emaldo

Full Installation Manual

Emaldo Power Core

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Trademark authorization

Attention

Due to product version upgrade or other reasons, the contents of the document will be updated irregularly. If there is no special agreement, the contents of the document cannot replace the safety precautions in the product label or user manual. All descriptions in the document are only used as a guide.

Contents

1 Safety

1.1 Applicable personnel

Only applicable to professionals who are familiar with local regulations and standards and electrical systems, have received professional training and are familiar with the relevant knowledge of this product.

1.2 Important safety warning - mandatory

In order to make better use of the Manual, the following symbols are used to highlight relevant important information. Please read the symbols and descriptions carefully.

 Danger	Indicate a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
 Warning	Indicate a hazard with a medium level of risk which, if not avoided, may result in death or serious injury.
 Caution	Indicate a hazard with a low level of risk which, if not avoided, may result in moderate or minor injury.
 Attention	Emphasize and supplement relevant contents, and possibly provide skills or knacks about optimized use of the product and help you solve a problem or save your time.

The energy storage system has been designed in strict accordance with safety regulations and passed the test. Please follow the relevant safety regulations of the place where the equipment is located during installation, operation and maintenance. Improper operation may cause electric shock, resulting in equipment and property losses.

Symbols and definitions

	Warning! Life risk
	There are potential dangers after the operation of energy storage system. Please take precautions when operating the energy storage system.
	Warning! Risk of burns

The energy storage system surface is hot, so it is forbidden to touch the equipment when it is running; otherwise, it may cause burns.

Equipment components can be recycled according to local environmental regulations.

This way up. Please always place the equipment in the direction indicated by the arrow during transportation, installation and storage.

Please do not treat it as domestic garbage.

Please handle this product/package carefully, and don't tip it over or hang it.

Keep dry and protect from rain. Please do not place this product/package in an excessively humid place.

CE mark.

After the energy storage system is powered off, the discharging of internal components is delayed. Please wait until the equipment is completely discharged according to the label time requirement.

Important

Indicate important installation, operation and maintenance information. Failure to follow the information given here may result in the invalidation of the equipment warranty.

1.3 General safety

Warning: Restricted use

This product is not suitable for life support equipment or medical equipment.

Caution: Equipment damage

Please use components or accessories produced or recommended by EMALDO or its authorized institutions.

Important

Do not attempt to install the equipment when there is any damage. Please refer to the warranty information for specific return information.

1.4 Personal safety

 Warning: Personal injury

- According to the recommendations of the Occupational Safety and Health Association (OSHA) or other local regulations, please use the safety lifting device when lifting this equipment.
- When operating this equipment, please use standard safety equipment, such as safety glasses, protective devices, steel-toed safety boots and helmets.
- When using electrical equipment, please follow the standard safety measures, such as removing all jewelry, using insulation tools and wearing cotton clothes.
- Do not install or repair this equipment alone. Accompanying can help when necessary.
- Do not touch the equipment while it is running. During the operation of the energy storage system, the temperature of some components may exceed 60°C. Please cool for at least 5 minutes after shutdown.
- Keep children, pets and other animals away from energy storage system, photovoltaic array and power grid modules.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

1.5 Equipment safety

 Warning: Fatal voltage

- Check the system configuration and identify all possible energy sources. Before any installation or maintenance of the equipment, make sure to disconnect all power supplies. Use an effective voltmeter (rated voltage is at least 1000VAC and 1000VDC) to confirm the power failure of terminals.
- Do not perform any operation other than installation instructions unless you have relevant qualifications or follow the instructions of EMALDO technical staff.
- Solar panels can supply power with the least available ambient light. To ensure safe

disconnection from the system, please install HVDC isolators, circuit breakers or accessible fuses according to local regulations. To avoid electric shock, please turn off the main switch of the energy storage system at least 5 minutes in advance before any installation or maintenance.

- Please completely disconnect all power supplies before carrying out any maintenance. Do not open the outgoing line compartment on the upper right side of the system. Do not pull the AC/DC cable when the energy storage system is running.


Warning: Risk of burns

- During operation, the inside and outside of the cabinet will get hot. Please do not open the cabinet or touch any internal parts. Before any maintenance operation, please allow enough time to cool the internal components of the energy storage system.


Warning: Risk of fire

- Please do not store inflammable and explosive articles and equipment in the same room.
- Ensure that the dimensions of AC cable, DC cable and ground cable meet local specifications. For dimensions requirements, please refer to the product brochure. Ensure that all conductors are in good condition, and it is forbidden to use damaged or substandard cables.


Caution: Equipment damage

- Please check thoroughly before starting the equipment to ensure that there are no tools or equipment left.
- Ensure that the spacing requirements are strictly observed. Keep all vents open and the air around the equipment circulating smoothly.
- Static electricity can damage sensitive electrical devices in the equipment. When touching the equipment, please make sure to eliminate static electricity and wear appropriate protective equipment.
- Do not open the cabinet cover of the energy storage system. In addition to operating the terminal according to the instructions in the Manual, any other operation or replacement of modules without EMALDO's authorization may lead to equipment damage or personal injury, and warranty failure.

- Static electricity may damage electronic components. Please take appropriate measures during operation to prevent damage to the equipment. Failure to do so may invalidate the warranty.
- Ensure that the output voltage of the proposed photovoltaic array is lower than the maximum rated input voltage of the energy storage system; Otherwise, the energy storage system may be damaged and the warranty will be invalid.
- Solar modules shall have IEC61730 A rating.

1.6 Electrical safety

Warning: Explosion, electric shock, fire disaster

- Ensure that all cables have the right size.
- Ensure that the energy storage system meets the spacing requirements.

- Ensure that the installation environment of the energy storage system is well ventilated and there is no residue nearby.
- Smoking is prohibited near the energy storage system, and sparks or flames are strictly prohibited.

- Use insulation tools and avoid throwing them on the energy storage system or other electrical components.
- The battery is prohibited from charging in the frozen state.

Important

- Please use the battery type recommended by EMALDO. Please follow the manufacturer's instructions for battery installation and maintenance.
- Properly isolate the energy storage system to resist low temperature. Discharging batteries freeze more easily than charging batteries.

1.7 Battery safety

Important

The Company will not be responsible for abnormal equipment function or component damage, personal safety accidents, property losses, etc. caused by the following reasons:

- The battery is not charged in time due to customer's reasons, so it is stored for an extended period, resulting in capacity loss or irreversible damage to the battery.
- Battery damage, drop, liquid leakage, etc. are caused by improper operation or failure to connect the battery as required.
- The battery is installed on site and connected to the system, and over-discharged due to the customer's failure to power on in time, resulting in damage.
- The user fails to set the battery operation management parameters correctly.
- The customer or the third party changes the battery usage scenario without informing the Company. For example, the battery provided by the Company is mixed with other batteries, including but not limited to mixing with other brands of batteries, mixing with batteries with different rated capacities, etc.
- Direct damage is caused to the battery due to the field equipment operating environment or external power parameters failing to meet the environmental requirements of normal operation. For example, the actual operating temperature of the battery is too high or too low, the power grid is unstable and power outages are frequent.
- Improper maintenance of customers causes frequent over-discharge of batteries, capacity expansion of customers on site or long-term inability to fully charge.
- The customer fails to properly maintain the battery according to the operation manual of the supporting equipment, including but not limited to failing to regularly check whether the battery terminal and the cabinet are firmly connected.
- The battery is stolen.
- The battery exceeds the warranty period.

 Danger

- Do not expose the battery to high temperature environment or around heating equipment, such as sunshine, fire source, transformer and heater. Overheating of the battery may cause fire and explosion.
- It is forbidden to disassemble, modify or destroy the battery (such as inserting foreign objects, and immersing in water or other liquids) to avoid leakage, overheating, fire or explosion of the battery.

- The fire hazard of lithium ion/sodium ion battery energy storage system is Class A or Class B. The following safety risks should be fully considered before battery operation:
    a. Battery electrolyte is flammable, toxic and volatile.
    b. The thermal runaway of the battery will produce combustible gas, as well as harmful gases such as CO and HF.
    c. There is a risk of deflagration and explosion in the accumulation of combustible gas generated after the thermal runaway of the battery.

Personal safety

- Appropriate personal protective equipment should be worn during equipment operation. In case of any fault that may cause personal injury or equipment damage, immediately stop the operation, report to the person in charge, and take effective protective measures.
- Before using tools, please master the correct use of tools to avoid personal injury and damage to equipment.
- When the equipment is running, the shell temperature is high and there is a danger of burning. Please do not touch it.
- In order to ensure personal safety and normal use, reliable grounding should be carried out before use.
- When the battery fails, the temperature may exceed the burn threshold of the touchable surface, so contact should be avoided.
- Do not open or damage the battery. The released electrolyte is harmful to the skin and eyes, and contact should be avoided.
- Do not put irrelevant items on the top of the equipment or insert them into any position of the equipment.
- Do not place flammable items around the equipment.
- Never put the battery into fire; otherwise, it may cause explosion or endanger personal safety.
- Do not place the battery module in water or other liquids.
- Do not short-circuit the battery terminals, which will cause combustion.

- The battery may cause the danger of electric shock and large short-circuit current. When using the battery, please pay attention to the following precautions:
    a. Remove watches, rings and other metal objects.
    b. Use tools with insulated handles.
    c. Put on rubber gloves and boots.
    d. Do not place tools or metal parts on the top of the battery.
    e. Disconnect the charging power supply before connecting or disconnecting the battery terminals.
    f. Determine whether the battery is accidentally grounded. If it is accidentally grounded, please remove the power supply from the ground.

- Do not use water or detergent to clean the electrical components inside and outside the cabinet.
- Do not stand on, lean against or sit on the equipment.
- Do not destroy each module of the equipment.

Basic requirements

- The battery must be stored separately and in the outer packaging, so as to avoid being mixed with other items, stored in the open air and stacked too high.
- The battery beyond the warranty period is prohibited from continuing to be used.
- Under normal circumstances, do not remove the battery packaging. If the battery needs to be recharged, recharging is carried out by professionals as required. The battery still needs to be put back into the package after recharging is completed.
- The battery should be carried in the direction required by the battery, and it is forbidden to turn upside down or tilt.
- Batteries should avoid collision.
- Welding, grinding and other similar work around the battery are prohibited to avoid sparks, arc and other fire hazards.
- Please use the battery within the operating temperature range specified in the Manual.

- Do not use a damaged battery (the battery drops, or is bumped or dented in the case). Damaged batteries may lead to the release of flammable gases. Do not store damaged batteries near undamaged products.
- The storage location of damaged batteries should not contain flammable materials, and non-professionals should not approach them.
- During the storage period of the damaged battery, the damaged battery should be monitored to make sure that there are no signs such as smoke, flame, electrolyte leakage or heating.

Battery requirements

- Before installing the battery, check whether the packaging is intact, and the battery with damaged packaging cannot be used.
- During battery installation, pay attention to the positive and negative poles, and it is forbidden to short-circuit the positive and negative poles of the battery.
- During installation, ensure that the terminal and cabinet seat are closely connected, and check them regularly.
- After installing the equipment, remove the empty packaging materials in the equipment area, such as cartons, foams, plastics and cable ties.

Danger, toxicity and abnormality emergency measures

 Danger

- Danger: The battery terminal touches other metals, which may lead to heating or electrolyte leakage. The electrolyte is flammable. If the electrolyte leaks, the battery should be removed immediately.
- Toxicity: Steam generated by battery combustion may irritate eyes, skin and throat.
- In case of electrolyte leakage or abnormal smell, contact with leaked liquid or gas should be avoided. Non-professionals should not approach. Contact professionals immediately. Professionals should wear goggles, rubber gloves, gas masks, protective clothing, etc. to prevent the harm caused by electrolyte overflow.
- Electrolyte is corrosive, and contact may cause skin irritation and chemical burns. In case of contact with battery electrolyte, the following measures need to be taken.

a. Inhalation: Evacuate the contaminated area, inhale fresh air and seek medical help immediately.

b. Eye contact: Rinse eyes with plenty of clear water for at least 15 minutes immediately, do not rub, and seek medical help immediately.

c. Skin contact: Wash the contact area with plenty of water and soap and seek medical help immediately.

d. Intake: Seek medical help immediately.

Fire emergency measures

 Danger

- In case of fire, the system should be powered down under the condition of ensuring safety.
- CO_2, FM-200 or ABC dry powder fire extinguishers are used to extinguish the fire.
- Firefighters need to avoid contact with high-voltage components during firefighting; otherwise, it may lead to the risk of electric shock.
- When the battery temperature is too high, it will lead to the deformation and damage of the battery, electrolyte overflow and toxic gas leakage. Wear respiratory protection equipment, and do not get close to it to avoid skin irritation and chemical burns.

Flood emergency measures

 Danger

- Under the condition of ensuring personal safety, power down the system.
- If any part of the battery is flooded, do not touch the battery to avoid electric shock.
- Do not use flooded batteries, and contact the battery recycling company for scrapping.

Emergency measures for battery drop

 Danger

- When installing the battery, if the battery drops or is strongly impacted, it may cause damage to the inside of the equipment, so it is strictly prohibited to continue using it, or there will be safety risks (battery leakage, electric shock injury, etc.).
- If there is obvious odor, damage, smoke and fire after the battery drops, evacuate people

immediately, call the police in time, contact the professional, and the professional will use fire-fighting facilities to extinguish the fire under the condition of ensuring safety.

- After the battery drops, if there is no obvious deformation or damage in appearance and there is no obvious odor, smoke or fire, contact a professional to transport the battery to an open and safe place or contact a recycling company for treatment.

Battery recycling

- Please dispose of waste batteries according to local laws and regulations, and do not treat batteries as domestic garbage. Improper disposal of batteries may lead to environmental pollution.
- If the battery leaks or is damaged, contact technical support or battery recycling company for scrapping.
- When the battery is unusable beyond its service life, contact the battery recycling company for scrapping.
- Avoid exposing waste batteries to high temperature or direct sunlight.
- Avoid exposing waste batteries to high humidity or corrosive environment.

1.8 Handling and transportation requirements

Important

- This product has passed UN38.3 (UN38.3: Section 38.3 of the sixth Revised Edition of the Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria) and SN/T0370.2-2009 Rules for the Inspection of Packaging for Export Dangerous Goods - Part 2: Performance Test and belongs to the ninth category of dangerous goods.
- Products can be sent directly to the site, and the transportation requirements such as truck and ship must be met. The packaging boxes must be firm. During loading, unloading and transportation, care should be taken to handle it, and moisture-proof measures should be taken. Affected by external environment (such as temperature, transportation, and storage), the specifications and parameters of the products shall be subject to the delivery date.

Loading and unloading requirements:

- The energy storage system should be loaded and unloaded according to the local laws, regulations and industry standards. Rough loading and unloading will lead to short circuit

or damage of the battery in the box, which may lead to battery leakage, rupture, explosion or ignition.

Conditions for shipment:

- Before shipment, check whether the battery is intact and there is no obvious odor, smoke, fire and other phenomena; otherwise, shipment is prohibited.

Requirements for transportation process:

- Sea transportation shall comply with IMDG CODE and the International Maritime Dangerous Goods Code.
- Land transportation shall comply with ADR or JT T617 transportation requirements.
- Regulatory requirements of the transport regulatory authorities at the countries of departure, transit and destination shall be met.
- The international rules for the transport of dangerous goods and the regulatory requirements of the transport regulatory authorities of the corresponding countries shall be observed.

During handling or transportation, it is forbidden to:

- Be directly exposed to rain and snow or fall into the water.
- Drop or have mechanical impact.
- Invert or dump.

1.9 Installation environment requirements

Important

- The operation and service life of the energy storage system are related to the operating temperature. Please install the energy storage system at the temperature equal to or better than the ambient temperature.
- When the ambient temperature is -20~50℃, if the system is installed in a cold environment, the system will start the built-in thermal control system to heat the battery to obtain better performance. The heating process will consume rechargeable power, which means that the energy efficiency of the system will be reduced in a short time.
- If the system is stored in a cold environment (for example, 0°C) before installation, it will

take some time (< 2h) for the energy storage system to be heated before charging. It is recommended to put it in a warm place before installation to help the effective adjustment and test.

- When the ambient temperature is over 45℃ or below -10℃, the charging and discharging power of the battery will be reduced.
- In the places with frequent natural disasters such as flood, debris flow, earthquake and typhoon, corresponding preventive measures should be taken for installation.
- The installation location is far away from fire source and heat source, so please do not place inflammable and explosive articles around the equipment.
- Avoid water accumulation in the installation position, keep away from water sources such as faucet, sewer pipe and sprinkler, and avoid water seepage.
- When the equipment is running, the outlet temperature of the cabinet will be high, so please do not install it in an easy-to-touch position.
- When the equipment is running, please do not block the vent or cooling system to prevent high temperature from causing fire.
- Do not place the equipment in an environment of inflammable and explosive gas or smoke, and do not carry out any operation in this environment.
- Do not install the equipment in moving scenes such as ships, trains and trucks.
- Do not use the power supply for the following purposes in the standby power scenario.
  a. Medical equipment directly related to human life.
  b. Control equipment such as trains and elevators, which may cause personal injury.
  c. Computer systems of social and public importance.
  d. The vicinity of medical equipment.
  e. Equipment similar to those described above.
- The energy storage system will be corroded when installed in salt-damaged areas. Please do not install it outdoors in salt-damaged areas. Salt-damaged area refers to the area within 500m from the coast or affected by sea breeze. The area affected by sea breeze varies according to meteorological conditions (such as typhoon and seasonal wind) or

topography (including dams and hills).

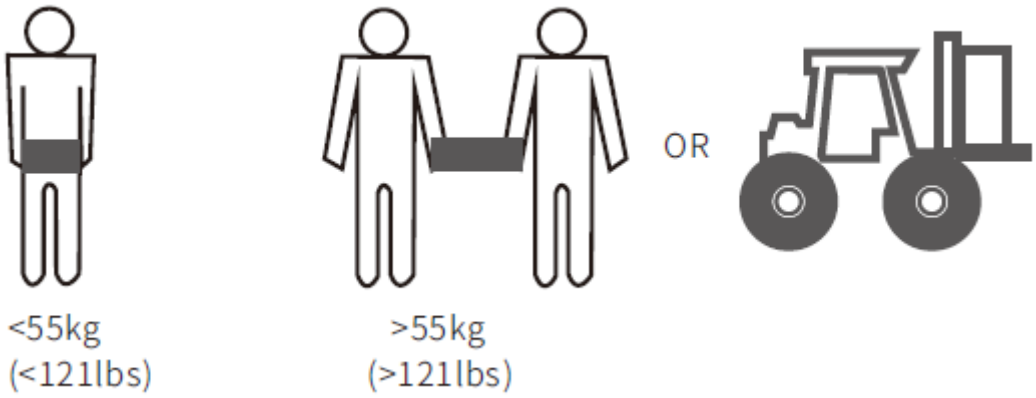
1.10 Mechanical requirements

Drilling safety

- The following safety precautions should be considered when drilling in the wall and ground: Goggles and protective gloves should be worn when drilling.
    a. During drilling, the equipment should be shielded to prevent debris from falling into the equipment.
    b. After drilling, the debris should be cleaned in time.

Safe handling of heavy objects

- When carrying heavy objects, prepare to bear the load to avoid being crushed by heavy objects or sprained.



- Wear protective gloves when handling equipment by hand to avoid injury.

1.11 Adjustment and test

When the equipment is powered on for the first time, the parameters need to be set correctly by professionals. Wrong settings may cause the equipment to be inconsistent with the certification of the country/region where it is located, which will affect the normal operation of the equipment.

1.12 Maintenance and replacement

Danger

During the operation of the equipment, there is high voltage, which may cause electric shock,

resulting in death, serious personal injury or serious property loss. Therefore, before any maintenance work, the equipment must be powered down and operated in strict accordance with the safety precautions listed in the Manual and other related documents.

- Maintain the equipment under the condition that you are familiar with and understand the contents of the Manual and have suitable tools and testing devices.
- Before maintenance, first power down the equipment, and then follow the instructions of the delayed discharging label and wait for the corresponding time to ensure that the equipment is powered down before operating the equipment.
- During maintenance, try to avoid irrelevant personnel from entering the maintenance site. Temporary warning signs or fences must be erected for isolation.
- If the equipment fails, please contact your dealer in time.
- The equipment can only be powered on again after the fault has been handled; otherwise, the fault may be enlarged or the equipment may be damaged.
- Do not repair without authorization; otherwise, there will be danger of electric shock, and the resulting failure is not within the warranty scope.
- Operation and maintenance personnel and professional technicians should be fully trained in safe use and equipment maintenance, and should operate with adequate preventive measures and protective equipment.
- When it is necessary to move or rewire, the power input must be cut off. After waiting for 5 minutes, the internal energy of the machine is completely discharged, and the multimeter is used to confirm that there is no dangerous voltage in the internal parts to be repaired before the maintenance can be started.
- Maintenance of batteries should be carried out or supervised by personnel who are familiar with batteries and the necessary preventive measures.
- When replacing the battery, replace the same type of battery or battery pack.
- After the maintenance operation, check immediately to ensure that no tools or other parts are left in the equipment.
- If the equipment is not used for a long time, store the battery and charge it according to the Manual.

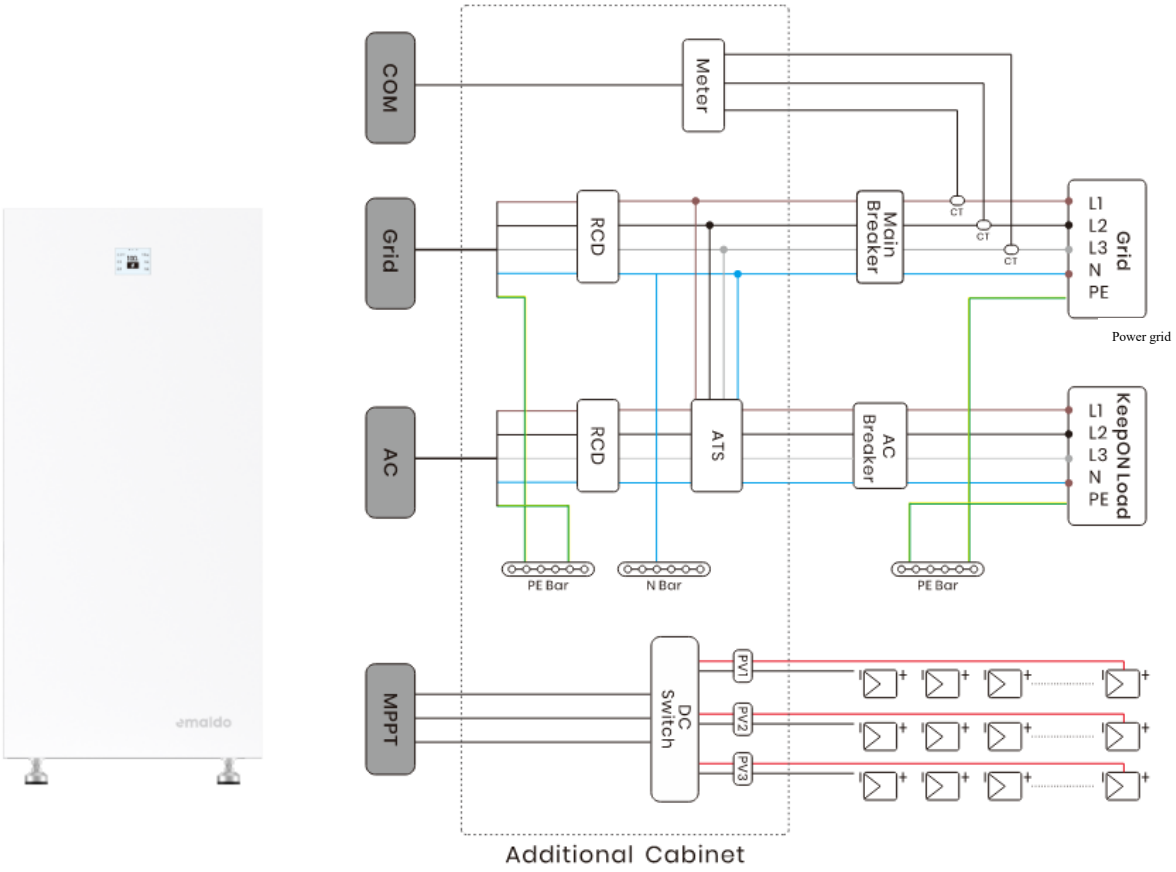
2 Product Introduction

2.1 Product introduction

Emaldo Power Core can connect 3 photovoltaic strings and 28 battery modules and power grid, provide new energy vehicle charging interface, and provide power supply for AC load through AC output.

The energy generated by photovoltaic array will be transmitted to battery, power grid and/or AC load automatically, depending on how to achieve the highest performance and the best economic return. The goal of the system is to maximize the use of energy generated by solar energy, while minimizing the use of power grid.

The charging interface of new energy vehicles can provide electricity for electric vehicles.



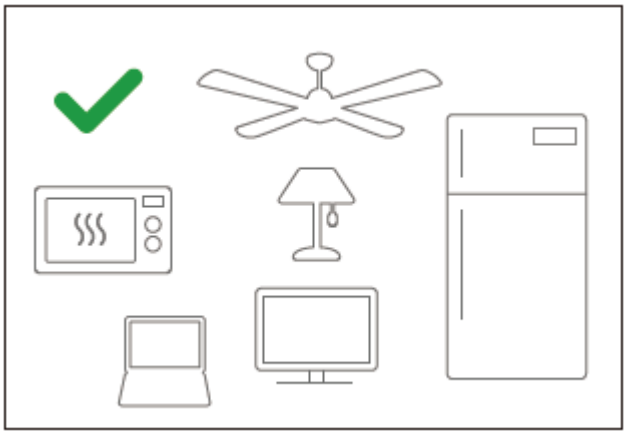
KeepON load

Emaldo Power Core can provide continuous AC power up to 10,800 W for AC load connected to KeepON load. The system can provide up to 21,600 W AC power to start the load. A large initial

power is required when starting the load. If the ambient temperature exceeds 45℃, the output of the energy storage system will decrease; if the ambient temperature exceeds 60℃, the system will be shut down.

Example of an AC load that can be connected to a KeepON load circuit:

- Lighting (compact fluorescent lamp or LED recommended)
- Refrigerator and freezer
- Small-sized plug-in appliances, such as cooking utensils, microwave ovens, televisions, radios, computers

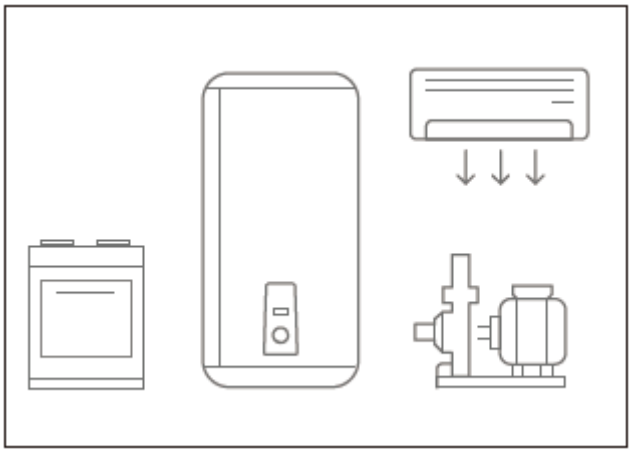


KeepON load available

Example of an impact AC load:

- Water pump
- Hot spring/Sauna
- Electric stove or oven
- Air-conditioner
- Hot water heater

Note: If the above impact load is connected to the KeepON load, please confirm that the total starting power does not exceed the maximum starting power of the energy storage system.



Impact AC load

2.2 Feature

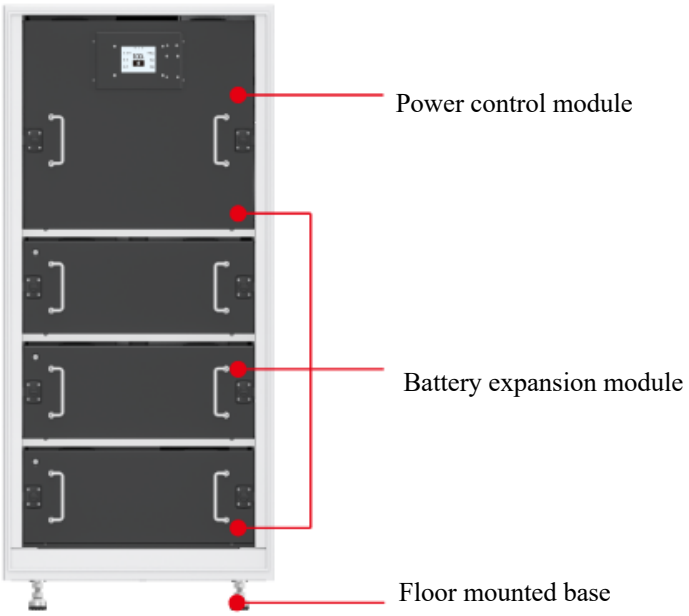
- Efficient and off-grid multi-scenario and multi-mode energy storage system
- Fashionable appearance and rich functions
- Intelligent operation, simple operation, and friendly monitoring
- Advanced EMALDO energy management system
- Modular design, easier to install and maintain
- Powerful AC load KeepON energy storage system
- Up to 86kWh stackable battery capacity expansion
- Integrate new energy vehicle charging system
- Battery temperature management of preheating and cooling
- Explosion-proof protective enclosure, suitable for outdoor use*
- Ground fault and insulation monitoring protection of photovoltaic array
- Maximum power point tracking (MPPT)
- Firmware OTA enables more possibilities
- 4G remote monitoring anytime, anywhere

*It is necessary to be placed outdoors under eaves

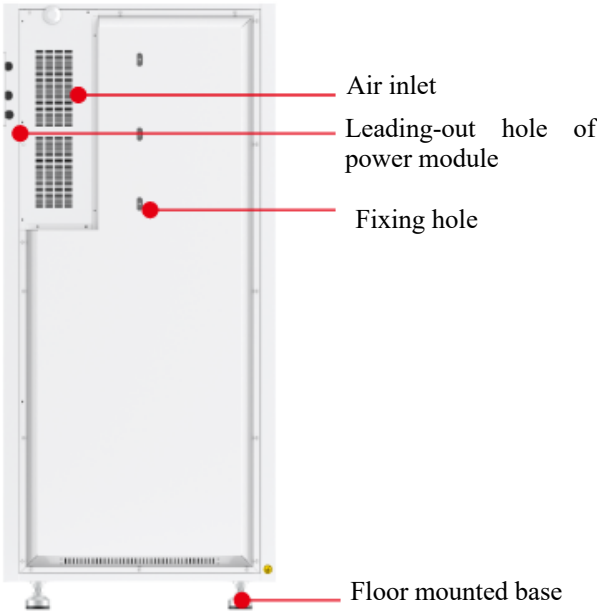
2.3 Dimensions

2.4 Appearance

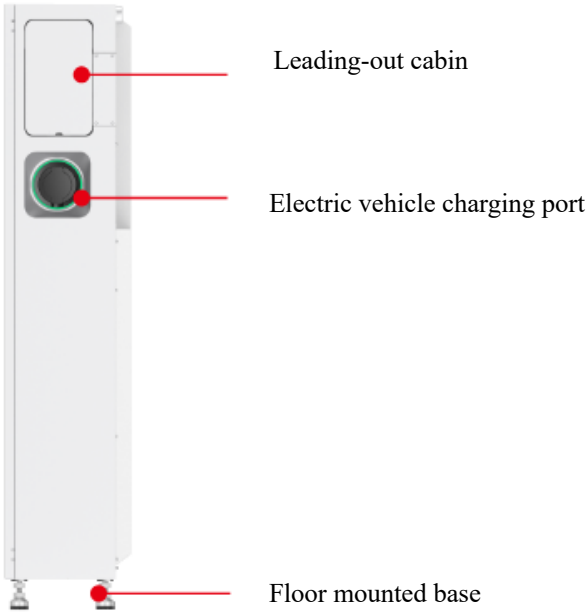
The Emaldo Power Core includes cabinet, power control module, and battery module. One power control module is provided, with a rated power of 10.8kW; There are 1-3 battery modules, with a single standard capacity of 3072Wh.



Front side



Rear side



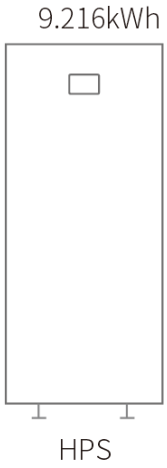
Right side

Left side

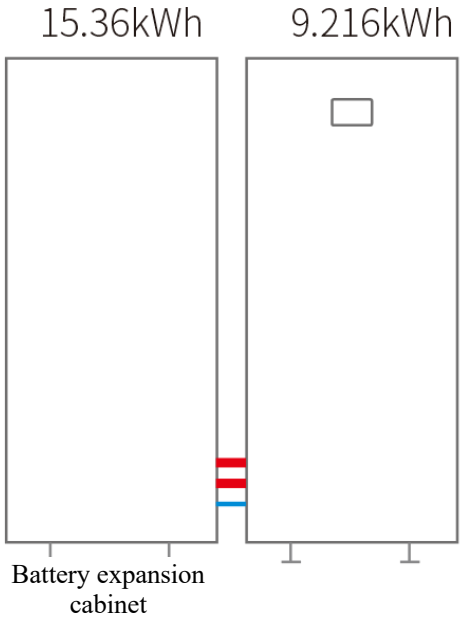
2.5 Battery capacity expansion

Emaldo Power Core supports expansion of multiple battery cabinets, with a maximum of 5 battery cabinets. One extended battery cabinet can connect up to 5 standard battery modules in parallel, totaling 15.36kWh. Five battery cabinets can be expanded up to 76.8kWh.

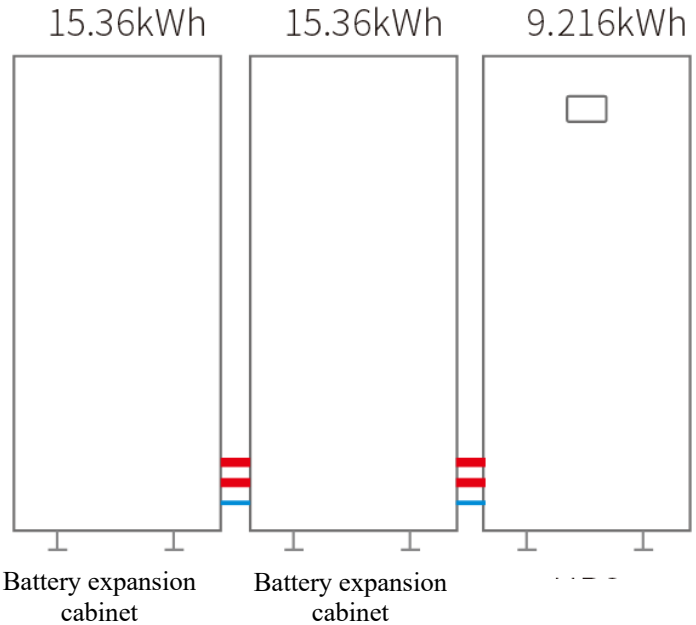
9.216kWh



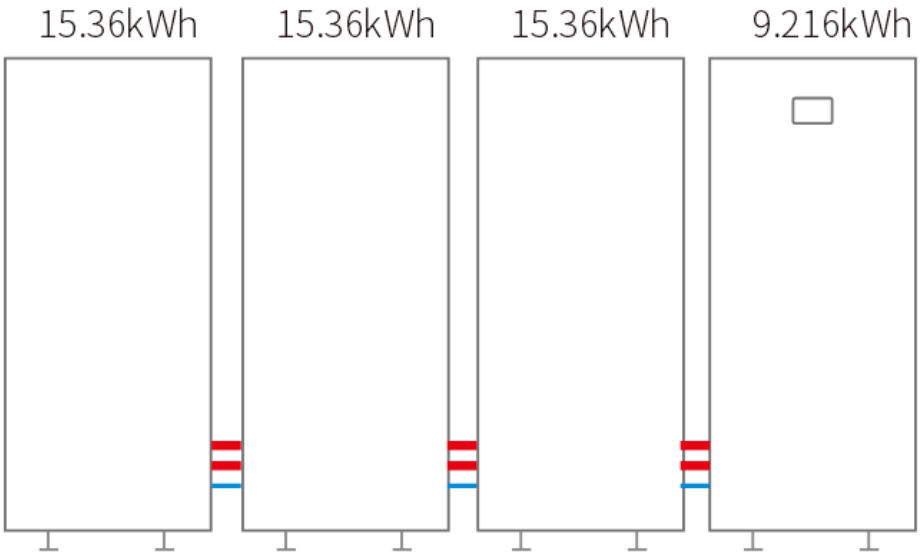
24.576kWh



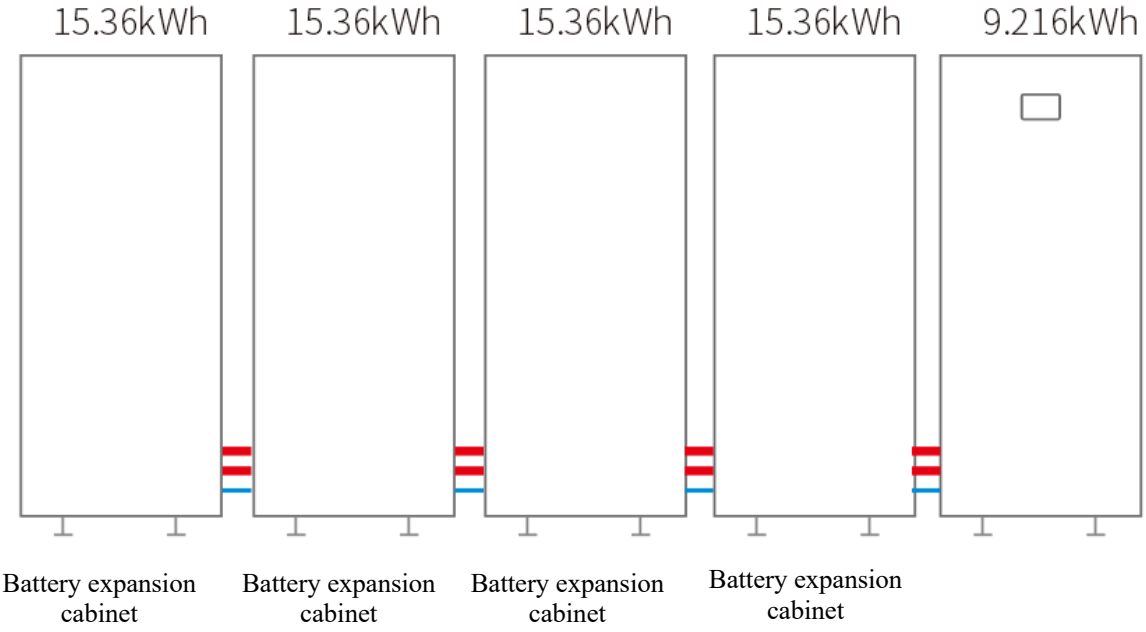
39.936kWh



55.296kWh



70.656kWh



Model	**EM-CAB-WH-01**
AC output (on-grid)	
Max output apparent power (VA)	10800VA
Rated output voltage (V)	400Vac
Rated output frequency (Hz)	50/60Hz
Max output current (A)	15.6A*3
Max input current (A)	15.8A*
Max power factor	0.8i…1…0.8c
THDv	<3%
AC output (off-grid)	
Rated output apparent power (VA)	10800VA
Rated output current (A)	15.6A*3
Max output current (A)	15.8A*3
Rated output voltage (V)	400Vac
Rated output frequency (Hz)	50/60 (± 0.5)Hz
EV output	
Rated output power(W)	Up to 10800W
Rated output current(A)	15.6*3A
Rated output voltage(V)	400Vac
Interface type	IEC Type2 (IEC62169)
Leakage protection	Integrated (external)
PV input	
Max input power (W)	10800W(3600W*3)
Max input open-circuit voltage (V)	550Vdc
MPPT voltage range (V)	90-500Vdc
Start-up voltage (V)	100Vdc

Max input current (A)	13A*3
Max short-circuit input current(A)	18A*3
MPPT Input string number	3

AC input

Rated input power (VA)	10800VA
Rated input current (A)	15.6A*3
Rated input voltage (V)	400Vac
Rated input frequency (Hz)	50/60Hz

Battery

Battery type	LFP(LiFePO4)
Battery capacity	3072Wh*(1-3 battery modules)
Rated battery voltage (V)	51.2
Battery voltage range (V)	40~58.8
Max charging current (A)	100A(depend on number of battery module)
Max discharging current (A)	250A((depend on number of battery module)

Efficiency

Max efficiency	97.00%
European efficiency	96.00%

Protection

Anti-islanding protection	Integrated
Reverse connection protection of photovoltaic input	Integrated
Insulation impedance detection	Integrated
Residual current detection	Integrated
Output overcurrent protection	Integrated
Output short circuit protection	Integrated

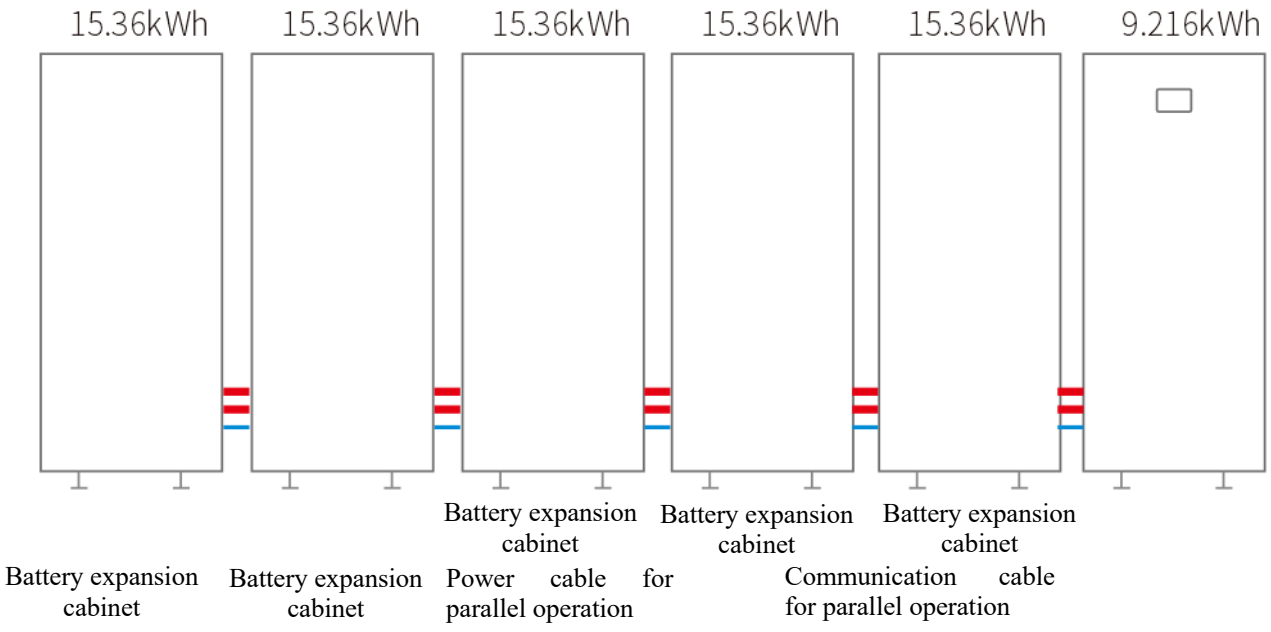
Output overvoltage protection	Integrated

General

Operating temperature (℃)	-20~50
Relative humidity	0~95%
Altitude (m)	2000m
Cooling	Forced air
Noise (dB)	<50dB
Display	E-INK+LED+APP
Communication	RS485(meter)
4G/WiFi/BlueTooth	YES/YES/YES
Topology	Transformerless
Weight (kg)	215 kg (including 3 battery modules)
Dimensions (W*H*Dmm)	700*1520*327 mm

2.6 Parameters

86.016kWh



3 Installation

3.1 Basic requirements

- During the operation of the energy storage system, the temperature of the air outlet on the left side of the cabinet may be relatively high. Please do not install it in a location where it is easy to access.
- Do not install in areas where flammable and explosive materials are stored.
- Do not install in a location that children can touch.
- The energy storage system is installed on the ground and fixed with wall-mounted components.
- The energy storage system cannot be installed to tilt it forward, place it upside down, tilt backward and tilt sideways.

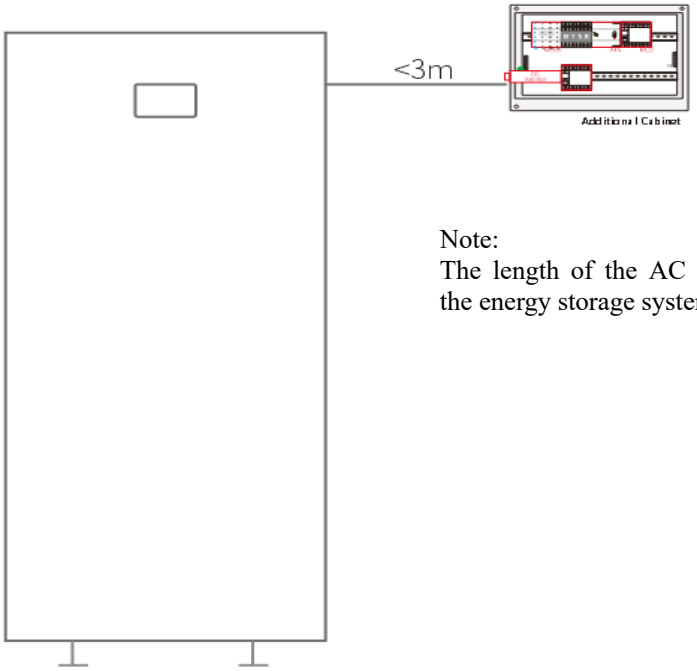
3.2 Choose position

Please select solid brick concrete structure, concrete wall and floor for installation location. If other types of wall and floor are selected, wall and floor must be made of flame-retardant materials and meet the requirements for equipment fixation.

The Additional Cabinet is delivered with the Emaldo Power Core and serves as an intermediate device connecting the energy storage system to the primary distribution box. AC input & output and energy metering communication lines of the system are connected to the Additional Cabinet, and then connected to users' existing primary distribution box before distributing electric power.

A portion of user load can also be obtained by adding new circuit breakers to the reserved rails in the Additional Cabinet.

Because the Additional Cabinet is closely related to the energy storage system, it shall be placed in a relatively suitable location to connect the Emaldo Power Core and users' existing primary distribution box, so as to distribute electric power reasonably.

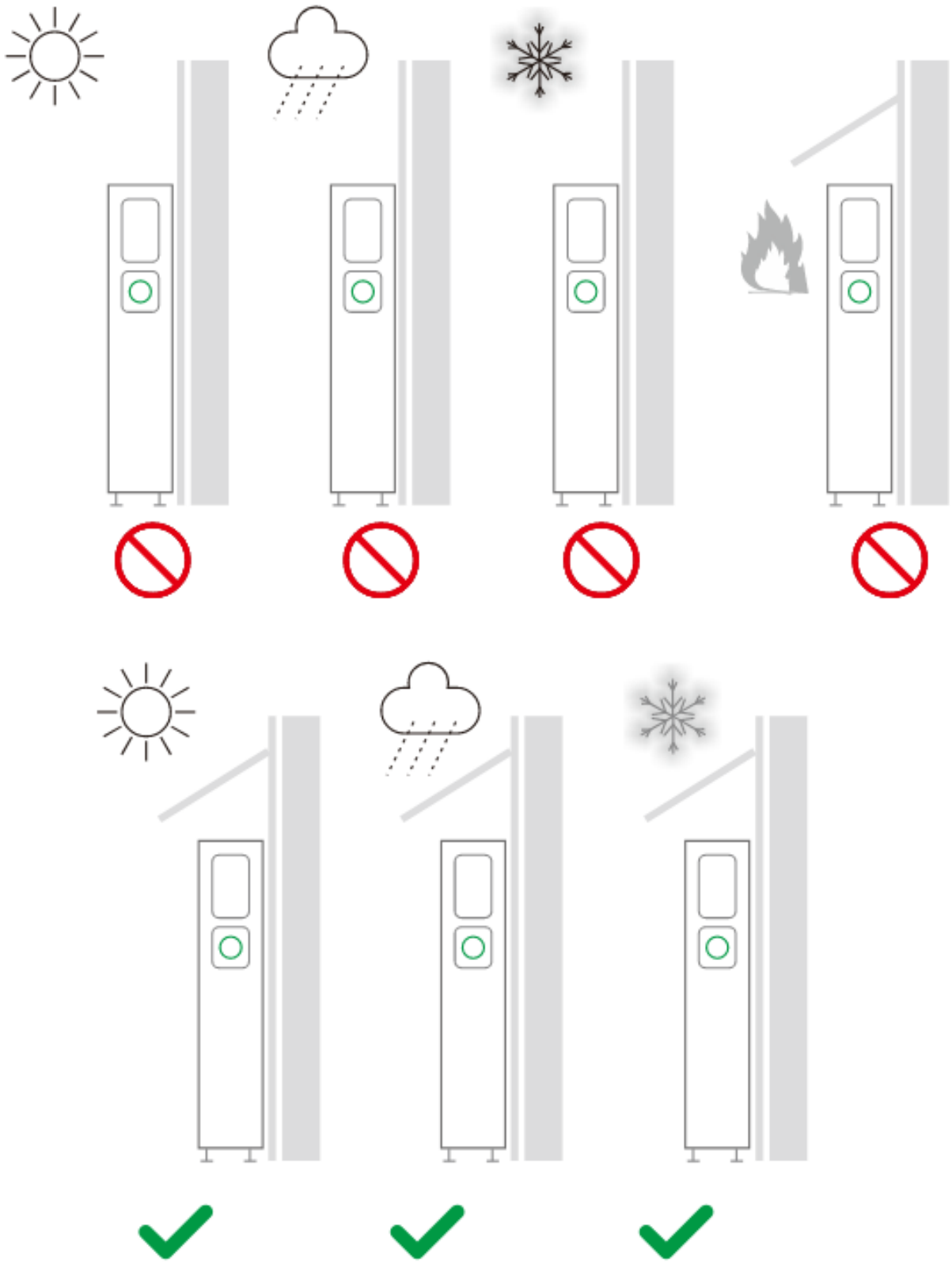


Note:
The length of the AC cable provided with the energy storage system is 3 meters.

Distance between Emaldo Power Core and Additional Cabinet

3.3 Installation environment

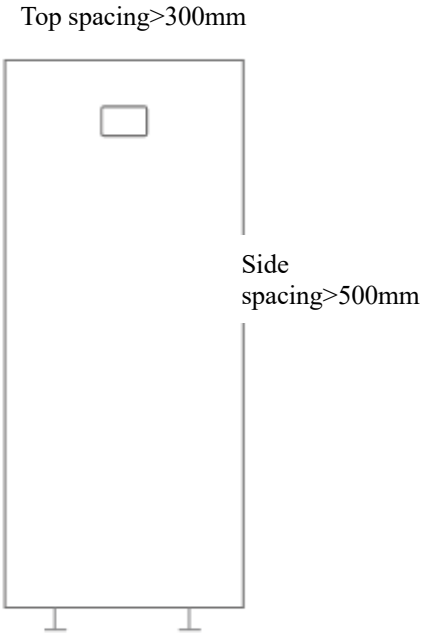
- The Emaldo Power Core can be installed indoors or outdoors under eaves, but there shall be no splashing onto the cabinet.
- The Emaldo Power Core must be installed vertically on the ground.
- In areas with sufficient air circulation, Emaldo Power Core operates more efficiently.
- It is recommended to reserve gaps around the Emaldo Power Core, with a minimum of 500mm on the side and 50mm on the back.
- If the ambient temperature is between -20°C and 50°C, the Emaldo Power Core will operate at full capacity. Please note that when the temperature is above 45°C, the maximum power of Emaldo Power Core will decrease.
- The battery has a lower tolerance to extreme temperatures than the power part of the energy storage system.



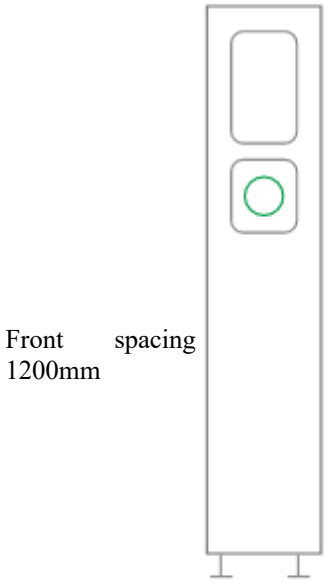
3.4 Installation space

When installing the energy storage system, it is ensured that there are no other equipment around (except EMALDO related equipment and sunshades), as well as flammable and explosive materials, and reserve sufficient space to ensure installation heat dissipation and

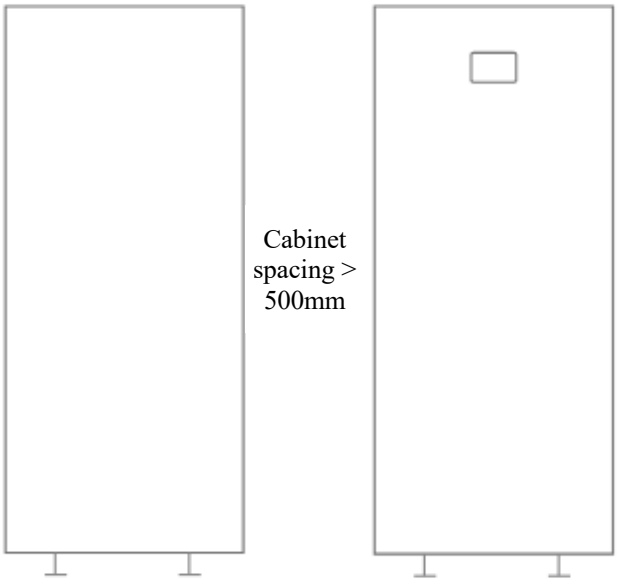
safety isolation requirements.



Spacing between top, left, and right



Interval between front and back



Note:
The battery expansion cabinet is optional. The standard length of the parallel line (along with the expansion cabinet) between cabinets is 1m.

Cabinet spacing

3.5 Check the outer packaging

Before opening the energy storage outer packaging, please check the outer packaging for any

visible damage, such as holes, cracks, or other signs of possible internal damage, and verify the model of energy storage system. If there are any packaging abnormalities or the model of the energy storage system does not match, please do not open them and contact your dealer as soon as possible.

3.6 Check delivered parts

After unpacking the outer packing of the energy storage system equipment, please check whether the delivered parts are complete and free of any obvious external damage. If there are any missing items or any damage, please contact your dealer.

3.7 Tool requirements

3.8 List of components

The following components are shipped with Emaldo Power Core:

- Additional Cabinet (including RCD, ATS, electricity meter, CT)
- Input dedicated cable*1 (3m)
- Output dedicated cable*1 (3m)
- Communication line for electricity meter*1 (3m)
- Car charging cable*1 (5m) and cable holder
- MPPT input cable*3 (3m, 2*2.5mm^2)
- Installation and Operation Manual

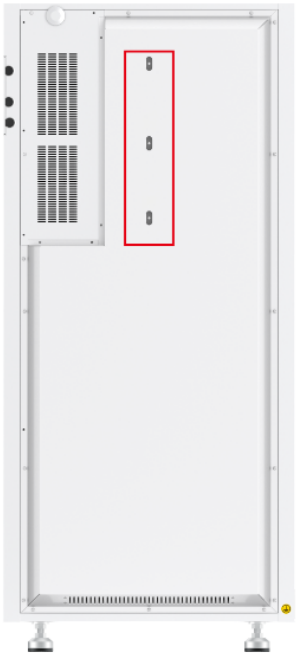
3.9 Installation of cabinet

 Danger

Before drilling holes, please make sure to avoid the embedded water supply line and power line inside the wall to avoid danger.

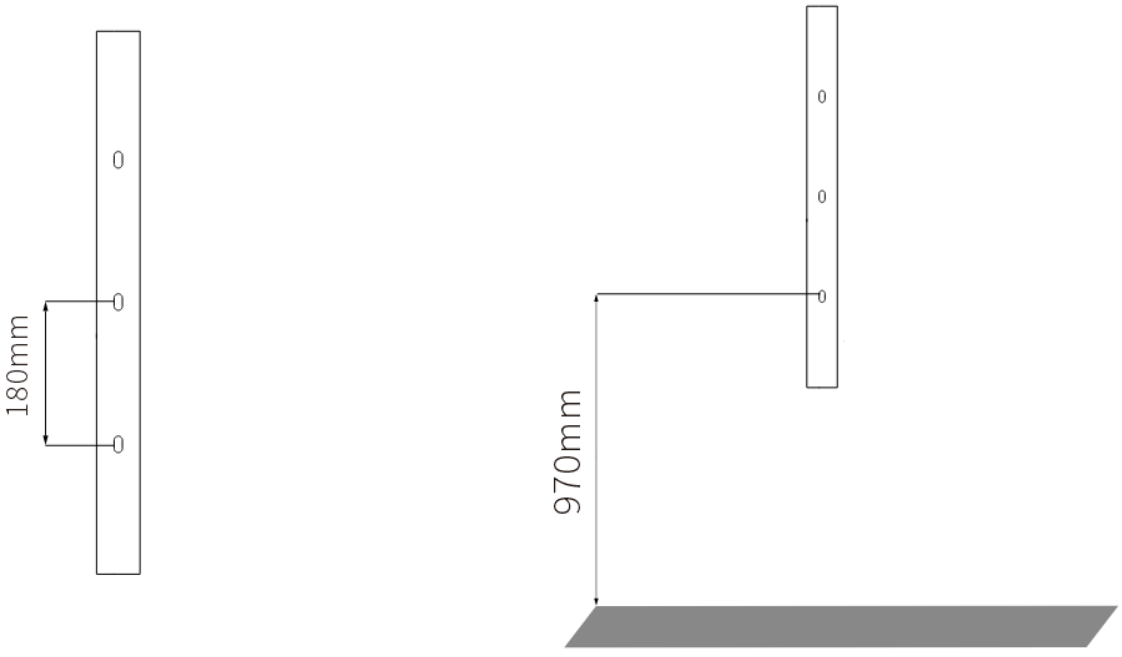
 Important

- Suitable fasteners shall be used to fix the Emaldo Power Core cabinet to the installation surface. EMALDO shall not be responsible for any damage caused by the use of unsuitable fasteners to secure the product.
- EMALDO provides some components and parts, but due to different installation surfaces, other different components and parts may be required.

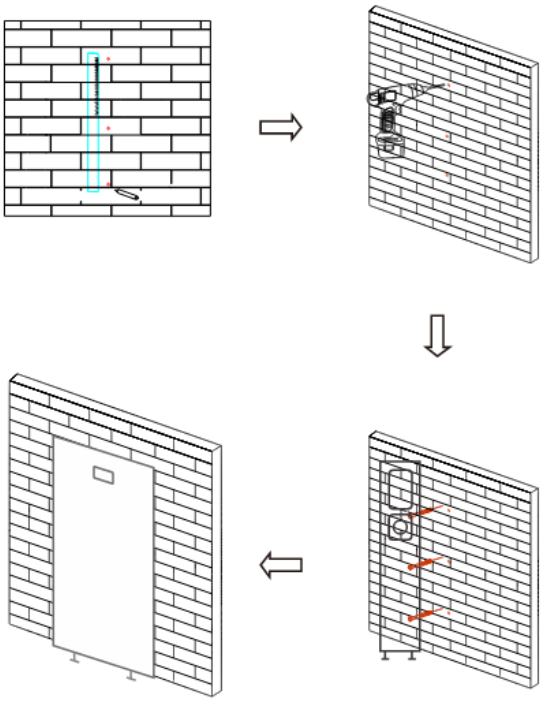


Wall-mounted holes
Used to secure the cabinet to the installation surface.

HPS



Without floor base



Step 1
A line marking template is used to determine the drilling location, level the hole location with a leveling instrument, and mark it with a marker.

Step 2
An electric drill is used to drill installation holes for M6 bolt at the marked points.

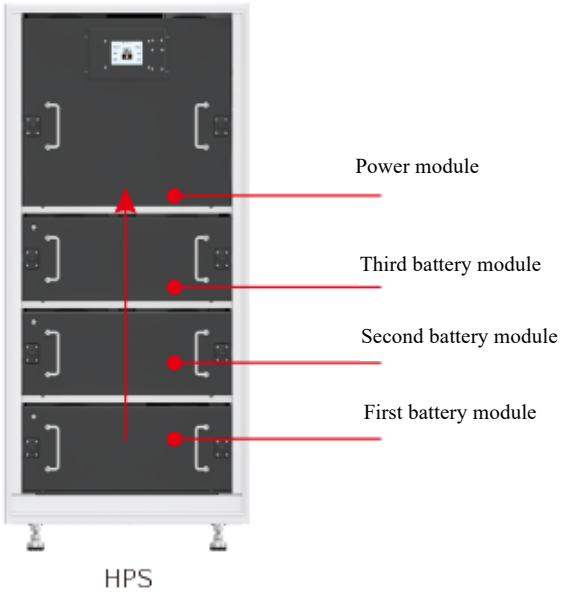
Step 3
Align the cabinet with the installation holes, tap the expansion bolts into the holes on the wall with a hammer, install the nuts (including elastic flat washers), and tighten the nuts with a wrench.

Note:
If no battery expansion cabinets are installed when installing Emaldo Power Core, it is recommended to install Emaldo Power Core on the right side, so that more battery cabinets can be expanded and installed on the left side if needed in the future.

Important

- Secure the wall-mounted bracket with M6 expansion bolts provided. If its length or quantity cannot meet the installation requirements, please provide M6 stainless steel expansion bolts for yourselves.
- In order to prevent dust from entering human respiratory tract or falling into eyes during drilling, operators shall wear protective glasses and dust masks.
- Dust inside and outside all holes shall be removed by the dust collector, and then the hole spacing shall be measured. For holes with large errors, relocation and drilling shall be carried out.
- After bolts, spring washers and flat washers are unscrewed, the upper end surface of the expansion pipe must be level with the cement wall surface or the floor without protruding out of the cement wall surface and the floor; otherwise, the engineering installation parts cannot be placed evenly on the wall surface.

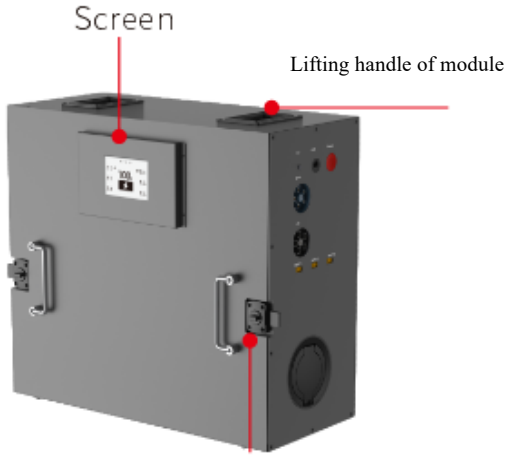
3.10 Installation of battery and power modules



Power module

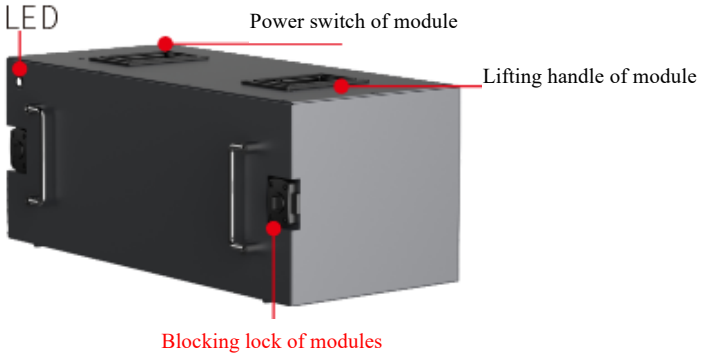
Step 1
Installation of the first battery module
Grasp the top handle of the battery module with both hands or by two persons, align it with the guide rail of the Emaldo Power Core cabinet module, and slowly push it forward. After pushing it forward a bit, release the handle, adjust the location, and then push it in with a slight force from the front of the module to ensure that the battery terminals are tightly connected to the cabinet terminals, and lock the linkage lock of the module front in place.

Step 2
In the same way, the second and the third battery modules and the power control module are installed in the bottom-up order.



Battery module

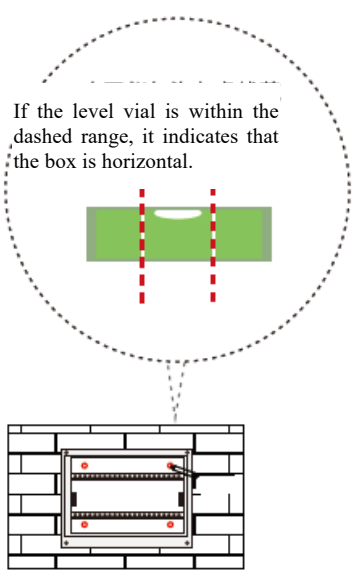
Note:
Battery module status:
Normal operation: LED light flashes slowly in blue.
Abnormal operation: LED light flashes slowly in red.

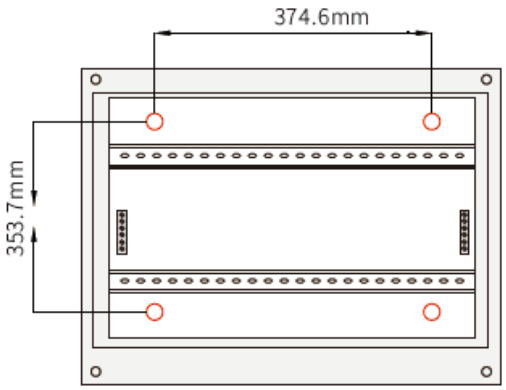


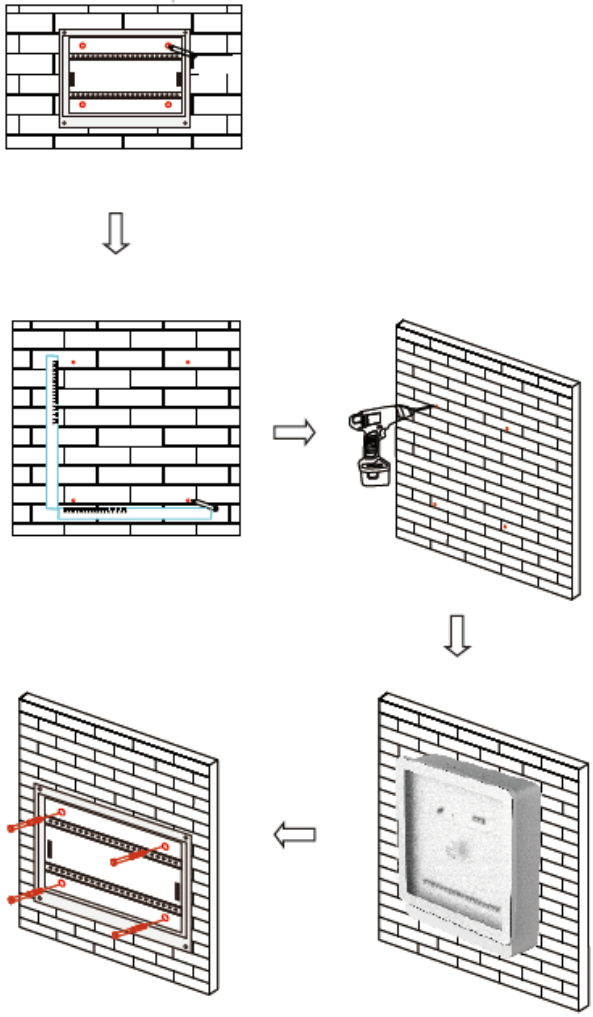
3.11 Installation of Additional Cabinet

Danger

Before drilling holes, please make sure to avoid the embedded water supply line and power line inside the wall to avoid danger.







Step 1
A line marking template is used to determine the drilling location, level the hole location with a leveling instrument, and mark it with a marker.

Step 2
An electric drill is used to drill installation holes for M8 bolt at the marked points.

Step 3
Align the distribution box with the installation holes, tap the expansion bolts into the holes on the wall with a hammer, install the nuts (including elastic flat washers), and tighten the nuts with a wrench.

Important

- Secure the distribution box with M8 expansion bolts provided. If its length or quantity cannot meet the installation requirements, please provide M8 stainless steel expansion bolts for yourselves.
- In order to prevent dust from entering human respiratory tract or falling into eyes during drilling, operators shall wear protective glasses and dust masks.
- Dust inside and outside all holes shall be removed by the dust collector, and then the hole spacing shall be measured. For holes with large errors, relocation and drilling shall be carried out.
- After bolts, spring washers and flat washers are unscrewed, the upper end surface of the expansion pipe must be level with the cement wall surface or the floor without protruding out of the cement wall surface and the floor; otherwise, the engineering installation parts cannot be placed evenly on the wall surface.

4 Electrical Connection

4.1 Wiring for energy storage system

The system wiring mainly includes two parts:

- Wiring for the Emaldo Power Core and Additional Cabinet. There will be three cables connected to the Additional Cabinet in the upper leading-out cabin on the right side of the Emaldo Power Core, namely Grid cable, AC cable and COM electricity meter communication cable.
- The Additional Cabinet is already connected to the user's primary distribution box. The cables are used for electricity selling RCD of Additional Cabinet, ATS automatic changeover switch output, and bidirectional electricity meter sampling.

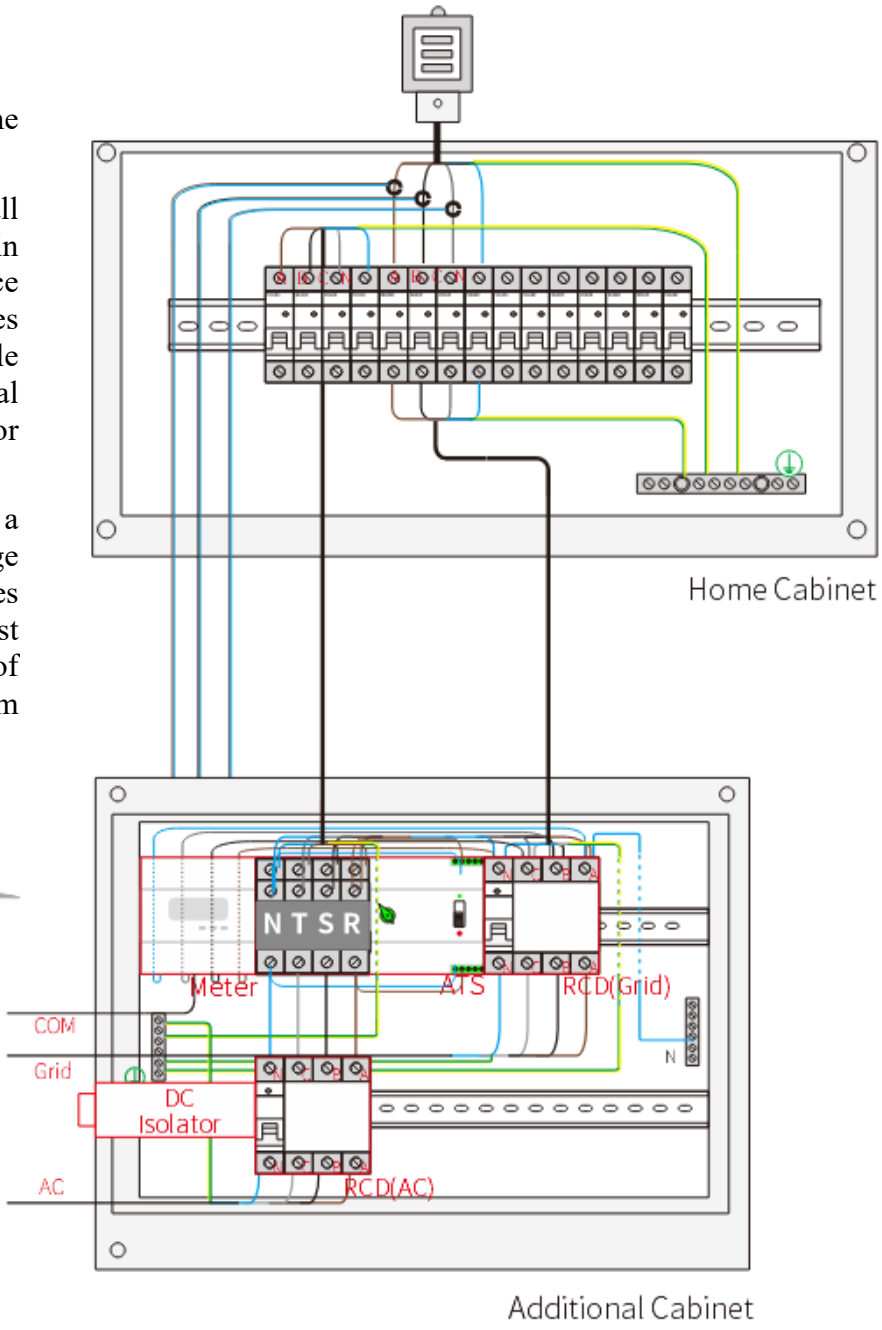
Notes:

Please pay attention to the wiring sequence of the devices.

The cable colors involved in all electrical connection diagrams in this chapter are for reference only, and the selection of cables shall conform to local cable standards (yellow and green dual color wires can only be used for protective grounding).

Emaldo Power Core is a transformer free energy storage system, and all other assemblies in the photovoltaic system must be compatible with this type of energy storage system architecture.

HPS



Important

- Equipment damage caused by incorrect wiring is not covered by the warranty for the equipment.
- The relevant operations of electrical connections must be completed by professional electrical technicians.
- When implementing electrical connections, operators must wear personal protective equipment.

4.2 Connect Additional Cabinet

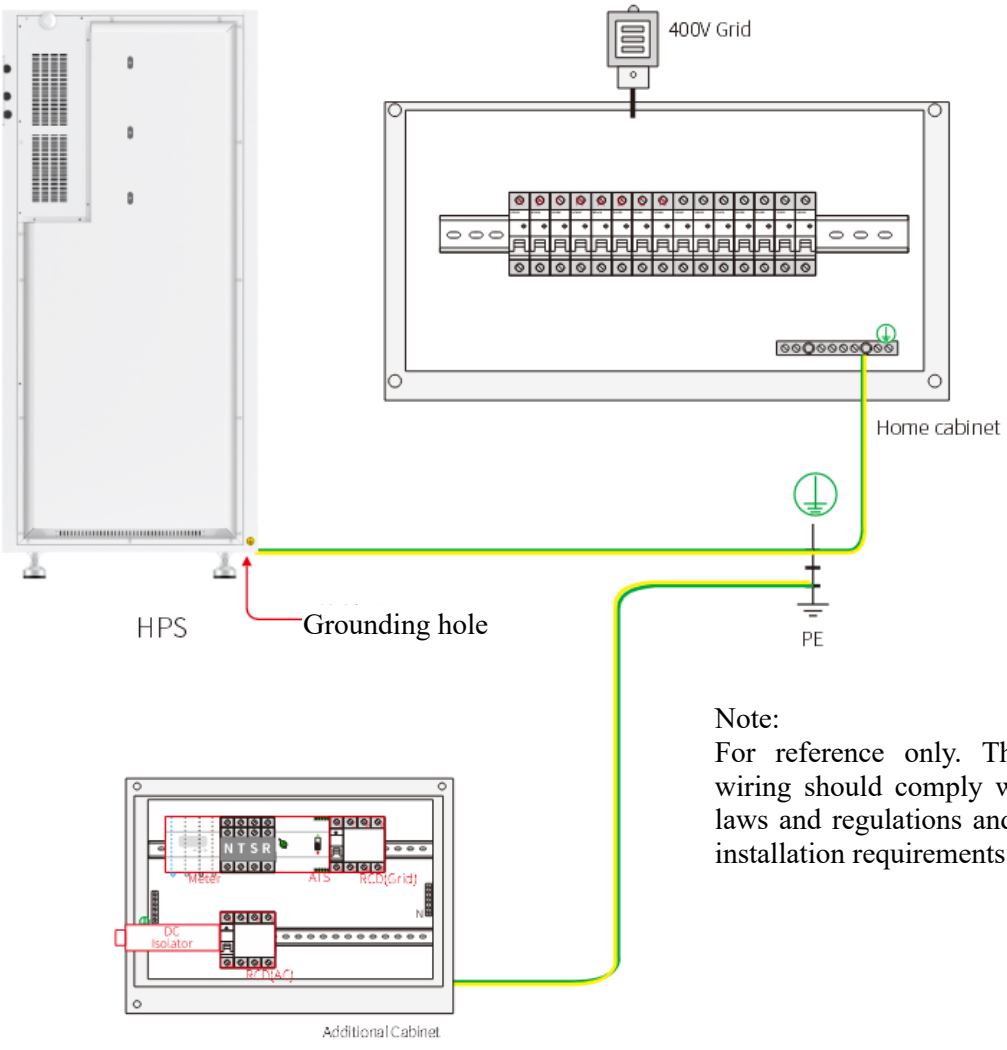
Connect protective grounding

Size of grounding conductor

Terminal location	Maximum conductor size
Protective grounding terminal	16mm^2

Warning: Electric shock!

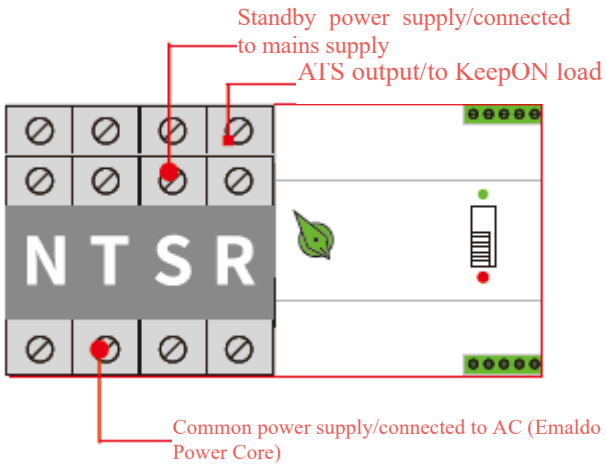
The equipment shall be properly grounded and the wiring should comply with local standards.



Main devices of Additional Cabinet

In this section, the required wiring in the Additional Cabinet is described. Internal components and wiring of the Additional Cabinet are shown as follows. The following precautions must be considered when wiring the Additional Cabinet:

- All system wiring must comply with national and local regulations.
- When wiring, please ensure that the polarity connection is correct to avoid any danger or damage to the equipment.
- Please connect the communication cable as per the instructions.

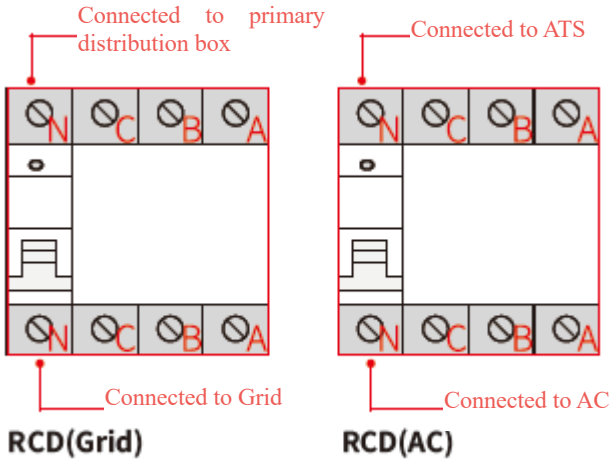


ATS automatic change-over switch:

This switch has two inputs and one output.

AC (Emaldo Power Core) is connected to common power input; Mains supply is connected to the standby power input. The output provides electric power for the KeepON load.

In the two inputs, when AC (Emaldo Power Core) fails and there is no input, the mains supply will be automatically cut in to ensure power supply for the loads.



RCD earth leakage circuit breaker:

One is Grid(Emaldo Power Core), connected to the circuit breaker of mains supply. The other is AC(Emaldo Power Core), connected to the KeepON load circuit breaker.

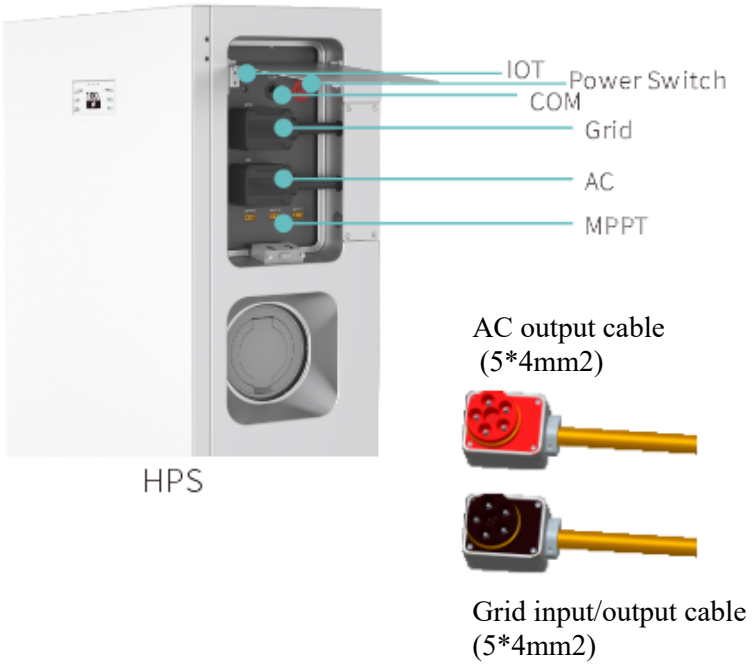
When the RCD circuit breaker is in the ON position, the circuit is connected.

When the RCD circuit breaker is in the OFF position, the circuit is disconnected.

Specifications of main devices of Additional Cabinet

Component	Specification
Electricity meter	Bidirectional, CT150/5
ATS	400Vac,40A
RCD	400Vac,40A,Type B
DC Isolator	6P16A600V

Wiring of leading-out cabin of cabinet



Step 1

Thread one end of the cable from the leading-out cabin through the outlet hole.

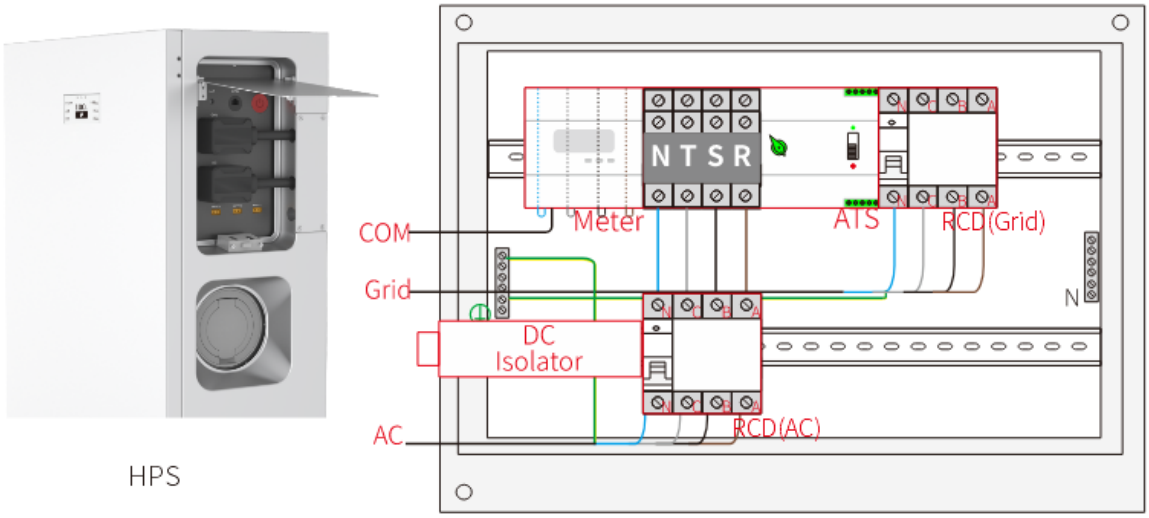
Step 2

Align the AC cable terminals and press them into the AC port of the energy storage system; Align the Grid cable terminals and press them into the Grid port of the energy storage system.

Step 3

Insert one end of the electricity meter communication cable RJ45 into the COM electricity meter communication port of the energy storage system.

Wiring from the leading-out cabin of the cabinet to Additional Cabinet



Step 1

Thread one end of the cable through the threading hole of Additional Cabinet from outside to inside.

Step 2

Press and connect the five wires of the AC cable into the lower part of the second row RCD (AC) and the ground bar in the line sequence, and then connect the upper part of RCD to the common power supply input terminal of ATS; Press and connect the five wires of the Grid cable into the output terminal and ground bar of the RCD (Grid) as per line sequence.

Step 3

Connect the other end of the electricity meter communication cable to the corresponding terminal of the electricity meter.

4.3 Wiring for photovoltaic array

Warning: Electric shock!

A small amount of exterior sunlight may activate photovoltaic modules. Please be careful during wiring to avoid electric shock or electric arc hazard.

Important

The photovoltaic array framework shall be earthed in accordance with local laws and regulations. Please consult the local power department about details.

Dimensional requirements for photovoltaic array conductors

Terminal location	Conductor size
MPPT1	TBD
MPPT2	TBD
MPPT3	TBD

When installing photovoltaic modules, the following parameters shall be considered:

- The maximum open circuit voltage of the PV string cannot exceed the maximum open circuit voltage of Emaldo Power Core
- The operating voltage of the PV string shall be greater than the minimum MPPT operating voltage of Emaldo Power Core

Emaldo Power Core DC input parameters

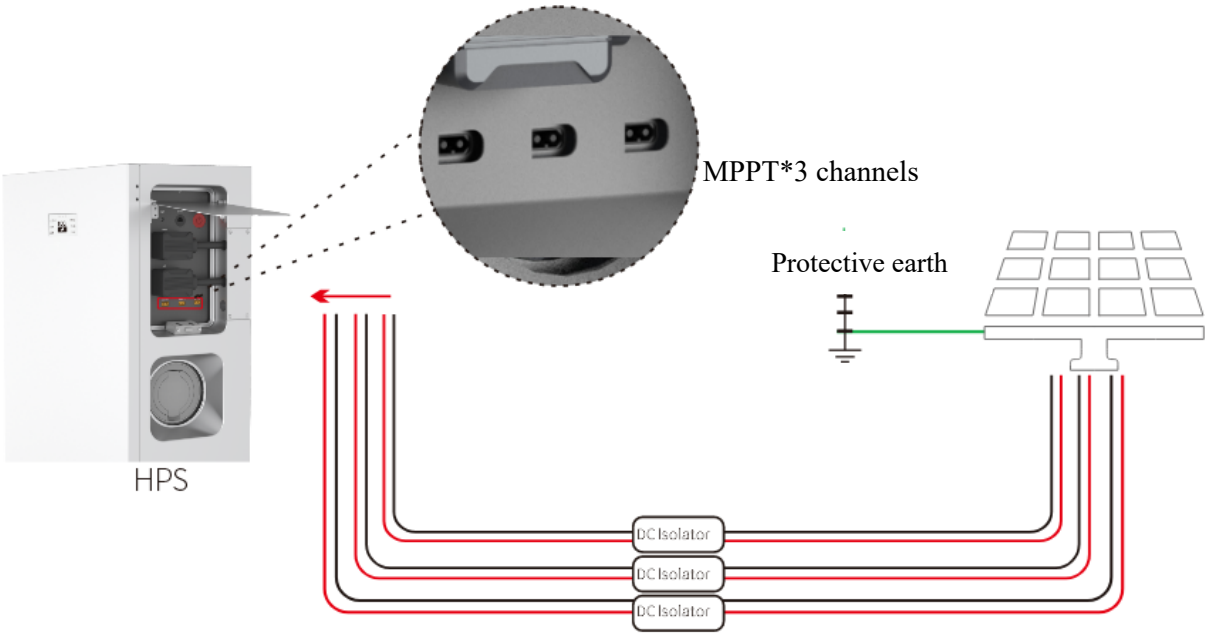
DC input parameters	Value
Maximum input power	10800W (3600W*3)
Maximum input voltage	550Vdc
MPPT operating range	90-500Vdc
MPPT No.	3

Specifications for photovoltaic module array

Module specifications (for reference) • 400Wp • Vmp: 30.9V • Imp: 12.9A • Voc: 36.9V • Isc: 13.7A	Total input power	MPPT input	Module quantity
	2400W	6 in series	6 pcs.
	3600W	9 in series	9 pcs.
	4800W	6 in series and 2 in parallel	12 pcs.
	6400W	8 in series and 2 in parallel	16 pcs.
	7200W	6 in series and 3 in parallel/9 in series and 2 in parallel	18 pcs.
	9600W	8 in series and 3 in parallel	24 pcs.
	10800W	9 in series and 3 in parallel	27 pcs.

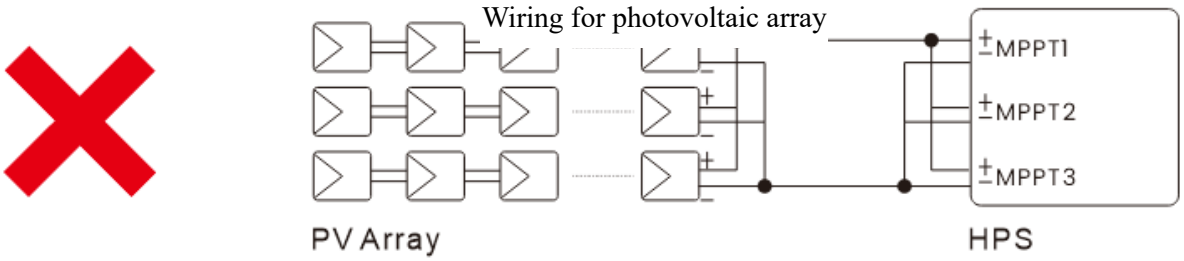
Important

The photovoltaic 3-channel MPPT input must be connected to a separate PV string as per each channel.

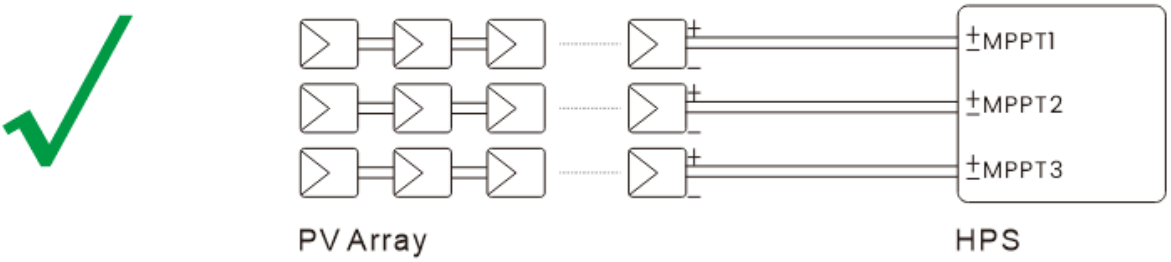


Note

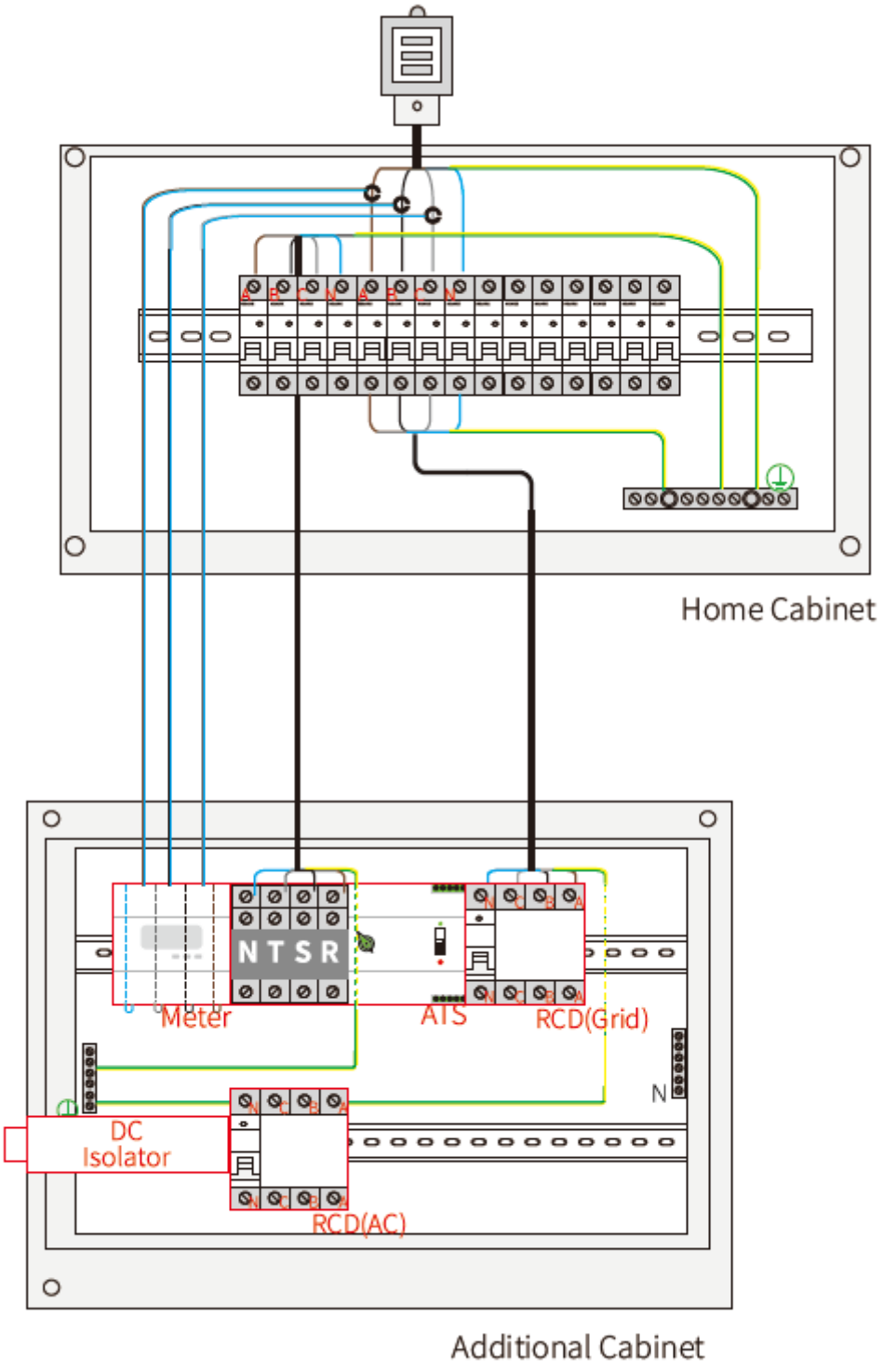
PV connection mode below is NOT allowed!



PV connection mode below is allowed!



4.4 Connect primary distribution box



Important

For the TN type power grid, the N line of the power grid must be connected to the N line of AC (Emaldo Power Core).

Step 1

Connect the output of ATS to the incoming line terminal of the corresponding circuit breaker (KeepON line) of the primary distribution box.

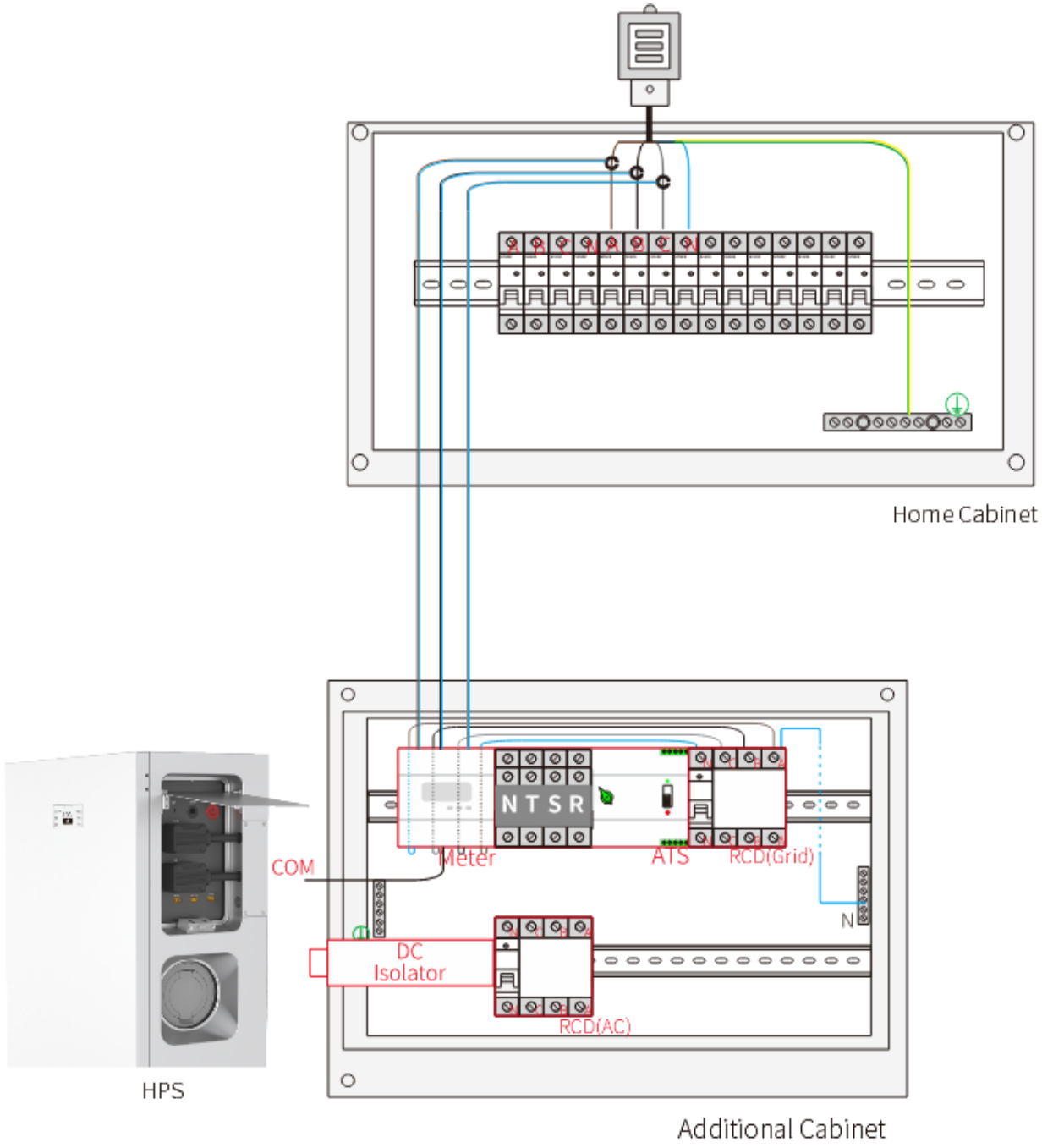
Step 2

Connect the upper wiring of RCD (Grid) to the leading-out terminal of the corresponding circuit breaker (electricity selling/electricity utilization line) in the primary distribution box.

Step 3

Install the CT of the electricity meter to the main incoming line and connect the voltage sampling line of the electricity meter. Please refer to "Installation of electricity meter" for details.

4.5 Installation of electricity meter



Step 1

Insert one end of the electricity meter communication cable RJ45 into the COM hole of the leading-out cabin of Emaldo Power Core, and connect the other end into the corresponding hole position of the electricity meter as per the line sequence.

Step 2

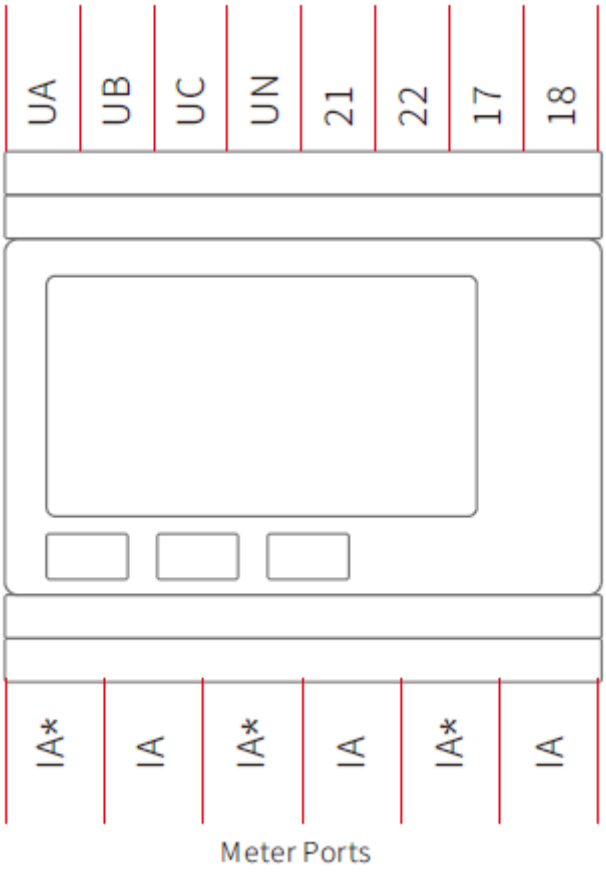
Install three open-type CTs onto the three-phase cable at the incoming line terminal of the primary distribution box, and connect the sampling cable to the corresponding hole position of

the electricity meter.

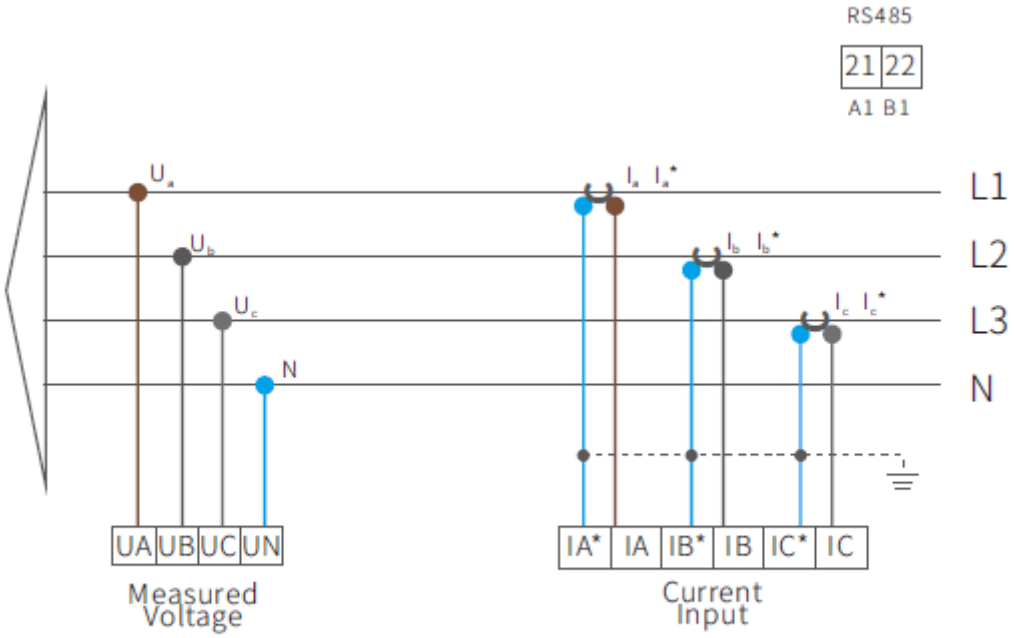
Step 3

Connect the voltage sampling line of the electricity meter to the incoming line terminal of RCD (Grid) and the corresponding hole position of the electricity meter as per the line sequence.

A grid meter can be used to measure the energy flowing out of or into the grid. The electricity meter is installed in the Additional Cabinet, and the energy storage system is equipped with RS485 communication cable. The instrument is 72 mm wide.



Meter Ports



Meter Connection

1. Insert the CT current sensor around the incoming line of the public power grid in the household cabinet.
2. The red wire of the Phase A CT sensor is connected to the terminal Ia* at the bottom of the instrument.
3. The black wire of the Phase A CT sensor is connected to the terminal Ia at the bottom of the instrument.
4. The red wire of the Phase B CT sensor is connected to the terminal Ib* at the bottom of the instrument.
5. The black wire of the Phase B CT sensor is connected to the terminal Ib at the bottom of the instrument.
6. The red wire of the Phase C CT sensor is connected to the terminal Ic* at the bottom of the instrument.
7. The black wire of the Phase C CT sensor is connected to the terminal Ic at the bottom of the instrument.
8. Prepare one piece of grounding wire for earthing.
9. Prepare 4 pieces of voltage (Ua, Ub, Uc, UN) induction wires for connecting RCD in the distribution box.

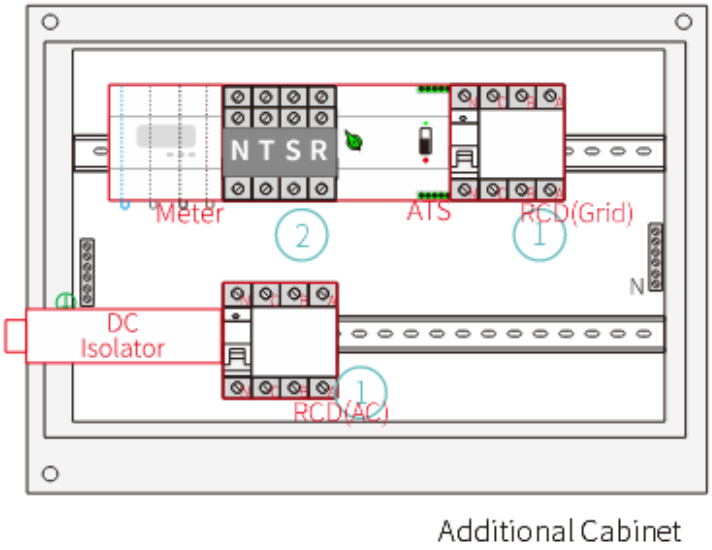
10. Connect the communication cable to terminals A1 (21) and B1 (22) of the instrument.
11. Connect the other end of the communication cable to the COM port of Emaldo Power Core
12. Note: The instrument is connected to the current transformer (CT). The shunt current transformer (CT) is connected. It is used for existing wiring to detect the maximum continuous rated current (AC) of 150A coming from the power grid.

4.6 Inspection after installation

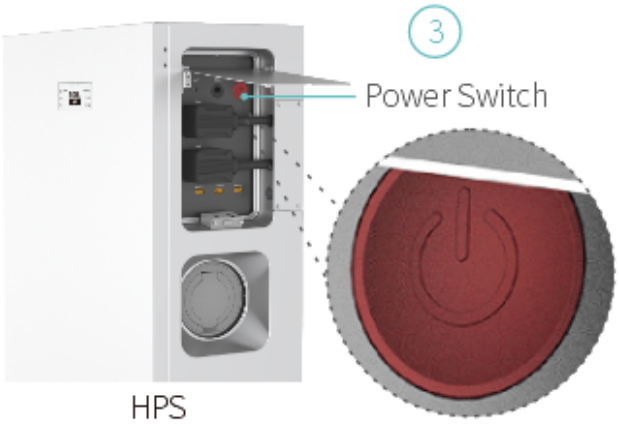
No	Inspection criteria
1	The energy storage system is installed correctly and securely.
2	The cable layout is reasonable and meets user requirements.
3	The cable tie shall be uniform and cut without leaving sharp corners.
4	The grounding wire is connected correctly, firmly and reliably.
5	The switch and all switches connected to the energy storage are in the "OFF" state.
6	AC cable, Grid cable, and electricity meter communication cable are connected correctly, firmly and reliably.
7	Install waterproof covers on unused terminals and interfaces.
8	The installation space is reasonable, the environment is clean and tidy, and there are no construction remnants.

5 Operation

5.1 Power On



Additional Cabinet



HPS

Perform the following steps to start the system.

Warning: Electric shock and burns are potential.

Step 1

Switch the RCD (Grid, AC) circuit breaker in the Additional Cabinet to the ON position.

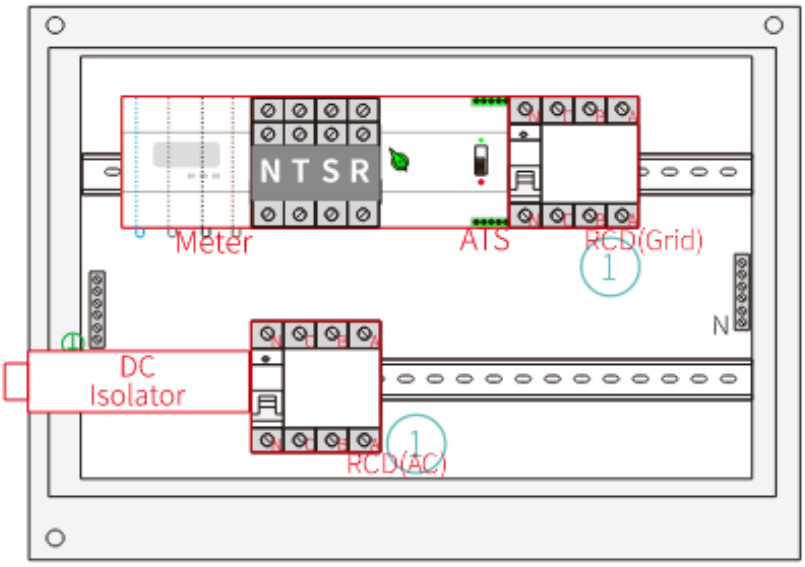
Step 2

Switch the ATS switch to the SOURCE A position and switch it to the AUTO mode.

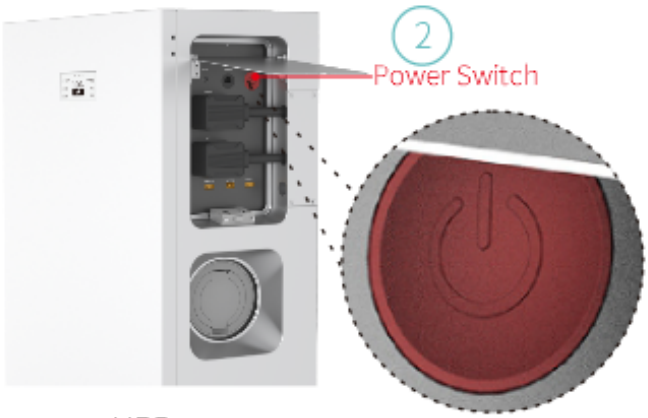
Step 3

Open the cover plate of the upper leading-out cabin on the right side of Emaldo Power Core, and press and hold the main switch of the energy storage system for more than 5 seconds. The blue light ring of the main switch will light up, and the system is started successfully.

5.2 Power Off



Additional Cabinet



HPS

Perform the following steps to shut down the system.

Warning: Electric shock and burns are potential.

Important

After the system is shut down, the ATS will automatically switch to the standby power supply to continue supplying power to the KeepON load. If it is necessary to cut off the ATS power supply, please use the MANUAL mode and switch to the SOURCE A position.

Step 1

Switch the RCD (Grid, AC) circuit breaker in the Additional Cabinet to the OFF position.

Step 2

Open the cover plate of the upper leading-out cabin on the right side of Emaldo Power Core, briefly press the main switch of the energy storage system, the main switch light ring will go out, and the system is shut down.

Note: After briefly pressing the main switch and the light ring goes out, the LED of the battery module will turn off after a period of self inspection.

5.3 Restart IoT

HPS

Warning: Electric shock and burns are potential.

Step 1

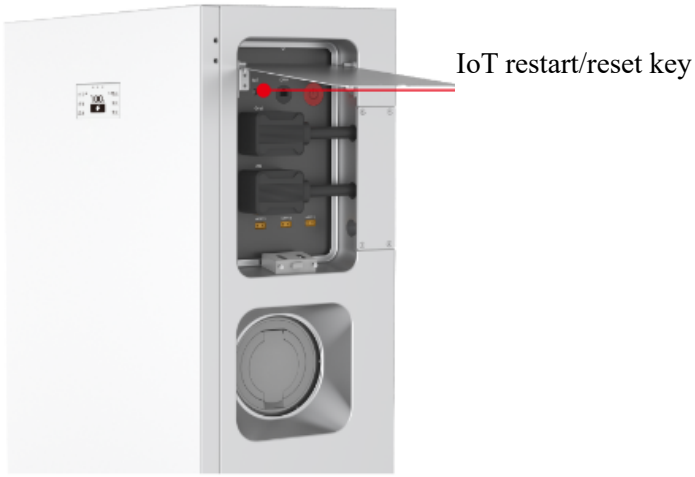
Open the front door of the Emaldo Power Core and locate the IoT button on the right side of the

top power control module display screen.

Step 2

Briefly press the IoT button, if a ”beep” sound is heard, the IoT is restarted successfully.

5.4 Reset IoT



HPS

Warning: Electric shock and burns are potential.

Important

After the IoT is reset, all settings of the energy storage system will be lost.

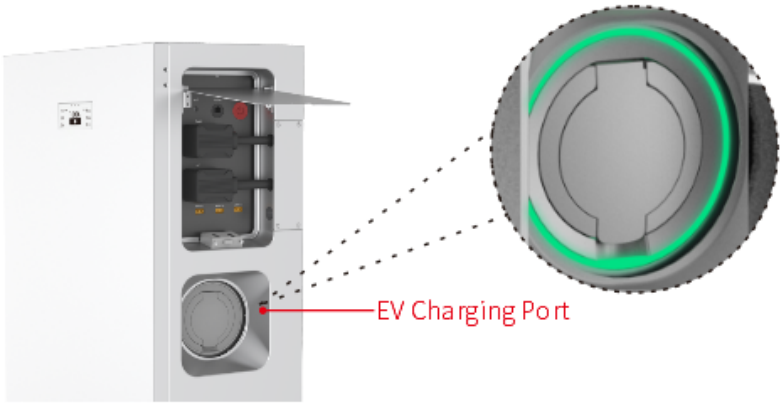
Step 1

Open the front door of the Emaldo Power Core and locate the IoT button on the right side of the top power control module display screen.

Step 2

Press and hold the IoT button for more than 10 seconds, and after hearing three times of ”beep”, it indicates that the IoT is successfully restored to factory settings.

5.5 Electric vehicle charging



HPS

EV Charging Cable

Step 1

Open the waterproof cover for electric vehicle charging port and insert the charging gun head.

Step 2

Insert the other end of the charging gun into the electric vehicle charging port.

Notes:

The length of the charging gun cable is 5m

Working status of the light ring:

Blue: Charging

Red: Faulty

Light off: not working

5.6 Configure via the app

Step 1:

Start by downloading the app to your mobile phone by scanning the applicable QR code below.

Step 2:

Get the App Guide to continue setting your Emaldo Power Core up and learn how to use it to it's full potential.

Step 3:

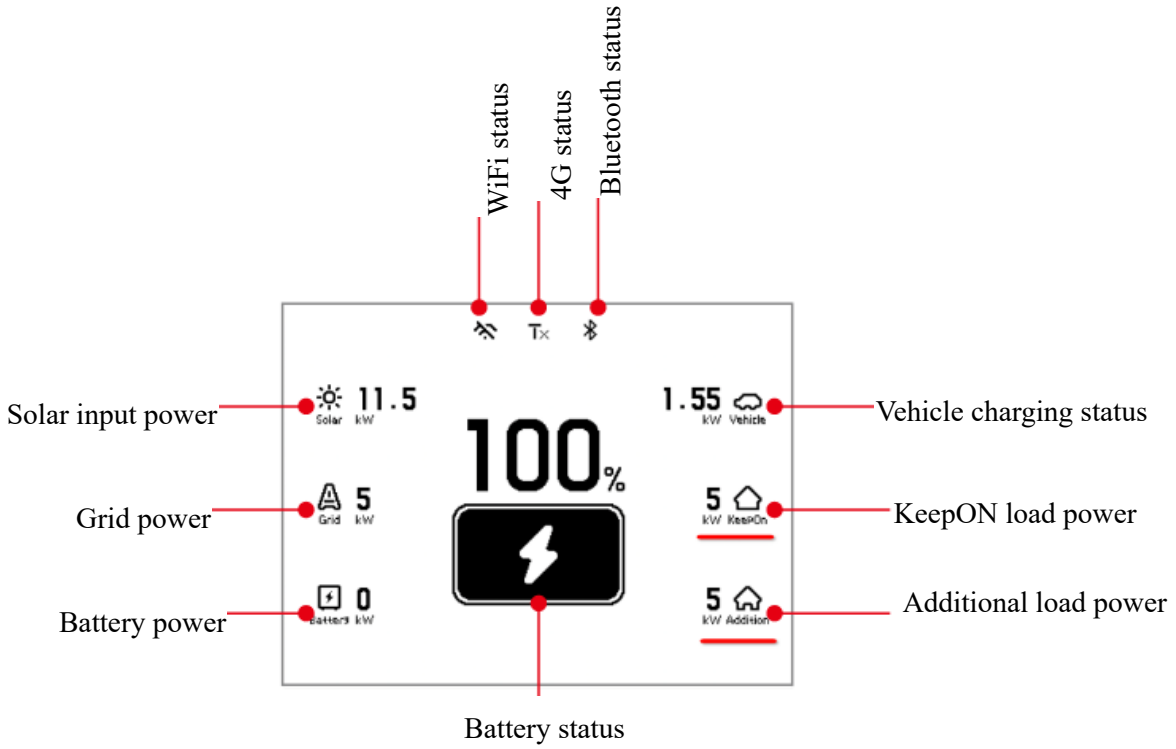
When prompted by the app, scan the QR code below to activate your new Emaldo Power Core.

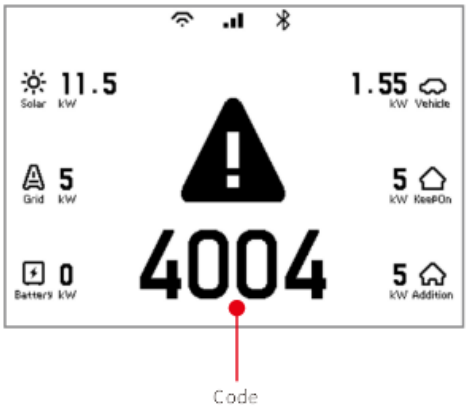
6 Troubleshooting

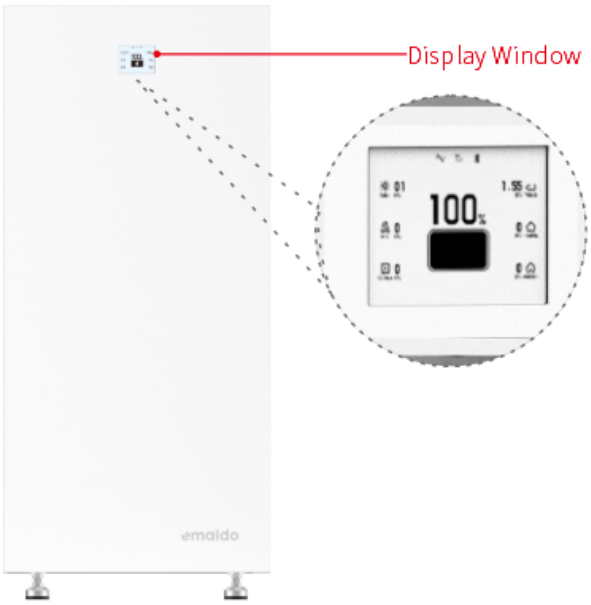
6.1 Screen display

The upper display screen of the cabinet will display main operation information of the energy storage system. They mainly include solar power, battery status, load power, vehicle charging

power, grid power, communication status, and information codes.







6.2 Code and information

Code	Information
1000	Inverter - battery overvoltage
1001	Inverter - battery undervoltage

1003	Inverter - battery overcurrent
1100	Inverter output overvoltage
1101	Inverter output undervoltage
1103	High DC component of inverter current
1106	Inverter output short-circuit
1213	Main relay adhesion test is abnormal
1300	Inverter insulation test is abnormal
1301	Inverter electric leakage test is abnormal
1307	Inverter busbar fault
1311	Inverter communication fault
1312	Inverter fan fault
1601	DC fault is the same as inverter communication failure
2000	Electric leakage protection for EV
2001	Overvoltage protection for EV
2002	Undervoltage protection for EV
2003	Overcurrent protection for EV
2004	Overheat protection for EV
2005	Electric leakage self-inspection of EV is abnormal
2006	EV grounding wire is abnormal
2007	EV-CP level is abnormal
2008	EV relay is abnormal
2011	EV charging gun communication failure
3000	PV overvoltage
3001	PV undervoltage
3002	PV overcurrent
4000	Water sensor of the cabinet is abnormal
4002	Operation of the cabinet fan is abnormal
5007	High temperature protection for battery pack charging
5008	Low temperature protection for battery pack charging

5015	Battery pack communication failure
6002	Bus voltage too low
9000	Due to power outage of mains supply, the battery emergency stock has been used
9005	Vehicle has been connected, waiting for intelligent charging
9006	Vehicle has been connected, waiting for timed charging
9007	Vehicle charging starts
9008	Vehicle charging ends
9013	Severe weather warning
9104	Device off-line

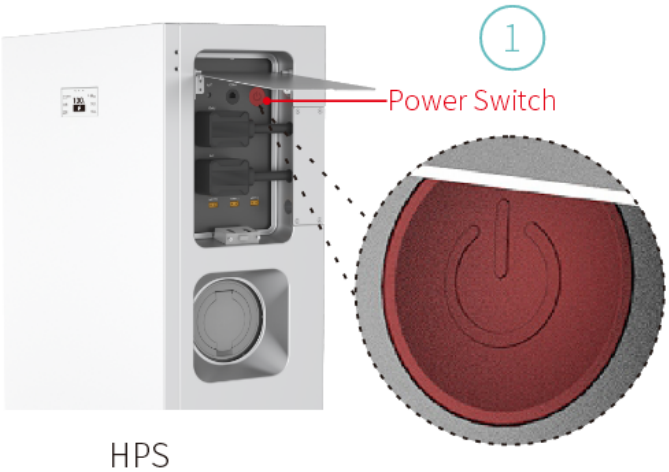
7 System Maintenance

To ensure the long-term normal operation of the energy storage system, it is recommended to perform routine maintenance as described in this chapter.

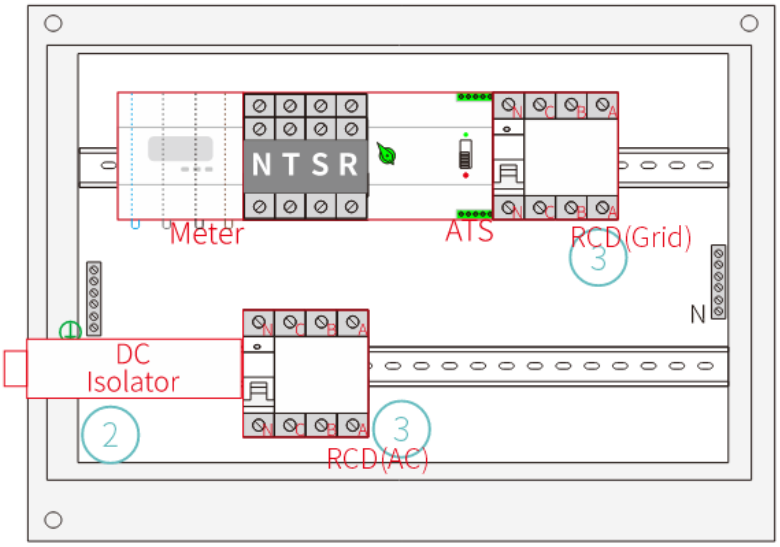
7.1 System power-off

 Warning

- After the system is powered down, there is still residual electricity and heat in the equipment case, which may cause electric shock or burns. Therefore, after the system is powered down for 5 minutes, protective gloves shall be worn before operating the energy storage system. Ensure that all indicators of the energy storage system are turned off and all switches of the Additional Cabinet are disconnected before maintenance operations can be carried out on the energy storage system.
- During the operation of the energy storage system, only disconnecting the main switch of the energy storage system does not completely power down the system, and maintenance operations cannot be performed on the energy storage system at this time.



HPS



Additional Cabinet

Step 1

Briefly press the main switch of the energy storage system to ensure that the system is powered off.

Step 2

Disconnect the DC isolator switch between the energy storage system and the PV string.

Step 3

Switch the RCD (Grid, AC) circuit breaker in the Additional Cabinet to the OFF position.

7.2 Routine maintenance

 Attention

Perform system power-down operation during maintenance such as system cleaning, electrical connection and grounding reliability.

Inspection content	Inspection method	Maintenance cycle
System cleaning	Regularly inspect the air inlet and outlet for obstructions, dust, and dirt.	Once every half year to one year
System operation status	Observe the appearance of the energy storage equipment for damage or deformation. Listen for any abnormal sounds during the operation of the energy storage equipment. When the energy storage equipment is running, check if all parameters of the energy storage equipment are set correctly.	Once half a year
Electrical connection	Check if the cable connection is loose or falls off. Check if the cable is damaged, and focus on checking the surface of the cable in contact with the metal surface for any signs of cut. Check if the unused DC input terminal and the waterproof cover of the charging base are tightly covered.	Maintain once half a year after the first adjustment and test, and once half a year to one year thereafter.
Grounding reliability	Check if the grounding cable is reliably earthed.	Maintain once half a year after the first adjustment and test, and once half a year to one year thereafter.

8 FAQ

- How does SOC change from 99% to 100% when the battery is almost fully charged?
  When the SOC is greater than 99%, it will enter a floating charge state, and the charging current will gradually decrease, ultimately SOC reaches 100%.
- When the battery temperature is low and it shows a certain charging power, but there is no change for SOC?

When the internal temperature of the battery module is low, the internal heating component starts to heat the battery. During the operation of the heating component, the heating power and the charging power are roughly equal, and the battery is not charged, with no change in SOC. Heating the battery is beneficial for maintaining the battery cell at a suitable operating temperature and prolonging the service life of the product.

- Is it better to place photovoltaic modules vertically or horizontally?
  Horizontally.
- Will wiring AC cable and communication cable together in the energy storage system affect communication quality?
  Wiring AC cable and communication cable together in the energy storage system will affect the communication quality, as the AC output from the AC cable generates a strong magnetic field due to the high current, which will have an effect on communication. Thus, generally, communication lines will be shielded and provided with certain isolation measures.
- The energy storage system has the low insulation impedance alarm. How to troubleshoot it?
  Turn off the energy storage system first, and then turn off all circuit breakers of the Additional Cabinet, and use a multimeter to test over the ground. If no problems are detected, a megger meter is used for measurement. Check the DC wiring to see if there is DC short circuit over the ground.
- Can different MPPT of the energy storage system be connected with different components?
  Yes.
- What does output overcurrent protection of the energy storage system mean?
  In the event of a sudden voltage jump or short circuit in the power grid, the output current of the energy storage system will sharply increase. To protect internal components from damage, the energy storage system will provide output overcurrent protection.
- What is anti-islanding protection?
  If the power grid is disconnected, the energy storage system may continue to operate with the local load, forming an island and posing a safety hazard. According to grid connection standards, it is required that the energy storage system shall shut down its output within the specified time.

- Can the energy storage system be ungrounded?

  The cabinet enclosure of the energy storage system is well grounded to ensure personal safety. It is strictly prohibited to have no grounding wire or poor contact with the grounding wire on the enclosure of the energy storage system.

- Are there any requirements for the installation position of the grounding wire in the energy storage system?

  The grounding wire for the energy storage system can be connected to the enclosure, but the cable requirements vary depending on the grounding point.

- What operations are required for the energy storage system when the project is connected to the grid?

  Check if wiring at AC and DC sides of the energy storage system is correct, and if the DC string voltage is normal. After grid connection operation at the AC side is completed, check if the AC side voltage of the energy storage system is normal. Turn on the main switch of the energy storage system and the switch in the distribution box, and the energy storage system will automatically detect the AC and DC side environment to complete the grid connection.

9 Certification and Standards

Safety:	IEC62109、IEC62619
EMC:	IEC61000
EV Safety:	IEC61851-1
EV Leakage:	IEC62955
Denmark:	TRLV_TP_EN 50549_DK

A Warranty Service Content

Service level	Business description	Response time
Remote support	Consultation Telephone: +45 7875 9563 Email: hello@emaldo.com	10:00 am to 17:00 pm
	Remote technical support (telephone response)	10:00 am to 17:00 pm (reply within 30 minutes)
	Online technical support (email and website support)	
Hardware replacement	Hardware replacement (replacement shipment)	The spare parts will be delivered within 2 working days after the confirmation of the replacement application. Please note that transportation delay caused by force majeure factors may result in delayed delivery of spare parts, and the delivery time is subject to specific circumstances.