SUNGROW
Clean power for all

Operation and Maintenance Guide

1+X Modular Inverter

SG1100UD Series

All Rights Reserved

Contents

1 About This Manual

This manual describes the methods for stopping, troubleshooting, and daily maintenance of the 1+X modular inverter.

1.1 Target Group

This manual is intended for professional technicians who are responsible for the installation, operation, and maintenance of MV grid-connected inverters. The professional technician is required to meet the following requirements:

- Know electronic, electrical wiring, and mechanical expertise, and be familiar with electrical and mechanical schematics.
- Should be familiar with the composition and working principles of the PV system and its front- and rear-level equipment.
- Have received professional training related to the installation and commissioning of electrical equipment.
- Be able to quickly respond to hazards or emergencies that occur during installation and commissioning.
- Be familiar with the relevant standards and specifications of the country/region where the project is located.

1.2 How to Use This Manual

Read through the manual carefully before performing any operation on the product.
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 version of the manual at **support.sungrowpower.com** or reach your sales for it.

1.3 Symbol Explanations

To ensure the safety of the users and their properties when they use the product and to make sure that the product is used optimally and efficiently, this manual provides users with the relevant safety information which is marked by the following symbols. The symbols that may be used in this manual are listed below. Please read carefully to make better use of this manual.

DANGER

DANGER indicates high-risk potential hazards that, if not avoided, may lead to death or serious injury.

WARNING

WARNING indicates moderate-risk potential hazards that, if not avoided, may lead to death or serious injury.

CAUTION

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

NOTICE

NOTICE indicates potential risks that, if not avoided, may lead to device malfunctions or financial losses.

NOTE indicates additional information, emphasized contents or tips to help you solve problems or save time.

2 Safety Instructions

When installing, commissioning, operating, and maintaining the product, strictly observe the labels on the product and the safety requirements in the manual. Incorrect operation or work may cause:

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

⚠ WARNING

- **Do not operate the product and cables (including but not limited to moving the product, installing the product, operating the product and cables, powering up the product, maintaining the product, and working at heights) in harsh weather conditions such as lightning, rain, snow, and level 6 or stronger wind.**
- **In case of fire, evacuate from the building or product area and call the fire alarm. Re-entry into the burning area is strictly prohibited under any circumstances.**
- **Tighten the screws with the specified torque using tools when fastening the product and terminals. Otherwise, the product may be damaged. And the damage caused is not covered by the warranty.**
- **Learn how to use tools correctly before using them to avoid hurting people or damaging the device.**

NOTICE

- **Maintain the device with sufficient knowledge of this manual and use proper tools.**

- The safety instructions in this manual are only supplements and cannot cover all the precautions that should be followed. Perform operations considering actual onsite conditions.
- SUNGROW shall not be held liable for any damage caused by violation of general safety operation requirements, general safety standards, or any safety instruction in this manual.
- When installing, operating, and maintaining the product, comply with local laws and regulations. The safety precautions in this manual are only supplements to local laws and regulations.

2.1 Operation

DANGER

When the product is working,

- **It is strictly forbidden to touch the live parts of the product. Otherwise, an electric shock may occur.**
- **It is strictly prohibited to disassemble any parts of the product. Otherwise, an electric shock may occur.**
- **It is strictly prohibited to touch any hot parts of the product (such as the heat sink). Otherwise, it may cause burns.**

2.2 Electrical Connection

DANGER

Before electrical connections, please make sure that the product is not damaged. Otherwise, it may cause danger!

Before electrical connections, please make sure that the product switch and all switches connected to the product are set to "OFF", and use measuring equipment to ensure that there is no voltage at the connection. Otherwise, an electric shock may occur!

DANGER

PV modules will generate lethal high voltage when exposed to sunlight.

- **Operators must wear proper personal protective equipment during electrical connections.**
- **Before performing an electrical connection, be sure to disconnect the PVS and use measuring equipment to ensure that cables are voltage-free.**
- **Respect the protection requirements and precautions of PV modules.**

DANGER

Danger to life due to a high voltage inside the inverter!

- **Be sure to use special insulation tools during cable connections.**
- **Note and observe the warning labels on the product, and perform operations strictly following the safety instructions.**
- **Respect all safety precautions listed in this manual and other pertinent documents.**

⚠ WARNING

Damage to the device caused by incorrect wiring is not covered by the warranty.

- **Electrical connection must be performed by professional personnel who wear personal protective equipment.**
- **All cables used in the PV generation system must be firmly attached, properly insulated, and adequately dimensioned.**

⚠ WARNING

Before connecting the PV module to this product, check and confirm the polarity correctness of the PV module, and then connect it to the corresponding position of this product.
During the installation and operation of the product, please ensure that the positive or negative polarities of PV strings do not short-circuit to the ground. Otherwise, an AC or DC short-circuit may occur, resulting in product damage. The damage caused by this is not covered by the warranty.

NOTICE

Comply with the regulations related to the local grid during wiring.

2.3 Hoisting and Transportation

⚠ WARNING

Risk of personal injury or device damage due to incorrect operation!

- **Follow the procedure of work of heights when walking on the top of the product.**
- **All hoisting and transportation must comply with the relevant codes and regulations of the nation/region where the project is located.**

NOTICE

All equipment and tools used during operation must have been regularly maintained.

⚠ CAUTION

Improper hoisting may cause personal injury!

- **It is strictly prohibited to stand within 5m - 10m outside the operating area (i.e., under the boom and the hoisted machine) to avoid casualties.**
- **The product must be hoisted and moved by professional personnel. Before the operation, be sure to wear personal protective equipment.**
- **Stop hoisting in the event of severe weather, such as heavy rain, thick fog, or strong wind.**
- **When hoisting and moving the product, be aware of its size and weight and keep the balance to prevent it from turning over or falling.**

2.4 Operation and Maintenance

⚠ DANGER

Risk of inverter damage or personal injury due to incorrect service!

- **Before maintaining the product, be sure to disconnect the output switch of the PVS and the load switch/disconnector of the transformer.**
- **After the inverter is powered off for 20 minutes, measure the voltage and current with measuring equipment. Only when there is no voltage nor current can operators who wear protective equipment operate and maintain the inverter.**
- **During maintenance, be sure to check the warning labels in the product and comply with the requirements on them.**
- **Even if the inverter is shut down, it may still be hot and cause burns. Operating the inverter with protective gloves after it cools down.**

⚠ DANGER

The devices inside the inverter carry high voltage. Touching these devices may lead to fatal electric shock.

- **Live line measurement can only be performed by professional personnel who know the PV system well. Before measurement, be sure to take proper protection methods (e.g., wear insulating gloves, etc.);**
- **During live line measurement, the operator must be accompanied by others to ensure personal safety.**

DANGER

Electric shock or fire may occur due to device damage or system fault.

- **Visually inspect for device damages or other hazards before the operation**
- **Check whether other external devices or circuit connections are in a safe state.**
- **Make sure the device is in a safe state before operating.**

WARNING

If some devices need to be replaced during operation and maintenance, please contact SUNGROW.

NOTICE

To avoid the risk of electric shock, do not perform any other maintenance operations beyond those described in this manual. If necessary, contact SUNGROW for maintenance. Otherwise, the losses caused are not covered by the warranty.

NOTICE

If work is carried out while the device is live, insulation protection is necessary and at least two personnel should be present at the site at the same time.
The PV plants where the inverter is located are usually located in off-city fields, and appropriate field rescue facilities should be prepared for use in need.

CAUTION

To prevent misuse or accidents caused by unrelated personnel, post prominent warning signs or demarcate safety warning areas around the device to prevent accidents caused by misuse.

2.5 Disposal

WARNING

Please scrap the inverter in accordance with relevant local regulations and standards to avoid property losses or casualties.

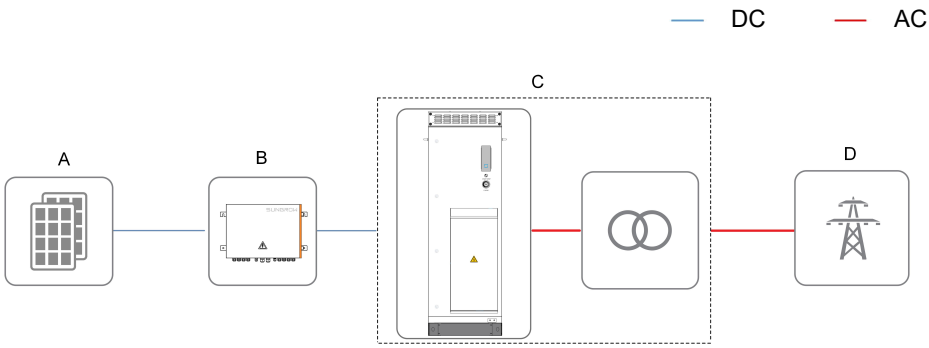
2.6 Symbol on Products

Marks	Explanation
	High voltage inside! Risk of electric shock by touching it!
	The temperature here is beyond the acceptable range for the human body, please do not touch it arbitrarily to avoid personal injury.
	Firmly ground the protective ground terminal to ensure the safety of operators.
	The inverter can only be maintained and overhauled after being powered off for 20 minutes.
	It is recommended to wear noise-cancellation earplugs since the product may generate noise during operation.
	It is strictly forbidden to touch the fan blades when the fan is rotating.
	Read this manual carefully before any operation on the product.
	Do not dispose of this product as household waste.

3 System Description

3.1 Application Scenarios

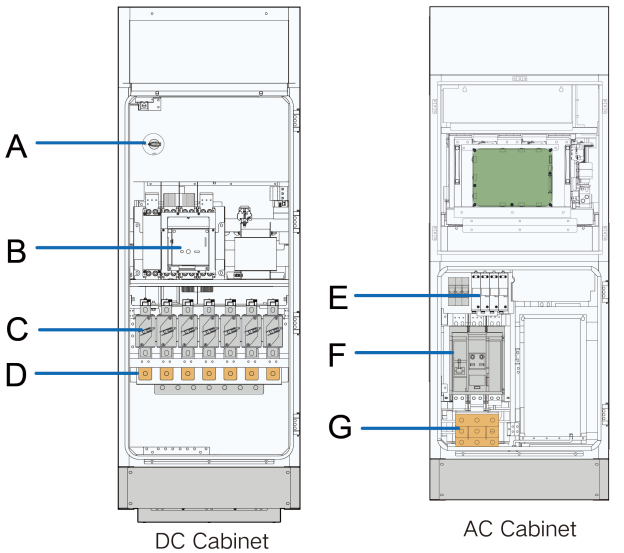
In large and medium-sized utility power plant systems, the 1+X Modular Inverter, which contains multiple PV inverter units, transformers, and other equipment, provides a sound solution to convert the DC power generated by PV arrays into AC power, and feed it into the grid.



No.	Name	Description
A	PV array	Monocrystalline silicon, polycrystalline silicon, and thin film without grounding.
B	PVS	Combine the current of multiple PV strings and output.
C	MV grid-connected inverter	Include inverter units that convert the DC power from the PV arrays into AC power. Include a transformer that converts the low-voltage AC power output by inverter units into medium-voltage AC power.
D	Grid	-

3.2 Internal Structure of Inverter Unit

Open the front door of the inverter unit cabinet to see the DC cabinet, as shown in the left figure below. Open the back door of the inverter unit cabinet to see the AC cabinet, as shown in the right figure below.



* The figure is for reference only. And the actual product received shall prevail.

No.	Name	Description
A	Maintenance switch QS2	Disconnect it before maintenance and repair.
B	DC load switch QS1	Control the on/off of the DC side circuits of the inverter.
C	DC fuse	-
D	DC wiring copper bar	-
E	Fuse of AC side SPD	-
F	AC circuit breaker QF1	Control the on/off of the AC side circuits of the inverter.
G	AC wiring copper bar	—

Maintenance switch QS2 could also be located at the bottom left corner of the AC side. The real product may differ.

4 Powering up and Powering down

4.1 Safety Instructions

DANGER

High voltage! Electric shock!

- **Wear proper protection equipment before all operations on the device.**
- **Do not touch the live terminals or conductors.**
- **Respect all safety instructions attached on the device and described in this manual.**
- **Respect all safety instructions prescribed by the manufacturer of devices connected to the inverter.**

WARNING

Grid-connection of the inverter can be performed only after receiving approval from the local utility grid company and by qualified personnel.

WARNING

When the inverter is operating, make sure there are no flammable materials within at least 5m around the installation site.
Local/national standards about the min. electric clearance around the inverter should be respected.

CAUTION

Make sure the installation is correct and no spare parts or tools are left inside the device.

NOTICE

Close the doors of the inverter and the internal devices if the commissioning process is stopped.

4.2 Powering Up Steps

Step 1 Turn on the maintenance switch QS2 of all inverter units and the external power supply equipment switch (which is, the QS4 switch inside the power distribution cabinet). Then, close the door.

Step 2 Turn on the load switch of the transformer, and close the door.

Step 3 Send a shutdown command through the WEB to shut down the inverter.

Step 4 Check and ensure that the **"Access Protection Enabling"** switch is off on the WEB page.

Step 5 Turn on the output switch of the upstream PVS.

Step 6 Turn on the DC load switch QS1 inside all inverter units.

Step 7 Rotate the **"START/STOP"** knob to the **"START"** position.

Step 8 Start up the inverter on the WEB page, and the inverter begins to work in the grid-connected state.

For the positions of the above switches, please see "3.2 Internal Structure of Inverter Unit" and "5 WEB Interface".

- - End

4.3 Powering Down Operations

4.3.1 Planned Powering Down

Step 1 Send a shutdown command through the WEB to shut down the inverter.

Step 2 Rotate the **"START/STOP"** knob to the **"STOP"** position.

Step 3 Turn off the output switch of the upstream PVS.

Step 4 Turn off the load switch of the transformer.

Step 5 Turn off the DC load switch QS1 inside all inverter units.

Step 6 Turn off the maintenance switch QS2 of all inverter units.

Step 7 Check and ensure that the AC circuit breakers QF1 of all inverter units are open.

Step 8 Open the power distribution cabinet, and turn off the external power supply equipment switch (which is, the QS4 switch inside the power distribution cabinet).

For the positions of the above switches, please see "3.2 Internal Structure of Inverter Unit" and "5 WEB Interface".

- - End

4.3.2 Unplanned (Emergency) Powering Down

Step 1 Press the emergency stop button on the DC side.

> **DANGER**
>
> **Upon pressing the emergency stop button, only the AC circuit breaker and DC load switch will open. The internal auxiliary power supply and PCB board will still carry voltage. Do not touch them!**

Step 2 Turn **"START/STOP"** knob to the **"STOP"** position.

Step 3 Turn off the output switch of the upstream PVS.

Step 4 Turn off the load switch of the inverter.

Step 5 Check and ensure that the DC side load switches QS1 of all inverter units are turned off.

Step 6 Check and ensure that the maintenance switches QS2 of all inverter units are turned off.

Step 7 Check and ensure that the AC circuit breakers QF1 of all inverter units are open.

Step 8 Turn off the external power supply equipment switch (which is, the QS4 switch inside the power distribution cabinet).

> For the positions of the above switches, please see "3.2 Internal Structure of Inverter Unit".

- - End

5 WEB Interface

5.1 Preparation Before Login

5.1.1 Login (PC)

Step 1 To connect the PC to the product, connect the network cable to the network port of the PMD switch.

Step 2 Configure the IP address of the PC. Set the IP address of the PC to the same network segment as the NET1 address of the smart unit board.

Default IP address of the NET1 port: 12.12.12.12.

Default IP address of the NET2 port: 14.14.14.14.

- - End

5.1.2 Login (Mobile Device)

Step 1 Enable WiFi on the mobile device (such as a mobile phone), search for the hotspot, such as SG-xxx (xxx represents the device SN), and enter the password. The password is **ESPWifi@123**.

Step 2 Open a browser on the mobile phone and enter the address (11.11.11.1) or domain (sungrow.net) to access the WEB interface.

- - End

5.2 Login Steps

Step 1 Enter the server address to enter the homepage as a visitor by default.

PC:

- NET1 port, URL: 12.12.12.12.
- NET2 port, URL: 14.14.14.14.

Mobile device:

URL:11.11.11.1.

Step 2 Click and select the desired language in the upper right corner of the interface.

Step 3 Click to enter the login interface.

Step 4 Enter the password and click **Login** to enter the interface as a general user.

PC password: pw8888.

After the initial login, please change the password in a timely manner to avoid pop-up modify password prompts.

- - End

5.3 Boot/Shutdown

Step 1 Click **"Overview"** → **"General Information"** on the left navigation bar to enter the homepage.

Step 2 Click **Boot** or **Shutdown** in the **Shortcut Menu**, taking SG1100UD×4–MV as an example.

- If an inverter unit needs to be started, e.g., Unit 1, check **SG4400UD_Unit1** and click **Save** to turn on the unit. If the whole inverter needs to be started, check the inverter model, e.g., **SG4400UD** and click **Save**to turn on the inverter.
- If an inverter unit needs to be shut down, e.g., Unit 1, check **SG4400UD_Unit1** and click **Save** to shut down the unit. If the whole inverter needs to be shut down, check the inverter model, e.g., **SG4400UD** and click **Save** to shut down the inverter.

- - End

5.4 Modifying Password

PC

Click in the upper-right corner of the interface, select **Modify Password**, enter the original password and new password, and click **Save**.

The password should be a combination of 6 to 32 uppercase letters, lowercase letters, numbers and special characters.

Reconnect and log in after password change.

5.5 Logout

To protect the account security, it is recommended to log out in time after the operation is completed.

Exit Method

Click and select **Logout** in the upper right corner of any interface.

6 Troubleshooting

If the inverter fails to output as expected or the power yield changes abnormally, check the following items before consulting SUNGROW:

- The open-circuit voltage of PV arrays
- Whether the emergency stop button is pressed
- Whether the inverter limits the output of active power

If the problem still persists or there are any other questions, please contact SUNGROW. It would be helpful if the following information is provided during a call:

- Model and S/N of the inverter and internal equipment
- Manufacturer and model of the upstream PVS and PV modules that connected to the inverter
- Communication and connection scheme of the inverter
- Fault information and a brief description of the fault
- Pictures of the fault occurrence site (if on-site conditions permit)

6.1 Inverter Troubleshooting

6.1.1 Viewing Fault/Alarm Information

View the fault and alarm information referring to Web.

6.1.2 Check Method

There are three levels of anomalies:

- Important fault: The inverter fails, shuts down, and stops grid-connected power generation.
- Secondary fault: Some parts of the inverter fail, but the inverter can still generate power in a grid-connected state.
- Prompt for fault: The inverter works normally, but its output power decreases due to external factors.

Fault Name	Fault Cause	Fault Level	Corrective Method
IGBT Module fault	The drive board generates a fault signal or a hardware over-current occurs.	Important	1. Check whether a short circuit occurs on the AC or DC sides of the inverter. 2. Check the grid for any exceptions. 3. Check whether the appearance of the internal IGBT module is normal.
Contactor fault	The contactor is faulty.	Important	Disconnect the AC and DC side switches of the inverter, and check whether the appearance of the AC contactor is obviously abnormal after the inverter is completely discharged.
AC current imbalance fault	AC current is unbalanced.	Important	Check the grid for anomalies. Check if there is a phase loss.
Reactor overtemperature	The temperature of the reactor is excessively high.	Important	1. Use a thermometer to check whether the current ambient temperature is within the temperature range advertised by the inverter. 2. Check whether the air inlet of the inverter and the inverter unit is normal. Make sure that the air inlet is not blocked, and replace the filter screen if necessary. 3. In the shutdown state, check whether the internal cooling fan of the inverter is stopped by foreign objects.

Fault Name	Fault Cause	Fault Level	Corrective Method
Control cabinet temperature fault	The temperature inside the control cabinet is excessively high	Important	1. Check whether the grid voltage is normal. 2. Check whether the control fan is normal. 3. Check the AC filter system. Check whether there are abnormalities on the surface of the AC filter capacitor, such as cracking. If necessary, check whether the three-phase current of the capacitor is balanced.
DC under-voltage	DC input voltage is excessively low.	Important	1. In the shutdown state, check whether the DC voltage displayed on the inverter is consistent with the measured value. 2. If not, check whether the DC side cables are shorted or wrongly connected.
DC (Bus) under-voltage	DC bus voltage is excessively low.	Important	Please refer to the troubleshooting method of “DC under-voltage”.
Neutral point shift	Voltage exists between the positive and negative poles of the DC side of the inverter and the neutral point potential.	Important	1. Check whether the DC side voltage of the inverter is short-circuited, whether the input voltage exceeds the allowable range, and whether the grid voltage is abnormal. 2. Check whether DC over-voltage, DC under-voltage, module fault, AC over-current, and other faults exist at the same time in the historical fault interface. If so, refer to the troubleshooting methods of related faults.

Fault Name	Fault Cause	Fault Level	Corrective Method
Abnormal temperature	If the temperature at the inverter inlet exceeds the protection threshold, this fault is triggered.	Important	1. Check whether the ambient temperature is normal; Use a thermometer to check whether the current ambient temperature is within the temperature range advertised by the inverter. 2. Check whether the air inlet of the inverter and the inverter unit is normal; Make sure that the air inlet is not blocked, and replace the filter screen if necessary. 3. In the shutdown state, check whether the cooling fan inside the inverter/inverter unit is stopped by foreign objects.
DC cabinet over-temperature	The temperature inside the DC cabinet is excessively high	Important	Refer to the troubleshooting method of “Abnormal Temperature”.
Grid over-voltage	The grid voltage is higher than the set protection value.	Important	1 Check whether the protection parameters in **Parameter Settings** -> **Protection Parameters** meet the grid standards of the location where the inverter is installed. 2 Disconnect the AC switch and measure whether the actual grid voltage is within the normal range. 3 In the shutdown state, check whether the grid voltage displayed on the inverter is consistent with the measured value.
Grid under-voltage	The grid voltage is lower than the set protection value.	Important	Refer to the troubleshooting method of "Grid over-voltage”.

Fault Name	Fault Cause	Fault Level	Corrective Method
Frequency fault	The grid frequency is abnormal.	Important	1 Check whether the protection parameters on the interface meet the grid standards of the location where the inverter is installed. 2 In the shutdown state, check whether the grid frequency displayed on the inverter is consistent with the actual value.
Islanding protection	The power grid fails or the AC instantaneous voltage exceeds the protection threshold.	Important	1. Check the grid for any exceptions. 2. Check whether a short circuit occurs on the AC side of the inverter. 3. Check whether the AC circuit breaker of the inverters is disconnected.
Control power exception	The control power is abnormal.	Important	1 Check whether the internal and external power supply control switches of the inverter are closed or disconnected at the same time. If they are closed at the same time, please disconnect one of the switches. If they are disconnected at the same time, please close one of the switches. 2 Check whether the internal and external power supply terminals are loose or poorly contacted. Tighten them if necessary.
DC voltage sampling fault	The DC voltage sampling is abnormal.	Important	In the shutdown state, check whether the DC voltage displayed on the inverter is consistent with the measured value.

Fault Name	Fault Cause	Fault Level	Corrective Method
Soft start fault	The inverter fails to start.	Important	Check whether the power grid is abnormal, such as harmonics and voltage balance.
DC SPD fault	The DC side SPD of the inverter fails.	Important	Check the status indicator of the SPD. 1. If the indicator changes from green to red, the SPD is damaged. It may be caused by local thunderstorms. Measure the AC and DC voltage and current. If voltages between the positive and negative poles to the ground are normal, replace the SPD. 2. If the indicator is normal, the SPD may be in poor contact with its holder. Replug the SPD and tighten it.
AC SPD fault	The AC side SPD of the inverter fails.	Important	1. Refer to the troubleshooting method of "DC SPD fault" to conduct preliminary troubleshooting. 2. Check whether the miniature circuit breaker is connected in series with the SPD trips. 3. If not, measure the AC and DC voltage and current. Ensure that there is no exception, and close the miniature circuit breaker again.

Fault Name	Fault Cause	Fault Level	Corrective Method
DC over-voltage	The DC side voltage of the inverter exceeds the protection threshold.	Important	Disconnect the DC switch of the inverter and check whether the open-circuit voltage of the PV arrays is normal; If not, the PV array configuration may be faulty. 2. Check and ensure that the AC side transformer is connected in a “Y” shape, and that the neutral point is not grounded. 3. In the shutdown state, check whether the DC voltage displayed on the inverter is consistent with the measured value.
PV polarity reversal	The polarity of the positive and negative poles of the PV strings is reversed.	Important	Check whether the DC side cables of the inverter are connected reversely.
Hardware fault	Inverter internal hardware fault	Important	Measure the DC voltage of the inverter and check whether a short circuit occurs in the inverter.
AC over-current	AC side current of the inverter is excessively high.	Important	1. Check whether cables on the AC and DC sides of the inverter are loose. 2. Check whether the insulation layer of cables is damaged. 3. Check whether terminals are short-circuited and grounded.
Overload protection	The output of the inverter exceeds the load limit.	Important	Refer to the troubleshooting method of "AC over-current”.
AC leakage current protection	The leakage current sampling value on the AC side of the inverter exceeds the protection threshold.	Important	1. Check whether the AC cable is damaged. 2. If the LV side of the transformer is connected in a “Y” shape, ensure that the neutral point is not connected.

Fault Name	Fault Cause	Fault Level	Corrective Method
Module over-temperature	The temperature of modules inside the inverter is excessively high.	Important	1. Check the air inlet. 2. Check whether the air outlet of the inverter is blocked. Replace the air filter screen if necessary. 3. Check whether the cooling fan is running during the operation of the inverter.
Fan/ Fan 2 exception	Fan/fan 2 inside the inverter fails.	Important	1. Check whether the grid voltage is normal. Use a multimeter to measure the grid voltage and check for phase loss. 2. Check whether the power supply of the cooling fan is normal. Use a multimeter to measure the three-phase power supply to ensure that the rated input voltage is 400 Vac.
Grounding fault	A grounding fault occurs.	Important	1 Check the DC cables. Check whether the positive grounding cable of each DC branch is damaged. Check whether the DC cable resistance to the ground is normal. 2 Check AC cables. Measure the three-phase voltage to ground and observe whether the voltage value is the same. Check the inverter and the box-type substation side SPD for damage.

Fault Name	Fault Cause	Fault Level	Corrective Method
AC switch fault	AC switch fails.	Important	1. Check whether the AC switch trips. 2. Check whether the appearance of the switch is normal. 3. Check whether the AC switch can be normally closed/disconnected. 4. Use a multimeter to measure whether the AC switch normally controls the on/off of the circuit.
Heat sink over-temperature	The temperature of the heat sink inside the inverter is excessively high.	Important	Check whether the cooling fan is normal. If so, check the air duct for blockage.
GFDI-pro	The DC grounding protection fails.	Important	1. The negative terminal of the inverter is not reliably grounded. 2. Check whether the negative grounding fuse is blown.
AC fuse fault	The fuse on the AC side of the inverter fails.	Important	Check whether the AC fuse is normal.
Grid voltage imbalance	Grid voltage is unbalanced.	Important	Measure the grid voltage and check for any imbalance.
Current Imbalance 2/Current Imbalance 3	The alternating current is unbalanced.	Important	Measure the grid voltage and check for phase loss.
AC cabinet over-temperature	The temperature of the AC cabinet exceeds the protection threshold.	Important	1. Check whether the fans inside the AC cabinet work normally. 2. Check whether the air inlet of the AC cabinet is blocked. 3. Check whether there is dust in the air inlet of the AC cabinet. Clean it if necessary.
DC fuse anomaly	The fuse on the DC side of the inverter fails.	Secondary	Check whether the DC fuse is blown. If so, please contact SUNGROW to replace the fuse.

Fault Name	Fault Cause	Fault Level	Corrective Method
Anti-PID power abnormality	The anti-PID power is abnormal.	Secondary	1. Check the insulation of AC cables. 2. Check the AC SPD. 3. Check and make sure that the neutral point on the LV side of the box-type substation is not grounded.
External power supply abnormal	The external power supply is abnormal.	Secondary	Use a multimeter to measure and check whether the voltage of the external power supply is abnormal.
Branch air switch abnormal	The air switch of the DC branch of the inverter is abnormal.	Secondary	Check whether the branch air switches are all closed, and check whether the state of them is **Closed** on the interface.
CT imbalance	The three-phase grid current is out of balance.	Secondary	Check whether the three-phase AC current is balanced on the interface.
Grounding fuse anomaly	The grounding fuse is abnormal.	Secondary	Remove the negative grounding fuse after the inverter is fully discharged. Check whether this fuse is blown. If so, check whether the neutral point of the transformer is not connected and whether the neutral point of PT/CT on the LV side of the box-type substation is grounded.
Meter communication abnormal alarm	The meter communication is abnormal.	Secondary	1. Check whether the communication cable of the meter is damaged. 2. Check the communication terminal of the meter is loose.
DC fuse fault	The fuse on the DC side of the inverter fails.	Secondary	Check whether the DC fuse is blown. If so, please contact SUNGROW to replace the fuse.

Fault Name	Fault Cause	Fault Level	Corrective Method
Branch fuse abnormal	The branch fuse of the inverter is abnormal.	Secondary	Please refer to the troubleshooting method of “DC fuse fault”.
Low insulation resistance	The insulation resistance is low.	Secondary	Please refer to the troubleshooting method of “Insulation resistance”.
DC switch anomaly	The DC switch of the inverter is abnormal.	Secondary	Check whether the branch air switches are all closed, and check whether the state of them is **Closed** on the interface.
Frequency deviation active power regulation	The active power of the inverter is regulated according to the change of the grid frequency.	Prompt	Check whether the power reduction at over-frequency is enabled on the interface. If so, it indicates that over-frequency occurs during operation.
Voltage deviation reactive power regulation	The reactive power of the inverter is regulated according to the change of the grid voltage.	Prompt	Check whether the reactive power regulation is set to **QU Mode** on the interface.
GFRT operation	The inverter runs through high voltage and low voltage.	Prompt	Check whether the grid voltage exceeds the set threshold of HVRT or LVRT.

If the fault/alarm cannot be cleared following the above corrective methods and still persists, please contact SUNGROW directly.

Fault Name	Fault Cause	Fault Level	Corrective Method
AC switch off	The AC switch is disconnected.	Important	Please contact SUNGROW.
Carrier sync flt	The carrier signal transmission is abnormal.	Important	Please contact SUNGROW.
Drive board fault	The drive board inside the inverter fails.	Important	Please contact SUNGROW.
Parallel machine communication failure	The communication inside the inverter is abnormal.	Important	Please contact SUNGROW.

Fault Name	Fault Cause	Fault Level	Corrective Method
Machine code repetition fault	The addresses of the inverter units inside the inverter are the same.	Important	Please contact SUNGROW.
Temperature and humidity board communication abnormal	The communication of the temperature and humidity board is abnormal.	Secondary	Please contact SUNGROW.
Branch reverse over-current	The branch reverse current is excessively large.	Secondary	Please contact SUNGROW.
DSP communication exception	The communication between inverter internal control board and smart unit board is abnormal.	Secondary	Please contact SUNGROW.

6.2 Other Faults

Fault Detail	Possible Cause	Corrective Method
The inverter shuts down shortly after startup	The DC input voltage is just enough to start the inverter. If the inverter is connected to loads, and the voltage cannot meet the requirements, causing the inverter to shut down.	Design and connect the battery panel series based on the recommended open-circuit voltage, increase the DC voltage input, and avoid applying the critical voltage value.
Upper computer communication failure	There are many possible reasons, please check one by one according to the description of "Corrective Method".	Check whether the local address, baud rate, and other parameters on the interface are consistent with those on the host computer. Check whether all wiring is good. If RS485 communication is adopted, check whether the A and B terminals are connected reversely. Replace the communication adapter and try again if the communication adapter does not match. If the fault is not caused by the foregoing reasons and still persists, please contact SUNGROW as soon as possible.
WiFi connection unresponsive/failed	Equipment is not compatible.	1. Refresh the Web page manually. 2. Restart or replace the mobile device and try connecting again. 3. Power off and restart the inverter to connect again.

Fault Detail	Possible Cause	Corrective Method
Failed is displayed on the operation or protection parameter setting interfaces	There are many possible reasons, please check one by one according to the description of "Corrective Method".	1. Check whether an inverter unit cannot work normally. 2. Check whether the inverter unit that works normally can normally accept instructions. 3. Please refer to the troubleshooting method of “DSP communication fault”. If the fault is not caused by the foregoing reasons and still persists, please contact SUNGROW as soon as possible.
Fail to export measuring point logs in batches	The amount of data exported at a single time is too large.	1. Export data in batches multiple times. 2. The time interval for exporting data shall not exceed 7 days.

7 Routine Maintenance

7.1 Safety Instructions

DANGER

Risk of inverter damage or personal injury due to incorrect service!

- **Disconnect the switches between the product and all power supplies before maintenance.**
- **After the inverter is powered off for 20 minutes, measure the voltage and current with measuring equipment. Only when there is no voltage nor current can operators who wear protective equipment operate and maintain the inverter.**

DANGER

The devices inside the inverter carry high voltage. Touching these devices may lead to fatal electric shock.

Therefore,

- **Live line measurement can only be performed by professional personnel who know the PV system well. Before measurement, be sure to take proper protection methods (e.g., wear insulating gloves, etc.).**
- **During live line measurement, the operator must be accompanied by others to ensure personal safety.**

DANGER

Electric shock or fire may occur due to device damage or system fault.

- **Visually inspect for device damages or other hazards before the operation**
- **Check whether other external devices or circuit connections are in a safe state.**
- **Make sure the device is in a safe state before operating.**

⚠ WARNING

If some devices need to be replaced during operation and maintenance, please contact SUNGROW.

Do not open the door to maintain the product on rainy, humid, or windy days. SUNGROW shall not be held liable for any damage caused by a violation of the notice.

For products with long downtime, a comprehensive and detailed inspection of the products must be carried out before powering up the product. First, the product and internal equipment as well as the film at the air inlet and outlet need to be checked for intactness. Then the product should be checked and tested by professionals before commissioning.

⚠ WARNING

Do not open the door to maintain the product on rainy, humid, or windy days. SUNGROW shall not be held liable for any damage caused by a violation of the notice.

⚠ WARNING

Wait for at least 20 minutes after shutdown and then open the cabinet door. Make sure that the inside of the product is completely uncharged before maintaining the product.

⚠ WARNING

After the maintenance work is completed, do not leave any metal part, such as screws and washers, or foreign object inside the inverter; otherwise, the product may be damaged!

NOTICE

To avoid the risk of electric shock, do not perform any other maintenance operations beyond those described in this manual. If necessary, contact SUNGROW for maintenance. Otherwise, the losses caused are not covered by the warranty.

⚠ CAUTION

To prevent misuse or accidents caused by unrelated personnel, post prominent warning signs or demarcate safety warning areas around the device to prevent accidents caused by misuse.

7.2 Maintenance Period

7.2.1 Maintenance (Once Every Three Years)

Item	Check method
Monitoring and protective equipment of the transformer	• Oil thermometer: Alarm temperature and tripping temperature. • Pressure relief valve: Check whether the pressure relief valve is in good contact. • Oil level: Check whether the oil level is at a normal range. • Pressure gauge: Check if the pressure gauge is normal.
Transformer oil leakage	Check these components for oil leakage: • De-energized tap-changer • Pressure gauge • Oil level gauge • Oil temperature gauge • Sleeve • Pressure relief valve and sample oil • Sealing part

7.2.2 Maintenance (Every two years)

Item	Check method
System status and cleaning	Check the following items, and correct immediately those failing to meet the relevant requirements: • Check whether there is any damage or deformation of the inverter and internal equipment. • Check if there is abnormal noise during the operation of internal equipment. • Check whether the temperature inside the inverter is excessively high. • Check whether the humidity and the amount of dust inside the inverter are within the normal range. Clean it if necessary. • Check whether the air inlet and outlet of the inverter are blocked.
Warning marks	Check whether the warning labels and marks are clearly visible and free of stains and damage. Replace them if necessary.
Ground of the shielded layer of cables	Check whether the cable shielding layer is in good contact with the insulation sleeve and whether the copper bus bar is firmly fixed.
Wiring between the terminal box and switch *	Check whether the terminal box and the switch are connected correctly.
SPD and fuse	Check whether the SPD and fuse are properly fastened.
Corrosion	Check whether there is oxidation or rust inside the inverter.

Note: * means optional.

7.2.3 Maintenance (Once A Year)

Item	Check method
Exterior of the inverter	Check the following items, and correct immediately those failing to meet relevant requirements: • Check whether there are flammable objects on the top of the inverter. • Check whether the welding points between the inverter and foundation steel plate are firm and if there is corrosion. • Check whether the enclosure of the inverter is damaged, painted, or oxidized. • Check whether the monitoring window and cabinet door can be opened flexibly. • Check whether the sealing strip is fixed properly.
Interior of the inverter	Check whether there are foreign objects, dust, dirt, and condensed water inside the inverter.
Wiring and cable layout	Start to inspect after completely powering down the internal devices of the inverter. For any non-conformances found during the inspection, correct them immediately. • Check whether the cable layout is normal and whether there is a short circuit. For any non-conformances found during the inspection, correct them immediately. • Check whether all inlet and outlet holes of the inverter are well sealed. • Check whether water leaks into the inverter. • Check whether the power cables are loose, and fasten them again by the torque specified previously. • Check whether the power cables and control cables are damaged, especially the part in contact with the metal enclosure. • Check whether the insulation tapes on the power cable terminals fell off.
Ground connection and equipotential connection	• Check whether the ground connection is correct and the grounding resistance shall be no more than 4 Ω. • Check whether the internal equipotential connection is correct.
Fan	• Check the running status of fans. • Check whether the fan blade rotates smoothly. • Check whether there is abnormal noise during the operation of the fans.
Screw	Check whether internal screws fell off.

Item	Check method
Exterior of the inverter	Check the following items, and correct immediately those failing to meet relevant requirements: • Check whether there are flammable objects on the top of the inverter. • Check whether the welding points between the inverter and foundation steel plate are firm and if there is corrosion. • Check whether the enclosure of the inverter is damaged, painted, or oxidized. • Check whether the monitoring window and cabinet door can be opened flexibly. • Check whether the sealing strip is fixed properly.
Interior of the transformer	Sample the internal oil at the oil leakage port to analyze the operation status of the transformer.

7.2.4 Maintenance (Every half a year to once a year)

Item	Check method
Safety function	• Check whether the shutdown key on the touchscreen and the e-stop button work normally. • Simulate shutdown. • Check the warning marks and other device marks, and replace them timely if they are fuzzy or damaged.
Software maintenance*	Check the settable parameters on the touchscreen.
Internal components inspection	• Check whether the circuit board and other components are clean. • Check the temperature of the heat sink and the amount of dust accumulated. Clean heat-dissipation modules with a vacuum cleaner if necessary. • Replace the air filter screen if necessary. Note! Be sure to check the ventilation of the air inlet. Otherwise, the fault may be caused due to overheating if the module cannot be cooled effectively.

Item	Check method
Air inlet and outlet	Check the temperature of the heat sink and the amount of dust accumulated. Clean heat-dissipation modules with a vacuum cleaner if necessary. For maintenance of air inlet and outlet, please refer to "9.1 Clean Top Air Outlet of Inverter Unit" 和"9.2 Clean Bottom Air Outlet of Inverter Unit".
Device maintenance	• Carry out regular inspection for corrosion of all metal components. • Check the contactor to ensure a normal mechanical operation. • Check the operation parameters (especially voltage and insulation).

* Generally, software does not need to be updated. When there are new requirements, optimizations, or on-site problems returning, software updates are carried out.

The recommended routine maintenance periods in the table are only for reference. The actual maintenance period shall be determined reasonably in consideration of the specific installation environment of the product.

Power plant scale, location, site environment, and other factors also affect the maintenance period of the product. It is necessary to shorten the maintenance period and increase the maintenance frequency in the event of a heavy sandstorm or dust in the operating environment.

8 Maintaining Inverter Units

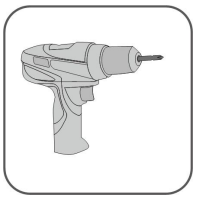
If some inverter units are faulty and need to be repaired during operation, replace the faulty unit following the steps in this section.

8.1 Installation Tools

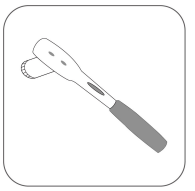
Installation tools include but are not limited to the following recommended ones. Other auxiliary tools on site can also be used as needed.

Screwdriver

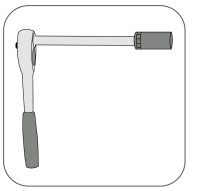
Slotted screwdriver



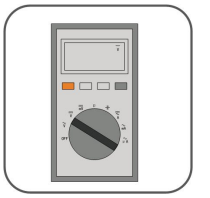
Electric screwdriver



Torque wrench



M5/M6/M8/M10/M12/M16 socket wrench



Multimeter

Safety gloves

Safety shoes

Safety helmet

8.2 Remove DC Side Cables

DANGER

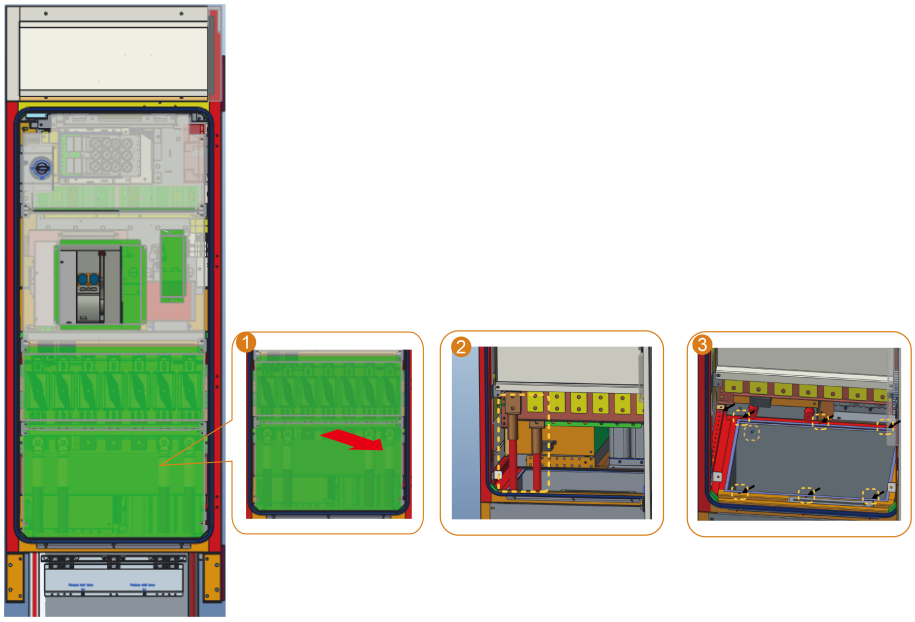
- **After the whole system is stopped, wait at least 20 minutes and confirm that the product is completely voltage-free inside. Then, you may proceed with the maintenance.**
- **Use a multimeter to test the DC bus fuse on the AC side. Make sure the voltage measurement is lower than the safe voltage for humans, and then you may proceed with inverter unit maintenance.**
- **Use a multimeter to test the SPD fuse on the DC side. Make sure the voltage measurement is lower than the safe voltage for humans, and then you may proceed with inverter unit maintenance.**

Step 1 Unscrew the M5 bolt assembly, and remove the DC cable sealing plate and the partitions between DC positive and negative terminals as indicated on the product label.

Step 2 Unscrew the M16 * and M6 bolt assembly and remove the DC positive and negative cables, and the grounding cable.

* The bolts used for DC positive and negative cables vary in different regions and may be M16 or M12 bolt assemblies. The product you have received may differ.

Step 3 Unscrew the M5 bolt assembly and remove the DC junction box and the screw of the grounding cable.

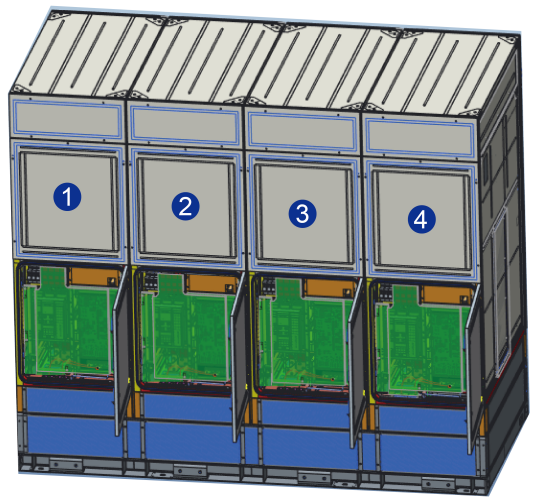


Reserve the junction box on the base to facilitate subsequent installation.

- - End

8.3 Remove AC Side Cables

1+X modular inverter is composed of multiple PV inverter units. Take SG4400UD as an example, the AC side layout of #1/#4 inverter unit and #2/#3 inverter unit is different. Pay attention to distinguish inverter units when removing the AC side cables.



* The numbering of the inverter units shown in the picture is for illustration only. Please refer to the actual No. of inverter units on site.

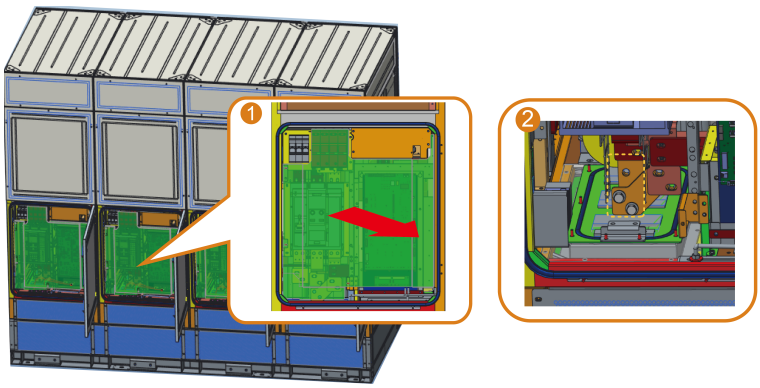
8.3.1 Remove #1/#4 Inverter Unit

DANGER

After the whole system is stopped, wait at least 20 minutes and confirm that the product is completely voltage-free inside before proceeding with the maintenance work.

Step 1 Unscrew the M5 bolt assembly and remove the AC cable PC plate.

Step 2 Unscrew the M10 bolt assembly and remove the AC wiring copper bar from front to back.



Step 3 Tear off all silicone pads marked in the figure below, then unscrew the M5 flange nut, and remove the AC epoxy plate, the PC plate, and the hose of cables between inverter units.

Inverter units #1 and #4 might be placed in opposite positions in the products. The actual product shall prevail!

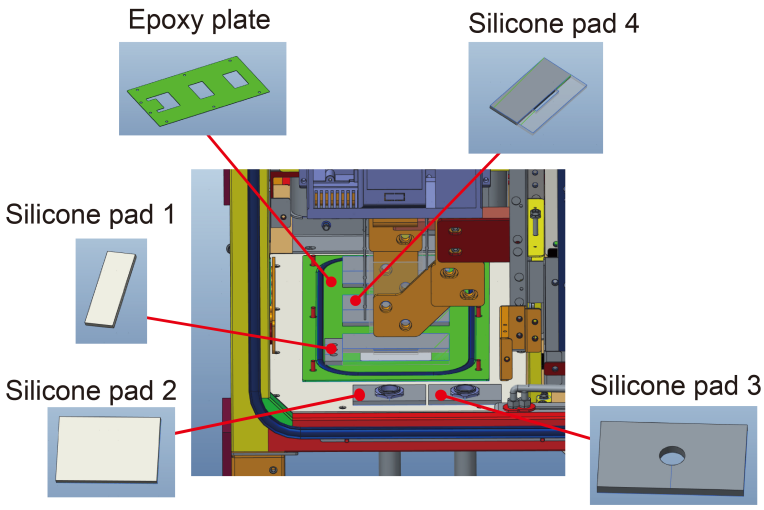


figure 8-1 1# Inverter Unit

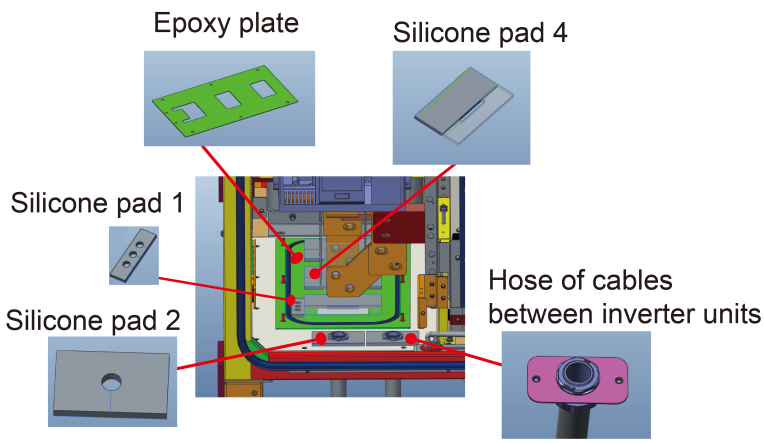
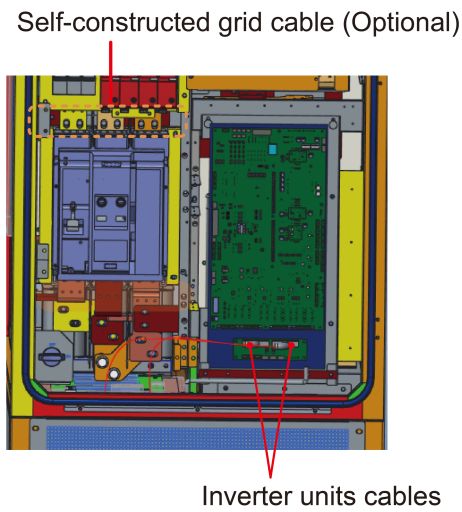


figure 8-2 #4 Inverter Unit

Step 4 Disconnect the cables between inverter units (unit-connecting cable) and cables of the self-constructed grid (optional). Take insulation measures for the unit-connecting cable and put them into the bottom junction box.



The components shown in the figure are for reference only. The product you have received may differ.

- - End

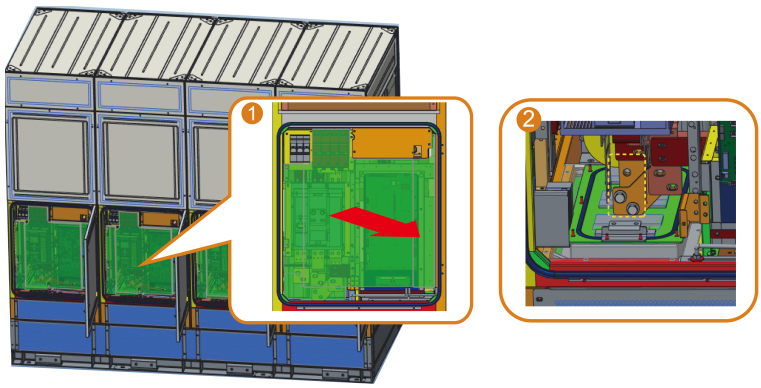
8.3.2 Remove #2/#3 Inverter Unit

DANGER

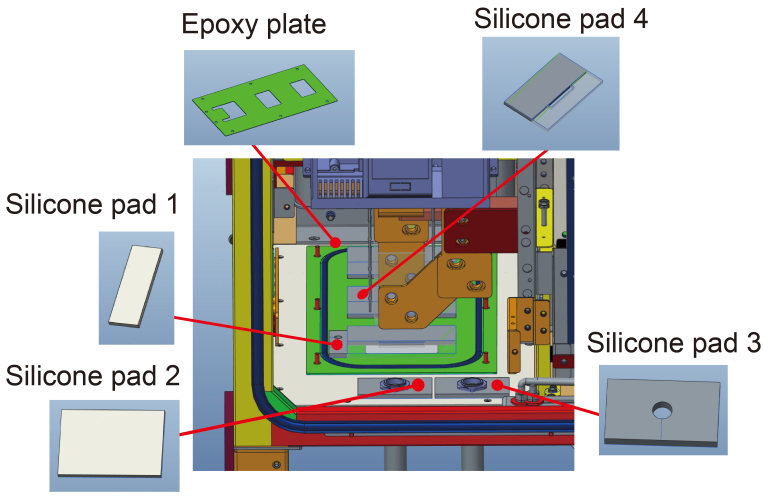
After the whole system is stopped, wait at least 20 minutes and confirm that the product is completely voltage-free inside before proceeding with the maintenance work.

Step 1 Unscrew the M5 bolt assembly and remove the AC cable PC plate.

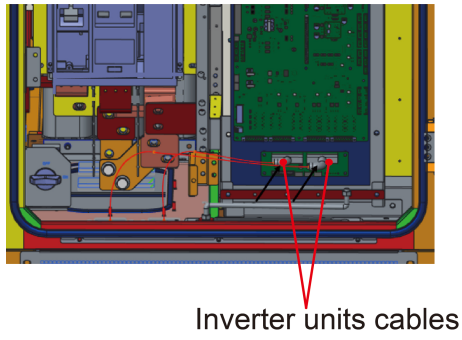
Step 2 Unscrew the M10 bolt assembly and remove the AC wiring copper bar from front to back.



Step 3 Tear off all silicone pads marked in the figure below, then unscrew the M5 flange nut, and remove the AC epoxy plate and the PC plate.



Step 4 Disconnect the cables between inverter units (unit-connecting cable). Take insulation measures for them, and put them into the bottom junction box.



The components shown in the figure are for reference only. The product you have received may differ.

- - End

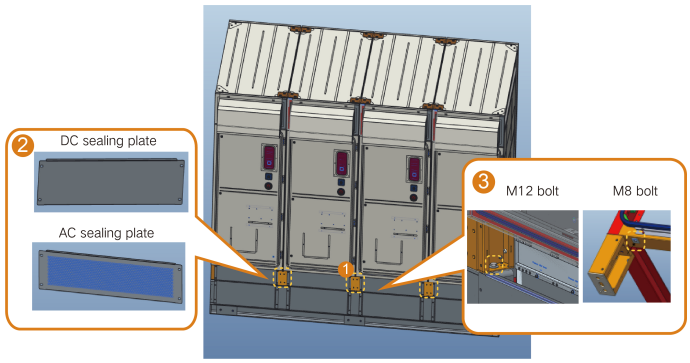
8.4 Remove Connections Between Inverter Units

Step 1 Unscrew the M8 bolts at the bottom of the AC and DC sides of the inverter unit. Remove the connecting pieces on the inverter unit to be maintained.

Step 2 Unscrew the M6 cross recessed hexagon bolt assembly and remove the DC and AC cable sealing plates on the bottom.

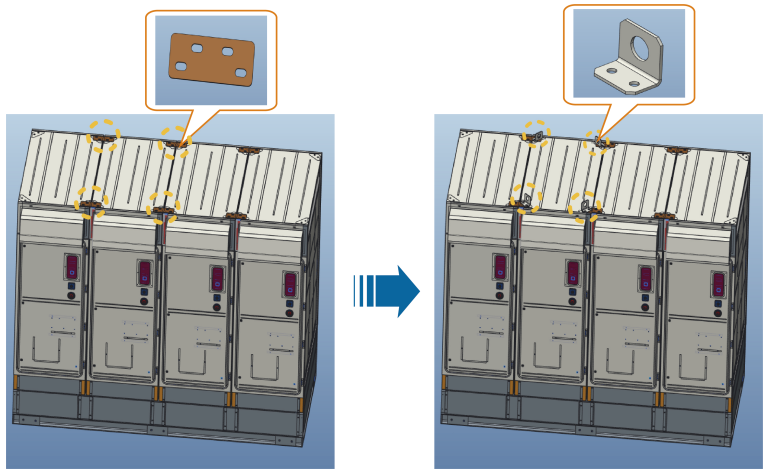
Step 3 Unscrew the M12 hexagon bolt assembly to separate the inverter unit and the base.

Step 4 Unscrew the M8 bolt that is used to fix the grounding cable of the inverter unit.

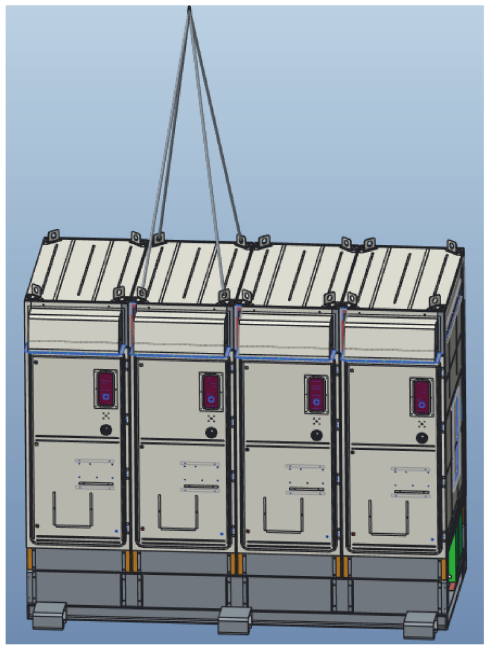


Some products may not have a connecting piece, hence the product you have received may differ.

Step 5 Unscrew the M10 hexagon bolt assembly, remove the connecting piece on the top of the inverter unit to be replaced and then install the lifting auxiliary part with the M10 hexagon bolt assembly. The direction of lifting auxiliary part is shown in the figure.



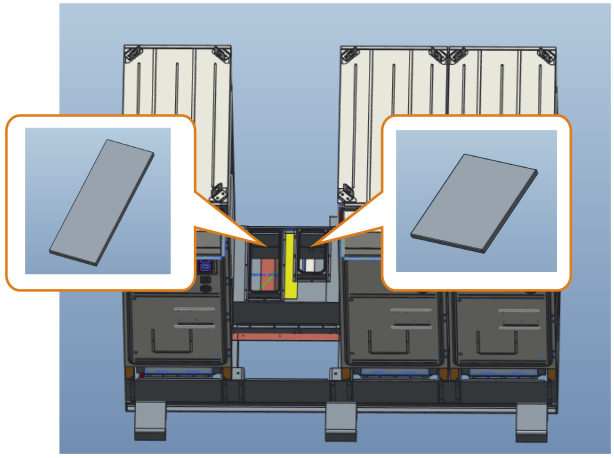
Step 6 Hoist the inverter unit out of the cabinet through the top four lifting auxiliary parts.



Use four flexible synthetic slings, with a length of at least 3.2 m and lifting capacity of over 2 tons, to lift the inverter unit.

Step 7 After the inverter unit is hoisted out of the cabinet, properly arrange the cables between units, insulated the exposed wire harness, and keep away from live parts.

Step 8 If a new inverter unit cannot be installed immediately, please use the M5 cross recessed hexagon bolt assembly to tighten the interface protection cover on the flat plate.



- - End

Install a new inverter unit in reverse steps.

⚠ WARNING

During installation, to ensure the sealing effectiveness, apply adhesive around all silicone pads to seal them off.

9 Common Maintenance Items

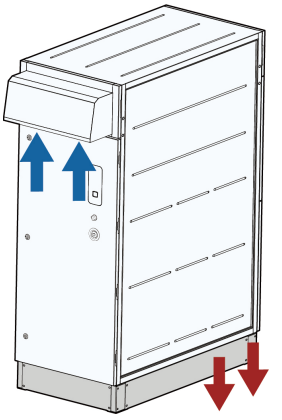
DANGER

- **Wait 20 minutes after the system is powered off, and then you can proceed with maintenance and overhaul.**
- **All component maintenance operations must be carried out while the product is in a power off state.**

Ensure that a functional spare device of the same model is available before replacing a damaged component.

9.1 Clean Top Air Outlet of Inverter Unit

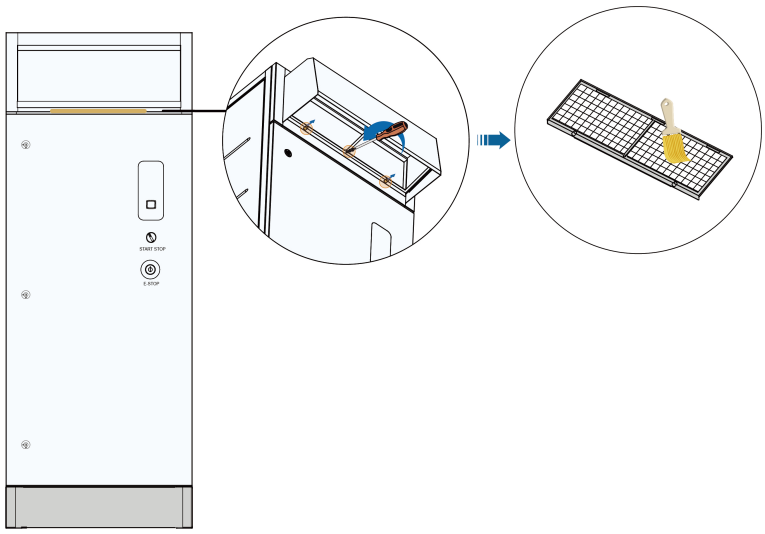
The following figure shows the heat dissipation mode of the inverter. The air inlet is located at the top of the DC cabinet, the air outlet is located at the lower parts of the AC cabinet.
It is expected to be finished in 5 minutes.



Step 1 Use a screwdriver to remove the M5 fixing screws of the air inlet for the first maintenance.

Step 2 Pull the spring plunger at both ends of the filter at the air inlet outward and tilt the filter downward to remove it. Clean the filter.

Step 3 Install the filter in reverse steps.



The M5 fixing screws are used for transport and do not need to be fit back.

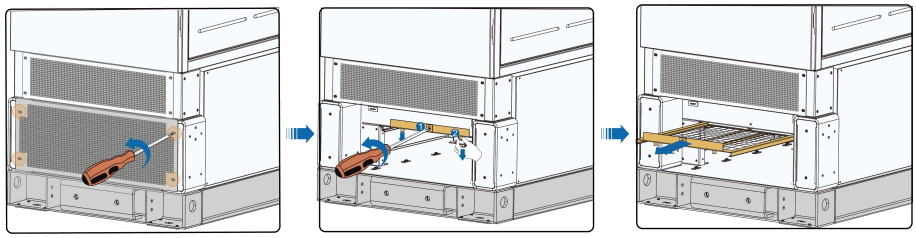
- - End

9.2 Clean Bottom Air Outlet of Inverter Unit

It is expected to be finished in 5 minutes.

Step 1 Remove the M6 cross recessed hexagon bolt assembly on the AC side base sealing plate and remove the sealing plate.

Step 2 Remove the M6 nuts on the air outlet filter, take out the and clean it.



Step 3 After cleaning, install the filter in reverse steps.

- - End

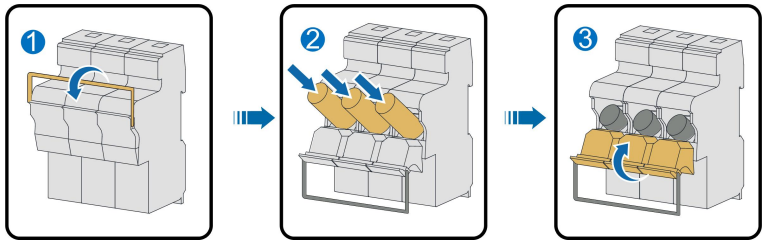
9.3 Replace Fuse in AC SPD

The position of fuse in AC SPD is shown in "3.2 Internal Structure of Inverter Unit", it is expected to be finished in 5 minutes.

Step 1 Open the fuse holder in the AC side.

Step 2 Remove the old fuses and insert the new fuses.

Step 3 Close the fuse holder in the AC side SPD.



- - End

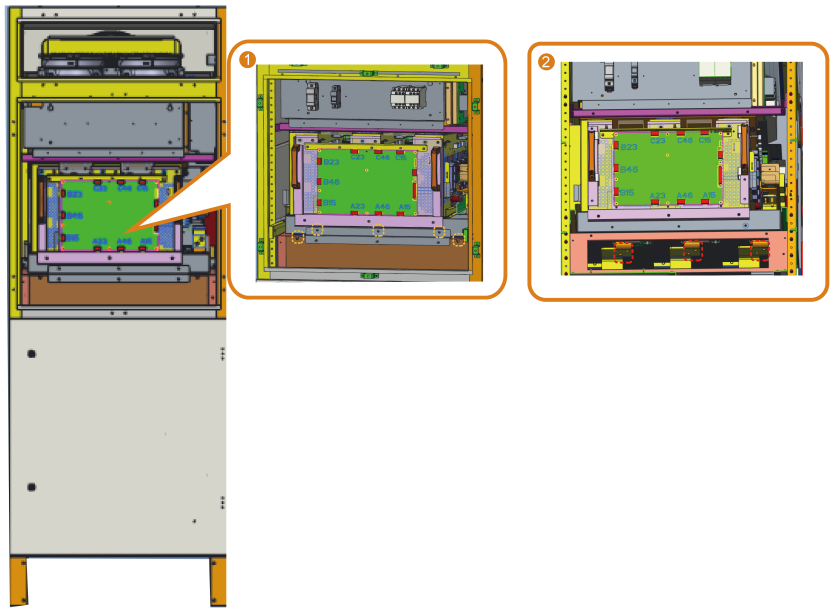
9.4 Replace IGBT Module

DANGER

Use a multimeter to test the DC bus fuse on the AC side. Make sure the voltage measurement is lower than the safe voltage for humans, and then you may proceed with module maintenance.

The replacement of the IGBT module is expected to take 80 minutes.

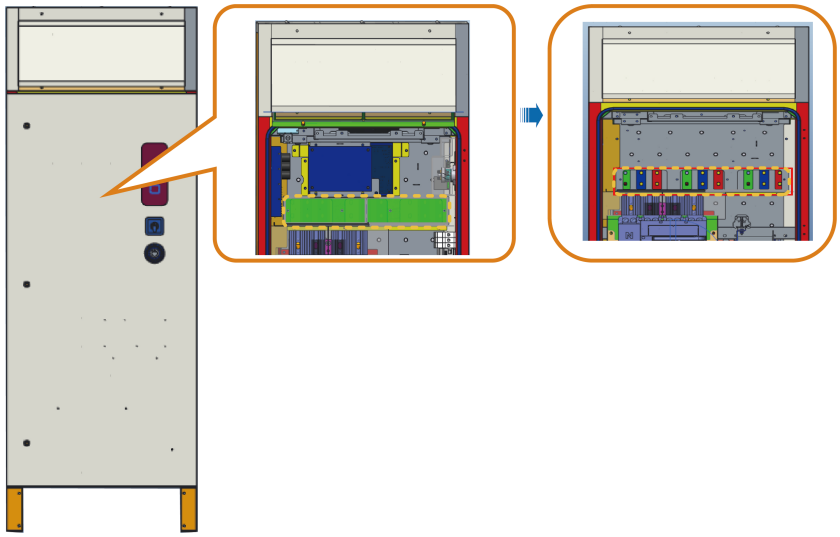
Step 1 Open the AC side cabinet door and remove the five M5 bolts below the IGBT module.



Step 2 Remove the flexible copper connections between the reactor and module, six M8 bolts in total.

Step 3 Open the DC side cabinet door and remove the separator plate.

Step 4 Fit the 18 bolts used for connecting the capacitance pool bus and the IGBT module.



Step 5 On the AC side, disconnect and remove the drive and grounding cables connected to the module, and take out the IGBT module.

You can also take out the IGBT module using the tooling. For details, see Instructions for IGBT Module Maintenance Tooling.

Step 6 Install the new IGBT module by completing the above steps in reverse.

WARNING

When removing/installing the new IGBT module, impacts to the module (especially its PCB board) must be avoided.

- - End

9.5 Replace Fans

DANGER

Use a multimeter to test the DC bus fuse on the AC side. Make sure the voltage measurement is lower than the safe voltage for humans, and then you may proceed with fan maintenance.

This section describes how to replace fans with an example of replacing the fan at the top right end of the AC side of the inverter as an example.

The replacement of the fan is expected to take 15 minutes.

Step 1 Remove the door of the cabinet, in which the cable duct for the fan to be maintained is located. And remove the grounding cable of the fan.

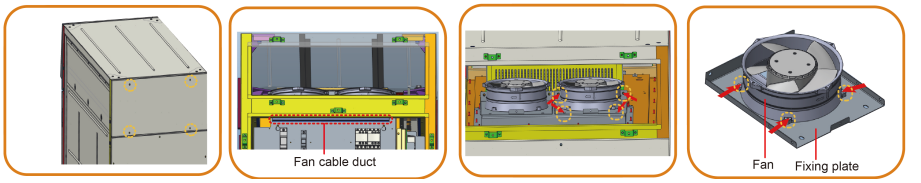
Step 2 Remove the M5 bolts from the top door on the AC cabinet and open the fan cabinet door.

Step 3 Open the fan cable duct and disconnect its wiring terminals.

Step 4 Remove the bolted connections between the fan fixing plate and the bottom platform.

Step 5 Remove the tie from the fan cables and take the fan out.

Step 6 Remove the four M5 bolts connecting the fan and the fixing plate. Then, install the new fan.



Step 7 Fix the new fan to the bottom fixing plate and install it inside the inverter unit by completing the steps above in the reverse order.

Observe the wire marks when performing the wiring of the fan. Make sure the wiring is completed correctly.

Fan wire color	Mark
Red	FAN * -+ / PE1–J *
Black	FAN * - - / PE1–J *
Yellow	FAN * -P / PD-J ** - 1
Blue	FAN * -F / PD-J ** - 3

* indicates numbers. FAN1 is for the left fan on the top of the AC side, and FAN2 is for the right one.

Steps above are intended for the wiring using the terminal block. Wiring may also be done using the plug-in terminals; you may unscrew the terminals directly.

- - End

9.6 Appearance Repair

Check the appearance of the product:

Case 1: Erasable traces

Case 2: Indelible traces

Case 3: Broken primer

Check whether the protective paint sprayed on the casing of the product fell off or peeled off. If so, repair it timely.

Spray a special protective paint to the exterior of the product every 5 years.

9.6.1 Erasable Traces

Tools

No.	Name	Source
1	Cleaning cloth	Beyond the scope of supply
2	Water	
3	Alcohol or other non-corrosive detergents	

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

Step 2 If the dirt cannot be cleaned with water, scrub with 97% alcohol till the surface is acceptable. (Or try to use non-corrosive detergents that are generally used locally)

- - End

9.6.2 Indelible Traces

Tools

No.	Name	Source
1	Abrasive paper	Beyond the scope of supply
2	Cleaning cloth	
3	Water	
4	Alcohol	
5	Brush	
6	RAL7035 oil paint	

Step 1 Polish the paint surface with blistering or scratches with abrasive paper for a smooth surface.

Step 2 Wet the cleaning cloth with water or 97% alcohol, and scrub the damaged parts to remove surface stains.

Step 3 Perform paint repair for the scratched parts with a soft brush after the surface is dried; brush the paint as uniform as possible.

- - End

9.6.3 Broken Primer

Tools

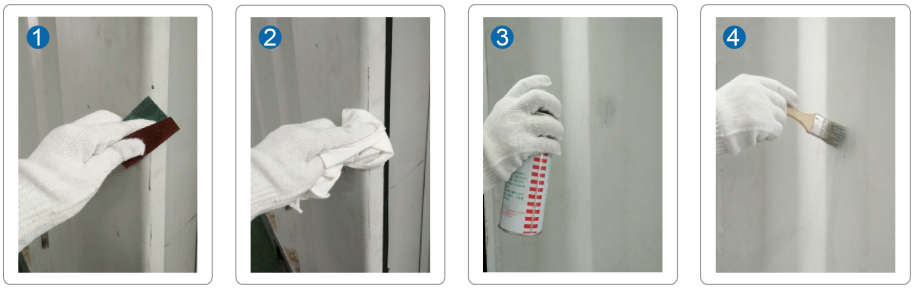
No.	Name	Source
1	Abrasive paper	Beyond the scope of supply
2	Cleaning cloth	
3	Water	
4	Alcohol	
5	Zinc primer	
6	Brush	
7	RAL7035 oil paint	

Step 1 Polish the damaged parts with abrasive paper to remove rust and other burrs for a smooth surface.

Step 2 Wet the cleaning cloth with water or 97% alcohol, and scrub the damaged parts to remove surface stains and dust.

Step 3 Spray the parts with base material exposed with zinc primer for protection after drying the surface. Ensure to spray to cover the bare base material completely.

Step 4 Perform paint repair for the damaged parts with a soft brush after the primer is dried, and brush the paint uniformly.



- - End

9.7 Replace DC Side Fuse

Step 1 Stop the inverter by referring to "4.3.1 Planned Powering Down ".

DANGER

Ensure the PVS is disconnected and the DC load switch QS1 is turned off.

Step 2 Wait 20 minutes for the internal capacitors to be fully discharged.

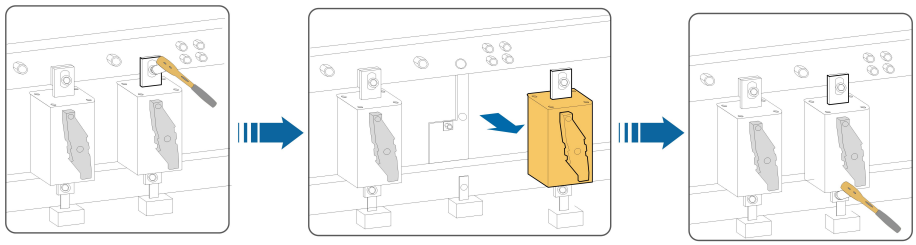
Step 3 Open the DC cabinet door and remove the protective cover on the DC fuse.

Step 4 Use a multimeter with a measurement capability of 1500V to test the DC side voltage of the inverter. Make sure the voltage measurements (positive voltage, negative voltage, positive to ground, and negative to ground) are all 0.

Step 5 Use a multimeter to test each DC input voltage and ensure that the wiring terminals are all voltage-free. Then, you may proceed to the next step.

Step 6 Find the faulty fuse. Use a socket wrench to loosen the fixing bolt on the fuse to be replaced. Then, remove the fuse.

Step 7 Use M10×30* bolts to secure the new fuse, at a torque of 34-40 N·m.



- - End

* If the DC input of the inverter is equipped with MPLC, use M8×30 and M10×30 bolts.

9.8 Maintenance of Other Components

The maintenance and estimated time required for other components are shown in the table below. For specific maintenance operations, please contact SUNGROW.

Name	Time (minutes)
DC busbar	360
Drive module	80
AC circuit breaker	60
DC load switch	50
Adapter board	20
DSP board	10
PT board	10
AC-/DC-side fans	15
AC filter capacitor	40
DC film capacitor	360
AC/DC side fuse	5
DC/AC SPD fuse	5
LVRT power box	10
LVRT power box parallel-connection pinboard	10

Name	Time (minutes)
AC/DC SPD	5
Balance board	10
Standby power board	10
LED screen	5
DC-side Current sensor	15
AC-side Current sensor	30
Three-phase transformer	20
Aluminum-shell resistor	5

* The maintenance time listed in the table is for reference only. The maintenance work should be conducted based on the on-site conditions.

10 Appendix

10.1 Quality Assurance

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

Evidence

During the warranty period, the customer shall provide the product purchase invoice and 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/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 stipulations of relevant international standards.
- The damage is caused by unexpected natural factors.

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

10.2 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**