Shenzhen Houny Battery

磷酸铁锂电池产品规格书

Power Lithium-Ion battery Specification

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1、适用范围 Applicable scope

本规格书适用于深圳市弘毅电池有限公司生产的磷酸铁锂电池组。

This specification applies to the lithium iron phosphate battery pack produced by Shenzhen Hongyi Battery Co., Ltd. 2、电池组特性 Battery pack specifications

电池组 Battery PACK	额定容量 Rated capacity（0.5C）	180Ah
	标称电压 Nominal voltage	12.8V
	能量 Energy	2304Wh
	最大充电电压 Max. charge voltage	14.6V
	推荐充电电流 Recommend Charge Current	90A
	最大充电电流 Max Charge current	180A
	持续放电电流 Continuous discharge current	180A
	最大瞬间放电电流 Maximum instant discharge current（within 30S）	1800A
	电池组内阻标准 Battery Pack Impedance standard	30m
	放电截止电压 Discharge cut-off voltage	9.6-11V
	电池重量 Weight (Approx.)	15.4Kg

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	尺寸 dimension（L W H）(mm)		345x190x245
	适用温度 Operating temperature	充电 Charge	0℃～45℃
		放电 Discharge	-10℃～65℃
保护板 BMS	单只过压保护值 Single cell over-charge cut-off voltage		3.65V±0.05V
	单只过压释放值 Single cell over-charge release voltage		3.55V±0.05V
	单只欠压保护值 Single cell under-discharge cut-off voltage		2.3V±0.05V
	单只欠压释放值 Singel cell discharge release voltage		2.7V±0.05V
	过流保护值 Over-discharge cut-off current		290±50A
	过流保护延时 Over-discharge cut-off current delay		300-800mS
	短路保护 Short-circuit protection		Yes
	短路保护延时 Short-circuit protection delay		480-800uS
	过流\短路保护恢复条件 Condition for the recovery of over-current and Short-circuit		Remove Loading Device
	均衡电流 Balance current		No
	均衡开启 Balance Condition		No

	通信协议	No

3、电池组性能 Battery Pack Performance

项目 Items	测试方法 Test Methods	合格标准 Acceptance criteria
3.1 低温放电容量 Discharge capacity at -10 C	电池按照 6.1 规定方法充电后，在-10℃±2℃下贮存 16h~24h，然后在-10℃±2℃ 下，以 0.5 C 放电至终止电压。 Step 1- The battery shall be charged in accordance with 6.1。Step 2 - The battery shall be stored，in an ambient temperature of 10 C ± 2 C， for not less than 16 h and not more than 24 h。Step 3 - The battery shall be discharged， in an ambient	放电容量/标称容量 95% Discharge Capacity/Nominal capacity 95%)
	temperature of 10 C ± 2 C， at a constant current of 0.5 C，until its voltage is equal to the specified end-of-discharge voltage。	0.5C： 70%
3.2 高温放电容量 Discharge capacity at 55 C	电池按照 6.1 规定方法充电后，在 55℃±2℃下贮存 5h，然后在 55℃±2℃ 下，以 0.5 C 放电至终止电压 。 Step 1- The battery shall be charged in accordance with 6.1。Step 2 - The battery shall be stored ， in an ambient temperature of 55 ℃ ± 2 C。Step 3 - The battery shall be discharged， in an ambient temperature of 55℃ ± 2 C， at a constant current of 0.5 C， until its voltage is equal to the specified end-of-discharge voltage。	0.5C: 95%

3.3 倍率性能 High rate discharge performance at 20 C	电池按照 6.1 规定方法充电后，在 20 C±5 C 搁置 1~4 小时，然后在 20±5℃的环境下，以 0.5C/ 1.0 C / 放电至终止电压。 Step 1 –The cell or battery shall be charged in accordance with 6.1。Step 2 –The cell or battery shall be stored， in an ambient temperature of 20 C ± 5 C， for not less than 1 h and not more than 4 h。 Step 3 –The cell or battery shall be discharged， in an ambient temperature of 20 C ± 5 C， at a constant current of 0.5C/ 1.0 C， until its voltage is equal to the specified end-of-discharge voltage。	0.5C: 100% 1C : 95%

3.4 荷电保持/恢复能力 Charge retention and recovery	电池按照 6.1 规定方法充电后，在 25±2℃的环境下贮存 28 天。再以 0.3 C 放电至终止电压。放电后的电池在 24h 内按照 6.1 充电，然后在 25±2℃的环境下保存 1~4 小时，再以 0.5C 放电至终止电压。 Step 1- The battery shall be charged in accordance with 6.1。Step 2 - The battery shall be stored in an ambient temperature of 20 C ± 5 C， for 28 days。Step 3 - The battery shall be discharged， in an ambient temperature of 20 C ± 5 C， at a constant current of 0,5 C， until its voltage is equal to the specified end-of-discharge voltage。 Step 4 – The battery shall then be charged in accordance with 6.1， within 24 h following the discharge of step 3。Step 5 – The cell or battery shall be stored， in an ambient temperature of 20 C ± 5 C， for not less than 1 h and not more than 4 h。Step 6 – The cell or battery shall be discharged， in an ambient temperature of 20 C ± 5 C， at a constant current of 0.5 C， until its	0.5C: 95%
	voltage is equal to the specified end-of-discharge voltage。	

3.5 存储性能 Charge recovery after storage	电池按照 6.1 规定方法充电后，在 25℃±2℃下，以 0.5 C 放电 60 分钟，然后在 25℃±2℃下贮存 90 天。电池按 4.1 方法充电，搁置 1~4 小时，然后在 25 ±2℃下，以 0.5 C 放电终止电压。充放电循环允许进行 5 次。 The battery shall be charged in accordance with 6.1。The battery shall be discharged， in an ambient temperature of 20 C ± 5 C， at a constant current of 0,5 C， for 60min。 The battery shall be stored in an ambient temperature of 20 C ± 2 C， for 90 days。 The battery shall be charged， in an ambient temperature of 20 C ± 5 C， in accordance with 6.1。The battery shall be stored， in an ambient temperature of 20 C ± 5 C， for not less than 1 h and not more than 4 h。 The battery shall be discharged， in an ambient temperature of 20 C ± 5 C， at a constant current of 0.5 C， until its voltage is equal to the specified end-of-discharge voltage。 Charge-discharge cycle may be repeated up to four additional times， as necessary to satisfy the requirement。	0.5C: 95%

3.6 循环寿命 Endurance in cycles	电池按照 6.1 规定方法充电后，搁置 30min；0.3 C 恒流放电至放电终止电压；搁置 30min；按照上述方法循环。当电池容量低于 80%额定容量时停止。 Step 1--The battery shall be charged in accordance with 6.1。Step 2--The battery shall be stored in an ambient temperature of 20 C ± 2 C， for 30 min。Step 3--The battery shall be discharged，in an ambient temperature of 20 C ± 5 C， at a constant current of 0,3 C， until its voltage is equal to the specified end-of-discharge voltage。 Step 4--The battery shall be stored in an ambient temperature of 20 C ± 2 C， for 30 min。 Step 5—Repeat step 1 to 4， until the capacity of battery less than 80% of its rated capacity	500cycle

4、环境适应性 Environmental Function

项目 Items	测试方法 Test Methods	合格标准 Acceptance criteria

4.1 温度循环 Temperature cycling	电池充满电后，按照下述步骤在强制通风箱中做温度循环（-20℃~75℃）。 步骤 1：电池在 75℃±2℃的环境温度下搁置 4 小时。步骤 2：在 30min 内将温度降低到 20℃±5℃，并保持 2 小时。步骤 3：在 30min 内将温度降低到-20℃±2℃，并保持 4 小时。步骤 4：在 30min 内将温度升高到 20℃±5℃，并保持至少 2 小时。步骤 5：再重复上述步骤 4 个循环。步骤 6：第 5 次循环后，储存 7 天。 Fully charged batteries are subjected to temperature cycling (- 20℃~+75℃) in forced draught chambers，according to the following procedure。Step 1: Place the batteries in an ambient temperature of 75℃ ± 2℃ for 4 h。Step 2: Change the ambient temperature to 20℃ ± 5℃ with in 30 min and maintain at this temperature for a minimum of 2 h。Step 3: Change the ambient temperature to - 20℃± 2℃ within 30 min and maintain at this temperature for 4 h。Step 4: Change the ambient temperature to 20℃± 5℃ within 30 min and maintain at this temperature for a minimum of 2 h。Step 5: Repeat steps 1 to 4 for a further four cycles。After the fifth cycle， store the batteries for seven days prior to examination。	不漏液不起火不爆炸 no fire， no explosion， no leakage

4.2 振动 Vibration	电池充满电后，确认电池电压为满电状态。然后将电池固定在振动台上，施加振幅为 0.76mm 的简谐振动，总的最大偏移为 1.52mm。电池以 1Hz 的速率，在频率 10Hz~55Hz~10 Hz 间往复振动，总时间为 90±5min。电池在三个垂直的安装位置（振动方向）上，分别振动一次。测试完成后，搁置 1 小时。 Fully charged batteries are vibration-tested under the following test conditions。 Simple harmonic motion is applied to the batteries with amplitude of 0.76mm， and a total maximum excursion of 1.52mm。 The frequency is varied at the rate of 1 Hz/min between the limits of 10 Hz and 55 Hz。 The entire range of frequencies (10 Hz to 55 Hz) and return (55 Hz to 10 Hz) is traversed in 90 min ± 5 min for each mounting position (direction of vibration)。 The vibration is applied in	不漏液 不起火、不爆炸 no fire， no explosion， no leakage
	each of three mutually perpendicular directions， in the sequence specified below。 Step 1: Verify that the measured voltage is typical of the charged product being tested。 Steps 2-4: Apply the vibration as specified in Table。 Step 5: Rest battery for 1 h。 then make a visual inspection。	
4.3 低压 Low pressure	电池充满电后，放置到 20 ℃± 5 ℃的真空箱中。将真空箱的压力逐渐降低到 11.6 kPa，保持 6 小时。 Each fully charged is placed in a vacuum chamber in an ambient temperature of 20 ℃± 5 ℃。 Once the chamber has been sealed， its internal pressure is gradually reduced to a pressure equal to or less than 11.6 kPa held at that value for 6 h。	不漏液不起火、不爆炸 no fire， no explosion no leakage

5、电芯安全性 cell Safety tests

5.1 外部短路 External short circuit	充满电的电池放置在 20℃±5℃环境中，用电阻不超过 5m 的线将正负极端子直接短接 10Min。 Fully charged batteries are stored in an ambient temperature of 20℃±5℃，battery is then shortcircuited by connecting the positive and negative terminals with a total external resistance of less than 5m 。 The batteries remain on test for 10Min。	不爆炸 不起火 no fire，no explosion
5.2 过充电 Overcharge	单体电池以 0.5 C 放电到终止电压，然后使用 5 V 的充电器，以 0.2C 电流充电 12.5 小时。 The cell is discharged with 0.5 C to the end-ofdischarge voltage， then charged from a power supply of 5 V， at the charging current 0.2 C for 12,5 h。	不爆炸 不起火 no fire，no explosion
5.3 过放电 Forced discharg	电池在 20℃±5℃下，以 0.5C 电流放电（如果有电子保护线路，应暂时除去放电电子保护线路），直至某一单体电池电压达到 0V 结束试验。 20 ℃± 5 ℃ ,0.5C discharge.((If has electronic protection circuits, the electronic discharge protection circuit should be temporarily removed), tests ends until a single battery voltage reaches 0V.	不爆炸 不起火 no fire，no explosion

6、 测试条件 Test Conditions 除非另有说明，所有测试都应在静止空气中进行。Unless otherwise stated， all tests

that are described in this clause shall be performed in still air。

6.1 充电方法 Charge procedure

充电前，电池应在 20±5℃的初始温度下以 0.5 C 恒流放电到放电终止电压。除非另有说明，电池应在 20±5℃初始温度下，以 0.2 C 恒流，以 (3.60V*N)限压充电到电流降至 0.02 C 结束。

Prior to charging， the battery shall be discharged at 20 C ± 5 C at a constant current of 0.5 C， down to the specified end-of-discharge voltage。

Unless otherwise stated， the battery shall be charged at constant current 0.2 C and limited volt at 3.60V*N ，then end until the current down to 0.02 C

6.2 环境 ambient 温 度/Temperature：20±5℃ 湿 度/Humidity：25-85％RH 大气压/Air pressure：86KPa～106 kPa

7、储存及其它事项 Storage and Others

7.1 长期储存 long time storage

长期储存的电池（超过 3 个月）须置于干燥、凉爽处，每 6 个月对电池进行一次充放电。

If the cell is stored for a long time(exceed three months)，the cell should be stored in drying and cooling place The cell should be charged and discharged each six months。

7.2 其它事项 others

本规格书中未提及的事项，须经双方协商确定。
Any matters that this specification does not cover should be covered between the customer and

8、保质期及产品责任 Warranty Period& Product Liability

8.1 保质期是从出厂日期（喷码/标示）开始起，质保期在销售合同中另定；

Warranty period begins from the delivery date， and is exclusively made in the sale contract。

8.2 若不按说明书中的预防措施操作而引发事故，本公司将不承担责任。
will not be responsible for any accidents caused by not following the precaution methods or directions。

8.3 如果保质期内发生的问题不是由于本公司的生产过程造成的或是由于客户本身滥用或使用不当造成的，本公司将不会无偿包换。

Problems arise not caused by our production process， but due to customers' negligence or improper usage， we will not be responsible for any replacements。

8.4 当本规格书版本更新时，不做另行通知。

When the specification is modified， does not inform the customer。

9、警告 Caution

9.1 不要拆解电池。Do not dismantle， open or shred the batteries。

9.2 电池应远离热源、火源，避免阳光直射。Do not expose batteries to heat or fire。Avoid

storage in direct sun light。

9.3 不要短路电池，避免将电池放置在容易引起短路的地方。Do not short-circuit the battery，Do not store batteries haphazardly in a box or drawer where they may be short-circuited by other metal objects。

9.4 充电口和放电口绝对不能混用，否则有可能发生安全事故。

Forbid confusedly using the charge socket and discharge socket， or accidents may occurred。

9.5 避免电池受到冲击。Do not subject batteries to mechanical shock。

9.6 电池发生泄漏时，避免电解液接触皮肤和眼睛。如果发生接触，立即用大量水冲洗；情况严重时应及时就医。In the event of a cell leaking， do not allow the liquid to come in contact with the skin or eyes。 If contact has been made， wash the affected area with copious amounts of water and seek medical advice。

9.7 连接时确保电池正负极和用电器正负极一致，避免反接。Observe the plus (+) and minus (-) marks on the battery and equipment and ensure correct use。

9.8 将电池放置在儿童不宜接触的地方。Keep batteries out of the reach of children。

9.9 电池应保持清洁、干燥。Keep batteries clean and dry。

9.10 电池端子变脏时，可用干布擦拭。Wipe the battery terminal s with a clean dry cloth if they become dirty。

9.11 电池使用前要先进行充电，应采用厂家指定的充电器按照用户手册说明充电。

Batteries need to be charged before use。 Always use the correct charger and refer to the manufacturer’s instructions or equipment manual for proper charging instructions。

9.12 电池不使用时，不要长时间充电。Do not leave a battery on prolonged charge when not in use。

9.13 电池经长时间储存后，经过几次充电和使用，性能会恢复最好。After extended periods of storage， it is necessary to charge and discharge the batteries several times

to obtain maximum performance。

9.14 电池在室温(20 C ± 5 C)下性能最好。The batteries give their best performance when they are operated at normal room temperature (20 C ± 5 C)。

9.15 保留说明书以作后续使用参考。Retain the original product literature for future reference。

9.16 电池不能作别的用途使用。Use only the battery in the application for which it was intended。

9.17 电池长时间不用时，需要从用电器上取下。When possible， remove the battery from the equipment when not in use。

9.18 电池不要随意丢弃。Dispose of properly。

9.19 电池做为电摩或其它备用电源使用时，要与负载的控制器或装置配套使用；因电池组配有保护电子线路，不可直接驱动纯电感负载，否则会损坏系统。
Cells used as E-motor or storage power should be matched with controller or related equipment.。Because the battery piles are matched with protection board，you can not drive the pure inductance equipment otherwise you could damage the whole system。

10、 免责声明 Free-responsibility declaration

Before using the battery， you should read the specifications，usage instruction and some attentionscarefully to learn its application method and areas 。 If the phenominon such as error using methodwrong circuit connection ， or input power data，working index are inconsisted with the specifcations happen and cause damage to production，circuit and its accessories， we are not responsible for it。

Shenzhen Houny Battery Co.,Ltd

产品使用前，请用户说细阅读产品规格书、使用说明书及使用注意事项等，了解产品的使用方法及应用范围；若出现产品使用方法错误、电路连接不对或采用的输入电源、负载功能参数与产品规格书所标性能参数不符等现象均属使用不当，由使用不当造成产品、负载及周边连接件的损坏，本公司均不承担任何责任。