

Preventative Maintenance Manual

SG3125HV-MV



All Rights Reserved

All Rights Reserved

No part of this document can be reproduced in any form or by any means without the prior written permission of Sungrow Power Supply Co., Ltd (hereinafter "SUNGROW").

Trademarks

SUNGROW and other SUNGROW trademarks used in this manual are owned by SUNGROW.

All other trademarks or registered trademarks mentioned in this manual are owned by their respective owners.

Software Licenses

- It is prohibited to use data contained in firmware or software developed by SUNGROW, in part or in full, for commercial purposes by any means.
- It is prohibited to perform reverse engineering, cracking, or any other operations that compromise the original program design of the software developed by SUNGROW.

About this manual

To ensure the safety and efficiency of the system, regular daily inspections of the photovoltaic power station are necessary. This manual mainly introduces the inspection intervals and steps of the photovoltaic power station.

This manual uses products sold in the European region as an example. Products sold in other regions are similar.

Target readers

This manual is applicable to operators of photovoltaic power station and electrical technicians with corresponding qualifications.

How to use this manual

Please read the manual carefully before using the product, and keep it in a place where it is easily accessible.

To continuously improve customer satisfaction, this product and its product manual are continuously improved and upgraded. Product version upgrades may cause discrepancies between the received manual and the product. The actual product may be different.

The manual will be continuously updated and revised, but it is inevitable that there may be minor discrepancies with the real products or errors. Users should base their usage on the actual products purchased and can obtain the latest version of the manual through scanning QR codes on the products or through sales channels.

The pictures in this manual are for reference only. The received product may be different.

Symbol explanation

In order to ensure the user's personal and property safety when using this product, and help the user use this product efficiently and optimally, relevant information is provided in the manual and highlighted with the following symbols.

The symbols listed below may be used in this manual. Please read carefully to make better use of this manual.

DANGER

It indicates that there is a serious potential danger, which can lead to death or serious injury if not avoided.

WARNING

It indicates that there is a moderate potential danger, which may lead to death or serious injury if not avoided.

CAUTION

This symbol indicates that there is a mild potential danger, which may lead to moderate or mild personal injury if not avoided.

NOTICE

This symbol indicates that there is a potential risk, which may cause the equipment to fail to operate normally or cause property damage if not avoided.



"Notes" are the additional information in the manual, which emphasize and supplement the contents, and may also provide skills or tips for optimizing the use of the product, and help the user solve a problem or save time.

Description of symbols on the product

Please always pay attention to the warning signs on the product, including:

Symbol	Description
	This symbol indicates that there is high voltage inside the machine, and touching it may cause electric shock.
	This symbol indicates that this is a protective earthing (PE) terminal, which needs to be grounded firmly to ensure the safety of operators.
	This symbol indicates that the manual should be read before any operation on the product.
	This symbol indicates that after the external power supply is disconnected, wait for 5 minutes before touching any internal conductive components.
	This symbol indicates a warning of danger. Do not operate this product while it is live!
	This symbol indicates a heavy load. Lifting heavy objects may cause back injury. Please use appropriate tools for lifting.
	This symbol indicates a warning of explosion.
	This symbol indicates a warning of corrosion.
	This symbol indicates that the item should not be disposed of together with domestic waste.
	This symbol indicates no smoking and lighting fires.
	This sign indicates that a medical center should be set up nearby.
	This sign means that if the item comes into contact with eyes, immediately rinse with flowing water or saline solution and seek medical attention promptly.

Symbol	Description
	This symbol indicates the need to wear safety goggles.
	This symbol indicates that the product is recyclable.
 Li-ION	This symbol indicates that lithium batteries are recyclable.

Contents

All Rights Reserved	I
About this manual	II
1 Safety Overview	1
1.1 Personnel Requirements.....	1
1.2 Weather and Environmental Requirements.....	1
1.3 PPE and ESE.....	2
1.4 Inspection Tools	3
1.5 Operation Requirements	4
1.6 Component Scrapping	5
2 General Inspection	6
2.1 Check the Packing List and Manual	6
2.2 Check the Integrity of the Warning Label	6
2.3 Check Grounding Resistance	7
2.4 Check the Product Appearance	7
3 Inverter	9
3.1 Inspection Checklist.....	9
3.2 Check System Status.....	13
3.3 Check UPS	15
3.4 Check Communication Connection	16
3.5 Check Appearance	16
3.6 Check System Cleanliness.....	19
3.7 Check Fans.....	22
3.8 Check Cable Connections	24
3.9 Check Equipment Maintenance Status.....	27
3.10 Check the Safety Switch.....	29
3.11 View Parameter Information on the Web Interface.....	30
3.12 Check the LCD Touch Screen	33
4 Transformer	37
4.1 Inspection Checklist.....	37
4.2 Check the External Condition of the Transformer	38
4.3 Check Cable Connections	41

4.4 Check the Transformer Protection Status	44
4.5 Check the Grounding Status.....	44
4.6 Check the Transformer Node Signal.....	44
5 Ring Main Unit Inspection	46
5.1 Inspection Checklist.....	46
5.2 Check Cleanliness.....	47
5.3 Check Cable Connections	47
5.4 Check Switch Function.....	51
5.5 Check Relay Protection Function (Optional).....	51
6 Foundation	52
6.1 Check the Foundation Structure	52
6.2 Check Product Fixation	52
7 Appendix	54
7.1 Starting.....	54
7.1.1 Inspection before starting.....	54
7.1.2 Start Steps	54
7.2 Normal Stop Steps	55
7.3 Tightening torque.....	55
7.4 Exclusion of Liability	56
7.5 Contact Information	56

1 Safety Overview

1.1 Personnel Requirements

All inspection operations must and can only be performed by professional technicians. Professional technicians must meet the following requirements:

- Hold an electrician work permit required by the country/region where the product is located, and within the validity period.
- Be familiar with local standards and relevant safety regulations for electrical systems.
- Be familiar with the principles and structure of the equipment, and have training or experience in operating the equipment.
- Fully read this manual and understand the relevant safety precautions, and be aware of the various potential dangers in the equipment operation and maintenance process.

1.2 Weather and Environmental Requirements

Weather requirements

WARNING

- **Inspect the equipment under favorable weather conditions whenever possible. In the event of adverse weather conditions such as heavy rain, fog, and strong winds, inspection should be suspended.**
- **Do not conduct maintenance operations while the doors of the system are open in overcast, rainy, humid or windy weather. Sungrow is not liable for any losses incurred if such situations cannot be avoided.**
- **Avoid opening the cabinet doors under high humidity conditions such as rain, snow, and dense fog. After closing the cabinet doors, ensure that the sealing strips around the doors are not curled up.**
- **Special inspections should be conducted for special seasons and abnormal weather conditions (such as rainy season, extreme cold, extreme heat, and typhoons).**

Warning sign settings

NOTICE

To prevent unauthorized personnel from approaching the equipment and causing misoperation or accidents, adhere to the following precautions:

- Place conspicuous warning signs around the equipment to prevent accidents caused by accidental turning-on.
- Set up warning signs or safety warning barriers near the equipment.

Escape routes

NOTICE

The power stations with the product are usually in remote wilderness areas. Please observe the following precautions.

- Prepare corresponding wilderness rescue facilities.
- Ensure that escape and rescue routes are unobstructed.

1.3 PPE and ESE

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

PPE

Be sure to wear the following PPE that meets local regulatory requirements for equipment inspection operations.



Fluorescent vest



Insulating gloves



Safety helmet



Safety goggles



Earplugs



Insulated shoes

ESE

If working on live equipment, ensure that there are at least two operators on site and prepare the following ESE to ensure personal safety.



Rescue rod



Insulated stool



Face shield

1.4 Inspection Tools

Using safe, reliable, well-maintained, and valid inspection tools is essential for ensuring the normal operation of equipment and personal safety.

Examples of inspection tools



Clamp-on ammeter



1500VDC multimeter



Phase rotator



Screwdriver



Wrench set



Torque wrench

The above are only some examples of commonly used inspection tools. The full list of the tools is not provided here. For the specific inspection tools for each inspection item, refer to the "Tool Preparation" section of each inspection item.

1.5 Operation Requirements

Electrical safety

⚠ DANGER

- Touching any contacts and terminals connected to the grid or equipment leads to the risk of electric shock!

⚠ DANGER

Fatal high voltages are present inside the product!

- Pay attention to and comply with the warning labels on the product.
- Adhere to all safety precautions listed in this manual and other relevant documentation for this equipment.

⚠ WARNING

- Replacement of internal components can only be carried out by professionals.

⚠ WARNING

- **To reduce the risk of electric shock, do not perform any maintenance operations beyond those specified in this manual.**
- **Contact Sungrow customer service personnel for repairs if necessary.**

Component security**NOTICE**

- **Do not apply a spray coating to any components inside or outside the equipment.**
- **Do not clean the equipment with detergents or expose it to harsh chemicals.**

1.6 Component Scrapping

When damaged internal components are found during inspections and need to be scrapped, they should not be treated as regular waste. Some components can be recycled for reuse, while others may pollute the environment.

Please contact a locally authorized professional recycling organization for proper disposal of the product and its internal components.

2 General Inspection

2.1 Check the Packing List and Manual

Step 1 Open the inverter door equipped with a screen.

Step 2 Find the documentation folder on the back of the door, open the PE bag, and take out the packing list.

Step 3 Check against the packing list to verify the completeness of documents. Contact Sungrow for any missing document.

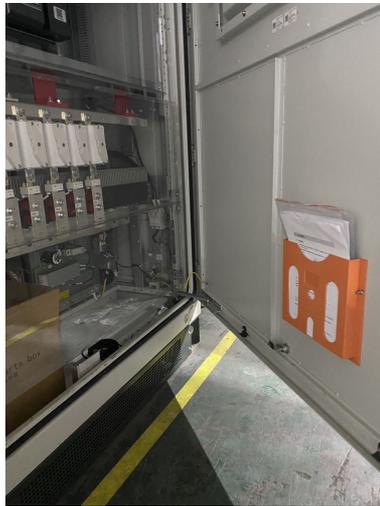


figure 2-1 Folder location

* The above pictures are for reference only. The received product may be different!

-- End

2.2 Check the Integrity of the Warning Label

Check machine warning signs and other device signs, if any signs are blurred or damaged, replace them promptly.



2.3 Check Grounding Resistance



It is suggested that the measurements should be repeated in different directions to enhance the accuracy of results.

Step 1 Shut down the inverter.

Step 2 Maintenance personnel should wear safety helmets and safety gloves, and visually check whether the grounding wires or grounding flat-rolled steel connected to the ground points of the inverter are damaged or rusted.

Step 3 Measure the resistance of the conductor between the grounding points to the reliable grounding points on the ground using a multimeter. The resistance should not be greater than 4Ω , otherwise resecure the grounding flat-rolled steel or replace the grounding wires.



* The above pictures are for reference only. The received products may be different!

-- End

2.4 Check the Product Appearance

Check for external damage and select an appropriate repair method based on the severity of the damage.

Level 1: Surface dirt that can be wiped away

- 1 Clean the dirty areas with a damp duster (or another cleaning tool).
- 2 If water is ineffective, use 97% alcohol to clean until the surface reaches an acceptable level of cleanliness. (You can also try using a non-corrosive detergent that is commonly used locally.)

Level 2: Surface dirt that cannot be wiped away

- 1 Use sandpaper to polish the surface areas where the paint is rough or scratched until smooth.
- 2 Clean the damaged area with a damp duster or 97% alcohol to remove any surface stains.
- 3 After the surface dries, use a soft bristle brush to touch up the scratched parts of the paint, and ensure an even paint application.



* The above pictures are for reference only. The received product may be different!

Level 3: Exposed substrate due to damaged primer

- 1 Use sandpaper to polish the damaged parts of the paint to remove rust and burrs on the surface until smooth.
- 2 Clean the damaged area with a damp duster or 97% alcohol to remove any surface stains and dust.
- 3 After the surface dries, spray a zinc-rich primer on the exposed substrate for protection. Ensure complete coverage of the exposed substrate.
- 4 After the primer dries, use a soft bristle brush to touch up the damaged areas, and ensure an even paint application.



* The above pictures are for reference only. The received product may be different!

3 Inverter

3.1 Inspection Checklist

The inspection checklist of the inverter is as follows.



- The recommended maintenance intervals provided below should be adjusted based on the specific environmental conditions where the product is installed.
- Factors such as the scale of the plant, installation location, and on-site environmental conditions will influence the maintenance intervals. If the operating environment is windy and sandy or contains heavy dust, it is necessary to shorten the maintenance intervals and increase the maintenance frequency.

S/N	Type	Details	Inspection interval
1	Check system status	<ol style="list-style-type: none">1 Check whether the interior and enclosure temperatures of the product are excessively high.2 Check whether the internal components and main circuits of the equipment are deformed or damaged.3 Check for condensation within the product.4 Check for any abnormal noises during the operation of the internal equipment.	Once a month
2	Check UPS	Check whether the UPS functions normally.	Once every three months
3	Check communication connection	Check whether the smart unit test PT board operates normally.	Once every three months

S/N	Type	Details	Inspection interval
4	Check appearance	<ol style="list-style-type: none"> 1 Check the top and surrounding areas of the product for any flammable or explosive materials, installation tools, or miscellaneous items. 2 Check whether the door locks and hinges of the product function normally. 3 Check the sealing strips for proper sealing performance. 	Once every six months
			Once every six months
5	Check system cleanliness	<ol style="list-style-type: none"> 1 Remove dust from internal components of the inverter. 2 Check radiators for dust. 3 Check the top air inlet for dust. Remove dust promptly if necessary. 4 Check the bottom air outlet for dust. Remove dust promptly if necessary. 	<p> If the power station is in other harsh environments such as sandstorms and willow catkins, please increase the frequency of inspections and cleaning according to the degree of dirt.</p>

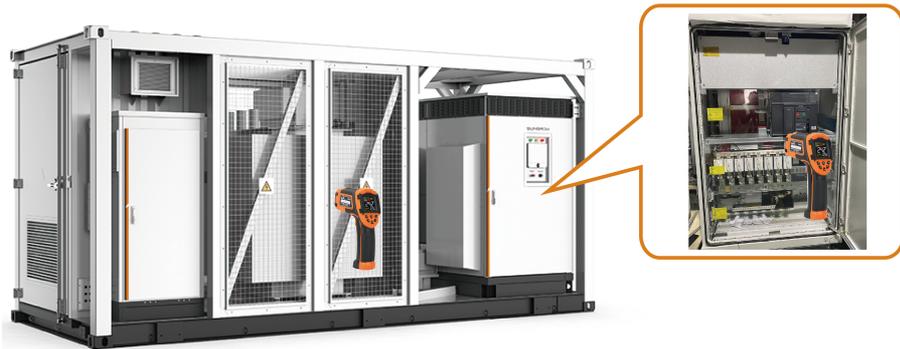
S/N	Type	Details	Inspection interval
			Once every six months
6	Check fans	<ol style="list-style-type: none"> 1 Check whether all cable inlets are properly sealed. 2 Clean fans to remove any internal dust accumulation in time. 3 Check whether the fans emit any abnormal noises during operation. 	<p> If the power station is in other harsh environments such as sandstorms and willow catkins, please increase the frequency of inspections and cleaning according to the degree of dirt.</p>
7	Check cable connections	<ol style="list-style-type: none"> 1 Check whether all cable inlets are properly sealed. 2 Check the surfaces where the power and control cables come into contact with metal for damage. 3 Check for loose connections of power supply and control cables. 4 Check whether all cables are routed correctly without short circuits. 5 Check whether the wrapping tape of connection terminals has been removed. If not, remove the wrapping tape promptly. 	Once a year

S/N	Type	Details	Inspection interval
8	Check equipment maintenance status	<ol style="list-style-type: none"> 1 Check whether contactors in the inverter are normal. 2 Check whether the indicator lights of the inverter are normal. 3 Check the tightening of screws at connections of reactors, AC switches, and DC switches. 	Once a year
9	Check the safety switch	<ol style="list-style-type: none"> 1 Check whether the start-stop knob is normal. 2 Check whether the emergency shutdown button is normal. 3 Check whether the key stop function of the LCD is normal. 4 Simulate power-off and shutdown. 	Once a year
10	View parameter information on the web interface.	<ol style="list-style-type: none"> 1 User login. 2 View inverter parameter settings. 3 View historical information. 	Once a year
11	Check the LCD touch screen	<ol style="list-style-type: none"> 1 Check whether the time displayed on the LCD touch screen is accurate. 2 If the button battery behind the LCD touch screen fails, replace it with a new button battery following the steps below. 3 Check the operating information of the inverter. 4 View historical information. 5 Check the software version. 6 Check whether the PC, PB, PA boards of the equipment are operating normally. 	Once a year

3.2 Check System Status

Step 1 Check whether the interior and enclosure temperatures of the product are excessively high.

- 1 Use a temperature measuring instrument to measure the temperatures of the interior and enclosure of the product, and record the temperatures.
- 2 Compare the measured temperatures with the specifications of each component, and replace any component with temperature exceeding the permissible range.



Step 2 Check whether the internal components and main circuits of the equipment are deformed or damaged.

- 1 Open the inverter cabinet door.
- 2 Visually check the internal components and main circuits for damage or deformation.
- 3 If there is any damage or deformation confirmed by a technician from the headquarters, request components of the same model and specification for replacement.

Step 3 Check for condensation within the product.

- 1 Open the inverter cabinet door, check for condensation on the cabinet doors and PC sealing plates.



Inverter unit 1

Inverter unit 2

- 2 If condensation is present, check for damage to sealing strips of the doors, and air inlets and outlets.
- 3 Replace damaged sealing strips and air dry condensation.

Step 4 Check for any abnormal noises during the operation of the internal equipment.

Determine whether the noises are caused by mechanical looseness or abnormal equipment vibration.

- Noises caused by mechanical looseness: Identify the loose parts and re-fasten the loose components.
- Noises caused by abnormal equipment vibration: Export fault waveform recording data and check if the values of capacitors or inductors are normal. If anomalies exist, replace the abnormal components.

Steps of fault recording export:

- 1 Connect a PC to the maintenance port of the LCD screen using a network cable. Input the default URL 192.168.1.100 to log into the web interface.
- 2 Input the operation and maintenance username **maintain** and the password **adamg1**.
- 3 Click "**Maintenance**", then click **Export faultwave data**. Select the faulty unit from the drop-down menu, In addition, select CAN-1 to export data of inverter unit 1, or select CAN-2 to export data of inverter unit 2.



- 4 Click **Export batch data**.

No.	Device name	Export
1	20180801084401_CAN1_1.xml	导出XML
2	20180801084415_CAN1_1.xml	导出XML
3	20180801085250_CAN1_1.xml	导出XML
4	20180801085301_CAN1_1.xml	导出XML
5	20180801103536_CAN1_1.xml	导出XML

- 5 Open the data using **FaultRecorder** and check whether the data of capacitors or inductors is normal.

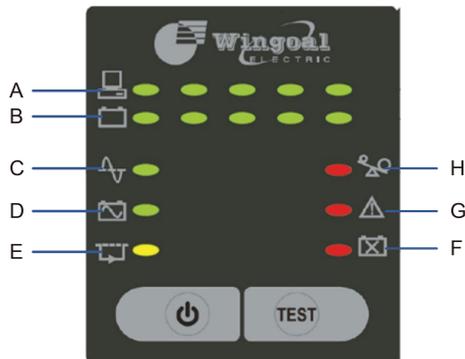


-- End

3.3 Check UPS

Step 1 Check whether the UPS functions normally.

Open the power distribution cabinet, check the UPS indicator lights to determine the battery SOC and operational status.



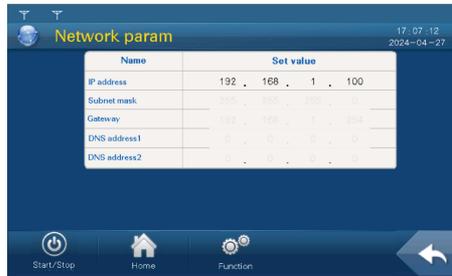
No.	Indicator light name	Description
A	Load indicator light	5 indicator lights show load capacity at 5%, 25%, 45%, 65%, and 85%. For example, if 3 lights are on, the load capacity is 51% ~ 68%.
B	SOC indicator lights	5 indicator lights indicate SOC levels at 24%, 48%, 72%, 96%, and >96%. For example, if 3 lights are on, the battery SOC is 48% ~ 72%.
C	Indicator light of utility power supply	It indicates that utility power is supplied to connected devices.
D	Indicator light of battery power supply	When utility power is not available, the UPS can supply power from its internal batteries to connected devices.
E	Bypass indicator light	In the "bypass" mode, utility power is directly supplied to connected loads.
F	No battery	It indicates that the battery failed the self-test.
G	Fault indicator light	It indicates that the UPS detected an internal fault.
H	Overload indicator light	It indicates that the connected device exceeds the defined "maximum load" of the UPS

-- End

3.4 Check Communication Connection

Check whether the smart unit test PT board operates normally.

Step 1 On the LCD screen, tap “**Function**→**Set Parameter**→**input the password 1111**, navigate to →**Com-parameter**→**Network param**” to view the IP address of the smart unit board.



Step 2 Connect a PC to the maintenance port of the LCD screen using a network cable. Input the default URL **192.168.1.100** to log into the web interface.

Step 3 Input the operation and maintenance username **maintain** and the password **adamg1**.

Step 4 Check whether the IP address of the PC and the NET address of the smart unit board are in the same network segment.



IP addresses being in the same network segment means that all but the last segment of the address are identical. For example, the default IP address of the smart unit is 192.168.13.100, and the IP address of the PC can be set to 192.168.13.1.

Step 5 If the two addresses are not in the same network segment, modify the IP address of the PC.

-- End

3.5 Check Appearance

Step 1 Check the top and surrounding areas of the product for any flammable or explosive materials, installation tools, or miscellaneous items.



Common flammable materials include but are not limited to linoleum, wood, paint, plastics, and decoration and fit-out materials.

- 1 Wear safety helmets, protective clothing and other protective gear, visually check if there are flammable and explosive materials around the all-in-one machine. If any, move the materials to another place away from the all-in-one machine.
- 2 Wear safety rope and other protective gear. Use a climbing ladder to check if there are flammable and explosive materials, tools or other debris on the top of the all-in-one machine. If any, move the items to another place away from the all-in-one machine.

Step 2 Check whether the door locks and hinges of the product function normally.

- 1 Wear safety gloves. With the cabinet door lock locked or unlocked, check if the inverter door can be opened and closed manually.
- 2 Wear safety gloves, and open the inverter cabinet doors. Open and close the doors repeatedly to check for any resistance or obstruction. If any abnormality is found, apply lubricating oil to the faulty door locks. If this does not resolve the issue, contact Sungrow for door replacement.



figure 3-1 Door lock

- 3 Visually check the screw cover plates of the inverter for any missing screws. If any screws are missing, contact Sungrow for new screws.
- 4 Use an appropriate wrench or screwdriver to check for loose screws. If any screws are loose, tighten them promptly.



figure 3-2 Side door of the inverter

- 5 Open side doors of the inverter, and utilize an electric screwdriver to detach screws from the side doors. Check whether the doors operate smoothly and whether they produce abnormal noises. If any doors exhibit stiffness or produce abnormal noises, apply lubricating oil to the hinges.

**figure 3-3** Hinge

* The above pictures are for reference only. The received product may be different!

Step 3 Check the sealing strips for proper sealing performance.

- 1 Open side doors of the inverter and check the outer rubber strips of the doors for problems such as damage, detachment, and breaks.
- 2 If any anomalies are detected, remove the defective rubber strips and replace them with new ones.

**figure 3-4** Front view of the inverter

* The above pictures are for reference only. The received product may be different!

-- End

3.6 Check System Cleanliness

Step 1 Remove dust from internal components of the inverter.

- 1 Open the cabinet door and remove the PC seal plate and sheet metal.
- 2 Check circuit boards, circuit breaker switches and other components for dust.
- 3 If dust is present, use a vacuum cleaner to remove the dust.



Step 2 Check radiators for dust.

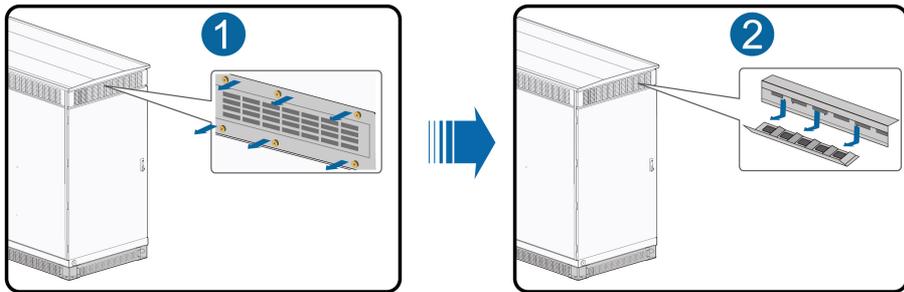
- 1 On the LCD screen, tap “**Function**→ **Run-information**→**INV Unit**”.
- 2 Check if the temperatures of **PM1**, **PM3**, and **PM5** are above 96 °C.
- 3 If higher than 96 °C, unscrew the bolts around the inverter’s side cabinet door equipped with radiators, and open the side door.
- 4 Open the inverter fan cover plate and check for dust on the radiator.
- 5 If dust is present, use a vacuum cleaner to remove the dust.



Step 3 Check the top air inlet for dust. Remove dust promptly if necessary.

Steps for cleaning the bolt-fastened air inlet

- 1 Loosen the fastening bolts on the top air inlet and remove the cover plate.
- 2 Remove the filter mesh and filter sponge.
- 3 Use a vacuum cleaner to clean the filter sponge.



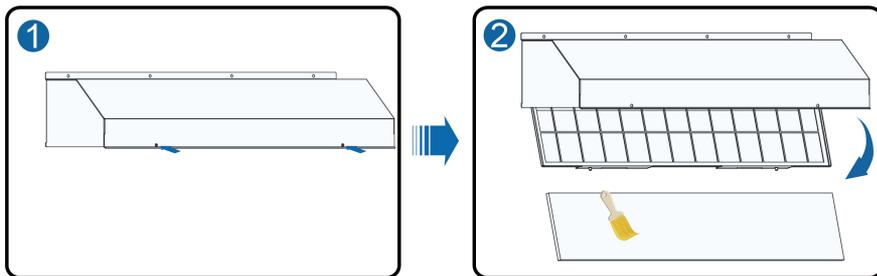
C001-M010

figure 3-5 Bolt-fastened top air inlet

After cleaning, be sure to restore the filter mesh and filter sponge.

Steps for cleaning the elbow air inlet

- 1 Pull the two spring plungers of the air outlet inward.
- 2 Flip the filter sponge pressure plate along the fixed axis. Open the pressure plate and remove the filter sponge.
- 3 Use a vacuum cleaner to clean the filter sponge.

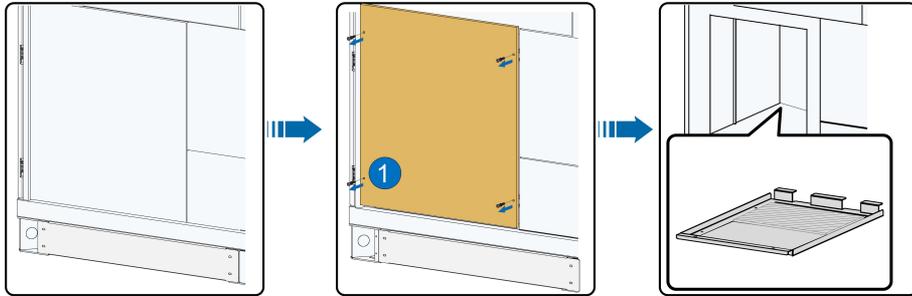


C001-M020

After cleaning, be sure to restore the filter sponge and pressure plate.

Step 4 Check the bottom air outlet for dust. Remove dust promptly if necessary.

- 1 Loosen the fixing screws of the filter mesh and the inverter bottom, and remove the filter mesh.
- 2 Use a vacuum cleaner to clean the filter sponge.



C000-M012

figure 3-6 AC-side bottom air outlets of the inverter unit

After cleaning, be sure to restore the filter mesh, filter components, filter sponge, etc.

-- End

3.7 Check Fans

The inverter contains a plurality of fans. This manual focuses on module fans but is applicable to other fans as well.

Step 1 Check whether the fans can operate at their full operating speeds.

- 1 On the LCD touch screen, tap **"Function→Set-parameter"**, input password **4040**, tap **Enter**, and adjustable speed duty ratio to 100%.



figure 3-7 Set adjustable speed duty ratio

- 2 In this state, check if each fan reaches its full operating speed.



Fans of different models may vary in full operating speed. For example, EBM fans may operate at a full speed of about 4000r/min, while Delta fans may operate at a full speed of about 3310r/min. Refer to specific manufacturer data for details.

Step 2 Clean fans to remove any internal dust accumulation in time.

Clean fans while the power is off !

- 1 Remove the inverter door and protective guard to expose the fans.

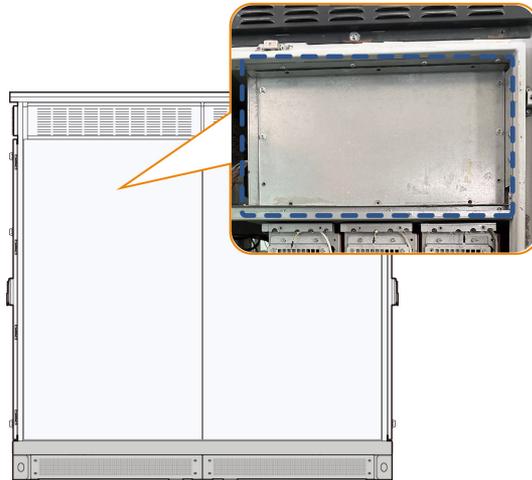


figure 3-8 Fan positions

- 2 Use a cleaning cloth to remove dust from the fans. If any cracks are found on the blades during cleaning, replace with new fan blades in time.
- 3 After cleaning, install the fans by reversing the disassembly steps.

Step 3 Check whether the fans emit any abnormal noises during operation.

- 1 If there are any abnormal noises, shut down and power off the equipment, and remove the protective guard outside the fan air chamber.
- 2 Check inside the fan chamber for any foreign objects and promptly remove them if any.
- 3 Manually rotate fans to check if the bearings emit any abnormal noises. If yes, replace them promptly.

-- End

3.8 Check Cable Connections

Step 1 Check whether all cable inlets are properly sealed.

- 1 Open the inverter cabinet doors to check whether cable inlets are well sealed with fire clay.
- 2 If there is any gap between a cable and fire clay, seal the gap.



Step 2 Check the power cable and copper nose are damaged.

- 1 Open the inverter cabinet doors, remove the transparent seal plates.
- 2 Inspect the connections of the terminals, and check whether any screw has loosened. If it has, tighten the screw properly using a torque wrench.
- 3 Check whether any terminal has changed color. If it has, replace the terminal.
- 4 Check the terminals and copper bars for deformation and cracks. If such damage is found, replace the terminal or copper bar in time.
- 5 Check whether the distance between the positive and negative wiring terminals is less than 50mm. If so, adjust the connection and make sure the distance between them is over 50mm.



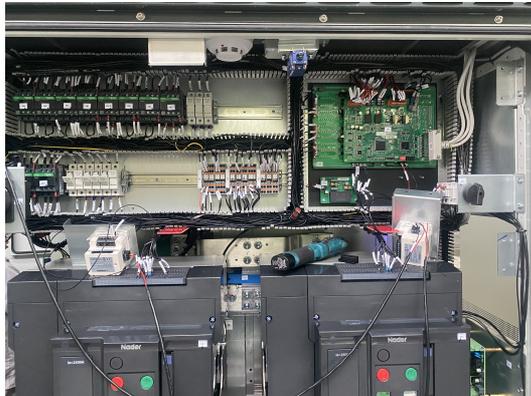
Step 3 Check the surfaces where control cables come into contact with metal for damage.

- 1 Open the inverter cabinet doors, remove the transparent seal plates and sheet metal.
- 2 Visually check the cables for sheath damage or breaks, especially at the points where they connect to metal. If any cable damage is detected, promptly request replacement materials or apply insulation remedies.



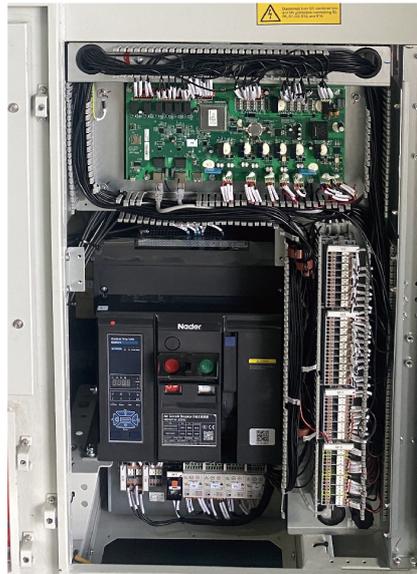
Step 4 Check for loose connections of control cables.

- 1 Open the inverter cabinet doors, remove the transparent seal plates and sheet metal.
- 2 Manually check the cables for looseness; retighten any loose cables according to the list of recommended torque in the appendix of the manual.



Step 5 Check whether all cables are routed correctly without short circuits.

- 1 Open the inverter cabinet doors, remove the transparent seal plates and sheet metal.
- 2 Check whether there is any client wiring on the inverter.
- 3 If yes, check whether the cable diameter, material and construction technique comply with the specifications.
- 4 For any inconsistencies, correct them according to the specifications.



Step 6 Check whether the wrapping tape of connection terminals has been removed. If not, remove the wrapping tape promptly.

-- End

3.9 Check Equipment Maintenance Status

Step 1 Check whether contactors in the inverter are normal.

The inspection and O&M of contactor fault information are mainly implemented through the following two methods: the first method is to use the LCD display screen or Web interface to perform remote monitoring and view the operating status and fault information of contactors in real time; The second method is to conduct on-site actual operation.



Fault information can be viewed on the LCD touch screen or on the web interface. This manual takes LCD touch screen operation as an example.

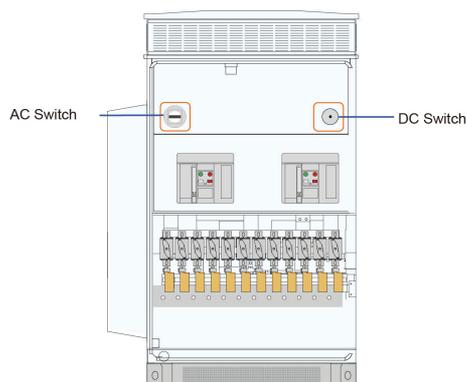
- 1 Tap **“Function→History-information→His-fault”** on the LCD touch screen to check if there is any contactor fault information.



figure 3-9 View contactor faults

- 2 Check whether the maintenance switch is normal.

Manually turn on and turn off the AC and DC maintenance switches. Check whether the switches can be turned on and off normally. Replace any switch that fails to function correctly.



- 3 Check whether the micro switches are normal. (Applicable only to SG3125HV-20 model)

The micro switches are located on DC fuses. Manually control the micro switches to check their flexibility in resetting. Replace any micro switch that does not operate smoothly.



figure 3-10 Microswitch

Step 2 Check whether the indicator lights of the inverter are normal.

Positions of the indicator lights are shown in illustration A. Check whether the equipment status is consistent with the real-time status of the indicator lights, as detailed in the table.

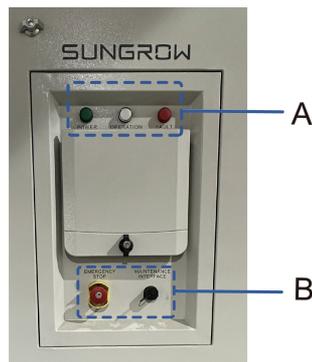


figure 3-11 Monitoring window

LED	Color	Description
POWER	Green	It indicates that the internal control power source of the inverter is supplying power.
	White	It indicates that the inverter is shut down.
OPERATION	Green	It indicates that the inverter is in grid-connected operation.
	Yellow	It indicates that the inverter is operating with an alarm.
FAULT	Red	It indicates an unresolved fault of the inverter. The indicator light will be off once the fault is cleared.

Step 3 Check the tightening of screws at connections of reactors, AC switches, and DC switches.

- 1 Check the tightening of screws at connections of reactors, AC switches, and DC switches. During operation, use a temperature detector to detect any abnormal heating within the inverter.
- 2 If overheating is detected, power off immediately to check whether the connecting screws at overheating positions are tightened.

-- End

3.10 Check the Safety Switch

Check the function of the start-stop knob, emergency shutdown button on the inverter and the key stop function of the LCD respectively. The start-stop knob and emergency stop button of the inverter are below the LCD touch screen, as shown in "[View Historical Information](#)"B above.

Step 1 Check whether the start-stop knob is normal.

Turn the start-stop knob to the On/Off position to check whether the LCD touch screen accurately reflects this action; Check whether the start-stop knob can be resets smoothly.

Step 2 Check whether the emergency shutdown button is normal.

- 1 While the inverter is operating, press the emergency stop button and check whether it disengages the AC and DC switches and trips the RMU.
- 2 Wait for about 5min, and then check whether the LCD touch screen and status indicator lights are off.

(This step applies only to units equipped with an integrated RMU!)

- 3 Use the dedicated key to reset the emergency stop button, power up the AC side of the inverter again, start the inverter, and observe whether the inverter resumes normal operation.

Step 3 Check whether the key stop function of the LCD is normal.

- 1 While the inverter is operating, open the LCD monitor cover of the inverter.
- 2 Click **Start/Stop** to apply an inverter shutdown command, observe whether the AC switches of unit 1 and unit 2 are tripped and whether the inverter stops operating. Additionally, check whether the current operating state displayed by the LCD touch screen is **Key Stop**.
- 3 Repeat the above step, apply a shutdown command to unit 1 and unit 2 separately, and check whether the corresponding unit is shut down.



figure 3-12 Shutdown

Step 4 Simulate power-off and shutdown.

- 1 While the inverter is operating, open the LCD monitor cover.
- 2 Click **Start/Stop** to apply an inverter shutdown command, observe whether the AC switches of unit 1 and unit 2 are tripped and whether the inverter stops operating. Additionally, check whether the current operating state displayed by the LCD touch screen is **Key Stop**.
- 3 Turn off the DC load and maintenance switches in the inverter, wait for about 5min, and then check whether the LCD and the status indicator lights are off.
- 4 Turn off the load switch of each branch combiner box and the medium-voltage load switch of the transformer, and complete the simulated power-off and shutdown.

-- End

3.11 View Parameter Information on the Web Interface.

The functions of the web interface and the LCD touch screen are basically the same. You can choose to view parameters on the web interface or the LCD touch screen.

Step 1 User login.

- 1 Connect the inverter to the "Maintenance" network port using a network cable.
- 2 Enter the IP address, such as 192.168.0.100, in the PC's address bar to access the login page.



- 3 Select the desired language, input **username** and **password**, and click **Log in**.

User role	Username	Password
O&M user	maintain	adamg1
General user	user	sglogger
Anon-ymous user	-	No password is required; you can log in directly.

Step 2 View inverter parameter settings.

- 1 Click “**Monitoring**→**Param. Setting**” on the homepage to view the parameter settings of the inverter. Take photos for records if necessary.

No.	Parameter name	Value	Data range	Unit
1	Control policy	Remote/local		
2	Start/Stop of unit 2	Stop		
3	Start/Stop of unit 1	Stop		
4	Start/Stop	Stop		
5	Stop delay	0	[0-600]	s
6	Stop slope	100	[0.1-500.0]	%/s
7	Start slope	10	[0.01-100.00]	%/s
8	Boot wait time	1	[0-600]	s
9	Start waiting time	60	[0-600]	s
10	Auto recovery time	60	[20-1800]	s
11	Night SVG switch	Disable		

figure 3-13 View inverter parameter settings

Step 3 View historical information.

- 1 Click “**Monitoring**→**Data Display**” on the homepage to view the **Historical Records** and **Historical Data** of the inverter.

No.	Parameter name	Current value	Unit
1	State of Turnkey Station	Stop	
2	Daily power generation of Turnkey Station	0.0	kWh
3	Daily charging capacity of the whole machine	0.0	kWh
4	Monthly power generation of Turnkey Station	0	kWh
5	Monthly charging capacity of the whole machine	0	kWh
6	Annual power generation of Turnkey Station	0	kWh
7	Annual charging capacity of the whole machine	0	kWh
8	Total power generation of Turnkey Station	0	kWh
9	Total charge of the whole machine	0	kWh
10	CO2 emission reduction of Turnkey Station	0	Kg

figure 3-14 View historical data and historical information

- 2 Click **Historical Data**, select the desired time frame for export, and then click **Export** to view historical data.

Time: 2024-05-09

Total number of historical data: 0

figure 3-15 Export historical data

-- End

3.12 Check the LCD Touch Screen

Step 1 Check whether the time displayed on the LCD touch screen is accurate.

- 1 Open the cover plate of the inverter's LCD touch screen.
- 2 Observe the time displayed in the lower right corner of the LCD to verify if it matches the current time.

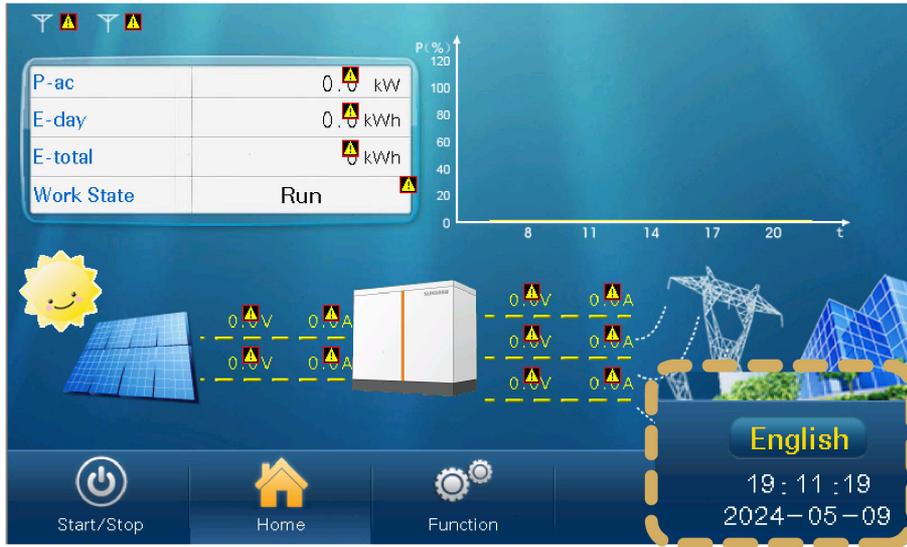


figure 3-16 Check time

- 3 If the time is incorrect, follow the steps below to calibrate the time.

- ① Tap **"Function → Set-parameter"** on the LCD touch screen.
- ② Input the password **1111**, and then tap **Enter**.
- ③ Tap **"Sys-parameters → Time"** to enter the clock interface. Tap the white box to modify the time.
- ④ After the modification is completed, tap **Enter** to confirm the modification.



figure 3-17 Modify time

Step 2 If the button battery behind the LCD touch screen fails, replace it with a new button battery following the steps below.

- 1 Open the door of the cabinet where the LCD touch screen is located. The button battery is on the back of the touch screen.
- 2 Pull out the button battery and its holder, and replace with a new button battery that meets the requirements.
- 3 Insert the button battery into the holder.

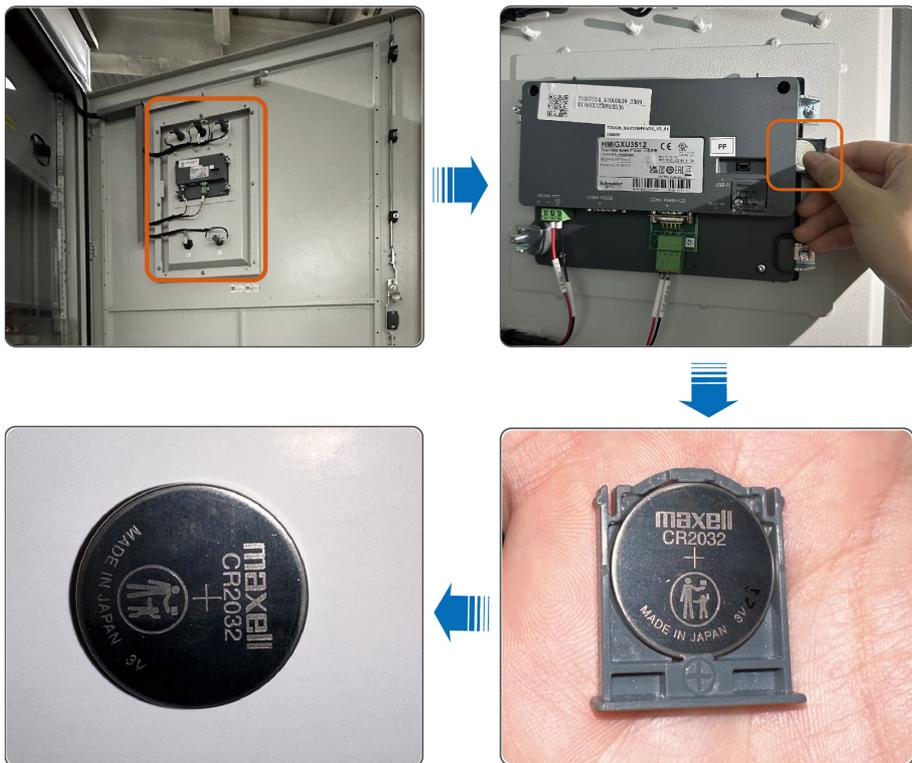


figure 3-18 Replace the button battery

Step 3 Check the operating information of the inverter.

- 1 On the LCD touch screen, tap "**Function** → **Run-information**", then tap **Overall** to view overall information, such as DC power, AC power, grid frequency, daily/monthly/annual/total power generation, temperature, humidity, and resistance.
- 2 Tap **INV Unit** to view information such as DC power, AC power, daily/monthly/annual/total power generation, efficiency, DC voltage, DC current, power factor, reactive power, internal temperature, AC voltage, AC current, module temperature of the inverter unit
- 3 Tap **DI Input** to view conditions of nodes in the transformer, such as oil temperature alarm, oil temperature tripping, low oil level tripping, oil pressure tripping, and medium voltage load switch status.



The conditions of the nodes involved should be determined according to the actual situation of the site.



figure 3-19 View operating information

Step 4 View historical information.

Tap **"Function →History-information"** on the main interface of the LCD touch screen to view historical events, historical faults and historical data of the inverter.



figure 3-20 Check historical information

Step 5 Check the software version.

- 1 Open the cover plate of the LCD touch screen.
- 2 Tap **"Function →Set-parameter"** on the main interface of the LCD touch screen to view the current software version of the inverter. Take a photo to record the software version information if necessary.



figure 3-21 Check the software version

* The figure is for reference only. The actual products may be different.

Step 6 Check whether the PC, PB, PA boards of the equipment are operating normally.

- 1 The software information of the PCboard, PBboard, PA board, PL board, PG board and PT board can be viewed by following the "figure 3-21 Check the software version" on the LCD touch screen.
- 2 If there is no software, check the power supply of each board. If the power supply is not normal, please check whether the 24V power pack used for power supply is normal.

-- End

4 Transformer

4.1 Inspection Checklist

The inspection checklist of the transformer is as follows.



- The recommended maintenance intervals provided below should be adjusted based on the specific environmental conditions where the product is installed.
- Factors such as the scale of the plant, installation location, and on-site environmental conditions will influence the maintenance intervals. If the operating environment is windy and sandy or contains heavy dust, it is necessary to shorten the maintenance intervals and increase the maintenance frequency.

S/N	Type	Details	Inspection interval
1	Check the external condition of the transformer	1 Check for oil leakage from the transformer.	Once a year
		2 Check the oil level gauge for normal operation.	
		3 Check whether the operating temperature is normal.	
		4 Check whether the operating noise is normal.	
		5 Check for external corrosion.	
		6 Check the main components of the transformer.	
2	Cable connections	1 Check electrical connections.	Once a year
		2 Check whether the transformer cover plate is tightly closed.	

S/N	Type	Details	Inspection interval
3	Transformer protection status	<ol style="list-style-type: none"> 1 Check on the web interface to see if there are any fault alarms for the pressure relief valves, thermometers, gas relays and other devices. 2 Check whether the dial indications of pressure relief valves, thermometers, gas relays, and other devices are within normal ranges. 3 Check whether the liquid level gauge changes with the oil temperature. 	Once a year
4	Grounding status	Please contact a third-party profession testing institution.	Once a year
5	Transformer node signal	Check whether power supply transformer alarms, tripping signals and other node signals are correct.	Once a year

4.2 Check the External Condition of the Transformer

The following inspection operations only require a visual assessment of the transformer and do not necessitate powering off the equipment.

Step 1 Check for oil leakage from the transformer.

- 1 Check the area on the container where the transformer is installed for any presence of transformer oil. (Please distinguish between oil and water.)
- 2 If oil leakage is detected, focus on inspecting the oil leakage traces on the transformer's surface, and identify the leakage point based on these traces, such as: low-voltage connection cabinet, high-voltage connection chamber, bottom of radiating fins (by touch), oil level gauge, gas relay, pressure release valve, oil drain valve, sampling valve, windings, and oil level temperature controller, among others.
- 3 In case of oil leakage, promptly take photographs to document the oil leakage, and contact Sungrow.

Step 2 Check the oil level gauge for normal operation.

- 1 Check if the pointer on the oil level gauge (as shown in A in the following figure) exceeds the upper or lower red lines on the dial.
- 2 Compare the oil level gauge with the thermometer (as shown in C in the following figure) and the oil level curve label (as shown in B in the following figure) on the transformer to check for any abnormal display on the oil level gauge. Examples of anomalies include when the thermometer indicates a high temperature while the oil level gauge indicates a low level, or vice versa. Such anomalies may indicate potential risks.
- 3 In the event of any of the aforementioned anomalies, promptly take photographs for documentation purposes and inform Sungrow.

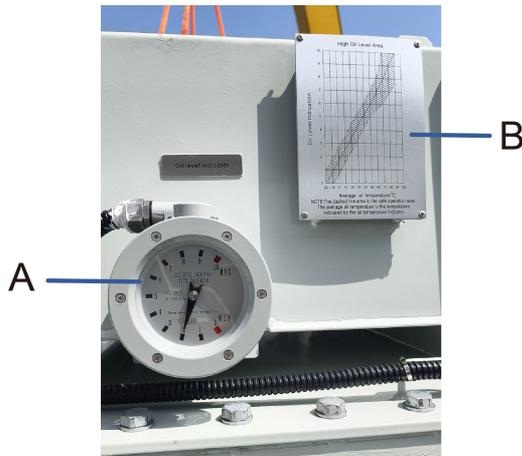


figure 4-1 Oil level gauge and oil level curve label



figure 4-2 Thermometer

Step 3 Check whether the operating temperature is normal.

- 1 View the historical highest temperature and operating temperature of the temperature controller, and take photos for records. The historical highest temperature corresponds

to the temperature indicated by the red pointer on the dial, while the operating temperature corresponds to the temperature indicated by the white pointer.

- 2 Check the historical temperature data recorded by the inverter for anomalies. To view historical temperature data recorded by the inverter, refer to "[View Historical Information](#)".



figure 4-3 Temperature controller

Step 4 Check whether the operating noise is normal.

- 1 If the transformer emits a humming sound during operation, it is considered a normal operating sound.
- 2 If a sharp, piercing noise is emitted during operation, refer to the most recent oil sample DGA analysis of the transformer to check for any anomalies.

Step 5 Check for external corrosion.

- 1 Check the radiating fins of the transformer, the surface of the oil tank and various accessories for visible rust or damage caused by rust.
- 2 If rust is present, take photos for records, remove the rust in time and take follow-up anti-corrosion measures. (For details, refer to the instructions in ISO 12944 standard.)



figure 4-4 Radiating fins

Step 6 Check the main components of the transformer.

Consult the manufacturer's data of gas relays, pressure relief valves, thermometers and other components, and check whether the functions and maintenance of each component are normal. Pay particular attention to the fault judgment criteria of pressure release valves and other components, as well as the procedures for addressing anomalies.

-- End

4.3 Check Cable Connections

Step 1 Check electrical connections.

- 1 Power down the inverter to stop its operation.
- 2 Open the terminal box of the transformer, check whether the connections of the XZ2 terminal block on the SCU and the XT1 terminal block of the transformer are intact.
- 3 Open the cabinet door of the high-voltage cable room in transformer. Check whether the cable connectors (as shown in Figure A below) are connected properly, whether there is any skew, whether the cable clamps (as shown in Figure B below) can securely clamp the cables (as shown in Figure C below), and whether the bolts are fastened without loosening.



figure 4-5 Cable compartment of the transformer

- 4 After inspection, close the cabinet doors.

Step 2 Check whether the transformer cover plate is tightly closed.

⚠ WARNING

Ensure that the equipment is shut down before inspection!

- 1 Check whether the cover plate at the connection between the transformer and the inverter is tightly closed.
 - ① Visually check the cover plate for any missing screws. If any screws are missing, contact Sungrow promptly.
 - ② Use a wrench or screwdriver to check whether screws for looseness. If any screws are loose, tighten them promptly.



figure 4-6 Cover plate at the connection between the transformer and the inverter

- 2 Check whether the cover plate on the transformer is tightly closed, using the same method as above.



figure 4-7 Cover plate at the connection between the transformer and the inverter

-- End

4.4 Check the Transformer Protection Status

Step 1 Check on the web interface to see if there are any fault alarms for the pressure relief valves, thermometers, gas relays and other devices.

Step 2 Check whether the dial indications of pressure relief valves, thermometers, gas relays, and other devices are within normal ranges.

Step 3 Check whether the liquid level gauge changes with the oil temperature.

-- End

4.5 Check the Grounding Status

WARNING

Perform ratio tests of the transformer, insulation impedance tests, and insulation impedance tests of the protection equipment wiring when the devices are shut down and the switches on the high and low voltage sides are turned off!

For specific tests, please contact a third-party profession testing institution.

4.6 Check the Transformer Node Signal

Check whether power supply transformer alarms, tripping signals and other node signals are correct.

Step 1 Connect a PC to the maintenance port of the LCD screen using a network cable. Input the default URL **192.168.1.100** to log into the web interface.

Step 2 Input the operation and maintenance username **maintain** and the password **adamg1**.

Step 3 Click "**System Settings** → **DI Settings**" to access the interface for checking and configuring nodes.

Step 4 Click “**System Settings → DO Settings**” to access the interface for checking and configuring nodes. (The necessity is to be confirmed)

Port No.	Node name	Measure point type	Operation
6	Gas Relay Trip	Normally open	Save
7	Gas Relay Alarm	Normally open	Save
8	Oil Temperature Alarm	Normally open	Save
9	Oil Temperature Trip	Normally open	Save
10	Low Oil Level Trip	Normally open	Save
11	Reserved	Normally open	Save
12	Pressure Relief Trip	Normally open	Save
13	Reserved	Normally open	Save
14	Reserved	Normally open	Save
15	MV Load Switch 2	Normally open	Save
16	MV Vacuum Circuit-Breaker	Normally open	Save
17	MV Disconnect Switch	Normally open	Save

table 4-1 Table of DI node configuration

DI port	Normally on/normally off	Transformer node signals
DI 6	Normally on	Gas Relay Trip
DI 7	Normally on	Gas Rela Alarm
DI 8	Normally on	Oil Temperature Alarm
DI 9	Normally on	Oil Temperature tripz
DI 10	Normally on	Low Oil Level Trip
DI 12	Normally on	Pressure Relief Trip
DI 15	Normally on	MV Load Switch 2
DI 16	Normally on	MV Vacuum Circuit-Breaker
DI 17	Normally on	MV Disconnect Switch
DI 19	Normally on	HV Room Smoke
DI 20	Normally on	Winding Temperature Alarm
DI 21	Normally on	Winding Temperature Trip

-- End

5 Ring Main Unit Inspection

5.1 Inspection Checklist

The inspection checklist of the ring main unit is as follows.



- The recommended maintenance intervals provided below should be adjusted based on the specific environmental conditions where the product is installed.
- Factors such as the scale of the plant, installation location, and on-site environmental conditions will influence the maintenance intervals. If the operating environment is windy and sandy or contains heavy dust, it is necessary to shorten the maintenance intervals and increase the maintenance frequency.

S/N	Type	Details	Inspection interval
1	Check Cleanliness	Check the inside of the ring main unit for dust.	Once a year
2	Check Cable-Connections	1 Check electrical connections. 2 Check the grounding connections.	Once a year
3	Check Switch Function	System status view: 1 Check whether the AC-side circuit breaker of the inverter can be turned off. 2 Check whether the circuit breaker of the ring main unit can be turned off. 3 Check whether the disconnecting switch of the ring main unit can be turned off. 4 Check whether the grounding switch of the ring main unit can be turned off.	Once a year
4	Check Relay Protection Function (Optional)	Check whether protective relays function normally.	Once a year

5.2 Check Cleanliness

Step 1 Check the inside of the ring main unit for dust.

- 1 Power off the CBU to ensure that the ring main unit is not electrified.
- 2 Open the door of the ring main unit and visually check the interior and bottom plate for dust.
- 3 If there is dust, use a brush, a dry duster and other tools to remove the internal dust.
- 4 If there is dust, use a broom to remove the dust on the internal bottom plate.

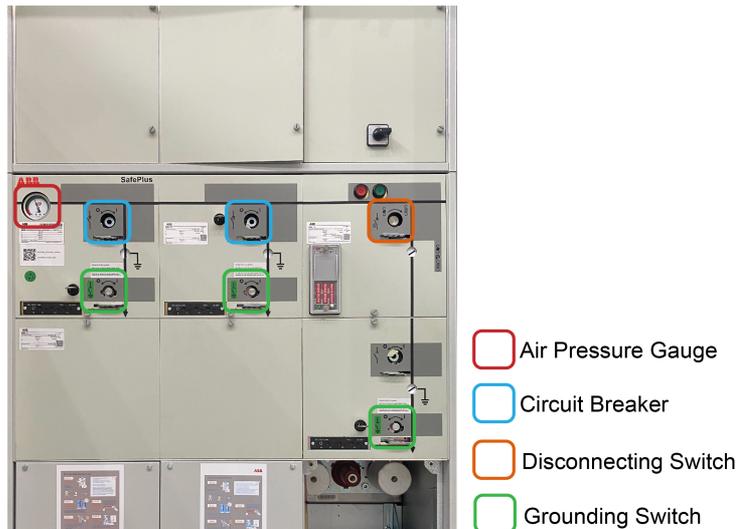


-- End

5.3 Check Cable Connections

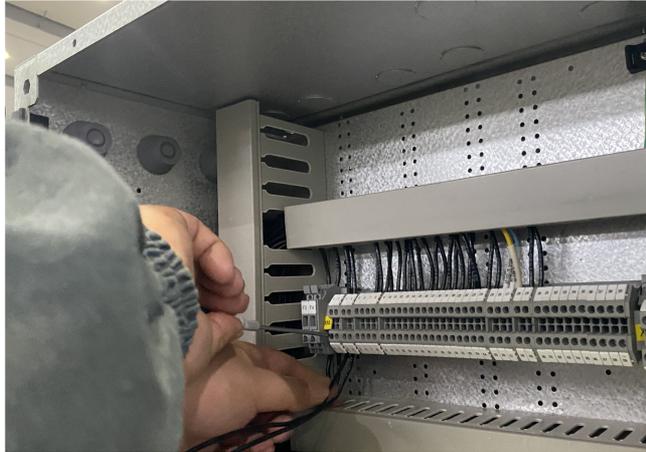
Step 1 Check electrical connections.

- 1 Power down the inverter to stop its operation.
- 2 Open the door of the high voltage chamber. The inside of the ring main unit is shown in the figure below. Observe the air pressure in the ring main unit and check whether the pointer of the air pressure gauge points to the green area.
- 3 Use the operating handle to disconnect the circuit breaker of the ring main unit, turn off the disconnecting switch, and set the grounding switch to the grounding position (at ○).

**figure 5-1** RMU

- 4 Open the low-voltage box on the top of the ring main unit.
 - ① Check the backs of the protective relays for any loose or dropped wires.
 - ② Check whether the connections of the XZ3 terminal block on the SCU and the XSG terminal block of the ring main unit are correct according to the line marks. For any loose or dropped wires, promptly tighten the connections with tools.



figure 5-2 SCU terminal block**figure 5-3** XSG terminal block

- 5 Open the cabinet door of the high-voltage cable room in the ring main unit. Check whether the cable connectors (as shown in Figure A below) are connected properly, whether there is any skew, whether the cable clamps (as shown in Figure B below) can securely clamp the cables (as shown in Figure C below), and whether the bolts are fastened without loosening.

**figure 5-4** Cable compartment of the ring main unit

- 6 If the equipment contains a CT, check whether the connections at both ends of the CT are secure and whether the cable lugs are intact. Tighten any loose connections promptly.



7 After inspection, close the cabinet doors.

Step 2 Check the grounding connections.

- 1 Use the appropriate wrench or screwdriver to check for loosening of the grounding cable fixing screws. Tighten any loose screws promptly.
- 2 Gently pull the grounding cables to check whether the cable lugs are secure.
- 3 Check whether the shielding layer and the semiconductor layer are grounded reliably.



figure 5-5 Grounding of the shielding layer and the semiconductor layer

-- End

5.4 Check Switch Function

Check whether the grounding switch and load switch of the ring main unit function normally.
While the inverter and ring main unit are powered off:

Step 1 Check whether the AC-side circuit breaker of the inverter can be turned off.

Step 2 Check whether the circuit breaker of the ring main unit can be turned off.

Step 3 Check whether the disconnecting switch of the ring main unit can be turned off.

Step 4 Check whether the grounding switch of the ring main unit can be turned off.

Please refer to "figure 5-1 RMU" for specific switch positions

-- End

5.5 Check Relay Protection Function (Optional)

Check whether protective relays function normally.

The main page of the protective relays displays information such as operating voltage, check whether the real-time data displayed by protective relays is normal.



Before delivery, the protective relays were verified according to the commissioning instructions.

6 Foundation

6.1 Check the Foundation Structure

Step 1 Visually check for significant gaps or any tilting of the foundation.

Step 2 Visually check the paint condition of the foundation concrete structure. Touch up damaged areas if any.

Step 3 Visually check for water seepage in the foundation concrete structure. If water seepage is observed, apply immediate waterproofing measures to the foundation.

Step 4 Use instruments such as a level gauge to determine whether the foundation surface is tilted.



Step 5 Visually inspect the bottom and surroundings of the foundation for any debris, and promptly clean up any debris.

-- End

6.2 Check Product Fixation

Check whether the product is firmly fixed to the foundation.

Step 1 Use a torque wrench to measure and verify whether the bolt torque at foundation connections is within the permissible limits specified in the specifications. If any discrepancies are found, re-tighten the bolts according to the torque range specified in the manual.

Step 2 Visually observe or use tools such as a hammer to lightly tap the embedded expansion bolts or chemical bolts to determine if they are loose. If looseness is found, contact the SUNGROW.

Step 3 Use the angle ruler to check whether L-shaped steel is installed horizontally. If any L-shaped steel is installed incorrectly, reinstall it.



Step 4 Check whether the embedded channel steel of the foundation is securely soldered to the container. If any soldering joints are insecure, repair soldering and apply anti-corrosion treatment afterward.



-- End

7 Appendix

7.1 Starting

7.1.1 Inspection before starting

After the maintenance or service work, inspect the following items, and then start inverter:

- All connections are performed in strict accordance with relevant manual and circuit diagram.
- The coverings of the internal devices are fixed and secured.
- The emergency stop button is released.
- Make sure, by using suitable instruments, that there is no ground fault of the PV array.
- Measure the DC, AC voltages with a multi-meter to check if the start-up conditions are met, and ensure no overvoltage hazard.
- Measure the DC voltage with multi-meter, and check if the polarity is correct.

WARNING

If the inverter has been stored for more than half a year in the required storage environment, a thorough and careful inspection is necessary before the inverter is powered on.

7.1.2 Start Steps

When the foregoing conditions are met, proceed as follows to start the inverter:

Step 1 Close the upstream and downstream switches of the inverter.

Step 2 Close the QS25 AC maintenance switch, and QS2 DC maintenance switch.

Step 3 Stop the inverter through the touchscreen.

Step 4 Manually close QS1 and QS3 DC load break switches inside the inverter. If the inverter was equipped with energy storage ports, close QS5 and QS7 as well.

Step 5 Perform the start operation through the touchscreen, and the inverter starts grid-connected operation.

After startup, the inverter will automatically check if parameters of the DC and AC side meet the grid-connection requirements. If the requirements are met, and the set time has been reached, the inverter will turn to the OPERATION mode and feed the generated AC current to the grid.

-- End

⚠ WARNING

The inverter needs no manual control in daily operation. Only qualified personnel are allowed to open the cabinet door for maintenance or troubleshooting. Keep the door closed and locked and store the keys of the door by appointed personnel during normal operation.

7.2 Normal Stop Steps

Proceed as follows to stop the inverter during normal maintenance and service work:

Step 1 Stop the inverter through the stop instruction on the LCD panel.

Step 2 Check to make sure the QS1 and QS3 DC load break switches are disconnected. If the inverter was equipped with energy storage ports, make sure the QS5 and QS7 are disconnected as well.

Step 3 Disconnect the QS25 AC maintenance switch, and QS2 DC maintenance switch.

Step 4 Check to make sure the QF1 and QF2 AC circuit breakers are disconnected.

Step 5 Disconnect the inverter downstream switches.

Step 6 Disconnect the inverter upstream switches.

Step 7 The inverter stops running.

-- End

⚠ WARNING

Never disconnect the AC or DC switch during normal operation. Otherwise, the inverter as well as the switch may be damaged.

7.3 Tightening torque

To avoid poor contact caused by the loosening of copper cable lugs due to stress, and to prevent heat or even fire due to increased contact resistance, make sure to tighten the screws on the cable lugs at the recommended torques:

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

Secure the cable in proper place to reduce pressure of cable lug.

7.4 Exclusion of Liability

The content of these documents is periodically checked and revised where necessary. call us or check our website www.sungrowpower.com for the latest information. No guarantee is made for the completeness of these documents. Contact our company or distributors for the latest version.

Guarantee or liability claims for damages of any kind are excluded if they are caused

- Improper or inappropriate use or install of the product
- Install or operate the product in unintended environment
- Install or operate the product without observing relevant safety regulations in the deployment location
- Ignore the safety warnings or instructions contained in all documents relevant to the product
- Install or operate the product under incorrect safety or protection conditions
- Alter the product or supplied software without authority
- Product malfunctions due to operation attached or neighboring devices running out of the allowed limit values
- Unforeseen calamity or force majeure

The use of supplied software produced by Sungrow Power Supply Co., Ltd. is subject to the following conditions:

- Sungrow Power Supply Co., Ltd. assumes no liability for direct or indirect damages arising from the use of Software. This also applies to the provision or non-provision of support activities.
- Software used for commercial purposes is prohibited.
- Decompiling, decoding or destroying the original program, including Software and the embedded software, is prohibited.

7.5 Contact Information

In case of questions about this product, please contact us.

We need the following information to provide you the best assistance:

- Model of the device
- Serial number of the device
- Fault code/name
- Brief description of the problem

For detailed contact information, please visit: <https://en.SUNGROWpower.com/contactUS>

SUNGROW

Sungrow Power Supply Co., Ltd.
www.sungrowpower.com