5	2.55	V
	Protection delay time 保护延时时间	1000	2000	3000	ms
	Recovery voltage 恢复电压	2.6	3.0	3.1	V
	Recovery conditions 恢复条件	Charge recovery 充电恢复			
Charge overcurrent protection 充电过流保护	Overcurrent protection value 过流保护电流	155		165	A
	Charge overcurrent delay 充电过流延时	2000	5000	7000	mS
	Overcurrent Release Condition 过流释放条件	Automatic recovery after a delay of 32S 延时 32 秒后自动恢复			
Discharge overcurrent protection 放电过流保护	Overcurrent protection current 1 过流保护电流 1	155		165	A
	Protection delay time 1 保护延时时间 1	2000	5000	7000	mS
	Overcurrent protection current 2 过流保护电流 2	250	280	350	A
	Protection delay time 2 保护延时时间 2	200		1000	ms
	Overcurrent Recovery Condition 过流恢复条件	Automatic recovery after a delay of 32S 延时 32 秒后自动恢复			

Short circuit protection 短路保护	Protection delay time 保护延时时间	300	400	500	μs
	Recovery conditions 恢复条件	Delay 5S recovery after disconnecting the load 断开负载后延时 5 秒恢复			
Temperature protection 温度保护	Charging high temperature protection value 充电高温保护值	60	65	70	℃
	Recovery value of charging high temperature protection 充电高温保护恢复值	50	55	60	℃
	Charging low temperature protection value 充电低温保护值	-3	-1	2	℃
	Recovery value of charging low temperature protection 充电低温保护恢复值	2	5	8	℃
	Discharge high temperature protection value 放电高温保护值	65	70	75	℃
	Discharge high temperature protection recovery value 放电高温保护恢复值	55	60	65	℃
	Discharge low temperature protection value 放电低温保护值	-15	-10	-5	℃
	Discharge low temperature protection recovery value 放电低温保护恢复值	-4	0	5	℃
Self-consumption 自耗电	Working mode 工作模式	/	20	50	μA
Operating temperature 工作温度	Normal operating range 正常工作范围	-20		70	℃
Storage temperature 储存温度	Humidity below 90% 湿度低于 90%时	40		85	℃