



FOGSTAR ENERGY

SEPLUS

V4 DIY  
KIT





# 51.2V DIY KIT

## 1. INTRODUCTION

This versatile battery pack system is suitable for both residential and commercial energy storage applications. It utilizes 3.2V LiFePO<sub>4</sub> cells arranged in a 16S1P configuration and is equipped with a V3 SEPLUS Smart BMS. Each pack can be expanded in parallel with up to 16 additional packs to effortlessly increase capacity.

Note: It's important to avoid mixing battery packs from different brands or models in parallel.

## 2. FUNCTIONALITY

Battery Voltage Calculation:

- 16-point battery voltage sampling with a tolerance of  $\pm 20\text{mV}$ .

Temperature Monitoring:

- 4 battery temperature sensors, 1 ambient temperature sensor, and 1 MOS temperature sensor.
- Temperature deviation tolerance of  $\pm 2^\circ\text{C}$ .

Battery Capacity and Cycle Times:

- Full charge and discharge cycles to determine actual capacity.
- Capacity estimation accuracy within 5% deviation.
- Customisable charging and discharging cycle times.

Smart Cell Balancing:

- Flexible charging and static balancing strategies to extend battery life.

Communication Interface:

- PC or intelligent front-end for monitoring, control, and parameter settings via telemetry, remote signalling, remote adjustment, and remote control.
- Adheres to YD/T 1363.3 communication protocol for cascade communication.

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### 2. FUNCTIONALITY

#### Historical Data Recording:

- Real-time battery status and alarm information recorded during abnormal conditions.
- Storage capacity for up to 500 historical fault data.

#### Battery Management System Parameter Settings:

- Customizable parameters include:
  - Cell battery over/under voltage
  - Battery total voltage over/under voltage
  - Charge and discharge over current
  - Battery high/low temperature
  - Battery capacity
  - Working mode
  - Charge and discharge limit current

#### Working Modes:

- Configurable modes such as charging and discharging current limiting, constant voltage output, and direct output.

#### Multiple Protection Functions:

- Hardware protection, battery protection, high and low temperature protection, output short circuit protection, and more.



**Download the Seplos  
Battery Monitoring  
Software here**

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### 3. APPERANCE AND FUNCTIONALITY



All products are packed in a dry, dust proof and moisture-proof box.

Packaging Specification: L 97cm x W50cm x H 36cm

Weight: 113kg

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## 3.1 SPECIFICATIONS

### 51.2V 14.3kWh 280Ah LiFePO4 Cells

|                                    |  |
|------------------------------------|--|
| Rated energy (kWh)                 | 14.3 kWh   |
| Configuration                      | 1P16S  |
| Nominal voltage (V)                | 51.2 V   |
| Working voltage (V)                | 42 V ~ 58.4 V  |
| Nominal capacity (Ah)              | 280 Ah   |
| Rated charge/discharge current (A) | 100 A / 200 A @ 25 ± 2 °C  |
| Maximum charging current           | 200 A @ 25 ± 2 °C  |
| Maximum discharging current        | 200 A @ 25 ± 2 °C  |
| Working temperature                | 0 ~ 40 °C (Charge), -20 ~ 40 °C (Discharge)  |
| Humidity (%)                       | 5 ~ 95%  |
| Altitude limited (m)               | 0 ~ 3000 m   |
| Weight (Kg)                        | 113 Kg ± 3 Kg  |
| Dimension (mm)                     | 817 × 412 × 267 mm   |
| Storage temperature and humidity   | -10 °C ~ 35 °C (within one month of storage), 25 ± 2 °C (within three months of storage), 65% ± 20% RH |
| Cycle life                         | 6000 cycles  |
| IP grade                           | IP20   |
| Communication mode                 | CAN & RS485  |

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## 3.2 SPECIFICATIONS

### 51.2V 15.2kWh 305Ah LiFePO4 Cells

|                                    |  |
|------------------------------------|--|
| Rated energy (kWh)                 | 15.2 kWh   |
| Configuration                      | 1P16S  |
| Nominal voltage (V)                | 51.2 V   |
| Working voltage (V)                | 42 V ~ 58.4 V  |
| Nominal capacity (Ah)              | 305 Ah   |
| Rated charge/discharge current (A) | 100 A / 200 A @ 25 ± 2 °C  |
| Maximum charging current           | 200 A @ 25 ± 2 °C  |
| Maximum discharging current        | 200 A @ 25 ± 2 °C  |
| Working temperature                | 0 ~ 40 °C (Charge), -20 ~ 40 °C (Discharge)  |
| Humidity (%)                       | 5 ~ 95%  |
| Altitude limited (m)               | 0 ~ 3000 m   |
| Weight (Kg)                        | 113 Kg ± 3 Kg  |
| Dimension (mm)                     | 817 × 412 × 267 mm   |
| Storage temperature and humidity   | -10 °C ~ 35 °C (within one month of storage), 25 ± 2 °C (within three months of storage), 65% ± 20% RH |
| Cycle life                         | 3500 cycles  |
| IP grade                           | IP20   |
| Communication mode                 | CAN & RS485  |

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## 3.3 SPECIFICATIONS

### 51.2V 16kWh 314Ah LiFePO4 Cells

|                                    |  |
|------------------------------------|--|
| RATED ENERGY (KWH)                 | 16 kWh   |
| CONFIGURATION                      | 1P16S  |
| NOMINAL VOLTAGE (V)                | 51.2 V   |
| WORKING VOLTAGE (V)                | 42 V ~ 58.4 V  |
| NOMINAL CAPACITY (AH)              | 314 Ah   |
| RATED CHARGE/DISCHARGE CURRENT (A) | 100 A / 200 A @ 25 ± 2 °C  |
| MAXIMUM CHARGING CURRENT           | 157 A @ 25 ± 2 °C (limited by MB31 cell discharge)   |
| MAXIMUM DISCHARGING CURRENT        | 157 A @ 25 ± 2 °C (limited by MB31 cell discharge)   |
| WORKING TEMPERATURE                | 0 ~ 40 °C (Charge), -20 ~ 40 °C (Discharge)  |
| HUMIDITY (%)                       | 5 ~ 95%  |
| ALTITUDE LIMITED (M)               | 0 ~ 3000 m   |
| WEIGHT (KG)                        | 113 Kg ± 3 Kg  |
| DIMENSION (MM)                     | 817 × 412 × 267 mm   |
| STORAGE TEMPERATURE AND HUMIDITY   | -10 °C ~ 35 °C (within one month of storage), 25 ± 2 °C (within three months of storage), 65% ± 20% RH |
| CYCLE LIFE                         | 8000 cycles  |
| IP GRADE                           | IP20   |
| COMMUNICATION MODE                 | CAN & RS485  |

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## 4. BMS PROTECTION PARAMETERS

### 4.1 INDIVIDUAL CELL OVER VOLTAGE PARAMETERS

| INDIVIDUAL CELL OVER VOLTAGE PARAMETER |        |                                  |  |   |
|--|--------|----------------------------------|--|---|
| FUNCTIONS                              | STATUS | ITEMS                            | DEFAULT  | CONFIGURABLE RANGE  |
| OVER VOLTAGE WARNING                   | ON     | Over voltage warning             | 3500mV   | Over voltage warning recovery - over voltage protection   |
|  |        | Over voltage warning recovery    | 3400mV   | 3000mV - over voltage warning                             |
|  |        | Under voltage warning            | 2900mV   | Under voltage protection - under voltage warning recovery |
|  |        | Under voltage warning recovery   | 3000mV   | Under voltage warning - 3300mV                            |
| OVER VOLTAGE PROTECTION                | ON     | Over voltage protection          | 3650mV   | Over voltage warning - 4500mV                             |
|  |        | Over voltage protection recovery | 3400mV   | Over voltage warning recovery - over voltage protection   |
|  |        | Over voltage recovery condition  | 1.Individual cell voltage decrease to over voltage recovery threshold.<br>2.The remaining capacity lower than 96% of the intermittent power supply. Both conditions should be satisfied. |   |
|  |        |                                  | Outputcurrent≥1A   |   |



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## 4. BMS PROTECTION PARAMETERS

### 4.2 INDIVIDUAL CELL LOW VOLTAGE PARAMETERS

| INDIVIDUAL CELL LOW VOLTAGE PARAMETERS |        |                                    |  |  |
|--|--------|------------------------------------|--|--|
| FUNCTIONS                              | STATUS | ITEMS                              | DEFAULT  | CONFIGURABLE RANGE                               |
| UNDER VOLTAGE PROTECTION               | ON     | Under voltage protection           | 2700mV   | 1500mV-under voltage protection recovery         |
|  |        | Under voltage protection recovery  | 2900mV   | Under voltage protection - under voltage warning |
|  |        | Under voltage protection condition | When an individual cell gets an undervoltage protection threshold, BMS maintain communication with inverter for 1 minute and powers off. |  |
|  |        | Under voltage protection recovery  | Input current $\geq$ 1A  |  |

### 4.3 PACK LOW VOLTAGE PARAMETERS

| PACK LOW VOLTAGE PARAMETERS |        |                                    |   |  |
|-----------------------------|--------|------------------------------------|---|--|
| FUNCTIONS                   | STATUS | ITEMS                              | DEFAULT   | CONFIGURABLE RANGE                               |
| UNDER VOLTAGE PROTECTION    | ON     | Under voltage protection           | 41.6V   | 36.0V - under voltage warning recovery           |
|                             |        | Under voltage protection recovery  | 46.0V   | Under voltage protection - under voltage warning |
|                             |        | Under voltage protection condition | When the total voltage reaches the under voltage protection threshold, the BMS maintains communication with the inverter for 1 minute and powers off. |  |
|                             |        | Under voltage protection recovery  | Input current $\geq$ 1A   |  |

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## 4. BMS PROTECTION PARAMETERS

### 4.4 PACK OVER VOLTAGE PARAMETERS

| PACK OVER VOLTAGE PARAMETERS |        |                                  |   |   |
|------------------------------|--------|----------------------------------|---|---|
| FUNCTIONS                    | STATUS | ITEMS                            | DEFAULT   | CONFIGURABLE RANGE  |
| OVER VOLTAGE WARNING         | ON     | Over voltage warning             | 56.0V   | Over voltage warning recovery over voltage protection     |
|                              |        | Over voltage warning recovery    | 54.0V   | 53.0V - over voltage warning                              |
|                              |        | Under voltage warning            | 46.4V   | Under voltage protection - under voltage warning recovery |
|                              |        | Under voltage warning recovery   | 48.0V   | Under voltage warning - 55.0V                             |
| OVER VOLTAGE PROTECTION      | ON     | Over voltage protection          | 57.6V   | Over voltage warning - 60.0V                              |
|                              |        | Over voltage protection recovery | 54.0V   | Over voltage warning recovery over voltage protection     |
|                              |        | Over voltage recovery condition  | 1. Individual cell voltage decrease to over voltage recovery threshold.<br>2. The remaining capacity is lower than 96% of the intermittent power supply. Both conditions should be satisfied. |   |
|                              |        |                                  | Output current≥ 1A  |   |

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## 4. BMS PROTECTION PARAMETERS

### 4.5 CELL HIGH/ LOW TEMPERATURE (CHARGING) PARAMETERS

| CELL HIGH/LOW TEMP CHARGING PARAMETERS |        |   |         |   |
|--|--------|---|---------|---|
| FUNCTIONS                              | STATUS | ITEMS                                       | DEFAULT | CONFIGURABLE RANGE  |
| CELL TEMPERATURE WARNING (CHARGING)    | ON     | High temperature warning                    | 50°C    | High temperature warning recovery high temperature protection |
|  |        | High temperature warning recovery           | 47°C    | 35°C - high temperature warning                               |
|  |        | High temperature protection (charging)      | 55°C    | 80°C - high temperature recovery                              |
|  |        | High temperature protection recovery        | 50°C    | High temperature warning recovery high temperature protection |
|  |        | Low temperature warning                     | 2°C     | Low temperature protection - low temperature warning          |
|  |        | Low temperature warning recovery (charging) | 5°C     | -10°C Low temperature warning                                 |
|  |        | Low temperature protection                  | -10°C   | -20°C Low temperature protection recovery                     |
|  |        | Low temperature protection recovery         | 0°C     | Low temperature protection - low temperature warning recovery |

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### 4. BMS PROTECTION PARAMETERS

#### 4.6 CELL HIGH/ LOW TEMPERATURE (DISCHARGING) PARAMETERS

| CELL HIGH/LOW TEMP DISCHARGING PARAMETERS       |        |  |         |  |
|---|--------|--|---------|--|
| FUNCTIONS                                       | STATUS | ITEMS  | DEFAULT | CONFIGURABLE RANGE   |
| CELL<br>TEMPERATURE<br>WARNING<br>(DISCHARGING) | ON     | High temperature warning                       | 52°C    | High temperature warning recovery<br>high temperature protection   |
|   |        | High temperature warning<br>recovery           | 47°C    | 80°C - high temperature warning                                    |
|   |        | High temperature protection<br>(charging)      | 55°C    | High temperature warning recovery -<br>high temperature protection |
|   |        | High temperature protection<br>recovery        | 50°C    | High temperature warning recovery<br>high temperature protection   |
|   |        | Low temperature warning                        | -10°C   | Low temperature protection - low<br>temperature warning            |
|   |        | Low temperature warning<br>recovery (charging) | 3°C     | -10°C Low temperature warning                                      |
|   |        | Low temperature protection                     | -15°C   | -30°C Low temperature protection<br>recovery                       |
|   |        | Low temperature protection<br>recovery         | 0°C     | Low temperature protection - low<br>temperature warning recovery   |

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## 4. BMS PROTECTION PARAMETERS

### 4.7 AMBIENT HIGH/LOW TEMPERATURE PARAMETERS

| CELL HIGH/LOW TEMP DISCHARGING PARAMETERS |        |   |         |  |
|---|--------|---|---------|--|
| FUNCTIONS                                 | STATUS | ITEMS                                       | DEFAULT | CONFIGURABLE RANGE   |
| CELL TEMPERATURES                         | ON     | High temperature warning                    | 50°C    | High temperature warning recovery<br>high temperature protection       |
|   |        | High temperature warning recovery           | 47°C    | 20°C - high temperature warning recovery                               |
|   |        | High temperature protection (charging)      | 60°C    | High temperature warning recovery<br>-high temperature protection 80°C |
|   |        | High temperature protection recovery        | 55°C    | High temperature warning recovery<br>high temperature protection       |
|   |        | Low temperature warning                     | 0°C     | Low temperature protection - low temperature warning                   |
|   |        | Low temperature warning recovery (charging) | 3°C     | Low temperature warning -60°C  |
|   |        | Low temperature protection                  | -10°C   | -30°C Low temperature protection recovery                              |
|   |        | Low temperature protection recovery         | 0°C     | Low temperature protection - low temperature warning recovery          |



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## 4. BMS PROTECTION PARAMETERS

### 4.8 MOSFET HIGH/LOW TEMPERATURE PARAMETERS

| MOSFET HIGH/LOW TEMPERATURE PARAMETERS |        |                                      |         |   |
|--|--------|--------------------------------------|---------|---|
| FUNCTIONS                              | STATUS | ITEMS                                | DEFAULT | CONFIGURABLE RANGE  |
| MOSFET TEMPERATURE                     | ON     | High temp warning                    | 90°C    | High temperature warning recovery high temperature protection |
|  |        | High temp warning recovery           | 85°C    | 60°C - high temperature warning                               |
|  |        | High temperature protection          | 100°C   | 120°C - high temperature warning                              |
|  |        | High temperature protection recovery | 85°C    | High temperature warning recovery high temperature protection |

### 4.9 CHARGING CURRENT LIMITING PARAMETERS

| CHARGING CURRENT LIMITING PARAMETERS |        |                                      |         |   |
|--------------------------------------|--------|--------------------------------------|---------|---|
| FUNCTIONS                            | STATUS | ITEMS                                | DEFAULT | CONFIGURABLE RANGE  |
| CURRENT LIMITING (CHARGING)          | OFF    | Active current limiting              | 10A     | When the charger current is $> 10A$ , current limiting is activated.  |
|                                      | ON     | Passive current limiting             |         | When the charger current $>$ charging over current warning (configurable) ,current limiting activated.              |
|                                      |        | Charging current limiting time delay | 5 min   | After the current limiting being activated, BMS re-check the current to judge whether to maintain current limiting. |

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## 4. BMS PROTECTION PARAMETERS

### 4.10 CHARGING OVER LIMITING PARAMETERS

| CHARGING OVER LIMITING PARAMETERS |                        |  |  |   |
|-----------------------------------|------------------------|--|--|---|
| FUNCTIONS                         | STATUS                 | ITEMS                                      | DEFAULT  | CONFIGURABLE RANGE  |
| OVERCURRENT WARNING (CHARGING)    | ON                     | Over current warning                       | 200A   | Charging over current warning recovery charging over current protection |
|                                   |                        | Over current warning recovery              | 195A   | 0A - charging over current warning                                      |
| OVERCURRENT PROTECTION (CHARGING) | ON                     | Over current protection                    | 210A   | 0A~150A   |
|                                   |                        | Over current protection time delay         | 10S  | Configurable  |
|                                   |                        | Overcurrent protection recovery conditions | BMS detects any output discharge current. After 60 seconds ,the protection recovers automatically. |   |
| EFFECTIVE CHARGING CURRENT        | Charging current (in)  |  | 1000mA   |   |
|                                   | Charging current (out) |  | 700mA  |   |

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## 4. BMS PROTECTION PARAMETERS

### 4.11 DISCHARGING OVER LIMITING PARAMETERS

| DISCHARGING OVER LIMITING PARAMETERS |        |  |  |  |
|--------------------------------------|--------|--|--|--|
| FUNCTIONS                            | STATUS | ITEMS                                      | DEFAULT  | CONFIGURABLE RANGE                                   |
| OVERCURRENT WARNING                  | ON     | Over current warning                       | -205A  | Over current protection-overcurrent warning recovery |
|                                      |        | Over current warning recovery              | -203A  | 0A - charging over current warning                   |
| OVERCURRENT PROTECTION               | ON     | Over current protection                    | -210A  | Transient over current protection - 0A               |
|                                      |        | Over current protection time delay         | 10S  | Configurable   |
|                                      |        | Overcurrent protection recovery conditions | BMS detects any input charge current. After 60 seconds, the protection recovers automatically. |  |

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## 4. BMS PROTECTION PARAMETERS

### 4.12 TRANSIENT OVER LIMITING PARAMETERS

| TRANSIENT OVER LIMITING PARAMETERS |        |                                    |  |  |
|------------------------------------|--------|------------------------------------|--|--|
| FUNCTIONS                          | STATUS | ITEMS                              | DEFAULT  | CONFIGURABLE RANGE                       |
| OVERCURRENT PROTECTION (TRANSIENT) | ON     | Over current protection            | -300A  | Discharge over current protection - 300A |
|                                    |        | Over current protection time delay | 30mS   | Configurable                             |
|                                    |        | Over current protection recovery   | BMS detects any input charge current. After 60 seconds, the protection recovers automatically. |  |
|                                    | OFF    | Over current lock                  | Continuously over current for 2 times. The over current lock times exceeded.                   |  |
|                                    |        | Over current lock times            | 5 times  |  |
|                                    |        | Over current lock release          | Connected with charger   |  |

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## 4. BMS PROTECTION PARAMETERS

### 4.13 SHORT CIRCUIT PARAMETERS

| SHORT CIRCUIT PARAMETERS      |                         |   |  |                    |
|-------------------------------|-------------------------|---|--|--------------------|
| FUNCTIONS                     | STATUS                  | ITEMS   | DEFAULT  | CONFIGURABLE RANGE |
| SHORT CIRCUIT PROTECTION      | ON                      | Short circuit protection current value and time delay | Programmed into the software (cannot be edited) Cannot be turned off.                          |                    |
|                               |                         | Short circuit protection recovery                     | BMS detects any input charge current. After 60 seconds, the protection recovers automatically. |                    |
|                               | ON                      | Short circuit protection lock                         | Continuously short in the output circuit. The over current protection lock times exceeded.     |                    |
|                               |                         | Short circuit protection lock times                   | 5 times  |                    |
|                               |                         | Short circuit protection lock release                 | Connected with charger   |                    |
|                               |                         |   |  |                    |
| EFFECTIVE DISCHARGING CURRENT | Discharge current (in)  |   | -1000mA  |                    |
|                               | Discharge current (out) |   | -700mA   |                    |



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## 4. BMS PROTECTION PARAMETERS

### 4.14 CELL BALANCE PARAMETERS

| SHORT CIRCUIT PARAMETERS |                    |                                  |  |                    |
|--------------------------|--------------------|----------------------------------|--|--------------------|
| FUNCTIONS                | STATUS             | ITEMS                            | DEFAULT  | CONFIGURABLE RANGE |
| CELL BALANCE             | ON                 | Standby balance                  | When there is no charging and discharging current flow, the stand by equalisation will be activated. |                    |
|                          |                    | Standby time                     | 10 hours   | Configurable       |
|                          | ON                 | Charging equalisation            | When at the charging or float charging status, the charging equalisation will be activated.          |                    |
|                          | BALANCE CONDITIONS | Activate voltage                 | 3350mV   | Configurable       |
|                          |                    | Activate voltage difference      | 30mV   |                    |
|                          |                    | End voltage                      | 20mV   |                    |
|                          | ON                 | Temperature                      | According to the temperature range of no equalisation (ambient temperature).                         |                    |
|                          |                    | No equalisation high temperature | 50°C   | Configurable       |
|                          |                    | No equalisation low temperature  | 0°C  |                    |
| CELL FAILURE             | ON                 | Voltage difference               | 500mV  | Configurable       |
|                          |                    | Voltage difference recovery      | 300mV  |                    |

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## 4. BMS PROTECTION PARAMETERS

### 4.15 CAPACITY PARAMETERS

| CAPACITY PARAMETERS |                                 |                               |   |                                      |
|---------------------|---------------------------------|-------------------------------|---|--------------------------------------|
| CAPACITY            | Cycle life accumulated capacity | 20%                           | Cycle life (configurable)   |                                      |
|                     | ON                              | Remaining capacity warning    | 15%   |                                      |
|                     | ON                              | Remaining capacity protection | 8%  | Output current flow will be cut off. |
| RESET BUTTON        | Power On/activation             |                               | When the BMS is in the sleep state, press the 1S reset button, the BMS will be activated, and the LED indicators will turn on in turn, then the BMS will turn into the normal working state.                                |                                      |
|                     | Shut down/hibernate             |                               | When the BMS is in standby or working state (except charging), press the 3S reset button, the BMS will be hibernated, and the LED indicator lights will turn on in turn, and then the BMS will go into a hibernation state. |                                      |

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## 4. BMS PROTECTION PARAMETERS

### 4.15 OTHER PARAMETERS

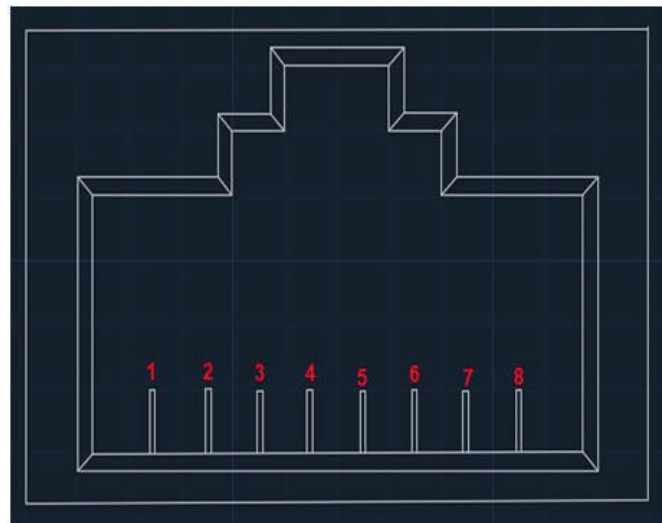
| OTHER PARAMETERS       |                            |  |   |  |
|------------------------|----------------------------|--|---|--|
| PRE-CHARGING           | 2000ms                     | 0-5000ms   | The pre-charging function will be activated once the BMS powers on.   |  |
| BMS POWER CONSUMPTION  | ON                         | Longest standby time   | 48 hours.   |  |
| EXTERNAL SWITCH        | OFF                        | When at the standby status, the BMS can be powered on/off through external switches. |   |  |
| LCD Screen             | ON                         | Monitoring software to check the cell voltage, temperature and current.              |   |  |
| Charging Activating    | ON                         | 1 minute   | The BMS powered off after under voltage protection. Press the button for recovering from protection status and activate output current. | Configurable                                   |
| Compensating impedance | Connection fault impedance | 10mΩ   | Default between 8 and 9   | Battery connection line impedance compensation |
|                        | Compensation 1             | 0mΩ  | 9   | Configurable                                   |
|                        | Compensation 2             | 0mΩ  | 13  |  |

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## 5. COMMUNICATION

### 5.1 CAN COMMUNICATION

The Seplos Battery Management System (BMS) transmits data via a CAN interface, operating at a baud rate of 500 kilobits per second. The CAN interface utilises 8P8C connectors to communicate with an inverter or a CAN TEST. RS485 is used to collect this information, which is then transmitted to the PCS through the CAN interface.



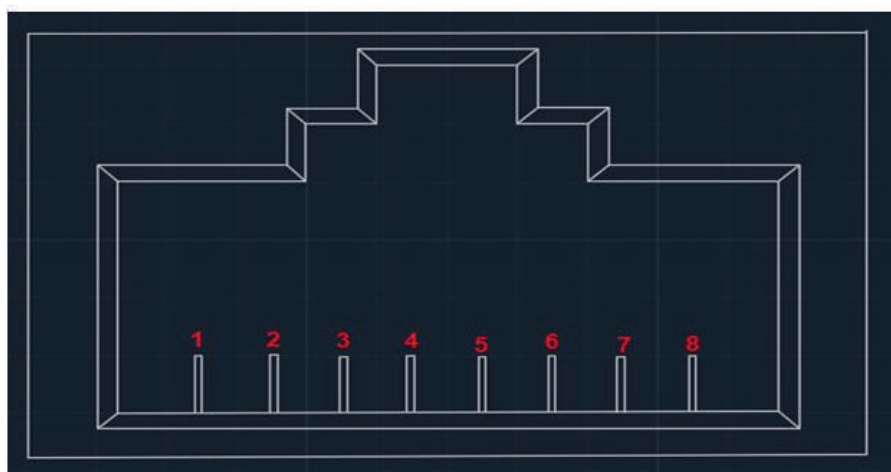
| PINS       | DEFINITION |
|------------|------------|
| 1、 2、 7、 8 | NC         |
| 4          | CAN-L      |
| 5          | CAN-H      |
| 3、 6       | GND        |

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## 5. COMMUNICATION

### 5.2 RS485 COMMUNICATION

The Battery Management System (BMS) can gather battery pack information using RS485 communication at a baud rate of 19200 bits per second. The RS485 interface employs 8P8C connectors for data transmission.



| PINS | DEFINITION                  |
|------|-----------------------------|
| 1/8  | RS485-B                     |
| 2/7  | RS485-A                     |
| 3/6  | GROUND                      |
| 4/5  | Internal communication (NC) |



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### 5. COMMUNICATION

#### 5.3 PARALLEL COMMUNICATION

When connected in parallel using RS485 connectors, the CAN connectors serve as the primary communication interface. End devices can access the collected battery information through the CAN interface.



#### 5.4 DIP SWITCHES

**DIP Address:** When battery packs are connected in parallel, each pack is uniquely identified by a DIP address. Bits 1 to 4 determine the individual address of each parallel pack, while bits 5 to 8 indicate the total number of slave packs.

**Host settings:** Bits 1 to 4 are fixed at 0, assigning the host a fixed address of 0, and bits 5 to 8 are set based on the number of parallel slaves.

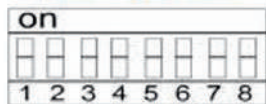
**Slave settings:** Bits 1 to 4 are set according to the device sequence, with slave addresses ranging from 1 to 15. Bits 5 to 8 remain fixed at 0.

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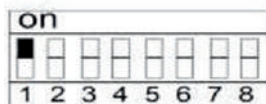
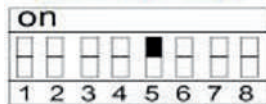
## 5. COMMUNICATION

### 5.4 DIP SWITCHES

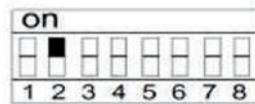
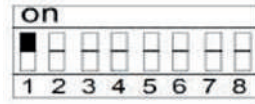
#### 1 PACK



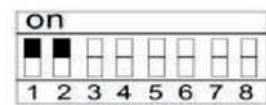
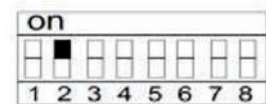
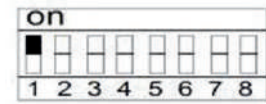
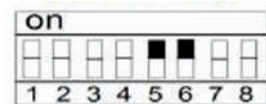
#### 2 IN PARALLEL



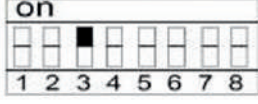
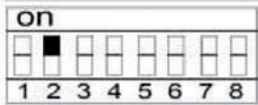
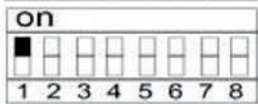
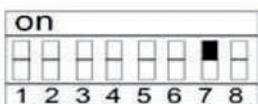
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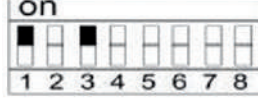
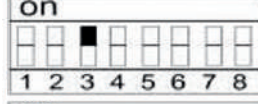
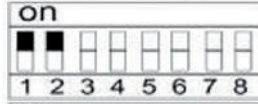
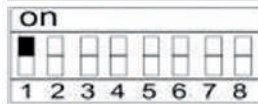
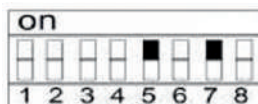
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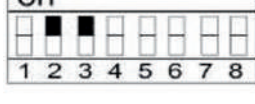
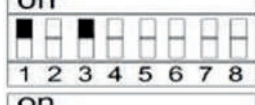
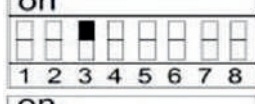
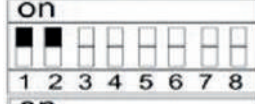
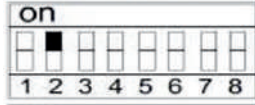
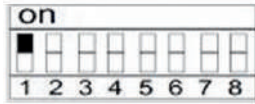
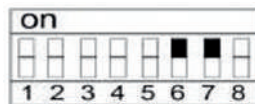
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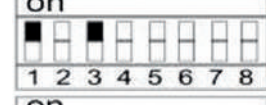
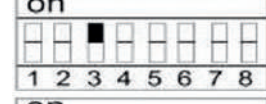
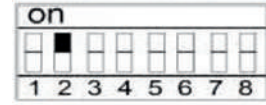
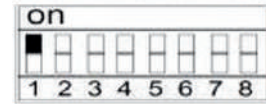
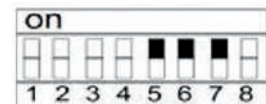
#### 6 IN PARALLEL



#### 7 IN PARALLEL



#### 8 IN PARALLEL



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## 6. WORKING MODE

### Charging Mode

When a charger is detected and its voltage exceeds the battery voltage by at least 0.5V, the BMS will activate the charging MOSFET. Once the charging current reaches the effective charging current value, the system enters charging mode.

### Discharging Mode

When a load is detected and the discharging current reaches the effective charging current value, the BMS enters discharging mode.

### Standby Mode

If the BMS is neither charging nor discharging, the system enters standby mode.

### Power Off Mode

The system will power off (without a charger) if:

- Any individual or all batteries remain in over-discharge protection mode for 30 seconds.
- The power button is pressed for 3 seconds (ensure no charger is connected; otherwise, the system will not enter low power mode).

### Waking the System

The system will enter working mode if:

- A charger is connected, and its voltage exceeds 300V.
- The power button is pressed for 3 seconds.







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## 7. LED LIGHTS









One running indicator (Green)

One warning indicator (Red)

And four capacity indicators (Green)

|   |   |   |   |   |   |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| SOC   |   |   |   | ALARM   | RUN   |

### 7.1 CAPACITOR INDICATORS







| STATUS   | CHARGING   |  |  |  | DISCHARGING  |  |  |  |
|----------|--|--|--|--|--|--|--|--|
| CAPACITY | L4  | L3  | L2  | L1  | L4  | L3  | L2  | L1  |
| 0-25%    | OFF  | OFF  | OFF  | BLINK  | OFF  | OFF  | OFF  | GREEN  |
| 25%-50%  | OFF  | OFF  | BLINK  | GREEN  | OFF  | OFF  | GREEN  | GREEN  |
| 50%-75%  | OFF  | BLINK  | GREEN  | GREEN  | OFF  | GREEN  | GREEN  | GREEN  |
| ≥75%     | BLINK  | GREEN  | GREEN  | GREEN  | GREEN  | GREEN  | GREEN  | GREEN  |
| RUNNING  | GREEN  |  |  |  | BLINKING   |  |  |  |

### 7.2 LIGHTS BLINKING EXPLANATION

| BLINK TYPE | LIGHT TIME | OFF TIME |
|------------|------------|----------|
| BLINK A    | 0.25S      | 3.75S    |
| BLINK B    | 0.5S       | 0.5S     |
| BLINK C    | 0.5S       | 1.5S     |

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## 7.3 RUNNING STATUS INDICATORS

| RUNNING STATUS INDICATORS |                                  |   |   |   |   |   |   |              |
|---------------------------|----------------------------------|---|---|---|---|---|---|--------------|
| SYSTEM                    | RUNNING                          | RUN   | ALM   | SOC   |   |   |   | REMARK       |
|                           |                                  |  |  |  |  |  |  |              |
| OFF                       | SLEEPING                         | OFF   | OFF   | OFF   | OFF   | OFF   | OFF   | OFF          |
| STANDBY                   | RUNNING                          | BLINK A   | OFF   | OFF   | OFF   | OFF   | OFF   | STANDBY      |
| CHARGE                    | RUNNING                          | GREEN   | OFF   | ACCORDING TO THE REMAINING CAPACITY   |   |   |   | BLINK B      |
|                           | OVERCURRENT WARNING              | GREEN   | BLINK B   | ACCORDING TO THE REMAINING CAPACITY   |   |   |   | BLINK B      |
|                           | OVERVOLTAGE PROTECTION           | BLINK A   | OFF   | OFF   | OFF   | OFF   | OFF   | -            |
|                           | TEMP AND OVER CURRENT PROTECTION | BLINK A   | BLINK A   | OFF   | OFF   | OFF   | OFF   | -            |
| DISCHARGE                 | RUNNING                          | BLINK C   | OFF   | ACCORDING TO THE REMAINING CAPACITY   |   |   |   |              |
|                           | WARNING                          | BLINK C   | BLINK C   |   |   |   |   |              |
|                           | TEMP OVER CURRENT, SCP           | OFF   | RED   | OFF   | OFF   | OFF   | OFF   |              |
|                           | UNDER VOLTAGE PROTECTION         | OFF   | OFF   | OFF   | OFF   | OFF   | OFF   | NO DISCHARGE |



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### 8. HEALTH AND SAFETY

- Do not place the battery on or near flammable materials.
- To ensure optimal performance, the ambient temperature should be between 10°C and 30°C.
- The installation site should have sufficient space around the battery for proper heat dissipation (as illustrated in the diagram below).
- Concrete surfaces or other non-flammable surfaces are suitable for installation.



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### 9. INVERTER CONNECTION

The battery should be turned off before connecting.

