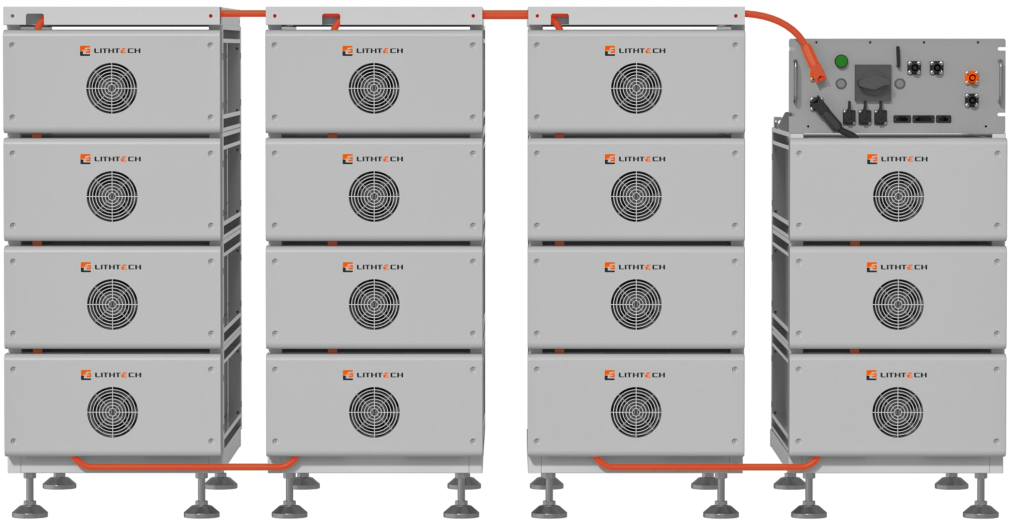
HP1600

High-Voltage Free-Grouping String Energy Storage System



User Manual

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1. Introduction

1.1. Introduction

The HP1600 is a high-voltage energy storage solution featuring a series architecture that supports flexible configurations of 3 to 15 battery packs—each with a rated capacity of 16.076 kWh (specifications: 51.2V, 314Ah; 16S1P). This product is particularly well-suited for applications where installation space is limited, high-rate discharge capabilities are required, or long-duration backup power is needed.

1.2. Product Features

HP1600 uses lithium iron phosphate as the battery anode material and is equipped with a high-performance BMS to effectively manage the battery cells. The system has the following characteristics:

- Meet European RoHS regulations, pass SGS certification, use the best non-toxic and pollution-free battery;
- The battery anode is made of lithium iron phosphate ($LiFePO_4$) material, which has good safety performance and long cycle life;
- Adopt high-performance BMS battery management mode, with over-discharge, over-charge,over-current,temperature and other protection functions;
- With charge and discharge automatic management and single cell balance function;
- Intelligent BMS, equipped with Bluetooth +WIFI modules, features functions such as remote information query, remote control and remote parameter modification;
- This BMS utilizes multiple battery packs connected in series, features robust scalability, and employs fan-based cooling.
- The battery has less self-discharge, and it can be recharged for up to 10 months during storage;no memory effect, shallow charging and discharging;
- It has a wide operating temperature range; discharge temperature -20℃~+55℃, charging temperature 0~55℃, and good cycle life and discharge performance at room temperature.Small battery size and light weight.

1.3. Product Identification Definition

Voltage of battery is higher than safety voltage, it's dangerous to touch.	Read manual before operation.	Please recycle the battery after serving.
Operate carefully.	Default battery can't be thrown to trash can.	

Safety Regulation

Only the personnel who have received the electrical system training and fully mastered the electrical knowledge can install this system. Always follow the safety regulations listed below and local safety regulations during installation.

- All power cables connected to the battery system must comply with local laws and regulations.
- The cables shall be arranged reasonably and protected to avoid touching these cables when

operating the power equipment.

- Installing cables while energized is prohibited.

Note the following before construction:

- **Installation space**

Please ensure that the installation space is sufficient to accommodate the battery and is well-ventilated.

- Project layout

Ensure the whole construction process of power equipment, batteries and other reasonable layout.

- Wiring layout

Ensure that the wiring reasonable, orderly; and consider the moisture-proof, corrosion prevention

- The whole installation process should wear anti-static wristband
- The installation site should be at least two or more peoples to operate
- Equipment and tools ready for installation.
- Please use a forklift to assist with installation when necessary

Warning: Fire Risk

- Battery systems are electrical devices, and despite careful design, electrical devices can still cause fires.
- Do not install battery systems in areas containing highly flammable materials or gases.
- Do not install battery systems in potentially explosive environments.
- The mounting structure for the battery system must be fire-resistant.

Security check

Flammable, explosive, or other hazardous materials must not be placed near batteries. Firefighting equipment, such as portable dry powder fire extinguishers or fire sand, should be available near the equipment. An automatic fire suppression system should be installed if necessary.

Environment Requirement

Working environment: there is no conductive dust and corrosive gas, and the following conditions are met:

- Ambient temperature:-10℃~+45℃
- Storage Temperature:0℃~+35℃
- Relative Humidity:10%~85%RH
- Altitude:<2000m
- The installation site should be more than 1,000 meters away from the coastline and avoid the core area of high salt spray corrosion.
- The installation point should be on a flat surface.。
- There should be no flammable or explosive facilities, such as heat sources, gas pipelines, or gas equipment, within 3 meters of the installation point.
- The installation site should be situated away from areas exposed to direct sunlight, rain,

frequent human or animal activity, poor ventilation, or potential fire and explosion hazards. Direct sunlight can cause the battery to overheat, subsequently triggering the BMS (Battery Management System) to limit power output; furthermore, direct sunlight accelerates the aging of both internal electrical components and external plastic parts. Exposure to rain may allow water to seep into the battery system, causing internal damage; in severe cases, this could even lead to a fire.

- The installation site should be located in a dry, waterproofed area, and—to the extent possible—should be free from frequent human or animal activity. The area must be well-ventilated, and the ambient temperature should be maintained between 10°C and 30°C. It is imperative to avoid environments characterized by high temperatures or high humidity, and to take precautions to prevent damage to the battery system caused by accidental physical impact from personnel.
- Keep away from dust and dirty areas.
- This battery system features an IP20 protection rating and is not suitable for outdoor installation; if installed in an enclosed space, please ensure adequate ventilation.

**Continued Use of the Battery System is Prohibited Under the Following Conditions:**

- If the unit is found to be damaged externally or internally, or any of the accessories are damaged or missing, contact LITHTECH. Do not operate the unit if it has suffered a violent mechanical shock of any kind.
- Deformation of the battery enclosure
- Water immersion
- Deformation due to dropping occurred during installation.

**Prohibited Installation Locations**

Warning: Lithium-ion battery energy storage systems must not be installed in bedrooms, living rooms, corridors, elevators, or other areas where people remain for extended periods or which serve as evacuation routes.

**Danger**

- **Risk of Electric Shock:** Before performing cleaning or maintenance, or connecting an electrical appliance to this unit, please turn off the unit and disconnect all power sources.
- **Risk of Electric Shock and/or ARC Flash Hazard:** Life threatening voltages may be present with the risk of ARC Flash in the event of an inadvertent short circuit.
- Authorized Personnel Only，Risk of Electric Shock.
- The room housing the battery system must be marked with warning signs indicating electrical hazards and equipped with a door lock. Children and unauthorized personnel are strictly prohibited from entering, in order to prevent potential electrical shock hazards.
- Non-professionals are strictly prohibited from disassembling or installing the battery system, to prevent accidents such as electric shock, short circuits, or burns.

**Disclaimer**

Lithtech assumes no liability for any direct or indirect losses of any kind arising from failure to comply with applicable regulations.

2. Specifications

2.1. Basic Information



Items	HP1600
Pack Rated Voltage (V)	51.2
Nominal capacity (Ah)	314
Protection level	IP20
Energy (kWh)	16.076
Size(mm) W*D*H	482*800*265±2(PACK)
System Series Count(unit)	3~15
Production countries	Made in China

2.2. Performance parameter

2.2.1. Battery Module Parameter Table

Type	Item	Parameter	Remarks
	Combination Method	1P16S	CBA71173207EES–314Ah
	Rating Voltage	51.2V	
	Rating Capacity (0.5C)	314Ah	Discharge capacity: 0.5C≥95%
	Impedance	≤20mΩ	
	Max. Charge Voltage	58.4V	

Battery Module	Discharge Cut-off Voltage	44.8V	
	Max. continuous charge current	157A	
	Recommended charge current	157A	
	Max. continuous discharge current	157A	SOC 30%~ 100%
	Recommended discharge current	157A	
	Battery Module Weight	≈120.5kg	N.W.
	Color	RAL7035	
	Communication port	Daisy Chain	
	BMS slave unit BMS (BMU)	M761-18V-9T_A	
	Ingress protection/cooling type	IP20/ Air	
	Fire extinguishing system	Gas aerosol	
	Operating temperature charge	0～55℃	
	Operating temperature discharge	-20℃～55℃	
	Storage temperature	-20℃～45℃	
	SOC % at shipment	50% SOC (sea transport) 30% SOC (air transport)	
	Cycle life	≥8000 Cycles(70%SOH)	
	Certifications	UN38.3	

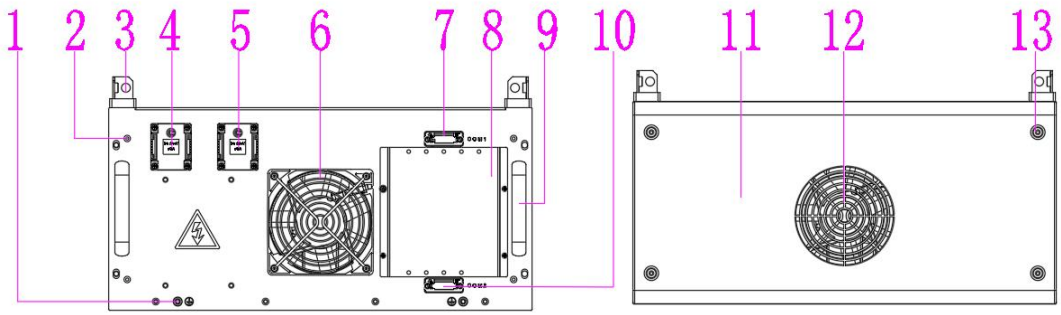
2.2.2. System Parameters Table

NO.	Items	Sub-Items	Parameters	Remark
1	Charging Voltage	Single cell charging over-voltage protection	3.65V	Release below 3.34V
		Battery pack of charging over-voltage protection	58.4V*n	n: Pack Quantity
2	Discharge voltage	Single cell discharge low voltage protection	2.8V	Release above 3.0V
3		Battery pack over-discharge protection	44.8V*n	n: Pack Quantity
4	Charging current	Recommended continuous charge current	157A(Factory default Settings)	
5		Rated charging current	157A	
6		Charging power	51.2*157*n kW	n: Pack Quantity
7		Over-current alarm	173A	
8		Over-current Protection 1	178A	

9		Over-current Protection 1	183A	
10	Discharge current	Recommended continuous discharge current	157A	
11		Rated discharge current	157A(Factory default Settings)	
12		Discharge power	51.2*157*n kW	n: Pack Quantity
13		Over-current alarm	173A	
14		Over-current Protection 1	178A	
15		Over-current Protection 2	183A	
16		Short circuit protection	No	
17	Temperature	Charge and discharge temperature range	Discharge temperature range: -20~55℃	
18		Charging temperature range	Charging temperature range: 0~55℃	
19	Capacity	Discharge-able capacity	314Ah	
20		Allow the use of DOD	100%	

2.3. Interface Definition

2.3.1. Battery Box Interface Definitions and Functions

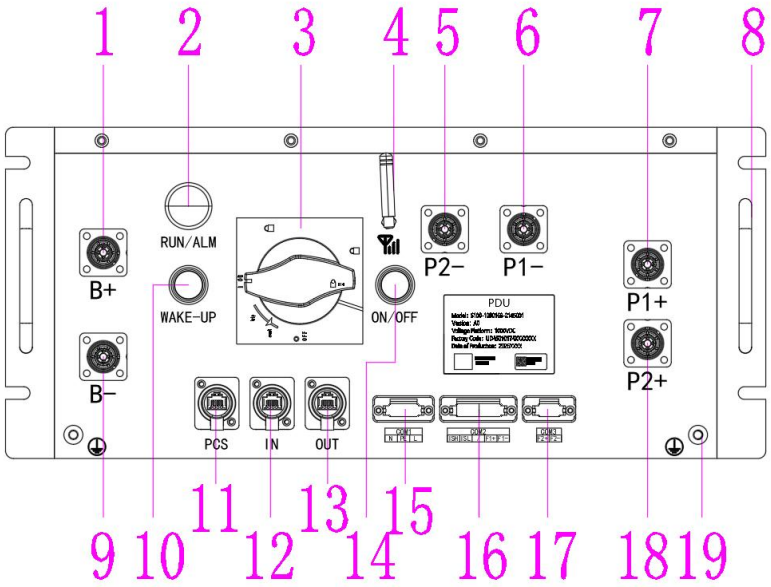


Interface definition diagram

No.	Name	Definition
1	Grounding	⏚
2	Face Mask Mounting Post	Securing the Enclosure Faceplate
3	Housing Locating Pin	Secure the battery box.
4	Positive terminal	Battery output positive
5	Negative terminal	Battery output negative
6	fan	Battery Enclosure Cooling
7	COM1	Address Code Input
8	BMU Protective Enclosure	Protect the BMU
9	handle	Install the battery pack
10	COM2	Address Code Output
11	Battery Box Cover	Protects the fan, insulates the positive and negative terminals, and serves as decoration.
12	Fan Vents	For Air Diversion

13	Battery Box Cover Mounting Holes	Install the fixing screws for the battery box cover.

2.3.2. PDU Interface Definitions and Functional Descriptions



No.	Name	Definition
1	B+	Battery System Main Positive Terminal _ Connects to the Battery Main Positive
2	RUN/ALM	Run: Green Alarm：Red
3	Main Circuit Breaker	ON：Close Circuit OFF:Open Circuit
4	Antenna	WiFi Antenna
5	P2-	Channel 2 Negative Output — Connects to Inverter Negative Terminal
6	P1-	Channel 1 Negative Output — Connects to Inverter Negative Terminal
7	P1+	Channel 1 Positive Output — Connects to Inverter
8	handle	Install the battery pack
9	B-	Battery System Main Negative Terminal _ Connects to the Battery System Negative Pole
10	Wake Up Switch	Latching Switch: Used by the BMS for self-powered power-up sequences.
11	PCS	BMS-to-Inverter Communication Interface _Connecting to the Inverter
12	IN	Multi-Cluster Battery Parallel Communication Interface_Input
13	OUT	Multi-Cluster Battery Parallel Communication Interface_Output
14	ON/OFF Switch	Latching Switch: Used to activate the BMS when powered by an external AC source.
15	COM1	AC Power Input Port: Connects to mains power.

16	COM2	BCU to BMU Communication+24V Fan Power Output
17	COM3	24V Fan Power Supply — If the number of battery modules is ≥ 12, connect COM2 of the last module to PDU COM3.
18	P2+	Channel 2 Positive Output — Connects to Inverter
19	Grounding	

2.4. Battery Management System (BMS)

2.4.1. Low Voltage Protection

Discharge low voltage protection:

When discharging, the voltage of any single cell is lower than the protection value, the over discharge protection will be triggered, the battery buzzer alarm. When the voltage of all cells is recovered to the range of released limit, the protection will be removed.

Charging Over Voltage Protection:

During charging, when the total voltage of battery pack or the voltage of any single cell reaches the protection limit, the system stops charging. When the total voltage and the single voltage return to the released limit range, the protection will be released.

2.4.2. Current Protection

Charging Over Current Protection:

When the charging current is more than the protection value,the system will stop charging. The protection will release after the system delays the rated time.

Discharging Over Current Protection:

When the discharge current is more than the protection value,the system will stop discharging. The protection will release after the system delays the rated time.

2.4.3. Temperature Protection

Charge low/high temperature protection:

During charging, when the battery temperature exceeds the range of 0℃~+55℃,the system would trigger the charging temperature protection, stops charging, recovering to the rated return value and then the protection is released.

Discharge low/high temperature protection:

During discharging, when the battery temperature exceeds the range of -20℃~+55℃, the system would trigger the discharging temperature protection, stops discharging, recovering to the rated return value and then the protection is released.

2.4.4. Fan Control

Tmax = Maximum cell temperature; Tmin = Minimum cell temperature. Fan: Upon BMS power-up, the fan is in the OFF state by default.

- **During charging or discharging:**

  Fan ON: Activates when Tmax ≥ 28 ℃ OR |Tmax - Tmin| ≥ 6 ℃.

  Fan OFF: Deactivates when Tmax ≤ 25 ℃ AND |Tmax - Tmin| ≤ 4 ℃.

- **During idle state:**

Fan ON: Activates when Tmax ≥ 33 ℃ OR |Tmax - Tmin| ≥ 6 ℃.

Fan OFF: Deactivates when Tmax ≤ 30 ℃ AND |Tmax - Tmin| ≤ 4 ℃.

2.5. Unpacking inspection

When the equipment arrives at the installation site, it must be loaded and unloaded in accordance with regulations to prevent sunlight and rain, Before unpacking, check the total number of pieces according to the shipping list attached to each packing box, and check whether the appearance of the packing box is intact.

Note: If the outer carton is deformed, please contact Lithtech immediately.

2.6. Parts list

Handle with care during unpacking to protect the surface coating of objects.

When opening the packaging box, the installer should first read the technical documents and check the list, and check whether the items are complete and intact according to the configuration table and packing list. If the internal packaging is damaged, it must be checked and recorded. The packing list is as follows

Accessory List

NO./ 序号	Part No./ 料号	Product Name/ 名称	SPEC./规格	QTY ./ 数 量	Remark/ 备注
1	YC.06.001.1222-A2	Power Cable PDU&BAT	EV50_ES090-03C50-2SNK-01_Orange_ Positive Power Cable	1	
2	YC.06.001.1223-A2	Power Cable PDU&BAT	EV50_ES090-03C50-1SNK-01_Black_ Unshielded_ Cable_155mm	1	
3	YC.06.001.1224-A1	Power Cable Battery module	EV_50mm²_SC50-8*2_L=640mm_Upper module	1	
4	YC.06.001.1225-A1	Power Cable Battery module	EV_50mm²_SC50-8*2_L=890mm_Lower module	2	
5	YC.06.001.1226-A1	Power Cable PDU&PCS/Inverter	EV_25mm²_ES090-03C25-2SNK-01_Orange_ L=2000mm_P1+	1	
6	YC.06.001.1227-A1	Power Cable PDU&PCS/Inverter	EV_25mm²_ES090-03C25-2SNK-01_Orange_ L=2000mm_P2+	1	
7	YC.06.001.1228-A1	Power Cable PDU&PCS/Inverter	EV_25mm²_ES090-03C25-2SNK-01_Black_L =2000mm_P1-	1	
8	YC.06.001.1229-A1	Power Cable PDU&PCS/Inverter	EV_25mm²_ES090-03C25-2SNK-01_Black_L =2000mm_P2-	1	
9	YC.06.002.0534	Com Cable PDU&Module	PGF-508-04(000)_L=185mm	1	
10	YC.06.002.0535	Com Cable Module&Module	PGF-508-04(000)_L=135mm	5	
11	YC.06.002.0536	Com Cable Module&Module	PGF-508-04(000)_L=525mm	6	

12	YC.06.002.0538	Com Cable PDU&PCS/Inverter	RJ45 male-to-male connectors at both ends, injection molded, shielded, L=2000mm	1	
13	YC.06.004.0476	AC Power Cable	RV_1.5mm²Brown*1_RV_1.5mm²Bule*1_RV_1.5mm²Bule and Green*1_RNB1.25-6*3_VE1508*3_L=2000mm/L=2000mmL=2000mm	1	
14	YC.06.005.0124	GND Cable	BVR_6mm²_OT10-6*2_OT6-6*2_L=320mm/320mm/320mm_Yellow and Green	4	
15	YC.10.011.0186	User manual	System Manual	1	
16	YC.01.042.0017	PDU	Air cooled_1000V250A_P721-W_WIFI+Bluetooth	1	With RJ45*1 + 4P*5.08
18	YC.03.002.0378	Modules and Module Copper Busbars	L264mm* W96mm*T3.0_T2 Pure Copper_Full Nickel Plating + Selective Powder Coating	11	Determine the number of copper busbars based on the series connection count.
19	YC.06.002.0537	Communication Wire Harness	Module-to-Module Interconnect Cable (Jumper)_Crimped at Both Ends_Zhiheng PGF-508-04(000)	3	
20	YC.06.004.0475	Power Harness	RVV_2*1.5mm²_300/500V_Black_One End: PGF-508-04(000), Other End: VE1510*2_L=3000mm	1	
21	YC.03.003.0256	Base Stand	L746mm * W480mm * H165mm_SGCC_ C3 _RAL 7035_Base Bracket	4	
22	YC.03.003.0257	Top Bracket	L746mm*W480mm*H40mm_SGCC_C3_RAL 7035_Top Bracket	3	
23	YC.03.003.0258	Cable Routing Bracket	L480mm*W50mm* H40mm*T1.2_SGCC_C3_RAL7035_Cable Routing Bracket 1	2	
24	YC.03.003.0259	Cable Routing Bracket	L480mm* W50mm*H40mm*T1.2_SGCC_C3_RAL7035_Cable Routing Bracket 2	1	

Note: As the number of battery modules within the battery system varies, the quantity of accessories will also differ; please refer to the actual accessory list.

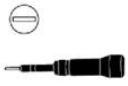
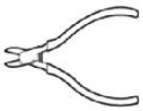
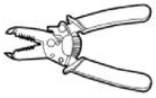
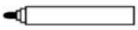
3. Installation

3.1. Protective Gear and Installation Tools

When installing the battery pack, please wear the following safety equipment.

 Insulating gloves	 Protective gloves	 Goggles	 Dust mask
 Insulated anti-smashing shoes	 Reflective vest	 Helmet	

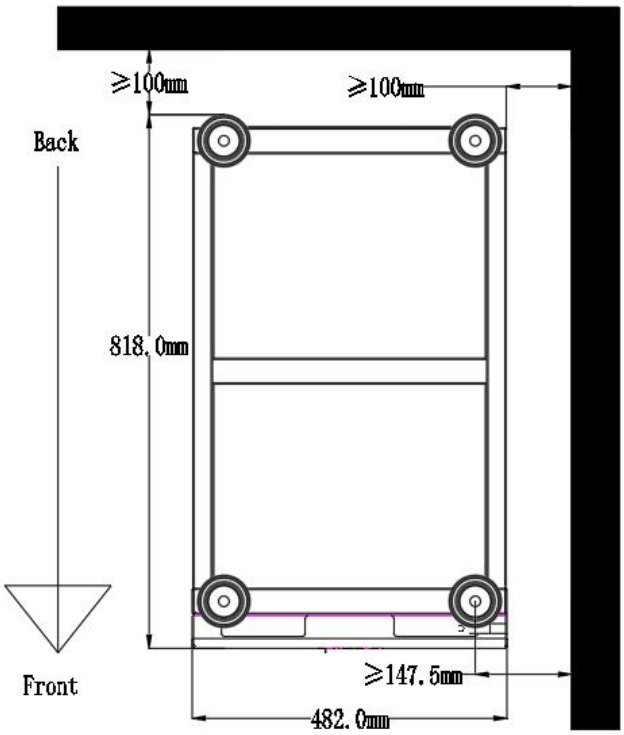
Installation tools

 Phillips insulated torque screwdriver	 Insulating Torque Socket Wrench (Including Extension Rod) ● Socket Size: 7mm~19mm ● Socket Depth: ≥32mm ● Socket Connection Matching with Torque Wrench ● Torque Range: 1.2N.m~45N.m	 Flathead insulated torque screwdriver	 Diagonal pliers
 Diagonal pliers	 Hydraulic clamps	 Multimeter	 Markers
 Steel tape measure	 Spirit level	 Impact drill	8mm drill bit
 Heat shrink tubing	 Heat gun	Cable ties	 Forklift

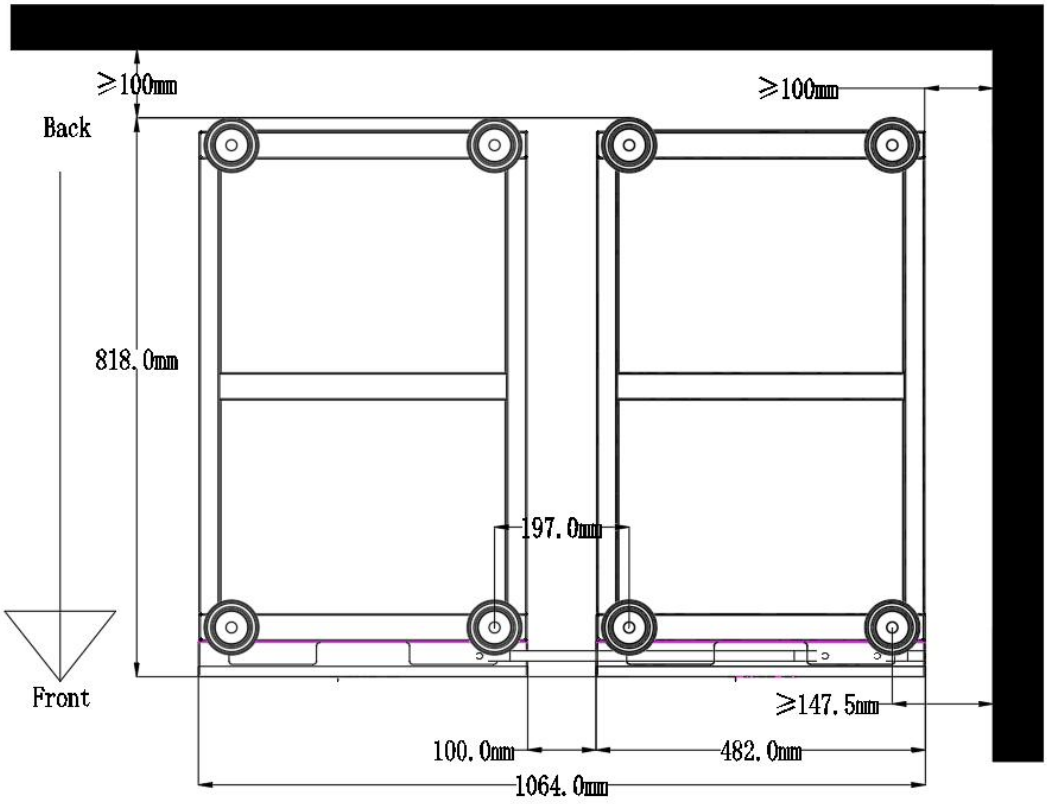
3.2. Battery System Installation Layout

- The clearance between the battery module and the wall shall be ⩾ 100 mm.
- Maintain a spacing of 100 mm between battery modules.

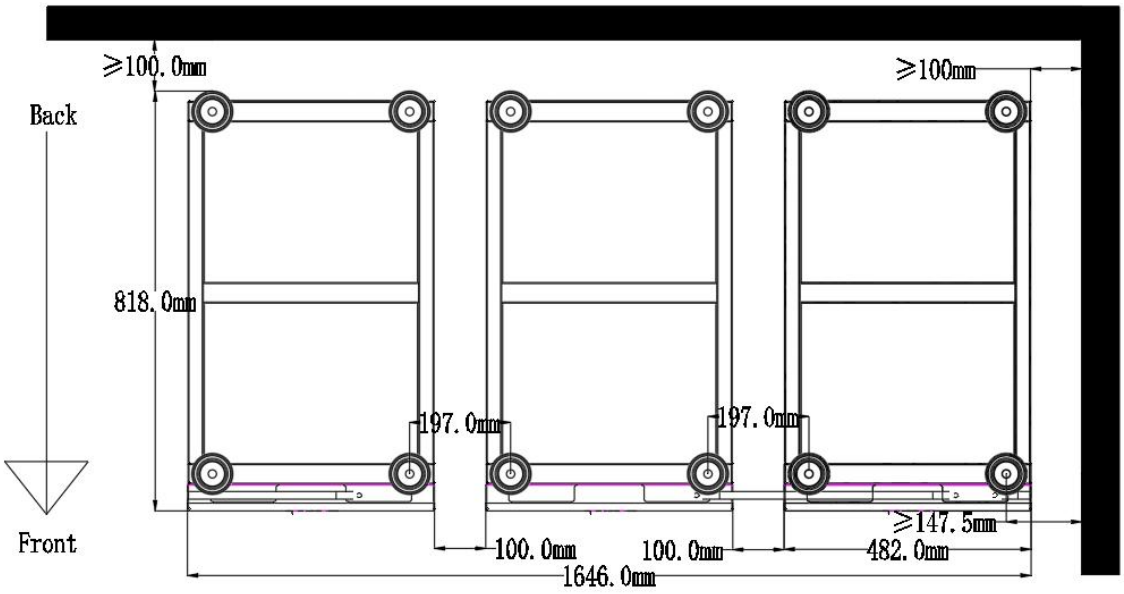
3.2.1. Size Requirements for Various Combinations



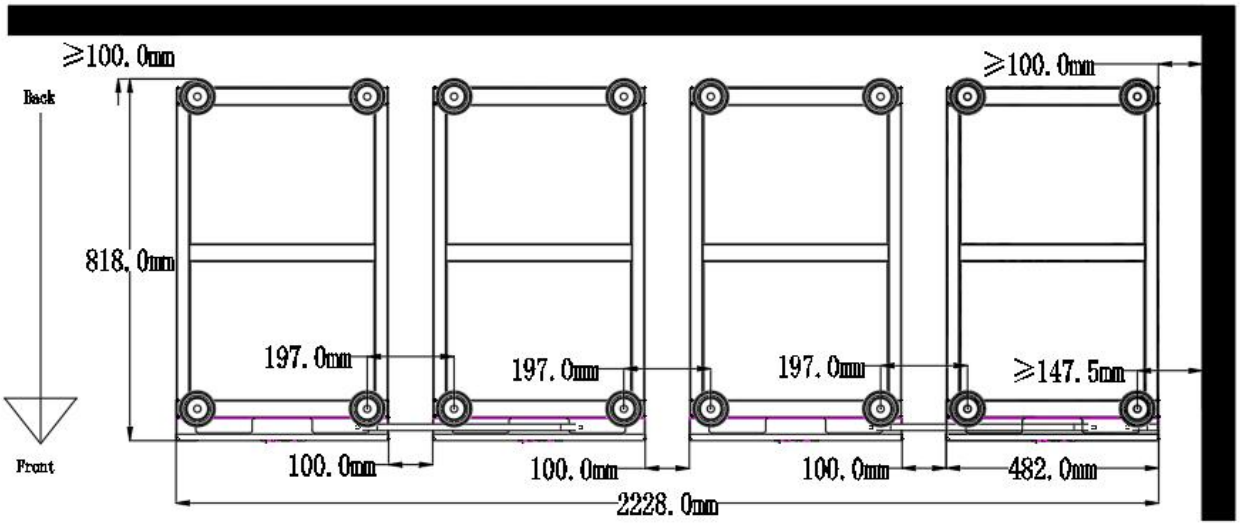
1 battery module stack



2 battery module stacks



3 battery module stacks

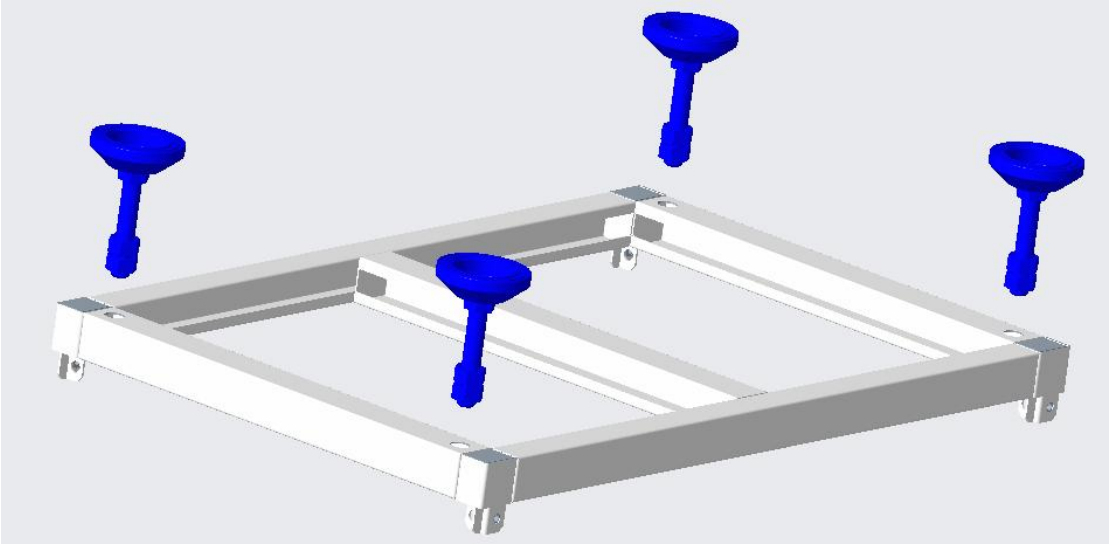


4 battery module stacks

3.2.2. Battery Module Stacking Installation Guide

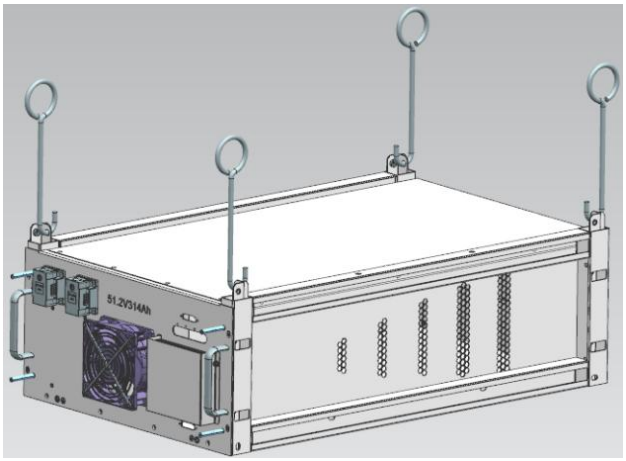
3.2.2.1. Install the Base Support

Based on the actual battery system specifications, determine the number of module stacks, mark the installation dimensions, and level the base supports.

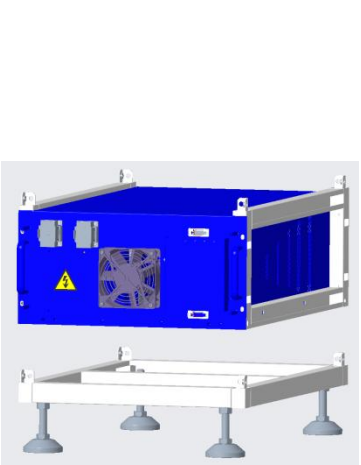


3.2.2.2. Stacked Battery

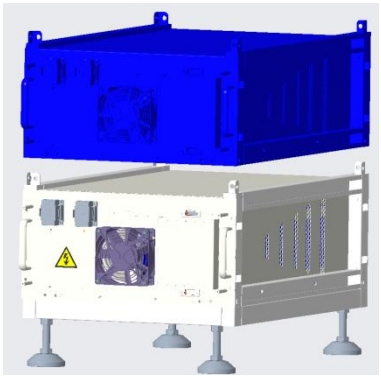
Use a forklift equipped with a lifting hook to hoist the battery box and install it onto the battery support base.

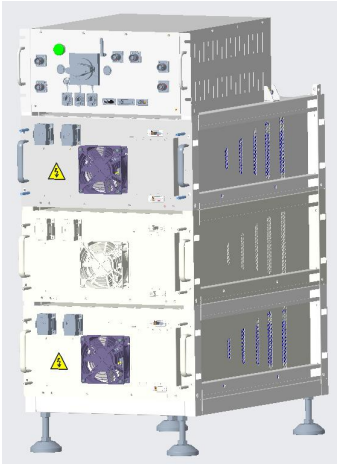


- Battery Module Stacking on the PDU Side
  - ➢ Install the Battery Cabinet
  - ➢ Install the PDU



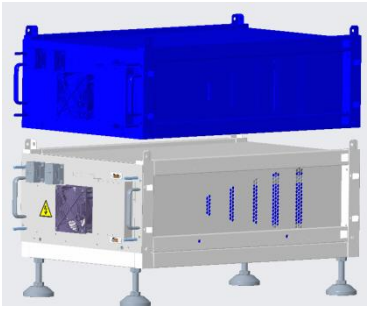
Install the Battery Box



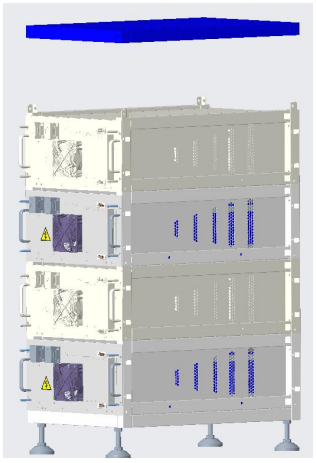


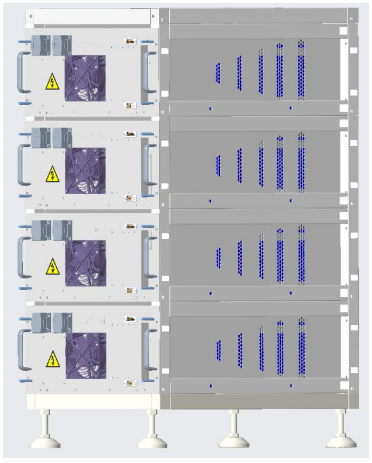
Installing the PDU

- Battery Module Stacked Installation



Install the Battery Box

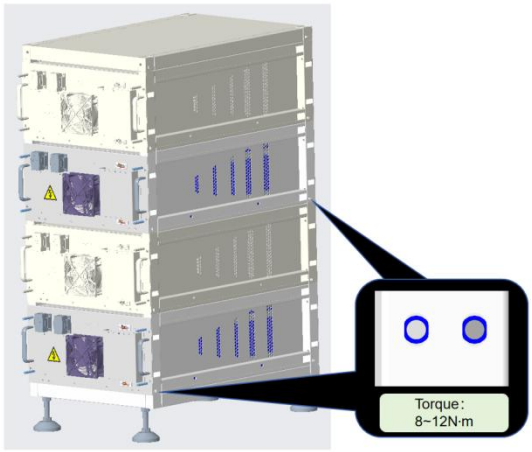




Install the Top Decorative Cover

Note: 1.A maximum of 4 battery packs can be stacked.

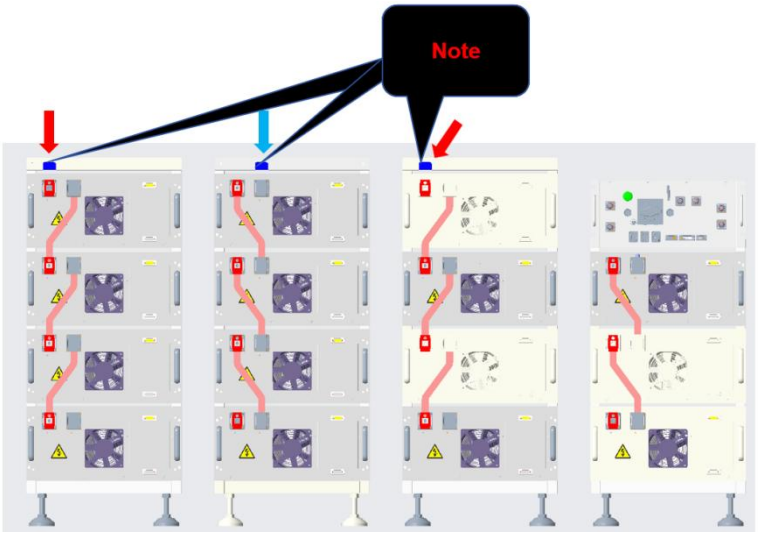
3.2.2.3. Install fixing screws for the battery module.



Install the fixing screws on both sides.



Install Power Line Brackets



Note: The power cable outlet for the second and fourth module stacks is shared and located above

the positive terminal of the battery pack; the power cable outlet for the third module stack is located above the negative terminal of the battery pack.

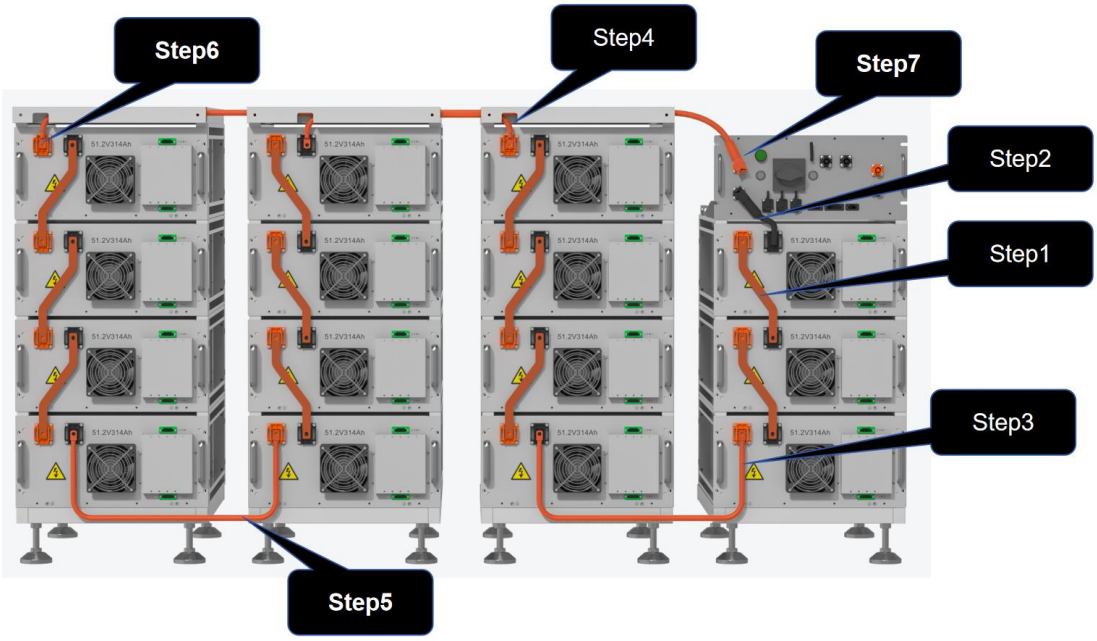
3.2.2.4. Stacked Battery Module Placement

Using a forklift, place the items in accordance with the actual stacking quantity, referencing "Size Requirements for Various Combinations."

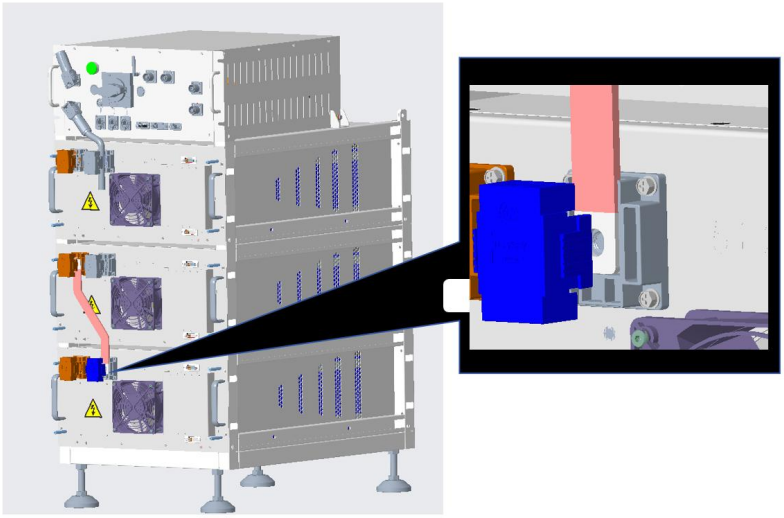
3.2.2.5. Install the ground wire.

Refer to Section 3.2.3, "Cyan Wire Harness Connection Method," to connect the ground wire.

3.2.2.6. Install Power Cables



Step 1:As shown in the figure below,install the copper busbar.



Note:

1. Do not simultaneously remove the positive and negative terminal insulation covers from a

single battery module.

2. Do not simultaneously remove the positive and negative terminal insulation covers from all modules.

Remove the insulation cover from a specific terminal of a battery module only when you are ready to install the corresponding busbar for that module; once the busbar installation is complete, immediately replace the insulation cover to prevent accidental contact and short circuits. This procedure also applies to the installation of power cables.

3. Upon completion of the installation, verify that the busbar connections align exactly with the accompanying image before proceeding to the next step of connecting the power lines.

Step 2:Install the Negative Power Cable

Note: Due to the length and stress of the power cable, the main negative cable needs to be connected to the PDU first, and then fastened to the battery box.

Step 3:Install the power cables for the first battery module stack and the second battery stack.

Note: First fasten the negative terminal of the second stack, then fasten the positive terminal of the first stack.

Step 4:Install the power cables for the second battery module stack and the third battery stack.

Note: First fasten the negative terminal of the third stack, then fasten the positive terminal of the second stack.

Step 5:Install the power cables for the third battery module stack and the fourth battery stack.

Note: First tighten the negative terminal of the fourth stack, then tighten the positive terminal of the third stack.

Step 6:Install the Main Positive Power Cable.

Step 7:Connect the main positive power plug to the PDU.

Note: Based on the actual stacking quantity and number of stacks in the battery system, refer to Section 3.2.3, "Schematic Diagram of Harness Connections for Varying Numbers of Battery Stacks."

3.2.2.7. Installing Communication Cables

Please refer to Section 3.2.3, "Fan + Green Harness Connection Method," to connect the communication cables and fan power cables.

Note: If the number of battery cabinets is ≥12, PDU COM3 must be connected to COM2 of the last cabinet via a wiring harness; otherwise, no connection is required.

3.2.2.8. Battery System Pre-Power-On Inspection

Verify that the wiring sequence of all power cables matches the provided image exactly, that the screws are securely tightened, and that the power cable connectors are firmly seated.

3.2.2.9. Battery System Inspection

Start the system, configure the network via the BMS App, and check the BMS information and operating status.

If the BMS information is normal, the relay is closed, and there are no fault alarms, please follow the power-down procedure to shut down the system.

Note：

1. 1. For instructions regarding the APP download and network configuration, please refer to the end of this document.
2. For instructions on powering the battery system on and off, refer to "4.1. Battery system power-on and power-off operation instructions."

3.2.2.10. Organize the wire harness.

Organize the wire harness and secure it with cable ties.

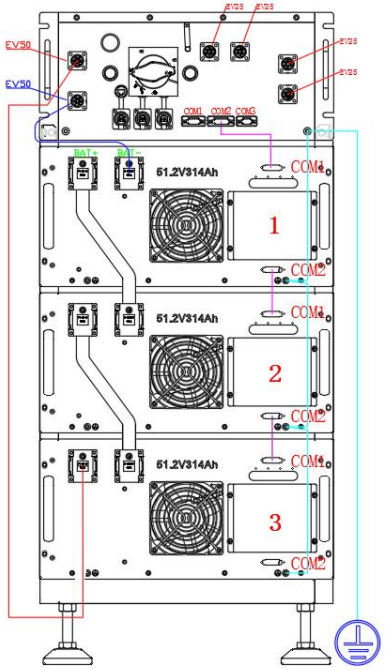
3.2.2.11. Install the face shield.

Install the battery system protective cover and fasten the screws.

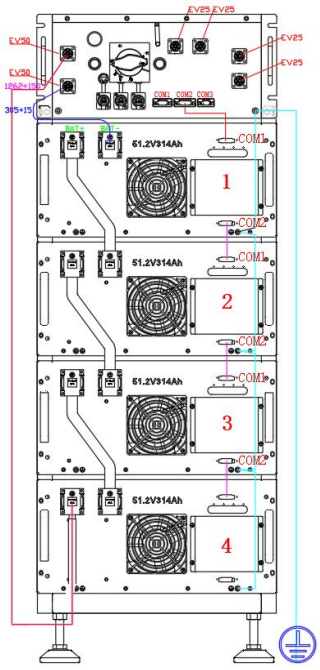
3.2.2.12. Connecting the Inverter System

Connect the positive and negative terminals of the inverter, and connect the communication cable.

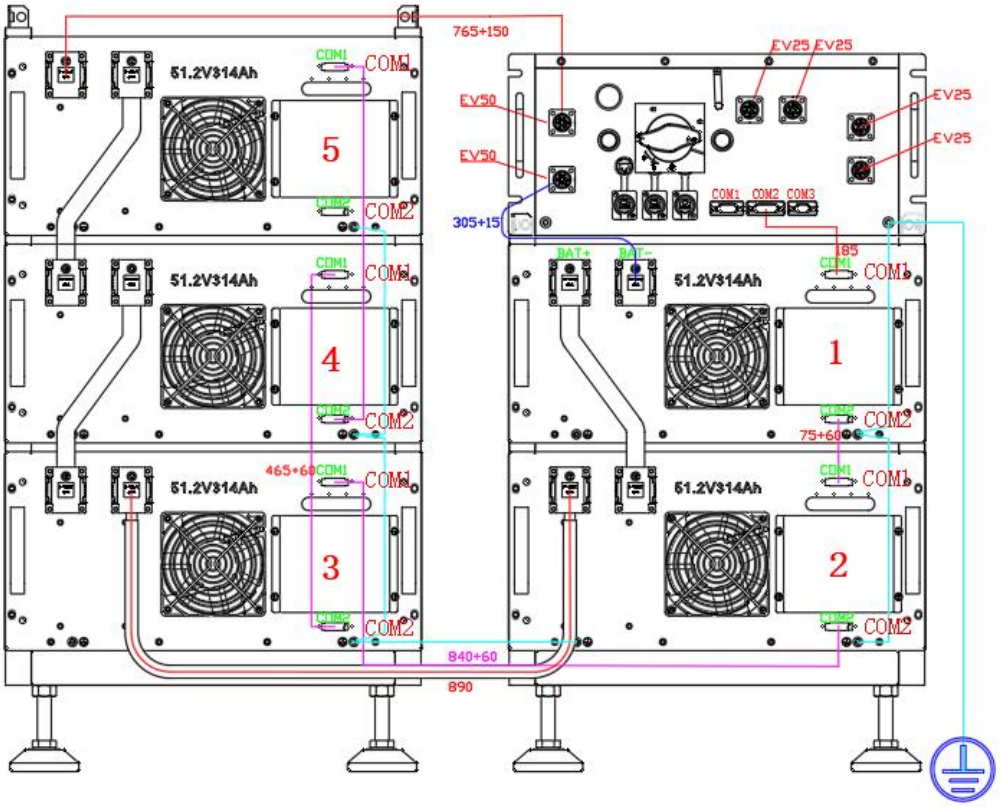
3.2.3. Schematic Diagram of Power Cable, Communication Cable, and Battery Module Address Connection Arrangement



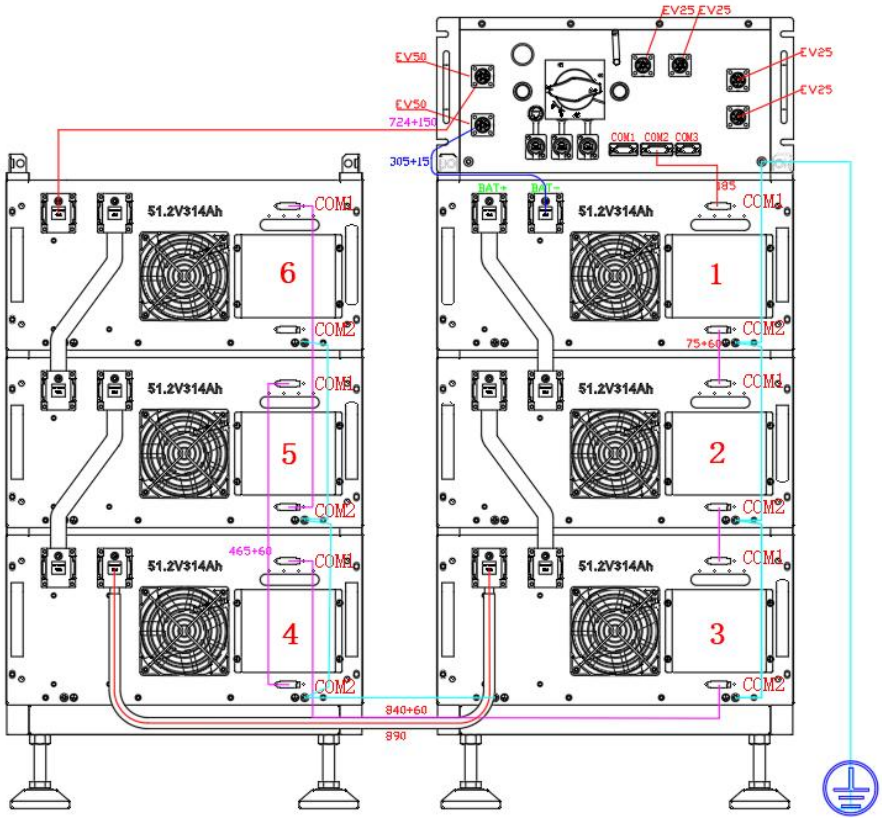
3 Battery Modules



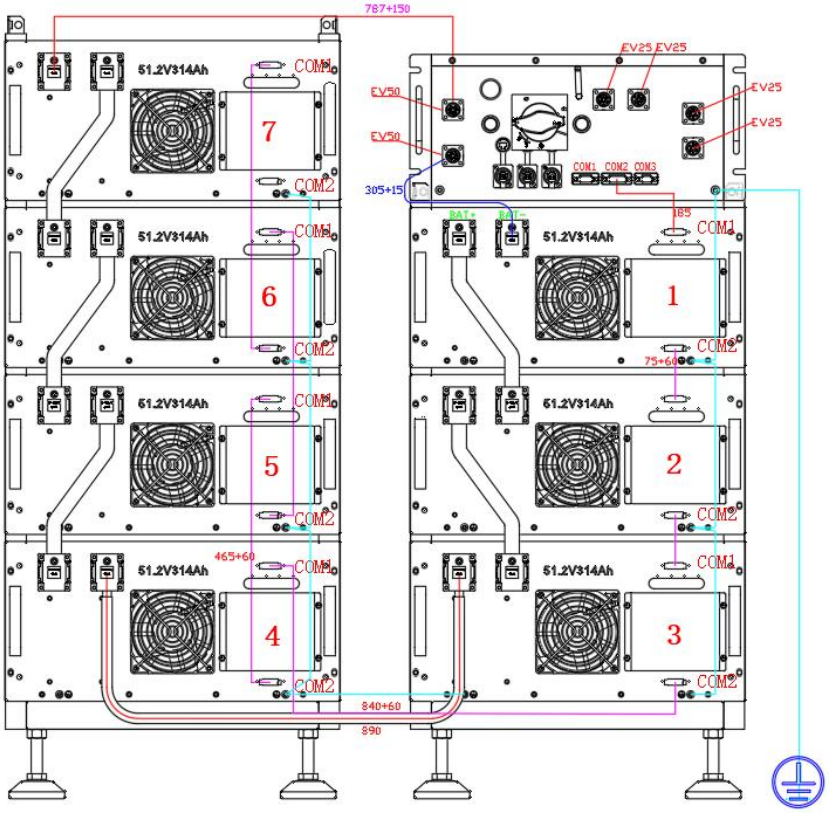
4 Battery Modules



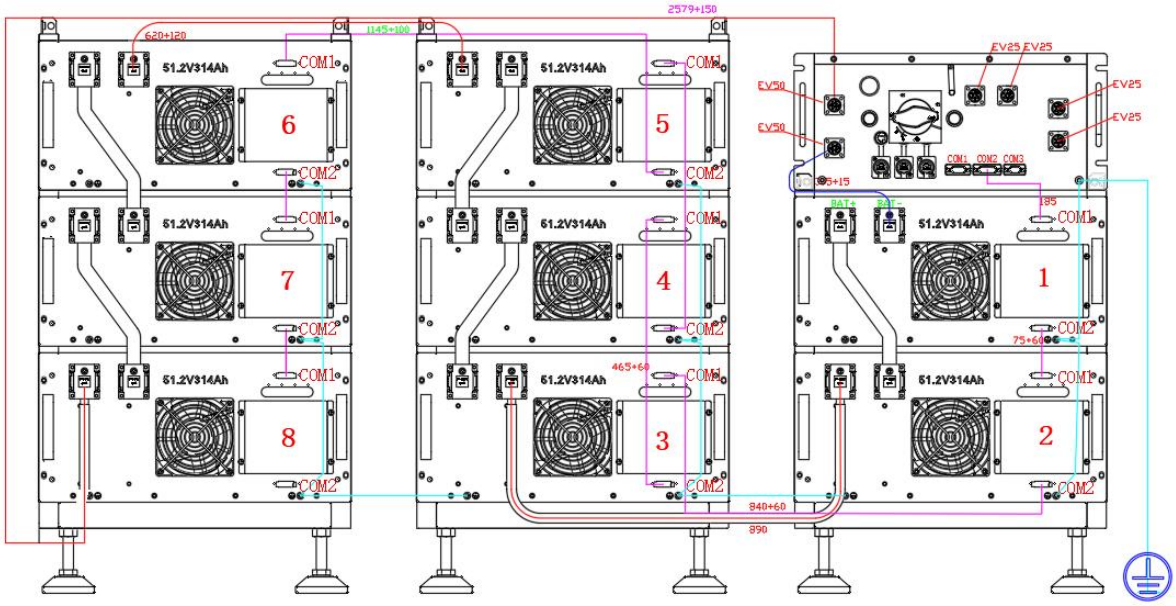
5 Battery Modules



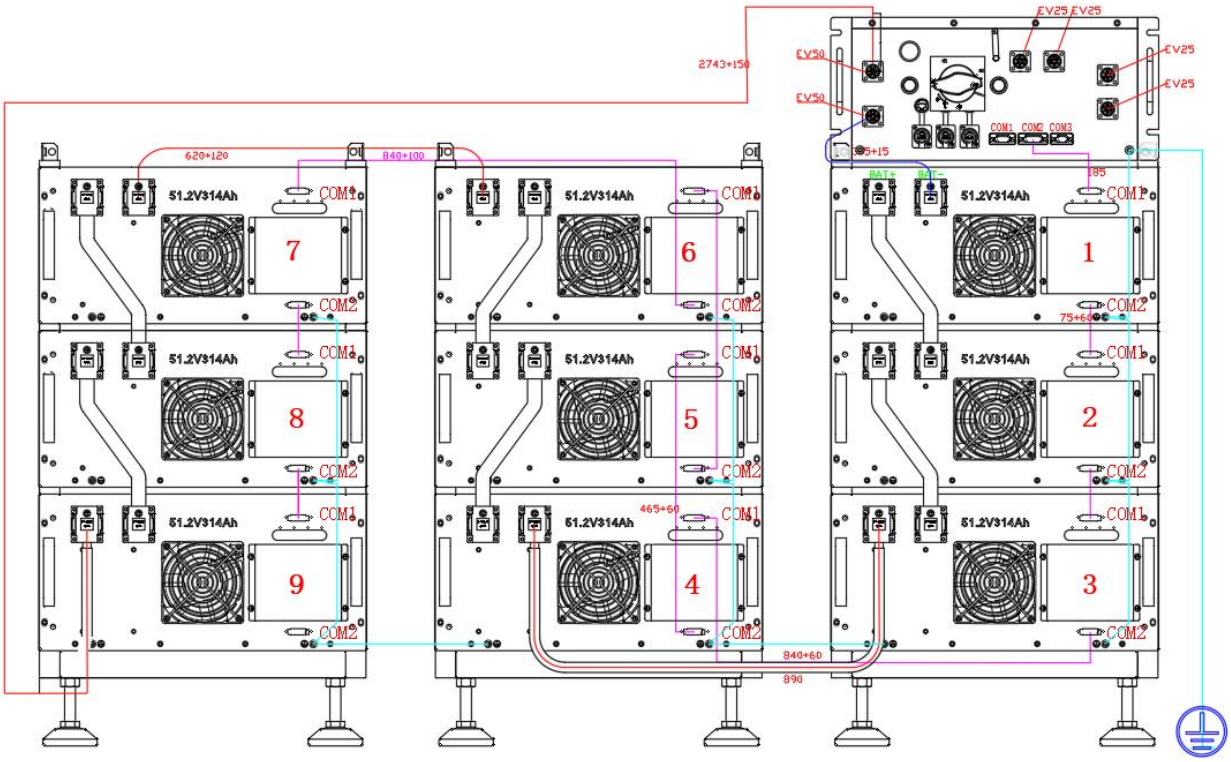
6 Battery Modules



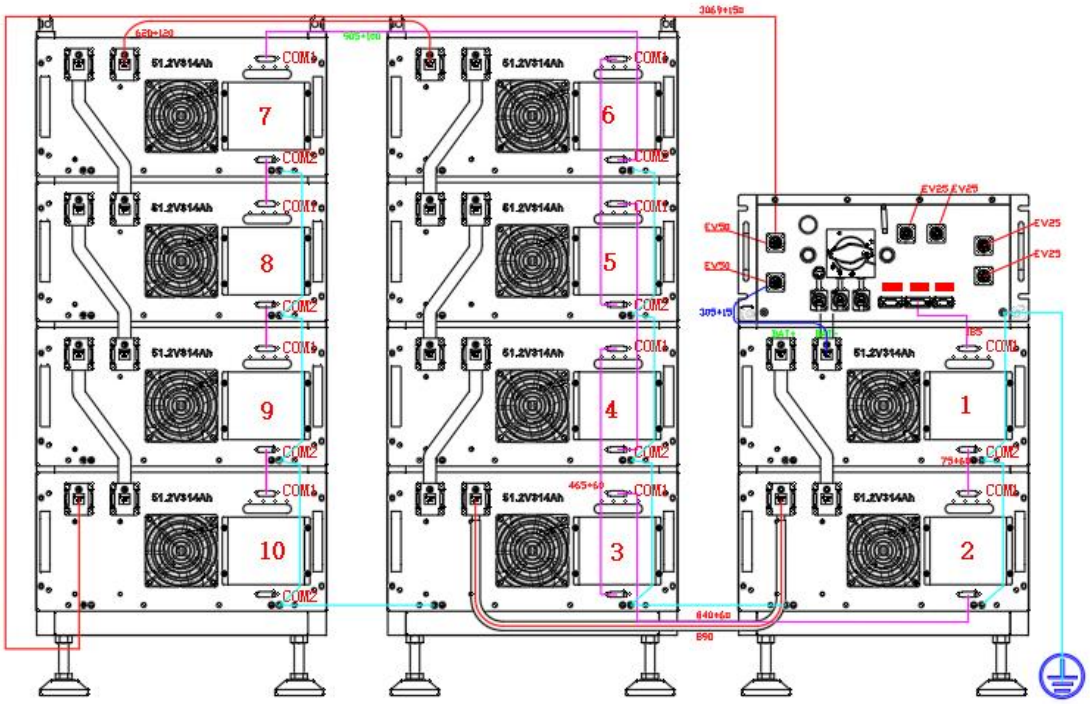
7 Battery Modules



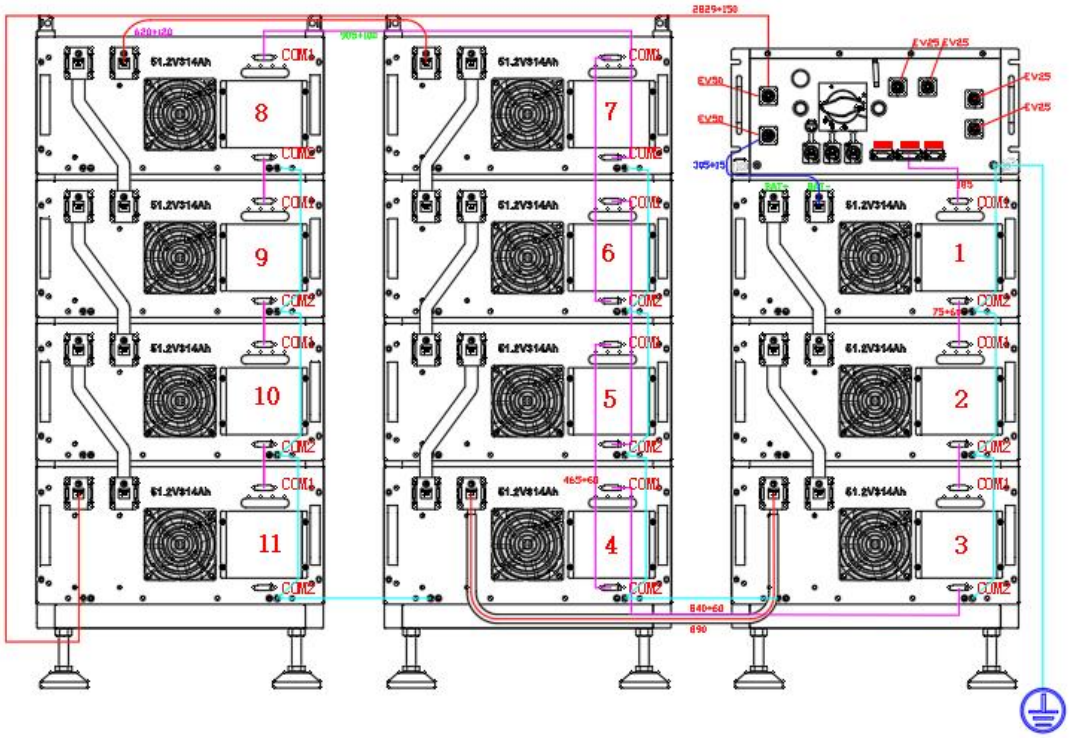
8 Battery Modules



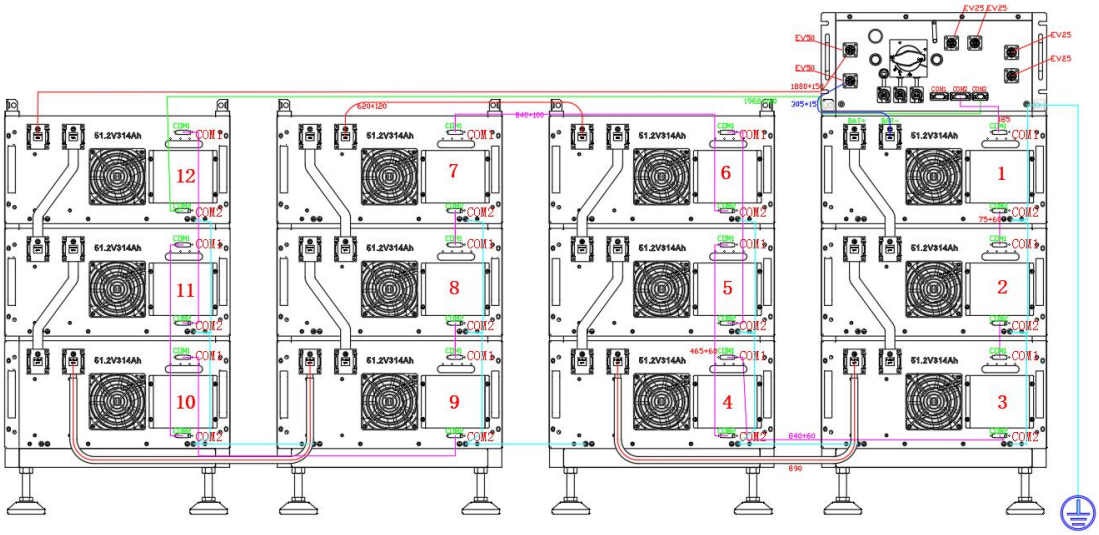
9 Battery Modules



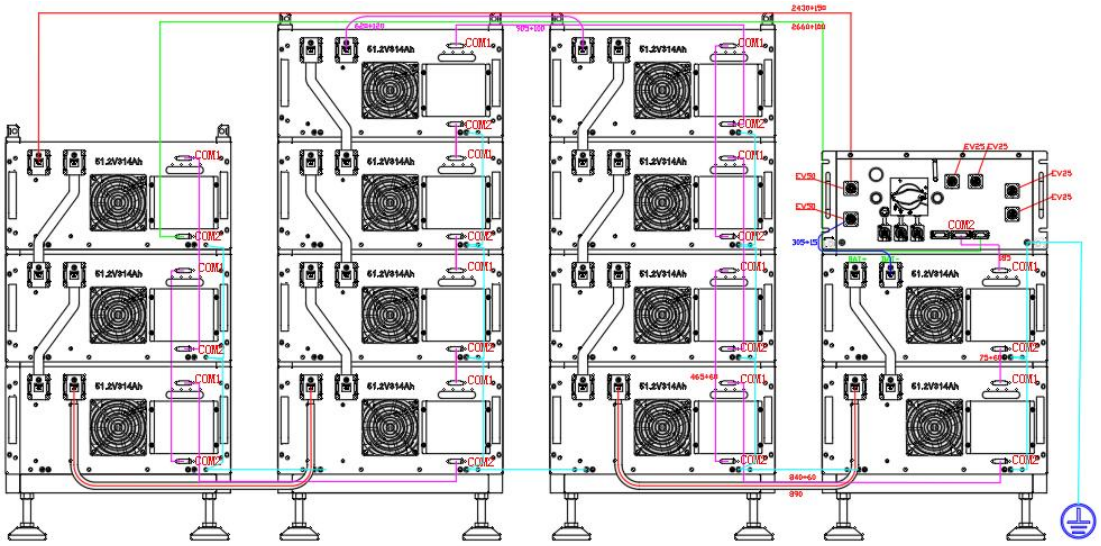
10 Battery Modules



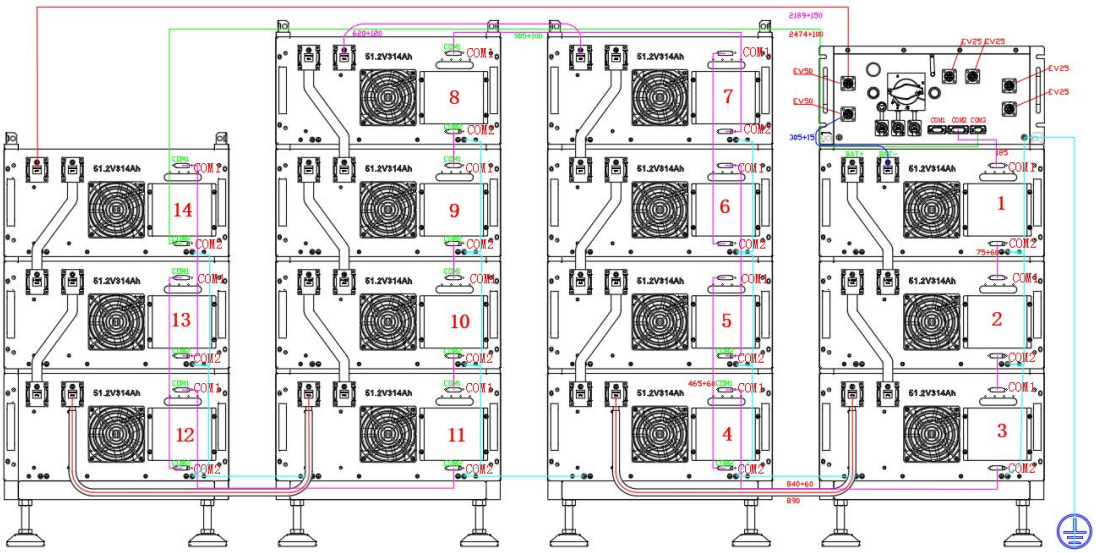
11 Battery Modules



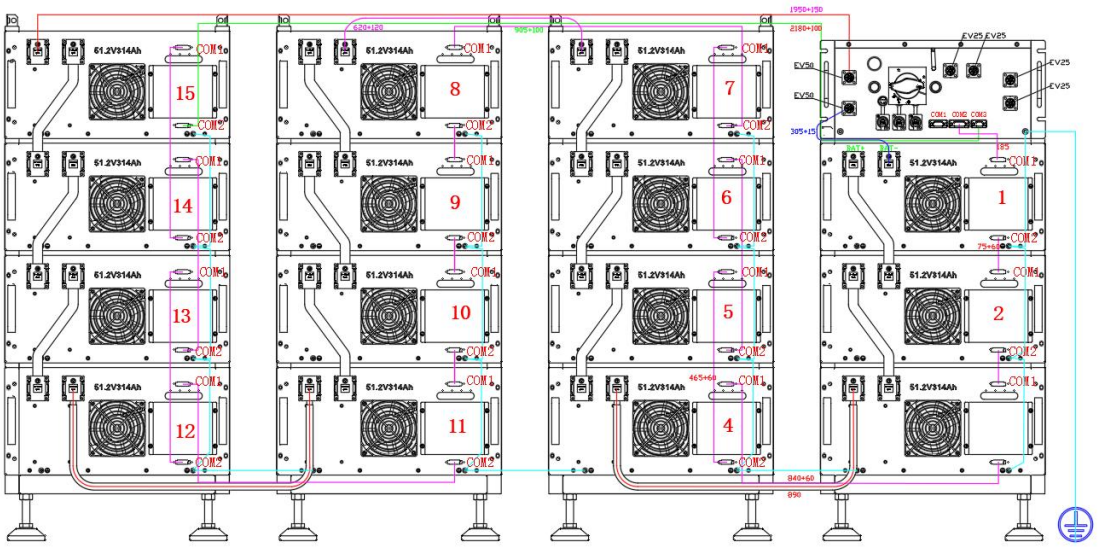
12 Battery Modules



13 Battery Modules



14 Battery Modules



15 Battery Modules

Wire Harness Color Definition Table

Colors	definition	Remarks
Red	Master Positive Power Cable / Module-to-Module Interconnect Power Cable	
Blue	Negative Power Cable	
light cyan	Ground wire	
Green	Highest-numbered battery | COM2 | Connect to PDU | COM1 | Fan power cable	Only battery packs consisting of 10 or more cells will feature this wire.
Pink	BCU-BMU Communication Cable	The communication cables for odd-numbered stacked modules are short, while those for even-numbered stacked modules are long.
Note： 1. The BMU address numbering is automatically assigned. COM2 serves as the communication output port, while COM1 serves as the communication input port; connections must be made exactly as shown in the accompanying image to ensure the BMU address numbering is correct. 2. The system wiring harnesses are supplied in lengths corresponding to their respective icon markings. Please arrange and install them according to the provided example images, based on the actual number of battery modules, to ensure proper connectivity.		

4. Using maintenance and troubleshooting

4.1. Battery system power-on and power-off operation instructions

- Battery System Power-On Operation Guide:

Step 1: Before starting the battery system, carefully inspect all power cable screws and verify their polarity.

Step 2: Toggle the battery system's main power switch to the "ON" position.

Step 3: Press the "WAKE UP" switch on the battery system to initiate startup.

Step 4: Once the battery system has completed its self-test, the RUN and SOC indicators will light up, signifying that the power-on process is complete.

Note: If the "WAKE UP" switch fails to start the battery system, connect an AC 220V power source to the COM1 port, set the ON/OFF switch to "ON," and then press the "WAKE UP" switch again to start the system.

- Battery System Power-Off Operation Guide:

Step 1: Set the Wake UP switch to OFF (the switch is in the OFF position when popped up); the battery system indicator light turns off (if power is present at the COM1 port, disconnect the AC input power and set the ON/OFF switch to OFF).

Step 2: Set the Main Battery switch to OFF.

4.2. Battery System Maintenance and Storage Requirements

4.2.1. Routine Maintenance Requirements

The HP1600 is a maintenance-free lithium iron phosphate battery. The battery system requires no internal maintenance, only periodic checks.

1. Cleaning and Maintenance: To prevent poor heat dissipation within the battery system, please use a vacuum cleaner to remove external dust accumulation every six months; if necessary, use a dry cloth to clean the exterior of the battery enclosure.

2. Power Cable Inspection: To ensure system safety, visually inspect the power cable and its connectors every six months for discoloration, burning, aging, or damage. If any problems are found, immediately turn off the power switch and contact the installer to replace the power cable.

Note: When vacuuming, please power down the battery system before cleaning.

4.2.2. Battery Long-Term System Storage Requirements

Storage Environment Requirements: Maintain a storage environment that is dry, well-ventilated, and clean. The storage temperature should range between 0°C and 40°C, with a relative humidity of 10% to 85% RH.

Prior to long-term storage, please charge the battery to a charge level of 30%–50% (reference voltage range for a single cell: 3.24V–3.30V). Please recharge the battery every three months and perform a full charge-discharge cycle every six months.

Reference Procedure for Charge-Discharge Cycling: Fully charge (charge until the BMS triggers an over-voltage alarm) → Fully discharge (discharge until the BMS triggers an

under-voltage alarm) → Charge to 30%–50%.

Note: In the event that the battery system sustains damage due to the user's failure to adhere to storage guidelines, our company assumes no liability or responsibility for any resulting losses.

4.3. Alarm Description and Solution

The fault levels within the BMS management system are categorized into Level 1 Alarms, Level 2 Alarms, and Level 3 Protection. A Level 1 Alarm serves as a notification alert; a Level 2 Alarm indicates a moderately severe fault, in which case the BMS restricts the charging and discharging power of the battery system; a Level 3 Alarm signifies a critical fault, prompting the BMS to disable both charging and discharging operations—specifically by forcibly disconnecting internal relays—to safeguard the battery system.

When the battery system detects a Level 1 or Level 2 fault alarm, the system reduces its power output. Once the conditions for recovery are met, the fault automatically clears, and power output returns to normal levels. Level 3 protection faults, however, do not self-recover; the battery system must be restarted to clear the fault.

Main alarm and protection

State	Alarm category	Alarm indication	Solution
Charging state	Cell over voltage alarm	ALM Red light is always on	Stop charging
	Charge over current alarm	ALM Red light is always on/	Stop charging and find out the cause of the fault
	Charging temperature alarm	ALM Red light is always on	Stop charging
Discharging state	Discharge over current alarm	ALM Red light is always on	Stop discharging and find out the cause of the fault
	Discharging temperature alarm	ALM Red light is always on	Stop discharging
	Total voltage under voltage alarm	ALM Red light is always on	Charge
	Cell Voltage Under-voltage alarm	ALM Red light is always on	Charge

4.4. Analysis and solution of common faults

Common faults and solutions

No.	Fault	Causal analysis	Solutions
1	When the Wake UP switch is set to ON (pressed), the BMS	1. Power switch is broken 2. DC-DC Converter Failure 3. Over-discharge of the battery	1. Replace the power switch 2. Power the system via the COM1 interface using AC

	system does not operate, and the RUN indicator light does not illuminate.	4. BMS is damaged.	power. 3. After starting the battery system, charge the battery system. 4. Replace the BMS
2	When the "Wake UP" switch is in the ON (pressed) position, the BMS system operates; however, the internal relay remains open, and the ALM indicator light flashes.	Battery data status is abnormal	Connect the mobile phone APP to the BMS Bluetooth or WIFI, read the fault and battery information, and select the corresponding solution through the BMS fault
3	DC power supply time is too short	1. Battery capacity attenuation 2. The consistency of the charge capacity carried by individual battery cells varies too much	Replace a battery
4	The BMS system is unable to communicate with the external inverter (or PCS).	1. The BMS communication protocol settings are incorrect. 2. Inverter communication protocol settings are incorrect. 3. Inverter communication interface connection is incorrect.	1. Reconfigure the communication protocol and restart the system. 2. Set the inverter communication protocol. 3. Reconnect the inverter-side communication interface.
5.	Insulation Fault	1. Humid weather triggers an insulation fault alarm in the BMS system. 2. Water ingress into the battery system leads to an insulation fault. 3. An internal fault within the battery system causes an insulation fault. 4. Issues related to the external inverter result in an insulation fault.	1. Improve the installation environment. 2. Use an insulation tester to identify the battery module exhibiting low insulation; open the module cover to inspect the actual condition. 3. Use an insulation tester to identify the component with abnormal insulation; open the enclosure cover to determine the root cause. 4. Disconnect the power cables connecting the battery system to the external inverter, and independently measure the insulation resistance between the battery system's positive and negative terminals to verify if it

			is within normal limits.
6	The battery system has no DC high-voltage output.	1. Internal fuse within the battery housing is damaged. 2. High-voltage connectors within the housing are loose or scorched. 3. Relevant internal components within the PDU are damaged.	1. Internal fuse within the battery housing is damaged. 2. High-voltage connectors within the housing are loose or scorched. 3. Relevant internal components within the PDU are damaged.

Feedback on Faults and Anomalies During Use：

If you encounter any problems during use, please provide screenshots of the relevant faults and BMS information from the app, and submit them to our after-sales service platform. We typically reply within 24 hours, provide a preliminary solution within 48 hours, and offer a full solution within 3 to 7 days. The link (or QR code) is as follows:

https://www.ltc-energy.com/support/

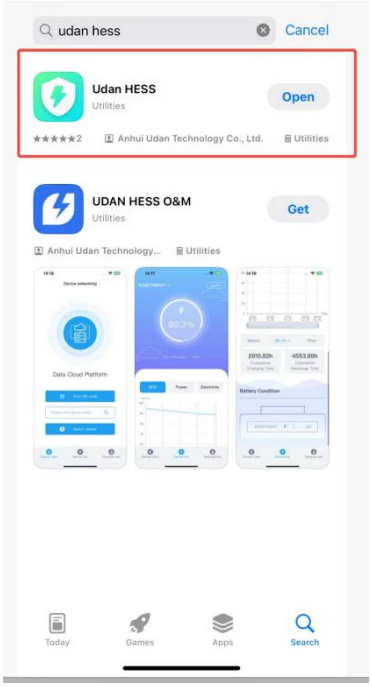
APP User Manual

1. APP Download and install

Please enter the download link and select the corresponding mobile operating system to install the app. Or Open the App Store, search for "Udan HESS", and download the app.

App Download Link:https://www.ievcloud.com/app_xdcn.html

Android App Download QR Code

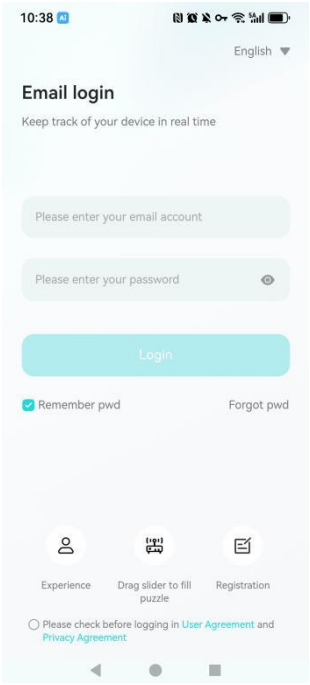


iOS Mobile Search and Download

2. Log in and register

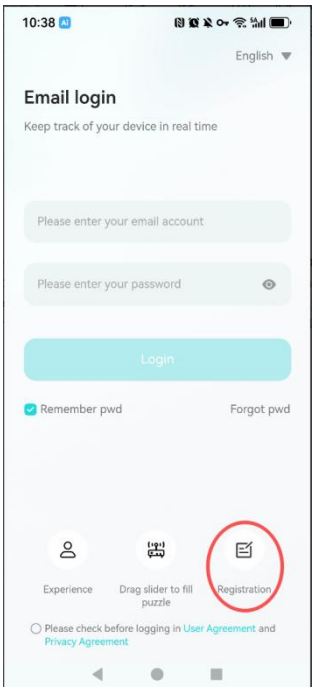
2.1. Log in

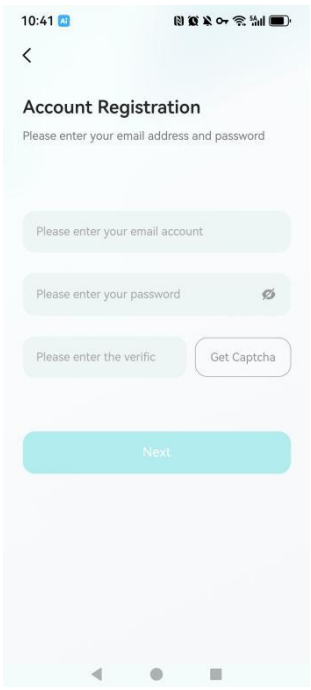
- After opening the APP, enter the login interface to log in with your account.
- Currently supports logging in through email accounts



2.2. Register

- At the bottom of the login page, click the "Account Registration" button to initiate and complete the registration process. Currently, you can register using an email address.
- Once registration is complete, log in to the App; you will then need to complete the device verification process by entering the device's SN code or scanning its QR code to identify the device and provide the required information.



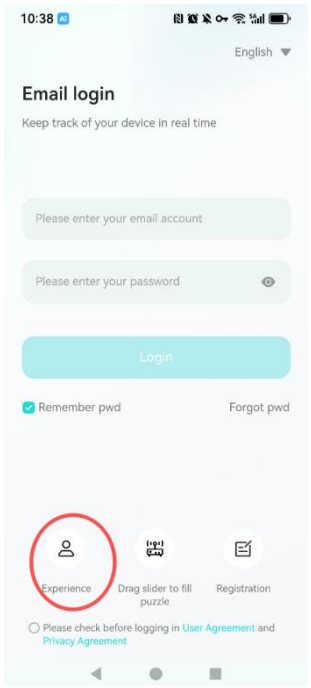




2.3. Experience login

At the bottom of the login page, click the "Guest Login" button to access and explore the app's features as a guest, without the need for registration.

Note: This function is intended solely for system debugging following installation, and is designed to quickly check for system faults.



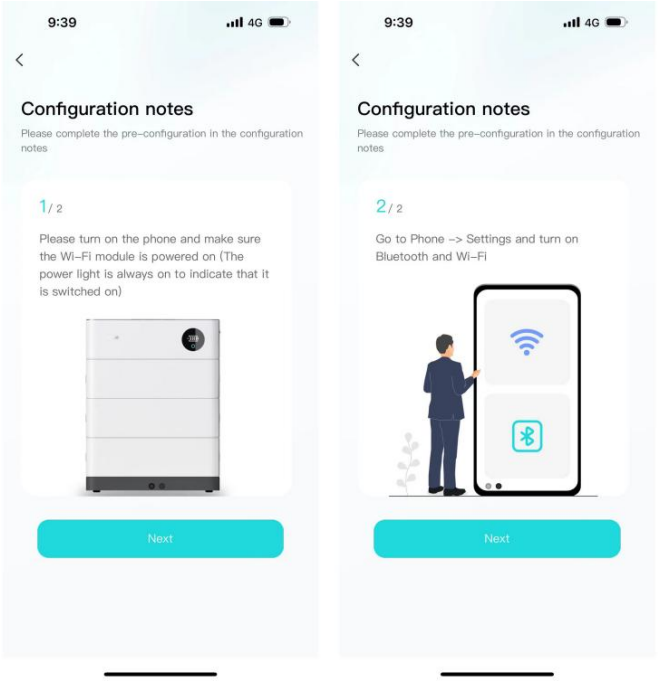
3. Equipment distribution network

3.1. Overview

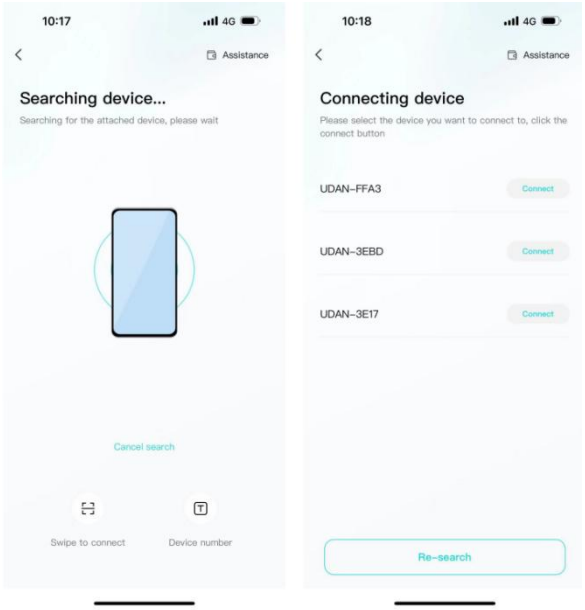
An equipment distribution network refers to the connection of devices to a cloud computing platform to assist users in obtaining real-time device data.

3.2. Distribution process

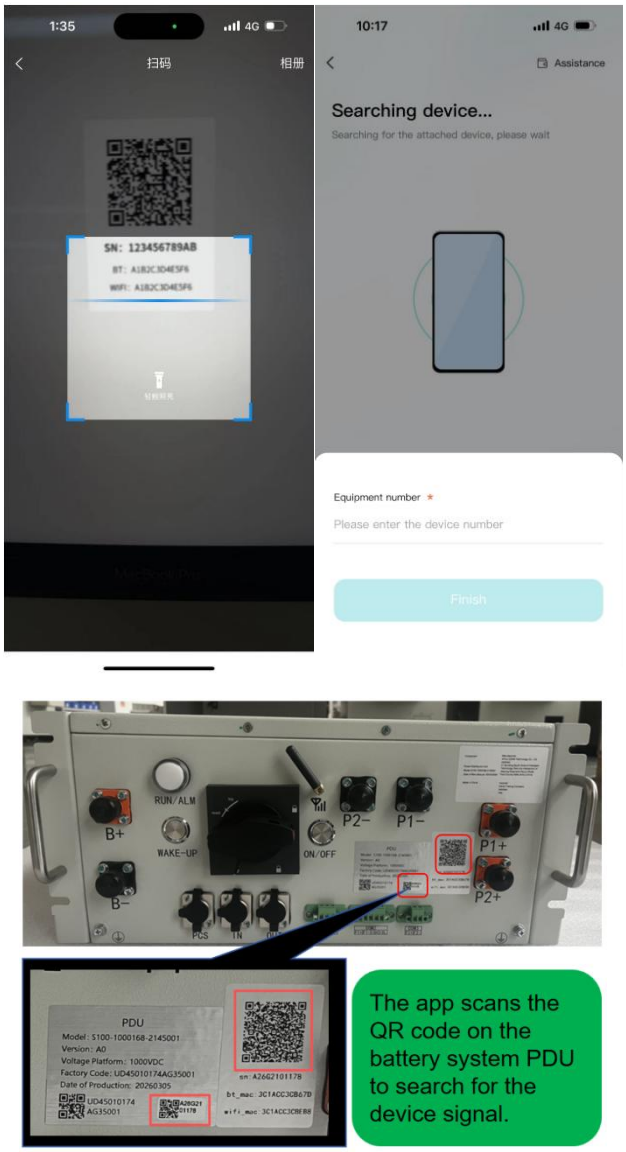
1. Preparation Before Distribution: Ensure the device is **powered on**, and enable the mobile phone's **Bluetooth and Wi-Fi functions**.



2. Connected devices: The current App supports Bluetooth search, device scanning, and manual input of SN code .

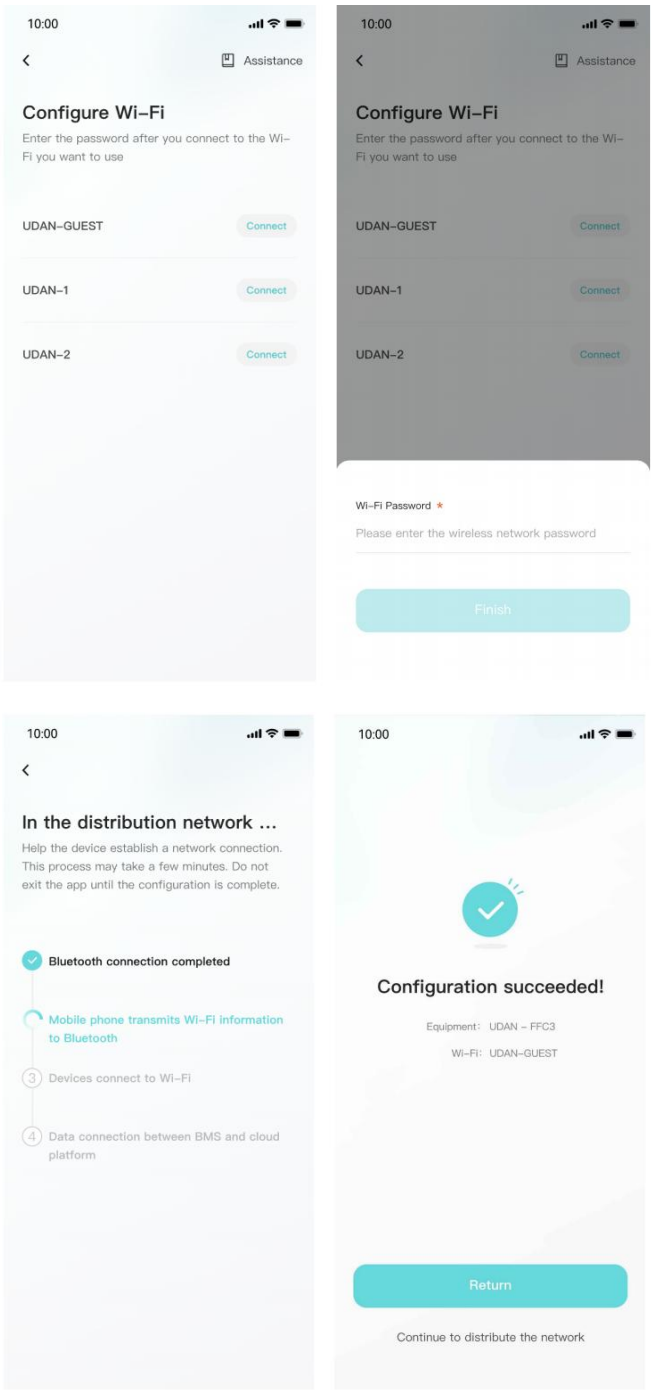


Connect after scanning the code.



Two Methods for Adding SN Codes

3. Connect to WiFi: After the device is connected, enter the WiFi connection process.
   - Select the WiFi you want to use and click the "Connect" button. Enter the WiFi password and click the "Finish" button to distribute the network.



4. App page

4.1. Equipment

The device homepage is used to display the currently managed device information.



- The top area displays the device name, battery energy, and message entry



- Middle area: Displays the current battery charging and discharging status, battery percentage, current power, and estimated full time.

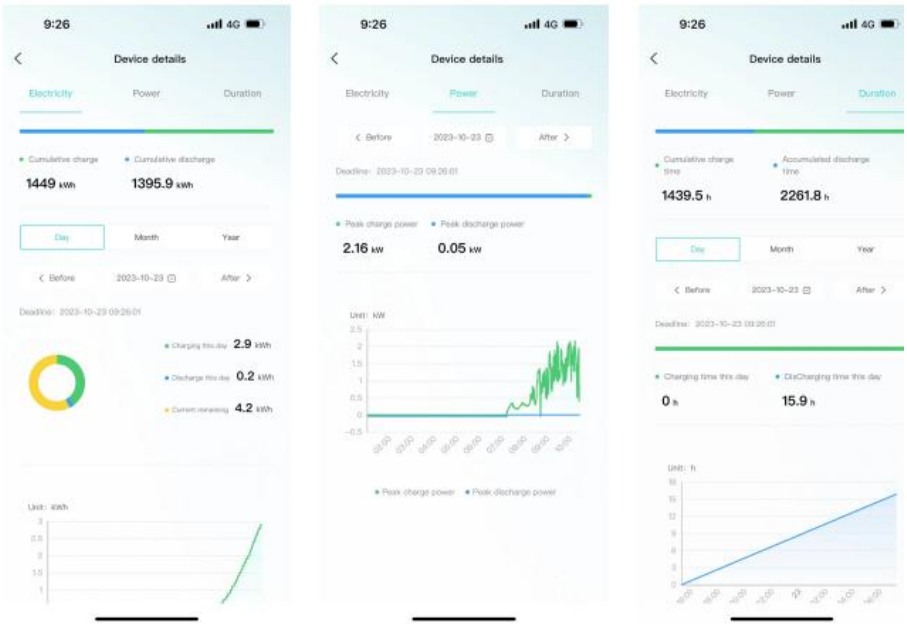


- The bottom area: Displays the device battery, charging time, and health check overview data of the day in the form of a card. You can click the corresponding card to view the details.



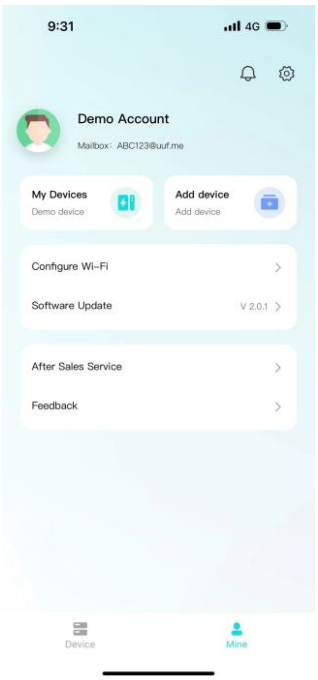
4.2. Data details

Display the data details of the current device, and view the battery, charging and discharging power, and charging and discharging time data separately, and support time filtering.



4.3. Mine

My page allows users to view my devices, add devices, configure WiFi, software updates, after-sales services, problem feedback, app settings .



- Click "My Devices" to access the Device Management page. Here, you can view all devices managed under your current account, switch the device displayed on the Home screen, unbind devices, and perform other related operations.

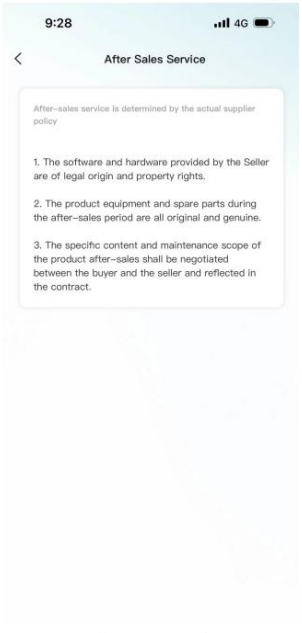


- Click "Add Device" to enter the code scanning page.
- Click "Equipment Distribution Network" to enter the equipment distribution network process.





- After clicking "software update", it will enter the version detection. If there is a new version, it will be updated.
- Click "after-sales services" and enter the after-sales services page to display the after-sales services declaration of the current supplier.

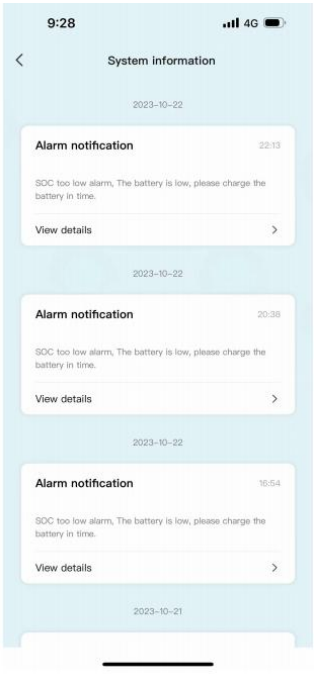


- Click "Feedback" to enter the feedback page. You can enter the current problem that needs feedback and submit it.



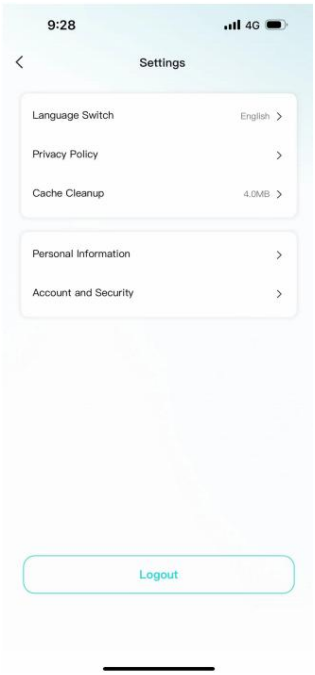
4.4. Message

Click on the device or my page, the message icon above, you can enter the inbox page to view the current notification or chat history.



4.5. App settings

- Click My Pages - Settings icon in the upper-right corner to enter the App Settings page.
- Settings page support: language switching, Privacy Policy, cache cleaning, personal information, account and security.



Note: If you need to use the PC client to create a sub-account for querying BMS parameters, please contact Lithtech to register the account.