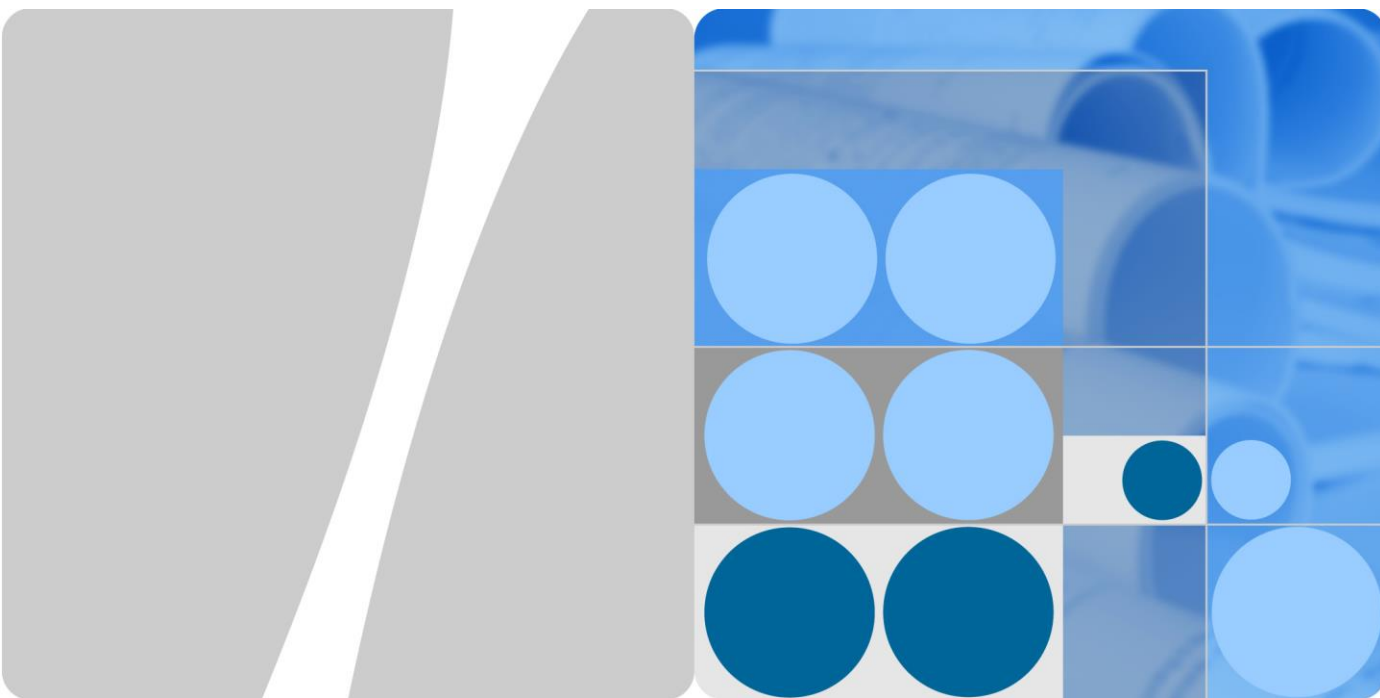


Part Number: 31010WDV



ACBox2000-21-D-A

User Manual (Pan-Europe Edition)

Issue 01
Date 2016-12-15

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About This Document

Purpose






This document describes the ACBox2000-21-D-A (ACBox2000 for short) in terms of its installation, electrical connections, commissioning, maintenance, and troubleshooting. Read through this document to understand the safety information as well as the ACBox2000 functions and features before installing and operating the ACBox2000.

Intended Audience

This document is intended for grid-tied photovoltaic (PV) power system personnel and qualified electrical technicians.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, or environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all updates made in previous issues.

Issue 01 (2016-12-15)

This issue is the first official release.

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1 Safety Precautions

General Safety

Huawei equipment can be installed, operated, and maintained only by personnel who have received a thorough training, understood all necessary safety precautions, and are able to correctly perform all operations.

- Only trained and qualified personnel are allowed to install, operate, and maintain Huawei equipment.
- Only qualified personnel are allowed to remove safety facilities and inspect the equipment.
- Only personnel certified or authorized by Huawei are allowed to replace devices or components (including software).
- Any fault or error that might cause safety problems must be reported immediately to a supervisor.



NOTICE

Read this document thoroughly before operations. Huawei shall not be liable for any consequence caused by violation of the storage, transportation, installation, and operation regulations specified in this document.

The safety precautions provided in this document do not cover all the safety precautions. Huawei will not be liable for any consequence caused by the violation of the safety operation regulations and design, production, and usage standards.

Local Laws and Regulations

When operating Huawei equipment, you must follow the local laws and regulations. The safety instructions in this document are only supplements to local laws and regulations.

Grounding Requirements

Comply with the following requirements for devices to be grounded:

- When installing a device, install the ground cable first. When removing a device, remove the ground cable at the very end.

- Do not damage the ground conductor.
- Do not operate the device in the absence of a properly installed ground conductor.
- The device must be connected permanently to the protection ground before any operation.
- Before operating the device, check the electrical connection of the device to ensure that it is securely grounded.

Personal Safety

- To avoid electric shock, ensure that AC INPUT and AC OUTPUT connections are not reversed.
- Before using a device, remove any conductors such as jewelry or watches to avoid electric shock or burns.
- In case of fire, immediately leave the building or the equipment area, and turn on the fire alarm bell or make an emergency call. Do not enter the building on fire in any case.
- When the operation is performed in a damp environment, ensure that the device is dry. If detecting water or signs of dampness in the cabinet, disconnect the power supply immediately.

Device Safety

- The device must be fixed securely on the floor or to other immovable objects such as walls and mounting racks before performing operations.
- Tighten the screws by using a tool when installing components.
- After the installation, remove packing materials from the equipment area.

High Voltage



DANGER

- The high voltage power supply provides power for the device operation. Direct or indirect contact (especially with a damp object) with the high voltage power supply may result in fatal injury.
 - Non-standard and improper high voltage operations may result in fire and electric shock.
-
- Personnel who perform high voltage operations and install AC facilities must be qualified to perform high voltage and AC operations.
 - Comply with local laws and regulations when bridging and wiring AC cables.
 - Follow local laws and regulations when operating AC-powered devices.
 - Use dedicated tools when performing high voltage and AC operations.

Power Cable



DANGER

Do not install or remove power cables for a device which is powered on. Transient contact between the core of a power cable and a conductor may generate electric arcs or sparks, which may cause fire or hurt eyes.

- Before installing or removing a power cable, turn off the upstream power switch, and use a multimeter to check that the AC voltage of the input port is zero.
- Before connecting a power cable, check that the label on the power cable is correct.

Component

To ensure that a device runs safely, replace a failed device component with a component of the same type and specifications.

2 Product Overview

2.1 Introduction

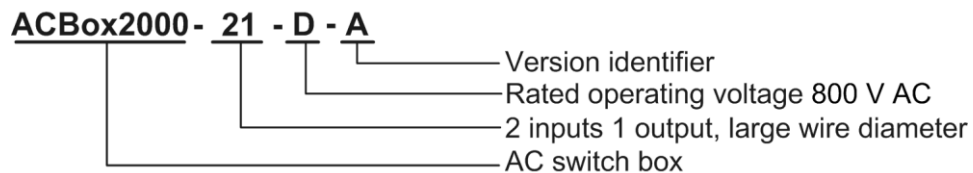
Function

The ACBox2000 is mainly used to combine inverter AC outputs. It also functions as a maintenance switch and turns off to isolate the AC voltage at the low-voltage side of the box-type transformer when the inverter is being maintained.

Model

Figure 2-1 describes the model number for the ACBox2000.

Figure 2-1 Model number description

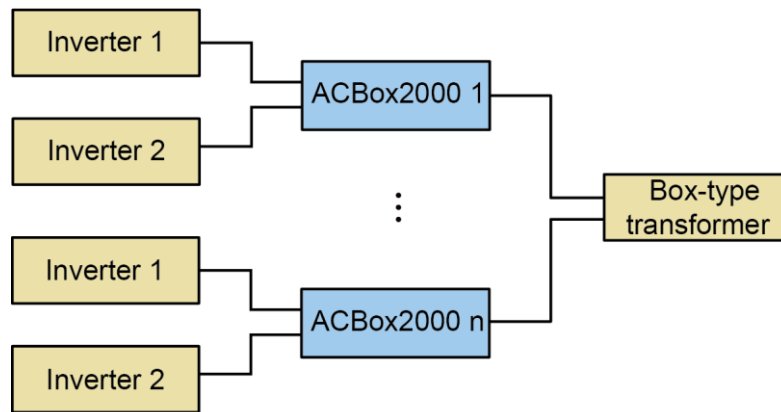


IP14J00002

Network Application

Figure 2-2 shows the location of the ACBox2000 in a grid-tied PV power system.

Figure 2-2 Networking



IP14N00001



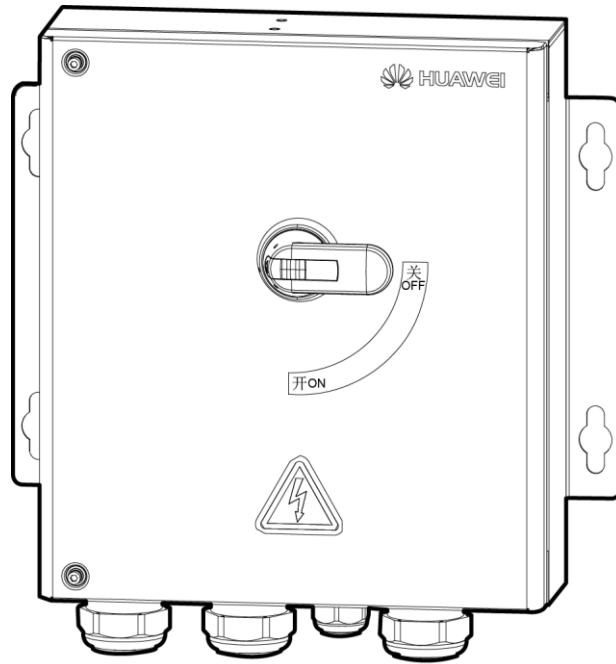
NOTICE

- The ACBox2000 functions as only the local maintenance isolation switch of the inverter and turns off when the inverter needs to be maintained to ensure that the inverter is isolated from the power grid.
- If the ACBox2000 is used in a grid-tied PV power system, the system on the AC side should meet the safety design specifications, such as IEC 60947 and IEC 60364.
- It is recommended that the ACBox2000 be installed near the inverter.

Appearance

Figure 2-3 shows an ACBox2000.

Figure 2-3 Appearance



2.2 Label Conventions

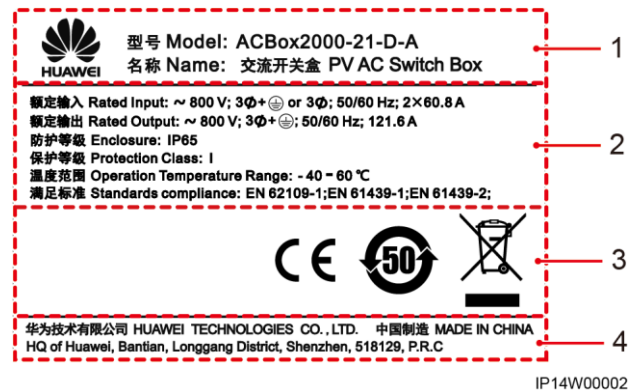
Identifiers

Symbol	Name	Meaning
	High voltage warning	The ACBox2000 operates at high voltage. All operations on the ACBox2000 may only be carried out by a trained electrician.
	Operation warning	Before removing the ACBox2000 cover, disconnect all AC power supplies.
	Refer to instructions	Remind operators to refer to the instructions shipped with the ACBox2000.

Nameplate

The ACBox2000 is labeled with a nameplate on the side that contains the model information, technical specifications, and compliance symbols, as shown in [Figure 2-4](#).

Figure 2-4 Nameplate



- (1) Trademark, product name, and model number
- (2) Important technical specifications
- (3) Compliance symbols
- (4) Company name and country of manufacture

[Table 2-1](#) describes the compliance symbols.

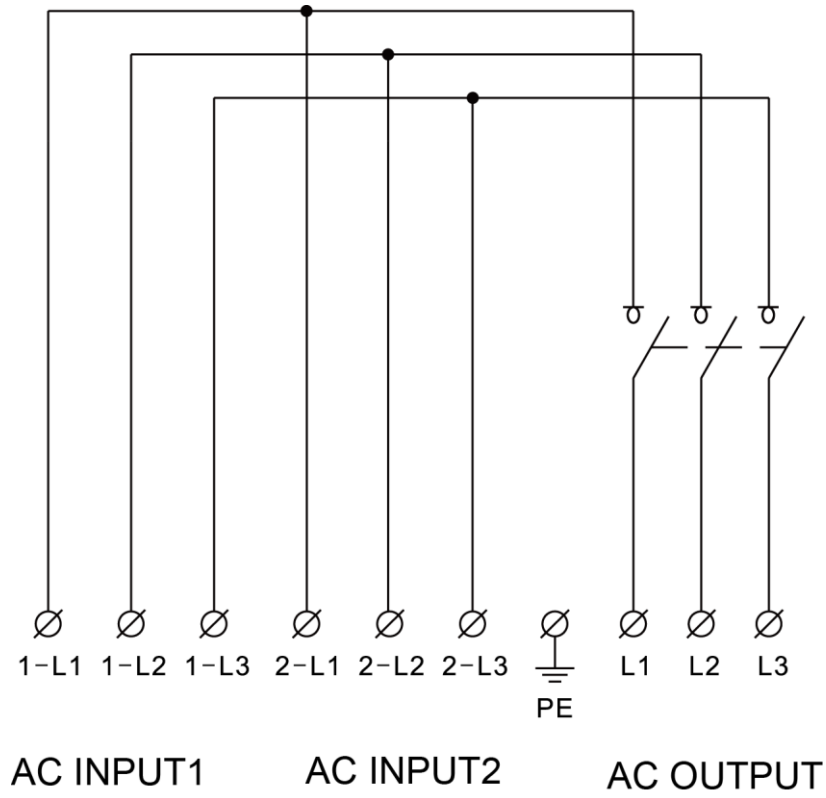
Table 2-1 Compliance symbols

Symbol	Name	Meaning
	CE certification mark	The ACBox2000 complies with Conformité Européenne (CE) certification standards.
	Environmentally friendly use period (EFUP)	The ACBox2000 is environmentally friendly for the specified period.
	EU WEEE mark	The ACBox2000 must not be disposed of as domestic waste.

2.3 Working Principle

[Figure 2-5](#) shows the ACBox2000 working principle.

Figure 2-5 Working principle



3 ACBox2000 Storage

If the ACBox2000 will not be used immediately, store it according to the following requirements:

- Do not remove the outer packing of the ACBox2000.
- Keep the storage temperature at -40°C to $+70^{\circ}\text{C}$ and the humidity at 4%–100% RH.
- The ACBox2000 should be stored in a clean and dry place and be protected from dust and water vapor corrosion.
- A maximum of six ACBox2000s can be stacked.
- Periodic inspections are required during storage. If any rodent bites are found, replace the packing materials promptly.
- Before using an ACBox2000 that has been stored for a long period, ensure that it is inspected and tested by professionals.

4 Installation

4.1 Checking Before Installation

Checking the Outer Packing

Before unpacking the ACBox2000, examine the outer packing for damage such as holes and cracks. If any such damage is found, do not unpack the ACBox2000 and contact the dealer immediately.



NOTE

Remove the outer packing only 24 hours before installing the ACBox2000.

Checking the Product and Accessories

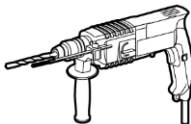
After unpacking the ACBox2000, check the product and accessories. If any damage is found or any component is missing, contact the dealer.

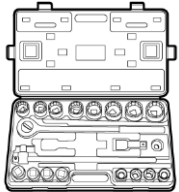
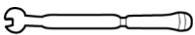
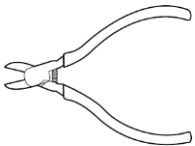
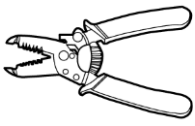







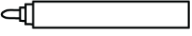
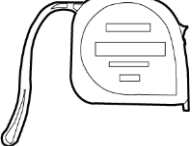
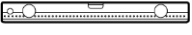
NOTE




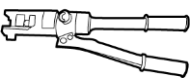
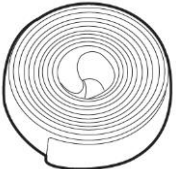

For the number of items included in the delivery, see the *Packing List* in the packing case.


4.2 Tools

Tool	Model	Function
Hammer drill 	Drill bit: Φ 14 mm, Φ 16 mm	<ul style="list-style-type: none">• Drill bit: Φ14 mm, used for drilling holes in supports• Drill bit: Φ16 mm, used for drilling holes in walls

Tool	Model	Function
Socket wrench 	N/A	Secures bolts and AC terminals.
Torque wrench 	Open end: 18 mm	Secures bolts.
Diagonal pliers 	N/A	Cut cable ties.
Wire stripper 	N/A	Peels cable jackets.
Multimeter 	N/A	Measures voltages.
Rubber mallet 	N/A	Hammers expansion bolts into holes.

Tool	Model	Function
Utility knife 	N/A	Removes packages.
Cable cutter 	N/A	Cuts power cables.
Vacuum cleaner 	N/A	Cleans up dust after drilling holes.
Marker 	Diameter: ≤ 10 mm	Marks signs.
Measuring tape 	N/A	Measures distances.
Level 	N/A	Levels hole positions.

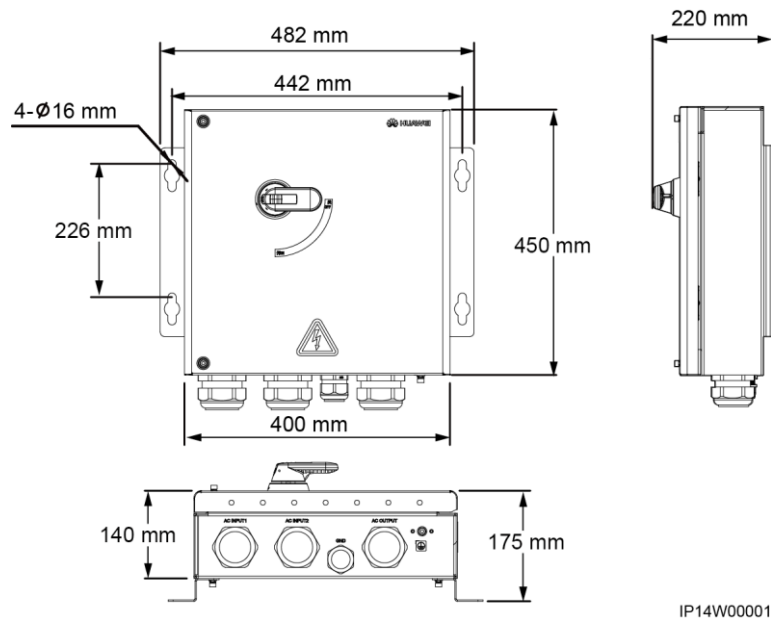
Tool	Model	Function
Protective gloves 	N/A	Protect your hands during installation.
Safety goggles 	N/A	Protect your eyes during hole drilling.
Anti-dust respirator 	N/A	Protects you from dust during hole drilling.
Hydraulic pliers 	N/A	Crimp OT terminals.
Heat shrink tubing 	N/A	Wraps the cable crimping area of an OT terminal.
Heat gun 	N/A	Heat-shrinks a tube.

Tool	Model	Function
Cable tie 	N/A	Binds cables.

4.3 Installation Dimensions

Figure 4-1 shows the installation dimensions for the ACBox2000.

Figure 4-1 Installation dimensions



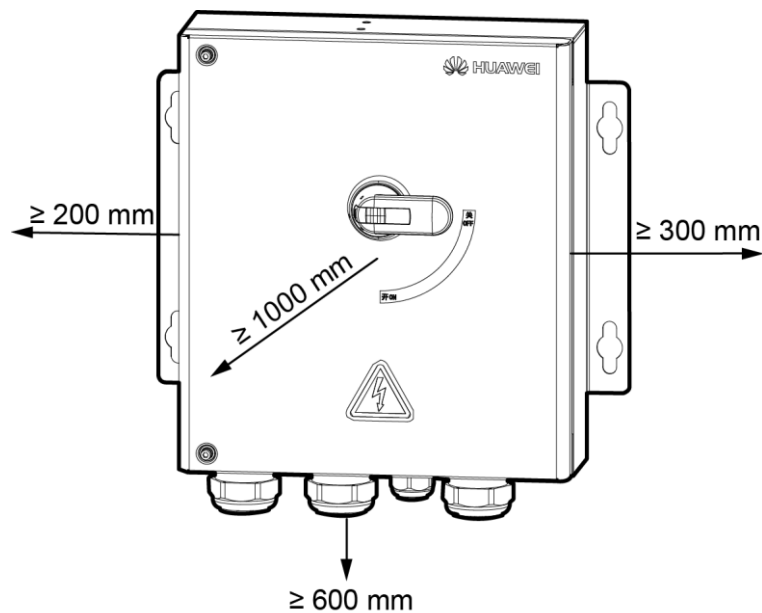
The following table describes the waterproof cable connector specifications.

Silk Screen	Model	Diameter Range
AC INPUT1	PG48	37–42 mm
AC INPUT2	PG48	37–42 mm
AC OUTPUT	PG48	37–42 mm
GND	1NPT	18–23 mm

4.4 Determining the Installation Position

- The ACBox2000 is protected to IP65 and can be installed indoors or outdoors.
- Do not install the ACBox2000 in areas with flammable or explosive materials.
- Do not install the ACBox2000 on flammable building materials.
- The carrier where the ACBox2000 is installed must be fireproof.
- The ACBox2000 weighs 11 kg. Ensure that installation surface is solid enough to bear the ACBox2000.
- The dimensions (W x H x D) of the ACBox2000 chassis are 400 mm x 450 mm x 140 mm. Reserve sufficient space around the ACBox2000 to facilitate installation and cable connection.

Figure 4-2 Installation space



IP14W00005

4.5 Wall-Mounted Installation

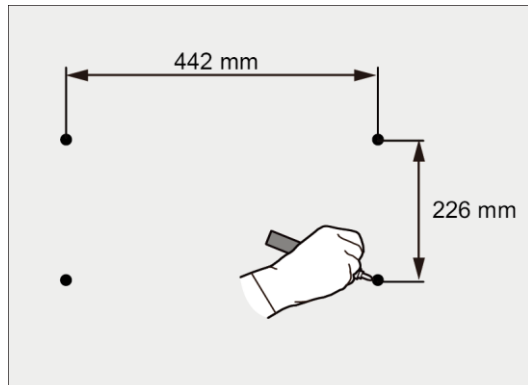
Prerequisites

Before wall-mounting the ACBox2000, prepare expansion bolts by yourself. M12x60 stainless steel expansion bolts are recommended.

Procedure

- Step 1** Locate the positions for drilling holes based on the ACBox2000 installation dimensions, level the hole positions using a level, and mark holes using a marker.

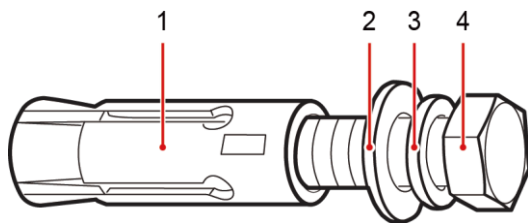
Figure 4-3 Marking holes



IP14H00005

Step 2 Drill holes using a hammer drill and install M12x60 expansion bolts.
An expansion bolt is composed of four parts, as shown in [Figure 4-4](#).

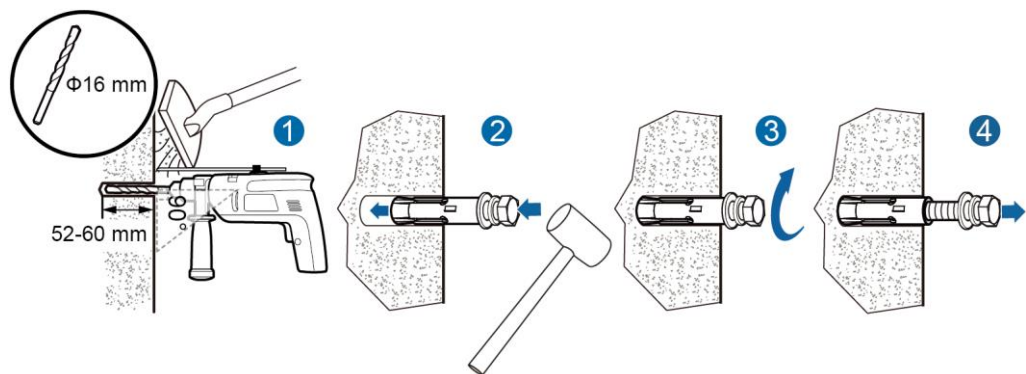
Figure 4-4 Expansion bolt composition



IS01HC0003

- (1) Expansion sleeve (2) Flat washer (3) Spring washer (4) Bolt

Figure 4-5 Drilling a hole and installing an expansion bolt



IS03H00001



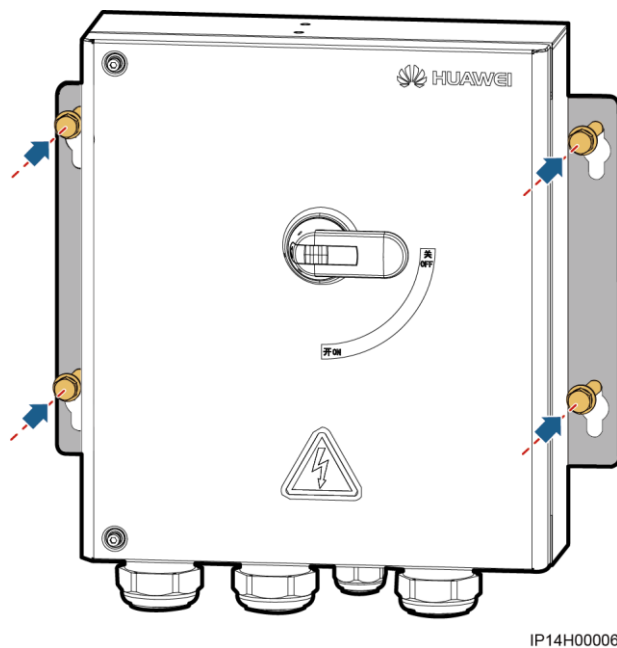
NOTICE

- To prevent dust inhalation or contact with eyes, wear safety goggles and an anti-dust respirator when drilling holes.
- Wipe away any dust in or around the holes and measure the hole distance. If the holes are inaccurately positioned, drill holes again.
- Level the head of the expansion sleeve with the concrete wall after removing the bolt, spring washer, and flat washer. Otherwise, the mounting bracket will not be securely installed on the concrete wall.

1. Put a hammer drill with a $\Phi 16$ mm drill bit on the marked hole positions perpendicularly against the wall and drill holes with a depth of 52–60 mm.
2. Vertically insert expansion bolts into the holes, and knock the expansion bolts completely into the holes by using a rubber mallet.
3. Partially tighten the expansion bolts.
4. Loosen the bolts.

Step 3 Install the ACBox2000 on the bolts, move it down to clamp the bolts on the holes, and tighten the bolts to a torque of 45 N·m using a torque wrench with an open end of 18 mm.

Figure 4-6 Securing the ACBox2000



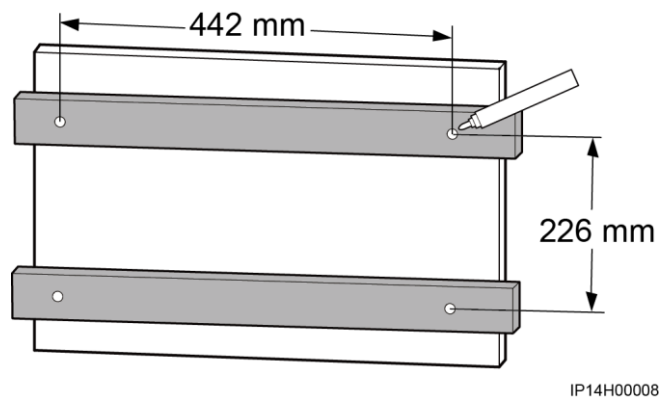
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4.6 Support-Mounted Installation

Procedure

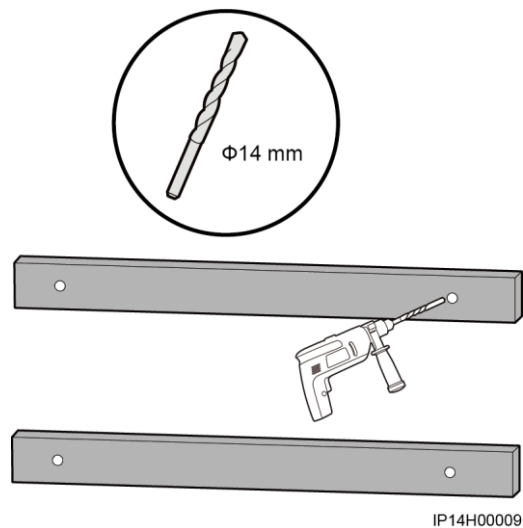
- Step 1** Locate the positions for drilling holes based on the ACBox2000 installation dimensions, level the hole positions using a level, and mark holes using a marker.

Figure 4-7 Marking holes



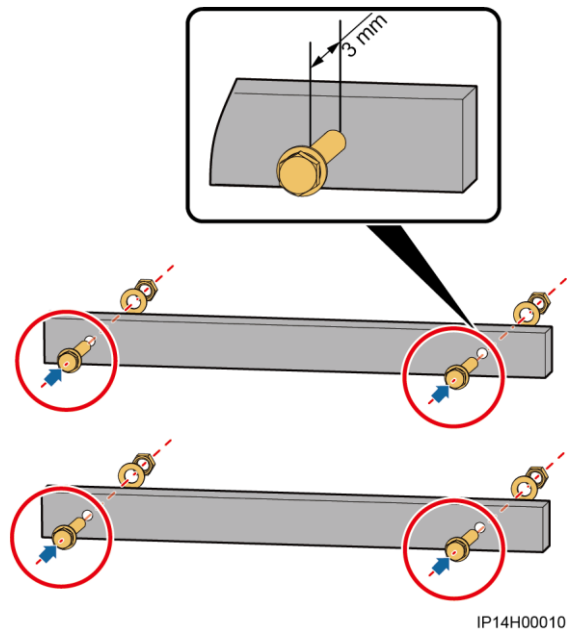
- Step 2** Drill holes using a hammer drill.

Figure 4-8 Drilling holes



- Step 3** Insert the delivered bolt assemblies (spring washers, flat washers, and M12x40 bolts) into the holes, and secure them using stainless steel nuts and flat washers.

Figure 4-9 Securing bolt assemblies

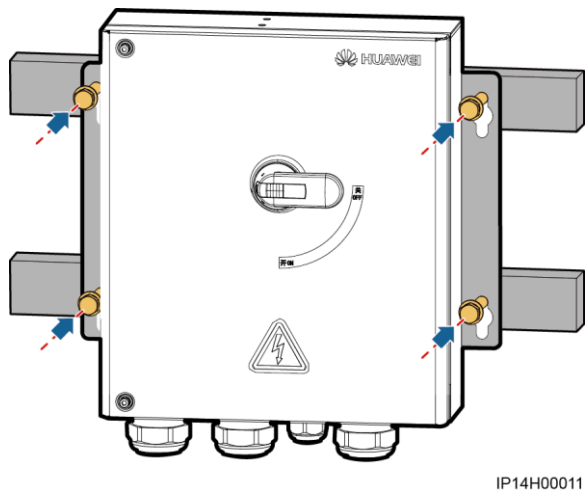


NOTE

Do not fully tighten the nuts. Keep the bolt heads about 3 mm away from the support.

- Step 4** Install the ACBox2000 on the bolts, move it down to clamp the bolts on the holes, and tighten the bolts to a torque of 45 N·m using a torque wrench with an open end of 18 mm.

Figure 4-10 Securing the ACBox2000



----End

4.7 Pole-Mounted Installation

Prerequisites

- To pole-mount an ACBox2000, you need to prepare pole-mounting brackets by yourself based on the ACBox2000 installation dimensions. For the ACBox2000 installation dimensions, see [4.3 Installation Dimensions](#).
- You are advised to use M12 U-shaped bolts to secure the pole-mounting brackets.



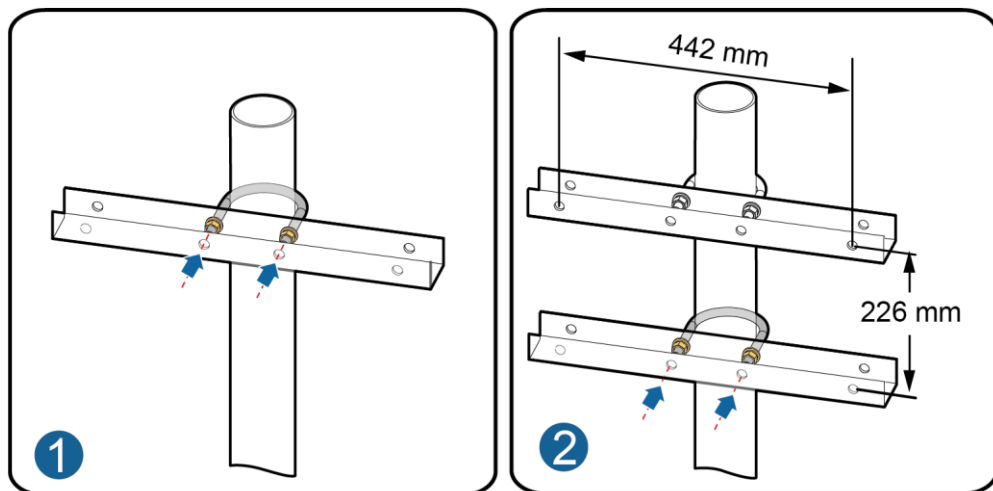
NOTE

Figures provided in this document are for reference only. The actual poles and pole-mounting brackets prevail.

Procedure

- Step 1** Secure the pole-mounting brackets to the pole and tighten the U-shaped bolts to a torque of 45 N·m using a torque wrench with an open end of 18 mm.

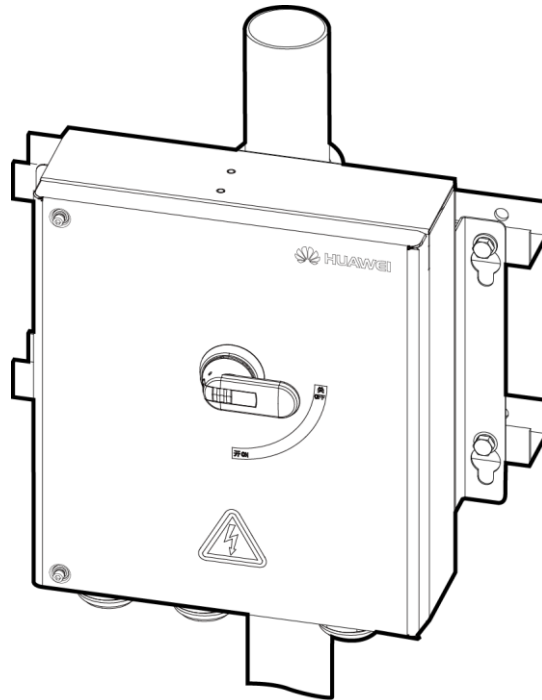
Figure 4-11 Securing pole-mounting brackets



IP14H00053

- Step 2** Secure the ACBox2000 to the pole-mounting brackets. For detailed operations, see [4.6 Support-Mounted Installation](#).

Figure 4-12 Securing an ACBox2000



IP14H00052

----End

5 Electrical Connections

5.1 Safety Precautions



DANGER

Before performing electrical connections, ensure that:

- The AC circuit breaker between the ACBox2000 and the box-type transformer is OFF. Place a warning sign at the AC circuit breaker to avoid incidents caused by switch-on of the circuit breaker.
- All DC switches of the two inverters that connect to the ACBox2000 are OFF.



NOTICE

Huawei shall not be liable for any device damage caused by violation of the cable connection regulations specified in this document.

5.2 Cable Specifications

Cable Type	Conductor Cross-Sectional Area
AC input power cable	Max. 3 x 70 mm ² (L1, L2, and L3) + 1 x 35 mm ² (PE)
AC output power cable	Max. 3 x 120 mm ² (L1, L2, and L3) + 1 x 70 mm ² (PE)



NOTE

Both the AC input and output power cables support 3W and 3W+PE connection modes.

5.3 Opening the Chassis Door

Prerequisites



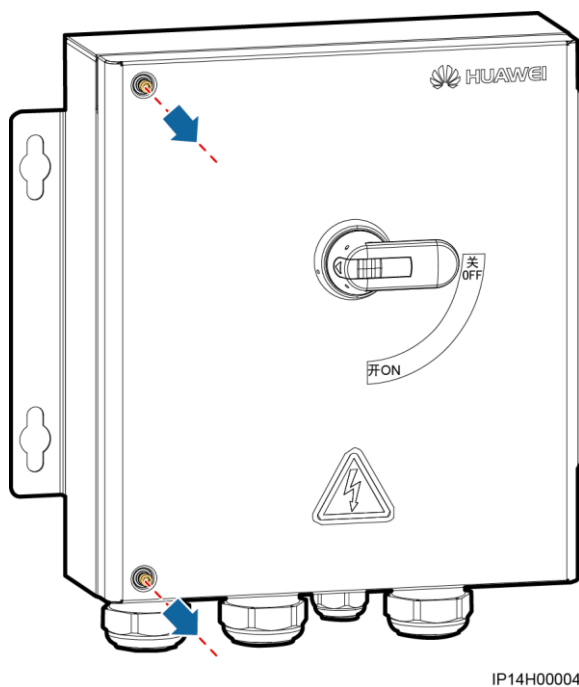
NOTICE

Before opening the chassis door, ensure that the handle of the isolation switch is in the OFF position; otherwise, the chassis door cannot be opened.

Procedure

Step 1 Remove the two screws from the chassis door using a hex key and set them aside.

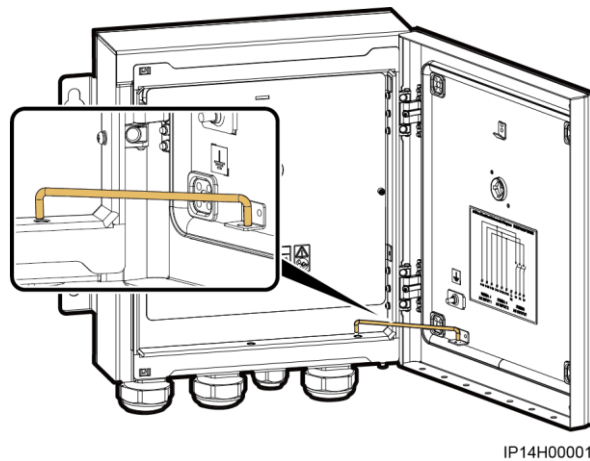
Figure 5-1 Removing screws



IP14H00004

Step 2 Open the chassis door and install a door rod.

Figure 5-2 Installing a door rod

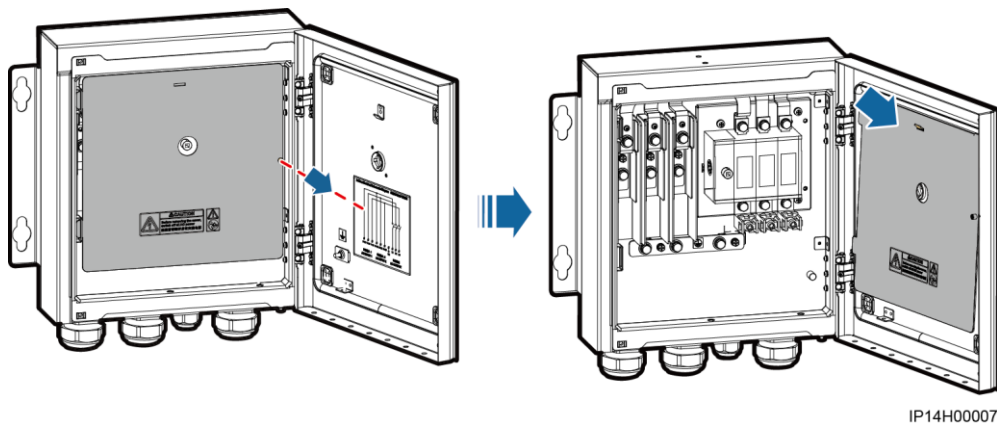


NOTE

The door rod is bound to the ground bar before delivery. When you open the chassis door for the first time, remove the cover and obtain the door rod.

Step 3 Remove the cover and hang it on the hook of the chassis door.

Figure 5-3 Removing the cover



----End

5.4 Connecting a Ground Cable

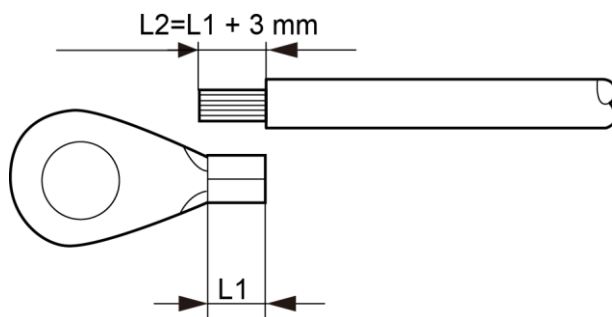
Context

You need to prepare M8 OT terminals.

Procedure

- Step 1** Remove an appropriate length of the insulation layer from the ground cable using a wire stripper.

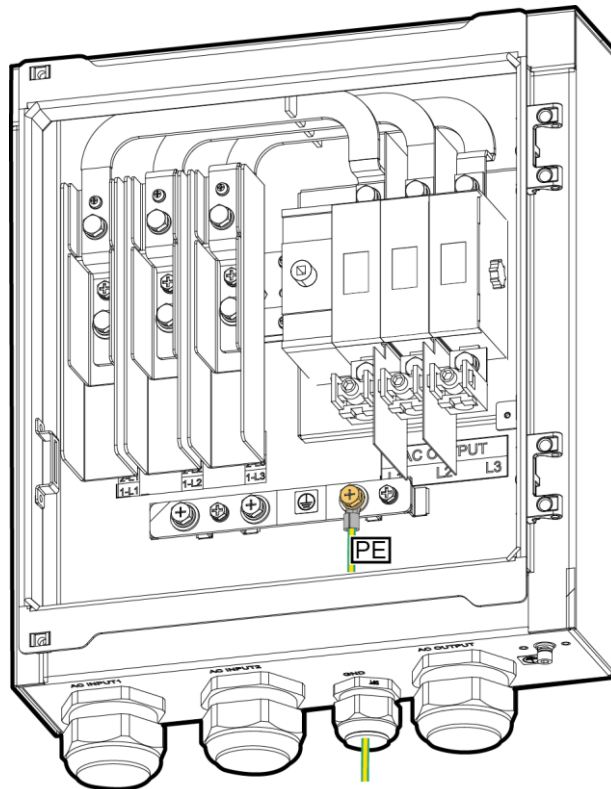
Figure 5-4 Peeling a cable



IP14Z00001

- Step 2** Insert the exposed core wire into the crimping area of the OT terminal and crimp it using hydraulic pliers.
- Step 3** Remove the locking cap from the GND waterproof cable connector (waterproof connector for short) at the bottom of the ACBox2000 and remove the plug from the locking cap.
- Step 4** Route the ground cable into the locking cap and then the GND waterproof connector.
- Step 5** Remove the bolt at the ground point.
- Step 6** Use the bolt to secure the ground cable crimped with the OT terminal and tighten the bolt to a torque of 8 N·m using a socket wrench.

Figure 5-5 Connecting a ground cable



----End

Follow-up Procedure

Check that the cables are connected correctly and securely, and then seal the waterproof connectors with firestop putty.

5.5 Connecting AC Input Power Cable 1

Context

You need to prepare M8 OT terminals.

Procedure

- Step 1** Remove an appropriate length of the jacket and insulation layer from the AC input power cable using a wire stripper.

 **NOTICE**

Ensure that the jacket is in the waterproof connector.

Figure 5-6 Peeling a cable (three core wires)

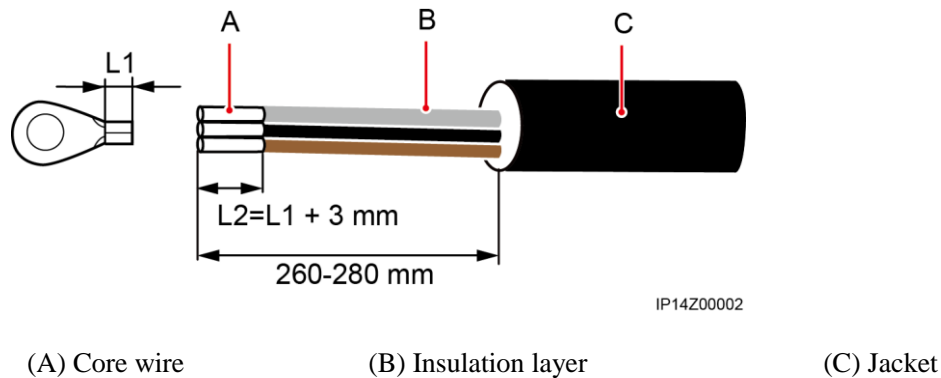
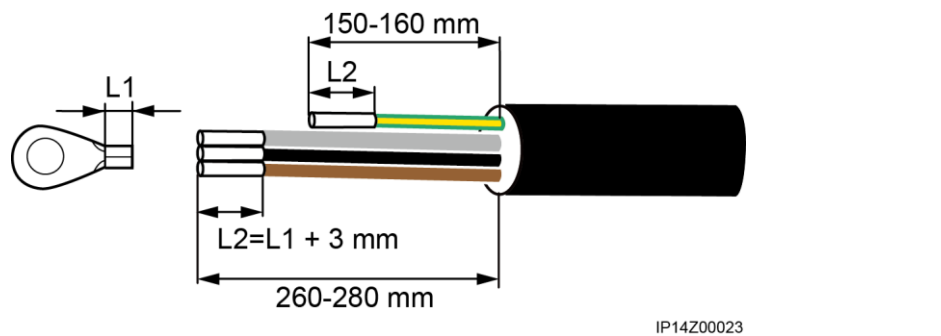




Figure 5-7 Peeling a cable (four core wires)



Step 2 Insert each exposed core wire into the crimping area of an OT terminal and crimp them using hydraulic pliers.

 **NOTE**
One core wire should be connected to one OT terminal.

Step 3 Wrap the wire crimping area with heat shrink tubing or PVC insulation tape.

 **NOTE**
If heat shrink tubing is used, put it over the cable and then crimp the OT terminal. Blow the heat shrink tubing using a heat gun until the tubing closely wraps the wire crimping area of the OT terminal. When using the heat gun, protect devices from being scorched.

Step 4 Remove the locking cap from the AC INPUT1 waterproof connector at the bottom of the ACBox2000 and remove the plug from the locking cap.

Step 5 Route the AC input power cable into the locking cap and then the AC INPUT1 waterproof connector.

- Step 6** Connect the AC input power cable to the AC input terminal block, and then secure them to a torque of 8 N·m using a 13 mm socket wrench with an extension rod. If you use a four-wire AC input power cable, connect the ground cable to the ground point and tighten it to a torque of 8 N·m using a 13 mm socket wrench with an extension rod.



NOTICE

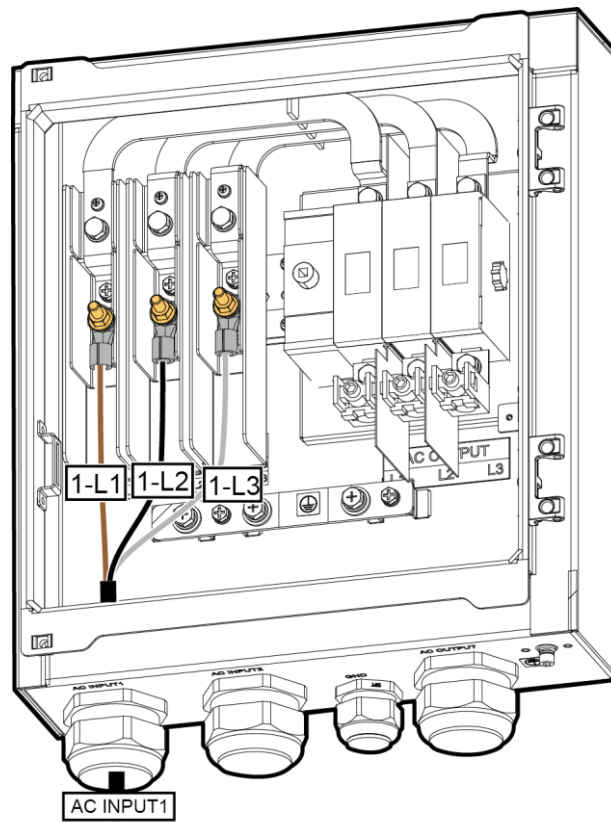
- Ensure that the inverter AC output L1 connects to the ACBox2000 AC input L1, the inverter AC output L2 connects to the ACBox2000 AC input L2, and the inverter AC output L3 connects to the ACBox2000 AC input L3. Avoid reverse connection.
- Verify that the AC input power cable is connected securely. Otherwise, the device may fail to operate or experience any fault that will damage the terminal block. For example, the ACBox2000 in operation may heat up due to unreliable connection. The damage caused by loose connection of the DC input power cable is beyond the warranty scope.



NOTE

- When you use a three-core cable, you are advised to connect AC input power cable 1 in the sequence of 1-L3, 1-L2, and 1-L1.
- When you use a four-core cable, you are advised to connect AC input power cable 1 in the sequence of PE, 1-L3, 1-L2, and 1-L1.

Figure 5-8 Connecting an AC input power cable (three core wires)



IP14I00003

Procedure

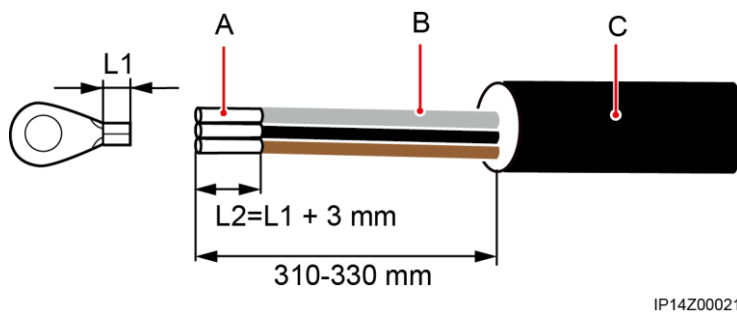
- Step 1** Remove an appropriate length of the jacket and insulation layer from the AC input power cable using a wire stripper.



NOTICE

Ensure that the jacket is in the waterproof connector.

Figure 5-10 Peeling a cable (three core wires)

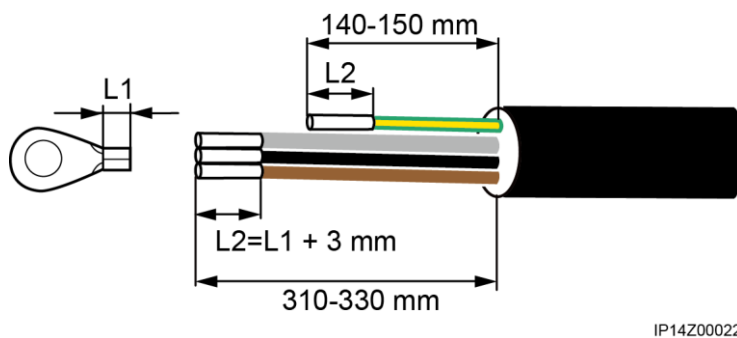


(A) Core wire

(B) Insulation layer

(C) Jacket

Figure 5-11 Peeling a cable (four core wires)



- Step 2** Insert each exposed core wire into the crimping area of an OT terminal and crimp them using hydraulic pliers.



NOTE

One core wire should be connected to one OT terminal.

- Step 3** Wrap the wire crimping area with heat shrink tubing or PVC insulation tape.



NOTE

If heat shrink tubing is used, put it over the cable and then crimp the OT terminal. Blow the heat shrink tubing using a heat gun until the tubing closely wraps the wire crimping area of the OT terminal. When using the heat gun, protect devices from being scorched.

- Step 4** Remove the locking cap from the AC INPUT2 waterproof connector at the bottom of the ACBox2000 and remove the plug from the locking cap.
- Step 5** Route the AC input power cable into the locking cap and then the AC INPUT2 waterproof connector.
- Step 6** Connect the AC input power cable to the AC input terminal block, and then secure them to a torque of 8 N·m using a 13 mm socket wrench with an extension rod. If you use a four-wire AC input power cable, connect the ground cable to the ground point and tighten it to a torque of 8 N·m using a 13 mm socket wrench with an extension rod.



NOTICE

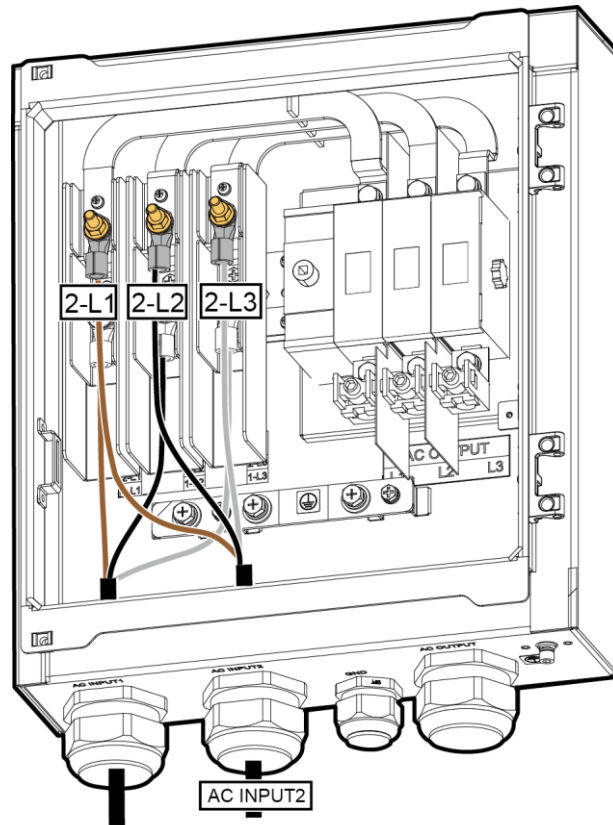
- Ensure that the inverter AC output L1 connects to the ACBox2000 AC input L1, the inverter AC output L2 connects to the ACBox2000 AC input L2, and the inverter AC output L3 connects to the ACBox2000 AC input L3. Avoid reverse connection.
- Verify that the AC input power cable is connected securely. Otherwise, the device may fail to operate or experience any fault that will damage the terminal block. For example, the ACBox2000 in operation may heat up due to unreliable connection. The damage caused by loose connection of the DC input power cable is beyond the warranty scope.



NOTE

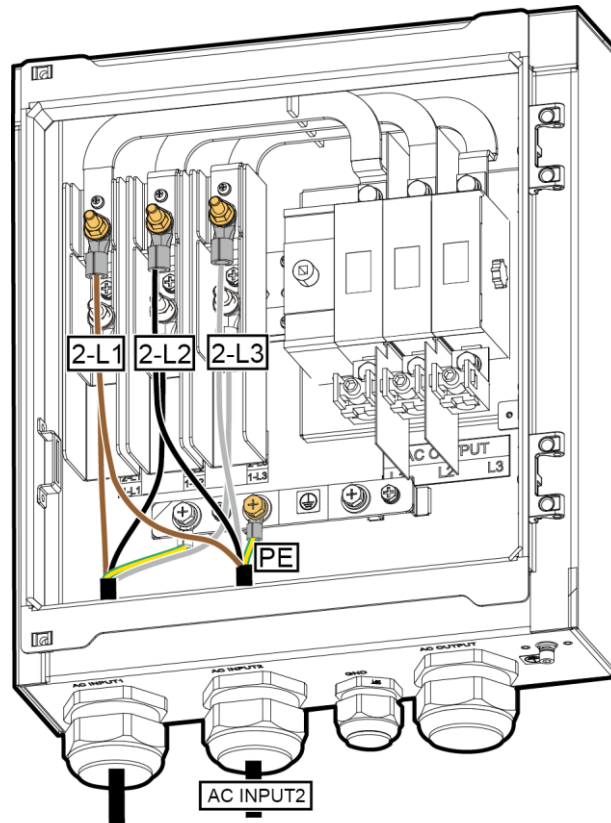
- When you use a three-core cable, you are advised to connect AC input power cable 2 in the sequence of 2-L1, 2-L2, and 2-L3.
- When you use a four-core cable, you are advised to connect AC input power cable 2 in the sequence of PE, 2-L1, 2-L2, and 2-L3.

Figure 5-12 Connecting an AC input power cable (three core wires)



IP14I00017

Figure 5-13 Connecting an AC input power cable (four core wires)



IP14I00018



NOTE

The wire colors shown in figures are for reference only. Select an appropriate cable according to the local standards.

----End

Follow-up Procedure

- Check that the cables are connected correctly and securely, and then seal the waterproof connectors with firestop putty.
- If cables need to be routed underground, reserve a margin of 0.5 meter for the AC power cable connecting to the ACBox2000 to avoid stress.

5.7 Connecting an AC Output Power Cable

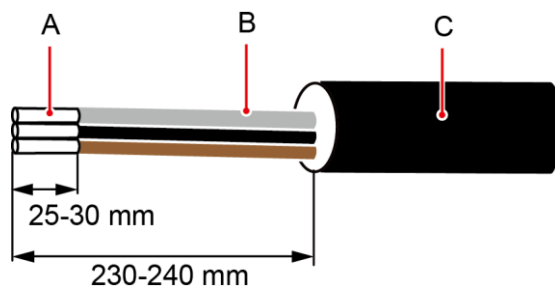
Procedure

- Step 1** Remove an appropriate length of the jacket and insulation layer from the AC output power cable using a wire stripper.

 **NOTICE**

- If the cable outer diameter is smaller than the diameter range of the waterproof connector. Ensure that the jacket is in the waterproof connector.
- If the cable outer diameter is greater than the diameter range of the waterproof connector, the jacket will be outside the waterproof connector. In this case, put an anti-ultraviolet jacket on the cable.

Figure 5-14 Peeling a cable (three core wires)



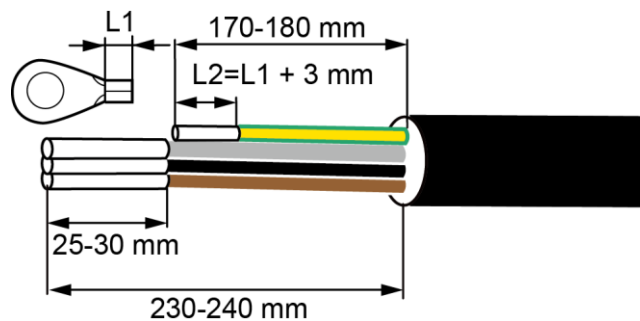
IP14Z00007

(A) Core wire

(B) Insulation layer

(C) Jacket

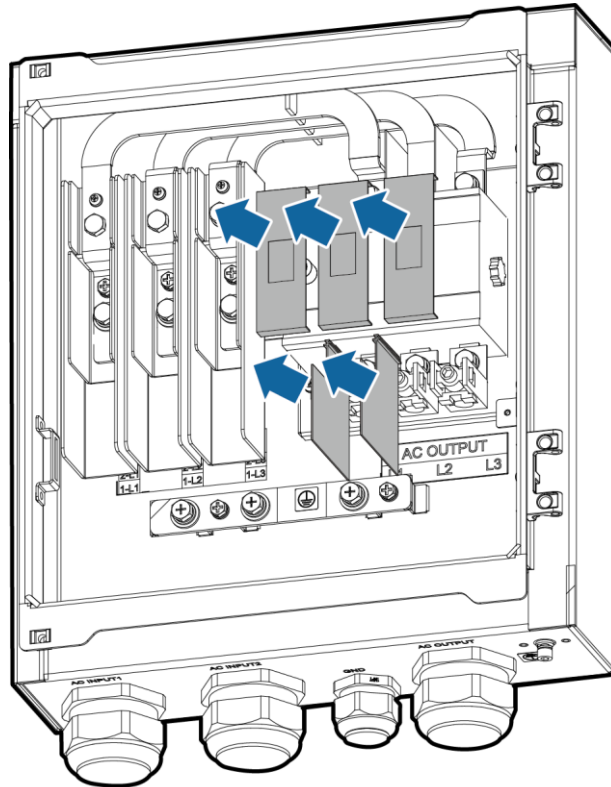
Figure 5-15 Peeling a cable (four core wires)



IP14Z00020

Step 2 Remove the safety warning panels and insulation partitions from the isolation switch.

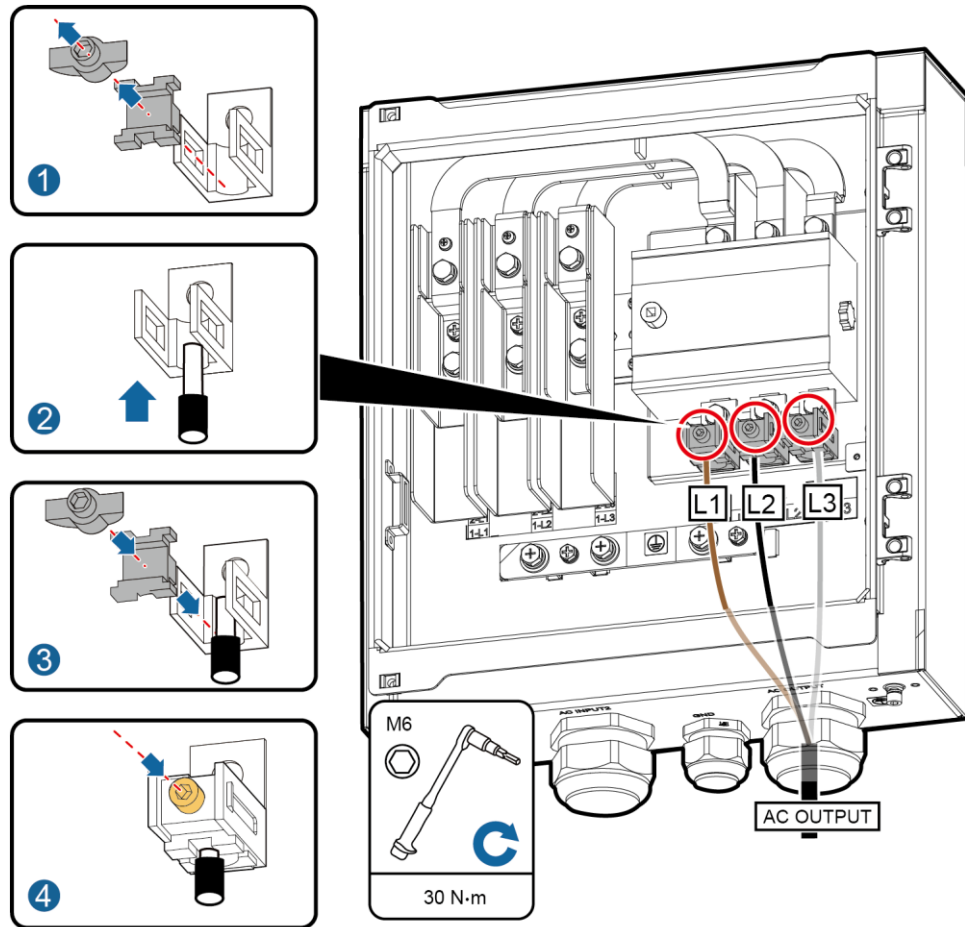
Figure 5-16 Removing safety warning panels and insulation partitions



IP14H00036

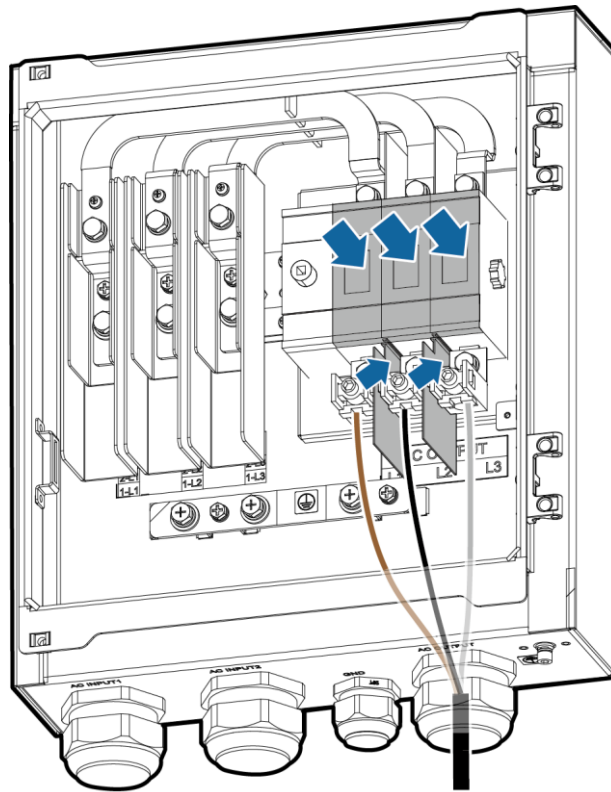
- Step 3** Remove the locking cap from the AC OUTPUT waterproof connector at the bottom of the ACBox2000 and remove the plug from the locking cap.
- Step 4** Route the AC output power cable into the locking cap and then the AC OUTPUT waterproof connector.
- Step 5** Connect the AC output power cable.

Figure 5-17 Connecting an AC output power cable (three core wires)



IP14I00016

Figure 5-19 Reinstalling safety warning panels and insulation partitions



----End

Follow-up Procedure

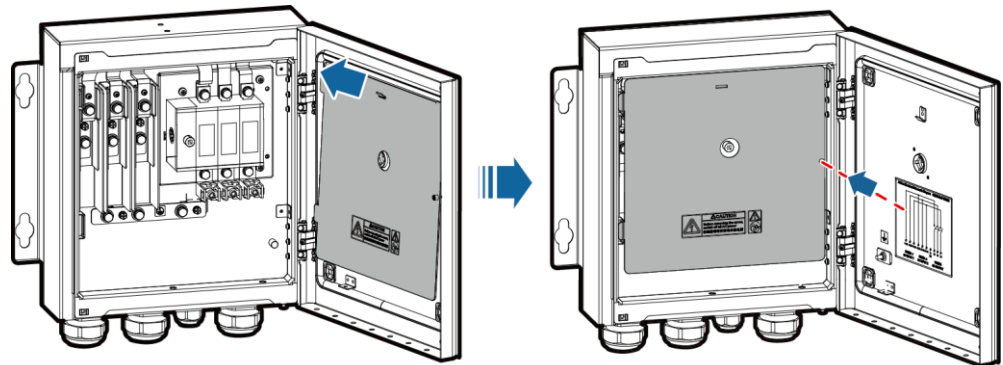
- Check that the cables are connected correctly and securely, and then seal the waterproof connectors with firestop putty.
- If cables need to be routed underground, reserve a margin of 0.5 meter for the AC power cable connecting to the ACBox2000 to avoid stress.

5.8 Closing the Chassis Door

Procedure

Step 1 Install the cover.

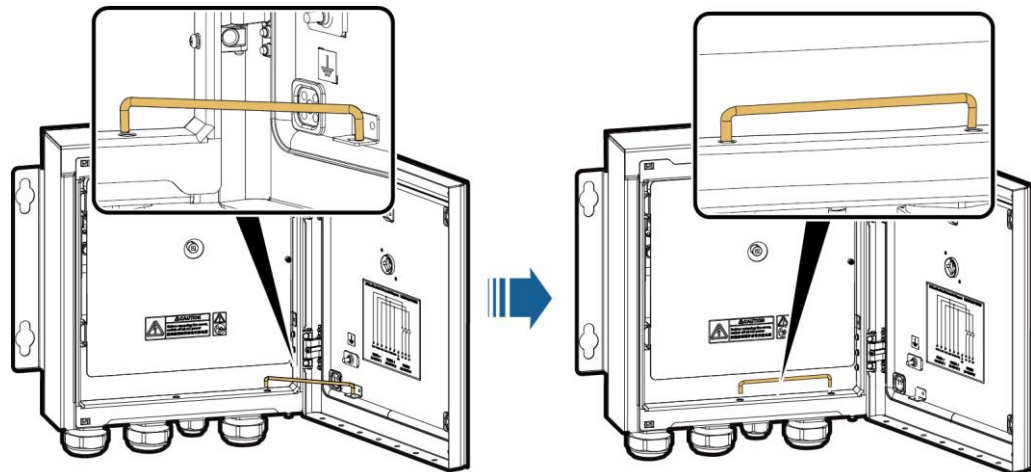
Figure 5-20 Installing the cover



IP14H00012

Step 2 Adjust the door rod.

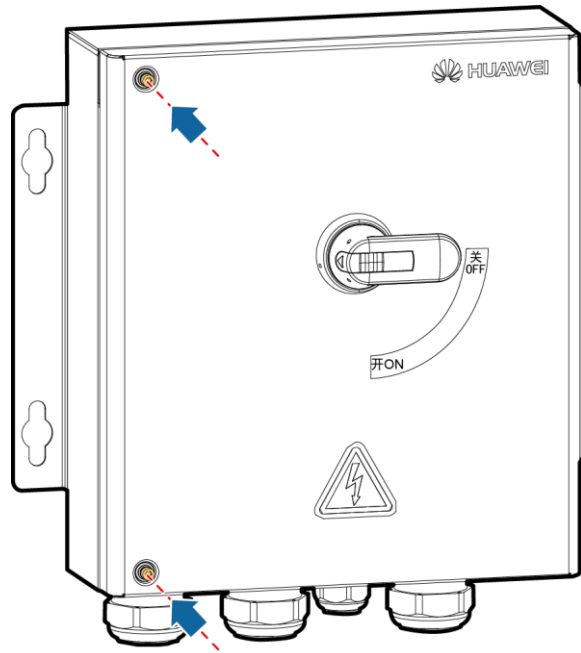
Figure 5-21 Adjusting the door rod



IP14H00002

Step 3 Close the chassis door and tighten the two screws on the door to a torque of 4 N·m using a hex key.

Figure 5-22 Tightening screws



IP14H00003

----End

6 System Commissioning

6.1 Checking Before Power-On

Table 6-1 Checking Before Power-On

No.	Check That	Check Result
1	The ACBox2000 is installed reliably in position.	<input type="checkbox"/> Yes <input type="checkbox"/> No
2	All ground cables are connected securely and reliably.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3	All AC input power cables are connected correctly, securely, and reliably. Phase cables L1, L2, and L3 are connected correctly.	<input type="checkbox"/> Yes <input type="checkbox"/> No
4	All AC output power cables are connected correctly, securely, and reliably. Phase cables L1, L2, and L3 are connected correctly.	<input type="checkbox"/> Yes <input type="checkbox"/> No
5	The insulation partitions and safety warning panels are installed reliably in position.	<input type="checkbox"/> Yes <input type="checkbox"/> No
6	No foreign matter is left inside the ACBox2000.	<input type="checkbox"/> Yes <input type="checkbox"/> No
7	No insulation layer is damaged and no metal is exposed.	<input type="checkbox"/> Yes <input type="checkbox"/> No
8	All cables are bound neatly, and cable ties are secured evenly and properly in the same direction.	<input type="checkbox"/> Yes <input type="checkbox"/> No
9	There is no unnecessary adhesive tape or cable ties on cables.	<input type="checkbox"/> Yes <input type="checkbox"/> No
10	Check that all used waterproof connectors at the chassis bottom are applied with firestop putty and all locking caps are tightened.	<input type="checkbox"/> Yes <input type="checkbox"/> No
11	Check that all the locking caps on idle waterproof connectors at the chassis bottom are tightened.	<input type="checkbox"/> Yes <input type="checkbox"/> No



NOTE

After checking that all the preceding items are passed, close the chassis door. For detailed operations, see section [5.8 Closing the Chassis Door](#).

6.2 System Power-On

Procedure

- Step 1** Switch on the output circuit breaker at the low-voltage side of the box-type transformer for the ACBox2000.
 - Step 2** Check that the output voltage of the ACBox2000 is consistent with the AC voltage at the low-voltage side of the box-type transformer using a multimeter.
 - Step 3** Turn the switch handle on the chassis door to ON.
- End

6.3 Powering Off the ACBox2000

Procedure

- Step 1** Send a shutdown command to inverters from the SUN2000 app, SmartLogger, or NetEco.
 - Step 2** Turn off all DC switches of the two inverters that connect to the ACBox2000.
 - Step 3** Switch off the output circuit breaker at the low-voltage side of the box-type transformer for the ACBox2000.
 - Step 4** Turn the switch handle on the chassis door to OFF.
- End

7 Routine Maintenance

Before maintaining the ACBox2000, power it off. For details, see [6.3 Powering Off the ACBox2000](#).



WARNING

- Ensure that the AC circuit breaker between the ACBox2000 and the box-type transformer is OFF. Place a warning sign at the AC circuit breaker to avoid incidents caused by switch-on of the circuit breaker.
- Ensure that all DC switches of the two inverters that connect to the ACBox2000 are OFF.

Table 7-1 Maintenance list

Item	Check Method	Maintenance Interval
System running status	<ul style="list-style-type: none">• Check that the ACBox2000 is not damaged or deformed.• Check that the ACBox2000 does not generate abnormal sound when it is in operation.	Semiannual
Cable connections	<ul style="list-style-type: none">• Check that cables are securely connected.• Check that cables are intact, in particular, the parts touching the metallic surface are not scratched.	The first inspection is half a year after the initial commissioning. From then on, the interval can be semiannual or annual.
Grounding reliability	Check that ground cables are securely connected.	The first inspection is half a year after the initial commissioning. From then on, the interval can be semiannual or annual.

8 Technical Specifications

Input

Item	ACBox2000-21-D-A
Rated input voltage	800 V AC
Rated input current	60.8 A x 2
Number of phases	3
Number of inputs	2

Output

Item	ACBox2000-21-D-A
Rated output voltage	800 V AC
Rated output current	121.6 A
Number of phases	3

Physical specifications

Item	ACBox2000-21-D-A
Chassis dimensions (W x H x D)	400 mm x 450 mm x 140 mm
Operating temperature	-40°C to +60°C
Highest operating altitude	4000 m
Relative humidity	4%–100% RH
Transportation and storage temperature	-40°C to +70°C
Weight	11 kg

Item	ACBox2000-21-D-A
Protection level	IP65
Cable routing	Routed in and out from the bottom
Maintenance mode	Maintained from the front