Single-phase Hybrid Inverter

☐ 3 kW ☐ 3.68 kW ☐ 4 kW ☐ 4.6 kW ☐ 5 kW ☐ 6 kW

YiNERGY

User Manual

Version 1.0

Statement

Make Life Better

Trademarks

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Notice

Due to product version upgrades or other reasons, the content of the document may be subject to periodic updates, unless otherwise agreed, the document content cannot replace the safety precautions in the product label or user manual.

All descriptions in the documentation are intended solely as guidelines for usage.

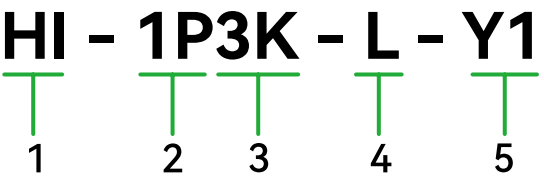
Scope of Validity

This manual is an integral part of Single-phase Hybrid Inverter. It describes the installation, electrical connection, commissioning, maintenance and troubleshooting of the product. Please read it carefully before operating.

This manual is valid for the following inverter models:

- HI-1P3K-L-Y1
- HI-1P3.68K-L-Y1
- HI-1P4K-L-Y1
- HI-1P4.6K-L-Y1
- HI-1P5K-L-Y1
- HI-1P6K-L-Y1

Model Description



1	**Product Type**	"HI" refers to Hybrid Inverter.
2	**Grid Type**	"1P" refers to Single Phase.
3	**Rated Power**	"3K" refers to the rated output power of 3 kW.
4	**Battery Type**	"L" refers to Low voltage battery.
5	**Version Number**	"Y1" refers to the first version.

Target Group

Only for professionals who are familiar with local regulations, standards and electrical systems, and who have received professional training and knowledge of this product.

Symbol Description

Different levels of warning messages in this manual are defined as follows:

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.

NOTE

Information that is important for a specific topic or goal, however not related to safety.

Change History

Version 1.0 (01/07/2024)

Initial release

Table of Contents

Make Life Better

1 Safety

The safety information contained in this document must be followed at all times when operating the equipment.

NOTICE

The inverter has been designed and tested in strict accordance with safety regulations. However, being an electrical equipment, it is crucial to adhere to the relevant safety instructions before any operation. Failure to operate the equipment properly may result in severe injuries or property damage. Please ensure you follow all safety guidelines diligently.

1.1 General Safety

NOTICE

- Due to product version upgrades or other reasons, the document content will be subject to periodic updates, unless there is a special agreement, the document content cannot replace the label on the product. All descriptions in the documentation are intended solely as guidelines for usage.
- Please carefully read this document to fully understand the product and precautions before installing the appliance.
- All operations of the equipment must be conducted by professional and qualified electrical technicians who are familiar with the relevant standards and safety specifications of the project location.
- When operating the inverter, it is essential to use insulating tools and wear personal protective equipment to ensure personal safety. Contact electronic devices requires wearing electrostatic gloves, electrostatic bracelets, anti-static clothing, etc. to protect the inverter from electrostatic damage.
- Any equipment damage or personal injury caused by failure to install, use and configure the inverter in accordance with the requirements of this document or the corresponding user manual is not the responsibility of the equipment manufacturer. For more information of product warranty, please visit the official website: https://www.yienergy-solar.com.

1.2 PV String Safety

DANGER!

Please use the DC terminal supplied with the box to connect the inverter DC cable. The use of other DC terminal can lead to serious consequences, and any resulting damage to the equipment will not be covered by the equipment manufacturer.

WARNING!

- Ensure that the PV modules and bracket system are well grounded.
- After the completing DC cable connection, please ensure that the cables are securely and correctly connected.
- Use a multi-meter to measure the positive and negative poles of the DC cable to verify correct polarity and no reverse connections. Ensure that the voltage is within the permissible range. Do not connect the same PV string to multiple inverters, otherwise it may cause damage to the inverter.

1.3 Inverter Safety

WARNING!

- Ensure that the voltage and frequency of the grid connection meet the inverter grid connection specifications.
- It is recommended to add protection devices such as circuit breakers or fuses on the AC side of the inverter, and the specifications of the protection devices should be greater than 1.25 times the rated current of the AC output of the inverter.
- The protective ground wire of the inverter must be securely connected to ensure that the impedance between the neutral wire and the ground wire is less than 10Ω.
- Copper core cable is recommended for AC output cable, if aluminum wire is required, a copper aluminum transition terminal is required for wiring.
- In case a single inverter overloaded event, the inverter can be automatically restarted. If it happens multiple times, the inverter restart time will be extended, to restart the inverter promptly, you can restart the inverter immediately through the App.
- If the photovoltaic system is not equipped with batteries, do not use the BACK-UP function. Otherwise, the manufacturer shall not be liable for related risks.

DANGER!

- Avoid bearing any load on the bottom terminal of the inverter during installation to prevent terminal damage.
- After installation, ensure the labels and warning signs on the inverter are clearly visible, it is forbidden to cover, deface or damage them.

1.4 Battery Safety

WARNING!

- The battery used with the inverter must be approved by the inverter manufacturer. The lists of approved batteries can be obtained through the official website.
- Before equipment installation, carefully read the user manual corresponding to the battery to understand the products and precautions. Strictly follow the requirements outlined in the battery user manual.
- If the battery is fully discharged, ensure that you charge the battery following the guidelines specified in the corresponding model's battery user manual.
- Battery current may be affected by some factors such as temperature, humidity, weather conditions, etc., which could result in current limiting and affect the load capacity.
- When connecting the DC cable, use a multi-meter to verify correct polarity, and ensure that the voltage falls within the permissible range.
- Do not connect one battery pack to multiple inverters, as it may cause damage to the inverter.

1.5 Personal Requirements

NOTICE

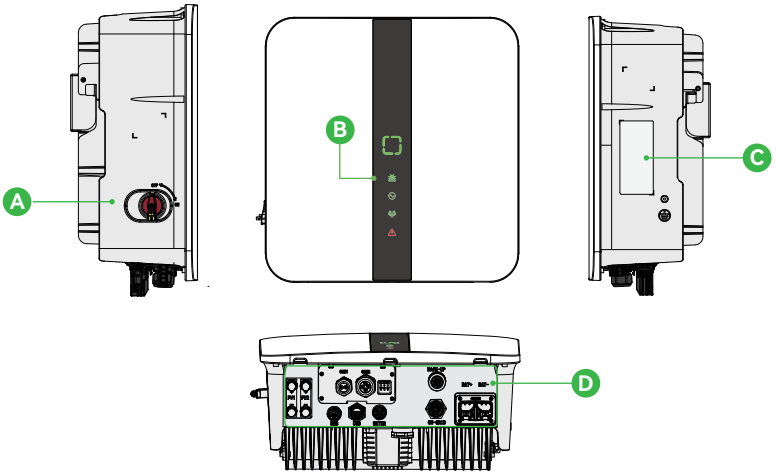
- The personnel responsible for equipment installation and maintenance must receive comprehensive training, understand all necessary safety precautions, and be capable of performing all operations correctly.
- Installation, operation, maintenance, replacement of equipment or parts is permitted to be conducted by qualified professionals or trained personnel only.

2.1 System Description

System Overview

The inverter regulates and optimizes the energy flow in photovoltaic systems through an integrated energy management system. The electricity generated by the photovoltaic system can be used by the load, stored in the battery, and also exported to the grid.

2.2 Appearance



A	DC switch	Disconnect the DC circuit when necessary.
B	LED panel	Including indicators, indicate the status of inverter.
C	Nameplate	Nameplate clearly identifies the device type, serial number, specific DC/AC parameters, certification, etc.
D	Electrical connection area	Including PV terminals, battery terminals, AC terminals, communication terminals, etc.

Figure 2-1 Appearance

2.3 Supported Power Grid

The inverter supports the following power grid types. For the grid types with N lines, the N voltage to ground needs to be less than 10 V.

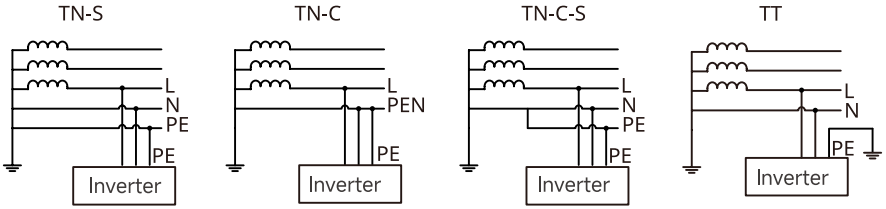


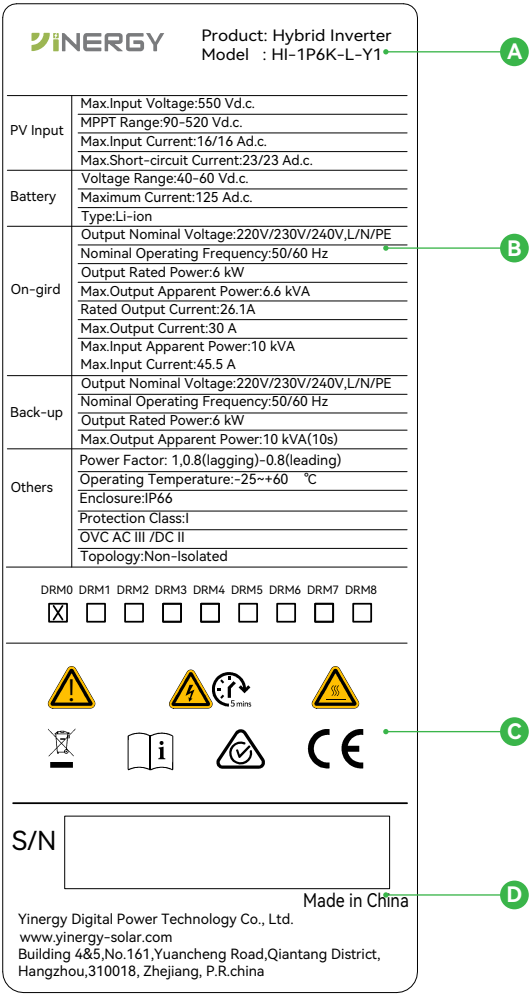
Figure 2-2 Power Grid

2.4 Symbols on the Label and Inverter

Table 2-1 Symbols

Symbol	Description
CE	CE Mark.
	Grounding point.
	High-temperature hazard. Do not touch the product under operation to avoid being burnt.
	Potential risks exist. Wear proper Personnel Protective Equipment before any operations.
	Read through the user manual before any operations.
	Do not dispose of the inverter as household waste Discard the product in compliance with local laws and regulations, or send it back to the manufacturer.
5min	Delayed discharge. Wait 5 minutes after power off until the components are completely discharged.

2.5 Nameplate



A YINERGY trademark, product type, and product model

B Technical data

C Safety symbols and certification marks

D Serial number and contact information

Figure 2-3 Nameplate

2.6 Working Principle

2.6.1 Circuit Diagram

The inverter unit converts DC into AC that meets the requirements of the power grid and feeds it into the power grid. The principle design of inverter is shown in the figure below:

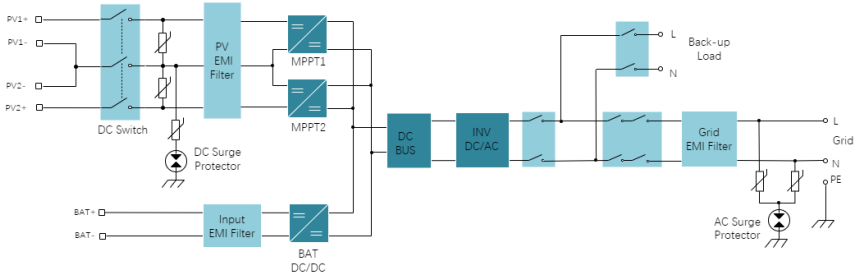


Figure 2-4 Circuit Diagram

N and PE cables are connected together in the Main Panel for wiring

NOTICE

Below wirings are applicable to areas in Australia, New Zealand, and etc.

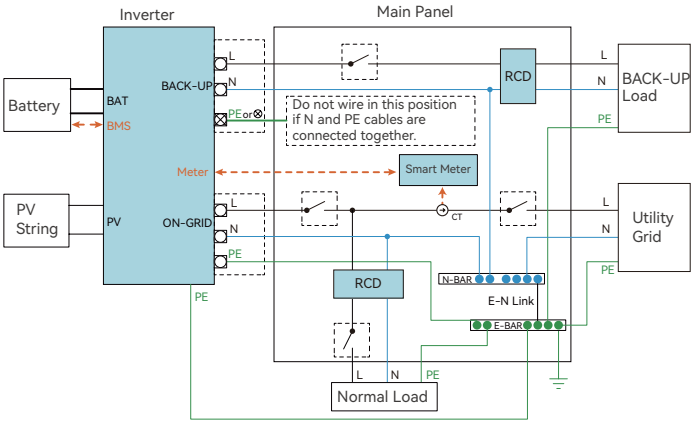


Figure 2-5 N and PE Cables Connection 1

N and PE cables in the Main Panel shall be wired separately

NOTICE

Ensure that the grounding of BACK-UP is correctly and tightened. Otherwise, the BACK-UP function may be abnormal in case of grid failure.

Other areas except Australia, New Zealand, etc., are applicable to the following wirings.

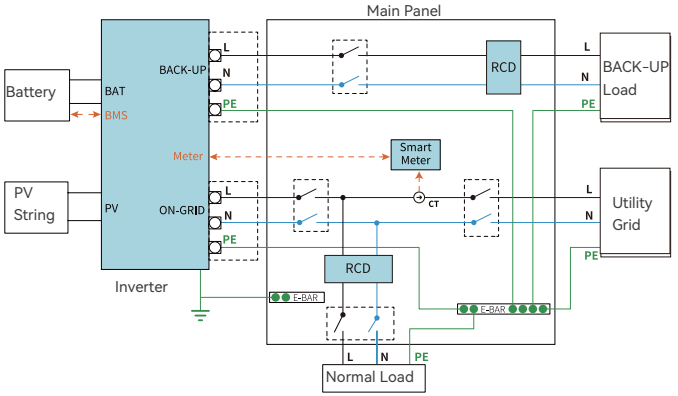


Figure 2-6 N and PE Cables Connection 2

2.6.2 Application Schemes

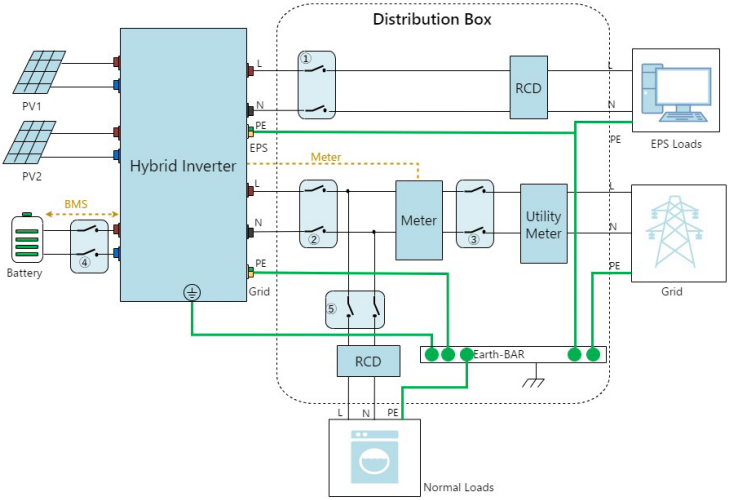


Figure 2-7 Application Scheme

2.7 Interfaces and Functions

The product is equipped with the following interfaces and functions:

AI-Dongle

The product is equipped with an AI-Dongle as standard, which provides a user interface for configuring and monitoring the product. The AI-Dongle can connect to the Internet via WLAN or the Ethernet cable. If you don't want to use AI-Dongle, the Yinergy communication products or the third-party monitor device can be chosen.

RS485 Interface

The product equipped with several RS485 interfaces. Some RS485 interfaces connected through RJ45 ports. Some RS485 interfaces connected through terminal block.

RJ45-1 and RJ45-2 ports: Two RS485 interfaces used to the product parallel operation. The monitoring information of all the slave inverters can exchange with the master inverter through the RS485 interfaces. And the master inverter transfers the monitoring information to Internet through the AI-Dongle.

RJ45-3 port: This RS485 interface used to connect the product to the third-party monitor device. If you don't want to use AI-Dongle, the third-party monitor device can be used.

Terminal block 2: This RS485 interface (Pin1 and Pin2) used to connect the external smart meter. If the smart meter be chosen to replace the current transformer, the smart meter can connect to this RS485 interface.

RS485/CAN (Controller Area Network) Interface

The product equipped with several RS485/CAN interfaces. The CAN interfaces and RS485 interfaces connected through one RJ45 ports.

RJ45-4 port: This RS485/CAN interface used to connect the BMS (Battery Manage System) of the battery. If the communication interface of the BMS is CAN interface, the pins for CAN interface can be chosen to connect. If the communication interface of the BMS is RS485 interface, the pins for RS485 interface can be chosen to connect.

RJ45-5 and RJ45-6 ports: Two RS485/CAN interfaces used to the product parallel operation. The control information can be exchanged between the master inverter and the slave inverter through the RS485/CAN interfaces. Both the pins for RS485 interface and CAN interface shall be chosen to connect.

Modbus RTU

The product is equipped with a Modbus interface. If the third-party communication device also complies with Yinergy Modbus protocol, which can be connected to this product.

Export active power control

The product is equipped with the export active power limit function, so as to meet the requirements of some national standards or grid standards for limiting the output power at the grid connection point. The export active power control solution measures the active power at the point where the customer's installation is connected to the distribution system

(point of grid connection) and then uses this information to control the inverter's output active power in order to prevent the export active power to the distribution system from exceeding the agreed export capacity.

The product is delivered with the current transformers as standard. The current transformers can be used to measure the export active power. The communication of the current transformers can be connected to the product through RS485. And the current transformer also can be replaced by the smart meter.

The smart meter that can be used with this product must be approved by Yinergy. For more information about the smart meter, please contact the service.

Multifunction Relay

The product is equipped with two multifunction relays as standard. The multifunction relays can be configured for the operating mode used by a particular system. For more information, please contact Yinergy service.

Temperature Senser Interface

The product is equipped with one temperature senser interface. If the temperature of the battery need be monitored, the external senser can be connected.

Inverter demand response modes (DRED)

The product shall detect and initiate a response to all supported demand response commands according to the standard AS/NZS 4777.2.

The product only supports the demand response mode DRM 0. The interaction with demand response enabling device (DRED) can be connected to the terminal block 3.

Current transformer interface

The current transformers can be used to measure the export active power and control the export active power at the point of grid connection. The three current transformers can be connected to terminal block 4.

Back-up function

The inverter is equipped with a back-up function which also called as an emergency power supply (EPS). The back-up function ensures that the inverter forms a three-phase back-up grid that uses energy from the battery and the PV system that is directly connected to the inverter to supply the critical load in the event of a utility grid failure.

In the event of a grid failure, the product disconnects from the grid. The product provides a standalone grid and the backup loads, which connect to EPS connector, continue to be supplied by the energy stored in the battery and the PV modules.

The charging of the battery is ensured by the existing PV system during back-up operation.

As soon as the utility grid is available again, the product will automatically connect to the grid and the loads are supplied with energy from the utility grid as needed.

Earth fault alarm

This product complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring. If an Earth Fault Alarm occurs, the red color LED indicator will light up. At the same time, the error code 160 and code 162 will be sent to the YiCloud.

2.8 Working Mode

Economic Mode

NOTICE

- Economic models can only be used when local laws and regulations are met, such as whether the power grid is allowed to charge the battery or whether the battery is allowed to discharge and sell to the power grid. If not, do not use this mode.
- It is recommended to use economic mode in scenarios when the peak-valley electricity price varies a lot.

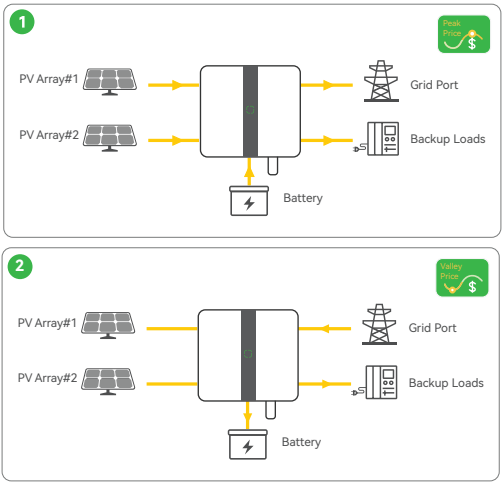


Figure 2-8 Economic Mode

In economic mode, the discharge and charging time of the battery should be preset according to the peak and valley electricity prices.

During peak electricity prices, the battery will discharge power to the load. Conversely, during valley electricity prices, the battery will be charged from the grid.

Self-Consumption Mode

NOTICE

- For solar power, consider self consumption mode in priority: the excess power charges the battery in day time; the battery supplies power to the load when there is no solar power generated at night. This will improve the self consumption rate and saves electricity costs.
- It is suitable for areas with high electricity prices and little or no solar power generation subsidies.

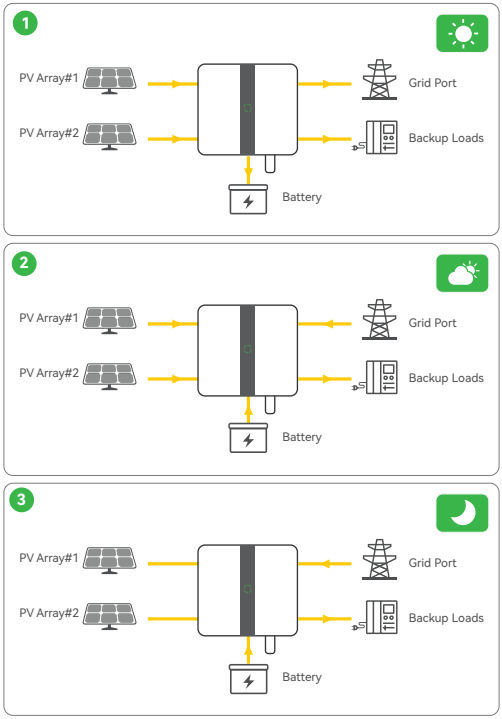


Figure 2-9 Self-Consumption Mode

In the self-consumption mode, solar power prioritizes supplying power to the load, with any excess power used for battery charging, then the remaining power will be feed back into the grid (or limited if necessary).

When there is no solar power generation at night, batteries are used to supply power to the load. Once the battery power is insufficient, the grid supplies power to the loads.

Back-up Mode

NOTICE

- In Back-up mode, you can set different battery SOC values for grid-tied and off-grid status. When the power grid is cut off, the inverter switches to off-grid mode, and the battery can discharge to supply power to the load to ensure that the BACK-UP load does not lose power; When the power grid is restored, the inverter switches to grid-tied mode. If the battery's SOC is lower than the set SOC, the battery can be charged by power grid.
- The purchase of electricity from the power grid to charge the battery must comply with local laws and regulations.
- Recommended for use in areas with unstable power grid.

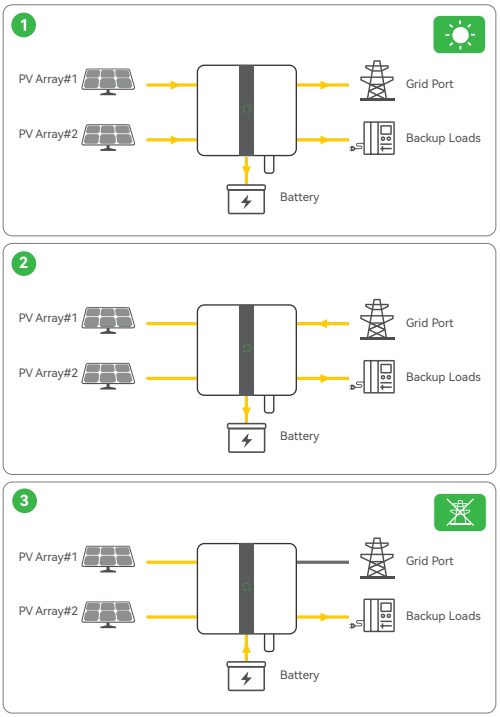


Figure 2-10 Back-up Mode

In the back-up mode, the battery is charged by both the PV system and the grid, and is always kept in a relatively high state of charge (SOC).

When the power generated by the PV system is sufficient, it charges the battery as priority, and the excess power charges the load, the remaining power will be sold to the grid. In case grid abnormality, the inverter will switch to off-grid mode and the battery will supply power to the important load / backup loads.nce the battery power is insufficient, the grid supplies power to the loads.

Off-grid Mode

NOTICE

- The PV energy storage system (ESS) is not suitable for powering life-sustaining medical devices. It cannot guarantee backup power in all circumstances.
- The hybrid inverter supports EPS with a switching time is less than 10ms. However, the EPS function may fail to start if the important load capacity exceeds the rated power of the inverter.

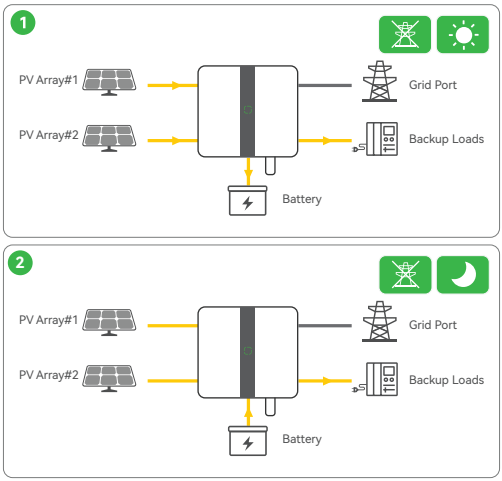


Figure 2-9 Off-Grid Mode

When the grid is off, system will automatically switch to EPS mode. In this mode, system supply emergency power from PV or battery tow support the backup loads, and in this mode, battery is required to balance the power difference of loads and PV.

3.1 System Overview

New PV + ESS

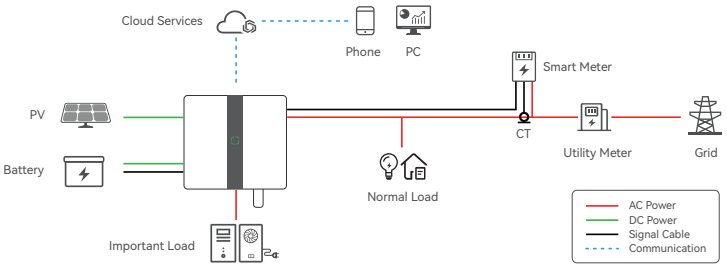


Figure 3-1 New PV + ESS

Retrofitting the Existing PV System

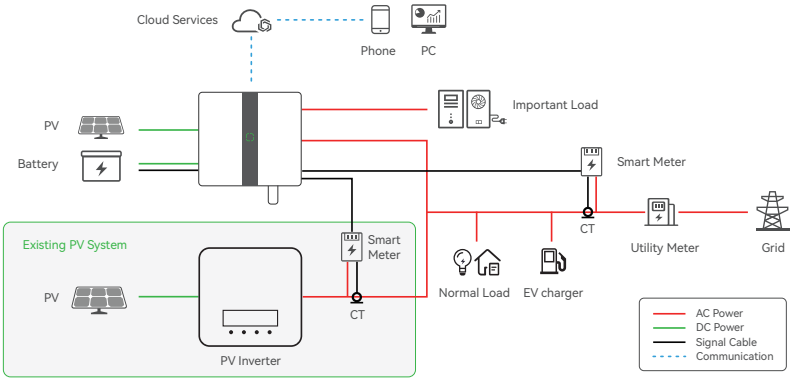


Figure 3-2 Retrofitting the Existing PV System

The AC terminal of the PV inverter and the GRID terminal of the hybrid inverter are to be connected in parallel. The smart meter of existing PV system and the smart meter in series with utility meter shall be connected to hybrid inverter to achieve system energy management. And PV inverter need to communicate with hybrid inverter to achieve anti-inverse flow function, otherwise, this function will be limited.

4 Transportation and Storage

If the inverter is not put into use immediately, the transportation and storage requirements needs to be met:

Transportation

- Observe the caution signs on the packaging of inverter before transportation.
- Pay attention to the weight of the inverter. Carry the inverters by the required number of personnel as specified by local regulations. (net weight of Single-phase Hybrid Inverter: 27 kg)
- Wear protective gloves when carrying the equipment by hand to prevent injuries.
- When lifting up the inverter, hold the bottom position of the carton. Keep the inverter horizontal in case of falling down.

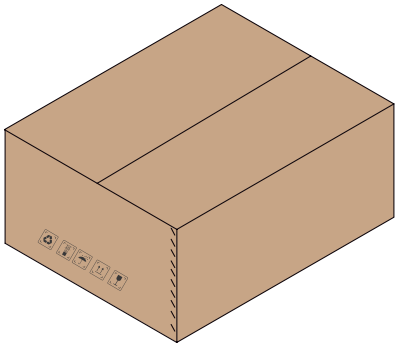


Figure 4-1 Caution Signs on the Packaging

Storage

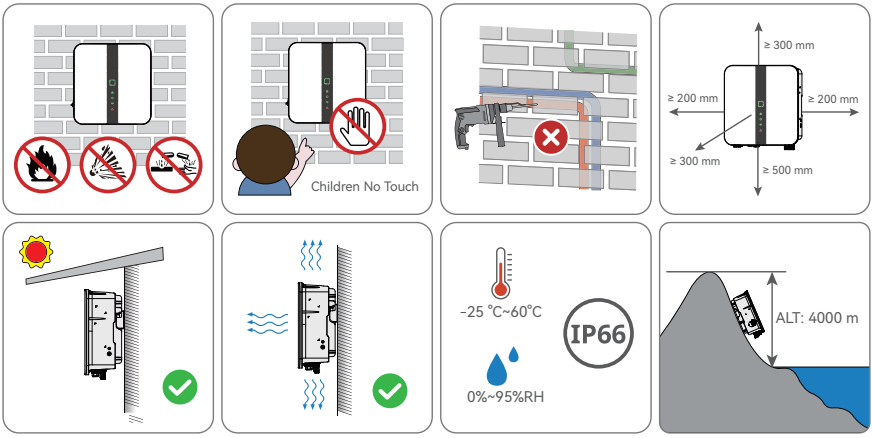
- The inverter must be stored indoors.
- Do not remove the original packaging material and check the outer packaging material regularly.
- The storage temperature should be between -40 ℃ and +70 ℃. The relative humidity should be between 0%RH and 100%RH.
- Stack the inverter in accordance with the caution signs on the inverter carton to prevent their falling down and device damage. Do not place it upside down.

5.1 Selection of Installation Location

The installation location selected for the inverter is quite critical in the aspect of the guarantee of machine safety, service life and performance. It has the IP66 ingress protection, which allows it to be installed outdoor. The installation position shall be convenient for wiring connection, operation and maintenance.

5.2 Environment Requirement

1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. Do not install the equipment in a place that is easy to touch, especially within children's reach. High temperature exists when the equipment is working. Do not touch the surface to avoid burning.
3. Avoid the water pipes and cables buried in the wall when drilling holes.
4. Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. 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 indoors or outdoors. The temperature and humidity at the installation site should be within the appropriate range.
7. Install the equipment at a height that is convenient for operation and maintenance, electrical connections, and checking indicators and labels.
8. The altitude to install the inverter shall be lower than the maximum working altitude 4000 m.
9. Install the equipment away from electromagnetic interference.

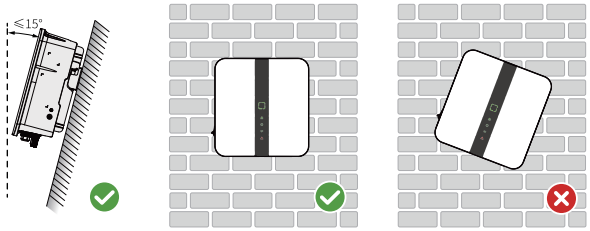


5.3 Installation Carrier Requirement

1. The mounting structure must be non-flammable and fire resistance.
2. Please ensure that the installation structure is solid enough to support the weight of inverter. The wall is required as a sturdy solid wall.
3. When the equipment is running, it will emit vibration, please do not install it on a structure with poor sound insulation, so as to avoid disturbing the residents of the living area by the noise during the equipment working.

5.4 Installation Angle Requirement

1. Install the inverter vertically or with a maximum back tilt of 15 degrees to facilitate heat dissipation.
2. Do not install the inverter in forward tilted, excessive back tilted, side tilted, horizontal, or upside-down positions.



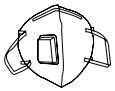
5.5 Tools Requirement

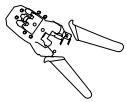
Installation tools include but are not limited to the following recommended ones. If necessary, use other auxiliary tools on site. The following tools must all comply with regulatory requirements.


Goggles

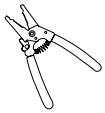

Safety shoes

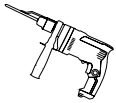

Safety gloves


Dust mask


RJ45 crimping tool

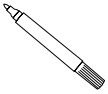

Diagonal pliers


Wire stripper


Hammer drill


Heat gun


Vacuum cleaner

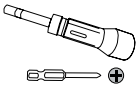

Marker


Level

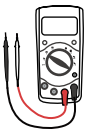

Heat shrink tube

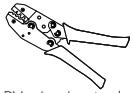

Cable tie


Rubber hammer

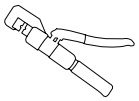

M2 M3 M4 M5

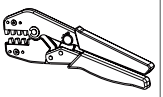
Torque wrench

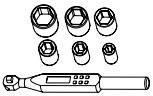

Multimeter

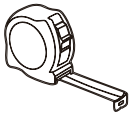

PV crimping tool


Tube type terminal crimping tool


YQK-70 hydraulic pliers


Crimping tool 4-6 m^2


Hex socket


Measuring tape

5.6 Additionally Required Materials

Table 5-1 Additionally Required Wires

No.	Cable	Type	Outer Diameter	Cross Section
1	PV cable	Outdoor multi-core copper wire cable Complying with ≥600 V and 30 A standard	4.5~7.8 mm	4~6 mm^2
2	Battery cable	Complying with 48 V and 125 A standard	9.5~12.5 mm	20~35 mm^2
3	Communication cable	Shielded twisted pair	4.5~6 mm	2×(0.5~1.0) mm^2
		CAT 5E outdoor shielded network cable	4.5~6 mm	8×0.2 mm^2
4	AC cable *	Grid	13~22 mm	6~10 mm^2
		Backup	10–12 mm	4~6 mm^2
5	Additional grounding cable *	Outdoor single-core copper wire cable	The same as that of the PE wire in the AC cable	

NOTE

* If local regulations have other requirements for cables, set the cable specification according to the local regulations.

The factors that affect cable selection include rated current, cable type, routing mode, ambient temperature, and maximum expected line loss.

The cabling distance between the battery and the inverter should be less than 10 m. and within 5 m is recommended.

6 Unpacking and Inspection

6.1 Unpacking

Before signing for the product, please check the following in detail:

- Check the outer packaging for any signs of damage, such as deformation, holes, cracks or other signs that may cause damage to the equipment inside the box, if any damage founded, do not open the package and contact your dealer.
- Unpacking the inverter according to the following figure.

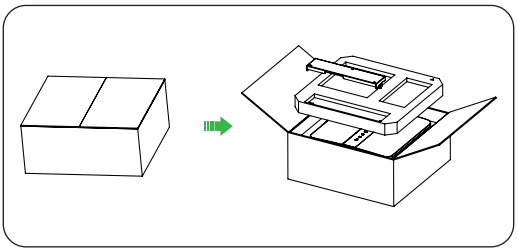


Figure 6-1 Unpacking the Inverter

- Verify that the inverter model is correct, if there is any discrepancy, do not open the package and contact your dealer.
- Check whether the type and quantity of deliverables are correct and whether the appearance is damaged. In case of damage, please contact your dealer.

6.2 Scope of Delivering

WARNING!

- For electrical connections, please use the terminal provided with the package, any damage to the device caused by the use of connectors of incompatible models will not be covered under the warranty.

Inverter

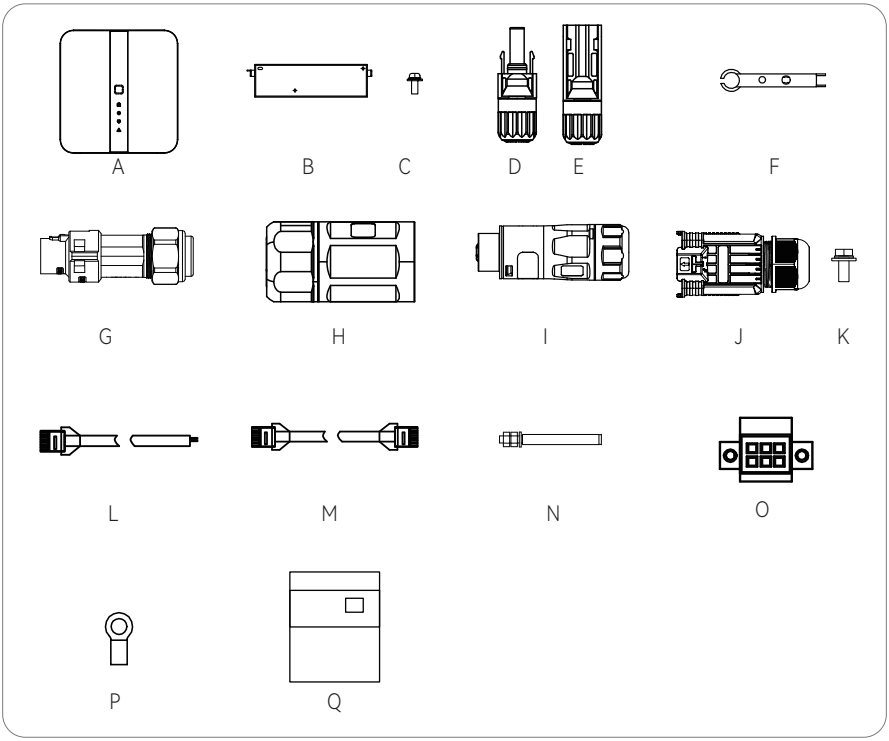


Table 6-1 Packing List of Inverter

Item	Description	Quantity
A	Inverter	1 pc
B	Bracket	1 pc
C	M4 Setscrew	2 pcs
D	Positive PV Connector	2 pcs
E	Negative PV Connector	2 pcs

Item	Description	Quantity
F	PV Disassembly Tool	2 pcs
G	Grid Connector	1 pc
H	RJ45 Connector	2 pcs
I	Backup Connector	1 pc
J	BAT Connector	1 pc
K	M8 Setscrew	2 pcs
L	Meter Network Cable	1 pc
M	Battery Network Cable	1 pc
N	M6 Expansion Screws	3 pcs
O	Plug Flange	1 pc
P	BAT Terminals	2 pcs
Q	Documents	/

Accessory Box

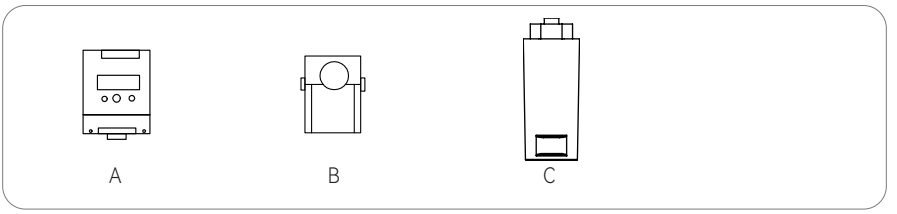


Table 6-1 Packing List of Accessory Box

Item	Description	Quantity
A	Smart Meter	1 pc
B	CT	1 pc
C	DTS, Optional (Wi-Fi, Ethernet, 4G)	1 pc

WARNING!

- When carrying out transportation, turnover, installation and other operations, adhere to the laws and regulations and relevant standards of the country and region where it is located.
- Do not use the wiring terminals and ports at the bottom to support any weight of the inverter.
- Before installation, the inverter needs to be transported to the installation site. In order to avoid personal injury or equipment damage during the handling, please pay attention to the following.
- Please follow the weight guidelines of the equipment and assign appropriate personnel to avoid the equipment exceeding the weight range that the human body can carry, thereby preventing injuries the personnel.
- Please wear safety gloves to avoid injuries
- Please ensure that the equipment is balanced during handling to avoid falling.

NOTICE

- When drilling holes, avoid the water pipes and power cables buried in the wall.
- When drilling holes, wear goggles and dust masks to avoid dust entering your respiratory tract or getting into your eyes
- Prepare an DC switch lock suitable for the lock hole diameter (Ø5 mm).
- Prepare an anti-theft lock suitable for the lock hole diameter (Ø8 mm).

7.1 Dimensions of Mounting

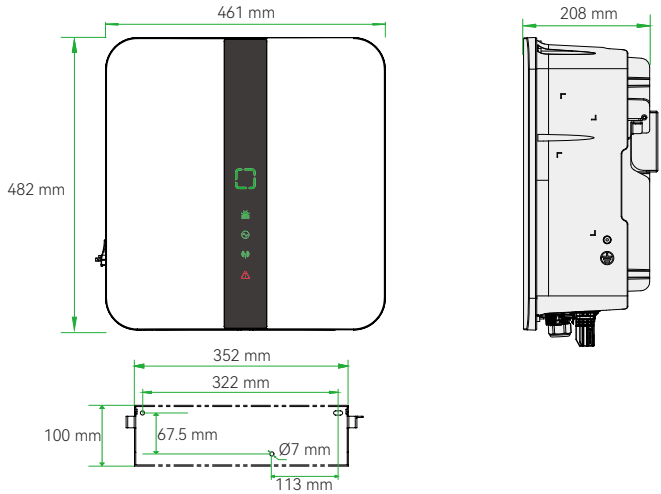


Figure 7-1 Dimensions

7.2 Installation Procedures

Step 1: Align the bracket horizontally on the wall and mark the position of the drill holes.

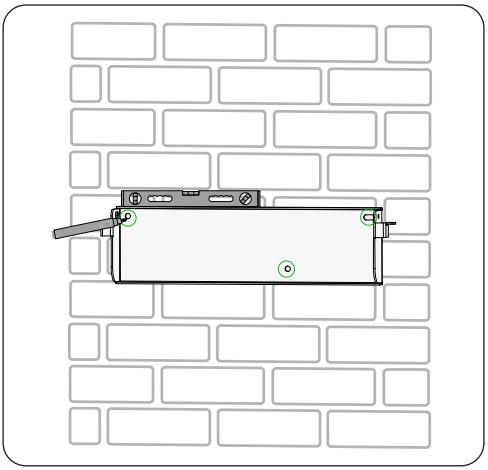


Figure 7-2 Marking Holes

Step 2: Set the bracket aside and drill holes with Ø8 drill bit. The depth of the holes should between 65-75 mm.

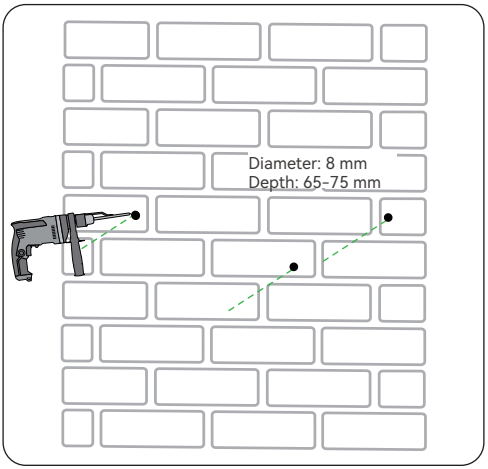


Figure 7-3 Drilling Holes

Step 3: Knock the expansion screws into the holes and secure the bracket to the wall with screws by torque wrench.

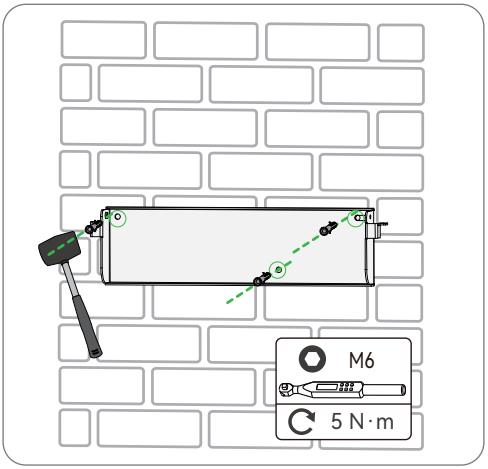


Figure 7-4 Insert Screws

Step 4: Lift the inverter by the handles and hang it on the bracket. The buckle on the bracket must be hooked into the keyways of the inverter. And then remove the handles.

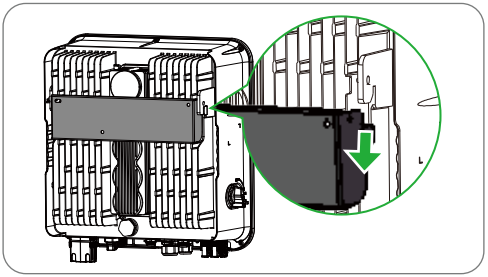


Figure 7-5 Hang the Inverter

Step 5: Secure the inverter to the bracket with M4 screw.

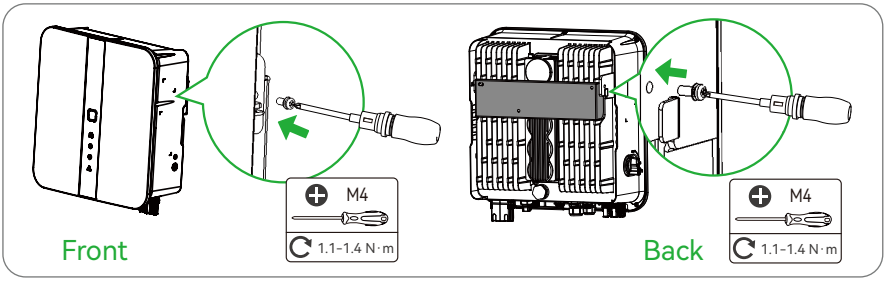


Figure 7-6 Secure the Inverter

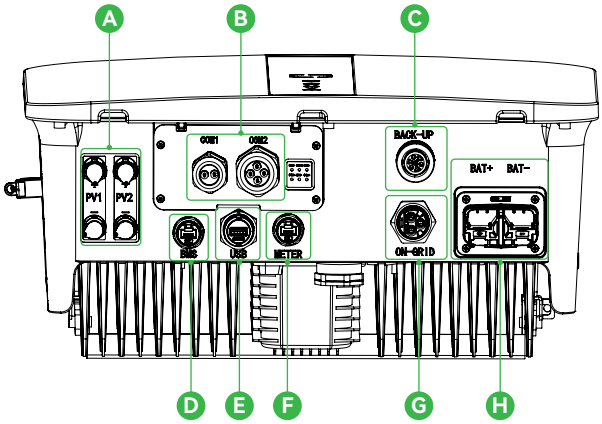
DANGER!

- All operations, cables and component specifications used in the electrical connection process must comply with local laws and regulations.
- Before making the electrical connection, please disconnect the DC switch and AC output switch of the inverter to ensure that the equipment is powered off. It is strictly forbidden to operate with electricity, to avoid risks of electric shock.
- Same kind of cables should be tied together and keep them separate from different types of cables, it is forbidden to entangle or cross each other.
- If the cable is subjected to excessive tension, it may cause poor wiring, please reserve a certain length of the cable when wiring, and then connect it to the inverter wiring port.
- When crimping the terminal block, please ensure that the cable conductor part is in full contact with the terminal block. Do not crimp the cable insulation skin together with the terminal block to prevent unreliable connections, equipment malfunction, or heat generation that could lead to damage to the inverter's terminal block.

NOTICE

- When making electrical connections, wear personal protective equipment such as safety shoes, protective gloves, and insulating gloves as required.
- Only professionals are allowed to perform electrical connection-related operations.
- The cable colors in the graphics in this article are for reference only. Specific cable specifications must comply with local regulatory requirements.

8.1 Terminals of Inverter



A	PV connection terminal	E	USB terminal
B	Communication terminal	F	Meter terminal
C	Back-up terminal	G	Grid connection terminal
D	BMS terminal	H	Battery connection terminal

Figure 8-1 Terminals of Inverter

8.2 Grounding Connection

The inverter must be grounded reliably. The connection point has been labeled with the following label: We recommend that the inverter is earthed to a nearby ground point.

WARNING!

- The protective ground of the chassis shell cannot replace the protective ground wire of the AC output port, ensure that both protective ground wires are reliably connected when wiring.
- When multiple inverters are used, ensure that the protective grounding points of all inverter chassis housings are equipotential connected.
- Please use your own protective ground wire, recommended specifications: Outdoor single core copper wire, Conductor cross-sectional area: 4~6 mm².

Step 1: Strip the insulation of conductor by wire stripper. Stripping length of 4-6 mm² wire is L1+2 mm.

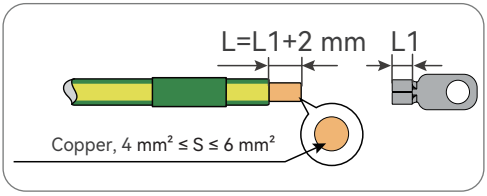


Figure 8-2 Striping the PE Cable

Step 2: Pull the heat-shrink tubing over the PE cable and insert the stripped section into the OT terminal.

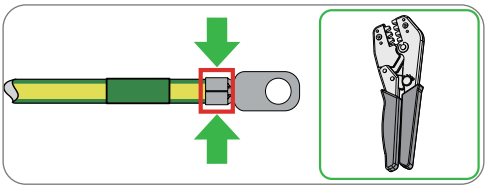


Figure 8-3 Crimping the Cable

Step 3: Use a heat gun to shrink it so that it can be firmly contacted with the terminal.

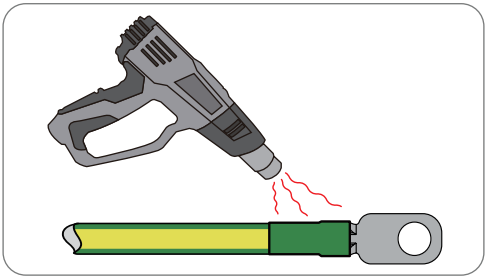


Figure 8-4 Shrinking the Tubing

Step 4: Connect the PE cable to the inverter and secure it with the original screw (Torque: 1.5-2 N·m).

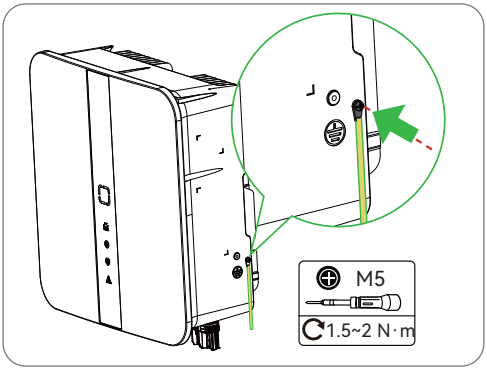


Figure 8-5 Securing the PE Cable

8.3 AC Connection

WARNING!

- It is prohibited to connect loads between the inverter and the AC switch directly connected to the inverter.
- In order to ensure that the inverter and the grid can be safely disconnected from the grid in the event of an abnormal situation, please connect the AC breaker on the AC side of the inverter. Multiple inverters cannot be connected to one AC breaker. Please choose the appropriate AC breaker according to local regulations.
- The inverter integrates a residual current monitoring unit, and when the inverter detects a leakage current greater than the allowable value, it will quickly disconnect from the grid.
- When the inverter is powered on, the BACK-UP AC port is live, if you need to perform maintenance on the BACK-UP load, please make sure the BACK-UP load circuit breaker is disconnected or the inverter is powered down, otherwise it may cause electric shock.

WARNING!

- Ensure that the AC wire exactly matches the "L1", "L2", "L3", "N", and grounding ports of the AC terminal when wiring. The inverter may be damaged if the cables are connected to the wrong terminal.
- Please ensure that the wire core is fully inserted into the terminal hole and is not exposed.
- Make sure the cable connections are tight to prevent overheating of the terminal block during device operation, which could lead to device damage.
- When connecting AC cables, it is recommended to connect the BACK-UP cable first and then the ON-GRID cable.

1. Choose whether to install RCD equipment according to local laws and regulations. The inverter can be externally connected with Type A RCD (residual current monitoring device) for protection when the DC component of the leakage current exceeds the limit.

2. RCD reference specification is 30 mA.

On Grid

Step 1: Prepare a Grid cable (three-core copper wire) and strip the insulation of the Grid as below. Remove the cable padding inside the insulation.

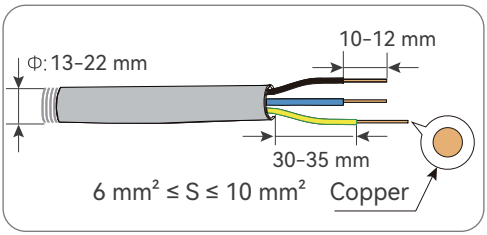


Figure 8-6 Striping the Cable

Step 2: Disassemble the AC connector as below. Remove rubber plugs based on the actual wire diameter.

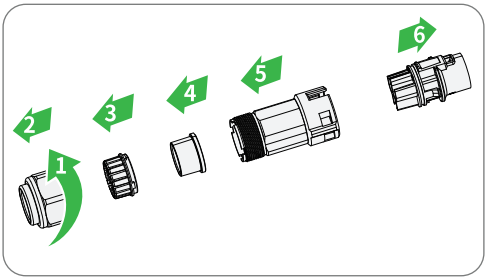


Figure 8-7 Disassembling the AC Connector

Step 3: Insert the crimped conductors L, N, and grounding conductor into the terminal block according to the labeling and tighten the terminal block screws.

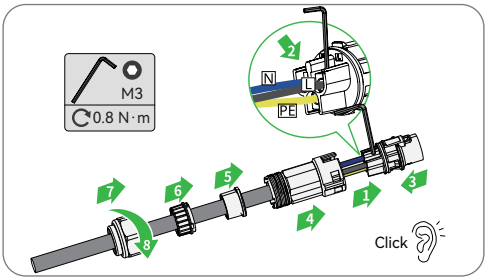


Figure 8-8 Assembling the AC Connector

Step 4: Remove the AC terminal caps and plug the assembled AC connectors into Grid terminal.

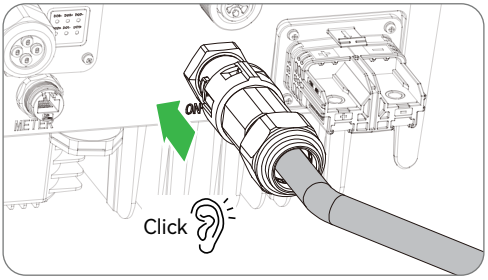


Figure 8-9 Installing the AC Connector to Inverter

Off Grid

Step 1: Prepare a EPS cable (three-core copper wire) and strip the insulation of the EPS as below. Remove the cable padding inside the insulation.

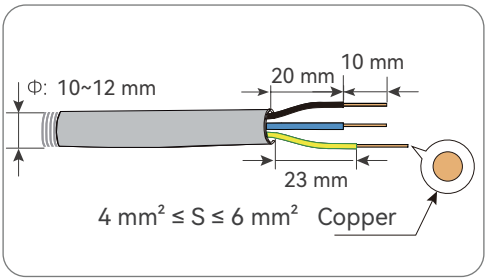


Figure 8-10 Striping the Cable

Step 2: Disassemble the AC connector as below. Remove rubber plugs based on the actual wire diameter.

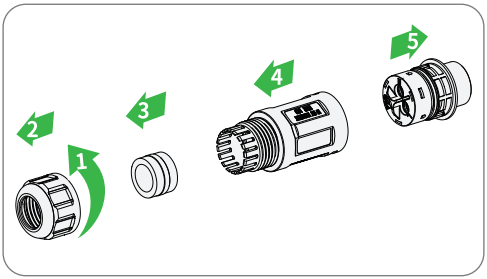


Figure 8-11 Disassembling the AC Connector

Step 3: Insert the crimped conductors L, N, and grounding conductor into the terminal block according to the labeling and tighten the terminal block screws.

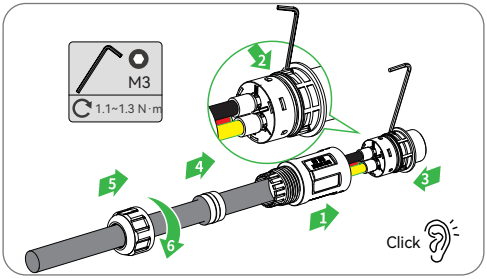


Figure 8-12 Assembling the AC Connector

Step 4: Remove the AC terminal caps and plug the assembled AC connectors into Grid terminal.

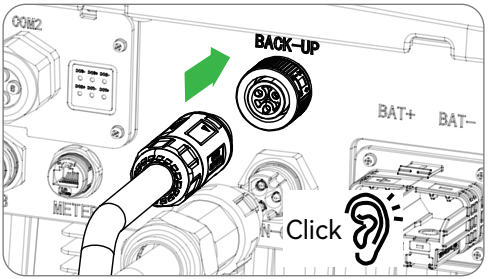


Figure 8-13 Installing the AC Connector to Inverter

8.4 PV Connection

DANGER!

- Do not connect the same PV string to multiple inverters, as it may cause damage.
- Before connecting the PV string to the inverter, please confirm the following information, otherwise it may cause permanent damage to the inverter, and in severe cases, it may cause fire, and lead to harm to personnel and property.
- Please make sure that the maximum short-circuit current and maximum input voltage of each MPPT are within the allowable range of the inverter.
- Make sure that the connection polarity of the PV string is correct.

WARNING!

- The PV string output does not support grounding, before connecting the PV string to the inverter, please ensure that the minimum insulation resistance of the PV string to ground meets the minimum insulation resistance.
- After the DC cable connection is completed, please ensure that is tight.
- Use a multimeter to measure the positive and negative poles of the DC cable to ensure that the positive and negative poles are correct and that there are no reverse connection. And ensure the voltage is within the permissible range.

Step 1: Strip approx. 7~8 mm of the cable insulation.

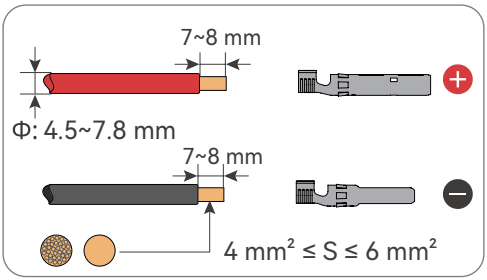


Figure 8-14 Striping the PV Cable

Step 2: Insert the stripped cable into the PV pin contact. Ensure that the stripped cable and the PV pin contact are of the same polarity. Crimp it with crimping tool for PV terminal.

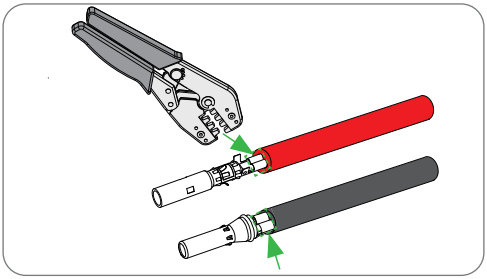


Figure 8-15 Inserting the PV pin contact and Crimping the terminal

Step 3: Thread the PV cable through swivel nut and insert the cable into the PV connector until a "Click" is heard. Gently pull the cable backward to ensure firm connection. Tighten the swivel nut clockwise. Verify that the PV connectors have the correct polarity before connection.

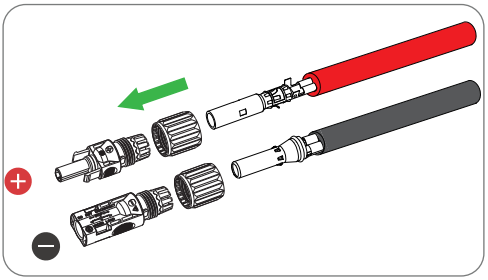


Figure 8-16 Threading the PV cable

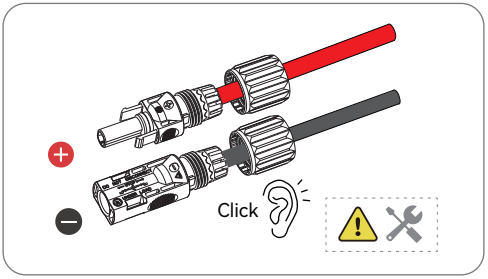


Figure 8-17 Securing the PV cable

Step 4: Use a multimeter to measure the positive and negative voltage of the assembled PV connectors. Make sure the open circuit voltage does not exceed the input limit of 550 V.

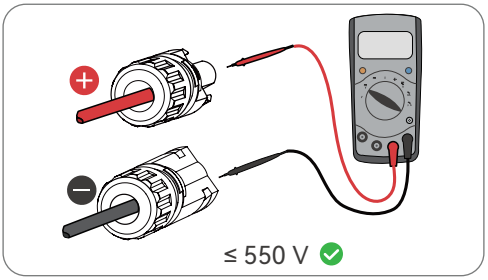


Figure 8-18 Measuring the Voltage of PV Connectors

Step 5: Remove the PV terminals caps and connect the assembled PV connectors to corresponding terminals until there is an audible "Click". The PV+ on the string side must be connected to the PV+ on the inverter side, and the PV− on the string side must be connected to the PV− on the inverter side.

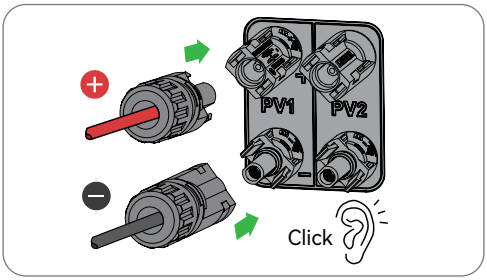


Figure 8-19 Connecting the PV cable

8.5 Battery Connection

DANGER!

- The battery used with the inverter needs to be approved by the inverter manufacturer. The lists of approved batteries can be obtained through the official website.
- Before connecting the PV string to the inverter, please confirm the following information, otherwise it may cause permanent damage to the inverter, and in severe cases, it may cause fire, and lead to harm to personnel and property.
- When the inverter is running, it is prohibited to connect and disconnect the battery cable, as illegal operation may cause the risk of electric shock.
- Do not connect the same battery pack to multiple inverters, as this may cause damage to the inverter.
- When connecting the battery cable, use an insulating tool to prevent accidental electric shock or short circuit of the battery.
- Please make sure that the battery open circuit voltage is within the allowable range of the inverter.
- A DC switch is required between the inverter and the battery.

WARNING!

- After completing the DC cable connection, please ensure that the cable connection is tight.
- Use a multimeter to measure the positive and negative poles of the DC cable to ensure that the positive and negative poles are correct and that there are no reverse connection. And ensure the voltage is within the permissible range.

Step 1: Strip approx. L1+2 mm of the cable insulation.

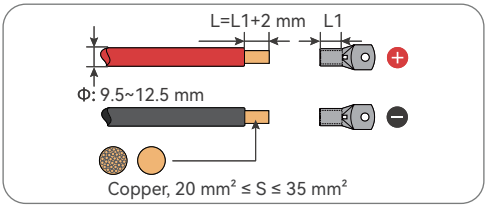


Figure 8-20 Striping the Battery Cable

Step 2: Open the spring.

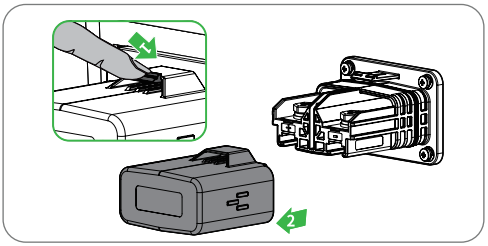


Figure 8-21 Open the Spring

Step 3: Disassemble the connector.

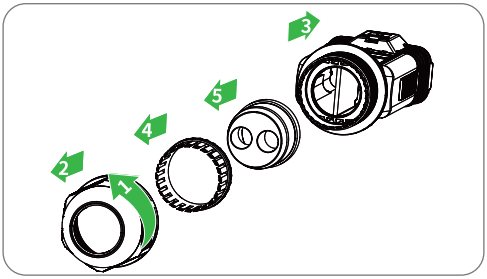


Figure 8-22 Disassemble the connector

Step 4: Carefully insert the stripped wire with twisted litz wires all the way in. The litz wire ends have to be visible in the spring.

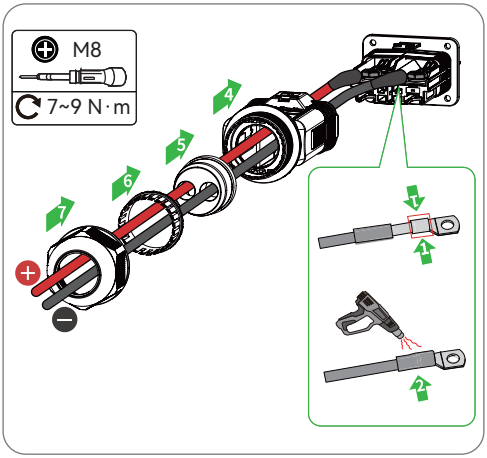


Figure 8-23 Insert the Wire

Step 5: Connect the assembled battery connectors to corresponding terminals.

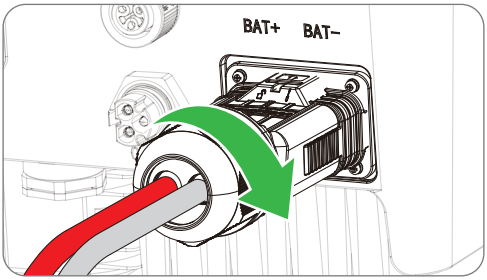


Figure 8-24 Connecting the battery Connector

8.6 Communication Connection

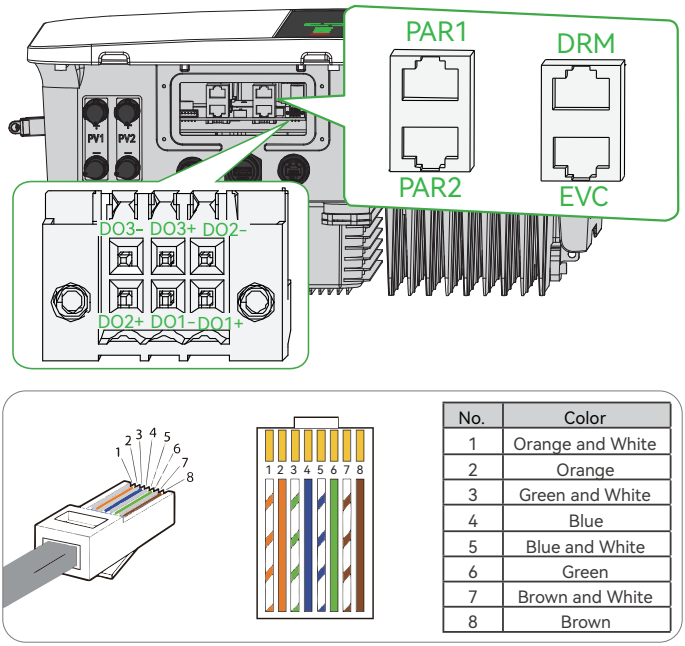
NOTICE

- Make sure that the communication device is connected to the right COM port. Route the communication cable far away from any interference source or power cable to prevent the signal from being influenced.

Table 8-2 Communication Connections PIN

Terminal	Connector	Color	PIN No.	PIN
COM1 / COM2	PAR1	Orange and White	1	485B
		Orange	2	485A
		Green and White	3	NC
		Blue	4	NC
		Blue and White	5	NC
		Green	6	NC
		Brown and White	7	CANH
		Brown	8	CANL
	PAR2	Orange and White	1	485B
		Orange	2	485A
		Green and White	3	NC
		Blue	4	NC
		Blue and White	5	NC
		Green	6	NC
		Brown and White	7	CANH
		Brown	8	CANL
	DRM	Orange and White	1	DRM1/5
		Orange	2	DRM2/6
		Green and White	3	DRM3/7
		Blue	4	DRM4/8
		Blue and White	5	REFGEN
		Green	6	COM/DRM0
		Brown and White	7	NC
		Brown	8	NC
	EVC	Orange and White	1	485_A

Terminal	Connector	Color	PIN No.	PIN
COM1 / COM2	EVC	Orange	2	485_B
		Green and White	3	FB_CTR_B
		Blue	4	FB_CTR_A
		Blue and White	5	NC
		Green	6	NC
		Brown and White	7	NC
		Brown	8	NC
	Connector	**PIN No.**		**PIN**
	Quick-Connect Terminal	1		DO3-
		2		DO3+
		3		DO2-
		4		DO2+
		5		DO1-
		6		DO1+



No.	Color
1	Orange and White
2	Orange
3	Green and White
4	Blue
5	Blue and White
6	Green
7	Brown and White
8	Brown

Figure 8-25 Terminals and PINs

Step 1: Cut the communication cable as needed. Use wire strippers to strip the outer jacket of the cable to expose the inner wires.

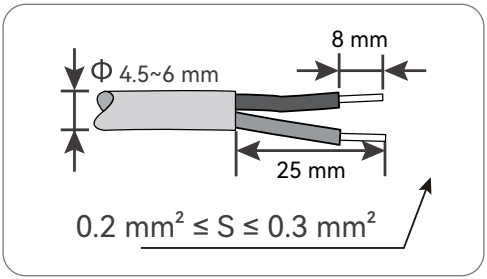


Figure 8-26 Striping the COM Cable

Step 2: Anti-clockwise loosen the swivel nut and pull out the sealing plugs. Keep them still in the cable support sleeve if you choose not to connect the cable. Thread the cable through the swivel nut, cable support sleeve, and connector enclosure in sequence.

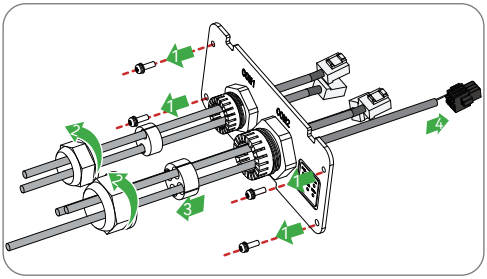


Figure 8-27 Inserting the Wires

Step 3: Secure the assembled connector on COM terminal.

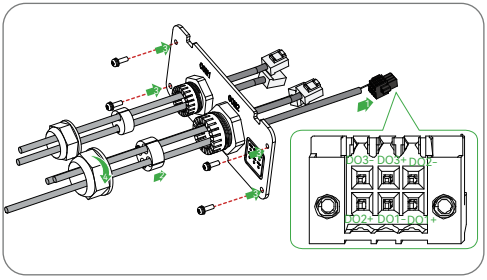


Figure 8-28 Securing the Connector

8.6.1 DRM Connection

According to AS/NZS 4777.2, the inverter needs to support the function of demand response mode (DRM). With the use of an external control box, active or reactive power regulation can be realized in a timely and fast manner, and the inverter can be operated stably during the process of regulation.

DRM 0~8 is available now.

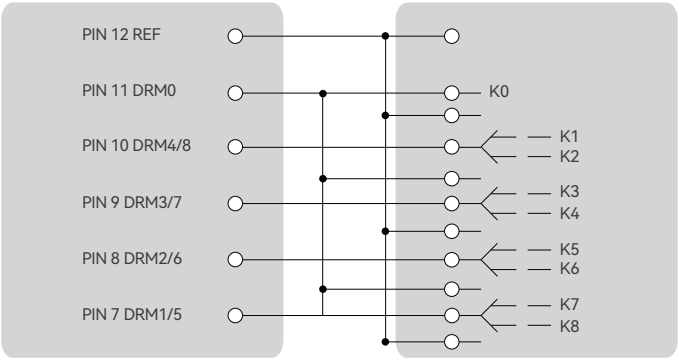


Table 8-3 DRM Operation

DRM Command	Switch	Function
DRM_MODE_0	K0	Power off
DRM_MODE_1	K7	No input power
DRM_MODE_2	K6	Input power less than 50% of rated power
DRM_MODE_3	K3	Input power less than 75% of rated power, release of maximum reactive power
DRM_MODE_5	K8	No output power
DRM_MODE_6	K5	Output power less than 50% of rated power
DRM_MODE_7	K4	Output power less than 75% of rated power, maximum reactive power absorption
DRM_MODE_1&2	K6, K7	Input power drops to 0 while not going off-grid
DRM_MODE_2&3	K3, K6	Input power less than 50% of rated power, release of maximum reactive power
DRM_MODE_5&6	K8, K5	Output power drops to 0 while not going off-grid
DRM_MODE_6&7	K5, K4	Output power less than 50% of rated power, maximum reactive power absorption

8.7 BMS, Smart Meter and CT Connection

Connecting the Battery BMS Communication and Meter Communication cables.

NOTICE

- Each inverter needs to be connected to one Meter independently. Do not connect multiple inverters to the same Meter.
- Confirm the following items for a proper use of the Meter and CT:

  1. Ensure that CT connects with the corresponding phase line: CT1 is connected to L1; CT2 is connected to L2; and CT3 is connected to L3.

  2. Connect CT according to the pointing direction of the Meter. It will display CT reverse fault on the inverter if it is the opposite direction.

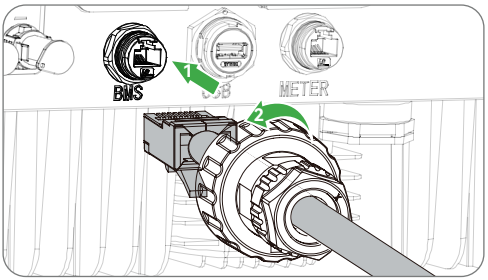


Figure 8-29 BMS Connection

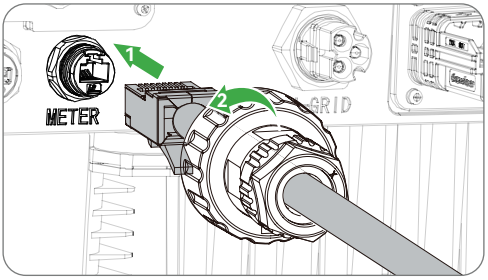


Figure 8-30 Meter Connection

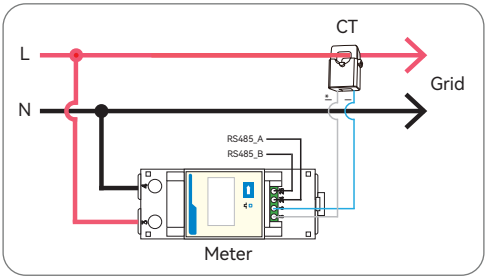


Figure 8-31 CT Connection

NOTICE

CT's arrow pointing to grid.

Table 8-4 PINs of BMS and Meter

Terminal	Connector	PIN No.	PIN
BMS	RJ45	1	TEMP+
		2	NC
		3	TEMP-
		4	CAN_H
		5	CAN_L
		6	NC
		7	RS485_A
		8	RS485_B
Meter	RJ45	1	NC
		2	NC
		3	NC
		4	485A
		5	485B
		6	NC
		7	NC
		8	NC

9.1 Check before Power-on

Serial	Checklist
1	The inverter installed firmly that easily for operation and maintenance.
2	All lines, including PE, PV, Battery, AC and communication, are connected correctly and firmly.
3	The cable bundling complies with the wiring requirements, is properly distributed, and free from damage.
4	Ensure that a waterproof cover is installed for unused wire holes.
5	Ensure that the used wire holes have been sealed.
6	Verify that the voltage and frequency of installed location meet the grid-tied requirement.

9.2 Powering on the System

Before turning on the AC switch between the inverter and the grid, use a multimeter to check that the AC voltage is within the allowed range.

Step 1: Turn on the AC circuit breaker on the ON-GRID side of the inverter.

Step 2: Turn on the AC circuit breaker on the BACK-UP side of the inverter.

Step 3: Turn on the energy storage circuit breaker between the inverter and the battery.

Step 4: Turn on the DC switch of the inverter.

NOTICE

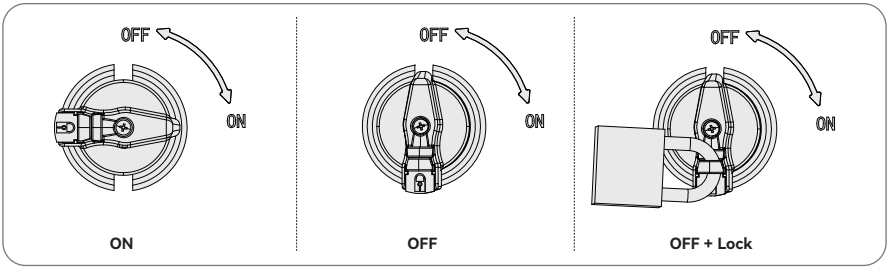
Please set the inverter parameters first via YiCloud app to ensure its normal operation. For details, please refer to 9.4 Setting Parameters via YiCloud App.

Step 5: Send a system check command on the APP (optional).

Step 6: Observe the LEDs to check the inverter operating status.

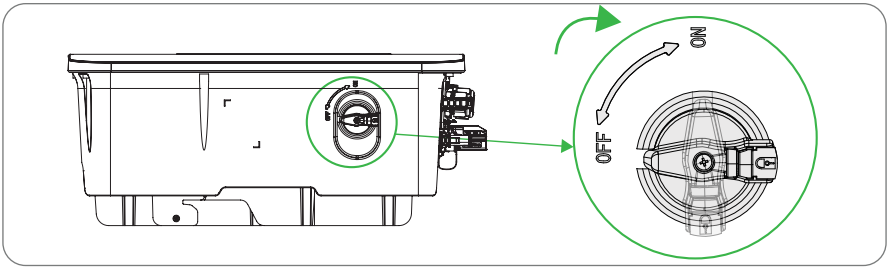
9.3 Operation of Lockable DC Switch

The lockable DC switch includes 3 states: ON, OFF, and OFF + Lock. The DC switch is in the OFF state by default.



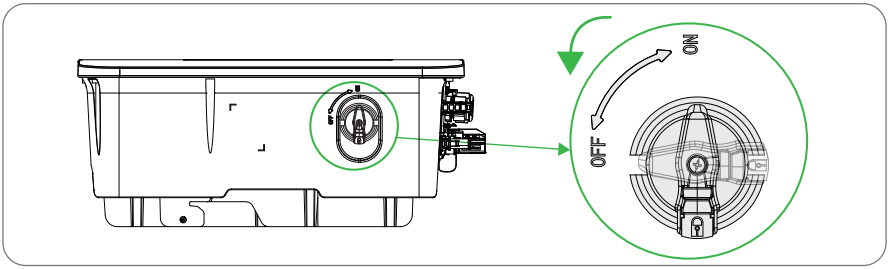
Turn on the DC switch

Turn on the DC switch from OFF state to ON state



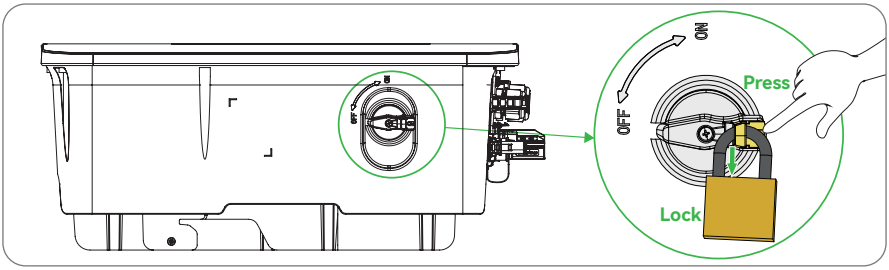
Turn off the DC switch

Rotate the DC switch from ON state to OFF state.



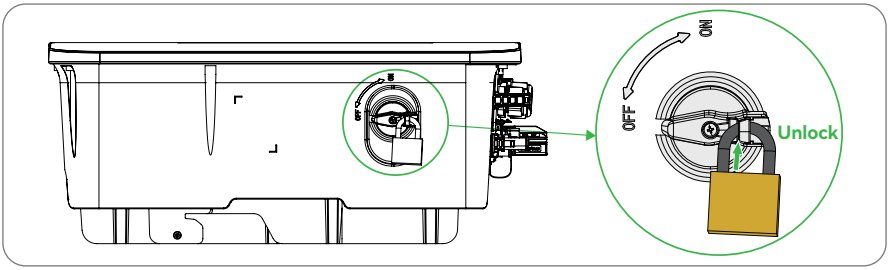
Lock the DC switch

Press the buckle and add a lock to the switch, and hearing a 'click' sound indicates that it is locked.



Unlock the DC switch

Remove a lock.



NOTE

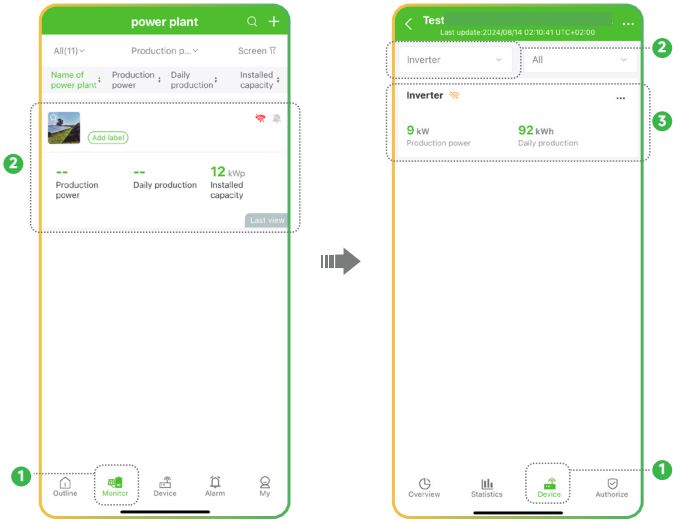
The lock needs to be provided by yourself.

9.4 Setting Parameters via YiCloud App

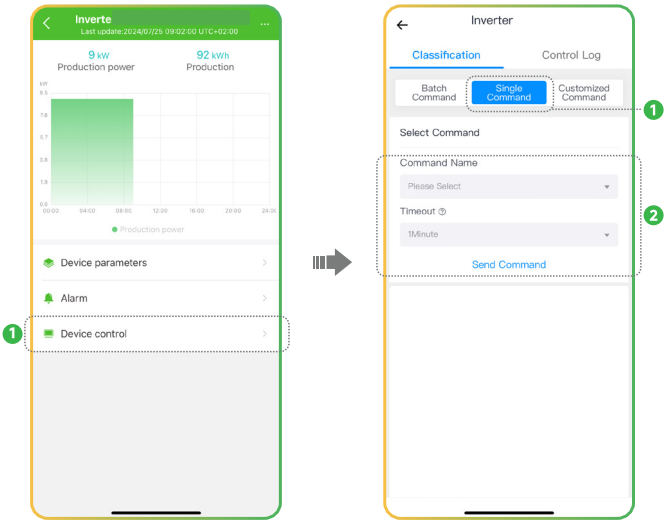
9.4.1 Setting Grid Code

Step 1: Log in to the YiCloud app. On the **Monitor** screen, find your own power plant.

Step 2: Select **Device**, choose **Inverter** in the drop-down list. Find your inverter in the table.



Step 3: Select certain Inverter, then **Device Control** > **Single Command**. The Command name is displayed.

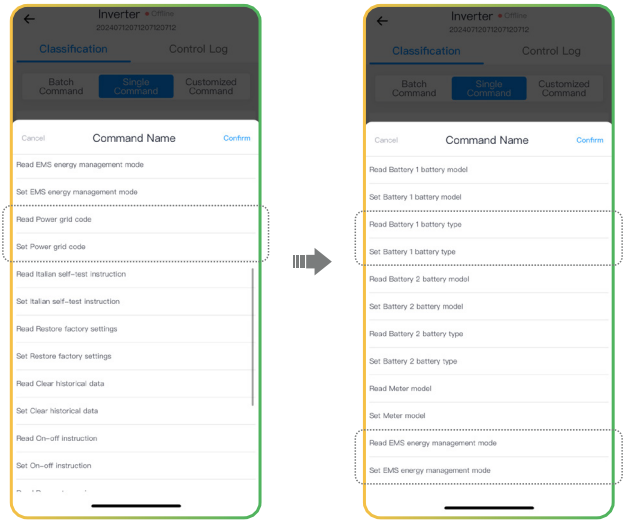


Step 4: Select **Set Power Grid**, and select the corresponding Country's name or Country Code.

NOTE

The grid code should be chosen at this step. And the parameters also should be set if the grid company has the different requirements.

You can also **Set Battery Type** and **Set EMS Energy Management Mode** through selecting the corresponding commands in the list, and then set the **Inputs**.



Step 5: Click **Send Command**.

9.4.2 Setting Device Control

Step 1: Log in to the YiCloud app. On the **Monitor** screen, find your own power plant.

Step 2: Select **Device**, choose **Inverter** in the drop-down list. Find your inverter in the table.

Step 3: Select certain Inverter, then **Device Control** > **Batch Command**.

SOC

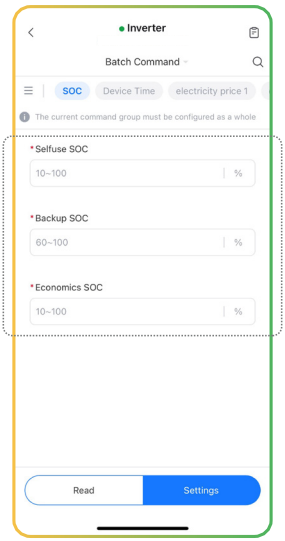


Table 9-1 SOC Parameters

Item	Description
Selfuse SOC	Set the SOC of Selfuse Mode
Backup SOC	Set the SOC of Backup Mode
Economics SOC	Set the SOC of Economics Mode

Device Time

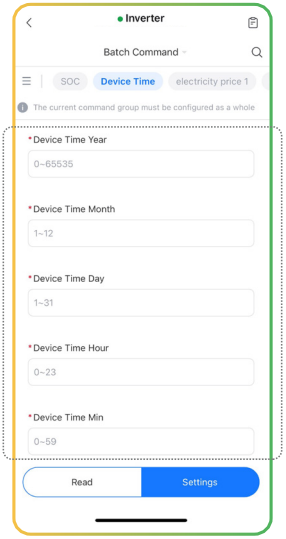


Table 9-2 Device Time Parameters

Item	Description
Device Time Year	Set the year of the device time
Device Time Month	Set the month of the device time
Device Time Day	Set the day of the device time
Device Time Hour	Set the hour of the device time
Device Time Min	Set the min of the device time
Device Time Sec	Set the second of the device time
Device Time Week	Set the week of the device time

Electricity Price 1 & Electricity Price 2

We can set peak-valley period and peak-valley flat electricity price through these two interfaces.

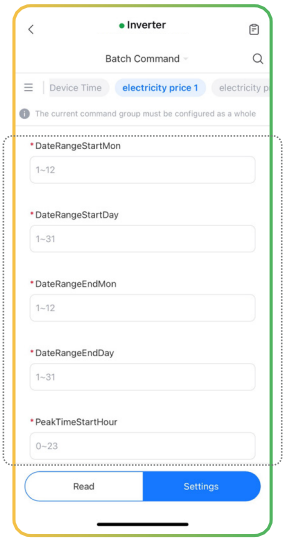


Table 9-3 Electricity Price Parameters

Item	Description
DateRangeStartMon	Set the start month of the price range
DateRangeStartDay	Set the start day of the price range
DateRangeEndMon	Set the end month of the price range
DateRangeEndDay	Set the end day of the price range
PeakTimeStartHour	Set the start hour of the peak time
PeakTimeEndHour	Set the end hour of the peak time
PeakPriceOut	Set the peak price
ValleyTimeStartHour	Set the start hour of the valley time
ValleyTimeEndHour	Set the end hour of the valley time
ValleyPriceOut	Set the Valley price
NormalPriceOut	Set the Normal price

Item	Description
Sell Price1 Time Start Hour	Set the start hour of the price1 time
Sell Price1	Set the Sell price1
Sell Price1 Time End Hour	Set the end hour of the price1 time
Sell Price2 Time Start Hour	Set the start hour of the price2 time
Sell Price2	Set the Sell price2
Sell Price2 Time End Hour	Set the end hour of the price2 time
Sell Price3 Time Start Hour	Set the start hour of the price3 time
Sell Price3	Set the Sell price3
Sell Price3 Time End Hour	Set the end hour of the price3 time

Dry Point 1

The dry point is mainly an output I/O signal point. You need to set the corresponding mode of the dry point based on the connected objects.

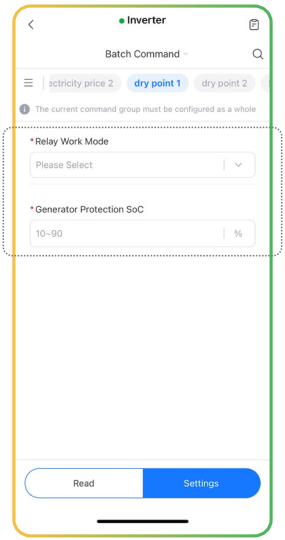


Table 9-4 Dry Point 1 Parameters

Item		Description
Relay Work Mode	No Disable	The dry point remains disconnected
	Earth Fault	Connect when the auxiliary DSP leakage current fault or insulation impedance alarm occurs, and disconnect otherwise
	Generator	In the dry point disconnected state, if the BMS communication is normal and the battery SOC is smaller than the SOC of the Generator protection, the dry point is connected. When the dry point is disconnected, if the SOC of the battery is greater than the SOC of the Generator protection, the battery is disconnected.
Generator Protection SoC		Set the SOC of the Generator protection

Dry Point 2

The dry point is mainly an output I/O signal point. You need to set the corresponding mode of the dry point based on the connected objects.

You can first set the mode in the Relay Load Mode.

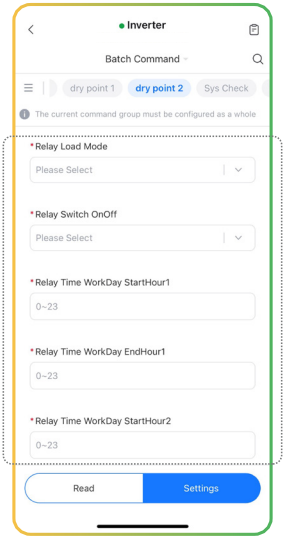


Table 9-5 Dry Point 2 Parameters

Item		Description
Relay Work Mode	RELAY MODE LOAD NULL	The dry point remains disconnected
	RELAY MODE LOAD Switch	Manually set the command to connect when the command is issued, otherwise it will disconnect.
	RELAY MODE LOAD Time	The device time is connected within the scheduled time period, otherwise it is disconnected.
	RELAY MODE LOAD Intelligent	If the device time is within the scheduled time period or the connecting duration has not ended, the dry point will be connected. If the device time is not within the scheduled time period and the connecting duration has expired, the dry point will disconnect. (The connecting duration starts counting from the scheduled time point).
	RELAY MODE LOAD Backup	In the dry point disconnect state, if the BMS communication is normal and the battery SOC is less than the load's backup protection SOC, it will be connected; in the dry point connected state, if the battery SOC is greater than the load's backup protection SOC, it will be disconnected.
Relay Switch OnOff		Set Disconnect or Connect load in the RELAY MODE LOAD Switch
Relay Time WorkDay StartHour1		In the RELAY MODE LOAD Time, set the start time of Timing 1 (Hour)
Relay Time WorkDay EndHour1		In the RELAY MODE LOAD Time, set the end time of Timing 1 (Hour)
Relay Time WorkDay StartHour2		In the RELAY MODE LOAD Time, set the start time of Timing 2 (Hour)
Relay Time WorkDay EndHour2		In the RELAY MODE LOAD Time, set the end time of Timing 2 (Hour)
Relay Intelligent WorkDay StartHour1		In the RELAY MODE LOAD Intelligent, set the start time of Timing (Hour)
Relay Intelligent WorkDay EndHour1		In the RELAY MODE LOAD Intelligent, set the end time of Timing (Hour)
Relay Intelligent Load Consumption Time		In the RELAY MODE LOAD Intelligent, set the minimum connect time (Minute)
Relay Intelligent Nominal Power Of Load		In the RELAY MODE LOAD Intelligent, select the minimum power on load
Relay Backup Protection SoC		Set the protection SoC in the RELAY MODE LOAD Backup

Bat

Table 9-6 Bat Parameters

Item	Description
Max SOC	Set the Max SOC of the battery
Min SOC	Set the Min SOC of the battery
Bat Min Add Power	Set the minimum supplementary battery power

VRT

Some of the parameters of the over- and under-voltage protection can be viewed. There are three levels of over-undervoltage protection.

The first level of over-undervoltage protection is enabled by default and cannot be turned off; the second / third level of over-undervoltage protection can be selectively turned on according to **VRT_FunCode**. The over-under-voltage protection value and maintenance time of the first / second / third level of over-under-voltage protection can be set.

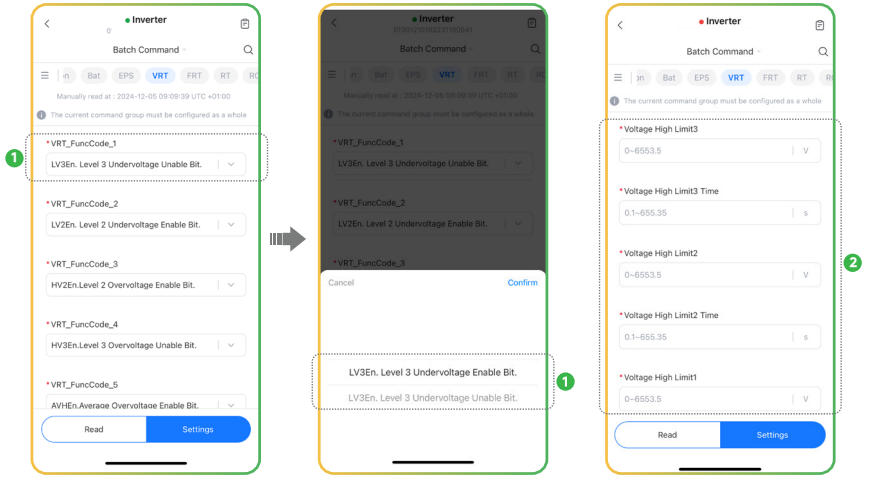


Table 9-7 VRT Parameters

Item	Description
VRT_FuncCode1	Set Level 3 undervoltage to enable or disable
VRT_FuncCode2	Set Level 2 undervoltage to enable or disable
VRT_FuncCode3	Set Level 2 overvoltage to enable or disable
VRT_FuncCode4	Set Level 3 overvoltage to enable or disable
VRT_FuncCode5	Set average overvoltage to enable or disable
VRT_FuncCode6	Set the low voltage crossing report to enable or disable
VRT_FuncCode7	Set the high voltage crossing report to enable or disable
VRT_FuncCode8	Set short disconnection recovery and no recovery
VRT_FuncCode9	Set Restore stable delivery valid or invalid
VRT_FuncCode10	Set instantaneous overvoltage to enable or disable

Item	Description
Voltage High Limit3	Set the voltage to cross the level 3 overvoltage point
Voltage High Limit3 Time	Level 3 overvoltage point maintenance time
Voltage High Limit2	Set the voltage to cross the level 2 overvoltage point
Voltage High Limit2 Time	Level 2 overvoltage point maintenance time
Voltage High Limit1	Set the voltage to cross the level 1 overvoltage point
Voltage High Limit1 Time	Level 1 overvoltage point maintenance time
Voltage Low Limit1	Set the voltage to cross the level 1 undervoltage point
Voltage Low Limit1 Time	Level 1 undervoltage point maintenance time
Voltage Low Limit2	Set the voltage to cross the level 2 overvoltage point
Voltage Low Limit2 Time	Level 2 overpressure point maintenance time
Voltage Low Limit3	Set the voltage to cross the level 3 overvoltage point
Voltage Low Limit3 Time	Level 3 overpressure point maintenance time
Recovery Stable Time	Set the recovery stabilization time
10 Min Avg Voltage	Set the 10-minute overvoltage value
VRT_En	The voltage crossing function is enabled
VRT_HighLimit	Set high start voltage
VRT_Low Limit	Set low start voltage
Transient Over Voltage	Set the instantaneous overvoltage value
Transient Over Time	Set the instantaneous overvoltage judgment time

FRT

In FRT you can view some parameters of the over- and under-frequency protection. There are three levels of over-underfrequency protection.

The first level of over-underfrequency protection is enabled by default and cannot be turned off; the second / third level of over-underfrequency protection can be selectively turned on according to **FRT_FunCode**. One / two / three levels of over-under-voltage protection value and maintenance time can be set.

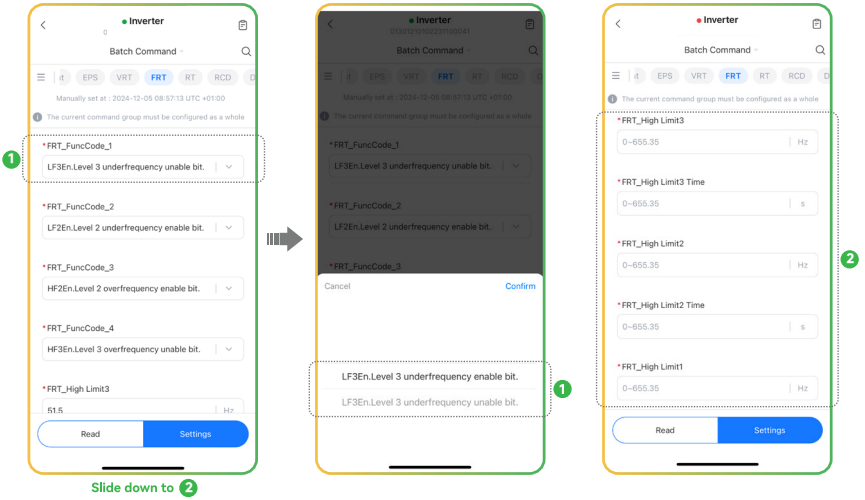


Table 9-8 FRT Parameters

Item	Description
FRT_FuncCode1	Set Level 3 underfrequency to enable or disable
FRT_FuncCode2	Set Level 2 underfrequency to enable or disable
FRT_FuncCode3	Set Level 2 overfrequency to enable or disable
FRT_FuncCode4	Set Level 3 overfrequency to enable or disable
FRT_High Limit3	Set the frequency to cross the level 3 overfrequency point
FRT_High Limit3 Time	Set the level 3 overfrequency point maintenance time
FRT_High Limit2	Set the frequency to cross the level 2 overfrequency point
FRT_High Limit2 Time	Set the level 2 overfrequency point maintenance time
FRT_High Limit1	Set the frequency to cross the level 1 overfrequency point
FRT_High Limit1 Time	Set the level 1 overfrequency point maintenance time

Item	Description
FRT_Low Limit1	Set the frequency to cross the level 1 underfrequency point
FRT_Low Limit1 Time	Set the level 1 underfrequency point maintenance time
FRT_Low Limit2	Set the frequency to cross the level 2 underfrequency point
FRT_Low Limit2 Time	Set the level 2 underfrequency point maintenance time
FRT_Low Limit3	Set the frequency to cross the level 3 underfrequency point
FRT_Low Limit3 Time	Set the level 3 underfrequency point maintenance time

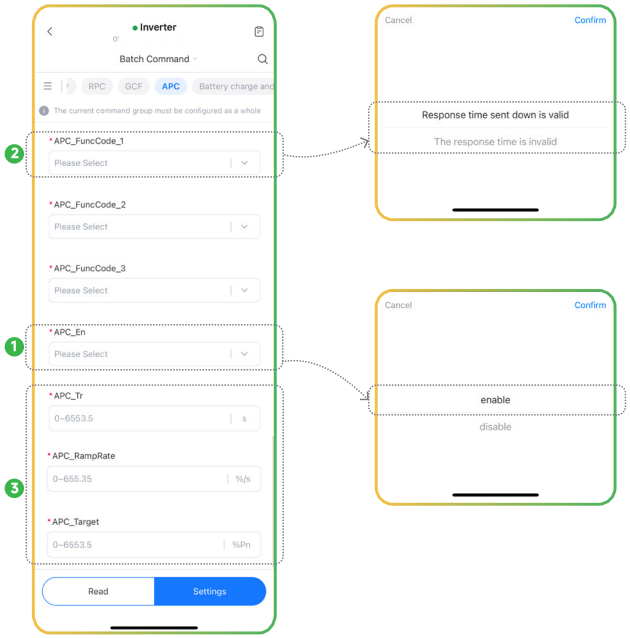
APC

Step 1: Swiped right the menu bar of **Batch Command** and select **APC**.

Step 2: Select **Enable** in the drop-down box of **APC_En** to enable Active Power Control.

Step 3: Set Function code in the drop-down box of APC_FunCode.

Step 4: Slide down the surface and set the corresponding values.

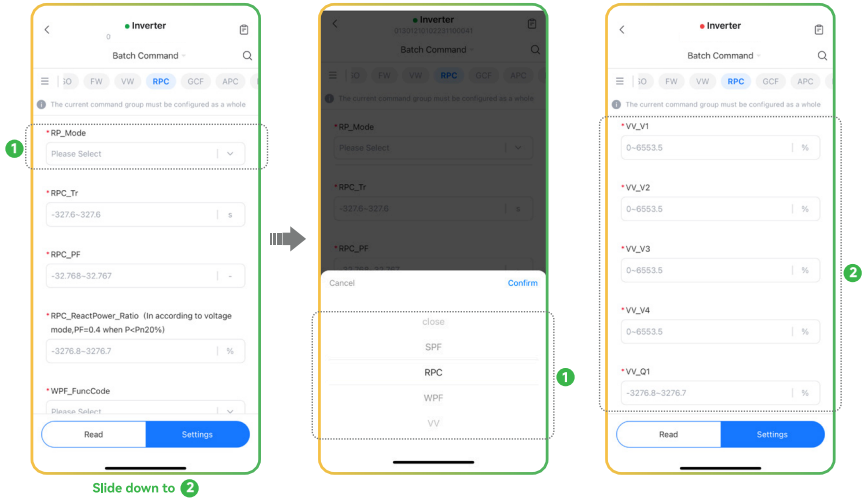


RPC

Step 1: Swiped right the menu bar of **Batch Command** and select **RPC**.

Step 2: Set parameters in the drop-down box of **RPC_Mode**.

Step 3: Slide down the surface and set the corresponding values.



Sys Check

After the inverter is installed. Use this command to check whether the installation is correct.

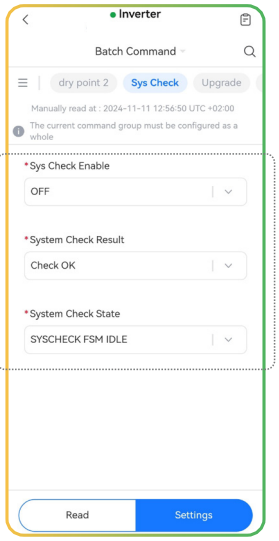


Table 9-9 Sys Check Parameters

Item	Description
Sys Check Enable	OFF is invalid, select ON to start the sys check.Then the sound of the relay jumping can be heard.
System Check Result	If there are multiple errors, the check result can only provide one direction for troubleshooting.
System Check State	Read the results 5 minutes after the start of the check. If the system check status is “SYSCHECK FSM IDLE” or “SYSCHECK FSM SHUTDOWN”,the check is complete. “SYSCHECK FSM IDLE” means no errors,the system check result will be “CHECK OK”. “SYSCHECK FSM SHUTDOWN” means there is at least one error, the system check result will tell you what errors may occur.

Safety

Table 9-10 Safety Parameters

Item	Description
National and Grid Integration Standards	Select by region. “Germany/European Union/UK G99/UK G98/ Poland/Czech Republic/Austria/Based on 4105/Based on 50549/ Switzerland/Italy/Australia”.If you choose a standard, the inverter will automatically configure other attached grid parameters when you send it. You can read them again and customize some grid parameters.
Rated Voltage	Select according to the local grid.
Rated Frequency	Select according to the local grid.

Grid Situation

Table 9-11 Grid Situation Parameters

Item	Description
GridIn Power Limitation	When the gridin power needs to be controlled, select this option.For example, when the power of the household cable is insufficient or too old.
Three Phase Unbalance Enable	When the feed power needs to be controlled, select this option. Select OFF. The unbalanced power of the load is provided by the grid. The three phase sum of the feed grid power is 0. Select ON. The unbalanced power of the load is provided by the inverter. The feed grid power of each phase is 0.

RT

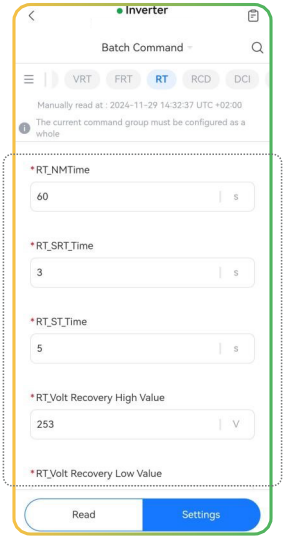


Table 9-12 RT Parameters

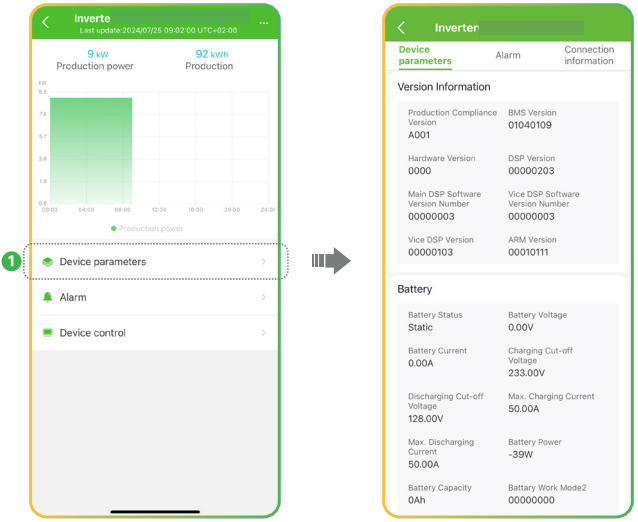
Item	Description
RT_NMTime	The waiting time after the grid is restored.
RT Volt Recovery High Value	When the grid voltage is within this range, reconnect
RT Volt Recovery Low Value	
RT Freg Recovery High Value	When the grid voltage is within this range, reconnect
RT Freg Recovery Low Value	

9.4.3 Check Device Parameters

Step 1: Log in to the YiCloud app. On the **Monitor** screen, find your own power plant.

Step 2: Select **Device**, choose **Inverter** in the drop-down list. Find your inverter in the table.

Step 3: Select certain Inverter, then **Device Parameters**. The parameters including **Version Information** and **Battery** are displayed.



10.1 Introduction of LED

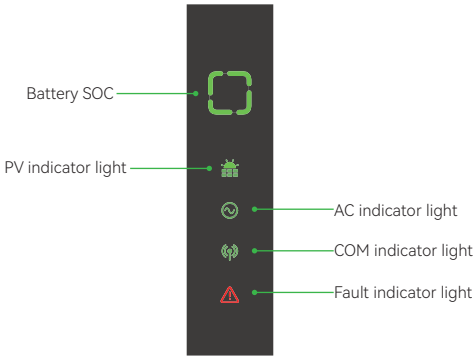


Figure 10-1 LED Panel

Table 10-1 LED Description

Item	Status		Description
PV		Always on	PV is generating power
		Blink 1	PV power is low (≤30% rated power)
		Off	PV is not working
AC		Always on	Grid is active and connected
		Blink 1	Grid is disconnected but EPS is on
		Off	Grid is disconnected and EPS is off
COM		Always on	Both BMS and meter communication are OK
		Blink 1	Communication of BMS is OK; meter fails
		Blink 2	Communication of meter is OK; BMS fails
		Off	Both BMS and meter communications are fails
FAULT		Always on	A fault has occurred
		Blink 1	RCM or IRD fault
		Off	No fault

Table 10-2 Battery LED Description

Item	Status		Description
 SOC		Always on	Battery SOC is 75%~100%
		3/4 on	Battery SOC is 50%~75%
		2/4 on	Battery SOC is 25%~50%
		1/4 on	Battery SOC is 10%~25%
		1/4 blink 1	Battery SOC is below 10%
		Full off	Battery is disconnected / not active

NOTICE

- Blink 1 means on for 0.5 s and then off for 0.5 s, blink 2 means on for 0.5 s and then off for 1 s.

11.1 Introduction of YiCloud

YiCloud provides customers with a platform that can monitor Yinergy inverter data and set it remotely. You can log in to your user account at any time through a personal computer, IOS or Android device to view real-time monitoring data or historical data, and perform remote settings as needed.

11.2 Operation on YiCloud Web

Open a browser and enter globalhome.yienergy.com to complete registration, login, add sites and other related operations according to the guidelines of user guide.

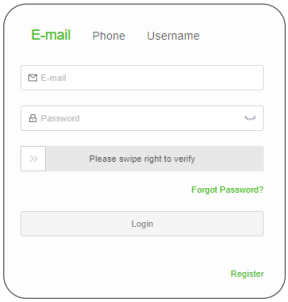


Figure 11-2 YiCloud Web

11.3 Operation on YiCloud App

11.3.1 Downloading and Installing App

Select and scan the QR code below to download YiCloud APP. In addition, you can search with the key word YiCloud in Apple Store or Google Play to download it.

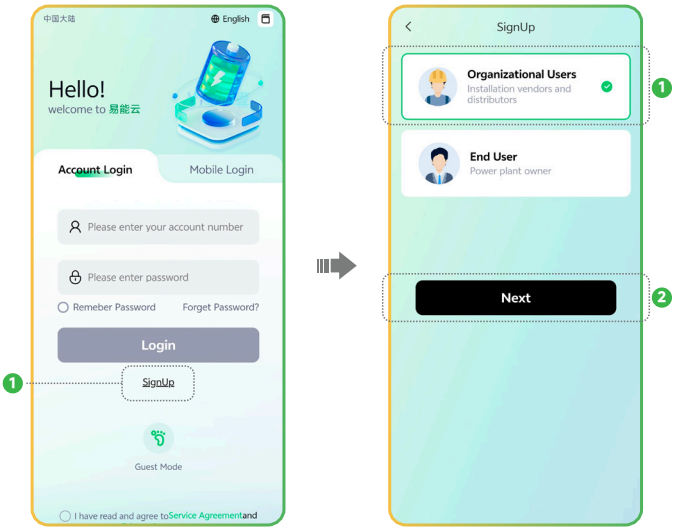
Android & IOS

Figure 11-1 QR Code

11.3.2 Create an Account

Step 1: Click **Sign Up** on the Home interface.

Step 2: Select **Organizational Users** on the interface of **Sign Up** to create an organizational account, then click **Next**.



Step 3: Configure your information.

Step 4: Check **I have read and agree to Service Agreement and Privacy Agreement**, then click **Sign Up Now**.

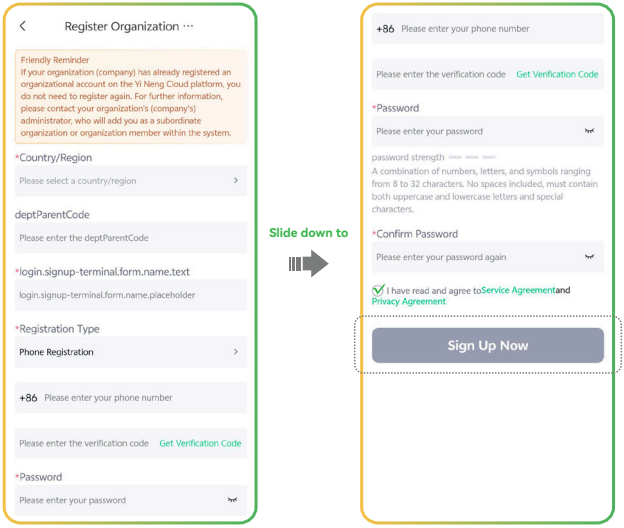


Table 11-1 Register Organizational Users Configuration

Item	Description
Country / Region	Fill in the country (region) where the organization is located.
Dept Parent Code	Entering a dept parent code means that your newly created organization is a child of that organization; not entering a dept parent code means that your organization is the parent organization. Registering an end user does not require a dept parent code, there is no organization information, and the rest of the process is the same as registering an organizational user.
Login. Signup-terminal. form. name. text	Custom the organizational acronym to login easily.
Registration Type	Can be divided into Phone registration and E-mail registration.
Account	Setting the account.
Password	Setting the password.
Confirm Password	Re-confirm your Password.

11.3.3 Create a Power Station

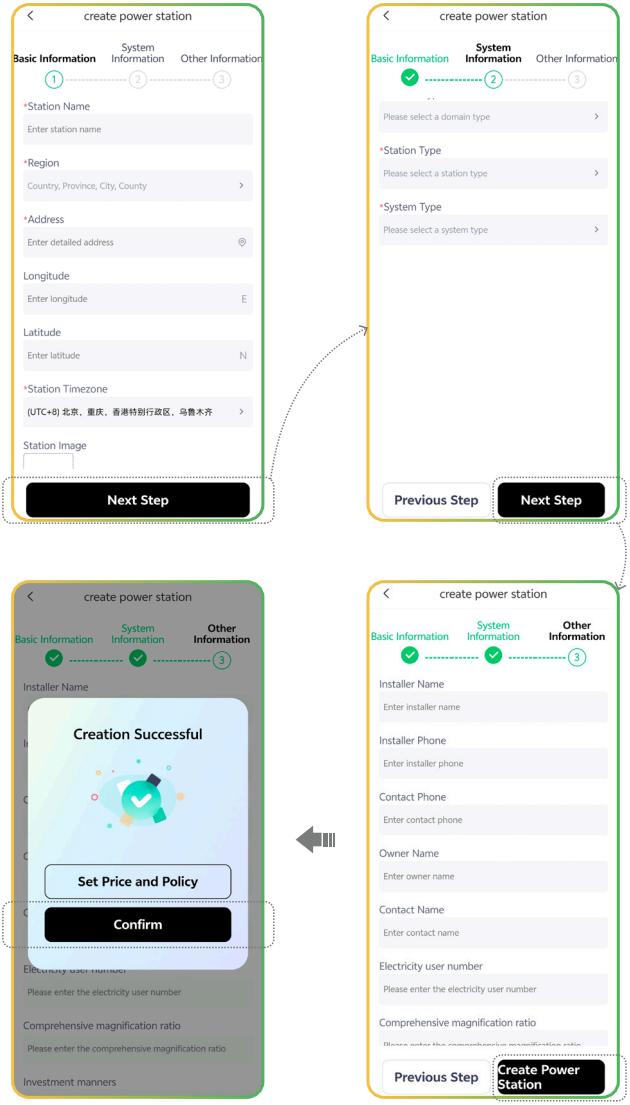
Step 1: Click **Monitor** on the Home interface.

Step 2: Choose **Power Station** on the top bar, and click +.

Step 3: Configure station information on the Create Power Station page.

Step 4: Click **Create Power Station**.

Step 5: Click **Confirm** on the pop-up.



Basic Information

Item	Description
Station Nama	Enter the name of the power station.
Region	Select Country, Province, City, County.
Address	Enter the location where the power station is located, which can be added in two ways: • Manual Input: manually enter the location of the power station in the input box. • Automatic Acquisition: the system automatically acquires the address of the location of the power station.
Longitude / Latitude	After getting the address, the latitude and longitude will be filled automatically, or you can fill in the latitude and longitude by yourself.
Station Timezone	Select the timezone of the power station.
Station Image	Upload a picture of the power station.

System Information

Item	Description
Domain Type	Select the type of power station domain.
Station Type	Select the type of power station.
System Type	Select the type of power station system. Selecting a different system type brings up different parameters to be filled in.

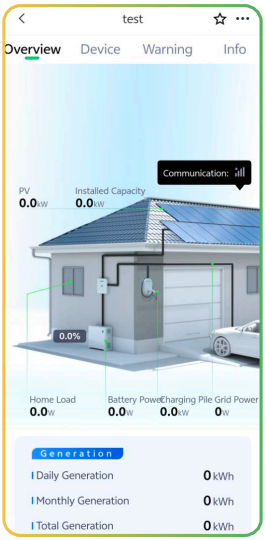
Other Information

Item	Description
Installer Name	Enter installer's name.
Installer Phone	Enter installer's phone number.
Contact Phone	Enter contact phone number.
Owner Name	Enter owner's name.
Contact Name	Enter contact name.
Electricity User Number	Enter Electricity User Number.

Other Information

Item	Description
Comprehensive Magnification Ratio	Enter Comprehensive Magnification Ratio.
Investment Approach	Enter the investment approach.
Investor	Enter the investor's name.

Step 6: Now the new power station have been created. Tap the power station to review the information.

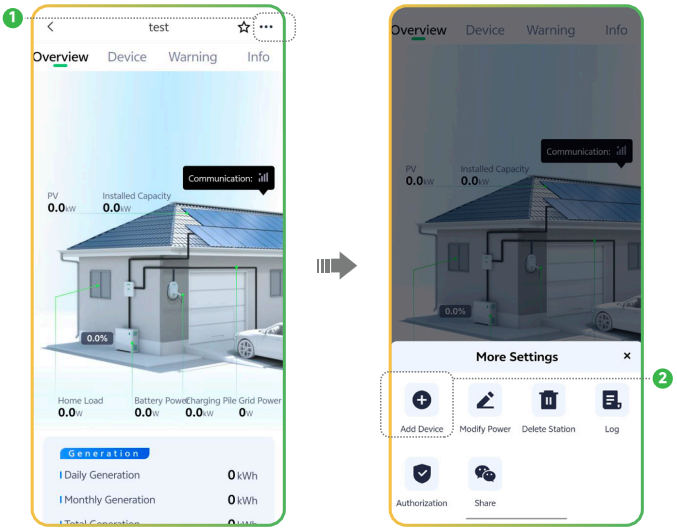


11.3.4 Add a Device

Adding devices can be categorized into scanning QR code and manual input.

Step 1: Click ●●● on the top right corner of the station details to bring up the **More Settings** pop-up.

Step 2: Select **Add Device**.



Scan QR Code

Step 1: The first time you will be prompted for camera privilege access.

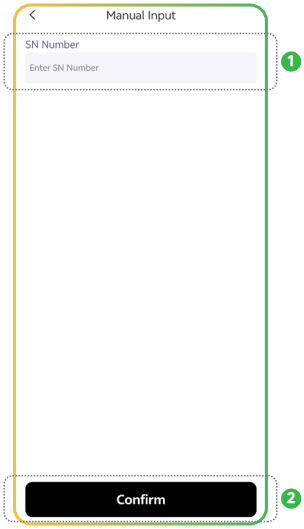
Step 2: Scan the QR code on the device, make sure the software recognizes it correctly and click **OK** to successfully add the device.

Manual Input

Step 1: Click **Manual Input** to go to the Manual Input interface.

Step 2: Manually enter the serial number (SN) of the device.

Step 3: Click **Confirm**.



12.1 Disconnecting the Inverter from Voltage Sources

Prior to performing any work on the product, always disconnect it from all voltage sources as described in this section. Always adhere to the prescribed sequence.

WARNING!

- Danger to life due to electric shock from destruction of the measuring device due to overvoltage!
- Please pay attention to all loads.
- Overvoltage can damage a measuring device and result in voltage being present in the enclosure of the measuring device. Touching the live enclosure of the measuring device results in death or lethal injuries due to electric shock.
- Only use measuring devices with a DC input voltage range of 1100 V or higher.

Step 1: Disconnect the miniature circuit breaker and secure against reconnection.

Step 2: Disconnect the DC switch and secure against reconnection.

Step 3: Wait until the LEDs have gone out.

Step 4: Use a current clamp meter to ensure that no current is present in the DC cables.

DANGER!

- DaPlease pay attention to all loadsnger to life due to electric shock when touching exposed DC conductors or DC plug contacts if the DC connectors are damaged or loose!
- The DC connectors can break or become damaged, become free of the DC cables, or no longer be connected correctly if the DC connectors are released and disconnected incorrectly. This can result in the DC conductors or DC plug contacts being exposed. Touching live DC conductors or DC plug connectors will result in death or serious injury due to electric shock.
- Wear insulated gloves and use insulated tools when working on the DC connectors.
- Ensure that the DC connectors are in perfect condition and that none of the DC conductors or DC plug contacts are exposed.
- Carefully release and remove the DC connectors as described in the following.

Step 5: Release and remove DC plug connectors, insert a wrench tool into the slots and press the wrench tool with an appropriate force.

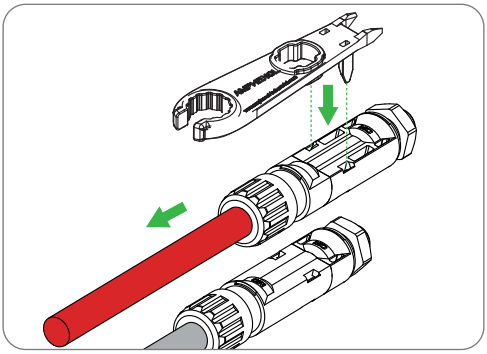


Figure 12-1 Remove DC Connectors

Step 6: Ensure that no voltage is present between the positive terminal and negative terminal at the DC inputs using a suitable measuring device.

Step 7: Disconnect the AC connector: Loosen the screw on the latch with a screwdriver.

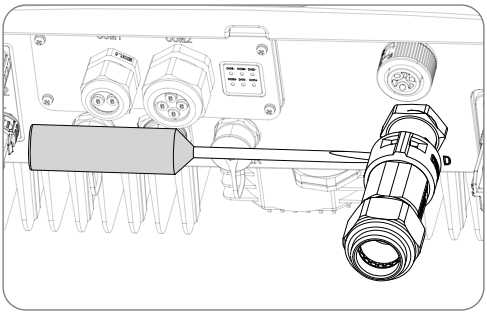


Figure 12-2 Loosening the Screw

Step 8: Slightly pull the connector out.

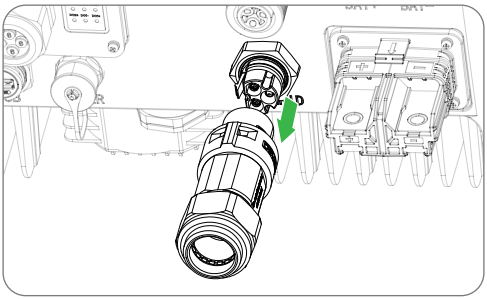


Figure 12-3 Pulling the Connector Out

Step 9: Loosen and remove the BACKUP Load connector. Rotate the latch. Remove the female end of the cable to unlock the account.

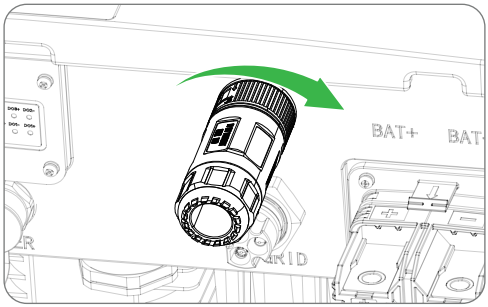


Figure 12-4 Rotating the Latch

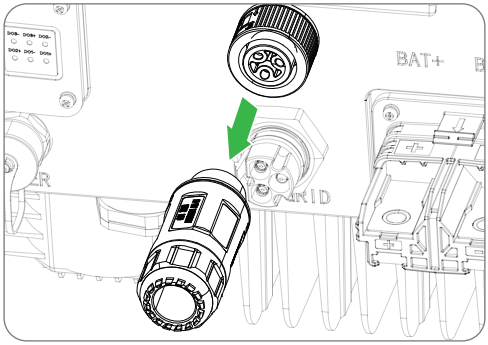


Figure 12-5 Remove Backup Connector

Step 10: Disconnect the battery connectors: Insert a flat screwdriver into the notch of connectors and slightly pull out the connector.

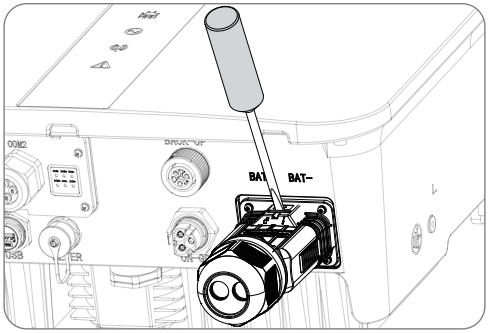


Figure 12-6 Inserting a Screwdriver

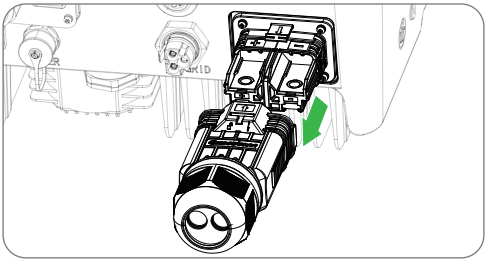


Figure 12-7 Pulling Out the Connector

Step 11: Remove the communication cover. Remove the communication cable in reverse order by referring to 8.6 Communication Connection.

Step 12: Hold down the buckle on the side of the Dongle and pull out the Dongle terminal.

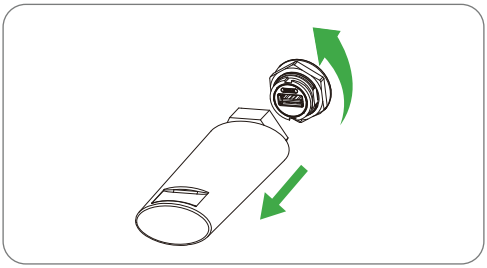


Figure 12-8 Pull Out the Dongle

12.2 Dismantling the Inverter

After disconnecting all electrical connections as described in 12.1 Disconnecting the Inverter from Voltage Sources, the inverter can be removed as follows.

Step 1: Dismantle the inverter referring to 7.2 Installation Procedures in reverse steps.

Step 2: If necessary, remove the wall-mounting bracket from the wall.

Step 3: If the inverter will be reinstalled in the future, please refer to 4 Transportation and Storage for a proper conservation.

13 Troubleshooting and Maintenance

13.1 Power off

DANGER!

- While operating and maintaining the inverter, please turn it off for processing. Operating the equipment with power may cause damage to the inverter or cause a risk of electric shock.
- After the inverter is powered off, it will take a certain amount of time for internal components to discharge. Please wait until the equipment is fully discharged according to the required label time requirements. Do not connect one PV array to multiple inverter, it may cause damage of inverter.

Step 1: Send a shutdown command on the App.

Step 2: Turn off the AC circuit breaker on the ON-GRID side of the inverter.

Step 3: Turn off the AC circuit breaker on the BACK-UP side of the inverter.

Step 4: Turn off the energy storage circuit breaker between the inverter and the battery.

Step 5: Turn off the DC switch of the inverter.

13.2 Troubleshooting

Please follow the methods below for troubleshooting. If the troubleshooting method cannot solve the issue, please contact the after-sales service center.

When contacting the after-sales service center, please collect the following information for quick resolution of the problem.

1. Inverter information, such as serial number, software version, equipment installation time, fault occurrence time, fault occurrence frequency, etc.
2. The installation environment of the equipment, such as weather conditions, presence of obstructed or shadows on the components, etc. It is recommended to provide photos, videos, and other files as auxiliaries to assist in analyzing problems.

No.	Fault Name	Diagnosis and Solutions
1	Grid off	Fault Reason: • Power grid outage. • The AC line or AC switch is disconnected. Solutions: • The alarm will automatically disappear after the power supply of the power grid is restored. • Check if the AC circuit or AC switch is disconnected.

No.	Fault Name	Diagnosis and Solutions
2	Grid over voltage protect	Fault Reason: The grid voltage is higher than the allowable range, or the duration of high voltage exceeds the set value for high voltage crossing Solutions: • If it occurs accidentally, it may be due to a short-term abnormality in the power grid. After detecting that the power grid is normal, the inverter will resume normal operation without manual intervention. • If it occurs frequently, please check if the grid voltage is within the allowable range. » If the grid voltage exceeds the allowable range, please contact the local power operator. » If the grid voltage is within the allowable range, it is necessary to modify the inverter grid over voltage protection point, HVRT, or turn off the grid over voltage protection function with the consent of the local power operator. • If it cannot be restored for a long time, please check whether the AC side circuit breaker and output cable are connected properly.
3	Grid under voltage protect	Fault Reason: The grid voltage is below the allowable range, or the duration of low voltage exceeds the set value of low voltage crossing. Solutions: The cable bundling complies with the wiring requirements, is properly distributed, and free from damage.
4	Grid over frequency protect	Fault Reason: The power grid is abnormal, and the actual frequency of the power grid is higher than the local power grid standard requirements. Solutions: • If it occurs accidentally, it may be due to a short-term abnormality in the power grid. After detecting that the power grid is normal, the inverter will resume normal operation without manual intervention. • If it occurs frequently, please check if the grid frequency is within the allowable range. » If the grid frequency exceeds the allowable range, please contact the local power operator. » If the grid frequency is within the allowable range, it is necessary to modify the inverter grid over frequency protection point or turn off the grid over frequency protection function with the consent of the local power operator.

No.	Fault Name	Diagnosis and Solutions
5	Grid under frequency protect	Fault Reason: The power grid is abnormal, and the actual frequency of the power grid is lower than the local power grid standard requirements. Solutions: • If it occurs accidentally, it may be due to a short-term abnormality in the power grid. After detecting that the power grid is normal, the inverter will resume normal operation without manual intervention. • If it occurs frequently, please check if the grid frequency is within the allowable range. » If the grid frequency exceeds the allowable range, please contact the local power operator. » If the grid frequency is within the allowable range, it is necessary to modify the inverter grid under frequency protection point or turn off the grid under frequency protection function with the consent of the local power operator.
6	Grid frequency shift protection	Fault Reason: The power grid is abnormal, and the actual frequency change rate of the power grid does not comply with local power grid standards. Solutions: • If it occurs accidentally, it may be due to a short-term abnormality in the power grid. After detecting that the power grid is normal, the inverter will resume normal operation without manual intervention. • If it occurs frequently, please check if the power grid frequency is within the allowable range. » If the grid frequency exceeds the allowable range, please contact the local power operator. » If the power grid frequency is within the allowable range, please contact your dealer or after-sales service center.
7	Anti-island protection	Fault Reason: The power grid has been disconnected, and due to the presence of loads, the grid voltage has been maintained. According to safety regulations and protection requirements, the grid connection has been stopped. Solutions: • Confirm if the power grid is disconnection. • Contact your dealer or after-sales service center.

No.	Fault Name	Diagnosis and Solutions
8	Low voltage ride through (LVRT) fault	Fault Reason: The power grid is abnormal, and the time for abnormal power grid voltage exceeds the time specified by LVRT. Solutions: • If it occurs accidentally, it may be due to a short-term abnormality in the power grid. After detecting that the power grid is normal, the inverter will resume normal operation without manual intervention. • If it occurs frequently, please check whether the power grid frequency is within the allowable range. If not, please contact the local power operator; If so, please contact your dealer or after-sales service center.
9	High voltage ride through (HVRT) fault	Fault Reason: The power grid is abnormal, and the time for abnormal power grid voltage exceeds the time specified by HVRT. Solutions: • Please refer to the No.8.
10	Ground fault circuit interrupter (GFCI) Protection	Fault Reason: The input insulation impedance to ground decreases during the operation of the inverter. Solutions: • If it occurs accidentally, it may be caused by an accidental abnormality in the external circuit. After the fault is cleared, normal operation will resume without manual intervention. • If it occurs frequently or cannot be restored for a long time, please check if the insulation impedance of the photovoltaic string to the ground is too low.
11	Direct current injection (DCI) Protection	Fault Reason: The DC component of the inverter output current is higher than the safety regulations or the machine's default allowable range. Solutions: • If the abnormality is caused by an external fault (such as power grid abnormality, frequency abnormality, etc.), the inverter will automatically resume normal operation after the fault disappears, without manual intervention. • If the alarm occurs frequently and affects the normal power generation of the power plant, please contact your dealer or after-sales service center.

No.	Fault Name	Diagnosis and Solutions
12	Low insulation impedance	Fault Reason: • The photovoltaic string is short circuited to the protective ground. • The installation environment of the photovoltaic string is relatively humid for a long time and the insulation of the line to the ground is poor. Solutions: • Check the impedance of the photovoltaic string to the protective ground. If the resistance value is greater than 50 kΩ, it is normal. If the resistance value is less than 50 kΩ, please investigate the short circuit point and rectify it. • Check if the protective ground wire of the inverter is correctly connected. • If it is confirmed that the impedance is indeed lower than the default value in a rainy and cloudy environment, please reset the "insulation impedance protection point" via APP.
13	Abnormal system grounding	Fault Reason: • The protective ground wire of the inverter is not connected. • When the output of the photovoltaic string is grounded, the AC output cables L and N of the inverter are reversed. Solutions: • Please confirm if the protective ground wire of the inverter is not connected properly. • If the output of the photovoltaic string is grounded, please confirm whether the AC output cables L and N of the inverter are reversed.
14	Internal communica-tion disconnect-ion	Fault Reason: Frame format error • Parity error • Can bus offline • Hardware CRC verification error • When sending (receiving), the control bit is set to receive (sending) • Transfer to units that are not allowed Solutions: Disconnect the AC output side switch and DC input side switch, after 5 minutes, connect the AC output side switch and DC input side switch. If the fault persists, please contact your dealer or after-sales service center.

No.	Fault Name	Diagnosis and Solutions
15	Abnormal AC sensor	Fault Reason: Abnormal sampling of AC sensor. Solutions: Disconnect the AC output side switch and DC input side switch, after 5 minutes, connect the AC output side switch and DC input side switch. If the fault persists, please contact your dealer or after-sales service center.
16	Abnormal Leakage current sensor	Fault Reason: Abnormal sampling of leakage current sensor Solutions: Disconnect the AC output side switch and DC input side switch, after 5 minutes, connect the AC output side switch and DC input side switch. If the fault persists, please contact your dealer or after-sales service center.
17	Abnormal relay	Fault Reason: • Abnormal relay (relay short circuit) • Abnormal control circuit • Abnormal AC measurement wiring (i.e. virtual connection or short circuit phenomenon) Solutions: Disconnect the AC output side switch and DC input side switch, after 5 minutes, connect the AC output side switch and DC input side switch. If the fault persists, please contact your dealer or after-sales service center.
18	Chamber over temperature	Fault Reason: • The installation position of the inverter is not ventilated • The ambient temperature is too high and exceeds 60 ℃ • Abnormal operation of internal fan Solutions: • Check whether the ventilation at the installation location of the inverter is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. • If there is no ventilation or the ambient temperature is too high, please improve its ventilation and heat dissipation conditions. • If the ventilation and ambient temperature are normal, please contact your dealer or after-sales service center.

No.	Fault Name	Diagnosis and Solutions
19	Bus over voltage	Fault Reason: • PV voltage is too high • Abnormal inverter BUS voltage sampling Solutions: Disconnect the AC output side switch and DC input side switch, and after 5 minutes, close the AC output side switch and DC input side switch. If the fault persists, please contact your dealer or after-sales service center.
20	PV input over voltage	Fault Reason: The photovoltaic array configuration is incorrect, too many photovoltaic panels in series. Solutions: Check the series configuration of the corresponding photovoltaic array string to ensure that the open circuit voltage of the string is not higher than the maximum working voltage of the inverter.
21	PV continuous hardware over current	Fault Reason: • Incorrect photovoltaic array configuration. • Hardware damage Solutions: Disconnect the AC output side switch and DC input side switch, after 5 minutes, connect the AC output side switch and DC input side switch. If the fault persists, please contact your dealer or after-sales service center.
22	PV continuous software over current	Fault Reason: • Incorrect photovoltaic array configuration • Hardware damage Solutions: Disconnect the AC output side switch and DC input side switch, after 5 minutes, connect the AC output side switch and DC input side switch. If the fault persists, please contact your dealer or after-sales service center.

13.3 Maintenance

Regular maintenance is required for the inverter. The table below lists the operational maintenance for expressing the optimum device performance. More frequent maintenance service is needed in the worse work environment. Please make records of the maintenance.

WARNING!

- Only qualified person can perform the maintenance for the inverter.
- Only use the spare parts and accessories approved by Yinergy for maintenance.

13.3.1 Removing the Inverter

WARNING!

- Ensure that the inverter is powered off before operation.
- When operating the inverter, please wear personal protective equipment.

Step 1: Disconnect all electrical connections of the inverter, including DC line, AC line, communication line, communication module, and protective ground wire.

Step 2: Remove the inverter from the mounting bracket.

Step 3: Remove the mounting bracket.

Step 4: Properly store the inverter. If the inverter will be used in the future, ensure that the storage conditions meet the specified requirements.

13.3.2 Scrap Inverter

When the inverter cannot continue be used and needs to be scrapped, please dispose of the inverter according to the electrical waste disposal requirements of the country/region where the inverter is located.

The inverter cannot be treated as household waste.

13.3.3 Maintenance Routines

Maintaining Item	Maintaining Method	Maintaining Period
System Clean	Check the heat sink, air intake, and air outlet for foreign matter or dust.	Once 6-12 months
Electrical Connection	Check whether the cables are securely connected. Check whether the cables are broken or whether there is any exposed copper core.	Once 6-12 months
Sealing	Check whether all the terminals and ports are properly sealed. Reseal the cable hole if it is not sealed or too big.	Once a year

Maintaining Item	Maintaining Method	Maintaining Period
General status of inverter	Check if there is any damage on the inverter. Check if there is any abnormal sound when the inverter is running.	Once 6 months

13.4 Recycling and Disposal

Dispose of the packaging and replaced parts according to the rules applicable in the country where the device is installed.

NOTE

Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.

13.5 Service and Warranty

If you have any technical problems concerning our products, please contact Yinergy service. We require the following information in order to provide you with the necessary assistance:

- Inverter device type
- Inverter serial number
- Type and number of connected PV modules
- Error code
- Mounting location
- Installation date
- Warranty card

For more information, refer to the Warranty for your region at www.yinergy-solar.com.

When the customer needs warranty service during the warranty period, the customer must provide a copy of the invoice, factory warranty card, and ensure the electrical label of the inverter is legible. If these conditions are not met, Yinergy has the right to refuse to provide with the relevant warranty service.

- PV Input

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Max. Input Power [W]	4500	5500	6000	7000	7500	9000
Max. Input Voltage [V]	550					
Rated Input Voltage [V]	360					
Start-up Input Voltage [V]	90					
MPPT Operating Voltage Range [V]	90 - 520					
Max. Input Current [A]	16					
Max. Short-circuit Current [A]	23					
Max. Backfeed Current to Array [A]	0					
No. of MPP Trackers	1	2	2	2	2	2
No. of Strings per MPP Tracker	1					

- AC Output (On Grid)

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Rated Output Power [W]	3000	3680	4000	4600	5000	6000
Rated Output Apparent Power [VA]	3000	3680	4000	4600	5000	6000
Max. Output Apparent Power [VA]	3300	4048	4400	5060*	5500	6600
Rated Output Current [A]	13	16	17.4	20	21.7	26.1
Max. Output Current [A]	15	18.4**	20	22.8	25	30
Power Factor	~1 (Adjustable from 0.8 leading t o 0.8 lagging)					
Total Harmonic Distortion, THDi	< 3%					
Max. Output Fault Current [A]	90 @ 3 µs					
Max. Output Overcurrent Protection [A]	81					

* The value is 4600 under the grid regulation of Germany.
** The value limit in the United Kingdom is set to 16 A.

- AC Input (On Grid)

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Max. Input Apparent Power [VA]	6000	7300	8000	9200	10000	10000
Rated Grid Voltage [V]	L / N / PE, 220 / 230 / 240					
Rated Grid Frequency [Hz]	50 / 60					
Current (Inrush) [A]	90 @ 3 µs					
Max. Input Current [A]	27.3	33.2	36.4	41.9	45.5	45.5

- Battery

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Battery Type	Li-ion / Lead-acid					
Battery Voltage Range [V]	40 - 60					
Max. Charge / Discharge Current [A]	75	75	100	100	125	125
Rated Power [W]	3000	3680	4000	4600	5000	6000
Communication Interface	CAN, RS485					

- Backup Output (Off Grid)

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Rated Output Power [W]	3000	3680	4000	4600	5000	6000
Peak Output Apparent Power, 10s [VA]	6000	7300	8000	9200	10000	10000
Switch Time [ms]	< 10					
Rated Grid Voltage [V]	L / N / PE, 220 / 230 / 240					

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Rated Grid Frequency [Hz]	50 / 60					
Max. Output Current [A]	15	16.8	20	22.8	25	30
Total Harmonic Distortion, THDv	< 3% (Linear load)					
Max. Output Fault Current (Peak and Duration) [A]	90 @ 3 μs					
Inrush Current (Peak and Duration) [A]	90 @ 3 μs					
Max. Output Overcurrent Protection [A]	81					

• Efficiency

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Max. Efficiency	98.0%					
Euro Weighted Efficiency	97.4%					
Max. Battery Discharge Efficiency	95.5%					

• Protection & Feature

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
DC Reverse Polarity Protection	Yes					
PV String Current Monitoring	Yes					
Insulation Resistor Monitoring	Yes					
Residual Current Monitoring	Yes					
Anti-islanding Protection	Yes					
Method of Active Anti-islanding	Frequency Shift					
AC Overcurrent Protection	Yes					
AC Short-circuit Protection	Yes					
AC Overvoltage Protection	Yes					
Overvoltage Category	DC II / AC III					
DC Switch	Yes					
Pollution Degree	III					
Surge Protection Device, SPD	DC Type II / AC Type II					
Rapid Shutdown, RSD	Optional					

• General Data

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Dimensions (W x H x D Bare Machine) [mm]	461 x 482 x 208					
Net Weight [kg]	27					
Installation	Wall-mounted					
Operation Temperature [℃]	-25 ~ +60 (> 45 Derating)					
Operation Humidity	0~95% RH, No Condensing					
Protection Degree	IP66					
Max. Operating Altitude [m]	4000 (> 2000 Derating)					
Cooling Method	Natural Convection					
Noise Emission [dB]	< 40					
Topology	Non-isolated					
Display	LED Indicators; Integrated Wi-Fi / 4G + APP					
Signal Input and Output	DRM, 1 × DI, 3 × DO					
Standby Consumption [W]	< 5					

• Standard Compliance

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Grid Regulation	EN 50549-10, VDE-AR-N 4105, G98, G99, CEI0-21, AS/NZS 4777.2					
Safety Regulation	IEC/EN 62109-1, IEC/EN 62109-2					
EMC	IEC/EN 61000-6-1, IEC/EN 61000-6-3					

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