



Residential Wall-mounted Series Specification

壁挂式家储规格书

Product Model /产品型号: TR4000WX

Product Part Number/成品编码: LJC51100007

Cell Type /电芯类型: LiFePO4

Cell Model/电芯型号: LF100LA/50160118 3.2V100AH_EVE

Version/版本: A0

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Revision History/版本修订记录

Version 版本	Release Date 发行日期	Modify The Content 修改内容	Issue Reason 发行原因	Remarks 备注
A0	2024. 05. 29	/	New 新版发行	



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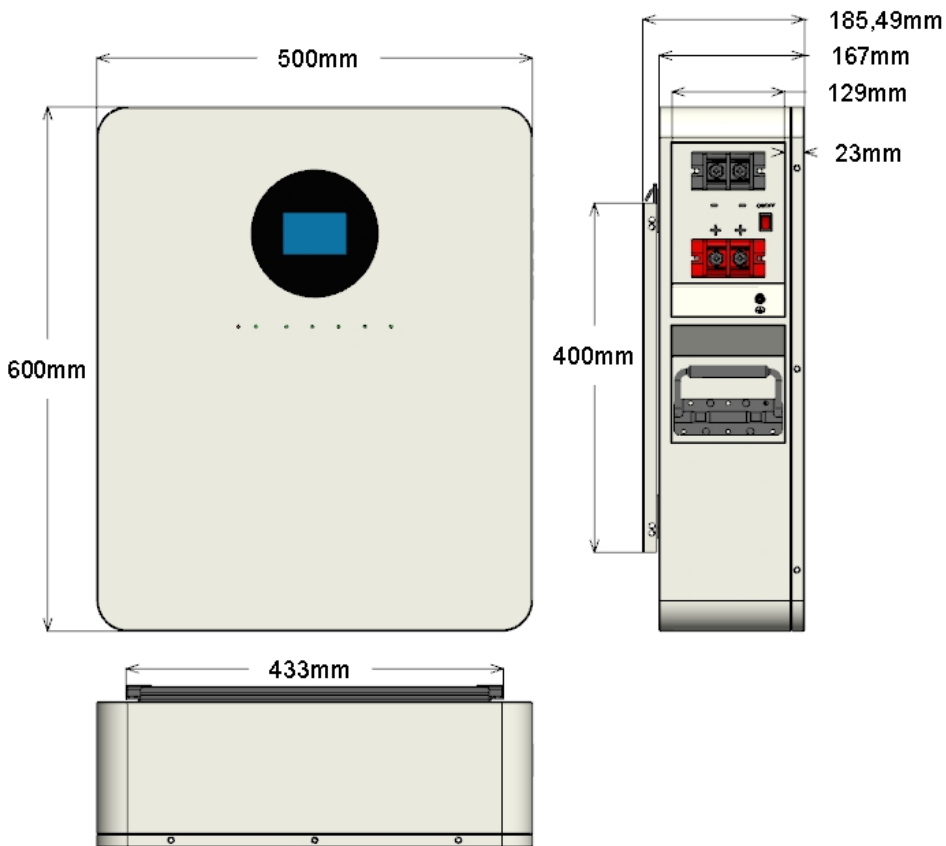
1.Battery System Specifications/电池系统规格

Type 类型	Item 内容		Parameter 参数	Remarks 备注
Cell 电芯	Cell Type 电池型号		LF100LA/50160118 3.2V100AH	
	Capacity 容量		100Ah	
	Rating Voltage 标称电压		3.2V	
	Impedance 内阻		IR(AC)≤0.5mΩ	
Battery System 电池系统	Combination Method 组合方式		16S1P	
	Rating Voltage 标称电压		51.2V	
	Rating Capacity 标称容量 (0.5C)		100Ah	Discharge Capacity: 0.5C≥95%
	Impedance 内阻		≤30mΩ	
	Max. Charge Voltage 最大充电电压		58.4V	Recommended 57.6V
	Discharge Cut-off Voltage 放电截止电压		44.8V	Recommended 48V
	Max. charge current 最大充电电流		100A	
	Recommended charge current 推荐充电电流		50A	
	Max. discharge current 最大放电电流		100A	SOC30%~ 100%
	Recommended discharge current 推荐放电电流		50A	
	Peak discharge current/time 峰值放电电流/时间		110A/1S±20mS	
	Battery Module Weight 电池模块重量		≈53kg	N.W. 净重
	Dimension 外形尺寸 W×H×T		600*500*167(±5mm) (Maximum product size/产品最大尺寸)	
	Operating Temperature 工作温度	Charge 充电	0~65℃	
		Discharge 放电	-20~65℃	
	Storage Temperature 存储温度		-20~45℃	



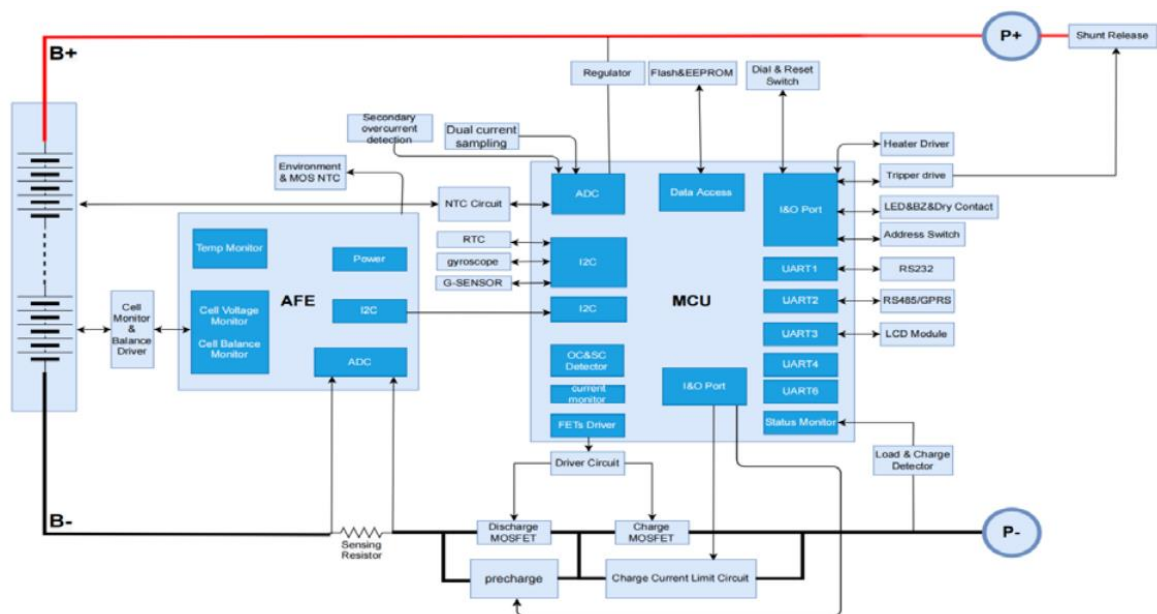
Battery Management System BMS 管理系统	Single Cell Over-charge Cut-off Voltage 单节过压保护值	3.65V	
	Single Cell Under-discharge Cut-off Voltage 单节过放保护值	2.7V	
	Over-Current Discharge Protection 放电过流保护	150A/1S±20mS	
	Communication Mode 通讯方式	CAN/RS485/RS232/Bluetooth /WIFI	
	display usage 显示方式	LCD color touch display LCD 彩色触摸显示屏	

2. Product Dimension,Printed content and Label/产品尺寸、丝印和标贴

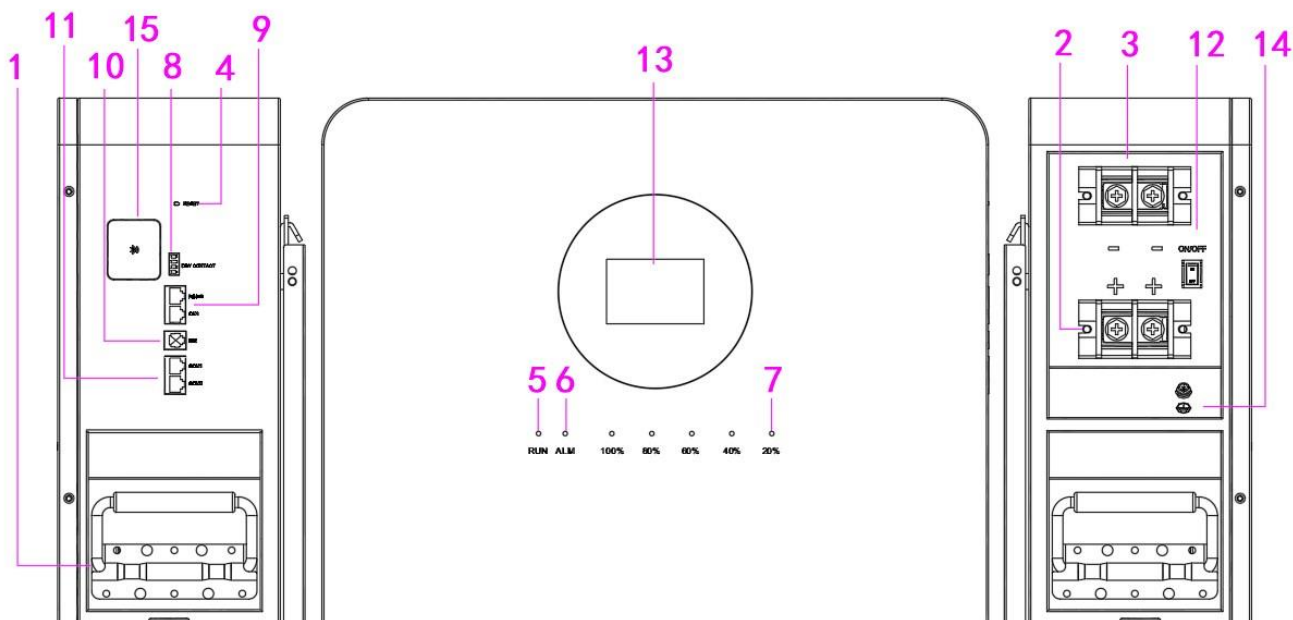
Product Dimensions 产品尺寸	
Outline sample drawing, dimensions. The color is subject to the actual object 外形示例图，尺寸：颜色以实物为准	
	
Printed content 丝印	



3. Control Diagram/控制原理



4. Interface Model and Pin Definition/接口型号及引脚定义



Front Panel Interface Illustration

前面板接口图示说明



4.1 Interface Description/接口说明

No.	Name 名字	Definition/定义
1	handle/提手	Install the battery pack 安装电池包使用
2	Positive terminal/正极端子	Battery output positive or parallel positive cable/电池输出正极或并联正极电缆
3	Negative terminal/负极端子	Battery output negative or parallel negative cable/电池输出负极或并联负极电缆
4	SW(Wake on battery Sleep switch) /重置开关	When the "OFF / ON" key is ON, press and hold this key for 3 seconds. Put the battery into the power-on or hibernation state./当“OFF / ON”键处于 ON 状态时, 按住该键 3 秒。将电池置于开机或休眠状态。
5	RUN Indicator/运行指示灯	Green light, flashing during standby, flashing during charging, and always on when discharging/绿灯常亮, 待机时闪烁, 充电时闪烁, 放电时常亮
6	ALM Indicator/告警指示灯	Red light, flashing when alarm. Protection is always on. Conditions that trigger protection Normally recover automatically after lifting/红灯, 报警时闪烁。保护总是开着的。触发保护的条件下通常在解除后自动恢复
7	SOC Indicator/电量指示灯	The number of green lights shows the remaining battery power, as shown in Table 2-3./绿灯个数表示电池剩余电量, 如表 2-3 所示。
8	Dry contact /干接点	Dry contact
9	CAN/RS485	Host external communication port, support CAN and RS485 communication/主机外部通信接口, 支持 CAN 和 RS485 通信
10	RS232 COM/RS232 接口	Test 调试
11	COM0、COM1	Slave internal parallel communication port, support RS485 communication/从机内部并行通信接口, 支持 RS485 通信
12	ON/OFF Switch/ON/OFF 开关	OFF/ON, Must be "ON" when used/OFF/ON, 使用时必须为 "ON"
13	LCD	LCD color touch display LCD 彩色触摸显示屏
14	grounding 接地	
15	Wifi/Bluetooth	Wifi/Bluetooth 蓝牙/Wifi



4.2 Indicator definition and description/指标定义及描述

Table 2-4 LED working status indication 表2-4 LED工作状态指示

status	Normal alarm/protection	RUN	ALM	power indicator light					explain
				L5	L4	L3	L2	L1	
									
power off	Dormant	off	off	off	off	off	off	off	All off
standby	Normal	F1	off	According to battery indicator/依据电量指示					stand by
	Alert	F1	F3						Cell low
charge	Normal	on	off	According to battery indicator (Power indicator Maximum LED blink)					ALM does not blink when the overcharge alarm is generated/
	Alert	on	F3						
	overcharge protection	on	off	on	on	on	on	on	If there is no mains supply, the indicator is in standby state
	Temperature/over current/fail-safe	off	on	off	off	off	off	off	stop charging
dischargi ng	Normal	F3	off	According to battery indicator					
	Alert	F3	F3						
	low-voltage protection	off	off	off	off	off	off	off	stop charging
	Temperature/over current/short circuit/reverse/f ail-safe	off	on	off	off	off	off	off	stop charging
lose efficacy		off	on	off	off	off	off	off	Stop charging/discharging

Table 2-5 Capacity instructions/表2-5容量说明

status 状态		recharge 充电					discharging 放电				
Capacity indicator light 容量指示灯		L5	L4	L3	L2	L1	L5	L4	L3	L2	L1
		●	●	●	●	●	●	●	●	●	●
电量%	0-20%	off	off	off	off	F2	off	off	off	off	ON
	20-40%	off	off	off	F2	ON	off	off	off	ON	ON
	40-60%	off	off	F2	ON	ON	off	off	ON	ON	ON
	60-80%	off	F2	ON	ON	ON	off	ON	ON	ON	ON
	80-100%	F2	ON	ON	ON	ON	ON	ON	ON	ON	ON
Running lights ●		常亮/ON					flicker /闪烁 (F3)				



Table 2-6 Flash description/表2-6 Flash描述

Flashing way	on	off	Remarks
Flashing 1	0.25S	3.75S	F1
Flashing 2	0.5S	0.5S	F2
Flashing 3	0.5S	1.5S	F3

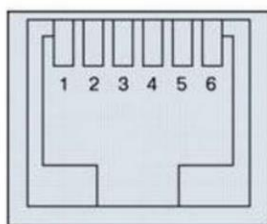
Remarks:Flash 1 is short for F1;Flash 2 is short for F2;Flash 3 is short for F3.

Notes:The alarm can be enabled or disabled through the host computer. The factory default is enabled.

4.3 RS232 Interface Definition/RS232接口定义:

BMS can communicate with the host computer through the RS232 interface, so that various information of the battery can be monitored through the host computer, including battery voltage, current, and temperature, Degree, status, and battery production information, the default baud rate is 9600bps.

BMS 可以通过 RS232 接口与上位机进行通讯,从而可通过上位机监控电池的各种信息,包括电池电压、电流、温度、状态及电池生产信息等,默认波特率为 9600bps。



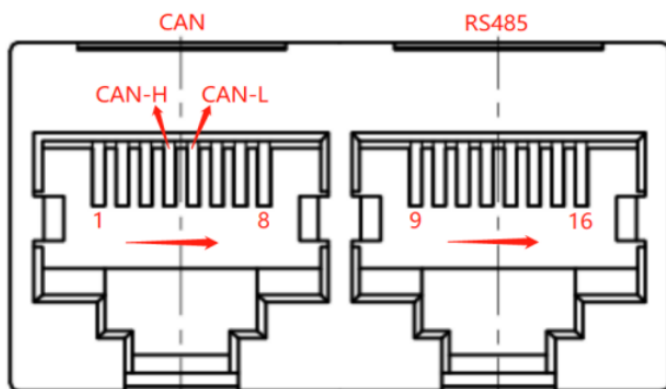
RS232—采用 6P6C 立式 RJ11 插座	
lead 引脚	Definitions specification 定义说明
1、2、6	NC
3	TX(单板)
4	RX (单板)
5	GND

4.4 RS485 And CAN Interface Definition/RS485和CAN接口定义:

485 Communication: The default baud rate is 9600bps. This interface is used to communicate with the inverter. When the battery is the master, it can summarize the slave data and communicate with the inverter. /485 通讯: 默认波特率为 9600bps, 此接口用于与逆变器通信, 当此电池为主机时, 可汇总从机数据与逆变器通信。

The default baud rate is 500K. This interface is used to communicate with the inverter. When the battery is the master, the slave data can be summarized to communicate with the inverter.

默认波特率 500K, 此接口用于与逆变器通信, 当此电池为主机时, 可汇总从机数据与逆变器通信。

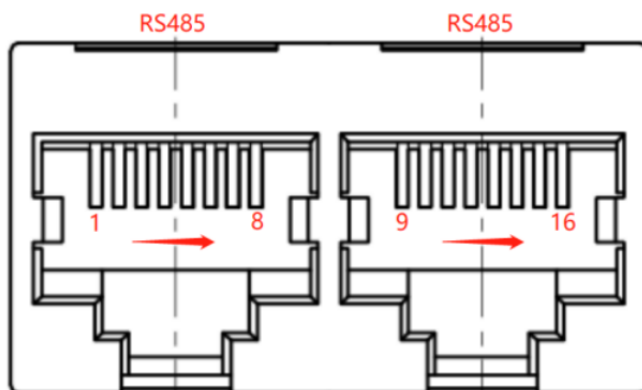


CAN--采用 8P8C 立式 RJ45 插座		RS485--采用 8P8C 立式 RJ45 插座	
lead 引脚	Definition specification 定义说明	RJ45-lead RJ45-引脚	Definition specification 定义说明
1、3、6、7、8	NC	9、16、	RS485-B1
4	CAN-H	10、15	RS485-A1
5	CAN-L	11、14	GND
2	GND	12、13	NC

4.5 Definition of two RS485 parallel communication ports/双RS485并联通讯接口定义：

You can view the PACK information. The default baud rate is 9600bps. If the monitoring device functions as a host and needs to communicate with the monitoring device over the RS485 port, set the address range to 2 to 15 based on the address polling data.

可以查看 PACK 的信息，默认波特率为 9600bps。如需通过 RS485 与监控设备通信，监控设备作为主机，依据地址 轮询数据，地址设置范围为 2~15。



COM0--采用 8P8C 立式 RJ45 插座		RS485--采用 8P8C 立式 RJ45 插座	
lead 引脚	Definition specification 定义说明	RJ45-lead RJ45-引脚	Definition specification 定义说明
1、8	RS485-A	9、16、	RS485-B
2、7	RS485-A	10、15	RS485-A
3、6	GND	11、14	GND
4	GND	13	UP_IN
5	DN_OP+	12	GND



4.6 DRY Interface Definition/干接点接口定义：



1 2 3 4

Pin number 引脚编号	Pin definition 引脚定义	Remarks 备注
1	NO	Normally open, closed during fault and protection. / 常开，故障、保护时闭合。
2	NO	
3	NO	Normally open, low battery alarm closed. / 常开，低电量告警闭合。
4	NO	

4.7 Bluetooth communication/蓝牙通信

BMS can communicate with the Bluetooth APP through Bluetooth, so as to monitor various information of the battery in the Bluetooth APP, including battery voltage, current, temperature, state, SOC, SOH and battery production information, etc. The default baud rate is 9600bps.

BMS 可以通过蓝牙与蓝牙 APP 通讯,从而在蓝牙 APP 监控电池的各种信息,包括电池电压、电流、温度、状态、SOC、SOH 及电池生产信息等，默认波特率为 9600bps。

4.8 WiFi 通信

Press and hold the reset button for 13-16 seconds. After the water light is fully on, it will turn into the state of 1 light, and then release it. Wait 8 seconds and you can see the new device in the APP add device.

长按复位按键 13-16 秒，流水灯全亮后变成亮 1 个灯的状态后松开，等待 8 秒即可在 APP 添加设备处看到新设备。

4.9 并机自动编码

After the communication parallel line is connected, the system host automatically codes after starting up (no matter the starting order of the master and slave, the host will always automatically code after starting up). If the code fails, all indicators of the corresponding single machine blink.

通讯并机线路接好后，系统主机开机后进行自动编码（无所谓主从机开机顺序，主机开机后会一直自动编码）。编码失败，则相应单机所有指示灯一起闪烁。

5. BMS Introduction/管理系统介绍

BMS has function for real-time monitor, including battery stated state, battery pack, single voltage, current, temperature, insulation and so on.

具有实时监控功能，包括电池组荷电状态、电池组及单体电压、电流、温度、绝缘等。

Alarm threshold table (parameters need to be set through the man-machine interface)



报警阈值表（参数需通过人机界面可设）

5.1 Basic parameters of BMS/ BMS基本参数:

No.	Item	Detail	Parameter	
序号	项目	描述	参数	备注
1	Single overcharge protection 单体过充保护	Unit overcharge alarm voltage 单体过充告警电压	$3.65 \pm 0.05V$	
		Single overcharge protection voltage 单体过充保护电压	$3.75 \pm 0.05V$	
		Cell overcharge protection delay 单体过充保护延时	$1.0S \pm 20mS$	
	Monomer over voltage protection is removed 单体过压保护解除	Cell overcharge protection release voltage 单体过充保护解除电压	$3.34 \pm 0.05V$	
		Capacity deactivation 容量解除	$SOC < 96\%$	
		Discharge cancellation 放电解除	Discharge current $> 1A$ 放电电流 $> 1A$	
2	Monomer over discharge protection 单体过放保护	Single overplay alarm 单体过放告警	$2.95 \pm 0.05V$	
		Single over discharge protection voltage 单体过放保护电压	$2.8 \pm 0.05V$	
		Monomer over discharge protection delay 单体过放保护延时	$1.0S \pm 20mS$	
	Release of monomer over release protection 单体过放保护解除	Cell over discharge protection release voltage 单体过放保护解除电压	$3.0 \pm 0.05V$	If the device cannot recover after 30 seconds of overcharge protection, the



		Discharges when there is a charge 有充电时解除	Access charger activation 接入充电器激活	device enters the low-power mode 过充保护 30S 后，仍无法恢复时，将进入低功耗模式
3	Overall overcharge protection 总体过充保护	Overall overcharge alarm voltage 总体过充告警电压	56.8±0.1V	
		Overall overcharge protection voltage 总体过充保护电压	57.6±0.1V	
		Overall overcharge protection delay 总体过充保护延时	1.0S±20mS	
	Overall over voltage protection is removed 总体过压保护解除	Overall overcharge protection release voltage 总体过充保护解除电压	53.44±0.1V	
		Capacity deactivation 容量解除	SOC<96%	
		Discharge cancellation 放电解除	Discharge current > 2A 放电电流>2A	
4	Overall over release protection 总体过放保护	Overall over discharge alarm voltage 总体过放告警电压	48±0.1V	If the device still fails to recover after 30 seconds of over discharge protection, the device enters the low-power mode 过放保护 30S 后，仍无法恢复时，将进入低功耗模式
		Overall over discharge protection voltage 总体过放保护电压	44.8±0.1V	
		Overall over discharge protection delay 总体过放保护延时	1.0S±20mS	



	Overall over release protection is removed 总体过放保护解除	Overall over discharge protection release voltage 总体过放保护解除电压	49±0.1V	
		Discharges when there is a charge 有充电时解除	Access charger activation 接入充电器激活	
5	Charge over current protection 充电过流保护	Charging over current alarm current 充电过流告警电流	105±3%A	If the status is locked for 10 consecutive times, it cannot be automatically unlocked 连续出现 10 次将锁定该状态, 不再自动解除
		Charge over current 1 Protect the current 充电过流 1 保护电流	110±3%A	
		Charging over current 1 Protection delay 充电过流 1 保护延时	1.0S±20mS	
	Charge over current release 充电过流解除	Automatic Cancellation Charter 自动解除	1min 后自动解除	
		Discharge cancellation 放电解除	Discharge current > 1A 放电电流>1A	
6	Discharge over current level 1 protection 放电过流 1 级保护	Discharge Over current 1 Alarm current 放电过流 1 级告警电流	105±3%A	If the status is locked for 10 consecutive times, it cannot be automatically unlocked 连续出现 10 次将锁定该状态, 不再自动解除
		Discharge over current Level 1 protection current 放电过流 1 级保护电流	110±3%A	
		Over current level 1 protection delay 放电过流 1 级保护延时	1S±20mS	
	Discharge over current 2 level protection 放电过流 2 级保护	Discharge over current Level 2 protection current 放电过流 2 级保护电流	≥150±3%A	
		Discharge over current 2 protection delay 放电过流 2 级保护延时	1000±20mS	



	Discharge over current protection is removed 放电过流保护解除	Automatic Cancellation Charger 自动解除	Automatically disconnects after 1 minute 1min 后自动解除	
		Charge release 充电解除	Charging current > 1A 充电电流>1A	
7	short-circuit protection 短路保护	Short-circuit protection 短路保护功能	YES 有	
		Short-circuit release 短路保护解除	When there is charging, the short circuit protection is removed 有充电时，短路保护解除	
			After the load is removed, it is automatically removed 负载移除后，将自动解除	
8	MOS High-Limit MOS 高温保护	MOS Over temperature Indicates the alarm temperature MOS 过温告警温度	90±5℃	
		MOS Over temperature protection temperature MOS 过温保护温度	115±2℃	
		MOS protection release temperature MOS 保护解除温度	85±2℃	
9	Cell temperature protection 电芯温度保护	Charging low temperature Indicates the alarm temperature 充电低温告警温度	3±2℃	
		Charging low temperature protection temperature 充电低温保护温度	0±2℃	



		Charge low temperature protection release temperature 充电低温保护解除温度	$5\pm 2^{\circ}\text{C}$	
		Charging over temperature Indicates the alarm temperature 充电高温告警温度	$50\pm 2^{\circ}\text{C}$	
		Charging high temperature protection temperature 充电高温保护温度	$55\pm 2^{\circ}\text{C}$	
		Charging high temperature protection release temperature 充电高温保护解除温度	$47\pm 2^{\circ}\text{C}$	
		Set the lower temperature to the alarm temperature 放点低温告警温度	$-15\pm 2^{\circ}\text{C}$	
		Discharge low temperature protection temperature 放电低温保护温度	$-20\pm 2^{\circ}\text{C}$	
		Discharge low temperature protection release temperature 放电低温保护解除温度	$-10\pm 2^{\circ}\text{C}$	
		Discharge over temperature Indicates the alarm temperature 放电高温告警温度	$55\pm 2^{\circ}\text{C}$	



		Discharge high temperature protection temperature 放电高温保护温度	$60 \pm 2^{\circ}\text{C}$	
		Discharge high temperature protection release temperature 放电高温保护解除温度	$50 \pm 2^{\circ}\text{C}$	
10	current consumption 消耗电流	Operating self-consuming electrical current 工作自耗电电流	$\leq 75\text{mA}$ (With display 带显示屏)	
			$\leq 45\text{mA}$ (Without display 不带显示屏)	
		Low power current 低功耗电流	$\leq 200 \pm 20\mu\text{A}$	
11	equalizer block 均衡功能	Equalizing opening voltage 均衡开启电压	3400mV	
		bypass opening pressure differential 开启压差	30mV	
		equalizing current 均衡电流		
12	Low battery alarm 电量低告警	The power supply is low for the alarm threshold 电量低告警门槛	$\text{SOC} < 10\%$	No alarm is generated during charging 充电时不告警
13	dormancy 休眠功能	Dormancy voltage 休眠电压	$3.15 \pm 0.05\text{V}$	
		delay time 延迟时间	30min	
14	Cell failure protection 电芯失效保护	Cell pressure difference 单体压差	Pressure difference $> 1\text{V}$ 压差 $> 1\text{V}$	Disallowed discharge 不允许放电
15	Full judgment 满充判断	Full charge voltage 满充电压	$> 58\text{V}$	At the same time, stop charging and update the SOC to 100% 同时满足后停止充电，并更新 SOC 为 100%
		cutoff current 截止电流	$< 2\text{A}$	



5.2 BMS function/BMS功能:

function 功能	stockpile 储存	☐ nothing ☐ Store 400 pieces ☒ Store 1000 pieces 无 储存 400 条 储存 1000 条
	Charge current limiting 充电限流	☐ nothing ☐ 5A ☐ 10A ☒ 20A ☐ _____A 无 5A 10A 20A _____A
		Definition: Charging current > 200A On 定义: 充电电流>100A 开启
	display screen 显示屏	☐ Nothing ☐ Chinese Intelligent 无 中文智能 ☐ English intelligence ☒ 3.5 color screen CTP35H-1.3 英文智能 3.5 寸彩屏 CTP35H-1.3
	dry contact 干接点	☐ Nothing 无 ☒ Have 有
		Definition: Dry contact 1-PIN1 to PIN2: Normally open, closed during fault protection. Dry contact 2-PIN3 to PIN4: On normally. The low battery alarm is closed. 定义: 干接点 1-PIN1 to PIN2:常开, 故障保护时闭合; 干接点 2-PIN3 to PIN4:常开, 低电量告警闭合;
	heating film 加热膜	☒ Nothing 无 ☐ Have 有
	reverse polarity protection 反接保护	☐ Nothing 无 ☒ Have 有
	weak current switch 弱电开关	☐ Nothing 无 ☒ Have 有
	buzzer 蜂鸣器	☐ Nothing 无 ☒ Have 有
	locate function 定位功能	☒ Nothing 无 (预留功能接口与线路) ☐ Have 有
	CAN parallel operation CAN 并机	☒ Nothing 无 ☐ Have 有
		definition 定义:
	trip unit 脱扣器	☐ Nothing 无 ☒ Have 有
		Definition: 1. After the charging MOS is turned off, if a charging current is detected, continue to start for 8S 2. After the discharge MOS is turned off, if a discharge current is detected, continue to start for 8S 定义: 1. 充电 MOS 关闭后, 若检测到有充电电流, 持续 8S 启动 2. 放电 MOS 关闭后, 若检测到有放电电流, 持续 8S 启动

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	communication protocol 通讯协议	PACE 标准化命名: 000-PACE RS232 V1.7-2022.10.22 000-PACE RS485 MS V1.0-2018.06.15 RS485: 001-PYLON RS485 LV V3.5-2019.12.23--9600 (派能) (默认) 002-Growatt RS485 V2.02-2019.07.24 (古瑞瓦特) 003-Voltronic RS485 Inverter V1.5-2022.01.18 (日月元) 012-Luxpowertek RS485 Inverter V0.3-2020.07.06 (鹏城 V03) 036-WOW RS485 Modbus V1.3-2017.06.27 (硕日) 015-Schneider V2.0.pdf (施耐德) 000-PACE RS485 Modbus V1.3-2017.06.27 (沛城) CAN: 001-PYLON CAN Inverter EMS (派能) (默认) 002-Growatt CAN LV V1.05-2019.08.28 (古瑞瓦特) 010-Victron CAN 2021.01.07 (维克多) 015-Schneider CAN V2.0 (施耐德) 012-Luxpowertek CAN V1.0-2020.02.11 (鹏城) 013-Sorotec CAN Inverter V1.0 (索瑞德) 017-SMA CAN V2.0 (SMA) 007-GoodWe CAN Inverter LV V1.7-2020.02.28 (固德威) 035-STUDER CAN V1.02-2018.06.14 (特能创新) 030-MUST CAN PV1800F (美世乐) 014-GINLONG CAN LV V1.0-2019.12.28 (锦浪) 028-Senergy CAN V1.1-2022.05.10 (盛能杰) 033-TBB CAN V1.05-2021.04.20 (TBB) 031-MEGAREVO CAN Inverter LV V1.1 (迈格瑞能) 008-Deye CAN LV 1.0-2022.04.02 (德业)
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6. Cell Reliability Test/电芯可靠性测试

Item 项目	Inspecting Method 测试方法	Standard 标准
Over ChargeProtection 过充电保护	The batteries is charged at 0.2 C ₅ A in the constant current till it reaches over charge protection voltage at (20±5) °C, connected with a charged for 24h. 电池在环境温度 20±5°C 的条件下, 以 0.2 C ₅ A 充电至 4.5V, 充电 24h。	No leakage, no fire, no explosion. 不漏液, 不起火、不爆炸。
Vibration 振动	After fully charging, fixing the battery onto the vibration platform. With amplitude 0.4mm circularly scanning vibrating in the frequency of 10-55HZ from three directions X、Y、Z for 30min respectively in its scanning frequency velocity 10CT/min. 标准充电后, 以 0.4mm 的振幅和 10~55Hz 的频率作谐振, 将电池安装在振动台上, 设置好 X.Y.Z 三个方向上从扫频速率为 1oct/min, 循环扫频振动 30min。	No leakage, no fire, no explosion. 不漏液, 不起火、不爆炸。
Short-circuit Protection	As the battery has completed charging, short circuit the positive and negative contacts with <5mΩ resistor for 10min, after 1h for appearance	No fire, no explosion. 不起火、不爆炸。



短路保护	check. 标准充电完成后,将正负极用 $<5\text{m}\Omega$ 电阻短路 10min 后将正负极断开,观察 1H。	
Cycle Life 循环寿命	The battery shall be constantly charged at $0.2C_{5A}$ in the temperature of $(20 \pm 5^\circ\text{C})$. When its voltage reaches 3.65V, it shall be charged to constant voltage charging. It shall not stop charging until its current is no more than $0.05 C_{5A}$. Put it aside for 0.5h~1h then discharge with $1.0 C_{5A}$ in the constant current to its final voltage 2.0V. When the discharging is finished, the battery shall be put aside for 0.5h~1h and has the next charge and discharge recycle. The above recycle test shall be continued unless there are two continuous discharging capacity less than 80%, which is taken as the end of the life. 电池循环寿命试验应在 $20^\circ\text{C} \pm 5^\circ\text{C}$, 以 $0.2 C_{5A}$ 充电, 当电池端电压达到充电限制电压时, 改为恒压充电, 直到充电电流小于或等于 $0.05 C_{5A}$, 停止充电, 0.5h~1h, 然后以 $1.0 C_{5A}$ 电流放电至终止电压, 放电结束后, 搁置 0.5~1h, 再进行下一个循环, 直至连续两次放电容量小于标称容量的 80%, 则认为寿命终止。	Its cycles shall be over 5000 times (80%DOD) . 循环寿命不低于 5000 次。 (80%DOD)

Note: The definitions of some nomenclatures of this specification

- (1) Standard charge: $0.2 C_{5A}$ ($20.4A$) charge at $20^\circ\text{C} \pm 5^\circ\text{C}$ to the voltage 3.65V, then change to charge with constant voltage till the current less than or equal to $0.05 C_{5A}$ ($5.1A$) .
- (2) Residual Capacity: The first discharge capacity after being tested by the specific procedure.
- (3) Standard cycle: charge at $0.2C_{5A}$, then rest for 60min, discharge at $0.2 C_{5A}$ to the cut-off voltage.
- (4) Recovery Capacity: The discharge capacity by implementing charge-discharge cycle repeatedly after being tested by the specific procedure.
- (5) All batteries tested above are within a month unless there are other regulations.

备注：以上标准中的一些术语的定义：

- (1) 标准充电：在环境温度 $20^\circ\text{C} \pm 5^\circ\text{C}$ 的条件下，以 $0.2C_{5A}$ 充电，当电池端电压达到充电电压 3.65V 时，改为恒压充电，直到充电电流小于或等于 $0.05 C_{5A}$ 后停止充电。
- (2) 剩余容量：电池经过特定的检测程序后的首次放电容量。
- (3) 标准循环：电池 $0.2C_{5A}$ 标准充电后，搁置 60min，以 $0.2C_{5A}$ 放电至放电截止电压。
- (4) 恢复容量：电池经过特定的检测程序后，通过反复充放电使状态恢复后的放电容量。
- (5) 用于上述测试的电池必须是交货一个月内的电池，除非另有规定。



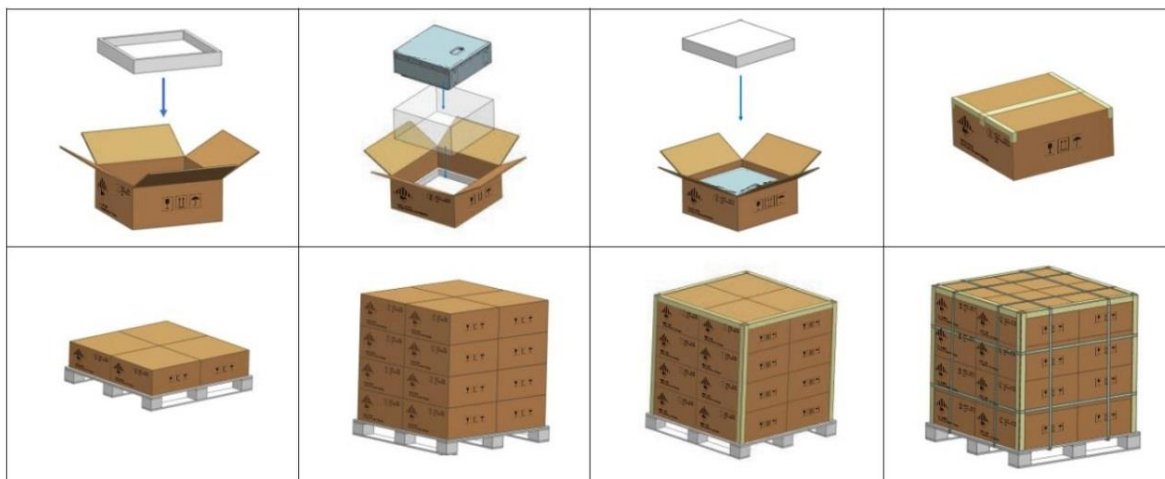
7. Part List/配件清单

NO. 序号	Part No. 料号	Product Name 名称	SPEC. 规格	QTY. 数量	Remarks 备注
1		EXT-COMM Cable 外部通讯线	2*RJ45_CAT5E_L=1500mm_BLACK	1	
2		EXT-COMM Cable 外部通讯线	2*RJ45_CAT5E_L=1000mm_BLACK	1	
3		Positive Cable 正极动力线	EV50_1500VDC_2*SC50-8_L=1500mm_RED	1	
4		Negative Cable 负极动力线	EV50_1500VDC_2*SC50-8_L=1500mm_BLACK	1	
5		screw 螺丝	M5* 30mm_Stainless Steel 304_Outer hexagon cross combination screws	4	Lock wall mount bracket
6		Expansion screw 膨胀螺丝	M10*100mm_ Stainless Steel 304_ Expansion screws	8	Lock wall mount bracket
7		wall mount 壁挂支架	L433mm*W422mm*H16mm*T3.0mm_Pearly white fine sand grain	1	
8		warranty card 保修卡	TR4000WX_300g_coated paper	1	
9		specification 说明书	TR4000WX_157g_coated paper	1	
10		Certificate 合格证	English Version_L40*W40mm	1	

8.Package, Transportation and Storage/包装、运输和存储

8.1 Package/包装

The package process is shown as follows:





Paper box should be equipped with corner protection and wrapped with films.

原始堆垛包装即纸箱侧边角有护板、护板捆扎带，外缠薄膜。

If packaging boxes cannot fill up a stack, the openings should be filled with solid paper boxes. Add air bags between stacks to prevent moving against carriage. As for inter-province carriage up to a distance of over 800 km, it is recommended to add air bags between stacks and van in order to prevent relative movement.

维持原来的货物堆垛包装强度。不够一个堆垛的空虚部分填充结实的空箱子。超过 800 公里的跨省运输，应增加气袋固定堆垛间靠紧车厢不移动。

Packaging boxes insufficient to fill up one pallet should be packed in wood boxes and carried by van-type vehicle.

不够一个卡板的几箱货物用木箱包装运输或快递，都用厢式车辆进行运输。

8.2 Transportation/运输

Product has cleared UN38.3 (Section 38.3 of the seven Revised Edition of the Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria) and SN/T 0370.2-2009 (Part 2: Performance Test of the Rules for the Inspection of packaging for Exporting Dangerous Goods). The Product is classified as class 9 dangerous goods, and shall be transported in accordance with the following:

电池组已通过 UN38.3 (《危险货物运输建议: 试验和标准手册》第七修订版 38.3 节) 和 SN/T 0370.2-2009 《出口危险货物包装检验规程-第 2 部分-性能检验》的认证 (此产品属于第九类危险品)，并应依照以下方式运输：

Use van-type vehicle including container and metallic van-type vehicle. Platform vehicle and convertible are prohibited.

必须厢式车辆运输，包括集装箱或者金属厢式车辆，禁止平板车、敞篷车运输。

- In order to protect PACK from moving, fall or crash, bandages and bubble bags shall be adopted during transportation.

Specifically, bandages apply to both long and short distance transports, and at least the last 1~2 rows at vehicle rear shall be bandaged. Short distance transport does not need bubble bags. But both bubble bags and bandages (at least the vehicle rear) should be used for long distance transport. If there isn't enough space for bubble bags, bandage application inside the whole car is an option.

为防止运输过程中电池组发生倾倒，移位，或碰撞，需采用捆绑带（飞机带）和气泡填充袋。其中，无论长途还是短途运输，均需要绑飞机带，且至少保证尾部（最后 1~2 排卡板）绑好。短途运输不需要填充气泡袋，长途需在车辆中间加气泡袋，并在尾部绑飞机带。如果车厢内缝隙不方便或不足以填充气泡袋时，可选择整车绑飞机带。

- Vehicle in the middle of unloading should berth near dock. Vehicles waiting to be unloaded should keep a safe distance of 6m from warehouse. The vehicle prohibits debris stacking and should stay away from other vehicles.

正在卸货要靠近装卸码头，非卸货等待的运输车辆停放区域距离仓库有 6m 安全距离，无杂物堆放，尽量远离其他车辆。

- Prohibit mixing up with explosive, inflammable or toxic objects

不得和易燃易爆物品，有毒物品等混装运输。

- Prohibit piling up with other objects.

禁止堆垛上再堆叠货物。

- Maintain original packaging and keep labels complete and recognizable.

维持原包装状态，保持原来标识完整。

- Prevent from direct exposure to sunlight, rain, condensation and mechanical damage.

禁止直接暴晒、淋雨、温差冷凝水、装卸机械损伤。

- Do not stack more than five PACKs.

堆叠不得超过五箱 PACK。

- Maintain temperature between -20℃ to 45℃, and keep humidity within 5%~95%RH during the storage.

运输过程中需将温度控制在-20℃至 45℃，并将湿度控制在 5%~95%RH 间。



- Extinguisher designed specifically for lithium battery shall be installed in carriers.

运输工具必须配置锂电池专用灭火器，并连同消防水、消防沙一并使用。

A damaged box or rattles during transport may indicate rough handling. Make a descriptive notation on the delivery receipt before signing. If obvious damage such as package hole or serious impact is found, please feedback to LITHTECH.

包装盒在运输过程中可能出现损坏。请签收前在交付单上对损坏情况做描述性的标注。如发现包装破洞或严重的撞击等明显损坏请反馈给立泰。

8.3 Storage/存储

8.3.1 Warehouse Management/仓库管理

- Seven meters heightened warehouse is not recommended to store Products. In case of the warehouse, Products should be placed not higher than two meters from floor.

不推荐使用立体式仓库（高度在 7 米以上为立体仓库）储存锂离子电池；如果用立体仓库，则放置在地面 2 米高度以下的货位。

- Batteries with safety deficiency and normal batteries should be separately stored with wall in-between or in different fire protection zones.

安全缺陷电池和正常电池放开区域存储，单独隔墙或者不同防火分区。

- Prevent electrical fire sources. Electrical tube, switch box and socket should be undamaged. 0.5 meters from floor standing air conditioner and dehumidifier should be free from inflammable materials. Use cold light source in warehouse. If spotlight is used, at least one meter therefrom should free from other inflammable materials.

管理电气火源，电气穿管不破损，开关箱、插座不破损；落地的空调、除湿机周围 0.5 米范围内无可燃物；仓库室内使用冷光源照明，如果用射灯在其周边至少 1 米无其他可燃物质。

- Warehouse should be labelled with smoking ban and confirmed without cigarette butts. Smoking points should be reasonably designed with a fire-retardant wall-separating warehouse. Wind at exit cannot blow cigarette butt near warehouse. Warehouse has no smoking signs, and confirm warehouse area no cigarette butts. Smoking points design reasonable, and warehouse has fire-retardant wall separated, exit will not have wind blowing cigarette butts near warehouse floor.

- Warehouse should have mice protective measures, like plugging up holes and caves, timer-connected mouse expeller, floor baffler against mouse, sealing door slot with less than 10mm gap.

仓库有防鼠措施，如堵住孔洞、设置有定时器联动的噪声驱鼠器，或门口设有挡鼠板或门缝有可以加密封后间隙不超过 10mm。

- Warehouse canopy must use fire retardant materials, prohibit inflammable materials like plastic or canvas.

仓库雨棚只能用阻燃材料，禁止用可燃材料如塑料雨棚、帆布雨棚。

- Warehouse should be equipped with fire detector, watch-keeper, and surveillance video kept for at least one month.

仓库有火灾探测器，联动值班室，仓库整体有视频监控，视频保存至少 1 个月。

- Keep a dry clean storage place with proper ventilation. Specifically, with a relative humidity of 5%~95%RH, if ambient temperature ranges between -30°C to 60°C, storage period lasts for seven days; if ambient temperature ranges between -20°C to 45°C, storage period lasts for six months.

保持存储环境干燥、通风、清洁，七天内存储温度为-30°C至 60°C，六个月内的存储温度则为-20°C至 45°C，相对湿度 5%~85%RH。

- Battery performance is vulnerable to chemical corrosion, strong acid, strong base, electrochemical corrosion, salt spray and radiation.

化学腐蚀、强酸、强碱、电化学腐蚀、盐雾和射线都会影响电池性能。

8.3.2 Fire extinguish device/配备灭火装置

- Battery sites must be equipped with multiple varieties of battery fire extinguishers, including fire sand, blanket and powder Extinguisher.



现场配置多种多样的锂电池灭火装置，包括：消防沙、防火毯、干粉灭火器等。

- Micro fire station is recommended to be deployed with firefighter uniform, helmet, fire protection mask, safety gloves, and at least one set of first aid kit including medical devices and drugs.

建议现场布置微型消防站，多套消防战斗服，头盔，防火面罩；高温手套，至少一套医疗急救箱，外用药品和器械。

8.3.3 Smoke discharge/排烟

- Equip 24 hours fan with failure alert. Fan should coordinate with smoke detector or gas concentration detector.

房间宜配置独立风机 24 小时运作有故障报警，或房间有独立风机且风机和烟雾报警器/或浓度报警器联动。

- The ventilation capability should be not less than 12 times per hour and fan speed should exceed 0.5 meters per second.

建议配备通风能力不低于 12 次/小时的换气能力或风机作用区域的风速不低于 0.5 米/秒。

- Fan portfolio includes axial flow fan on wall (effective distance less than 5 meters), fan with fixed air hose, and mobile fan with flexible aluminum foil. Wall fan combined with mobile fan is recommended.

建议灵活组合使用风机。包括：墙壁轴流风机（作用距离不超过 5 米），或固定风管的风机，或带伸缩铝箔管道的移动风机，鼓励见墙壁风机和移动风机组合排烟。

8.3.4 Fire retardant buildings/建筑耐火

- Warehouse and plant should use level two fire retardant buildings, like rock wool colour steel plate, plasterboard and iron rain-shed. Inflammable materials like foam and plastics are prohibited.

电池的仓库和车间使用二级耐火建筑；不得使用易燃建筑材料如泡沫彩钢板、塑料雨棚，可使用阻燃的岩棉彩钢板、石膏板、铁皮雨棚。

8.3.5 Separate storage/单独存放

- Lithium batteries should not be stored with inflammable or toxic objects.

锂离子电池不得和易燃或有毒等危险品一起存放。

- Design various fire protection zones. Normal batteries and batteries with safety deficiencies should be stored separately.

要在不同防火分区，正常的锂离子电池和安全缺陷电池不要混放。

- The shipment module SOC is more than 30% and the module need be charged after six months during storage.

模组出货 SOC 为不小于 30%，超过六个月需要对模组进行补电。

- Recharge: Charge the module that has been stored for over six months.

补电：当 PACK 存储超过六个月时，需要进行补电。

9. Hazard Warning and Cautions/危险警告及注意事项

9.1 Hazard Warning/危险警告

9.1.1 Forbid Disassemble Batteries/禁止拆装电池

The battery has protective component and circuit internally to avoid danger. Mishandling such as improper disassembly will destroy its protective function and make it heat, smoke, distort or burning.

电池内部具有保护机构和保护电路可以避免发生危险。不会拆装会损坏保护功能，将会造成让电池发热、冒烟、变形或燃烧。

9.1.2 Forbid Short-circuit Batteries/禁止将电池短路

Do not touch the plus and minus contacts with metals. Do not put the battery with metal element together in either storage or movement. If the battery is short-circuit, it carries magnified current, which will cause damage and make the battery heat, smoke, distort or burning.



不要将电池的正负极用金属连接，也不要将电池与金属片放在一起存储和移动。如果电池被短路，将会有超大电流流过，将会损坏电池，造成电池发热、冒烟、变形或燃烧。

9.1.3 Forbid heat and burn the batteries/严禁加热和焚烧电池

If heating or burning the battery, it will caused the isolated element in the battery dissolved, protection function stopped or the electrode burning, over heated, which will make the battery heat, smoke, distort or burning.

加热和焚烧电池会造成电池隔离物的溶化、安全功能丧失或电解质燃烧，过热就会使电池发热、冒烟、变形或燃烧。

9.1.4 Avoid charging near fire or in the sunlight/避免在火源附近或阳光直射下充电

Otherwise, it will cause internal protection circuit and its function lost or abnormal chemical reactions, which will lead to heating, smoking, distortion or burning.

否则会造成电池内部保护电路和功能丧失和发生不正常的化学反应，电池有可能发热、冒烟、变形或燃烧。

9.1.5 Danger in using non-indicated chargers in/使用非专用充电器给电池充电，会发生危险

Charging in abnormal condition, the battery will cause internal protection circuit and its function lost or abnormal chemical reactions, which will lead to heating, smoking, distortion or burning.

在非正常的条件下充电会造成电池内部保护电路功能丧失和发生不正常的化学反应，电池有可能发热、冒烟、变形或燃烧。

9.1.6 Forbid Damage Batteries/禁止破坏电池

Do not allow damage the batteries with the metals gouged, forged or dropped etc., otherwise, it will cause over-heated, distort, smoke or burning, even in danger.

禁止用金属凿入电池、锤打或摔打电池或其他方法破坏电池，否则会造成电池发热、冒烟、变形或燃烧，甚至会发生危险。

9.1.7 Do not touch the leak-out batteries/不要直接触及漏液电池

The leak-out electrolyte will cause the skin uncomfortable. If it drops into eyes, do not rob the eyes but wash in time, and go to hospital for treatment.

渗漏的电解液会造成皮肤不适，万一电解液进入眼睛，尽快用清水冲洗，不可揉眼，并迅速送医院处理。

9.2 Cautions /注意事项

9.2.1 Notice/注意

The battery shall be prevented to be exposed in effulgence so as not to cause over-heated, distort, smoke andweaken its performance and cycle life.

避免在强光曝晒环境下使用电池，以免发热、变形、冒烟.至少避免电池性能下降、降低寿命。

9.2.2 Electro Static-free/防静电

There is a protective circuit inside the battery to prevent contingency. Do not use the battery in the Electro static circumstances (above 1000V), for it is easily destroyed the circuit board so that the battery doses not work and causes over-heated, distort, smoke or burning.

电池中装有保护电路以避免各种意外情况发生。不要在产生静电的场所使用电池，因为静电（1000V 以上）容易损坏保护板，而导致电池工作不正常，发热、变形、冒烟或起火燃烧。

9.2.3 Discharging Temperature Range/充电温度范围



Recommended discharging temperature range is 0~40℃, beyond which it will result in decadence of the battery performance and shortness of its life.

推荐的充电温度范围是 0~50℃。在超出此范围的环境中充电会造成电池性能下降、减少寿命。

9.2.4 Read carefully the manual before use or whenever in need/

在使用电池之前，请仔细阅读使用手册并经常在需要时阅读。

9.2.5 Charging Method/充电方式

Use the special chargers in the recommended charging method to charge the batteries.

请使用专用充电器和推荐的充电方式，在推荐的环境条件下给电池充电。

9.2.6 Guarantee period/保用期

Guarantee is three year since it is out of the factory. Any damage by incorrect use and not quality problem, even in its guarantee period, free service won't be provided by the manufacture.

保用期自出厂之日起三年，但属于使用不当而非质量问题，即使在保用期内，生产厂家也不会无偿更换新电池。

10. Disclaimer/免责声明

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11. Attachment/附件

None