SUNGROW
Clean power for all

Preventive Maintenance Manual

PowerStack



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About This Manual

To ensure system safety and operational efficiency, routine inspections of the energy storage system (ESS) are required. This manual introduces the inspection intervals and procedures for the ESS.

This manual takes the products sold in markets following IEC standards as an example. Products sold in other markets are similar in terms of inspection requirements.

Target Group

This manual is intended for operators in energy storage plants and qualified electrical technicians.

How to Use This Manual

Read through this manual carefully before using the product, and keep it properly in an easy-to-reach place.

To increase customer satisfaction, the product and its manual will be updated and improved constantly. If the manual you have received is slightly inconsistent with the real product, it is probably owed to a product update. In such a case, the real product shall take precedence.

The manual may be updated and revised from time to time, however, there still might be slight deviations from the real product or errors. In such cases, the actual product you have purchased should take precedence. You can find the latest manual by scanning the QR code on the product or reaching your sales.

The figures in this manual are for reference only. The actual product received may differ.

Symbols in the Manual

To ensure the safety of life and property for users when using the product and to improve the efficiency of product use, the manual provides relevant information, which are highlighted by the following symbols.

Symbols used in this manual are listed below. Please review carefully for better use of this manual.

⚠ DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a moderately hazardous situation which, if not avoided, will result in death or serious injury.

⚠ CAUTION

Indicates a slightly hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

Indicates a potential hazard which, if not avoided, will result in device malfunction or property damage.

"NOTE" indicates supplementary information, emphasis on specific points, or tips related to the use of the product that might help to solve your problems or save your time.

Signs on the Product

Observe at all times the warning signs on the product, including:

Sign	Definition
	High voltages inside! Risk of electrical shock hazards when touching it.
	Protective earthing (PE) terminal. This terminal must be connected for reliable grounding to ensure the safety of the operator.
	Read the manual before performing any operation on the product.
	After the product is disconnected from external power sources, wait at least 5 minutes before touching any of its internal conductive parts.
	Danger! Do not work on the product when it carries voltage.
	Beware of heavy weights! Lifting the heavy object directly may cause back injury. Please lift it with the assistance of proper tools.
	Beware of explosion.
	Beware of corrosion.
	Do not dispose of it together with household waste.

Sign	Definition
	No fires.
	A nearby medical facility must be set up.
	If it gets in your eyes, flush you eyes immediately with running water or saline, and seek medical advice in time.
	Wear safety goggles.
	The product is recyclable.
	The lithium battery is recyclable.
	Noise hazard! Wear earplugs.

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1 Scope of Application

This manual applies to the following models of PowerStack series energy storage systems:

- ST225kWh-110kW-2h-AU
- ST455kWh-110kW-4h-AU

External Design

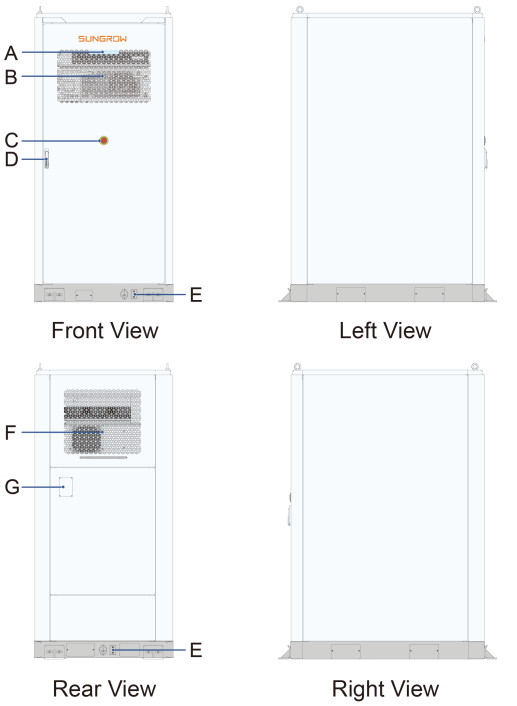


Figure 1-1 External Design of ST225kWh-110kW-2h-AU

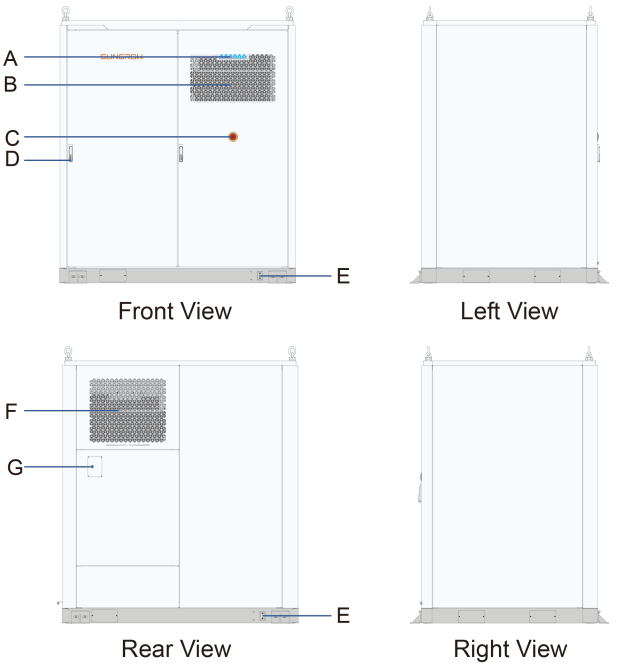


Figure 1-2 External Design of ST455kWh-110kW-4h-AU

*The figure is for reference only. Optional components such as explosion vent panel and emergency ventilation fans are not shown. The actual product shall prevail.

No.	Item
A	LED indicator
B	Air inlet
C	Emergency stop button
D	Door lock
E	Grounding point
F	Air outlet
G	Nameplate

Internal Components

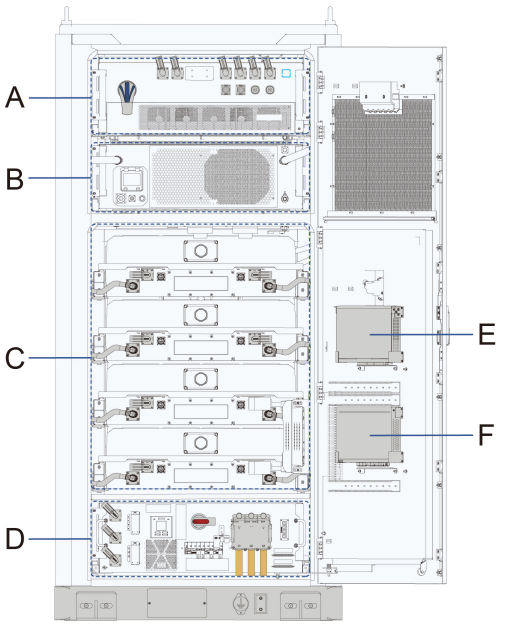


Figure 1-3 Internal Components of ST225kWh-110kW-2h-AU

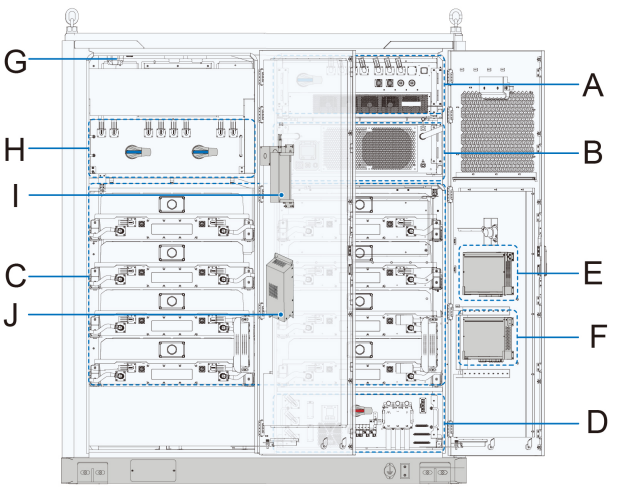


Figure 1-4 Internal Components of ST455kWh-110kW-4h-AU

*The figure is for reference only. The selection or location of some components is subject to change based on the project design. The final configuration of the supplied product shall prevail!

No.	Item
A	DC/AC power converter unit (SC110CX)

No.	Item
B	Liquid cooling unit
C	Battery Rack (compartment)
D	Power distribution box
E	LC300
F	EMS300CP (optional)
G	Fire suppression system (FSS)
H	Switch gear (S/G)
I	Aerosol Device
J	Dehumidifier (optional)

2 Safety Overview

2.1 Personnel Requirements

All inspection operations must and may only be performed by qualified technical personnel. Qualified technical persons must:

- Hold a valid electrician license as required by the country or region where the product is located.
- Be familiar with local standards and relevant safety codes for electrical systems.
- Be proficient in the principles and structure of the equipment and have experience in equipment operation or training.
- Read through this manual carefully and master relevant safety instructions, and clearly recognize all potential hazards associated with equipment operation and maintenance.

2.2 Weather and Environment Requirements

Weather Requirements

⚠ WARNING

- **Inspect the equipment in good weather conditions whenever possible. Stop inspection in severe weather conditions, such as heavy rain, fog, or strong wind.**
- **Do not open the door and maintain the system on rainy, humid, or windy days. SUNGROW shall not be held liable for any possible damage arising from failure to observe this instruction.**
- **Do not open the cabinet door on days with rain, snow, heavy fog, or high humidity. Make sure the sealing strip around the door does not curl after closing the cabinet door.**
- **Perform special inspection in response to adverse seasonal and weather conditions, such as rainy seasons, extreme cold, extreme heat, and typhoons.**

Place Warning Signs

NOTICE

To prevent unauthorized personnel from approaching the equipment and causing accidental operation or injury, observe the following precautions:

- **Put up highly visible warning signs around the equipment to prevent accidents caused by inadvertent switching-on.**
- **Set up warning signages or fence off a warning zone near the equipment.**

Escape Route

NOTICE

Power plants where the products are installed are typically located in remote field environments. Please observe the following precautions:

- **Equip the site with appropriate rescue facilities.**
- **Keep all escape routes and rescue routes clear off any obstruction.**

2.3 Protective Equipment

Protective equipment includes personal protective equipment (PPE) and electrical safety equipment (ESE).

PPE

Be sure to wear the following PPE compliant with local regulations when performing equipment inspection and operation.



High-visibility vest



Safety gloves



Safety helmet







Goggles	Earplugs	Safety shoes

ESE

For live operation, make sure that at least two personnel are present on site and that the following ESE is prepared to ensure personal safety.

		
Rescue hook	Insulated stool	Protective masks

2.4 Inspection Tools

Using safe, well-maintained, and in-date inspection tools is essential for ensuring both reliable equipment operation and personal safety.

Examples of Inspection Tools

		
Clamp meter	1500 VDC multimeter	Phase rotation tester
		
Screwdriver	Wrench set	Torque wrench



Two-pole voltage tester

The above list includes only a few commonly used inspection tools. Other standard tools are not listed here. For the specific tools required for each inspection task, please refer to the Tool Preparation section provided under each corresponding inspection item.

2.5 Operation Requirements

Battery Safety

⚠ WARNING

- **There are no user-maintainable parts inside battery units.**
- **Only personnel authorized by SUNGROW can remove, replace, or dispose of batteries. Users are not allowed to perform battery maintenance.**

⚠ DANGER

Dismantling or incinerating batteries may result in fire.

Electrical Safety

⚠ DANGER

- **Touching power grid or contact points and terminals in the devices connected to the power grid may lead to electric shock!**
- **Voltage may be generated on the battery or grid side. Verify that there is no voltage present using a standard voltmeter before touching.**

⚠ DANGER

Hazardous high voltage inside the product!

- **Always note and observe warning signs on the product.**
- **Observe safety precautions listed in this manual and other pertinent documents.**
- **Observe relevant protection requirements and precautions for batteries.**

⚠ DANGER

Ensure the system has stopped running before power-off!

⚠ DANGER

Voltage may remain in the batteries even after the power supply of the ESS is disconnected. Before performing any operation, wait 10 minutes and then verify that the equipment is completely de-energized.

⚠ WARNING

Replacement of internal components must be performed exclusively by qualified personnel.

⚠ WARNING

- **To prevent electric shock, do not perform any maintenance operations beyond those covered in this manual.**
- **If maintenance services are required, contact SUNGROW Customer Service for maintenance.**

Component Safety

NOTICE

- **Do not spray paint over any internal or external components of the equipment.**
- **Do not apply cleaning agents to any components or expose them to harsh chemicals.**

2.6 Component Disposal

Do not dispose of the damaged components identified during inspection as general waste. Some components may be recycled, while others may pose environmental hazards.

Please contact an authorized, specialized recycling service in your locality for proper disposal of the product and its internal components.

3 ESS Inspection Checklist

- The recommended maintenance frequency is listed below. The frequency must be adjusted based on the installation site conditions.
- The maintenance frequency is subject to factors such as plant size, installation position, and on-site environment. For the equipment operating in sandy or dusty environments, it is necessary to shorten the intervals and increase the maintenance frequency.

Module	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
Exterior inspection and cleaning	1. Check the surroundings of the cabinet for any flammables. If necessary, move them at least 10 m away from the cabinet.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	1
	2. Use a vacuum cleaner or broom to clean the equipment surface and base.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2
	3. Inspect the interior of the cabinet, focusing on key areas such as the air inlet filter screen, air inlets and outlets, and air ducts. Clean these areas with a vacuum cleaner.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2
	4. Inspect the interior of the cabinet for signs of water ingress.	BESS container,	Once a year	1

Module	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
		transformer cabinet (optional), and ATS equipment		
Cabinet structure inspection	1. Inspect the internal and external metal parts of the cabinet, including electrical equipment and cable connectors, for signs of oxidation or corrosion.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	1
	2. Inspect the fastening screws of the DC/AC power converter unit, liquid cooling unit, and power distribution box, and check whether any screws have shifted relative to the torque marks.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	1
	3. Inspect the enclosure surface for dents or deformation that may cause paint damage.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	2
	4. Check whether the door lock opens and closes smoothly. Lubricate the door lock, hinges, and other components if necessary.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	5

Module	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
	5. Check the enclosure sealing strips to ensure they are intact, and replace any damaged ones.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	Two minutes for check and 10 minutes for replacement
	6. Inspect the labels and markings (such as safety warnings, terminal identifications, and operating instructions) on equipment panels and enclosure surfaces. Replace any ones that are illegible, damaged, or missing.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	5
Cable connection inspection	1. Visually check power and signal cable terminal latches for looseness.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	2
	2. Inspect power cables for signs of cuts or damage, especially where they contact metal surfaces.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	2
	3. Inspect all cabinet cable entries to ensure they are fully sealed with firestop putty.	BESS container, transformer cabinet (optional),	Once a year	2

Module	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
		and ATS equipment		
	4. Check whether the insulating cable ties are loose or missing.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	2
	5. Inspect the connections of the cable shielding layers, insulating sleeves, and grounding flat steel for looseness.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	2
Electrical performance inspection	1. Inspect the surge protective device and fuses for signs of damage, and replace them promptly if necessary.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	Two minutes for check and five minutes for replacement
	2. Check whether the emergency stop button can function properly. Perform the following operations as needed: • Maintenance personnel shall wear safety helmets and safety gloves. When the ESS cabinet is in the standby state, press the emergency stop button, and observe whether the AC	BESS container and ATS equipment	Once a year	5

Module	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
	side switch is disconnected and whether the system is shut down. • Wait for approximately 10 s and observe whether the LED status indicator light turns from blue to red. • Release the emergency stop button using the key, power on the AC side, and start up the ESS cabinet. Confirm that the system resumes normal operation.			
	3. Inspect the equipment for abnormal noise during operation (excluding normal fan noise and regular electrical humming).	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	1
	4. Check whether the mechanical operation of components such as load switches, circuit breakers, and contactors is normal. If any looseness is found, request spare parts for replacement.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	5
	5. Check whether the UPS operates properly and check for any anomaly alarms. If the UPS cannot operate properly, submit a spare-part replacement request.	BESS container	Once a year	2
LCS inspection	1. Inspect coolant pipes for any signs of leakage.	BESS container	Once a year	1

Module	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
	2. Inspect the water pump for visible leakage (excluding condensation). If any leakage is found, replace the seal rings.	BESS container	Once a year	Two minutes for check and 10 minutes for replacement
	3. Check the coolant for impurities or dark discoloration, and test its pH.	BESS container	Once every six months	5
	4. Check whether the dehumidifier operates properly and inspect the drain pipe for blockages.	BESS container	Once a year	2
FSS inspection	1. Annual inspection of the FSS is recommended.	BESS container	Once a year	—
Remote data check	1. Check the EMS interface for any system overtemperature faults or alarms.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2
	2. Check whether the operating parameters, such as voltage and power, are within the allowable range.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2

Module	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
	3. Check the cooling unit alarm on the EMS. If the coolant level is too low, refill the coolant on site.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2
	4. Log in to the LC user interface and check the dehumidifier's operating status.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2
	5. Save the history curves, fault logs, and dispatch records to the corresponding files.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2
Battery recharge	1. If the system remains idle for more than six months, perform the following recommended operations: • Perform charge-discharge cycles and adjust the SOC to 30%–40%. After charging, ensure that the SOC values remain consistent across all ESS stacks. • Charge the UPS once.	BESS container	Once every six months	—

4 Exterior Inspection and Cleaning

4.1 Inspection Checklist

The exterior and cleanness inspection items for the BESS container and its internal components, transformer cabinet (optional), and ATS equipment are listed in the table below:

- The recommended maintenance frequency is listed below. The frequency must be adjusted based on the installation site conditions.
- The maintenance frequency is subject to factors such as plant size, installation position, and on-site environment. For the equipment operating in sandy or dusty environments, it is necessary to shorten the intervals and increase the maintenance frequency.

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
1	Check the surroundings of the cabinet for any flammables. If necessary, move them at least 10 m away from the cabinet.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	1
2	Use a vacuum cleaner or broom to clean the equipment surface and base.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2
3	Inspect the interior of the cabinet, focusing on key areas such as the air inlet filter screen, air inlets and outlets, and air ducts. Clean these areas with a vacuum cleaner.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
4	Inspect the interior of the cabinet for signs of water ingress.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	1

The manual covers multiple configuration scenarios. Perform maintenance according to the actual configuration at the project site.

4.2 Safety Precautions

⚠ WARNING

Follow the procedure for working at heights when inspecting the top of the cabinet. Maintenance personnel must wear personal protective equipment (PPE) such as safety helmets and safety harnesses.

⚠ WARNING

- **Maintenance personnel must wear PPE when handling flammables. PPE, including but not limited to safety helmets, safety gloves, and protective clothing, must comply with relevant national/regional standards.**
- **Handle flammables during the daytime whenever possible. If handling at night is unavoidable, never use open flames for lighting.**
- **Do not smoke or engage in any activity involving fire when handling flammables.**
- **Do not throw, drag, or flip flammables.**

⚠ WARNING

- **Do not clean the equipment with water directly. Use a vacuum cleaner if necessary.**
- **Do not use cleaning agents to clean internal devices or expose the devices to harsh chemicals.**

⚠ WARNING

Circuit boards and components must be cleaned using dry tools such as dry paper towels. SUNGROW shall not be held liable for any equipment damage caused by the use of other tools.

NOTICE

The air inlets and outlets must be checked for proper ventilation. Otherwise, a fault may be caused due to overheating if the module cannot be cooled effectively.

NOTICE

When closing the door, ensure the sealing strips around the door do not curl.

4.3 Tool Preparation

Before performing exterior inspection and cleaning, prepare the required tools to ensure smooth maintenance, including but not limited to the following:

No.	Name	Quantity (pcs)	Description
1	Ladder	1	A 2.5 m A-frame ladder is recommended. (The cabinet height is 2450 mm. Adjust the ladder height based on the actual site foundation height.)
2	Safety harness	1	-
3	Safety helmet	1	-
4	Safety gloves	1	-
5	Dust mask	1	-
6	Cleaning cloth	1	It is recommended to use cleaning cloth or other cleaning tools.
7	Broom	1	-
8	Industrial vacuum cleaner	1	It is recommended to use an industrial vacuum cleaner equipped with swivel casters and fixed casters.

4.4 Inspection Procedure

This section introduces exterior and cleanness inspection items for the BESS container, transformer cabinet (optional), and ATS equipment.

1. Check the surroundings of the cabinet for any flammables. If necessary, move them at least 10 m away from the cabinet.
   a. Wear PPE such as safety helmets and protective clothing, and visually check for flammables around the ESS cabinet.
   b. Wear PPE such as safety harnesses, and use a ladder to check for flammables on the top of the ESS cabinet.
   c. If any flammables are found, maintenance personnel shall wear PPE such as safety gloves and dust masks and move the flammables to a designated storage area away from the ESS cabinet.
2. Use a vacuum cleaner or broom to clean the equipment surface and base.
   a. Visually check the foundation for foreign objects, dust, and dirt.
   b. In case of heavy dust accumulation, wear a dust mask and remove the dust with a broom or an industrial vacuum cleaner.
3. Inspect the interior of the cabinet, focusing on key areas such as the air inlet filter screen, air inlets and outlets, and air ducts. Clean these areas with a vacuum cleaner.



Figure 4-1 Interior of ESS Cabinet



Figure 4-2 Interior of Transformer Cabinet



Figure 4-3 Interior of ATS Equipment

a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.

b. Maintenance personnel shall wear safety helmets and safety gloves, and open the cabinet door.

c. Check internal air inlets and fan air outlets for blockages.

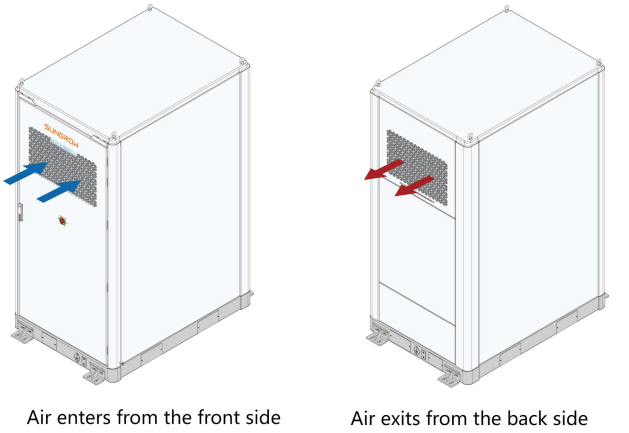


Figure 4-4 Air Inlet and Outlet of ESS Cabinet

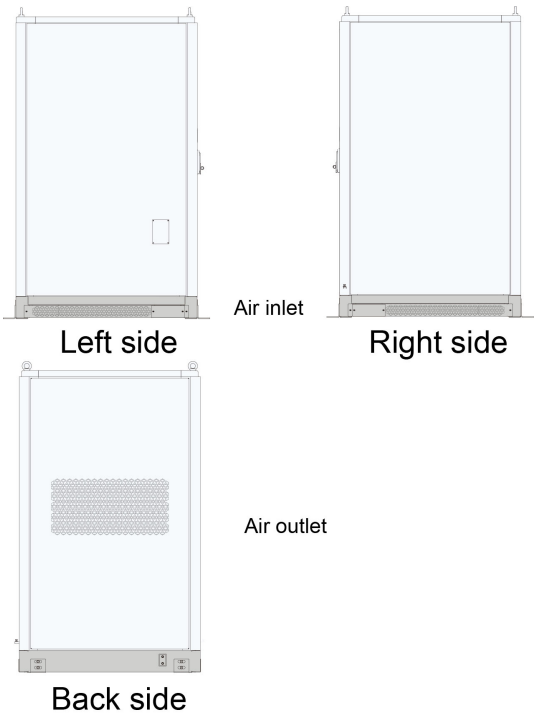


Figure 4-5 Air Inlet and Outlet of Transformer Cabinet

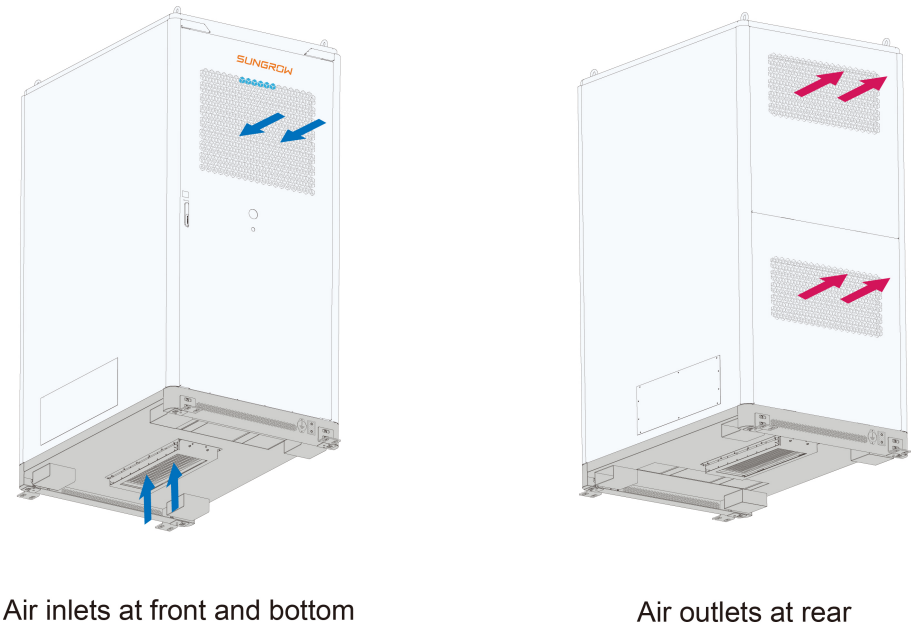


Figure 4-6 Air Inlet and Outlet of ATS Equipment

1. If any blockage is found, clear the obstruction, and manually turn the fan to check whether it rotates smoothly.
2. If the filter screens at the air inlets and outlets are severely blocked, clean the filter screen.

d. Wipe all internal surfaces of the cabinet with a dry paper towel or dry cloth. Determine whether internal dust removal is required based on how dirty the paper towel or cloth is after wiping. If heavy dust buildup is found inside the cabinet, wear a dust mask and use a portable industrial vacuum cleaner to remove the dust. The component system must be powered down and de-energized.



Figure 4-7 Wiping with Dry Paper Towel or Dry Cloth

4. Inspect the interior of the cabinet for signs of water ingress.

a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.

b. Maintenance personnel shall wear safety helmets and safety gloves, and open the cabinet door.

c. Use a flashlight or searchlight to carefully check all corners of the equipment for signs of water accumulation.

d. If water accumulation is found, troubleshoot each possible cause one by one until the cause is identified, and take appropriate measures to prevent water ingress.

1. Check whether the cabinet door is properly closed and whether the door sealing strips have failed.
2. Check whether the cable entries are completely sealed.
3. Check whether there is condensation caused by excessive air humidity.

5 Cabinet Structure Inspection

5.1 Inspection Checklist

The cabinet structure inspection items for the BESS container and its internal components, transformer cabinet (optional), and ATS equipment are listed in the table below:

- The recommended maintenance frequency is listed below. The frequency must be adjusted based on the installation site conditions.
- The maintenance frequency is subject to factors such as plant size, installation position, and on-site environment. For the equipment operating in sandy or dusty environments, it is necessary to shorten the intervals and increase the maintenance frequency.

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
1	Inspect the internal and external metal parts of the cabinet, including electrical equipment and cable connectors, for signs of oxidation or corrosion.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	1
2	Inspect the fastening screws of the DC/AC power converter unit, liquid cooling unit, and power distribution box, and check whether any screws have shifted relative to the torque marks.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	1
3	Inspect the enclosure surface for dents or deformation that may cause paint damage.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	2

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
4	Check whether the door lock opens and closes smoothly. Lubricate the door lock, hinges, and other components if necessary.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	5
5	Check the enclosure sealing strips to ensure they are intact, and replace any damaged ones.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	Two minutes for check and 10 minutes for replacement
6	Inspect the labels and markings (such as safety warnings, terminal identifications, and operating instructions) on equipment panels and enclosure surfaces. Replace any ones that are illegible, damaged, or missing.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	5

The manual covers multiple configuration scenarios. Perform maintenance according to the actual configuration at the project site.

5.2 Safety Precautions

DANGER

High voltage hazard! Electric shock hazard!

- **Do not touch live parts!**
- **Ensure that both the AC and DC sides are de-energized before inspection.**

⚠ WARNING

- **The gas released by the rust remover is flammable. Keep the remover away from high temperatures, sparks, flames, and areas where electrostatic discharge is generated.**
- **The rust remover shall be used in well-ventilated areas.**
- **Avoid contact with skin and eyes, and do not inhale the rust remover vapors. In case of accidental contact or inhalation, seek medical attention immediately.**

⚠ WARNING

- **Verify all input cable polarities to ensure correct connection.**
- **Do not pull wires or cables forcefully to avoid damaging the insulation.**
- **Ensure that all cables and wires maintain an appropriate bending radius.**
- **Take necessary auxiliary measures to reduce mechanical stress applied on cables and wires.**

NOTICE

Follow standard operating procedure to connect or disconnect cables. Do not use excessive force during operation.

NOTICE

When closing the door, ensure the sealing strips around the door do not curl.

NOTICE

Cable reconfiguration must comply with applicable local standards and regulations.

5.3 Tool Preparation

No.	Name	Quantity (pcs)	Description
1	Safety helmet	1	-
2	Safety gloves	1	-
3	Dust mask	1	-
4	Rust remover	1	It is recommended to use a metal surface rust remover that can quickly

No.	Name	Quantity (pcs)	Description
			remove rust without corroding the material of the workpiece.
5	Grease	1	-
6	Sealing strip	1	-
7	Zinc-rich primer	1	-
8	Dry paper towel / dry cleaning cloth	1	It is recommended to use dry cleaning tools, such as cleaning cloth and paper towels.
9	Industrial vacuum cleaner	1	It is recommended to use an industrial vacuum cleaner equipped with swivel casters and fixed casters.
10	Screwdriver	1	It is recommended to use an electric screwdriver.
11	Flashlight	1	It is recommended to use a flashlight, searchlight, or other lighting tools.

5.4 Inspection Procedure

This section introduces cabinet structure inspection items for the BESS container, transformer cabinet (optional), and ATS equipment.

1. Inspect the internal and external metal parts of the cabinet, including electrical equipment and cable connectors, for signs of oxidation or corrosion.
   a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.
   b. Maintenance personnel shall wear safety helmets and safety gloves, open the cabinet door, and visually inspect the interior for corrosion or oxidation.
   c. If corrosion or oxidation is found on the interior, it is recommended to replace the affected components.
   d. If structural parts are rusted, sand the rusted area with sandpaper or rust remover, and repair the paint with a soft brush.



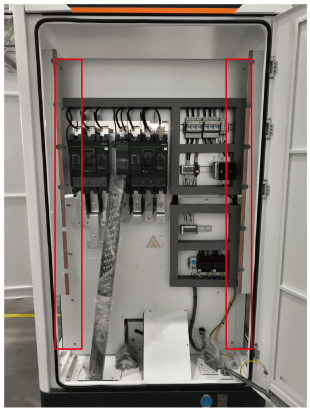
Figure 5-1 Rust Removal and Paint Repair

*The figure is for reference only. The actual product may differ.

2. Inspect the fastening screws of the DC/AC power converter unit, liquid cooling unit, and power distribution box, and check whether any screws have shifted relative to the torque marks.



Figure 5-2 Locations of Screws Inside ESS Cabinet



Front side

Figure 5-3 Locations of Screws Inside Transformer Cabinet



Figure 5-4 Locations of Screws Inside ATS Equipment

a. Maintenance personnel shall wear safety helmets and safety gloves, and check the fastening screws of the DC/AC power converter unit, liquid cooling unit, and power distribution box for any looseness.

b. If any looseness is found in the above parts, tighten them using a screwdriver or wrench. For tightening torque specifications, refer to 12.3 Tightening Torque.

3. Inspect the enclosure surface for dents or deformation that may cause paint damage. Choose an appropriate solution based on the severity of the damage.

a. Level 1: Surface dirt is removable.

1. Wet the cloth (or other scrubbing tools) with water, then wipe the dirty areas on the surface.

2. If water cannot remove the dirt, use 97% alcohol to wipe the surface until it is clean enough (You may also use non-corrosive cleaning agents that are commonly used in your area.)

b. Level 2: Surface dirt is not removable.

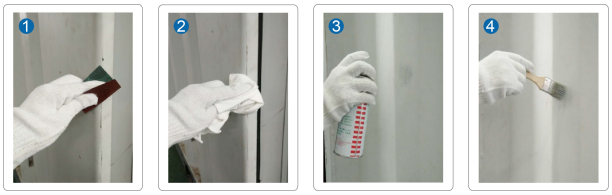
1. Use sandpaper to sand areas where the paint surface has roughness or scratches until the surface becomes smooth.
2. Wet the cloth with water or 97% alcohol, and scrub the damaged area to remove the dirt and stain from the surface.
3. After the surface is dried, apply touch-up paint to the scratched area using a soft brush. Ensure the paint is evenly applied.



*The figure is for reference only. The actual product may differ.

c. Level 3: Primer damage with exposed substrate

1. Sand the damaged area with sandpaper and remove the rusts or burrs to create a smooth surface.
2. Wet the cloth with water or 97% alcohol and scrub the damaged area to remove the dirt and stain from the surface.
3. Let the surface dry completely. Then, spray zinc-rich primer on the area where the substrate is exposed. Ensure the spray covers the exposed substrate completely.
4. After the primer is dried, apply touch-up paint to the damaged area using a soft brush. Ensure the paint is evenly applied.

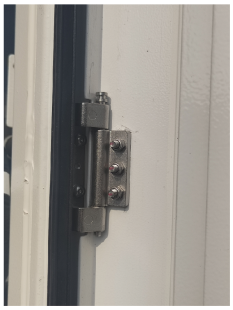


*The figure is for reference only. The actual product may differ.

4. Check whether the door lock opens and closes smoothly. Lubricate the door lock, hinges, and other components if necessary.

a. Wear safety gloves, open and close the door, and check whether the locks and hinges operate smoothly.





*The figure is for reference only. The actual product may differ.

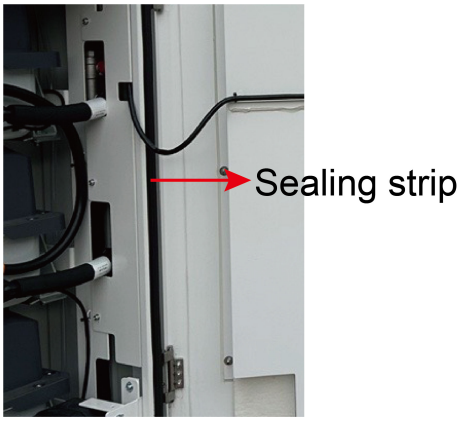
b. If sticking, jamming, or other abnormalities occur in the door locks or hinges during opening or closing, locate the obstruction, and apply grease to the hinge structure at that position.

c. If the lock body is corroded and the door cannot be opened, request spare parts for replacement.

5. Check the enclosure sealing strips to ensure they are intact, and replace any damaged ones.

a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.

b. Wear safety gloves and open the cabinet door. Check whether the sealing strips on each cabinet door are cracked, detached, or severely worn. Pull the sealing strips to check whether their elasticity is normal.



*The figure is for reference only. The actual product may differ.

c. If any abnormality is found during the inspection, it is recommended to replace the corresponding sealing strips.

d. Apply silicone sealant to the connection points of the sealing strips.

6. Inspect the labels and markings (such as safety warnings, terminal identifications, and operating instructions) on equipment panels and enclosure surfaces. Replace any ones that are illegible, damaged, or missing.

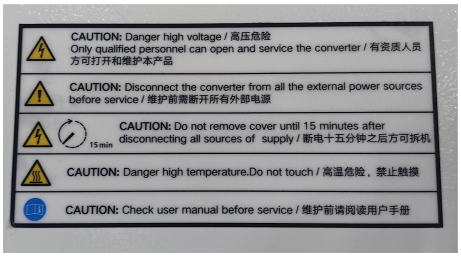


Figure 5-5 Warning Labels

*The figure is for reference only. The actual product may differ.

a. Visually inspect the warning labels on the cabinet panel and internal components to ensure that they are clearly visible and legible.

b. If any warning label is detached, damaged, or dirty, remove the label and clean the surface with alcohol. After the surface is dry, attach a new warning label.

6 Cable Connection Inspection

6.1 Inspection Checklist

The cable connection inspection items for the BESS container and its internal components, transformer cabinet (optional), and ATS equipment are listed in the table below:

- The recommended maintenance frequency is listed below. The frequency must be adjusted based on the installation site conditions.
- The maintenance frequency is subject to factors such as plant size, installation position, and on-site environment. For the equipment operating in sandy or dusty environments, it is necessary to shorten the intervals and increase the maintenance frequency.

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
1	Visually check power and signal cable terminal latches for looseness.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	2
2	Inspect power cables for signs of cuts or damage, especially where they contact metal surfaces.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	2
3	Inspect all cabinet cable entries to ensure they are fully sealed with firestop putty.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	2
4	Check whether the insulating cable ties are loose or missing.	BESS container, transformer cabinet (optional),	Once a year	2

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
		and ATS equipment		
5	Inspect the connections of the cable shielding layers, insulating sleeves, and grounding flat steel for looseness.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	2

6.2 Safety Precautions

⚠ WARNING

- **Verify all input cable polarities to ensure correct connection.**
- **Do not pull wires or cables forcefully to avoid damaging the insulation.**
- **Ensure that all cables and wires maintain an appropriate bending radius.**
- **Adopt necessary auxiliary measures to reduce the stress applied to cables and wires.**

NOTICE

Follow standard operating procedure to connect or disconnect cables. Do not use excessive force during operation.

NOTICE

Cable reconfiguration must comply with applicable local standards and regulations.

NOTICE

The cabinet must have two grounding points, both of which shall be reliably grounded.
The grounding method must comply with the applicable local standards and regulations.

6.3 Tool Preparation

No.	Name	Quantity (pcs)	Description
1	Safety helmet	1	-
2	Safety gloves	1	-
3	Dust mask	1	-
4	Sealing material	1	-
5	Cable tie	1	-
6	Screwdriver	1	It is recommended to use an electric screwdriver.

6.4 Inspection Checklist

This section introduces the cable connection inspection items for the BESS container, transformer cabinet (optional), and ATS equipment.

1. Visually check power and signal cable terminal latches for looseness.

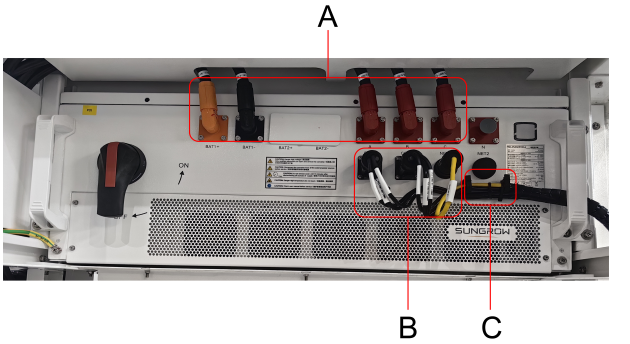


Figure 6-1 PCS Cables

*The figure is for reference only. The actual product may differ.

No.	Description
A	Power cable and base
B	Communication cable and base
C	Cable tie

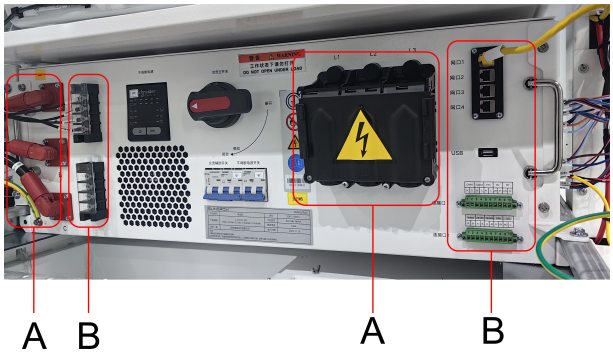


Figure 6-2 BSP Cable

*The figure is for reference. The actual product may differ.

No.	Description
A	Power cable and base
B	Communication cable and base

a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.

b. Maintenance personnel shall wear safety helmets and safety gloves, and open the cabinet door.

c. Visually check whether the terminal latches of the power cables and signal cables are properly engaged. If any connection is loose, tighten it.

2. Inspect power cables for signs of cuts or damage, especially where they contact metal surfaces.

a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.

b. Maintenance personnel shall wear safety helmets and safety gloves, and open the cabinet door.

c. Use a flashlight or searchlight to carefully check the internal cables for insulation layer damage. Pay particular attention to bends and corners, hinge connection points, connection points between the equipment and conduits. If insulation layer damage is found on any conductor, replace the affected conductor promptly. For cable preparation procedure, refer to 12.2 Prepare Cables.

d. Check whether the bolt connections show any signs of discoloration or burning. If so, it is recommended to replace the affected bolts.

3. Inspect all cabinet cable entries to ensure they are fully sealed with firestop putty.



Figure 6-3 Sealing of Cable Entries

*The figure is for reference only. The actual product may differ.

a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.
b. Maintenance personnel shall wear safety helmets and safety gloves, and open the cabinet door.
c. Inspect all cable entries inside the cabinet to ensure they are fully sealed with firestop putty. If any entries are not fully sealed, use firestop putty or equivalent materials to seal them completely.

4. Check whether the insulating cable ties are loose or missing.

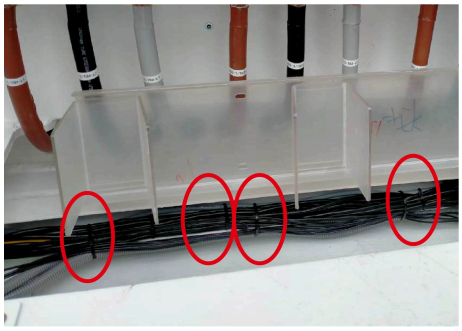


Figure 6-4 Cable Ties

a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.
b. Maintenance personnel shall wear safety helmets and safety gloves, and open the cabinet door.
c. Use a flashlight or searchlight to carefully check whether the insulating cable ties on internal cables is damaged or detached.
d. If any of the above conditions are found, secure the cables again using insulating cable ties.

5. Inspect the connections of the cable shielding layers, insulating sleeves, and grounding flat steel for looseness.
   a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.

b. Maintenance personnel shall wear safety helmets and safety gloves, and check the grounding cables, insulating sleeves, and grounding flat steel. Shake them by hand to check whether they are secure.

c. If any looseness is found in the above parts, tighten them using a screwdriver or wrench. For the tightening torque, refer to 12.3 Tightening Torque.

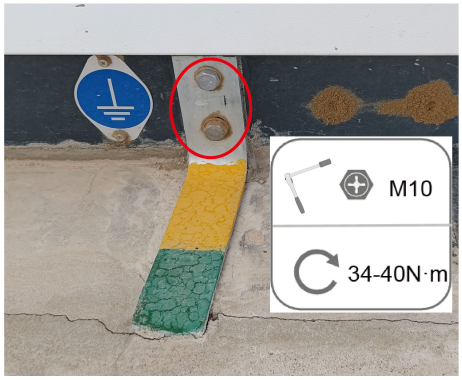


Figure 6-5 Tightening

7 Electrical Performance Inspection

7.1 Inspection Checklist

The electrical performance inspection items for the BESS container and its internal components, transformer cabinet (optional), and ATS equipment are listed in the table below:

- The recommended maintenance frequency is listed below. The frequency must be adjusted based on the installation site conditions.
- The maintenance frequency is subject to factors such as plant size, installation position, and on-site environment. For the equipment operating in sandy or dusty environments, it is necessary to shorten the intervals and increase the maintenance frequency.

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
1	1. Inspect the surge protective device and fuses for signs of damage, and replace them promptly if necessary.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	Two minutes for check and five minutes for replacement
2	2. Check whether the emergency stop button can function properly. Perform the following operations as needed: • Maintenance personnel shall wear safety helmets and safety gloves. When the ESS cabinet is in the standby state, press	BESS container and ATS equipment	Once a year	5

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
	the emergency stop button, and observe whether the AC side switch is disconnected and whether the system is shut down. • Wait for approximately 10 s and observe whether the LED status indicator light turns from blue to red. • Release the emergency stop button using the key, power on the AC side, and start up the ESS cabinet. Confirm that the system resumes normal operation.			
3	3. Inspect the equipment for abnormal noise during operation (excluding normal fan noise and regular electrical humming).	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	1
4	4. Check whether the mechanical operation of components such as load switches, circuit breakers, and contactors is normal. If any looseness is found, request spare parts for replacement.	BESS container, transformer cabinet (optional), and ATS equipment	Once a year	5
5	5. Check whether the UPS operates properly and check for any anomaly alarms. If the UPS cannot operate properly, submit a spare-part replacement request.	BESS container	Once a year	2

7.2 Safety Precautions

DANGER

After the emergency stop button is pressed, the internal FSS remains energized. Do not touch!

NOTICE

During maintenance or shutdown, any capacity loss resulting from either of the following two conditions lasting for more than 120 hours shall not be covered by the warranty.

- **The cell voltage during discharge is below 2.7 V.**
- **The SOC of any Rack is 0%.**

The Web interface may differ depending on the software version. The figures in this manual are for reference only.

7.3 Tool Preparation

No.	Name	Quantity (pcs)	Description
1	Safety helmet	1	-
2	Safety gloves	1	-
3	Dust mask	1	-
4	Surge protective device	1	-
5	Fuse	1	-
6	Screwdriver	1	It is recommended to use an electric screwdriver.

7.4 Inspection Procedure

This section introduces the electrical performance inspection items for the BESS container, transformer cabinet (optional), and ATS equipment.

1. Inspect the surge protective device and fuses for signs of damage, and replace them promptly if necessary.

The cabinet door needs to be opened for inspection only when the LC interface indicates a surge protection abnormality or abnormal disconnection of an internal cabinet circuit. No inspection is required during normal operation.

a. Log in to the LC user interface and check for SPD faults or node alarms. For login procedure, please refer to 12.1.2 LC Login Steps.
b. If SPD faults or DC voltage node alarms occur, shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.
c. Maintenance personnel shall wear safety helmets and safety gloves, and open the cabinet door.
d. If an SPD fault occurs, replace the surge protective device. If a DC voltage node alarm occurs, replace the fuse.

2. Check whether the emergency stop button can function properly.
   a. Maintenance personnel shall wear safety helmets and safety gloves. When the ESS cabinet is in the standby state, press the emergency stop button, and observe whether the AC side switch is disconnected and whether the system is shut down.



Figure 7-1 Emergency Stop Button of ESS Cabinet

*The figure is for reference only. The actual product may differ.

   b. Wait for approximately 10 s and observe whether the LED status indicator light turns from blue to red.
   c. Release the emergency stop button using the key, power on the AC side, and start up the ESS cabinet. Confirm that the system resumes normal operation.
3. Inspect the equipment for abnormal noise during operation (excluding normal fan noise and regular electrical humming).

NOTICE

Opening the cabinet door is not recommended for this check.

   a. Maintenance personnel shall wear safety helmets and stand near the cabinet to listen for any abnormal sounds (excluding fan noise or regular electrical humming).
   b. If abnormal noise is detected, wear safety gloves, open the ESS cabinet doors, and locate the source of the noise by checking possible sources one by one.

c. If the abnormal noise originates from the fan, shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.

d. Check whether the fan is blocked by any foreign objects. If no blockage is found but the noise persists, consider replacing the fan.

e. If the abnormal noise originates from a capacitor, inductor, or other components, replace the part if conditions allow. If replacement is not feasible, contact a field service engineer for support.

4. Check whether the mechanical operation of components such as load switches, circuit breakers, and contactors is normal. If any looseness is found, request spare parts for replacement.

a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.

b. Maintenance personnel shall wear safety helmets and safety gloves, open the cabinet door, and remove the cover.

c. Manually operate the load switches, circuit breakers, and contactors to check for their mechanical operation.



Figure 7-2 Circuit Breakers and MCBs

d. If any operational issues are identified, replace the corresponding switch promptly.

5. Check whether the UPS operates properly and check for any anomaly alarms. If the UPS cannot operate properly, submit a spare-part replacement request.

a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.

b. Maintenance personnel shall wear safety helmets and safety gloves, and open the cabinet door.

c. If the UPS indicator light shows an abnormal status or an alarm is displayed, troubleshoot the fault according to the indicated abnormal condition.

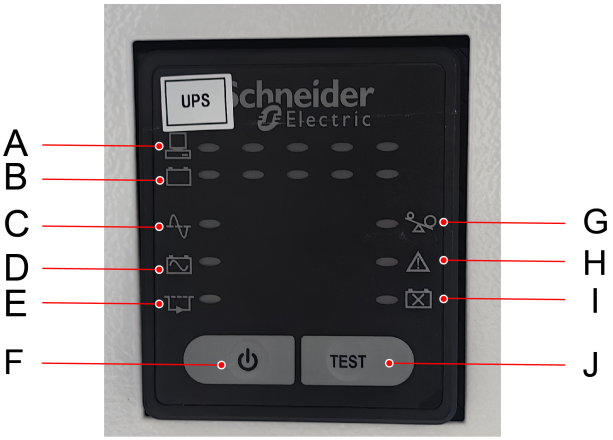
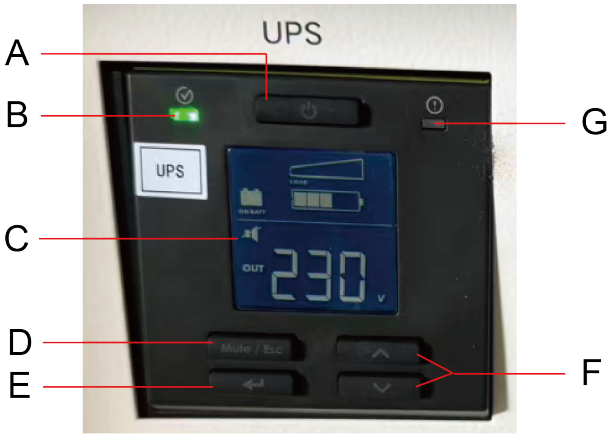


Figure 7-3 UPS Panel

*The figure is for reference only. The actual product may differ.

No.	Description	No.	Description
A	Load indicator light	F	UPS on/off button
B	Battery capacity / input voltage indicator light	G	Overload indicator
C	Online indicator	H	Fault indicator
D	Battery mode indicator	I	Battery replacement indicator
E	Bypass mode indicator	J	Battery self-test / input voltage display / mute button



No.	Description	No.	Description
A	UPS on/off button	E	Confirmation button

No.	Description	No.	Description
B	Status indicator	F	Up/down button
C	LCD display screen	G	Alarm indicator light
D	Mute/exit button		

d. Check the UPS battery for any signs of leakage or deformation. Remove the screws on the BSP panel, and check the interior for damaged UPS batteries. Replace the part if conditions allow. If replacement is not feasible, contact a field service engineer for support.

8 LCS Inspection

8.1 Inspection Checklist

The LCS inspection items for the BESS container and its internal components are listed in the table below:

- The recommended maintenance frequency is listed below. The frequency must be adjusted based on the installation site conditions.
- The maintenance frequency is subject to factors such as plant size, installation position, and on-site environment. For the equipment operating in sandy or dusty environments, it is necessary to shorten the intervals and increase the maintenance frequency.

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
1	1. Inspect coolant pipes for any signs of leakage.	BESS container	Once a year	1
2	2. Inspect the water pump for visible leakage (excluding condensation). If any leakage is found, replace the seal rings.	BESS container	Once a year	Two minutes for check and 10 minutes for replacement
3	3. Check the coolant for impurities or dark discoloration, and test its pH.	BESS container	Once every six months	5
4	4. Check whether the dehumidifier operates properly and inspect the drain pipe for blockages.	BESS container	Once a year	2

8.2 Safety Precautions

⚠ WARNING

Under normal conditions, coolant does not pose a health hazard, but excessive exposure may cause irritation to the eyes, skin, and respiratory system.

8.3 Tool Preparation

Before LCS inspection, prepare the required tools to ensure smooth maintenance, including but not limited to the following:

No.	Name	Quantity (pcs)	Description
1	Safety helmet	1	-
2	Safety gloves	1	-
3	Dust mask	1	-
4	Ladder	1	A 2.5 m A-frame ladder is recommended. (The ESS cabinet height is 2450 mm. Adjust the ladder height based on the actual site foundation height.)
5	Safety harness	1	-
6	Soft brush	1	-
7	Screwdriver	1	It is recommended to use an electric screwdriver.
8	Coolant fill and drain tool	1	-
9	pH test strip	1	-

8.4 Inspection Procedure

This section introduces the LCS inspection items for the BESS container.

1. Inspect coolant pipes for any signs of leakage.
   a. Shut down the Block. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.

b. Maintenance personnel shall wear safety helmets and safety gloves, and open the ESS cabinet door.

c. Use a flashlight or searchlight to carefully inspect all corners inside the equipment for any signs of leakage.



Figure 8-1 Check Using Flashlight or Searchlight

*The figure is for reference only. The actual product may differ.

d. If any leakage is detected, locate and repair the leak before refilling the coolant. Open the ESS cabinet door, and refill the coolant tank until the liquid level of the glass tube is between the midline and the H line.



*The figure is for reference only. The actual product may differ. For specific procedure regarding coolant refilling, draining, and pH testing, see “Coolant Draining and Refilling” in ST200CS O&M Guide.

2. Inspect the water pump for visible leakage (excluding condensation). If any leakage is found, replace the seal rings.

a. Shut down the LCS, and remove the mesh cover panel on the left side of the liquid cooling unit. Inspect the water pump and pipe joints for visible leakage (excluding condensation).

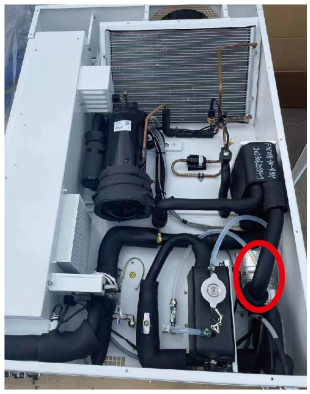


Figure 8-2 Water Pump of Liquid Cooling Unit

b. If dripping is found, drain the coolant from the system.

c. Replace the seal rings at the water pump and pipe joints.

- The coolant discharged from the system shall be collected and disposed of in an environmentally sound manner.
- For specific procedure regarding coolant refilling, draining, and pH testing, see “Coolant Draining and Refilling” in ST200CS O&M Guide.

3. Check the coolant for impurities or dark discoloration, and test its pH.

a. Issue system shutdown command via the LC software.

b. Turn off the upstream AC power supply switch. Verify power-off status of the AC main-circuit terminals (L1/L2/L3) on power distribution box using a multimeter.

c. Turn off the AC main switch, AC auxiliary switch, and UPS switch on the BSP.

d. Press and hold the UPS power switch for three seconds to power off the UPS.

e. Turn off the switch on the panel of the liquid cooling unit.

f. Remove the sealing plug from the fill port.

g. Gently and slowly open the valve (not fully open) to release roughly 10 mL of coolant.



*The figure is for reference only. The actual product may differ.

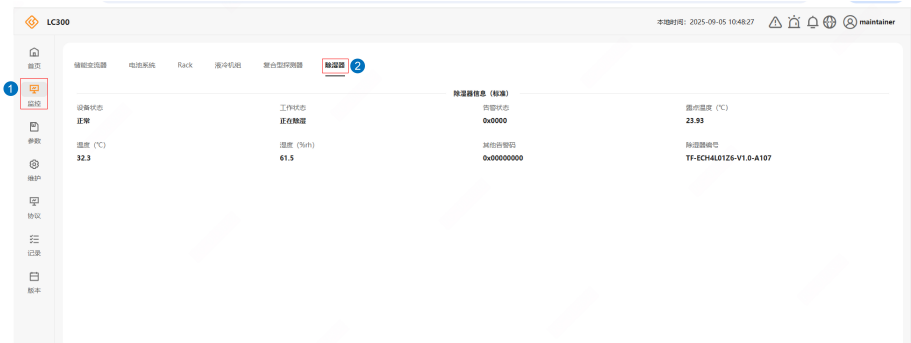
h. Use pH test strips or a pH meter to test the coolant sample, and obtain the current pH value. If the value is below 7.3, replace the coolant (system draining and refilling).

- It is recommended to replace the coolant every five to six years.
- For specific procedure regarding coolant refilling, draining, and pH testing, see “Coolant Draining and Refilling” in ST200CS O&M Guide.

4. Check whether the dehumidifier operates properly and inspect the drain pipe for blockages.

a. Log in to the LC software. For login procedure, see 12.1.2 LC Login Steps.

b. Access the device information interface of the dehumidifier, and check parameters such as **Device status**, **Alarm status**, **Other alarm code** for any abnormal conditions. If an anomaly occurs, please record the status information and alarm code, and report it to SUNGROW service personnel.



c. Check the dehumidifier drain pipe for blockages or U-bends. If blocked, clear the drain pipe. If a U-bend forms, trim the pipe so that it extends smoothly without kinks.



Semiconductor dehumidifier



Compressed refrigeration dehumidifier

*The figure is for reference only. The actual product may differ.

9 FSS Inspection

9.1 Inspection Checklist

The FSS inspection items for the BESS container and its internal components, transformer cabinet (optional), and ATS equipment are listed in the table below:

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
1	Annual inspection of the FSS is recommended.	BESS container	Once a year	-

9.2 Safety Precautions

⚠ DANGER

In the event of obvious fire or even explosion at the site, do not approach the ESS cabinet to perform emergency startup operations.

NOTICE

- **The FSS should be regularly inspected and maintained by trained and qualified personnel who have passed relevant exams.**
- **When operation and management personnel receive an alarm or fault signal from an ESS cabinet via the software or the plant-level fire alarm control panel (FACP), the system must be manually reset on site by certified fire safety technicians after a thorough on-site evaluation under safe conditions.**

9.3 Inspection Procedure

This section introduces the FSS inspection items for the BESS container and its internal components, transformer cabinet (optional), and ATS equipment.

1. Perform the annual FSS inspection.

a. To perform the annual FSS inspection, please contact SUNGROW. After the specific requirements are clarified, SUNGROW will provide a dedicated fire protection joint commissioning plan.

The tests performed by SUNGROW are limited to verifying normal equipment operation. If local regulations require additional testing, the customer shall arrange for qualified personnel to carry out the relevant work.

10 Remote Data Check

10.1 Inspection Checklist

The remote data inspection items for the BESS container and its internal components, transformer cabinet (optional), and ATS equipment are listed in the table below:

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
1	Check the EMS interface for any system overtemperature faults or alarms.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2
2	Check whether the operating parameters, such as voltage and power, are within the allowable range.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2
3	Check the cooling unit alarm on the EMS. If the coolant level is too low, refill the coolant on site.	BESS container	Once every six months	2
4	Log in to the LC user interface and check the dehumidifier's operating status.	BESS container	Once every six months	2
5	Save the history curves, fault logs, and dispatch records to the corresponding files.	BESS container, transformer cabinet (optional), and ATS equipment	Once every six months	2

10.2 Safety Precautions

DANGER

- **Hazardous high voltage inside the product!**
- **Observe at all times the warning signs on the product.**

- The Web interface may differ depending on the software version. The figures in this manual are for reference only.
- If the owner does not have a VPN and cannot log in to the LC interface remotely, the data can be viewed locally instead.

10.3 Tool Preparation

No.	Name	Quantity (pcs)	Description
1	Laptop	1	-
2	Ethernet cable	1	-
3	Adapter	1	RJ45 to USB adapter / RJ45 to USB Type-C adapter

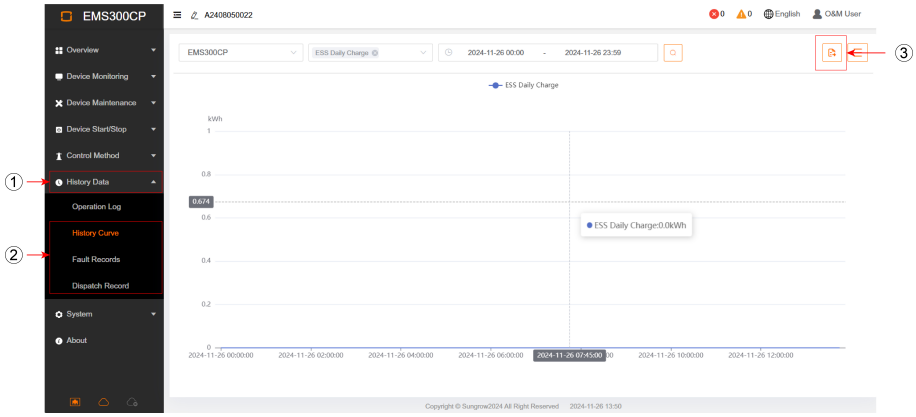
10.4 Inspection Procedure

This section introduces remote data check for the BESS container, transformer cabinet (optional), and ATS equipment.

1. Check the EMS interface for any system overtemperature faults or alarms.
   a. Log in to the EMS300CP Web interface. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.
   b. Check **Device status**, **Alarm status**, **Other alarm code**, and other information for any overtemperature faults or alarms. If an anomaly occurs, please record the status information and alarm code, and report it to Sungrow service personnel.
2. Check whether the operating parameters, such as voltage and power, are within the allowable range.
   a. Log in to the EMS300CP Web interface. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.
   b. Click on**Device monitoring** to check whether the operating parameters, such as voltage and power, are within the allowable range. If an anomaly occurs, please

record the status information and alarm code, and report it to Sungrow service personnel.

3. Check the cooling unit alarm on the EMS. If the coolant level is too low, refill the coolant on site.
   a. Log in to the EMS300CP Web interface. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.
   b. Check **Device status**, **Alarm status**, **Other alarm code**, and other information for any cooling unit alarms. If an anomaly occurs, record the status information and alarm code, and refill the coolant on site.
4. Log in to the LC user interface and check the dehumidifier's operating status.
   a. Log in to the LC software. For login procedure, refer to 12.1.2 LC Login Steps.
   b. Access the device information interface of the dehumidifier, and check parameters such as **Device status**, **Alarm status**, **Other alarm code** for any abnormal conditions. If an anomaly occurs, please record the status information and alarm code, and report it to Sungrow service personnel.
5. Save the history curves, fault logs, and dispatch records to the corresponding files.
   a. Log in to the EMS300CP Web interface. For specific procedure, refer to 12.4.2 Startup/Shutdown via Web.
   b. Click **History data > History curve / Fault records / Dispatch records > Export** to export fault records to the local device.



*The figure is for reference only. The actual product may differ.

11 Battery Recharge

11.1 Inspection Checklist

The battery recharge inspection items for the BESS container and its internal components are listed in the table below:

No.	Item	Applicable System	Maintenance Interval (Month)	O&M Duration (min)
1	If the system remains idle for more than six months, perform the following recommended operations: 1. Perform charge-discharge cycles and adjust the SOC to 30%–40%. After charging, ensure that the SOC values remain consistent across all ESS stacks. 2. Fully charge the UPS once.	BESS container	Once every six months	26

11.2 Safety Precautions

⚠ DANGER

Before replacing a component, ensure that all AC and DC circuits are completely de-energized.

NOTICE

Follow standard operating procedure to connect or disconnect cables. Do not use excessive force during operation.

11.3 Inspection Procedure

Step 1 If the system remains idle for more than six months, perform the following recommended operations:

NOTICE

The batteries must not be stored for more than six consecutive months. If the UPS remains powered off for an extended period, it is recommended to charge the UPS batteries at least once every month, for 24 hours each time. Additionally, perform a self-test. If the abnormal conditions persist after recharging, replace the UPS batteries.

a. Perform charge-discharge cycles and adjust the SOC to 30%–40%. After charging, ensure that the SOC values remain consistent across all ESS stacks.

b. Fully charge the UPS once.

- Connect external power to the ESS cabinet (power on the BSP AC side).
- Close the AC switch.
- Close all miniature circuit breakers (including the AC auxiliary switch and UPS switch).



--End

12 Appendix

12.1 Web Login

12.1.1 EMS Login Procedure

Prerequisite

This section uses the user interface of the standard configuration as an example. The actual user interface may vary.

Preparation Before Login

- Connect the PC to EMS300CP with an Ethernet cable.
- Configure the PC's IP address to be on the same network segment as the EMS300CP Ethernet ports (ETH1, ETH2, and ETH5). The IP addresses of these Ethernet ports are listed in the table below. If the default address of ETH2 is 12.12.12.12, then the IP address of the PC can be set to 12.12.12.X, where X cannot be 12, and the subnet mask can be set to 255.0.0.0.

Table 12-1 Controller IP Address

Port	Default IP Address
ETH1	192.168.13.200
ETH2	12.12.12.12
ETH5	13.13.13.13

The IP addresses above are for reference only. The actual ones may differ and shall prevail. To view the actual IP configuration of each physical network port, log in to the system using its corresponding virtual IP address.

Login Procedure

Step 1 Connect the PC to EMS300CP with an Ethernet cable.

Step 2 Enter the IP address of the Ethernet port in the address bar on the PC to enter the Web interface of EMS300CP.

Step 3 In the upper-right corner of the EMS300CP page, select the desired language, click **Login**, and enter the password to log in as an O&M user.

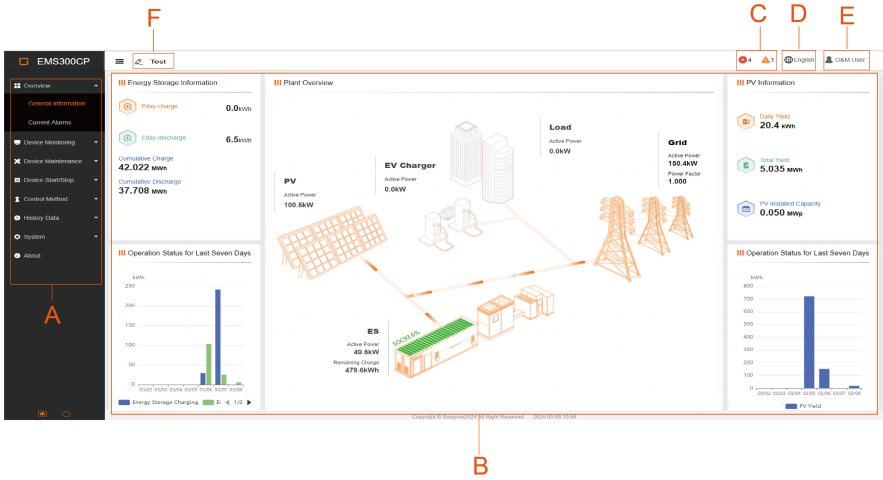
User types include **Ordinary user** and **O&M user**.
Ordinary user can view basic information, real-time faults, and device monitoring information of the system.
O&M user not only has the permissions of **Ordinary user**, but also can set and modify the control strategies and parameters of the system.
This manual briefly describes the basic operations on the Web interface, using the **O&M user** permissions as an example.

Please change the password promptly upon first login. To change the password, click **O&M user > Change password**.
If you forgot your login password, contact SUNGROW and provide the S/N and system time of the current device to obtain a dynamic password.

--End

Web Home Page

The Web home page is shown below:



No.	Name	Description
A	Navigation bar	Displays the main functions of the Web page.
B	Function display area	Display the function currently queried or the parameters currently set.
C	Fault and alarm icons	Display the level and quantity of current system faults and alarms. Click the corresponding value to enter the corresponding interface.
D	Language	Used to switch the display language as needed.
E	User	Displays the username of the current account.

No.	Name	Description
F	Plant name	Click to edit the name of the plant.

 indicates the connection status of the Ethernet port.

 indicates the cloud access status.

The figure is for reference only. The actual user interface may differ and shall prevail.

12.1.2 LC Login Steps

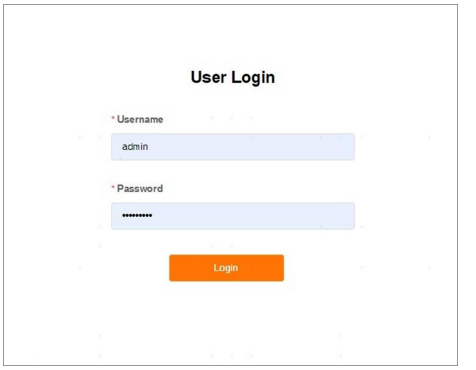
12.1.2.1 Preparation Before Login

- Set the IP address of the PC to be on the same network segment as that of the device.
- Connect the PC to the ETH2 port of the device.
- The default IP address of the ETH2 port is 192.168.13.100. The IP address of the PC can be set to 192.168.13.99 and the subnet mask can be set to 255.255.255.0.

12.1.2.2 Login Steps

Step 1 Connect the PC to the device with an Ethernet cable.

Step 2 In the PC address bar, enter the IP address of the LC, such as 192.168.13.100, to go to the login page, as shown in the following figure.



Step 3 Enter the username and password. Click **Login**.

The system supports two user roles, **Operator** and **Admin**.
The password for the **Operator** account is 1111. For passwords for other user roles, please contact SUNGROW.

Step 4 In the upper right corner of the page, select your preferred language.

--End

12.2 Prepare Cables

⚠ DANGER

- **Before electrical connection, check that the cables are all intact and well-insulated. Poor insulation or cable damage may result in safety hazards. If necessary, replace the cable immediately.**
- **Be sure to prepare cables in a safe area away from the equipment. Prevent debris from entering the equipment, which may cause short circuits and fire risks.**

The cables used must meet the following requirements:

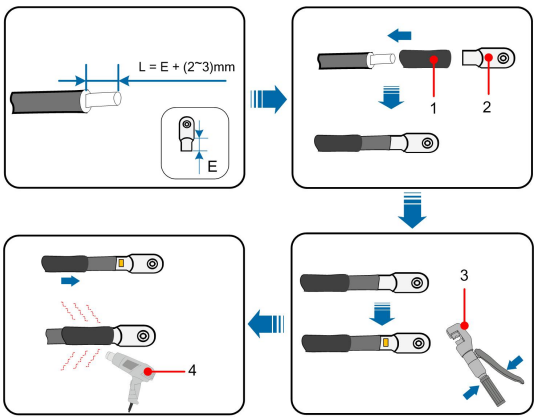
- The cables must have a sufficient current-carrying capacity. The current-carrying capacity of a conductor is subject to factors including but not limited to:
  - Environmental conditions
  - Insulation material of the conductor
  - Cable laying method
  - Material and cross-sectional area of the cable
- Select cables with a proper diameter according to the maximum load, and the cables should be long enough.
- Ensure that all cables and wires have sufficient space for any bends.
- During electrical connection, do not forcibly pull any wires or cables, as this may diminish their insulation performance.
- The DC input cables must be identical in specification and material.
- The three-phase AC output cables must be identical in specification and material.
- Use flame-retardant cables.
- Keep a sufficient distance between the cables and the heat-generating components, to prevent the cable insulation layer from aging or getting damaged due to high temperature.
- After completing each connection, carefully check that the connection is correct and secure. Poor contact or oxidation of the contact surface may cause overheat or even fires.
- Take necessary auxiliary measures to reduce the stress on cables and wires.
- Select cables with appropriate cross-sectional areas, according to the actual environmental conditions for heat dissipation of the cables laid on-site.
- Select communication cables equipped with corresponding shielding protection according to the requirements of SUNGROW.
- Secure the power cables and the communication cables separately. Ensure a minimum clearance of 10 cm between the high-current cables and the low-current cables to avoid electromagnetic interference.

- Inspect the connection between the wiring terminal and the copper bar. If any part of the heat shirk tubing is caught between them, remove it immediately. Otherwise, it may lead to poor contact or even damage due to heat.

NOTICE

- **Cables used shall comply with the requirements of local laws and regulations.**
- **The cable colors in the figures in this manual are for reference only. Please select cables according to local cable codes.**

Crimp OT/DT terminal

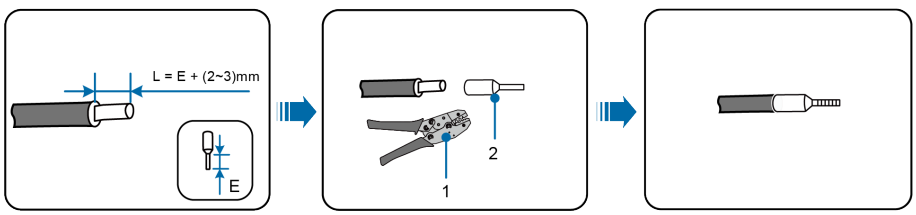


No.	Name	No.	Name
1	Heat shrink tubing	3	Hydraulic pliers
2	OT/DT terminal	4	Heat gun

NOTICE

- **Strip the cables with caution. Avoid scratching the core wires.**
- **After crimping, the conductor crimp barrel of the OT/DT terminal must fully enclose the core wire, forming a closed cavity that ensures a tight and secure connection between the wire and the terminal.**
- **Take appropriate protective measures when using a heat gun to prevent heat damage to the equipment.**

Crimp Ferrule



No.	Name
1	Crimping tool
2	Ferrule

12.3 Tightening Torque

To prevent copper terminals from loosening under stress, which may cause poor contact, or from increased contact resistance that could lead to overheating or fire, ensure the screws securing the terminals are tightened to the following torque specifications.

Screw	Torque (N·m)	Screw	Torque (N·m)
M3	0.7–1	M8	18–23
M4	1.8–2.4	M10	34–40
M5	4–4.8	M12	60–70
M6	7–8	M16	119–140

*The torque values listed in the table apply to bolt-and-nut assemblies only and are not suitable for self-clinching nuts or studs. Please follow the actual conditions on site.

**To reduce the stress on the copper terminals, secure the cable at appropriate positions.

12.4 Power on/off

12.4.1 Powering-On Procedure

Inspect the equipment thoroughly before powering it on. The equipment can only be powered on after all the inspection items are confirmed to meet the requirements.

The power-on procedure herein is for reference only.

Step 1 PCS power-on: Set the DC-side load switch of the PCS to ON. Ensure that the emergency stop button on the cabinet is in the reset state.

Step 2 Power on the ATS equipment (skip this step if no ATS equipment is configured).

a. Close the grid-side circuit breaker QF1 (GRID) or the DG-side circuit breaker QF2 (GEN). Then close the load-side circuit breaker QF4 (LOAD), BESS-side circuit breaker QF5 (BESS), and PV-side circuit breaker QF6 (PV) in sequence.

b. Close the control-circuit breakers Q1 (AC FAN), Q2 (SMPS), and Q3 (AC 230V).

1. Only one of the grid-side circuit breaker QF1 and the DG-side circuit breaker QF2 can be closed. Select the one to be closed based on the customer's on-site operating mode.
2. Under normal conditions, the maintenance circuit breaker QF3 must remain open. It shall be manually closed only in the event of a fault in the system control circuit or thyristor.
3. In off-grid mode, both the grid-side circuit breaker QF1 and the DG-side circuit breaker QF2 must remain open.

Step 3 Power on the transformer cabinet (skip this step if no transformer cabinet is configured).

a. Close the molded-case circuit breaker (MCCB) QF2 (1# AC main circuit switch) to close the PCS-side switch.

b. Close the MCCB QF1 (2# AC main circuit switch) to close the load/grid-side switch.

c. Close the switch QS1 (fan) to supply AC power to the fan.

Step 4 Power on the AC side of the system: Close QF1 (AC main switch) on the power distribution box panel.

Step 5 Power on the AC auxiliary power supply: Close Q1 (AC auxiliary switch) on the power distribution box panel.

Step 6 Power on the UPS: Close Q2 (UPS switch) on the power distribution box panel, and press the power button on the UPS.

The auxiliary power supply is used to power devices including the network switch, LC, and fans.

Step 7 Power on the liquid cooling unit: Open the liquid cooling switch panel and check the status of the circuit breakers in the liquid cooling unit. If any circuit breaker is open, close it.

--End

After the power-on procedure is completed, start the system from the software interface. For details, see Section12.4.2 Startup/Shutdown via Web.

12.4.2 Startup/Shutdown via Web

This section uses the user interface of the standard configuration as an example. The actual user interface may vary.

For the EMS login procedure, refer to12.1.1 EMS Login Procedure.

Users can configure the startup settings for the devices and start or stop the devices in the plant in one click. The configuration page of grid-connected/off-grid startup is shown below:

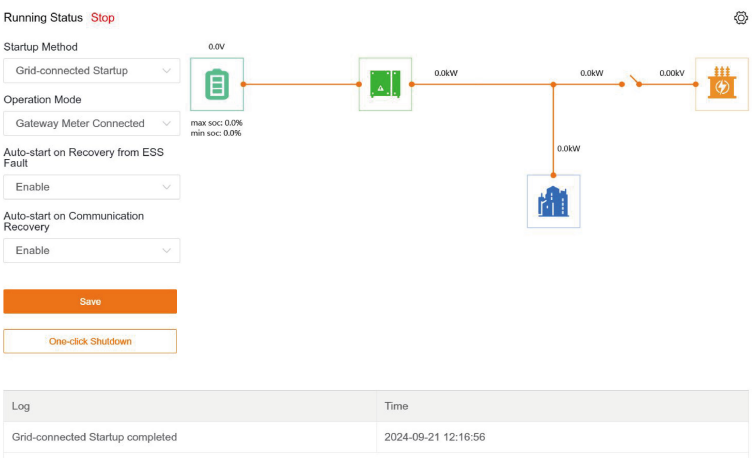


Figure 12-1 On/Off-Grid Startup

Configure Startup Parameters

Step 1 Choose **Device start/stop > On/off-grid startup**.

Step 2 Select a startup method for devices in the plant from the **Startup method** drop-down list.

- Off-grid startup
  When the device is in the off-grid status, select **Off-grid startup** to start all the devices in the plant. Upon successful startup, **Operating status** displays Off-grid.
  Configure the black start parameters before proceeding with the startup. To do this, click  in the upper-right corner to open the black start configuration window. The descriptions of the parameters are shown below:

Parameter	Description
Black start SOC threshold	Default: 46
Min. units for system operation	Number of units with the minimum SOC.
Load rated power	Configure this parameter according to actual conditions.
Startup mode	Configure this parameter according to actual conditions. - VSG mode: Users can select VSG mode to connect one or more LCs. - Off-grid mode: Users can select off-grid mode to connect one LC.
System waiting time	Range: 0–100. Default value: 20.
System timeout	Range: 0–200. Default: 60.

- Grid-connected startup

When the device is in the grid-connected status, select **Grid-connected startup** to start all the devices in the plant. Upon successful startup, **Operating status** displays Gird-connected.

At least one LC is needed to start the system. The system starts the LC first.

Step 3 Select an **Operating mode**.

Three operation modes are available, Gateway meter connected, Gateway meter not connected, and Auto on/off-grid switching. When the system is in Stop state, you can select Gateway meter connected or Gateway meter not connected for startup. After the system starts operating properly, the operation mode will automatically change to Auto on/off-grid switching. In this mode, the system will switch between grid-connected startup and off-grid startup according to the voltage changes at the point of connection (PoC).

Step 4 Enable or disable **Auto-start on recovery from system fault**. This function is enabled by default. When this function is enabled, if a fault occurred in the ESS, the plant will restart automatically after recovering from the ESS fault.

Step 5 Enable or disable **Auto-startup on communication recovery**. This function is enabled by default. Enabled: If the ESS communication is interrupted, the plant will restart automatically after the communication is restored.

Step 6 Click **Save**, then click Yes in the confirmation dialog to start the system.

--End

One-Click Shutdown

Users can click **One-click shutdown** to stop the devices in the plant. At this time, the operating status will be Shutdown.

View Operation Log

Detailed operation logs are displayed at the bottom of the screen during the execution of grid-connected or off-grid start/stop commands.

12.4.3 Planned Shutdown

Planned shutdown refers to a state where the facility is intentionally powered off for maintenance, testing, or repairs.

Prerequisite

Power-off preparation: Operate the software to shut down the system, and disconnect the battery relay (in special case, the user can press the emergency stop button of the cabinet).

The power-down steps in this manual are for reference only. The steps for actual projects may vary!

Step 1 Shut down the UPS and turn off Q2 (UPS switch) on the panel.

Step 2 Turn off Q1 (AC auxiliary switch) on the panel.

Step 3 Turn off QF1 (AC main switch) on the panel.

Step 4 Rotate the handle of the PCS DC load switch to the "OFF" position.

DANGER

Before operating the AC wiring terminals, ensure the upstream switches of the energy storage battery cabinet are turned off.

Step 5 Power down the transformer cabinet (skip this step if there is no transformer cabinet).

a. Turn off fan switch QS1 (fan);

b. Turn off molded case circuit breaker QF1 (2# AC main circuit switch);

c. Turn off molded case circuit breaker QF2 (1# AC main circuit switch).

Step 6 Power down the ATS (skip this step if there is no ATS cabinet).

Before powering down, ensure that:

a. Important loads are stopped;

b. The internal thyristors of equipment are disconnected;

c. The PV inverter is shut down (if any PV inverter is equipped for the system and put into operation);

d. The PCS is shut down;

e. The diesel generator is shut down (if any diesel generator is equipped for the system and put into operation).

a. Turn off PV-side circuit breaker QF6 (PV);

b. Turn off BESS-side circuit breaker QF5 (BESS);

c. Turn off miniature circuit breakers Q1 (AC FAN), Q2 (SMPS), and Q3 (AC 230V) in turn;

d. Turn off load-side circuit breaker QF4 (LOAD);

e. Turn off maintenance circuit breaker QF3 (MAINTAINCE) (if it is put into use before powering down);

f. Turn off frame circuit breaker QF2 on the diesel generator side (GEN) or grid-side circuit breaker QF1 (GRID).

Determine whether the system was operating in diesel generator start mode or grid-side start mode prior to powering down, and turn off either circuit breaker QF2 or QF1 accordingly.

--End

After the system completes self-discharge, proceed with voltage check.

12.5 UPS Fault Recovery

Problem	Possible cause	Solution
The UPS cannot be turned on	Battery is not connected correctly;	Check whether the battery connectors are in good condition.
	ON/OFF button has not been pressed	Press the ON/OFF button to power up the UPS and connect the device to the power supply.
	The UPS is not connected to the mains power supply	Check whether the ends of the power cable between the UPS and the mains supply are connected safely and reliably.
	Very low voltage or no mains voltage	Check the mains power supply connected to the UPS with the help of a desk lamp. If the light is very dim, check the mains voltage.
The UPS cannot be turned off	ON/OFF button has not been pressed	Press the ON/OFF button to turn off the UPS.
	UPS internal fault	Don't try to use the UPS. Unplug the UPS and send it for repair in time.
The UPS occasionally beeps	Normal sound of battery-powered UPS during operation	The UPS is protecting the device connected with it.
The UPS cannot provide the expected backup time	The UPS battery may have weakened due to recent power outages or is nearing the end of its lifespan.	Charge the battery. The battery should be recharged after a long power outage. Frequent use of the battery or operation at high temperature will accelerate battery loss. If the battery life is running out, please replace the battery even if the LED battery replacement indicator is not on.
All LED indicators are off and the UPS has been	The UPS has been turned off, and the battery has been completely discharged after a long power outage.	When the power supply is restored and the battery is fully charged, the UPS will resume normal operation.

Problem	Possible cause	Solution
plugged into the outlet.		
The LED panel displays a bypass overload alarm, and the UPS gives a continuous alarm sound.	UPS overload	The devices connected to it exceed the maximum load specified in the technical specifications. The alarm will continue until the overload is removed. Disconnect unnecessary devices from the UPS to solve the overload problem.
Fault LED indicator is on	UPS internal fault	Do not try to use the UPS, turn it off and send it for repair in time.
Battery replacement LED indicator is on	When the battery replacement LED indicator is flickering and beeps every two seconds, it indicates that the battery is disconnected	Check whether the battery connectors are in good condition.
	Low battery level	Charge the battery for 24 hours. Then carry out a self-test. If the problem still exists after recharging, please replace the battery.
	Battery self-test failed	The UPS gives short beeps for 1min and the battery replacement LED indicator is on. The UPS alarms every 5 hours. After charging the battery for 24 hours, perform a self-test to confirm the battery replacement status. If the battery passes the self-test, it will stop giving alarms and the LED indicator will be on.
Even if the mains power is available, UPS is still runing on	The mains voltage is high, low or unstable. The generator powered by cheap fuel cannot provide stable voltage	Connect the UPS to a different electrical outlet. Test the input voltage according to the displayed mains voltage.

Problem	Possible cause	Solution
battery power.		
Online LED indicator	No LED indicator is on	The UPS is operating on battery power or is not turned on.
	LED indicator is flickering	The UPS is conducting an internal self-test.

12.6 Repair Exterior Damage

12.6.1 Cleaning Procedure Using Cleaning Agent

Prerequisite

For dust or dirt on the product container, clean it with water or alcohol as needed.

User-Supplied Tools

Table 12-2 Cleaning Tools

No.	Item
1	Cleaning cloth
2	Water
3	Alcohol or other non-corrosive cleaning agents

Step 1 Wet the cleaning cloth (or other scrubbing tools) with water, and then wipe the dirty areas on the surface.

Step 2 If wiping with water cannot remove the dirt, use 97% alcohol to wipe the surface until it is clean enough. (You may also use non-corrosive cleaning agents that are commonly used in your area.)



--End

12.6.2 Topcoat Repair

Prerequisite

If minor scratches or topcoat powdering result in the paint peeling off without exposing the substrate, repair the topcoat.

Selection and Formulation of Topcoat

Table 12-3 Selection and Formulation of Topcoat

Brand and Model	Chemistry	Mixing Ratio	Thinner Type	Drying Time (Minimum)
Jotun topcoat Hardtop XP or Hardtop XPL	Two-component chemically cured aliphatic paint	Ratio of base agent to curing agent: 10:1 (by volume)	Jotun Thinner No. 10	5°C, 24 h 10°C, 12 h 23°C, 5 h 40°C, 3 h
AkzoNobel topcoat Interthane 990	Two-component acrylic polyurethane paint	Ratio of base agent to curing agent: 6:1 (by volume)	International GTA056	5°C, 24 h 25°C, 6 h 35°C, 4 h

- If paints from other manufacturers are used, please contact SUNGROW for confirmation.
- For two-component paint supplied in two parts, each part must be agitated thoroughly before being mixed in the specified proportions.
- The thinner can be added only after the base and curing agent have been mixed.
- Do not use paint past its shelf life.

User-Supplied Tools

Table 12-4 Cleaning Tools

No.	Item
1	400-grit / 600-grit sandpaper
2	Cleaning cloth
3	Alcohol
4	Brush
5	Topcoat
6	Coating thickness gauge

Environment Requirements

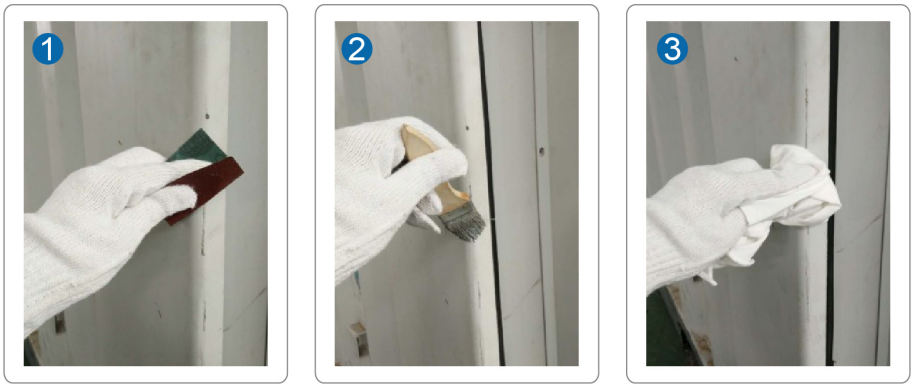
- Ambient temperature: 5°C–40°C
- Substrate temperature: 5°C–60°C
- Relative humidity: 10%–85% RH

Repair Procedure

Step 1 Use sandpaper to grind the area with burrs or scratches until the gray primer is exposed. Measure the primer thickness using a coating thickness gauge. The primer shall be at least 150 μm thick.

Step 2 Remove all residues from the surface using a clean brush.

Step 3 Wipe the surface with a cleaning cloth dampened with alcohol or a cleaning agent to remove any remaining powder or dust. Ensure the surface is clean.



Step 4 Repair the topcoat.

a. Check the surface color, and prepare the topcoat in the matching color.

Commonly Used Colors for Topcoat

RAL 7035 (Light gray)	RAL 9003 (Signal white)	RAL 7016 (Anthracite gray)

b. Prepare the topcoat paint according to the specifications provided in Table 12-3 Selection and Formulation of Topcoat.

c. Apply the paint in a criss-cross pattern. Once the coat is fully dry, measure the coat thickness with a coating thickness gauge. The thickness for a single layer shall be within the range of 50 μm–100 μm.



d. When applying multiple coats, make sure the previous coat has completely dried before applying the next. The final total thickness, including both the primer and topcoat, shall be at least 240 μm.

Step 5 Inspect the coating appearance to ensure uniform color, smooth transitions, and compliance with the specified thickness.

--End

12.6.3 Double-Layer Paint Repair

Prerequisite

If the rusted area is large, with deep scratches and dents exposing the substrate, both the topcoat and primer need to be repaired.

Selection and Formulation of Primer and Topcoat

Table 12-5 Selection and Formulation of Primer and Topcoat

Brand and Model	Chemistry	Mixing Ratio	Thinner Type	Drying Time (Minimum)
Jotun primer Jotamastic 90	Two-component epoxy paint	Ratio of base agent to curing agent: 3.5:1 (by volume)	Jotun Thinner No. 17	5°C, 30 h 10°C, 10 h 23°C, 3 h 40°C, 1.5 h
AkzoNobel primer Interseal 670HS	Two-component epoxy paint	Ratio of base agent to curing agent: 5.67:1 (by volume)	International GTA220	5°C, 36 h 10°C, 16 h 25°C, 10 h 40°C, 4 h
Jotun topcoat Hardtop XP or Hardtop XPL	Two-component chemically cured aliphatic paint	Ratio of base agent to curing agent: 10:1 (by volume)	Jotun Thinner No. 10	5°C, 24 h 10°C, 12 h 23°C, 5 h 40°C, 3 h
AkzoNobel topcoat Interthane 990	Two-component acrylic polyurethane paint	Ratio of base agent to curing agent: 6:1 (by volume)	International GTA056	5°C, 24 h 25°C, 6 h 35°C, 4 h

- It is recommended to use primer and topcoat from the same manufacturer.
- If paints from other manufacturers are used, please contact SUNGROW for confirmation.

- For two-component paint supplied in two parts, each part must be agitated thoroughly before being mixed in the specified proportions.
- The thinner can be added only after the base and curing agent have been mixed.
- Do not use paint past its shelf life.

User-Supplied Tools

Table 12-6 Cleaning Tools

No.	Item
1	400-grit / 600-grit sandpaper
2	Cleaning cloth
3	Alcohol
4	Brushes of different sizes
5	Grinder (with conical and cylindrical grinding heads)
6	Putty
7	Topcoat
8	Primer
9	Coating thickness gauge

Environment Requirements

- Ambient temperature: 5°C–40°C
- Substrate temperature: 5°C–60°C
- Relative humidity: 10%–85% RH

Procedure

Step 1 Grind all uneven areas of the coating with a grinder or sandpaper until the surface is smooth and shows a metallic luster, with a seamless transition between the rusted area and the intact coating.

Uneven surface areas feature residual burrs, metal fragments, and welding slag on the mechanical structure, seams, sharp edges, and other areas.

Step 2 For deep defects such as scratches or bumps, apply putty to the target area to create a smooth and even surface.

Step 3 Remove all residues from the surface using a clean brush.

Step 4 Wipe the surface with a cleaning cloth dampened with alcohol to remove any remaining powder or dust. Ensure the surface is clean.



Step 5 Repair the primer.

a. Check the surface color, and prepare the primer in the matching color.

Commonly Used Colors for Primer

RAL 7035 (Light gray)	RAL 9003 (Signal white)	RAL 7016 (Anthracite gray)

b. Prepare the primer according to the specifications provided in Table 12-5 Selection and Formulation of Primer and Topcoat.

c. Apply the primer with a small brush as a pre-coat. Measure the coating thickness at corners and seams using a coating thickness gauge, and verify that the thickness is within the range of 70 μm–80 μm.

d. After the pre-coat has dried, apply the primer in a criss-cross pattern. After drying, check that the dry film thickness is within the range of 100 μm–300 μm.

Step 6 To repair the topcoat, refer to 12.6.2 Topcoat Repair.

Step 7 Inspect the coating appearance to ensure uniform color, smooth transitions, and compliance with the specified thickness.

--End

For spray-type paint:

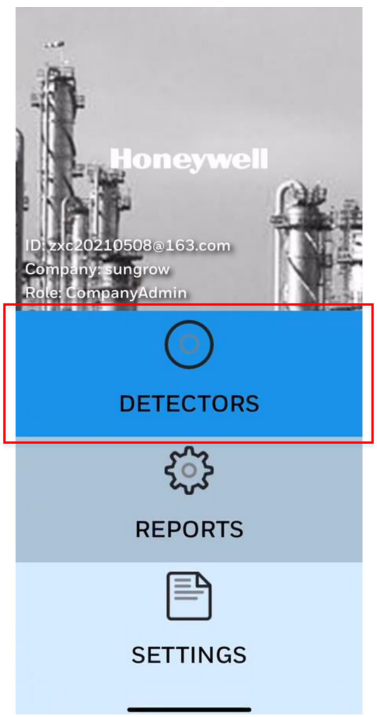
1. Cover the area within an 800 mm radius around the damaged spot using masking paper.
2. If you spray paint on the exposed area, after drying, check that the dry film thickness is within the range of 100 μm–300 μm.

12.7 Connect the detector via Bluetooth

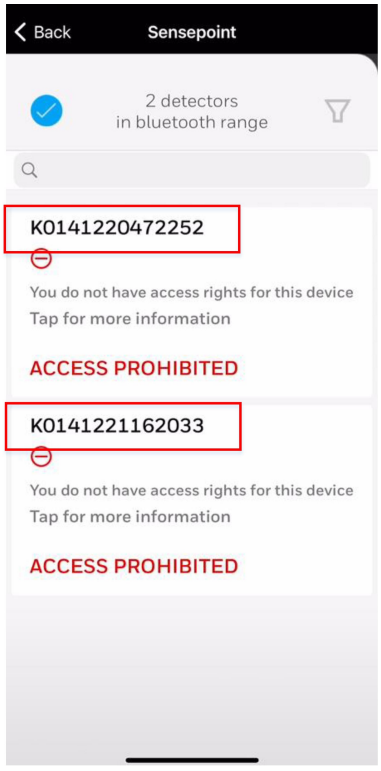
Prerequisite

Run the Sensepoint software on the mobile phone, and connect to the combustible gas detector via Bluetooth.

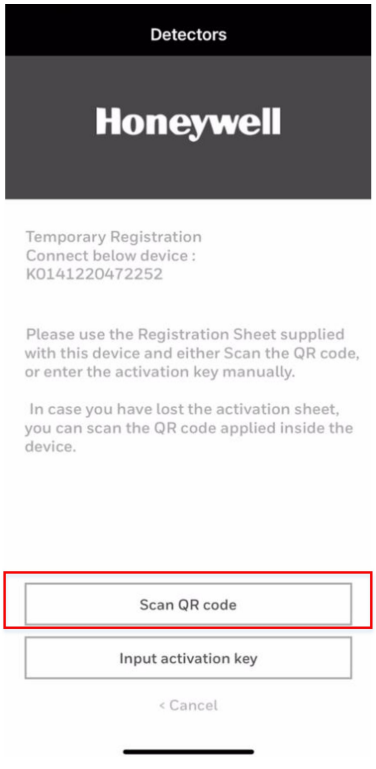
Step 1 Click **DTEECTORS**.



Step 2 Select the sensor that needs to be calibrated based on the SN.



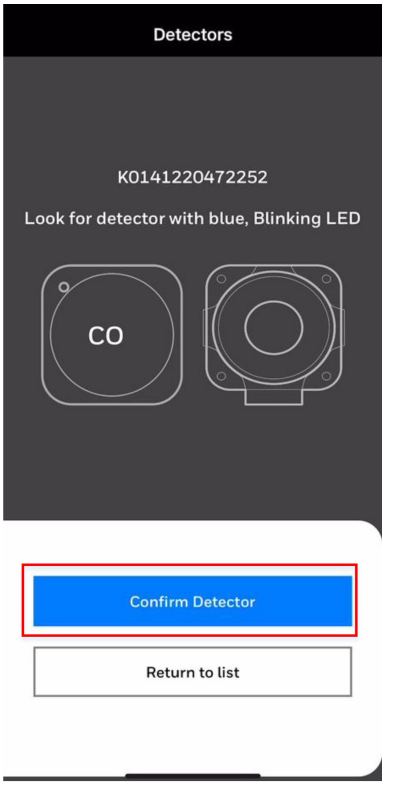
Step 3 Click the **Scan QR code** button.



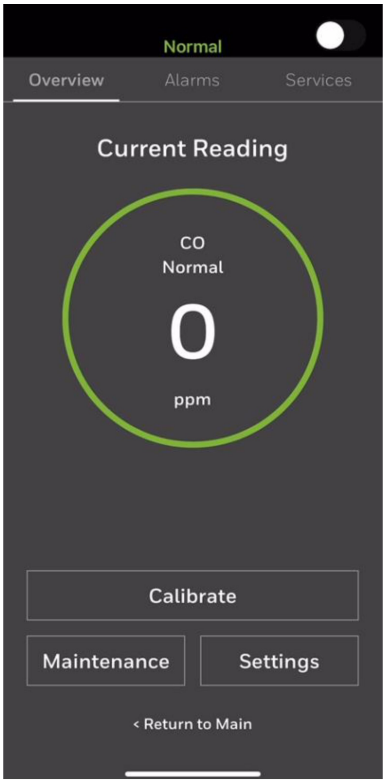
Step 4 Scan the QR code on the side of the detector.



Step 5 Click **Confirm Detector**.



Step 6 The interface below indicates that the phone has been connected to the combustible gas detector.



--End

12.8 Terms

Abbreviation	Definition
A	
ATS	Automatic Transfer Switch
B	
BCP	Battery Connection Panel
BSP	Battery Supply Panel
BM	Battery Module
BC	Battery Cluster
BMS	Battery Management System
BSC	Battery System Controller
E	

Abbreviation	Definition
ESS	Energy Storage System
ESC	Energy Storage Cabinet
EMS	Energy Management System
F	
FSS	Fire Suppression System
H	
HVAC	Heating, Ventilating and Air Conditioning
L	
LCS	Liquid Cooling System
LC	Local Controller
M	
MSD	Manual Service Disconnect
P	
PCS	Power Conversion System
PMD	Power Distribution Cabinet
S	
SCC	Smart Control Cabinet
SOC	State Of Charge
U	
UPS	Uninterruptible Power Supply

12.9 Quality Assurance

If product faults occur during the warranty period, SUNGROW will provide free service or replace the product with a new one.

The software security update period for this product aligns with the warranty period. During the warranty, security patches or updates will be provided if any vulnerabilities or compatibility issues are identified.

Evidence

During the warranty period, the customer shall provide the product purchase invoice with a date. In addition, the trademark on the product shall be undamaged and legible. Otherwise, SUNGROW has the right to refuse to honor the quality guarantee.

Conditions

- After replacement, unqualified products shall be processed by SUNGROW.
- The customer shall give SUNGROW a reasonable period to repair the faulty device.

Exclusion of Liability

In the following circumstances, SUNGROW has the right to refuse to honor the quality guarantee:

- The free warranty period for the whole machine or components has expired.
- The device is damaged during transport.
- The device is incorrectly installed, refitted, or used.
- The device operates in harsh conditions beyond those described in this manual.
- The fault or damage is caused by installation, repairs, modification, or disassembly performed by a service provider or personnel not from SUNGROW.
- The fault or damage is caused by the use of non-standard or non-SUNGROW components or software.
- The installation and use range are beyond the stipulations of relevant international standards.
- The damage is caused by unexpected natural factors.

For faulty products in any of the above cases, if the customer requests maintenance, paid maintenance service may be provided based on the judgment of SUNGROW.

Product dimensions and parameters are subject to change without prior notice. The latest documentation from SUNGROW shall prevail in case of any deviation.

12.10 Contact Information

In case of questions about this product, please contact us. We need the following information to provide you with the best assistance:

- Model of the device
- Serial number (S/N) of the device
- Fault code/name
- Brief description of the fault

For detailed contact information, please visit: **https://www.sungrowpower.com/en/about-us/contact-us**

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