DYNESS



# STACK100

## USER MANUAL

**Battery Module**
51.2V/100Ah

File version-20250307-V2-EN information might be subject to change without notice during product improving.

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## Revision History

| Revision No. | Revision Date | Revision Reason |
|---|---|---|
| V0 | 2024.07.31 | First Published. |
| V1 | 2024.12.16 | Parameters changed. |
| V2 | 2025.03.07 | Add Installation precautions |

# Safe handling of lithium batteries guide

**DANGER**

Before installation or operation you must read the “STACK100 User Manual” carefully.

The batteries will produce high-voltage DC power and might cause lethal voltage and electric shock.

Only qualified persons are allowed to wire the batteries.

**WARNING**

This product is a high-voltage DC system, and should be operated by authorized persons only.

Risk of battery system damage or personal injury.

DO NOT disconnect while the system is running!

Keep all power sources off and verify that they are de-energized.

Battery damage may result in electrolyte leakage. If the electrolyte is leaked, do not touch the leaked electrolyte or volatile gas, and contact the after-sales service team for help immediately. If leaked material was touched accidentally, please follow the steps below:

- Inhalation of leaked material: Evacuate from the contaminated area and seek medical assistance immediately.
- Eye contact: Flush with clean water for at least 15 minutes and seek medical assistance immediately.
- Skin contact: Wash the contact area thoroughly with soap and clean water and seek medical assistance immediately.
- Ingestion: Induce vomiting and seek immediate medical assistance.
- Do not move the battery system if it is connected to an external expansion module.

If you need to replace or add a battery, please contact the after-sales service center.


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CAUTION

Risk of battery system failure or life cycle reduction.

**Before Connecting**

Please check the product and packing list after unpacking. If the product is damaged or parts are missing, please contact the local dealer.

Before installation, make sure that the grid is disconnected and the battery is switched off.

Do not invert the positive and negative cables and ensure there is no short circuit to the external device.

It is prohibited to connect the battery to AC power directly.

The battery system must be properly grounded and the resistance must be less than 1Ω.

Ensure that the electrical parameters of the battery system are compatible with the respective equipment.

Keep the battery away from water and fire.

**During Use**

If the battery system needs to be moved or repaired, the power must be disconnected and the battery must be switched off.

It is prohibited to connect different types of batteries.

It is prohibited to connect the battery to incompatible or faulty inverters.

It is prohibited to disassemble the battery (to avoid the warranty sticker being removed or damaged).

In case of fire, only a dry powder fire extinguisher must be used, foam extinguishers are prohibited.

Please do not open, repair or disassemble batteries; this is reserved for Dyness staff or authorized personnel. We do not take any responsibility caused by violation of safety operation or equipment safety standards.

**Maintenance**

Please read the user manual carefully.

If batteries are stored for a long time, it is required to charge them every 10~12 months, and the SOC should be no less than 50%.

Do not expose cables outside.

All battery terminals must be disconnected for maintenance.

Please contact the supplier within 24 hours if there is something abnormal.

Warranty claims are excluded for direct or indirect damage due to items above.

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# 1 Introduction

## Brief Introduction

STACK100 is a high-voltage battery storage system based on lithium iron phosphate batteries, and it is one of the new energy storage products developed and produced by Dyness. It can be used to support reliable power for various types of equipment and systems. STACK100 is especially suitable for application scenes of high power, limited installation space, restricted load-bearing and long cycle life.

## Product Properties

- The entire module is non-toxic, non-polluting and environmentally friendly.
- Anode material is made from LiFePO4 with safety performance and long cycle life.
- The Battery Management System (BMS) comes with protective functions including over-discharge, over-charge, over-current and high/low temperature.
- The system can automatically manage the charge and discharge state and balance the current and voltage of each cell.
- Flexible configuration, multiple battery modules can be connected in series for expanding voltage and capacity.
- 1C discharge, built-in air-cooling system.
- Each PACK has an independent fire extinguishing device.
- The module has less self-consumption, up to 10~12 months without charging; no memory effect, excellent performance of shallow charge and discharge.
- Working temperature range is from -20 to +50°C, with excellent discharge performance and cycle life.
- Small size and lightweight, standard module is easy to install and maintain.


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## Product identity definition

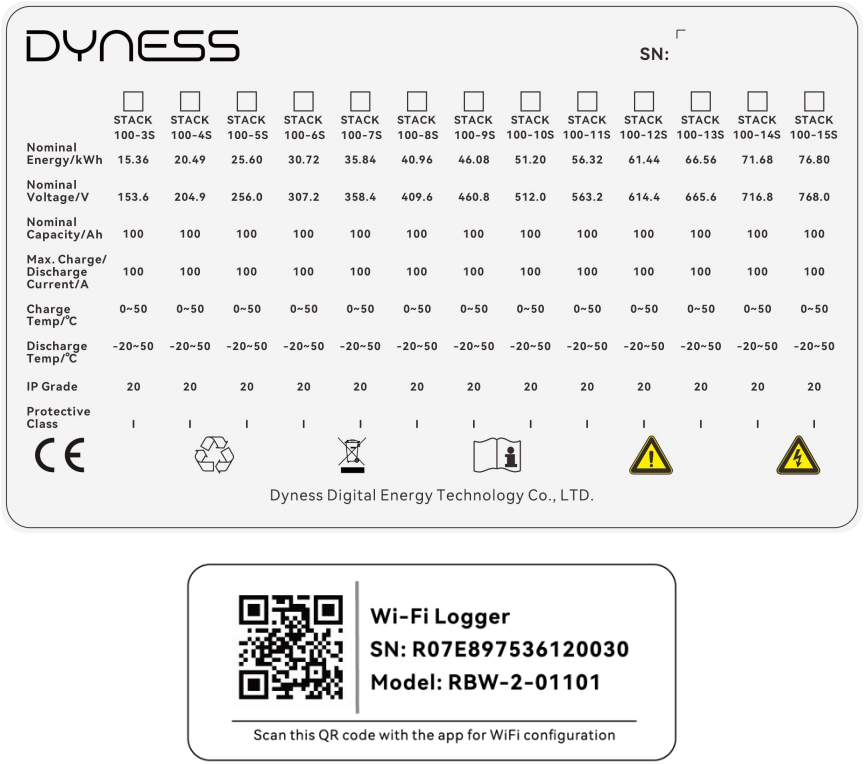



Figure 1-1 Battery energy storage system nameplate and WiFi QR code label




Figure 1-2 Labels with heating function

(Only systems with heating function will be labeled with this label)

| | |
|---|---|
|  | The battery voltage is higher than the safe voltage, and direct contact results in an electric shock hazard. |
|  | Be careful with your actions and be aware of the dangers. |
|  | Read the user manual before use. |
|  | Do not dispose of the scrapped batteries with household waste; they must be recycled by professional personnel or institutes. |

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| | |
|---|---|
|  | After the useful life of the battery, it can continue to be used after being recycled by a professional recycling organization. |
|  | This battery meets European directive requirements. |
|  | Keep away from open flames or other ignition sources. |
|  | Be aware of explosive gas. |
|  | Be aware of battery leakage. |
|  | Heavy objects. Lift with care. |
|  | Keep the battery pack away from children. |

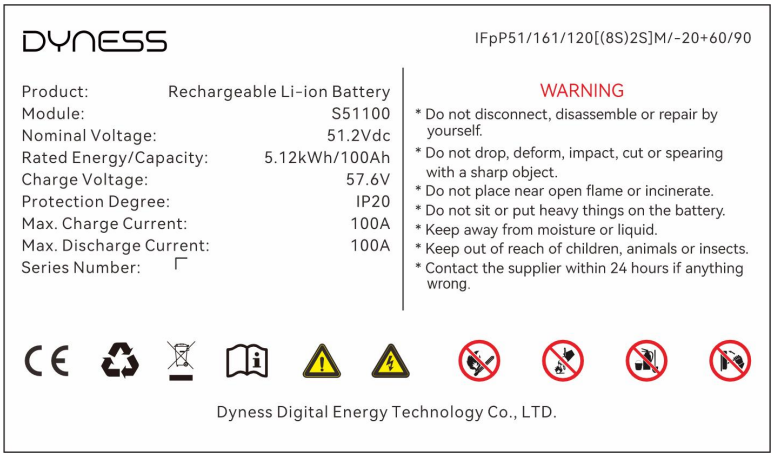



Figure 1-2 Battery module label


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# 2 Product specifications

## System Performance Parameter

Table 2-1 Parameters of the STACK100 system

| Model | STACK 100-3s | STACK 100-4s | STACK 100-5s | STACK 100-6s | STACK 100-7s |
|---|---|---|---|---|---|
| Module Voltage/Capacity | 51.2V/100 Ah | 51.2V/100 Ah | 51.2V/100 Ah | 51.2V/100 Ah | 51.2V/100 Ah |
| System Modules Serial Number | 3 | 4 | 5 | 6 | 7 |
| System Energy Range | 15.4kWh | 20.5kWh | 25.6kWh | 30.7kWh | 35.8kWh |
| Operating Voltage | 134-175V | 179-233V | 224-292V | 268-350V | 313-408V |
| Recommended Charge/Discharge Current | 50A (0.5C) | 50A (0.5C) | 50A (0.5C) | 50A (0.5C) | 50A (0.5C) |
| Max.Charge/Discharge Current | 100A (1C) | 100A (1C) | 100A(1C) | 100A (1C) | 100A (1C) |
| Peak Discharge Current(2min 25℃) | 125A (1.25C) | 125A(1.25 C) | 125A(1.25 C) | 125A (1.25C) | 125A(1.25 C) |
| Depth of Discharge | 95% | 95% | 95% | 95% | 95% |
| Communication | CAN/ RS485 | CAN/ RS485 | CAN/ RS485 | CAN/ RS485 | CAN/ RS485 |
| Cycle Life [1] | ⩾8000 cycles/10 Years | ⩾8000 cycles/10 Years | ⩾8000 cycles/10 Years | ⩾8000 cycles/10 Years | ⩾8000 cycles/10 Years |
| Single Module Weight | 47Kg | 47Kg | 47Kg | 47Kg | 47Kg |
| Single Cluster Dimension[W*D*H] | 591*390*634mm | 591*390*768mm | 591*390*901mm | 591*390*1035mm | 591*390*1168mm |
| Charging Temp. Range | 0～50℃ | 0～50℃ | 0～50℃ | 0～50℃ | 0～50℃ |
| Discharging Temp. Range | -20～50℃ | -20～50℃ | -20～50℃ | -20～50℃ | -20～50℃ |
| Protection Level | IP20 | IP20 | IP20 | IP20 | IP20 |
| Fire Protection System | Aerosol fire extinguisher | | | | |
| Installation method | Stack type | | | | |
| Cooling method | Forced wind cooling | | | | |
| WIFI Module | Built-in WIFI module; APP OTA function | | | | |
| Certification & Safety Standard | CE,EMC/CE,RED/62619/63056/62477/62040 /UN38.3 | | | | |
| Compatible Inverters | Goodwe/Solis/Deye/Solplanet/Solinteg/Sunways/Hoymiles/SAJ/Sinexcel/Growatt/ATESS/Megarevo/Sineng etc. | | | | |

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| Model | STACK 100-8s | STACK 100-9s | STACK 100-10s | STACK 100-11s | STACK 100-12s |
|---|---|---|---|---|---|
| Module Voltage/Capacity | 51.2V/100 Ah | 51.2V/100 Ah | 51.2V/100 Ah | 51.2V/100 Ah | 51.2V/100 Ah |
| System Modules Serial Number | 8 | 9 | 10 | 11 | 12 |
| System Energy Range | 41kWh | 46.1kWh | 51.2kWh | 56.3kWh | 61.4kWh |
| Operating Voltage | 358-467V | 403-525V | 448-584V | 492-642V | 537-700V |
| Recommended Charge/Discharge Current | 50A (0.5C) | 50A (0.5C) | 50A (0.5C) | 50A (0.5C) | 50A (0.5C) |
| Max.Charge/Discharge Current | 100A (1C) | 100A (1C) | 100A(1C) | 100A (1C) | 100A (1C) |
| Peak Discharge Current(2min 25℃) | 125A (1.25C) | 125A(1.25 C) | 125A(1.25 C) | 125A (1.25C) | 125A(1.25 C) |
| Depth of Discharge | 95% | 95% | 95% | 95% | 95% |
| Communication | CAN/ RS485 | CAN/ RS485 | CAN/ RS485 | CAN/ RS485 | CAN/ RS485 |
| Cycle Life [1] | ⩾8000 cycles/10 Years | ⩾8000 cycles/10 Years | ⩾8000 cycles/10 Years | ⩾8000 cycles/10 Years | ⩾8000 cycles/10 Years |
| Single Module Weight | 47Kg | 47Kg | 47Kg | 47Kg | 47Kg |
| Single Cluster Dimension[W*D*H] | 591*390*1 302mm | 591*390*1 435mm | 591*390*1 569mm | 591*390*1 702mm | 591*390*1 836mm |
| Charging Temp. Range | 0～50℃ | 0～50℃ | 0～50℃ | 0～50℃ | 0～50℃ |
| Discharging Temp. Range | -20～50℃ | -20～50℃ | -20～50℃ | -20～50℃ | -20～50℃ |
| Protection Level | IP20 | IP20 | IP20 | IP20 | IP20 |
| Fire Protection System | Aerosol fire extinguisher | | | | |
| Installation method | Stack type | | | | |
| Cooling method | Forced wind cooling | | | | |
| WIFI Module | Built-in WIFI module; APP OTA function | | | | |
| Certification & Safety Standard | CE¸EMC/CE¸RED/62619/63056/62477/62040 /UN38.3 | | | | |
| Compatible Inverters | Goodwe/Solis/Deye/Solplanet/Solinteg/Sunways /Hoymiles/SAJ/Sinexcel/Growatt/ATESS/Megarevo /Sineng etc. | | | | |


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| Model | STACK 100-13s | STACK 100-14s | STACK 100-15s |
|---|---|---|---|
| Module Voltage/Capacity | 51.2V/100Ah | 51.2V/100Ah | 51.2V/100Ah |
| System Modules Serial Number | 13 | 14 | 15 |
| System Energy Range | 66.6kWh | 71.7kWh | 76.8kWh |
| Operating Voltage | 582-759V | 627-818V | 672-876V |
| Recommended Charge/Discharge Current | 50A (0.5C) | 50A (0.5C) | 50A (0.5C) |
| Max.Charge/Discharge Current | 100A (1C) | 100A (1C) | 100A(1C) |
| Peak Discharge Current(2min 25℃) | 125A (1.25C) | 125A(1.25C) | 125A(1.25C) |
| Depth of Discharge | 95% | 95% | 95% |
| Communication | CAN/ RS485 | CAN/ RS485 | CAN/ RS485 |
| Cycle Life [1] | ⩾8000 cycles/10 Years | ⩾8000 cycles/10 Years | ⩾8000 cycles/10 Years |
| Single Module Weight | 47Kg | 47Kg | 47Kg |
| Single Cluster Dimension[W*D*H] | 591*390*1969mm | 591*390*2103mm | 591*390*2236mm |
| Charging Temp. Range | 0～50℃ | 0～50℃ | 0～50℃ |
| Discharging Temp. Range | -20～50℃ | -20～50℃ | -20～50℃ |
| Protection Level | IP20 | IP20 | IP20 |
| Fire Protection System | Aerosol fire extinguisher | | |
| Installation method | Stack type | | |
| Cooling method | Forced wind cooling | | |
| WIFI Module | Built-in WIFI module; APP OTA function | | |
| Certification & Safety Standard | CE,EMC/CE,RED/62619/63056/62477/62040 /UN38.3 | | |
| Compatible Inverters | Goodwe/Solis/Deye/Solplanet/Solinteg/Sunways /Hoymiles/SAJ/Sinexcel/Growatt/ATESS/Megarevo /Sineng etc. | | |

[1]Test conditions: 0.2C Charging/Discharging, @25°C, 95% DOD

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## Battery Module

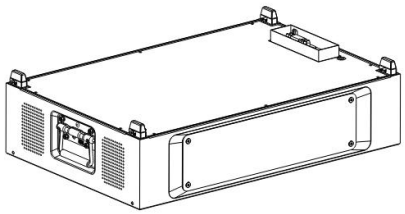


Figure 2-1 Battery module

Table 2-2 Product parameters

| Module name | S51100 |
|---|---|
| Cell technology | Li-ion (LFP) |
| Battery module capacity (kWh) | 5.12 |
| Battery module voltage (V/DC) | 51.2 |
| Battery module capacity (Ah) | 100 |
| Number of battery module cells (pcs) | 16 |
| Battery cell capacity (Wh) | 320 |
| Battery cell voltage (V/DC) | 3.2 |
| Battery cell capacity (Ah) | 100 |
| Dimensions (W*D*H, mm) | 590*390*133.5 |
| Pollution degree (PD) | II |
| Ambient temperature (°C) | 0~50 |
| IP protection class | IP20 |
| Weight (kg) | 47 |

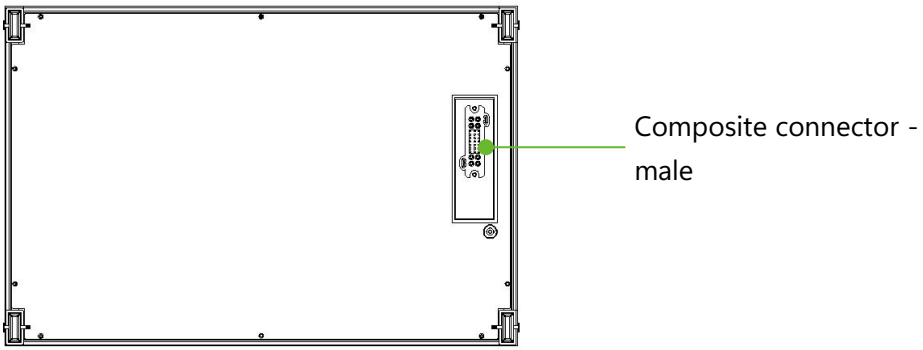



Figure 2-3 S51100 top connector


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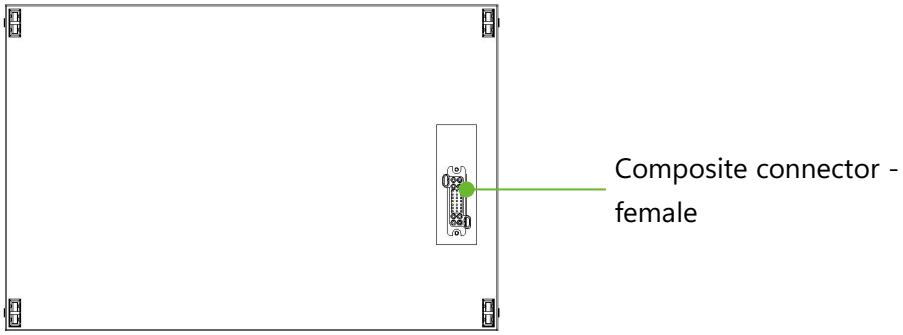



Figure 2-4 S51100 bottom connector

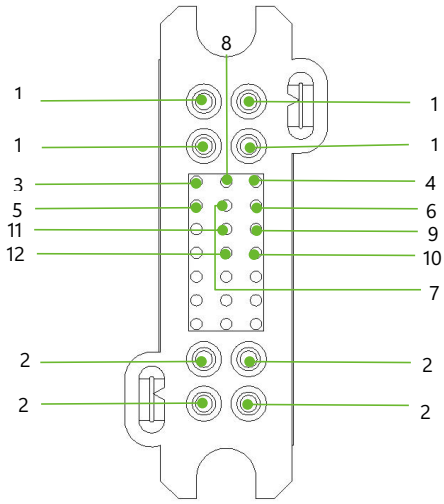



Figure 2- 5 Composite connector - male

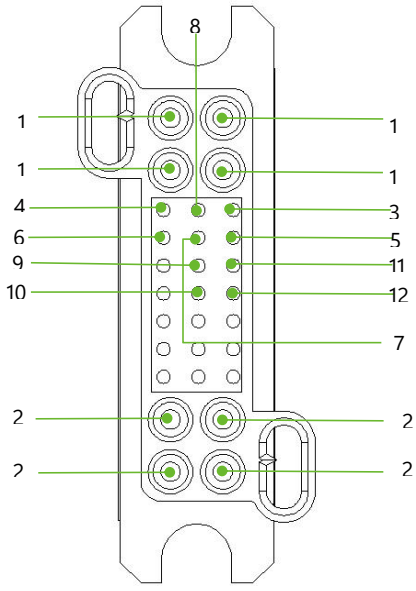



Figure 2-6 Composite connector - female

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Table 2-3 Connector definition

| Item | Name | Definition |
|---|---|---|
| 1 | Composite connector - male | Battery module output and communication interface |
| 2 | Composite connector - female | Battery module output and communication interface |

Table 2-4 Port definition

| No. | Composite connector - male | Composite connector - female |
|---|---|---|
| 1 | Positive output | Negative output |
| 2 | Negative output | Module negative |
| 3 | IPC | IPC |
| 4 | IPB | IPB |
| 5 | IMB | IMB |
| 6 | 24V- | 24V- |
| 7 | 24V+ | 24V+ |
| 8 | IMC | IMC |
| 9 | 24V- | 24V- |
| 10 | 24V- | 24V- |
| 11 | 24V+ | 24V+ |
| 12 | 24V+ | 24V+ |

## Battery controller

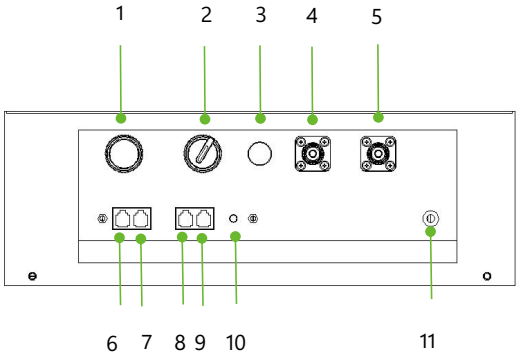



Figure 2-7 BDU right connector

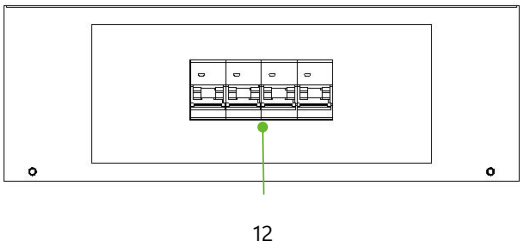



Figure 2-8 BDU left connector


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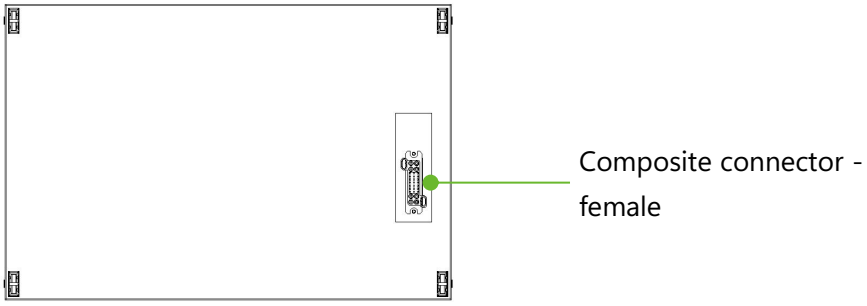



Figure 2-9 BDU bottom connector

Table 2-5 Connector definition

| Item | Name | Definition |
|---|---|---|
| 1 | Power Wake Button | Long press this button to start the battery system |
| 2 | Power On switch | Turn on the switch to power the BMS system |
| 3 | WiFi antenna | Receiving and sending WiFi signals |
| 4 | External negative female | Connect battery system to inverter negative terminal |
| 5 | External positive socket | Connect battery system to inverter positive terminal |
| 6 | Inverter CAN/RS485 | RJ45 communication port between battery system and inverter |
| 7 | Inverter CAN/RS485 | RJ45 communication port between battery system and inverter |
| 8 | Parallel in | Parallel communication connection of multi cluster systems |
| 9 | Parallel out | Parallel communication connection of multi cluster systems |
| 10 | WiFi antenna | Receiving and sending WiFi signals |
| 11 | Grounding | Shell ground connection |
| 12 | DC breaker | The master switch of the battery system, you must switch it on before switching on the Power On and Power WAKE switches; short circuit protection. |

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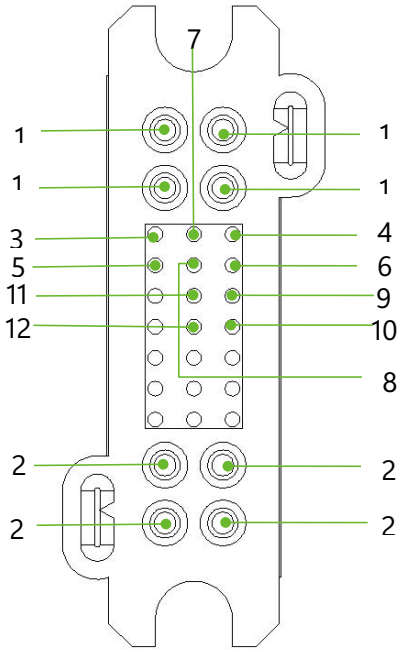



Figure 2-10 Power On switch

Table 2-6 Port definition

| No. | Definition |
|---|---|
| 1 | Positive output |
| 2 | Negative output |
| 3 | IPC |
| 4 | IPB |
| 5 | IMB |
| 6 | 24V- |
| 7 | IMC |
| 8 | 24V+ |
| 9 | 24V- |
| 10 | 24V- |
| 11 | 24V+ |
| 12 | 24V+ |


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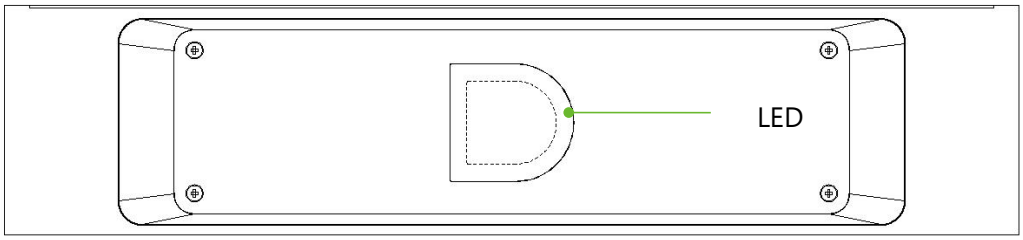



Figure 2-11 BDU front view

Table 2-7 LED status indicators

| LED status | Information |
| --- | --- |
|  | SOC 50% |
|  | SOC 100% |
| Current SOC increases to 100% ,then cycles  | Charge |
| Drop from current SOC to 0%, then loop  | Discharge |
| Green light flashing(Current SOC)  | Standby |
| Yellow light flashing  | Communication failure between batteries or communication failure between lamp board and BMS |
| Red light on  | System protection |

**DANGER**

Ensure ON/OFF switch is turned on before waking up the battery. Otherwise it will affect the auto test process and cause danger.

DO NOT switch off the ON/OFF switch during normal operation, only in emergencies. Otherwise it will cause the battery current to surge.

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**CAUTION**

If the DC breaker trips because of over-current or short circuit, you must wait for 30 minutes to switch it on again, otherwise it may cause damage to the breaker.

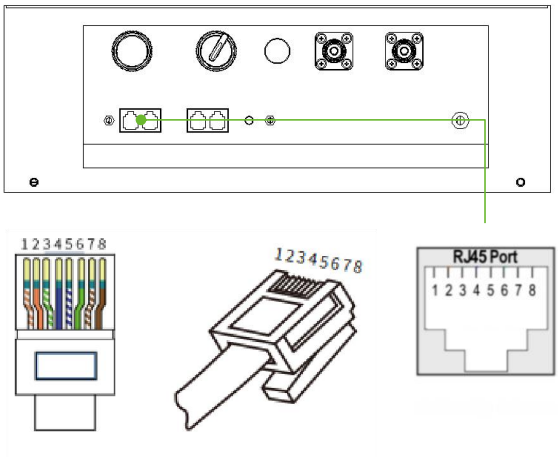



Figure 2-12 "Inverter CAN/RS485" port pins

Table 2-8 Definition of "Inverter CAN/RS485" port pins

| PIN | Color | Definition |
|---|---|---|
| PIN1 | Orange/White | 485_B |
| PIN2 | Orange | 485_A |
| PIN3 | Green/White | Reserved |
| PIN4 | Blue | CANH |
| PIN5 | Blue/White | CANL |
| PIN6 | Green | NC |
| PIN7 | Brown/White | NC |
| PIN8 | Brown | NC |


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# 3 Installation and Configuration

## Environmental Requirements

**DANGER**

**Cleanliness**

The battery system has high voltage connectors. The environmental conditions will affect the isolation of the system.

Before installation and switch-on, dust and swarf must be removed to keep the system clean. The environment must be dust-proof to a certain extent.

Dust and humidity must be regularly checked during continuous operation of the system.

**Fire Protection System**

The room must be equipped with a fire protection system or fire extinguishers (Recommended: foam extinguisher). The fire protection system needs to be regularly checked to ensure its normal condition. Please refer to your local fire protection equipment for use and maintenance requirements.

**Grounding System**

Make sure that the grounding point for the battery system is stable and reliable before installation. If the battery system is installed in an independent equipment cabin (e.g. container), ensure that the grounding of the cabin is stable and reliable.

The resistance of the grounding system must be ≤100mΩ.

**CAUTION**

**Temperature**

STACK100system working temperature range: -20°C to +50°C; Optimum temperature: 18°C to 30°C; Exceeding the working temperature range will cause over-temperature/under-temperature alarms or protection of the battery system which may lead to the reduction of cycle lives.

**Cooling System**

It is essential to equip a cooling system to keep the battery system in a relevant temperature range. Over-temperature/under-temperature alarms or protection of the battery system may lead to the reduction of lifespan.

**Heating System**

It is essential to equip a heating system to keep the battery system in a relevant temperature range. If the environment is lower than 0°C, the system may be shut down for

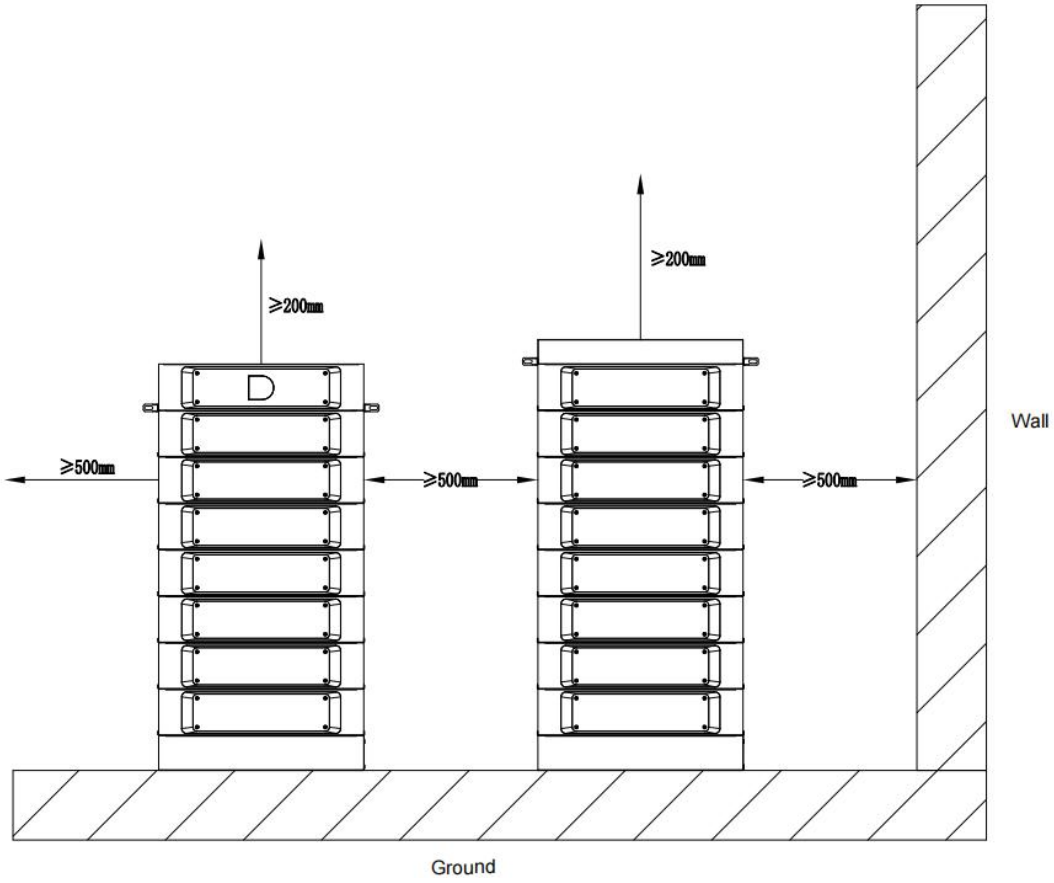
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protection. It is necessary to open the heating system first. Exceeding the working temperature range will cause the battery system over-temperature/under-temperature alarm or protection of the battery system may lead to the reduction of cycle lives.

## Installation location precautions

**DANGER**

Please note that the battery should be installed with a minimum safe clearance from the surrounding equipment or battery. Please refer to the minimum clearance diagram below.





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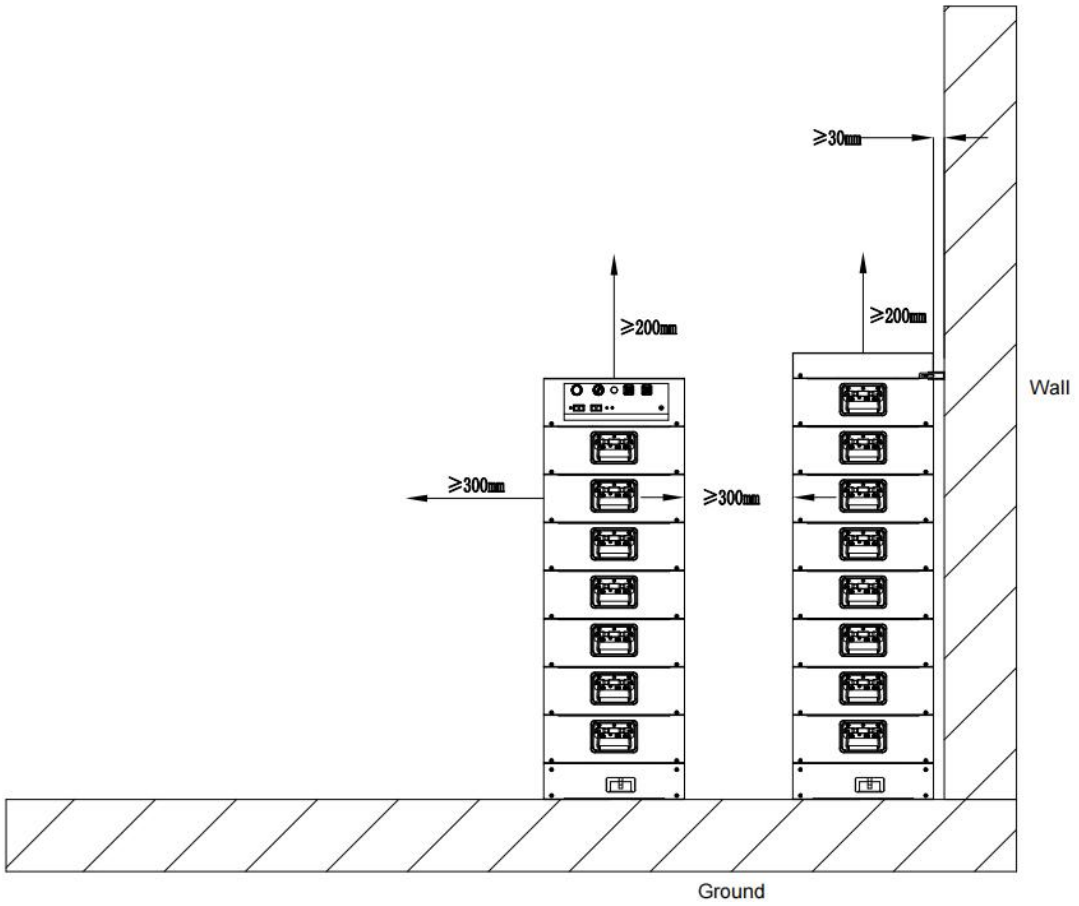



Figure 3-1 Minimum clearance

Note:

1.The system should be installed with the help of at least 2 grown-up males.

2.If more than 12 of the mare to be configured, It is suggested to divide into two columns.

The battery system should be installed indoors, away from flammable and explosive materials.

.

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## Tools

The following tools are required to install the battery pack:

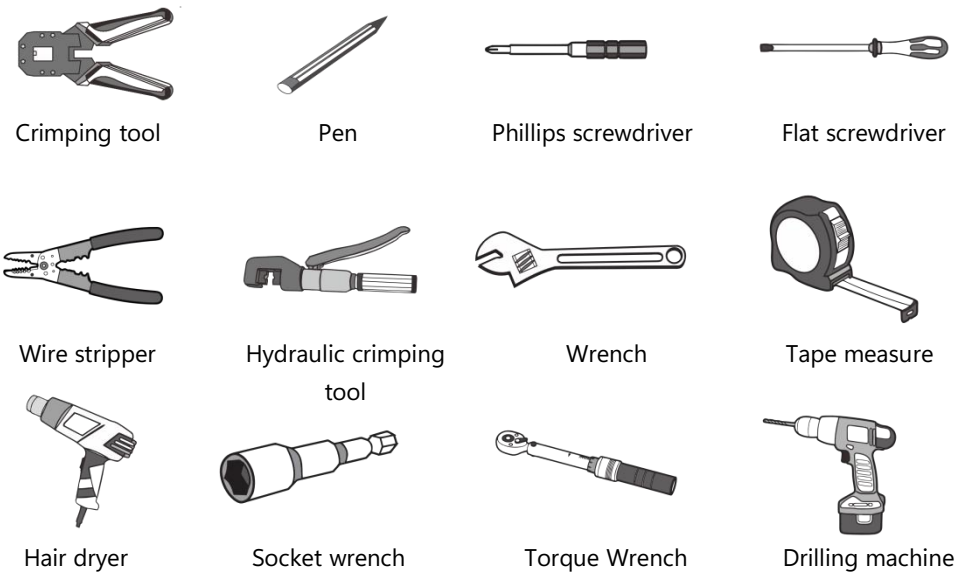



Figure 3-3 Installation tools

## Safety Gear

We recommend wearing the following safety gear when working with batteries:

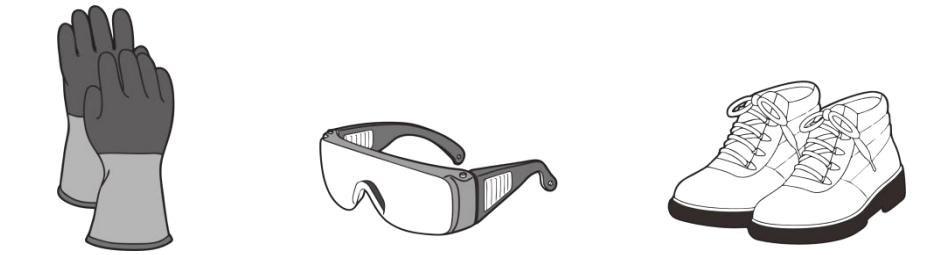



Figure 3-4 Safety gear

## Unpacking inspection

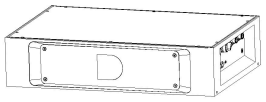
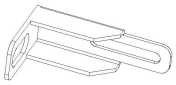
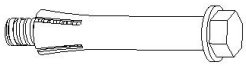
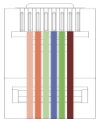
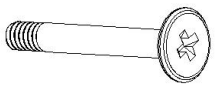
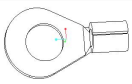
- When the equipment arrives at the installation site, unloading should be performed according to rules and regulations, to prevent from being exposed to direct sunlight. The battery should not be installed in direct sunlight. Please refer to Section 3.3
- Before unpacking, the total number of packages shall be indicated according to the shipping list attached to each package, and all packages shall be checked for good condition.
- Handle with care and protect the surface coating of the goods.
- Upon opening the package, the installation personnel should read the technical documentation, verify the list according to configuration table and packing list and


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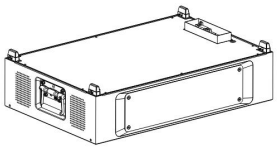
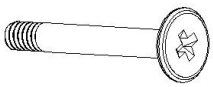
ensure that the goods are complete and intact. If the internal packing is damaged, goods should be examined and recorded in detail.

Check the components of the STACK100 Battery System in different capacities

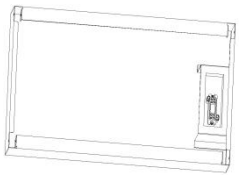
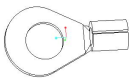
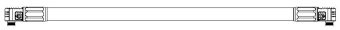
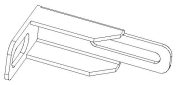
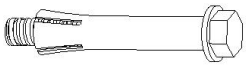
Table 3-1 Scope of delivery

| Package | Name | Specifications | Quantity | Image |
|---|---|---|---|---|
| A | BDU | 590*390*133.5mm | 1 |  |
| | Base | 590*390*100mm | 1 |  |
| | Fixing bracket | To secure with the wall | 2 |  |
| | Expansion Bolt | M6*80 | 2 |  |
| | Expansion Bolt | M12*100 | 4 |  |
| | CAN resistor | RJ45-CAN-120, Pin4&5 | 1 |  |
| | Flat head Phillips screws | M5*30 | 4 |  |
| | Terminal | OT4-6 | 2 |  |
| | Communication cable to inverter | b/L2000mm/RJ45 plug at both sides, CAN | 1 |  |
| | Communication cable to inverter | b/L2000mm/RJ45 plug at both sides, RS485 | 1 |  |

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| Package | Name | Specifications | Quantity | Image |
|---|---|---|---|---|
| | Power cable-negative | Positive cable, UL10269 4AWG , red, 2050mm | 1 |  |
| | Power cable-positive | Negative cable,UL10269 4AWG, black, 2050mm | 1 |  |
| | User Manual | User Manual | 1 |  |
| | Warranty Card | \ | 1 |  |
| | Letter to customer | \ | 1 |  |
| | Packing list | \ | 1 |  |
| B | S51100 | 590*390*133.5mm | 1 |  |
| | Flat head Phillips screws | M5*30 | 4 |  |
| | Packing list | \ | 1 |  |
| C (optional) | Expansion Base | 590*390*100mm | 1 |  |


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| Package | Name | Specifications | Quantity | Image |
|---|---|---|---|---|
| | Expansion Cover | 590*390*70mm | 1 |  |
| | Flat head Phillips screws | M5*30 | 4 |  |
| | OT terminal | OT4-6 | 2 |  |
| | Communication parallel cable | Communication between two cluster | 1 |  |
| | Series cable | Two clusters in series UL10269 4AWG | 2 |  |
| | Fixing bracket | fix to the wall | 2 |  |
| | Expansion Bolt | M6*80 | 2 |  |
| | Expansion Bolt | M12*100 | 4 |  |
| | Packing list | \ | 1 |  |

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Table 3-2 Scope of delivery

| Model | Battery system capacity | Configuration | |
|---|---|---|---|
| STACK100-3S | 15.4kWh | A+B*3 | |
| STACK100-4S | 20.5kWh | A+B*4 | |
| STACK100-5S | 25.6kWh | A+B*5 | |
| STACK100-6S | 30.7kWh | A+B*6 | |
| STACK100-7S | 35.8kWh | A+B*7 | |
| STACK100-8S | 41kWh | A+B*8 | |
| STACK100-9S | 46.1kWh | A+B*9 | |
| STACK100-10S | 51.2kWh | A+B*10 | |
| STACK100-11S | 56.3kWh | A+B*11 | |
| STACK100-12S | 61.4kWh | A+B*12 | |
| STACK100-13S | 66.6kWh | A+B*13 | A+B*13+C（Recommend two columns） |
| STACK100-14S | 71.7kWh | A+B*14 | A+B*14+C（Recommend two columns） |
| STACK100-15S | 76.8kWh | A+B*15 | A+B*15+C（Recommend two columns） |

## Equipment installation

Note:

1. If more than 12 battery modules are to be installed,you are advised to install them in two columns.
2. One battery column (15 Battery + 1 BDU) is about 2236 mm in height. Please maintain a clearance of 200mm above the CM. Namely, ensure that the distance between the floor and the ceiling is greater than 2436 mm for the convenience of installation and better heat dissipation.If the height is not enough,you are advised to install them in two columns.
3. The system should be installed with the help of at least 2 grown-up males.
4. .If the use of a conduit is required, please install the bushing to the reserved hole before installing the expansion screw.

### Installation Preparation

1. Make sure that the environment meets all technical requirements.


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2. Prepare equipment and tools for installation.

3. Confirm that the DC breaker is in the OFF position.

## Mechanical Installation

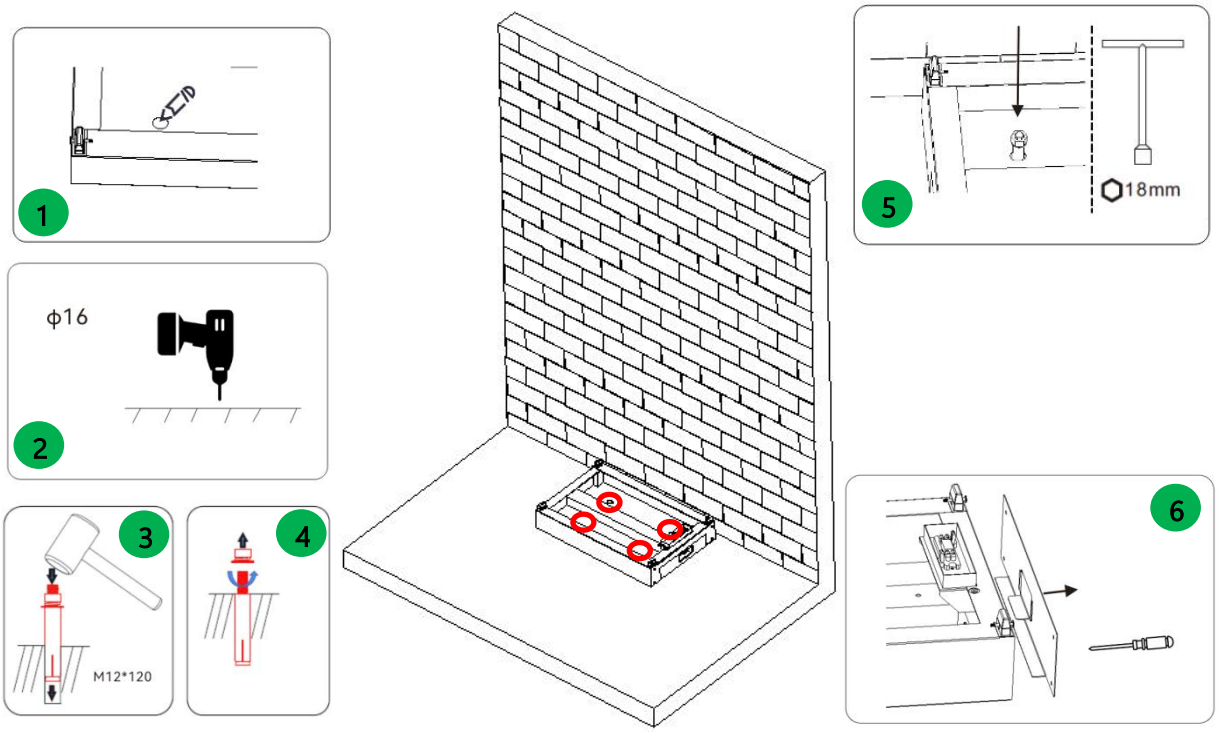
**DANGER**

The battery system is a high-voltage DC system. Ensure that installation area of STACK100 is stable and reliable.

Please confirm that the battery system is switched off before connecting. Electric shock and damage to the inverter may be caused if the battery is connected directly without being switched off.

Otherwise, the system cannot work properly. The voltage of the battery is too high, please pay attention to self-protection during measurement.

**Step 1**: Install the battery base.




1.Mark the hole positions using a marker.

2.Drill holes at the marked positons to a depth of 95 mm.

3.Knock the expansion screws into the holes(M12x120)

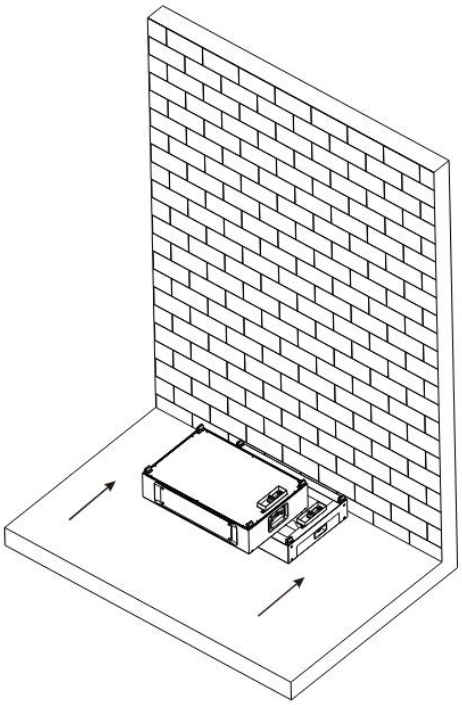
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4.Remove the flat washer, the spring washer and the nut.Place the base on the selected position, then install the flat washer, the spring was her and the nut.

5.Tighten the nut to secure the base.

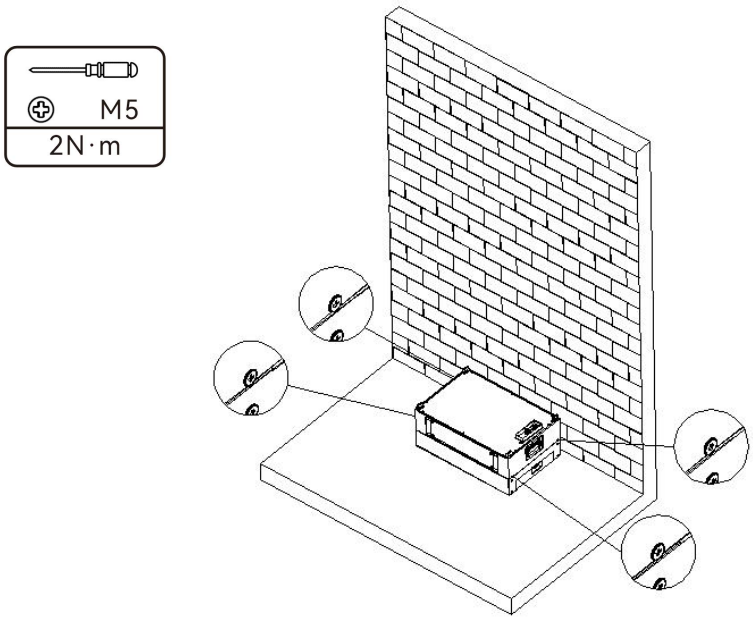
6.When installing in two columns, you need to remove the cover on the side of the base and install the communication line and power line between two columns.

**Step 2**: Place the Battery Module onto the base, ensuring that the locating pins of the Battery with the locating points on the base.

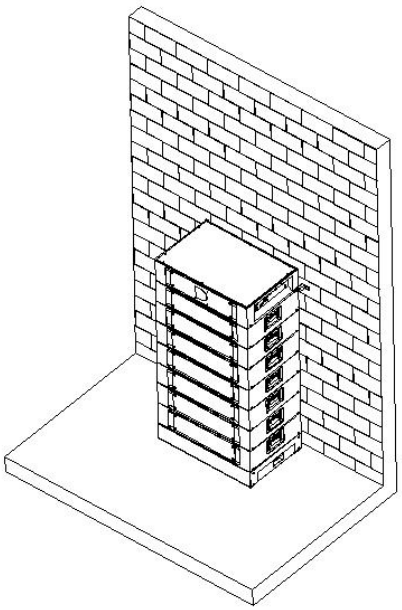



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**Step 3**: Install four M5*30 locking screws on the left and right sides.

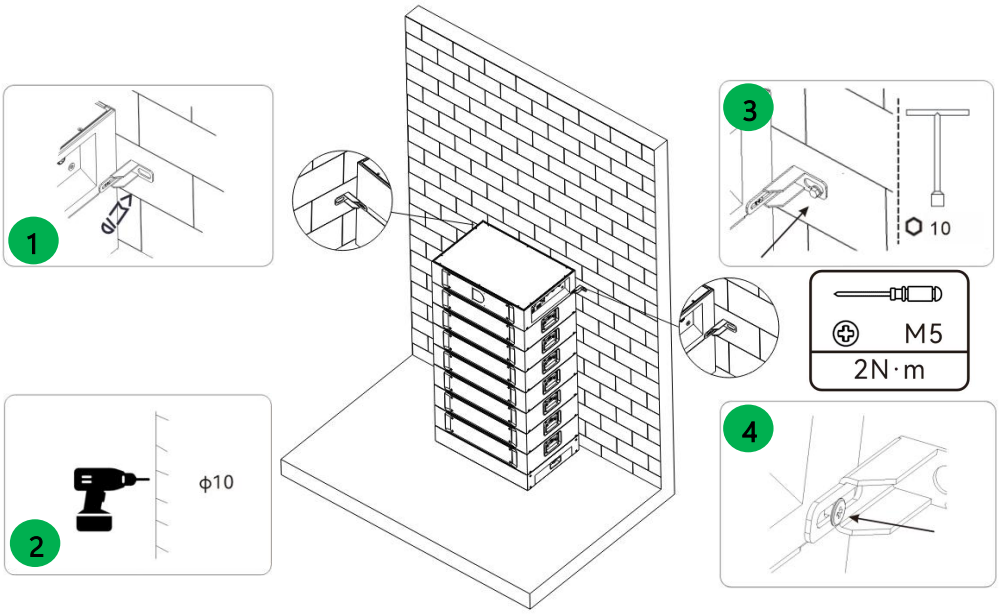



**Step 4**: Repeat steps 2 and 3 until the required batteries and BDU are installed.



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**Step 5**: Installed hanging ear.




1.Mark the hole positions using a marker.

2.Drill holes at the marked positions to a depth of 90 mm.

3.Hanging ears are installed on the left and right sides respectively and locked to the wall with expansion screws(M6x80).

4.Use two M5*30 screws to fix the left and right Hanging ears to the chassis respectively.


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## Expansion package installation

**TIPS**

1. If the number of battery packs in a single cluster is greater than 11, it is recommended to use an expansion pack for installation.
2. After expansion, the standard base becomes an expansion base, and the yellow label needs to be pasted by the customer himself.
3. The operation guide for changing the standard base to an expanded base is attached in Annex 1.

Install according to the minimum distance in Figure 3-1

**DANGER**

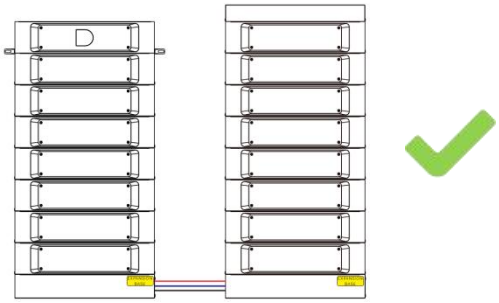
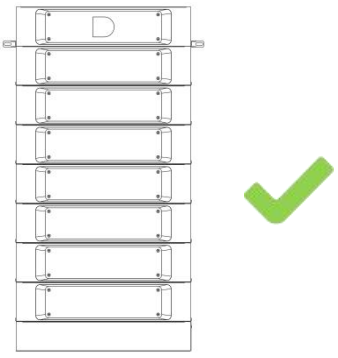
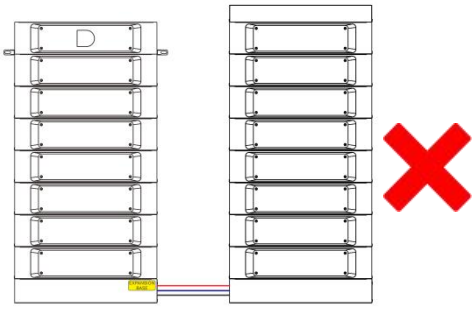
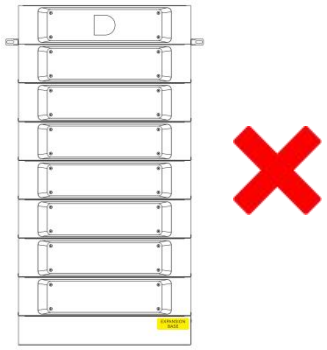
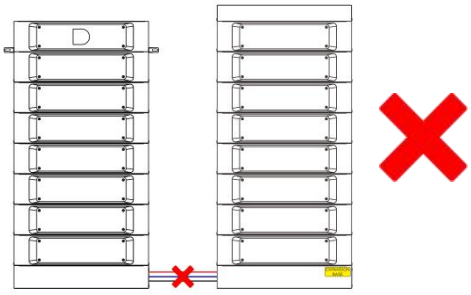
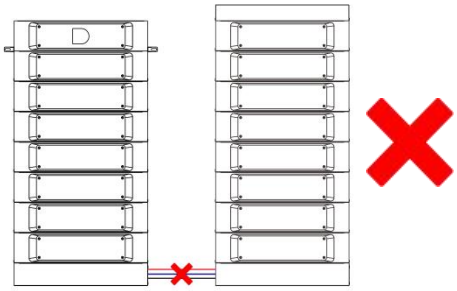
**The Extended cover must be exclusively used with the expansion-labeled base. Stacking with standard Base units is prohibited to prevent circuit interruption.**

**TIPS**

The following illustrations depict the correct and incorrect connection methods.

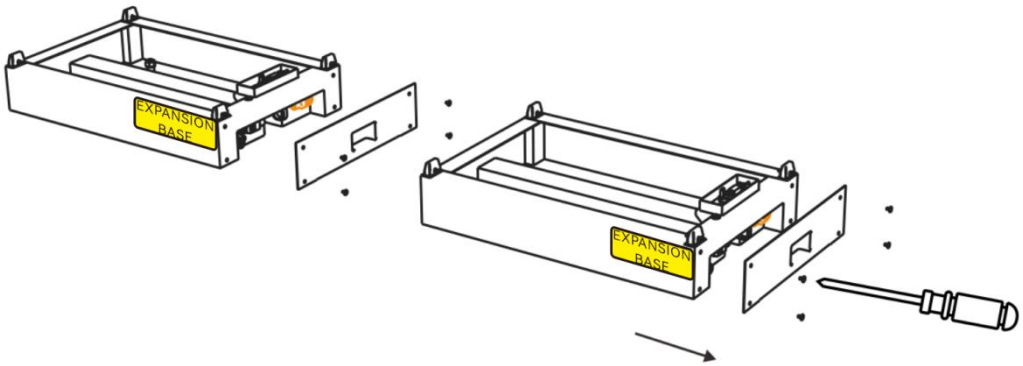



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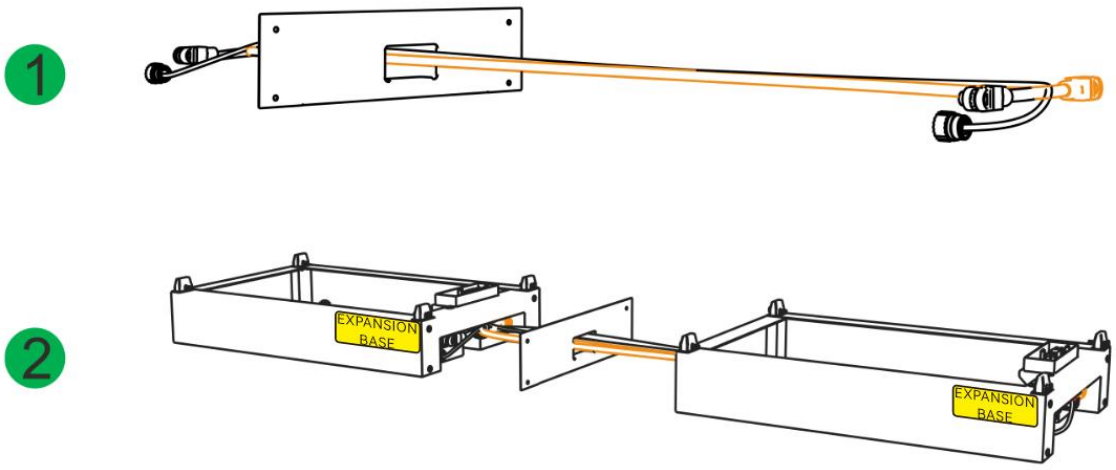
| | | |
|---|---|---|
| Expansion cover in conjunction with Expansion Base |  |  |
| Expansion covers are prohibited from being used with standard bases. |  |  |
| |  |  |


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**Step 1**: Use a Screwdriver to unscrew the right cover of the left and right rows of bases.



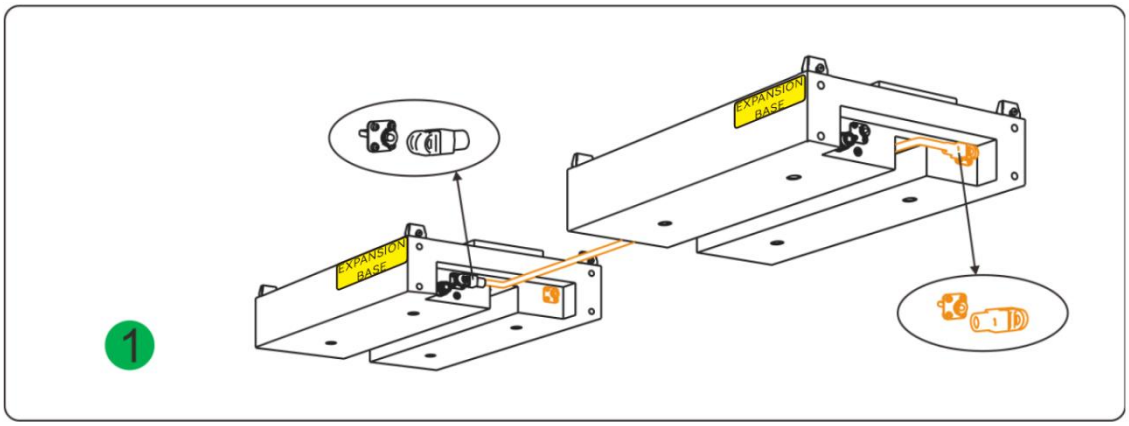

**Step 2:** Install three cables.



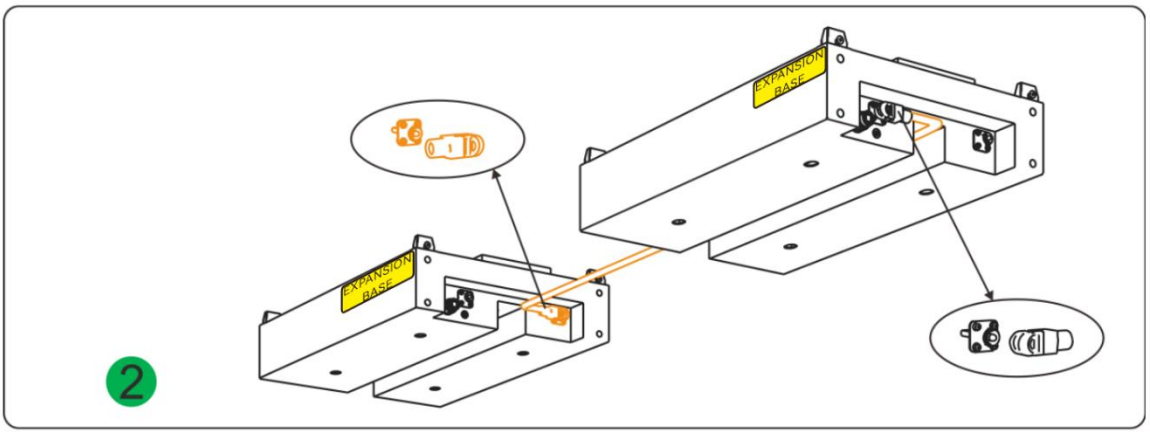

1. Thread the base side cover of the BDU column through the left end of the cable.
2. Pass the right end of the cable through the groove under the expansion package and connect it to the corresponding positive and negative poles and communication ports.

Wiring details:

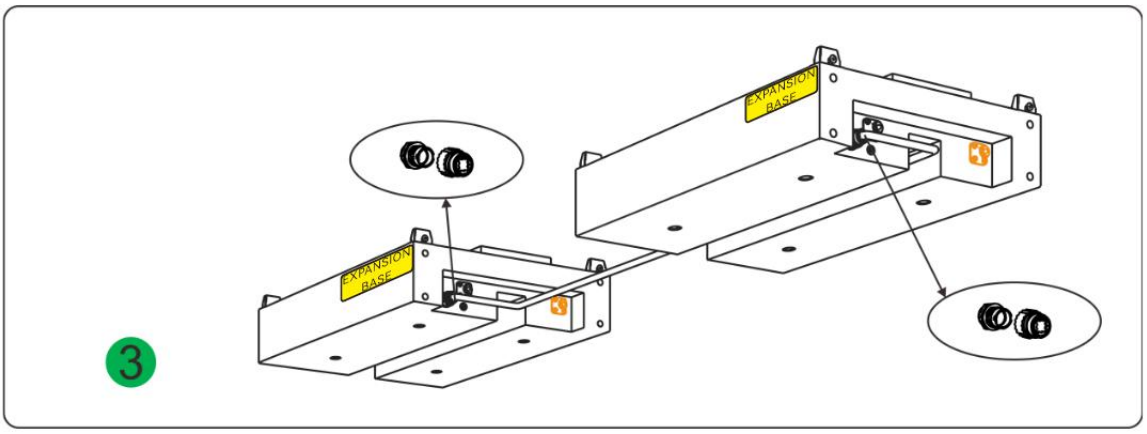
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The negative connector of the power line is connected to the negative interface of the main cluster base.



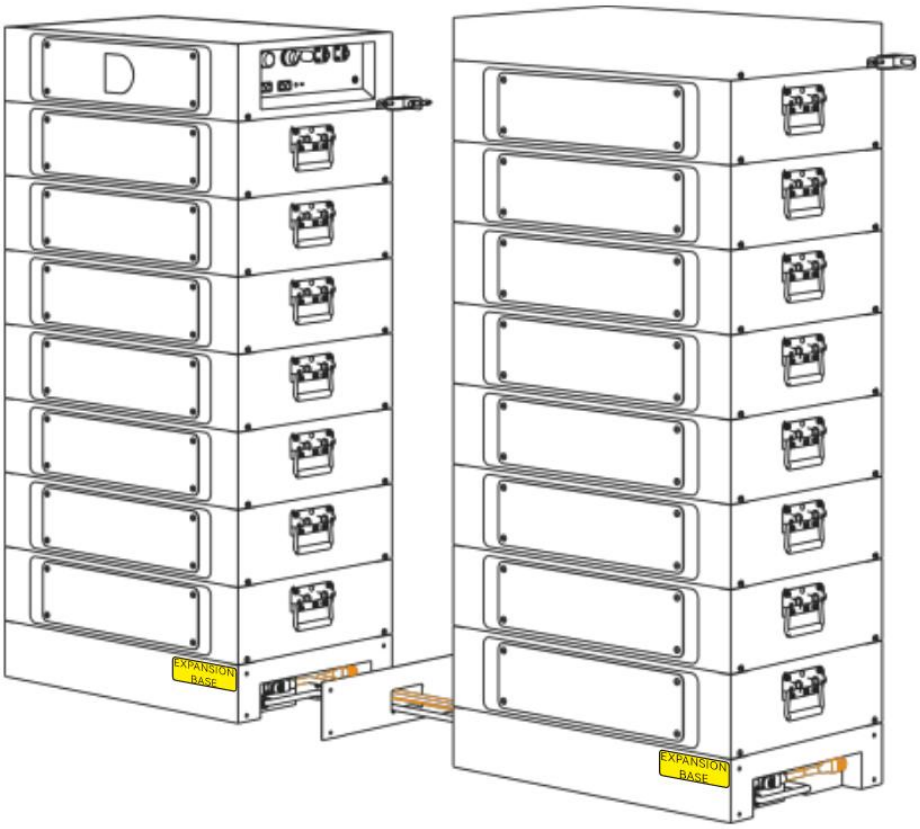

The positive connector of the power line connects the positive interface of the expansion cluster base.




The left end of the communication line is connected to the communication port of the main cluster, and the right end is connected to the communication port of the expansion cluster.

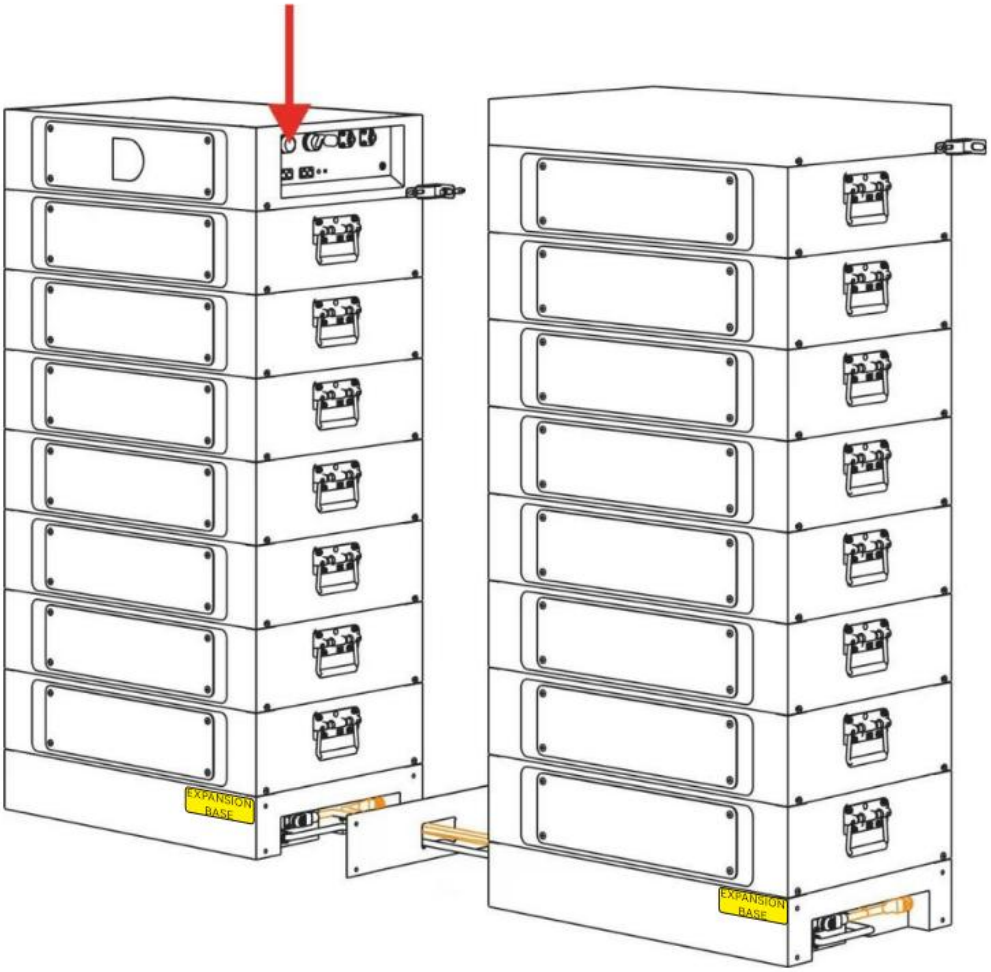

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**Step 3:** Install the battery module according to the above installation steps.




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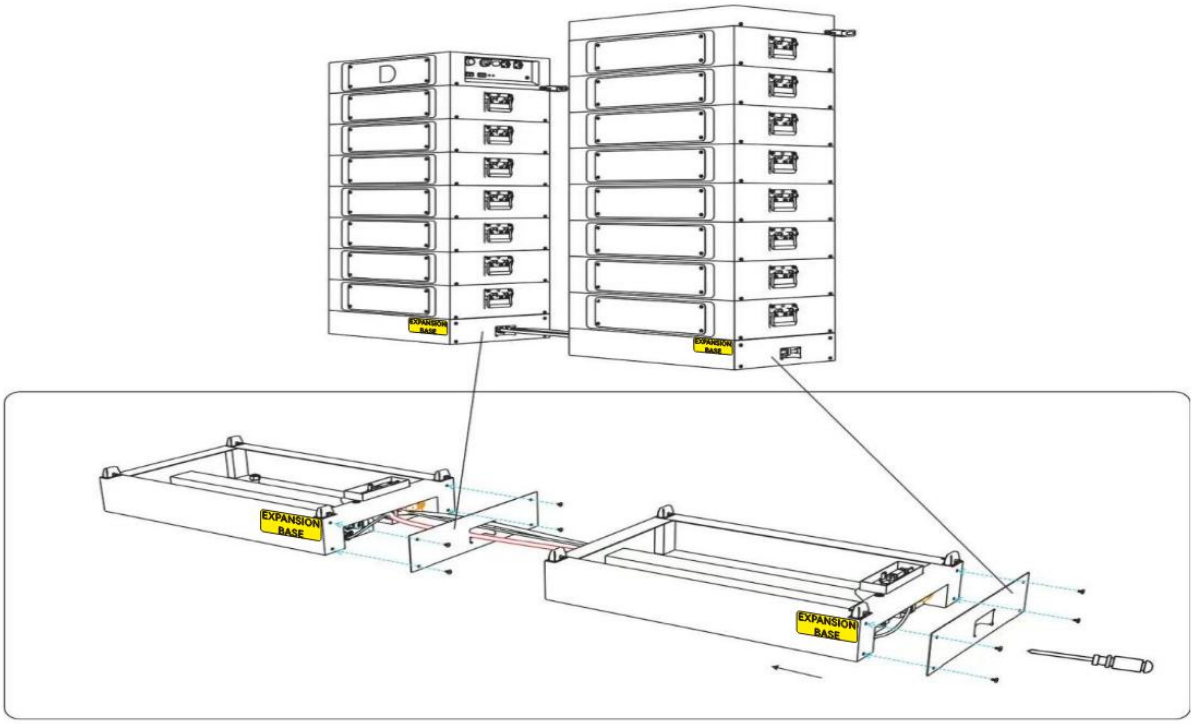
**Step 4:** Press the "Wake Up" button on the BDU to start up and check if the installation is successful.





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**Step 5:** After checking the circuit, lock the right cover of the two cluster bases separately.




**DANGER**

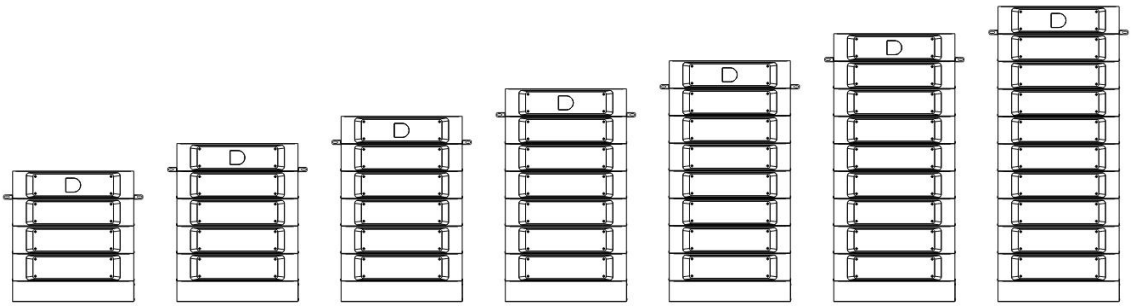
The battery system is a high-voltage DC system. Ensure that installation area of STACK100 is stable and reliable.

Please confirm that the battery system is switched off before connecting. Electric shock and damage to the inverter may be caused if the battery is connected directly without being switched off.

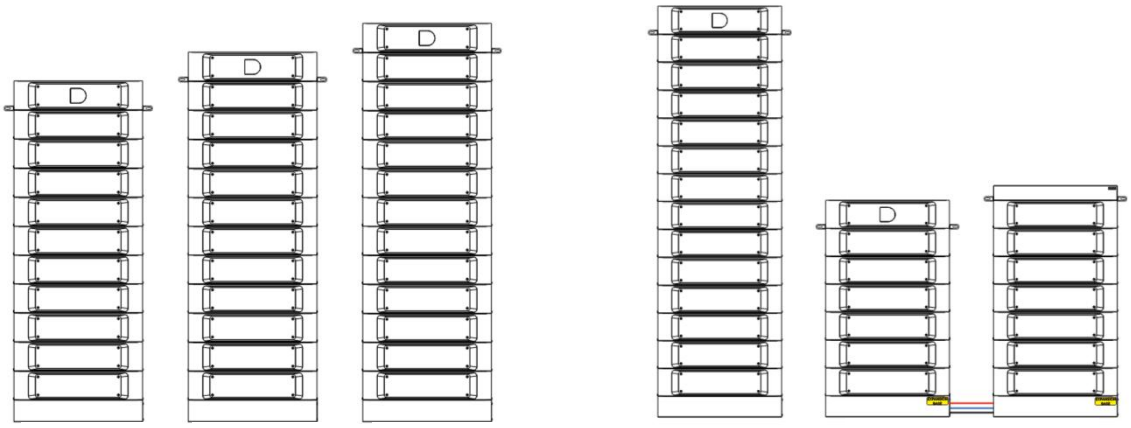
Otherwise, the system cannot work properly. The voltage of the battery is too high, please pay attention to self-protection during measurement.

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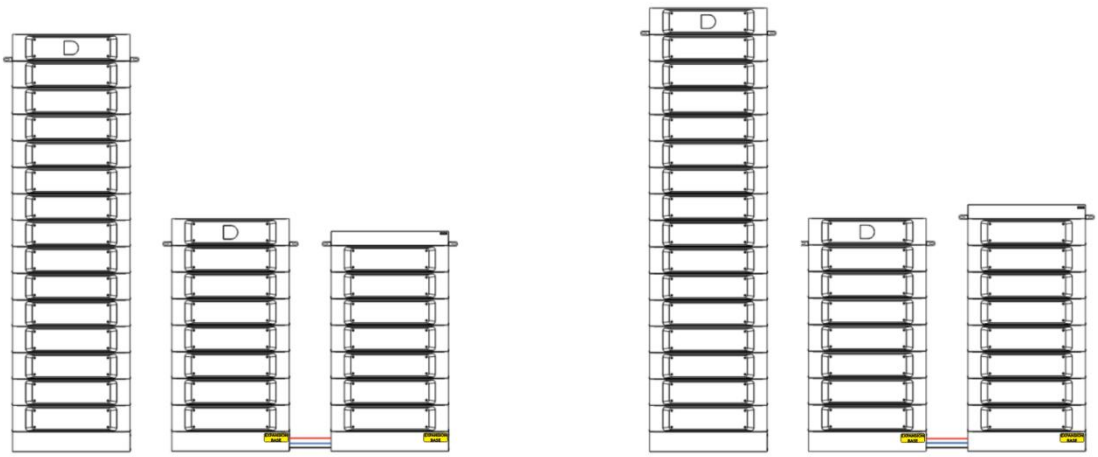
## Battery Capacity Description



15.36kWh 20.49kWh 25.60kWh 30.72kWh 35.84kWh 40.96kWh 46.08kWh



51.20kWh 56.32kWh 61.44kWh 66.56kWh 66.56kWh（Two columns）



71.68kWh 71.86kWh（Two columns） 76.80kWh 76.80kWh（Two columns）


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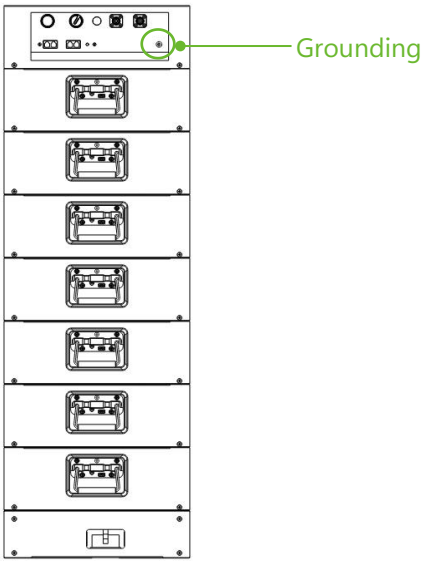
Note:

When configuring the Battery Modules in two columns, please purchase two bases and the extension cables for series connection, which include the power cable, the communication cable .

Table 3-2 Battery system self-test

## Step 1 Electrical installation

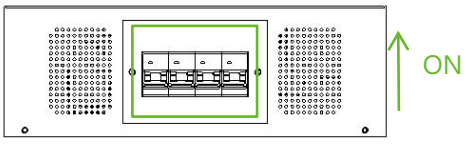
After the system installation is completed. There is a touch down point



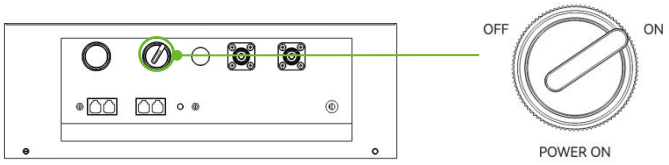

at the top of the BDU, as shown in the figure below:

## Step 2 Battery system self-test

1. Switch the DC breaker of the BDU on.



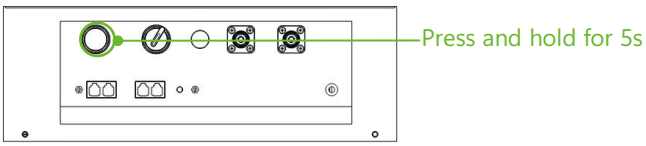

2. Turn the POWER ON knob to ON.




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## Step 2 Battery system self-test

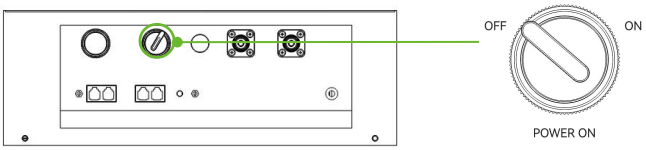
3. Press and hold the WAKE button for approx 5s, battery power on.



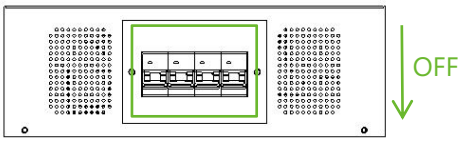

4. Check the system output voltage.

- Use a multimeter to measure the output voltage on the positive and negative ports of the BDU.
- The output voltage should conform to the Operating Voltage range in Table “P7 Table 2-1 Parameter of the STACK100 system”.

5. Turn the POWER ON knob to OFF, battery shutdown.




6. Switch the BDU DC BREAKER to OFF position.





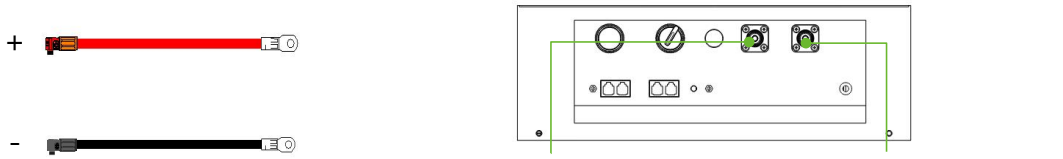
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## Step 3 Connecting inverter

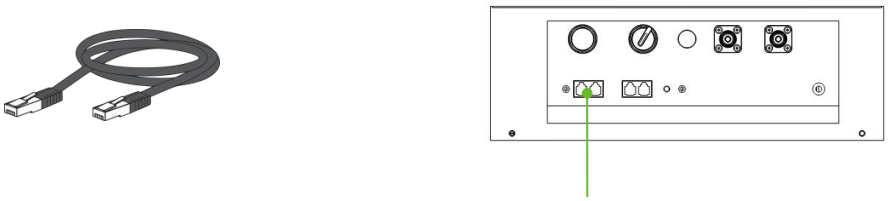
1. Connect the external power cable to the inverter

If the 2m power cable is not long enough, please find another power cable of the same specification.

There are two sizes of communication cable to connect the inverter, one is cable labeled with RS485, matching Kostal; one is cable labeled with CAN, matching Soils/GDW/Solinteg/Growatt/Sosen/Deye/SINENG/ATESS/SINEXCEL/Solplanet, please use them differently.




2. Connect the Inverter CAN/RS485 communication cable to the inverter RJ45 CAN/RS485 port.




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## Step 4 Parallel system

Important:

The parallel connection of the STACK100series and all other related work are only allowed by professional and qualified electricians.

The total voltage difference between clusters is less than 20V; SOC of each cluster should be 100% and time interval between newly added cluster and existing cluster should be less than 3 years.

Maximum 12 STACK100clusters are allowed to be connected in parallel.

For parallel operation, the communication cable can only be used with the CAN cable label.Parallel wiring.

The general configuration diagram of the STACK100 in parallel connection is as under.

Take three clusters for example:

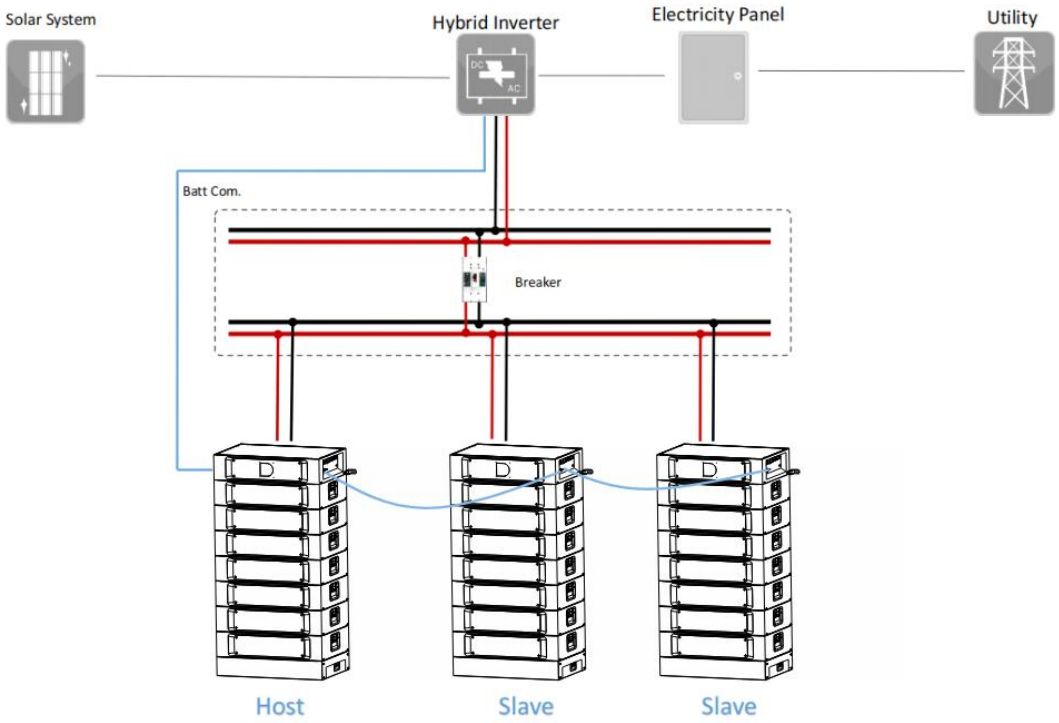


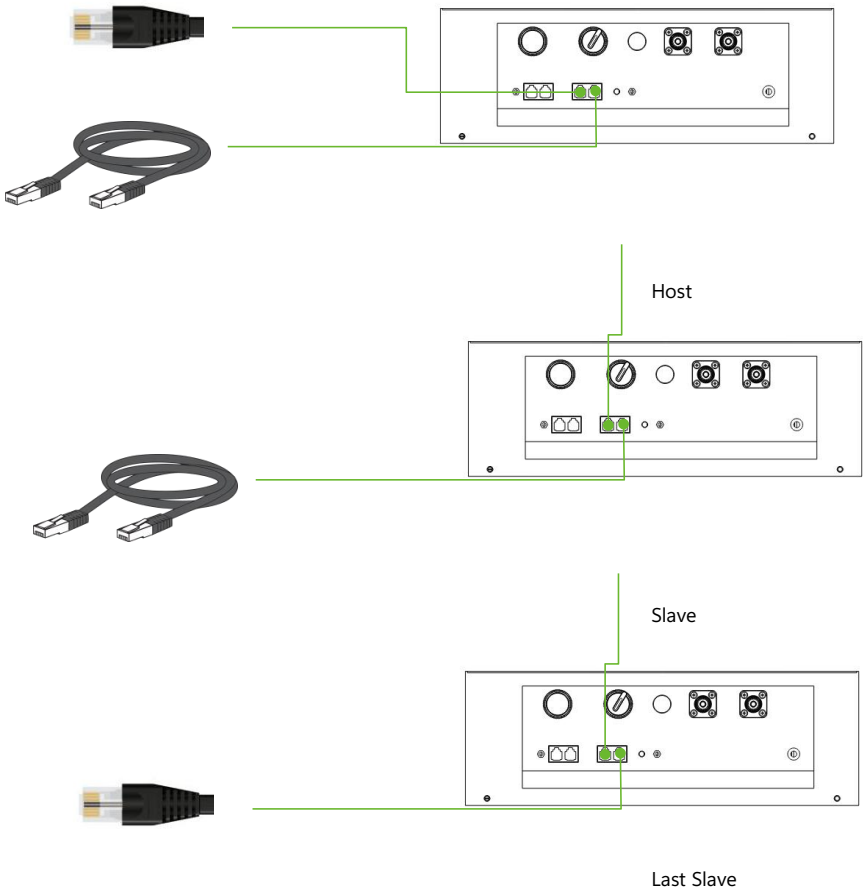

Figure 5-1 The general configuration diagram of the STACK100


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## Step 4 Parallel system

Communication network cable connection between STACK100 and STACK100: standard network cable

For multi cluster parallel systems, the communication line connection between clusters is Host's Parallel 2 to the second cluster's(Slave) Parallel 1 and so on.Then connect a 120 Ω CAN resistor to the port of the host parallel 1 and the last slave parallel 2. Ensure the stability of CAN communication.



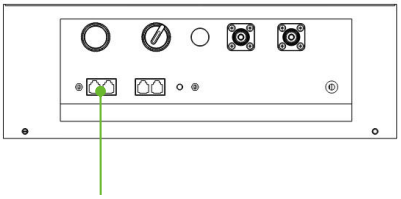

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## Step 4 Parallel system

Communication network cable connection between inverter and STACK100(Host):

CAN/RS485 of the BDU of STACK100 to the communication port of the inverter.





Connect to the inverter RJ45 CAN/RS485 communication port

Host

### Attention

- The STACK100 in parallel must be of the same model and same capacity.
- During capacity expansion, make sure SOC of each module is 100%.
- Power on sequence of multiple clusters: Start the Slave first, then start the Host last.


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# 4 Maintenance

## Troubleshooting:

**DANGER**

The battery system is a high-voltage DC system. Ensure that the installation area of the STACK100is stable and reliable.
Please confirm that the battery system is switched off before connecting. Electric shock and damage to the inverter may be caused if the battery is connected to the inverter directly without being powered off.
Otherwise, the system cannot operate properly. The voltage of the battery is too high, please pay attention to self-protection during measurement.

| No. | Problem | Possible Reason | Solution |
|---|---|---|---|
| 1 | Pressing the "WAKE" button does not turn on the device, and the “D” light remains off. | The BDU DC breaker is not switched on. | Switch the BDU DC breaker on. |
| | | The ON/OFF switch of the BDU is not switched on. | Switch the ON/OFF switch on. |
| | | The battery voltage is severely low (<100V) or damaged. | Contact the battery manufacturer for further inspection. |
| 2 | Pressing the "WAKE" button turn on the device, the “D” light will turn on, but the display status of the light is yellow or red. | Improper placement of batteries and BDU during installation, resulting in misalignment of blind insertion pins. | Check the blind insertion pin and reset the misplaced blind insertion pin. |
| | | Battery system protection. | Charge the battery to leave protection mode，or contact the battery manufacturer for further inspection. |
| 3 | The battery has no voltage output. | Battery changes into over-discharged protection. | Charge the battery to leave protection mode. |
| | | Communication failure | Check if the connection of |

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| | | | |
|---|---|---|---|
| | | with inverter. | the communication cable and PIN definition are correct. |
| | | Inverter has an error. | Check for inverter errors and restore the inverter. |
| 4 | Battery shutdown | BDU DC circuit breaker open circuit. | Switch the BDU DC breaker on. |
| | | Battery changes into over-discharged protection. | Charge the battery to leave protection mode. |
| | | Battery is in sleep mode. | Press and hold the WAKE button for approx. 15s. |
| 5 | SOC jump during battery charging and discharging process. | The battery system has not undergone full charge calibration for a long time. | Perform a full charge calibration once. |
| | | Inconsistent SOC of battery module. | The system performs 10 ~ 50 full charge balancing cycles (depending on the SOC difference of the module, the number of full charge balancing will vary)；<br>or fully charge each battery module separately with BDU and DC power supply. |
| | | Differences in battery cell consistency or damage. | Contact the battery manufacturer for further inspection. |


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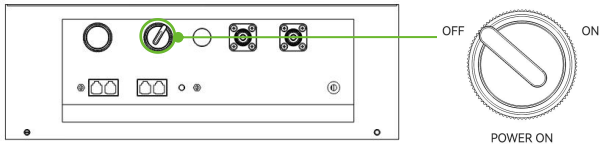
## Replacement of Main Components

Replacing the Battery Controller (BDU)

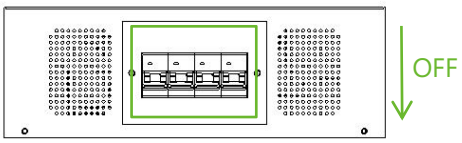
**WARNING**

Turn off the entire battery system. Ensure that the negative and positive terminals are de-energized.

1. Turn the POWER ON knob to OFF,battery shutdown




2. Switch the BDU DC BREAKER to OFF position.




- Disconnect the connecting cable.
- Remove the four screws on the BDU and remove the BDU from the system.



Figure 4-1 BDU right connector

- Exchange BDU. Then fix it with two screws.
- After replacing the new BDU, the battery self-test needs to be performed again (Refer to P19 Table 3-2 Battery system self-test)

## Battery Maintenance

**DANGER**

Battery maintenance should only be carried out by professional and authorized persons. Turn off the battery system first carrying out maintenance.

Voltage check:

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[Periodical maintenance] Check the voltage of the battery system with the monitoring software. Check whether the system voltage is normal. For example: Check whether the single cell voltage is out of range.

Voltage check:

[Periodical maintenance] Check the SOC of the battery system with the monitoring software. Check whether the SOC of the batteries is normal.

Cable check:

[Periodical maintenance] Visually inspect all cables of the battery system. Check whether the cables are broken, aging or loose.

Balancing:

[Periodical maintenance] The battery system will become unbalanced if it has not been charged fully for a long time. Solution: Perform balancing maintenance (fully charge) every 10~12 month. Generally this maintenance progress needs to be completed when external devices such as the monitoring software and battery and inverter have proper communication.

Output relay check:

[Periodical maintenance] Under low load (low current), check the output relay OFF and ON condition; listen if the relay clicks, which means that it switches off and on normally.


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# 5 Storage

For long-term storage (more than 3 months), the battery cells should be stored within the temperature range of 5 to 45°C, relative humidity <65% and non-corrosive gases.
The battery module should be stored within the temperature range of 5 to 45°C, dry, clean and well ventilated environment. The battery should be charged to 50 - 55% SOC before storage.
We recommend activating the battery system (discharge and charge) every 10~12 months. Corresponding to the battery system that has been installed and used normally, it is necessary to regularly fully charge the battery to calibrate the SOC. It is recommended to fully charge and calibrate at least once every 2 weeks.

**CAUTION**

The lifespan of the battery will be greatly reduced if you do not follow above instructions to store the battery for a long term.

# 6 Shipment

The battery module is pre-charged to 50% SOC or according to customer requirements before shipment. The remaining capacity of battery cells is determined by the storage time and condition after shipment.
The battery modules meet UN38.3 certificate standard.
In particular, special rules for the carriage of goods on the road and the current dangerous goods law, specifically ADR (European Convention on the International Carriage of Dangerous Goods by Road), as amended, must be observed.

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# Annex 1 Stack100 Expansion Pack Usage Guide

## The difference between the base and how to use it



Standard Base



Expansion Base

## 1. Single-cluster use



=



SBDU

+



Standard Base

**CAUTION**

When using a single cluster, the base needs to use a standard base, and the expansion base cannot be used.


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## 2. Two clusters for expansion use



First Cluster

=



SBDU

+



Expansion Base



=



Expansion Cover

+



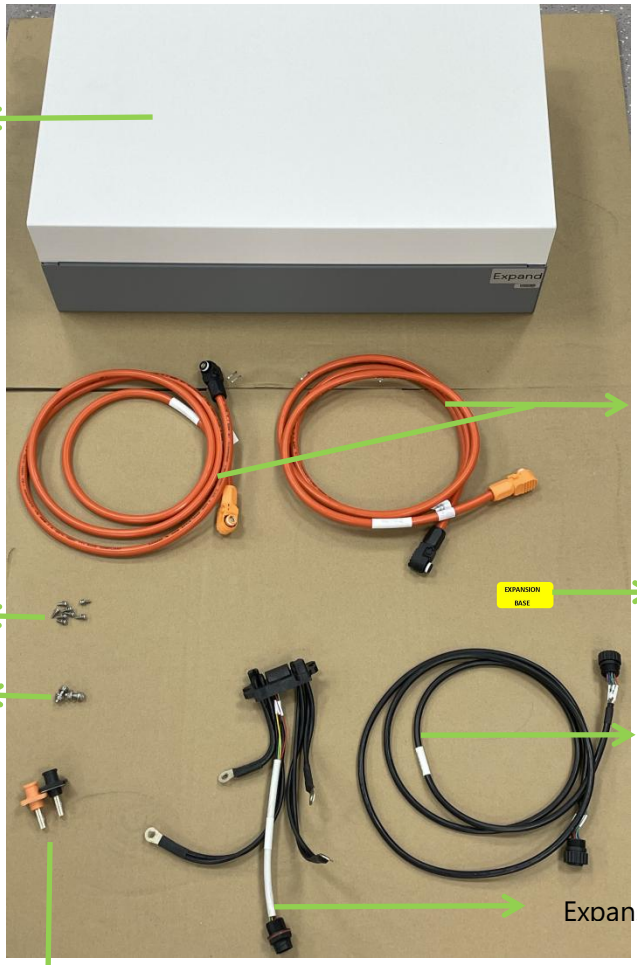
Expansion Base

**CAUTION**

When using the expansion, the standard base needs to be converted into an expansion base. When using the expansion, the standard base cannot be used in any cluster.

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## Expansion Pack Parts




Expansion Base & Cover *1 Pair

Power Cable* 2 PCS

Expand Tags* 1 PCS

M3 Screws *8 PCS

M6 Screws* 2

Expansion Comm Cable*1PCS

Expansion Base Plugins*1

Positive and Negative Sockets*1 Pair

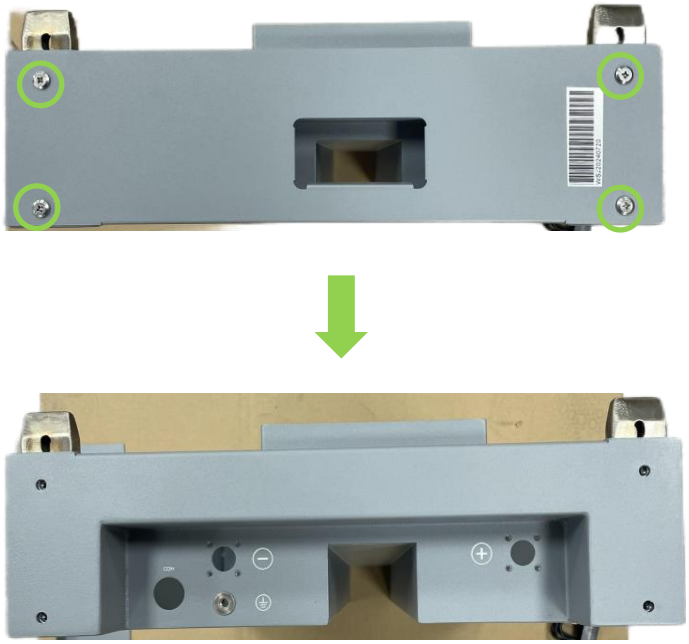

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## The original system standard base needs to be modified to an expansion base



### 1. Remove the original base panel

Remove the four bolts that are fixed by the panel and remove the panel.



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## 2. Disassemble the plug-in from the original base

Remove the 2 fixing bolts



## 3. Install the positive and negative terminal plugs

Install the positive and negative sockets and lock them with 8 M3 screws.

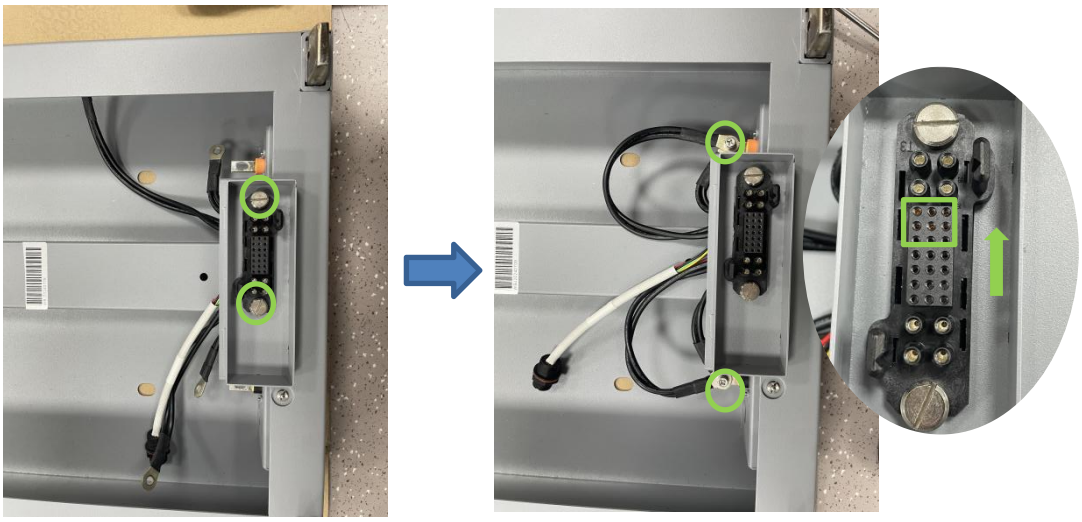


**CAUTION**

The positive and negative sockets need to be installed according to the silk screen mark on the base, and cannot be installed in reverse.


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## 4. Install the extension plugin and secure the plugin cable bundle



**CAUTION**

1. Both positive and negative terminals need to have two wires fixed to them.
2. When installing the plug-in, the terminals inside the plug-in need to be upward.

## 5. Install the communication interface

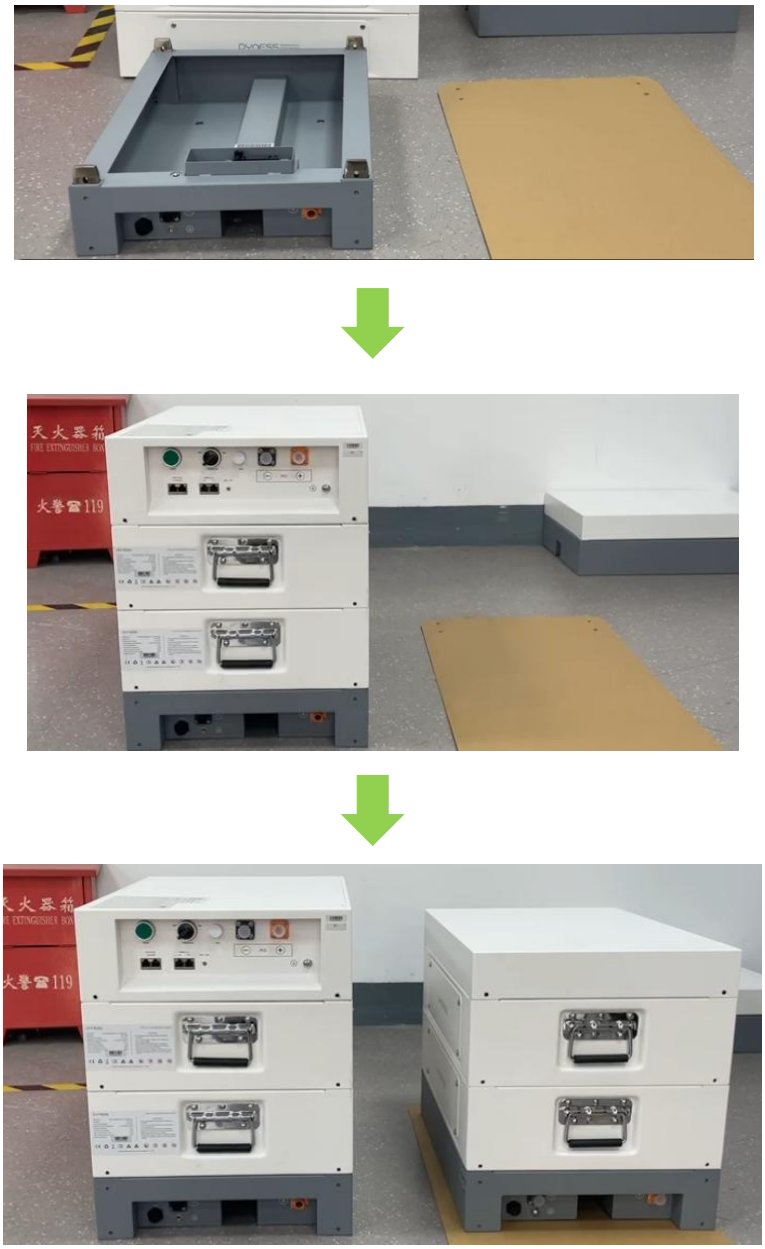


## 6. After the base modification is completed, a label needs to be attached



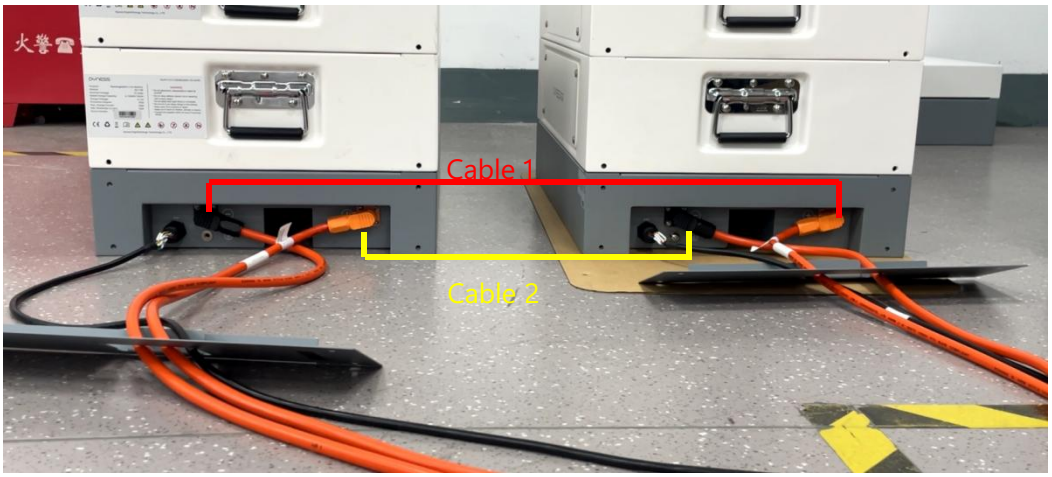

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## System stacking




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## Connect the series cable




**CAUTION**

The cables need to be connected as shown above, the black plug needs to be connected to the black socket, and the red plug needs to be connected to the red socket.

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