Smart Energy Controller

SEC3000

User Manual

Copyright Statement

NOTICE
The information in this document is subject to change due to product updates or other reasons. This document cannot replace the product labels or the safety precautions unless otherwise specified. All descriptions in the document are for guidance only.

01 About This document

1.1 Overview

This document describes the product information, installation, electrical connection, commissioning, troubleshooting, and maintenance. Read through this document before installing and operating the product. All the installers and users have to be familiar with the product features, functions, and safety precautions. This document is subject to update without notice. For more product details and latest documents, refer to https://en.goodwe.com/.

1.2 Applicable Model

This document is applicable to Smart Energy Controller SEC3000 (or SEC3000, for short).

1.3 Symbol Definition

DANGER
Indicates a high-level hazard that, if not avoided, will result in death or serious injury.
WARNING
Indicates a medium-level hazard that, if not avoided, could result in death or serious injury.
CAUTION
Indicates a low-level hazard that, if not avoided, could result in minor or moderate injury.
NOTICE
Highlight and supplement the texts, or some skills and methods to solve product-related problems to save time.

2 Safety Precaution

Please strictly follow these safety instructions in the user manual during the operation.

WARNING
The equipment is designed and tested strictly in compliance with related safety rules. Read and follow all the safety instructions and cautions before any operations. Improper operation might cause personal injury or property damage as the equipmentis an electrical equipment.

2.1 General Safety

NOTICE
• The information in this document is subject to change due to product updates or other

reasons. This document cannot replace the product labels or the safety precautions unless otherwise specified. All descriptions in the document are for guidance only.

- Before installations, read through this document to learn about the product and the precautions.
- All installations should be performed by trained and knowledgeable technicians who are familiar with local standards and safety regulations.
- Use insulating tools and wear personal protective equipment (PPE) when operating the equipment to ensure personal safety. Wear anti-static gloves, cloths, and wrist strips when touchingan electronic equipment to protect the equipment from damage.
- Unauthorized disassembly or modification may cause damage to the equipment, which is not covered within the warranty scope.
- Strictly follow the installation, operation, and configuration instructions in this document. The manufacturer shall not be liable for equipment damage or personal injury if you do not follow the instructions. For more warranty details, visit https://en.goodwe.com/warranty

2.2 Personnel Requirements

NOTICE

- Personnel who install or maintain the equipment must be strictly trained, learn about safety precautions and correct operations.
- Only qualified professionals or trained personnel are allowed to install, operate, maintain, and replace the equipment or parts.

2.3 Grounding Safety

WARNING

Make sure the equipment is reliably grounded before operation.

2.4 Personal Safety

DANGER

- Use insulating tools and wear personal protective equipment (PPE) when operating the equipment to ensure personal safety.
- Do not touch the equipment when it is short-circuited. Keep away from the equipment, and turn off the power immediately.
- Before wiring, disconnect all upstream switches to ensure the equipment is not powered on.

2.5 Equipment Safety

DANGER

Make sure the installation place is solid enough to bear the equipment weight before installation.

WARNING

- Use appropriate tools for proper installation, maintenance, etc.

- Observe local standards and safety regulations when operating the equipment.
- Unauthorized disassembly or modification may cause damage to the equipment, which is not covered within the warranty scope.

2.6 Safety Symbols and Certification Marks

DANGER

- All labels and warning marks must be clear and distinct after the installation. Do not block, alter, or damage any label.
- The following descriptions are for reference only.

No.	Symbol	Meaning
1		Potential risks exist. Wear proper PPE before any operations.
2		HIGH VOLTAGE HAZARD. Power off the equipment before any operations.
3		Read through the document before any operations.
4		Do not dispose of the equipment as household waste. Discard the product in compliance with local laws and regulations, or send it back to the manufacturer.
5		CE marking.

2.5 EU Declaration of Conformity

2.5.1 Equipment with Wireless Communication Modules

The equipment without wireless communication modules sold in the European market meets the requirements of the following directives:

- Radio Equipment Directive 2014/53/EU (RED)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

2.5.2 Equipment without Wireless Communication Modules

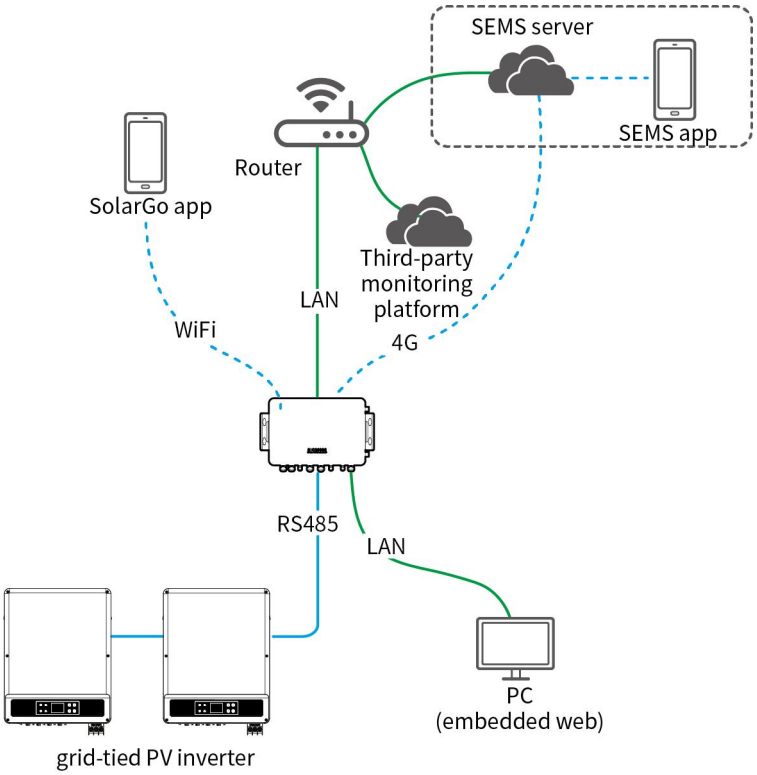
The equipment without wireless communication modules sold in the European market meets the requirements of the following directives:

- Electromagnetic compatibility Directive 2014/30/EU (EMC)
- Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

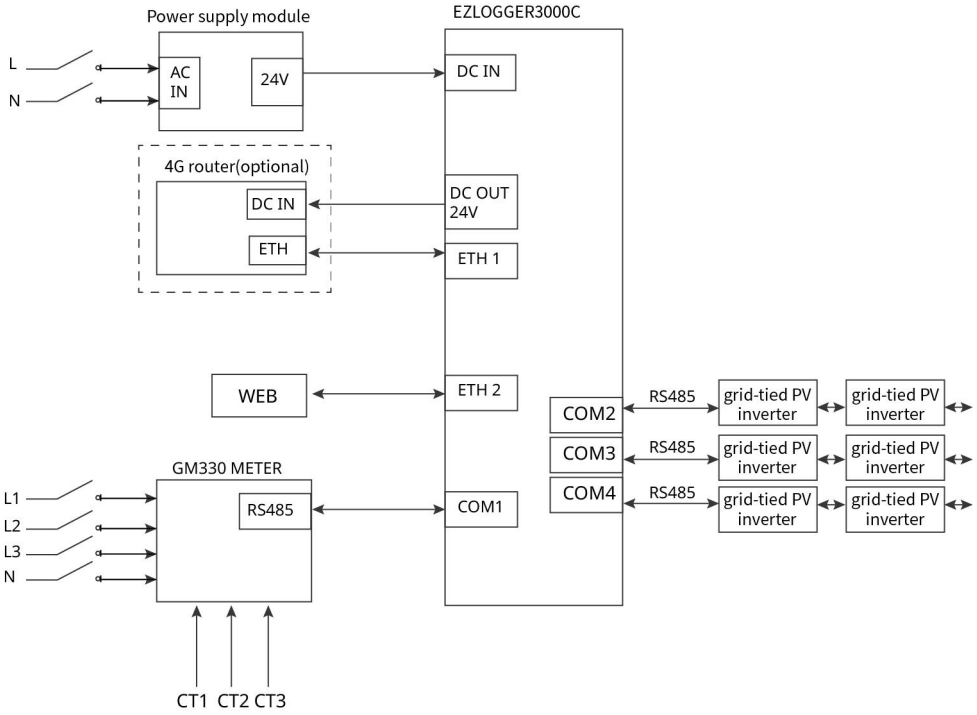
3 Product Introduction

3.1 System Overview

SEC is specified for the monitoring and management platform of PV power generation. It can be applied to collect data from devices in a PV power generation system, such as grid-tied PV inverters, smart meters, etc., store logs, and send data to the monitoring management platform for centralized monitoring, operation, and maintenance of the PV system.

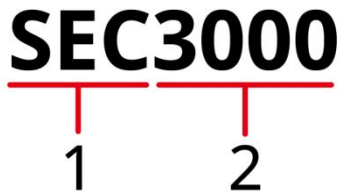


3.2 Circuit Diagram



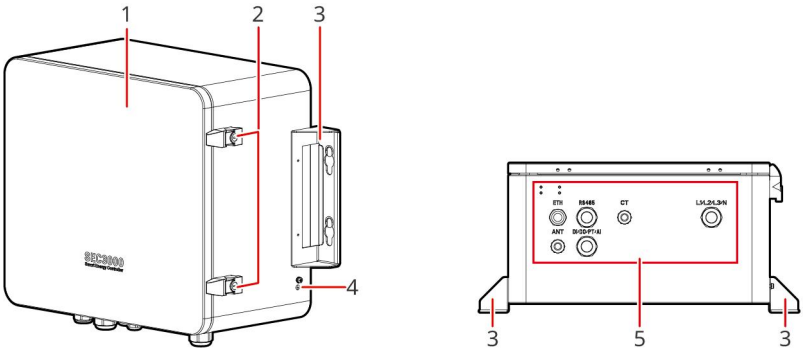
3.3 Model

The following model is involved in the document:



No.	Meaning	Explanation
1	Product function	SEC: Smart Energy Controller
2	Code for generation	3000: the third generation

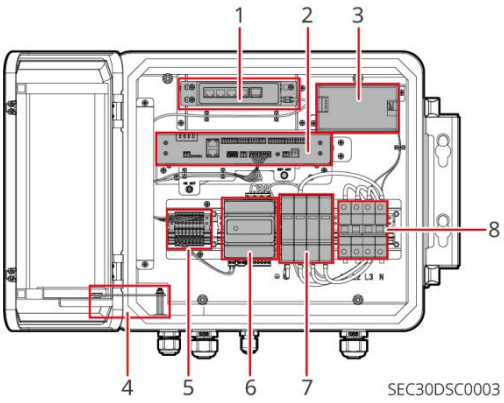
3.4 Appearance



SEC30DSC0002

No.	Parts	No.	Parts
1	Cabinet door	2	Lock
3	Mounting plate	4	Grounding point
5	Cable hole	-	-

3.5 Product Introduction

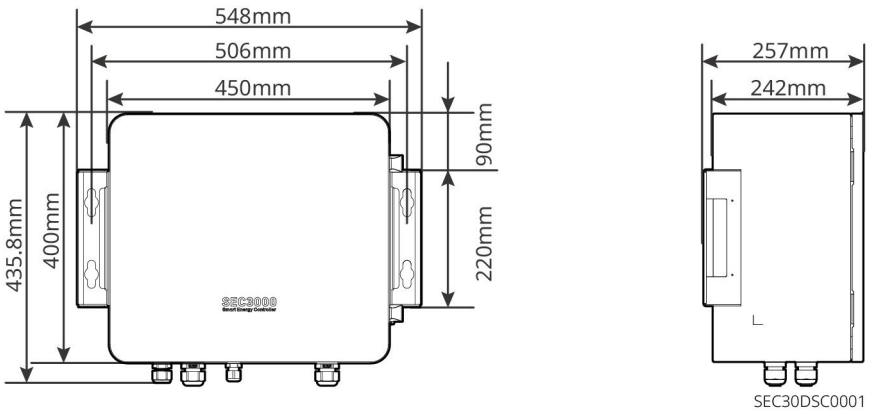


SEC30DSC0003

No.	Item	Explanation
1	4G router	● Optional parts. Optional parts support purchase from GoodWe or be prepared by customers. ● A reserved DIN rail allows a self-purchased 4G router to be installed inside the SEC3000 enclosure. Recommended maximum dimensions: 185*80*155 mm; power supply: 24 V.
2	Data logger	● In-built smart data logger： EzLogger3000C. ● Collect the third-party equipment to the data logger for DRED, RCR and remote shutdown.

3	24 V power module	For powering EzLogger3000C inside SEC3000.
4	Limit lever	For fixing the cabinet door.
5	RS485 communication terminal	• It is connected to grid-tied PV inverters via the RS485 communication cable. And supports a maximum of 60 grid-tied PV inverters. • Visit Compatibility list of GoodWe inverters and IoT products to check compatible inverters. • A1/B1 ports are occupied, and are connected to internal smart meters of SEC3000 in default.
6	Smart meter	• In-built GoodWe smart meter: GM 330 • For checking data of the on-grid point, and adjusting the power feed into the grid.
7	Surge protection module (SPD)	If damages occur, contact the after-sales service.
8	Three-phase circuit breaker	• It is connected to the power grid via an AC cable to power on/off the SEC3000 system. • When connected to a three-phase four wire power grid, the supported input voltage range : line voltage 156 - 480 V. • When connected to a three-phase three wire power grid, the supported input voltage range: line voltage 90-264 V.

3.6 Dimensions



3.7 Indicators

Check the LED of the in-built data logger and smart meter of SEC3000.

EzLogger3000C

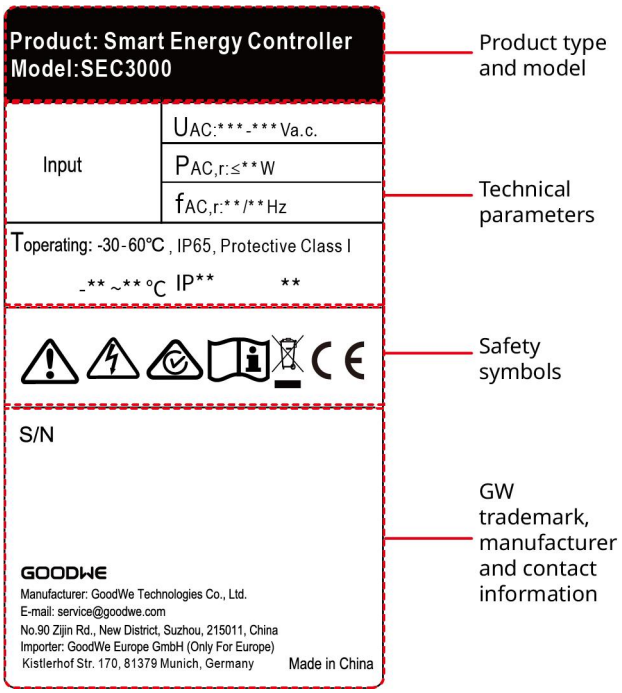
Indicator	Indicator status	Explanation
PWR		Steady green: power supply is normal.
		Green light off: power off or abnormal power supply.
RUN		Steady green / green off: abnormal operation of the equipment.
		Green light blinks slowly: Normal operation of the equipment.
NET		Steady green / green off: the equipment is connected normally to the server.
		Green light blinks quickly: the equipment is connected to the router, but the connection with the server is abnormal.
		Green light blinks slowly: the equipment is not connected to the router.
ALM		Steady red: all inverters are running abnormally.
		Red light blinks quickly: data logger is upgrading.
		Red light off: at least one inverter is working normally.

Smart meter

Model	Status	Explanation
Power indicator light 	On	The smart meter is powered on. No RS485 communication.
	Blink	The smart meter is powered on. Normal RS485 communication.
	Off	The smart meter is powered off.
Communication light 	Off	Reserved
	Blink	Press the Reset button for at least more than 5 seconds, power light, purchasing or selling electricity indicator light flash: reset the meter.

Purchasing from or selling to the utility grid 	On	Import from the grid.
	Blink	Export to the grid.
	Off	No purchasing or selling.
	Reserved	

3.8 Nameplate



4 Check and Storage

4.1 Check and Storage

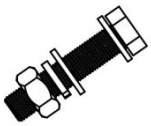
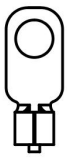
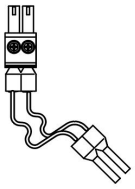
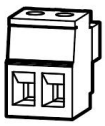
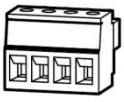
Check the following items before receiving the product.

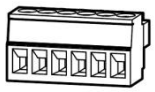
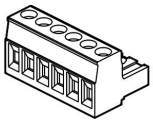
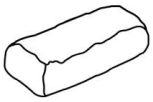
1. Check the outer packing box for damage, such as holes, cracks, deformation, and others signs of equipment damage. Do not unpack the package and contact the supplier as soon as possible if any damage is found.
2. Check the product model. If the product model is not what you requested, do not unpack the product and contact the supplier.

4.2 Deliverables

WARNING

- Check the deliverables for correct model, complete contents, and intact appearance. Contact the supplier as soon as possible if any damage is found.
- After being taken out of the package, it is forbidden to put deliverables in rough, uneven or sharp places to prevent peeling paint.

Parts	Explanation	Parts	Explanation
	Smart Energy Controller x 1		M12 expansion bolt x 4
	M10 assembly bolt and nut x 4		Tube terminal x 20
	Tube terminal x 4 L1/L2/L3/N		Grounding OT terminal x 1
	Key x 4		4G router power cable x 1 Only applicable to scenes in which 4G routers are not applied.
	2PIN communication terminal x 4		4PIN communication terminal x 4

	6PIN communication terminal x 2		CT communication terminal x 1
	4G x 1 Optional		Fireproofing mud x 1
	Documents x 1	-	-

4.3 Storage

If the equipment is not to be installed or used immediately, please ensure that the storage environment meets the following requirements:

Time requirement:

- If the inverter has been stored for more than two years or has not been in operation for more than six months after installation, it is recommended to be inspected and tested by professionals before being put into use.
- To ensure good electrical performance of the internal electronic components of the inverter, it is recommended to power it on every 6 months during storage. If it has not been powered on for more than 6 months, it is recommended to be inspected and tested by professionals before being put into use.

Packing Requirements:

Do not unpack the outer package or throw the desiccant away.

Installation Environment Requirements：

- Place the equipment in a cool place away from direct sunlight.
- Store the equipment in a clean place. Make sure the temperature and humidity are appropriate and no condensation. Do not install the equipment if the ports or terminals are condensed.
- Keep the equipment away from flammable, explosive, and corrosive matters.

Stacking Requirements:

- Stack the equipment complying with the labels and requirements on the packing box.
- The equipment must be stacked with caution to prevent them from falling.

5 Installation

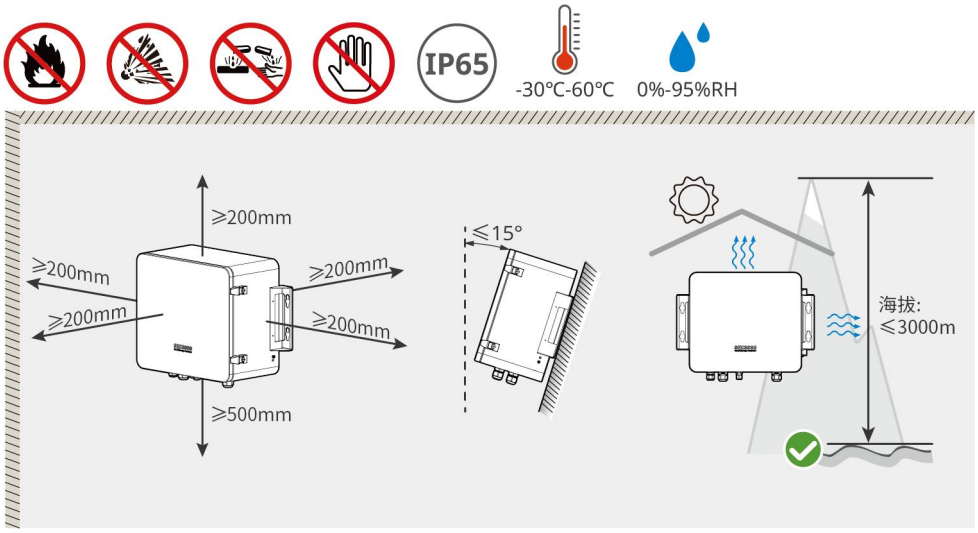
DANGER

Install and connect the equipment with the deliverables included in the package. Otherwise, the manufacturer shall not be liable for the damage.

5.1 Installation Requirements

5.1.1 Installation Environment Requirements

1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. The temperature and humidity at the installation site should be within the appropriate range.
3. Do not install the equipment in a place that is easy to touch, especially within children's reach.
4. It is recommended to install the equipment in a sheltered place. Build a sunshade if it is needed.
5. The place to install the equipment shall be well-ventilated for heat radiation and large enough for operations.
6. The equipment with a high ingress protection rating can be installed outdoors.
7. Install the equipment at a height that is convenient for operation and maintenance, electrical connections, and checking indicators and labels.
8. equipment installation altitude needs to be lower than the maximum working altitude.
9. Install the equipment away from electromagnetic interference. If there are radio stations or wireless communication equipment below 30 MHz near the installation location, the distance between the equipment and the wireless electromagnetic interference equipment needs to exceed 30m.

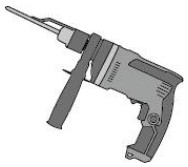
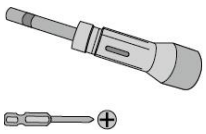
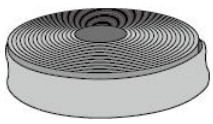


SEC30INT0002

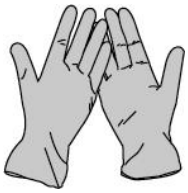
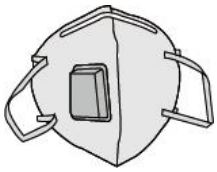
5.2.3 Installation Tool Requirements

NOTICE
The following tools are recommended when installing the equipment. Use other auxiliary tools on site if necessary.

Installation Tool Requirements

Tool	Explanation	Tool	Explanation
	Diagonal pliers		Crimping tool
	Wire stripper		Open-end wrench
	Hammer drill (Φ15mm)		Torque wrench M5/M7
	Rubber hammer		Socket wrench
	Marker		Multimeter
	Heat shrink tube		Heat gun
	Cable tie		Vacuum cleaner
	Level	-	-

Personal Protective Equipment

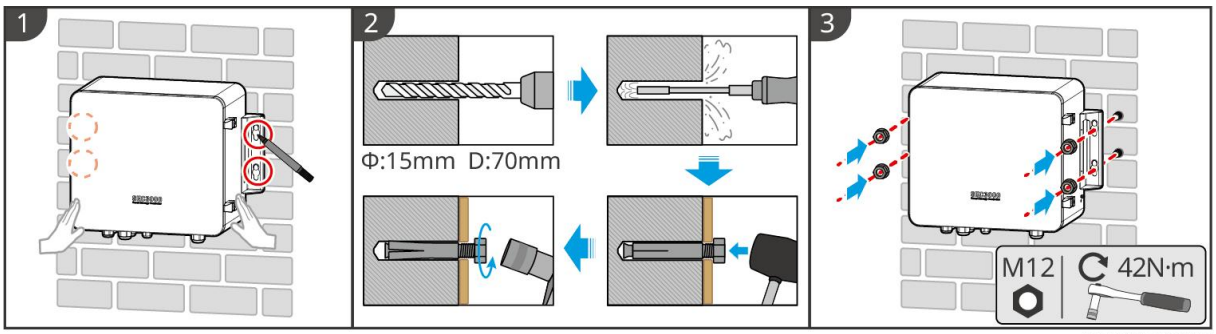
Tool	Explanation	Tool	Explanation
	Insulation gloves and safety gloves		Dust mask
	Goggles		Safety shoes

5.2 Installation

CAUTION

- Avoid the water pipes and cables buried in the wall when drilling holes.
- Wear goggles and a dust mask to prevent the dust from being inhaled or contacting eyes when drilling holes.
- Make sure the device is firmly installed in case of falling down.

Wall-mounted installation



SEC30INT0003

Step 1: Put the equipment on the wall horizontally and mark positions for drilling holes.

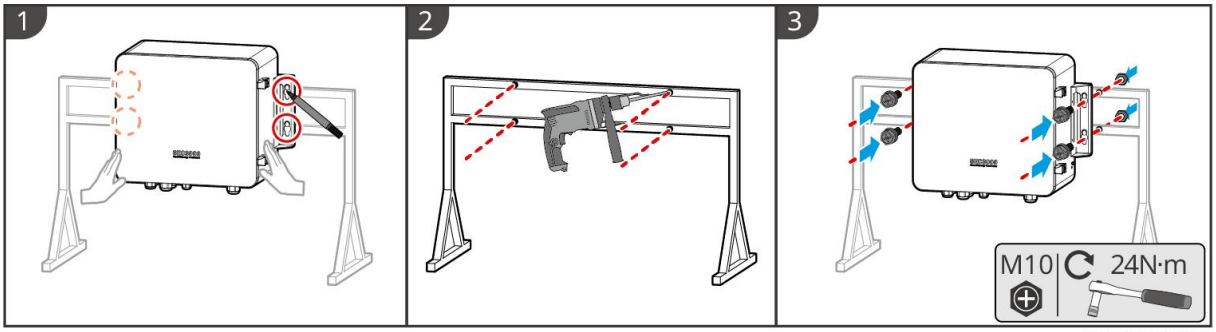
Step 2: Drill holes with hammer drill, and install expansion bolts.

Step 3 : Mount the equipment onto the expansion bolt, and use torque wrench to tighten the expansion bolts.

Bracket-mounted Installation

NOTICE

When applying this method, you need to prepare bracket in appropriate size.



SEC30INT0004

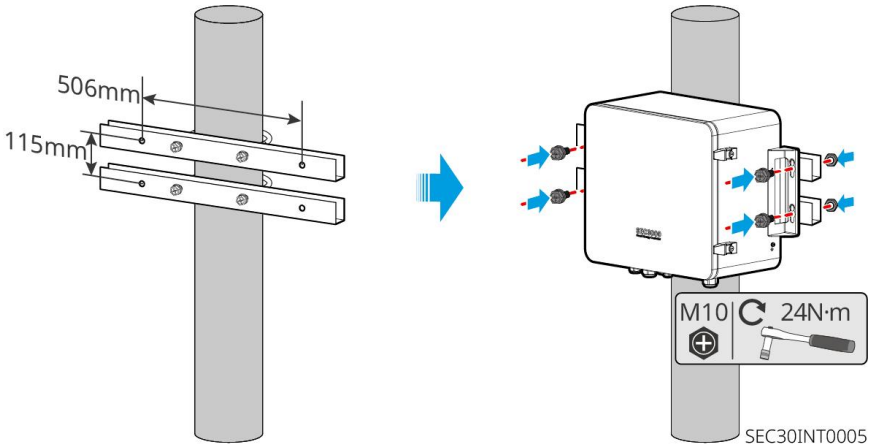
Step 1: Confirm the mounting hole position of the bracket and mark positions for drilling holes.

Step 2: Drill holes with the hammer drill.

Step 3 : Mount the equipment onto the bracket with combination bolts, and use torque wrench to tighten the bolts.

Pole-mounted Installation

NOTICE
When applying this method, prepare the necessary pole mounting accessories in appropriate size.



Step 1: Secure the pole mounting accessories to the mounting pole, and use torque wrench to tighten the bolts.

Step 2: Mount the equipment onto the pole with combination bolts, and use torque wrench to tighten the bolts.

6 System Wiring

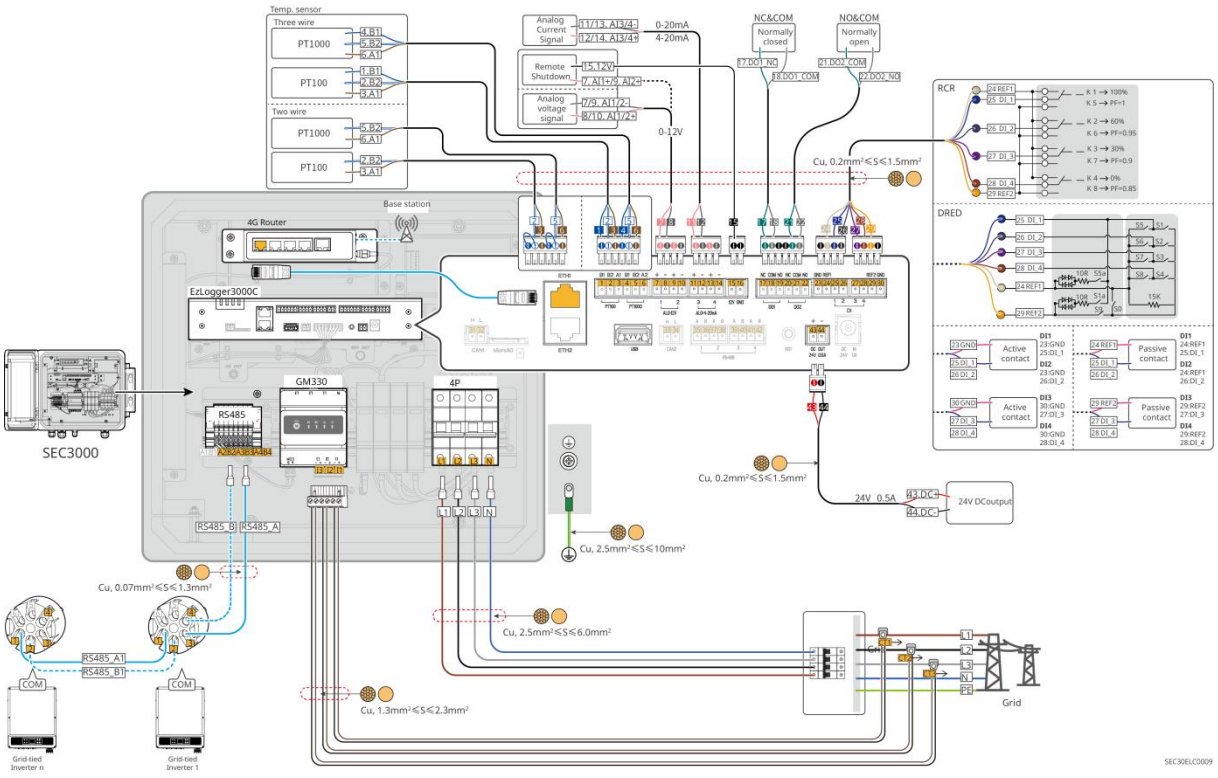
DANGER

- All operations, cables and parts specification during the electrical connection shall be in compliance with local laws and regulations.
- Disconnect all AC switches of the equipment before any electrical connections to ensure the equipment is not powered on. Do not work with power on. Otherwise, an electric shock may occur.
- Tie the same type cables together, and place them separately from cables of different types. Do not place the cables entangled or crossed.
- If the tension is too large, the cable may be poorly connected. Reserve a certain length of the cable before connecting it to the equipment cable port.
- When crimping the terminals, ensure that the conductor part of the cable is in full contact with the terminals. Do not crimp the cable jacket with the terminal. Otherwise the equipment may not operate, or its terminal block may be damaged due to heating and other phenomenon because of unreliable connection after operation.

NOTICE

- Wear PPE like safety shoes, safety gloves, and insulating gloves during electrical connections.
- All electrical connections should be performed by qualified professionals.
- Cable colors in this document are for reference only. The cable specifications shall meet local laws and regulations.

6.1 Detailed System Wiring Diagram



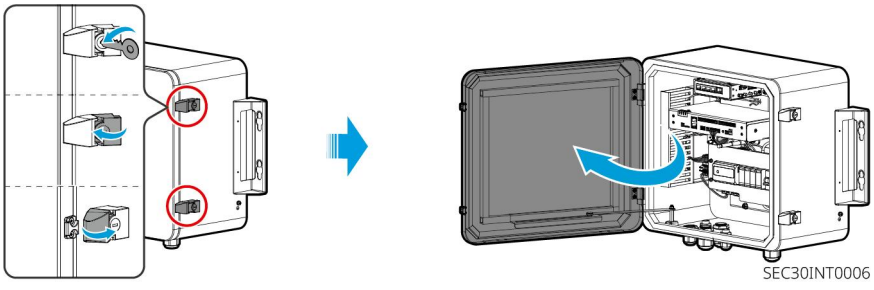
- A maximum of 20 inverters could be connected via a RS485 connection.

6.2 Preparing Materials

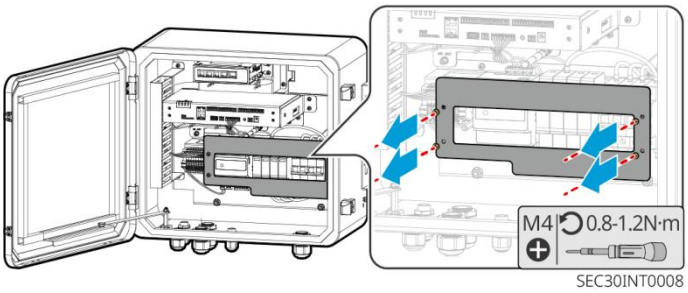
Preparing Cables

No.	Cable	Recommended specifications	How to get
1	PE cable	• Outdoor single core copper cable • Cross-sectional area: 2.5 - 10 mm² • Outer diameter： 2.5 - 4.5 mm	Prepared by customers
2	Smart meter CT cable	• Outdoor single core copper cable • Cross-sectional area: 1.3 - 2.3 mm² • Outer diameter： 2.0 - 3.0 mm	Prepared by customers
3	Three-phase AC cable	• Outdoor single core copper cable • Cross-sectional area: 2.5 - 6.0 mm² • Outer diameter： 2.5 - 4.0 mm	Prepared by customers
5	RS485 communication cable of external equipment	• Shielded twisted pair (STP) in line with the local standard • Cross-sectional area: 0.07 -1.3 mm² • Outer diameter： 1.0 - 2.5 mm	Prepared by customers
6	Ethernet cable for external equipment	• Shielded network cable: CAT 5 and above standard network cable and RJ45 shielded connector • Length of network cable: no more than 100 m	Prepared by customers

Opening the Cabinet Door

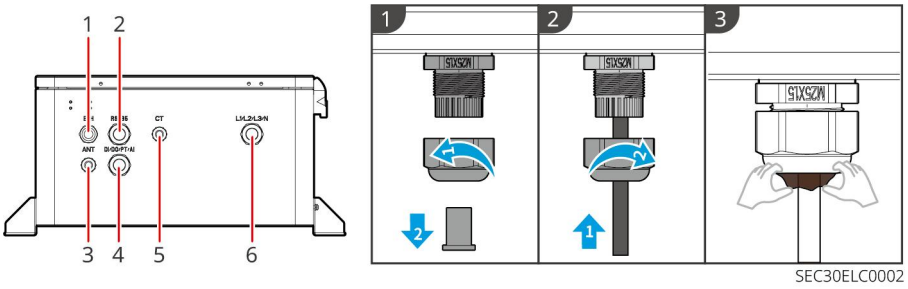


Remove cover in wiring area



Cable hole

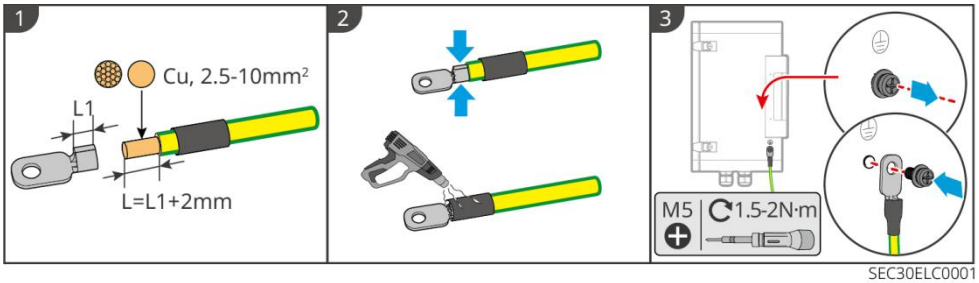
NOTICE
To ensure proper sealing, after installing the cable gland at the wire hole, seal it with mud.



No.	Silkscreen	Explanation
1	ETH	Wire hole of the network cable
2	RS485	Wire hole of the RS485 communication cable
3	ANT	Wire hole of antenna
4	DI/DO/PT/AI	Wire hole of DI/DO/PT/AI communication cable
5	CT	Wire hole of smart meter CT cable
6	L1/L2/L3/N	Three-phase AC cable

6.3 Connecting the PE Cable

WARNING
● When installing the equipment, the grounding cable must be installed first; when removing the equipment, the grounding cable must be removed last. ● To improve the corrosion resistance of the terminal, it is recommended to apply silica gel or paint on the grounding terminal after installing the PE cable.

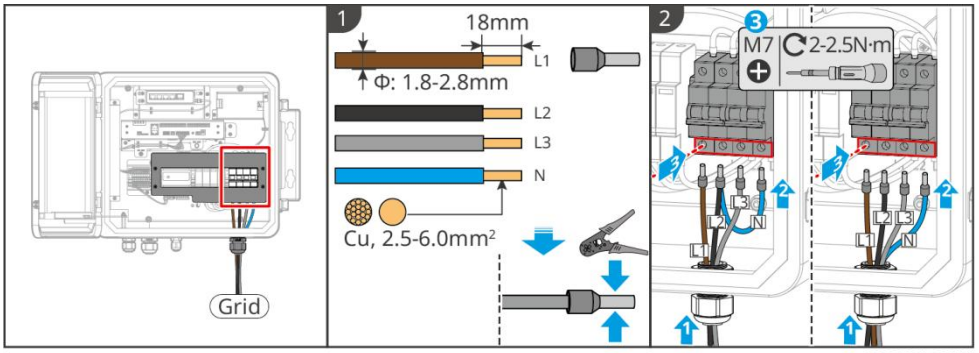


SEC30ELC0001

6.5 Three-Phase AC Input Cable

NOTICE

Support connecting three-phase three wire system or three-phase four wire system. If you need to connect three-phase three wire system, please short circuit L2 and the neutral (N) wire.



SEC30ELC0003

6.6 Smart Meter CT Cable

WARNING

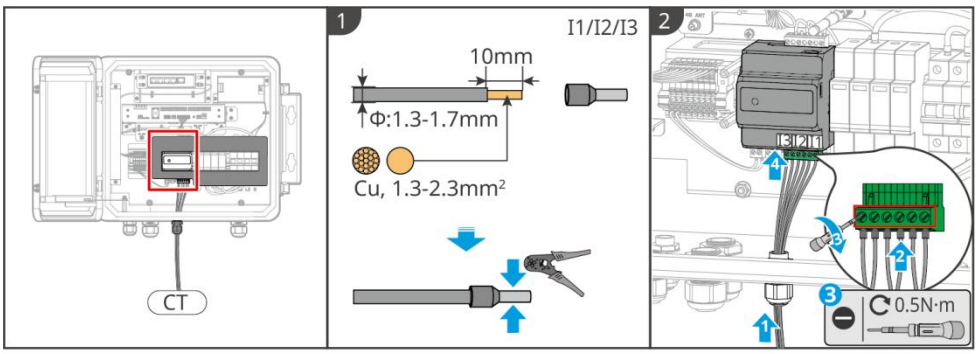
In areas at risk of lightning, if the meter cable exceeds 10m and the cables are not wired with grounded metal conduits, it is recommended to use an external lightning protection equipment.

NOTICE

- In-built smart meter of SEC: GM330.
- You can purchase it from GoodWe or prepare by yourself. CT ratio requirement: nA /5A.
  - nA : primary current input of the CT (range of n: 200 - 5000).
  - 5A: secondary current output of the CT.
- Ensure that the CT is connected in the correct direction and phase sequences, otherwise the monitoring data will be incorrect.
- Outer diameter of the AC cable should be smaller than the hole diameter of the CT, so that the AC cable can be routed through the CT.
- To ensure accurate current detection, the CT cable is recommended to be no more than 30m.

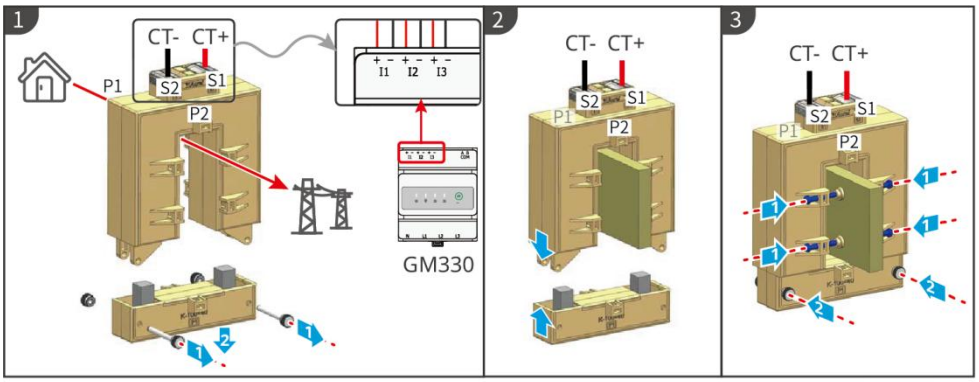
- Do not use network cable as the CT cable. Otherwise the smart meter may be damaged due to high current.
- CTs vary slightly in dimensions and appearance depending on the model, but they are installed and wired in the same way.

Connection steps



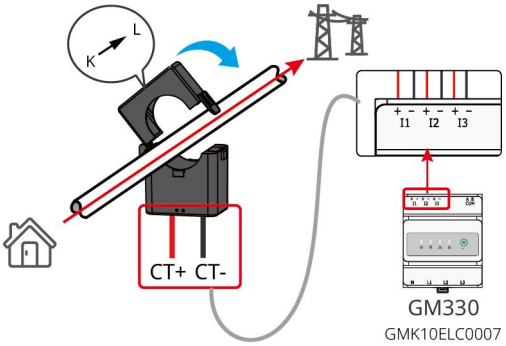
SEC30ELC0004

Installing the CT (Type I)



GMK10ELC0006

Installing the CT (Type II)



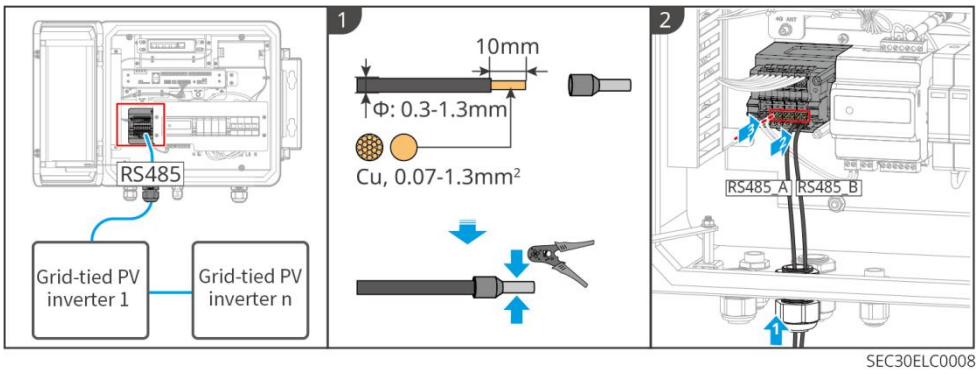
GMK10ELC0007

6.7 RS485 Communication Cable (grid-tied PV inverters)

NOTICE

- The system supports connecting inverters of the same model or a mixture of different models of grid-tied inverters.
- The maximum number of grid-tied inverters that can be connected: 60 units.

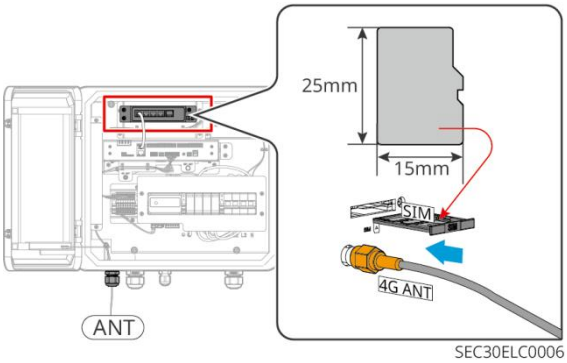
- SEC provides 3 available RS485 communication cable to any one of the RS485 terminal groups. Each RS485 terminal group can connect up to 20 inverters.



6.8 4G Antenna

NOTICE

- If the GoodWe 4G router is selected, it will be installed before shipment.
- Routers from other manufacturers are also supported. If selected, the 4G router needs to be installed manually.
- The SIM card needs to be prepared by the client. Recommended SIM card (size: 25 mm × 15 mm, capacity ⩾ 64 KB). When connecting a single inverter, the data plan should be at least 5MB per day. For N inverters, the data plan should be at least 5 × N MB per day.



6.9 DO/DI/AI/PT Cable

NOTICE

- SEC has a in-built data logger. To enable functions such as DRED, RCR, remote shutdown or to connect an external equipmensuch as a temperature sensor, and connect the corresponding cable.
- SEC has reserved wiring holes for DI/DO/AI/PT connections. If corresponding cables need to be connected, they should be routed through the designated wiring holes.
- If using a self-provided 4G router, connect it to the 24 V DC output port of the data logger

to supply power to the router.

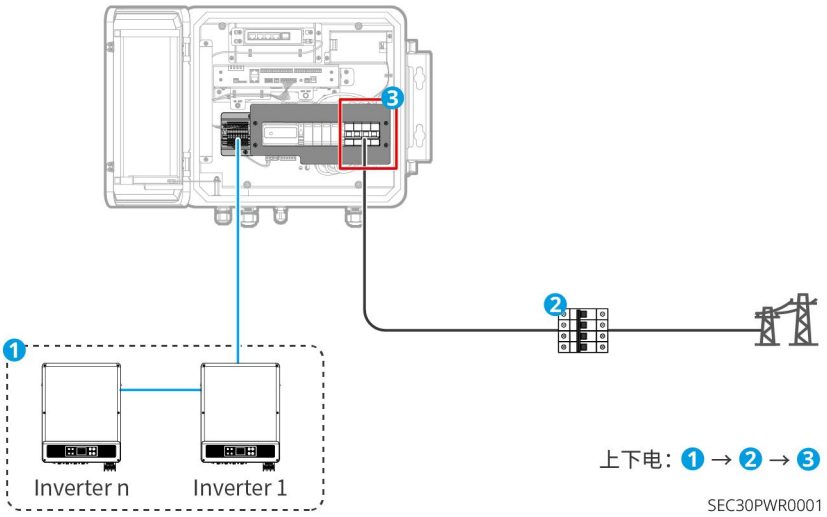
- For corresponding cable and specific connection steps, refer to EzLogger3000C User Manual.

7 System Operation

7.1 Check before Power ON

No.	Check Item
1	The equipment is firmly installed in a clean place where is well-ventilated and easy to operate.
2	The PE cable, AC output cable, and communication cable are connected correctly and securely.
3	Cable ties are intact, routed properly and evenly.
4	Unused wire holes are sealed with waterproof covers.
5	Make sure the used cable holes are sealed properly.

7.2 System Power ON



7.3 Indicator

Check the LED of the in-built data logger and smart meter of SEC3000.

EzLogger3000C

Indicator	Indicator status	Explanation
PWR		Steady green: power supply is normal.
		Green off: power off or abnormal power supply.
RUN		Steady green / green off:abnormal equipment operation.

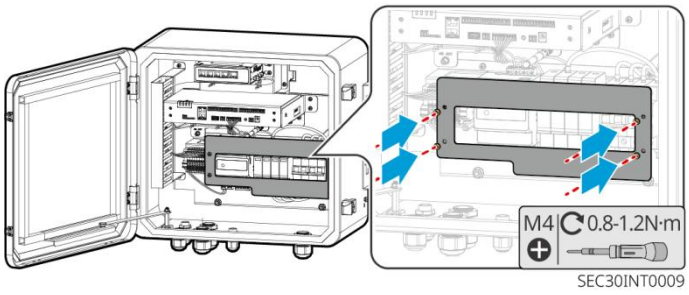
		Slow blinking green: Normal operation of the equipment.
NET		Steady green: the equipment is connected normally to the server.
		Fast blinking green: the equipment is connected to the router, but the connection with the server is abnormal.
		Slow blinking green: the equipment is not connected to the router.
ALM		Steady red: all inverters are in disorder.
		Fast blinking red: the data logger is upgrading.
		Red off: at least one inverter is working normally.

Smart meter

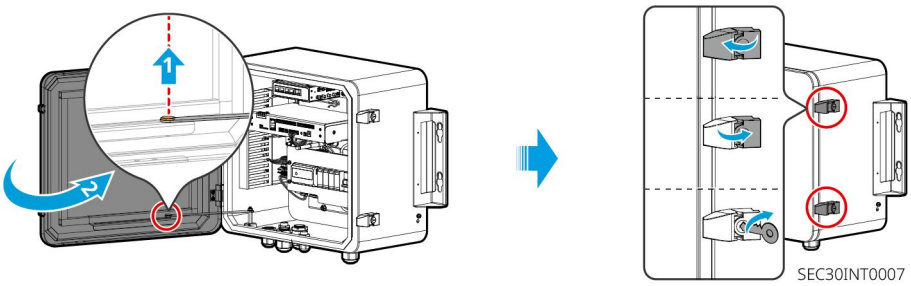
Type	Status	Explanation
Power light	Steady on	Smart meter powered on, no RS485 communication
	Blink	Smart meter powered on, normal RS485 communication
	Off	Smart meter is powered off.
Communication light	Off	Reserved
	Blink	Press the Reset button for at least 5 seconds, power light, purchasing or selling electricity indicator light flash: reset the meter.
Purchasing or selling electricity indicator light.	Steady on	Import from the grid.
	Blink	Export to the grid.
	Off	No purchasing or selling.
	Reserved	

7.4 Closing the Cabinet Door

Install cover in wiring area



Close the cabinet door



8 System Commissioning

Refer to EzLogger3000C User Manual for commissioning. For more details, scan the QR code below for the user manual.

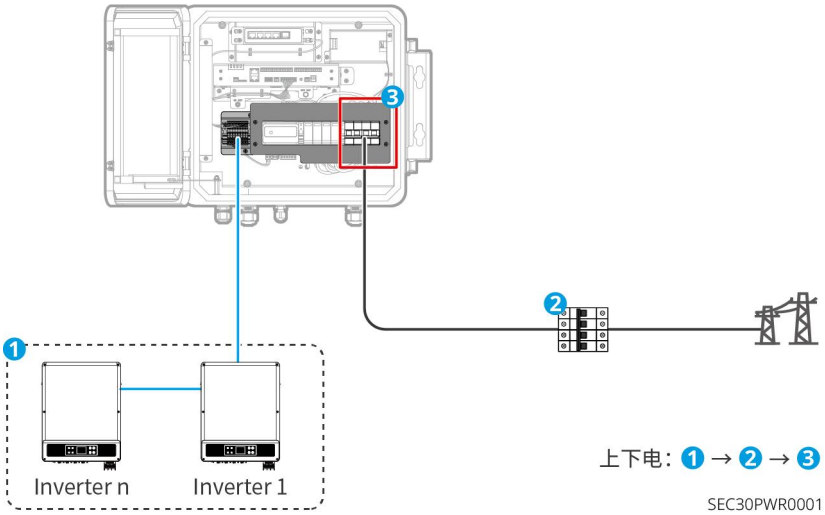
EzLogger3000C User Manual

9 Maintenance

9.1 System Power OFF

DANGER

Power off the system before operations and maintenance. Otherwise, damages to the equipment or electric shocks may occur.



9.2 Remove the equipment

DANGER

- Make sure the equipment is powered off.
- Wear proper PPE before any operations.

Step 1: Disconnect all electrical connections, including power cable and communication cable.

Step 2: Remove the equipment.

Step 3: Store the SEC properly. If it needs to be used later, ensure that the storage conditions meet the requirements.

9.3 Dispose of the Equipment

If the SEC cannot work anymore, dispose of it according to the local disposal requirements for electrical equipment waste. Do not dispose of it as household waste.

9.4 Routine Maintenance

⚠ WARNING

- Contact after-sales service for help if the copper conductor is exposed. Do not touch or disassemble privately because high voltage danger exists.
- In case of other emergencies, contact the after-sales service as soon as possible. Operate following the instructions or wait for the after-sales service personnel.

Maintaining Item	Maintaining Method	Maintaining Period	Maintaining Purpose
System Cleaning	Check if the installation space meets requirements and if there is any debris around the device.	Once 6 months	Prevent heat dissipation failures.
System installation	1. Check if the equipment is installed securely and whether the screws are installed tightly. 2. Check if the equipment is damaged or deformed.	Once 6 months - 12 months	Ensure that the equipment is installed securely.
Electrical Connection	Check if the cables are securely connected. Check if the cables are	Once 6 months - 12 months	Ensure the reliability of electrical connection.

	broken or there is any exposed copper core.		
Sealing	Check if all the terminals and ports are properly sealed. Reseal the cable hole if it is not sealed or too big.	Once a year	Confirm that the machine seal and waterproof performance are intact.

9.5 Troubleshooting

Perform troubleshooting according to the following methods. Contact the after-sales service if these methods do not work.

Collect the information below before contacting the after-sales service, so that the problems can be solved quickly.

1. Product information like serial number, software version, installation date, fault time, fault frequency, etc.
2. Installation environment, including weather conditions, whether the PV modules are sheltered or shadowed, etc. It is recommended to provide some photos and videos to assist in analyzing the problem.
3. Utility grid situation.

No.	Fault	Solutions
1	Data logger indicator not lit after being powered on.	1. Check if the SEC3000 in-built three-phase circuit breaker (L1-N) has voltage output to the 24 V power module (voltage range : 90 Vac - 264 Vac). 2. Make sure the three-phase circuit breaker is switched on.
2	Meter indicator not lit after being powered on.	1. Three-phase four wire system: Check if the SEC3000 in-built three-phase circuit breaker (L1-N) has voltage output to the 24 V power module (voltage range : 90 Vac - 264 Vac). 2. Three-phase three wire system: check the in-built three-phase circuit breaker, and whether L2 and the neutral (N) wire are short circuited, and whether L1-L2 has line voltage output to the 24 V power module (line voltage range: 90 Vac - 264 Vac). 3. Make sure the three-phase circuit breaker is

		switched on.
3	Unable to load the Web page.	1. Check if web page is visited 1 minute later after the equipment is powered on. 2. Check if the equipment is correctly connected with and PC via network cables. 3. Check if the IP address setting is modified to 172.18.0.XXX or automatic access. 4. Clear the cache of the browser page.
4	The equipment is offline on the Web page.	1. Check if all devices connected to SEC3000 have all been powered on. 2. Check if the inverter is correctly connected to the RS485 communication terminal of the SEC3000.
5	Smart meter displays abnormal data.	1. Check if the CT ratio setting in the web interface matches the actual CT ratio in use. 2. Check if the CT wiring is correct. 3. Three-phase four wire system: check if the wiring sequence (N/L1/L2/L3) of the SEC3000 in-built three-phase circuit breaker is correct. 4. Three-phase three wire system: check the in-built three-phase circuit breaker to make sure whether L2 and the neutral (N) cable are short circuited, and whether the wiring sequence (/L1/L2/L3) is correct.

10 Technical Parameters

Model	SEC3000
Communication	
Max. Inverters Supported	RS485: 60
RS485 interface	4
Ethernet	2*RJ45, 10/100Mbps
4G	Optional
Digital/Analog Input/Output	DI×4, DO×2, AI×4
Configuration	
Datalogger	EzLogger3000C*1
Smart Meter	GM330*1
Meter Voltage Measurement Range（Vac)	3L/N/PE: 172~415（line voltage） 3L/PE: 100~240（line voltage）
Meter Frequency Measurement Range（Hz)	50/60
Meter Current Measurement Range	nA:5A（200≤n≤5000)
Power Supply	/
Power Consumption (W)	≤15
Mechanical	
Dimensions (W×H×D mm)	450*400*242
Weight (kg)	≤11
Installation Method	Wall mounting, bracket mounting, pole mounting
Environment	
Operating Temperature Range (℃)	-30~+60
Storage Temperature Range (℃)	-40~+70
Relative Humidity	0~95%(non-condensing)

Max. Operating Altitude (m)	3000
Ingress Protection Rating	IP65
Anti-corrosion Class	C5L

11 Appendix

11.1 Abbreviation

Abbreviation	English
U_{batt}	Battery Voltage Range
$U_{batt,r}$	Nominal Battery Voltage
$I_{batt,max\ (C/D)}$	Max. Continuous Charging Current Max. Continuous Discharging Current
$E_{C,R}$	Rated Energy
U_{DCmax}	Max.Input Voltage
U_{MPP}	MPPT Operating Voltage Range
$I_{DC,max}$	Max. Input Current per MPPT
$I_{SC\ PV}$	Max. Short Circuit Current per MPPT
$P_{AC,r}$	Nominal Output Power
$S_{r\ (to\ grid)}$	Nominal Apparent Power Output to Utility Grid
$S_{max\ (to\ grid)}$	Max. Apparent Power Output to Utility Grid
$S_{r\ (from\ grid)}$	Nominal Apparent Power from Utility Grid
$S_{max\ (from\ grid)}$	Max. Apparent Power from Utility Grid
$U_{AC,r}$	Nominal Output Voltage
$f_{AC,r}$	Nominal AC Grid Frequency
$I_{AC,max(to\ grid)}$	Max. AC Current Output to Utility Grid
$I_{AC,max(from\ grid)}$	Max. AC Current From Utility Grid
P.F.	Power Factor
S_r	Back-up Nominal apparent power
S_{max}	Max. Output Apparent Power (VA) Max. Output Apparent Power without Grid
$I_{AC,max}$	Max. Output Current
$U_{AC,r}$	Nominal Output Voltage
$f_{AC,r}$	Nominal Output Frequency
$T_{operating}$	Operating Temperature Range

$I_{DC,max}$	Max. Input Current
U_{DC}	Input Voltage
$U_{DC,r}$	DC Power Supply
U_{AC}	Power Supply/AC Power Supply
$U_{AC,r}$	Power Supply/Input Voltage Range
$T_{operating}$	Operating Temperature Range
P_{max}	Max Output Power
P_{RF}	TX Power
P_D	Power Consumption
$P_{AC,r}$	Power Consumption
$F_{(Hz)}$	Frequency
$I_{SC\ PV}$	Max. Input Short Circuit Current
U_{dcmin}-U_{dcmax}	Range of input Operating Voltage
$U_{AC,rang(L-N)}$	Power Supply Input Voltage
$U_{sys,max}$	Max System Voltage
$H_{altitude,max}$	Max. Operating Altitude
PF	Power Factor
THDi	Total Harmonic Distortion of Current
THDv	Total Harmonic Distortion of Voltage
C&I	Commercial & Industrial
SEMS	Smart Energy Management System
MPPT	Maximum Power Point Tracking
PID	Potential-Induced Degradation
Voc	Open-Circuit Voltage
Anti PID	Anti-PID
PID Recovery	PID Recovery
PLC	Power-line Communication
Modbus TCP/IP	Modbus Transmission Control / Internet Protocol

Modbus RTU	Modbus Remote Terminal Unit
SCR	Short-Circuit Ratio
UPS	Uninterruptible Power Supply
ECO mode	Economical Mode
TOU	Time of Use
ESS	Energy Storage System
PCS	Power Conversion System
SPD	Surge Protection Device
DRED	Demand Response Enabling Device
RCR	Ripple Control Receiver
AFCI	AFCI
GFCI	Ground Fault Circuit Interrupter
RCMU	Residual Current Monitoring Unit
FRT	Fault Ride Through
HVRT	High Voltage Ride Through
LVRT	Low Voltage Ride Through
EMS	Energy Management System
BMS	Battery Management System
BMU	Battery Measure Unit
BCU	Battery Control Unit
SOC	State of Charge
SOH	State of Health
SOE	State Of Energy
SOP	State Of Power
SOF	State Of Function
SOS	State Of Safety
DOD	Depth of discharge

11.2 Terminology Explanation

Explanation of Overvoltage Categories

Overvoltage Ⅰ : Equipment connected to circuits with measures limiting the transient overvoltage to a very low level.

Overvoltage Ⅱ : Energy-consuming equipment supplied by a fixed installation. This category includes appliances, portable tools, and other household or similar loads. If specific reliability and suitability requirements apply to such equipment, Overvoltage Ⅲ should be used instead.

Overvoltage Ⅲ : Equipment within fixed installations in which reliability and suitability must meet special requirements. This includes switching devices within fixed installations and industrial equipment permanently connected to fixed installations.

Overvoltage Ⅳ :Equipment used at the power supply side of the distribution system. This includes measuring instruments and upstream overcurrent protection devices.

Explanation of Moist Scenarios Categories

Environment parameter	Level		
	3K3	4K2	4K4H
Humidity range	0~+40℃	-33~+40℃	-33~+40℃
Temperature range	5% - 85%	15% - 100%	4% - 100%

Explanation of Environment Categories

Outdoor inverter: ambient temperature (-25~+60 ℃) , suitable for environments with pollution degree 3.

Indoor inverter Ⅱ:ambient temperature (-25~+40 ℃) , suitable for environments with pollution degree 3.

Indoor inverter Ⅰ:ambient temperature (0~+40 ℃) , suitable for environments with pollution degree 2.

Explanation of Pollution Degree Categories

Pollution degree 1: No pollution or only dry, non-conducive pollution.

Pollution degree 2: Generally, only non-conducive pollution, but occasional short-term conducive pollution due to condensation must be considered.

Pollution degree 3: Conducive pollution or non-conducive pollution that becomes conducive due to condensation.

Pollution degree 4: Persistent conducive pollution, such as pollution caused by conducive dust or rain and snow.