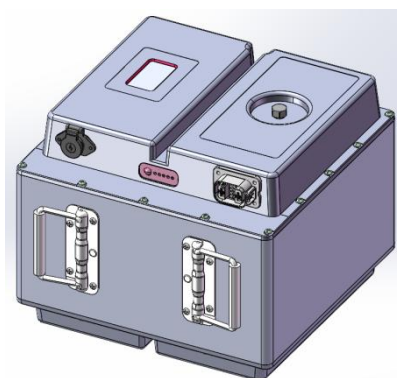




磷酸铁锂电池组规格书

Approval Sheet



Customer No. 客户代码	
Product Model 产品型号	GW-M7238C
Product Code 产品编码	
Cell Type 电芯类别	Lithium Iron Phosphate
Pack Mode 组合方式	23S3P
Nominal Voltage 电压	73.6V
Nominal Capacity 容量	38.4Ah

Prepared by 制作	Checked by 审核	Approved by 批准
ZQQ 2025-10-31	leili	NWJ

Approved by customer 客户承认 (Stamp) (盖章)	Prepared by 测试/日期	Checked by 审核/日期	Approved by 批准/日期



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Rev: A0
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修 订 记 录

Product Modification Record List

Revision No. 版本号	Description 内容描述	Modify 修改人	Approval 审批人	Date 日期
A0	First Issue 新版发行	ZQQ	NWJ	2025-10-31



1. 使用范围 Scope

本规格书只适用于金轮所供应的 73.6V38.4Ah 磷酸铁锂电池组。

This specification only applies to the reference battery pack 73.6V38.4A supplied by Golden Wheel Energy.

2. 主要参数 Rating

项目 Item	参数 Rating	备注 Note
电池类型 Type	LiFePO ₄ Battery	
组合方式 Pack Method	23S3P	
标称容量 Nominal capacity	38.4Ah (Min 36.48Ah)	Charge/Discharge: 0.5C Cut-off Voltage: 57.5V
标称电压 Nominal voltage	73.6V	
能量 Energy	2826Wh (Min 2684Wh)	
充电方式 Charge method	CC/CV	
充电截止电压 Charge cut-off voltage	83.95V	
放电截止电压 Discharge cut-off voltage	57.5V	
标准充电电流 Standard charge current	9A	
最大充电电流 Max. charge current	38.4A	
标准放电电流 Standard discharge current	19A	
最大持续放电电流 Max. continues discharge current	90A	
循环寿命 Cycle life	≥2000 times (周)	80% 25°C/0.5C
内阻 Internal impedance	≤50mΩ	
尺寸 Dimension	L324*W310*H258 mm	
重量 Weight	Approx. 31.5kg	
工作温度范围 Working temperature range	Charge:0°C--55°C Discharge: -20°C--55°C	
储存温度 Storage Temperature	0°C--35°C	
通讯协议 Communication protocol	整车 CAN 通讯协议 SDB 0.0.2 版本 Vehicle CAN Communication Protocol SDB Version 0.0.2	包含充电、放电协议 Including charging and discharging protocols



3. BMS 参数 BMS Parameter

3.1 功能特性 Function Characteristics

- 具有单体电压、总体电压检测，过充、过放警告及保护功能。常温下静态电压采样精度可达 $\leq 25\text{mV}$ 。

With single cell voltage, battery pack voltage detection, over-charge, over-discharge alarm and protection functions. The sampling accuracy of static voltage at room temperature is less than or equal to 25mV .

- 具有充、放电电流检测，充、放电过流警告及保护功能。充电电流显示为正，放电电流显示为负，常温下电流采样精度可达 $\leq 2\% \text{ @FS}$ 。

With charge and discharge current detection, over-charge and over-discharge current warning and protection functions. The charging current is shown as positive, and the discharge current is shown as negative. The sampling accuracy of the current at room temperature is less than or equal to $2\% \text{ @fs}$.

- 具有电芯、环境、MOS 温度检测，电芯高、低温警告及保护功能，MOS 高温警告及保护功能，环境高、低温警告功能。常温下温度采样精度可达 $\leq 4^\circ\text{C}$ 。

With cell, environment, MOS temperature detection, cell high and low temperature alarm and protection function, MOS high temperature alarm and protection function, environment high and low temperature alarm function. At room temperature, the sampling accuracy is less than or equal to 4°C .

- 短路保护功能。

Short Circuit Protection.

3.2 基本参数设置 (注：以下参数除特殊注明以外， 25°C 环温下测试)

Basic Parameter Setting (Note: The following parameters are tested at 25°C environment temperature unless otherwise specified).

序号 No	Item 项目	Symbol 符号	Content 详细内容	Criterion 标准	备注 Note
1	Over charge Protection 过充保护		Over charge detection voltage 过充电检测电压	$3.65\text{V} \pm 0.03\text{V}$	
			Over charge detection delay time 过充电检测延迟时间	$2000 \sim 3000\text{ms}$	
			Over charge release voltage 过充电解除电压	$3.50\text{V} \pm 0.03\text{V}$	
			Charging overcurrent protection 充电过流保护	$45\text{A} \pm 20\%$	
2	Over discharge protection 过放保护		Over discharge detection voltage 过放电检测电压	$2.5\text{V} \pm 0.05\text{V}$	
			Over discharge detection delay time 过放电检测延迟时间	$2000 \sim 3000\text{ms}$	
			Over discharge release voltage	$2.7\text{V} \pm 0.1\text{V}$	



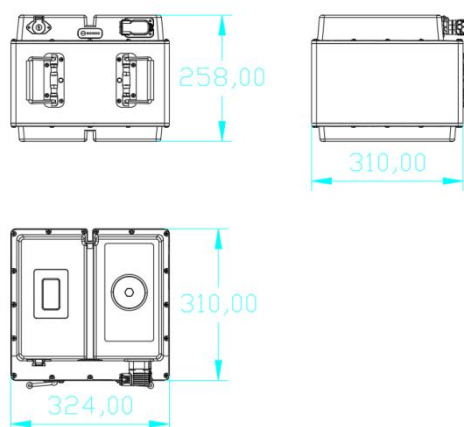
			过放电解除电压		
3	working current 工作电流		Continuous Output Discharging Curren 可持续工作电流	90A±20%	
4	Over current protection 过流保护		Over current detection voltage 过电流检测电压	50mV	
			Over current detection current 过电流保护电流	115A±20%	
			Detection delay time 检测延迟时间	2000--3000ms	
			Release condition 保护解除条件	Disconnect the load 断开负载	
5	Short protection 短路保护		Detection condition 保护条件	External circuit short-circuit or current exceeding 600A 外部电路短 路或电流大于 600A	
			Release condition 保护解除条件	Disconnect the short-circuited circuit 断开短路电 路	
			Detection of delay time 检测延迟时间	≤1ms	
6	Interior resistance 内阻		Main loop electrify resistance 主回路通态电阻	$R_{DS} \leq 20m\Omega$	
7	Charging over-temp protection temp 充电过温保护温度		60°C	°C	
8	Charging over-temp recovery temp. 充电过温保 护恢复温度		55°C	°C	
9	Discharge over-temperature		65°C	°C	



	protection temperature 放电过温保护温度				
10	Discharge over-temp protection recovery temperature 放电过温保护恢复温 度		60°C	°C	
11	Charging low-temperature protection temperature 充电低 温保护温度		0°C	°C	
12	Recovery temp. for charge low-temp protection 充电低温 保护温度恢复		5°C	°C	
13	Discharge low-temperature protection temperature 放电低 温保护温度		-30°C	°C	
14	Discharge low-temp recovery temp. 放电低温保护温度恢 复		-20°C	°C	

4. 外观结构 Appearance and structural dimensions

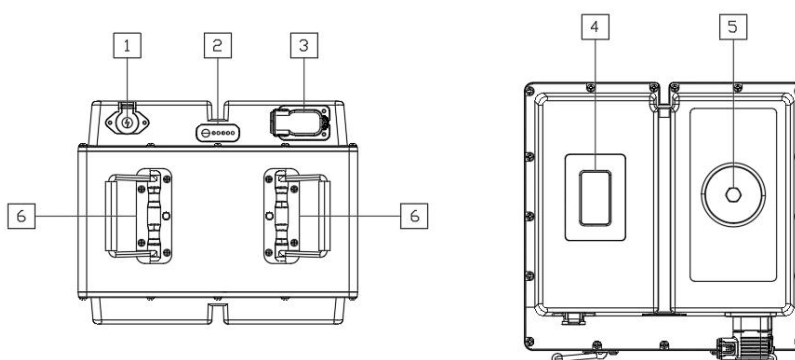
按照此规格书要求，正常储存或操作，电池不应出现破裂、划痕、变形、污迹、电解液泄露等不良现象。
It shall be free from any defects such as scratch, distortion, contamination and leakage.



Unit 单位 (mm)					
L(长度)	324±2	W(宽度)	310±2	H (厚度)	258±2

5. 电池组面板定义 Battery string panel definition

The labels on the panel correspond to the following 面板标示对应下面说明



No.	描述 Description	丝印 Silk-screen	备注 Remark
1	充电接口 Charging interface	/	电池接充电器端口 Battery connected to charger port
2	电量指示灯 battery indicator	/	电池电量和异常显示 Battery level and abnormal display
3	放电接口 Discharge interface	/	电池放电端口 Battery discharge port
4	GPS	/	电池定位和信息上传 Battery positioning and information upload
5	防爆阀 Explosion proof valve	/	电池腔内气体排放 Gas emissions inside the battery



			chamber
6	提手 handle	/	产品搬运提手 Product handling handle

6. 电池性能及测试条件 Performance

6.1 标准测试条件 Standard Test Condition

电池应在到货日期一个月内测试，除非规格书中特别注明，本规格书规定的测试条件为：温度： $20\pm 5^{\circ}\text{C}$ ，相对湿度： $65\pm 20\%$ ，标准充电后，9A 放电到截止电压 57.5V，为电池的标准容量，允许 5 次循环，其中一次达到最小容量即为合格

The battery shall be evaluated within 1 month from the arrival date.

Unless otherwise stated in these specifications, the following test shall be carried out in an ambient temperature of $20\pm 5^{\circ}\text{C}$, relative humidity of $65\pm 20\%$

Discharge capacity when the battery is discharged at 9A to 57.5V after being standard charged. Five cycles are permitted for this test. The test shall be terminated at the end of the first cycle which meets the requirement.

6.2 测试仪器 Testing Instrument or Apparatus

6.2.1 尺寸测量工具 Dimension Measuring Instrument

测量尺寸的仪器精度应大于等于 0.01mm.

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

6.2.2 万用表和安培计 Voltmeter and Ammeter

测量电池电压时万用表内阻应大于 $10\text{K}\Omega/\text{V}$ ，电流表及电线在内的总内阻应小于 0.01Ω .

Voltmeters and ammeters shall be equal or more precision instruments of $10\text{K}\Omega/\text{V}$ and 0.01Ω .

6.2.3 内阻仪 Impedance Meter

内阻测试仪测试原理应为交流阻抗法(1kHz LCR)

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

7.3 电池性能 Electrical Performance

名称 Item	测试方法及条件 Condition	要求 Specification
开路电压 Open-Circuit Voltage	标准充电后，24 小时内测量的开路电压 The open-circuit voltage shall be measured within 24hours after standard charge.	$\geq 71.3\text{V}$
电池容量 Battery Capacity	标准充电后，搁置 30 分钟，然后用 0.5C 电流放电至截止电压，记录放电时间 The discharge time at 0.5C shall be measured after standard charge at $20\pm 5^{\circ}\text{C}$ and rest 30mins.	$\geq 100\%$



循环寿命 Cycle Life	在 $20\pm5^{\circ}\text{C}$ 状态下, 用 9A 恒流充电至充电电压, 再恒压直至充电电流 $\leq 0.05\text{C}$; 搁置 1 小时, 再用 0.5C 电流放电至截止电压, 又搁置 1 小时, 然后重新充放电循环 2,000 次, 记录放电时间 To charge the battery with 9A to charging voltage, then CV to the charging current $\leq 0.05\text{C}$, after 1h rest, then use 0.5C to discharge the battery to cut-off voltage, 1h rest, The discharge time on standard discharge shall be measured after 2000cycles of standard charge and discharge at $20\pm5^{\circ}\text{C}$.	$\geq 80\%$
荷电保持能力 Charge(capacity) retention	在 $20\pm5^{\circ}\text{C}$ 状态下,标准充饱电后, 电芯搁置 28 天,然后用 0.5C 放电至截止电压, 记录放电时间 The discharge time at 0.5C shall be measured after standard charge and then storage at $20\pm5^{\circ}\text{C}$ for 28days	$\geq 80\%$
温度性能 1 Temperature Characteristic1	标准充电后, 在 $55\pm2^{\circ}\text{C}$ 条件下贮存 5h, 然后用 0.5C 放电至截止电压 57.5V 记录放电时间 After standard charging at $20\pm5^{\circ}\text{C}$, laying the battery at $55\pm2^{\circ}\text{C}$ for 5hour, then discharge at 0.5C to 57.5V, record the discharge time	$\geq 80\%$
温度性能 2 Temperature Characteristic2	标准充电后, 在 $-10\pm2^{\circ}\text{C}$ 条件下贮存 16-24h, 然后用 0.5C 放电至截止电压, 记录放电时间 After standard charging at $20\pm5^{\circ}\text{C}$, laying the battery at -10°C for 16-24 hour, then discharge at 0.5C to 57.5V, record the discharge time	$\geq 60\%$

8. 出货带电量 Delivery Condition

正常情况下, 电池出厂前带电量 $50\%\pm 5\%$, 如有特殊要求, 需提出后确认, 出货电压: 73.6-78.2V
Approx. $50\%\pm 5\%$ charged.

Shipment voltage: 73.6-78.2V.

If there are special requirements, please confirm before release open order.

9. 警告 Warnings

为防止电池可能发生的泄漏,发热,起火,请注意以下预防措施:

To prevent the possibility of the battery from leaking, heating, fire, Please READ this specification carefully before usage and observe the following precautions:

- 严禁将电池系统裸露放置于室外雨淋。
- 禁止将电池在热高温源旁,如火,加热器等使用设备。
- 禁止颠倒正负极使用电池。
- 禁止将电池直接接入电源插座。
- 禁止将电池丢入火或加热器中。
- 禁止用金属直接将电池的正负极进行短路连接。
- 禁止敲击或抛掷,踩踏电池等。
- 禁止直接焊接电池和用钉子或其它利器刺穿电池。
- 搬运、装配、试验过程中应避免电池箱倒置。



- 充放电时，严禁用其他物品覆盖在电池箱上，否则热量积累，会导致电池出现性能下降、漏液等问题。
- 用户未经允许，不得随意打开电池箱，严禁拆卸电池，以免损伤绝缘部件，导致短路、影响使用。
- 严禁擅自改装电池系统。在电池组中，为防止发生危险，装有保护系统，若保护系统遭到损坏，可能导致充电无法控制，或者充放电电流超过设定边界值，从而造成电池漏液、发热、破裂。
- Prohibit to let battery pack bareness on outdoor for rain.
- Do not use and leave the battery near a heat source as fire or heater.
- Do not reverse the position and negative terminals.
- Do not connect the battery to an electrical outlet.
- Do not discard the battery in fire or heat it.
- Do not transport and store the battery together with metal objects such as necklaces, hairpins etc.
- Do not knock or throw, step on the battery, etc
- Do not directly solder the battery and pierce the battery with a nail or other sharp object.
- To avoid battery in version when carriage, assemble, test.
- Do not allow others objects on battery cabinet when charge and discharge, or it will cause hot accumulation, leading to battery performance decline or leakage issue and so on.
- Users cannot open the battery cabinet without permit, prohibit to break down battery pack, to avoid break insulation to short circuit and effect on usage.
- Prohibit to refit battery pack. The manufacturer install protection system for it in order to prevent danger, if protect system broken, it leads that charge cannot control properly, or charge and discharge current is beyond than the set value, to its leakage, heat and fracture.

10. 电池操作说明 Battery operation instruction

10.1 充电 Charge

- 充电电流：不能超过规格书规定的最大的充电电流
- 充电电压：不能超过规格书规定的最高的限制电压
- 充电温度：电池充电温度必须按照规格书的温度范围执行
- 先恒流后恒压方式充电，禁止颠倒的方式充电。如果电池正负极颠倒充电会带来危险。
- Charging current: Do not surpass the biggest charging current which in this specification.
- Charging voltage: Do not surpass the highest voltage which in this specification.
- Charge temperature: The charge temperature is in according to this specification.
- First constant current after constant voltage charging, reverse charging is prohibited. It can be dangerous if the battery is charged upside down.

10.2 放电电流 Discharge

- 电池放电电流不能超过规格书规定的最大放电电流，
- 过大的电流放电会造成电池发热和容量衰减。
- 电池放电温度必须按照规格书的温度范围执行
- Discharge current: Do not surpass the biggest discharge current which in this specification.
- Discharge voltage: Do not be less than the lowest voltage which is in this specification.
- Discharge temperature: The discharge temperature is in according to this specification.

10.3 过放电 Over-discharge

短时间的过充过放不影响电池的使用，但是长时间的过放电会影响到电池的功能失效，电池永久性不能



适用，可能电池过放还有一个原因是自动能量的消失。预防电池过放的出现方法电池应保持一定的电量。

After the short time excessively discharges charges immediately cannot affect the use, but the long time excessively discharges can cause the battery the performance, battery function losing. The battery long-term has not used, has the possibility to be able to be at because of its automatic flashover characteristic certain excessively discharges the condition, for prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity.

10.4 贮存电池 Storage

电池贮存在规格书规定的温度范围内，如果电池贮存超过三个月，建议你开始给电池充电。

The battery should store in the product specification stipulation temperature range. If it stores over 3 months, you should carry on additional charge to the battery

10.5 连续充电时间不能超过 8 个小时.

Please do not continuously charge the battery over 8hours.

11. 其它事项 Others

- 客户若需要将电池用于超出文件规定以外的设备，或在文件规定以外的使用条件下使用电池，应事先联系优尼可，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。

- 对于在超出文件规定以外的条件下使用电池而造成的任何意外事故，优尼可公司概不负责。

- 如有必要，优尼可公司会以书面形式告之客户有关正确操作使用电池的改进措施。

- 任何本说明书中未提及的事项，须经双方协商确定。

- The customer is requested to contact Unique 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.

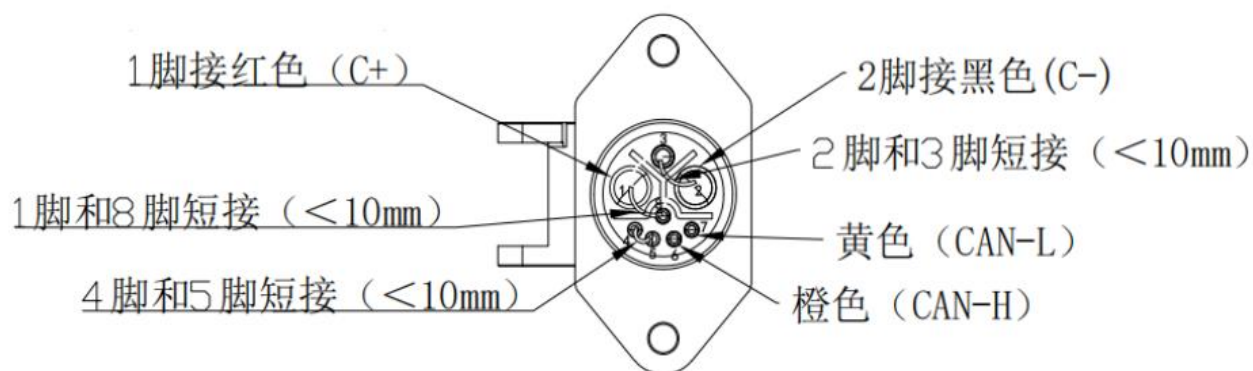
- Unique will take no responsibility for any accident when the battery is used under other conditions than those described in this Document.

- Unique will inform, in a written form, the customer of improvement(s) regarding proper use and handing of the battery, if it is deemed necessary.

- Any matters not mentioned in this manual shall be determined through consultation between both parties.

充电连接器型号及接口定义

品牌：和谐 型号：2+1+5



放电连接器型号及接口定义

品牌：鸿儒 型号：2+8

