Installation Manual.

R-MP233125A0-US

MPack 233A

2025 1ST EDITION

E-mail: support@renon-usa.com

Buyer:

_____

Supporter:

Renon Power Technology Inc.

Renon Power

We Care About Sustainability

With our own R&D team and automatic production factory, we are dedicated to delivering innovative, reliable, and affordable energy storage solutions to global customers.

At Renon, we believe that sustainable energy is the future. We are passionate about reducing carbon emissions and preserving our planet for future generations. That's why we invest heavily in research and development, leveraging the latest technologies to design and manufacture energy storage systems that are efficient, scalable, and adaptable.

Our products are designed to meet the needs of a wide range of applications, from residential and commercial buildings to industrial facilities and utility-scale projects. Whether you're looking to reduce your energy bills, increase your energy independence, or support your sustainability goals, Renon has the right solution for you.

Our commitment to quality and customer satisfaction is unwavering. We work closely with our clients to understand their unique needs and provide customized solutions that meet or exceed their expectations. We also provide comprehensive technical support, maintenance, and warranty services to ensure that our customers get the most out of their investment.

Join us on our mission to make renewable energy within reach.

PROVIDE INNOVATIVE, RELIABLE, AND AFFORDABLE ENERGY STORAGE SOLUTIONS TO CUSTOMERS

Renewable · Reliable · Remarkable

CONTENTS

1. Safety Precautions

1.1 General Statement

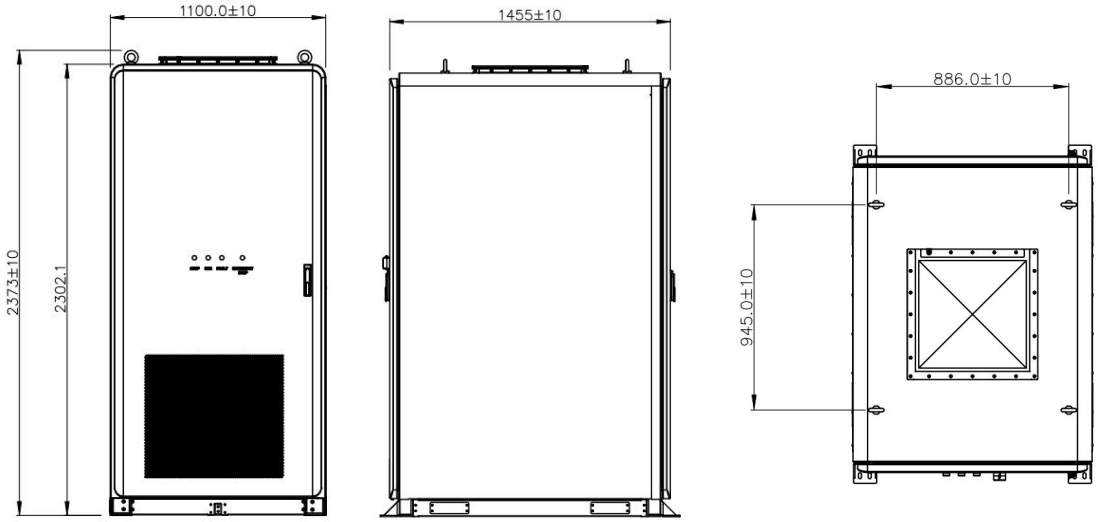
- Due to the product version upgrade or other reasons, the document content will be updated irregularly. Without special agreement, the document content cannot replace the safety precautions in the product label or user manual. All descriptions in the documentation serve as use guides only.
- Please read the quick installation instructions carefully before installation.
- All operations of the equipment must be carried out by professional and qualified electrical technicians, who shall be familiar with the relevant standards and safety specifications in the location of the project.
- Before installing the equipment, check whether the deliverable type is consistent with the order and the quantity is complete and the appearance is damaged. If anything is abnormal, please contact the after-sales service center.
- When operating the equipment, use insulation tools and wear personal protective equipment to ensure personal safety. Contact electronic devices should wear electrostatic gloves, electrostatic bracelet, anti-static clothing, etc., to protect the equipment from static electricity damage.
- Equipment damage or personnel injury caused by the failure to install, use or configure the equipment according to the requirements of this document or the corresponding user manual is not within the scope of responsibility of the equipment manufacturer.

1.2 Security Statement

- When operating the equipment, please observe the safety precautions listed in this manual and other relevant documents of the equipment and the safety marks on the product.
- To protect the equipment from damage during transportation, ensure that the transport personnel are professionally trained. Record the operation steps during transportation and keep the equipment balanced to avoid the equipment drop.
- The energy storage system is heavy equipment, please use appropriate equipment and tools and take protective measures during installation and maintenance. Improper operation can cause personal injury or product damage.
- Equipment shall be installed on a concrete or other non-combustible surface base.
- Before installation, ensure that the base is horizontal, firm, smooth, dry, with sufficient bearing force, and prohibit depression or tilt.
- Do not place the equipment in a high temperature environment to ensure that there is no heat source near the equipment.
- After the installation of the equipment, ensure that the labels and warning signs on the box must be clearly visible, and shielding, alteration and damage are prohibited.
- There is a fatal high voltage inside the equipment, there is an electric shock danger, do not touch at will.
- Before operating the equipment, ensure that the system is grounded reliably, and take relevant protective measures. Otherwise, there may be a danger of electric shock.
- When operating the equipment, ensure that the equipment is in no damage, without failure, otherwise there may be a risk of electric shock and fire.
- Ensure that all switches of the equipment are disconnected before installation, wiring or maintenance.
- Do not open the equipment cabinet door during the equipment operation and touch any wiring terminals or components. Otherwise, there will be a danger of electric shock.
- Non-professionals should not open the cabinet door to touch the cabinet parts without permission, otherwise there may be a risk of electric shock.
- Do not disassemble or modify any part of the equipment without the official authorization of the equipment manufacturer. The damage caused is not within the responsibility of the equipment manufacturer.

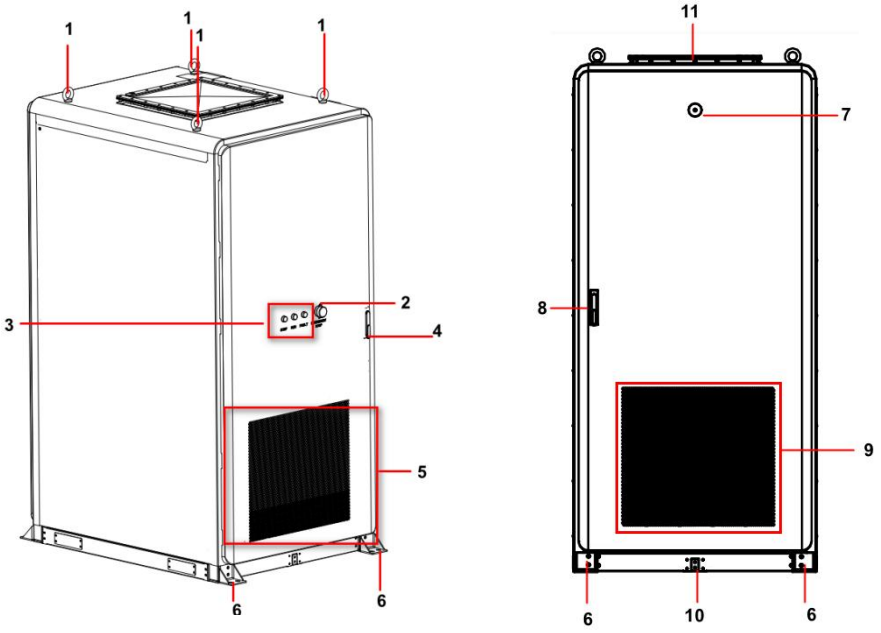
2. Product Profile

2.1. Size



Front View　　Side View　　Top View

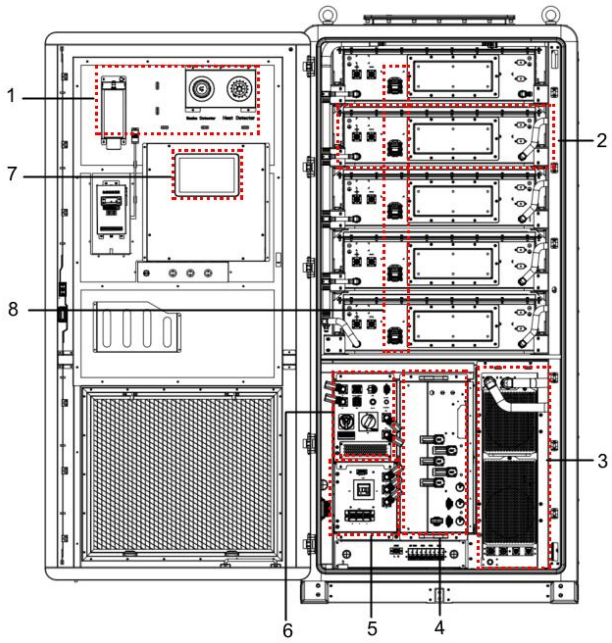
2.2. Surface



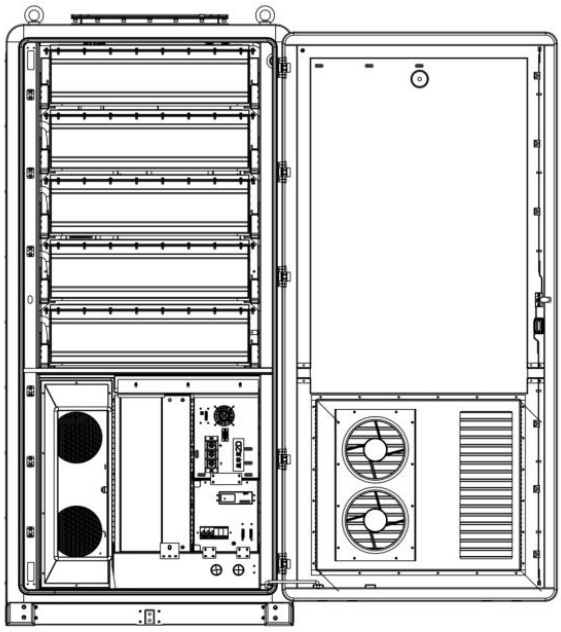
Front View　　Back View

No.	Name	Instructions
1	Lifting Ring	Can use lifting rings for hoisting the energy storage system.
2	Emergency Stop	When an emergency occurs in the energy storage system, this button can be used to stop the system from operating.
3	LED indicator	Stop Light、Fault Light、Run Light
4	Front door Lock	Please use a key to unlock the equipment door. When no internal operation is needed, please close and securely lock the equipment door.
5	Air Intake	Introduce external air into the internal part of the energy storage system.
6	Mounting Hole	Fix mounting
7	WIFI	Can connect to WiFi to improve wireless communication signal strength.
8	Rear Door Lock	Please use a key to unlock the equipment door. When no internal operation is needed, please close and securely lock the equipment door.
9	Air Outlet	Emit the air that has been heated or circulated from within the energy storage system.
10	Ground Terminal	For Equipment Grounding
11	Explosion Vent Panel	ESS explosion vent rapidly relieves pressure during thermal runaway.

2.3. Introduction to Key Components



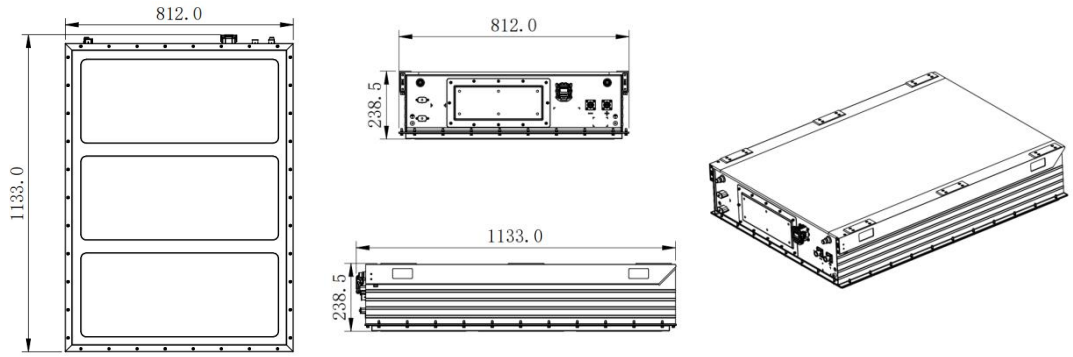
Front View



Back View

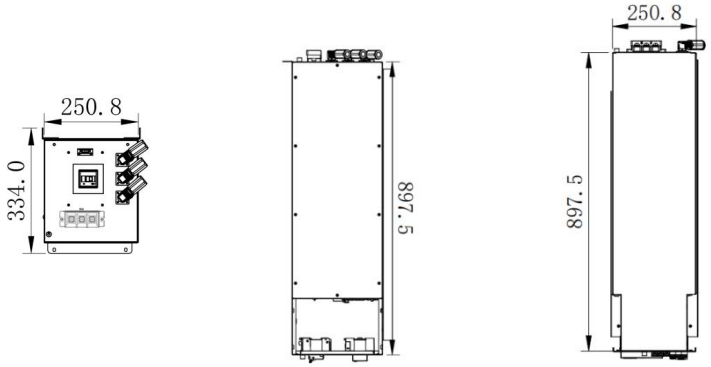
No.	Name	Remarks
1	Fire Protection System	Heat Detector、Smoke Detector and Aerosol
2	Battery Module	
3	Chiller	
4	PCS	Power Conversion System
5	AC Distribution Box	
6	DC Main Control Box	
7	Cabinet-level EMS	Energy Management System
8	MSD	Battery Maintenance Switch Disconnect Device

2.3.1. Battery Module



No.	Project	Parameters	Remarks
1	Configuration	1P52S	
2	Rated Energy (kWh)	46.6	25℃
3	Rated Voltage(V)	166.4	For cell 3.2V
4	Allowable voltage range(V)	140.4-187.2	For cell 2.7V-3.6V
5	Dimension (W*D*H)	32.0in × 44.6 in × 9.4 in (812.0mm × 1133.0mm × 238.5mm)	
6	Weight	727.53lb（330kg）	

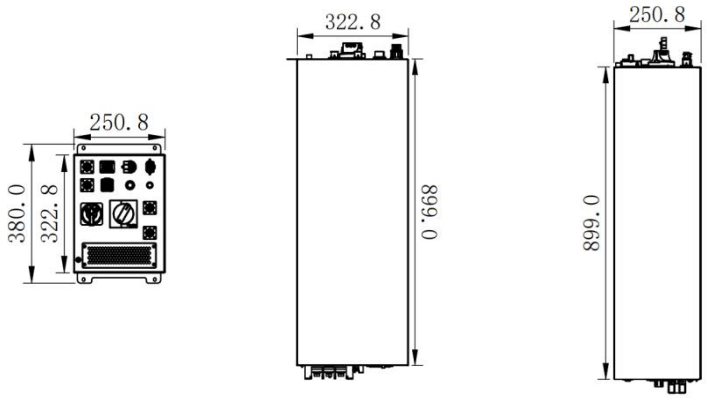
2.3.2. AC Distribution Box



Front View Side View Top View

No.	Project	Parameters
1	Dimension (W*D*H)	13.2 in× 35.3 in× 9.9 in (334.0mm× 897.5mm× 250.8mm）
2	Operating current(A)	250A
3	Operating Voltage(V)	480V

2.3.3. DC Main Control Box



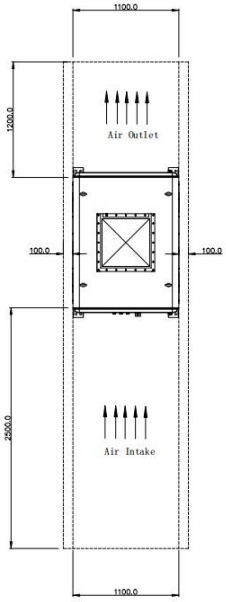
Front View Side View Top View

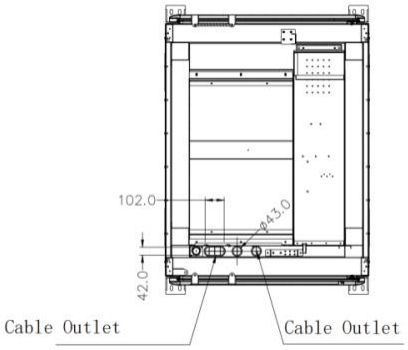
No.	Project	Parameters
1	Dimension (W*D*H)	35.4in× 9.9in× 15.0in (899.0mm× 250.8mm× 380.0mm)
2	Operating current(A)	250A
3	Operating Voltage(V)	1000V

3. Install

3.1. Install the Base Requirements

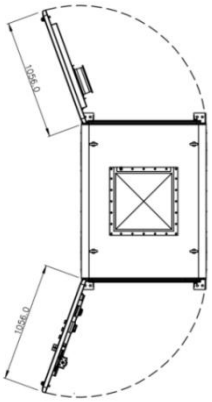
To ensure better airflow, it is recommended to reserve sufficient space around the cabinet's installation location.

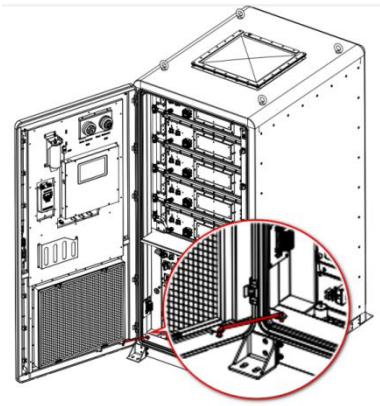




- Minimum Space Requirement for Single Cabinet Installation
- System Air outlet and intake Illustration
- Bottom Cable Entry and Exit Diagram Description

3.1.1. Door Opening Angle

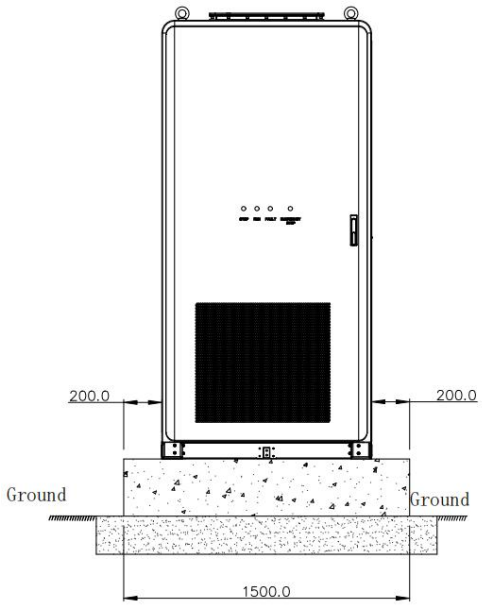




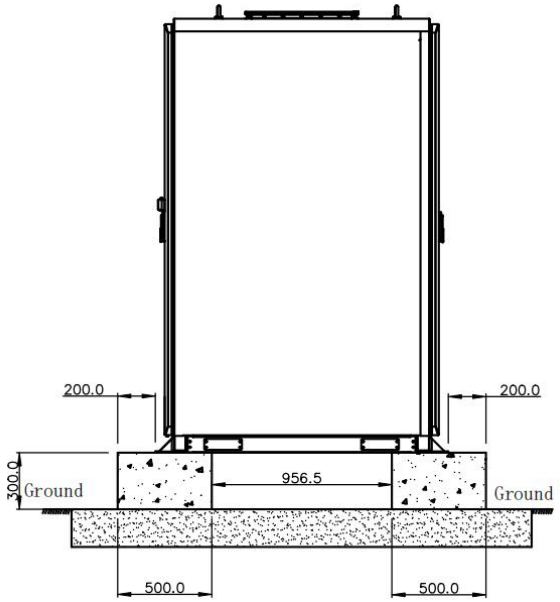
- Maximum Door Opening Angle(<110°)
- Door hook: prevent the door from slamming shut in the wind.

3.1.2. Base Requirements

The base of the battery cabinet can be constructed using either concrete or channel steel. The attached diagrams and table specify the requirements for concrete base, including but not limited to: soil compaction standard, materials, surface tolerance, and load-bearing capacity (5952 ± 3%lb/2700kg±3%). If steel channel brackets are selected as an alternative solution, they must meet equivalent key performance criteria.



Front View



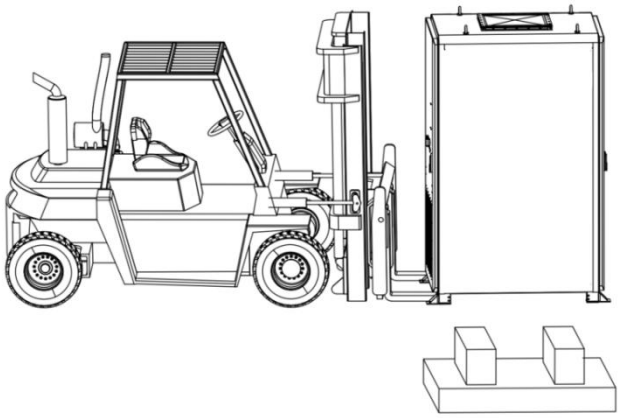
Side View

Notice		
1	Excavation & Soil Compaction	➢ During base excavation, the base soil must be compacted (mechanically stabilized). ➢ Loose, wet, or organic soils require ground improvement (e.g., soil replacement or stabilization). ➢ The base site shall be located at the highest elevation of the surrounding area to prevent water accumulation.
2	Materials	➢ Base Layer: 7.9 in(200mm) thick C15 lean concrete (subgrade support). ➢ Main Structure: C30 structural concrete, minimum bearing capacity of 5.688psi(4000kg/m²).
3	Surface Tolerance	➢ The base surface must be leveled with a spirit level, ensuring flatness within 0.12in(3mm) deviation.
4	Load-Bearing Requirements	➢ The concrete pedestal shall be horizontally leveled and evenly textured to distribute the product's total weight (5952±3%lb/2700±3%kg) uniformly.
5	General Notes	➢ This drawing is a schematic guide for product positioning. Final base design must comply with local codes and site-specific geotechnical conditions. ➢ Anchor Bolts: Use stainless steel M12×150 expansion anchors to secure the energy storage cabinet. ➢ Fireproofing: After installation, seal all wire penetrations with fire-rated duct sealant (Fireproof putty). ➢ Disclaimer: This base plan is for reference only. Final design adjustments may be required based on soil reports and local regulations.

3.2. Lifting Operation

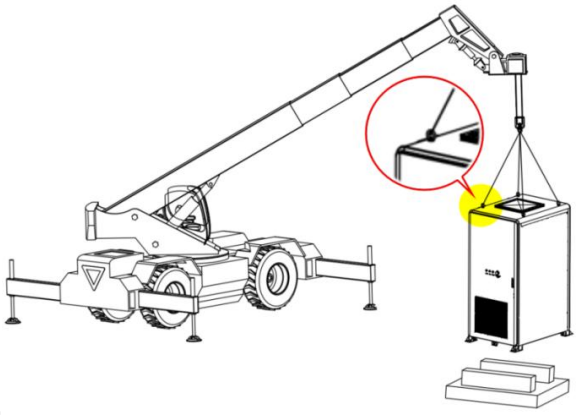
Notice
➢ Throughout the entire process of lifting the Battery Energy Storage System (BESS), it is essential to strictly adhere to the safety operating procedures of the crane. ➢ No personnel are allowed to stand within a 5-meter to 10-meter radius of the operating area. In particular, standing under the lifting boom or beneath the machine being lifted or moved is strictly prohibited to avoid any risk of injury or fatalities. ➢ In the event of adverse weather conditions, such as heavy rain, dense fog, or strong winds, lifting operations must be suspended.

3.2.1. Forklift Transport



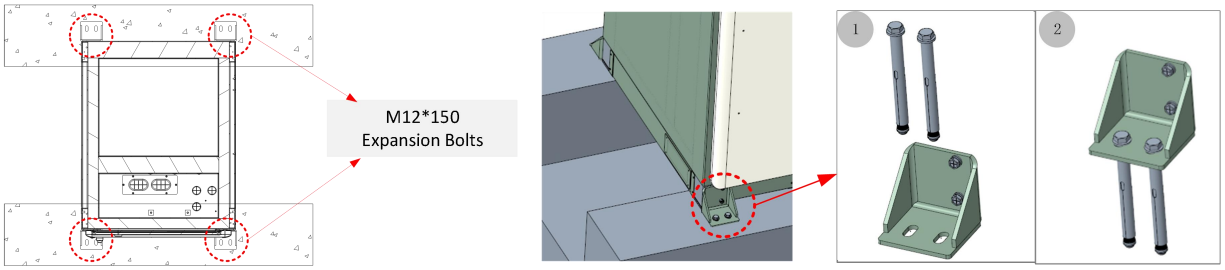
- Forklift Selection: Choose a forklift based on the installation area's space constraints. It is recommended to use an internal combustion engine-driven forklift with a rated load capacity exceeding 6600lb(3000Kg).
- Fork Arm Requirements: The fork arms must be longer than 63in(1600mm) and the width is 25.6in-29.5in (650mm-750mm).
- Forklift Angle: Lift from the front/back of the battery cabinet, not the side of the cabinet（as shown in the diagram on the left）
- Prohibition of Forklift Movement After Cable Connection

3.2.2. Crane Transport

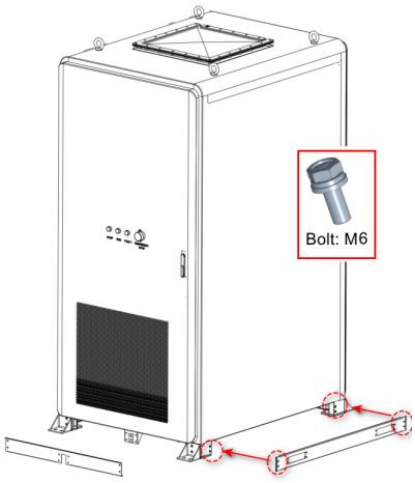


- Select a crane with a load capacity of ≥11023lb(5000kg).
- Use four lifting slings, with each sling having a recommended load capacity of ≥3306.9lb(1500 kg).
- Use the four standard lifting lugs located on the top of the cabinet as lifting points.
- Attach each lifting strap between a lifting lug and the crane hook.

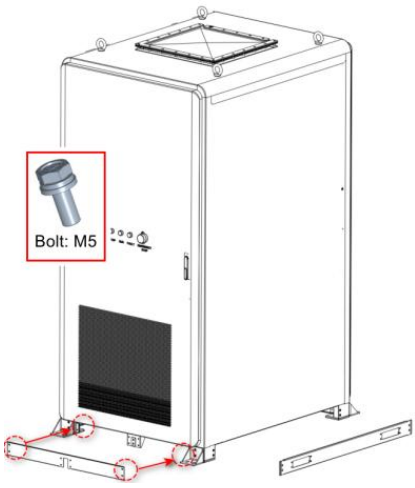
3.3. Secure the Cabinet



3.4. Install Enclosure Panels



Secure the left and right side panels using M6 bolts.



Secure the front and rear side panels using M5 bolts.

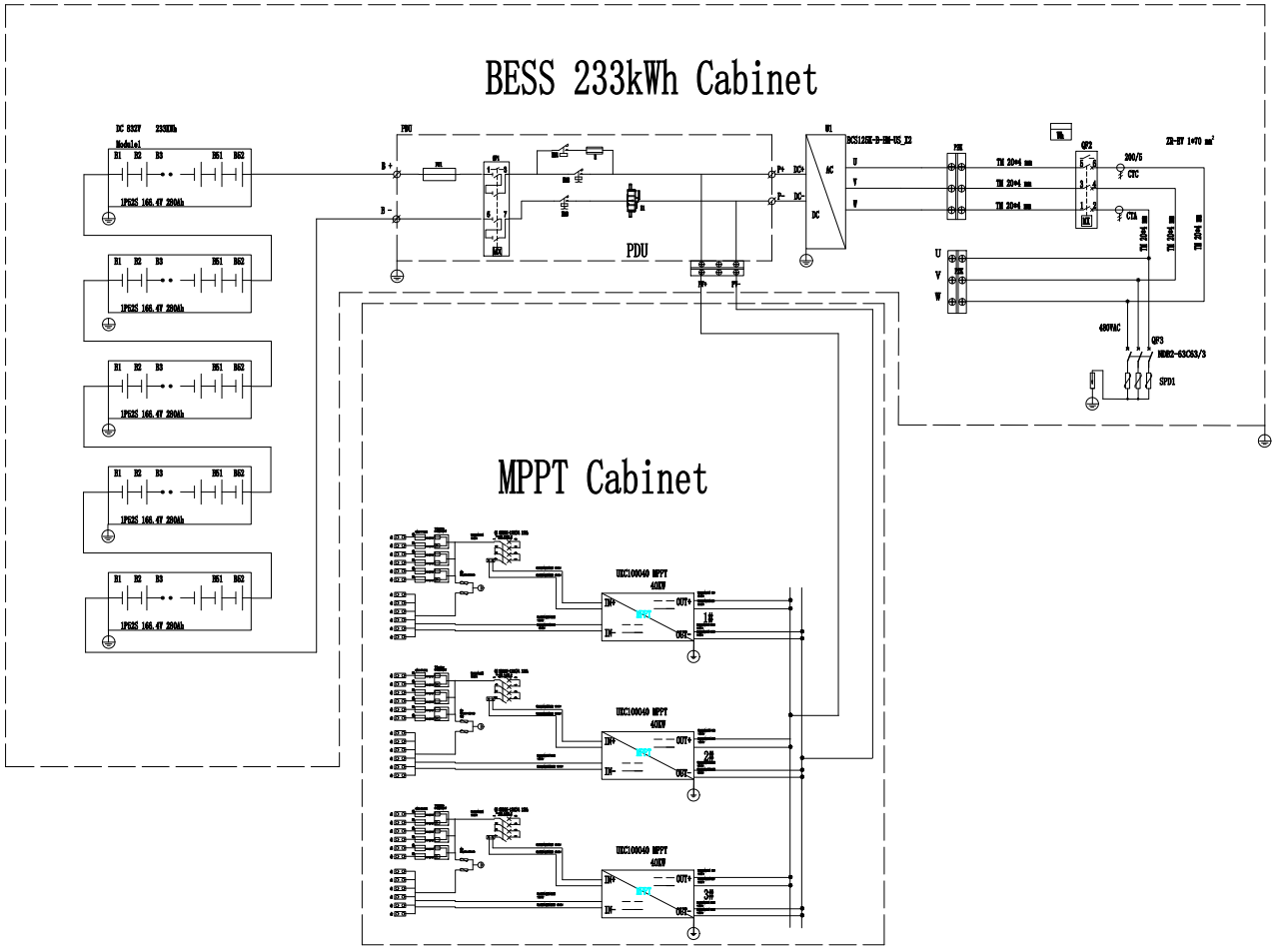
3.5. Electrical connection

Danger

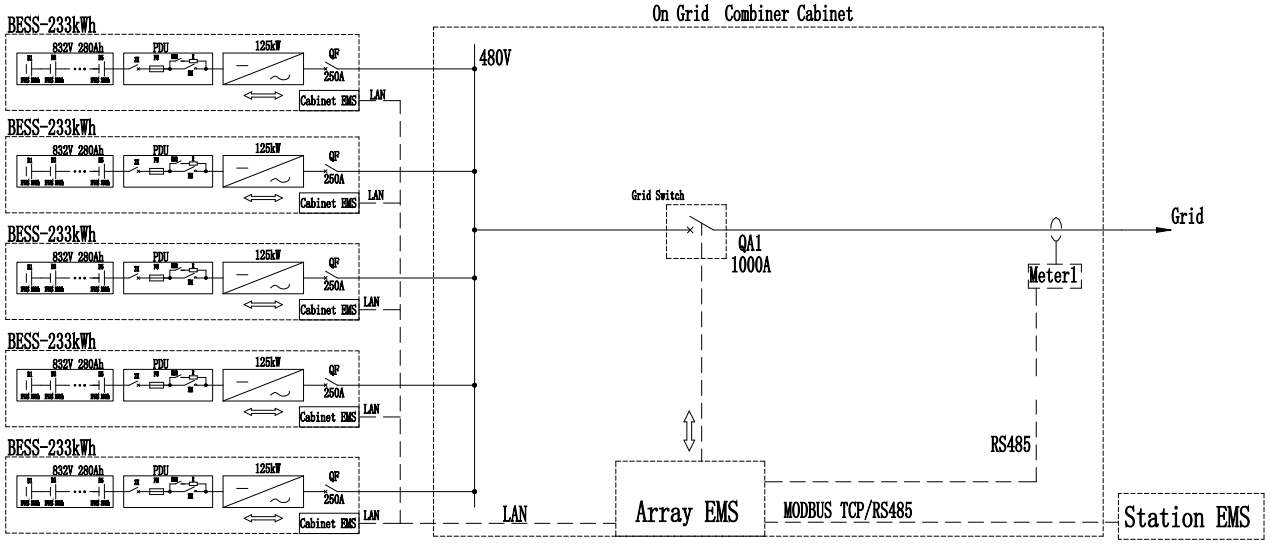
- Do not touch live parts.
- Before wiring, ensure the polarity of all input cables is correct for each circuit.
- Never pull cables or wires forcefully to prevent insulation damage.
- Ensure all cables/wires have sufficient bending space/flexibility to avoid strain.
- Use strain relief measures (e.g.,ties) to minimize mechanical stress on cables.
- After each wiring step, inspect connections to ensure they are secure and correctly installed.

3.5.1. Electrical Wiring Diagram

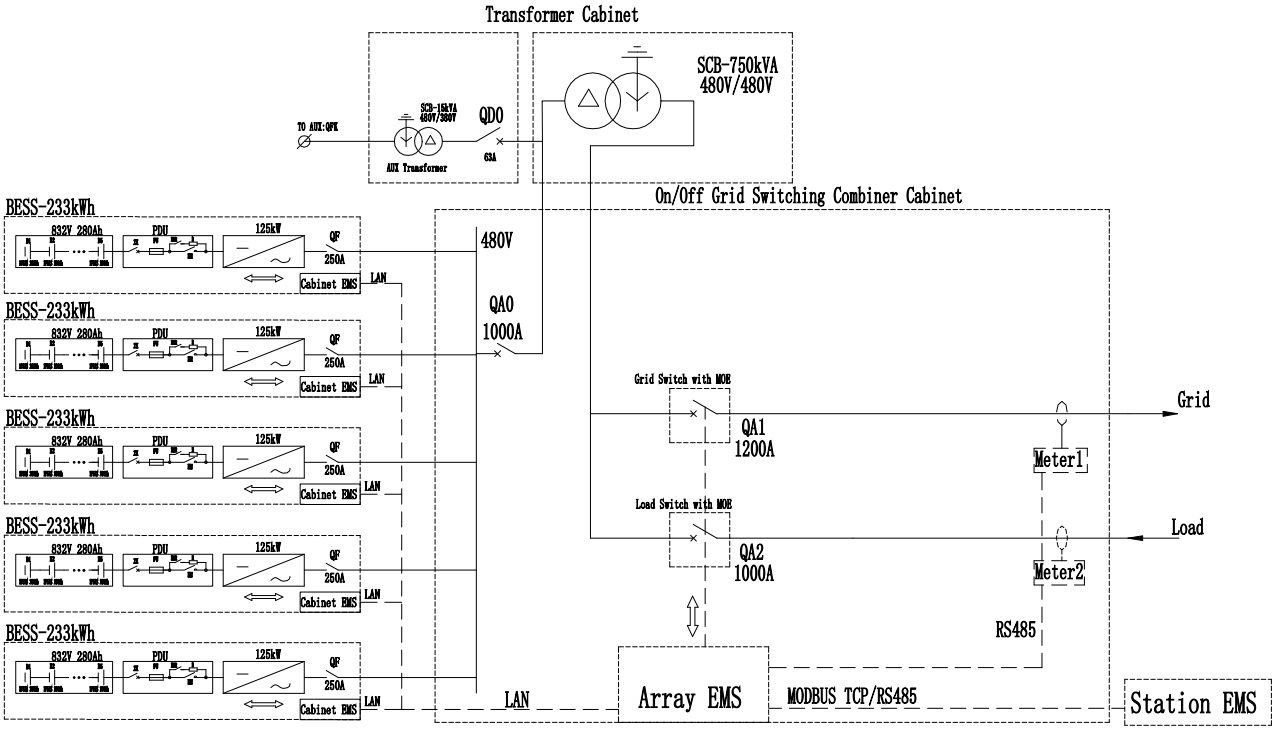
(1) Single battery cabinet&MPPT



(2) US-compliant 5×233kWh grid-connected ESS(480V ON Grid)



(3) US-compliant 5×233kWh hybrid on/off-grid ESS (480V ON/OFF Grid)



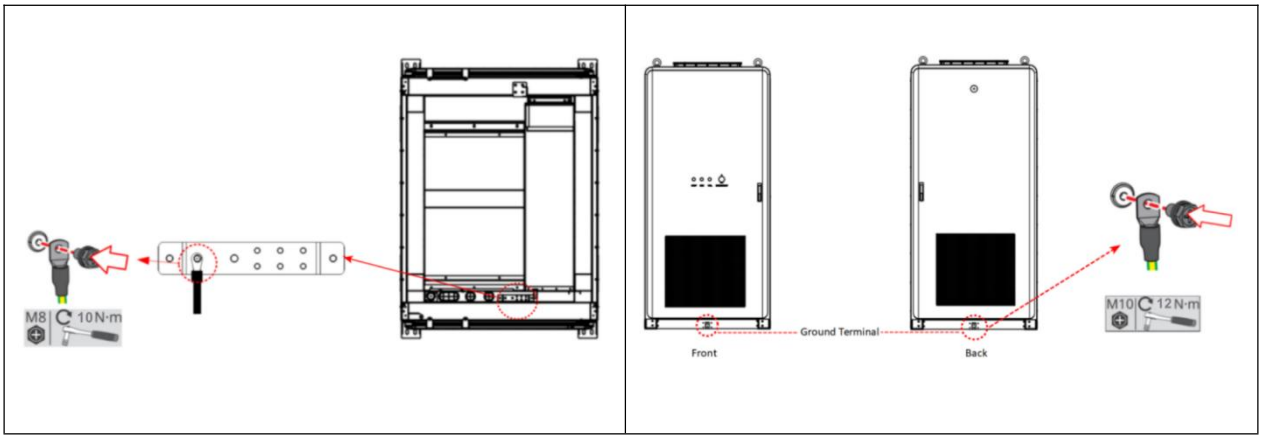
Danger

- All electrical connections must be strictly made in accordance with the wiring diagram/schematic.
- All electrical connections must be performed only when the equipment is completely de-energized (no power supply).

3.5.2. Pre-Wiring Preparation

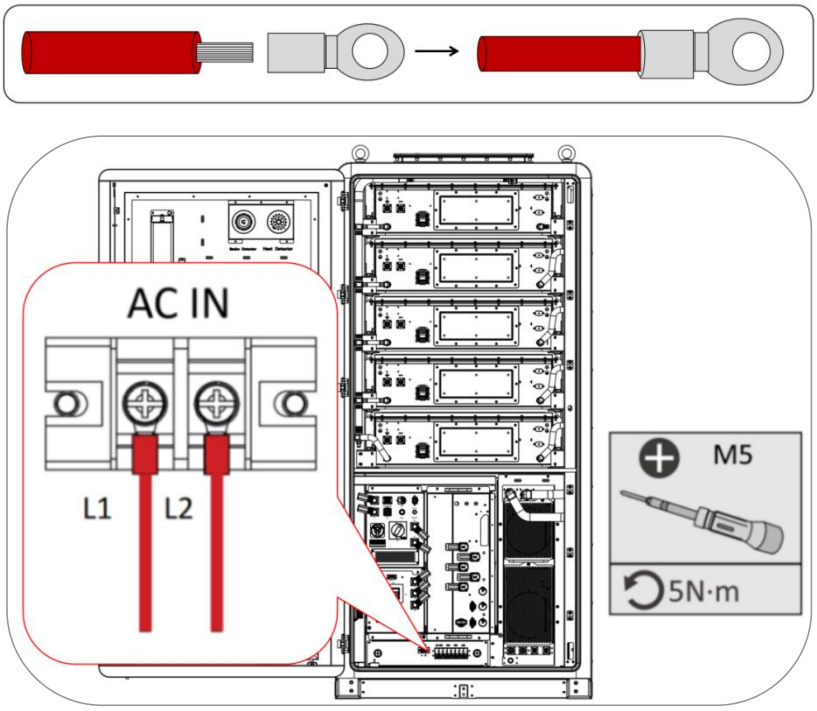
3.5.3. Grounding Wire Connection

Recommended Wire Gauge ≥ 2AWG.



3.5.4. Auxiliary Power Supply Wire Connection

Connect the auxiliary power supply wire to the port located on the inner side of each battery cabinet.

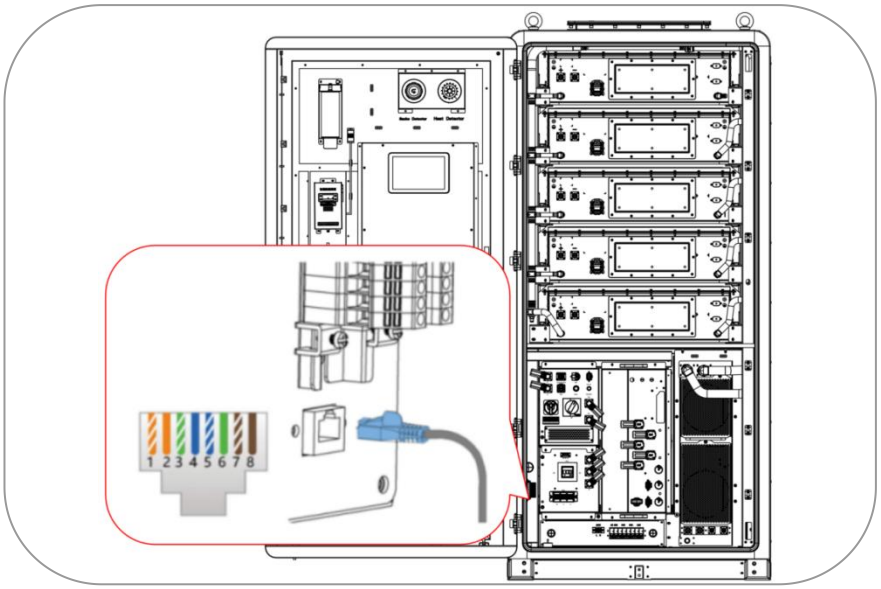


No.	Name	Specification
1	Recommended Wire Gauge	12AWG
2	Connection terminal	RNB5.5-5

3.5.5. Communication Wire Connection

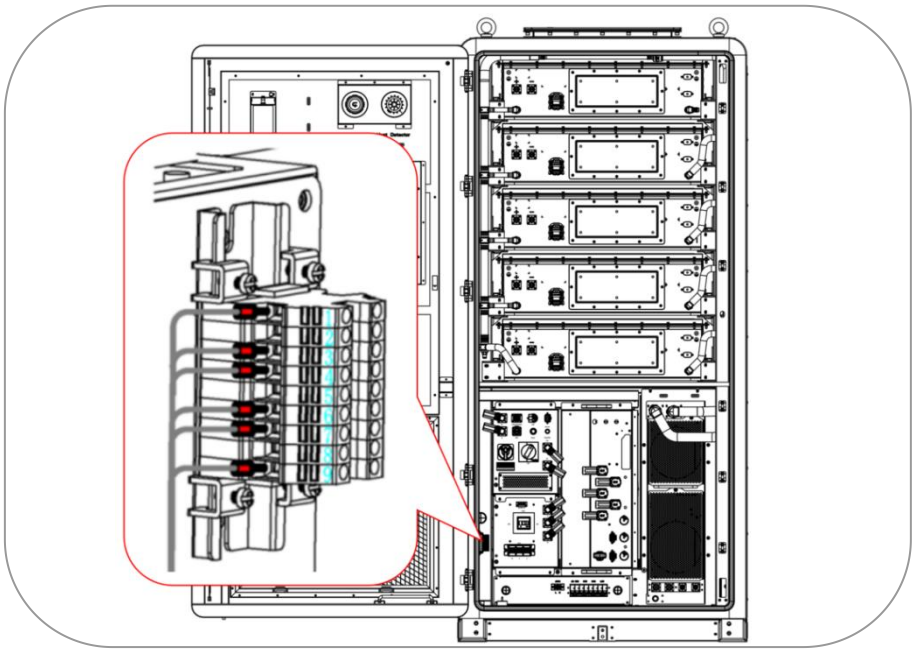
3.5.5.1. LAN Communication Wire Connection

When connecting the LAN communication wire, the wire routing path should avoid interference sources, power wires, etc., to avoid affecting the signal reception.

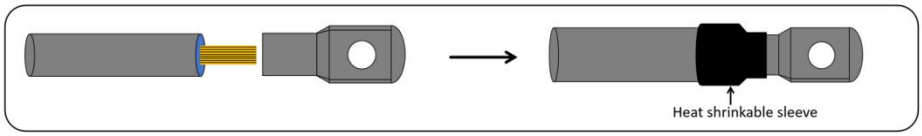


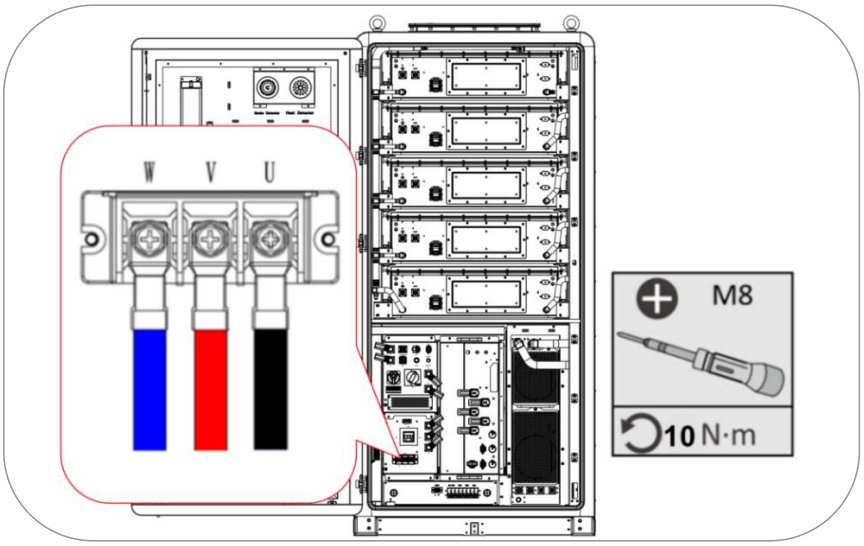
3.5.5.2. RS485 Communication Wire Connection

Note
● RS485 communication cable please use Two-Core Shielded wire. ● The recommendation is to use 20AWG.



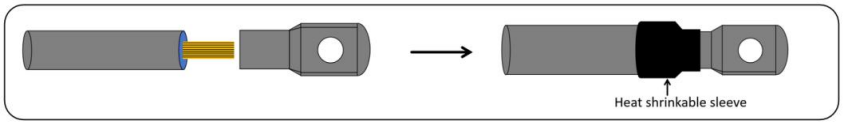
3.5.6. AC Wire Connection

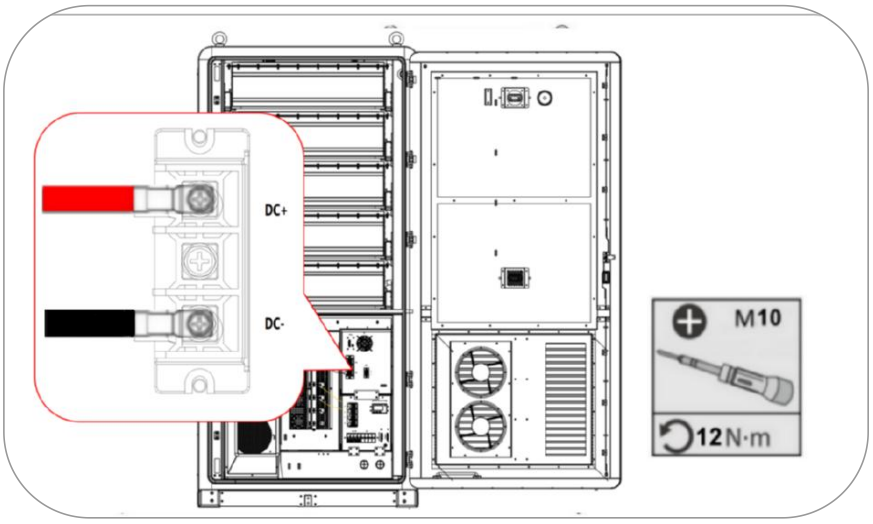




No.	Name	Specification
1	Recommended Wire Gauge	U/V/W:2/0 AWG
2	Connection terminal	SC70-8

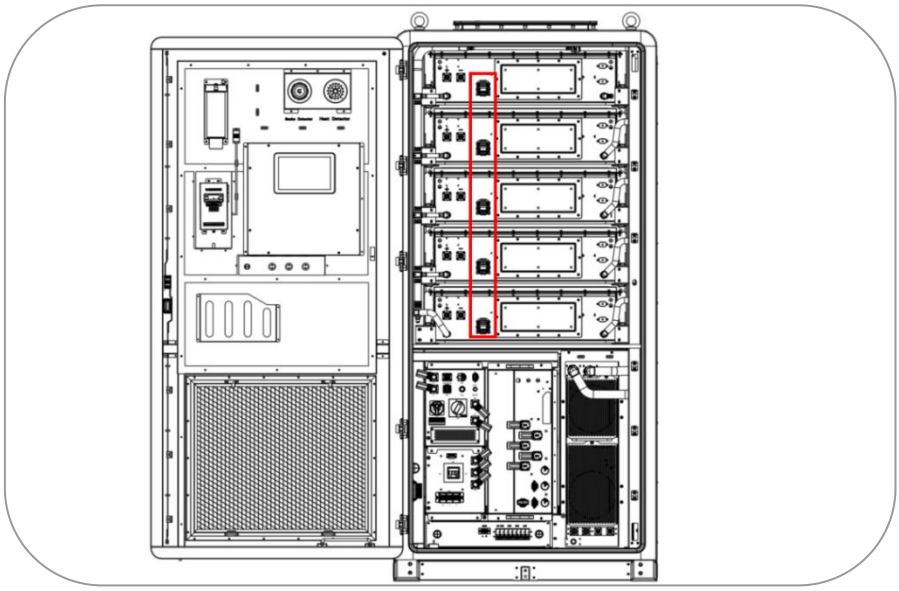
3.5.7. DC Wire Connection





No.	Name	Specification
1	Recommended Wire Gauge	4/0AWG
2	Connection terminal	DT120-10

3.5.8. Battery Maintenance Switch Disconnect Device (MSD)



Note
● Installation of MSD should be conducted after the fixation of racks and harness.

Install the MSD cover onto the battery module by:

1. Aligning the maintenance switch cover handle vertically with the base guide slot and pushing inward
2. Rotating the handle after full insertion
3. Audibly confirming the 'click' engagement
4. Securing the secondary lock (reverse for removal)

4. Test Operation of Equipment

4.1. Check Before Charging

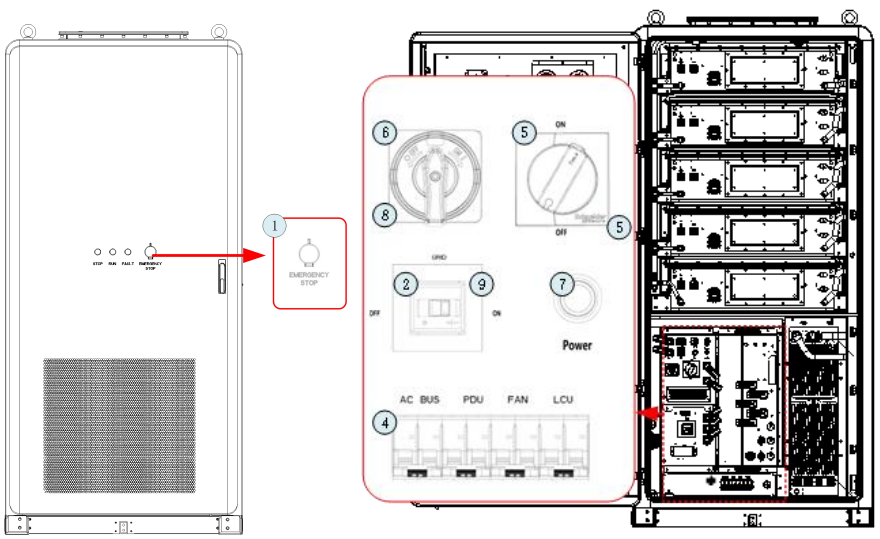
No.	Check items
1	The equipment is installed firmly installed, the installation position is convenient for operation and maintenance, the installation space is convenient for ventilation and heat dissipation, and the installation environment is clean and tidy.

2	Protect the ground wire, grid-connected AC wire, load wire and communication wire are correctly and firmly connected.
3	Cable binding meets the wiring requirements, reasonable distribution and no damage.
4	Battery cluster switch, AC switch and DC power switch have been disconnected.
5	The voltage and frequency of the grid-connected access point of the battery racks meet the grid-connected requirements.

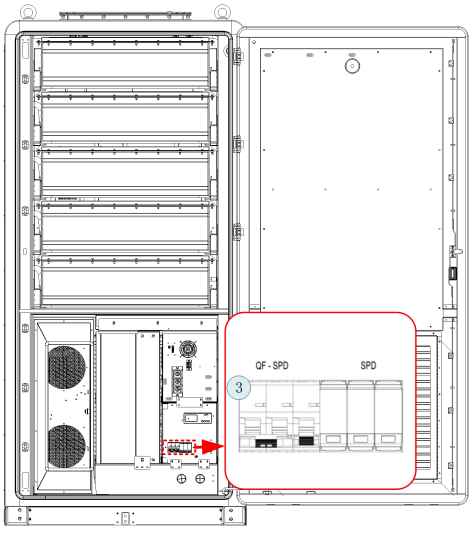
4.2. Power on the equipment

Power on Steps:

1. Verify the emergency stop button, and ensure it's release.
2. Verify the AC circuit breaker is in OFF position.
3. Inspect the rear cabinet's lightning protection (QF -SPD) disconnect switch status.
4. Turn on the AC auxiliary power breakers (front and rear), following this sequence: ①First turn on the AC BUS disconnect switch ②Then turn on all other switches.
5. Switch the DC circuit breaker to the ON position.
6. Move the DC isolation switch to the ON position.
7. Press the DC main control box power switch.
8. Return the DC isolation switch to the OFF position.
9. Switch On the AC circuit breaker.



Front View

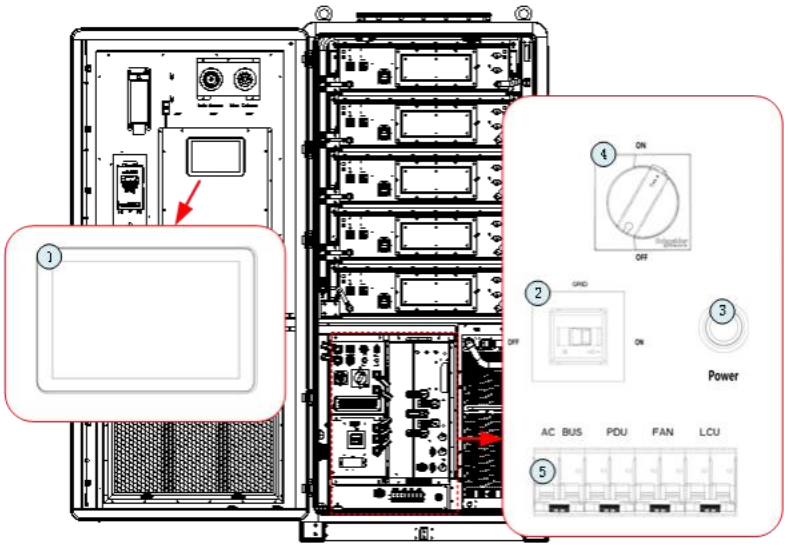


Back View

4.3. Power Down the equipment

Power down Steps:

1. Shut down the system via the display interface (do not power off while high-power loads are active).
2. Open the AC circuit breaker to disconnect it.
3. Press the DC main control box power switch to turn it off.
4. Rotate the black DC breaker knob to the OFF position.
5. De-energize the AC auxiliary power breakers (front and rear), following this sequence: ①First turn off the AC BUS disconnect switch ②Then turn off all other switches.

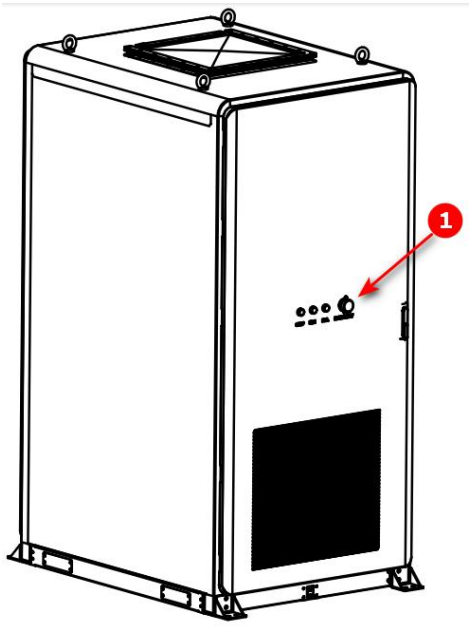


Back View

4.4. Equipment door-close

Note
➢ After the energy storage system is powered on, if there is no abnormal situation, please close the equipment door.
➢ Close the equipment door and keep the key properly.

4.5. Emergency Stop

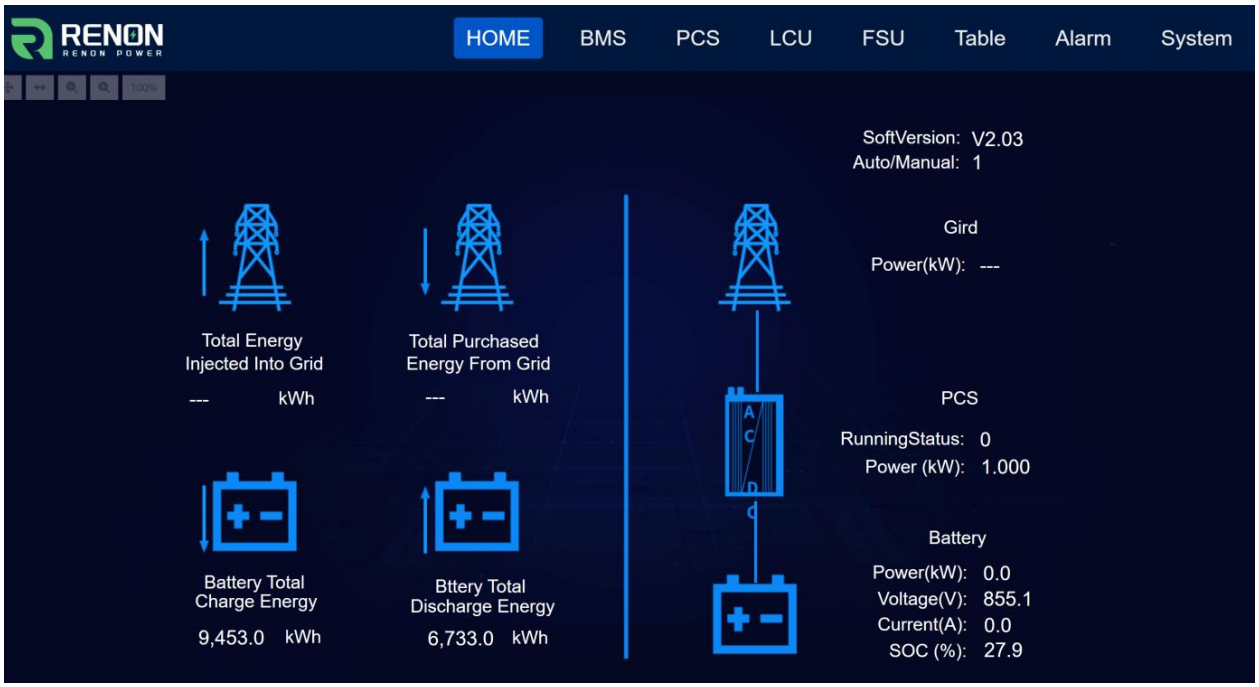


5. User Interface

Note
➢ Screenshots in this manual are for reference only. Actual features are subject to the latest app version.

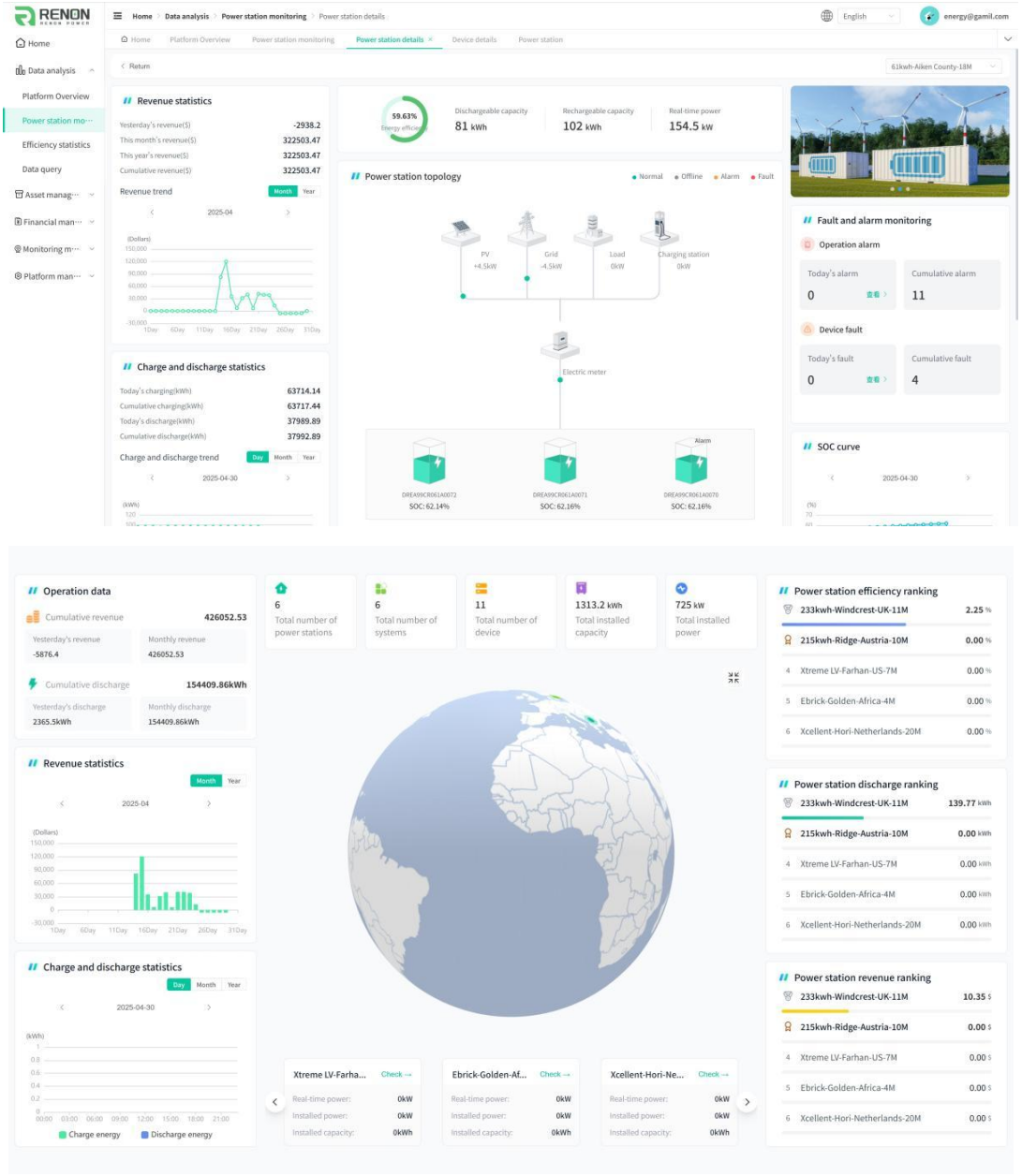
5.1. Local Touchscreen

The Overview menu is the home page of the energy storage system EMS, providing a quick overview of the system's overall status, including operating mode, component connections, key performance parameters, software version, device SN, and operating mode (Auto/Manual). It also displays the number of alarms and faults, as well as the topology relationships between the inverter, battery pack, PV components, and load, enabling easy monitoring and troubleshooting.

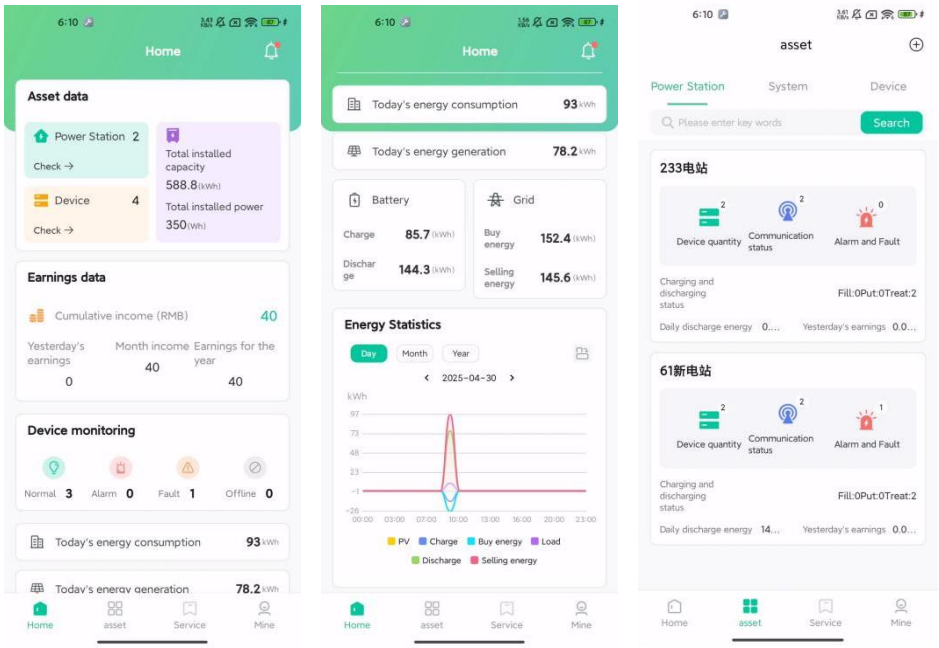


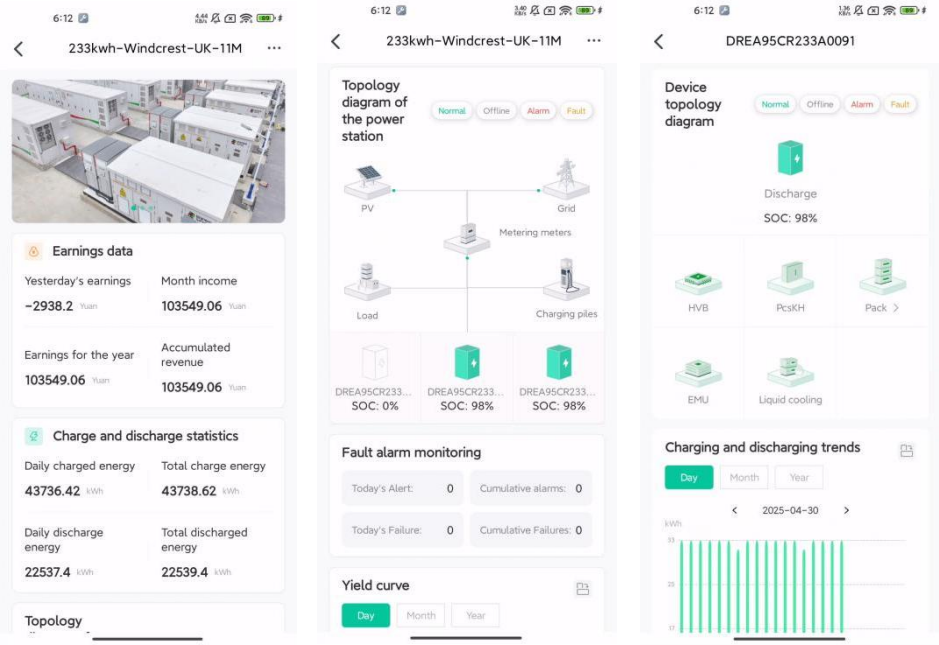
5.2. Cloud Interface

The cloud platform offers functions such as platform overview, data monitoring (displayed through charts, curves, and other formats), parameter settings, alarm logs, firmware upgrades, VPP configuration, report management, operation logs, and device and station management. These features aim to intuitively present equipment operating status, assist in decision-making, and enhance the system's operational convenience and management efficiency.



5.3. App Interface





6. Emergency Response Measures for Critical Situations

6.1. Electrolyte Leakage from Batteries

If electrolyte leakage occurs, avoid contact with the leaked liquid or gases. Electrolyte is corrosive and may cause skin irritation or chemical burns upon exposure. If accidental contact occurs, take the following actions:

Inhalation: Evacuate the contaminated area immediately and seek medical assistance.

Eye Contact:Flush eyes with clean water for a minimum of 15 minutes and seek immediate medical attention.

Skin Contact: Thoroughly wash the affected area with soap and water, then seek medical assistance promptly.

Ingestion: Induce vomiting and seek emergency medical care immediately.

6.2. Fire Incident

Battery fires may release toxic and hazardous gases.

In the event of a fire, immediately contact the fire department, inform emergency responders, and provide product-specific details.

If safe to do so, disconnect upstream and downstream equipment switches to isolate the system.

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