

# Energy Storage Battery Unit

## CPS ESSR-05/10/15/20KH1

### Quick Installation Guide

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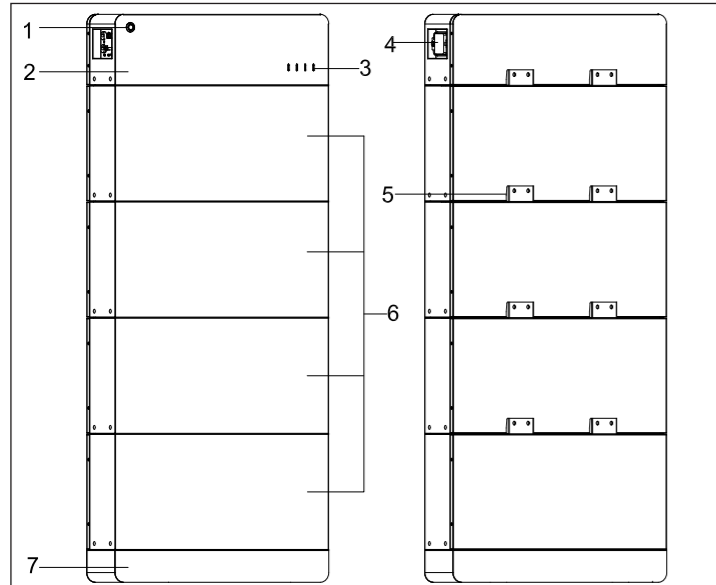
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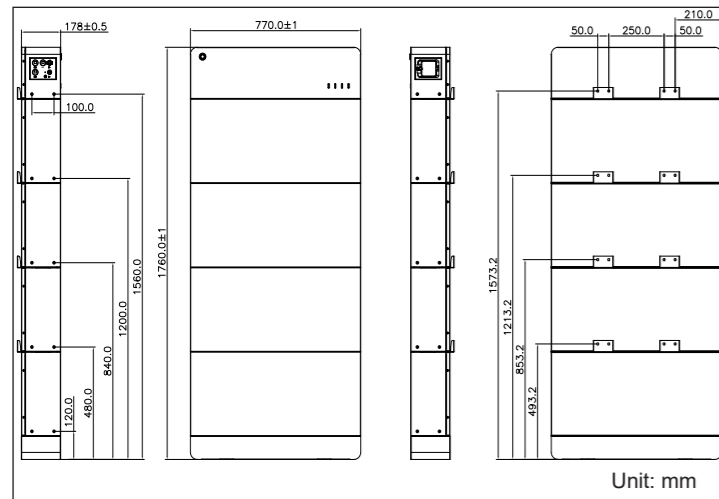
## 1 Product Components and Dimensions

### 1.1 Product Components



| No. | Name                     | Function   |
|-----|--------------------------|--|
| 1   | ON/OFF button            | Indicate startup/shutdown and operation state        |
| 2   | Power control module     | Control battery operation and inverter communication |
| 3   | LED indicator            | Indicate SOC of the battery unit                     |
| 4   | Circuit Breaker          | Manual shut-down switch                              |
| 5   | Wall anchor              | Fasten battery module onto wall                      |
| 6   | Battery extension module | Battery energy storage module                        |
| 7   | Base module              | Base of the Battery System                           |

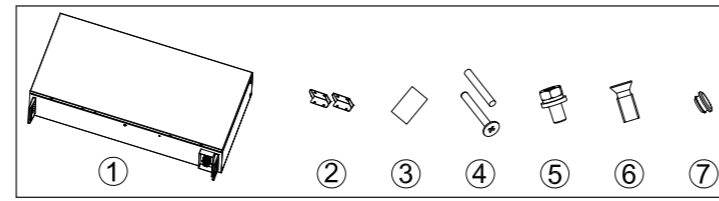
### 1.2 Dimension



## 2 Installation

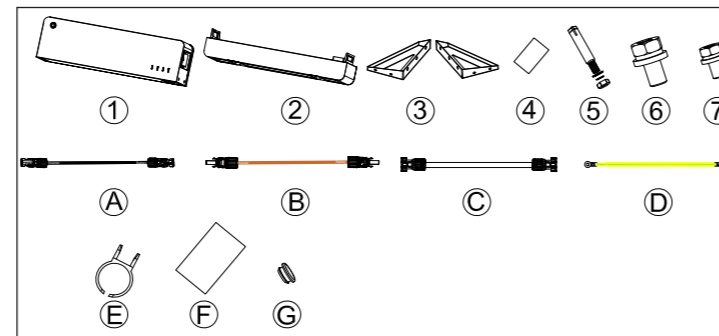
### 2.1 Scope of Delivery

Packing list of each battery extension module



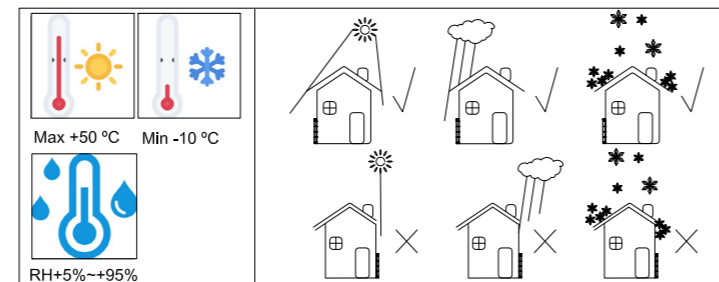
| No. | Name                         | QTY | Usage  |
|-----|------------------------------|-----|--|
| 1   | Battery extension module     | 1   | One extension module is 5.12kwh                  |
| 2   | Wall anchor                  | 2   | Fasten extension module onto wall                |
| 3   | Document bag                 | 1   | Include packing list, warranty card              |
| 4   | Φ8X40 self-tapping screw     | 4   | Lock wall anchor onto wall                       |
| 5   | M4X10 combination screw      | 4   | Lock extension module and handle                 |
| 6   | M4X10 countersunk head screw | 4   | Fasten wall anchor onto battery extension module |
| 7   | Dust cap                     | 4   | Prevention from dust                             |

Packing list of each power control module:

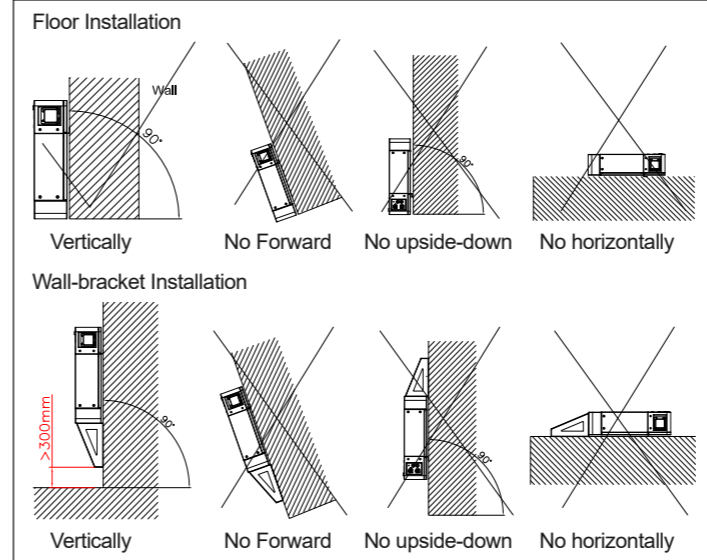
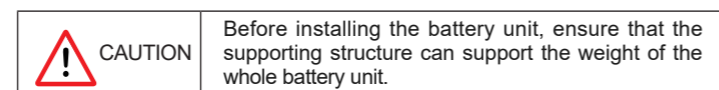


| No. | Name                         | QTY | Usage   |
|-----|------------------------------|-----|---|
| 1   | Power control module         | 1   | Control battery operation and PCS communication     |
| 2   | Base module                  | 1   | Sustain battery extension module                    |
| 3   | Wall bracket                 | 1   | Support the whole battery unit                      |
| 4   | Document bag                 | 1   | Include packing list, warranty card and quick guide |
| 5   | M12X100 expansion screw      | 6   | Fasten wall bracket                                 |
| 6   | M8X16 combination screw      | 4   | Fasten wall bracket and base module                 |
| 7   | M4X10 combination screw      | 5   | Fasten control module & GND cable                   |
| A   | Negative power output cable  | 1   | Connect inverter to battery P-, 2m                  |
| B   | Positive power output cable  | 1   | Connect inverter to battery P+, 2m                  |
| C   | Inverter communication cable | 1   | Communicate with inverter, 2m                       |
| D   | Grounding cable              | 1   | GND, 2m   |
| E   | Removal tool                 | 1   | Removal tool for PV/BAT connector                   |
| F   | Positioning template         | 1   | Locate mounting holes                               |
| G   | Dust cap                     | 4   | Prevention from dust                                |

### 2.2 Installation Environment



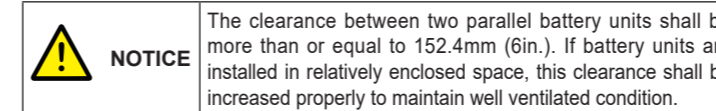
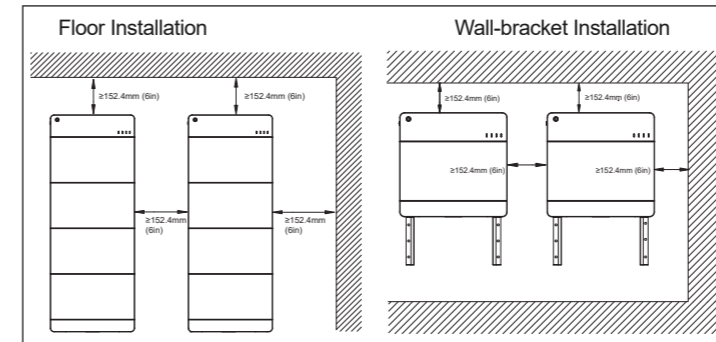
### 2.3 Installation Mode Requirements



### 2.4 Tools Required & Torque Values

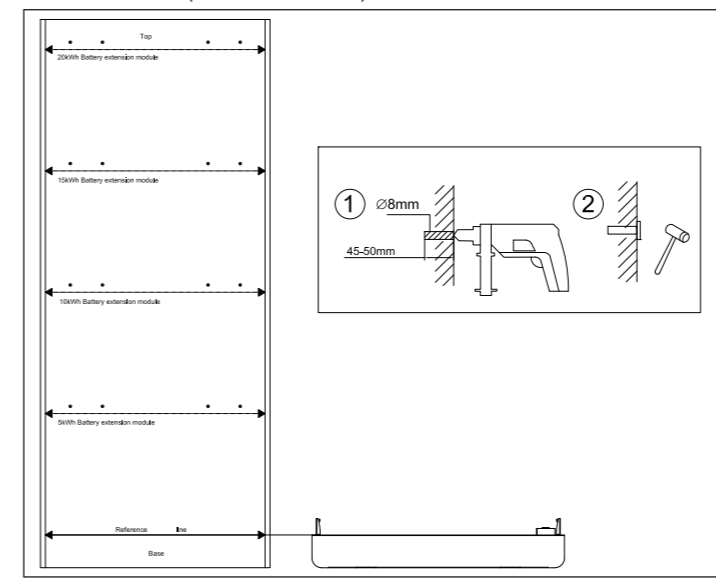
| No. | Tools                 | Usage   | Torque    |
|-----|-----------------------|---|-----------|
| 1   | M4 torque screwdriver | Tighten M4X10 combination screw, M4X10 countersunk head screw and Φ8X40 tapping screw | 1.2 N.m   |
| 2   | #14 socket wrench     | Tighten M8X16 combination screw   | 22-26 N.m |
| 3   | #19 socket wrench     | Tighten M12X100 expansion screw   | 40-45N.m  |

### 2.5 Recommended Clearances

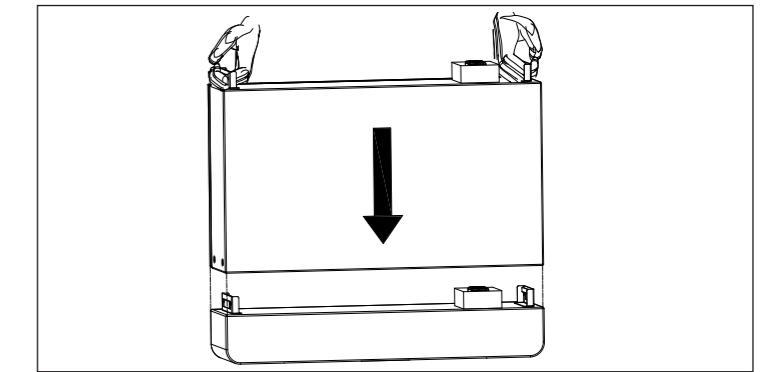


### 2.6 Floor Installation

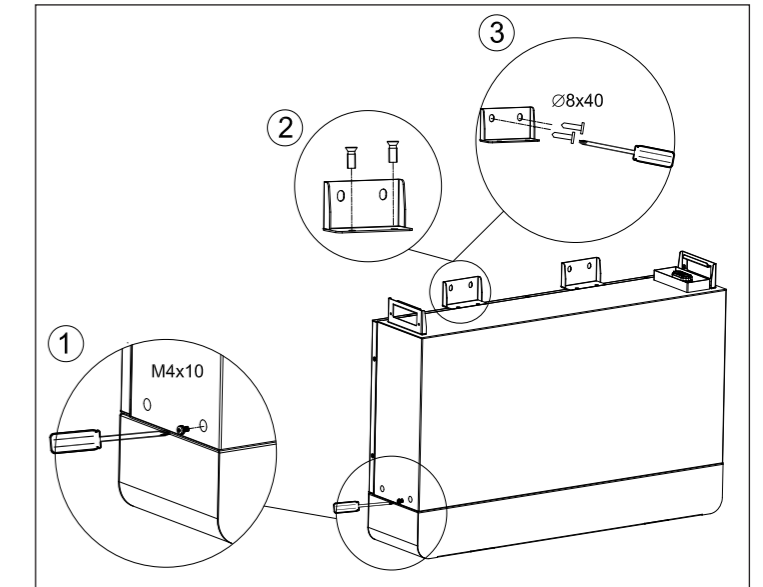
1. Place base module on a level floor and keep within 19 mm from wall surface. Align reference line of positioning template with the top surface of base and then position the template onto wall. Drill correct number of holes according to hole positions on the template, and then knock expansion tubes of Φ8X40 tapping screws into the wall.  
 Tools: electric drill (with Φ8mm drill bit), and rubber mallet.



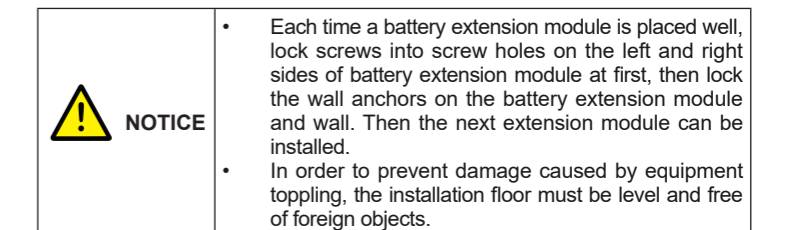
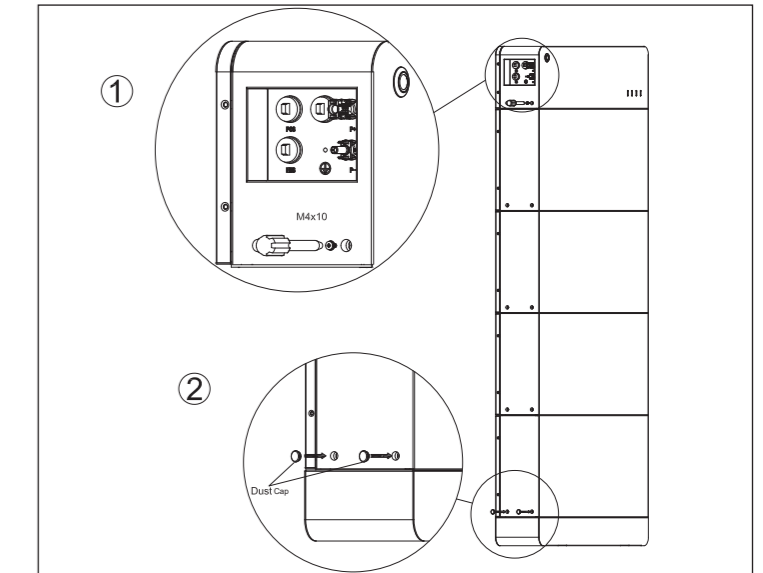
2. Two people jointly lift the battery extension module, align the battery extension module with base module and position it on the base module.



3. Lock screws into screw holes on both sides of the battery extension module, to ensure extension module is securely installed on the base module; fasten wall anchor on the battery extension module, and then fasten it on the wall. Similarly, install other battery extension modules in turn and fasten them.  
 Tools: M4X10 combination screw, M4X10 countersunk head screw, Φ8X40 tapping screws, M4 torque screwdriver.

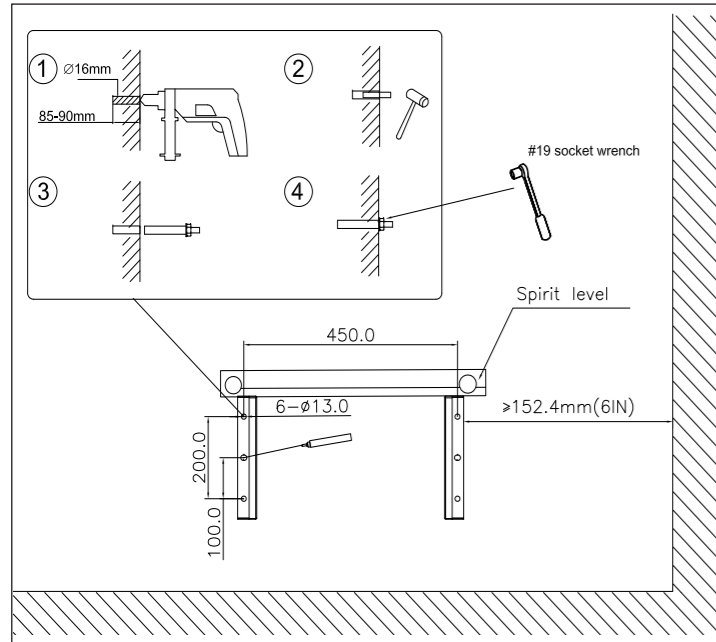


4. Fasten power control module onto the battery extension module. Then insert dust caps into all the side screw holes, repeat this operation on the opposite side till all the side screw holes are plugged up.  
 Tools: M4X10 combination screw and M4 torque screwdriver.

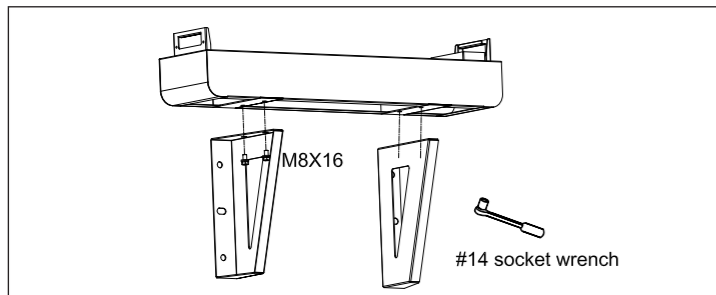


## 2.7 Wall-bracket Installation

1. Make sure the installation position is level with a level ruler at first, and then mark the hole positions on the structure wall according to the dimensions of the wall bracket. Drill holes at the marked positions, knock external steel tube of M12X100 expansion screws into wall, and then fix the wall bracket on the wall with M12X100 expansion screws.  
Tools: marker, electric drill (with  $\Phi 16\text{mm}$  drill bit), rubber mallet and #19 socket wrench.



2. Fasten the base module onto the wall bracket.  
Tools: M8X16 combination screw and M6 torque screwdriver.



3. Finish all the subsequent steps by referring to the procedures of floor installation.

**NOTICE**

- Battery extension module weighs about 55 kg ( $\approx 122$  lbs). Check the wall bracket again before hanging the battery unit to ensure that the wall bracket is firmly fixed on the support structure and locked with the base.
- Considering the weight of the machine, it is recommended that at least 2 people install it together (it is not recommended that the battery unit with 3 or more battery extension modules is installed with wall-bracket).

## 3 Electrical connection

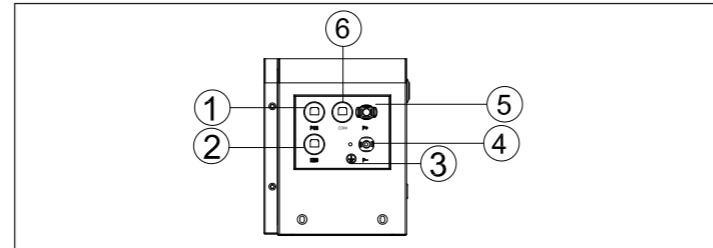
### 3.1 Cable specification

| Cable Name           | Cable Type                           | OD (mm) | Cross-sectional area (mm <sup>2</sup> ) |
|----------------------|--------------------------------------|---------|---|
| DC cable             | Silicon wire, 600V, 6mm <sup>2</sup> | 5-6     | 6                                       |
| Grounding cable      | 10 AWG, yellow-green wire            | /       | 2.5                                     |
| Communication cables | CAT5e shielded twisted pair          | /       | 0.5                                     |

### 3.2 Tools and torques

| No. | Tools                   | Usage                   | Torque value |
|-----|-------------------------|-------------------------|--------------|
| 1   | M4 Phillips screwdriver | Locking grounding cable | 1.4~1.8 N.m  |
| 2   | Diagonal pliers         | Cut cables              | -            |
| 3   | Wire stripper           | Strip cables            | -            |
| 4   | Crimping pliers         | Crimp terminals         | -            |

### 3.3 External wiring ports



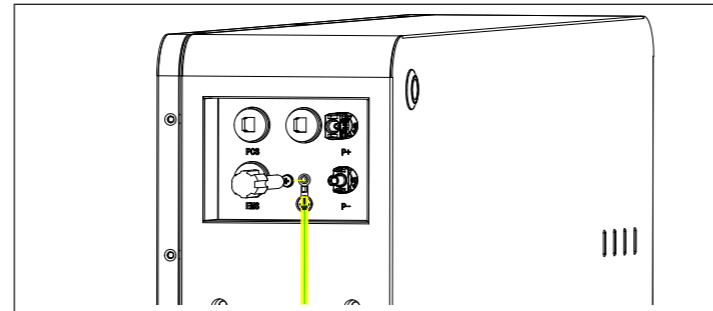
| No. | Name                            | Function                      |
|-----|---------------------------------|-------------------------------|
| 1   | PCS communication port          | Communicate with PCS          |
| 2   | EMS communication port          | Communicate with EMS          |
| 3   | GND terminal                    | Connect to external GND point |
| 4   | DC negative quick-plug terminal | Connect negative power cable  |
| 5   | DC positive quick-plug terminal | Connect positive power cable  |
| 6   | Extension COM OUT               | Extension communication       |

### 3.4 Grounding

**WARNING**

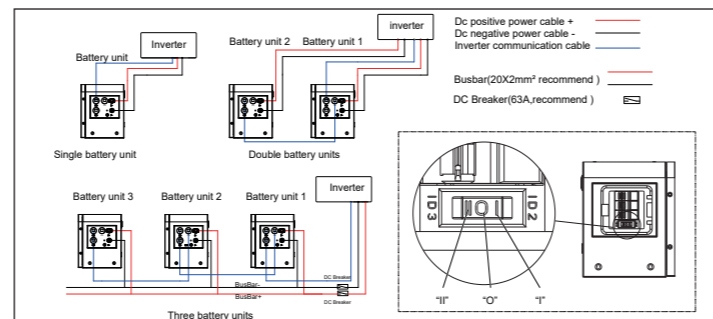
Confirm that the protective Grounding cable is reliably connected. Disconnection or looseness may cause electric shock.

- Connect the grounding point of the power control module to the external grounding point with grounding cable.
- After connecting the grounding cable, tighten the compression nut of the cable fastening head.

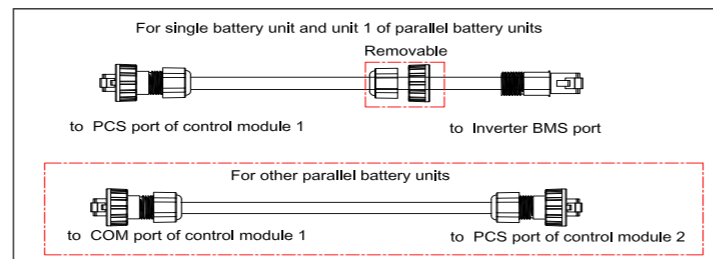


### 3.5 Communication connection and Power line connection

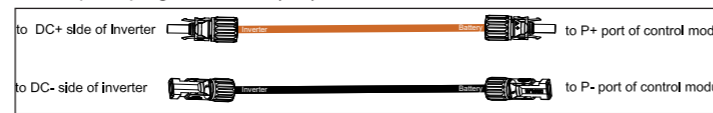
Connect communication cable and power line cable as showed below.  
For more than one battery unit, turn DIP switch of any one battery unit to "O" as Master, then turn DIP switches of other battery units to "I" or "II" as Slave.  
**Note:** Do not turn both DIP switches to "I" or "II".



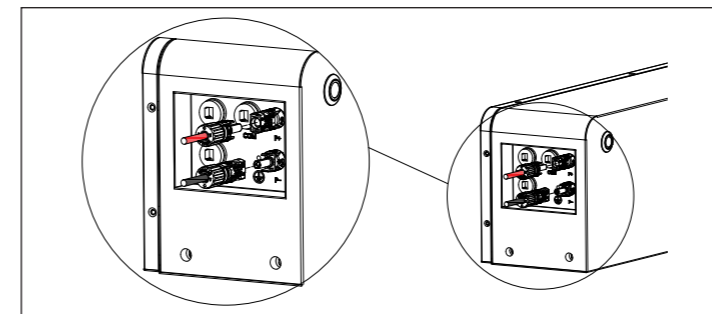
1. Insert communication cable to BMS port of inverter and PCS ports of battery unit as below.



2. Identify carefully cable stickers on Positive and Negative power output lines. Insert quick-plug connector (left) of cable into PV connector of inverter.



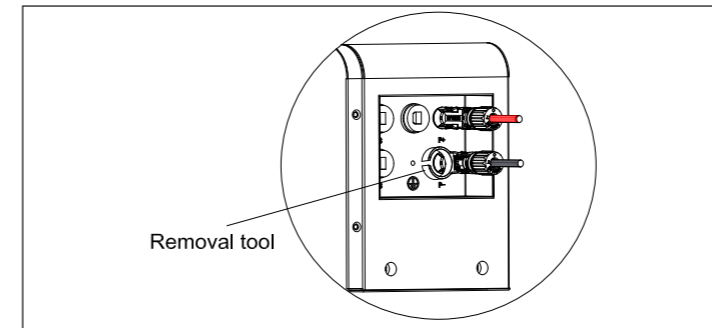
3. Insert DC positive quick-plug connectors and DC negative quick-plug connectors of the power output line into the P+ port and P- port of power control module correctly.



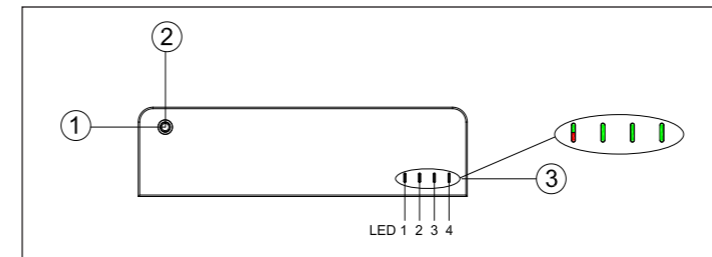
**NOTICE**

Adjust cable length to ensure that the power output line does not generate significant tension on the connector, to prevent poor contact.

4. To disconnect power output line, use removal tool to press indicated snap on the quick-plug connector, and pull out the connector with a slight force.



## 4 ON/OFF indicator and LED display



| No. | Description               | Indicator Meaning  |
|-----|---------------------------|--|
| 1   | ON/OFF button             | Power on/off the battery unit  |
| 2   | Operation state indicator | <ul style="list-style-type: none"> <li>In standby state, the operation state indicator flashes (on for 0.25s and off for 3.75s);</li> <li>In charging process (charging current is greater than 1A), the operation state indicator flashes slowly (on for 0.5s and off for 1.5s); If heating film starts working, this indicator will keep on.</li> <li>In discharging process (discharge current is greater than 1.6A), the operation state indicator flashes fast (on for 0.5s and off for 0.5s);</li> </ul> |
| 3   | Alarm indicator           | <ul style="list-style-type: none"> <li>After the alarm is started, the alarm indicator flashes (on for 0.5s and off for 0.5s);</li> <li>After the protection is started (except for under voltage protection and overvoltage protection), the alarm indicator flashes;</li> <li>When there is no alarm and no protection, the alarm indicator goes out.</li> </ul>   |
|     | Battery level indicators  | <ul style="list-style-type: none"> <li>In standby state, battery level indicators display normally;</li> <li>During charging, SOC indicators LED1, LED2, LED3 and LED4 flash slowly accordingly when SOC is 0~25%, 25~50%, 50~75% and <math>\geq 75\%</math>;</li> <li>During discharging process, SOC indicators LED4, LED3, LED2 and LED1 flash fast when SOC is 0~25%, 25%~50%, 50%~75%, and <math>\geq 75\%</math> before reaching undervoltage protection.</li> </ul>                                     |

## 5 Commissioning

**WARNING**

Before the battery unit is powered on, it's important to check the installation for any potential hazards.

### 5.1 General startup process

- Close DC Breaker (if any) configured between inverter and battery unit.
- Switch on the circuit breaker of power control module.
- Turn on the inverter.
- Power on the energy storage battery unit (Shortly press the ON/OFF button for 1 second).

### 5.2 Shutdown process

- Turn off the inverter.
- Power off the energy storage battery unit.
- Switch off the circuit breaker of power control module.
- Open DC Breaker (if any) configured between inverter and battery unit.

## 6 Troubleshooting

| Faults                        | Causes  | Troubleshooting  |
|-------------------------------|---|--|
| Alarm indicator flashes       | Cell voltage is below the undervoltage protection threshold           | <ol style="list-style-type: none"> <li>This alarm indicator reminds that battery is almost discharged, which can return to normal automatically after recharging.</li> <li>If the battery is low for a long time, user should stop discharging and arrange for charging.</li> </ol>  |
|                               | Cell voltage exceeds over-voltage protection threshold                | <ol style="list-style-type: none"> <li>This alarm indicator reminds that battery is fully charged, which can return to normal automatically.</li> <li>If the battery is high for a long time, the user should stop charging and arrange for discharge.</li> </ol>  |
|                               | Battery temperature is higher than temperature protection upper limit | <ol style="list-style-type: none"> <li>This alarm indicator reminds that battery temperature is too high, which can return to normal automatically after temperature is normal.</li> <li>Users should check if there is heating source in the battery environment, and remove it if any;</li> <li>Check the inverter charging and discharging data to see if there are any faults in the inverter;</li> <li>If protection occurs multiple times, contact service personnel for maintenance and troubleshooting.</li> </ol> |
|                               | Battery temperature is lower than temperature protection lower limit  | <ol style="list-style-type: none"> <li>This alarm indicator reminds that battery temperature is too low, which can return to normal automatically after temperature is normal.</li> <li>Check whether battery environment meets the installation requirements;</li> <li>If protection occurs many times, contact service personnel for maintenance and troubleshooting;</li> <li>Check the battery configuration and if there is a heating film.</li> </ol>  |
| Shut down due to malfunctions |   | <ol style="list-style-type: none"> <li>This alarm indicator reminds that battery shuts down due to malfunctions, users can find the problem based on the number of flashes and the corresponding fault list in the user manual.</li> <li>Restart the unit to confirm if the fault phenomenon eliminates.</li> <li>If faults cannot be eliminated, user should stop using and contact service personnel to repair inverter and battery unit.</li> </ol>   |