
# Power Lite (L051100-A1) Product Specification

**Ver 1.1**

## Revision History:

| Date | Revision | Description | Owner |
|---|---|---|---|
| 2021-12-10 | V1.0 | Initial Release | TangXX |
| 2022-02-16 | V1.1 | SOC Transportation Range update to 50% | TangXX |
| | | | |
| | | | |

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## 1. Scope

This document is a specification, as an input file for the design and development of the PACK, and as a standard for acceptance of battery system products.

## 2. Terminology and Basis for Writing

### 2.1 Definition of Terms

| | |
|---|---|
| Battery Cell | The smallest energy storage unit, a basic electrochemical energy storage device, consisting of a positive electrode, a negative electrode, an electrolyte, a separator, and a casing, also called a cell. |
| Battery Module | Intermediate energy storage unit, a combination of several single-unit and circuit devices (monitoring and protection circuits, electrical and communication interfaces), also called modules, placed in a mechanical electrical unit. |
| Battery Pack | A power supply system consisting of a number of battery modules, circuit equipment (protection circuits, cell management systems, electrical and communication interfaces), and thermal management devices for powering electrical devices. |
| Nominal Voltage | Indicates or identifies an appropriate voltage approximation for the cell. |
| Capacity | The amount of electricity that can be supplied by a fully charged battery under specified conditions. Usually expressed in Ah. |
| Energy Capacity | The energy that can be supplied by a fully charged cell under specified conditions. Usually expressed in Wh or kWh. |
| Nominal Capacity | At the beginning of life (BOL), the minimum capacity that can be provided by a fully charged cell at a rate of 1 C (C-rate). |
| Unit | "V" (Volt) Volt (V), voltage unit<br>"A" (Ampere) Ampere (A), current unit<br>"Ah" (Ampere-Hour) Ampere-hour (Ah), charge unit<br>“Wh” (Watt-Hour) Watt-hour (Wh), unit of electrical energy<br>“Ω” (Ohm) ohm (Ω), resistance unit<br>°C (degree Celsius) Celsius (°C), temperature unit<br>"mm" (millimeter) mm (mm), length unit<br>"s" (second) seconds (s), time unit<br>"kg" (kilogram) kilograms (kg), weight unit<br>"Hz" (Hertz) Hertz (Hz), frequency unit |

## 2.2 **Abbreviations**

| | |
|---|---|
| OPAL | OPAL Energy Pte Ltd. |
| BMS | Battery Management System |
| BMU | Battery Management Unit |
| BOL | Begin of Life |
| Bus-bar | Battery pole connecting rod |
| CAN | Controller Area Network |
| C-CAN | BMU and CMC communication CAN |
| CMC | Cell Manager Circuit |
| EOL | End of Life |
| HV | High Voltage |
| LV | Low Voltage |
| OCV | Open Circuit Voltage |
| SOC | State of Charge |

## 3. Technical Parameters

The key parameters of the battery system are as follows:

| NO. | Key Item | Specification | Remarks |
|---|---|---|---|
| 3.1 | Battery Model | Opal L051100-A1 | Cathode: Lithium iron Phosphate；Anode：Graphite. |
| 3.2 | Module Model | M026100-A 1P8S Module | 2 Module In series |
| 3.3 | Nominal Capacity | 100Ah | |
| 3.4 | Nominal Voltage | 51.2V | Single cell voltage 3.2V |
| 3.5 | Operating Voltage Range | 44.8V～57.6V | |
| 3.6 | Rated Energy | 5.12kWh | |
| 3.7 | Usable Battery Capacity | 100Ah | |
| 3.8 | Usable Battery Energy | 5.12kWh | |
| 3.9 | Battery Depth of Discharge | 100% | |
| 3.10 | Battery Max Charge/Discharge Power | 2.56kw/5.12kw | |
| 3.11 | The short circuit current | 210A | |

| | | | |
|---|---|---|---|
| 3.12 | Available SOC Range | 0% ~ 100% | |
| 3.13 | SOC Transportation Range | 50% | |
| 3.14 | Operating Temperature | Charging Temperature：0℃~55℃；Discharge Temperature：-20℃～55℃ | Detailed use conditions need to refer to the charge and discharge window |
| 3.15 | Storage Temperature | -20°C ~ 50 °C | Longer than three months<br>25 ° C storage |
| 3.16 | Working Humidity | 20~80%RH | |
| 3.17 | Standard Charging Current | 0.5C (50A) | |
| 3.18 | Maximum Charging Continuous Current | 0.5C (50A) | |
| 3.19 | Standard Discharge Current | 0.5C (50A) | |
| 3.20 | Max Discharge Continuous Current | 0.5C（50A） | （0.5C，25℃±2℃） |
| 3.21 | Rated DC Power | 2.56kw | |
| 3.22 | ΔVoltage | ≤20mV | 60 min after standing and stopped after charging and discharging |
| 3.23 | IP Rating | IP20 | |
| 3.24 | Recommended Indoor/Outdoor Usage | Indoor | |
| 3.25 | Weight | ~45Kg | Actual weight requires weighing confirmation |
| 3.26 | Dimensions | Length：440（±5）mm<br>Width：530（±5）mm<br>Height：132（±5）mm | |
| 3.27 | Communication | CAN/RS485/Dry Contact | |
| 3.28 | Certificate (Battery, Power Lite Inside) | TUV/IEC 62619/UN38.3 | |
| 3.29 | Calendar Life2 | 10 Years | |

## 4. Battery System Structure

### 4.1 Dimensions and External Surface Requirements

The appearance of the power Lite battery system is shown below. The battery system consists of 16pcs of LFP cells connected in serial.


Figure 1、Schematic Diagram of the Power Lite Battery System

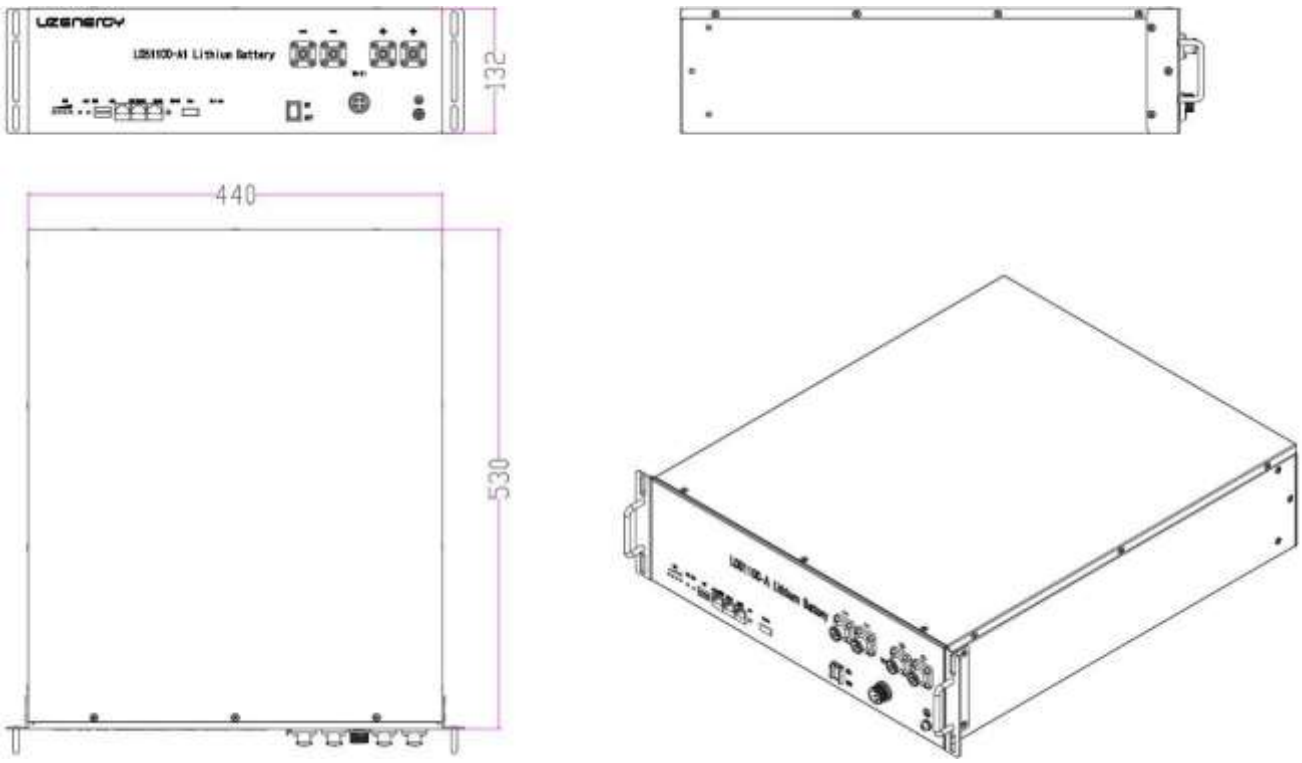



Figure 2、Power Lite Battery System Size Chart

Appearance requirements: The appearance of the assembly has no obvious processing or bumping flaws, no crack on the surface, and no burrs on the weld.

## 4.2 Electrical Schematic

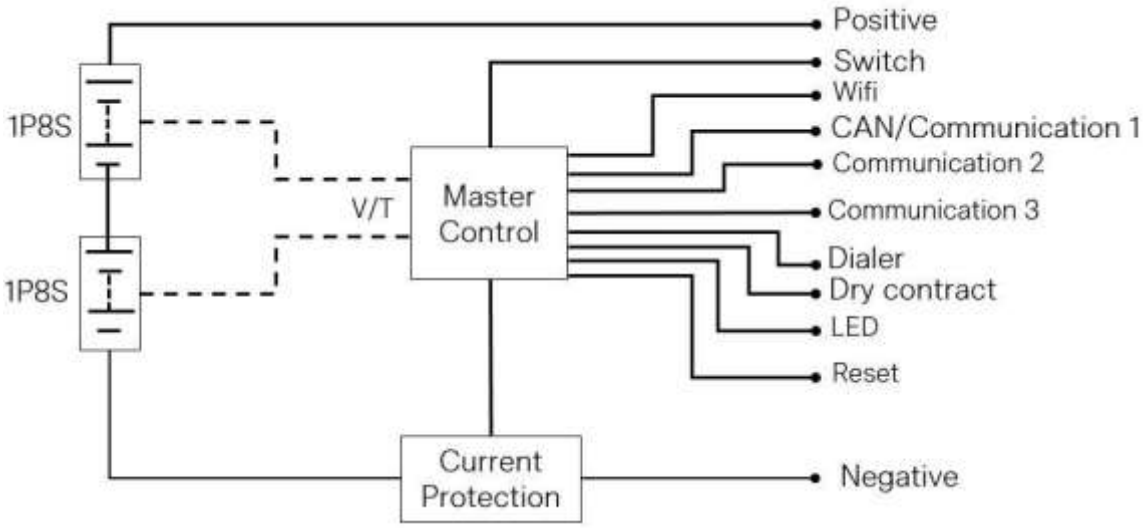



Figure 3, Electrical Schematic
(For reference only, this module does not contain sampling wiring harness)

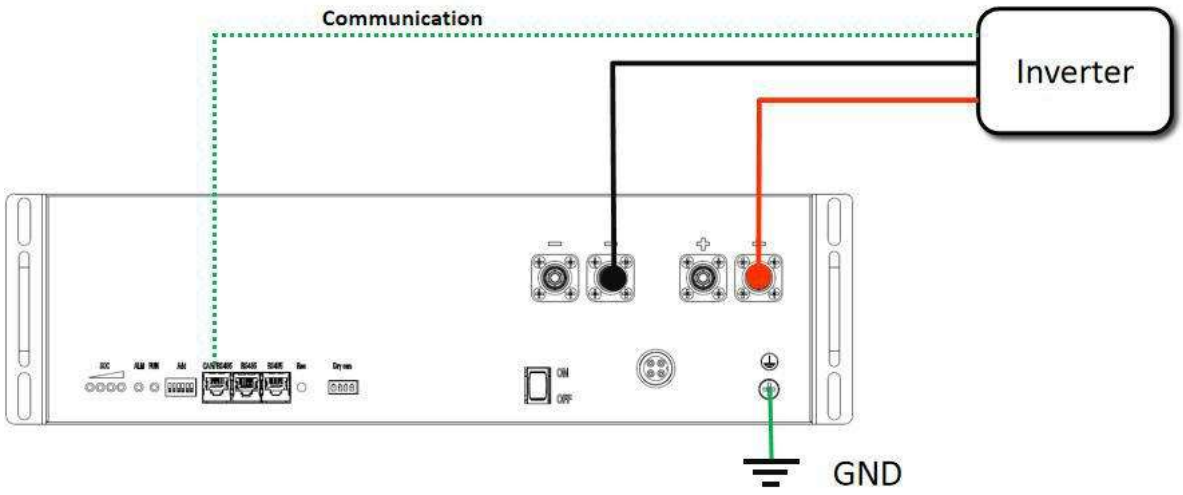
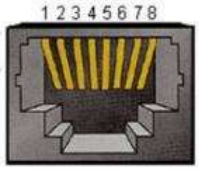
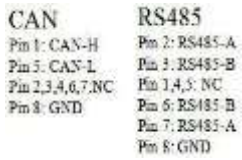
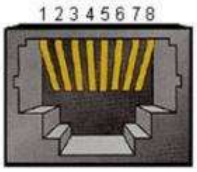



Figure 4, System wiring Schematic
（DC Breaker Technical Parameters: 125A/2P/DC125V ）

## 4.3 Battery System Panel Connector

| Connector | Connector socket model | Connector plug type | Definition | Remark | |
|---|---|---|---|---|---|
| Positive 1 | PSR6XBB | PSRP6XB25 | Orange 5.7mm | 4AWG 25mm2, IP67 | or |
| Positive 2 | PSR6XBB | PSRP6XB25 | Orange 5.7mm | 4AWG 25mm2, IP67 | or |

| | | | | |
|---|---|---|---|---|
| Negative 1 | PSR6XAB | PSRP6XA25 | Orange 5.7mm | 4AWG or 25mm2, IP67 |
| Negative 2 | PSR6XAB | PSRP6XA25 | Orange 5.7mm | 4AWG or 25mm2, IP67 |
| Communication Port x1 | RJ45   | Pin 1: CAN-H<br>Pin 2: RS485-A<br>Pin 3: RS485-B<br>Pin 4: NC<br>Pin 5: CAN-L<br>Pin 6: RS485-B<br>Pin 7: RS485-A<br>Pin 8: GND | CAN/RS485 |   |
| Communication Port x2 | RJ45   | Pin 1：NC<br>Pin 2: RS485-A<br>Pin 3: RS485-B<br>Pin 4: NC<br>Pin 5: NC<br>Pin 6: RS485-B<br>Pin 7: RS485-A<br>Pin 8: GND | RS485 | Internal connection,communicate to BMS upper computer |
| Wifi Socket | Magpie wifi Stick V190603-R | | | Function(Option) |

OpalEnergy