



Fully Liquid Cooling C&I Battery System

Maintenance Manual

HoyUltra2 (HESS-261-2h)

Legal Notice

Hoymiles has made every effort to ensure the accuracy and completeness of this manual. However, this manual may be changed and revised due to product enhancements or user feedback.

Hoymiles reserves the right to modify this manual without prior notice at any given time. The latest version of this manual can be found by visiting the Hoymiles official website www.hoymiles.com or scanning the QR Code on the right.



Emission Compliance

This equipment has been tested and found to comply with the limits applied by the local regulations. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

** Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.*

Warranty

Follow the installation instructions in this manual to ensure warranty compliance and reliability. The current warranty conditions can be accessed at www.hoymiles.com.

Contact Information

If you have technical queries or any questions concerning our products, please contact our support through the Hoymiles service portal:



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Using This Manual

Symbols

•	List (first level)
-	List (second level)
Step 1, Step 2, ...	Installation steps in a defined order

Related Documents

Datasheet	Datasheet_HoyUltra2(HESS-261-2h)_Global_EN
User Manual	User Manual_HoyUltra2(HESS-261-2h)_Global_EN

Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
AC	Alternating Current	BMS	Battery Management System
DC	Direct Current	PE	Protective Earthing
EMS	Energy Management System	PV	Photovoltaic
PCS	Power Conversion System	SPD	Surge Protective Equipment

**Unless otherwise stated, the devices mentioned in this manual are referred to using the abbreviations defined above.*

Revision History

Version	Description
REV1.1	This issue marks the initial official release.

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1 About This Manual

1.1 Purpose

This manual provides information on the routine maintenance, troubleshooting, and parts replacement of the Fully Liquid Cooling C&I Battery System (ESS).

Before maintaining the ESS, ensure that you are familiar with the features, functions, and safety information provided in this manual.

1.2 Validity

This manual is valid for:

Model	Nominal Battery Energy	Charge/Discharge Time
HESS-261-2h	261 kWh	2 hours

1.3 Audience

This manual is intended for use by qualified persons only. Qualified persons must have the following skills.

- Understanding of the ESS operations and related functionalities
- Knowledge of the ESS installation, use, and maintenance
- Competence in handling risks occurring in the ESS installation, use, and maintenance
- Familiarity with local electrical codes and regulations

2 Safety Information

Before transporting, storing, installing, operating, and maintaining the equipment, read this document, and follow all the safety instructions on the equipment and in this manual.

Incorrect operation or work may cause:

- Injury or death to the operator or a third party.
- Damage to the product and other properties.

NOTE

- The safety instructions in this manual are only supplements and cannot cover all the precautions that should be followed. Perform operations considering actual on-site conditions.
- Hoymiles shall not be held liable for any damage caused by violation of general safety operation requirements, general safety standards, or any safety instruction in this manual.

2.1 Safety Symbols

Safety symbols are used in this manual as follows:

Symbol	Description
 DANGER	This symbol indicates high level risks that, if not avoided, may lead to death or serious physical injury.
 WARNING	This symbol indicates medium level risks that, if not avoided, may lead to serious personal injury or equipment damage.
 CAUTION	This symbol indicates low level risks that, if not avoided, may lead to minor or moderate personal injury or financial losses.
 NOTICE	This symbol indicates potential risks that, if not avoided, may lead to equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	This symbol supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

2.2 Additional Symbols

The product label contains the following symbols with their meanings described below:

Icon	Explanation
	High Voltage Hazardous voltage exists after the device is powered on. Take protective measures during operation and maintenance (O&M).
	CE Mark
	TÜVRheinland Mark
	Read the Manual First Read this manual carefully before performing any installation, operation, or maintenance. Keep this manual for future reference.
	Treatment Electrical equipment that has reached the end of life must be collected separately and returned to an approved recycling facility to comply with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation as national law. Return any devices you no longer need to an authorized dealer or an approved collection and recycling facility.
	Attention to Safety Please be aware of the potential risks before performing any operation on the equipment.

Icon	Explanation
	No Flammables Do not place the equipment near heat sources or fire sources.
	No Explosives Do not store any flammable or explosive materials in the equipment area.
	No Toxic Do not expose the equipment to toxic substances.
	High Voltage High voltage exists after the equipment is powered on. Only qualified and trained electrical technicians are allowed to install and operate the equipment.
	Protective Earthing This symbol indicates a protective earthing terminal which needs to be firmly grounded to ensure the safety of operators.

2.3 Personal Safety

DANGER

- Ensure that power is off during installation. Do not install or remove a cable with power on. Transient contact between the core of the cable and the conductor will cause electric arcs, sparks, fire, or explosion, which may result in personal injury.
- Do not smoke in the equipment area, as it may cause fire, electric shocks, or explosion, resulting in property damage, personal injury, or even death.
- Non-standard and improper operations on the energized equipment may cause fire, electric shocks, or explosion, resulting in property damage, personal injury, or even death.
- Before operations, remove conductive objects such as watches, bracelets, bangles, rings, and necklaces to prevent electric shocks.
- During operations, use dedicated insulated tools to prevent electric shocks or short circuits. The dielectric withstanding voltage level must comply with local laws, regulations, standards, and specifications.

WARNING

- During operations, wear personal protective equipment such as protective clothing, insulated shoes, goggles, safety helmets, and insulated gloves.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain the equipment.

⚠ CAUTION

- Do not power on the equipment before it is installed or confirmed by professionals.
- Do not touch the power supply equipment directly or with conductors such as damp objects. Before touching any conductor surface or terminal, measure the voltage at the contact point to ensure that there is no risk of electric shock.
- Do not touch a running fan with your hands, components, screws, tools, or boards. Otherwise, personal injury or equipment damage may occur.
- Do not stop protective devices. Pay attention to the warnings, cautions, and related precautionary measures in this document and on the equipment.
- Do not touch operating equipment because the enclosure is hot.
- If there is a likelihood of personal injury or equipment damage during operations, immediately stop, report the case to the supervisor, and take feasible protective measures.
- In the case of a fire, immediately leave the building or the equipment area and activate the fire alarm or call emergency services. Do not enter the affected building or equipment area under any circumstances.

2.4 Storage and Installation Environment Safety

⚠ DANGER

- Do not place the equipment near heat sources or fire sources, such as smoke, candles, heaters, or other heating devices. Overheat may damage the equipment or cause a fire.
- Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.
- Do not store any flammable or explosive materials in the equipment area.

⚠ WARNING

- Do not perform any operations on the equipment (including but not limited to handling, installation, electrical connection, powering on, maintenance, and working at heights, etc.) in harsh weather conditions such as lightning, rain, snow, and level 6 or stronger wind.
- Do not install the equipment in an area with strong vibration, noise, or electromagnetic interference.
- Do not install the equipment near liquids. Do not install it under areas prone to condensation, such as under water pipes and air exhaust vents, or areas prone to water leakage, such as air conditioner vents, ventilation vents, or feeder windows of the equipment room. Ensure that no liquid enters the equipment to prevent faults or short circuits.
- Keep the storage, installation and operating environments of the equipment within the allowed ranges. Otherwise, its performance and safety will be compromised.

⚠ WARNING

- Ensure that the equipment is stored or installed in a clean, dry, and well ventilated area with proper temperature and humidity and is protected from dust and condensation.
- Ensure that the ground in the installation environment is solid, free from spongy or soft soil, and not prone to subsidence. The site must not be located in a low-lying land prone to water or snow accumulation, and the horizontal level of the site must be above the highest water level of that area in history.
- When installing the equipment, ensure that the installation surface is flat enough and the foundation is solid enough to bear the weight of the equipment.

2.5 Mechanical Installation Safety

DANGER

- Before installation, disconnect all electrical connections to prevent electrical hazards.
- During installation, comply with the instructions of on-site supervisors and equipment operating procedures to ensure safe and compliant installation.

WARNING

- Before handling equipment, ensure that the cabinet is securely fastened with a balanced center of gravity. Otherwise, tipping or falling cabinets may cause bodily injury and equipment damage.
- Ensure that all installation tools are ready and inspected by a professional organization. Do not use tools that have signs of scratches or fail the inspection, or whose inspection validity period has expired. Ensure that the tools are secure and not overloaded.
- Do not drill holes into the equipment. Doing so may affect the sealing performance and electromagnetic containment of the equipment and damage components or cables inside. Metal shavings from drilling may short-circuit boards inside the equipment.

2.6 Electrical Connection Safety

DANGER

- Before connecting cables, ensure that the equipment is intact. Otherwise, electric shocks or fire may occur.
- Before connecting cables, turn off the switches of the equipment and its upstream and downstream switches. Otherwise, personal injury may occur.
- Prevent foreign matter from entering the equipment during operations. Otherwise, equipment short-circuits or damage, load power derating, power failure, or personal injury may occur.
- Operators must comply with electrical connection operation standards. Otherwise, electric shocks or fire may occur.

DANGER

Danger to life due to a high voltage inside equipment! Comply with the following requirements:

- Use dedicated insulated tools to avoid electric shocks or short circuits.
- Be sure to use special insulation tools during cable connections.
- Note and observe the warning symbol on the equipment, and perform operations following the safety instructions.
- Operators must be accompanied by another person to ensure personal safety.

WARNING

When connecting grounding cables, comply with the following requirements:

- For the equipment that needs to be grounded, install the ground cable first when installing the equipment and remove the ground cable last when removing the equipment.
- Ensure that the grounding impedance of the equipment complies with local electrical standards.
- Do not work on the equipment in the absence of a properly installed ground conductor.
- Do not damage the ground conductor.

⚠ WARNING

When connecting cables, comply with the following requirements:

- When selecting, installing, and routing cables, follow local safety regulations and rules.
- Ensure that all cables are properly connected and insulated, and meet specifications.
- When routing power cables, ensure that there is no coiling or twisting.
- When cable connection is completed or paused for a short period of time, seal the cable holes with sealing putty immediately to prevent small animals or moisture from entering.
- After completing the cable connection, ensure that the cables are not exposed and the insulation is not damaged.

⚠ CAUTION

- When connecting cables, observe ESD (Electrostatic Discharge) protection regulations and wear ESD clothing and ESD gloves or a wellgrounded ESD wrist strap.
- Do not route cables near the air intake or exhaust vents of the equipment.

2.7 Operation Safety

⚠ DANGER

- Do not open cabinet door while the equipment is running.
- Do not touch switches, cables, or other components while the equipment is running. Otherwise, electric shocks may occur.

⚠ WARNING

- To prevent damage or fire due to high temperature, ensure that the exhaust vents or heat dissipation systems are not obstructed or covered by other objects while the equipment is running.
- Do not touch the equipment surface. High temperature may cause scalds.

2.8 Maintenance Safety

⚠ DANGER

- Before equipment maintenance, turn off the switches of the equipment and its upstream and downstream switches. Otherwise, personal injury may occur.
- Residual voltage exists after the equipment is powered off. Use an electroscope of a proper voltage level to check whether the equipment is energized and ensure that the equipment is completely powered off.

⚠ CAUTION

- Check the fire safety of the equipment regularly, at least once a month.
- Check equipment connections periodically, ensuring that all screws are securely tightened and all cables are not damaged.
- If fault diagnosis and troubleshooting need to be performed after power-off, take the following safety measures:
 - Disconnect the power supply.
 - Check whether the equipment is live.
 - Install a ground cable. Hang warning signs and set up fences.

2.9 Battery Safety

DANGER

Do not connect the positive and negative poles of a battery. Otherwise, the battery may be short-circuited. To avoid battery short circuits, do not maintain batteries with power on.

- Do not expose batteries to high temperatures or heat sources. Battery overheating may cause leakage, smoke, flammable gas release, thermal runaway, fire, or explosion.
- Protect batteries from mechanical vibration, falling, collision, punctures, and strong impact. Otherwise, the batteries may be damaged or catch fire.
- To avoid leakage, smoke, flammable gas release, thermal runaway, fire, or explosion, do not disassemble, change, or damage batteries.
- There is a risk of fire or explosion if the model of the battery in use or used for replacement is incorrect. Please contact [Hoymiles technical support](#) for battery replacement.

WARNING

- Before installing and commissioning batteries, prepare fire fighting facilities, such as fire sand and carbon dioxide fire extinguishers, according to construction standards and regulations.
- Before operating batteries, prepare and install fire fighting facilities that comply with local laws and regulations are installed.
- After batteries are discharged, charge them in time to avoid damage due to overdischarge.

2.10 Other Safety

CAUTION

To prevent misuse or accidents caused by unrelated personnel during installation, daily maintenance, or inspection of the equipment, observe the following:

- Attach "**Do not switch on**" labels near the upstream and downstream switches or circuit breakers to prevent accidental connection.
- Place warning signs or strips near the operation area.
- Remove the cabinet door key and keep it properly after operation.

CAUTION

- All operations on the equipment must comply with national or regional standards.
- At least two personnel must be present onsite to perform installation, routine maintenance, inspection, and other operations.
- If issues not mentioned in the manual arise or if you are unsure how to proceed with certain operations, please contact [Hoymiles technical support](#).

3 Maintenance Procedures

The basic procedures for maintenance are as follows:

Step 1 Prerequisites: Confirm the maintenance scope, prepare parts and tools.

Step 2 Power-Off: Disconnect the DC switch on the battery side and the AC switch on the grid side. If the ESS is in external power supply mode, disconnect the external power supply. Use an electroscope of a proper voltage level to check whether the ESS is completely powered off.

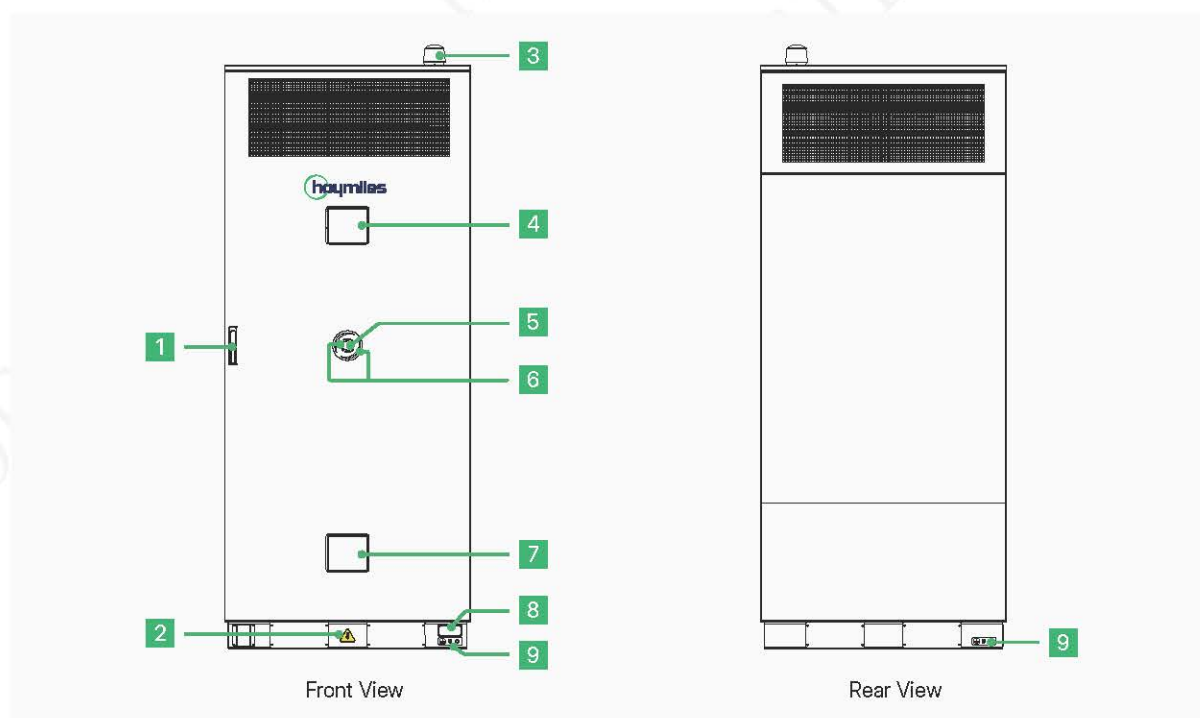
Step 3 Maintenance: Perform maintenance according to the manual guidelines.

Step 4 Functional Verification: Gradually apply load from no-load to full-load conditions to verify the normal operation of the replaced component.

4 System Commissioning

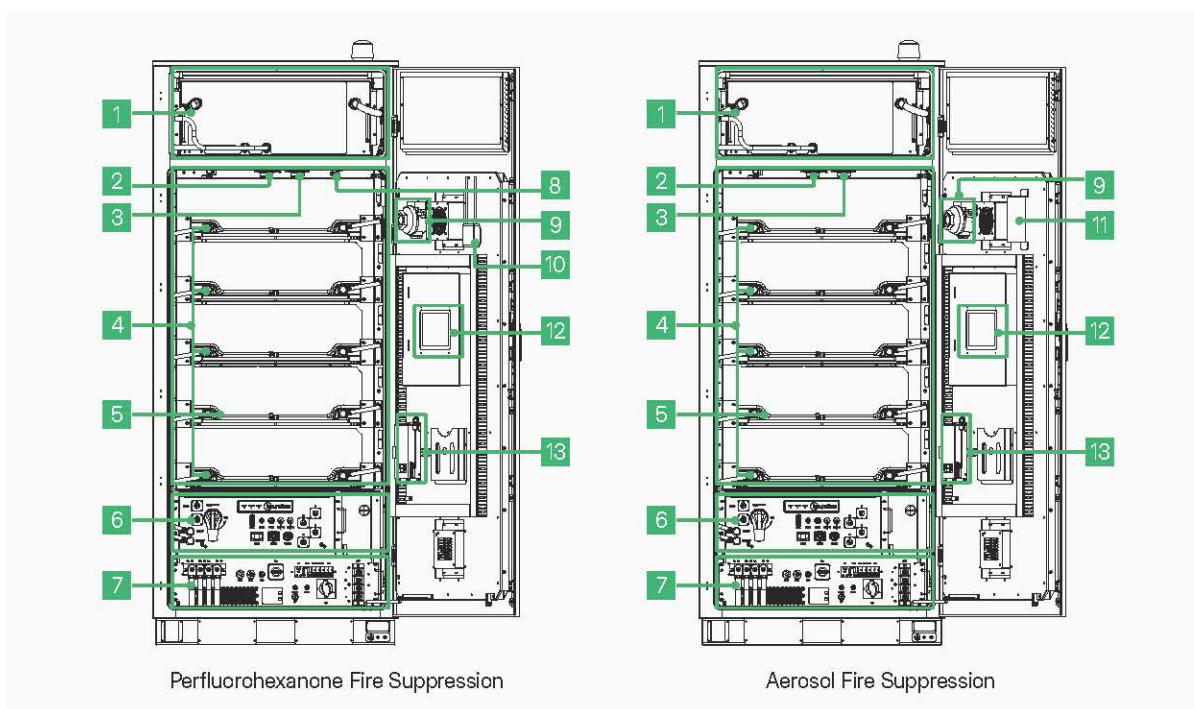
4.1 Components

4.1.1 Appearance



NO.	Name	Description
1	Cabinet Door Lock	To open or close the cabinet door, use the key provided.
2	High Voltage Symbol	High voltage inside! Risk of electric shock by touching it!
3	Fire Alarm Horn/Strobe	Generates alarms when severe fault or fire alarm occurs.
4	Explosion-Proof Fan Outlet	Air outlet of the air duct for the explosion-proof fan.
5	Emergency Stop Switch	Stops the ESS and disconnects the internal AC switch in emergencies.
6	Indicator	Indicates the working status of the ESS. For indicator description.
7	Explosion-Proof Fan Inlet	Air inlet of the air duct for the explosion-proof fan.
8	Nameplate	Includes the ESS model and serial number (SN).
9	PE Terminal	Firmly ground the protective ground terminal to ensure the safety of operators.

4.1.2 Internal

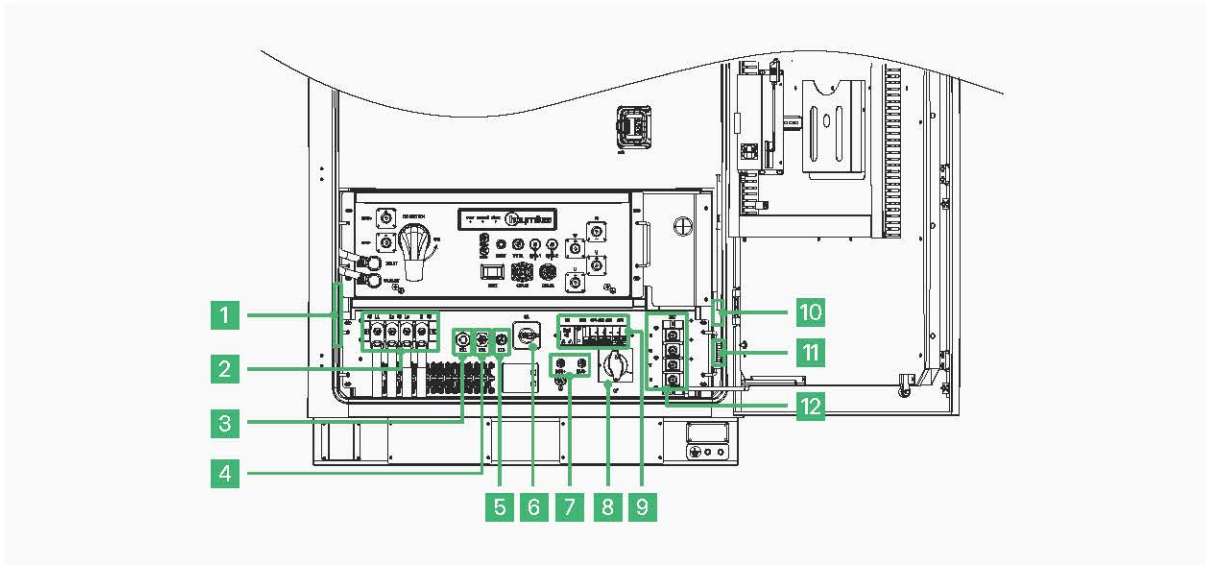


NO.	Name	Description
1	Liquid-Cooling Controller	Maintains the temperature of battery PACKs, PCS, and other components within an appropriate range.
2	Smoke Detector	Detects the real-time presence of smoke in the cabinet.
3	Temperature Detector	Measures the real-time ambient temperature in the cabinet.
4	Battery RACK	Includes five battery PACKs.
5	Liquid-Cooling Piping Network	Connects the liquid-cooling controller to the battery PACKs, PCS, and other components to transfer coolant.
6	PCS	Model: HPCS125 PCS exchanges energy between the batteries and the grid.
7	Wiring Area	Wiring and switching area.
8	Fire Sprinkler	When the cabinet temperature exceeds a predetermined threshold, the fire sprinkler releases perfluorohexanone into the enclosure to releases extinguishant.
9	Combustible Gas Detector	Detects the real-time presence of flammable gases in the cabinet.
10	4G Module	The 4G module connects the HESS to the IoT.
11	Aerosol Fire Suppression Device	When the aerosol fire suppression device senses the high temperature, it automatically starts and releases extinguishant.
12	EMS	Energy Management System, which schedules and monitors energy of the overall system.
13	Environment Management System	Includes the dehumidifier and water immersion detector. Dehumidifier: Used for dehumidification inside the ESS. Water Immersion Detector: Detects water based on the resistance change between both electrodes.

NOTE

The figures in this document are for reference only.

4.1.3 AC Box



NO.	Name	Description
1	Switch	Multi-cabinet communication connection
2	AC Terminal	Grid-side AC connection
3	Auxiliary Power Port	External auxiliary power supply input
4	Liquid-Cooling Controller Port	Liquid-cooling controller power interface
5	Explosion-Proof Fan Port	Explosion-proof fan power interface
6	Auxiliary Power Transfer Switch (SA)	Switches between external auxiliary power supply and internal main circuit power supply modes
7	DC Bus Terminals	Positive and negative terminals of the DC bus
8	Main Circuit Breaker (QF)	Main switch on the AC side
9	Circuit Breakers (QF1-QF5)	QF1: Auxiliary power main switch QF2: UPS power switch QF3: Liquid-cooling controller power switch QF4: Explosion-proof fan power switch QF5: Maintenance socket power switch XS: Maintenance socket
10	Network Port Adapter	Multi-cabinet communication connection
11	Auxiliary Terminal	External dry contacts and communication connections
12	AC Box Output Terminals (2XT)	—

4.2 Indicators

Status		Description			
		AC Input Main Circuit Breaker Status	Fire Suppression System Alarm Status	Non-Fire Suppression System Alarm Status	PCS Status
	Not lit	OFF	No alarm	No alarm	-
	Blinking red	ON	Level II or higher alarm	No alarm	-
	Steady red	ON	Level I or no alarm	Level III or higher alarm	-
	Blinking green	ON	Level I or no alarm	Level II or lower alarm	Standby or Stop
	Steady green	ON	Level I or no alarm	Level II or lower alarm	Running

4.3 Power-On/Off

4.3.1 Maintenance Tools

Maintenance tools include but are not limited to the following recommended tools. Other auxiliary tools may be used if necessary.



4.3.2 Check Before Power-On

NO.	Item	Checked	
		Yes	No
1	Installation environment complies with User Manual HoyUltra2(HESS-261-2h)_Global_EN .	☐	☐
2	Grounding copper busbar and AC terminal connections are correct, secure, and safe.	☐	☐
3	All cables are intact, well-insulated, appropriately sized, and securely connected.	☐	☐
4	Cable trench supports are properly installed, and cable routing meets requirements.	☐	☐
5	No tools, drilling debris, or foreign objects are left inside the cabinet.	☐	☐
6	DC input polarity is correct, voltage $\leq$ PCS maximum allowable input.	☐	☐
7	The AC-side voltage is within the allowable range, the frequency is stable, and the phase sequence is correct. Ensure that the neutral wire is not mistakenly connected to the phase wire.	☐	☐
8	AC circuit breaker and DC disconnect switch are disconnected.	☐	☐
9	E-stop button is released, and the equipment is ready for operation.	☐	☐
10	MSD is installed and locked.	☐	☐

4.3.3 Power-On Procedures

⚠ WARNING

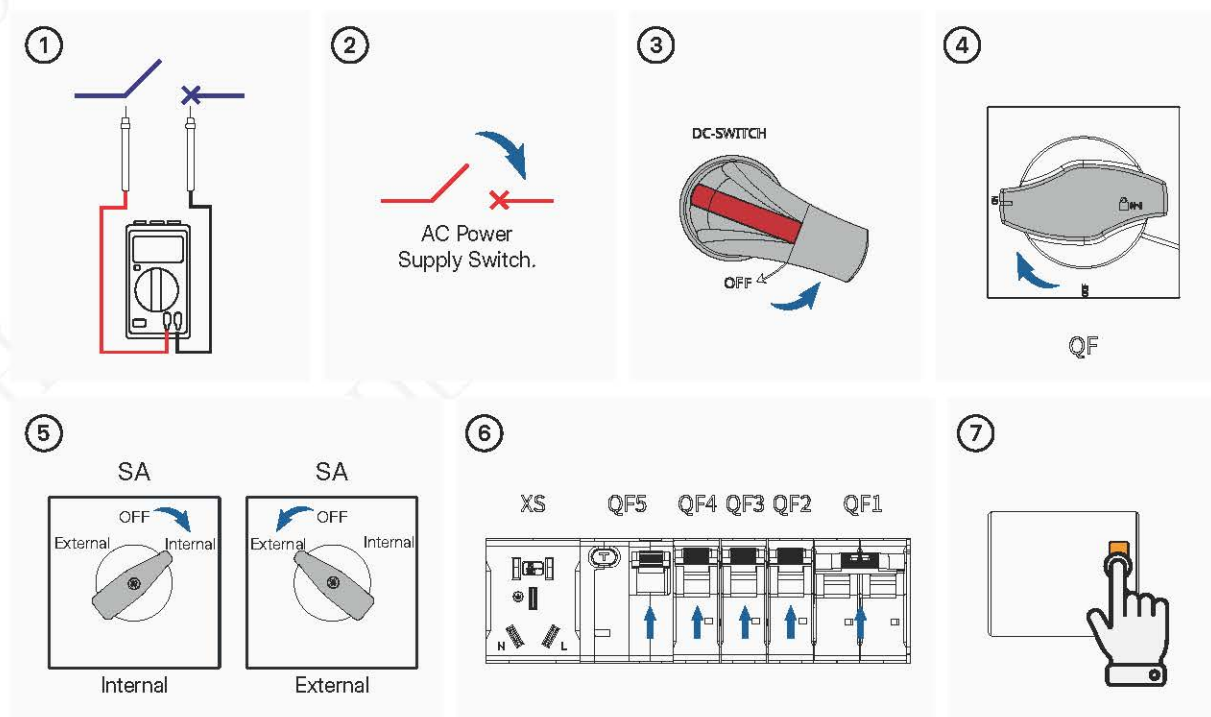
- Follow the power-on procedures strictly. Equipment damage caused by improper operation will not be covered under any warranty.
- Before turning on the AC circuit breaker, use a multimeter to measure the grid voltage and ensure that the voltage is within the allowed operating voltage range of the ESS.

Prerequisites

Ensure that the ESS is fault-free refer to [4.3.2 Check Before Power-On](#), and ensure that all protective measures for the operators are in place.

Procedures

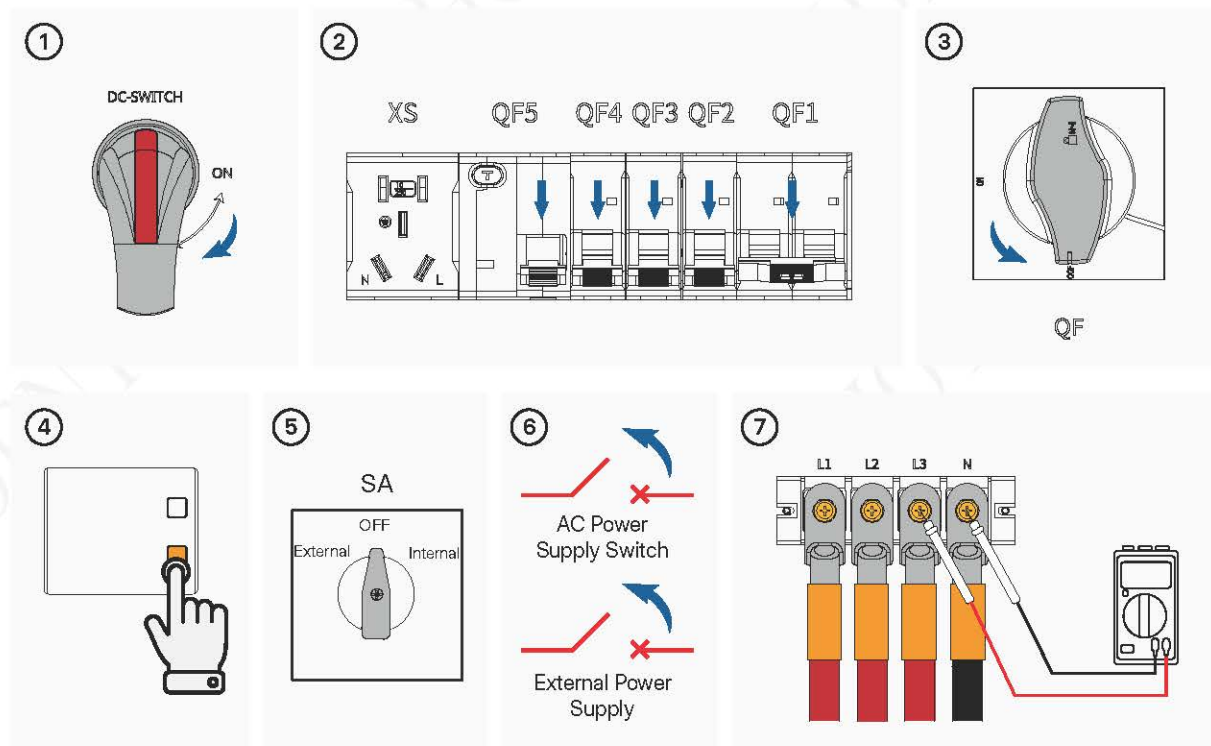
- Step 1** Use a multimeter to measure the grid voltage and ensure that the voltage is within the allowed operating voltage range of the ESS.
- Step 2** Turn on the AC power supply switch.
- Step 3** Turn on the PCS DC load switch (QS).
- Step 4** Turn on the AC main circuit breaker (QF) in the AC box.
- Step 5** For external auxiliary power supply: Rotate the **switch SA** to the left **External**. For internal auxiliary power supply: Rotate the **switch SA** to the right **Internal**.
- Step 6** Turn on the circuit breakers **QF1 to QF5** in the AC box sequentially.
- Step 7** Start the UPS by pressing and holding the UPS Start button for 2 seconds. The UPS will be powered on and will work normally after completing the self-check. The power indicator lights for the switch and 4G router will illuminate, the EMS screen be activated, and the water immersion transmitter indicator will illuminate. The dehumidification device will also perform a startup self-test.
- Step 8** If the above steps operate normally, the power-on is complete. If charge/discharge schedules have been configured, the system will automatically execute the plans.



4.3.4 Power-Off Procedures

For maintenance or inspection, follow the steps below:

- Step 1** Turn off the PCS DC load switch (QS).
- Step 2** Turn off the circuit breakers **QF1 to QF5** in the AC box sequentially.
- Step 3** Turn off the AC main circuit breaker (QF) in the AC box.
- Step 4** Press and hold the UPS shutdown button for 2 seconds to power off the UPS.
- Step 5** Rotate the switch SA to the middle **OFF**.
- Step 6** Turn off the AC power supply switch. If the ESS is in external power supply mode, disconnect the external power supply.
- Step 7** For external auxiliary power supply: Rotate the **switch SA** to the left **External**. For internal auxiliary power supply: Rotate the **switch SA** to the right **Internal**.
- Step 8** Use an electroscope to check whether the AC terminals are energized and ensure that the ESS is completely powered off.



4.4 Pre-Commissioning Configuration

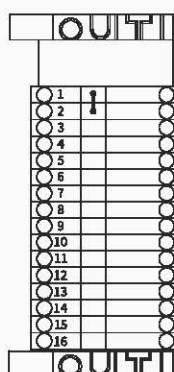
4.4.1 Measuring Meter

Step 1 With the system de-energized:

If an **internal metering meter** (pre-installed in the cabinet) is selected, no wiring is required.

If an **external metering meter** is selected, connect it to the auxiliary terminals **X1:6** and **X1:8**. (For the location of terminal X1, refer to [4.1.3 AC Box](#).)

The auxiliary terminal is shown in the figure below:



Symbol	Name	Description
X1:1	External E-stop	Remove short clip when connecting external E-stop
X1:2	External E-stop	
X1:3	External anti-reverse current meter 485A	User wiring for external anti-reverse current meter communication
X1:4	External anti-reverse current meter 485B	
X1:5	Internal meter 485A	Pre-connected when the optional internal meter is selected
X1:6	External measuring meter 485A	—
X1:7	Internal meter 485-B	Pre-connected when the optional internal meter is selected
X1:8	External measuring meter 485B	—
X1:9	Liquid-cooling controller 485A	Pre-connected when the optional internal liquid-cooling controller is selected
X1:10	External fire panel 485A	—
X1:11	Liquid-cooling controller 485B	Pre-connected when the optional internal liquid-cooling controller is selected
X1:12	External fire panel 485B	—
X1:13	Reserved (undefined) 485A	—
X1:14	Reserved (undefined) 485B	—
X1:15	Switch power +	Pre-connected when optional switch is selected; Reserved otherwise
X1:16	Switch power -	

Step 2 The metering meter is a specified model (other models are under development). After connection, configure parameters such as CT ratio, PT ratio, and current polarity as required.

Step 3 After proper connection, check whether the uploaded data is normal.

NOTE

The EMS page is currently unavailable in English. If you have any questions, please contact Hoymiles technical support.

4.4.2 Anti-Reverse Current Meter

Step 1 With the system de-energized, connect the anti-reverse current meter to the auxiliary terminals **X1:3** and **X1:4**. (For the location of terminal X1, refer to [4.1.3 AC Box](#). For terminal descriptions, refer to [4.4.1 Measuring Meter](#).)

Step 2 The anti-reverse current meter is a specified model (other models are under development). After connection, configure parameters such as CT ratio, PT ratio, and current polarity as required.

The screenshot displays the '设备管理' (Device Management) section of the Hoymiles EMS interface, specifically the 'RS485通讯管理' (RS485 Communication Management) tab. The interface is organized into a grid of configuration panels for different device types:

- IO转换模块 (IO Conversion Module):** Baud rate: 9600 Band; Data bits: 8 Data bits; Parity: None Parity; Stop bits: 1 Stop Bits; Address: 1.
- 除湿机 (Dehumidifier):** Baud rate: 9600 Band; Data bits: 8 Data bits; Parity: None Parity; Stop bits: 1 Stop Bits; Address: 2.
- 液冷机组 (Liquid Cooling Unit):** Baud rate: 9600 Band; Data bits: 8 Data bits; Parity: None Parity; Stop bits: 1 Stop Bits; Address: 1.
- 指示灯 (Indicator Light):** Baud rate: 9600 Band; Data bits: 8 Data bits; Parity: None Parity; Stop bits: 1 Stop Bits; Address: 1.
- 总计量电表 (Total Metering Meter):** Baud rate: 9600 Band; Data bits: 8 Data bits; Parity: None Parity; Stop bits: 1 Stop Bits; Address: 1. Includes CT and PT ratio settings.
- 防逆流电表 (Anti-reverse Current Meter):** Baud rate: 9600 Band; Data bits: 8 Data bits; Parity: None Parity; Stop bits: 1 Stop Bits; Address: 1. Includes CT and PT ratio settings.
- 柜内单项电表 (Cabinet Single-phase Meter):** Baud rate: 9600 Band; Data bits: 8 Data bits; Parity: None Parity; Stop bits: 1 Stop Bits; Address: 3. Includes CT and PT ratio settings.
- 柜内三相电表 (Cabinet Three-phase Meter):** Baud rate: 9600 Band; Data bits: 8 Data bits; Parity: None Parity; Stop bits: 1 Stop Bits; Address: 2. Includes CT and PT ratio settings.

Each panel includes a '恢复默认' (Restore Default) button. The interface also features a sidebar with navigation options like '首页' (Home), '实时监控' (Real-time Monitoring), '实时告警' (Real-time Alarm), '能量管理' (Energy Management), '通讯管理' (Communication Management), '历史数据' (Historical Data), '日志管理' (Log Management), and '关于系统' (About System).

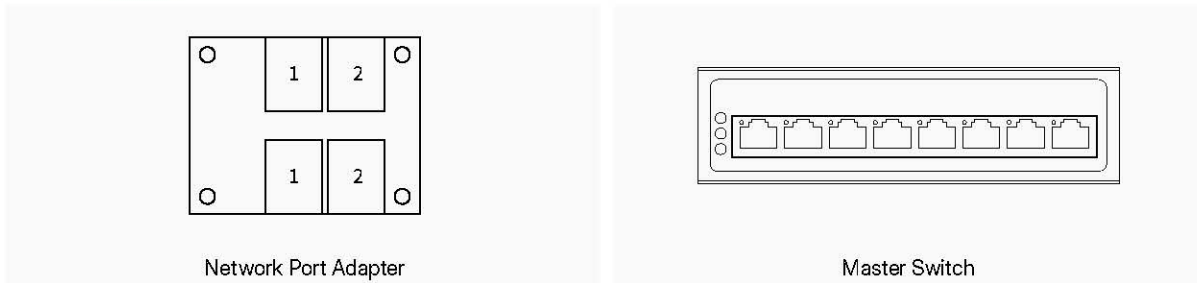
Step 3 After proper connection, check whether the uploaded data is normal.

Step 4 After configuring the metering meter and anti-reverse current meter, ensure that all integrated system devices (e.g., fire protection, liquid cooling) are online with no alarms or faults, then configure control strategies to prepare for operation.

4.4.3 Parallel Mode

When multiple systems operate in parallel, configure one ESS as the Master, and connect the other ESSs to the Master via Ethernet cables. The Master will handle power dispatch.

Step 1 With the system de-energized, connect the 1# port of the Network port adapters of both the Master and Slave units to the Master Switch. (For the location of Network port adapter and switch, refer to [4.1.3 AC Box \(10\)](#).)



Symbol	Name	Description
ZJB:1	Parallel Communication	Connect port 1 to the internal switch when the ESS serves as a master.
ZJB:2	Reserved	Connect port 1 to the master's switch when the ESS serves as a slave.

Step 2 Set the Master EMS number to "0", and configure the number of Slaves according to the actual quantity.

Step 3 Configure all Slaves as standalone units, and set the EMS address of all Slaves to "1". Verify on the Master that all Slaves are online.



Step 4 After configuring the metering meter and anti-reverse current meter, ensure that all integrated system devices (e.g., fire protection, liquid cooling) are online with no alarms or faults, then configure control strategies to prepare for operation.

4.4.4 Control-Strategy Configuration

The ESS requires control strategies to be configured before operation.

For the configuration procedures, refer to [5 S-MLES Cloud](#) to create a new site, configure control strategies, and set other EMS control parameters.

After the strategies are configured, the system will operate automatically. Check whether there are any faults on master or slaves, and whether the data is normal.

5 S-MLES Cloud

5.1 Login

Prerequisites

- Ensure the PC can access the external network.
- A browser (such as Chrome, Firefox, Microsoft Edge, etc.) is installed on the PC. The latest version of Chrome is recommended.

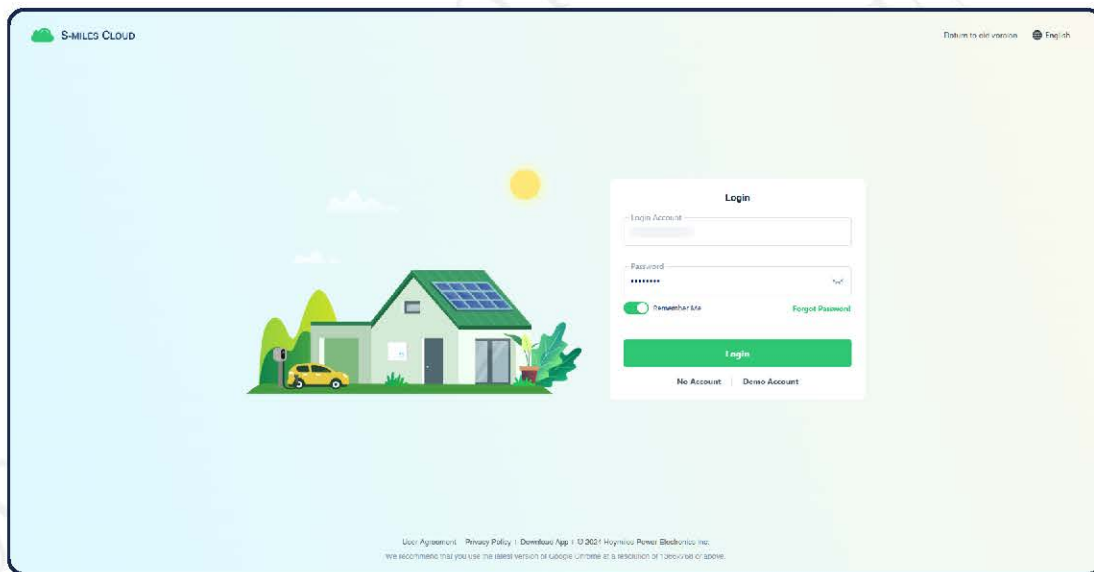
Procedures

Step 1 Go to <https://global.hoymiles.com/website/login>.

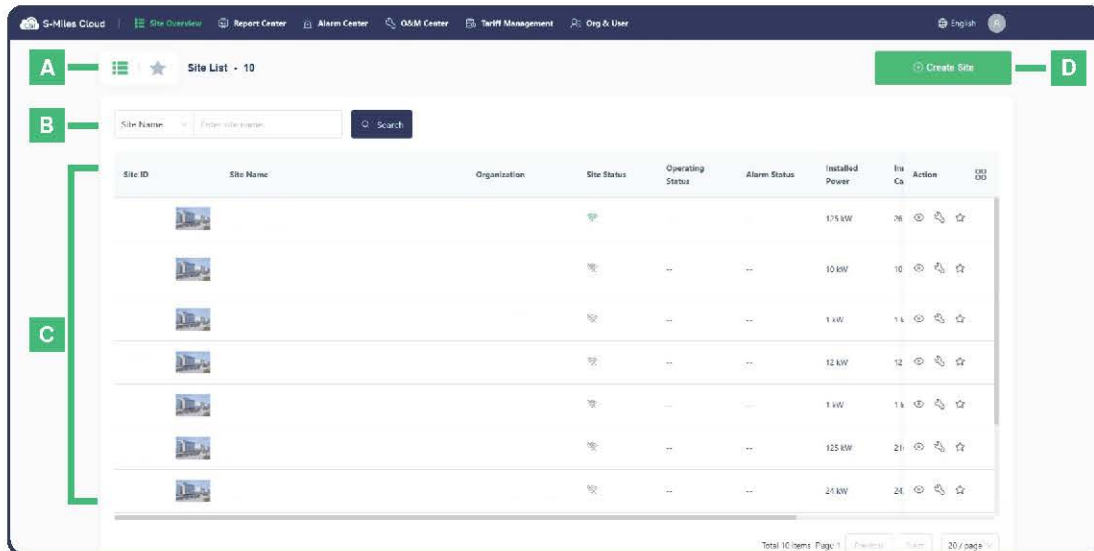
Step 2 Select the language.

Step 3 Enter your account and password.

Step 4 Click **Login**.



5.2 Site List Overview

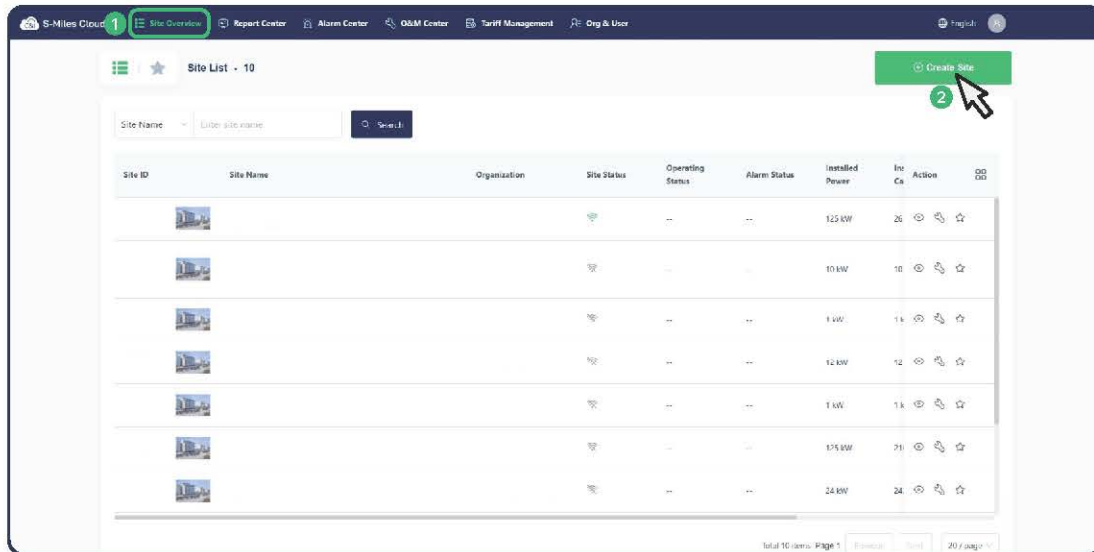


No.	Item	Description	
A	Site List		Site List: Displays all sites within the organization and their basic information in a list format.
			My Favorites: Displays all my favorited sites and their basic information in a list format.
B	Search		Filter sites by the criteria.
C	Site Information	—	Click the on the right of Action , then check/uncheck the information labels to display/hide specific information in the list. Users can view the following site information: Site ID, Site Cover, Site Name, Organization, Site Status, Operating Status, Alarm Status, Installed Power, Installed Capacity, Profit Today, Historical Profit, Charge Today, Historical Charge, Discharge Today, Historical Discharge, SOC (%), Days since Commissioning, Commissioning Date.
			Site Status: - Offline - Normal - Unfinished - Inactive
			Operating Status: - Charge - Discharge - Standby - Shutdown
D	Create Site		Alarm Status: - Normal - Warn - Alarm - Fault - Critical
			Create a new site. Refer to 5.3 Creating a Site .

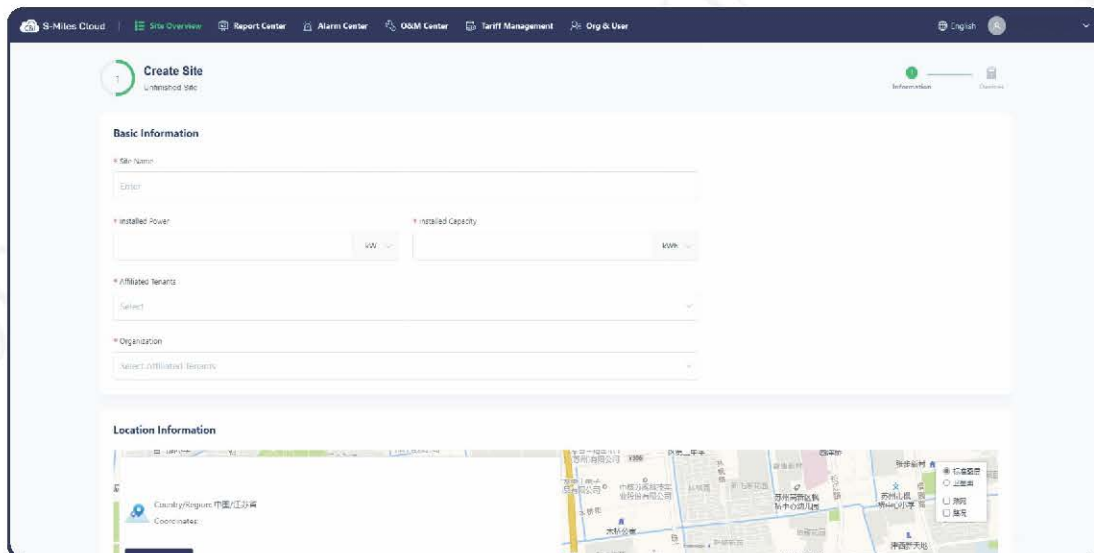
5.3 Creating a Site

Step 1 Click  **Site Overview** in the menu bar.

Step 2 Click  **Create Site** in the upper-right corner.

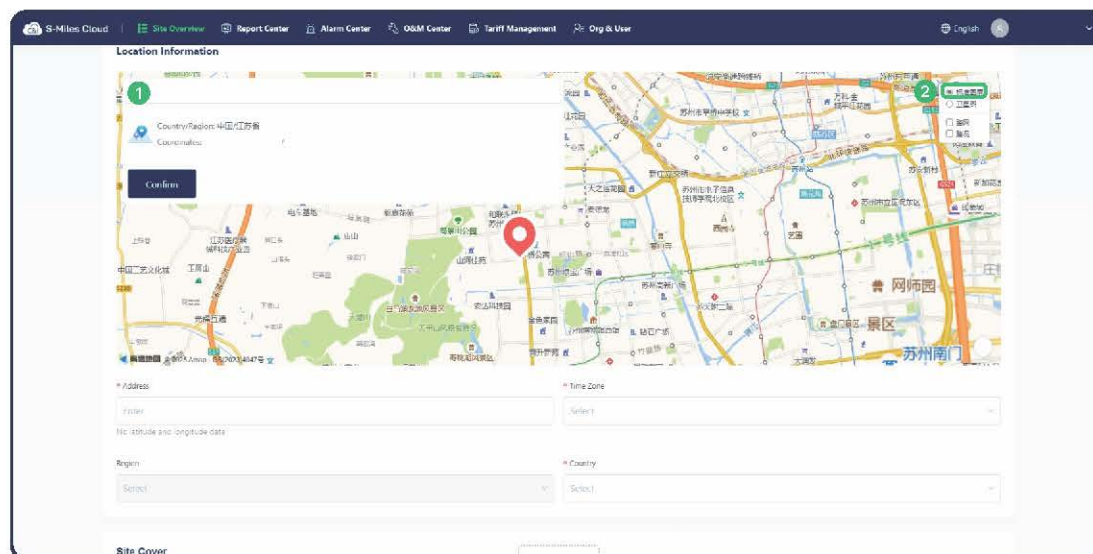


Step 3 Enter the basic information of the site. Fields marked with * are mandatory.

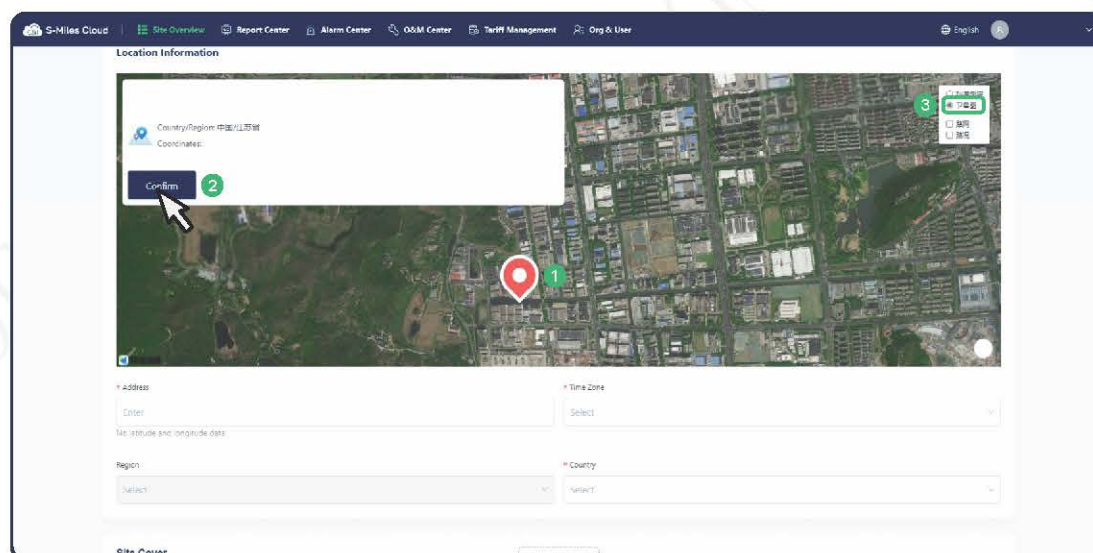


Step 4 Enter the **Location Information**. You can enter the site address in the search field, or click the site location on the map. **Time Zone** and **Country** are automatically filled by the system. The map style can be selected as **Standard Layer** or **Satellite Map**.

Standard Layer



Satellite Map



NOTE

- To pan the map, drag the map.
- To zoom the map, scroll your mouse wheel.

Step 5 Upload a **Site Cover** image (note the file requirements), then click **Next**.

NOTE

Please upload pictures in JPG, JPEG, PNG, or GIF format. The size of a single file cannot exceed 5 MB.

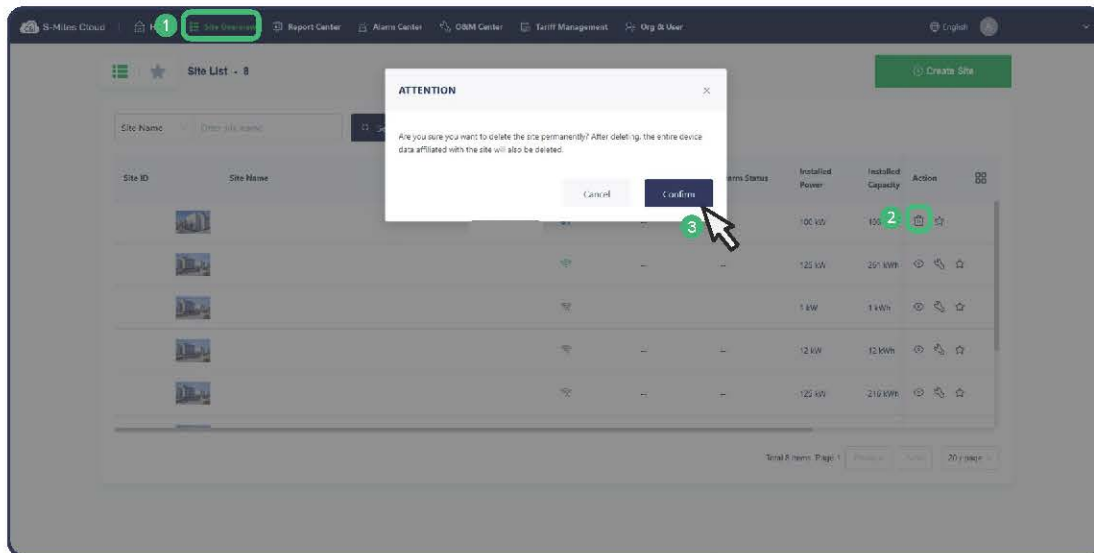
Step 6 Enter the device **SN** (Serial Number), then click **Save**.

5.4 Deleting a Site

5.4.1 Deleting an Unfinished Site

Step 1 Click  **Site Overview** in the menu bar.

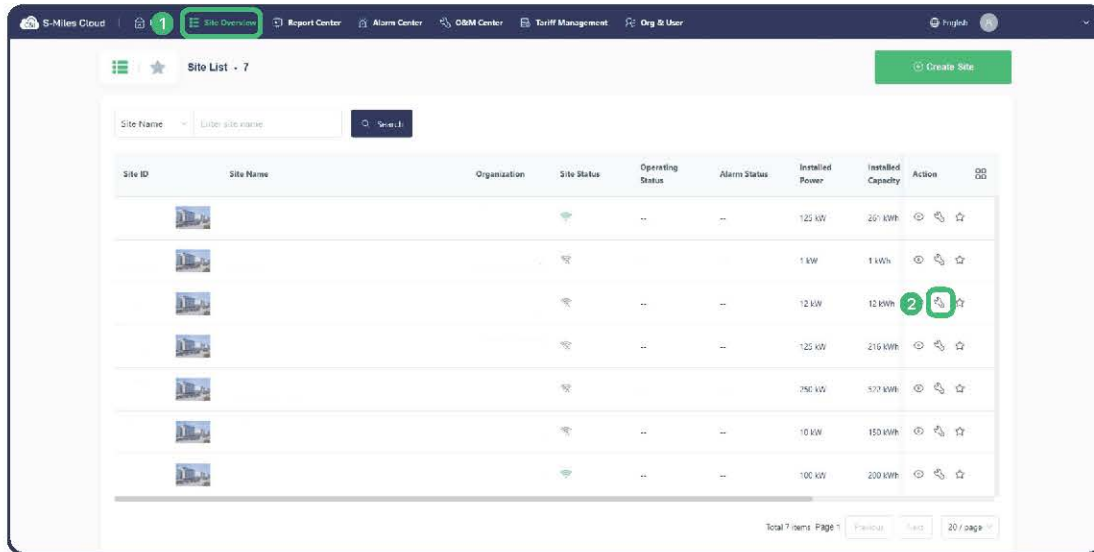
Step 2 Find the target site, click  in the **Action**, then click **Confirm**.



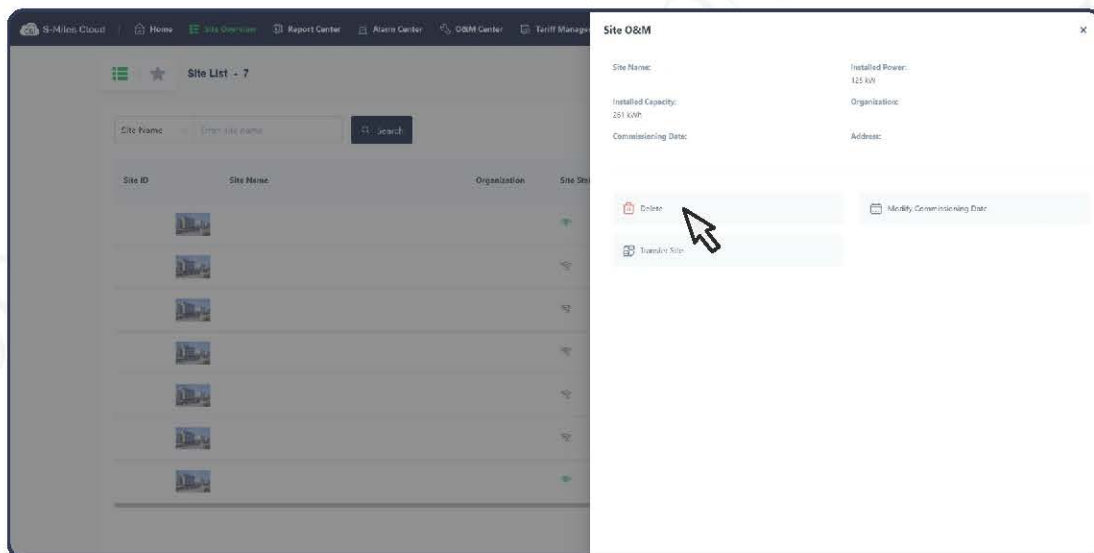
5.4.2 Deleting an O&M Site

Step 1 Click  **Site Overview** in the menu bar.

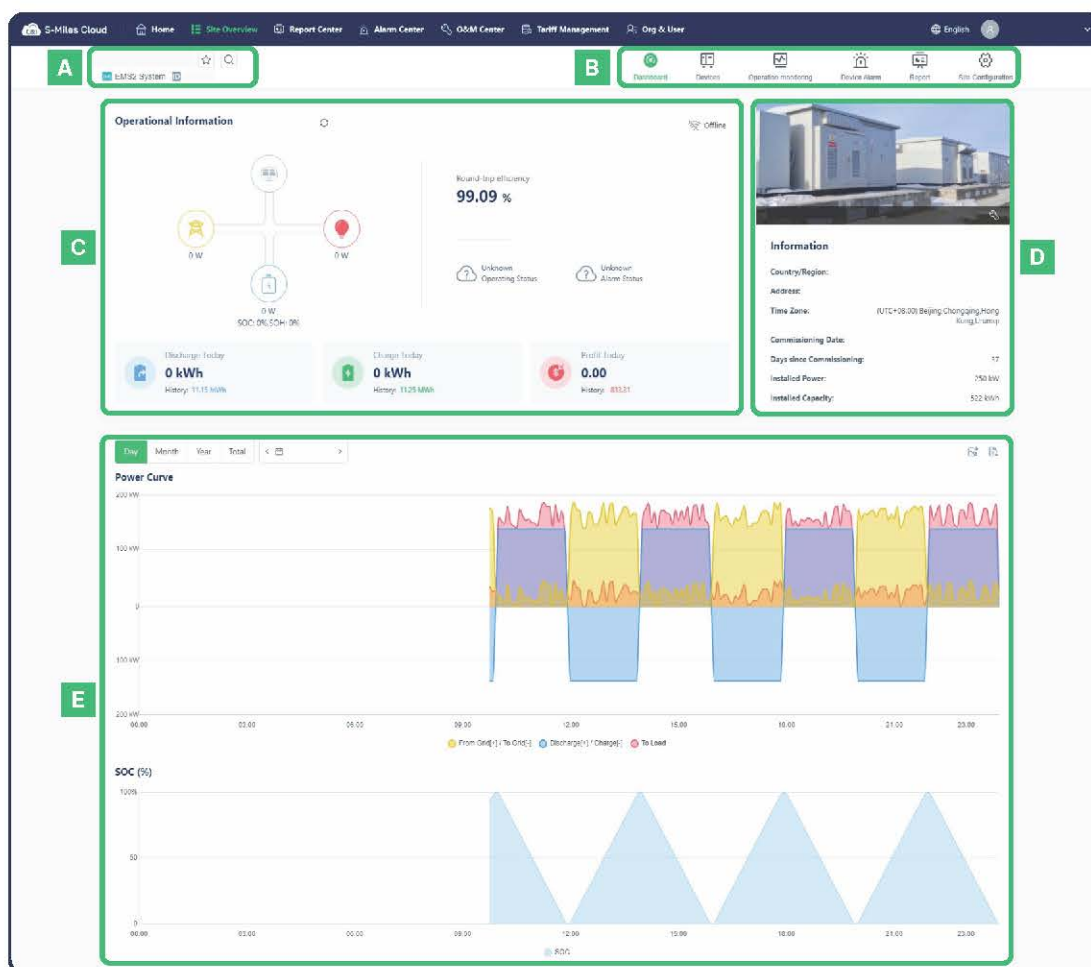
Step 2 Find the target site, click  in the **Action**.



Step 3 Click  **Delete** on the left, then click **Confirm** in the pop-up window.

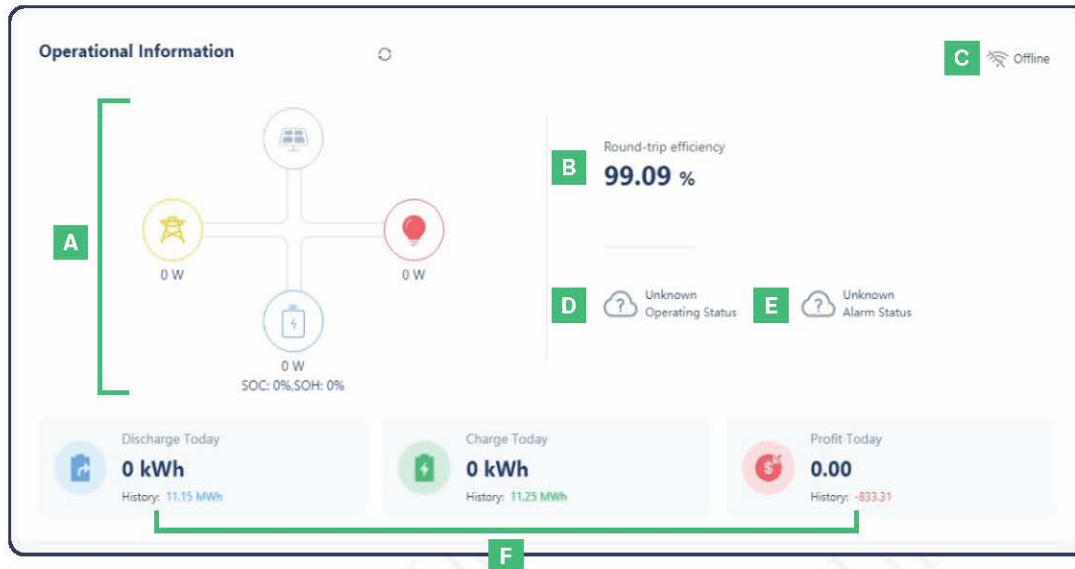


5.5 Dashboard



No.	Item	Description		
A	Basic Information	—	Site Name	—
		EMS	Site Type	EMS: Energy Storage System
		ID	Site ID	Unique identifier.
		★	Favorite	Favorite / Unfavorite the site.
		Q	Search	Search for a site by entering its name or ID.
B	Site Menu Bar	📊	Dashboard	—
		📱	Devices	—
		📈	Operation monitoring	—
		🚨	Device Alarm	—
		📄	Report	—
		⚙️	Site Configuration	—
C	Operation Information	Operation information panel of the EMS. For details, refer to 5.5.1 Operation Information .		
D	Site Information	Core basic data of the ESS, For details, refer to 5.5.2 Site Information .		
E	Site Charts	Power Curve: Current operating power of the site. SOC (%): Current SOC of the battery. For details, refer to 5.5.3 Site Charts .		

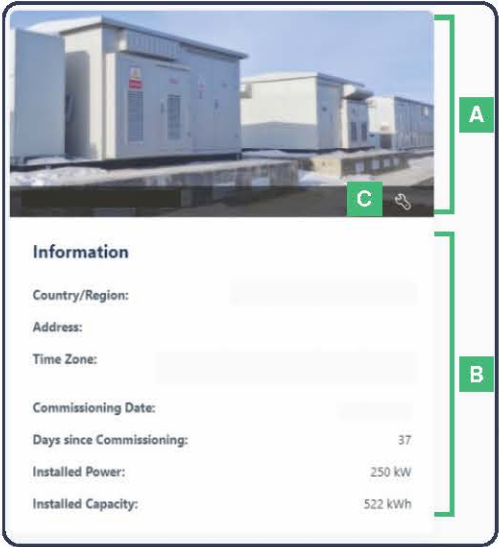
5.5.1 Operation Information



No.	Item	Description
A	Energy Flow Diagram	A diagram showing the direction of energy flow and power transfer between different modules: • Grid • PV • Battery • Load • SOC State of Charge, reflecting the remaining battery capacity as a percentage of its nominal capacity. • SOH State of Health, reflecting the battery aging and performance degradation.
B	Round-Trip Efficiency	Total Discharge / Total Charge (Percentage)
C	Site Status	• Offline • Normal • Unfinished • Inactive
D	Operating Status	• Charge • Discharge • Standby • Shutdown
E	Alarm Status	• Normal • Warn • Alarm • Fault • Critical
F	Discharge Today	Discharge Today / History
	Charge Today	Charge Today / History
	Profit Today	Profit Today / History

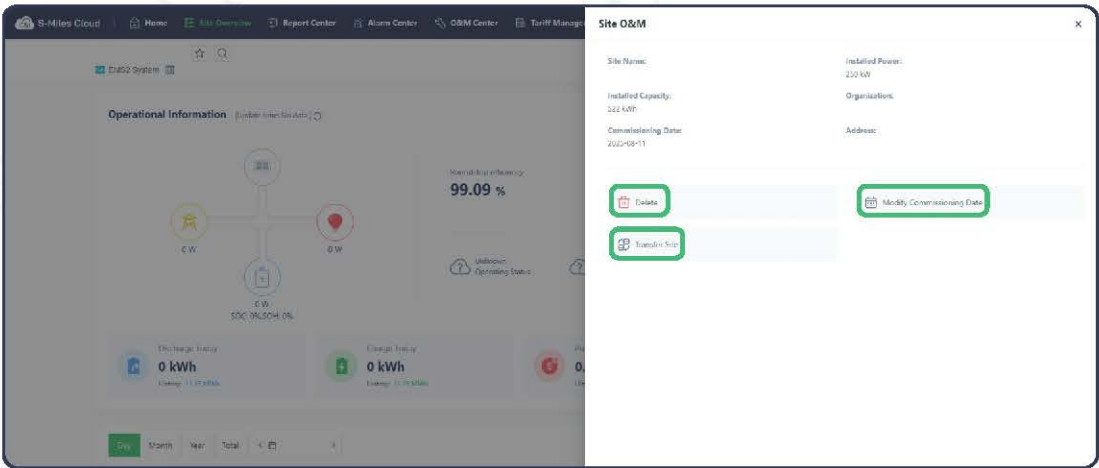
5.5.2 Site Information

Site Information This module displays the core data of the ESS.

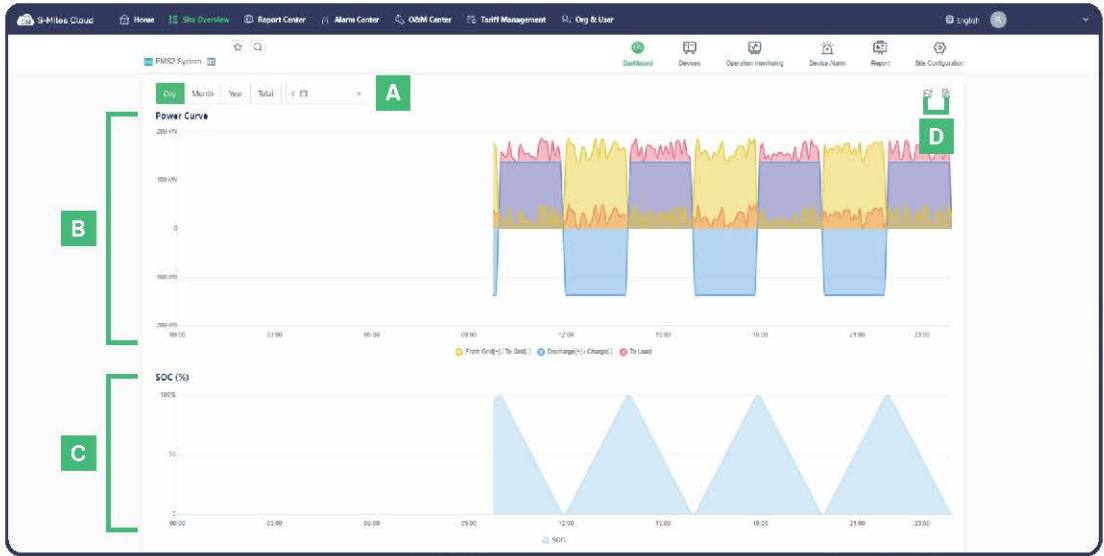


No.	Item	Description	
A	Site Cover Image	Set during site creation. For details, refer to 5.3 Creating a Site .	
B	Site Information	Country/Region	Country/region where the site is located.
		Address	Physical address of the site.
		Time Zone	Time zone of the site.
		Commissioning Date	The date when the site was officially put into operation.
		Days since Commissioning	Total days the site has been operational since the commissioning date.
		Installed Power (kW)	Total power of the ESS.
		Installed Capacity (kWh)	Total energy capacity of the ESS.
C	Site O&M	Modify the commissioning date, transfer the site, or delete the site. Refer to Site O&M .	

Site O&M



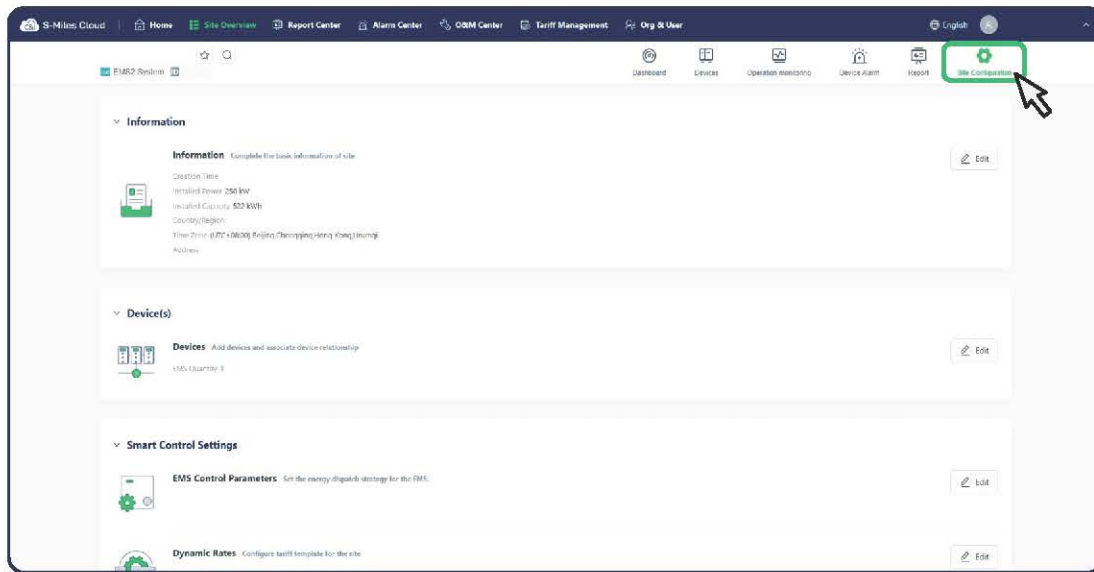
5.5.3 Site Charts



No.	Item	Description
A	Date	Select the date.
B	Power Curve (kW)	The operational power of the site at various time. - From Grid[+] / To Grid[-] - Discharge[+] / Charge[-] - To Load
C	SOC (%)	The State of Charge of the ESS at various time. SOC
D	Export	Export the Power Curve and SOC (%) as an image file (PNG) or a CSV file.

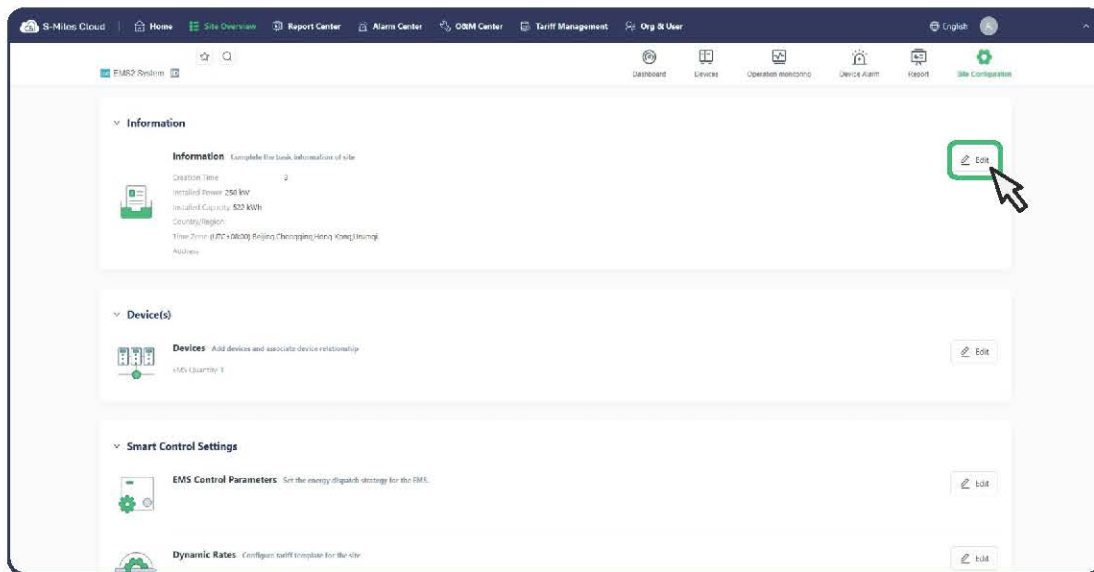
5.6 Site Configuration

Click  **Site Configuration** in the site menu bar.

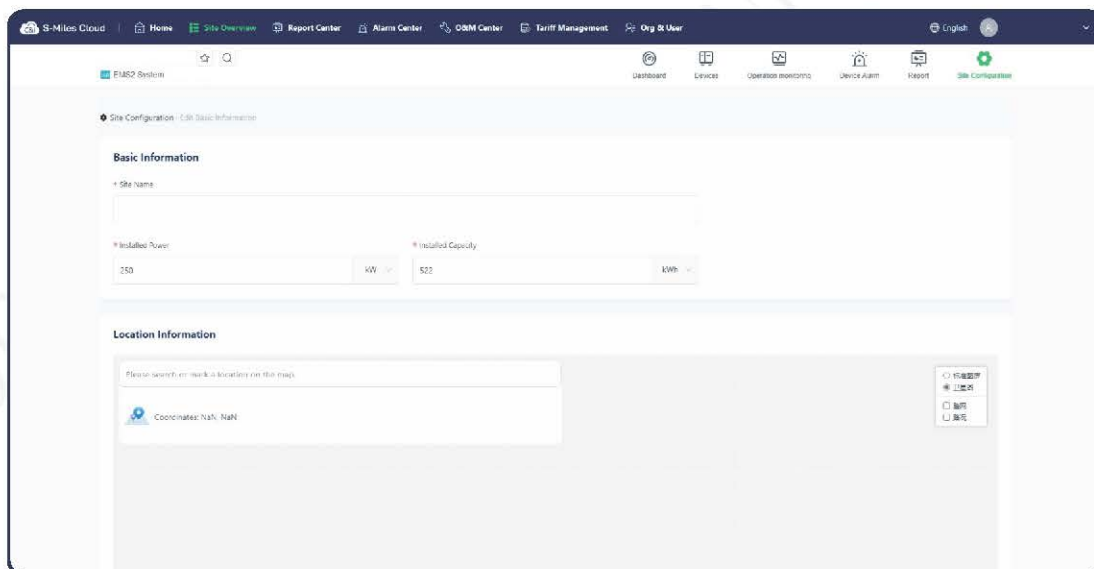


5.6.1 Site Information Configuration

Step 1 Click  **Edit** on the right of the **Information**.

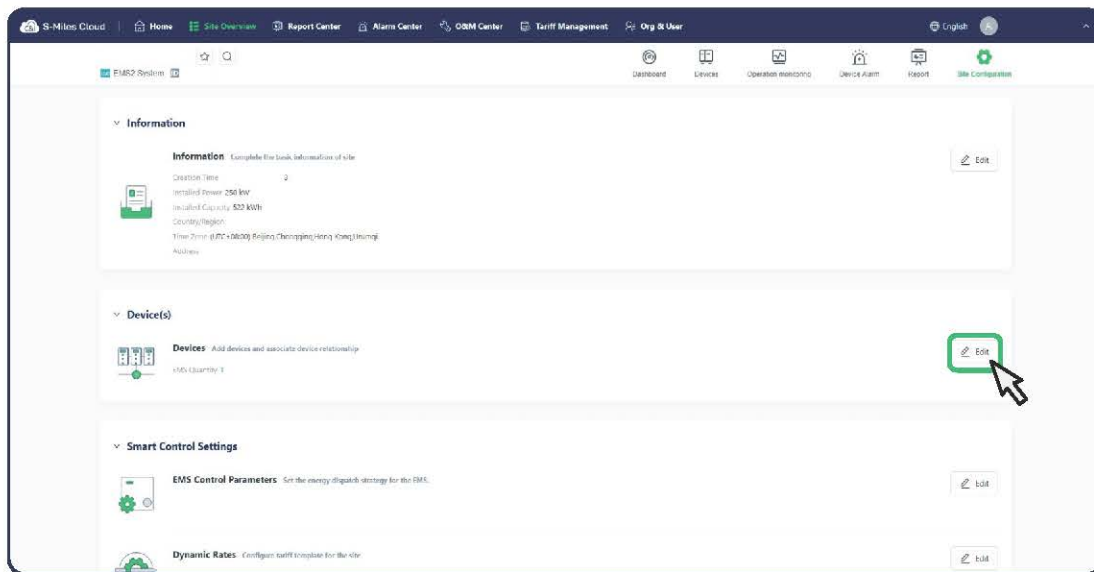


Step 2 Modify the **Basic Information** as needed. For details, refer to [5.3 Creating a Site](#).

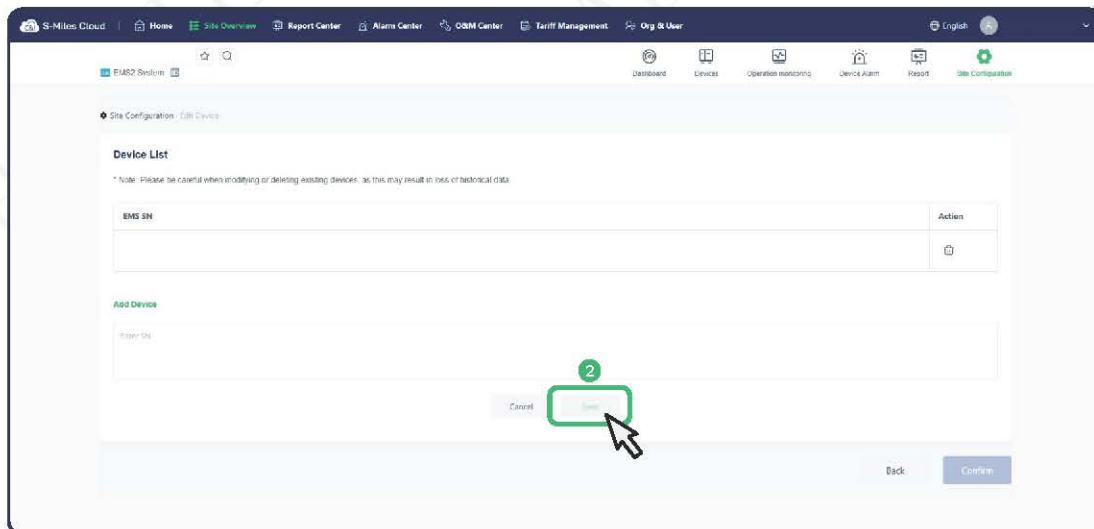
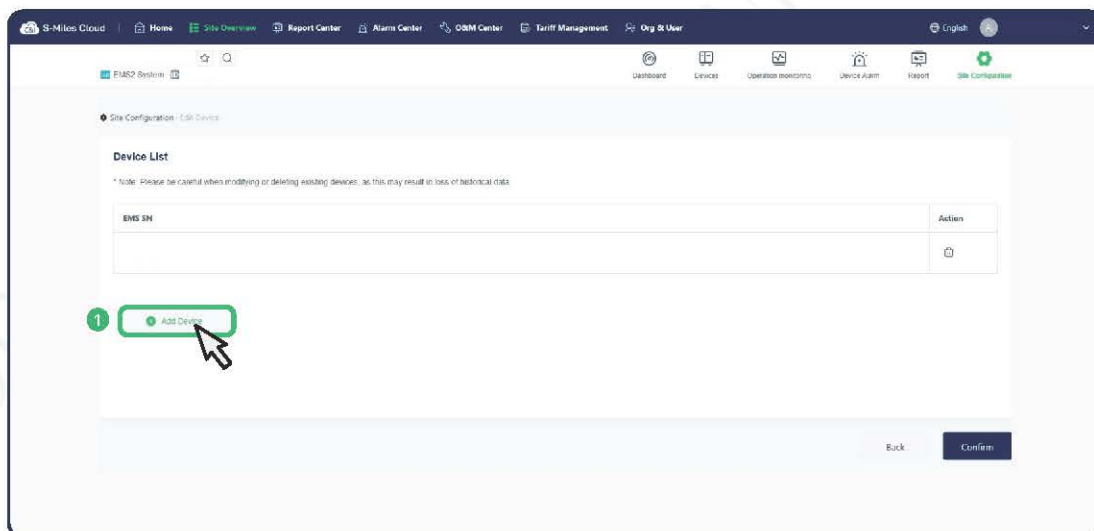


5.6.2 Device Configuration

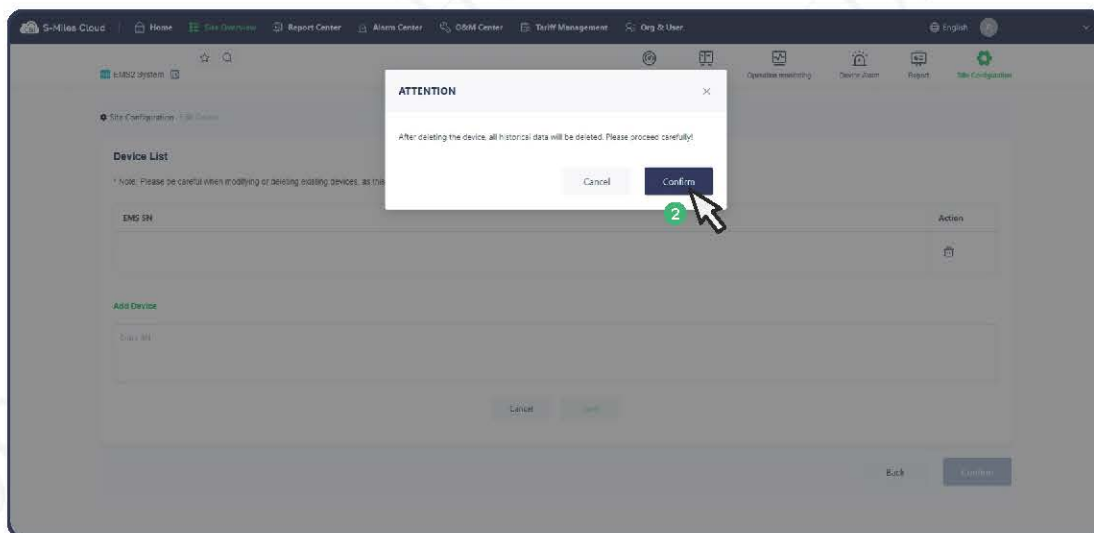
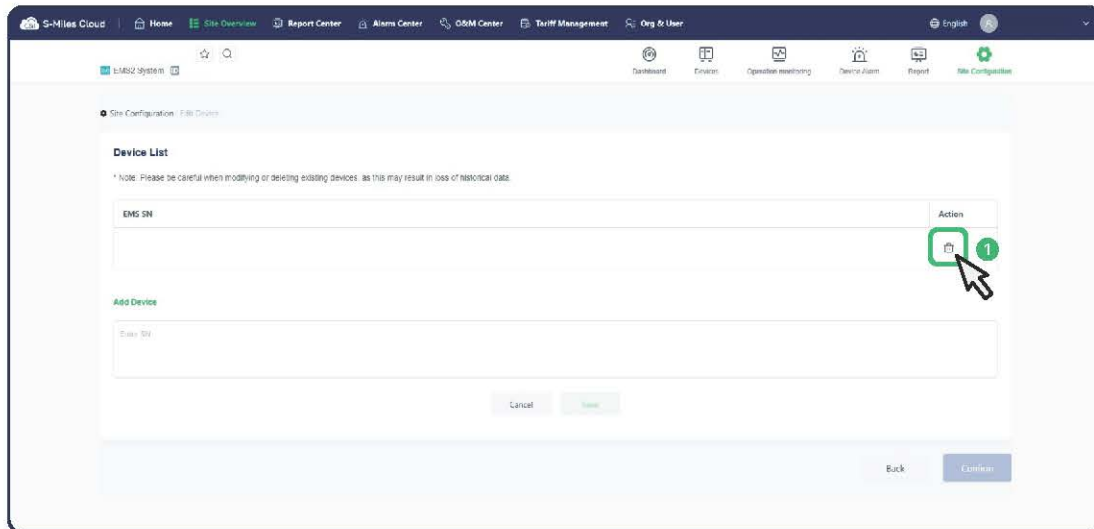
Step 1 Click  **Edit** on the right of the **Device(s)**.



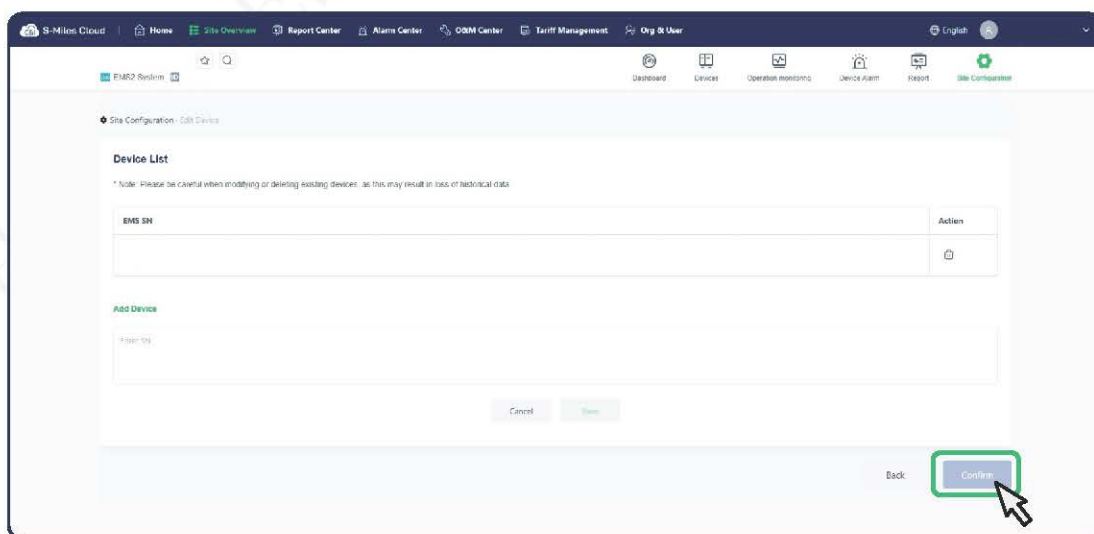
(Optional) Step 2 Add a new device: click  **Add Device**, enter the device **SN**, then click **Save**.



(Optional) Step 3 Delete a device: Find the target device, click  **Delete** in the **Action** column, then click **Confirm** in the pop-up window.

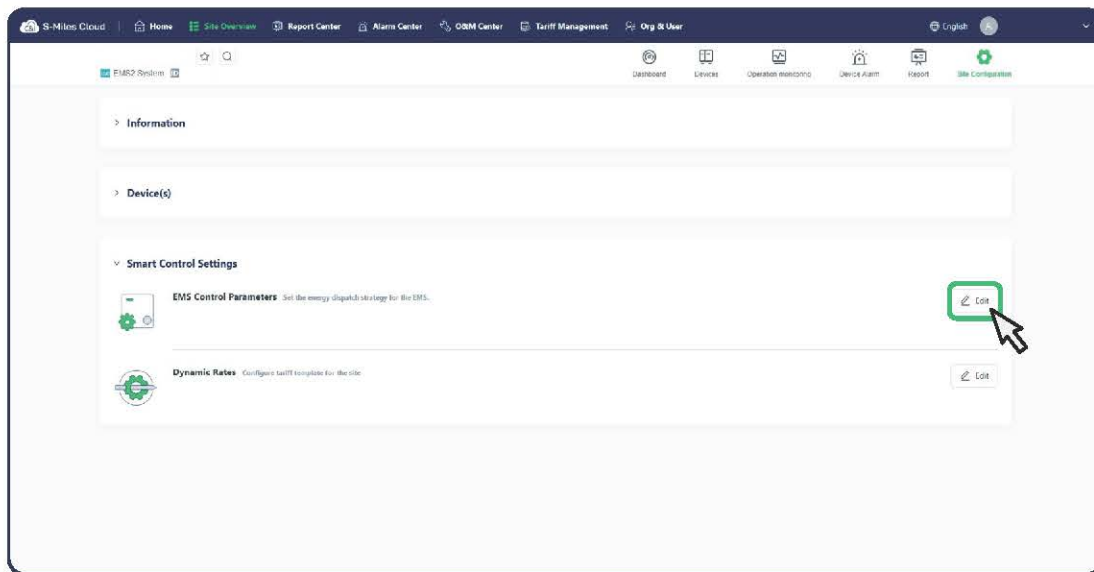


Step 4 Click **Confirm** to save.



5.6.3 EMS Control Parameters

Click **Smart Control Settings > EMS Control Parameters**, then click **Edit** on the right.



5.6.3.1 Local Control

Smart Control Settings

Thermal Management Settings

Heating Setpoint: 5 °C Heating Return Difference: 2 °C Cooling Setpoint: 30 °C

Cooling Return Difference: 2 °C Delta-T Control Setpoint: 5 °C Delta-T Return Difference: 1 °C

Min. Pump Circulation Power: 6.5 kW

Power Settings

Backup Enable: ☒ Backup SOC: 8 %

Off-Grid Enable ☒ Output Line Voltage: 480 V Output Frequency: 50 Hz

Anti-Reverse Enable ☒ Anti-Reverse threshold: 5 kW

Control Strategy

Time-of-Use

No.	Date Period	Action
1	Jan 1 ~ Dec 31	

[Add Charge/Discharge Data](#)

☐ PV Consumption

☐ Dynamic Capacity Increase

Demand Management Enable ☒

Constant Demand

Project	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Demand Power Target(kW)	1	0	0	0	0	0	0	0	0	0	0	2

☐ Dynamic Demand

Cancel **Save**

No.	Item	Description
A	Thermal Management Settings	For details, refer to Thermal Management Settings .
B	Backup Enable	For details, refer to Backup Enable .
C	Off-Grid Enable	For details, refer to Off-Grid Enable .
D	Anti-Reverse Enable	For details, refer to Anti-Reverse Enable .
E	Control Strategy	For details, refer to Control Strategy .
F	Demand Management Enable	For details, refer to Demand Management Enable .
G	Save	Any changes under this module must be saved by clicking the Save button at the bottom of the page.

5.6.3.2 Remote Control

S-Miles Cloud | Home | Site Overview | Report Center | Alarm Center | O&M Center | Tariff Management | Org & User | English

EHSS2 System | Dashboard | Devices | Operation monitoring | Device Name | Report | Site Configuration

Site Configuration > Smart Control Settings

Smart Control Settings

Local Control | Remote Control

Thermal Management Settings

Heating Setpoint: 5 °C | Heating Return Difference: 2 °C | Cooling Setpoint: 30 °C

Cooling Return Difference: 2 °C | Delta-T Control Setpoint: 5 °C | Delta-T Return Difference: 1 °C

Min. Pump Circulation Power: 6.5 kW

Power Settings

Anti-Reverse Enable: ☒

Anti-Reverse Threshold: 5 kW

Demand Management Enable ☒

☒ Constant Demand

Project	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Demand Power Target(kW)	1	0	0	0	0	0	0	0	0	0	0	2

☐ Dynamic Demand

Cancel | **Save**

No.	Item	Description
A	Thermal Management Settings	For details, refer to Thermal Management Settings .
B	Anti-Reverse Enable	For details, refer to Anti-Reverse Enable .
C	Demand Management Enable	For details, refer to Demand Management Enable .
D	Save	Any changes under this module must be saved by clicking the Save button at the bottom of the page.

Thermal Management Settings

Step 1 Set the parameters for thermal management configuration.

Step 2 Click **Save** at the bottom of the page.



Parameter	Description
Heating Setpoint	Min. Battery Temperature $\leq$ Heating Setpoint : The ESS starts and activates heating mode.
Heating Return Difference	Min. Battery Temperature $>$ (Heating Setpoint + Heating Return Difference): - If the PCS Run Status is Discharge Running, Charge Running, or Zero-Power Running: The ESS starts and activates pump circulation mode. - If the PCS Run Status is Fault Shutdown, Normal Shutdown, or Standby: - Battery Delta-T $\geq$ Delta-T Control Setpoint: The ESS starts and activates pump circulation mode. - Battery Delta-T $<$ (Delta-T Control Setpoint + Delta-T Return Difference): The ESS shuts down.
Cooling Setpoint	Max. Battery Temperature $\geq$ Cooling Setpoint : The ESS starts and activates cooling mode.
Cooling Return Difference	Max. Battery Temperature $<$ (Cooling Setpoint + Cooling Return Difference): - If the PCS Run Status is Discharge Running, Charge Running, or Zero-Power Running: The ESS starts and activates pump circulation mode. - If the PCS Run Status is Fault Shutdown, Normal Shutdown, or Standby: - Battery Delta-T $\geq$ Delta-T Control Setpoint: The ESS starts and activates pump circulation mode. - Battery Delta-T $<$ (Delta-T Control Setpoint + Delta-T Return Difference): The ESS shuts down.
Delta-T Control Setpoint / Return Difference	Used in conjunction with Heating Return Difference and Cooling Return Difference .
Min. Pump Circulation Power	- PCS Running Power $\geq$ Min. Pump Circulation Power: The pump runs at full speed. - PCS Running Power $<$ Min. Pump Circulation Power for 1 minute: The pump shuts down.

Backup Enable

Step 1 Enable **Backup Enable**.

Step 2 Set **Backup SOC**.

Step 3 Click **Save** at the bottom of the page.



Off-Grid Enable

Step 1 Enable **Off-Grid Enable**.

Step 2 Set **Output Line Voltage** and **Output Frequency**.

Step 3 Click **Save** at the bottom of the page.

Anti-Reverse Enable

Step 1 Enable **Anti-Reverse Enable**.

Step 2 Set **Anti-Reverse threshold**.

Step 3 Click **Save** at the bottom of the page.

Control Strategy — Time-of-Use

Step 1 **Control Strategy > Time-of-Use**.

Step 2 Click **+ Add Charge/Discharge Date** at the bottom.

Step 3 Set **Start Date** and **End Date** for the charge/discharge period. (the **Date Period** must not overlap with any existing periods, and **End Date** cannot be earlier than **Start Date**)

Step 4 Click **+** on the left of the corresponding row to expand the list.

Step 5 Click **+ Add Charge/Discharge Time** on the right.

Step 6 Set **Charge/Discharge** type, **Start Time**, **End Time**, and **Active Power**. (the **Time Period** must not overlap with any existing periods, and **End Time** cannot be earlier than **Start Time**.)

(Optional) Step 7 To delete a **Time Period**, click **Delete** on the right.

(Optional) Step 8 To delete a **Date Period**, click **Delete** on the right.

Step 9 Click **Save** at the bottom of the page.

Control Strategy — PV Consumption

Step 1 Control Strategy > PV Consumption.

Step 2 Set **Anti-Reverse threshold**.

Step 3 Click **+ Add Time Period** at the bottom.

Step 4 Set **Start Time** and **End Time**. (the **Time Period** must not overlap with any existing periods, and **End Time** cannot be earlier than **Start Time**.)

(Optional) Step 5 To delete a **Time Period**, click **Delete** on the right.

Step 6 Click **Save** at the bottom of the page.

Control Strategy — Dynamic Capacity-Increase

Step 1 Enable **Dynamic Capacity-Increase**.

Step 2 Set **Transformer Power Limit** and **Max. Charging Load Power**.

Step 3 Click **Save** at the bottom of the page.

Demand Management Enable — Constant Demand

Step 1 Enable **Constant Demand**.

Step 2 Set **Demand Power Target(kW)** for each month.

Step 3 Click **Save** at the bottom of the page.

Demand Management Enable — Dynamic Demand

Step 1 Enable **Dynamic Demand**.

Step 2 Set **Start Date (1~31)**, **Initial Demand Power Target(kW)**, and **Monthly Adjustment Factor**.

Step 3 Click **Save** at the bottom of the page.

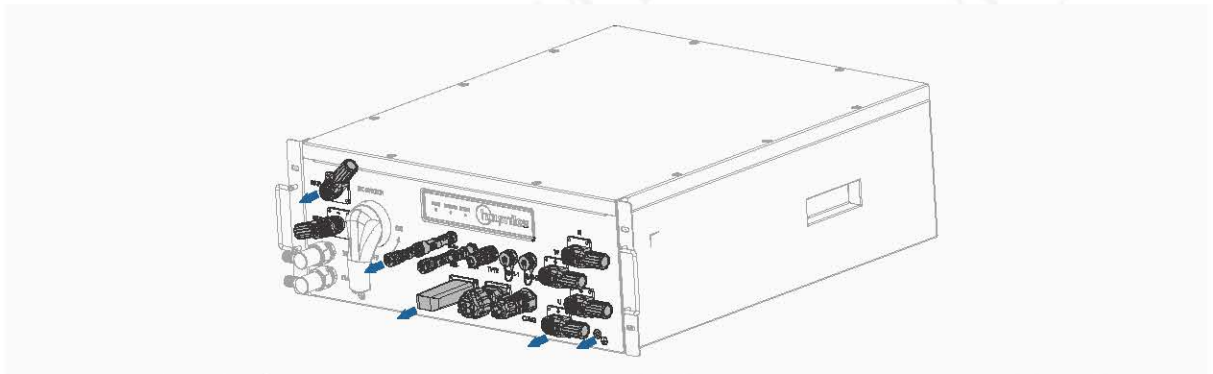
6 Replacing a PCS

6.1 Prerequisites

- Confirm the position of the PCS. (Refer to [4.1.2 Internal](#))
- Power off the ESS. (Refer to [4.3.4 Power-Off Procedures](#))
- Prepare tools: Phillips screwdriver, 13 mm socket combination.
- Recommended persons ≥ 2 .

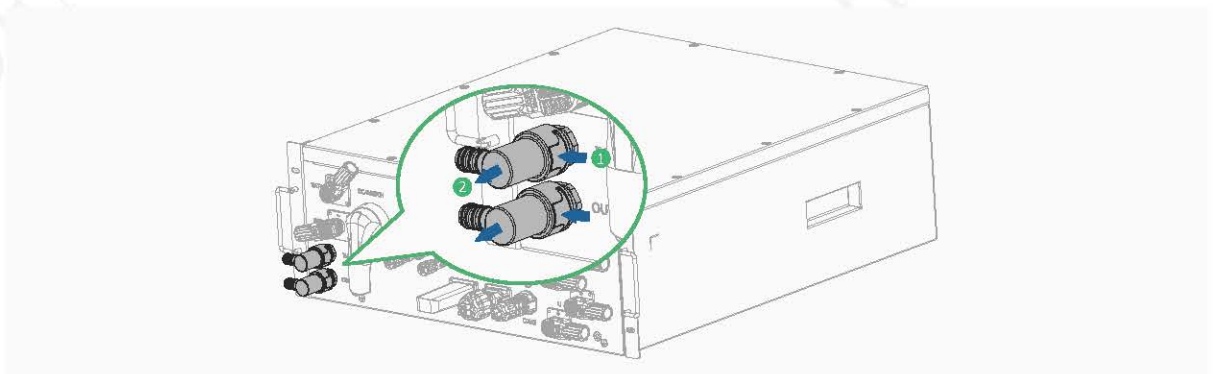
6.2 Procedures

Step 1 Remove the DC, AC, sampling, communication, Wi-Fi, and PE terminals/cables of the PCS (grey items in figure).

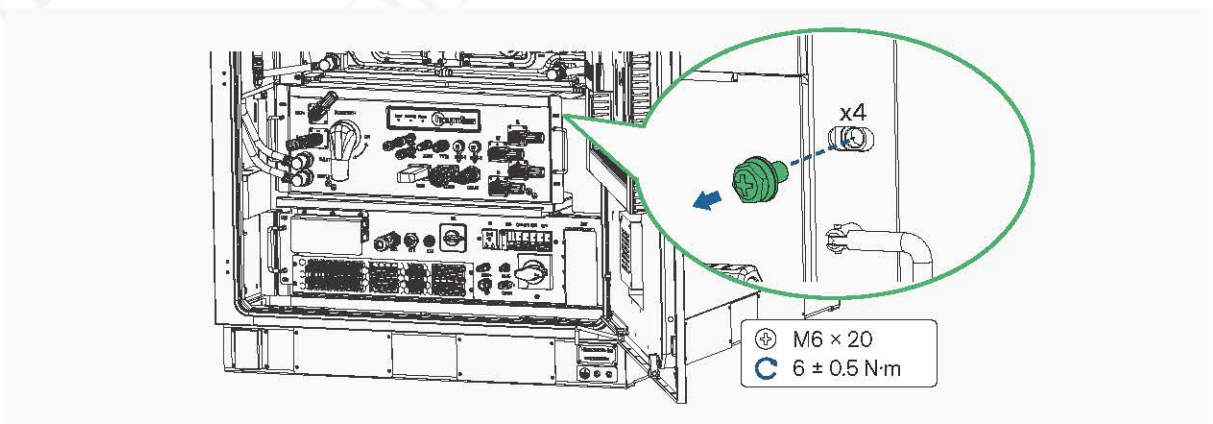


Step 2 Remove the liquid cooling pipes. (The PCS uses a stop valve, so there is no need to drain the liquid. Simply wipe away the residual liquid at the ports after disconnection.)

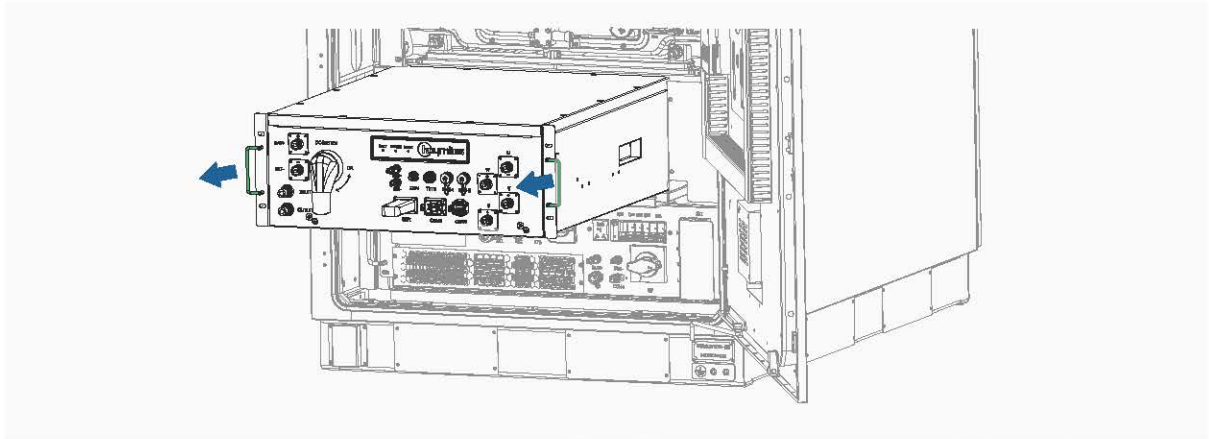
- Press the snap on the pipe connectors.
- Pull the pipes outward to remove it.



Step 3 Remove the 4 screws (2 on each side).

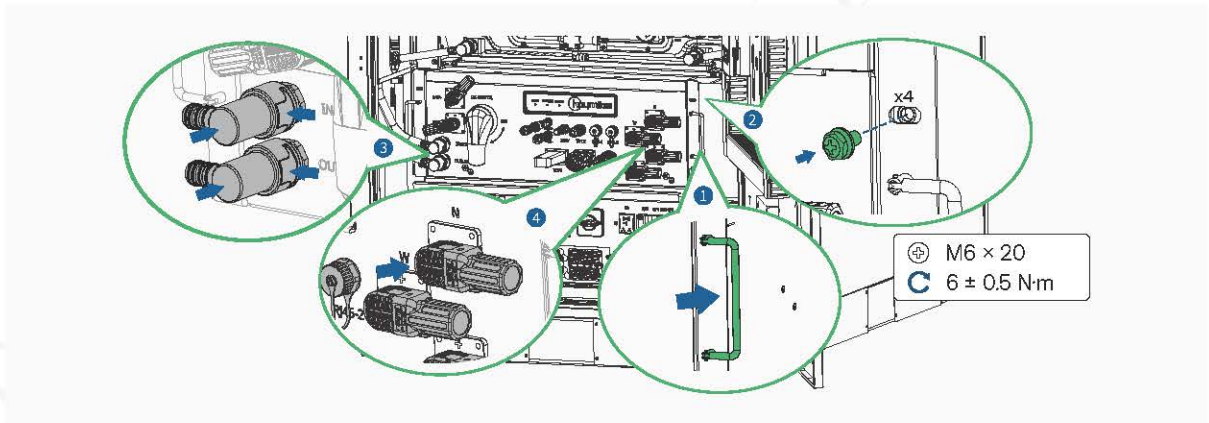


Step 4 Hold the handles on both sides of the PCS, and pull it outward firmly.



Step 5 Install a new PCS into the cabinet:

- Reinstall the PCS mounting screws.
- Reconnect the liquid cooling pipes (all removed pipes must be reinstalled).
- Reconnect the terminals and cables. (all removed terminals and cables must be reinstalled).



Step 6 After installation, perform [4.3.2 Check Before Power-On](#) and [4.3.3 Power-On Procedures](#).

Step 7 Log in to the [S-MLES Cloud](#), and check that all parameters are set correctly.

7 Replacing a Pack

7.1 Prerequisites

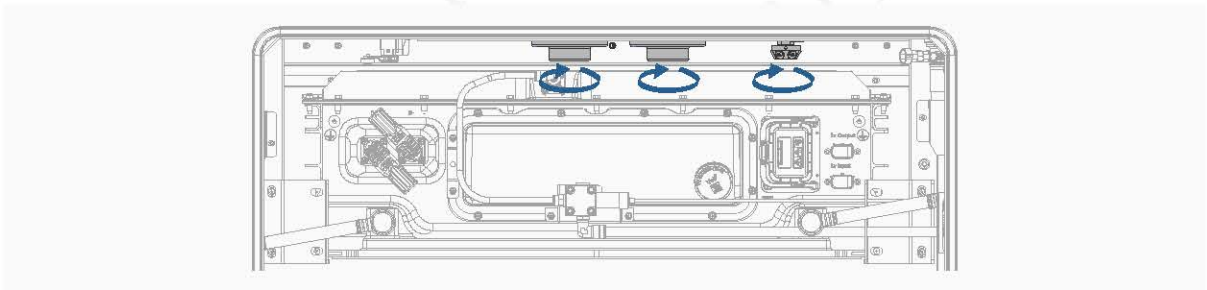
- Confirm the position of the Pack. (Refer to [4.1.2 Internal](#))
- Power off the ESS. (Refer to [4.3.4 Power-Off Procedures](#))
- Prepare tools: Phillips screwdriver, 13 mm socket combination and pack fixture.
- Recommended persons ≥ 4 .

Check Before Replacement

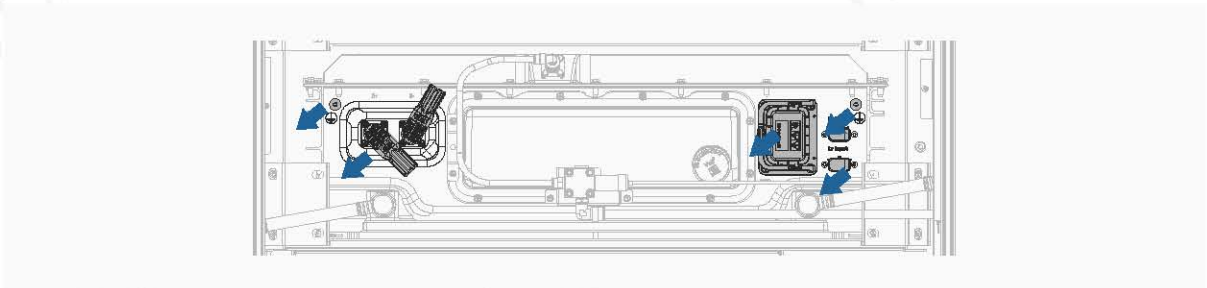
After the ESS is shut down and powered off, wait **5 - 10 minutes** before opening the cabinet door. Visually inspect the faulty battery pack for obvious signs of sparking, burning, swelling, leakage, damage, or pungent odors. If any abnormalities are detected, contact [Hoymiles technical support](#) immediately.

7.2 Procedures

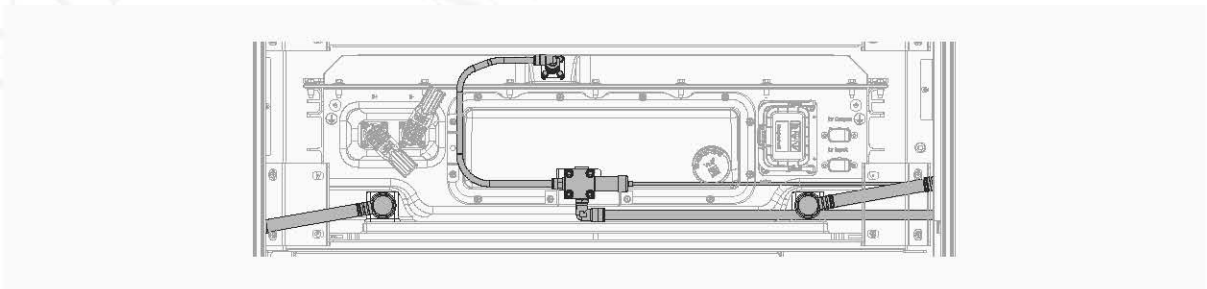
(Optional) Step 1 When replacing the top-layer battery pack, first remove the smoke detector, temperature detector, and fire sprinkler.



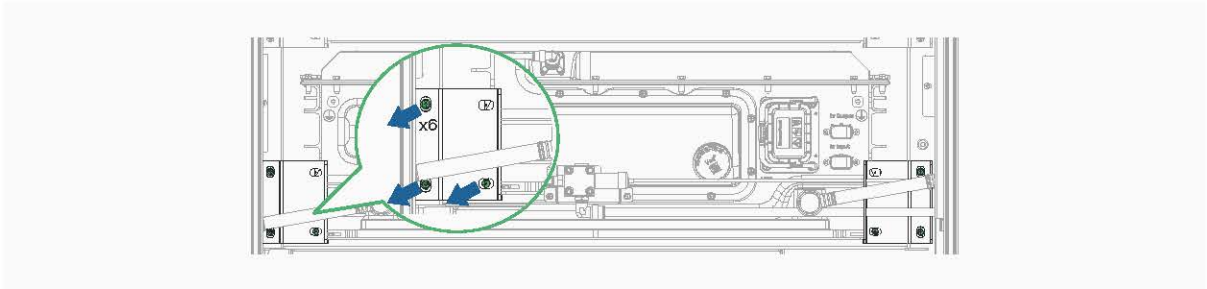
Step 2 Remove the Manual Service Disconnect (MSD), positive power / negative power / communication / PE terminals, and all cables of the PCS (grey items in figure).



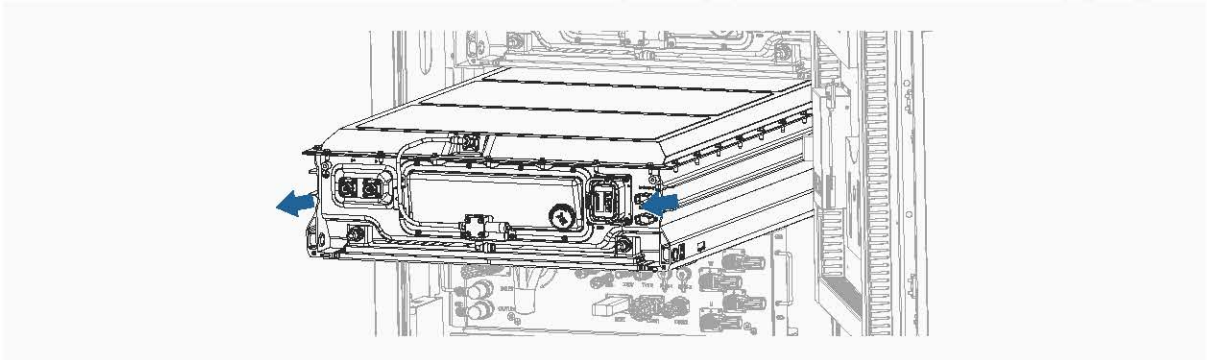
Step 3 Remove the liquid cooling pipes.



Step 4 Use a 13 mm socket to remove the 6 screws (3 on each side).

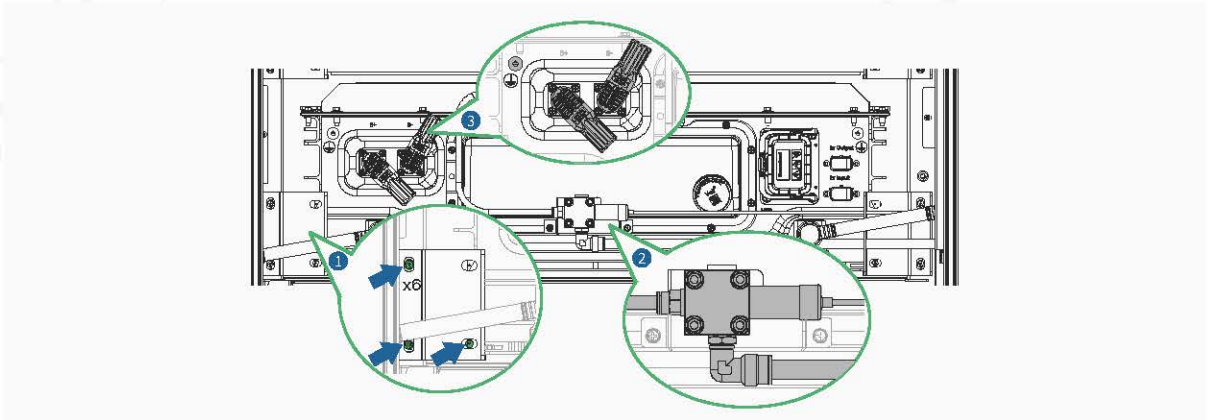


Step 5 Pull the battery pack outward (The battery pack weighs ≈ 350 kg. Use a pack fixture to handling ESS).



Step 6 Install a new battery pack into the cabinet:

- Reinstall the battery pack mounting screws.
- Reconnect the liquid cooling pipes (all removed pipes must be reinstalled).
- Reconnect the terminals and cables. (all removed terminals and cables must be reinstalled).



Step 7 After installation, perform [4.3.2 Check Before Power-On](#) and [4.3.3 Power-On Procedures](#).

Step 8 Log in to the [S-MLES Cloud](#), and check that all parameters are set correctly.

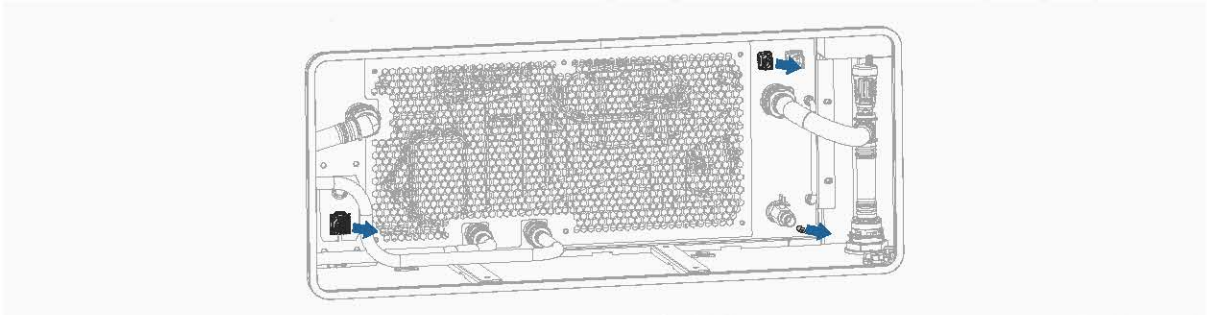
8 Replacing a Liquid-Cooling Controller

8.1 Prerequisites

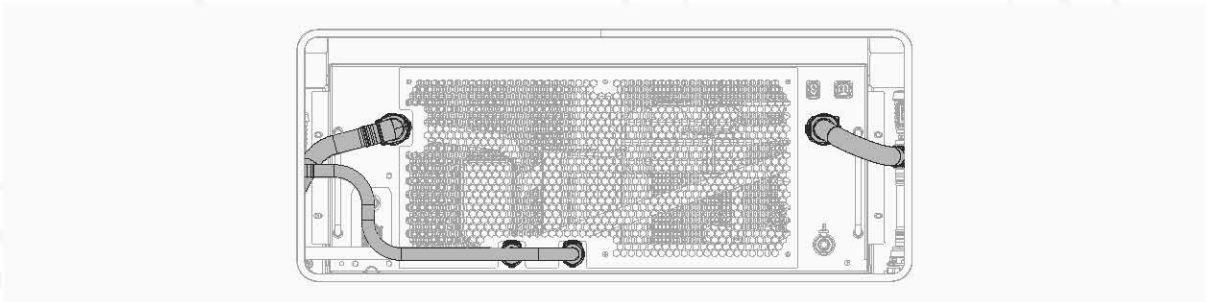
- Confirm the position of the liquid-cooling controller. (Refer to [4.1.2 Internal](#))
- Power off the ESS. (Refer to [4.3.4 Power-Off Procedures](#))
- Prepare tools: Phillips screwdriver, 13 mm socket combination and fixture.
- Recommended persons ≥ 3 .

8.2 Procedures

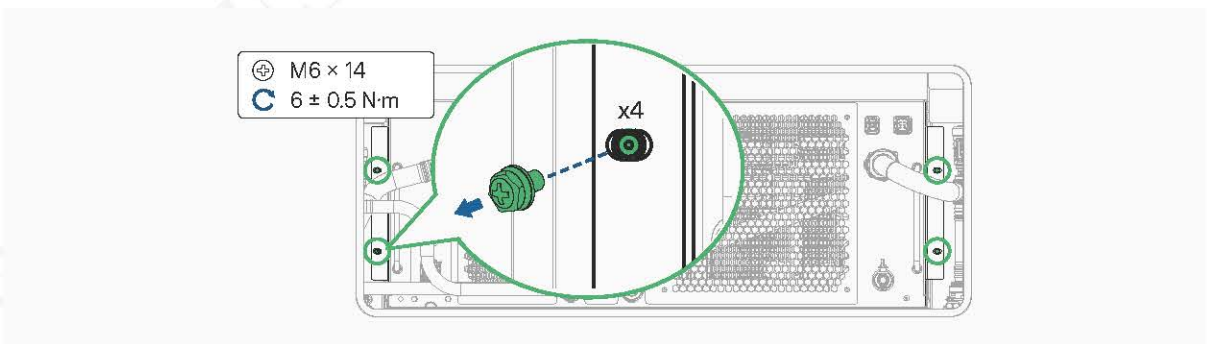
Step 1 Remove the power supply / PE terminals, and all cables of the PCS (grey items in figure).



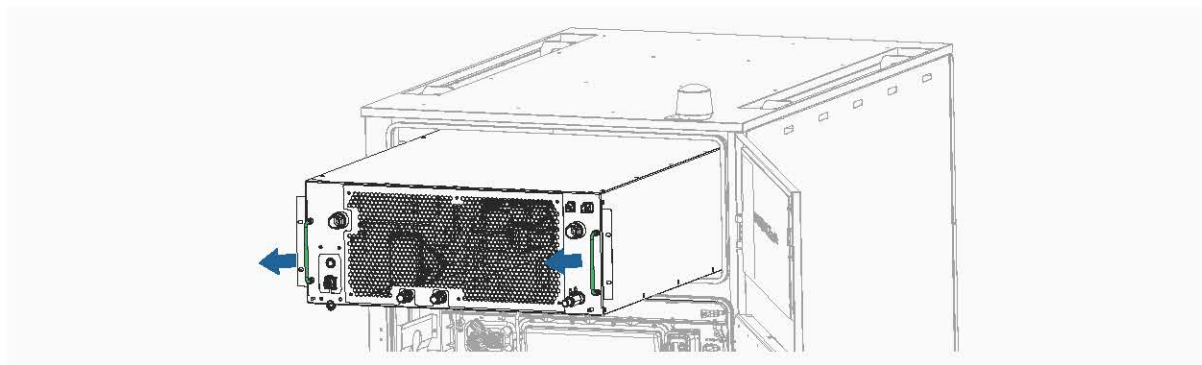
Step 2 Remove the liquid cooling pipes.



Step 3 Remove the 4 screws (2 on each side).

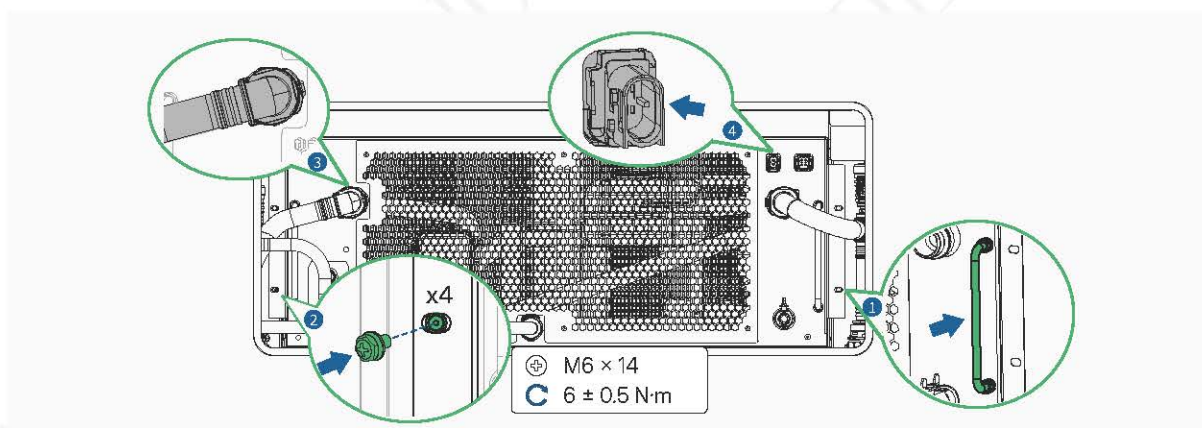


Step 4 Hold the handles on both sides of the liquid-cooling controller, and pull it outward firmly.



Step 5 Install a new liquid-cooling controller into the cabinet:

- Reinstall the mounting screws.
- Reconnect the liquid cooling pipes (all removed pipes must be reinstalled).
- Reconnect the terminals and cables. (all removed terminals and cables must be reinstalled).



Step 6 After installation, perform [4.3.2 Check Before Power-On](#) and [4.3.3 Power-On Procedures](#).

Step 7 Log in to the [S-MLES Cloud](#), and check that all parameters are set correctly.

9 Replacing a AC box

⚠ CAUTION

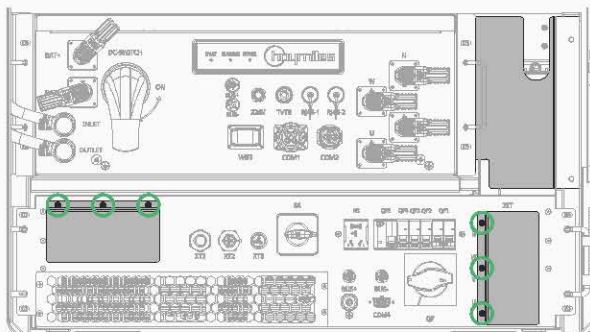
Attach "Do not switch on" labels near the circuit breakers to prevent accidental connection.

9.1 Prerequisites

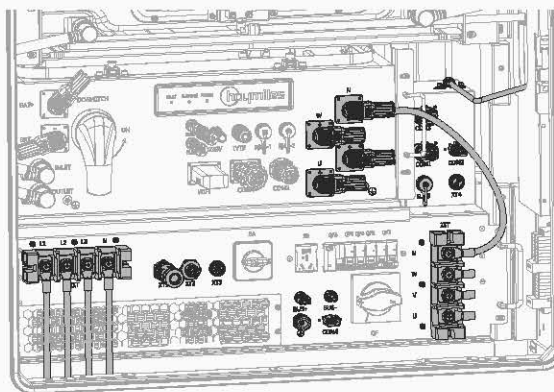
- Confirm the position of the AC box. (Refer to [4.1.2 Internal](#))
- Power off the ESS. (Refer to [4.3.4 Power-Off Procedures](#))
- Prepare tools: Phillips screwdriver, 13 mm socket combination and cable cutter.
- Recommended persons ≥ 2 .

9.2 Procedures

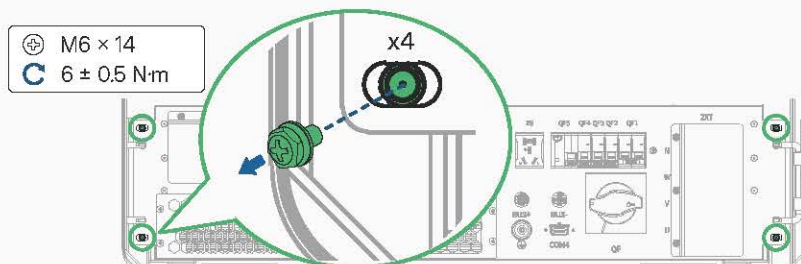
Step 1 Remove the 1XT, 2XT, and fire protection cover plates. (grey items in figure).



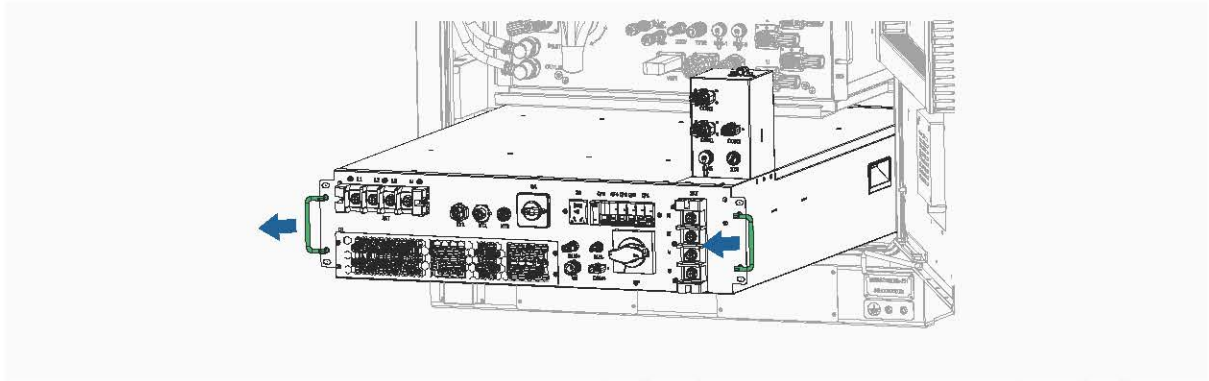
Step 2 Remove the AC, sampling, communication, and DC output terminals/cables. (grey items in figure).



Step 3 Remove the 4 screws (2 on each side).

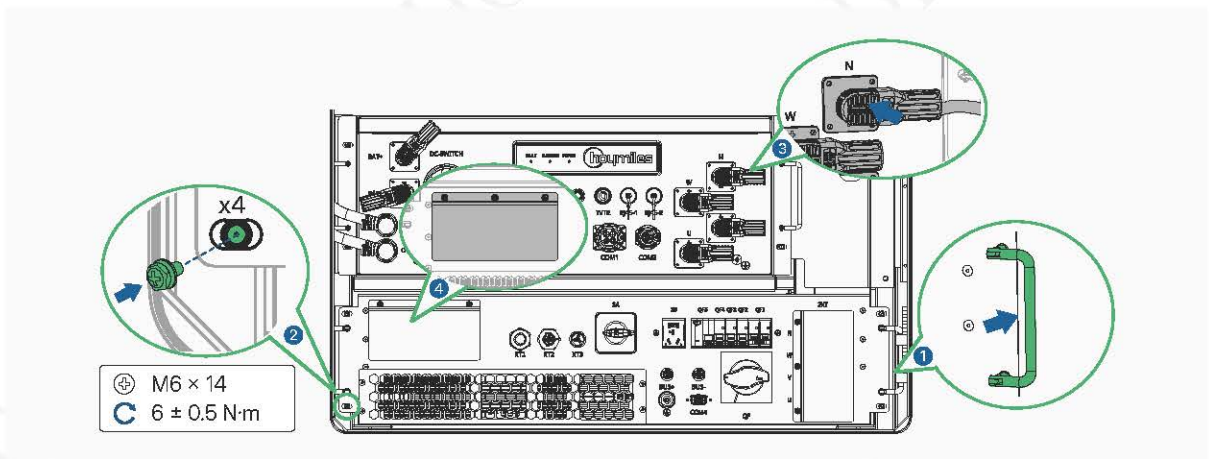


Step 4 Hold the handles on both sides of the AC box, and pull it outward firmly.



Step 5 Install a new AC box into the cabinet:

- Reinstall the mounting screws.
- Reconnect the terminals and cables. (all removed terminals and cables must be reinstalled).
- Reattach all cover plates (all cover plates must be reattached).



Step 6 After installation, perform [4.3.2 Check Before Power-On](#) and [4.3.3 Power-On Procedures](#).

Step 7 Log in to the [S-MLES Cloud](#), and check that all parameters are set correctly.

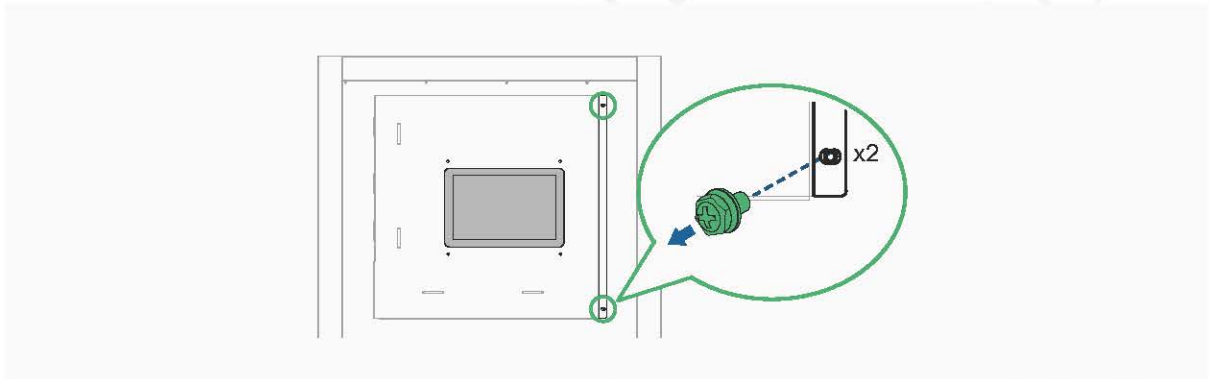
10 Replacing a EMS

10.1 Prerequisites

- Confirm the position of the EMS. (Refer to [4.1.2 Internal](#))
- Power off the ESS. (Refer to [4.3.4 Power-Off Procedures](#))
- Prepare tools: Phillips screwdriver and socket combination.
- Recommended persons ≥ 1 .

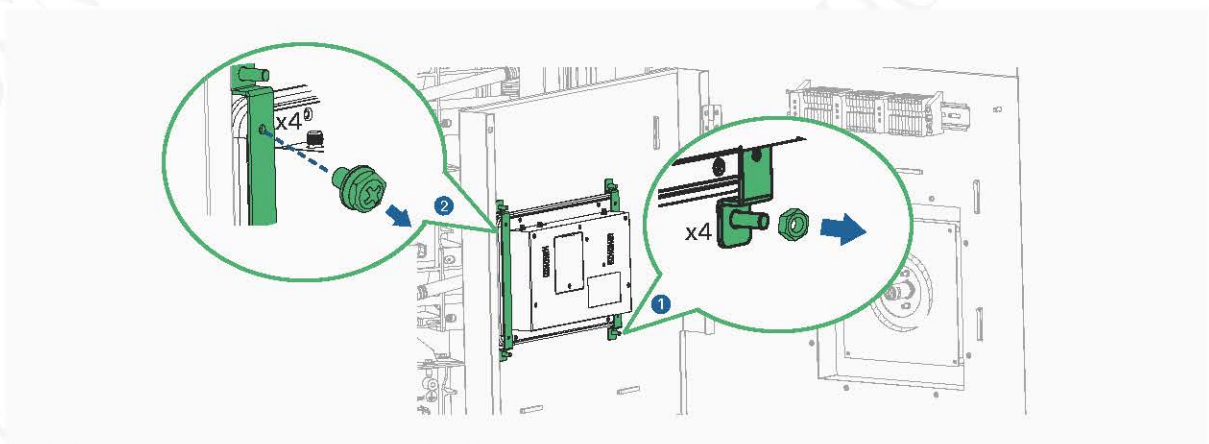
10.2 Procedures

Step 1 Remove the screws on the top and bottom of the cover plate.



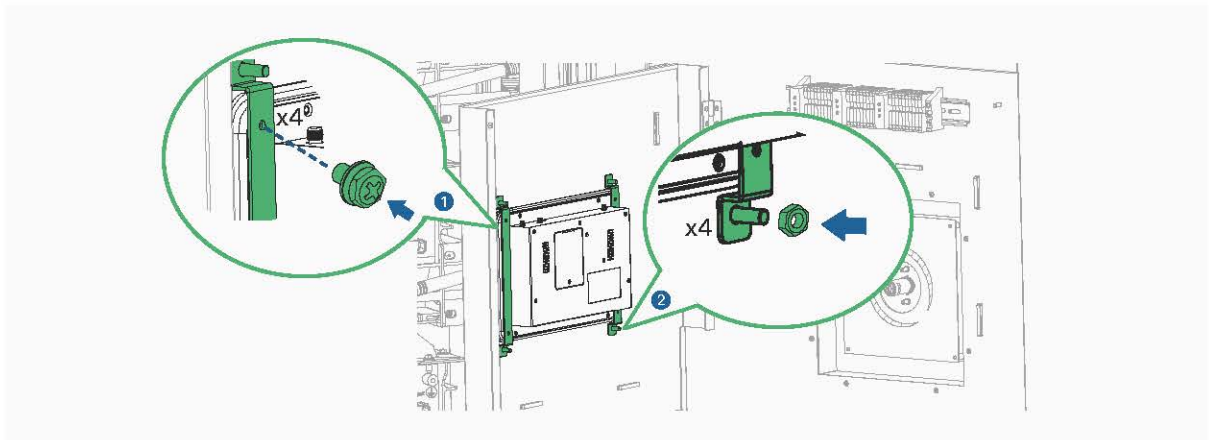
Step 2 Open the cover plate, then:

- First, remove the nuts on the bracket behind the EMS.
- Next, remove the screws connecting the EMS to the bracket.
- Finally, disconnect all cables from the EMS and remove the EMS.



Step 3 Install a new EMS:

- First, reconnect all cables to the new EMS.
- Then, tighten the screws connecting the EMS to the bracket.
- Next, tighten the bracket nuts.
- Finally, tighten the screws on the front of the cover plate.



Step 4 After installation, perform [4.3.2 Check Before Power-On](#) and [4.3.3 Power-On Procedures](#).

Step 5 Log in to the [S-MLES Cloud](#), and check that all parameters are set correctly.

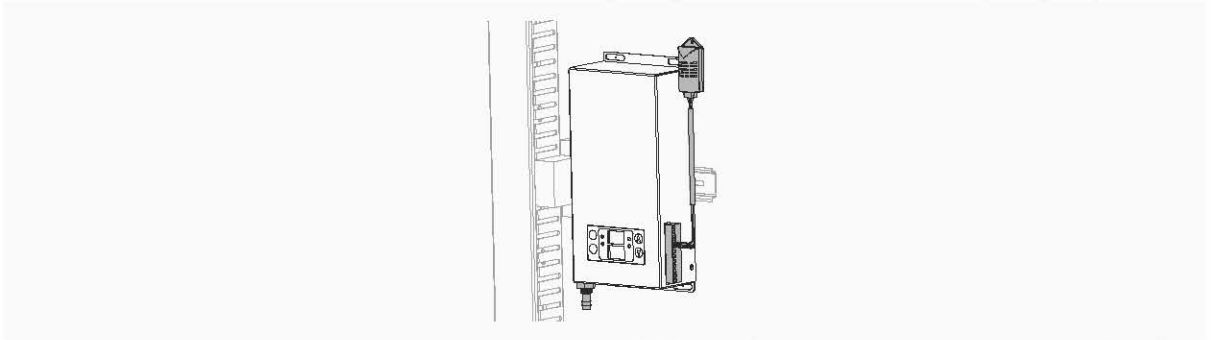
11 Replacing a Dehumidifier

11.1 Prerequisites

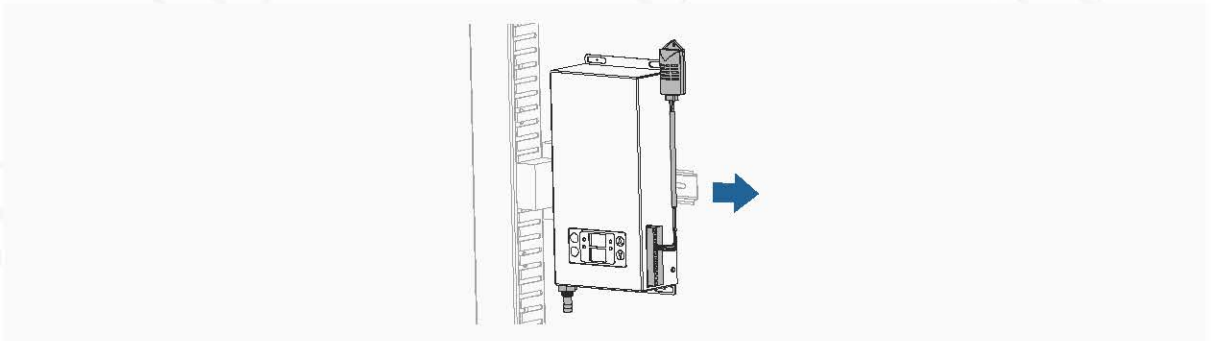
- Confirm the position of the dehumidifier. (Refer to [4.1.2 Internal](#))
- Power off the ESS. (Refer to [4.3.4 Power-Off Procedures](#))
- Prepare tools: Phillips screwdriver and socket combination.
- Recommended persons ≥ 1 .

11.2 Procedures

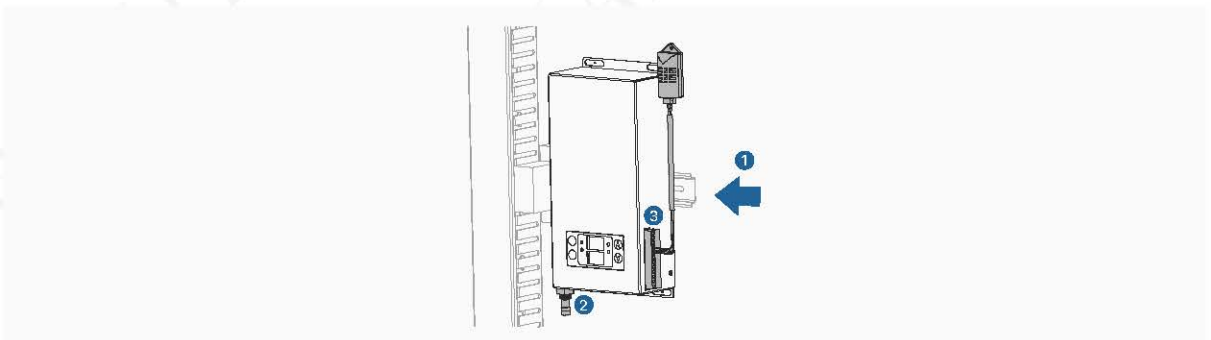
Step 1 Disconnect the external pipes, terminals, and cables from the dehumidifier.



Step 2 Slide the dehumidifier to the right to disengage it from the mounting rail, then remove it.



Step 3 Take a new dehumidifier, secure it onto the mounting rail, then reconnect the external pipes, terminals, and cables.



Step 4 After installation, perform [4.3.2 Check Before Power-On](#) and [4.3.3 Power-On Procedures](#).

Step 5 Log in to the [S-MLES Cloud](#), and check that all parameters are set correctly.

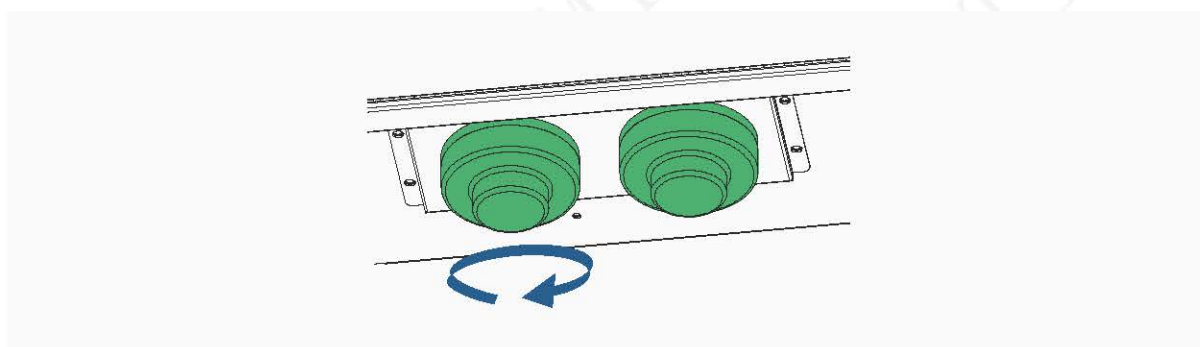
12 Replacing a Smoke/Temperature Detector

12.1 Prerequisites

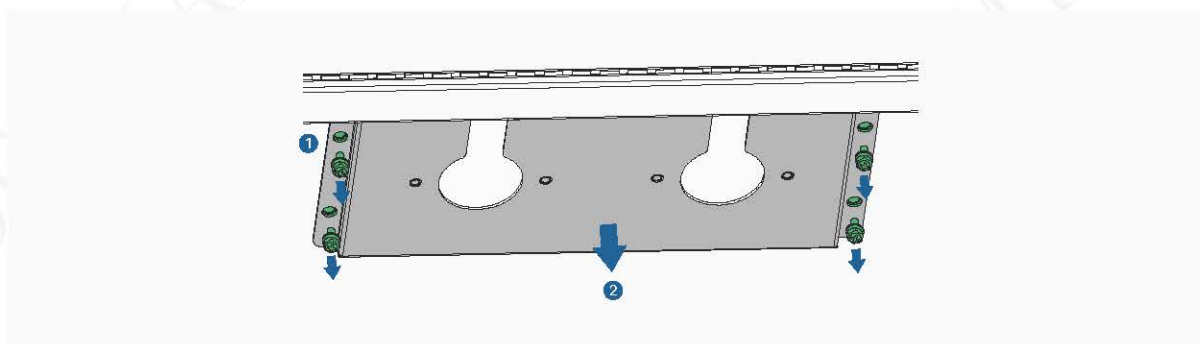
- Confirm the position of the smoke/temperature detector. (Refer to [4.1.2 Internal](#))
- Power off the ESS. (Refer to [4.3.4 Power-Off Procedures](#))
- Prepare tools: Phillips screwdriver.
- Recommended persons ≥ 1 .

12.2 Procedures

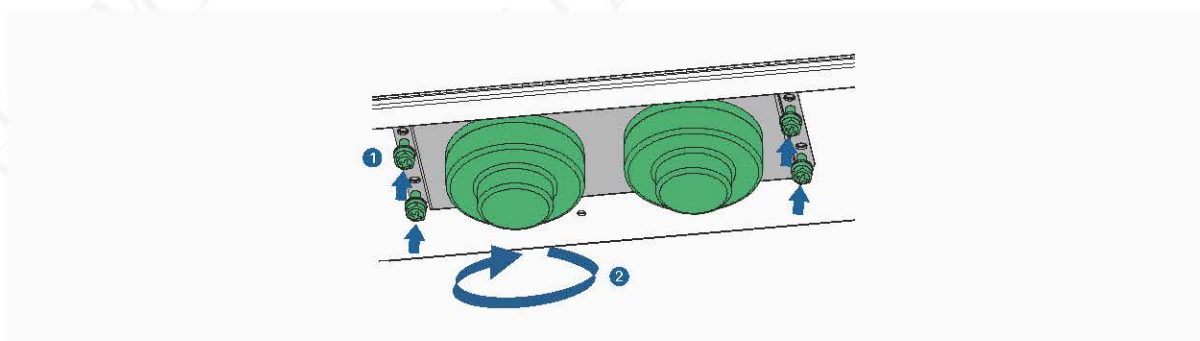
Step 1 Hold the sensor head of the faulty detector, rotate it counterclockwise until it aligns with the notch, then remove it and disconnect the cables.



(Optional) Step 2 Remove the 4 screws and detach the base.



Step 3 Install a new base and tighten the mounting screws. Reconnect the detector cable, then hand the sensor head of the new detector and rotate it clockwise to lock it into the base.



Step 4 After installation, perform [4.3.2 Check Before Power-On](#) and [4.3.3 Power-On Procedures](#).

Step 5 Log in to the [S-MLES Cloud](#), and check that all parameters are set correctly.

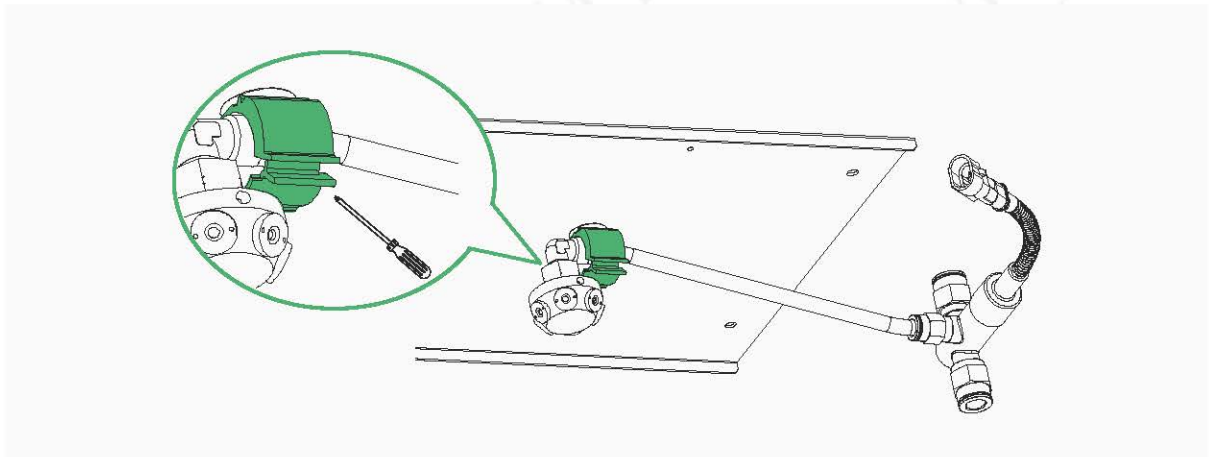
13 Replacing a Fire Sprinkler

13.1 Prerequisites

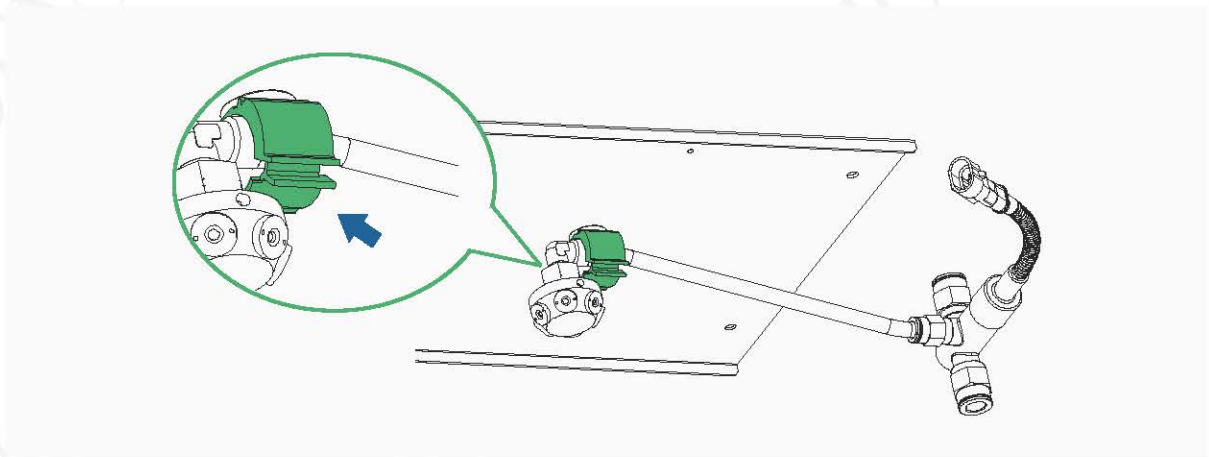
- Confirm the position of the fire sprinkler. (Refer to [4.1.2 Internal](#))
- Power off the ESS. (Refer to [4.3.4 Power-Off Procedures](#))
- Prepare tools: Phillips screwdriver.
- Recommended persons ≥ 1 .

13.2 Procedures

Step 1 Use a screwdriver to release the fastening clip of the sprinkler head. Remove the sprinkler head and pipe, then disconnect them.



Step 2 Take a new sprinkler head, reconnect it to the pipe, and secure them into the top fastening clip.



Step 3 After installation, perform [4.3.2 Check Before Power-On](#) and [4.3.3 Power-On Procedures](#).

Step 4 Log in to the [S-MLES Cloud](#), and check that all parameters are set correctly.

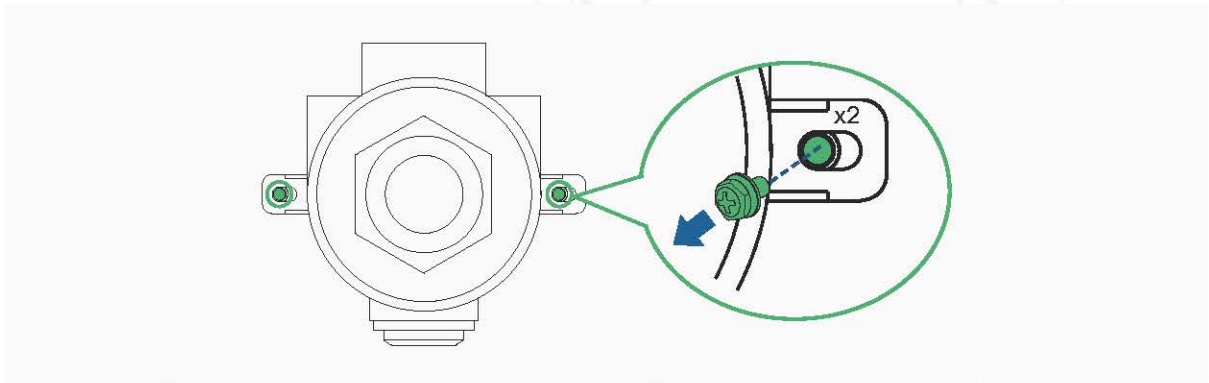
14 Replacing a Combustible Gas Detector

14.1 Prerequisites

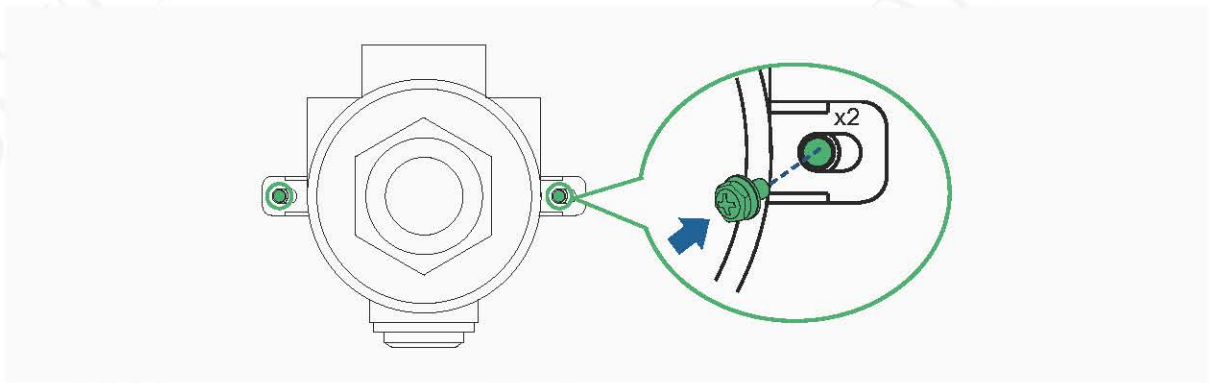
- Confirm the position of the combustible gas detector. (Refer to [4.1.2 Internal](#))
- Power off the ESS. (Refer to [4.3.4 Power-Off Procedures](#))
- Prepare tools: Phillips screwdriver and socket combination.
- Recommended persons ≥ 1 .

14.2 Procedures

Step 1 Remove the 2 screws (one on each side) and detach the detector. Disconnect the cables at the bottom of the detector.



Step 2 Take a new detector, reconnect the cables to its bottom, align the detector mounting holes with those on the cabinet, and then tighten the screws.



Step 3 After installation, perform [4.3.2 Check Before Power-On](#) and [4.3.3 Power-On Procedures](#).

Step 4 Log in to the [S-MLES Cloud](#), and check that all parameters are set correctly.

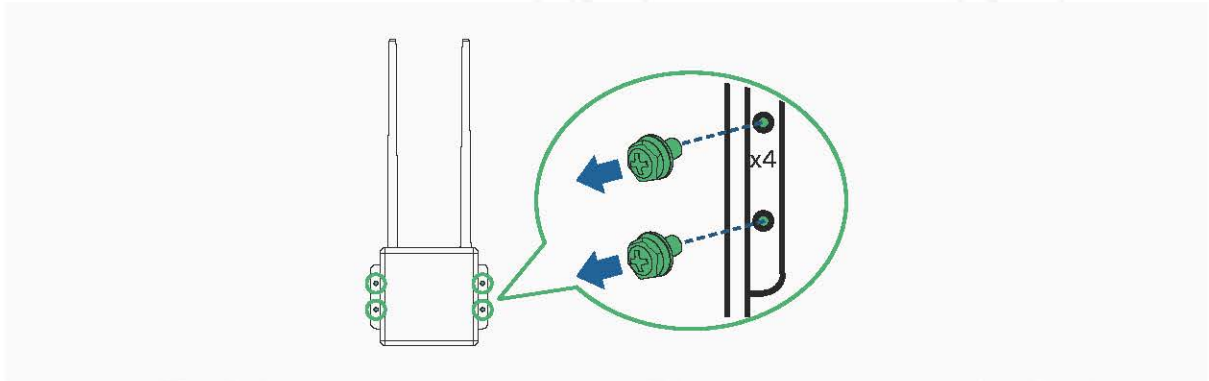
15 Replacing a 4G Module

15.1 Prerequisites

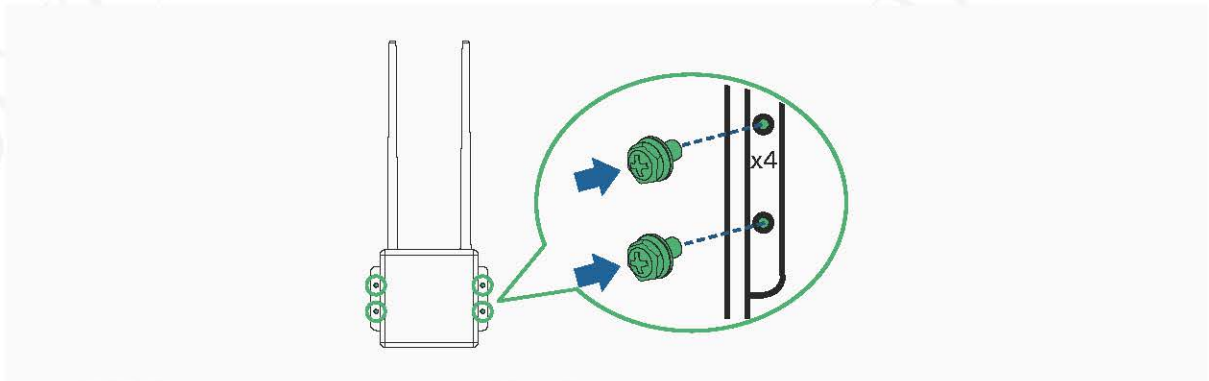
- Confirm the position of the 4G module. (Refer to [4.1.2 Internal](#))
- Power off the ESS. (Refer to [4.3.4 Power-Off Procedures](#))
- Prepare tools: Phillips screwdriver.
- Recommended persons ≥ 1 .

15.2 Procedures

Step 1 Remove the 4 screws (two on each side) and detach the module. Disconnect the cables at the bottom of the module.



Step 2 Take a new 4G module, reconnect the cables to its bottom, align the module mounting holes with those on the cabinet, and then tighten the screws.



Step 3 After installation, perform [4.3.2 Check Before Power-On](#) and [4.3.3 Power-On Procedures](#).

Step 4 Log in to the [S-MLES Cloud](#), and check that all parameters are set correctly.

16 Maintenance and Troubleshooting

Before maintenance and inspection, please ensure to read and comply with the information in the "[2 Safety Information](#)" section.

DANGER

Before equipment maintenance, comply with the following requirements:

- Wear personal protective equipment and use dedicated insulated tools to avoid electric shocks or short circuits.
- Turn off the switches of the equipment and its upstream and downstream switches, and disconnect the internal power supply connections. Otherwise, personal injury may occur.
- Ensure that the ground cables are properly grounded.

WARNING

- When operating a potentially charged component, block or wrap them with insulation plates or insulation tapes.
- After completing the operation, ensure that no irrelevant metal devices such as screws and washers are left inside the equipment.

CAUTION

- Attach "**Do not switch on**" labels near the upstream and downstream switches or circuit breakers to prevent accidental connection.
- Place warning signs or strips near the operation area.

16.1 Maintenance

WARNING

Residual voltage exists after the HESS-261-2h is powered off for **20 minutes**. Use an electroscope of a proper voltage level to check whether the HESS-261-2h is completely powered off.

The internal components of the ESS are susceptible to ambient temperature, humidity, dust, and vibration, which may lead to aging and wear, and potential faults. Therefore, routine and periodic maintenance is required to ensure normal operation and extend service life.

Please perform periodic maintenance on the ESS according to the following table:

Maintenance Item	Check Item	Troubleshooting	Power Off Required or Not	Door Opening Required or Not
Routine Maintenance				
Routine Maintenance	Monitor the input/output voltage/current and operating status of the ESS cabinet in real-time, and assign personnel to conduct regular inspections. Perform timely maintenance if any abnormal operation of the equipment or abnormal voltage/current is detected.	Contact Hoymiles technical support engineer to evaluate and handle the problem.	NO	NO
	Check that there are no abnormal noise inside the cabinet.			
	Check that there are no odor inside the cabinet.			
	Read the internal temperature of the ESS cabinet and observe for abnormalities.			

Maintenance Item	Check Item	Troubleshooting	Power Off Required or Not	Door Opening Required or Not
Semi-annual Maintenance				
Cabinet	Check that the cabinet-door lock is intact.	Replace the door lock.	NO	NO
	Check that there is no obvious paint peeling or rust on the cabinet surface.	Repaint the damaged part.		
Cabinet	Check that the cabinet exterior is free from obvious coating peeling and scratches.	Contact Hoymiles technical support engineer to evaluate and handle the problem.	NO	NO
	Check that there is no foreign objects around the rear explosion relief panel.	Remove any foreign objects.		
	Check that the air filter is not damaged or distorted.	Replace the filter.		
	Check and clean the air filter and the outdoor fan vent to ensure that there is no scale, dirt, or blockage.	Clean the air filter and the outdoor fan vent (You are advised to use a vacuum cleaner, cloth, or brush to clean the air filter. You do not need to remove the air filter for cleaning).		
	Check that there is no dust buildup at the vents of the cabinet.	Clean up the dust.		
	Check that the protective tube for the communications cable on the rear of the cabinet is intact and secured.	Replace the damaged protective tube in a timely manner and reinforce the falling part.		
	Check that the smoke exhaust vent of the cabinet is not dirty or blocked.	Clean the smoke exhaust vent of the cabinet.		
Liquid-Cooling Controller	Check that there are no potential hazards, contaminants, or rubbish around the unit.	Handle potential hazards and clean up rubbish.	YES	YES
	Check that the pump works properly without abnormal noise.	Replace the liquid-cooling controller.		
	Check whether the coolant level is below the MIN level.	If the coolant level is below the MIN level, add coolant until it reaches the MAX level.		
	Check that all cable wiring screws are tightened.	Tighten the screws.		
	Check that the ventilation openings of the cabinet is not dirty or blocked.	Clean up the dust and blocked.		
	Check that all terminals are secured.	Reconnect the cables.		
Liquid-Cooling Piping Network	Check that no leakage occurs on the liquid-cooling piping network and coolant inlet and outlet.	Replace the leakage component or liquid-cooling controller.	YES	YES
	Check that the dehumidifying fan screws are secured and not deformed.	Reconnect the cables.		
Dehumidifier	Check that the dehumidifying fan screws are secured and not deformed.	Reconnect the cables.	YES	YES

Maintenance Item	Check Item	Troubleshooting	Power Off Required or Not	Door Opening Required or Not
PACK	Check that there is no obvious damage, paint peeling off, or rust on the appearance.	Contact Hoymiles technical support engineer to evaluate and handle the problem.	YES	YES
	Check that no leakage occurs on the coolant inlet and outlet of the pack and the metal edges at the bottom of the pack.	Leakage at the coolant inlet and outlet: Replace the male connectors of the stop valves at the inlet and outlet after draining the coolant. Other cases: Replace the pack.		
	Check that cables are securely connected.	Secure the cables.		
	Check that cables are intact, especially that the cable sheath contacting a metal surface is intact.	Replace the faulty cable.		
	Check that the ground cable is securely connected.	Reconnect the ground cables to ensure reliable grounding.		
PCS	Check for leakage at the coolant inlet and outlet of the PCS.	Replace the male connectors of the stop valves at the inlet and outlet after draining the coolant.	YES	YES
	Check that the enclosure is not damaged or deformed.	Contact Hoymiles technical support engineer to evaluate and handle the problem.		
	Check that the parameters are set correctly.			
	Check that cables are securely connected.	Secure the cables.		
	Check that cables are intact, especially that the cable sheath contacting a metal surface is intact.	Replace the faulty cable.		
	Check that the ground cable is securely connected.	Reconnect the ground cables to ensure reliable grounding.		
Fire Suppression System	Check that the detectors are normal and that the inspection indicators blink properly.	Replace the faulty component.	YES	YES
	Carry out spot checks on the detectors with smoke or heat generated by using dedicated devices.			

NOTE

In harsh scenarios such as deserts and catkins, perform maintenance based on the site requirements to ensure that there is no blockage or dust buildup.

17 Troubleshooting

17.1 Alarm Severity and Protection Actions

No.	Alarm Severity	Protection Action		Comment
		Basic	Fire Suppression	
1	Level I (Minor Alarm)	Alarms Only	Alarms Only	Automatically Reset
2	Level II (Moderate Alarm)	Charge Prohibited, Discharge Allowed.	Fire Alarm Horn/Strobe	Automatically Reset
		Discharge Prohibited, Charge Allowed.	Open push rod and fan for ventilation	
		Charge/Discharge Prohibited, PCS Standby	—	
3	Level III (Major Alarm)	Charge/Discharge Prohibited	Fire Alarm Horn/Strobe	Automatically Reset
		PCS Shutdown	—	
4	Level IV (Critical Alarm)	Charge/Discharge Prohibited	Fire Alarm Horn/Strobe	Manually Reset
		PCS Shutdown	Close push rod and fan	
		Disconnect Main and Auxiliary Circuit Breakers	Release fire extinguishing agent	

17.2 EMS Troubleshooting

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
1	PCS Communication Fault	III	Charge/Discharge Prohibited + Shutdown	1. Communication wiring abnormality. 2. PCS unresponsive.	1. Check whether the communications cable is loose, disconnected, or incorrectly connected. If yes, reconnect the cable. 2. Restart the system by power cycling. 3. If the alarm persists, contact technical support.
2	BMS Communication Fault			1. Communication wiring abnormality. 2. BMS unresponsive.	
3	Anti-Reverse Current Meter Communication Fault			1. Communication wiring abnormality. 2. Anti-reverse current meter unresponsive.	
4	Manager Measuring Meter Communication Fault	I	Alarms Only	1. Communication wiring abnormality. 2. Manager measuring meter unresponsive.	

17.3 PCS Troubleshooting

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
1	Grid Overvoltage	III	Charge / Discharge Prohibited + Shutdown	Actual grid overvoltage.	Check whether the grid voltage is normal.
				Grid sampling circuit abnormality.	Check whether the grid voltage sampling circuit is normal.
				Fault protection parameter setting is unreasonable.	Check whether the grid overvoltage threshold is within a reasonable range.
				—	If none of the above causes are confirmed, contact technical support.
2	Grid Undervoltage			Actual grid undervoltage.	Check whether the grid voltage is normal.
				Grid sampling circuit abnormality.	Check whether the grid voltage sampling circuit is normal.
				Fault protection parameter setting is unreasonable.	Check whether the grid undervoltage threshold is within a reasonable range.
				—	If none of the above causes are confirmed, contact technical support.
3	Grid Overfrequency			Actual grid overfrequency.	Check whether the grid frequency is normal.
				Grid sampling circuit abnormality.	Check whether the grid frequency sampling circuit is normal.
				Fault protection parameter setting is unreasonable.	Check whether the grid overfrequency threshold is within a reasonable range.
				—	If none of the above causes are confirmed, contact technical support.
4	Grid Underfrequency			Actual grid underfrequency.	Check whether the grid frequency is normal.
				Grid sampling circuit abnormality.	Check whether the grid frequency sampling circuit is normal.
				Fault protection parameter setting is unreasonable.	Check whether the grid underfrequency threshold is within a reasonable range.
				—	If none of the above causes are confirmed, contact technical support.

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
5	TRIP Fault	III	Charge / Discharge Prohibited + Shutdown	Overvoltage on the DC side or overcurrent on the AC side.	If the alarm occurs repeatedly, contact technical support.
6	AC Hardware Overcurrent			Excessive current on the AC side.	
7	DC Hardware Overcurrent			Excessive current on the DC side.	
8	Half-Bus Hardware Overvoltage			Half-bus overvoltage on the DC side.	
9	A-Phase IGBT Drive Disconnection			IGBT failure.	Contact technical support.
10	B-Phase IGBT Drive Disconnection			IGBT failure.	Contact technical support.
11	C-Phase IGBT Drive Disconnection			IGBT failure.	Contact technical support.
12	DC Main Switch Fault			Adhesion of switch contact.	Check whether the switch contact are adhesive.
				Feedback signal disconnection.	Check whether the switch feedback circuit is functioning correctly.
				Feedback signal disconnection.	Check whether the control signal circuit is functioning correctly.
				—	If the alarm persists, contact technical support.
13	AC Instantaneous Overvoltage			Instantaneous overvoltage on the AC side.	If the alarm occurs repeatedly, contact technical support.
14	IGBT Overheating			Overtemperature is caused by overloading, abnormal water circulation, fan failure, etc.	Check whether the water circulation is normal, the air duct is blocked, the fan is damaged, and check whether the ambient temperature is too high.
				Overtemperature is caused by abnormal temperature sampling.	Check whether the temperature sampling is normal.
				—	If the alarm persists, contact technical support.
15	Relay Inductor Overheating Fault	Overtemperature is caused by overloading, abnormal water circulation, fan failure, etc.	Check whether the water circulation is normal, the air duct is blocked, the fan is damaged, and check whether the ambient temperature is too high.		
		Overtemperature is caused by abnormal temperature sampling.	Check whether the temperature sampling is normal.		
		—	If the alarm persists, contact technical support.		

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
16	Relay Inductor Low Temperature Fault	III	Charge / Discharge Prohibited + Shutdown	Actual low temperature is caused by abnormal water circulation, etc.	Check whether the water circulation is normal, and check whether the ambient temperature is too low (The actual temperature below -35°C is considered as normal protection).
				Low temperature is caused by abnormal temperature sampling.	Check whether the temperature sampling is normal.
				—	If the alarm persists, contact technical support.
17	Inlet Overheating Fault			Overtemperature is caused by overloading, abnormal water circulation, fan failure, etc.	Check whether the water circulation is normal, the air duct is blocked, the fan is damaged, and check whether the ambient temperature is too high.
				Overtemperature is caused by abnormal temperature sampling.	Check whether the temperature sampling is normal.
				—	If the alarm persists, contact technical support.
18	Inlet Low Temperature Fault			Actual low temperature is caused by abnormal water circulation, etc.	Check whether the water circulation is normal, and check whether the ambient temperature is too low (The actual temperature below -35°C is considered as normal protection).
				Low temperature is caused by abnormal temperature sampling.	Check whether the temperature sampling is normal.
				—	If the alarm persists, contact technical support.
19	Outlet Overheating Fault			Overtemperature is caused by overloading, abnormal water circulation, fan failure, etc.	Check whether the water circulation is normal, the air duct is blocked, the fan is damaged, and check whether the ambient temperature is too high.
				Overtemperature is caused by abnormal temperature sampling.	Check whether the temperature sampling is normal.
				—	If the alarm persists, contact technical support.
20	Outlet Low Temperature Fault			Actual low temperature is caused by abnormal water circulation, etc.	Check whether the water circulation is normal, and check whether the ambient temperature is too low (The actual temperature below -35°C is considered as normal protection).
				Low temperature is caused by abnormal temperature sampling.	Check whether the temperature sampling is normal.
				—	If the alarm persists, contact technical support.

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion	
21	Cavity Overheating Fault	III	Charge / Discharge Prohibited + Shutdown	Overtemperature is caused by overloading, abnormal water circulation, fan failure, etc.	Check whether the water circulation is normal, the air duct is blocked, the fan is damaged, and check whether the ambient temperature is too high.	
				Overtemperature is caused by abnormal temperature sampling.	Check whether the temperature sampling is normal.	
				—	If the alarm persists, contact technical support.	
22	Cavity Low Temperature Fault			Actual low temperature is caused by abnormal water circulation, etc.	Check whether the water circulation is normal, and check whether the ambient temperature is too low (The actual temperature below -35°C is considered as normal protection).	
				Low temperature is caused by abnormal temperature sampling.	check whether the temperature sampling is normal.	
				—	If the alarm persists, contact technical support.	
23	Battery Overvoltage			Battery voltage is too high.	Check whether the battery voltage is within a normal range.	Check whether the battery overvoltage threshold is set correctly.
					Check whether the battery undervoltage threshold is set correctly.	
24	Battery Undervoltage			Battery voltage is too low.	Check whether the battery voltage is within a normal range.	Check whether the battery undervoltage threshold is set correctly.
					Check whether the grid voltage sampling circuit is normal.	
25	Battery Polarity Reversed			The positive and negative electrodes of the battery are connected reversely.	Check whether the PCS positive and negative buses are connected correctly to the battery.	
				DC slow start time is too long.	Check whether the grid voltage and battery voltage are within a normal range.	
26	DC Slow Start Timeout			DC slow start time is too long.	Check whether the AC switch is functioning correctly.	If the alarm persists, contact technical support.
					Check whether the carrier synchronization cable is not securely connected.	Check whether the carrier synchronization cable is securely connected.
					The relevant function code parameters are not set correctly.	Check whether the relevant function code parameters are within a reasonable range.

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
28	BMS E-Stop Fault	III	Charge / Discharge Prohibited + Shutdown	DI2 is reserved to receive the BMS emergency stop command.	Check whether the reserved DI2 is at a low voltage.
29	DC Software Overcurrent			Excessive current on the DC side.	Check whether the overcurrent parameters on the DC side are within a reasonable range.
30	Grid Voltage RS Sampling Fault			Sampling circuit abnormality.	Contact technical support.
31	Grid Voltage ST Sampling Fault				
32	Grid Voltage TR Sampling Fault				
33	Inverter Phase A Voltage Sampling Fault				
34	Inverter Phase B Voltage Sampling Fault				
35	Inverter Phase C Voltage Sampling Fault				
36	Module Current A Sampling Fault			Sampling circuit abnormality.	Contact technical support.
37	Module Current B Sampling Fault				
38	Module Current C Sampling Fault				
39	Bus Current Sampling Fault				
40	Battery Voltage Sampling Fault				
41	Bus Vpo Sampling Fault III				
42	Bus Von Sampling Fault				
43	Overloading	II	Charge / Discharge Prohibited + Standby	PCS overcurrent running for too long.	Confirm if the power dispatch command exceeds PCS specifications.
44	AC Switch Closure Timeout			Grid synchronization time is too long.	If the alarm occurs repeatedly, contact technical support.
45	Grid Phase-Locked Loop (PLL) Fault			Grid PLL is malfunctioning.	
46	Parallel CAN Communication Timeout			CAN communication connection cable is disconnected.	Check whether the CAN communication cable is normal.
				No host in the parallel system.	Check whether there is a host in the communication system

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
47	Parallel CAN Number Conflict	II	Charge / Discharge Prohibited + Standby	Multiple equipments have the same identifier.	Check whether there are two or more equipments with the same identifier in the communication system.
48	Parallel CAN Host Conflict			There are multiple hosts in the system.	Check whether there two or more hosts in the communication system.
49	Full Bus Software Overvoltage			Actual overvoltage on the DC bus.	Check whether the bus voltage is normal.
				Bus voltage sampling circuit abnormality.	Check whether the bus voltage sampling circuit is normal.
				Fault protection parameter setting is unreasonable.	Check whether the bus voltage threshold is within a reasonable range.
				—	If none of the above causes are confirmed, contact Hoymiles technical support engineers.
				50	Full Bus Software Undervoltage
Bus voltage sampling circuit abnormality.	Check whether the bus voltage sampling circuit is normal.				
Fault protection parameter setting is unreasonable.	Check whether the bus undervoltage threshold is within a reasonable range.				
—	If none of the above causes are confirmed, contact technical support.				
51	DCI Limit Exceeded				
				Contact technical support.	
52	DCV Limit Exceeded			DC component of AC-side voltage exceeds limit.	Contact technical support.
53	Abnormal control command tracking			PWM drive line abnormality (reversed connection, disconnection, etc.).	Check the PWM drive line.
				Sampling circuit abnormality(voltage/ current sampling circuit reversed or disconnected, etc.).	Check the voltage/current sampling circuit.
		—	Contact technical support.		

17.4 BMS Troubleshooting

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
1	PACK Overvoltage	III	Charge/ Discharge Prohibited + Shutdown + Dry Contact Output Active	The voltage of the battery PACK is too high.	Check that the ESS is not charged and check whether an alarm indicating abnormal battery sampling is generated. If yes, handle the alarm by referring to the alarm handling suggestions.
					If no alarm indicating abnormal battery sampling is generated, wait for 5 minutes and check whether the alarm is cleared.
					If the alarm persists, contact technical support.
2	PACK Undervoltage			The voltage of the battery PACK is too low.	Check that the ESS is not charged and check whether an alarm indicating abnormal battery sampling is generated. If yes, handle the alarm by referring to the alarm handling suggestions.
					If no alarm indicating abnormal battery sampling is generated, wait for 5 minutes and check whether the alarm is cleared.
					If the alarm still persists, connect to the grid for charging within 48 hours.
					If the alarm still persists after the ESS is charged for 1 hour, contact technical support.
3	RACK Overvoltage			The voltage of the battery RACK is incorrect.	Check whether the number of battery packs configured on the PC interface is consistent with the number of battery packs installed onsite. If not, adjust it to be consistent.
					Check whether the total voltage sampling cable is loose, or disconnected. If yes, reconnect the cable.
					If the alarm persists, contact technical support.
4	RACK Undervoltage			The voltage of the battery RACK is incorrect.	Check whether the number of battery packs configured on the PC interface is consistent with the number of battery packs installed onsite. If not, adjust it to be consistent.
					Check whether the total voltage sampling cable is loose, or disconnected. If yes, reconnect the cable.
					If the alarm persists, contact technical support.
5	PACK Overtemperature			The liquid-cooling controller is faulty.	Check for any liquid-cooling controller alarms. If yes, handle the alarm by referring to the alarm handling suggestions.
				Overtemperature caused by the fault of the cell NTC.	Open the battery pack front panel and replace the faulty BMU.
		—	If the alarm persists, contact technical support.		

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
6	PACK Low temperature	III	Charge/ Discharge Prohibited + Shutdown + Dry Contact Output Active	The liquid-cooling controller is faulty.	Check for any liquid-cooling controller alarms. If yes, handle the alarm by referring to the alarm handling suggestions.
				Low temperature caused by the fault of the cell NTC.	Open the battery pack front panel and replace the faulty BMU.
				—	If the alarm persists, contact technical support.
7	Battery Temperature Inconsistent			The cell inconsistency is severe.	Wait for 30 minutes and check whether the alarm is cleared.
				The cell temperature sampling is abnormal.	If this alarm still exists , prioritize resolving alarms of liquid-cooling controller and BMU temperature sampling fault
				—	If the alarm persists, contact technical support.
8	Battery Voltage Inconsistent			The cell inconsistency is severe.	Wait for 30 minutes and check whether the alarm is cleared.
				The cell voltage sampling is abnormal.	If this alarm still persists , prioritize resolving alarms of BMU temperature sampling fault.
				—	If the alarm persists, contact technical support.
9	Master-Slave Communication Fault			The BMU communication is abnormal.	Check whether the communications cable is loose, disconnected, or incorrectly connected. If yes, reconnect the cable.
				The BMU is faulty.	Replace the BMU.
10	PACK Voltage Sampling Fault			The FPC connector is loose, the cable is disconnected, or the BMU is faulty.	Remove and reinstall the FPC connector to the BMU and check whether the alarm persists. If yes, replace the BMU.
		If the alarm persists after the BMU is replaced, replace the battery pack.			
		If the alarm persists, contact technical support.			
11	PACK Temperature Sampling Fault	The FPC connector is loose, the cable is disconnected, or the BMU is faulty.	Remove and reinstall the FPC connector to the BMU and check whether the alarm persists. If yes, replace the BMU.		
			If the alarm persists after the BMU is replaced, replace the battery pack.		
			If the alarm persists, contact technical support.		
12	CAN Hall Sensor Communication Fault	The communication cable is disconnected.	Check whether the communications cable is loose, disconnected, or incorrectly connected. If yes, reconnect the cable.		
			If the alarm persists, contact technical support.		

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
13	Inconsistent Between RACK Voltage and Accumulated Voltage	II	Charge/ Discharge Prohibited, Standby	The total voltage value of RACK is incorrect.	Check whether the number of battery packs configured in the PC interface matches the number installed onsite. If not, adjust it to be consistent.
					Check whether the total voltage sampling cable is loose, or disconnected. If yes, reconnect the cable.
					If the alarm persists, contact technical support.
14	EMS Communication Fault	I	Alarm Only	The communication cable is disconnected.	Check whether the communications cable is loose, disconnected, or incorrectly connected. If yes, reconnect the cable.
					If the alarm persists, contact technical support.

17.5 Liquid-Cooling Controller Troubleshooting

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
1	Liquid Level Alarm	I	Alarm Only	The coolant is insufficient or there is no coolant.	Fill coolant in the coolant tank until it is higher than the MIN line. If the alarm still persists after refilling, contact technical support.
2	System High Pressure			High pressure > system limit 4.2MPa.	If the alarm occurs repeatedly, contact technical support.
3	Excessive Outlet Water Pressure of the Battery			> 2.8bar	
4	Excessive Outlet Water Pressure of the PCS			> 2.8bar	
5	Pressure Fault of High-Temperature/Pressure Sensor			The Sensor is experiencing a short circuit or open circuit.	
6	Battery Inlet Temperature Sensor Fault			The Sensor is experiencing a short circuit or open circuit.	
7	Battery Inlet Pressure Sensor Fault			The Sensor is experiencing a short circuit or open circuit.	If the alarm occurs repeatedly, contact technical support.
8	Battery Outlet Temperature Sensor Fault			The Sensor is experiencing a short circuit or open circuit.	

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
9	PCS Inlet Temperature Sensor Fault	I	Alarm Only	The Sensor is experiencing a short circuit or open circuit.	If the alarm occurs repeatedly, contact technical support.
10	PCS Outlet Temperature Sensor Fault			The Sensor is experiencing a short circuit or open circuit.	
11	PCS Inlet Pressure Sensor Fault			The Sensor is experiencing a short circuit or open circuit.	
12	Battery Water pump fault			The power supply to the water pump is abnormal or the cable to the water pump is loose or damaged.	Check the power supply and wiring connections to the battery pump; Power off and then power on, If the alarm occurs repeatedly, contact technical support.
13	PCS Water pump fault			The power supply to the water pump is abnormal or the cable to the water pump is loose or damaged.	Check the power supply and wiring connections to the PCS; Power off and then power on, If the alarm occurs repeatedly, contact technical support.
14	Compressor Fault			The power supply to the Compresso is abnormal or the cable to the water pump is loose or damaged.	Check the power supply and wiring connections to the compressor ; Power off and then power on, If the alarm occurs repeatedly, contact technical support.
15	Temperature Fault of Low-Temperature/ Pressure Sensor			The Sensor is experiencing a short circuit or open circuit	If the alarm occurs repeatedly, contact technical support.
16	Pressure Fault of Low-Temperature/Pressure Sensor			The Sensor is experiencing a short circuit or open circuit	
17	Temperature Fault of High-Temperature/ Pressure Sensor			The Sensor is experiencing a short circuit or open circuit	

17.6 Fire Suppression System Troubleshooting

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
1	Low Pressure of Firefighting Bottle	I	Alarm Only	Equipment Fault.	If the alarm occurs repeatedly, contact technical support.
2	Abnormal Pressure Feedback of Firefighting Bottle				
3	Abnormal Explosion Relief Panel				
4	Explosion-Proof Fan Fault			The fan power input or feedback cable is abnormal, or the fan is fault.	Check whether the power input cable and control cable of the explosion-proof fan are disconnected or whether the cable connectors are exposed. If yes, reconnect the cables. If not, use a multimeter to check whether the cables are broken.
					Check whether the fan is damaged or burnt. If yes, replace the fan.
					If the alarm persists, contact technical support.
5	Smoke Abnormality	The humidity inside the cabin is too high, the sensor is dusty, or the cabin is on fire.	Observe the system remotely for 30 minutes to check whether other exceptions (such as abnormal battery voltage, battery temperature, and combustible gas concentration) occur. During the remote observation, do not approach the ESS or open the ESS doors.		
			If no exception is found during the 30-minute remote observation, send trained personnel to the site and observe the system for 30 minutes from a safe distance. If there is smoke or fire, evacuate onsite personnel as soon as possible, call the fire emergency service, and provide firefighters with related.		
			If no exception is found during remote observation and onsite observation, open the ESS doors and check and replace the smoke detector.		
6	Temperature Abnormality		The cabinet is on fire or the sensor is faulty.	Observe the system remotely for 30 minutes to check whether other exceptions (such as abnormal battery voltage, battery temperature, and combustible gas concentration) occur. During the remote observation, do not approach the ESS or open the ESS doors.	

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
6	Temperature Abnormality	I	Alarm Only	The cabinet is on fire or the sensor is faulty.	If no exception is found during the 30-minute remote observation, send trained personnel to the site and observe the system for 30 minutes from a safe distance. If there is smoke or fire, evacuate onsite personnel as soon as possible, call the fire emergency service, and provide firefighters with related product information, including the battery pack type, ESS capacity, and battery pack location. If no exception is found during remote observation and onsite observation, open the ESS doors and check and replace the temperature detector.
7	High Concentration of Combustible Gas			The gas concentration is high or the detector is faulty.	Observe the system remotely for 30 minutes to check whether other exceptions (such as abnormal battery voltage, battery temperature, and combustible gas concentration) occur. During the remote observation, do not approach the ESS or open the ESS doors. If no exception is found during the 30-minute remote observation, send trained personnel to the site and observe the system for 30 minutes from a safe distance. If there is smoke or fire, evacuate onsite personnel as soon as possible, call the fire emergency service, and provide firefighters with related product information, including the battery pack type, ESS capacity, and battery pack location. Do not enter the affected building or equipment area under any circumstances, and do not open the ESS doors. Isolate and monitor the site. Keep irrelevant personnel away from the site. After the fire is extinguished, the site must be handled by professionals in accordance with local laws and regulations. Do not open the ESS doors without permission. If no exception is found during remote observation and onsite observation, open the ESS doors and check and replace the combustible gas detector.
8	Temperature Detector Alarm			Equipment Fault.	If the alarm occurs repeatedly, contact technical support.
9	Smoke Detector Alarm				
10	CO Detector Alarm				
11	O ₂ Detector Alarm				
12	VOC Detector Alarm				

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
13	3.3V Alarm of Sensor Module Alarm in PACK Firefighting	I	Alarm Only	PACK Firefighting Device Fault.	If the alarm occurs repeatedly, contact technical support.
14	GND Alarm of Sensor Module Alarm in PACK Firefighting				
15	Sensor Module Detached Alarm of PACK Firefighting				
16	Puncture Valve Alarm of PACK Firefighting				
17	Smoke Detector Alarm of PACK Firefighting				
18	NTC Alarm of PACK Firefighting				
19	CO Detector Alarm of PACK Firefighting				
20	VDD 5V Alarm of PACK Firefighting				
21	Flash Alarm of PACK Firefighting				
22	Smoke Not Tuned to Zero of PACK Firefighting				

17.7 Environment Control System Troubleshooting

No.	Alarm Name	Alarm Severity	Protection Action	Possible Cause	Suggestion
1	E-Stop Alarm	IV	Charge / Discharge Prohibited + Shutdown + Disconnect Main and Auxiliary Circuit Breakers	1. The E-Stop button is pressed. 2. The feedback cable to the E-Stop button is disconnected.	1. Rectify the system fault first. 2. After the fault is rectified, rotate the E-Stop button out. 3. Check whether the cable to the E-Stop button is disconnected or whether the cable connector is exposed. If not, use a multimeter to check whether the cable to the E-Stop button is broken. 4. If the alarm persists, replace the E-Stop button
2	Water Alarm	III	Charge / Discharge Prohibited + Shutdown	Water accumulates in the ESS or the sensor is faulty.	1. Check whether there is water inside the ESS cabinet. If yes, drain the water. If not, replace the water sensor. 2. If the alarm persists after the replacement, contact technical support.
3	SPD Fault	III	Charge / Discharge Prohibited + Shutdown	The detection cable is disconnected or the SPD is faulty.	1. Check whether the SPD signal cable is loose and whether the cable connector is exposed. 2. Check whether the SPD indicator changes its color or is burnt. If the color has changed, replace the SPD. 3. If the alarm persists, contact technical support.
4	ESS Door Open	I	Alarm Only	The ESS door is open.	1. Check whether the door is completely closed. If not, close the door completely. 2. Check whether the cable to the door limit switch is disconnected. If yes, connect the cable properly. 3. Check whether the door status sensor is displaced or the door panel is deformed. If yes, restore it to the original status. If not, replace the sensor. 4. If the alarm persists, contact technical support.



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