	PRODUCT SPECIFICATION	DOC NO.:	PPS-D11SM-3.2V50Ah
		REV. :	A2
		SHEET :	1 / 18

产品规格书

PRODUCT SPECIFICATION

型号：3.2V 50Ah

Model: 3.2V 50Ah

PACK 设计 Pack Design	PACK 工艺 Pack Process	PACK 审批 Pack Approval	电芯审批 Cell Approval	品质审批 QA. Approval	销售审批 Sales Approval
邹贵松	张烈	黄勇良	唐晓伟	谢宏波	傅新华

客户确认 Client Approval	**签名 Signature：**	**日期 Date：**
	公司代码 Company Code：	
	公司印章 Company Stamp：	

Confidential ：（）Level 3 隐私（）Level 2 高密（√ ）Level 1 低密

江西赣锋锂电科技股份有限公司

Jiangxi Ganfeng LiEnergy Technology Co., Limited.

表单编号：QSP-052-02A0

更新记录 Update record

版本 Revision	描述 Description	日期 Date	修订人 Reviser
A0	初版发行 Original Release	2024/3/22	JIANG
A1	循环寿命变更： 1、0.5C 循环寿命改为 6000 次 2、增加 1C 循环寿命：4000 次 Cycle life change: 1. Change the cycle life from 0.5C to 6000 times 2. Increase 1C cycle life: 4000 cycles	2024/7/23	Zou
A2	1、 模组尺寸变更 2、 增加售后及质保条款 1、Module size change 2、Increase in after-sales and warranty terms	2025/4/25	Zou

目录 Catalogue

术语与定义 Terms and definitions

术语 Term	定义 Definition
产品 Product	本规格书中的“产品”是指赣锋锂电生产的可充电磷酸铁锂体系电池模组。 The "product" in this specification refers to the rechargeable lithium iron phosphate system battery module produced by GFL.
客户 Customer	指《赣锋锂电产品销售合同》重点买方。 Refers to the key buyer of GFL battery product sales contract.
赣锋锂电 GFL	指江西赣锋锂电科技股份有限公司。 Refers to Jiangxi Ganfeng LiEnergy Technology Co., Ltd.
模组 Module	将一个及一个以上单体电芯按照串联、并联或串并联方式组合，且只有一对正负极端子，并作为电源使用的组合体。 One or more single cores are combined in series, parallel or series parallel mode, and only one pair of positive and negative terminals are used as a combination of power supply.
电池包 Battery pack	通常包括电池模组、电池管理模块、及相应附件，具有从外部获得电能并可对外输出电能的单元。 It usually includes battery module, battery management system and corresponding accessories, and has a unit that obtains electric energy from the outside and can output electric energy.
标称容量 Nominal capacity	由制造厂商宣称的蓄电池模组或系统的放电容量值。 The discharge capacity value of the battery module or system declared by the manufacturer.
可用电量 Available power	在规定条件下测得的蓄电池模组或电池包的实际放电电量值。 The value of the actual discharge of the battery module or battery pack measured under the specified conditions.
充电倍率 Charging rate	充电电流与电池模组或系统标称容量的比值。 The ratio of the charging current to the nominal capacity of the battery module or system.
标准充电 Standard charge	本规格书所述的充电模式。 The charging mode described in this specification.
标准放电 Standard discharge	本规格书所述的放电模式。 Discharge mode described in this specification.
电池管理系统 (BMS)	客户用于监测和记录产品在整个服务期限内的运行参数的一种有效的追踪和控制系统。其追踪和记录的参数包括但不限于电压、电流、温度等，以控制产品的运行并确保产品运行环境及运行条件符合。 An effective tracking and control system used by customers to monitor and record the operating parameters of products throughout the service life. The parameters tracked and recorded include but are not limited to voltage, current, temperature, etc., so as to control the operation of the product and ensure that the product operation environment and operation conditions meet the requirements.
电芯温度 Cell temperature	由接入电池的温度传感器测量的电芯大面温度。 The large surface temperature of the cell measured by the temperature sensor

	connected to the battery.
循环 Cycle	电池按规定的充放标准充放一次为一个循环。充电可以由一些部分充电组合在一起形成。放电可以由一些部分放电组合在一起形成。 The battery shall be charged and discharged according to the specified charging and discharging standard. Once is a cycle. Charging can be formed by a combination of partial charging. The discharge can be formed by a combination of partial discharges.
生产日期 Date of manufacture	电池的制造日期。每个相关的电池的顶端贴纸上标示的明确的日期代码为制造日期。 Date of manufacture of the battery. The clear date code marked on the top sticker of each relevant battery is the manufacturing date.
开路电压 Open circuit voltage	没有接入任何负载和电路时测得的电池的电压。 The voltage of the battery measured when no load or circuit is connected.
充电状态 State of charge	在无负载的情况下，以安培小时或者以瓦特小时为单位计量的电池充电容量状态的所有的线性关系。如：若将电芯满充至 3.65V 视为 100%SOC，电芯满放至 2.5V 视为 0%SOC。 All linear relationships of battery charge capacity states measured in ampere hours or watt hours without load. For example, if the cell is fully charged to 3.65v, it is regarded as 100% SOC, and if the cell is fully discharged to 2.5V, it is regarded as 0% SOC.
温度上升 Temperature rise	在本技术协议规定的条件如充电过程或者放电过程中电芯温度低的升高。 Under the conditions specified in this technical agreement, such as the rise of low cell temperature during charging or discharge.
测量单位 Unit of measure	“V”（Volt）（V），Voltage unit “A”（Ampere）（A），Current unit “Ah”（Ampere-Hour）Ampere-hour（Ah），Load unit “Wh”（Watt-Hour）Watt-hour（Wh），Energy unit “Ω”（Ohm）Ohm（Ω），Resistance unit “mΩ”（Milliohm）Milliohm（mΩ），Resistance unit “℃”（degree Celsius）Centigrade（℃），Temperature unit “mm”（millimeter）Millimeter（mm），Length unit “s”（second）second（s），Time unit

1．适用范围 Scope of application

本规格书详细描述了赣锋锂电生产的 1P1S-50Ah 可充电磷酸铁锂电池模组的性能指标、设计参数、产品使用条件及风险警示。

This specification describes in detail the performance index, design parameters, product service conditions and risk warning of 1P1S-50Ah rechargeable lithium iron phosphate battery module produced by GFL.

2. 产品指标 Product index

2.1 电气性能参数 Electrical performance parameters of battery module

NO.	参数 Project	产品规格 Parameter	条件 Condition
2.1.1	模组串并联方式 Combination mode	1P1S	/
2.1.2	模组标称电压 Nominal voltage	3.2V	3.2V*N, N stands for the number of strings
2.1.3	模组标称容量 Nominal capacity	50Ah	@25℃±2℃,0.5C
2.1.4	模组可用电量 Available power of module	⩾160Wh	Test method:（25℃±2），fresh cell a) Discharge at a constant current of 0.5C to the lowest cell voltage of 2.5V cut-off; b) Allow to stand for 30 minutes; c) Charge at a constant current of 0.5C to the highest unit voltage of 3.65V, and let it sit for 60S; d) Charge at a constant current of 0.05C until the highest single cell voltage of 3.65V is cut off; e) Allow to stand for 30 minutes; f) Discharge at a constant current of 0.5C to the lowest cell voltage of 2.5V cut-off; g) Allow to stand for 30 minutes; h) Charge at a constant current of 0.5C to a cutoff of 25% ±5% SOC. Repeat the above steps 3 times, taking the average value as the standard
2.1.5	最高工作电压 Max operating voltage	3.65V	3.65V*N, N stands for the number of strings
2.1.6	最低工作电压 Min operating voltage	2.5V	2.5V*N，N stands for the number of strings
2.1.7	正常工作温度范围（充电）Normal operating temperature range (charging)	0~55℃	N.A
2.1.8	正常工作温度范围（放电）Normal operating temperature range (discharge)	-20~55℃	
2.1.9	标准充放电倍率 Standard charge discharge ratio	0.5C	25℃±2 环境温度 25℃±2 ambient temperature
2.1.10	最大可持续充放电倍率 Maximum sustainable	1C	

	charge/discharge ratio		
2.1.11	自放电 Self discharge	≤3.5%/ month	出货三个月以后的电芯，标准充电到40%SOC，25±2℃储存 Fresh cell after 3 months, 40%SOC, 25±2℃ Storage
2.1.12	海拔要求 Altitude requirements	≤2000m	N.A
2.1.13	工作环境湿度 Humidity of working environment	20%~80%	N.A
2.1.14	最佳存储温度 Optimum storage temperature	25℃±2	N.A
2.1.15	出货电量 Shipment quantity	20%~50%SOC	以实际出货为准 Subject to the actual shipment
2.1.16	循环寿命 Cycle life	≥6000	0.5C charge and discharge,90%DOD, 80%EOL,Temp:25±2℃, 300±50kgf preload
2.1.17		≥4000	1C charge and discharge,90%DOD, 80%EOL,Temp:25±2℃, 300±50kgf preload

2.2 物理性能参数 Module physical performance parameters

NO.	类别 Project	参数 Parameter	备注 Condition
2.2.1	模组重量 Module weight	(1.2±0.5) Kg	预估重量，以实际为准 Estimated weight, subject to actual conditions
2.2.2	模组尺寸 Module Size	见下文图纸 See dimensional drawing below	N.A
2.2.3	模组安装尺寸 Module installation dimensions	见下文图纸 See dimensional drawing below	N.A
2.2.4	正负极螺柱规格 Specification of positive and negative pole bolt	M6*14mm	Mounting torque of nut ≤ 5.5Nm

2.3 常用螺栓参考扭矩表 Reference torque table for common bolts

规格 Bolt specification	螺栓强度等级 Bolt strength grade						
	4.6	5.6	5.8	6.8	8.8	9.8	10.9
	N.m	N.m	N.m	N.m	N.m	N.m	N.m
M3	0.51	0.63	0.84	1.01	1.35	1.52	1.9
M4	0.95	1.19	1.59	1.91	2.54	2.86	3.57
M5	2.28	2.85	3.8	4.56	6.09	6.85	8.56

M6	3.92	4.91	6.54	7.85	10.5	11.8	14.7
M8	9.48	11.9	15.8	19	25.3	28.4	35.4
M10	19.1	23.8	31.8	38.1	50.8	57.2	71.5

3. 供货范围 Scope of supply

单个供货系统货范围如下表 The supply scope of single system is as follows:

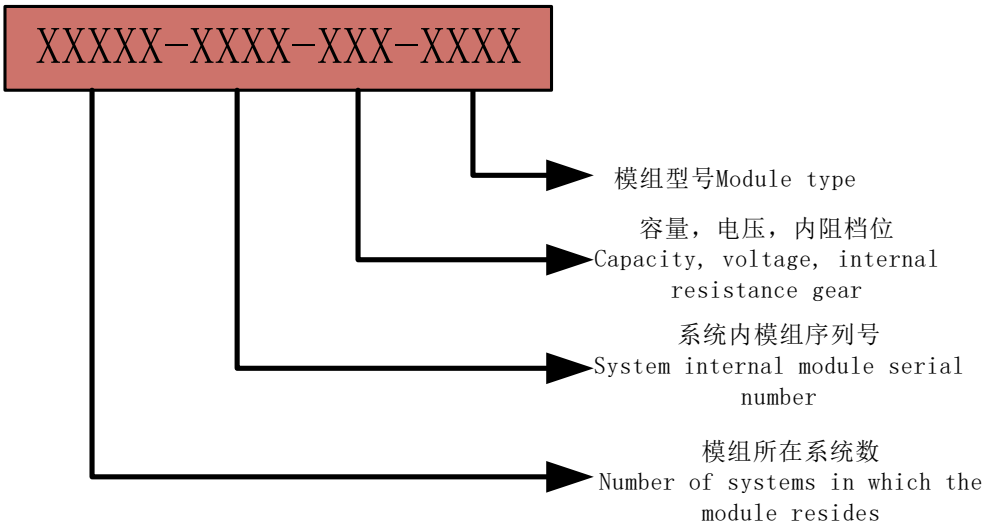
NO.	名称 Project	参数 Parameter	用量 Configuration	备注 Remarks
3.1	1P1S-50Ah module	3.2V/50Ah	/	不含采集线及其他辅件，配组信息以商务合同为准 Excluding acquisition lines and other accessories, the configuration information shall be subject to the commercial contract

4. 应用条件、产品认证、质保售后 Application conditions, product certification, quality assurance and after-sales service

4.1 应用条件 Application conditions

4.1.1 客户必须按规格书要求配对使用，不可混用，包装标示卡等识别码如下所示：

4.1.1 Customers must use them in accordance with the requirements of the instructions, and cannot mix them., as shown below.



4.1.2 客户电池必须按要求配备电池管理系统使用，严密监控，管理并保护每一个电池，按照赣锋锂电的电芯规格书参考设置保护参数，并且与赣锋锂电确认保护参数。

4.1.2 Customer batteries must be equipped with a battery management system for use in accordance with the requirements, closely monitor, manage and protect each battery, set the protection parameters in accordance with GFL's cell specifications for reference, and confirm the protection parameters with GFL.

4.1.3 客户应向赣锋锂电提供电池管理系统详细的设计方案，系统特点、框架、系统数据、格式等相关信息，以供赣锋锂电对该系统进行设计评估，并建立电池管理档案。

4.1.3 The customer shall provide GFL with a detailed design of the battery management system, system features, framework, system data, format and other relevant information for GFL's design evaluation of the system and establishment of the battery management file.

4.1.4 未经赣锋锂电同意，客户不可擅自修改或者改变电池管理系统的设计和框架，以免影响电池的使用性能。

4.1.4 without the consent of GFL, the customer shall not modify or change the design and framework of the battery management system without authorization, so as not to affect the service performance of the battery.

4.1.5 客户应保存完整的电池运行的监测数据，用作产品质量责任划分的重要参考依据。不具备完整的电池产品使用期限内的监测数据的，赣锋锂电不承担产品质量保证。

4.1.5 The customer should keep complete monitoring data of the battery operation, used as an important reference basis for the division of responsibility for product quality. GFL does not guarantee the quality of the product if it does not have complete monitoring data of the battery within the service life of the product.

4.1.6 模组在 PACK 内设计规范要求

4.1.6 module design specification requirements in pack

a）应考虑模组能承受的机械载荷，避免模组出现过负荷运行，出现机械部件失效；

a) Consideration should be given to the mechanical load that the module can withstand to avoid overloaded operation of the module and failure of mechanical parts;

b）保证模组与模组，模组与 PACK 之间留有足够的安全距离，在 PACK 受到外部挤压时，模组不受影响；

b) Ensure that there is enough safety distance between the module and the module, and between the module and the pack. When the pack is squeezed externally, the module will not be affected;

c)箱体与模组接触部位（面）需光滑平整，不能有毛刺、突起或颗粒，防止刺破模组外部防护结构；

c) The contact part (surface) between the pack and the module shall be smooth and flat without burrs, protrusions or particles to prevent piercing the external protective structure of the module;

d）箱体设计应充分考虑电芯的散热问题，由于电池箱散热设计问题和热管理设计导致的电池模组、电池包损坏，赣锋锂电不承担质量保证责任；

d)The case design should give full consideration to the heat dissipation of the battery cells, GFL does not bear the quality assurance responsibility for the damage of battery modules and packs caused by the heat dissipation design problems and thermal management design of the battery case;

e）客户应将电池模组安全地固定在安装平面，并将电源线安全的束缚在合适的位置，避免因摩擦而引起的电弧与火花；

e) The customer shall securely fasten the battery module to the mounting plane and safely restrain the power cord in a suitable location to avoid arcs and sparks caused by friction;

f）在 PACK 设计上模组必须正向放置（极柱面朝上），禁止侧放或倒放；

f) In the pack design, the module must be placed in the positive direction (pole face up), and it is forbidden to put it side or upside down;

g）在 PACK 设计上应充分考虑产品的防水防尘问题，箱体必须满足国家有关标准规定的防水、防尘等级；由于防水、防尘问题而导致的电池模组，电池损坏的（如腐蚀、生锈）赣锋锂电不承担质量保证责任。

g) The waterproof and dustproof problems of the product shall be fully considered in the pack design, and the pack must meet the waterproof and dustproof grades specified in relevant national standards; For the battery module caused by waterproof and dustproof problems, if the battery is damaged (such as corrosion and rust), GFL will not bear the responsibility of quality assurance.

4.1.7 BMS 电池管理系统要求：（甲方应至少按下列的最低要求配置 BMS 电池管理系统保护电池）

4.1.7 BMS battery management system requirements: (First Party shall at least configure the BMS battery management system to protect the battery according to the following minimum requirements)

a）单体电压采样精度误差≤5mv；

a) Single voltage sampling accuracy error ≤ 5mV;

b）SOC 估算误差≤5%；

b) SOC estimation error ≤ 5%;

c）SOH 精度误差≤5%；

c) SOH accuracy error ≤ 5%;

d）电流采样精度≤±（1%FS+0.5%RD）；

d) Current sampling accuracy ≤± (1% FS + 0.5% RD);

e）温度采样精度±2℃。BMS 需带温度采样及管理功能，单个模组(≥8 个电芯)不能少于 2 路温度检测；

e) Temperature sampling accuracy ±2 ℃. BMS shall be equipped with temperature sampling and management functions, and a single module (≥ 8 cells) shall not be less than 2 channels of temperature detection;

f）均衡功能。BMS 必须具备均衡功能，起到电芯均衡作用，均衡电流不小于 50mA，不大于 FPC/采集线的载流能力；

f) Equalization function. BMS must have equalization function and play the role of cell equalization. The equalization current shall not be less than 50mA and not greater than the current carrying capacity of FPC/ acquisition line;

g)BMS 建议保护参数设置：

g) BMS recommended protection parameter settings:

NO.	参数 Parameters	保护措施 Protective measures	备注 Remarks
1. 单体电池充电保护电压（V) Charging protection voltage of single battery (V)	3.55V	停止充电 Stop charging	N.A
2. 单体电池放电保护电压（V） Discharge protection voltage of single battery (V)	2.7V	停止放电 Stop discharging	N.A
3. 系统充电保护电压（V） System charging protection voltage (V)	(3.55V*N)V	停止充电 Stop charging	N 代表电池串数 N stands for the number of strings
4. 系统放电保护电压（V） System discharge protection voltage (V)	(2.7V*N)V	停止放电 Stop discharging	N 代表电池串数 N stands for the number of strings
5. 电池充电高温保护（℃） Battery charging high temperature protection (℃)	55℃	停止充电，加强散热 Stop charging and enhance heat dissipation	N.A
6. 电池放电高温保护（℃） Battery discharge high temperature protection (℃)	55℃	停止放电，加强散热 Stop charging and enhance heat dissipation	
7. 电池充电低温保护（℃） Battery charging low temperature protection (℃)	0℃	停止充电，启动加热 Stop charging and start heating	
8. 电池放电低温保护（℃） Battery discharge low temperature protection (℃)	-20℃	停止放电，启动加热 Stop charging and start heating	

4.1.8 客户应保证以下储能柜或储能系统的使用环境，如超出环境条件使用， 赣锋锂电的产品质量保证责任失效。

4.1.8 The Customer shall ensure that the following energy storage cabinets or energy storage systems are used in the following environments, and if they are used in excess of the environmental conditions, the product quality warranty of GFL shall be null and void.

4.1.9 储能产品为客户定制化产品，客户或使用方应向赣锋锂电提供包含且不限于产品部署的电网、地质、气候等参数条件，如需变更配置、结构、参数以及产品部署地区，客户需征询赣锋锂电的建议，如客户未征询或未采纳赣锋锂电建议以及客户提供参数错误，发生的一切质量、安全问题，赣锋锂电均不承担责任。

4.1.9 Energy storage products are customised products, the customer or the user shall provide GFL with parameters including and not limited to the power grid, geology, climate and other conditions of product deployment, if there is a need to change the configuration, structure, parameters and the product

deployment area, the customer needs to consult GFL's advice, if the customer fails to consult or does not adopt GFL's advice and the customer provides incorrect parameters, the occurrence of all the quality, safety issues GFL will not be responsible for any quality or safety issues that may occur if the customer does not consult or adopt GFL's suggestions or if the customer provides wrong parameters.

4.1.10 储能系统配件（如电池、逆变器、控制器等）需为官方推荐或认证的配件。使用非官方或非认证配件可能导致系统性能下降、故障甚至安全事故。因此，对于使用非官方配件引起的任何问题，赣锋锂电不承担相应责任。

4.1.10 Energy storage system accessories (e.g. batteries, inverters, controllers, etc.) must be officially recommended or certified. The use of unofficial or non-certified accessories may result in system performance degradation, failure or even safety accidents. Therefore, GFL will not be responsible for any problems caused by the use of unofficial accessories.

4.2 产品认证 Product certification

本产品如涉及到出口的相关第三方认证，所产生的认证费用需双方商务另行商定。

If the product involves export related third-party certification, the certification fee shall be separately agreed by both parties.

4.3 售后、质保、验收 After sales, quality assurance and acceptance

4.3.1 本产品只负责中国大陆区域相关售后，如果涉及境外售后所产生的相关费用，需要双方商务另行商定。

4.3.1 The product is only responsible for the relevant after-sales service in mainland China, if it involves the relevant costs arising from the after-sales service outside the country, it is necessary for the two sides to agree on the business separately.

4.3.2 如果由于买方责任导致的产品异常，赣锋锂电不承担产品质量保证职责，异常处理费用由买方承担。

4.3.2 If the product is abnormal due to the customer's responsibility, GFL does not assume the responsibility of product quality assurance, and the abnormal handling expenses shall be borne by the customer.

4.3.3 赣锋锂电对因违反规格书内注意事项造成的任何损失不承担责任。

4.3.3 GFL will not be responsible for any loss caused by violating the precautions in the specification.

4.3.4 模组到货后 7 个工作日内客户需进行验收，超过 7 个工作日产品默认验收合格。

4.3.4Customers are required to accept the modules within 7 working days after the modules arrive, and the products are accepted by default after more than 7 working days.

4.3.5 质保期内，如产品发生除使用不当与灾害、战争等不可抗、不可预测的因素之外的原因造成的故障，经双方技术人员共同确认确属于产品质量问题，由赣锋锂电负责免费维修或更换。在质保期内，免费更换下来的故障件所有权归属赣锋。

对于超过质保期的产品，赣锋将提供有偿维修或更换服务。

如双方确认故障是由客户使用不当造成，赣锋锂电根据实际情况协助客户处理，必要时提供有偿服务。对故障原因确认不能达成一致时可请第三方鉴定确认。

除中国法律的强制性规定外，本说明书规定提供的质量保修服务是本公司对顾客承担的唯一责任。

受控中心 2025.04.28 受控正本

4.3.5 During the warranty period, if the product fails due to reasons other than improper use, disasters, wars and other irresistible and unpredictable factors, and if the technical personnel of both parties confirm that it is a product quality problem, GFL will be responsible for repairing or replacing it free of charge. During the warranty period, the ownership of the faulty parts replaced free of charge belongs to GFL. For products exceeding the warranty period, GFL will provide paid repair or replacement services. If both parties confirm that the fault is caused by the customer's improper use, GFL will assist the customer to deal with it according to the actual situation and provide paid service if necessary. If no agreement can be reached on the confirmation of the cause of failure, a third party may be asked to identify and confirm the cause of failure.
Except for the mandatory provisions of Chinese laws, the quality warranty service provided in this manual is the only responsibility of the Company to the customer.

5. 包装、贮存、运输 Packaging, storage and transportation

5.1 包装 Packing

量产包装箱印刷字迹清晰可辨，无重影、模糊及漏印等现象；纸箱表面需有明确的制造商等信息；纸箱内部采用EPE填充。

The printed words of the mass-production packaging box are clear and legible, without ghosting, blurring and leakage; the surface of the carton needs to have clear information such as the manufacturer; the inside of the carton is filled with EPE.

样品包装视具体情况而定，以满足运输条件为宜。

Sample packing is subject to specific conditions, and it is appropriate to meet the transportation conditions.

5.2 贮存 Keep in storage

当电池组需要长期存放时，请将电池组充电至电量的一半以上。标准充放电（充满和放空）至少每月循环一次，小电流（0.1c）每三个月激活一次。环境要求：温度25±5℃，相对湿度45%~80%，大气压70kPa~106kPa，置于干燥、通风处，避免接触腐蚀性物质，远离火源和热源。

When the battery pack is to be stored for a long period of time, please charge the battery pack to more than half of its capacity. Standard charging and discharging (fully charged and discharged) should be cycled at least once a month, and small current (0.1c) should be activated every three months. Environmental requirements: temperature 25±5℃, relative humidity 45%~80%, atmospheric pressure 70kPa~106kPa, placed in a dry, ventilated place, avoid contact with corrosive substances, and keep away

from fire and heat sources.

5.3 运输 Transport

电池模组应包装后进行运输，在运输过程中应防止剧烈振动、冲击或挤压，防止日晒雨淋。可使用汽车、火车、轮船、飞机等交通工具进行运输。

The battery module should be packed for transportation, and should be prevented from violent vibration, impact or extrusion, sunshine and rain during transportation. It can be transported by cars, trains, ships, airplanes and other means of transportation.

5.4 维护 Mantainance

5.4.1 在使用/维护过程中，请勿自行解剖或拆解储能系统及电池组、重新装卸、更换电池组中的电池。

5.4.1 Do not dissect or dismantle the energy storage system and battery pack, reassemble, or replace the batteries in the battery pack during use/maintenance.

5.4.2 储能系统需要定期进行维护保养以确保其正常运行和延长使用寿命。若用户未按照产品说明书或本公司建议的维护周期进行维护，导致系统性能下降、故障频发或损坏，赣锋锂电不承担相应责任。

5.4.2 The energy storage system requires regular maintenance to ensure its normal operation and prolong its service life. If the user fails to maintain the system in accordance with the product specifications or the maintenance intervals recommended by the Company, resulting in a decline in system performance, frequent failures or damage, GFL shall not be liable.

5.5 标识 Marking

客户应确保产品的原始序列号或原始序列号完整且可读，或者产品的铭牌或序列号不被修改或更改。

Customer shall ensure that the original serial number or original serial numbers of the Products are complete and readable or that the nameplate or serial numbers of the Products are not modified or altered.

6. 安全防范 Security precautions

6.1 禁止在高温环境使用或放置电池，例如在阳光直射下的汽车中。电池可能会着火，冒烟，爆炸或者引起发热。同时，可能会造成电池性能和寿命的劣化。

6.1 It is prohibited to use or place the battery in a high-temperature environment, such as in a car under direct sunlight. The battery may catch fire, smoke, explode or cause heat. At the same time, it may cause deterioration of battery performance and life.

6.2 充电温度范围规定在 0℃~55℃之间，放电温度范围规定在-20℃~55℃之间。不要在规定的温度范围之外对电池进行充电或放电。否则，会导致产热、漏液、或者严重损害。另外，可能会造成电池性能和寿命的劣化。

6.2 The charging temperature range is between 0 ℃ and 55 ℃, and the discharge temperature range is between - 20 ℃ and 55 ℃. Do not charge or discharge the battery outside the specified temperature range. Otherwise, it may cause heat generation, liquid leakage, or serious damage. In addition, it may cause

deterioration of battery performance and service life.

6.3 禁止电池模组正负极短路，严格按照标示说明连接电池组正负极，禁止反向充放电。

6.3 Prohibit short-circuiting the positive and negative terminals of the battery module, connect the positive and negative terminals of the battery pack in strict accordance with the labeling instructions, and prohibit reverse charging and discharging.

6.4 禁止将电池组浸入水中、置于火中，微波炉中或压力容器中。

6.4 It is forbidden to immerse the battery pack in water, fire, microwave oven or pressure vessel.

6.5 当发现电池模组有电解液泄露时，应避免皮肤和衣服接触电解液。如有接触，应立即用清水冲洗，之后再向附近医院寻求帮助。

6.5 When an electrolyte leakage from the battery module is detected, skin and clothing contact with the electrolyte should be avoided. In case of contact, flush with water immediately and seek help from a nearby hospital afterwards.

6.6 用户在设计制造电池系统时，应避免电池模组免受机械震动、碰撞及压力冲击，尖锐物体刺穿电池模组内电芯壳体的情况发生，否则会有电池模组发生电芯内部短路，热失控，火灾和爆炸的安全隐患。

6.6 When designing and manufacturing the battery system, users should avoid the battery module from being protected from mechanical vibration, collision and pressure impact, and sharp objects piercing the shell of the battery module. Otherwise, there will be potential safety hazards such as internal short circuit, thermal runaway, fire and explosion of the battery module.

6.7 在充放电过程中，请远离易燃材料。可能会造成着火，冒烟，爆炸或者引起发热。

6.7 Keep away from flammable materials during charging and discharging. It may cause fire, smoke, explosion or heat.

6.8 电池模组在充放电过程中可能发生不适当的终止充放电现象。如:超出允许的充放电时间充放电，超出电池允许的充放电电压或充放电温度（温度数据异常，与环境温度相差过大且无变化）等。上述现象被定义为“不适当的终止充电”。当发生以上现象时，可能意味着电池系统出现漏电或某些部件出现故障。在没有找到根本原因并彻底解决之前继续对该电池充电可能会引起电池过热或发生火灾。当发生以上现象时，可能意味着电池系统出现漏电或某些部件出现故障。在没有找到根本原因并彻底解决之前请勿对该电池进行充放电。该电池只有经过有认证资格的技术人员全面检查后，确定根本原因并彻底解决改善后方可恢复充放电。

6.8 The battery module may be improperly terminated during the charging and discharging process. Such as: charging and discharging beyond the allowable charging and discharging time, beyond the allowable charging and discharging voltage of the battery or charging and discharging temperatures (temperature data is abnormal, and the difference with the ambient temperature is too large and unchanged) and so on. The above phenomena are defined as "improper termination of charging". When the above phenomena occur, it may mean that there is a leakage in the battery system or that some components are malfunctioning. Continuing to charge the battery without finding the root cause and solving it completely may cause overheating or fire. When the above phenomenon occurs, it may mean that there is a leakage in the battery system or some components have failed. Do not charge or discharge this battery until the root cause has been found and completely resolved. Charging and discharging of this battery should be resumed only after a thorough inspection by a certified technician to determine the root cause and to

completely resolve the improvement.

6.9 电池组在使用过程中，如果出现漏液、有异味、异响，请立即停止充放电并与厂家联系，请勿私自拆卸、分解电池模组，私自拆卸、分解后的电池模组，否则赣锋锂电不承担任何产品质量保证。

6.9 Battery pack in the process of use, if there is leakage, odor, noise, please immediately stop charging and discharging and contact the manufacturer, do not privately disassemble, decomposition of the battery module, privately disassembled, decomposition of the battery module, otherwise, GFL does not assume any product quality assurance.

6.10 不要随意处理报废的电池组件，以免污染当地环境。如果电池已使用到期，请委托/联系专业公正规且合格的回收组织或制造商进行特殊处理。必须遵守使用国家现行的回收和处置的规定和法规。如果电池拆卸后无法立即回收和处理，则应保存在保护区域内。

6.10 Do not dispose of the end-of-life battery components to avoid polluting the local environment. If the batteries have reached the end of their useful life, commission/contact a professional and qualified recycling organisation or manufacturer for special treatment. It is important to comply with the rules and regulations on recycling and disposal in force in the country of use. If the battery cannot be recycled and disposed of immediately after disassembly, it should be kept in a protected area.

6.11 电池组使用时必须配置 BMS 或者类似系统。

6.11 The battery pack must be equipped with a BMS or similar system.

6.12 储能系统自身存在一定功耗，客户应避免储能柜长时间断开外网(处在不能充电状态)，长时间不充电会导致储能柜内电池到达过放状态。电芯电压低于 2.0V 时，电芯内部可能会遭到永久性的损坏，此时赣锋锂电的产品质量保证责任失效。

6.12 The energy storage system itself has a certain power consumption, customers should avoid long time disconnection of the storage cabinet from the external network (in the state of not being able to charge), a long time without charging will lead to over-discharge of the battery in the storage cabinet. If the voltage of the battery cell is lower than 2.0V, the internal part of the battery cell may be permanently damaged, and the product quality warranty of GFL will be invalidated at this time.

6.13 在产品使用过程中，客户发现可疑或缺陷后仍然继续使用产品导致的损坏情形，赣锋锂电不承担任何产品质量保证。

6.13 In the process of product use, the customer found suspicious or defects still continue to use the product damage caused by the situation, GFL does not assume any product quality assurance.

7. 风险警告 Risk warning

7.1 警示声明 Warning statement

警 告 WARNING

1. 电池存在潜在的危险，在操作和维护时必须采取适当的防护措施！
The battery has potential hazards, and proper protective measures must be taken during operation and maintenance!
2. 不正确地维护电池组，可能导致严重的人身伤害和财产损失！
Improper maintenance of the battery pack may cause serious personal injury and property damage!
3. 必须使用正确的工具和防护装备操作电池组。
The battery pack must be operated with the correct tools and protective equipment.
4. 电池组的维护必须由具有电池专业知识并经过安全培训的人士执行。
The maintenance of the battery pack must be carried out by personnel with battery expertise and safety training.
5. 不遵守上述警告可能会造成多种灾难。
Failure to comply with the above warnings could result in multiple disasters.

7.2 不正确的电池维护，可能会受到化学品腐蚀、电击或者电弧的伤害。直流电压与交流电压对人体的伤害是同样严重的，因此维护时还必须采取保护措施以避免电流的伤害。

7.2 Improper battery maintenance may cause damage from chemical corrosion, electric shock or electric arc. The harm of DC voltage and AC voltage to human body is equally serious, so protective measures must be taken during maintenance to avoid the harm of current.

7.3 在维护电池和选择防护装备时，必须考虑到以上潜在的风险，防止发生意外短路，造成电弧、爆炸或热失控。

7.3 When maintaining batteries and selecting protective equipment, the above potential risks must be taken into account to prevent accidental short circuit, resulting in electric arc, explosion or thermal runaway.

8. 图表 Chart

模组尺寸图 Module dimension drawing

GanfengLiEnergy	PRODUCT SPECIFICATION	DOC NO.:	PPS-D11SM-3.2V50Ah
		REV. :	A2
		SHEET :	18 / 18

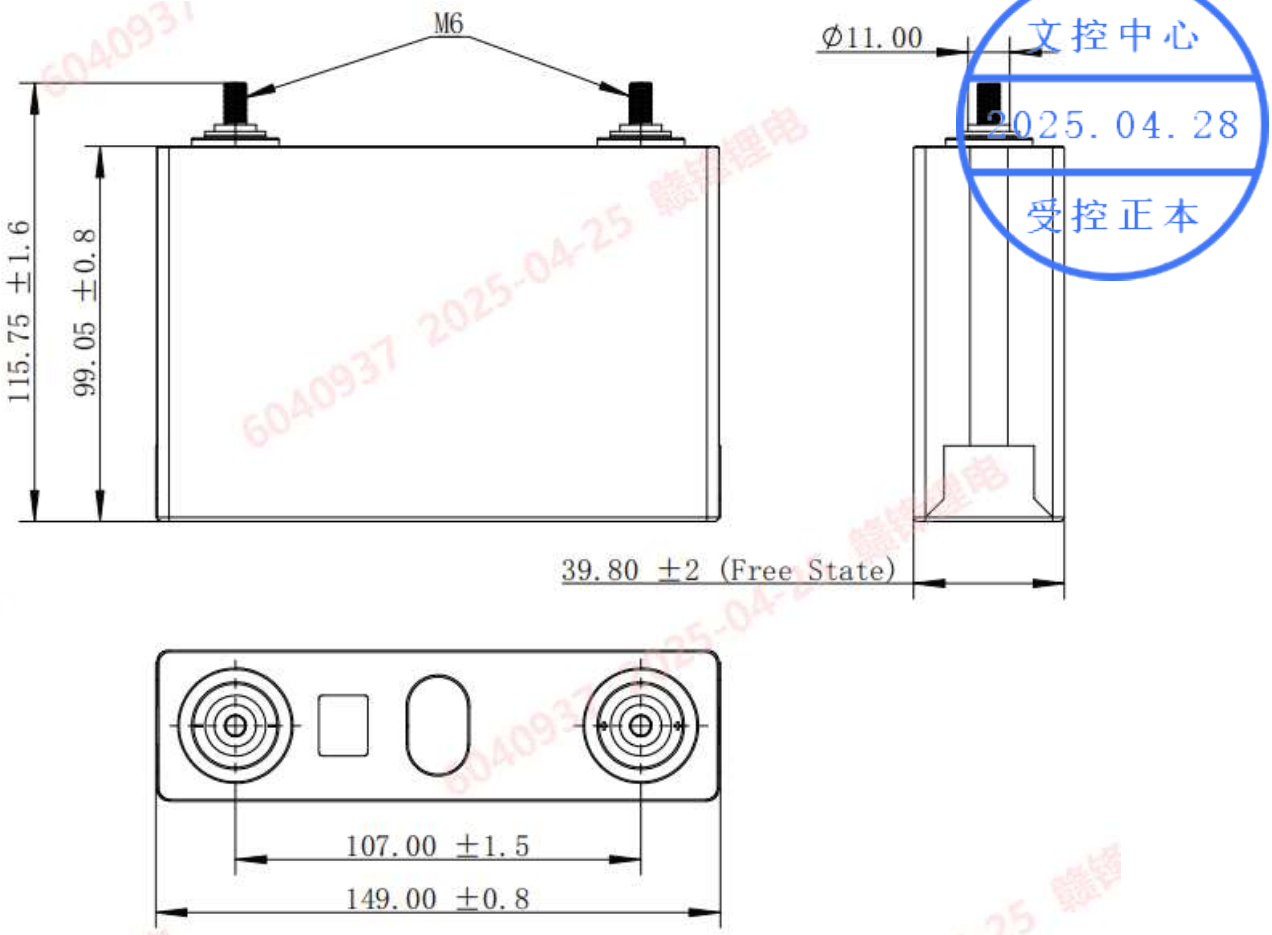


图 1 1P1S-50Ah 模组尺寸示意图

Fig. 1 dimension diagram of 1P1S-50Ah module

注：Note：

1. 数模图仅供参考，具体以出货实物为准。

1.The numerical simulation diagram is for reference only, and the specific details are subject to the actual shipment.

2. 上图中电芯尺寸为自由状态下的电芯尺寸，客户设计模组时应考虑给电芯施加初始压力。

2. The dimensions of the cells in the above diagram are the dimensions of the cells in the free state, and the customer should consider the initial pressure to be applied to the cells when designing the module.

3. 若客户将模组组装成 PACK 使用，客户应按规格书中模组尺寸自行设计 PACK 尺寸，如因尺寸装配问题导致模组无法装入 PACK，赣锋不承担责任。

3. If the customer assembles the module into a PACK for use, the customer should design the PACK size according to the module size in the specification book. If the module cannot be installed into the PACK due to size assembly problems, Ganfeng will not be responsible.

4. 由于本规格书为中英双语，如对规格书英文部分有疑问，以中文为准。

4. As this specification is bilingual in both Chinese and English, if there are any questions about the English part of this specification, the Chinese version shall prevail.

表单编号：QSP-052-02A0