

产 品 规 格 书

Data-sheet & Specification

大容量单电芯 1kWh 户用移动电源

| | | |
|----------------------------------|-------------------------|--------------------|
| 产品型号/版本 Product model&Version | JYINS-1K500-PC50579-1.3 | |
| 客户承认 Customer approved | | |
| 客户名称(Customer)_____ | 签 名 | |
| 客户型号(Model)_____ | | |
| 料 号 (P / N)_____ | | |
| 制作部门(Execution Dept.) | | |
| 制作 Executed By | 审核 Checked By | 确认 Confirmed by |
| Li | Zhang | Zhang |

文件修订摘要

Summary of File Changes

| 日期 Date | 版本号 Version | 修订说明 Revision Description | 制定人 Prepared by | 核准人 Checked by |
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| 2025/09/05 | 1.0 | 新订 Initial release | Li | Zhang |
| 2025/10/09 | 1.1 | 优化 PCB 细节 Optimize PCB details | Li | Zhang |
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| | | | | |
| | | | | |

文件使用声明:

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配件清单(Parts list)

| 序号 No. | 名称 Part Name | 型号 Model | 数量 Qty | 说明 Description |
|-----------|-----------------|---------------------------------|-----------|-------------------|
| 1 | 电源板 | PW-50579A-1.3 | 1 | |
| 2 | 控制板 | CTR-50579C-1.2 | 1 | |
| 3 | 灯板 | DSP-50328B-1.2 | 1 | |
| 4 | 螺丝 | M6*12 三合一 | 2 | |
| 5 | 风扇 | USTF402012HW | 3 | |
| 6 | 线材 | 330mm-4P-2.5S-PS16-YD-1.0 | 1 | 开关线 |
| 7 | 线材 | 9P-170mm-9P-2.5S-1.1 | 1 | LED 线 |
| 8 | 线材 | 150mm-2P-2.5S-NTC(M3)-1.0 | 1 | BAT ntc 线 |
| 9 | 线材 | XT30UF-300mm-XT30UM-16AWG-1.0 | 1 | PV 线 |
| 10 | 线材 | 250FS-300mm-250FS-18AWG-BR-1.0 | 1 | ACIN_L |
| 11 | 线材 | 250FS-300mm-250FS-18AWG-BL-1.0 | 1 | ACIN_N |
| 12 | 线材 | 250FS-300mm-250FS-18AWG-RED-1.0 | 1 | ACOUT_L |
| 13 | 线材 | 250FS-300mm-250FS-18AWG-BK-1.0 | 1 | ACOUT_N |
| 14 | | | | |

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1. 产品介绍(Introduction)

本产品适用于大容量单电芯便携电源的主控制电路。具有光伏、市电对大容量电芯的充放电功能，控制电池能量逆变器为负载可用的市电电压。可控制电池的充电和放电过程，进行交直流的变换，在无电网情况下可以直接为交流负荷供电。本产品是一款光伏便携储能产品，可以高效地控制太阳能、市电、电池储能与负载之间的能量转换。适用于移动便携储能。

This product is suitable for the main control circuit of large capacity single cell portable power supplies. It has the function of charging and discharging large capacity cells with photovoltaic and mains power, and controls the battery energy inverter to provide the available mains voltage for the load. It can control the charging and discharging process of the battery, perform AC/DC conversion, and directly supply power to AC loads in the absence of a power grid. This product is a portable photovoltaic energy storage product that can efficiently control the energy conversion between solar energy, mains power, battery storage, and loads. Suitable for mobile portable energy storage.

2. 产品特性(Product characteristics)

- 具有过温、过载、短路保护，支持非线性负载和电机启动应用。

Equipped with over temperature, overload, and short circuit protection, supporting non-linear loads and motor starting applications.

- 适用于 3.2V 单电芯电池系统直流供电应用。

Suitable for DC power supply applications in 3.2V battery systems.

- 额定输出功率 500W，AC230V，50Hz/60Hz，纯正弦波输出。

Rated output power 500W, AC230V, 50Hz/60Hz, Pure sine wave output.

- 3.2V 直流侧输入过压/欠压保护。

3.2V DC side input over-voltage/under-voltage protection.

- 出色的负载适应性

Excellent load adaptability

- 输出 500W, AC230V, 50Hz 纯正弦波交流电, 强劲过载能力, 适用各种 IT 设备, 电动工具, 家用电器, 不挑负载;

Output 500W, AC230V, 50Hz pure sine wave AC power, strong overload capacity, suitable for various IT equipment, electric tools, household appliances, no load picking;

- 安全系数高 (High safety factor)

具有过温, 过载, 过压, 欠压, 短路等保护, 支持非线性负载和电机启动应用;

Equipped with protection against overheating, overload, over-voltage, under-voltage, short circuit, etc., supporting non-linear loads and motor starting applications;

- 高效能与小体积 (High efficiency and small volume)

采用先进技术设计, 低损耗, 低发热, 峰值效率最高达 90% 以上, 节省电池电量, 延长放电时间; 高功率密度, 占用空间小, 重量轻, 结构强度高, 适合移动式和家用储能应用;

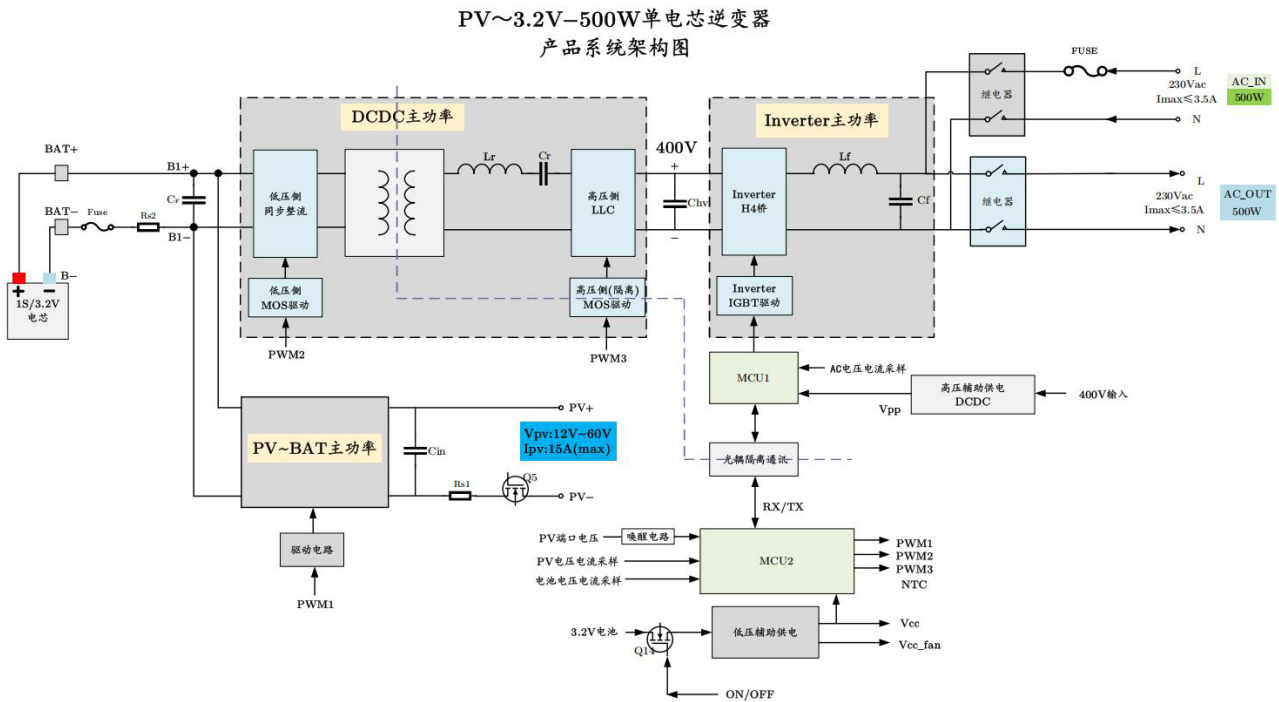
Adopting advanced technology design, low loss, low heat generation, peak efficiency can reach up to 90% or more, saving battery power and prolonging discharge time; High power density, small space occupation, light weight, strong structural strength, suitable for mobile and household energy storage applications;

- 采用模拟与数字组合控制技术 (Adopting a combination of analog and digital control technology)

采用模拟与数字化结合的控制技术, 软硬多重完善保护, 稳定可靠产品设计全玻璃纤维双面板材, 配合大跨距元件, 结实, 耐腐蚀, 大幅提高环境适应性。

Adopting a control technology combining simulation and digitization, the product is designed with a stable and reliable double-sided fiberglass panel, which is sturdy, corrosion-resistant, and significantly improves environmental adaptability.

3. 功能示意框图(Functional schematic diagram)



4. 环境要求(Environmental requirements)

| 项目 project | 参数 Parameters | 单位 Unit |
|-----------------------------|--|------------|
| 工作温度 working temperature | 充电模式: -0~60 Charger mode: -0~60 | °C |
| | 放电模式: 0~60 Discharge mode: 0~60 | °C |
| 储存温度 Storage temperature | -20~70 | °C |
| 工作湿度 Working humidity | 5%~95%相对湿度 5%~95% relative humidity | %RH |
| 储存湿度 Storage humidity | 5%~95%相对湿度 5%~95% relative humidity | %RH |

5. 电气特性 (Electrical characteristics)

5.1. 基本参数设置(Basic parameter settings)

| 技术参数 Technical parameter | | 额定规格 Rating parameter |
|--|---|---|
| 额定功率 Rated power | | 500VA/500W |
| 额定容量 Rared capacity | | 1KWh |
| 产品架构 Product architecture | | 500W 双向逆变器带光伏充电 500W bidirectional inverter with PV charging |
| 输出相数 Output phase number | | 单相输出 Single phase output |
| 电池类型 Battery type | | 单串磷酸铁锂电池 1 series LFP batteries |
| 电网模式 规格 Grid mode spec | 额定输入电压 Rated input voltage | 230VAC |
| | 输入电压范围 Input voltage range | 176~264 VAC |
| | 额定输入频率 Rated input frequency | 50Hz/60Hz |
| | 功率因素 Power factor | ≥ 0.99 @ Nominal Voltage (100% Load) |
| | 最大输入电流 Max input current | 3.5A |
| | 效率 efficiency | 85.0% max |
| PV 矩阵 MPPT 规格 PV matrix MPPT spec | 最大太阳能充电功率 Max PV charging power | 300W (输入 20V 以上) 300W (input above 20V) |
| | PV 电压范围 PV voltage range | 12~55Vdc |
| | PV 启动电压 PV starting voltage | $\geq 9.1V$ |
| | 最大输入限流 Max input current limiting | 15A |
| | PV Array 最大开路电压 PV Array Max open circuit voltage | 60VDC |
| | MPPT 追踪效率 MPPT tracking efficiency | $\geq 99\%$ |
| PV 对电池充电效率 PV on battery charging efficiency | 87% (max) @200W 85% (max) @300W | |
| 逆变模式规格 | 输出电压 output voltage | 176VAC~230VAC $\pm 5\%$ |

| | | |
|----------------------------------|---|--|
| Inverter mode spec | 输出额定频率 Output rated frequency | 50Hz or 60Hz |
| | DC to AC 效率 DC to AC efficiency | 电池离网: 85%; Battery off grid:85%; |
| | 市电到逆变模式 (UPS Mode) | 20ms (典型) |
| 电池端规格 Battery spec | 电池额定电压 Rated voltage of battery | 3.2VDC (放电模式, 电池电压 \geq 2.6V 启动) 3.3VDC (discharge mode, battery voltage \geq 2.6V start) |
| | 电池电压范围 Battery voltage range | 2.8-3.65VDC |
| | 充电方式 Charging method | 三段式充电(磷酸铁锂电池) Three stage charging (LiFePO3 battery) |
| | 电池电压欠压点 Battery voltage UVP | 2.8 \pm 0.1V |
| | 电池电压过压点 Battery voltage OVP | 3.65 \pm 0.1V |
| 保护功能 Protection function | 逆变器保护功能 Inverter protection function | 输入欠压、过压、输出过载、过温、短路保护 Input UVP, OVP, output overload, OTP, OCP protection |
| 尺寸 size | 高*宽*厚 (mm) H * W * T (mm) | (长 \times 宽 \times 厚) 210 \times 170 \times 45mm (L * W * T) 210 \times 170 \times 45mm |
| | 净重 (kg) Net weight (kg) | 1KG |
| 环境参数 Environmental parameters | 噪音 Noise | < 50dB |
| | 湿度 Humidity | 5%~95% 相对湿度 5%~95% relative humidity |
| | 工作温度 working temperature | -0 $^{\circ}$ C~60 $^{\circ}$ C(45 $^{\circ}$ C~60 $^{\circ}$ C范围做整机功率降额) -0 $^{\circ}$ C~60 $^{\circ}$ C (Derating of 45 $^{\circ}$ C~60 $^{\circ}$ C) |
| | 储存温度 Storage temperature | -20 $^{\circ}$ C~70 $^{\circ}$ C |
| | 海拔 Altitude | 3000m (超过 2000 米做功率降额) 3000m (for power reduction exceeding 2000m) |
| | 散热方式 Heat dissipation method | 强制风冷 (内部有 3 个 12V/0.15A 风扇) Forced air cooling (with three 12V/0.15A fans inside) |
| 电量指示灯 Battery level indicator | LED 灯 LED light | 5 状态指示灯 5 status indicator lights |
| | | 电量显示 Battery Level Display |

5.2. 安规要求(Safety requirements)

| 序号 No. | 项目 Project | 测试要求 Testing requirements | 标准 Standard | |
|-----------|---|------------------------------|---------------------------------|--------------|
| 1 | 防雷要求 Lightning protection requirements | AC 端口 AC port | 线线之间: 2KV Between lines: 2KV | IEC61000-4-5 |
| 2 | 安全要求 safety requirements | AC~DC | 2000Vac/10mA/1min | |
| | | AC~PE | 1500Vac/10mA/1min | |
| | | BAT/PV~PE | 500Vac/10mA/1min | |

5.3. 接口定义(interface definition)

| 端口类型 Port type | 端子定义 Terminal Definition | | 描述 Description | 备注 Remarks |
|-----------------------------------|-----------------------------|----------|---|---------------|
| 电池输入端子 Battery input terminals | 1 | BAT+ | 电池正极 Battery positive pole | |
| | 2 | BAT- | 电池负极 Battery negative pole | |
| 光伏接口 PV interface | 1 | PV+ | 光伏输入正极 PV input positive pole | |
| | 2 | PV- | 光伏输入负极 PV input negative pole | |
| AC_IN | 1 | AC_IN_L | 输入正极 Input positive pole | |
| | 2 | AC_IN_N | 输入负极 Input negative pole | |
| AC_OUT | 1 | AC_OUT_L | 输出正极 Output positive pole | |
| | 2 | AC_OUT_N | 输出负极 Output negative pole | |
| 开关 switch | 1 | K1 | 开启离网逆变输出 Enable off-grid inverter output | |
| | 2 | LED+ | LED+(switch) | |
| | 3 | K2 | 关闭离网逆变输出 Turn off off-grid inverter | |

| | | | output | |
|----------------------|---|---------|-------------------|--|
| | 4 | EN-LED | LED-(switch) | |
| 风扇 1 FAN 1 | 1 | +12V_F | 风扇正端 FAN positive | |
| | 2 | FAN | 风扇负端 FAN negative | |
| | 3 | GND | NC | |
| 风扇 2 FAN 2 | 1 | +12V_F | 风扇正端 FAN positive | |
| | 2 | FAN | 风扇负端 FAN negative | |
| | 3 | GND | NC | |
| 风扇 3 FAN 3 | 1 | +12V_F | 风扇正端 FAN positive | |
| | 2 | FAN | 风扇负端 FAN negative | |
| | 3 | GND | NC | |
| LED | 1 | GND | 地/GND | 驱动显示 Direct I/O drive Display |
| | 2 | +5V_D | +5V | |
| | 3 | K2 | NC | |
| | 4 | K1 | NC | |
| | 5 | P5 | 红灯/Red | |
| | 6 | P4 | 绿灯/Green | |
| | 7 | P3 | 绿灯/Green | |
| | 8 | P2 | 绿灯/Green | |
| | 9 | P1 | 绿灯 Green | |
| NTC | 1 | NTC_BAT | | |
| | 2 | GND | | |
| 升级端口 Upgrade port | 1 | +3.3V | | |
| | 2 | TX | | |
| | 3 | RX | | |
| | 4 | GND | | |

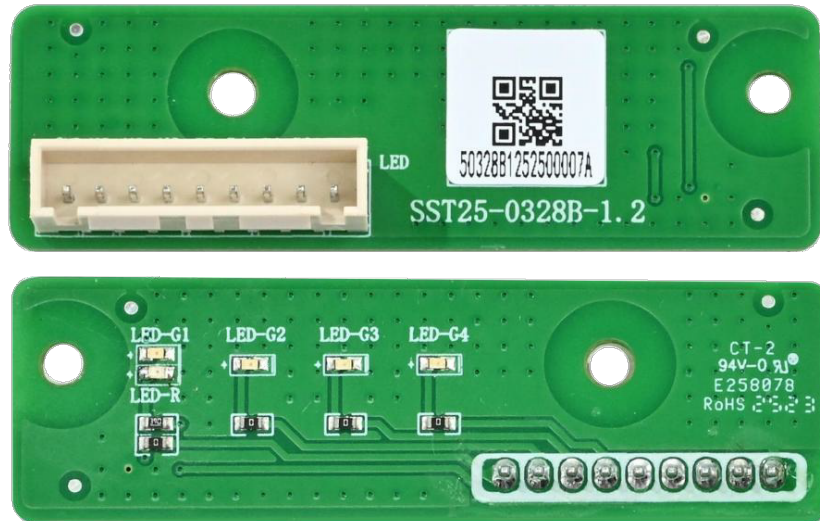
5.4. LED 定义(LED definition)

| 产品状态 Product status | 故障灯 (红灯) Failure light (red) | 25%电量 (绿灯) 25% power (green) | 50%电量 (绿灯) 50% power (green) | 75%电量 (绿灯) 75% power (green) | 100%电量 (绿灯) 100% power (green) |
|---|---------------------------------|------------------------------------|------------------------------------|------------------------------------|--------------------------------------|
| 电量不足(5%) Low power (5%) | 闪烁 Flash | 灭 OFF | 灭 OFF | 灭 OFF | 灭 OFF |
| 25%电量 25% power | 灭 OFF | 常亮 ON | 灭 OFF | 灭 OFF | 灭 OFF |
| 50%电量 50% power | 灭 OFF | 常亮 ON | 常亮 ON | 灭 OFF | 灭 OFF |
| 75%电量 75% power | 灭 OFF | 常亮 ON | 常亮 ON | 常亮 ON | 灭 OFF |
| 100%电量 100% power | 灭 OFF | 常亮 ON | 常亮 ON | 常亮 ON | 常亮 ON |
| 短路故障 Short circuit fault | 常亮 ON | 闪烁 Flash | 灭 OFF | 灭 OFF | 灭 OFF |
| 输出过功率保护 Output over power protection | 常亮 ON | 灭 OFF | 闪烁 Flash | 灭 OFF | 灭 OFF |
| 功率温度保护 Power temperature protection | 常亮 ON | 灭 OFF | 灭 OFF | 闪烁 Flash | 灭 OFF |
| 电池过温保护 Battery over-temperature protection | 常亮 ON | 灭 OFF | 灭 OFF | 灭 OFF | 闪烁 Flash |
| 电池低温保护 Low temperature battery protection | 常亮 ON | 闪烁 Flash | 闪烁 Flash | 灭 OFF | 灭 OFF |
| 电池过放故障 Battery over-discharge fault | 常亮 ON | 闪烁 Flash | 闪烁 Flash | 闪烁 Flash | 灭 OFF |
| 其他故障 Other failures | 常亮 ON | 闪烁 Flash | 闪烁 Flash | 闪烁 Flash | 闪烁 Flash |

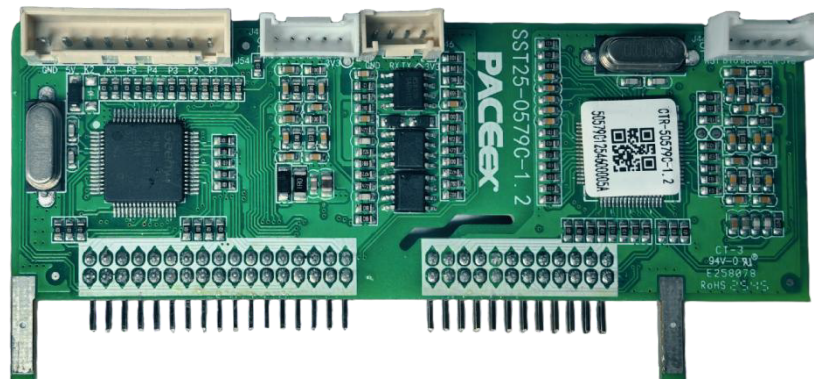
6. 实物图与尺寸图(Physical and dimensional drawings)

参考实物图（以最终版为准）Reference physical image: (final version shall prevail)

1) LED 实物图 LED physical drawing



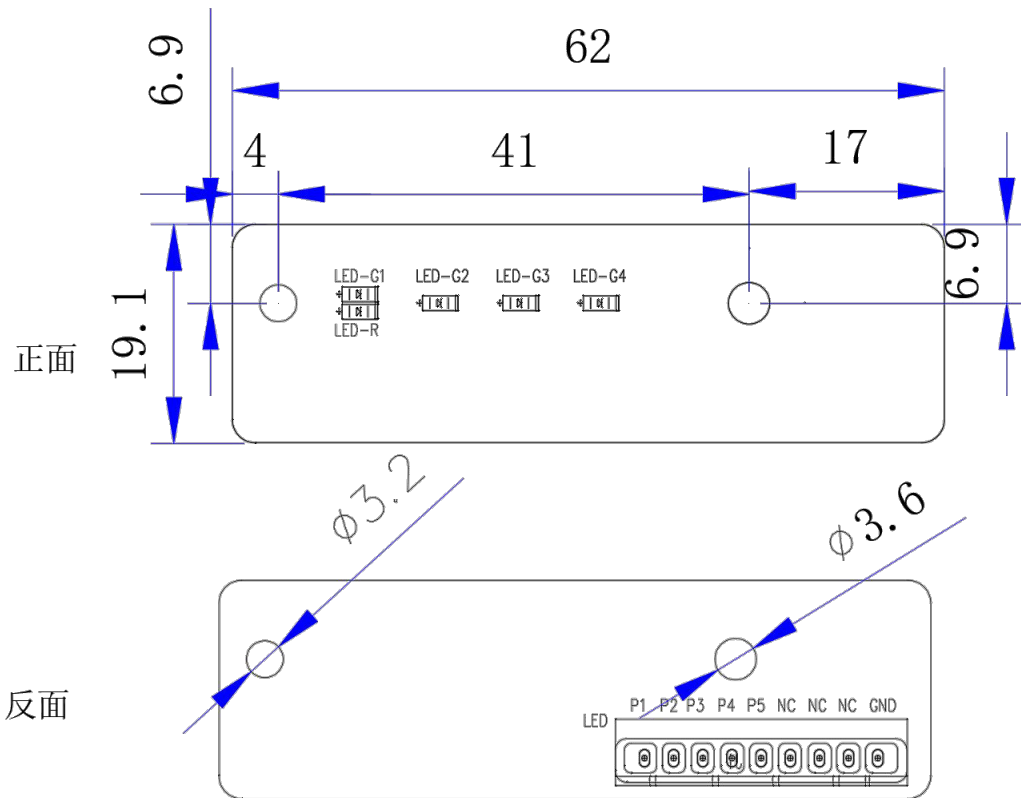
2) 控制板实物图 Physical picture of the control panel



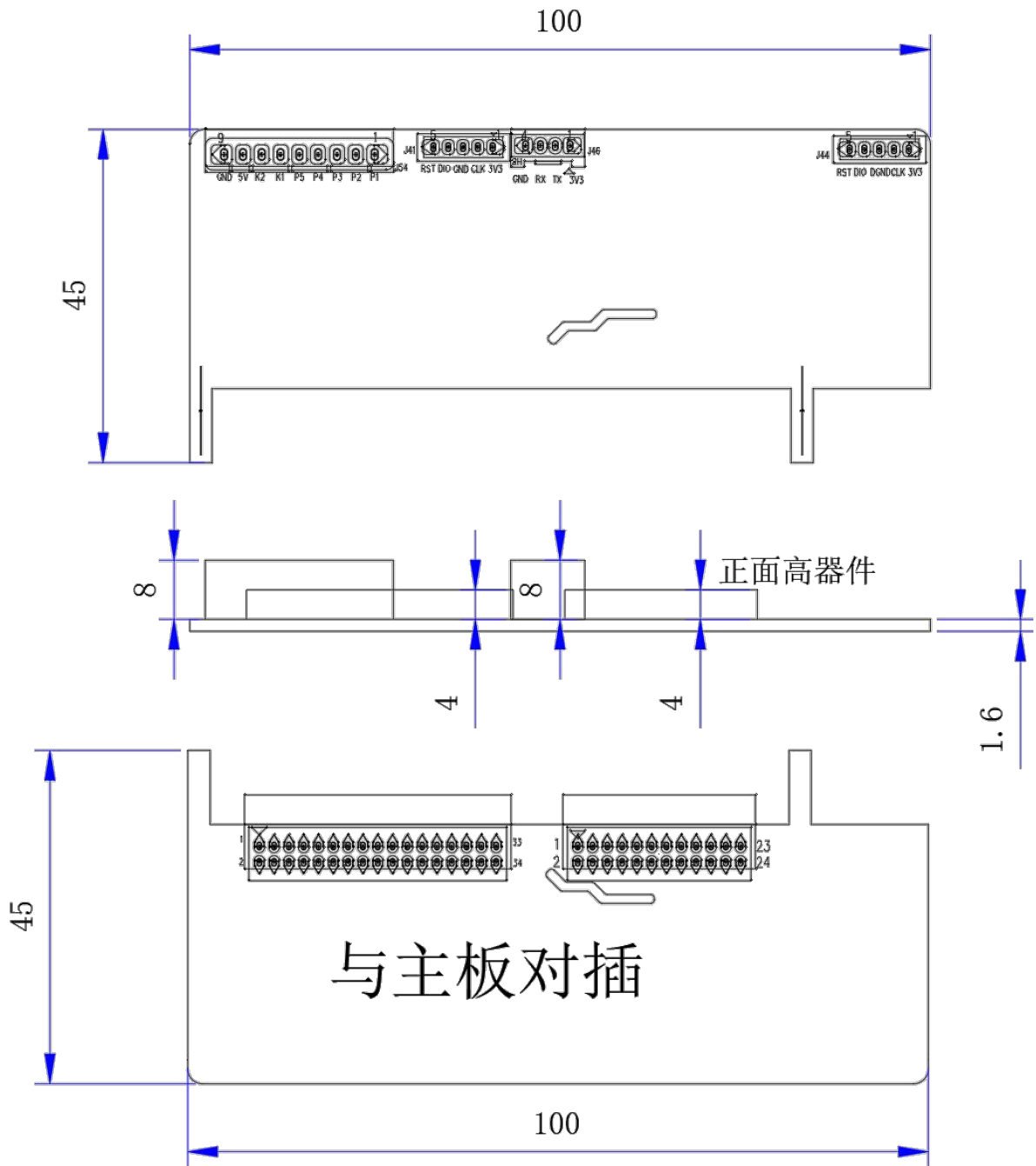
3) 主板实物图 Physical drawing of motherboard

待定

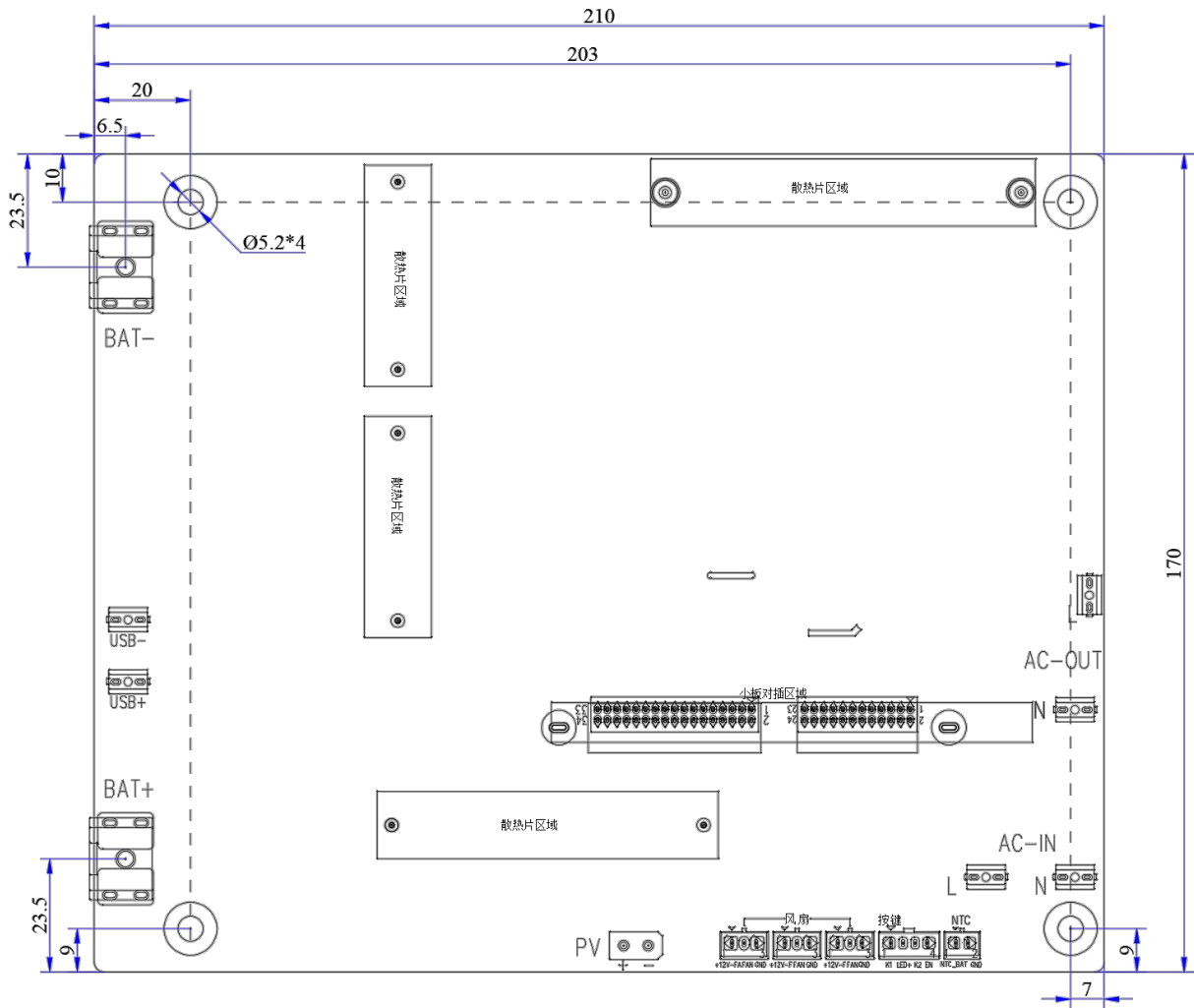
4) LED 灯板尺寸 LED panel size



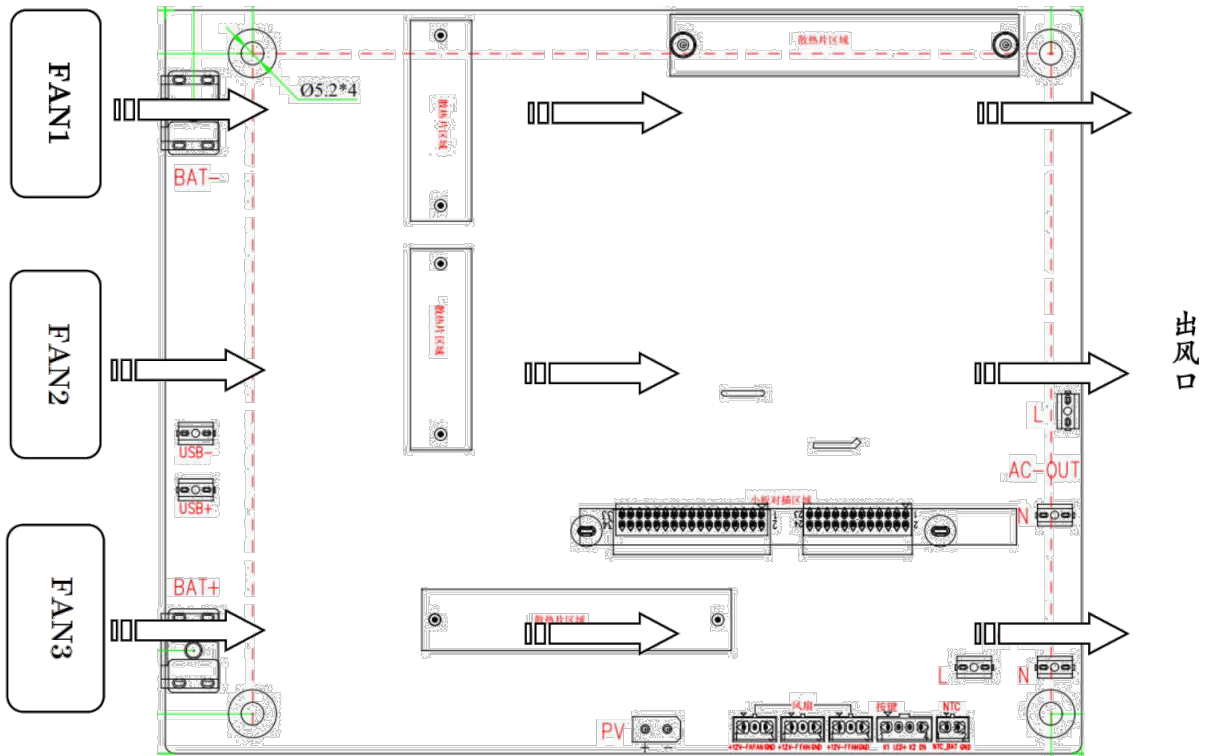
5) 控制板尺寸图 Control panel size



6) 主板尺寸 Main board size



7) 风扇散热参考示意图 Fan Cooling Diagram Reference



7. 维护和保养(Maintenance and upkeep)

- 请在规定温度及环境下使用或存储本产品，远离水源、热源，以及其他金属物件。

Please use or store this product at the specified temperature and environment, away from water sources, heat sources, and other metal objects.

- 安全起见,请勿将本产品长期存储在高于 45°C 或者低于 -10°C 的环境中。

For safety reasons, please do not store this product for a long time in an environment above 45 °C or below -10 °C.

- 为了延长电池的使用寿命, 推荐在 20°C 至 30°C 的环境使用本产品。

To extend the service life of the battery, it is recommended to use this product in an environment between 20 °C and 30 °C.

- 若本产品连接的电池电量严重不足且闲置时间过长, 产品将进入深度睡眠模式, 再次使用之前需对本产品电池充电才能恢复使用。

- If the battery connected to this product is severely low and idle for a long time, the product will enter deep sleep mode. Before using it again, the battery of this product needs to be charged to resume use.

8. 使用注意事项(Precautions for use)

- 严禁在本产品工作时将其靠近热源, 如火源或加热炉。

It is strictly prohibited to place this product near heat sources, such as ignition sources or heating furnaces, during operation.

- 严禁让本产品接触任何液体, 请勿将本产品浸入水中或将其弄湿。切勿在雨中或者潮湿的环境中使

It is strictly prohibited for this product to come into contact with any liquid. Do not immerse this product in water or wet it. Do not use this product in rain or damp environments.

- 禁止在强静电或者强磁场环境中使用本产品。

Do not use this product in environments with strong static electricity or strong magnetic fields.

- 禁止用导线或其它金属物体致使本产品短路。

- Do not use wires or other metal objects to cause short circuits in this product.

- 请勿使用非官方提供的部件或配件。如需更换，请到沛城科技官方销售渠道查询相关购买信息。

Do not use unofficial parts or accessories. If replacement is required, please go to the official sales channel of Peicheng Technology to inquire about relevant purchase information.

- 使用本产品时，请严格遵循本用户手册的使用环境温度。温度过高，可能会引起电池起火，甚至爆炸；温度过低，产品性能将会严重降低，甚至无法满足正常使用要求。

When using this product, please strictly follow the ambient temperature specified in this user manual. If the temperature is too high, it may cause the battery to catch fire or even explode; If the temperature is too low, the product performance will be severely reduced, and it may even fail to meet normal usage requirements.

- 禁止在使用过程中强行堵转风扇，或让本产品处于不通风或多尘的空间内。

It is prohibited to forcefully turn the fan or place this product in an not ventilated or dusty space during use.

- 请避免撞击，跌落，剧烈震动，如出现严重外力冲击，请立即关闭电源停止使用。运输时请固定好，避免震动与撞击。

Please avoid impacts, falls, and severe vibrations. In case of severe external impact, please immediately turn off the power and stop using. Please secure during transportation to avoid vibration and impact.

- 如果本产品接口有污物，请使用干布擦干净。

If there is dirt on the interface of this product, please use a dry cloth to wipe it clean.

- 请小心放置本产品，以防产品的倒导致损坏。若产品倾倒并出现严重损坏的情况，请立即关机，将电池放置于开阔区域，远离可燃物和人群，并按照当地的法律法规的要求进行报废。

Please be careful when placing this product to prevent damage caused by its collapse. If the product is dumped and severely damaged, please shut down immediately, place the battery in an open area, away from combustibles and people, and dispose of it in accordance with local laws and regulations.

- 请将本产品存放在儿童和宠物不能接触的地方。

Please store this product out of reach of children and pets.

- 产品需存放于干燥通风处。

The product needs to be stored in a dry and ventilated place.

- 在潮湿环境下(海边水边等环境)建议配备防潮袋一起使用，避免浸水泡水，若发现产品内部进水，不得再次使用开机，触碰产品前请做好防触电措施，请立即静置在安全防水开阔区域，并立即联系沛城科技客服处理。

- It is recommended to use a moisture-proof bag together in humid environments (such as by the seaside or by the water) to avoid soaking in water. If water is found inside the product, it should not be used again. Before touching the product, please take measures to prevent electric shock, and immediately leave it in a safe and waterproof open area. Contact PACE Technology customer service for assistance.

浙江精英电器有限公司

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