



INNAGATOR SERIES



USER MANUAL

1MWh400kW Innagator

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ABOUT THIS MANUAL

This manual is intended to guide the operation and maintenance personnel of the 983kWh/400kW energy storage system. It mainly describes the safety, operation, and maintenance of transportation and storage, PCS cabinet, battery cabinet, power control cabinet, fire suppression system, air conditioning, and other components. Before installing and using the energy storage system, read this manual carefully to get familiar with the safety information and functions and features of the energy storage system.

Audience

This manual is intended for qualified technical personnel.




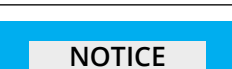
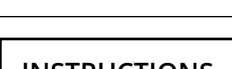
Installation must and can only be performed by professional technicians who meet the following requirements:

- Technical support engineers.
- Hardware installation engineers.
- Commissioning engineer.
- Maintenance engineer.

Symbol Specification

In order to ensure the personal and property safety of users when using this product, and to ensure the best and effective use of this product, this manual provides users with relevant safety information, highlighted by the following symbols.

Below is a list of symbols used in this manual. Please read it carefully to make the best use of this manual.

	Indicates an immediate and dangerous situation that, if not avoided, will result in death or serious injury.
	Indicates a moderately hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a minor hazard which, if not avoided, could result in minor or moderate injury.
	Conveys device or environment safety warning information. This could result in equipment damage, data loss, performance deterioration, or unanticipated results if not avoided. The notice does not involve personal injury.
	Highlights important information, best practices, and tips. The note addresses information unrelated to personal injury, equipment damage, and environmental damage.

SAFETY PRECAUTIONS

General Safety

Before transporting, storing, installing, operating, using, and/or maintaining the device, read this manual and strictly follow the labels on the device and all safety precautions in this manual. In this manual, "Equipment" means products, software, components, spare parts, and/or services related to this manual. "Company" means the equipment's manufacturer (producer), seller, or service provider.

The terms "Danger", "Warning", "Attention" and "Notice" in this manual do not represent all safety matters that should be followed, and you must also comply with relevant international, national, or regional standards and industry practices. The company does not assume any responsibility for violations of safety operation requirements or violations of design, production, and use of equipment safety standards.

The Company shall not be liable for any of the following circumstances or the results thereof:

- Equipment damage caused by earthquakes, floods, volcanic eruptions, debris flow, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornados, extreme weather, force majeure;
- Does not operate under the conditions of use described in this manual;
- The installation and use environment does not meet the relevant international, national, or regional standards;
- Installation and use of equipment by unqualified personnel;
- Do not follow the instructions and safety warnings in the product and documentation;
- Disassemble or modify the product or modify the software code without authorization;
- Damage caused by transportation by you or a third party entrusted by you;
- Damage caused by storage conditions that do not meet product documentation requirements.
- Your materials and tools do not meet the requirements of local laws, regulations, and related standards;
- Damage caused by your or a third party's negligence, intent, gross negligence, malpractice, or not caused by our company.

Personal Safety



- Do not operate with power on during installation. Electrical installation is prohibited. Remove the cable. The moment the cable core contacts the conductor, it may generate electric arcs, sparks, or fire and explosion, which may cause fire or personal injury.
- When the device is powered on, improper or incorrect operations may cause fire, electric shock, or explosion, resulting in personal injury or property damage.
- Do not wear watches, bracelets, rings, necklaces, and other conductive objects during operation to avoid burns.
- Special insulation tools must be used during the operation to avoid electric shock damage or short circuit faults. Meet local laws, regulations, standards, and regulations.



- Special protective tools, such as protective clothing, insulating shoes, goggles, safety hats, and gloves, must be used during operation. Install ground cables for devices that need to be grounded. When removing the device, the protection must be removed last.

Routine Requirement

- Do not disable equipment protection and ignore the manual and equipment's warnings, cautions, and precautions.
- If any fault is found during the equipment operation that may cause personal injury or equipment damage, terminate the operation immediately, report the fault to the responsible person, and take effective protective measures.
- Do not power on the device before it is installed or confirmed by professional personnel.
- Do not touch the power supply device directly, using other conductors, or indirectly through damp objects. Before touching any conductor surface or terminal, measure the voltage at the contact point to ensure there is no electric shock danger.
- Do not touch the shell when the temperature is too high, which may cause burns.
- Do not touch the fan with your fingers, parts, screws, tools, or boards. Otherwise, hands or equipment may be damaged.
- In case of fire, evacuate the building or equipment area, press the fire alarm bell, or call the fire alarm number. Under no circumstances is it permitted to re-enter the burning building or equipment area.

Personnel Requirement

- The personnel who operate the equipment include professional personnel and trained personnel.
- The personnel responsible for device installation and maintenance must be strictly trained, master the correct operation methods, and understand the safety precautions and relevant standards of the country/region where they are located.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain the equipment.
- Only qualified professionals are allowed to remove safety facilities and repair devices.
- Personnel in special scenarios, such as electrical, climbing, and equipment operations, must have special operation qualifications required by the local country/region.
- Medium voltage equipment operators must hold a high voltage electrician operating certificate.
- Replacement of equipment or components (including software) must be done by authorized professionals.
- Keep away from the device except for the personnel who operate the device.

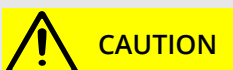
Electrical Safety



- Before making an electrical connection, ensure the device is not damaged. Otherwise, electric shock or fire may occur.
- Non-standard and incorrect operations may cause fire or electric shock.
- Prevent foreign bodies from entering the device. Otherwise, the device may be short-circuited or damaged, load power supply derating or power failure, and personal injury may occur.



- When installing a device that needs to be grounded, install the PGND cable first. When removing a device, remove the PGND cable at the end.



- Do not allow cables to pass through the device's air inlet and air outlet.

Routine Requirement

- The installation, operation, and maintenance must follow the sequence of steps in the manual. Do not modify, add, or change the equipment or change the installation sequence without authorization.
- Only with the permission of the power department of the country or region where it is located can it be connected to the grid.
- Comply with power station safety regulations, such as operation tickets and work ticket systems.
- Install temporary fences or warning ropes in the working area and hang "Do not enter" signs, non-staff are strictly prohibited to enter.
- Before installing or removing power cables, disconnect the device and its front and rear switches.
- When liquid is found inside the device, turn off the power immediately and do not continue to use it.
- Before operating the equipment, check that the tools used meet the requirements and are registered. After the operation is complete, retrieve the device by number to prevent it from being left inside the device.
- Before installing a power cable, ensure that the label on the cable is correct and the terminal is insulated.
- Use an appropriate range torque tool to tighten screws when installing devices. When using a wrench to tighten, ensure that the wrench is not crooked and the torque value error does not exceed 10% of the specified.
- Use a torque tool to fix the screws and double-check with red and blue marks. After the installation personnel confirm that the screws are tightened, paint a blue mark on the screws. After the inspector confirms the tightening, paint the red mark (draw the line mark needs to cross the edge of the screw).
- Ensure that all protective shells and insulation tubes of electrical components are installed properly after installation to prevent electric shock.
- If a device has multiple inputs, disconnect all inputs before performing any operation on the device.
- When you maintain the power supply or distribution equipment at the rear of the power supply device, turn off the output switch of the power supply device.
- During equipment maintenance, hang "Do not close" signs on the upstream and downstream switches or circuit breakers and post warning signs to prevent accidental connections. You can power it on again only after the fault is rectified.
- During fault diagnosis and troubleshooting, the following safety measures must be taken if power failure is required:
 - » Power failure;
 - » Electrical inspection;
 - » Installation of ground wire;
 - » Hang signs and install barriers.
- Periodically check the screw that connects the device terminal and ensure that it is tight.
- If a cable is damaged, replace it with a professional to avoid risks.
- It is strictly prohibited to alter, damage, or cover the logo and nameplate on the equipment and timely replace the logo that has become unclear due to long-term use.
- Do not use water, alcohol, or oil to clean the device's internal and external electrical components.

Grounding Requirement

- The backup grounding impedance must meet the local electrical standards.
- The device should be permanently connected to the protected area. Before operating the device, check the electrical connections of the device to ensure that the device is reliably grounded.
- Do not operate the device without a ground conductor installed.
- Do not damage the ground conductor.
- For devices that use a three-core socket, ensure that the ground terminal in the three-core socket is connected to the protective ground.
- For a device with a high contact current, ground the protective ground terminal of the device cover before connecting the input power to prevent electric shock caused by the contact current of the device.

Wiring Requirement

- The selection, construction, and routing of cables must comply with local laws, regulations, and regulations.
- Do not loop or twist during the routing of power cables. If the length of the power cable is not enough, replace the power cable. Do not use a joint or solder joint in the power cable.
- All cables must be securely connected, properly insulated, and of appropriate specifications.
- The cable slots and holes have no sharp edges. The positions of the cable pipes and holes must be protected to prevent sharp edges and burrs.
- If cables are routed from the top of the cabinet to the cabinet, bend them in the U-shape outside the cabinet before entering the cabinet.
- Cables of the same type should be bundled together in a straight and neat appearance without skin damage. Cables of different types are routed at least 30mm apart. Do not intertwine or cross cables.
- When cables are connected or left during cable connection, seal the cable port with mud immediately to prevent water vapor and small animals from entering the port.
- Cables buried in the ground are securely secured using cable supports and cable clips. Ensure that cables in the backfilled area are tightly attached to the ground to prevent deformation or damage caused by force during backfilling.
- When external conditions (such as the laying mode or ambient temperature) change, verify the cable selection by referring to the IEC-60364-5-52 or local laws and regulations, for example, whether the carrying current meets requirements.
- The insulation layer may be aged or damaged when cables are used in high temperatures. Keep at least 30mm away from the heating device or the heat source.
- When the temperature is too low, violent impact or vibration may crack the plastic cover of the cable. In order to ensure construction safety, the following requirements should be followed:
 - » Cables should be laid and installed at temperatures higher than 0 ° C. Handle cables cautiously, especially in a low-temperature environment.
 - » If the ambient temperature is lower than 0 ° C, move cables to the ambient temperature and store them for at least 24 hours before routing cables.
- Do not push the cables from the vehicle. Otherwise, the cable performance deteriorates, which will affect the current carrying and temperature rise.

Antistatic Requirement

NOTICE

- The static electricity generated by the human body may damage the electrostatic-sensitive components on the board, such as the large-scale integrated circuit (LSI).
- Observe the ESD regulations before you touch a device, such as a board, module with exposed circuit board, or application-specific integrated circuit (ASIC) chip. Wear ESD clothes, ESD gloves, or an ESD wrist strap, and ensure that the other end of the ESD wrist strap is well grounded.
- When holding a board or a module with an exposed circuit board, hold the edge of the board or module without components. Do not touch the components with your hands.
- Before you store or transport the removed boards or modules, pack them with ESD packaging materials.

Environmental Safety

DANGER

- Do not place the device in an environment with flammable or explosive gas or smoke, and do not perform any operations in such an environment.
- Do not store flammable and explosive materials in the equipment area.
- Do not place the equipment near heat sources or fire sources, such as fireworks, candles, heaters, or other heating equipment that may be heated. The device may be damaged, or a fire may occur.

WARNING

- The device should be installed in an area away from liquid. Do not install the device under the water pipe or air outlet where condensation may occur. Do not install it under the equipment room's air conditioner port, air vent, or cable window to prevent liquid from entering the device. The device is faulty or short-circuited.
- When the equipment is running, do not block the vent, or heat dissipation system or cover it with other items to prevent high-temperature damage to the equipment. Prepare or fire.

CAUTION

- Do not allow cables to pass through the device's air inlet and outlet.

Routine Requirement

- Store the device in a clean, dry, well-ventilated place in an appropriate temperature and humidity environment. Keep the device away from dust and condensation.
- Do not install or operate the equipment beyond the range specified in the technical specifications; otherwise, the performance and safety of the equipment will be affected.
- Do not install, use, or operate outdoor equipment or cables (including but not limited to carrying equipment, operating equipment, and cables, plugging and unplugging signal interfaces connected to outdoors, working at heights, outdoor installation, or opening doors) in bad weather such as thunder, rain, snow, or strong wind above level 6.
- Do not install the device in an environment exposed to dust, smoke, volatile gas, corrosive gas, infrared radiation, organic solvents, or excessive salt.

- Do not install the device in an environment with metal or magnetic conductive dust.
- Do not install the device in an area prone to breeding fungi, molds, and other microorganisms.
- Do not install the device in an area disturbed by strong vibrations, noise sources, or electromagnetic fields.
- Site selection should comply with local laws, regulations, and relevant standards.
- Installation environment: The ground should be solid and free of bad geology, such as rubber soil, soft soil, or easy subsidence. Low-lying areas, such as water accumulation and snow, are strictly prohibited. The water level of the site should be higher than the highest water level in the area.
- Do not install the device in a position that can be flooded by water.
- If the device is installed in a place with dense vegetation, in addition to routine weeding, harden the ground under the device, such as laying cement and stones.
- When installing, operating, or maintaining the device, clear the water, snow, ice, or debris on the top of the device and then open the door to prevent debris from falling into the device.
- Ensure that the surface is strong enough to meet the load-bearing requirements.
- After installing the device, clear the empty packing materials from the device area, such as cartons, foam, plastic, and cable ties.

Mechanical Safety



- When working at altitude, you must wear a safety hat, safety belt, or waist rope and tie it to a strong structural part. It is strictly prohibited to hang on a moving, unstable object or a metal with sharp edges and corners to prevent the hook from slipping and falling.



- The tools must be fully prepared and have passed the inspection by professional organizations. Do not use the tools with scars, unqualified inspection, or beyond the validity period of the inspection. Ensure that the tools are firm and not overloaded.
- Before installing a device into the cabinet, ensure that the cabinet is secured to prevent the cabinet from tilting and falling due to the unstable center of gravity, which may hurt security personnel or damage the device.
- When pulling out a device, take care of unstable or heavy devices installed in the cabinet to avoid being crushed or hurt.
- Do not drill holes in the device. Drilling holes may damage the sealing performance, electromagnetic shielding performance, internal components, and device cables. Metal chips generated from drilling may enter the device and short-circuit the circuit board.

Routine Requirement

- Paint scratches during transportation and installation must be repaired in time. Do not expose the scratches for a long time.
- Without the evaluation of the company, it is forbidden to arc welding, cutting, and other operations on the equipment.
- It is prohibited to install other equipment on top of the equipment without our evaluation.
- When working in the space above the top of the device, protect the device from damage.
- Use the correct tools and know how to use them correctly.

High Altitude Safety

- All operations carried out more than 2 meters above the ground belong to high-altitude operations, and guardians must be installed for high-altitude operations.
- Only after relevant training and qualification can you work at altitude.
- Steel pipe rain is not dry, or other dangerous conditions should stop working at altitude. After the above situation, the safety person and relevant technical personnel must check all kinds of operating equipment to confirm the safety of the operation.
- The high-altitude work site the danger zone should be demarcated, obvious signs should be set up, and unrelated personnel should be strictly prohibited from entering.
- Guardrails and signs shall be set up along the openings and holes of high-altitude operations to prevent missteps.
- It is strictly prohibited to pile scaffolding, springboard, or other debris on the ground below the high-altitude working area. Ground personnel are prohibited from staying or passing directly below the high-altitude operation area.
- Carry the equipment and tools with you to prevent equipment damage or personal injury caused by falling tools.
- It is strictly forbidden for aerial workers to throw objects from a high altitude to the ground or to throw objects from the ground to a high altitude. Objects should be carried by slings, hanging baskets, elevated vehicles, or cranes.
- Avoid working on the upper and lower layers at the same time. If unavoidable, a special protective shed or other protective measures must be set up between the upper and lower layers, and the upper layer is strictly prohibited from stacking tools and materials.
- When disassembling scaffolding upon completion, it shall be carried out in layers from top to bottom. It is strictly forbidden to disassemble the upper and lower layers at the same time. When removing one part, it shall prevent the collapse of other parts.
- The operators at high altitudes shall work strictly with the safety regulations at high altitudes, and the company shall not be responsible for the accidents caused by violating the safety regulations at high altitudes.
- It is strictly prohibited to laugh and play while working at altitude, and it is strictly prohibited to rest in the altitude working area.

Ladder Safety

- Use wooden or insulated ladders when teleclimbing operations may be involved.
- Priority is given to the platform ladder with a protective guardrail in the climbing operation. A one-step ladder is prohibited.
- Before using a ladder, ensure that the ladder is in good condition and has the proper weight. Do not use the ladder overweight.
- The ladder must be placed in a secure place and held by someone during operation.
- When climbing a ladder, keep your body steady and ensure that your center of gravity does not deviate from the edge of the ladder to reduce danger and ensure safety.
- The pull rope must be firm when using the miter ladder.



Hoisting Safety

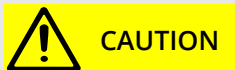
- All hoisting personnel must undergo relevant training and be qualified before starting work.
- Temporary warning signs or fences shall be erected to isolate the hoisting area.
- The foundation for lifting operations must meet the load-bearing requirements of the crane.
- Before hoisting equipment, ensure the lifting tool is securely secured to a fixed object or wall that meets the load-bearing standards. Do not walk under the lifting arm or objects during hoisting.
- Do not drag wire ropes, spreader, or impact with hard objects when hoisting.
- During hoisting, ensure that the Angle between the two cables is not greater than 90°, as shown in the following figure.

Equipment Security

Energy Storage System Safety



- Do not open the cabinet door while the system is running.
- Do not stand outside the cabinet door when the energy storage system is faulty.



- When the fire alarm is triggered, evacuate the scene immediately.

NOTICE

- The energy storage system must set up fences, walls, and other protective measures and erect safety warning signs for isolation to avoid equipment transport. Unauthorized personnel may enter during the operation, resulting in personal injury or property damage.

Battery Safety



- Do not short-circuit the positive and negative terminals of the battery. Otherwise, it will cause a short circuit of the battery. A short circuit in the battery will generate a large current and instantly release a large amount of energy, causing the battery to leak, smoke, release flammable gas, fire, or explosion. To avoid battery short circuit, electricity the pool does not allow live maintenance.
- Do not expose the battery to high-temperature environments or heat-generating devices, such as high-temperature sunshine, fire sources, transformers, and heaters. Overheating the battery may cause leakage, smoke, release of flammable gases, fire, or explosion.
- Do not allow the battery to receive a mechanical shock, drop, collision, hard object puncture, or pressure impact. Otherwise, the battery may be damaged or fire.
- Do not disassemble, modify, or destroy the battery (such as inserting foreign matter, external extrusion, intrusion into water, or other liquids) so as to avoid causing battery leakage, smoke, release of flammable gas, fire, or explosion.
- Do not use other metal objects on battery terminals. This may cause heat or electrolyte leakage.
- Use or replace the battery model is not sure there will be fire or explosion risk. Please use the model recommended by the manufacturer of Batteries.
- Battery electrolyte is toxic and volatile. When there is electrolyte leakage or abnormal odor, avoid contact with liquid or gas leakage dew. Non-professional personnel should not approach, please contact professional personnel immediately. Professionals should wear goggles, rubber gloves, gas masks, protective clothing, etc., power off the device in a timely manner, and remove the leaking battery. Contact technical support.



DANGER

- The battery is a closed system that releases no gas under normal operation. If in extreme abuse situations under such harsh conditions as burning, needling, squeezing, overcharging, or other conditions that may cause the battery to lose thermal control, possibly damage or abnormal chemical reactions occur in the battery.
- The gas produced by the combustion of the battery can irritate the eyes, skin, and throat. Please pay attention to protection.



WARNING

- Do not install the battery under the equipment room's air conditioner port, air vent, cable window, or water pipe. This prevents liquid from entering the device and causing a fault or short circuit.
- During battery installation and commissioning, fire extinguishing facilities, such as fire extinguishing sand and carbon dioxide extinguishing, must be equipped according to the construction standards and regulations, fire alarms, etc. Before putting it into operation, it is necessary to ensure that there are firefighting facilities that comply with local laws, rules, and regulations.
- After the battery is discharged, charge the battery in time. Otherwise, the battery may be damaged due to over-discharge.

Statement

The company shall not be responsible for the damage and other results of the batteries provided by the company caused by the following reasons:

- Battery damage caused by earthquakes, floods, volcanic eruptions, mudslides, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, extreme weather, force majeure.
- Direct damage caused to batteries, including but not limited to excessively high or low operating temperature of batteries, unstable power grids, and frequent power outages due to the on-site device operating environment or external power parameters that cannot meet environmental requirements for normal operation.
- Battery damage, drop, leakage, or rupture caused by improper operation or failure to connect the battery as required.
- The battery is installed on-site and connected to the system. The battery is damaged due to over-discharge if it is not powered on in time due to your fault.
- Battery damage caused by delayed acceptance due to your reasons.
- Battery operation management parameters are not set correctly.
- If you mix the battery provided by our company with other batteries, resulting in accelerated capacity decay, including but not limited to: with other brands of batteries, with batteries of different rated capacities, etc..
- Your improper maintenance causes frequent over-discharge of the battery, on-site expansion, or long-term failure to charge fully.
- You do not properly maintain the battery according to the operation manual of the supporting equipment, including but not limited to: do not regularly check whether the battery terminal screws are tightened.
- Battery damage caused by failure to store the battery in accordance with storage requirements (such as in a humid, rain-prone environment).
- Because of your reasons, do not charge in time, resulting in battery storage, capacity loss, or irreversible damage to the battery.

- Battery damage caused by you or a third party, including but not limited to: failure to relocate or install the battery according to the requirements of the company.
- You attach an additional load to the battery yourself.
- The battery has expired its maximum storage period.
- The battery warranty has expired. Batteries that exceed the warranty period have certain security risks and are not recommended to continue to use.

Short-Circuit Protection

- When installing and maintaining batteries, use insulation tapes to wrap exposed cable terminals on batteries.
- Prevent foreign objects (such as conductive objects, screws, and liquids) from entering the battery and causing short circuits.

Drain Treatment

NOTICE

- Electrolyte overflow may cause potential damage to the device. The spilled electrolyte may corrode metal objects and boards, reducing performance or even damaging the board.

The electrolyte is corrosive, and contact may cause skin irritation and chemical burns. If it comes into contact with the battery electrolyte, the following measures should be taken:

- Inhalation: Evacuate the contaminated area, get fresh air immediately, and seek immediate medical help.
- Eye contact: Immediately rinse eyes with plenty of water for at least 15 minutes without rubbing and seek immediate medical help.
- Skin contact: Wash contact areas immediately with plenty of water and soap, and seek medical help immediately.
- Ingestion: Seek medical help immediately.

SITE REQUIREMENT

Routine Requirement

Wear appropriate personal protective equipment at all times during any assembly operation on-site. The following personal protective equipment is considered a minimum requirement:

- In a dry environment, S3-class anti-hole soles and steel-toe safety shoes.
- On the rainy or wet ground, wear S5 safety boots with anti-hole soles and steel-toe caps.
- Close-fitting flame-retardant work clothes.
- Suitable for flame-retardant work pants.
- Safety gloves.

Location Requirement

Site selection requirements are generally as follows:

- Do not install in low-lying areas. The installation level must be at least 300mm higher than the highest water level in the area.

- To prevent wildfires caused by high temperatures in summer from causing fires in the energy storage system, the installation site of the energy storage system or the energy storage power station should be free of vegetation and flammable plants within 3 meters of the surrounding area.
- Considering safety, the distance between the energy storage system and residential buildings is $\geq 12\text{m}$, and the distance between the energy storage system and schools, hospitals, and other densely populated buildings is $\geq 30.5\text{m}$. If this safety distance cannot be met, a firewall should be built between the energy storage system and the building.
- The safe distance between the energy storage system and the production building shall comply with local fire codes or standards.

China region:

- » The safety distance between the energy storage system and the Class A production building should be $\geq 12\text{m}$, the safety distance between the energy storage system and the Class B production building should be $\geq 10\text{m}$, the safety distance between the energy storage system and the class C, D, and E production buildings with fire resistance grade 1 and 2 should be $\geq 10\text{m}$, and the safety distance between the energy storage system and the Class 3 fire resistance production buildings should be $\geq 12\text{m}$. If the external walls of the adjacent buildings are non-burning bodies with no Windows or doors and no exposed burning eaves, the fire spacing can be reduced by 25% based on 3m.
- » If the above safety distance cannot be met, a firewall must be set up between the battery equipment room, energy storage room, or energy storage installation area and class C, D, and E buildings. A fire-resistant firewall of no less than 3h should be installed for security protection, and the length and height of the firewall should exceed the outer outline of the energy storage system by 1m each. At the same time, the space requirements for equipment transportation, installation, and maintenance must be considered.

Non-China region:

- » Outdoor storage systems should be at least 10 feet away from boundaries, public roads, buildings, flammable materials, hazardous materials, high piles, and other hazards not associated with the grid infrastructure.
- » When one of the following conditions is met, the distance between the energy storage system and the production building can be reduced to 0.9m, and the space requirements of equipment transportation, installation, and maintenance need to be considered.
- An energy storage system or an energy storage power station should be installed in an environment free from the risk of explosion, with convenient transportation conditions, and reliable fire suppression system equipment.

INSTRUCTIONS

- During the installation, commissioning, and operation of the energy storage system, comply with the fire prevention principle: The number of gas fire extinguishers near each unit is not less than two.
- The distance between the exhaust device of the energy storage system and the heating, ventilation, and air conditioning intakes, Windows, doors, discharge platforms, and fire sources of other buildings or facilities shall be greater than 4.6m.
- Reserve water extinguishing system ports at the energy storage system site.
- The site area required in the near future should be satisfied, and there should be room for expansion according to the needs of the whole life cycle.
- Choose a well-ventilated area.

INSTRUCTIONS

- Do not install energy storage systems in salt-damaged or polluted areas because they may be corroded. Energy storage systems can be used in the following or better environments:
 - » Outdoor environment greater than 2000m from the coast. Using the energy storage system is not recommended when it is 500m to 2000m away from the coast (if you need to use it, check with the distributor or the company's engineers). The energy storage system cannot be used when the distance from the coast is less than 500m.
 - » Distance from smelters, coal mines, thermal power plants, and other heavy pollution sources greater than 1500m ~ 3000m.
 - » The distance is greater than 1000m to 2000m from moderate pollution sources such as chemical, rubber, and electroplating.
 - » The distance from light pollution sources such as food, leather, heating boilers, slaughterhouses, centralized garbage dumps, and sewage treatment stations is greater than 500m to 1000m.

Requirements of Site Selection for Flood Control and Waterlogging

- Large-scale electrochemical energy storage system (power $\geq 100\text{MW}$) station site design elevation should be higher than the frequency of 1% flood water level or the highest historical waterlogging water level.
- Medium and small electrochemical energy storage system (power $< 100\text{MW}$) site design elevation of the station area should be higher than the flood level with a frequency of 2% or the highest historical waterlogging level.
- When the design elevation of the site of the station area cannot meet the above requirements, another site should be selected, or different flood control and waterlogging prevention measures should be taken according to different circumstances.
- For energy storage power stations along rivers, rivers, lakes, and seas affected by wind and waves, flood control facilities' elevation shall consider the wind and wave height with a frequency of 2% and a safety elevation of 0.5m.
- When a large amount of catchment water flows into or through the base outside the base, side ditches or flood drainage ditches should be set up to discharge water on the ground in an organized manner.

Foundation Requirement

Requirements of Foundation Design Scheme

- The energy storage system must be installed on concrete or other non-combustible surfaces. Ensure the installation plane is level, firm, smooth, and has sufficient bearing capacity. No sag or tilt is allowed.
- The foundation pit bottom of the equipment foundation must be tamped and filled.
- Do not disturb the foundation by soaking water after excavation. If the foundation is disturbed by soaking water, continue excavation and replace it with filling.
- The horizontal error between the contact surface between the base and the cabinet is less than or equal to 3mm.
- The foundation must be above the highest local historical water level and at least 300mm above the level ground.
- Construct drainage facilities based on local geological and municipal drainage requirements to ensure no standing water is generated at the foundation. The foundation construction should meet the local area's historical maximum rainfall drainage requirements, and the discharged water should be treated according to local laws and regulations.

- When constructing the foundation, consider the cable routing problem of the energy storage system and reserve trenches or cable inlet holes.
- The reserved holes in the foundation and cable inlet holes at the bottom of the device should be sealed.
- Foundation drawings are not to be used as final construction drawings and are for reference only. The user must review the basic design parameters of the energy storage system according to the requirements of the installation environment, geology, and earthquake resistance of the project site.

Lifting Requirement

- Before hoisting, ensure that the crane and hoisting ropes meet the load-bearing requirements.
- Do not drag the cabinet when installing or removing the hoisting equipment. Otherwise, the cabinet may be scratched.
- Do not lift or move battery packs after installing them in the energy storage system.

Lifting Process	Matters Needing Attention
Before Lifting	The hoisting personnel must be trained and qualified before taking up the post.
	Before using lifting tools, check that they are complete.
	Ensure the lifting tool is firmly fixed to a fixed object or wall that can bear the load.
	For outdoor use, lifting the equipment in clear weather with no wind is recommended.
	Check that the crane and steel cable meet the requirements before hoisting.
	All doors of the equipment are closed and locked.
	Ensure safe and reliable connection of steel cables.
During the Lifting Process	The hoisting sequence from left to right or right to left is recommended to ensure smooth hoisting.
	No unrelated personnel are allowed to enter the hoisting area, and no one is allowed to stand under the hoisting arm.
	Ensure that the crane position is suitable, not long-distance lifting.
	Keep it stable, and the diagonal inclination of the cabinet is no more than 5°.
	Ensure that the Angle between two cables is no more than 90°.
	The lifting equipment should be handled gently, and the cabinet should fall slowly and smoothly to avoid impact on the internal equipment.
	When the cabinet is in contact with the base, the lifting steel cable should be removed after the base is stressed evenly.
	Do not drag wire rope and spreader, and do not collision equipment.
Follow-up cabinet hoisting can be performed only after the cabinet is secured.	

UNPACKING AND ACCEPTANCE

NOTICE

- To prevent the equipment from tipping over, use a rope to secure the case containing the equipment to the forklift before moving. Be careful.
- Moving, bumping, or falling may cause damage to the device.
- Once the device is placed, remove the packaging carefully to avoid scratching the device. Keep it during unpacking so the device is stable.
- After unpacking, check whether the fastening components and detachable parts are loose. If they are loose, inform the carrier immediately and the manufacturer.








INSTALLATION EQUIPMENT

Preparation Before Installation

Wear appropriate personal protective equipment during any assembly operation on site. The following personal protective equipment is considered a minimum requirement:

- In a dry environment, S3-class anti-hole soles and steel-toe safety shoes.
- On rainy or wet ground, wear S5 safety boots with anti-hole soles and steel-toe caps.
- Close-fitting flame-retardant work clothes.
- Suitable for flame-retardant work pants.
- Safety gloves.


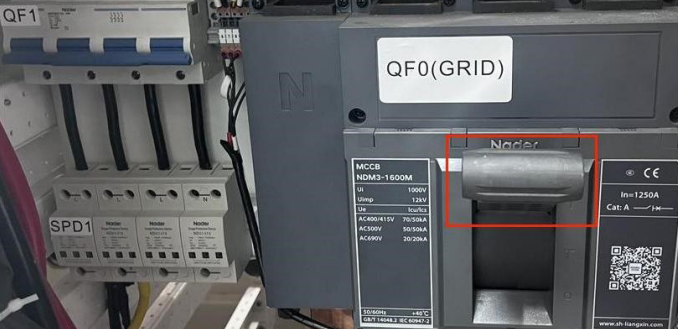



Protective Tool



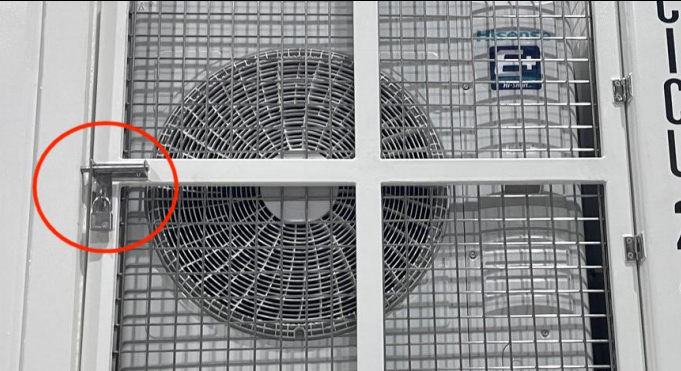


 Insulating gloves	 Protective gloves	 goggles	 Dust mask
 Insulated shoes	 Reflective vest	 Safety Helmet Hat	

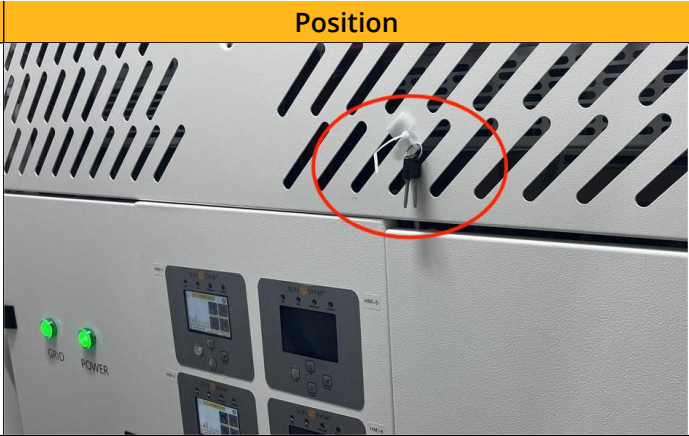

Inventory of Materials and Equipment

After disassembling, please check the list and contact us as soon as possible if there is a lack of material.

No.	Material	Quantity	Position
1	Exhaust outlet hood	1	
2	Exhaust air intake hood	1	
3	Pressure relief opening	1	
4	Battery cabin outlet hood 1	1	
5	Battery cabin outlet hood 2	1	

No.	Material	Quantity	Position
6	Flash drive	1	
7	Circuit breaker operating lever	1	
8	Fire emergency start button reset key	2	
9	Remote control for fire gas probe	1	
10	Fire control key (fire control and reset key universal)		

No.	Material	Quantity	Position
11	Container door lock and key	2	
12	Container maintenance key	1	
13	Air conditioning cabinet door lock and key	1	
14	PCS air inlet shutter door lock and key	1	
15	AC control cabinet door key	2	

No.	Material	Quantity	Position
16	PCS cabinet door key	2	
17	Battery power line	176	
18	Communication cable (short)	176	
19	Communication cable (length)	16	

Pre-Installation Inspection

Check the Outer Packing

Before unpacking the outer package of the device, check the outer package for visible damage, such as holes, cracks, or other signs of possible internal damage, and check the device model. If there is any abnormal packaging or equipment model discrepancy, do not open it and contact your dealer as soon as possible.

Check Deliverables

After unpacking the equipment, check that the deliverables are complete and without any obvious external damage. If anything is missing or damaged, contact your dealer.

Installation Requirements

- Assembly must be carried out in accordance with the design and technological requirements and these regulations and relevant standards.
- The installation environment must be clean. The assembly environment temperature, humidity, dust-proof, lighting, and shock-proof of high-precision products must meet the relevant regulations.
- The parts must be cleaned before assembly, free of burrs, flash edges, oxide, rust, sand, dust and stains.





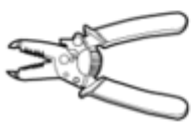



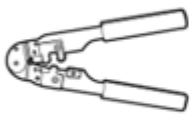
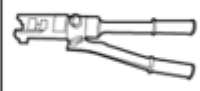


- The parts shall not be bumped, scratched or rusted during assembly.
- The relative positions of each component after assembly should be accurate.
- Fasteners specified in the tightening torque requirements must be tightened using a torque wrench and tightened according to the specified tightening torque.









Bolt Size (mm)	Torque Value (N.m)
M8	10.3~14.4
M10	20.0~28.0
M12	35.0~50.0
M14	56.0~80.0
M16	88.0~124.0
M18	120.0~170.0
M20	172.0~242.0

Installation Tool

INSTRUCTIONS

- The image tool is for reference only.
- This tool list cannot list only a few tools that may be used on-site. On-site installation personnel and users must prepare tools not listed based on site conditions.

 Phillips insulated torque screwdriver	 Insulated torque socket wrench (with extension bar)	 Straight insulated torque screwdriver	 Diagonal pliers
 Wire stripper	 Wire cutter	 Rubber mallet	 Utility knife
 Cable crimper with crystal head	 Hydraulic tongs	 multimeter	 Marker pen

			
Steel tape measure	Spirit level	Dust collector	Percussion drill
			
Impact bit	Heat shrink bushing	Heat gun	Cable tie

Personnel Qualification Requirements

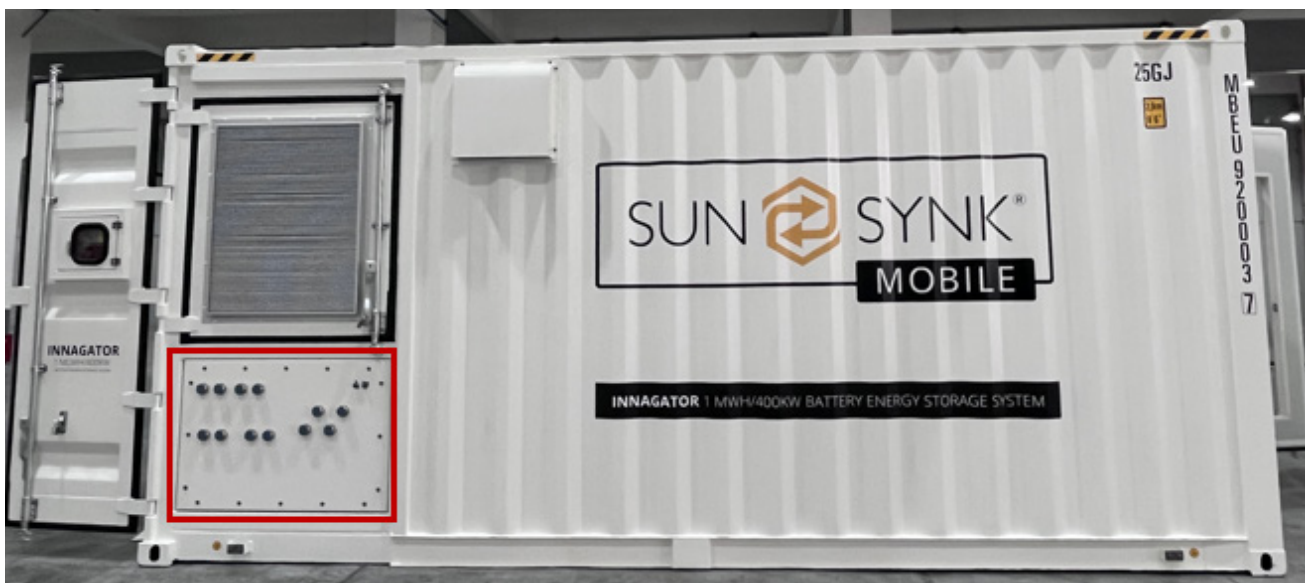
Installation must and can only be performed by professional technicians who meet the following requirements:

- Technical support engineers.
- Hardware installation engineers.
- Commissioning engineer.
- Maintenance engineers.

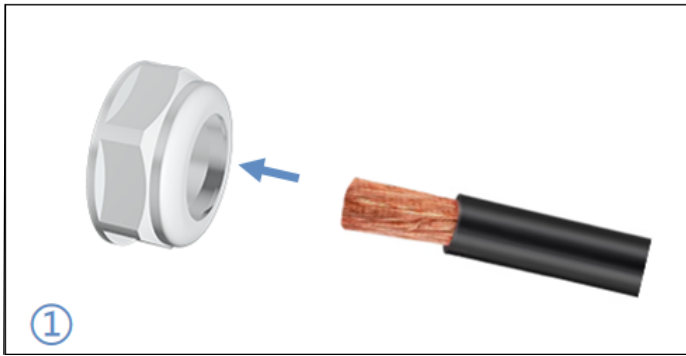
Field Installation Guide

The items to be assembled are as follows:

1. Installation position

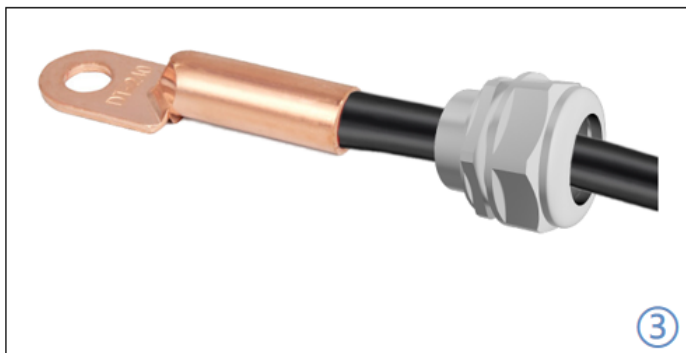
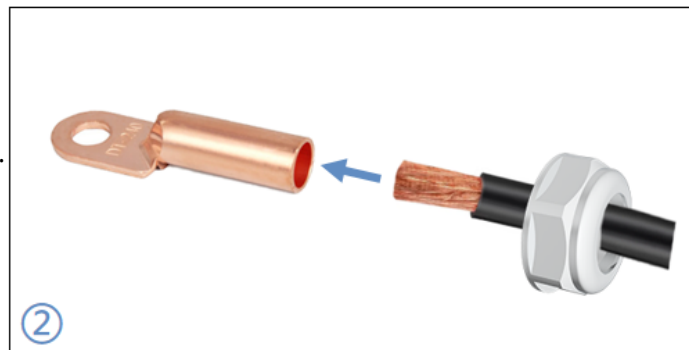


Procedure



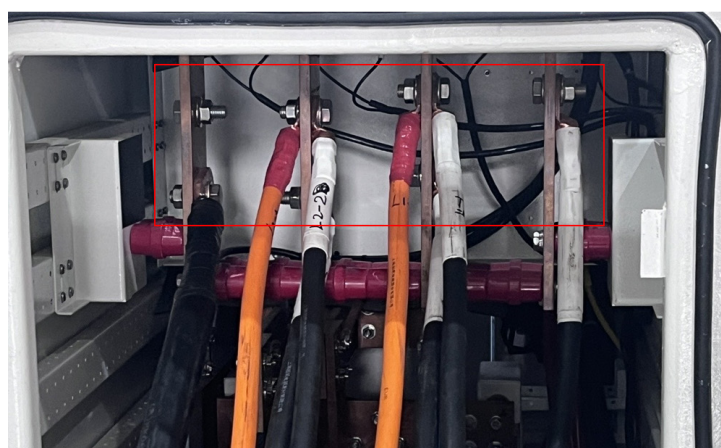
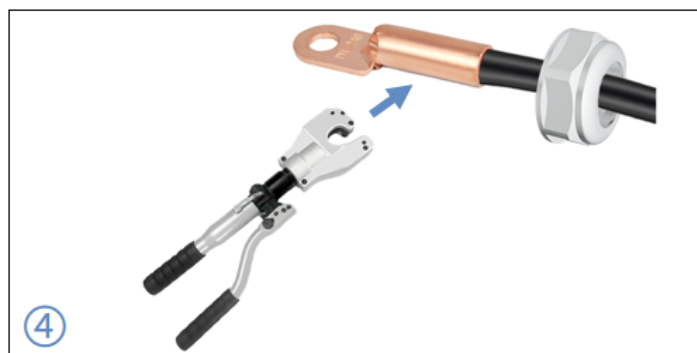
- ① Use a 300mm² copper cable section to pass through the PG head.

- ② The terminal are DT-240 or DT-300. The strip length of the power cable is 66mm, and the PGND cable is 60mm.



- ③ Into the terminal, PG inner diameter maximum 40mm.

- ④ Press the DT terminal with hydraulic pliers to ensure that the cable is secured inside the DT terminal.



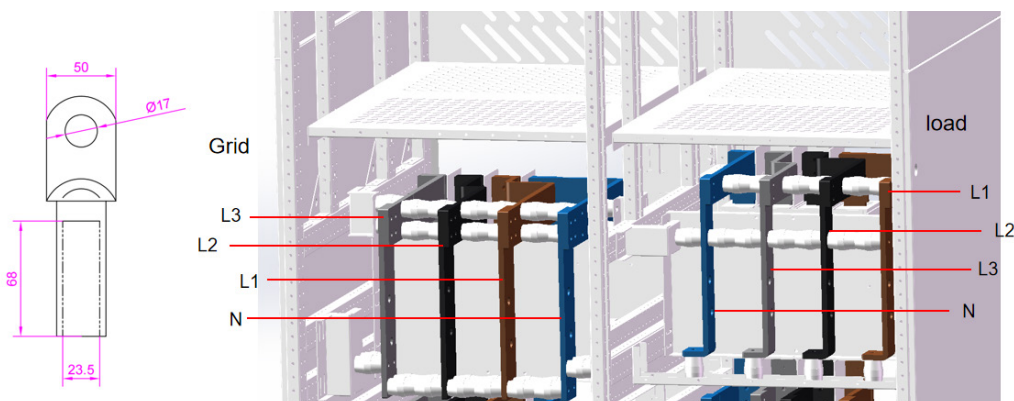
2. Connecting to the power grid copper bar

L1, L2, L3, N: 300mm²*2 is recommended for copper cable section, DT300 is recommended for DT terminal type (size as shown in the following figure), 66mm strip length is recommended, and M14 bolts and nuts will be equipped.

3. Connect the load copper bar

L1, L2, L3, N: 300mm²*1 is recommended for copper cable section, DT300 is recommended for DT terminal type (size as shown in the following figure), 66mm strip length is recommended, and M14 bolts and nuts will be equipped.

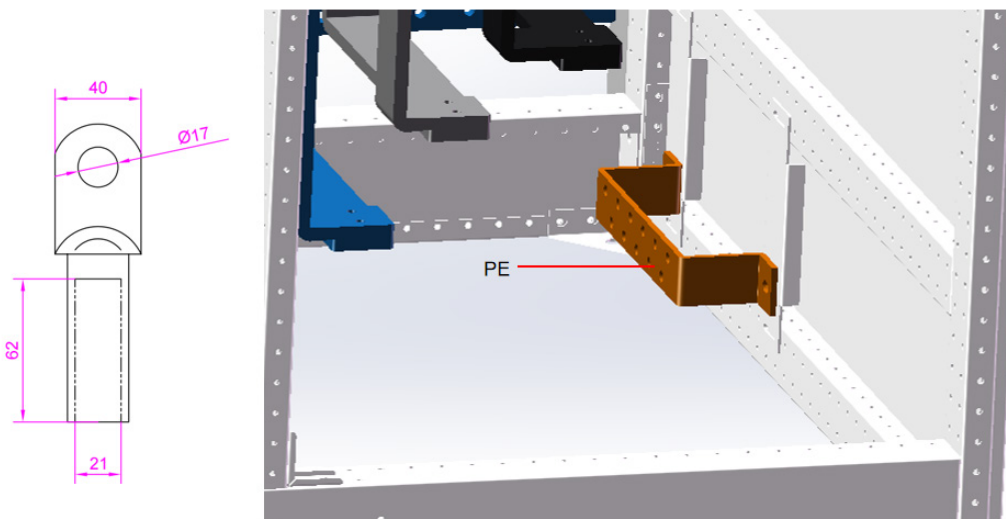
Name	Type	Same Cable Section	Strip Length	Terminal	Model Number	Source
Power line	Single core copper wire	300mm ²	66mm	M17 DT terminal	DT300	User provided



4. Ground bar

The section of copper cable is recommended to be 240mm²*1, the DT terminal type is recommended to be DT240 (size as shown in the following figure), the strip length is recommended to be 60mm, and we will provide M14 bolts and nuts.

Name	Type	Same Cable Section	Strip Length	Terminal	Model Number	Source
Protective ground wire	Single core copper wire	240mm ²	60mm	M17 DT terminal	DT240	User provided



5. Fire control panel

Unscrew the screws, and open the panel. There is a button switch, the system needs to be closed before power on, the system needs to be disconnected. Check whether the screen is on. If it is on, the power is on.



6. Installation of the electromagnetic device for gas bottle

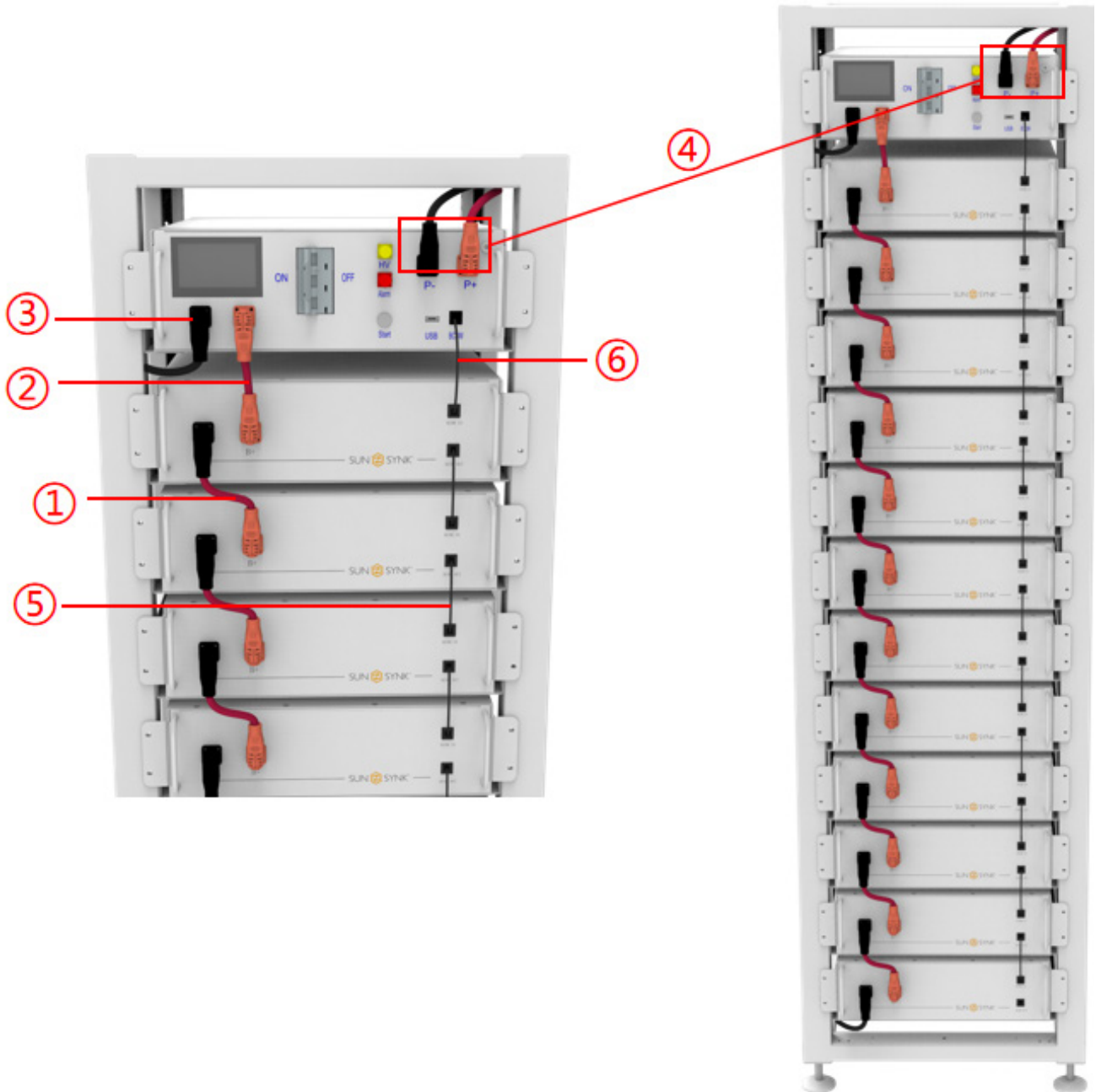
Step 1: Cut off the cable ties and get the electromagnetic device.

Step 2: Install the electromagnetic device into the drive rod inside the electromagnetic device protective cover.



7. Battery cabinet power cable installation

- a) Eleven ① power lines connect 12 battery packs in series.
- b) A ② power cable is connected to the top battery pack and the high-voltage box.
- c) A ③ power cable connects the high-voltage box to the bottom battery pack.
- d) Two ④ power lines on the top of the battery rack, just insert the corresponding holes.
- e) Connect 11 ⑤ communication network cables to the battery pack.
- f) One ⑥ communication network cable (long) connects the top layer battery pack and the high voltage box.

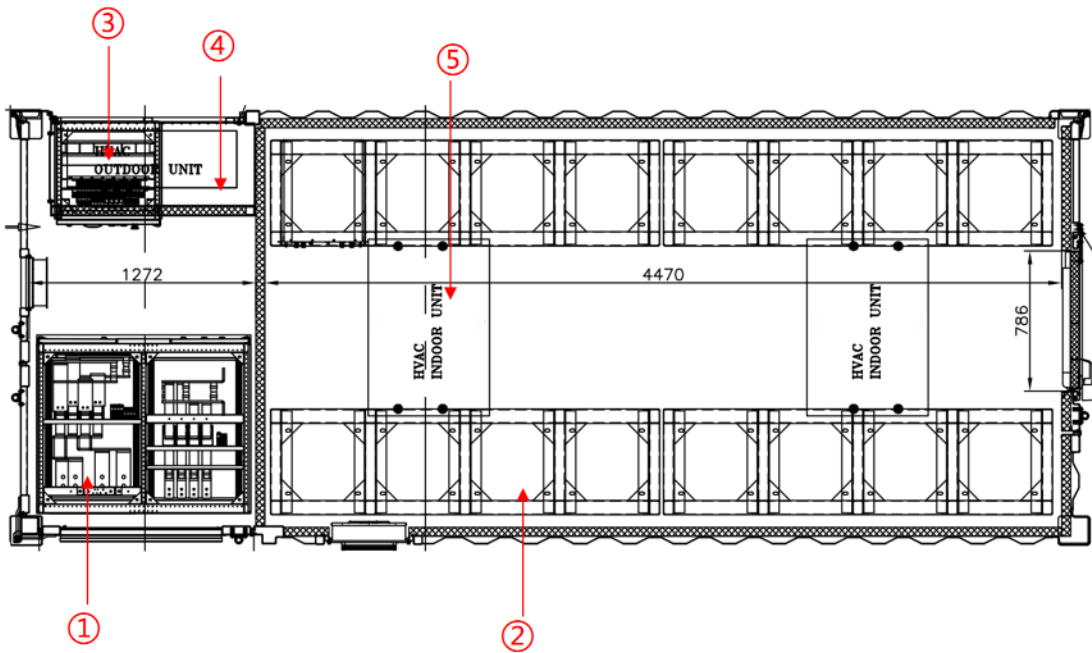


PRODUCT INTRODUCTION

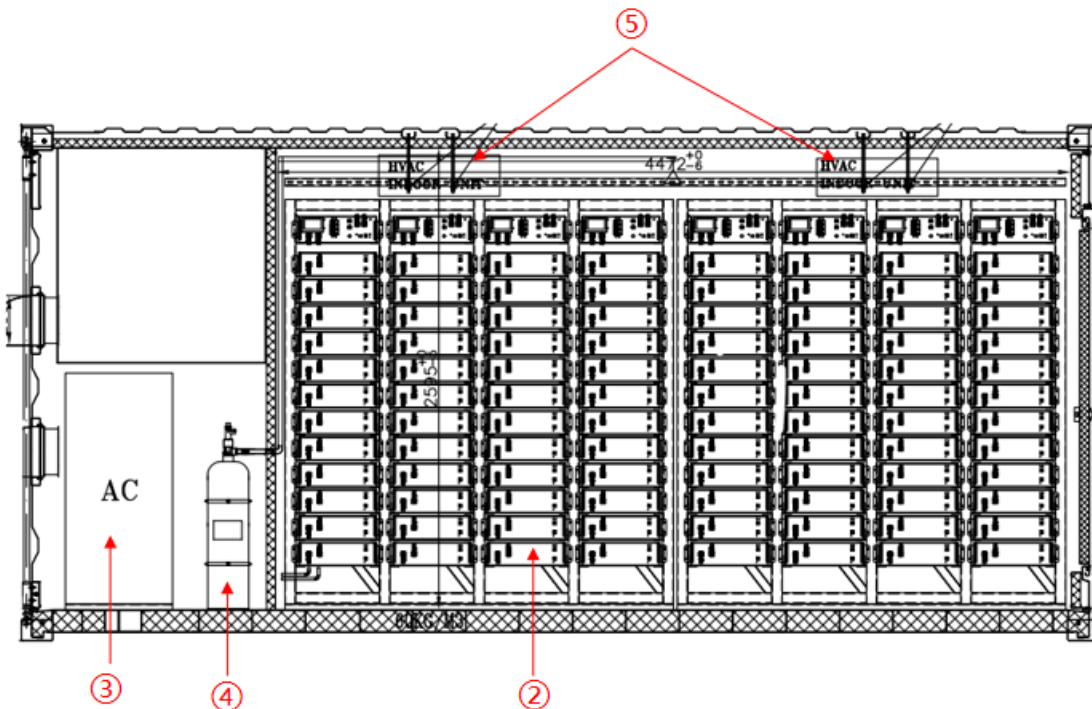
Main Component

No.	Name	Quantity
1	PCS Cabinet	8
2	Battery Cabinet	16
3	Distribution Cabinet	1
4	Fire suppression System	1
5	Air Conditioner	2

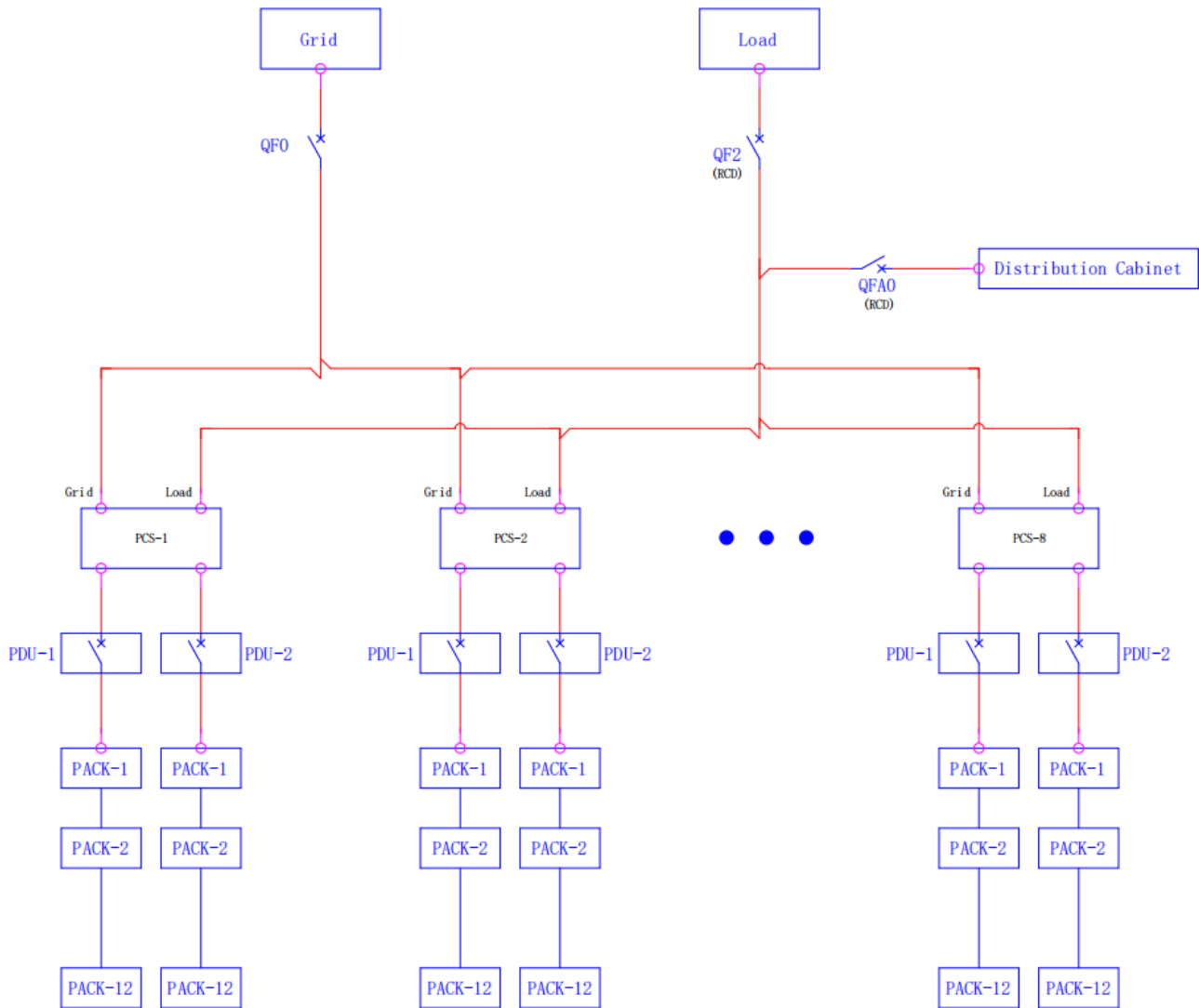
Top View



Profile Map



System Topology



Function Introduction

The energy storage battery system consists of an energy storage converter system and an energy storage battery system. The system is mainly used in industrial and commercial scenarios. The energy storage converter system integrates PCS and system distribution. The energy storage battery system integrates battery, LCS, and FSS. Through intelligent fan cooling, outdoor container design can better balance the system temperature. Through the combination of energy storage equipment, conversion equipment, and electronics, as well as intelligent operation and maintenance, it contributes to easier installation and operation. Through system safety design, it ensures more efficient battery performance and longer service life.

Product Parameter List

Model	SUNSYNK400K-2H
System Specification	
Grid AC Input/Output Power	700/400 kW
Load AC Output Power	400
AC Output Frequency and Voltage	50/60Hz; 400Vac
Off-Grid Back up Power	400 kW
Off-Grid Switching Duration	20ms
Grid Type	3W+N+PE
THD	<3%
Power Factor	-1-+1
System Communication	ETH
Black Start	Yes
Fire Detection	Heat and smoke detection
Fire Alarm	Alarm panel, strobes and horns with UPS backup
Aux Load	6KW
Auxiliary Power Interface	400Vac. 3W+N+PE
Auxiliary Power Back Up	30min (important load)
Local Emergency Stop	Yes
Remote Stop/Shut-off	Yes
Battery Technical Specification	
Energy Configuration	980 kWh
Battery Operating Voltage	480 ~ 700 V
Battery Communication	CAN,RS485
Pack Configuration	1P16S (16 Cells)
Rack Configuration	1P192S (12 Packs)
Stack Configuration	8*2*1P192S (16 Racks)
Other Technical Specification	
Dimension (L x W x H)	6058*2438*2896 mm (238.50*95.98*114.02 in)
Weight Appr.	16500 kg
IP Rating of Enclosure	IP54
Seismic Parameter	9
Noise @1m distance	≤ 80 dB °C
Operating Temperature Range	-20~45
Relative Humidity	≤95% (non condensing)
Certification	IEC62477, UN3536, CE

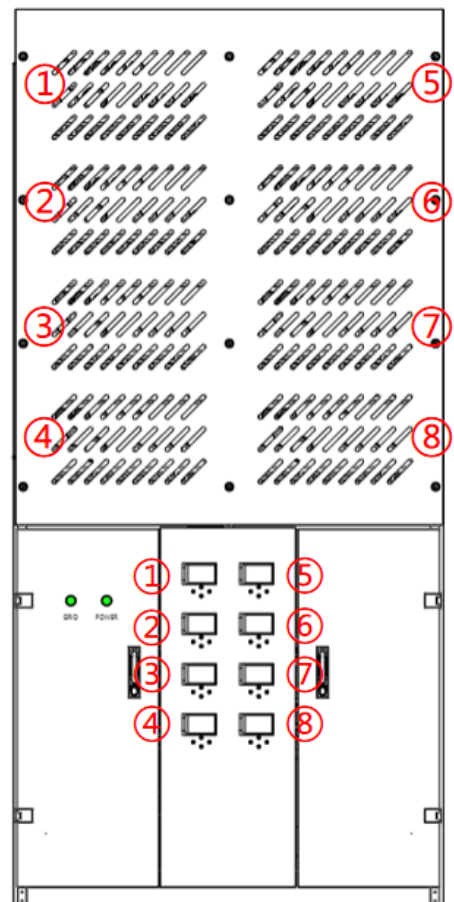
Precautions for Use



- Do not allow the LOAD power to exceed 400kW; otherwise, shutdown or protection events may occur
- If a capacitive or inductive load exceeding 50kW is connected, the system may experience downtime or protection events
- Do not use a cable smaller than the diameter recommended in the Installation Procedure.
- Risks such as overheating and fire. If the cable size is larger than the recommended size, see the Maximum Size of the cable connector's allowable diameter.

Function Introduction

Integral Cabinet



Operation and Display Panel

The operation and display panel, as shown below, is located below the inverter. It includes four indicators, four function keys, and an LCD display that displays operating status and input/output power information.

LED Indicators

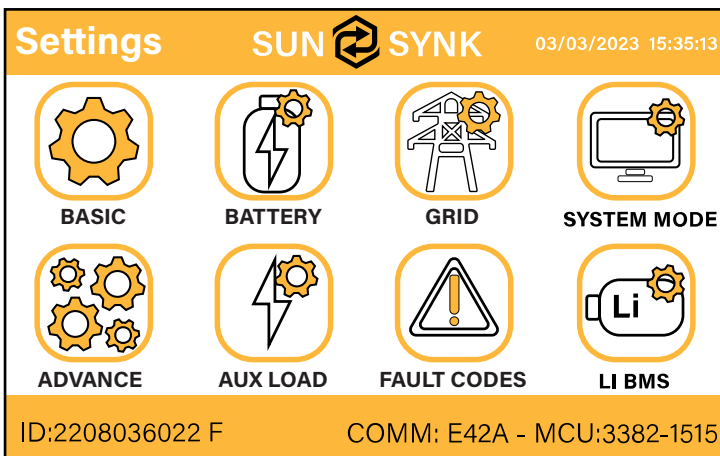
LED Indicator		Meaning
DC	Green LED solid light	PV connection normal
AC	Green LED solid light	Grid connection normal
Normal	Green LED solid light	PCS works normally
Alarm	Red LED solid light	Fault or warning
GRID	Green led solid light	Power on the grid
POWER	Green led solid light	GRID breaker closing

Function Buttons

Function Key	Description
Esc	To exit the previous mode
Up	Go back to the previous choice
Down	Go to the next selection
Enter	Confirm setting change (If not pressed each time the setting will not be saved)

Screen Interface

To access Settings, click on the gear icon on the right top of the navigation menu.



What this page displays:

- Serial number.
- Software version.
- Time, Date, and MCU.

What you can do from this page:

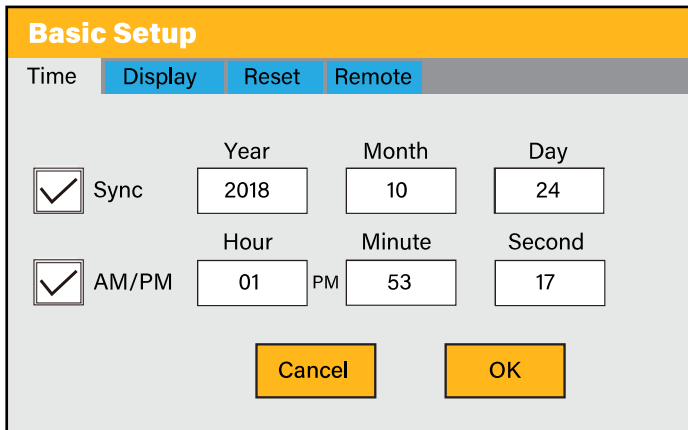
- Access the Basic Setup Page (press the BASIC icon).
- Access the Battery Setup Page (press the BATTERY icon).
- Access the Grid Setup Page (press the GRID icon).

- Access the real-time programmable timer/system mode (press the SYSTEM MODE icon).
- Access the advanced settings such as Paralleling and Wind Turbine (press the ADVANCE icon).
- Access the auxiliary load/smart load settings (press the AUX LOAD icon)
- Access the fault code register (press the FAULT CODES icon).
- Set up Li BMS (press the LI BMS icon).

Basic Setup

1. Set Time (Clock)

To set time, click on the BASIC icon and then on 'Time'



What this page displays:

- Time.
- Date.
- AM/PM.

What you can do from this page:

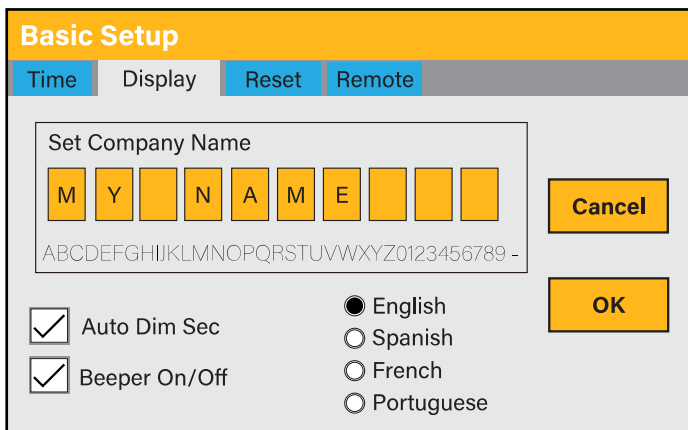
- Adjust / set time.
- Adjust / set date.
- Adjust / set AM/PM.

How to set up:

- Touch the screen on the box you wish to change.
- Change the number (increase/decrease) using the UP and DOWN buttons.
- Press OK to set the changes.

2. Set Company Name / Beeper / Auto dim

To set company name click on the BASIC icon and then on 'Display'.

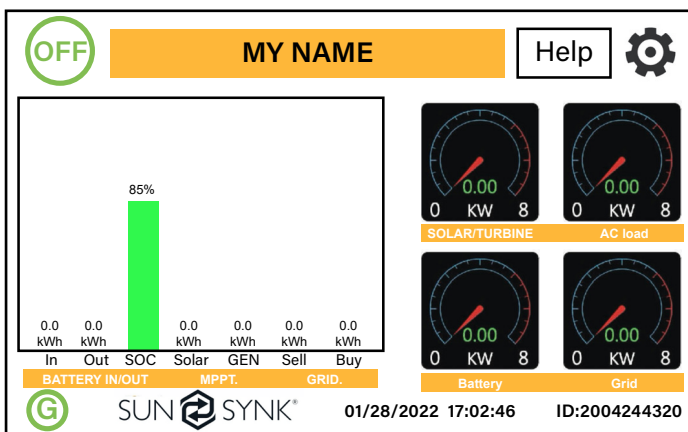


What this page displays:

- Beeper status (ON/OFF)
- Installers names.

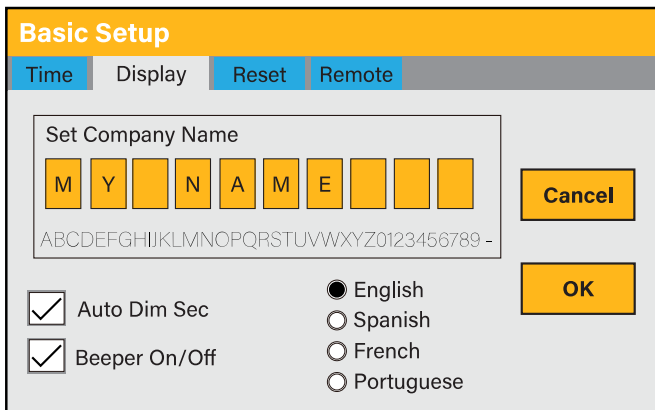
What you can do from this page:

- Set up your company name.
- Switch the beeper ON or OFF.
- Set the LCD backlight to auto dim.



How to change the name:

Change the letters in each box by moving the arrows up and down and then select OK. This will change the name on the home screen.



How to set the auto dim:

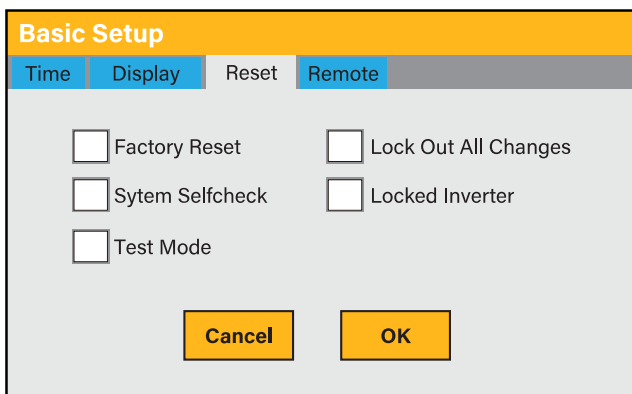
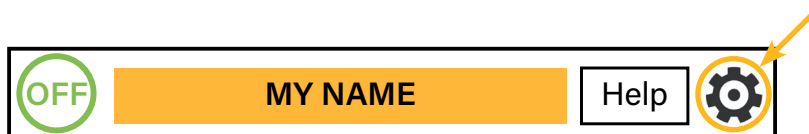
Set a number in the auto dim box to dim the LCD after a number of seconds.

How to turn the beep on or off:

Check or uncheck the beep box and the press OK to configure it as you prefer.

3. Factory Reset and Lock Code

To access the Settings, click on the gear icon on the right top of the menu.



What this page displays:

- Reset status.
- Whether the 'lock code' is used or not.

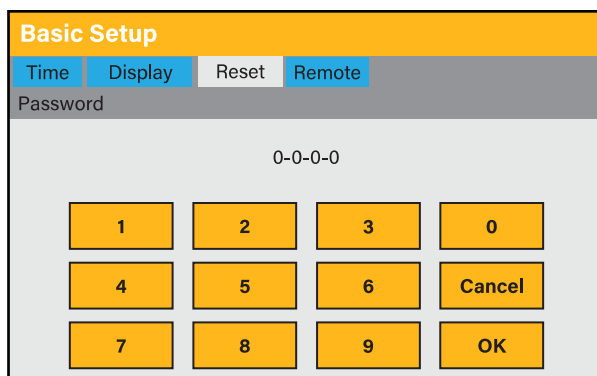
What you can do from this page:

- Reset the inverter to the factory settings.
- System diagnostics.
- Change or set the 'lock code'.

- **Factory Reset:** Reset all parameters of the inverter
- **Lock out all changes:** Enable this menu to set parameters before the unit is locked and cannot be reset.

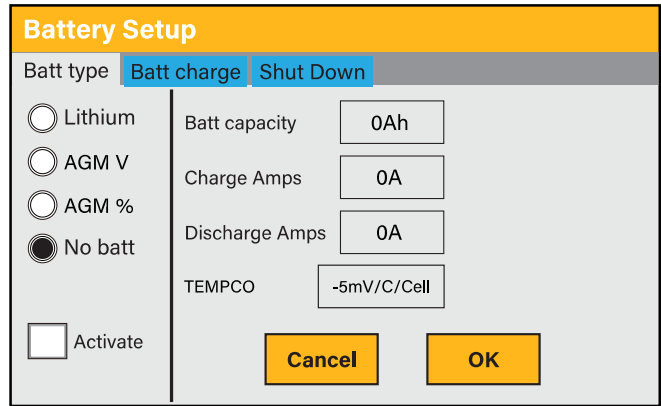
***Before performing a successful 'Factory Reset' and locking the systems, the user must enter a password to allow the setting to take place. The password for 'Factory Reset' is 9999 and for lockout is 7777.**

- **System self-check:** Allows the user to conduct a system diagnosis. After ticking this item, it needs input the password. The default password is 1234
- **Locked Inverter:** This function is used to lock the inverter completely so no access can be gained. It will ask for a 5-digit code that only the Sunsynk Technical staff can assist with.
- **Test mode (only for engineers):** For engineers to conduct tests.



Battery Setup Page

To configure battery settings, click on the BATTERY icon and then on 'Batt type'.

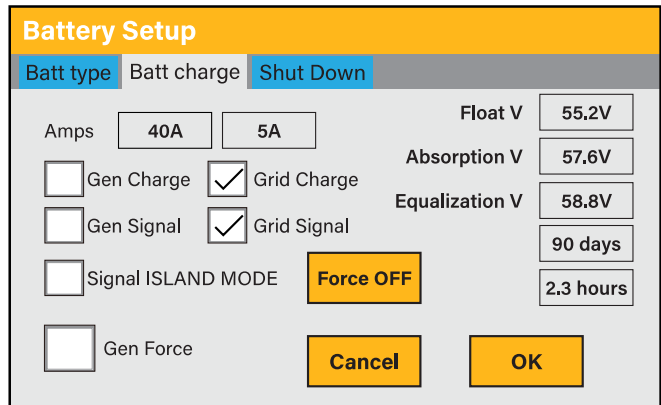


What this page displays:

- **Lithium:** This is BMS protocol. Please reference the document (Approved Battery).
- **AGM V:** Use battery voltage for all settings (V).
- **AGM %:** Use battery SOC for all settings (%).
- **No batt:** Tick this box if no battery is connected to the system. If it's ticked and the CT coil is connected, the inverter operates as a grid-tied inverter.
- **Battery capacity in (Ah):** For non-BMS-batteries the range allowed is 0-2000Ah, while for lithium-ion, the inverter will use the capacity value of the BMS.
- **Charge/Discharge Amps:** The Max battery charge/discharge current (0-50A for 29.9/30/35/40/50KW model).
- **Active battery:** This feature will help recover a battery that is 100% discharged by slowly changing from the solar array. Until the battery reaches a point where it can change normally.
- **TEMPCO settings:** The temperature coefficient is the error introduced by a change in temperature.

Generator & Battery Page

To configure battery charging settings, click on the BATTERY icon and then on 'Batt Charge'.



What this page displays:

- **Amps:** Charge rate of 40A from the attached generator in Amps.
- **Grid Amps:** Current that the grid charges the battery.
- **Grid Charge:** It indicates that the grid will charge the battery.
- **Grid Signal:** This indicates when the grid should no longer charge the battery.
- **Gen Charge:** Uses the GEN input of the system to charge the battery bank from an attached generator.

- **Gen Signal:** Normally open (NO) relay that closes when the Gen Start signal state is active.
- **Gen Force:** When the generator is connected, it is forced to start without meeting other conditions.
- **Force OFF:** This is to force the generator to switch off.
- **Signal ISLAND MODE:** When "signal island mode" is checked and the inverter connects the grid, the ATS port voltage will be 0. When "signal island mode" is checked and the inverter is disconnected from the grid, the ATS port voltage will output 230Vac. This feature and outside NO type relay can realize N and PE disconnection or bond.
- **Float V:** The voltage at which a battery is maintained after being fully charged.
- **Absorption V:** The level of charge that can be applied without overheating the battery.
- **Equalization V:** Equalizing charge/overcharge to remove sulphate crystals that build up on the plates over time on lead-acid batteries.

NOTICE

Do not alter these settings too often on the same battery, as it may damage the battery.

Battery Discharge Page

To configure inverter's shut-down settings, click on the BATTERY icon and then on 'Shut Down'.

The screenshot shows a 'Battery Setup' dialog box with three tabs: 'Batt type', 'Batt charge', and 'Shut Down'. The 'Shut Down' tab is active. It contains the following settings:

- Shut Down: 20%
- Low Batt: 20%
- Restart: 40%
- Low Power Mode < Low Batt:
- Low Noise Mode:

At the bottom of the dialog are two buttons: 'Cancel' and 'OK'.

What this page displays:

- **Shutdown 20%:** It indicates the inverter will shutdown if the SOC is below this value.
- **Low Batt 20%:** It indicates the inverter will alarm if the SOC below this value.
- **Restart 40%:** Battery voltage at 40% AC output will resume.
- **Low Power Mode<Low Batt:** If selected and when battery SOC is less than the "Low Bat" value, the self-consumption power of the inverter will be from the grid and battery simultaneously. If unselected, the self-consumption power of the inverter will be mainly from the grid.
- **Low Noise Mode:** Low noise mode is used to change the switching frequency of the IGBTs from 15kHz to 20kHz, we did this because 15kHz was in the audible range still meaning that people with great hearing could hear a high pitch noise when using other electrical products, the inverter interacted with it on the AC line with electrical noise.

What you can do from this page:

- Adjust battery shut down (voltage or %)
- Adjust low battery warning (voltage or %)
- Adjust restart (voltage or %)

Setting Up a Lithium Battery

To set up a lithium-ion battery, click on the BATTERY icon and visit the 'Batt Type' column.

What this page displays:

- This information will only display if the 'Lithium' option is selected under 'Batt Type'.
- The type of communion protocol.
- Approved batteries.
- **BMS_Err_Stop:** When it is active, if the battery BMS fails to communicate with inverter, the inverter will stop working and report fault.

What you can do from this page:

- Set up you Lithium-ion battery.

After installing a lithium battery, check the communications page by clicking on the 'Li BMS' icon to see if the BMS information is visible. Suppose some information is not displayed correctly (it should look like the diagram below), then there will be a communication error.

Li BMS Help ?	
Sum Data	Details Data
Battery Voltage: 530.6V	
Battery Current: -1A	
Battery Temp: 22.0C	
Total SOC: 85%	
Total SOH: 100%	
Battery Chage Voltage: 580.1V	
Charge Current Limit: 50A	
Discharge Current Limit: 50A	

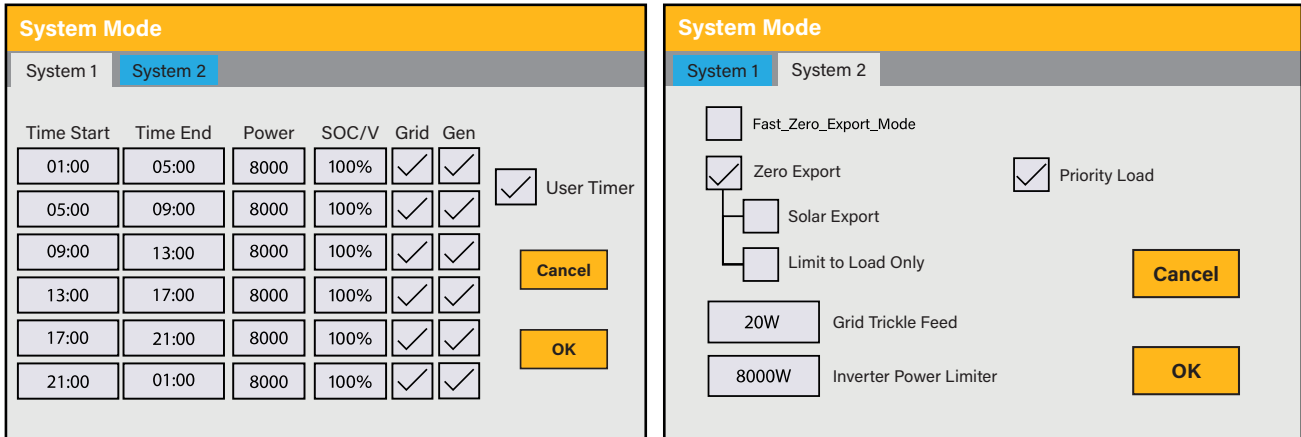
Li BMS Help ?								
Sum Data					Details Data			
	Volt	Curr	Tem	SOC	Energy	Charge		Fault
1	503.1V	19.70A	29.6C	33.0%	26.0Ah	0.0V	0.0A	0 0 0
2	503.8V	31.70A	37.6C	51.0%	25.5Ah	532V	25.0A	0 0 0
3	503.5V	25.10A	29.9C	52.0%	6.0Ah	532V	25.0A	0 0 0
4	503.7V	30.70A	32.1C	12.0%	26.0Ah	0.0V	0.0A	0 0 0
5	503.5V	00.00A	30.6C	48.0%	32.0Ah	0.0V	0.0A	0 0 0
6	503.6V	15.40A	30.6C	52.0%	39.1Ah	0.0V	0.0A	0 0 0
7	000.0V	00.00A	0.0C	00.0%	00.0Ah	0.0V	0.0A	0 0 0
8	503.8V	19.30A	31.0C	52.0%	25.5Ah	0.0V	0.0A	0 0 0
9	503.9V	16.30A	30.6C	52.0%	26.0Ah	0.0V	0.0A	0 0 0
10	000.0V	00.00A	0.0C	00.0%	00.0Ah	0.0V	0.0A	0 0 0
11	000.0V	00.00A	0.0C	00.0%	00.0Ah	0.0V	0.0A	0 0 0
12	000.0V	00.00A	0.0C	00.0%	00.0Ah	0.0V	0.0A	0 0 0
13	000.0V	00.00A	0.0C	00.0%	00.0Ah	0.0V	0.0A	0 0 0
14	000.0V	00.00A	0.0C	00.0%	00.0Ah	0.0V	0.0A	0 0 0
15	000.0V	00.00A	0.0C	00.0%	00.0Ah	0.0V	0.0A	0 0 0

Therefore, if a communication error occurs:

1. Check that your data cable is the correct type.
2. Check that the data cable is plugged into the correct sockets. Usually, RS485 is employed, but some battery manufacturers use others.

Program Charge & Discharge Times

To set 'Charge' and 'Discharge' times, click on the 'System Mode' icon after clicking on the gear icon.



What this page displays:

- **Zero Export:** A setting to prevent the inverter exporting power to the grid.
- **Solar Export:** The ability to limit power supply to only the household loads.
- **Priority to Load Only:** Set the power limits to supply only the loads connected to the LOAD port.
- **Grid peak shaving:** When this is selected, the grid output power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and stored battery energy to supplement. If there is not enough PV energy or stored energy to meet the load requirement, grid power will increase to meet the load needs.

If nothing ticked: This Mode allows the hybrid inverter to sell back any excess power produced by the solar panels to the grid. If the use time is active, the battery energy can also be sold into the grid. The PV energy will be used to power the load and charge the battery, and then excess energy will flow to the grid. Power source priority for the load is as follows:

1. Solar Panels.
2. Grid.
3. Batteries (until programable % discharge is reached).

Concerning the detailed next figures:

1. Tick this box to not export power back to the grid (the CT coil will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load).
2. Tick this box if you wish to export your solar power back to the grid.
3. Tick this box if you only want to supply power to the load side of the inverter.
4. 'Zero Export Power' is the amount of power flowing from the grid to the inverter. Set this value to '20 - 100W' to instruct the inverter to always take the prescribed amount of power from the grid to minimise the tripping of sensitive pre-paid electricity meters if 'Reverse Power Detection' occurs.
5. This controls the maximum overall power, both to the 'Load' and 'Grid' ports combined. It is set to Low if an 'over-current' fault occurs.
6. Tick this box if you wish to set the solar panels to give power to the 'Load'. If you untick this box, the solar will send power to charge the batteries.

System Mode

Real Start Time, Real End Time, Power Limit, Battery % or voltage when an action is to happen, Charge from Grid, Charge from Gen, No tick = Discharge, User Controller

Time Start	Time End	Power	SOC/V	Grid	Gen
01:00	05:00	8000	100%	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
05:00	09:00	8000	100%	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
09:00	13:00	8000	100%	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
13:00	17:00	8000	100%	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
17:00	21:00	8000	100%	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
21:00	01:00	8000	100%	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

User Timer Cancel OK

System Mode

System 1 System 2

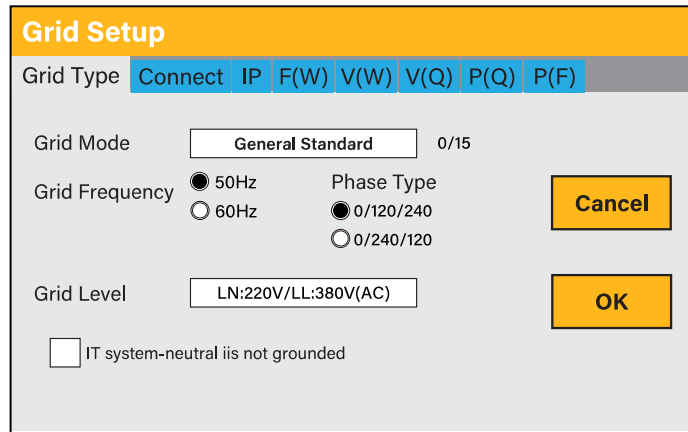
Fast_Zero_Export_Mode
 Zero Export
 Solar Export
 Limit to Load Only
 Priority Load
 Grid Trickle Feed
 Inverter Power Limiter

1 → 2 → 3 → 4 → 5 → 6

Cancel OK

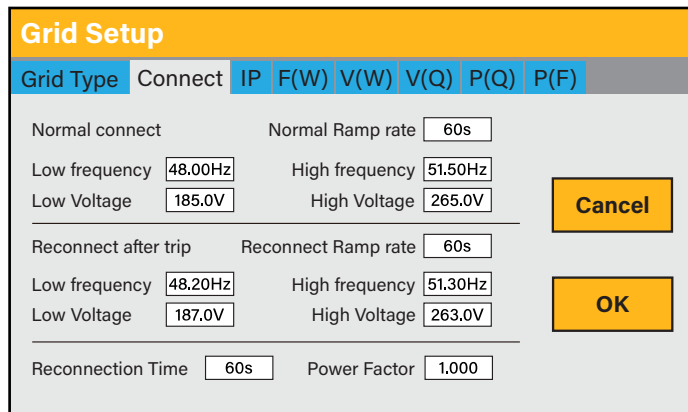
Grid Supply Page

In the Settings menu, click on the GRID icon.



What this page displays:

- Grid Mode:** General Standard, UL1741 & IEEE1547, CPUC RULE21, SRD-UL-1741, CEI 0-21, AustraliaA, Australia B, Australia C, EN50549_CZ-PPDS(>16A), NewZealand, VDE4105, OVE_Directive R25. Please follow the local grid code and then choose the corresponding grid standard.
- Grid Level:** There are several voltage levels for the inverter output voltage in off-grid mode. LN:230VAC, LL:400VAC, LN:240VAC LL:420VAC, LN:120VAC, LL:208VAC, LN:133VAC, LL:230VAC.
- IT system:** For the IT grid system, the Line voltage (between any two lines in a three-phase circuit) is 230Vac. If your grid system is an IT system, please enable "IT system" and tick the "Grid level" as 133-3P, as the picture above shows.



What this page displays:

- Normal connect:** The allowed grid voltage/frequency range when the inverter first time connects to the grid.
- Normal Ramp rate:** It is the startup power ramp.
- Reconnect after trip:** The allowed grid voltage/frequency range for the inverter connects the grid after the inverter trip from the grid.
- Reconnect Ramp rate:** It is the reconnection power ramp.
- Reconnection time:** The waiting time period for the inverter to connect the grid again.
- Power factor:** This is used to adjust the inverter's reactive power.

Grid Setup

Grid Type Connect IP F(W) V(W) V(Q) P(Q) P(F)

Over voltage U,(10min. running mean) 260.0V

HV3	265.0V		HF3	51.50Hz	
HV2	265.0V	-- 0.10s	HF2	51.50Hz	-- 0.10s
HV1	265.0V	-- 0.10s	HF1	51.50Hz	-- 0.10s
LV1	185.0V	-- 0.10s	LF1	48.00Hz	-- 0.10s
LV2	185.0V	-- 0.10s	LF2	48.00Hz	-- 0.10s
LV3	185.0V		LF3	48.00Hz	

Buttons: Cancel, OK

What this page displays:

- **HV1:** Level 1 overvoltage protection point;
- **HV2:** Level 2 overvoltage protection point;
- **HV3:** Level 3 overvoltage protection point.
- **LV1:** Level 1 undervoltage protection point;
- **LV2:** Level 2 undervoltage protection point;
- **LV3:** Level 3 undervoltage protection point.
- **HF1:** Level 1 over frequency protection point;
- **HF2:** Level 2 over frequency protection point;
- **HF3:** Level 3 over frequency protection point.
- **LF1:** Level 1 under frequency protection point;
- **LF2:** Level 2 under frequency protection point;
- **LF3:** Level 3 under frequency protection point;
- **0.10s:** Trip time.

Grid Setup

Grid Type Connect IP F(W) V(W) V(Q) P(Q) P(F)

F(W)

Over frequency

Start freq f 50.20Hz

Stop freq f 50.20Hz

Start delay f 0.00s

Stop delay f 0.00s

Droop f 40%PE/Hz

Under frequency

Start freq f 49.80Hz

Stop freq f 49.80Hz

Start delay f 0.00s

Stop delay f 0.00s

Droop f 40%PE/Hz

Buttons: Cancel, OK

What this page displays:

- **FW:** This series inverter is able to adjust inverter output power according to grid frequency.
- **Droop f:** The percentage of nominal power per Hz.

For example: "Start freq f>50.2Hz, Stop freq f<50.2, Droop f=40%PE/Hz" when the grid frequency reaches 50.2Hz, the inverter will decrease its active power at Droop f of 40%. And then, when the grid system frequency is less than 50.2Hz, the inverter will stop decreasing output power. For the detailed setup values, please follow the local grid code.

Grid Type	Connect	IP	F(W)	V(W)	V(Q)	P(Q)	P(F)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				Lin: 20.0%	Lout: 5.0%		
V1	109.0%	P1	100%	V1	90.0%	Q1	44%
V2	110.0%	P2	20%	V2	95.7%	Q2	0%
V3	111.0%	P3	20%	V3	104.3%	Q3	0%
V4	111.0%	P4	20%	V4	112.2%	Q4	-60%

What this page displays:

- **V(W):** It adjusts the inverter active power according to the set grid voltage.
- **V(Q):** It adjusts the inverter reactive power according to the set grid voltage. This function adjusts inverter output (active and reactive) power when grid voltage changes.
- **Lock-in/Pn 5%:** When the inverter active power is less than 5% rated power, the VQ mode will not take effect.
- **Lock-out/Pn 20%:** If the inverter active power increases from 5% to 20% rated power, the VQ mode will take effect again.

For example: V2=110%, P2=20%. When the grid voltage reaches 110% times of rated grid voltage, the inverter output power will reduce its active output power to 20% rated power.

For example: V1=90%, Q1=44%. When the grid voltage reaches 90% times of the rated grid voltage, the inverter output power will output 44% reactive output power.

For the detailed setup values, please follow the local grid code.

Grid Type	Connect	IP	F(W)	V(W)	V(Q)	P(Q)	P(F)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				Lin: 404.3%	Lout: 646.9%		
P1	0%	Q1	0%	P1	0%	F1	-2.400
P2	0%	Q2	0%	P2	0%	F2	0.000
P3	0%	Q3	0%	P3	0%	F3	0.000
P4	0%	Q4	0%	P4	0%	F4	6.000

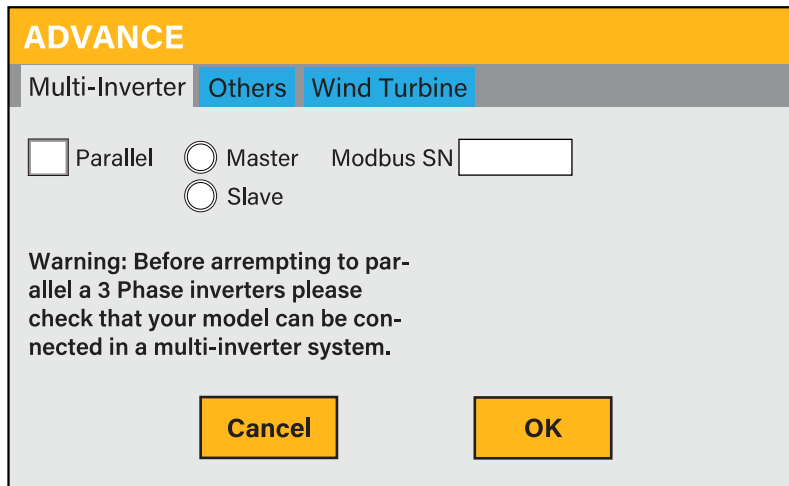
What this page displays:

- **P(Q):** It adjusts the inverter reactive power according to the set active power.
- **P(PF):** It adjusts the inverter PF according to the set active power.
- **Lock-in/Pn 50%:** When the inverter output active power is less than 50% rated power, it won't enter the P(PF) mode.
- **Lock-out/Pn 50%:** When the inverter output active power is higher than 50% rated power, it will enter the P(PF) mode.

For the detailed setup values, please follow the local grid code.

Paralleling Inverters Advanced Settings

To configure multi-inverter settings, click on the ADVANCE icon.



What this page displays:

If the inverter operates as a master or a slave.

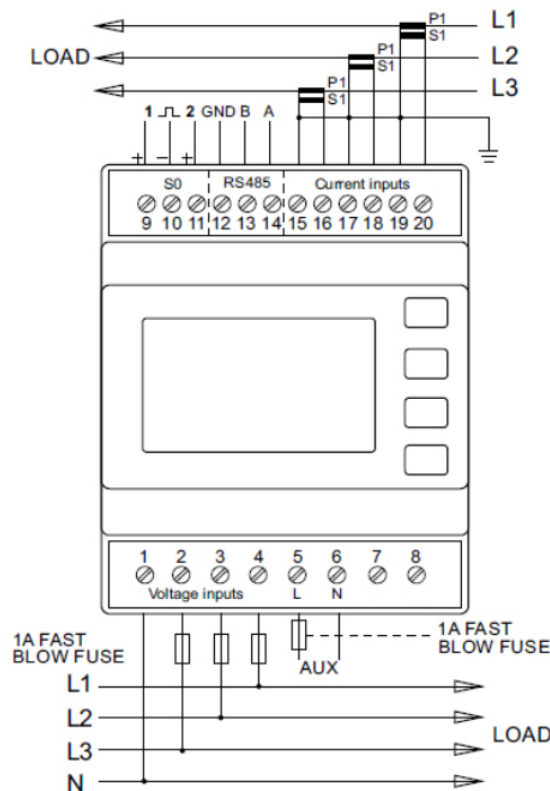
- **Modbus Device ID:** 'Modbus SN' that must be unique for each inverter connected to the bus/wire.

What you can do from this page:

- Set the inverter as a master or slave per bus/wire.
- Set the phase in which the inverter will be paralleled.
- Set the Modbus SN for paralleling.

Electric Meter Wiring and Setup

Wiring Diagram



Setup Operation

Press and hold  to enter the setting screen. The default password is 1000.













If you enter an incorrect password, "PASS Err" is displayed.







Press  to exit the setting screen.

1. Key setting description:











- a. After the password is confirmed, enter the Setting menu. You can find the page for setting parameters through  and .
- b. Press  to access the selection menu.
- c. If the page blinks, press  or  to set the value. If it does not blink, a submenu still exists.
- d. After selecting the menu, press  to confirm the entry, you will see the SET logo.
- e. After completing the setting, press  to exit the setting, and other functions can be set through  and .
- f. If you want to completely exit, you can press  continuously until you completely exit the setup program.

2. Digital input method

In the setup program, you may need to enter a number or enter a password, usually from left to right, as follows:




- a. Use  and  to set blinking characters.
- b. Press  to confirm the input digit. The blinking character automatically jumps to the next digit.
- c. In sequence, until all Settings are completed, press  to exit the setting.

3. Set the Modbus communication address

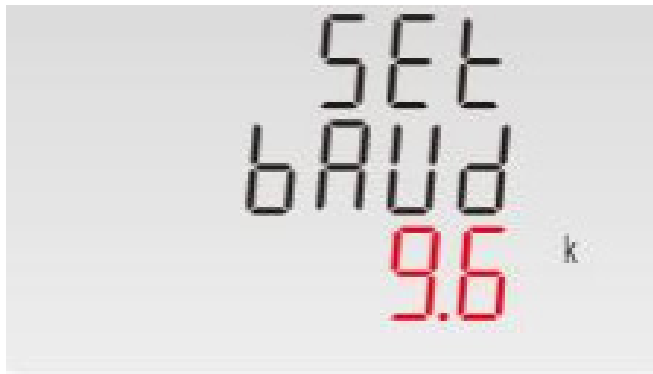
1		Press M  and P  to find the communication address setting interface
1-1		Press and hold E  to enter the stroboscopic screen.
1-2		Press M  and P  to set the address 001 to 247. Press and hold E  to confirm the Settings. Press U/I  to exit.


4. Communication baud rate setting

Users can set by panel key communication baud rate: 2.4 k, 4.8 k, 9.6 k, 19.2 k, 38.4 k.

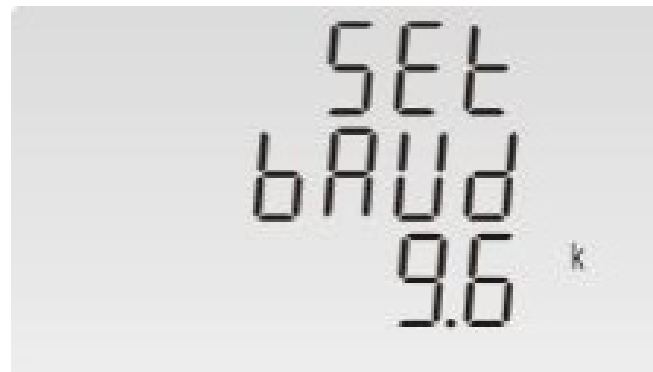
2		Press M  and P  to find the communication baud rate setting screen
---	---	--



2-1





Press and hold  to enter the stroboscopic screen.

2-2



Set the communication baud rate by pressing  and .



Press and hold  to confirm the Settings. Press  to exit.

5. Check bit Settings

The user can set the communication check bit by pressing the panel button: EVEN/ODD/NONE.


3



Press  and  to find the communication check bit setting interface



3-1





Press and hold  to enter the stroboscopic screen.

3-2



Set the communication check bit by pressing **M**  and **P** .

Press and hold **E**  to confirm the Settings. Press **U/I**  to exit.

6. Stop bit Settings

The user can set the stop bit: 1 or 2 by pressing the button on the panel.






1



Press **M**  and **P**  to find the stop setting screen.

2



Press and hold **E**  to enter the stroboscopic screen. Set the stop bit by pressing the **M**  and **P**  buttons. Press and hold **E**  to confirm the Settings. Press **U/I**  to exit.

NOTICE

The stop bit defaults to 1. The value can be set to 2 only when the parity bit is NONE.

7. Current transformer parameter Settings

The user can set the secondary current (1A or 5A) according to the actual needs, and then set the transformer ratio.

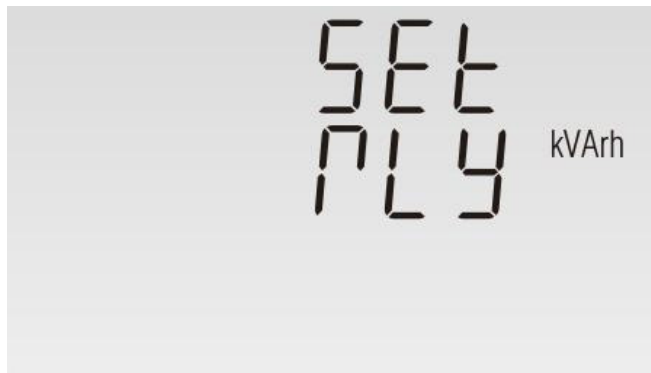
1		Find the current transformer setting interface by pressing and .
2		Press and hold to enter the secondary current stroboscopic screen. Select Settings by pressing and : 5A/1A
3		Transformer ratio setting: Press and hold to enter the current ratio stroboscopic screen. Press and to select Settings: 0001-2000.

For example, if CT1 is set to 100, the primary current is 100A.

8. Pulse setting

The user can set the pulse 1 output type: active power kWh and reactive power kVArh.

1



Press and to find the pulse setting interface.

2



Press and hold to enter the stroboscopic screen. Select Settings by pressing and : kWh or kVArh. Press and hold to confirm the Settings. Press to exit.

9. Demand cycle setting

This function is used to calculate the amount of electricity and power demand.

Optional Settings: 0,5,8,10,15,20,30,60 minutes.

1



Press and to find the demand period setting interface.










2



Press and hold to enter the stroboscopic screen. Press and to select Settings: 0,5,8,10,15,20,30,60 minutes. Press and hold to confirm the Settings. Press to exit Settings and return to the Settings menu.




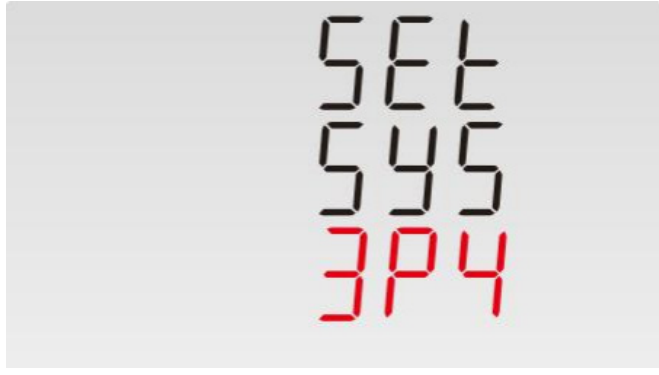



10. Power grid system type setting

Users can set the network system type according to actual requirements.

1 	<p>Press  and  to find the grid system setting interface.</p> <p>The current screen displays three phases and three wires.</p>
2 	<p>Press and hold  to enter the stroboscopic screen. Select Settings by pressing  and  : 1P2(W), 1P3(W),3P3(W),3P4(W). Press and hold  to confirm the Settings. Press  to exit.</p>

11. Clear the Settings



The user can set the maximum current demand and the maximum power demand by pressing the button on the panel.

1 	<p>Press  and  to find the grid system setting interface.</p> <p>The current screen displays three phases and three wires.</p>
2 	<p>Press and hold  to enter the stroboscopic screen. Long press  to clear the demand.</p> <p>Press  to exit.</p>

12. Change the password Settings


1



Press **M**  and **P**  to find the page for changing the password.



2





Press **E**  to enter the stroboscopic screen.

3



Enter a new password by pressing **M**  and **P** .

Press and hold **E**  to confirm the Settings

Press **U/I**  to exit Settings and return to the Settings menu.

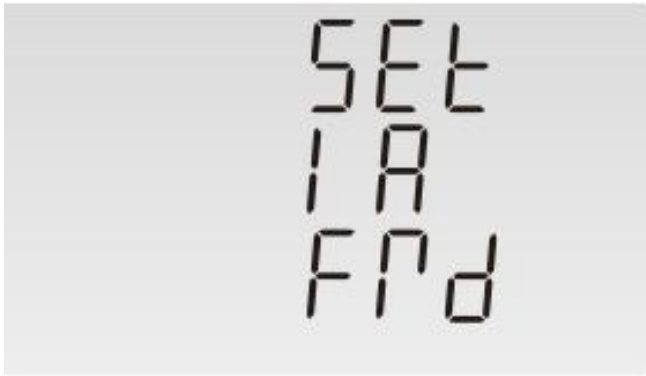
13. Current reverse setting


1



Press **M**  and **P**  to find the current reverse setting interface.




2




Press  to enter phase A. The default Frd is forward FRD.

3




Select A/B or C phase by pressing  and .
Press and hold  to confirm the Settings.

Press  to exit Settings and return to the Settings menu.

When the A-phase current transformer is reversed, the current can be reversed through the setting on the meter.



1



Press  to enter phase A. The default Frd is forward FRD.

2



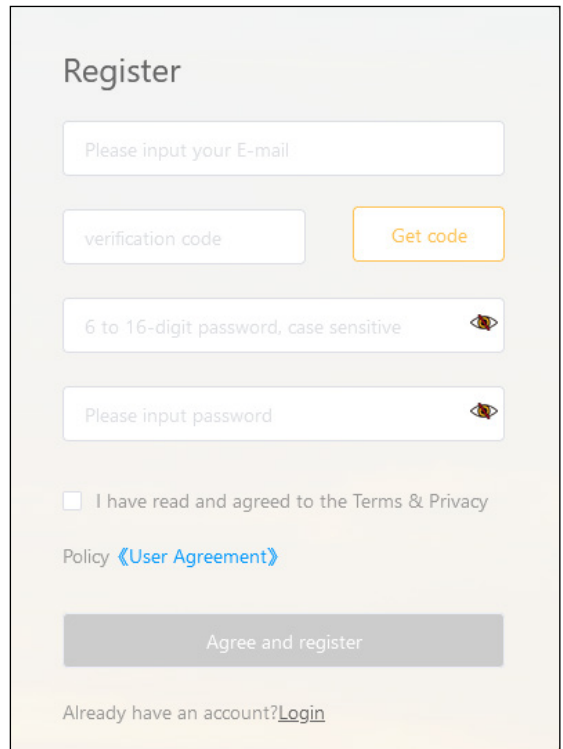
Long press the  key, and the red character flashes.
Press  to select Frd (forward) or Rev (reverse).

PCS Cloud Platform Login and How to Access the Internet

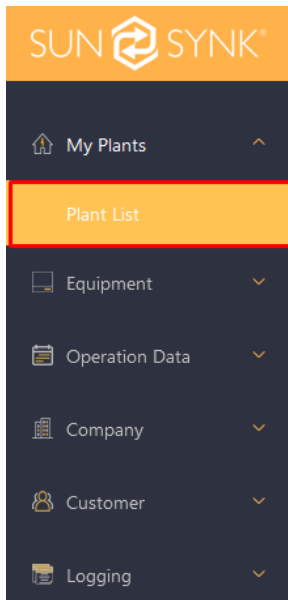
1 Enter <https://sunsynk.net> in your browser to access the web version of the management tool. Then, click 'Sign Up' on the Login page to access the Registration page.



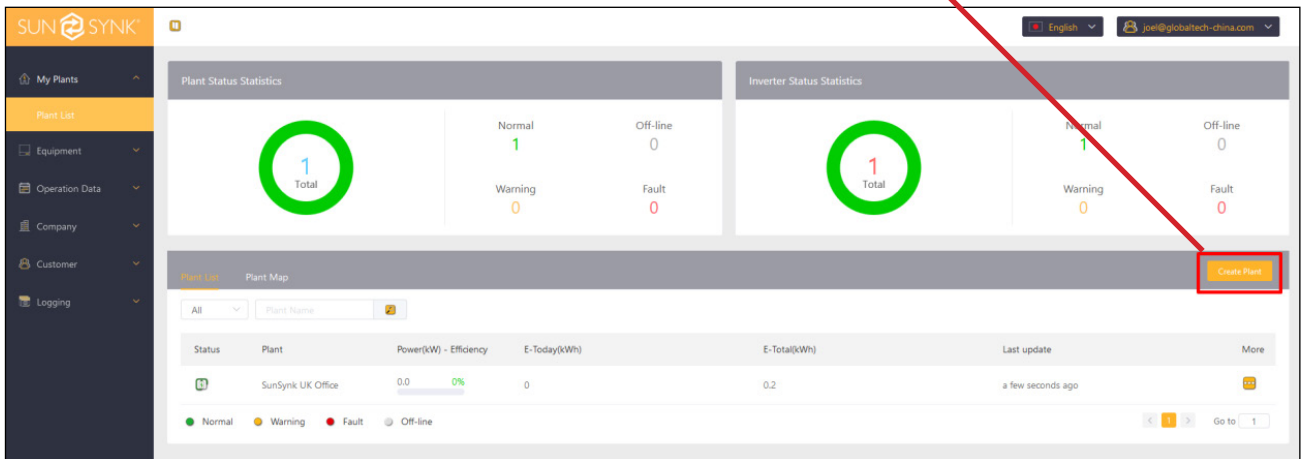
2 Enter a valid phone number or e-mail address to receive the verification code. After completing the registration information, enter a password, check the box in the user agreement to indicate that you have read and agree to the agreement, then click 'Agree and register'.



3 Create plant: After logging into PV-CSP, you can create your own plant and monitor the operation status and power generation data in real time. In the menu, first click 'My Plant', then 'Plant List'.



3.1 To create a new plant, click 'Create Plant' on the right corner of the page.



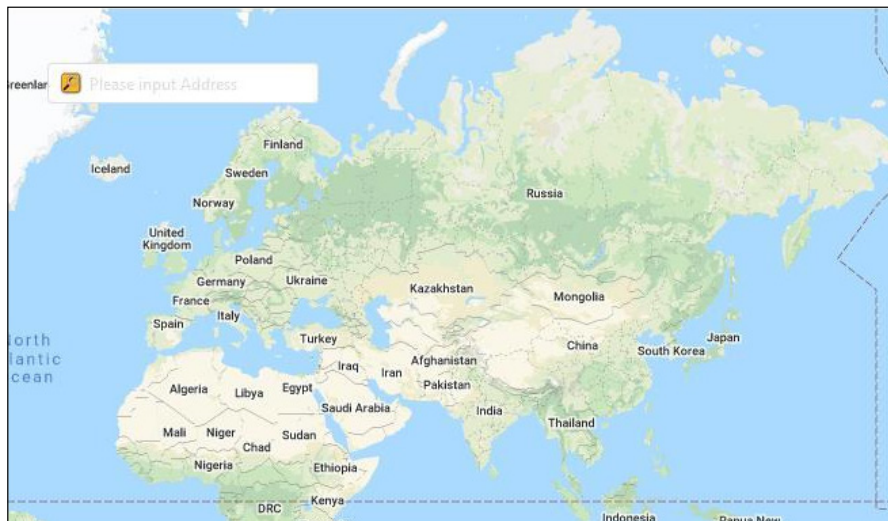
3.2 Enter the Serial Number (SN) and KEY on the Data Logger label, then click the 'Next'.

The screenshot shows the 'Create Plant' interface with a progress bar at the top. The 'Plant Info' step is active. Below the progress bar, there are four icons representing different steps: 'Add Device', 'Plant Info.', 'Revenue Info.', and 'Contacts'. Under the 'Plant Info.' icon, there are two input fields: '* SN' and '* Key', both with 'Please input' as a placeholder. To the right of these fields is a QR code with the following text: 'Wi-Fi Stick', 'P/N: EGG-0009-M5', 'S/N: 54051-0001', 'KEY: QD5B ***** WHHW BYAY', and 'Chengde LUNTER Information Technology Co., Ltd.'. Below the QR code is a 'Cancel' button and a 'Next' button.

3.3 Enter the total capacity in 'Capacity' select the correct type in 'Plant Type', the information displayed on the page will be different if choose different types of plants. To ensure the accuracy of the plant statistics, please fill in the information on the page correctly.

The screenshot shows the 'Create Plant' interface with the 'Capacity' and 'Plant Type' sections. There are four input fields: '* Plant Name' (placeholder: 'Please input'), '* Capacity' (placeholder: 'Please input', unit: 'kWp'), '* Commissioning Date' (calendar icon, value: '2021-04-28'), and 'Installer' (placeholder: 'Please input'). Below the 'Commissioning Date' field, there are two radio buttons for 'Plant Type': 'Grid-Tied' (selected) and 'Energy Storage (AC Coupling)'. Below these, there are two more radio buttons: 'Energy Storage (DC Coupling)'. To the right of the input fields is a dashed box with a plus sign icon and the text: 'Upload picture The file format must be JPG, JPEG, PNG, and size can not exceed 10MB'.

3.4 You can enter the installation address of the plant in the address input box on the map to locate the specific installation location or you can use the map to select the correct installation location.

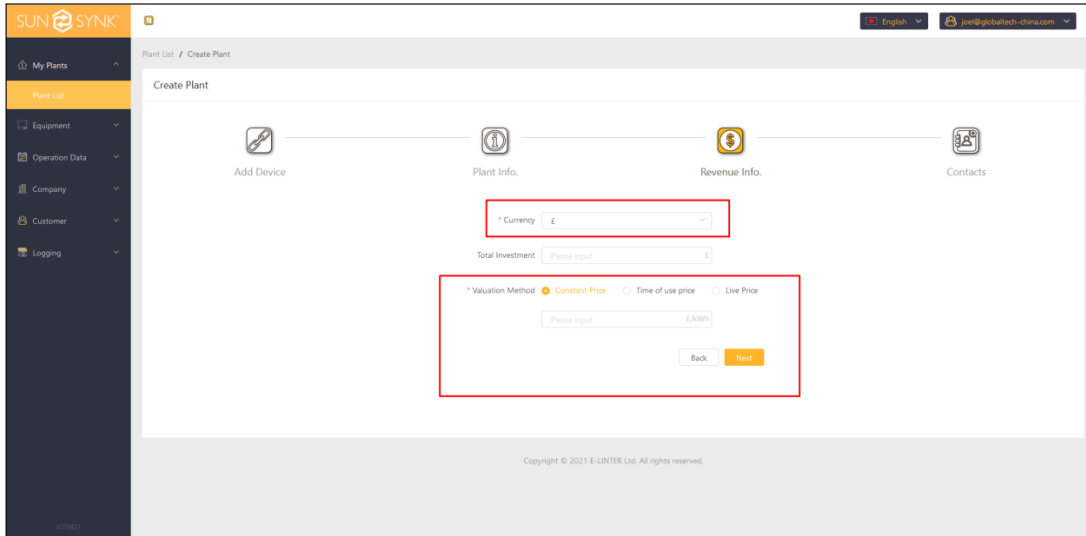


3.5 Also, please confirm if the time zone of the plant is correct. If it is not, please change it. Finally, click 'Next'

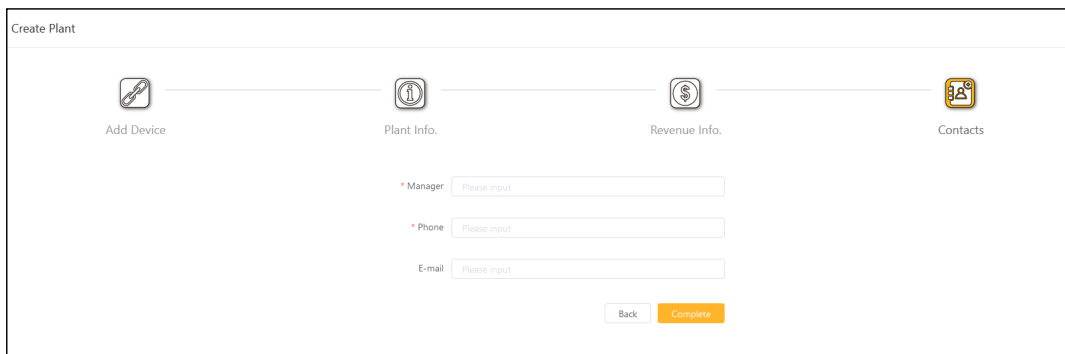
The screenshot shows the 'Create Plant' interface with the 'Time Zone' section. There is a dropdown menu for '* Time Zone' with the value '(UTC+00:00)Dublin,Edinburgh,Lisbon,London'. To the right of the dropdown menu is a red box with the text: 'Please select the correct time zone'. Below the dropdown menu and the red box are two buttons: 'Back' and 'Next'.

3.6 Select your currency, your total investment, and your preferred Valuation Method.

Note: The Live Price option is only currently available for UK customers.

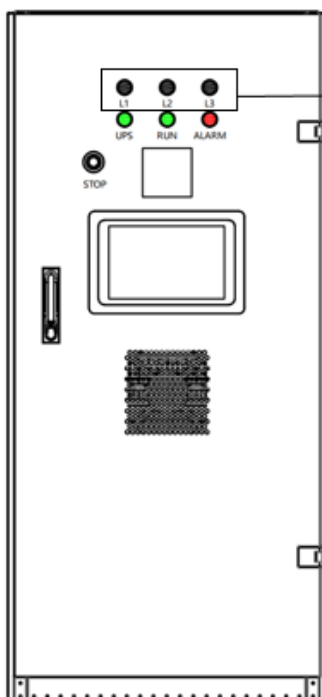


3.7 Enter the name of the user who is going to manage the system, their phone number and e-mail.



Distribution Cabinet

Integral Cabinet

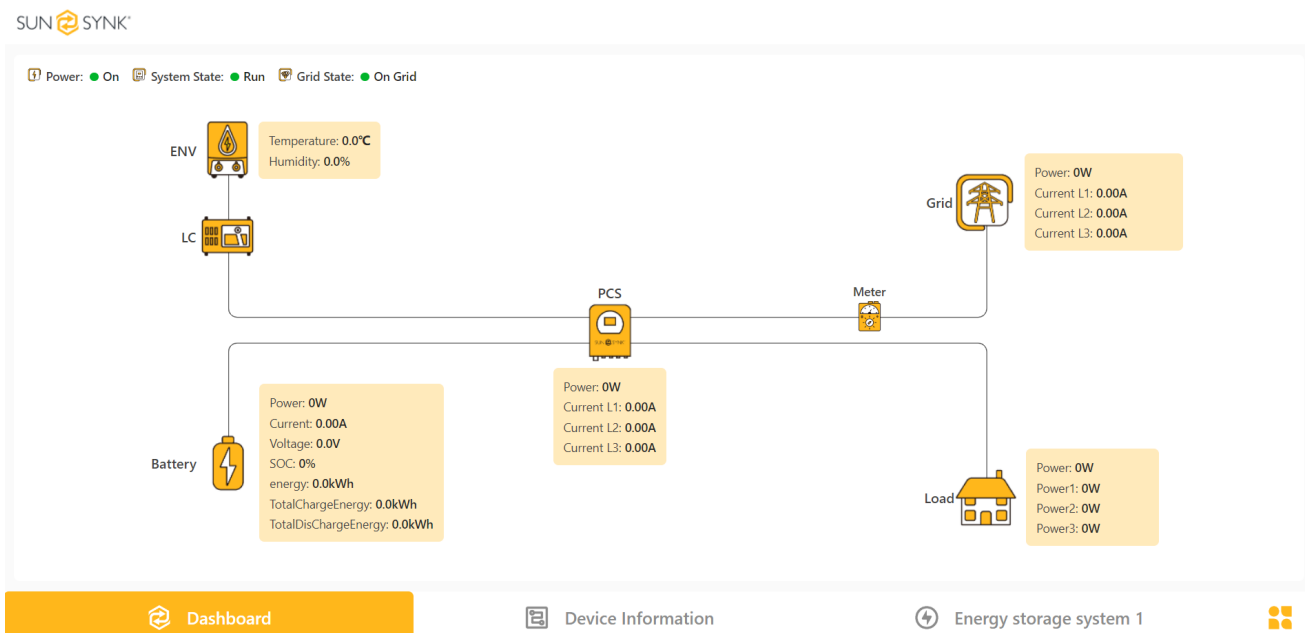


- Operation and display panel: The operation and display panel are shown in the picture below, which includes six indicators, an emergency stop button, an electric meter display screen, and a display control screen.
- STOP: emergency stop button. If an emergency fault occurs, press this button.
- Electric meter: View three-phase voltage, three-phase current, three-phase power, etc.
- Display control panel: View battery cluster current and voltage faults.

LC light		Description
UPS	Green led solid light	The mains supply is normal
RUN	Green led solid light	Normal grid connection
ALARM	Red led solid light	Fault or warning
L1, L2, L3	White led solid light	Three-phase power supply normal

Display and Control Screen Interface

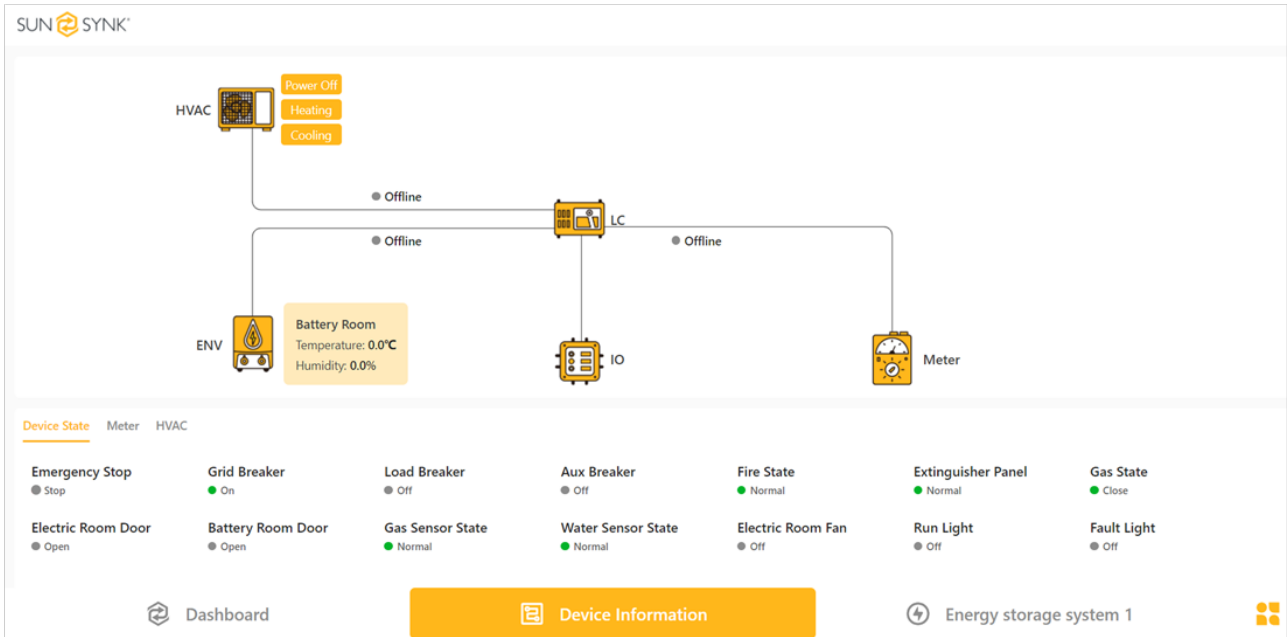
PCS Summary Information



What this page displays:

- Click the PCS icon to display all converter information.
- Click Dashboard to enter the PCS summary page.
- Click Environment Info. The Environment information page is displayed.
- Click Energy storage system to go to the Energy Storage System page.
- Click the lower right corner of the drop-down menu appears, you can switch the energy storage system.
- Power: Displays the energy status.
- Run State: Displays the system status.
- Off Network State: Displays the network status.
- TEMP, Humidity: Humidity information is displayed.
- Battery: Displays battery information.
- Grid: Displays power grid information.
- Load: Displays load information.

Environmental Information



What this page displays:

- Air conditioner status.
- Meter status.
- Temperature and humidity information.

What you can do from this page:

- Power Off: turns off the air conditioner
- Heating: Set the air conditioner to heat
- Cooling: The air conditioner is used for cooling

Device status feedback information:

- Emergency Stop: indicates the emergency stop state.
- Grid Breaker/Load Breaker/Aux Breaker: indicates the circuit breaker connection status.
- Fire State/Extinguisher Panel/Gas State: indicates the fire status.
- Electric Room Door/ Battery Room Door: access control status.
- Gas Sensor State: gas concentration state.
- Water Sensor State: Water sensor state.
- Electric Room Fan: Controls the switch of the electric fan.
- Run Light/Fault Light: indicates the switch of the control indicator.

The meter collects information: Voltage, current, power, etc.

Device State	Meter	HVAC
Uab 0.0V	Ubc 0.0V	Uca 0.0V
Ua 0.0V	Ua 0.0V	Ua 0.0V
Uc 0.0V	Uc 0.0V	Uc 0.0V
La 0.000A	La 0.000A	La 0.000A
Lb 0.000A	Lb 0.000A	Lb 0.000A
Lc 0.000A	Lc 0.000A	Lc 0.000A
Pt 0W	Pt 0W	Pt 0W
Pa 0.0W	Pa 0.0W	Pa 0.0W
Pb 0.0W	Pb 0.0W	Pb 0.0W
Pc 0.0W	Pc 0.0W	Pc 0.0W
Qt 0.0var	Qt 0.0var	Qt 0.0var
Qa 0.0var	Qa 0.0var	Qa 0.0var
Qb 0.0var	Qb 0.0var	Qb 0.0var
Qc 0.0V	Qc 0.0V	Qc 0.0V
PFt 0.000	PFt 0.000	PFt 0.000
PFa 0.000	PFa 0.000	PFa 0.000
PFb 0.000	PFb 0.000	PFb 0.000
PFc 0.000	PFc 0.000	PFc 0.000
Freq 0.00Hz	Freq 0.00Hz	Freq 0.00Hz
ImpEp 0.00kWh	ImpEp 0.00kWh	ImpEp 0.00kWh
ExpEp 0.00kWh	ExpEp 0.00kWh	ExpEp 0.00kWh

Air conditioning information: Air conditioning Cooling, heating, and temperature information.

Device State Meter HVAC

Air TEMP 0.0°C	Air HUMID 0.0%	HAVC1 Stop	HAVC2 Stop	Timeout Flag Offline
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Energy Storage System

SUN SYNK[®]

No Fault

The diagram shows a central PCS (Power Conversion System) connected to Battery 1, Battery 2, Grid, and Load. Battery 1 and Battery 2 are both offline with 0W power and 0% SOC. The Grid and Load are also showing 0W power. The PCS is in a 'Close' state with 0W power.

PCS Battery 1 Battery 2 Grid Load

Work State Standby	Power 0W	Current L1 0.00A	Current L2 0.00A	Current L3 0.00A	HeatSinkTemp 0.0°C	Energy 0.0kWh
TotalChargeEnergy 0.0kWh	TotalDisChargeEnergy 0.0kWh					

Dashboard Device Information Energy storage system 1

What this page displays:

- Battery 1 Information.
- Battery 2 Information.
- Hybrid converter information.
- Power Grid Information.
- Load information.

What you can do from this page:

- Click the switch button to turn the converter on or off.

Converter status information:

- Running status.
- Power.
- Three phase current.
- Radiator temperature.
- Charge and discharge amount.

Battery status information:

PCS	Battery 1	Battery 2	Grid	Load		
Work State Normal	Battery Mode Standby	SOC 0%	Power 0W	Current 0.00A	Voltage 0.0V	Max Cell V 0.000V
Min Cell V 0.000V	Max Cell TEMP 0°C	Min Cell TEMP 0°C				

PCS	Battery 1	Battery 2	Grid	Load		
Work State Normal	Battery Mode Standby	SOC 0%	Power 0W	Current 0.00A	Voltage 0.0V	Max Cell V 0.000V
Min Cell V 0.000V	Max Cell TEMP 0°C	Min Cell TEMP 0°C				

- Running status.
- Battery status.
- Battery power.
- Battery current.
- Total battery pressure.
- Minimum cell voltage.
- Minimum cell temperature.

Grid display information:

PCS	Battery 1	Battery 2	Grid	Load		
Power 0W	Frequency 0Hz	Current L1_In 0.00A	Current L1_Out 0.00A	Voltage L1 0.0V	Power L1 0W	Current L2_In 0.00A
Current L2_Out 0.00A	Voltage L2 0.0V	Power L2 0W	Current L3_In 0.00A	Current L3_Out 0.00A	Voltage L3 0.0V	Power L3 0W

- Total power.
- Frequency.
- L1/L2/L3 Voltage, power, current.

Load information:

PCS	Battery 1	Battery 2	Grid	Load		
Power 0W	Frequency 0Hz	Voltage L1 0.0V	Power L1 0W	Voltage L2 0.0V	Power L2 0W	Voltage L3 0.0V
Power L3 0W						

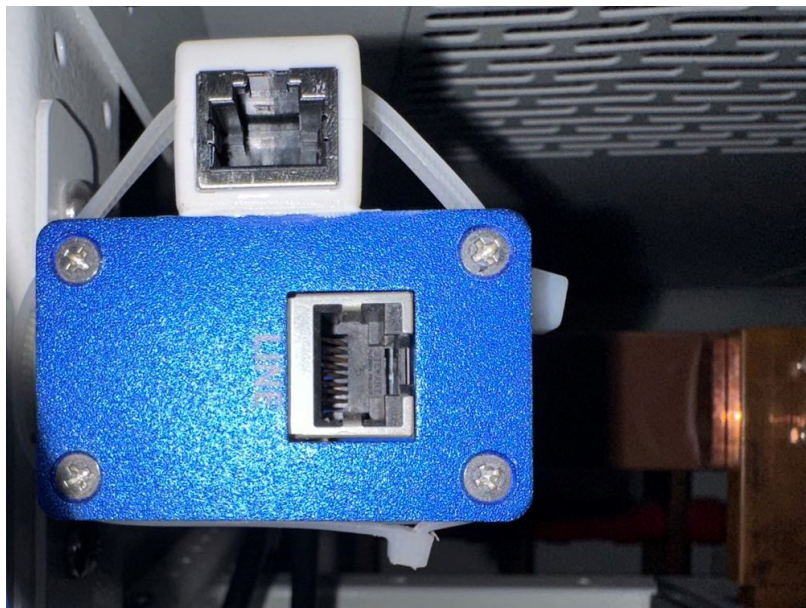
- Power.
- Frequency.
- L1/L2/L3 Voltage, power, current.

Access WEB Pages Remotely

Drag a network cable, plug the network cable into the white network port, and use a laptop to access the LC interface.

1. Connect the network cable to LC port 4 and connect the other end to a computer.
2. Change the computer IP address to 192.168.4.04.
 - a. Open the "Start" menu, search for and open "Control Panel".
 - b. In the Control Panel, select "Network and Internet" (or simply "Network Settings").

- c. On the network and Internet, select Network and Sharing Center.
 - d. In the Network and Sharing Center, select Change Adapter Settings.
 - e. In the Adapter Settings, locate the network adapter that is currently in use, right-click, and select "Properties".
 - f. In the adapter properties, find "Internet Protocol Version 4 (TCP/IPv4)" and select it, then click the "Properties" button.
 - g. In the TCP/IPv4 properties, select "Use the following IP address" and manually enter the IP address, subnet mask, and default gateway you want to set.
 - h. Finally, click "OK" to save the Settings.
3. Open the computer browser, type <http://192.168.4.136:8080>, you can view the LC interface.



Battery Cabinet

Integral Cabinet

Power switch: Once the device is properly installed and the cables are properly connected, set the circuit breaker to the ON position and press the Start button to turn on the device.

HV: Steady yellow indicates that the battery power circuit is closed.

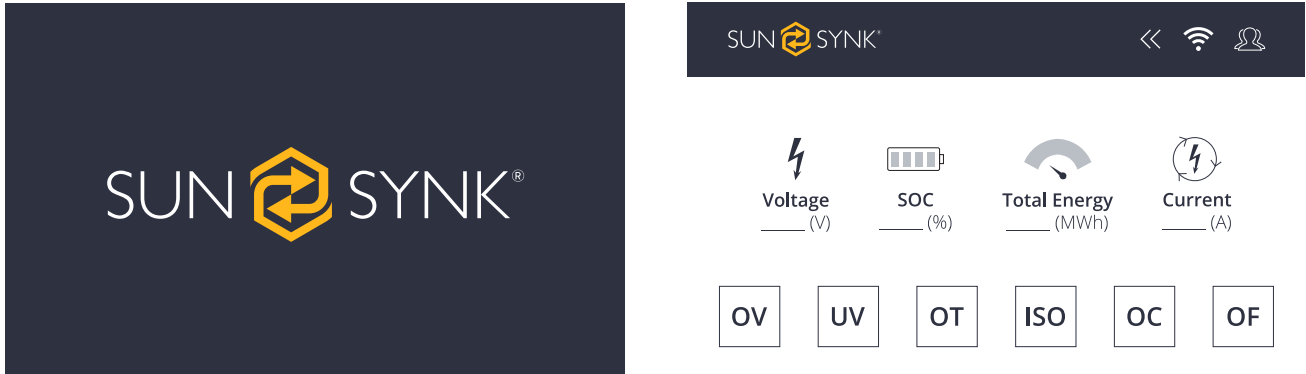
Alarm: The high-voltage box sends an alarm signal when the red light is on.









Screen Interface

Home Screen

The default interface will appear after powering on. If the screen is not touched for more than 13 minutes, it will darken and the default interface replaces the other interface. Click this screen to enter the user interface.



Basic Parameters

 Wi-Fi Icon	<ul style="list-style-type: none"> No Wi-Fi icon on the screen indicates no Wi-Fi signal. The flashing Wi-Fi icon on the screen indicates the Wi-Fi is in connecting. The Wi-Fi icon on the screen indicates the Wi-Fi is connected.
 System maintenance icon	Click this icon to enter the system maintenance.
 Voltage	Total battery voltage.
 Current	Battery current, the positive value representing discharge, the negative value representing charge.
 SOC	Battery remaining energy.
 Total energy	Accumulated discharging energy.

Fault Indication

When the corresponding fault type occurs, the red background indicator on the screen will light up. The description of each is shown below.

OV	Over Voltage
UV	Under Voltage
OT	Over Temperature
UT	Under Temperature
ISO	Insulation failure, there is a risk of current leakage
OC	Over Current
OF	Other Faults
DV	Different Voltage
DT	Different Temperature

System Maintenance

Click the  icon on screen to enter the maintenance system password confirmation interface.

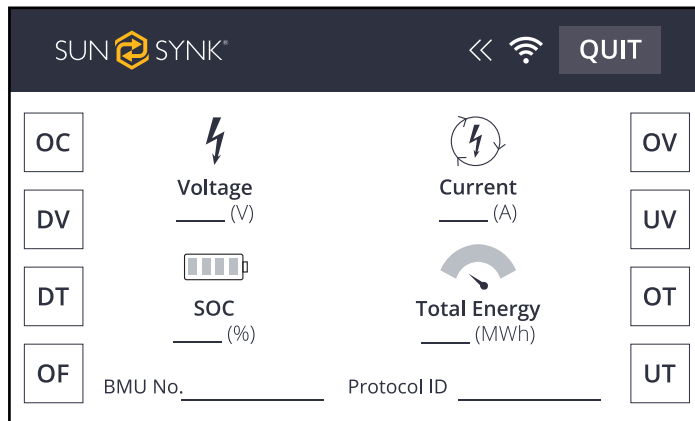


Enter the password 123 and press the Confirm key to enter the main interface of system maintenance. The operation shall be performed by a professional.



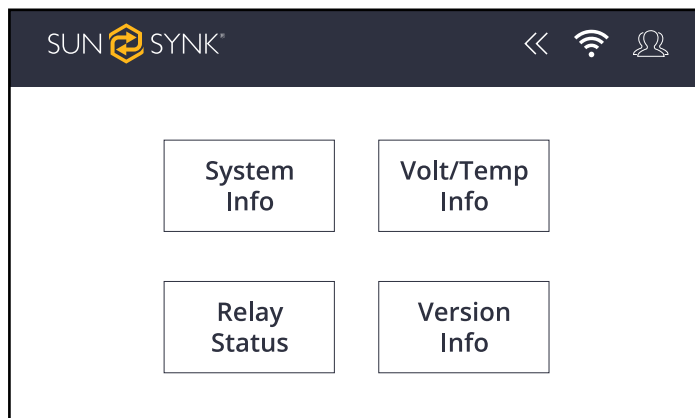
Main Screen

This screen shows the main information of the system, like the Voltage (V), SOC (%), Current (A), Total Energy (MWh), the BMU number, and the protocol ID. Click this screen to enter the system maintenance menu. Click on each Fault Indication to enter in the Fault Page.



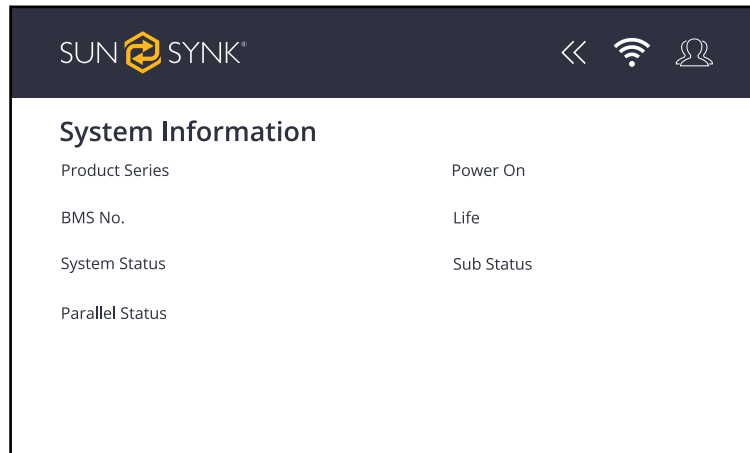
System Maintenance Menu

The Menu page presents information about High Voltage Series Battery system, voltage, temperature, version, and the relay status.



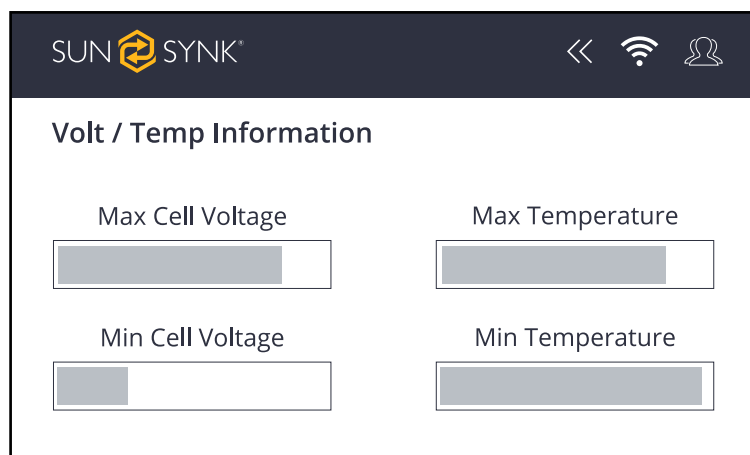
System information

This screen shows the information about the High Voltage Series Battery system. Information like product series, number of the BMS, the system status, parallel status, power status, battery life status, and sub status.



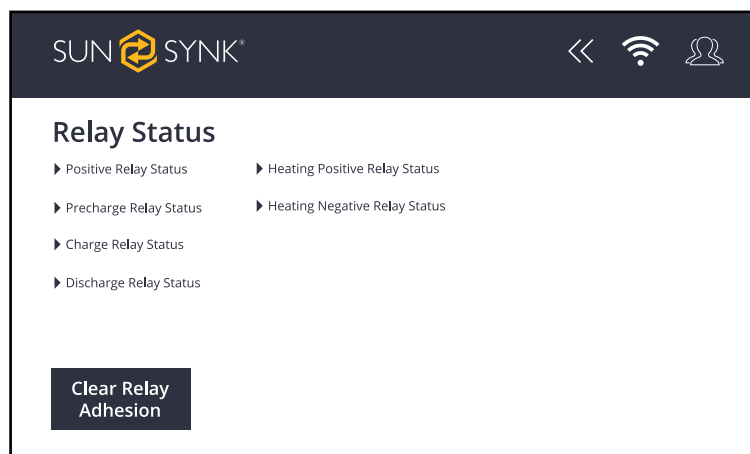
Volt/Temp information

This screen shows the information about the system voltage and temperature.



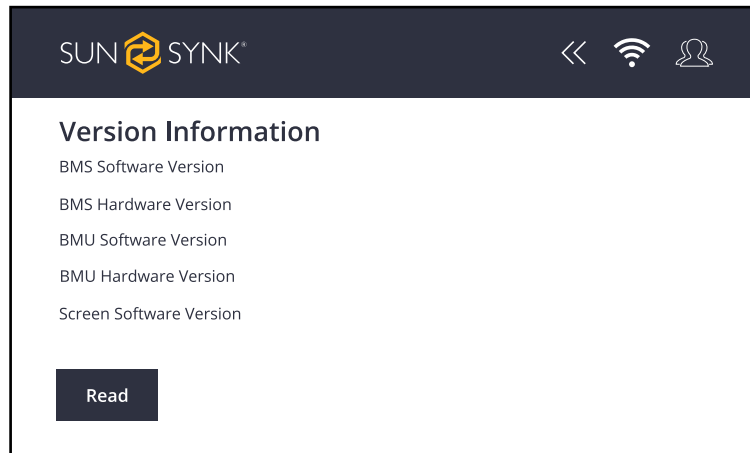
Relay status

This screen shows statuses related to the relay. In addition, in this page you can clear the relay adhesion.



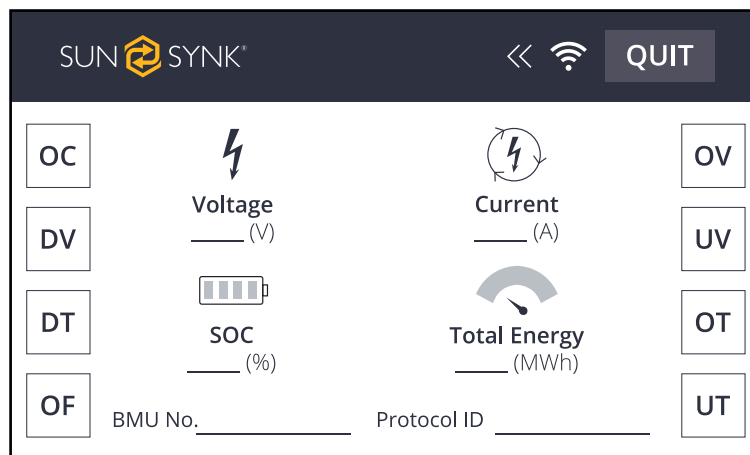
Version information

This page contains all the information about BMS, BMU, and Screen software and hardware versions.



Fault Pages

In "Home Screen" page, click on each Fault Indication to enter in the Fault Page related.

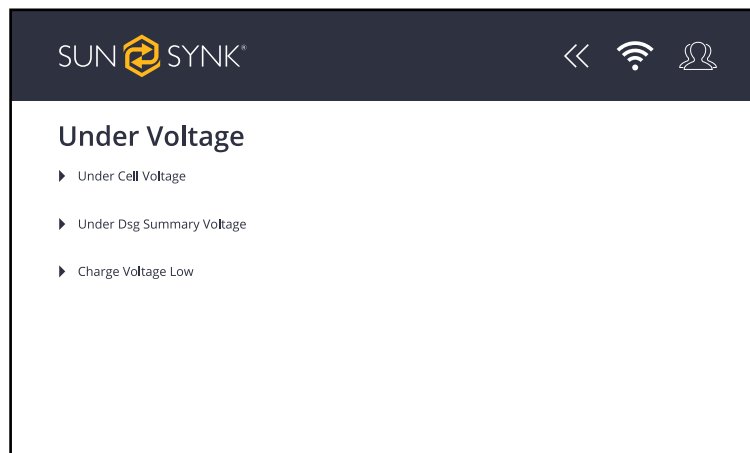


Fault warning:

OV red	Overvoltage is displayed. Click OV to view fault details
UV turns red	Indicates undervoltage. Click UV to view details.
OT turns red	If the temperature is too high, click OT to view details.
UT turns red	If the temperature is too low, click UT to view details.
ISO turns red	Indicates that the insulation is faulty and there is a risk of leakage. Click ISO to view the detailed fault.
OC turns red	The charge overcurrent is displayed. Click OC to view the fault details.
OF turns red	Indicates other faults. Click OF to view details.

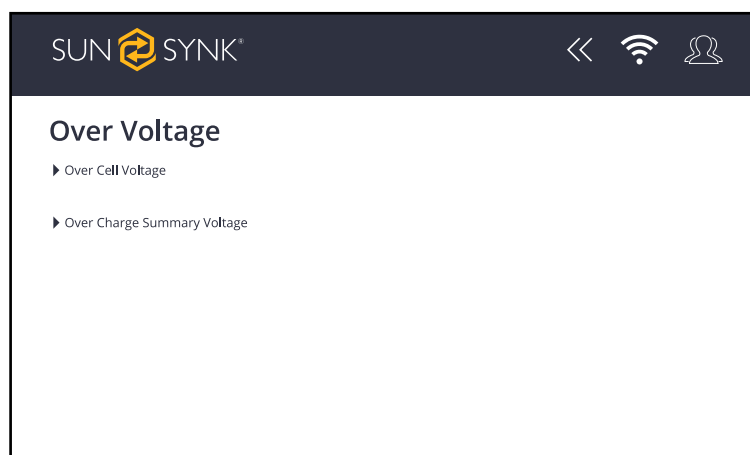
Under Voltage (UV)

This screen shows the faults related to the under voltage of the system.



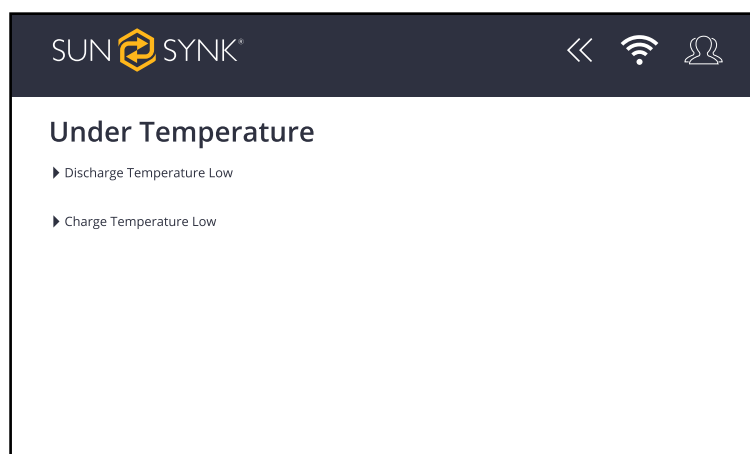
Over Voltage (OV)

This screen shows the faults related to the over voltage of the system..



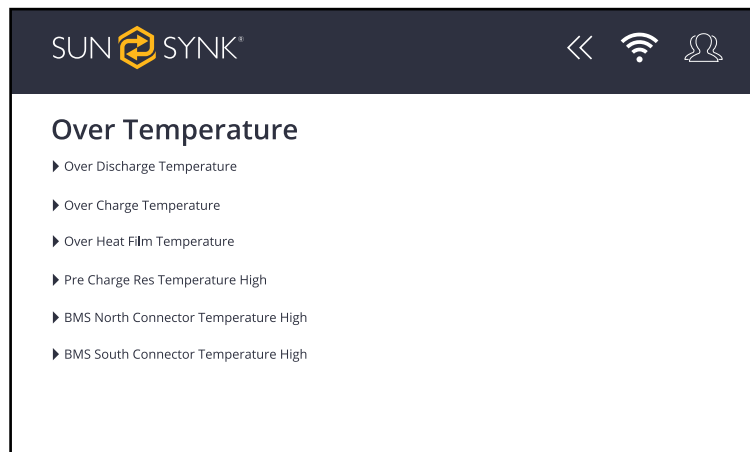
Under Temperature (UT)

This screen shows the faults related to the under temperature of the system.



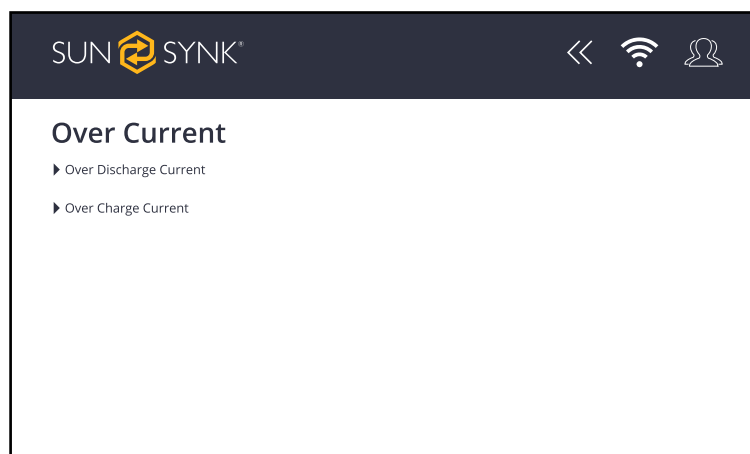
Over Temperature (OT)

This screen shows the faults related to the over temperature of the system.



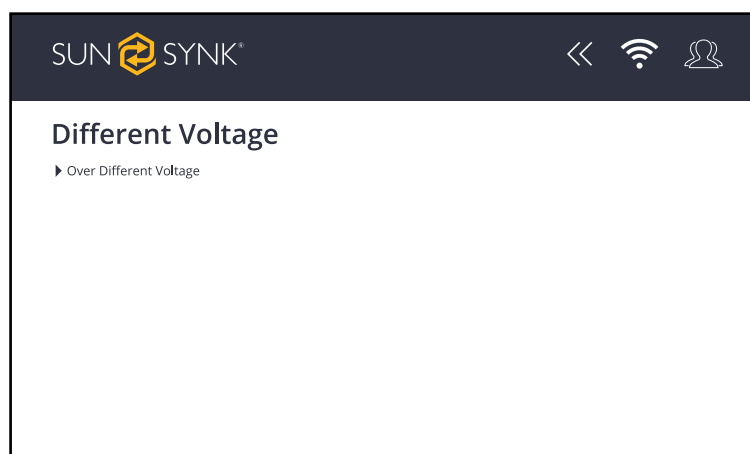
Over Current (OC)

This screen shows the faults related to the over current of the system.



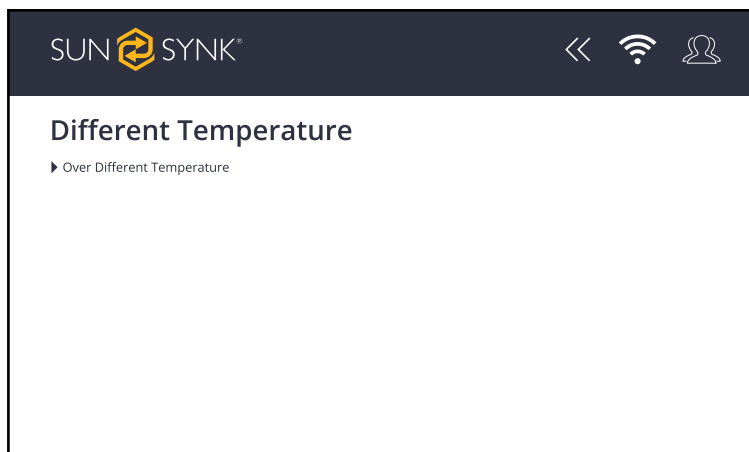
Different Voltage (DV)

This screen shows the faults related to the different voltage of the system.



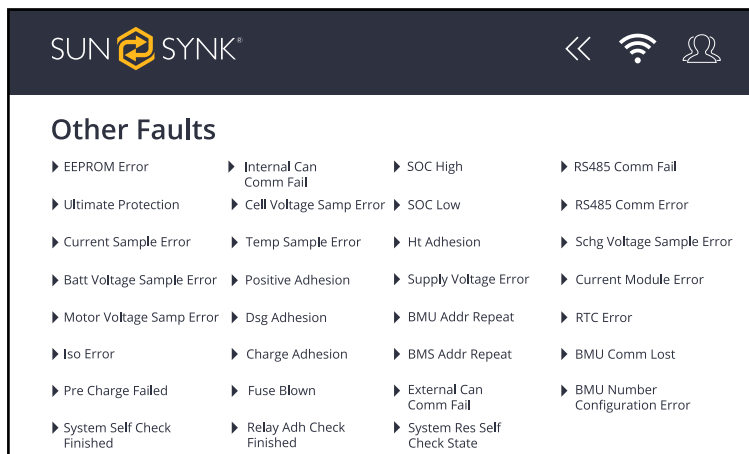
Different Temperature (DT)

This screen shows the faults related to the different temperature of the system.



Other Faults (OF)

This screen shows the other faults of the system.



Descriptions of Different Types of Faults and Protection

Abbreviation	Screen protection event description	HVESS-Monitor protection event description	HVESS-Monitor alarm event description
OT	BMS southward connector overtemperature	BMU connector overtemperature protection	BMU connector overtemperature alarm
	BMS northward connector overtemperature	BMS connector overtemperature protection	BMS connector overtemperature alarm
	Pre-charge resistor overtemperature level-2 alarm	Pre-charge resistor overtemperature protection	Pre-charge resistor overtemperature alarm
	Heating film overtemperature level-2 alarm	Heating film overtemperature protection	Heating film overtemperature alarm
	Charge overtemperature level-2 alarm	Charge overtemperature protection	Charging overtemperature alarm
	Discharge overtemperature level-2 alarm	Discharge overtemperature protection	Discharge over temperature alarm
	/	Power loop overtemperature protection	Power loop overtemperature alarm
UT	Charge under temperature level-2 alarm	Charge under temperature protection	Charge under temperature alarm
	Discharge under temperature level-2 alarm	Discharge under temperature protection	Discharge under temperature alarm
OC	Charge overcurrent level-2 alarm	Charge overcurrent protection	Charge overcurrent alarm
	Discharge overcurrent level-2 alarm	Discharge overcurrent protection	Discharge overcurrent alarm
DV	Excessive differential voltage level-2 alarm	Excessive differential voltage protection	Excessive differential voltage alarm
DT	Excessive differential temperature level-2 alarm	Excessive differential temperature protection	Excessive differential temperature alarm
OV	Total charge voltage too high	Total voltage too high protection	Total voltage too high alarm
	Cell overvoltage level 2 alarm	Cell overvoltage protection	Cell overvoltage alarm
UV	Charge voltage too low	Charging voltage too low	/
	Total discharge voltage too low	Total voltage too low protection	Total voltage too low alarm
	Cell undervoltage level-2 alarm	Cell undervoltage protection	Cell undervoltage alarm

Abbreviation	Screen protection event description	HVESS-Monitor protection event description	HVESS-Monitor alarm event description	
OF	Abnormal numbers of BMU	Abnormal numbers of BMU	/	
	BMU lost	BMU lost	/	
	RTC clock fault	RTC clock fault	/	
	Current module fault	Current module fault	/	
	SCHG total voltage acquisition fault	SCHG total voltage acquisition fault	/	
	Abnormal RS485 communication	Abnormal RS485 communication	/	
	RS485 communication failure	RS485 communication failure	/	
	PCS-CAN BUS communication failure	PCS-CAN BUS communication failure	/	
	Repeated BMS address fault	Repeated BMS address fault	/	
	Repeated BMU address fault	Repeated BMU address fault	/	
	Abnormal power supply voltage	Abnormal power supply voltage	/	
	Heating relay adhesion	Heating relay adhesion	/	
	SOC too low	SOC too low	/	
	SOC too high	SOC too high protection	/	
	Fuse Blown	Fuse Blown	/	
	Charge relay adhesion	Charge relay adhesion	/	
	Discharge relay adhesion	Discharge relay adhesion	/	
	Master positive relay adhesion	Master positive relay adhesion	/	
	Temperature acquisition failure	Temperature acquisition failure	/	
	Cell voltage acquisition fault	Cell voltage acquisition fault	/	
	Inter communication failure	INTER-CAN BUS communication failure	/	
	Pre-charge failure	Pre-charge failure	/	
	Insulation level 2 alarm	Insulation level 2	Insulation level 1	
	External total voltage acquisition fault	External total voltage acquisition fault	/	
	Internal total voltage acquisition fault	Internal total voltage acquisition fault	/	
	Current acquisition fault	Current acquisition fault	/	
	Limit protection	Limit protection	/	
	EEPROM failure	EEPROM storage failure	/	
	ISO EEPROM failure	Insulation level 2	Insulation level 2	/

Fire Suppression System

The energy storage fire protection system mainly comprises a detection part and a fire extinguishing part, which can realize the automatic detection, alarm, and fire protection functions of the protected area or battery box.

The detection part mainly includes the detector, the fire control host, the emergency start and stop button, the sound and light alarm, and the gas discharge indicator.

The fire extinguishing part mainly includes gas fire extinguishing devices, pipelines, nozzles, etc. The fire extinguishing device usually uses perfluorohexanone fire extinguishing device.



Function Key	Description
Scroll (up)	Flip page up
Escape	Back
Accept	Sure
Scroll (down)	Flip page down

High safety of the automatic fire control system: The fire control system of the storage container has automatic control and management functions. Through the monitoring of the external environment and internal equipment, the fire control system can automatically control the fire when the fire breaks out.

Advantages and features:

- The detector can be built into the battery compartment to achieve early detection and early alarm.
- The detector threshold can be adjusted according to the site environment.
- Multi-sensor fusion technology, fire alarm secondary confirmation mechanism, reduce the probability of system misoperation.
- The host adopts PLC control and LCD display, with easy operation, maintenance, modification, and adjustment characteristics.
- Can achieve remote monitoring.

Temperature Detector



Technical Specification	
Operating Voltage	24V (16V~28V)
Standby Current	≤60uA
Alarm Current	≤55mA
Indicator	Red
Wiring	Polarized 2-core for Zone. Polarized 2-core for remote indicator.
Alarm Reset	Instant power failure (Min.2s,Max.1.0VDC)
Sensitivity	A1R, A2S & BS
Typical Fixed Temperature	A1: 58 °C A2: 62°C B: 77°C
Ambient Temperature	A1: -10°C~+50°C A2: -10°C~+50°C B: -10°C~+65°C
Relative Humidity	≤95%
Housing Material	ABS
Class of Protection	IP2X
Dimensionality	Diameter: 100mm Height: 54.5mm (with base)
Mounting Hole Spacing	45mm~75mm
Weight	About 110 grams

Light Smoke Detector



Technical Specification	
Operating Voltage	24V (16V~28V)
Standby Current	≤60uA
Alarm Current	≤55mA
Indicator	red
Wiring	Polarized 2-core for Zone. Polarized 2-core for remote indicator.
Alarm Reset	Instant power failure (Min.2s,Max.1.0VDC)
Sensitivity	Level 1 (default) and Level 2
Ambient Temperature	-10°C~+50°C
Relative Humidity	≤95%, noncondensing
Housing Material	ABS
Class of Protection	IP2X
Dimensionality	Diameter: 100mm Height: 54.5mm (with base)
Mounting Hole Spacing	45mm~75mm
Weight	About 110 grams

Emergency Stop/Start Button

In case of emergency (fire, short circuit, etc.), please stop the container in an emergency and press the container emergency stop button to control the container.

(1) Emergency stop: Press the emergency stop button outside the container. Then, disconnect the controlled part of the main circuit. At this time, the system enters the fault state.

(2) Scram elimination: the scram button is suspended outside the container. Then, the container emergency stop signal is eliminated, the system returns to the working state and waits for the control command;

Fire Agent Release Button



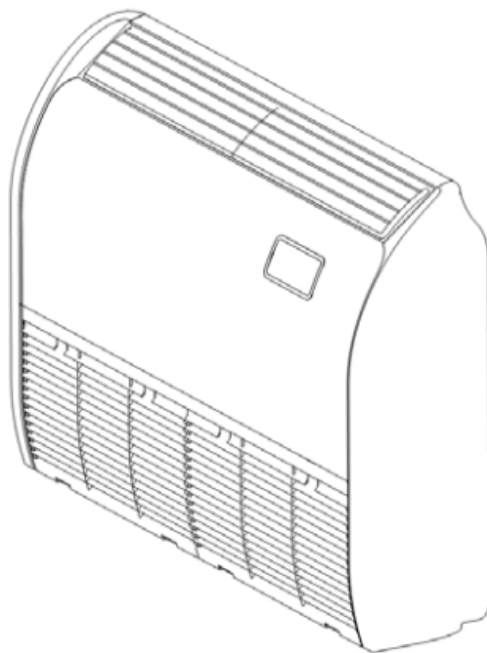
Technical Specification	Description
Approval/Certification	Certified by LPCB and VdS
Supply/Operate Voltage	Max. 30Vdc
Product Size	93 x 89 x 60 mm
Construction and Finishing	Yellow RAL1006, ABS: glass element.
IP Rating	IP24D
Weight	184g (including rear box)
Operating Conditions/Temperature	-0°C~+65°C

Cancel the Agent Release Button



Technical Specification	Description
Static Current	0mA
Alarm Current	There are decisions on the type of control devices and the number/type of field devices connected to the system.
Index	N/A
Controls	Green button
Product Size	87×87×58 mm
Construction and Finishing	Polycarbonate, green button, yellow call point housing, black back housing
IP Rating	IP24
Operating Conditions/Temperature	-0°C~+65°C
Relative Humidity	95% non-condensing

Air Conditioner



Air Conditioning -AW-24URSCA- Product Specification for Integrated Indoor Types

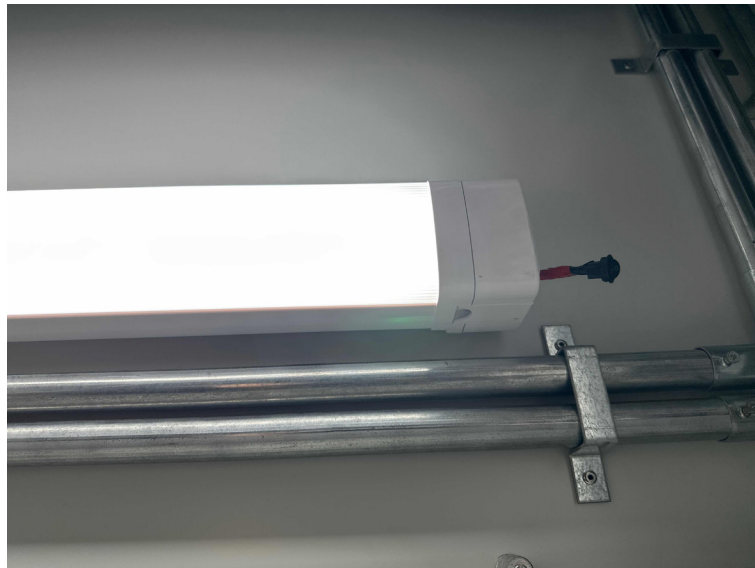
Model	MC125
Size, quality (internal machine)	
Overall Dimensions (H * W * D)	230*990*680mm
Weight	32kg
Installation Mode	Suspension mounting
Cooling	7.1kW 24200Btu/h
Heat	8.5kW 29000Btu/h
Power Input Cooling	70W
Power Input Heating	70W
Sound Pressure	45/41/37 dB(A)
Sound Pressure (Floor)	48/44/40 dB(A)
Air Velocity	16.1/14.0/11.3
Accelerate Setting HH1	17.8m ³ /min
Accelerate Setting HH2	20.0m ³ /min
Appearance and Color	Neture white
Connection Type	Bell nut link (with bell)
Pipeline Liquid	9.53mm 3/8inch
Pipeline Gas	15.88mm 5/8inch
Condensate Drainage	I.D.32mm
Net Weight	32kg
Gross Weight	39kg

Size, quality (external)		
Machine Type	HVR-140W	
Power Source	220V-50Hz	
Overall Dimensions (H * W * D)	990*950*320mm	
Weight	880kg	
Refrigeration Operation	Rated Capacity	14.0kW
	Rated Power	4.17kW
Heating Operation	Rated Capacity	16.0kW
	Rated Power	4.28kW
IPLV (C)	6.8	
APF	5.05	
Maximum Number of Internal Machine Connections	6	
Refrigerant Flow Control	Microcomputer control electronic expansion valve	
Piping Connection Mode	Horn connection (with horn connection)	
Heat Exchanger	Multiple fork fin tube	
Outdoor Unit Air Volume	4260 m ³ /h	
Noise	Cold	52 dB(A)
	Warm	54 dB(A)
Operating Range	Refrigeration	-5~46 °C DB
	Heating	-20~23 °C WB
Trachea	15.88mm	
Liquid Pipe	9.53mm	
Amount of Refrigerant to be Charged	4.0kg	
Minimum Line Current	31.0A	
Maximum Fuse Current	40.0A	

Lighting System

When the container system is about to be transported, or there is no mains power supply for a long time, the spare battery of the lamp must be full, and the switch next to each lamp must be disconnected.

When the container system is ready to be connected to the power grid, close the switch next to each light in advance.



POWER ON THE SYSTEM

Check Before Power-On

Routine Inspection

Serial Number	Check Item	Acceptance Criteria
1	Equipment appearance	<ul style="list-style-type: none"> The equipment is in good condition without damage, rust or paint loss. If the paint is off, repair the paint. The device label is clearly visible. Replace the damaged label in time.
2	Cable appearance	The cable protection layer is intact without obvious damage.
3	Cable connection	<ul style="list-style-type: none"> The cable connection position is the same as the design. Terminals are prepared in accordance with specifications and are securely connected. The labels on both ends of each cable face the same direction.
4	Cable routing	<ul style="list-style-type: none"> Cable routing complies with the separation principle between strong and weak cables. Cables are neat and beautiful. Cut the cable fasteners neatly without exposed spikes. Leave a margin as required at the turning, do not tighten. The cables are straight and smooth, and the cables in the cabinet are not crossed.
5	Copper bar	The copper bar is not deformed or damaged by dipping.
6	Switch	<ul style="list-style-type: none"> The switches of the external DC PDC are OFF. The battery cluster switch is OFF.

Energy Storage System Installation Check

Cabinet Inspection

Serial Number	Check Item	Acceptance Criteria
1	Install	<ul style="list-style-type: none"> Installed as designed. All cabinet doors can be opened normally.
2	Appearance	Cabinet surface without cracks, dents, scratches. If any are missing Paint, please touch up the paint.
3	Cabinet grounding	Solid ground
4	Attachments	The number and positions of external accessories to be installed meet design requirements.
5	Identification	Labels are correct, clear, and complete..

Inside Inspection

Serial Number	Check Item	Acceptance Criteria
1	Circuit Breaker	<ul style="list-style-type: none"> ■ Installed as designed. ■ All cabinet doors can be opened normally.
2	Copper Bar	Cabinet surface without cracks, dents, scratches. If the paint is off, repair the paint.
3	Cable	Solid ground.
4	Battery Pack	The number and positions of external accessories to be installed meet design requirements.
5	Foreign Body	Labels are correct, clear, and complete.
6	Lightning Protector	The SPD status indicator is green.
7	Sub-components (CMU,- adapter, integrated gas extinguishing unit)	There is no damage to the appearance of each sub-com- ponent.
8	Cabinet Grounding	The ground conductor is securely connected to the ground terminal board or copper of the cabinet Row.

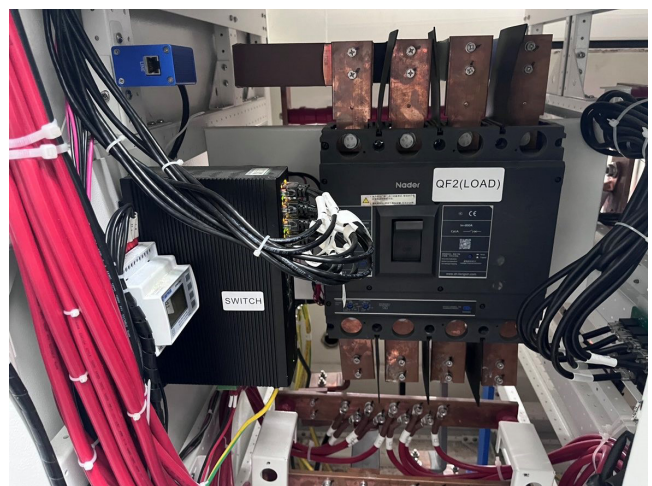
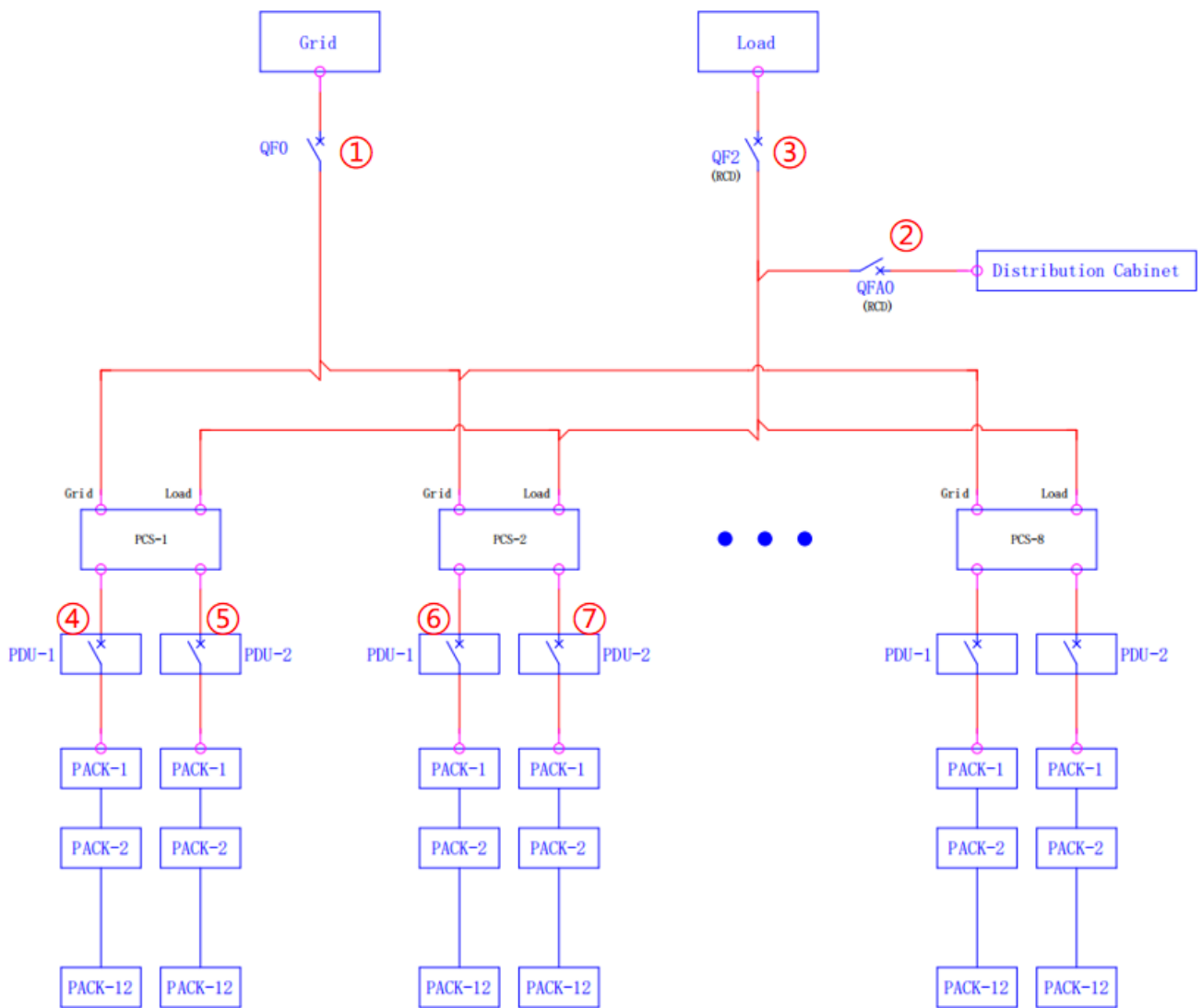
Fire Suppression System Check

NOTICE

Before powering on the system, ensure that the fire suppression system is working properly.

Power-On Process

Procedure	Item	Remark
1	Grid power-on	Serial number 1 is shown in Figure bellow.
2	Load power supply	Serial number 3 is shown in Figure bellow.
3	Auxiliary power supply Power on	Serial number 2 is shown in Figure bellow.
4	PCS power-on	Numbers 4, 5, and 6 are shown in Figure bellow.
5	Power on the PDC	Numbers 1, 2, and 3 are shown in Figure bellow.













1. Power on the Grid, observe the grid light status, no power grid, stop discharge, power off the grid.
2. Continue discharging, off-grid operation, close QF0, observe the state of the POWER light, disconnect QF0 when it is not on, and correct the wiring position.
3. If the Grid is on, turn on QF0 and observe the status of the Power indicator. If the Power indicator is on, turn on the UPS host and turn on QFB1 to QFB8 successively.
4. Observe the status of the UPS host, UPS indicator, power meter, water flood, temperature and humidity, LC, display control panel, cabinet lighting, cabinet fan (temperature control is adjustable), running light, and warning light.
5. If any exception occurs, disconnect QFB1 to QFB8, shut down the UPS, correct the cable position, and repeat the preceding steps.
6. If normal, turn on QFA0 to QFA11 in turn, and observe the status of L1/L2/L3 indicator, air conditioner inside/outside unit, lighting, socket (container), fire extinguishing system, UPS host display, electric shutter, and exhaust fan.
7. If any exception occurs, disconnect QFA1~QFA11, correct the wiring position, and repeat the above steps.

8. Normally, press the power button on the 1~16 clusters of high-pressure boxes successively and observe the power light status of the 1~16 clusters of high-pressure boxes.
9. If it is not all bright, press the power button on the HVDC box of 1 to 16 clusters successively, disconnect QFB4 to QFB7 successively, correct the wiring position, close QFB4 to QFB7 successively, and then press the power button on the HVDC box of 1 to 16 clusters successively.
10. Full light, close the circuit breaker on the 1~16 clusters of the high-pressure box in turn and observe the alarm light status of the 1~16 clusters in turn.
11. If any exception occurs, disconnect the circuit breaker on HVDC boxes 1 to 16 in turn, press the power button on HVDC boxes 1 to 16 in turn, disconnect QFB4 to QFB7 in turn, correct the power line of the faulty cluster and the cable position in the HVDC box, and repeat the above steps.
12. If normal, press the DC switch button of PCS1~8 successively.

PRODUCT MAINTENANCE

Preparation Before Maintenance

			
Insulating gloves	Protective gloves	goggles	Dust mask
			
Insulated shoes	Reflective vest	Safety Helmet Hat	Safety belt



CAUTION

- Operation and maintenance safety requirements:
- Before connecting or removing a cable, turn off the protection switch of the corresponding loop.
- Place a warning sign indicating that the switch cannot be closed at the disconnected switch.
- Use the corresponding voltage level of the electroscope test is live, ensure that the equipment has been completely powered off.
- If there are live bodies nearby, use insulation boards or tape to shield or wrap them.
- Securely connect the loop to be repaired to the main grounding loop using a ground cable, and then perform O&M.
- Remove the ground cable between the maintenance loop and the main grounding loop after the overhaul is complete.

Battery Cabinet Maintenance

Interval	Content
Quarterly Maintenance	<ol style="list-style-type: none"> 1. Check the battery system voltage. 2. Check whether the system voltage is abnormal. For example, the battery voltage is too high or too low. 3. Check the SOC of the battery system and check whether the SOC of the battery string is abnormal. 4. Visually inspect all cables of the battery system to check whether the cables are broken, aged, or loose. 5. If the battery pack is not fully charged for a long time, the battery pack will be unbalanced. It is recommended to do balance maintenance every three months (charge to full). Under normal circumstances, the system communicates with external devices automatically.
Half-Year Maintenance	<ol style="list-style-type: none"> 1. In the case of low load (small current), control the output relay OFF and ON and hear the relay click, which means the relay can be switched on and off normally. 2. Check the dust in the battery compartment and clean the dust regularly. Otherwise, parts may be damaged. 3. Periodically check the temperature inside the cabinet and the temperature of the large cable to avoid damage due to dust accumulation or other reasons. 4. Check the working environment's temperature, humidity, and other parameters and whether there is dust on the electrical components.
Annual Maintenance	<ol style="list-style-type: none"> 1. Check all switches on the system, including electrical manual start switch, manual/automatic switch, emergency stop switch, and backup power switch. 2. Analyze historical records to check whether there are accidents (alarm and protection) and analyze their causes. 3. Check the cables and boxes for standing water or seepage. 4. Check whether the cables and copper bars in the cabinet heat, melt, or discharge and whether the ground cables are properly connected. 5. Periodically check whether the ground is firmly grounded. In particular, carefully check the fan, power module, input and output terminals, and grounding. 6. Check the loosening of the line, if the line is loose, it is easy to lead to poor contact and short circuit.

Note [1] Monthly maintenance is recommended in high-temperature ($\geq 35^{\circ}\text{C}$) or low-temperature ($\leq 0^{\circ}\text{C}$) environments.

Note [2]: It is recommended to clean every sandstorm in the dust area; It is recommended to clean once before entering the summer. In other areas, ensure the filter or condenser is not blocked according to the actual situation. Recommended tool: High-pressure water gun.

PCS Cabinet Maintenance

Interval	Content
Quarterly Maintenance	<ol style="list-style-type: none"> 1. Check the temperature, humidity and other parameters of the working environment, and whether there is dust on the electrical components. 2. Check whether the ground cable is corroded and remove the corrosion. 3. Check whether the heat shrink pipe is damaged. 4. Check whether the PCS maintenance door opens or closes properly.
Half-Year Maintenance	<ol style="list-style-type: none"> 1. Check whether the heat shrink pipe is damaged. 2. Check the connection of the copper bar: If the copper is discolored, it indicates that the copper bar may be overheating. 3. Periodically check the temperature inside the cabinet and the temperature of the large cable to avoid damage due to dust accumulation or other reasons. 4. Check whether the PCS air duct is firmly installed or properly sealed.
Annual Maintenance	<ol style="list-style-type: none"> 1. Check all switches on the system, including electrical manual start switch, manual/automatic switch, emergency stop switch, backup power switch. 2. Check the cables and boxes for standing water or seepage. 3. Check whether the cables and copper bars in the cabinet heat, melt, or discharge, and whether the ground cables are properly connected. 4. Periodically check whether the ground is firmly grounded. 5. In particular, carefully check the fan, power module, input and output terminals, and grounding Check the loosening of the line, if the line is loose, it is easy to lead to poor contact and short circuit.

Note [1] Monthly maintenance is recommended in high temperature ($\geq 35^{\circ}\text{C}$) or low temperature ($\leq 0^{\circ}\text{C}$) environments.

Note [2] : It is recommended to clean every sandstorm in the dust area; It is recommended to clean once before entering the summer. In other areas, ensure that the filter or condenser is not blocked according to the actual situation. Recommended tool: High pressure water gun.

Distribution Cabinet Maintenance

Interval	Content
Quarterly Maintenance	<ol style="list-style-type: none"> 1. Periodically check the temperature and humidity of the power control cabinet to prevent hardware faults caused by temperature and humidity. 2. Periodically check the working environment and ventilation to avoid hardware faults or accelerated aging caused by poor ventilation and heat dissipation. 3. Check whether the LC indicator light, display control panel, and electric meter display are normal.
Half-Year Maintenance	<ol style="list-style-type: none"> 1. Replace the filter every six months. If the filter is blocked, the heat dissipation of the device will be seriously affected. 2. Check the power supply of the control system regularly, and perform switching experiments regularly for the redundant power system. 3. Periodically check whether the ground is firmly grounded and whether the grounding resistance meets requirements. 4. The power supply of the control system should be checked regularly, and the switching experiment should be carried out regularly for the redundant power supply system.

Annual Maintenance	<ol style="list-style-type: none"> 1. Check all switches on the system, including electrical manual start switch, manual/automatic switch, emergency stop switch, backup power switch 2. Maintenance of on-site instrumentation, timely handling of problems, and careful operation and fault diagnosis records. 3. Regularly check whether the network connector and the connecting cable are firm, and whether the terminal in the cabinet is firm and reliable
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Note [1] Monthly maintenance is recommended in high temperature ($\geq 35^{\circ}\text{C}$) or low temperature ($\leq 0^{\circ}\text{C}$) environments.

Note [2] : It is recommended to clean every sandstorm in the dust area; It is recommended to clean once before entering the summer. In other areas, ensure that the filter or condenser is not blocked according to the actual situation. Recommended tool: High pressure water gun.

Fire Suppression System Maintenance

Interval	Content
Quarterly Maintenance	<ol style="list-style-type: none"> 1. Check that the warning signs are firmly installed, can be read and are not damaged. 2. Check the control disk to ensure that it works properly. 3. Check whether the hand-pull starter, emergency stop switch, and manual/automatic transfer switch are in place and in normal working condition. 4. Check whether the equipment in the cylinder room is complete and in normal working condition. 5. Verify that all the equipment that maintains the sealing of the protected area is in good condition. 6. Observe the pressure gauge on the cylinder valve to check whether the gauge pointer of the cylinder is in the specified area. If the pointer is out of the specified area (in the red area), it indicates that the extinguishing agent needs to be refilled. 7. Check whether the system components are damaged or corroded. If there are obvious signs of aging or corrosion, replace damaged parts. 8. Check whether the nozzle has physical damage, aging or corrosion, if there is obvious physical damage, aging corrosion phenomenon, then replace the nozzle. If there are any obstructions, please clear them. Remove debris and dust from the nozzle.
Half-Year Maintenance	<ol style="list-style-type: none"> 1. Pressure gauge and cylinder: Check whether the cylinder pressure gauge pointer is in the specified area. If the pointer is out of the specified area (in the red zone), it indicates that the extinguishing agent needs to be refilled. 2. Pipes, pipe supports and manifolds: Check pipes, pipe supports and manifolds for logistics damage, aging or corrosion. If there is obvious aging or corrosion, replace the damaged parts. Tighten loose parts and clean pipes. 3. Nozzle: Check the nozzle for physical damage, aging or corrosion. If there are obvious signs of damage, aging or corrosion, replace the nozzle (the nozzle must be replaced with a nozzle with the same part number, ensuring that the nozzle is not blocked). 4. Check the fixing of the equipment, fire extinguishing agent conveying pipeline and support and hanger between the storage piles, and ensure that they are not loose.

Annual Maintenance

1. Check all the nozzles to make sure that they are in the original position with the same size and opening aperture as the original design. Inspect the nozzle for corrosion and damage, and verify that the nozzle is not blocked inside or outside.
2. Check the pipe network to ensure that the pipe network is secured to the support and that all pipe connectors and fasteners are securely connected.
3. Check that the warning signs are firmly installed, can be read and are not damaged.
4. Check the condition of the cylinder, looking for signs of damage or corrosion, and check the date of the cylinder's last hydraulic test.
5. Check the condition of the cylinder high pressure release hoses for signs of problems such as wear or aging, and verify that all hose connections are reliable and intact.
6. Check all pressure signal feedback devices for damage or corrosion, and make sure the switch is correctly installed on the network management.
7. Check all switches on the system, including the electrical manual start switch, hand/automatic switch, emergency stop switch, backup power switch.

Note [1] Monthly maintenance is recommended in high temperature ($\geq 35^{\circ}\text{C}$) or low temperature ($\leq 0^{\circ}\text{C}$) environments.

Note [2] : It is recommended to clean every sandstorm in the dust area; It is recommended to clean once before entering the summer. In other areas, ensure that the filter or condenser is not blocked according to the actual situation. Recommended tool: High pressure water gun.

Note [3] : The area with severe dust/snow and ice shall be maintained according to the actual situation to ensure that there is no foreign matter and snow cover on the blasting disc. Meanwhile, when removing foreign matter/snow, it shall be cleaned in the specified area to avoid improper action during the removal to damage the blasting device.

Air Conditioning Maintenance

Interval	Content
Quarterly Maintenance	<ol style="list-style-type: none"> 1. Check whether the exterior is intact. 2. No obvious paint loss or rust. 3. The screws are not loose and fall off. 4. The fan rotates normally, without stalling or abnormal sound. 5. Clean the filter regularly, so that the surface is clean and no blockage. 6. Regularly check the working environment and ventilation conditions to avoid the service life caused by poor ventilation and heat dissipation.
Half-Year Maintenance	<ol style="list-style-type: none"> 1. Clean the filter every six months. If the filter is blocked, it will seriously affect the heat dissipation of the equipment.
Annual Maintenance	<ol style="list-style-type: none"> 1. It is recommended to replace the battery of the air conditioner remote control once a year to prevent damage caused by battery aging. 2. Inspect and repair field instrumentation, deal with problems in time, and take operation and fault diagnosis records seriously.

Auxiliary System Maintenance

Pre-Maintenance Inspection

Check Appearance

1. Check the surface of the container for rust or wear.
2. Check whether the container is deformed.
3. Check whether the doors on both sides of the container and PCS maintenance doors are open or closed normally.
4. Check whether the container PCS air duct and air conditioner air duct are firmly installed or sealed.
5. Check the container emergency stop button.

Check Safety Sign

- Check whether the safety sign on the door is worn, fallen or aging.
- Check whether the container nameplate is loose or fallen.



Check the Grounding Wire

1. Check whether the ground cable on both sides of the box is loose.
2. Check whether the ground copper bar on both sides of the box is rusty, worn, and oxidized.

Check the Lighting

1. Check whether the inside of the lamp is black.
2. Check whether the lighting tube power line is loose.
3. Open the light switch of the door on both sides of the container body respectively, and the light can be illuminated normally.

Other Maintenance

Change the Safety Label

There are many safety signs on the inside and outside of the box. If the identifier is damaged, fallen, or aging, you need to replace it with a new one.

1. Remove the old safety sign, wipe it with a wet cloth, and remove the adhesive mark.
2. After the logo is dried, please paste the new logo in the original location.
3. Press the mark hard to ensure that there are no bubbles in the mark and the paste is firm.

Exterior Paint

If the surface of the box is worn or the paint is chipped, repaint it.

1. Use sandpaper to clean the removed paint.
2. Select the container color number of spray paint.
3. Horizontally move the paint peeling place, paint with spray paint, spray surface should be smooth.

Replace the Luminaire

The input voltage of the light source in the container is normal. If the light does not work, replace it with a new one.

1. Disconnect the QFA4 circuit breaker in the power control cabinet and test with a multimeter to ensure that there is no voltage.
2. Remove the lamp connector, push the lamp fixing buckle to one side, and remove the old lamp.
3. Fix the new light on the fastener. Tighten the joint.
4. Close the power control cabinet QFA4 circuit breaker, check whether the light is on.

TRANSPORT REQUIREMENT

Disassembly Inspection and Pre-Transport Sealing Requirements

Structural Inspection

Battery cabin air inlet/battery cabin air outlet/battery cabin pressure relief port/power distribution cabin air outlet 1/ power distribution cabin air outlet 2/ Air discharge indicator chamber.

Inspection requirements:

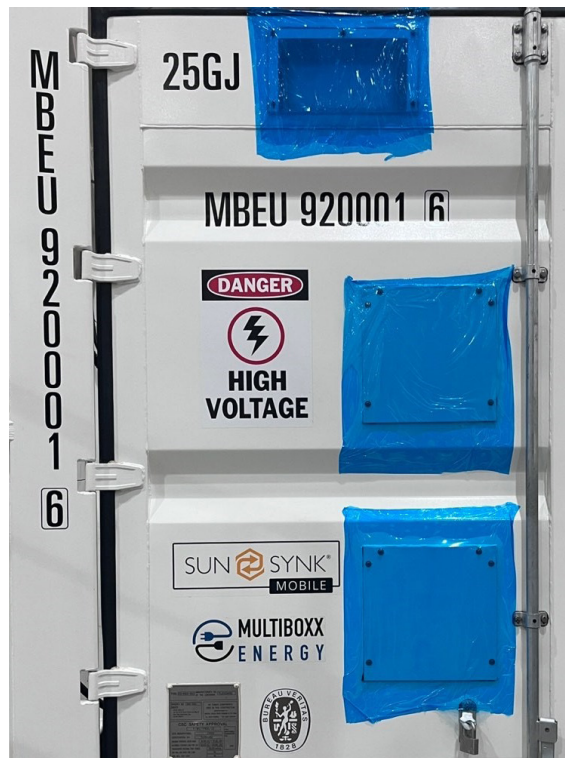
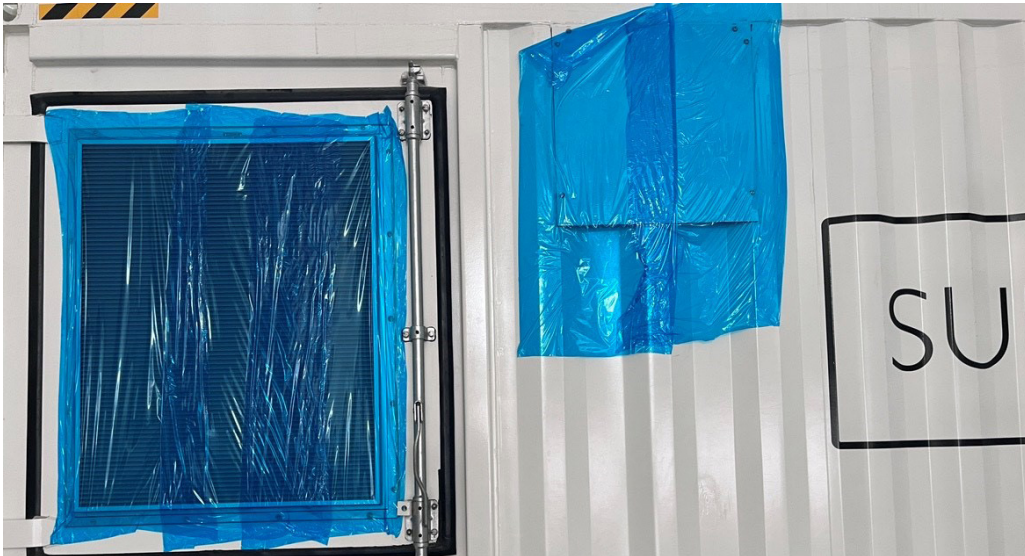
1. Remove the air hood, wrap it with pearl cotton, and place it in a packing box to secure.
2. Use sealing plates and rubber strips to seal the air inlet and outlet.
3. Louvers are sealed with blue film.
4. Large rain cover for containers (dustproof and waterproof).



Cable Connection Port

Inspection requirements:

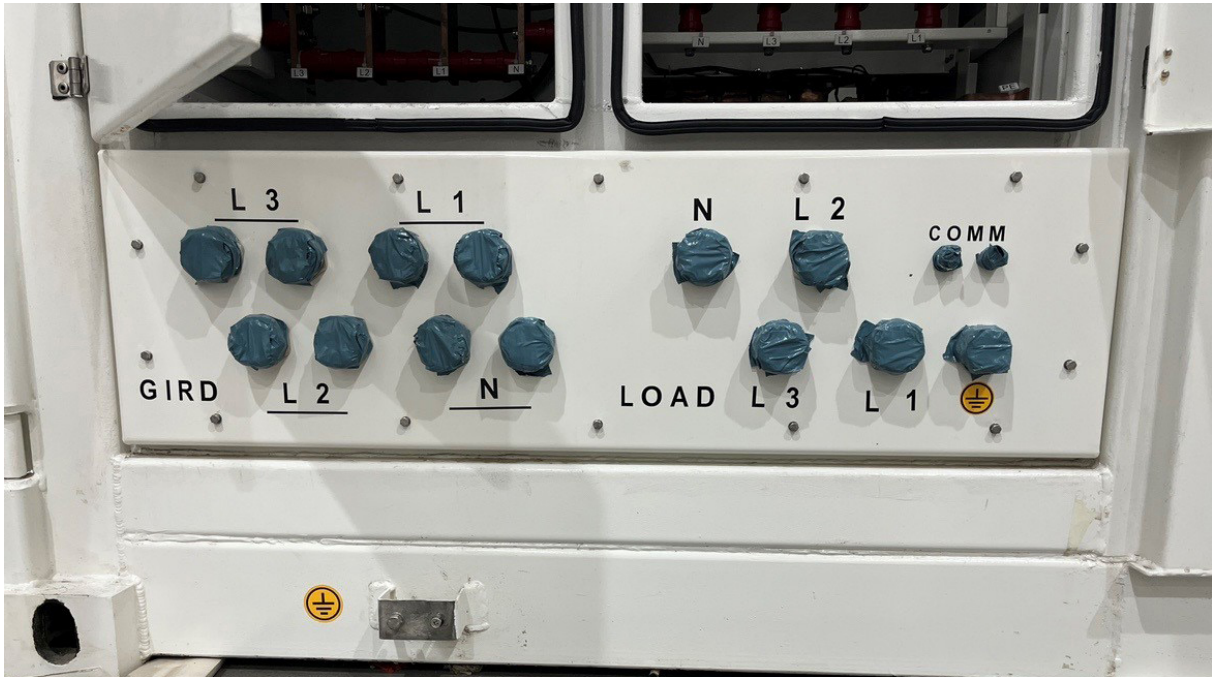
1. Wrap + cylindrical rubber strips with wound sealing tape.



Secure the Device

Inspection requirements:

1. Check whether all the installation components are properly secured with black lines.



Battery/Distribution Hatch Door

1. All cabin doors are closed and unlocked (customs lock will follow).



Electrical Inspection

1. Power cables.

- Remove and disconnect the battery power cable.
- The power lines connected to other nuts are marked black.

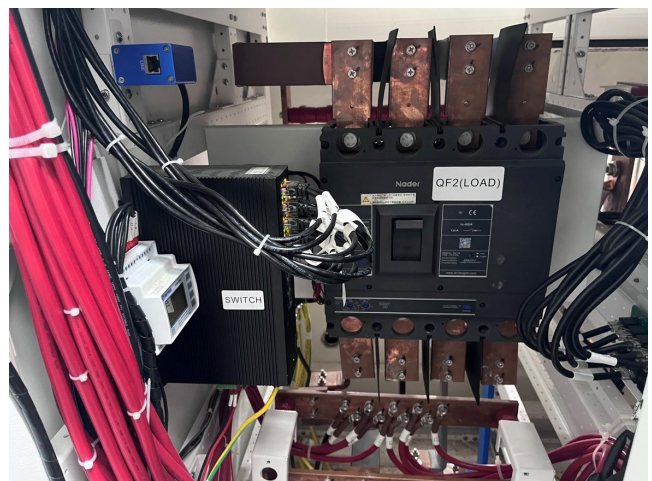


2. Connect signal cables or auxiliary cables.

- Pull back all DI/DO and communication signal cables.
- Pull back all the 220V, 24V, and 12V auxiliary power cables.

3. Circuit Breaker.

- QF0 on the power grid is off, QF2 on the load side is off, the high voltage box (press the Start button first, and then disconnect the circuit breaker), and the auxiliary circuit breaker are all off.



4. UPS backup battery.
 - The cabinet is powered off. The lead-acid battery is disconnected from the DC switch QFB9 of the UPS cabinet.

Air Conditioning Inspection

1. Air conditioner condensate is evacuated.



2. Close the air conditioner to restore the initial state.
3. The external cabinet door of the air conditioner is locked.



Fire Inspection

1. Spare lead-acid batteries.
 - The lead-acid battery is secured using 3M strong adhesive.
2. Smoke/temperature detector.
 - Fasten the knobs on the sensor and base. Use tape to secure the base and sensor.
3. Fire extinguishing controller/exhaust controller.
 - The fire extinguishing controller is in the Automatic state.
 - The door of the fire extinguishing controller cabinet is locked.
 - The key to the control cabinet is secured to the corrugated pipe using cable ties.



4. Emergency start button.
 - Resetting the key Secure the key in the emergency start button frame with adhesive tape.
 - Emergency start button The structural wall is closed and locked.
5. Fire cylinder.
 - Manual start, solenoid valve safety bolt is complete. Field operation solenoid valve safety pull ring removed.
 - The gas cylinder is firmly fixed and not loose.
 - Cylinder pressure 1.8-3.2Mpa@-10-50 °C, 2.5Mpa@20 °C.

Cylinder Pressure and Temperature Comparison Table

Temperature	Nominal Pressure
0	22.10
5	22.80
10	23.50
15	24.30
20	25.00
25	25.80
30	26.50
35	27.30
40	28.10
45	28.80
50	29.50

Environmental Monitoring

Environmental requirement:

- There is no water or condensation inside the container.
- The case is free of foreign bodies such as dust, iron filings, screws, and tools.
- When shipping, 10PCS desiccant, each 1000g.

Label Paste

Hazard certification.

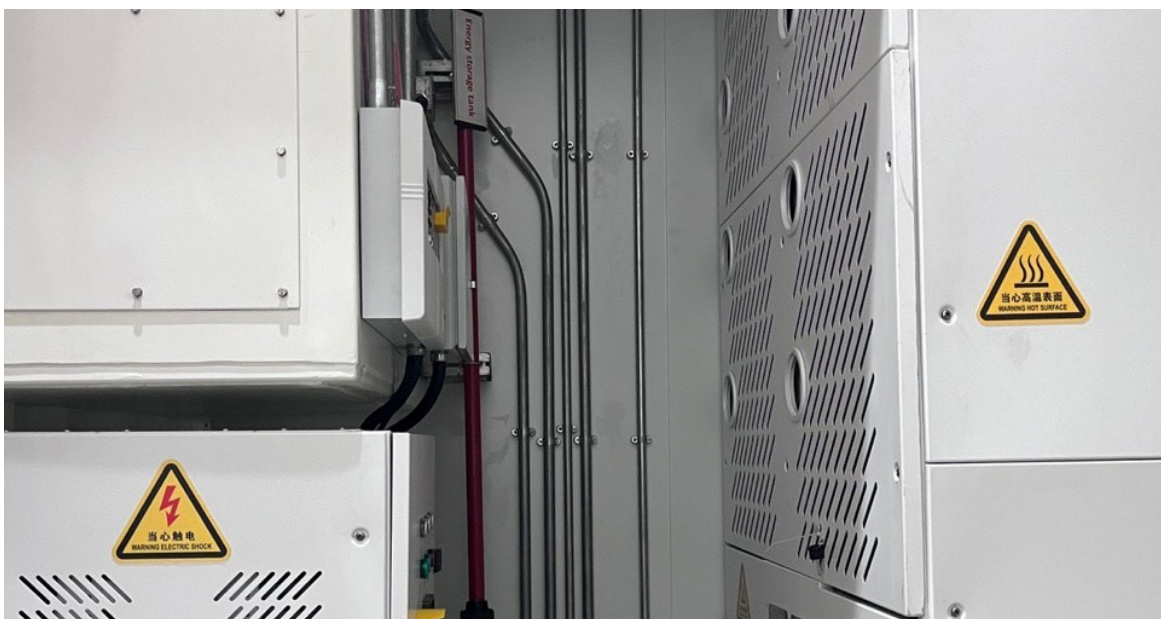
- UN3536 Labels.
- 9 diamond-shaped dangerous Goods label.

Safety requirements.

- Glen door panel: two anti-shock identifiers.



- PCS cabinet: one high-temperature anti-scalding label for door panel and one electric shock label for side panel.
- AC cabinet door plate: 1 electric shock.



- Exhaust fans of the electrical cabin: 2 anti-pinch or safety signs inside, 2 high-temperature anti-scalding fans outside.



- Battery compartment: 1 anti-shock, 1 high voltage



Transportation/Security

30% SOC is reserved for battery packs before delivery.

Container Handling Requirement

- When loading and unloading the goods, the crane of the corresponding tonnage must be used. Nylon rope (belt) or wire rope can be used when hoisting.
- The turning process should be carried out strictly in accordance with the hoisting drawing.
- Keep the container stable during hoisting.
- The whole lifting process should be carried out slowly, pay attention to the balance of the container, and do not move too fast.
- No one shall stand under a container or crane.



Transport Regulatory Requirements

- Transport service providers must be qualified for the transport of dangerous goods.
- Comply with the international rules for the transport of dangerous goods and meet the regulatory requirements of the transport regulatory authorities of the country of origin, route, and destination.
- The transportation should be by sea or road with good road conditions, not by rail or air. Turbulence and tilt should be minimized during transportation.
- Shipping complies with the shipping requirements of the International Maritime Dangerous Goods Code (IMDG Code).
- Land transport complies with ADR or JT/T 617 transport requirements.
- Before transportation, check that the battery package is intact and free of odor, leakage, smoke, or fire. Otherwise, the battery is prohibited from transportation.
- The shipping cases must be secure, handled with care, and protected from moisture during loading, unloading, and transportation.
- Handle batteries with care. Do not touch them, and pay attention to personal safety.
- Unless otherwise specified, dangerous goods cannot be mixed in the same vehicle or container with goods containing food, pharmaceuticals, animal feed, and their additives.

Shipping:

1. The external gaps of containers must be sealed with sealing plates and bags before shipment to ensure that internal devices are not affected during transportation
2. For protective shell. Avoid bumps during transportation, prevent paint film scratches, and equipped with a rainproof canvas cover.
3. When shipping by sea, it is necessary to attach relevant marks certified by the classification society: owner code, case number, weight, and other relevant marks.
4. When shipping by sea, it is necessary to obtain MSDS certification and paste the label of Category 9 dangerous goods.

Land Transportation:

1. Obey traffic rules.
2. The container equipment has been loaded with batteries, it is prohibited to speed on flat asphalt roads, the speed limit is 70 km/h on highways, and the speed limit is 50 km/h when turning; Town road 40 km/h, avoid emergency start and emergency braking.

For more information, training videos, software upgrades, help line or forum please refer to <http://www.sunsynkmobile.com> - Tech Support (Do not forget to register first on the website).



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