GROWATT




# WIT 29.9-50K-XHU Hybrid Inverter
# User Manual

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# 1 Notes on this manual

## 1.1 Introduction

This manual is intended to introduce the WIT 29.9-50K-XHU Hybrid Inverters manufactured by Shenzhen Growatt New Energy Co., Ltd. (hereinafter referred to as Growatt) in terms of their installation, operation, commissioning, maintenance and troubleshooting. Please read this manual carefully before using the product, and keep it in a convenient place for further reference. The content of this manual is continually reviewed and amended, where necessary. Growatt reserves the right to make changes to the material at any time and without notice.

**Note:**
"WIT" refers to the product name. "29.9-50K" refers to the power range.

## 1.2 Target Group

This document is intended for qualified technicians. Only qualified and well-trained technicians are allowed to install and operate the WIT inverter. Should any questions arise during installation, you can visit en.growatt.com to leave a message.

## 1.3 Product Range

WIT 29.9-50K-XHU (AC 380V/400V) inverters offering five power options: 29.9kW, 30kW, 36kW, 40kW, and 50kW. In total, there are 5 products available in this series. This manual is valid for the following models:

Table 1.1 WIT 29.9-50K-XHU series model introduction

| | |
|---|---|
| WIT 29.9K-XHU | 3-Phase Hybrid Inverter with UPS function |
| WIT 30K-XHU | |
| WIT 36K-XHU | |
| WIT 40K-XHU | |
| WIT 50K-XHU | |

# Safety Precautions 2

## 2.1 Safety Instructions

1) Please read this manual carefully before installation. Damages caused by failure to follow the instructions in the manual are beyond the warranty scope.
2) Only qualified and trained electrical technicians are allowed to perform operations on the WIT Inverter.
3) During installation, please do not touch other parts inside the equipment other than the wiring terminals.
4) Ensure that all electrical connections comply with local electrical standards.
5) Only designated personnel are permitted to perform maintenance on the inverter.
6) Before operating the WIT Inverter in on-grid mode, ensure that you have obtained any permission needed from the local grid operator.

**Transportation:**

| | |
|---|---|
|  **WARNING** | • Risk of injury when lifting the WIT Inverter, or injury caused by a falling inverter as it is heavy. Please transport and lift the inverter carefully. |

**Installation:**

| | |
|---|---|
|  **NOTICE** | • Please read this manual carefully before installation. Damages caused by failure to observe instructions specified in this manual are not covered under any warranty. |
|  **DANGER** | • Do not connect any cables before installation. |
|  **WARNING** | • Please observe the installation instructions specified in this manual, including the installation environment and clearance requirements.<br>• Install the WIT Inverter in a dry and well-ventilated location; otherwise, performance de-rate may be initiated due to excessive temperature.<br>• Please read the installation instructions and safety precautions carefully before installation. |

**Electrical Connections:**

| | |
|---|---|
|  **DANGER** | • Before connecting cables, ensure that the PV SWITCH of the WIT Inverter are OFF, and turn off the switch and breaker on the AC side and the battery side. Otherwise, high voltages may cause severe injuries.<br>• It must be operated by qualified and trained electrical technicians. Technicians should observe instructions in this manual and local regulations.<br>• High voltages may cause electric shocks and serious injury. Please do not touch the WIT Inverter in operation.<br>• Do not install the inverter in potentially explosive and flammable atmospheres. |
|  **WARNING** | • Each WIT Inverter must be equipped with an AC circuit breaker. Multiple WIT Inverters cannot connect to the same AC circuit breaker.<br>• Do not connect the load between the WIT Inverter and the circuit breaker.<br>• If the cable is thick, do not shake the cable terminals after tightening them. Otherwise, the loose connection may cause overheating and device damage. Ensure that the terminals are properly connected before starting the WIT Inverter.<br>• Ensure the correct polarity of the terminals before connecting the PV array to the WIT Inverter. |

**Maintenance and replacement:**

| | |
|---|---|
|  **DANGER** | • It must be operated by qualified and trained electrical technicians. Technicians should observe instructions in this manual and local regulations.<br>• After turning off the DC switches and the AC breakers, wait for at least five minutes before performing any operations to avoid risks.<br>• When the OLED screen indicates “PV Isolation low”, do not touch the chassis as a ground fault may have been detected.<br>• Beware of high voltages which may cause electric shocks. |
|  **WARNING** | • To ensure good dissipation, clean the fan regularly.<br>• Do not use the air pump to clean the fan. Otherwise, the fan may be damaged. |

**Others:**

| | |
|---|---|
|  | • Upon receiving the product, check if the contents are intact and complete. If any damage is found or any component is missing, please contact your distributor. |
|  WARNING | • The maximum PV input voltage cannot exceed 1100V. The battery input voltage cannot exceed 900V.<br>• For the WIT Inverter that will not be put into operation in the future, you should properly dispose of them by yourself. |

## 2.2 Symbol Conventions

| Symbol | Description |
|---|---|
|  DANGER | **DANGER** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury. |
|  WARNING | **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. |
|  CAUTION | **CAUTION** indicates a hazard with potential risk which, if not avoided, could result in minor or moderate injury. |
|  NOTICE | **NOTICE** indicates that under certain circumstances, improper operations could result in property damage. |
|  | **Remind** operators to check the instructions before installing or operating the WIT Inverter. |

## 2.3 Label Description

| Symbol | Name | Meaning |
|---|---|---|
|  | High voltage | High voltages exist after the WIT Inverter is powered on. Only qualified and trained electrical technicians are allowed to perform operations. |
|  | Burn warning | Do not touch a running inverter because it generates high temperatures on the shell. |
|  | Grounding | Indicates the position for connecting the PE cable. |
|  | Delay discharge mark | Residual voltage exists after the WIT Inverter is powered off. It takes 5 minutes to discharge to the safe voltage. |
|  | Refer to the manual | Remind operators to refer to the manual before installing and operating the WIT Inverter. |
|  | DC | Direct Current. |
|  | AC | Alternating Current. |

# Product Description 3

| | |
|---|---|
| NOTICE | The front view and the bottom view of all models are identical. |

## 3.1 Overview

Front view:

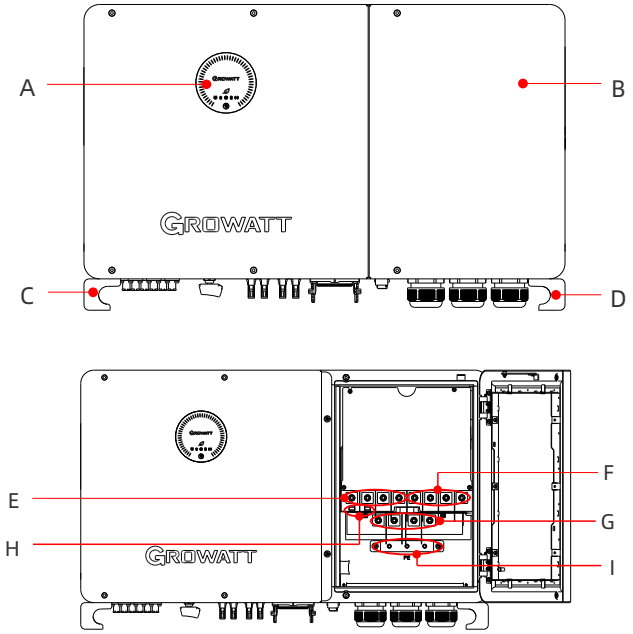



Fig 3.1 Front view

Bottom view:

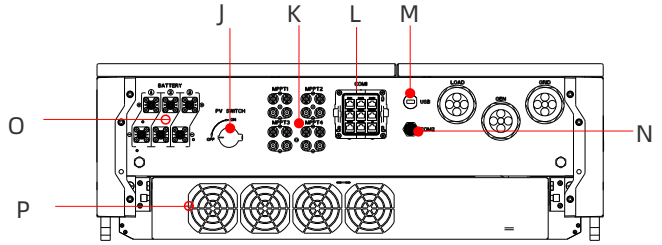



Fig 3.2 Bottom view

Left view:

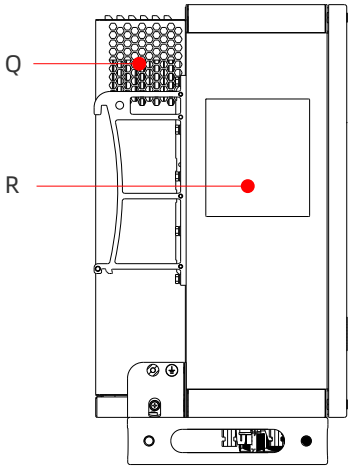



Fig 3.3 Left view of WIT 29.9-50K-XHU

Right view:

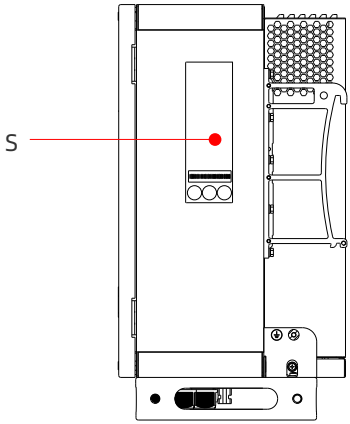



Fig 3.4 Right view of WIT 29.9-50K-XHU

Table 3.1 Component description

| No. | Description | No. | Description |
|---|---|---|---|
| A | Display | B | Right cover plate |
| C | Left corner guard | D | Right corner guard |
| E | Load wiring terminal | F | Power grid connection terminal |
| G | Generator connection terminal | H | Battery power supply terminal (BMS AC) |
| I | Grounding bar | J | PV Switch |
| K | PV terminal | L | COM1 (RJ45*9) |
| M | USB interface | N | COM2 (4-pin terminal) |
| O | Battery terminal | P | Fan |
| Q | Heat sink | R | Indicator description label |
| S | Nameplate | | |

## 3.2 Basic Data

Table 3.2 Dimensions and weight

| | Model | Size (mm) | | | Weight (kg) |
|---|---|---|---|---|---|
| | | Height | Width | Depth | |
| The WIT Inverter without package | WIT 29.9-50K-XHU | 585 | 920 | 320 | 92kg |
| The WIT Inverter with package | WIT 29.9-50K-XHU | 500 | 1080 | 765 | 106kg |

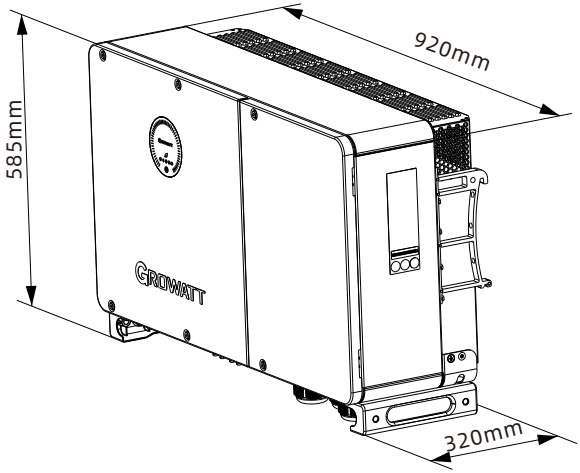

920mm
585mm
320mm
GROWATT

Fig 3.5

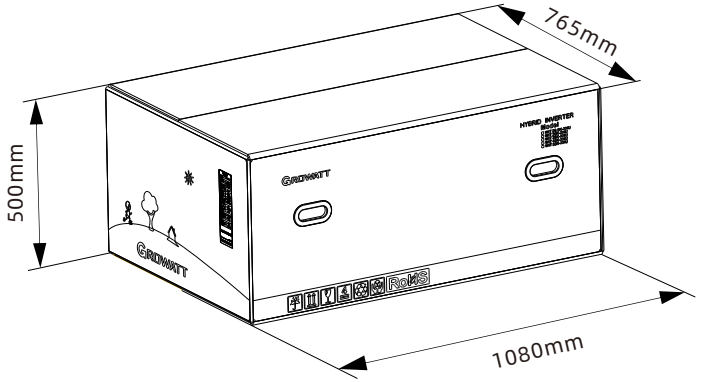

765mm
500mm
1080mm
GROWATT
HYBRID INVERTER
RoHS

Fig 3.6

## 3.3 Nameplate

The figure below shows the nameplate of WIT 50K-XHU as an example. The nameplate figure is for reference only. The actual nameplate prevails. For the specifications, please refer to Section 10 Product Specifications.

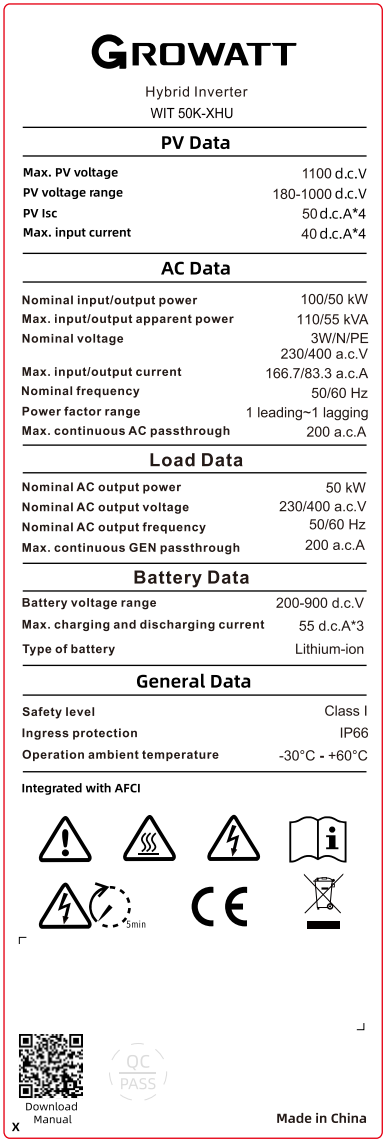



Fig 3.7 Nameplate

## 3.4 **Operating Principle of WIT 29.9-50K-XHU**

1> The hybrid inverter receives DC inputs from PV strings which go through the MPPT routes. The DC power is then converted into AC power through the inverter circuit to power the loads and feed power into the grid;
2> The PV strings can supply power to charge the battery through the MPPT routes;
3> Convert battery power to AC power supplies for the loads and feeding to the grid;
4> Charge the battery from the grid through a rectifier circuit;
5> Convert the DC power from PV strings and the battery power into AC power through the inverter circuit to power critical loads.
6> When the GEN port is connected to the generator and set to the GEN mode, the generator can supply power to the loads or charge the battery.
7> During on-grid operation,it will supply grid power and WIT inverter power to the loads connected via the GEN port and the Load port;during off-grid operation,it will supply WIT inverter power to the loads connected via the GEN port and the Load port, and when the battery soc is≤50% or the sum of the load power is ≥1.1 times the rated load of WIT inverter, the power supply to smart loads will be cut off.
8> When the GEN port is connected to the on-grid inverter and set to "AC Couple" mode, during on-grid operation, the on-grid inverter will be connected to the grid and output power; during off-grid operation, the on-grid inverter will remain connected and generating power together with the WIT inverter.

**NOTE:** WIT 29.9-50K-XHU models have 4 MPPT routes.

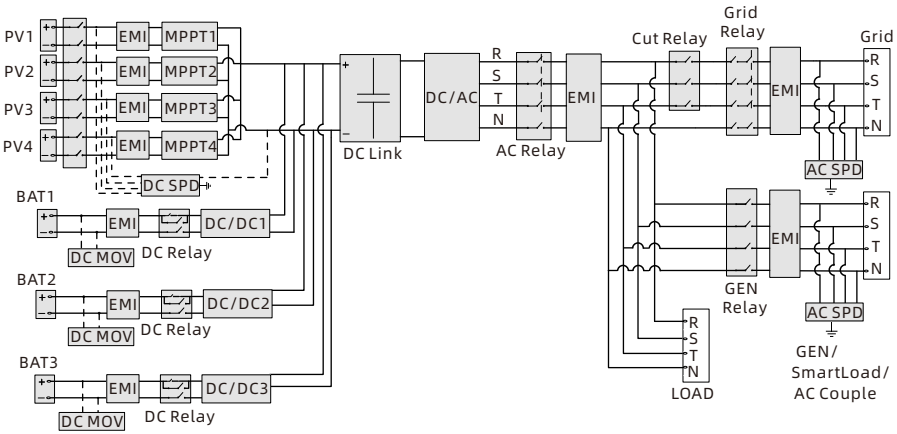



Fig 3.8 WIT 29.9-50K-XHU Grid-connected conceptual diagram

## 3.5 Storing the WIT Inverter

1> Put the WIT Inverter in the original package and place it in a dry and well-ventilated place.
2> Keep the storage temperature from -40°C to +70°C and the humidity from 0%-95% RH.
3> A maximum of three WIT Inverters can be stacked. Do not stack the inverters without package.
4> If the WIT Inverter has been long-term stored, inspections and tests should be conducted by qualified personnel before installation.

| | |
|---|---|
| | Wrong time and date may occur if the WIT Inverter has been stored for over one month. Fix the time and date before connecting the inverter to the grid. For details, see 7.1 Commissioning the WIT Inverter. |

## 3.6 Supported Grid Types

Grid connection modes for WIT 29.9-50K-XHU Hybrid Inverters are shown in Fig 3.9.

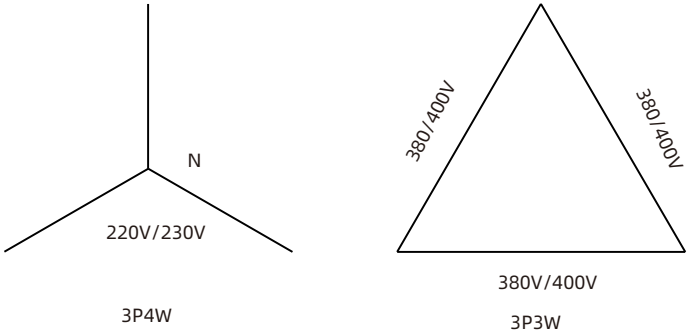



Fig 3.9 380V/400V system (type Y/△)

## 3.7 AFCI Function

### 3.7.1 AFCI function Description

An AFCI, or Arc-Fault Circuit Interrupter, is a solution designed to detect and mitigate the risk of electrical arcing in a photovoltaic (PV) system, supported by intelligent arc detection algorithm. Arcing can occur when there is a high voltage breakdown in the electrical insulation or when conductive materials come into contact with each other. This can pose a fire hazard and damage the system components. The AFCI continuously monitors the system for potential arc faults and, if detected, interrupts the circuit to prevent a fire or other damage. AFCIs are required by the National Electrical Code (NEC) in certain parts of a PV system, such as the DC side of the inverter, to improve safety and reduce the risk of fires.

**NOTE:**

1. The AFCI Function of the WIT Inverter is disabled by default. If you want to enable the AFCI, please contact Growatt support.
2. Do not connect the Maximum Power Point Trackers (MPPTs) on the DC side in parallel as it might trigger the AFCI mistakenly.

### 3.7.2 Clearing the Alarm

In the event that the WIT Inverter reports "AFCI Fault" and the PV indicator turns red, an arc fault might have been detected. Please perform the following steps to clear the alarm.

**Step 1:** Disconnect the WIT inverter from all power sources. Turn off the battery switch and the AC output circuit breaker, then turn the DC switches to the OFF position. Wait until the error message disappears.

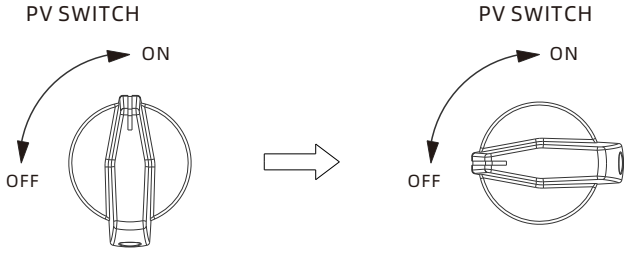



Fig 3.10

**Step 2:** Troubleshooting. Check if the open-circuit of all PV strings are within the permissible range.

**Step 3:** After the fault is cleared, restart the inverter. Turn on the battery switch and the AC breaker, and turn the DC switch to the ON position. Wait until the system is working properly.

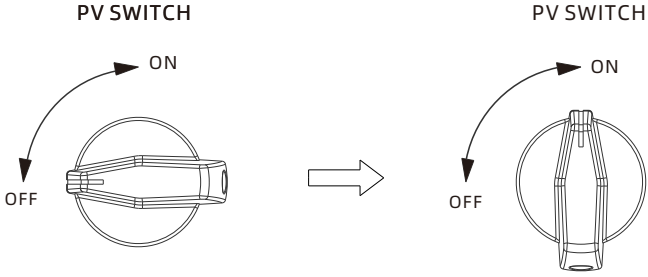



Fig 3.11

If the WIT Inverter passes the AFCI self-test, it will work in the normal mode and the PV indicator will be green. If it fails, the inverter will report "Error 425". In this case, please reboot the system and perform Step 1 to Step 3. If it failed again, please disconnect all power sources and contact Growatt support.

## 3.8 PID Function

PID (Potential Induced Degradation) typically occurs in PV systems where there is a voltage potential between the solar cells and the grounded frame or other conductive elements of the system. This potential difference, combined with high humidity and temperature, can lead to leakage currents that degrade the performance of the solar modules over time. The PID function integrated in Growatt inverters can effectively reverse the PID effect by applying DC voltage to the PV modules during nighttime, enhancing solar energy harvest and performance.

# 4 Inspection upon delivery

Unpacking and inspection

1> Before unpacking the WIT Inverter, check the shipping box for any externally visible damage. If any damage is found, contact the shipping company as soon as possible.

2> After unpacking the WIT Inverter, check if the scope of delivery is intact and complete. If any damage is found or any component is missing, contact your distributor.

Check the following items:

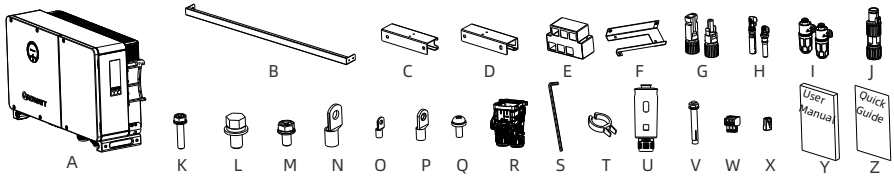



Fig 4.1 Packing list of WIT 50K-XHU

Table 4.1 Packing list

| No. | Description | Quantity | No. | Description | Quantity |
|---|---|---|---|---|---|
| A | The WIT Inverter | 1 | P | SC35-8 AC terminal | 4 |
| B/C/D | Wall mount kit | 1/1/1 | Q | M4*12 screw | 9 |
| E/F | Battery terminal anti-dismantle element | 1/1 | R | COM1 waterproof cover | 1 |
| G | PV+(-) connector | 8(8) | S | Allen wrench | 1 |
| H | PV+(-) metal contact | 8(8) | T | PV connector disconnect tool | 1 |
| I | Battery +(-) terminal | 3(3) | U | ShineWiLan-X2 | 1 |
| J | COM2 terminal | 1 | V | M10*90 expansion bolt | 4 |
| K | M6*28 screw | 2 | W | BMS-AC terminal | 4 |
| L | M8*20 screw | 12 | X | RJ45 | 8 |
| M | M6*12 screw | 5 | Y | User Manual | 1 |
| N | SC50-8 AC terminal | 8 | Z | Quick Guide | 1 |
| O | SC25-6 PE terminal | 3 | | | |

**NOTE:**

1.Sturdy and durable though the packing carton is, please carry and handle it with caution.

2.The component of WIT 29.9~50K-XHU inverters are similar to those in the above table, but the contents of the component (product model and specific parameters) may be adjusted in different models.

# Installation 5

## 5.1 Basic Installation Requirements

A. The installation location must be suitable for WIT's weight for a long period time. (Refer to Table 3.2 for the weight of the WIT Inverter).
B. Ensure that the installation position is suitable for the dimensions of the WIT Inverter.
C. Do not install the WIT Inverter in areas with flammable or non heat-resistant materials.
D. The WIT Inverter is protected to IP66 and can be installed indoors or outdoors.
E. Do not expose the WIT Inverter to direct sunlight. Otherwise, excessive temperature may lead to power reduction.
F. Keep the humidity at 0% to 95% RH.
G. Keep the ambient temperature at -30℃ to 60℃.
H. The WIT inverter can be installed vertically or backward tilted. Please refer to the figures below:

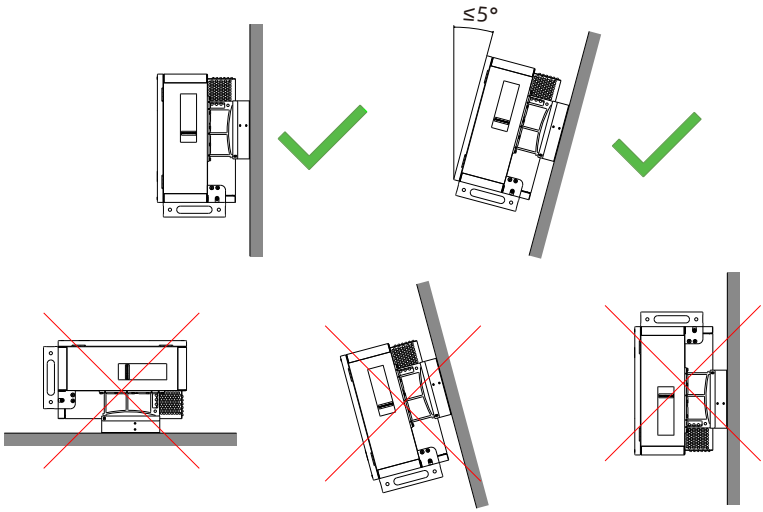



Fig 5.1

I. Reserve enough clearance around the WIT Inverter to ensure sufficient space for heat dissipation and operation. Leave a clearance of 0.6 m on both sides, approximate 0.6 m above and below the WIT Inverter, and 1 m in front of the inverter.

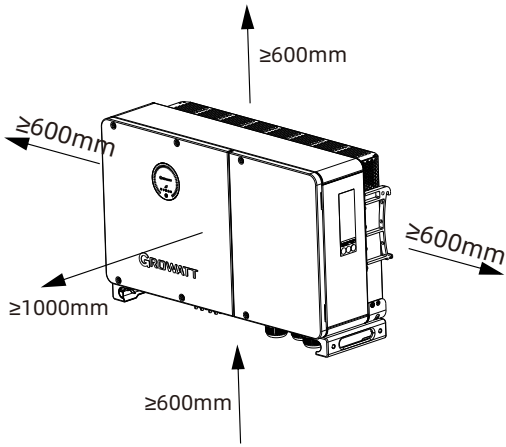



Fig 5.2

J. Keep the WIT Inverter away from strong interference sources.
K. Ensure that the WIT Inverter is not accessible to children.

## 5.2 Installation Environment Requirements

A. Though the WIT Inverter is protected to IP66, do not expose it to direct sunlight, rain and snow. Please refer to the figures below:

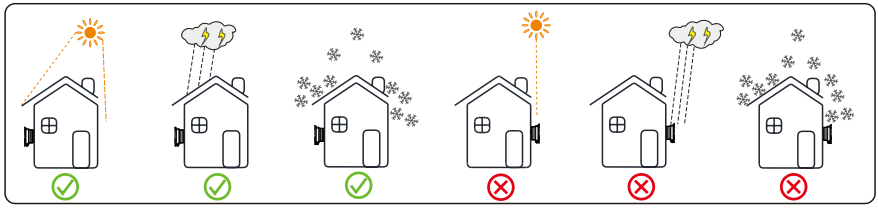


Fig 5.3

B. To reduce the de-rate performance of the inverter and extend inverter's life span, we strongly recommend you install an awning. For the distance between an awning and inverter, please refer to following figure.

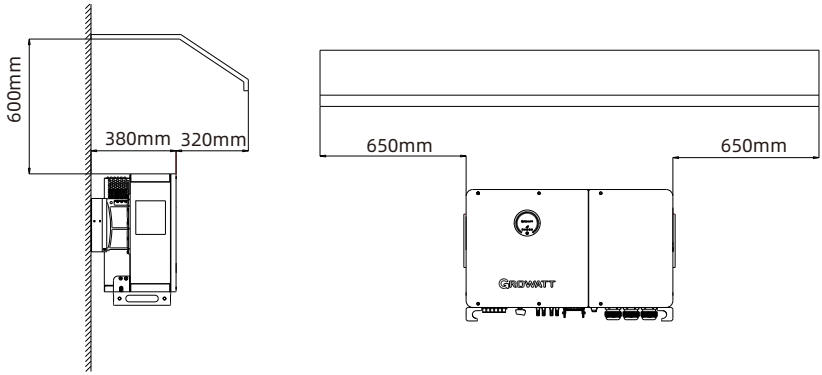
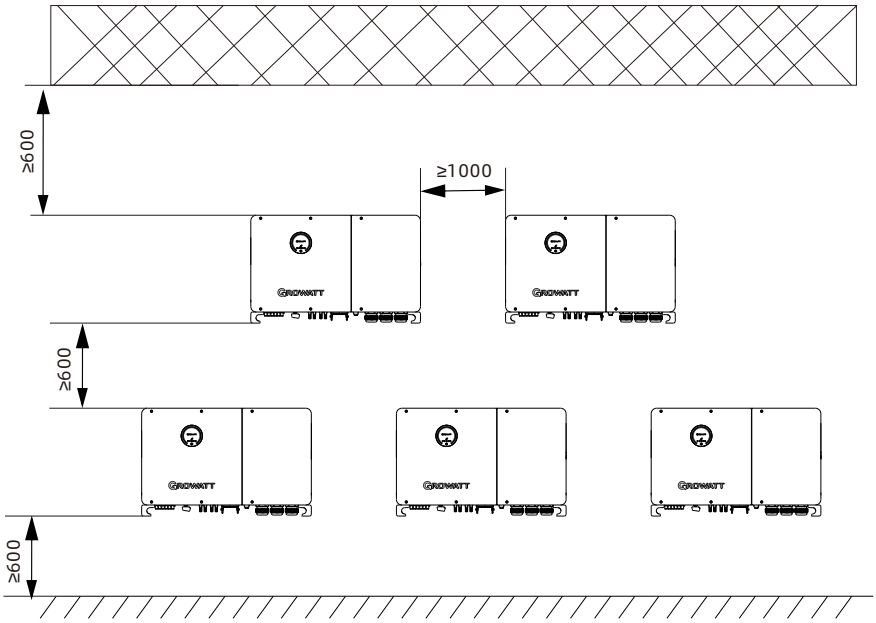



Fig 5.4

C. When you install multiple WIT inverters on one surface, inverters should be installed as following drawing. (Choose one of the two options below).

unit: mm



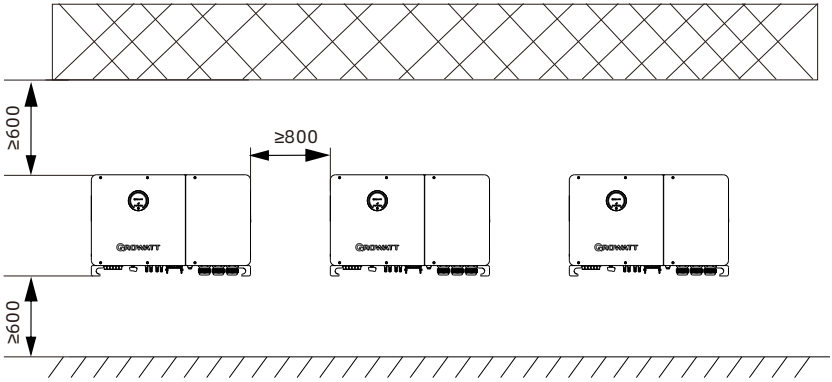



Fig 5.5

D. Do not place the WIT Inverter in an enclosed and narrow space for operation.

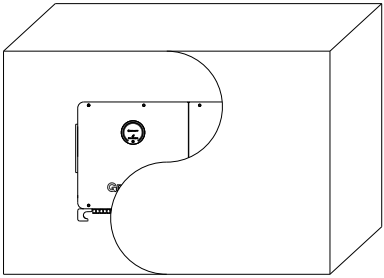


Fig 5.6

## 5.3 Moving the WIT Inverter

| | |
|---|---|
| **CAUTION** | • The inverter is heavy, please move it with care and keep balance to avoid personnel injury.<br>• Do not place the inverter with its wiring and signal terminals at the bottom contacting with floor or any other object because the terminals are not designed to support the weight of inverter. |

1> As shown in Fig 5.7, two persons are required to lift the inverter out of the package and transport it to the installation position.
2> When you are moving the inverter, please keep the balance.

**Notice:** There will be front and bottom mark on the package.

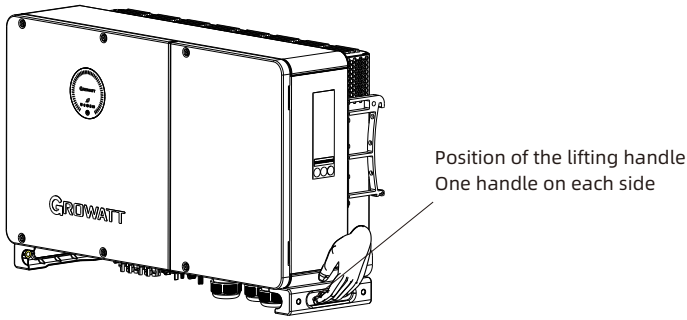



Fig 5.7

## 5.4 Wall Mount Bracket Installation

Before installing the inverter, you need install the wall mount bracket so that the inverter can be securely mounted on the wall.

Wall mount bracket (unit: mm):

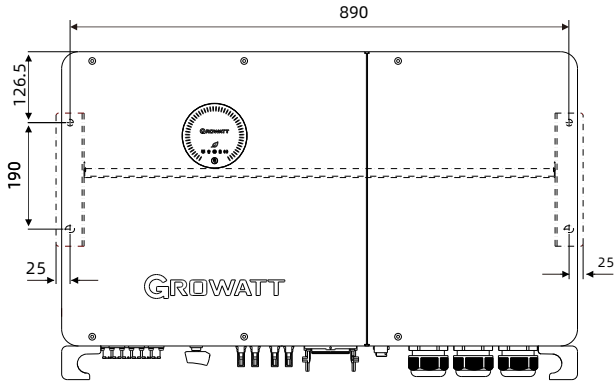



Fig 5.8

**STEP 1:** Use the wall mount plate as a template, drill holes into the wall and insert the expansion bolts as Fig 5.9 show.

**STEP 2:** Tighten the bolts to attach the wall mount bracket onto the wall securely as illustrated below.

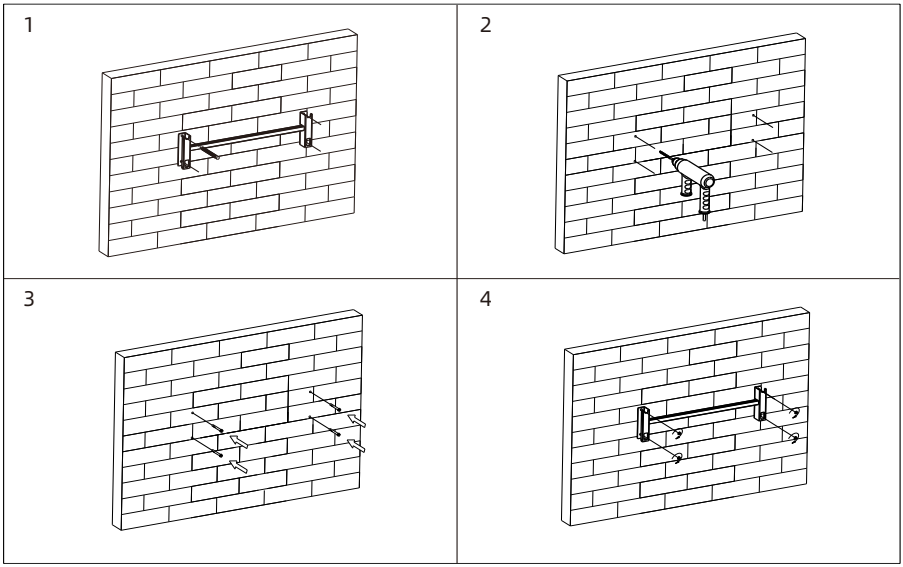



Fig 5.9

**Note:**

1> The wall where the expansion bolts are installed should be a solid concrete or brick wall with a thickness of at least 100 mm.

2> Ensure that the bracket has been firmly installed before mounting the inverter onto it.

## 5.5 Installing the Inverter

After verifying that the wall mount bracket has been firmly installed on the wall, mount the inverter onto the bracket.

1> Run the rope, which is strong enough to bear the weight of the inverter, through the two hoist rings, as shown below;

2> Hang the inverter onto the wall mount bracket and install the bolts. Please keep balance when moving the inverter.

3> Check if the inverter has been properly mounted and tighten all screws.

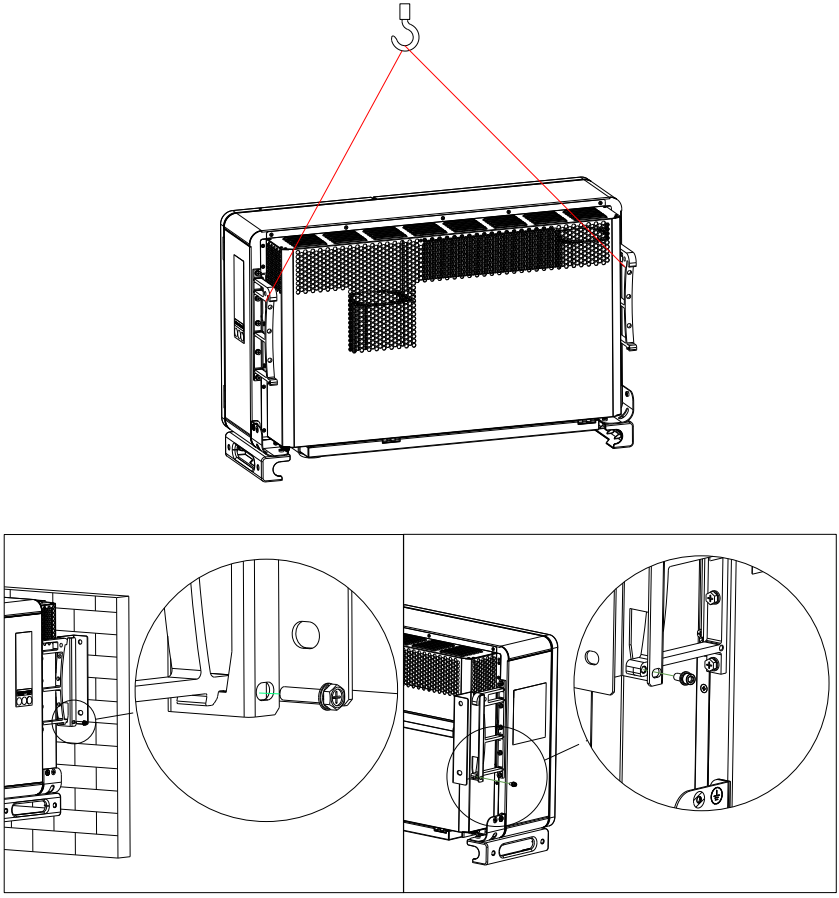


Fig 5.10 Wall-mounted installation

| | |
|---|---|
| **NOTICE** | Ensure that the wall meets the load-bearing requirements of the equipment. For details about the weight, see Table 3.2. |

# 6 Electrical Connection

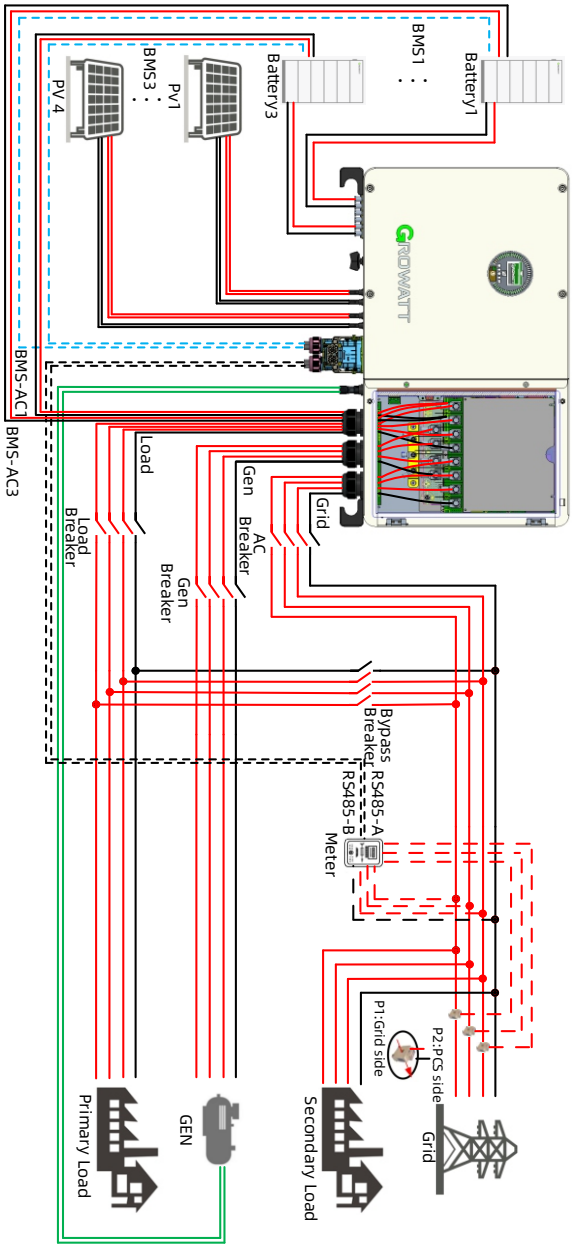



Fig 6.1 Wiring diagram of the system with a single WIT 50K-XHU inverter (Gen mode)

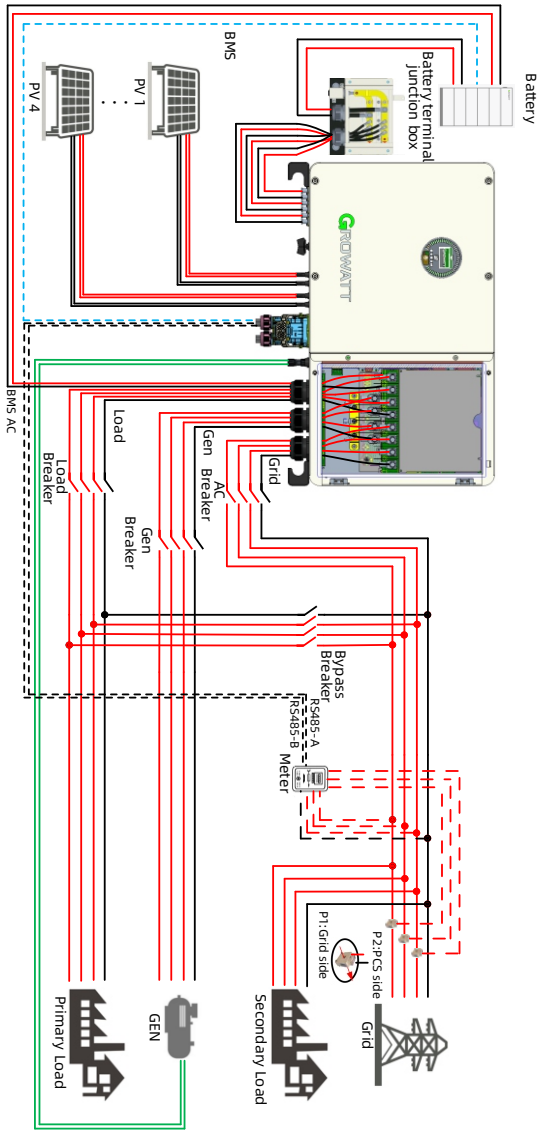



Fig 6.2 Wiring diagram of the system with a single WIT 50K-XHU inverter (with the WIT-XHU battery terminal junction box)

**NOTE:**

1. The WIT-XHU battery terminal junction box is optional;
2. When one cluster of battery is connected, run the power cables through the battery terminal junction box and the BMS communication cable should be connected to BMS1 on the COM1 port.

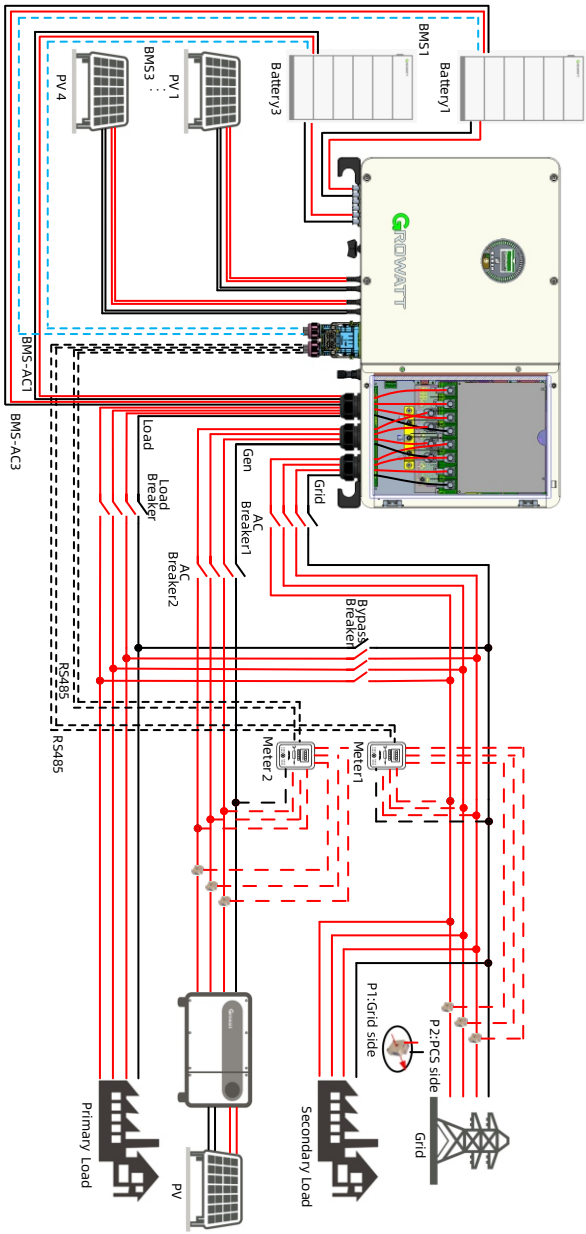



Fig 6.3 Wiring diagram of the system with a single WIT 50K-XHU inverter and two meters (AC couple mode)

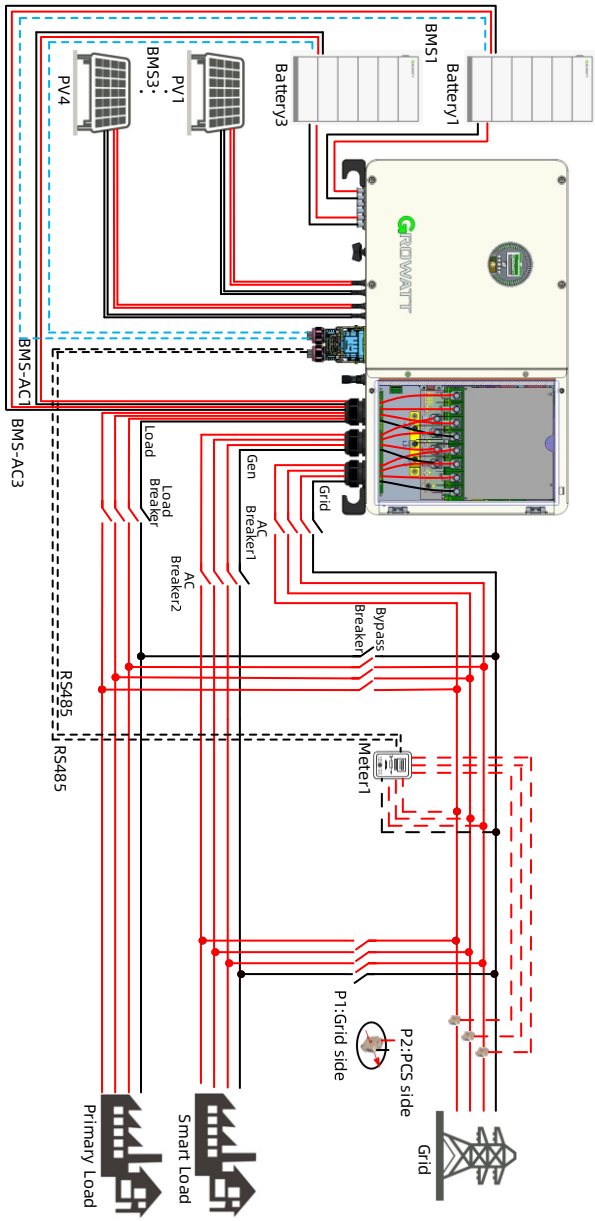



Fig 6.4 Wiring diagram of the system with single WIT 50K-XHU inverters in smart load mode

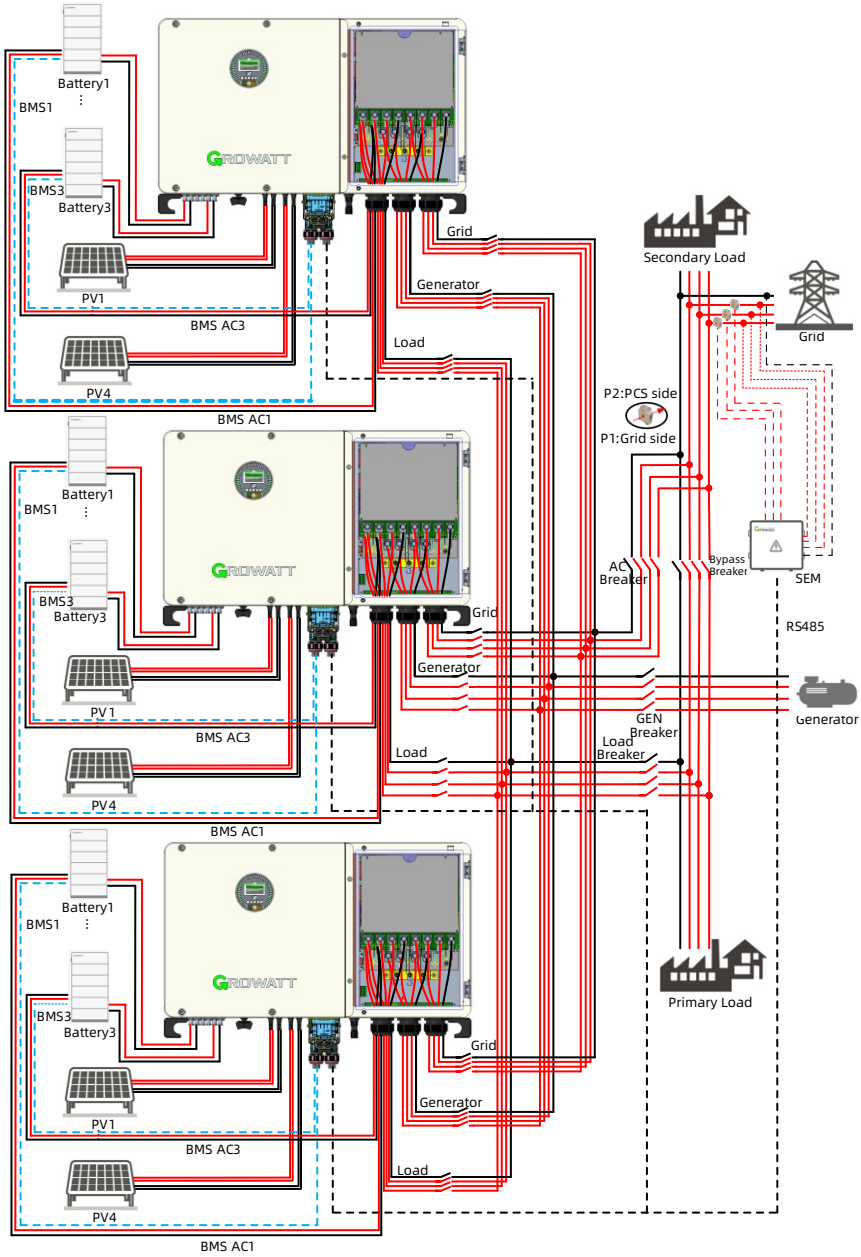



Fig 6.5 Wiring diagram of the system with three WIT 50K-XHU inverters connected in parallel

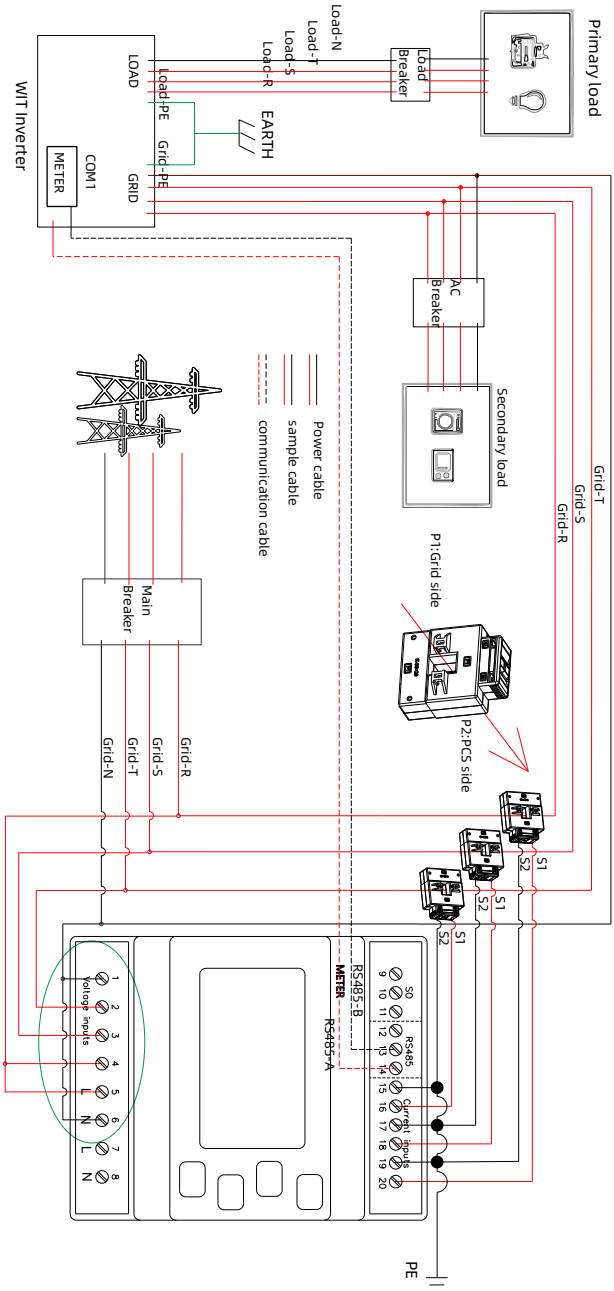
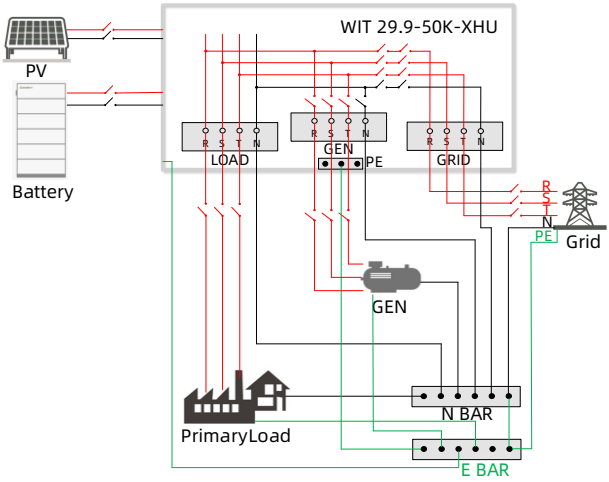
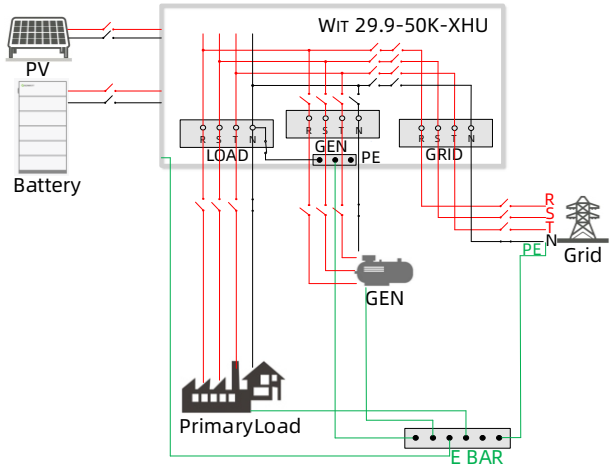



Fig 6.6 Meter wiring method

Wiring modes vary depending on the region as shown in Fig 6.7 below. Please select the appropriate wiring mode according to locally applicable safety standards.
Fig6.7(a): Neutral line of alternative supply must not be isolated or switched.
Fig6.7(b): Neutral line of alternative supply can be isolated or switched.




(a) Wiring mode for AU/NZ




(b) Wiring mode for other regions

Fig 6.7 Wiring modes for different regions

## 6.1 Connecting The Ground Cables

1. It is essential to connect the ground cable to the WIT inverter before connecting other cables to prevent personal injury or device damage.
2. All non-current-carrying metal parts and the enclosures of the devices of the energy storage system, including the rack and the enclosures of the combiner box, the distribution panel, the inverter and the battery should be properly grounded.
3. For a single WIT inverter, connect a ground cable to the ground point on the chassis shell. For a system with multiple WIT inverters connected in parallel, ensure that the enclosures of the WIT Inverters, the metal racks of the PV modules and the batteries should be connected to the same area to achieve equipotential bonding.
4. The position of the ground points of the WIT 29.9-50K-XHU Hybrid Inverter is shown in Fig 6.8.

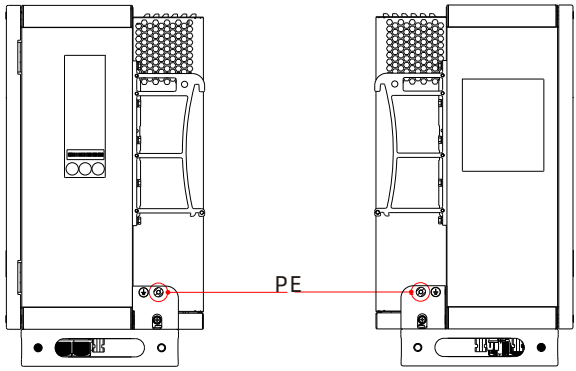



Fig 6.8 Ground points

**NOTE:**

1. Keep the lightning protection grounding at the greatest possible distance from the protective grounding.
2. Protect the terminals of the ground cables against rain and do not expose the them to open air.
3. Tighten the screws to a torque of 60 kgf·cm.

## 6.2 Connection on the AC Side

| | |
|---|---|
|  DANGER | • Before connecting cables, ensure that the DC switches on the WIT Inverter are OFF. Turn off the switches and breakers on the GRID side, GEN side and the battery side. Otherwise, the high voltages of the WIT Inverter may result in electric shocks.<br>• Only qualified and trained electrical technicians are allowed to perform operations. Technicians must observe instructions in this manual and local regulations.<br>• High voltages may cause electric shocks and serious injury. Please do not touch the inverter in operation.<br>• Do not place inflammable and explosive materials around the WIT Inverter. |
|  WARNING | • Each WIT Inverter must be equipped with a separate AC circuit breaker. Multiple WIT Inverters cannot connect to the same AC circuit breaker (not applicable to off-grid mode).<br>• Please do not connect loads between the WIT Inverter and the circuit breaker.<br>• If the cable is thick, do not wiggle the cable after tightening the cable terminals. Otherwise, the loose connection may cause overheating that will damage the device. Ensure that the terminals are properly connected before starting the WIT Inverter.<br>• Upon completion of the AC wiring, remember to seal the water-proof silicone mat with the fireproof mud in order to ensure good waterproof performance. |

Preparation:

1> Ensure the grid voltage and the grid frequency are within the acceptable range;

2> Disconnect the DC switches and the AC breakers on the grid side, generator side and the battery side.

**The circuit breaker on the AC side:**

AC circuit breaker needs to be installed on the grid side, ensuring a safe disconnection between the WIT Inverter and the upstream input when an exception occurs.

1. Recommended AC breaker specifications for WIT 29.9-50K-XHU models

| Device type | Rated voltage of the circuit breaker | Rated current of the circuit breaker |
|---|---|---|
| WIT 29.9K-XHU | 400V | 150A |
| WIT 30K-XHU | 400V | 150A |
| WIT 36K-XHU | 400V | 150A |
| WIT 40K-XHU | 400V | 200A |
| WIT 50K-XHU | 400V | 250A |

2. Recommended load breaker specifications for WIT 29.9-50K-XHU models

| Device type | Rated voltage of the circuit breaker | Rated current of the circuit breaker |
|---|---|---|
| WIT 29.9K-XHU | 400V | 80A |
| WIT 30K-XHU | 400V | 80A |
| WIT 36K-XHU | 400V | 80A |
| WIT 40K-XHU | 400V | 100A |
| WIT 50K-XHU | 400V | 125A |

3. Recommended bypass breaker specifications for WIT 29.9-50K-XHU models

| Device type | Rated voltage of the circuit breaker | Rated current of the circuit breaker |
|---|---|---|
| WIT 29.9K-XHU | 400V | 80A |
| WIT 30K-XHU | 400V | 80A |
| WIT 36K-XHU | 400V | 80A |
| WIT 40K-XHU | 400V | 100A |
| WIT 50K-XHU | 400V | 125A |

4. Recommended Gen breaker specifications for WIT 29.9-50K-XHU models

| Device type | Rated voltage of the circuit breaker | Rated current of the circuit breaker |
|---|---|---|
| WIT 29.9K-XHU | 400V | 150A |
| WIT 30K-XHU | 400V | 150A |
| WIT 36K-XHU | 400V | 150A |
| WIT 40K-XHU | 400V | 200A |
| WIT 50K-XHU | 400V | 250A |

**NOTE**:
For the PCS to operate in Smart Load mode, select the appropriate AC breaker based on the smart load power.

**Recommended power cable specifications:**

1.Recommended AC power cable specifications for WIT 29.9-50K-XHU models.

| Device type | GRID Recommended cable specification | LOAD Recommended cable specification | GEN Recommended cable specification |
|---|---|---|---|
| WIT 29.9K-XHU | 35mm² | 25mm² | 35mm² |
| WIT 30K-XHU | 35mm² | 25mm² | 35mm² |
| WIT 36K-XHU | 35mm² | 25mm² | 35mm² |
| WIT 40K-XHU | 50mm² | 35mm² | 50mm² |
| WIT 50K-XHU | 50mm² | 35mm² | 50mm² |

**AC side connection steps:**

1. Open the right cover plate. The position of the cover is shown in Fig 6.9;

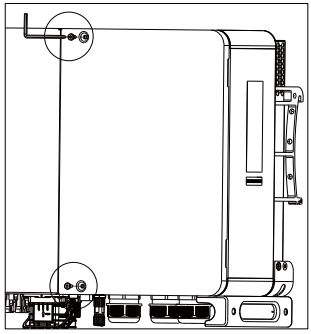


Fig 6.9

2. Connect a ground cable to the copper grounding bar. Fig 6.10 shows the position of the grounding bar inside the right cover plate;

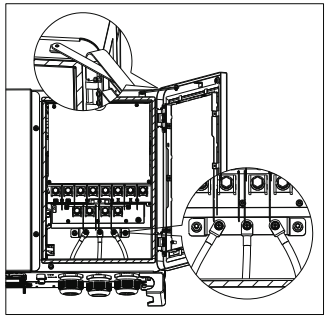


Fig 6.10

3. Connect the main power cables according to the label. Fig 6.11 shows the position of the label and the AC terminals.

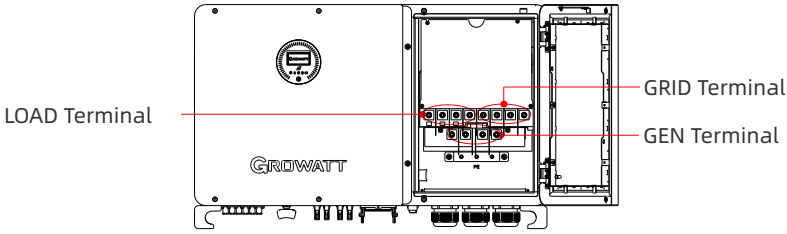



Fig 6.11 AC terminal wiring position and diagram

**NOTE:**

1. Determine the stripped length based on the wiring terminal specifications (recommended length: 22-26 mm). Crimp the cable and terminal using a crimper as shown below. Loosen the PG type cable gland and route the cables through it. Then connect the cables to the corresponding terminals. Secure the cables by tightening the screws.

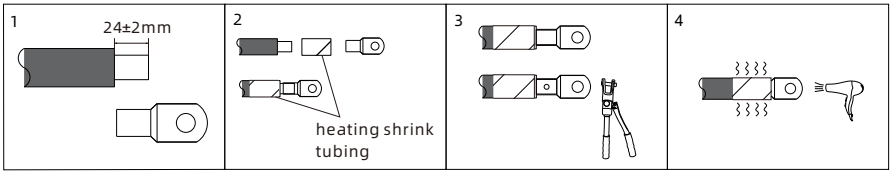



Fig 6.12 Crimping a cable

2. Cold-pressed terminals are delivered with the package. Select terminals based on the cable specifications;
3. After connecting the cables, apply fireproof mud to the waterproof silicone mat at the inlet side. Lock the cover of the AC junction box after the fireproof mud is applied. See Fig 6.13 below.

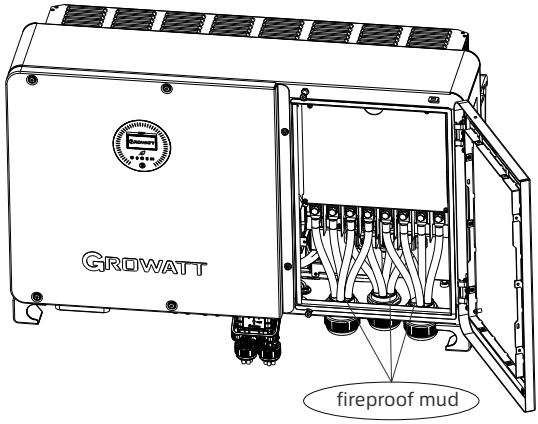



Fig 6.13 Applying fireproof mud

| | |
|---|---|
| WARNING | • Any device damage caused by failure to seal the output terminal gaps as instructed is beyond the scope of warranty and Growatt shall not be liable for the damage. |

## 6.3 Connection on the PV Side

| | |
|---|---|
| DANGER | • Before connecting cables, ensure that the PV SWITCH of the WIT Inverter are OFF, and turn off the breakers on the AC side and the battery side. Otherwise, the high voltages of the WIT Inverter may cause electric shocks.<br>• Only qualified and trained electrical technicians are allowed to perform operations. Technicians must observe instructions in this manual and local regulations.<br>• Check the positive and negative terminals before connecting the PV module to the WIT Inverter.<br>• High voltages may cause electric shocks and serious injury. Please do not touch the inverter in operation.<br>• Please do not place inflammable and explosive materials around the WIT Inverter. |
| WARNING | • The maximum open-circuit voltage of each string should not exceed 1100Vdc.<br>• Ensure that the following conditions are met; Otherwise, fire hazard or inverter damage may occur. Growatt is not liable for the consequence and it is beyond the warranty scope. |

**NOTE:**

1. When exposed to sunlight, PV modules will generate voltage. High voltages presented in the PV strings connected in series could be fatal. Therefore, shield the PV modules from sunlight before connecting the DC input power cable and ensure that the DC switches on the WIT Inverter are OFF.
2. The PV modules connected in series should be of the same model.
3. The maximum short-circuit current of each PV string must be lower than or equal to 50A.
4. The total panel power should not exceed twice the WIT Inverter input power.
5. For optimal system configuration, it is recommended to connect two DC inputs with an equal number of PV modules.

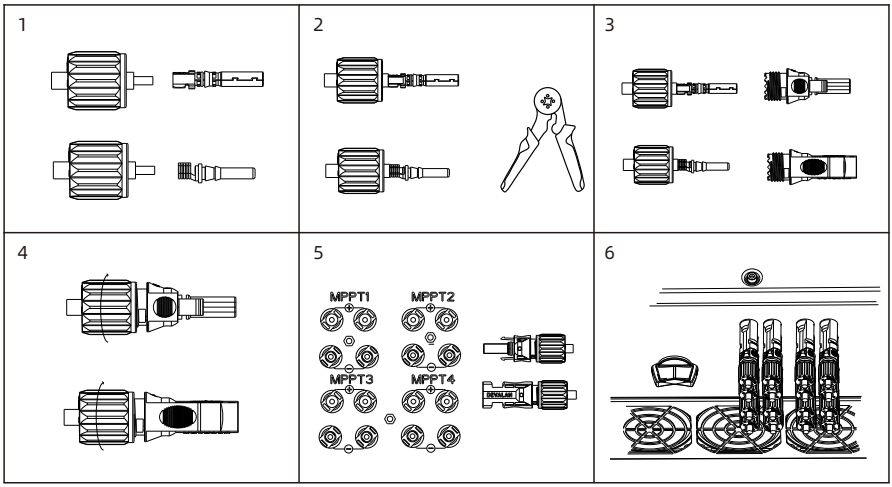



Fig 6.14 PV terminals

**Procedure for connecting cables on the PV side:**

1. Strip 6-8 mm of the insulation layer of the PV cables.
2. Insert the exposed core wires into the crimping area of the wiring terminal and crimp them using a crimping plier;
3. Route the cable through the cable sealing sleeve and insert the insulation sleeve until it snaps. Slightly pull the cable back to ensure that it is securely connected. Then tighten the locking nut;
4. Insert the positive and negative connectors of the PV modules to the corresponding terminals on the inverter. For the maximum input current of different models, please see Table 6.1. For the cable specifications, please see Table 6.2.

Table 6.1 Maximum current of a single MPPT route

| Device type | Max. current of a single MPPT route |
|---|---|
| WIT 29.9K-XHU | 40A |
| WIT 30K-XHU | 40A |
| WIT 36K-XHU | 40A |
| WIT 40K-XHU | 40A |
| WIT 50K-XHU | 40A |

Table 6.2 Cable specifications on the PV side

| Device type | Recommendation cable specifications |
|---|---|
| WIT 29.9K-XHU | 4-6mm² |
| WIT 30K-XHU | 4-6mm² |
| WIT 36K-XHU | 4-6mm² |
| WIT 40K-XHU | 4-6mm² |
| WIT 50K-XHU | 4-6mm² |

**NOTE:**

1. For a single WIT Inverter, connect the ground cable of the inverter. For a system with multiple WIT Inverters connected in parallel, connect the ground cables of all inverters and the metal racks of the PV modules to the same area to ensure equipotential bonding. Before connecting the PV cables, ensure that the ground cables on the PV side are properly connected.
2. Use male and female connectors in pair. Ensure the correct polarity before connecting the PV string to the inverter.
3. The total current of all strings cannot exceed the WIT Inverter's maximum input current;
4. Do not touch the solar panels in operation;
5. The wires should be tinned and are not frayed or cracked.

## 6.4 Connection on the Battery Side

| | |
|---|---|
| **DANGER** | • Before connecting cables, ensure that the DC switches of the WIT Inverter are OFF, and turn off the breakers on the AC side and the battery side. Otherwise, the high voltages of the WIT Inverter may cause electric shocks.<br>• Only qualified and trained electrical technicians are allowed to perform operations. Technicians must observe instructions in this manual and local regulations.<br>• High voltages may cause electric shocks and serious injury. Please do not touch the inverter in operation.<br>• Please do not place inflammable and explosive materials around the WIT Inverter. |
| **WARNING** | • Ensure that all cables are securely connected before powering on the WIT Inverter. Loose connection may cause overheating that will damage the device.<br>• The battery cables on WIT inverter are protected by a structural shield. After connect all cables, we should restore the removed structural shield to avoid human touch. |

**NOTE:**
The recommended battery voltage is 512V.

Table 6.3 Cable specifications on the Battery side

| Device type | Recommendation cable specifications |
|---|---|
| WIT 29.9K-XHU | 16mm² |
| WIT 30K-XHU | 16mm² |
| WIT 36K-XHU | 16mm² |
| WIT 40K-XHU | 16mm² |
| WIT 50K-XHU | 16mm² |

### 6.4.1 Connecting the Main Power Cable of the Battery

**Preparation:**
1. Check that the battery terminals of the WIT Inverter are intact;
2. Disconnect the DC switches on the WIT inverter, the AC breaker and the DC switch on the battery;
3. Take out the battery terminals from the accessory kit delivered with the package. See Packing List in Section 4;

**Procedure for connecting the main battery power:**
1. Connect the ground cable to the battery power ground bar, as shown in Fig 6.10;
2. Strip 11.5-12.5 mm of the insulation layer of the DC cables;
3. Crimp the battery cables and the battery terminals using crimping pliers, and then tighten the insulation sleeve;
4. Install the anti-dismantle elements.
5. Connect the battery cables to the battery terminals on the inverter, as shown in Fig 6.15;

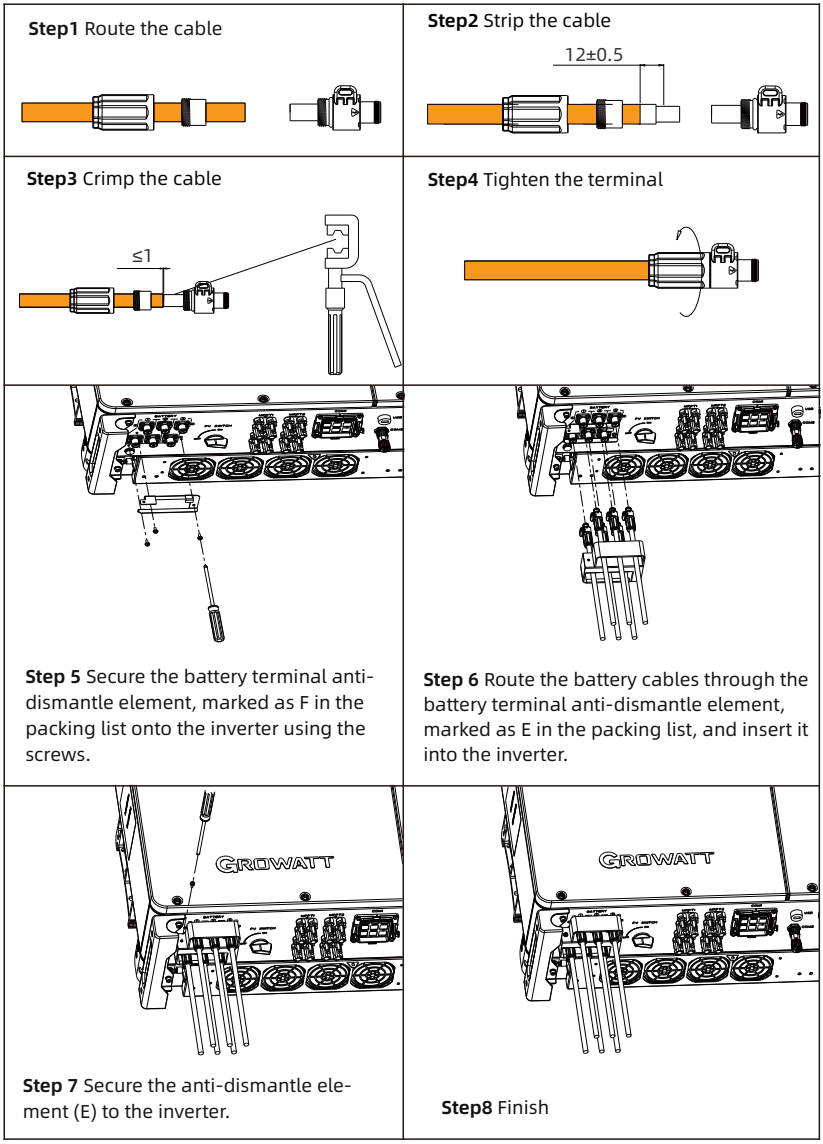



Fig 6.15 Position of the battery terminals

**NOTE:**

1> Connect the ground cable before connecting the battery cable; the ground point is shown in Fig 6.10.

2> The length of the battery cable is recommended to be no more than 10m.

### 6.4.2 Connecting the Battery BMS-AC terminal

**NOTE:** Perform operations according to on-site requirements.

**Procedure for connecting the battery BMS-AC terminal:**

1. Open the right cover plate of the inverter, the position of which is shown in Fig 6.16;
2. Find the corresponding terminals from the accessory kit. Refer to Table 6.4 to connect the terminals;

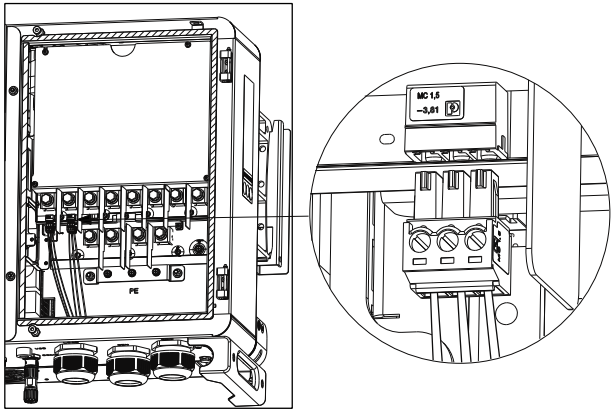



Fig 6.16 BMS-AC terminal

Table 6.4 Definitions of BMS-AC terminal

| BMS-AC terminal port definition | | |
|---|---|---|
| **Number** | **Definition of signal** | **Note** |
| CN4/CN5/CN6 | LOAD R/LOAD S/LOAD T | Supply power to the BMS |
| CN7 | LOAD N | |

**NOTE:**

1. Reinstall the battery protective plate and the right cover plate after the cable connection is completed.
2. Select phase or line voltage according to actual needs.

## 6.5 Connecting Communications Cables

### 6.5.1 COM1 Connection

The COM1 terminal of the WIT 29.9-50K-XHU Inverter includes 9 RJ45 ports. It is used for parallel connection via PARA-IN and PARA-OUT communication terminals, battery communication via BMS1, BMS2 and BMS3 terminals, and external equipment communication via RS485 and DRMs function.
Connect the communication cables to the corresponding terminals as required. For details, see Table 6.5;

**Procedure for connecting the COM1 terminal:**

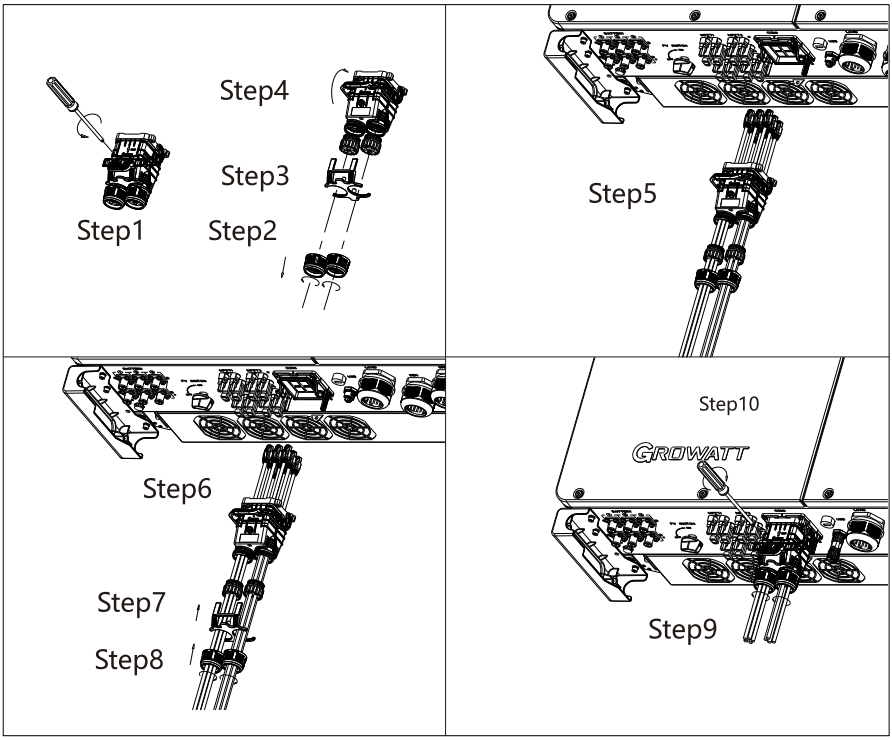



Fig 6.17

1> Remove the fixing screws and disassemble the COM1 waterproof cover as Step 1-4 show;
2> Crimp the communication cable as follows:

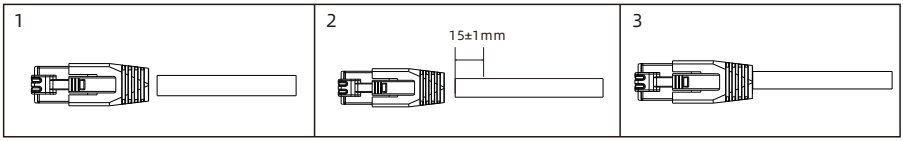



Fig 6.18

Loosen the cable gland and remove the watertight caps inside the cable gland based on the number of the cables and keep the unused holes with watertight cap. Lead the cable into the holes in the cable gland (the 5-hole fastening rings inside the cable gland are with openings on the side. Please separate the gap with hand and squeeze the cables into the holes from the side openings. Hole diameter: 5.5~7.0 mm). Route the cables through the COM1 terminal waterproof cover as Step 5 shows. Connect the cable to the corresponding terminal.

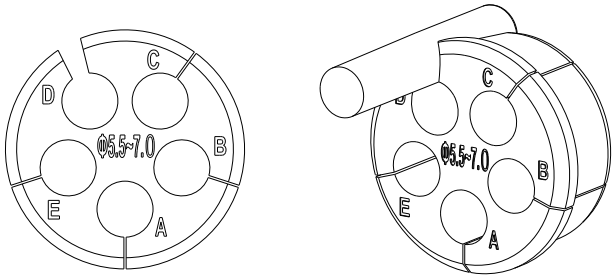



Fig 6.19

3> Tighten the COM1 terminal cover as Step 6-8 shows.
4> Secure the screws as Step 9 shows.

**Detailed information of COM1**

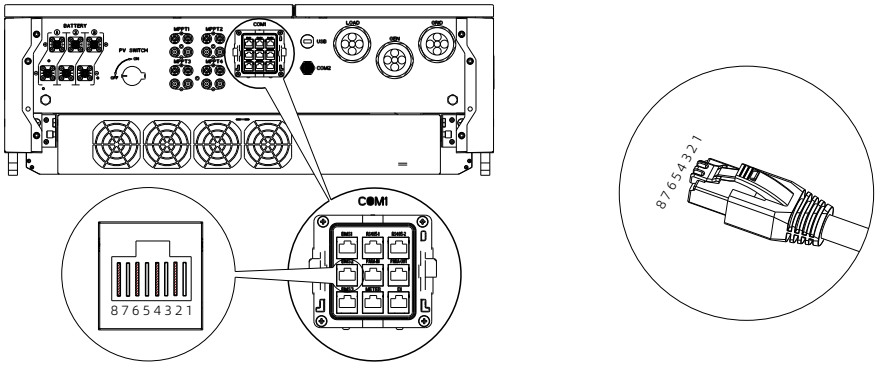



Fig 6.20 COM1 communication terminal

Table 6.5 COM1 communication terminal description

| Definition of battery communication terminal | | | |
|---|---|---|---|
| **Silk screen** | **Pin** | **Definition of signal** | **Function and Note** |
| BMS1 | 1 | BAT RS485_B | Communication of battery1 (mandatory) |
| | 2 | BAT RS485_A | |
| | 3 | BAT1 DI_1 | |
| | 4 | BAT1 CAN_H | |
| | 5 | BAT1 CAN_L | |
| | 6 | BAT1 DI_2 | |
| | 7 | BAT1 WAKE-(GND.S) | |
| | 8 | BAT1 WAKE+ | |
| BMS2 | 1 | BAT RS485_B | Communication of battery2 (mandatory) |
| | 2 | BAT RS485_A | |
| | 3 | BAT2 DI_1 | |
| | 4 | BAT2 CAN_H | |
| | 5 | BAT2 CAN_L | |
| | 6 | BAT2 DI_2 | |
| | 7 | BAT2 WAKE-(GND.S) | |
| | 8 | BAT2 WAKE+ | |
| BMS3 | 1 | BAT RS485_B | Communication of battery3 (mandatory) |
| | 2 | BAT RS485_A | |
| | 3 | BAT3 DI_1 | |
| | 4 | BAT3 CAN_H | |
| | 5 | BAT3 CAN_L | |
| | 6 | BAT3 DI_2 | |
| | 7 | BAT3 WAKE-(GND.S) | |
| | 8 | BAT3 WAKE+ | |

| Definition of battery communication terminal | | | |
|---|---|---|---|
| **Silk screen** | **Pin** | **Definition of signal** | **Function and Note** |
| RS485-1 | 1 | RS485_1B | RS485-1: Meter2/ShineBus/ ShineMaster (1/4/5) RS485-3: EMS/VPP(7/8) |
| | 2 | GND.S | |
| | 3 | / | |
| | 4 | RS485_1B | |
| | 5 | RS485_1A | |
| | 6 | / | |
| | 7 | RS485_3B | |
| | 8 | RS485_3A | |
| RS485-2 | 1 | RS485_1B | RS485-1: Meter2/ShineBus/ ShineMaster (1/4/5) RS485-3: EMS/VPP(7/8) |
| | 2 | GND.S | |
| | 3 | / | |
| | 4 | RS485_1B | |
| | 5 | RS485_1A | |
| | 6 | / | |
| | 7 | RS485_3B | |
| | 8 | RS485_3A | |
| METER | 1 | RS485_2B | RS485_2: METER1 output (export limitation meter wiring port for a single inverter) |
| | 2 | GND.S | |
| | 3 | / | |
| | 4 | / | |
| | 5 | RS485_2A | |
| | 6 | / | |
| | 7 | / | |
| | 8 | / | |

| Definition of battery communication terminal | | | |
|---|---|---|---|
| **Silk screen** | **Pin** | **Definition of signal** | **Function and Note** |
| DI | 1 | DRM1/5 | DRMS/RCR/DI function |
| | 2 | DRM2/6 | |
| | 3 | DRM3/7 | |
| | 4 | DRM4/8 | |
| | 5 | REF | |
| | 6 | COM | |
| | 7 | / | |
| | 8 | / | |
| PARA-IN | 1 | / | Parallel input |
| | 2 | GND.S | |
| | 3 | Sc_A/H | |
| | 4 | PL_CANH | |
| | 5 | PL_CANL | |
| | 6 | Sc_B/L | |
| | 7 | GND.S | |
| | 8 | master_CAN | |
| PARA-OUT | 1 | / | Parallel output |
| | 2 | GND.S | |
| | 3 | Sc_A/H | |
| | 4 | PL_CANH | |
| | 5 | PL_CANL | |
| | 6 | Sc_B/L | |
| | 7 | Slave_CAN | |
| | 8 | GND.S | |

### 6.5.2 COM2 Connection

The COM2 terminal is used for Generator start-up and emergency stop.

1. Strip 23-27 mm of the cable jacket and 8-12mm of the wire insulation.
2. Crimp the COM2 cable and the terminal using a crimping plier, and then tighten the insulation sleeve;
3. Connect the COM2 cable to the COM2 terminal on the inverter, as shown in Fig 6.21;

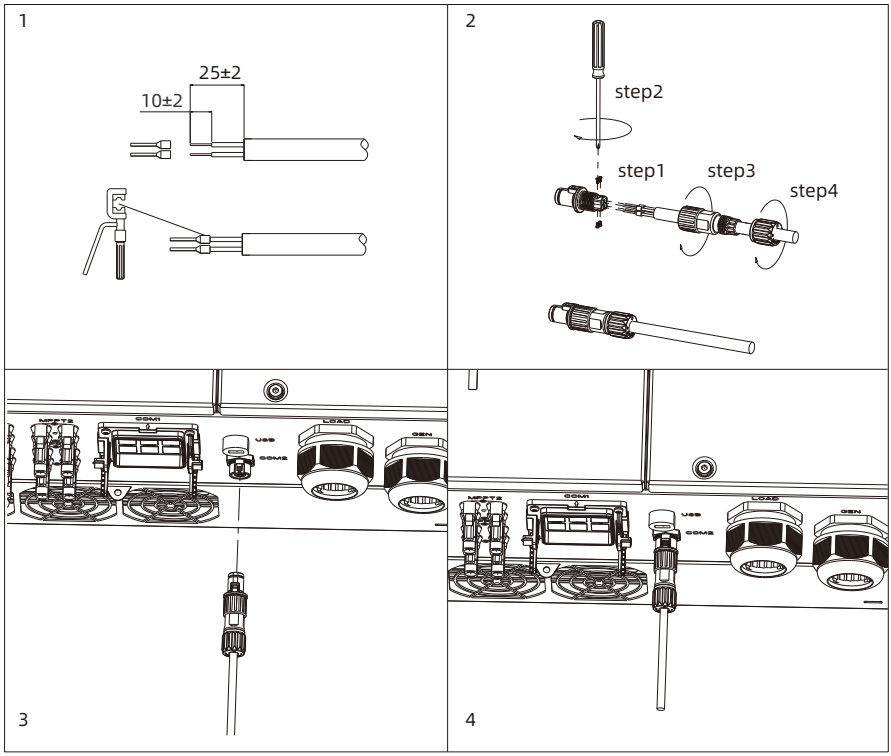



Fig 6.21 Connecting to the COM2 terminal

**NOTE:**
The external communication terminal of the WIT 29.9-50K-XHU Inverter is a 4-pin connector. The matching terminal is in the accessory kit. The connection procedure is as follows:
1. Connect the communication cable to the corresponding terminal as required.

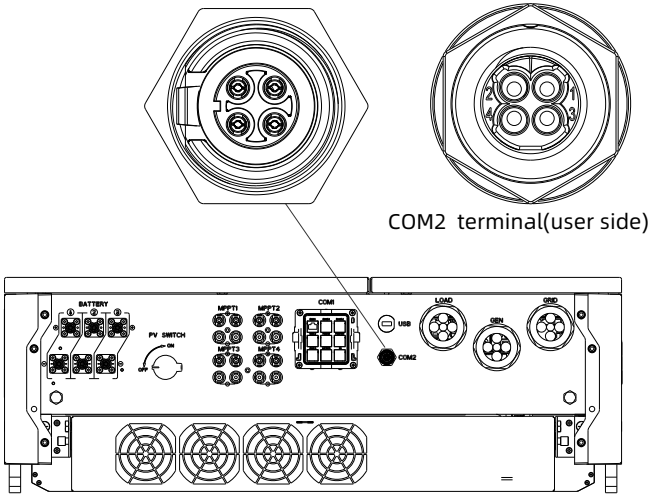



Fig 6.22 COM2 communication terminal

2. The COM2 communication terminal contains two dry contacts (voltage free). PIN 1 and 2 are for emergency stop signal; PIN 3 and 4 are for DG start-up signal.

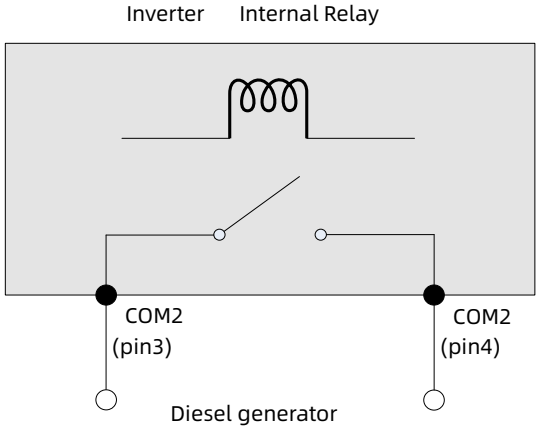



Fig 6.23

**Note:** Maximum dry contact input: 24VDC 1A.

### 6.5.3 USB connection

The WIT-XHU series inverter is equipped with a USB interface as standard, which can be connected to a USB to WiLAN-X2 monitoring module for remote monitoring. In addition, you can also quickly upgrade the inverter software through the U disk.
Steps to install the monitoring module:

1> Loosen the waterproof cover of the USB interface and remove it.

2> As shown in Fig 6.24, insert the WiLAN-X2 module into the USB interface, and the LED indicator of the WiLAN-X2 module will be on.

3> As shown in Fig 6.24, make sure that the ▲ is facing frontwards as the inverter has been wall-mounted, insert the monitoring module into the USB interface, and tighten the lock.

**Note:**

If a USB to WiLAN-X2 module is installed, please take the module and the data cable away, and tighten the waterproof cover when the operator leaves to prevent water from entering the interface.

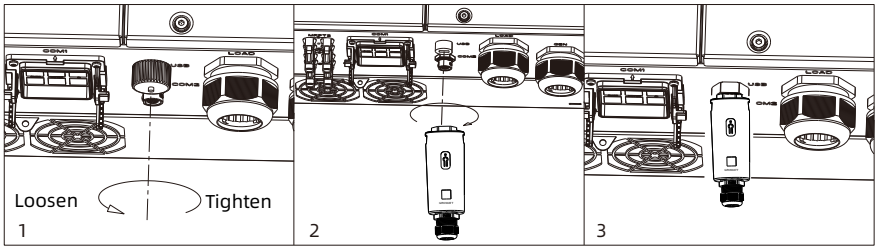



Fig.6.24 USB Connection

## 6.6 Post-installation Checks

The following table lists the post-installation items to be checked:

| Position | Item | Check item |
|---|---|---|
| | Ground cable connected to the chassis | Check the cable specifications; ensure that the cable has been securely fastened |
| AC side | Ground cable on the AC side | Check the cable specifications; ensure that the cable has been securely fastened |
| | Grid side | Check the cable specifications; ensure that the cable has been securely fastened |
| | Load side | Check the cable specifications; ensure that the cable has been securely fastened |
| | GEN side | Check the cable specifications; ensure that the cable has been securely fastened |
| | Waterproof silicone gel mat | No gap exists; the fireproof mud has been evenly applied |
| | Right cover plate | Re-install the cover and secure it with screws after checking all items on the AC side |
| PV side | Ground cable on the PV side | Check the cable specifications; ensure that the cable has been securely fastened |
| | PV+/PV- | Check the cable specifications; ensure that the cable has been securely fastened; confirm that the number of PV modules matches the rated power |
| Battery side | Ground cable on the battery side | Check the cable specifications; ensure that the cable has been securely fastened |
| | BAT+/BAT- | Ensure that the positive and negative terminals are connected correctly and securely; the sealing rubber ring is properly seated into the gland |
| | BMS-AC | Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland |
| | Cable bundling | The cables are bundled in the specified position |

| Position | Item | Check item |
| --- | --- | --- |
| Communication terminals | COM1 | Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland |
| | COM2 | Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland |
| | USB | Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland |

# 7 Commissioning

## 7.1 Commissioning the WIT Inverter



- The WIT Inverter might show wrong time and date if it has been stored for over a month. You need to set the correct time and date before connecting the WIT Inverter to the grid.

### 7.1.1 Set the Communication Address

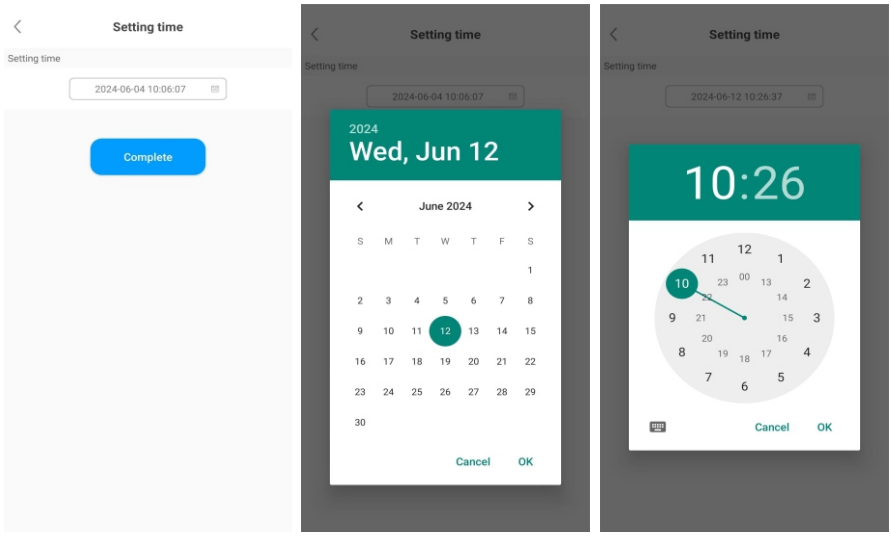
After the WIT Inverter is powered on, you can set the communication address of the WIT Inverter via RS485 communication or the USB to WiLAN module. When multiple inverters are connected in parallel with RS485 hand-in-hand communication, each inverter should be set to different communication addresses. For a single inverter, the default communication address is set to1.

**NOTE:**
The communication address of the WIT Inverter ranges from 1 to 254.
By connecting the WIT Inverter to the host computer through RS458 communication, you can change its communication address via ShineBus. This operation should be performed by professional personnel.

### 7.1.2 Set the Time and Date

#### 7.1.2.1 Set the time and date on the APP

Follow the instructions in Section 6.5.3 to connect the datalogger. When the inverter is powered in, you can set inverter time and date referring to Section 8.1.1. Tap General settings>Setting time, then enter the password “growatt+date”. For instance, if the date is Feb. 28, 2024, the password would be “growatt20240228”. After that, tap “Yes”, set the correct date, then click “OK”. Proceed to set the time, and click “OK”.




### 7.1.2.2 Set the Date & Time Automatically

Connect the WIT Inverter to the server following the procedure specified in Section 8.1.2 when the inverter is powered on, then the WIT Inverter will update its date and time automatically.

## 7.2 Mode of operation

### 7.2.1 Waiting Mode

When the PV voltage is greater than 180V or the battery voltage is greater than 190V, the WIT Inverter will be powered on and enters the waiting mode.
In waiting mode, the WIT Inverter performs self-check. If the system is normal and the PV voltage is greater than or equals to 195V or the battery voltage is greater than or equals to 200V, the WIT inverter will attempt to turn on.

### 7.2.2 Operating Mode

#### 7.2.2.1 Operating Mode of WIT 29.9-50K-XHU

➢ **Load First:**
In Load First mode, the WIT inverter prioritizes supplying the solar power and battery energy to the loads. If Export Limitation is disabled, the surplus solar power can be fed to the grid, but the battery energy will not be exported to the grid; if Export Limitation is enabled, neither solar power nor battery energy would be sent to the grid.
Priority of power supplied to the loads:
1. Solar panels;
2. Batteries;
3. Grid.

**NOTE:** In Load First mode, a meter is required.

➢ **Battery First:**

In Battery First mode, the solar power is prioritized towards charging the battery until the battery SOC (state of charge) reaches the preset upper threshold. Then it will supply power to the loads. The further excess solar power, if any, can be fed to the grid (Export Limitation disabled). In case that the solar power is insufficient, the WIT inverter will draw power from the grid to charge the battery or supply the loads.

Priority of power directed to charge the battery:

1. Solar panels;
2. Grid.

➢ **Grid First:**

In Grid First mode, the WIT inverter prioritizes supplying the solar power to the loads, exports the excess solar power to the grid, and sends the further surplus power to charge the power. If the solar power is insufficient to support the loads, the battery will discharge to supply power to the loads and the surplus battery power will be sent to the grid for revenue.

Priority of power supplied to the loads:

1. Solar panels;
2. Batteries;
3. Grid.

➢ **Solar only backup**

In Solar only backup mode, the grid cannot charge the battery, the solar power is prioritizes charging the battery until the SOC of the battery reaches the preset upper threshold, the excess energy of solar carries the load. If the excess energy of the solar is not enough to carry the load, it is supplemented by the grid; if the excess energy of the solar is greater than the load, the excess energy is reversed to the grid.

➢ **Idle/Charge from clipped solar**

In Idle mode, when the solar energy is greater than the load, the solar supplies power to load first, and the excess energy is reversed to the grid; when the solar energy is less than load, the solar and the grid carry the load together. In this mode, the battery is neither charged nor discharged.

➢ **PTO**

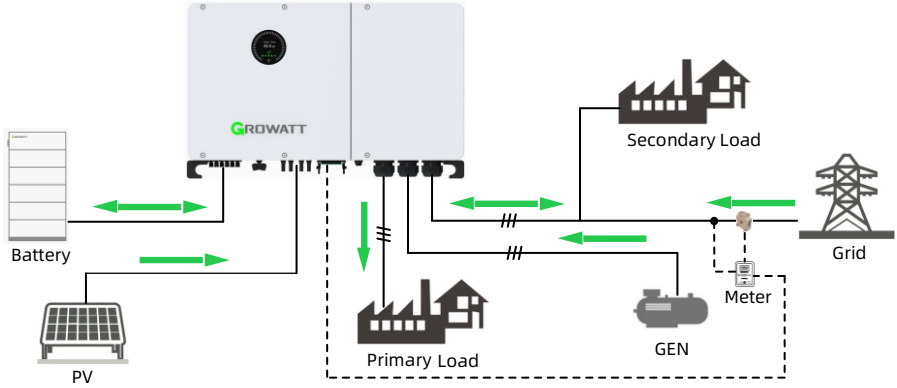
In PTO mode, the solar only charges the battery and the inverter circuit is always in standby.

➢ **Grid first(ECO)**

In ECO mode, the solar and the battery prioritize the power to meet the load demand, the excess energy of the solar is reversed to the grid, and the energy of the battery is only supplied to load, the excess battery energy is not reversed to the grid.

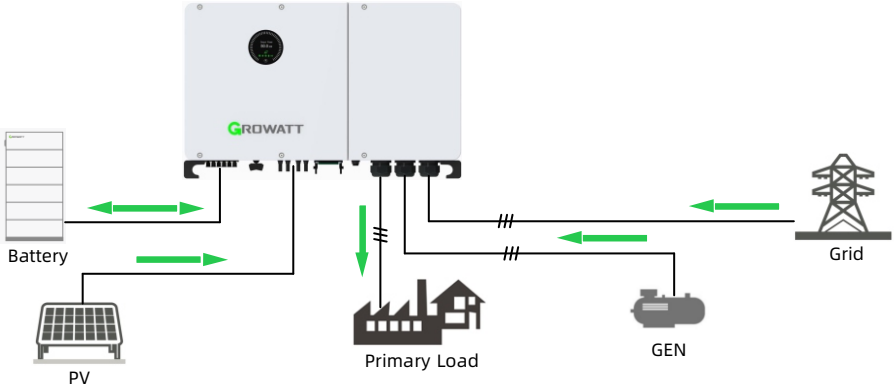
➢ **Zero export to meter:**

With Export Limitation enabled, no solar power or battery energy will be fed to the grid in this mode. The inverter output is only supplied to the loads connected before the external meter connection point. A meter is required. For the meter wiring mode, please refer to Fig 6.6 in Chapter 6. The external meter will detect power flowing to the grid and regulate the generated power so that only so much energy is generated as is currently consumed by the primary loads, secondary loads and charging the battery.




➢ **Zero export to GRID:**

In this mode, there is no output at the inverter's GRID port. The solar and battery power can only by supplied to Primary Loads via the LOAD port. The meter is not required.



➢ **Smart Load:**

Smart loads are connected to the GEN port and the Smart Load mode is set: during on-grid operation, it will supply grid power to smart loads; during off-grid operations, the power supply to smart loads is cut off. The wiring method is shown in Chapter 6 Fig 6.4.

➢ **AC couple:**

The grid-tied inverter is connected to the GEN port and the AC Couple mode is set: during on-grid operation, the grid-tied inverter will be connected to the grid and generate electricity via the GEN port; during off-grid operation, the grid-tied inverter remains connected to the WIT inverter and generating power. The wiring method is shown in Chapter 6 Fig 6.5.

The GEN port supports three types of multiplexing: diesel generator, smart load, and AC couple. you can choose one of the three to match your system as needed.

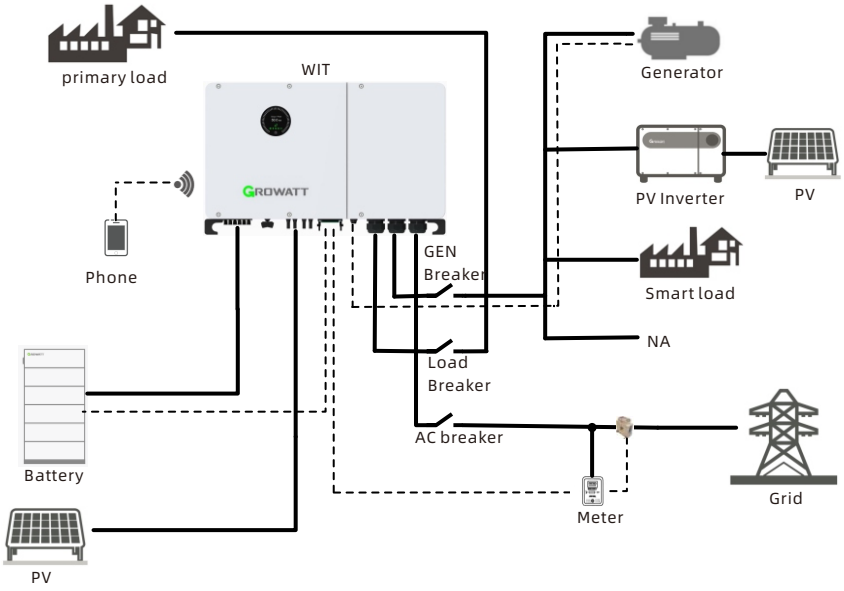


Table7.1 Introduction to GEN Port Multiplexing

| Device | GEN Port Connected Devices | Introduction |
|---|---|---|
| GEN | diesel generator | When the GEN port is connected to a diesel generator, the diesel generator can be activated (dry contact control) when the grid is abnormal and the SOC of the battery is lower than the set value, instead of AC, to supply power to the load and charge the battery. |
| PV INVTER | AC couple | When the GEN port is connected to the PV inverter, the system has AC couple function. When the grid is normal, it executes the normal photovoltaic storage inverter work logic; when the grid is abnormal, the PV inverter can carry load or charge the battery after the WIT is turned on off-grid |
| Smart Load | smart load | Smart loads are connected to the GEN port and the Smart Load mode is set: during on-grid operation, it will supply grid power and WIT inverter power to smart load and primary load; during off-grid operation ,it will only supply WIT inverter power to smart load and primary load. If the sum of the load power is ≥1.1 times the rated load of WIT inverter or the battery soc is≤50%, the smart load will be cut off. |
| NA | No external device | / |

#### 7.2.2.2 System Operating Strategies of WIT 29.9-50K-XHU

➢ **TOU (Time of use):**

Configure the system to work in the preset mode during different time segments based on the peak-valley periods and electricity price.

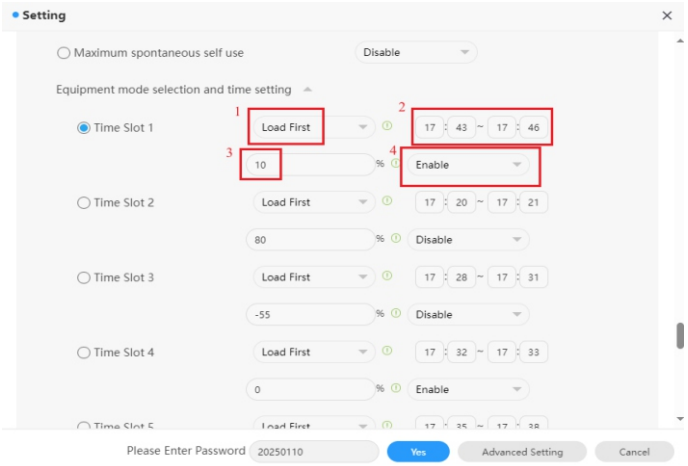
Step1: set system mode, include load first, grid first, battery first, solar only backup, idle, PTO, ECO;

Step2: set time period;

Step3: set power percentage, positive for charging, negative for discharging;

Step4: set enable/disable.

A total of 6 time slots are available for setting.



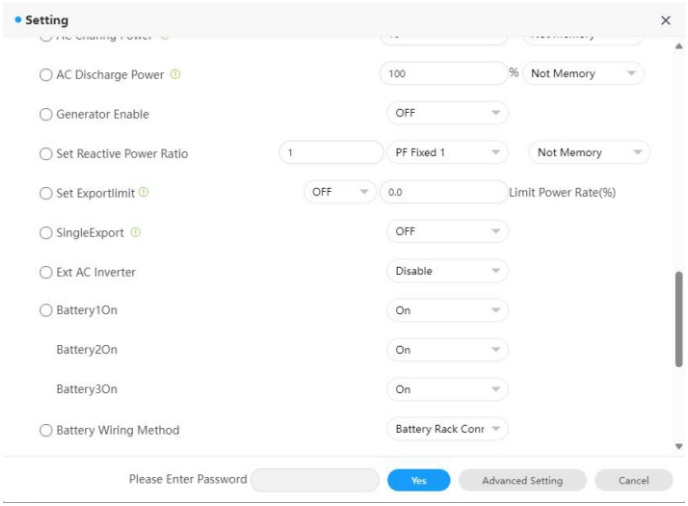

➢ **Self-consumption:**

The WIT inverter prioritizes supplying the solar power and battery energy to the loads. If Export Limitation is disabled, the surplus solar power can be fed to the grid, but the battery energy will not be exported to the grid; if Export Limitation is enabled, neither solar power nor battery energy would be sent to the grid. In case that the solar power is insufficient, the battery will discharge to power the loads.

Priority of power supplied to the loads:

1. Solar panels;
2. Batteries;
3. Grid.

**NOTE:** In Load First mode, a meter is required.



➢ **Grid Peak Shaving:**

By regulating the AC-side power output and battery power output of the WIT inverter, the grid-side downstream power and counter-current power can be better controlled. During the low peak of power consumption, the excess power of the WIT inverter is converted into battery energy to realize battery power reserve and maximize the benefit of power consumption.

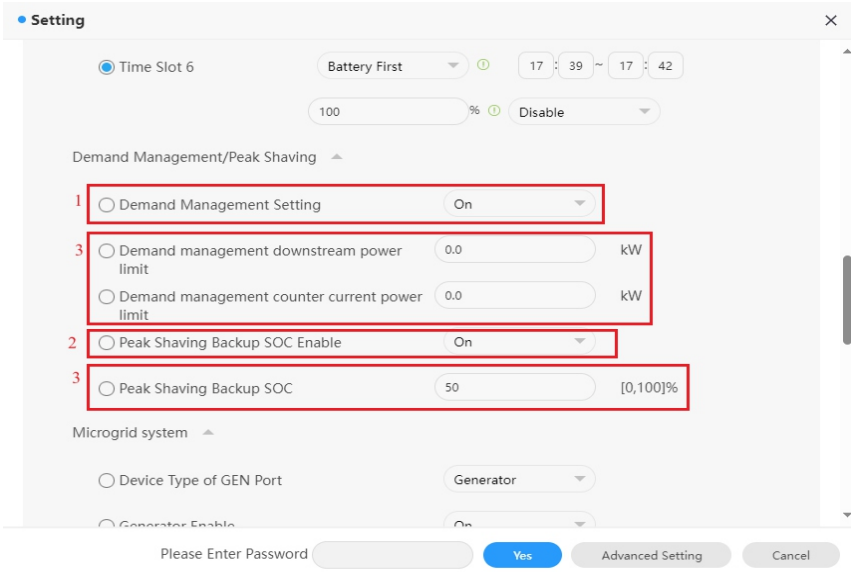
Step1: enable peak shaving;

Step2: enable peak shaving backup SOC;

Step3: set "Demand management downstream power limit","Demand management counter current power limit", "Peak Shaving Backup SOC".

After "Demand Management Setting" and "Peak Shaving Backup SOC Enable" are enabled, when the SOC value of the battery is greater than backup SOC, the system will limit the power taken from the grid to the "Demand management downstream power limit", and increase the output power of the AC side of the WIT inverter to ensure the load demand.

When the SOC of the battery is equal to the SOC of the backup power and the system load is less than the set"Demand management downstream power limit", the battery stops discharging to ensure the battery power. When the SOC of the battery is less than the backup SOC and the system load is less than the set"Demand management downstream power limit", the excess power after carrying load within PV and AC downstream limit will start charging for the battery.



➢ **Micro-grid (PV-ESS-DG Power System):**

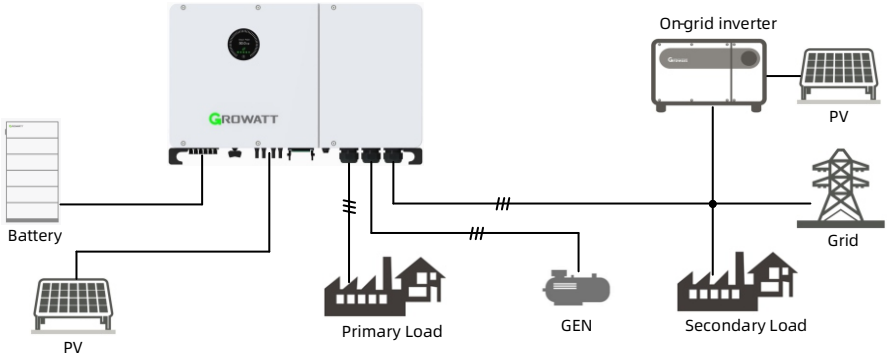
A generator is connected to the GEN port:

If the grid power is normal, the WIT inverter will work in the grid-tied mode:

1. If the power generated by the grid-tied inverter is sufficient to support the loads, the surplus power will be used to charge the battery;
2. If the power generated by the grid-tied inverter is insufficient, the WIT inverter will supply the solar power to the loads, and direct the surplus power to charge the battery.
3. If the solar power of the WIT inverter is insufficient, the battery will discharge to power the loads.
4. The battery will stop discharging when the SOC is lower than the cutoff threshold and it will draw the grid power to support the loads.

If the grid power is abnormal, the WIT inverter will work in the off-grid mode:

1. The solar power of the WIT inverter is supplied to the loads first, and the surplus power is sent to charge the battery.
2. If the solar power of the WIT inverter is insufficient, the battery will discharge to power the loads.
3. When the battery SOC is lower than the preset diesel generator startup threshold, the DG will start automatically to generate power;
4. If charging from the DG is enabled, the DG will charge the battery.
5. When the battery SOC is higher than the preset diesel generator shutdown threshold, it will disconnect the DG, and shut down the DG.




➢ **User-defined dry contact:**

After enabling the user-defined DI port and inputting the DI signal, it will carry out the AC active power and power factor according to the corresponding DI instructions.

**Note:**

1. The User-defined dry contact and DRMS share the same port.
2. Only one DI signal can be input at the same time.

### 7.2.3 Fault Mode

The intelligent control system of the WIT Inverter monitors and adjusts the system status in real time. When the WIT Inverter detects an alarm, the corresponding status light will turn red and the OLED will display the alarm. When the WIT Inverter detects a fault, the system status indicator and the corresponding status light will turn red and the OLED will display the fault. After the fault or alarm is cleared, the system recovers and all status indicators will be steady green.

**NOTE:** For details about faults and alarms, please see 9.2 Troubleshooting.

### 7.2.4 Shutdown Mode

When the battery SOC is lower than the discharge cutoff SOC and the PV string output power does not meet the requirements for grid-tied power generation, the WIT Inverter will automatically shut down. In shutdown mode, the inverter still consumes a bit energy (PV>Grid>Battery) to wait to start up again when the operating requirements are met.

**NOTE:**
When the PV input voltage is less than 200V or the battery input voltage is less than 200V, the WIT inverter will automatically shut down.

## 7.3 LED and OLED Displays Panel

The LED and OLED display panel demonstrating the running status of the WIT Inverter is shown in the Fig 7.1. The symbol description is shown in Table 7.2; The user interfaces are shown in Fig 7.2, and the LED indicator description is shown in Table 7.3.

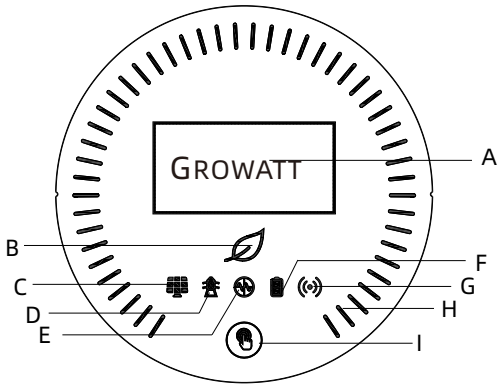



Fig 7.1 Display panel

Table 7.2 Symbol Description

| Position | Description | Note |
|---|---|---|
| A | OLED screen | Displays the main system information |
| B | System indicator | Displays the system status |
| C | PV indicator | Indicates the operation status on the PV side |
| D | Grid/GEN indicator | indicates the operation status on the grid side and the GEN port status |
| E | Off-grid indicator | Off-grid status display |
| F | Battery indicator | Indicates the status of the battery |
| G | Communication | Indicates the communication status and other system faults |
| H | Running light | Indicates the charging and discharging mode of the battery and some other statuses |
| I | Button | You can switch the information displayed on the OLED by pressing the button |

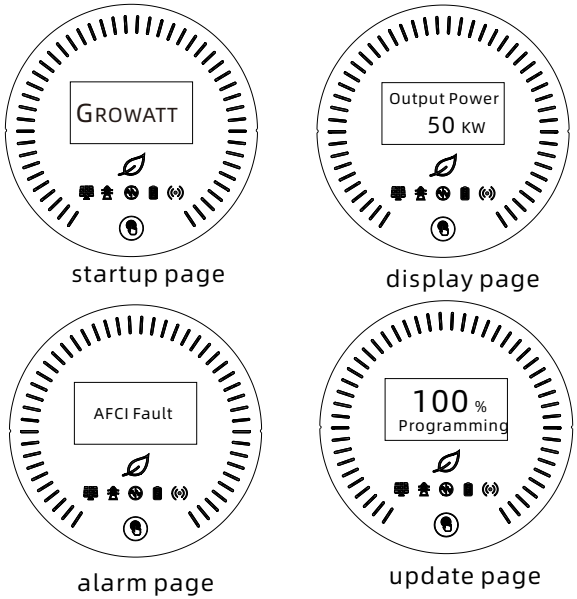



Fig 7.2 User interfaces

Table 7.3 Indicator description

| | Status | Meaning |
|---|---|---|
|  | Off | The system initialization at power-on |
| | Steady green | The system is operating properly |
| | Blinking green | System in standby or firmware upgrade |
| | Steady red | System failure |
|  | Off | The PV voltage dose not reach the operating voltage |
| | Steady green | The PV voltage reaches the operating voltage and there are no error or warning |
| | Steady red | A fault or alarm is reported on the PV side |
|  | Off | No grid |
| | Steady green | Successfully connected to the grid |
| | Steady red | A fault or alarm is reported on the grid side |
|  | Off | The system operates in grid-connected mode |
| | Steady green | The system operates in off-grid mode with no faults or alarms on the inverter side |
| | Steady red | The system operates in off-grid mode with faults or alarms on the inverter side |
|  | Off | The system is not connected to any battery |
| | Steady green | No faults and alarms for any of the batteries connected to the system（When multiple clusters of batteries are connected to the system, the battery indicator turns green when the page is turned to the page corresponding to normal battery; the light turns red when the page is turned to the page corresponding to abnormal battery; and the light goes out when the page is turned to the page corresponding to battery not connected to the system） |
| | Steady red | All batteries are faulty or alarmed |

| | Status | Meaning |
|---|---|---|
|  | Off | No host computer communication or USB flash drive read/write |
| | Steady green | Host computer communication is normal or the USB flash drive reads and writes normally |
| | Blinking green | The WIT Inverter is upgrading or the USB interface is reading and writing data |
| | Steady red | External communication fails, or a system fault occurs |
|  | Steady white | Battery is in standby mode |
| | Rotates clockwise | Charging mode |
| | Rotates anticlockwise | Discharging mode |
|  | Displays critical system information. Users can call up and switch the interface by tapping the button.<br>When a fault or alarm occurs in the system, the fault or alarm will be displayed | |
|  | The OLED will be activated when the button is pressed. The OLED will turn off if there is no operation for 5 minutes. | |
|  | Progress less than 50%: system is functioning normally, system, PV, grid, off-grid, battery and communication indicators show real-time status of system | |
| | Progress greater than 50%: PV, grid, off-grid, battery are steady green, system indicator and communication indicator blinking green | |
| | After the system firmware update is completed, the system, PV, grid, off-grid, battery and communication indicators are steady green for 8s | |
| In the first 3s after power-on, the OLED display shows the company LOGO, the running lights are steady green, and the system, PV, grid, off-grid, battery and communication indicators lights are all off.;<br>After 3s, the system, PV, grid, off-grid, battery and communication indicators are steady green for 8s. | | |

## 8.1 Remote Monitoring

Growatt WIT 29.9-50K-XHU Hybrid inverters support remote monitoring, which can be enabled by installing a datalogger. For more information on operation and configuration methods, Scan the following QR code.

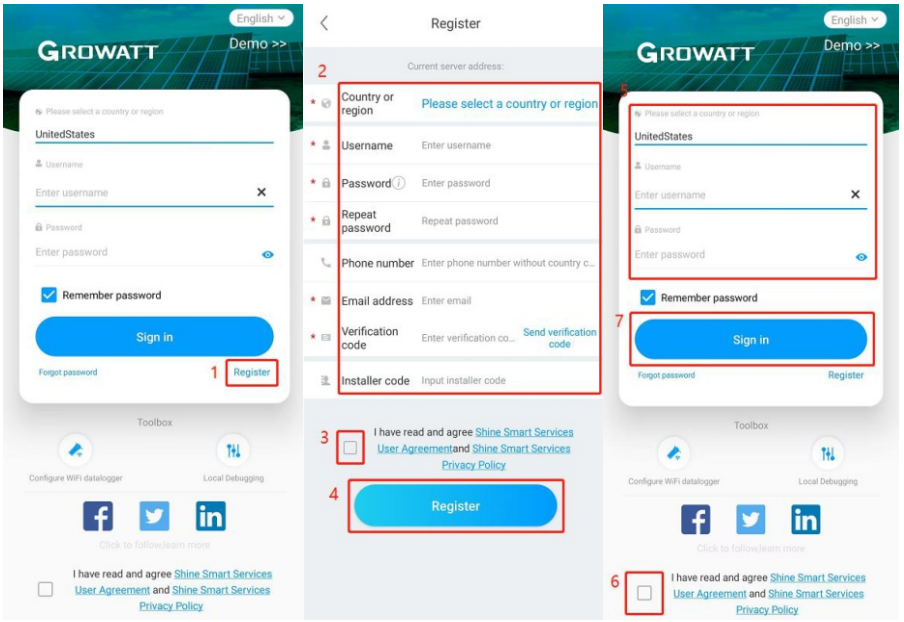
| Compatible Datalogger | Installation & Operation Guide Linkage |
|---|---|
| ShineWiLAN-X2 | |

### 8.1.1 Remote Monitoring on the APP (ShinePhone)

Scan the QR code below or search for "Shinephone" in Google/Apple Store to download and install the mobile app.

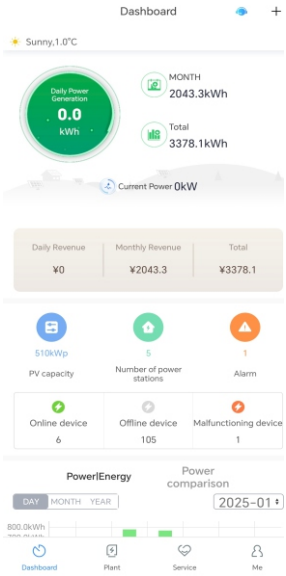
**NOTE:**
(1) Download and install the latest version of ShinePhone.
(2) See https://server.growatt.com.
(3) Shinephone and Server accounts are universal.

Account Registration on ShinePhone
Run the APP and tap "Register" on the login page. Fill in the information as required. Fields marked with * are mandatory. Tick the checkbox to agree to the Privacy Policy. Once the account is successfully registered, you can log in to the home screen. The registration page is shown below:



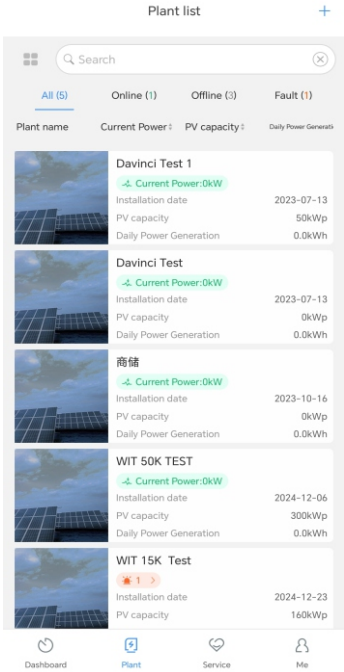

Home Screen of ShinePhone

**1. Dashboard:** displays the critical information of all power plants under the account, such as the total yield, the total revenue and the status of the device. Please refer to the figures below:

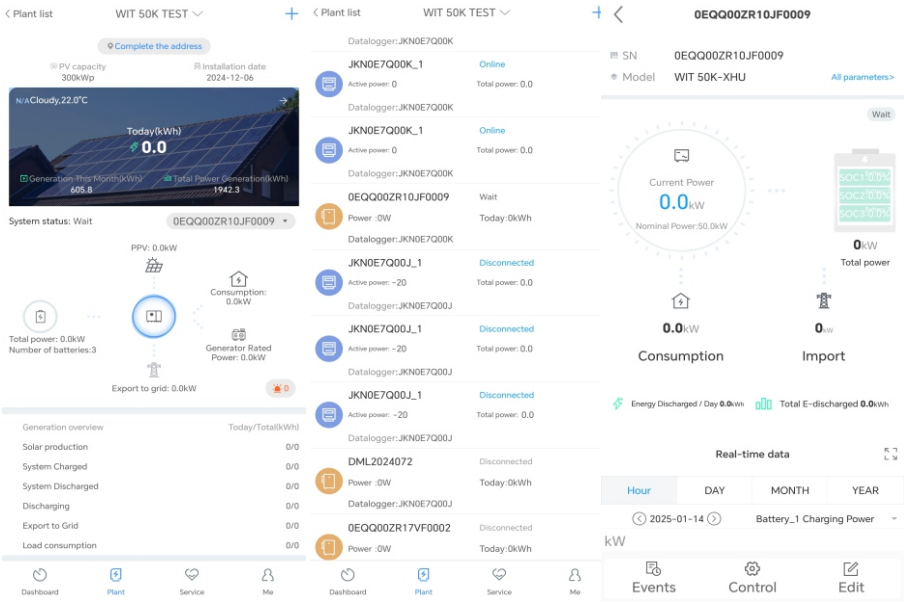




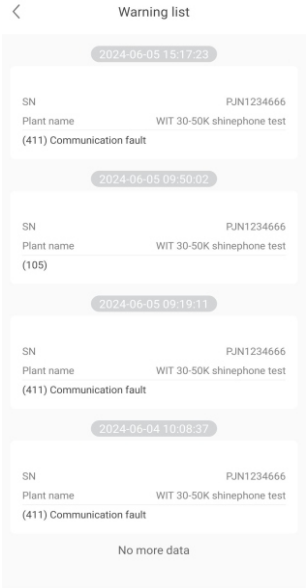

**2. Plant:** displays the plant list and the basic information about each PV plant, as shown in the figure below. You can select your target plant to view detailed information.



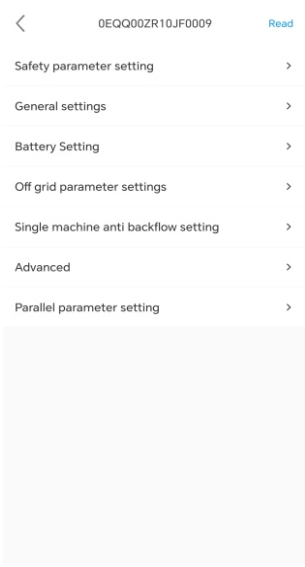

Detail Page of the WIT Inverter:
To access details about the WIT Inverter or related devices:
(1) Tap “Plant” and the “Plant List” will be displayed. Select your target plant, then you can access the real-time data and history record of the power plant;
(2) Select the WIT Inverter marked with its SN from “My device list”.
(3) On the Detail Page, you can view information about the inverter and related devices. Three sections - “Events”, “Control” and “Edit”, are available at the bottom.

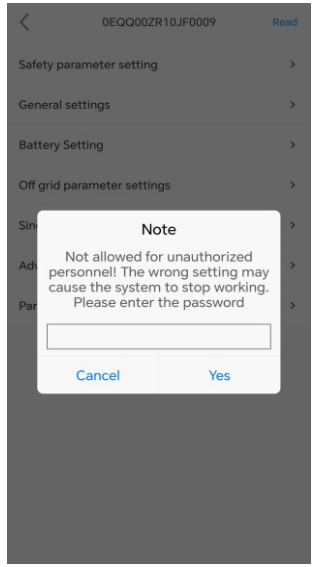



(4) On the "Events" screen, you can view the fault/warning message and suggested trouble-shooting measures.



5) On the "Control" screen, you can configure the WITInverter. The password is in the format of "growatt + the current date", e.g. growatt20250110.



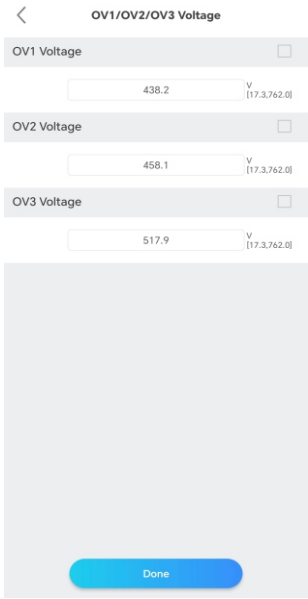

➢ Safety Parameters：include UV1/UV2/UV3 Frequency, OV1/OV2/OV3 Frequency UV1/UV2/UV3 Voltage and OV1/OV2/OV3 Voltage.



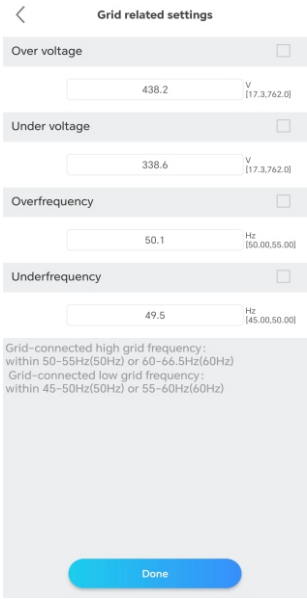




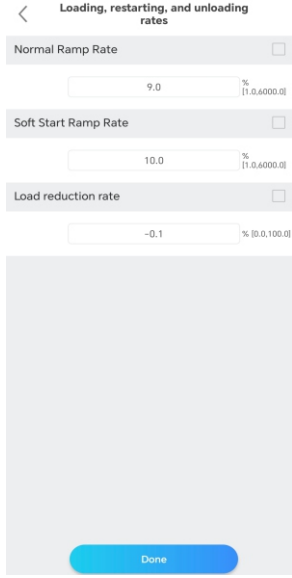




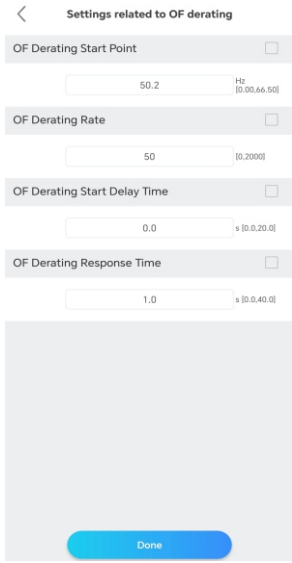

➢ Grid related settings: include High Grid Voltage Limit, Low Grid Voltage Limit, High Grid Frequency Limit, Low Grid Frequency Limit.



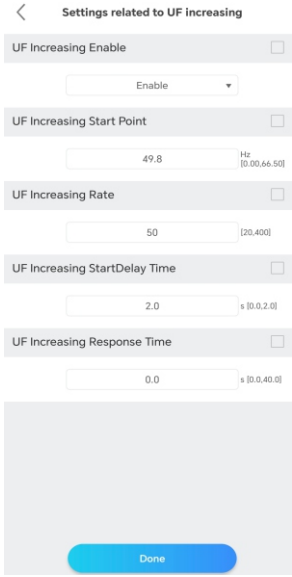
➢ Loading, restarting, and unloading rates, include Loading rate, Restart loading rate and Load reduction rate.



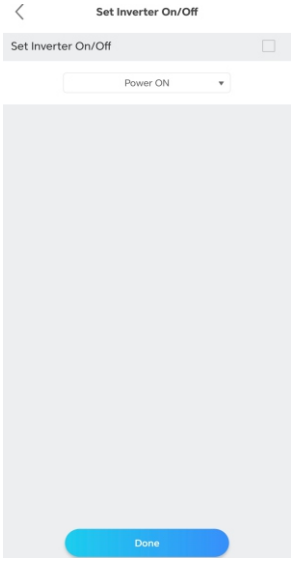

➢ Settings related to OF derating, include Derating Start point(f), Derating Gradient(f), Over-frequency load reduction delay time and Over-frequency load reduction response time.

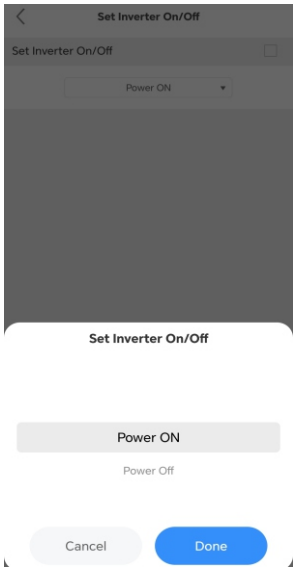


- Settings related to UF increasing: before enable UF increasing, the capability is not available; after enable UF increasing, you can set UF Increasing Start Point, Under-frequency loading slope, Under-frequency loading delay time and Under-frequency loading response time.

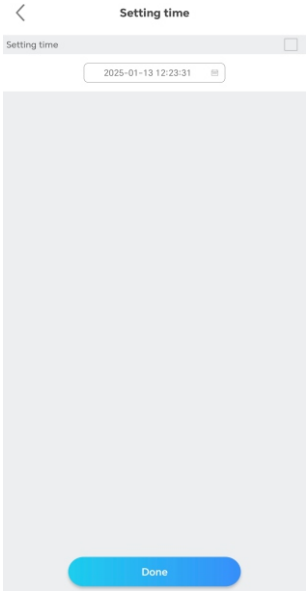


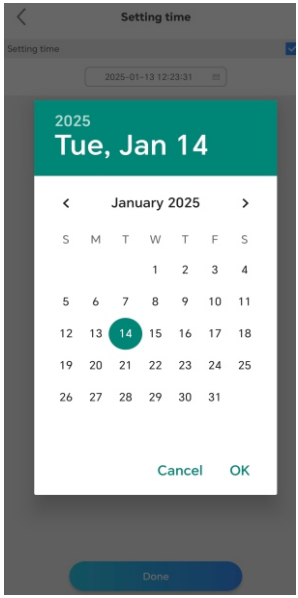

- Set Inverter On/Off: you can set inverter on/off.



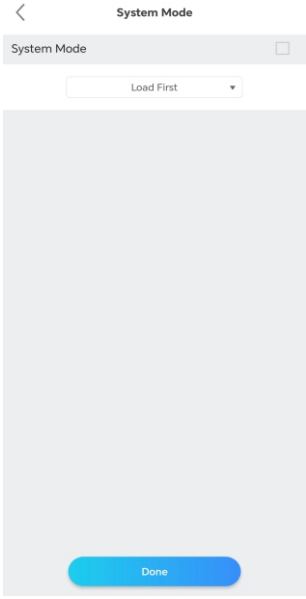



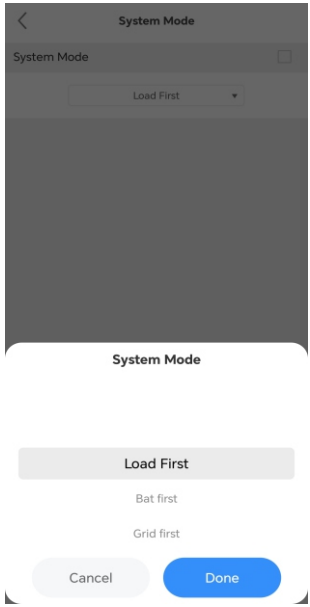
➢ Set Time: you can set the time for the device.



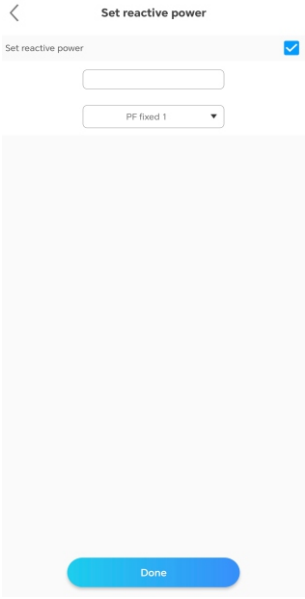



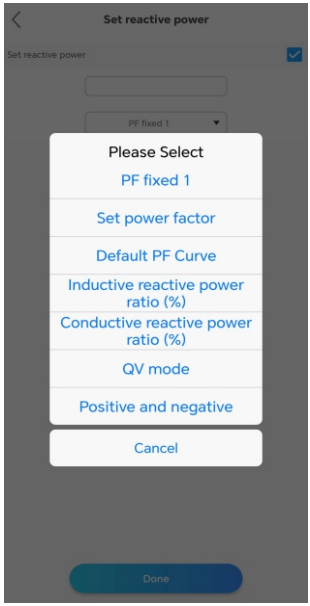

➢ System Mode: you can set the system mode, including Load first, Battery first, Grid first, Solar only backup,Idle, PTO, ECO.



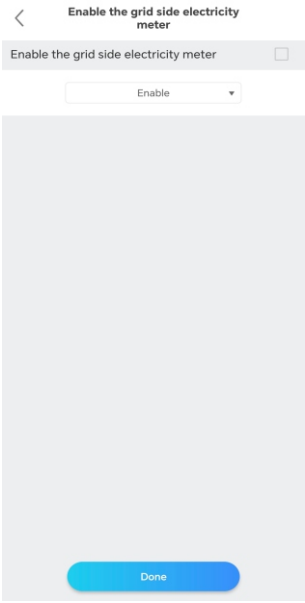



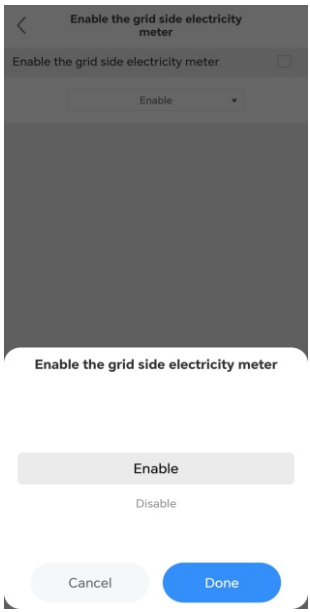
➢ Set Reactive Power:you can set the corresponding PF mode.



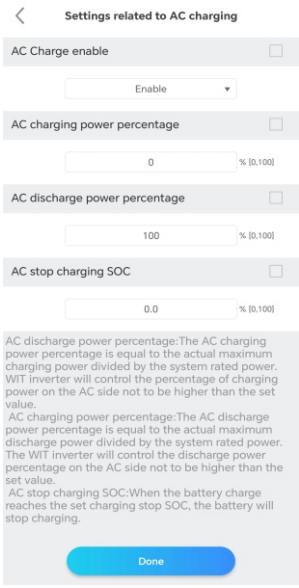



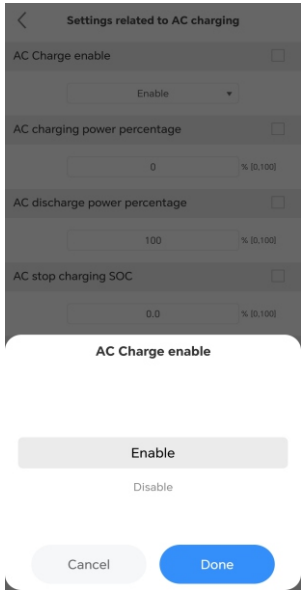

➢ Enable the grid side electricity meter: you can select to enable/disable the grid side electricity meter.



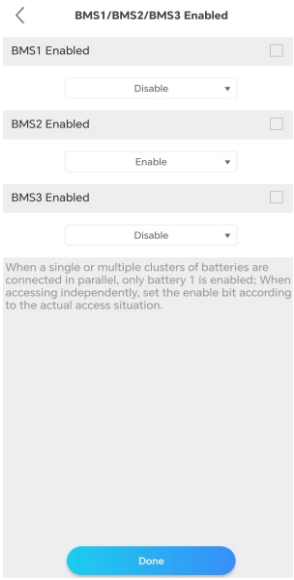



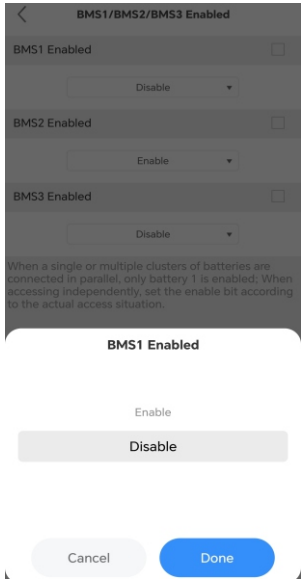
➢ Settings related to AC charging：you can select to enable/disable the AC Charge, set the AC discharge power percentage, set the AC charging power percentage and set the AC stop charging SOC.



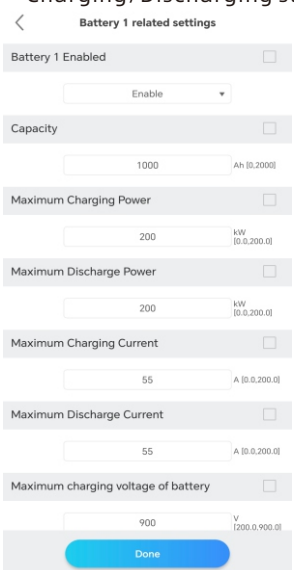



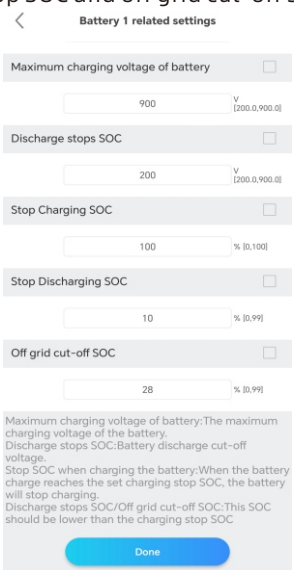

➢ BMS1/BMS2/BMS3 Enabled: you can select to enable/disable the BMS1/2/3.

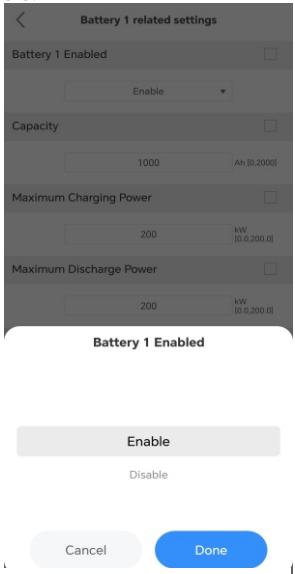


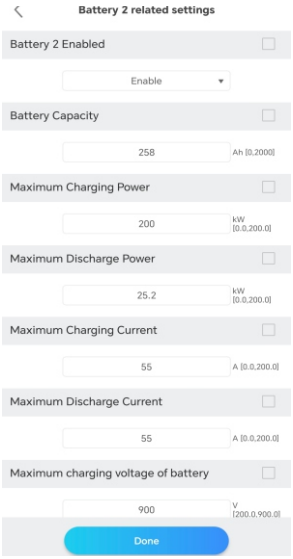



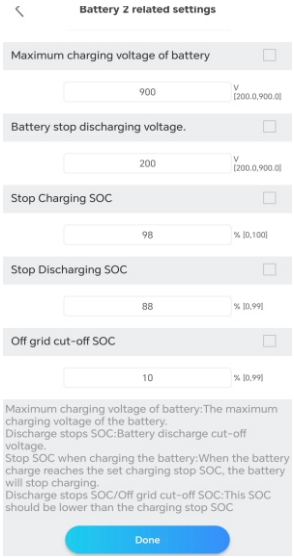
➢ Battery1/2/3 related settings: you can select to enable/disable the Battery1/2/3 and set Battery-related parameters, including the battery capacity, ranging from 0 to 2000 Ah; the maximum charging/discharging power, ranging from 0 to 200 kW; the maximum charging/discharging current, ranging from 0 to 200A; the maximum battery charging voltage, ranging from 200V to 900V; and the battery discharge cutoff voltage, ranging from 200 V to 900V.、Charging/Discharging stop SOC and off grid cut-off SOC.

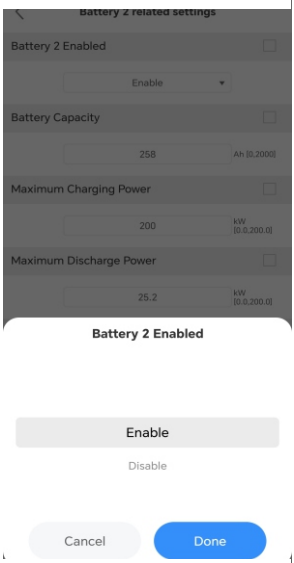


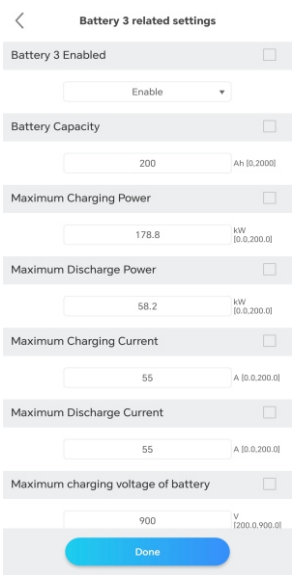



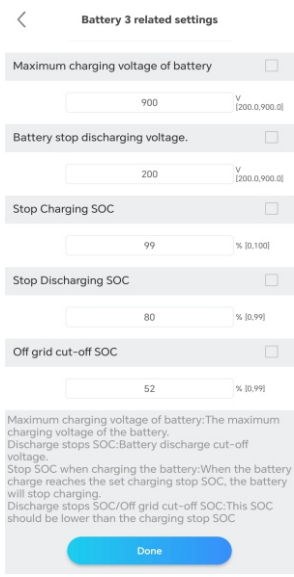



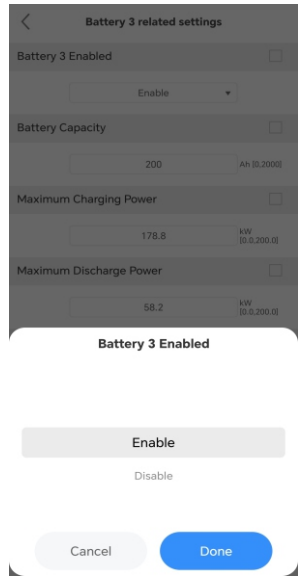



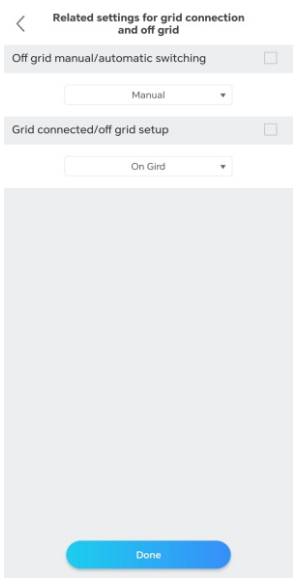



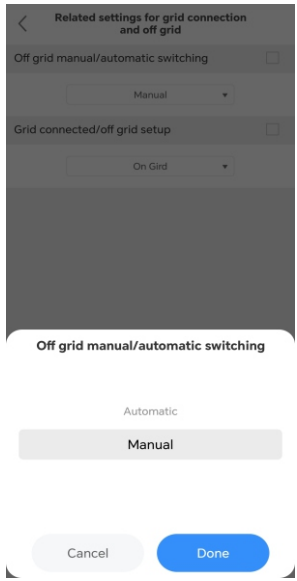


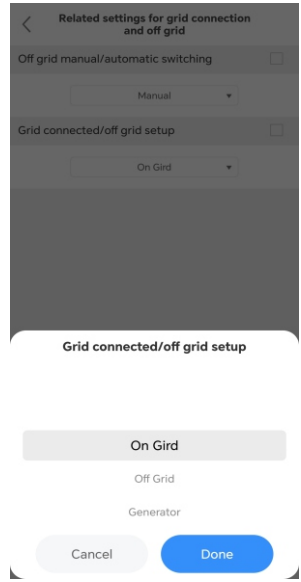




➢ Related grid manual/automatic switching: you can choose to switch the working mode manually or automatically. If "Manual" is selected, you can set the device to operate in on-grid or off-grid or generator mode. Generally, you are advised to select "Automatic" mode switch.



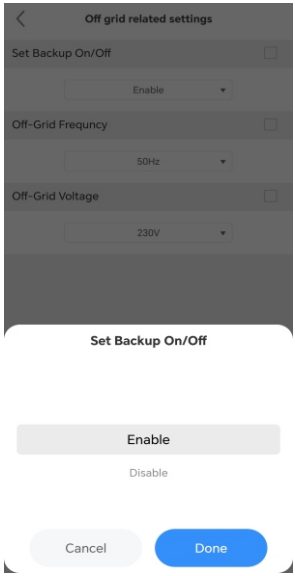



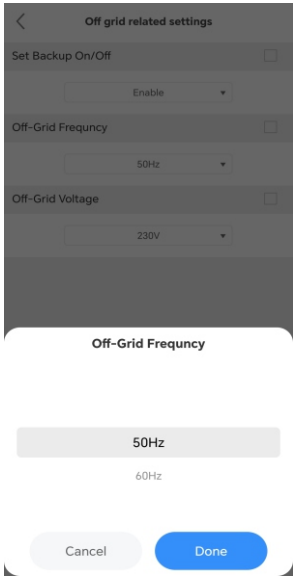



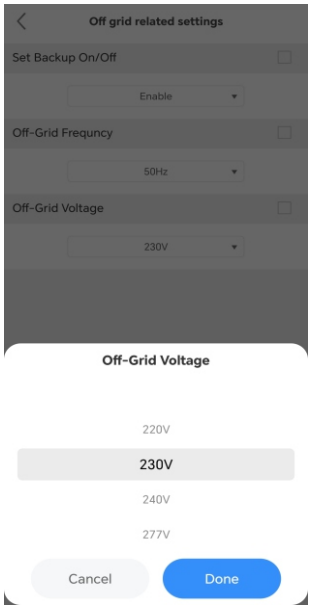
➢ Off grid related settings: you can set whether to enable the off-grid function. If select disable, this function doesn't work. If select enable, you can set EPs voltage and Eps frequency.

**Note:** Factory default off-grid enable.



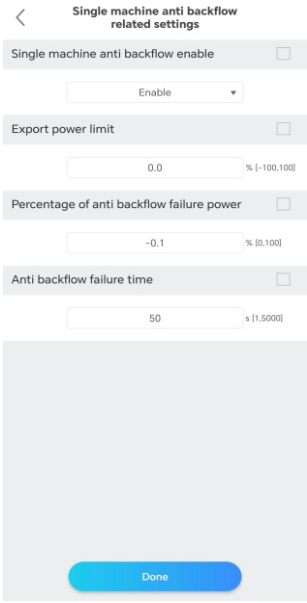



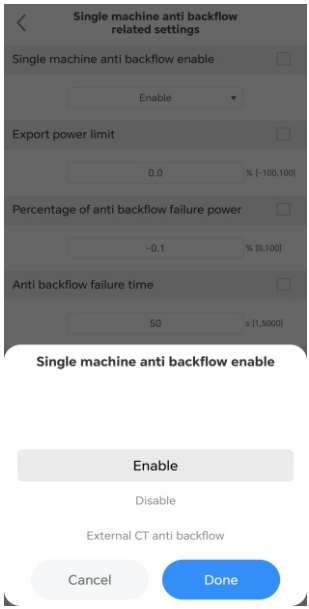



➢ Single machine anti backflow related settings: you can select to enable/disable single machine anti backflow. If select disable, this function doesn't work. If select enable, you can set export power limit, percentage of anti backflow failure power and anti backflow failure time.

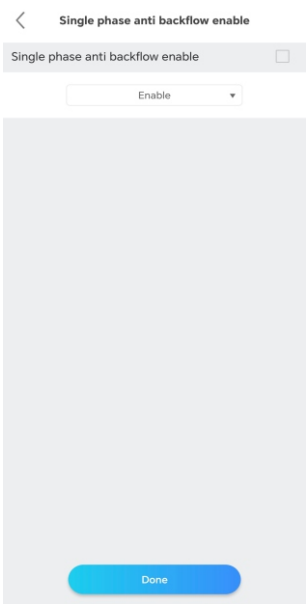
**Note**: The meter must be connected to export limit.

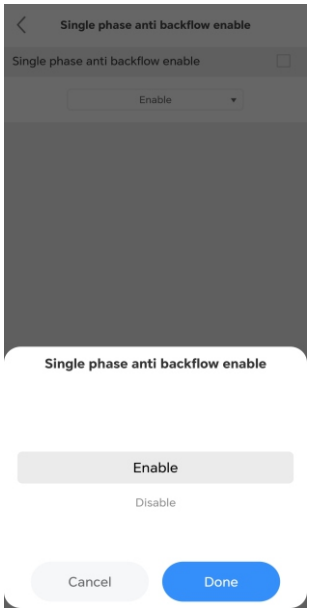


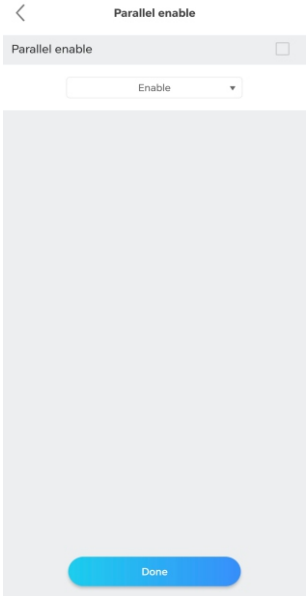

➢ Single phase anti backflow enable: you can select to enable/disable the single phase anti backflow.

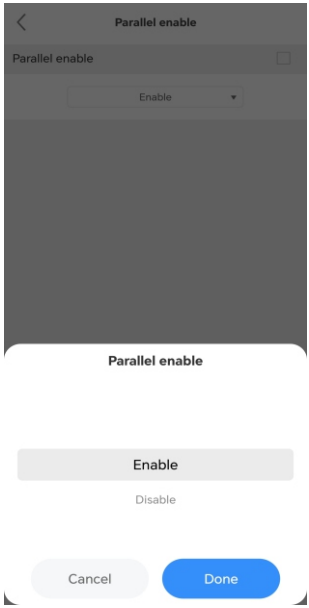
**Note:** Single phase anti backflow can be used if the Single machine anti backflow is enabled.



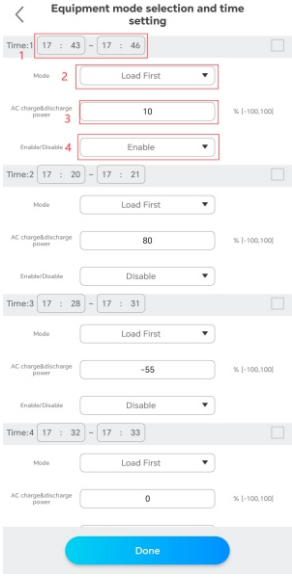



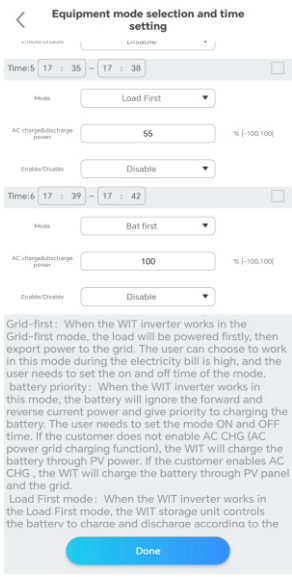

➢ Parallel parameter setting: you can select to enable/disable the parallel.

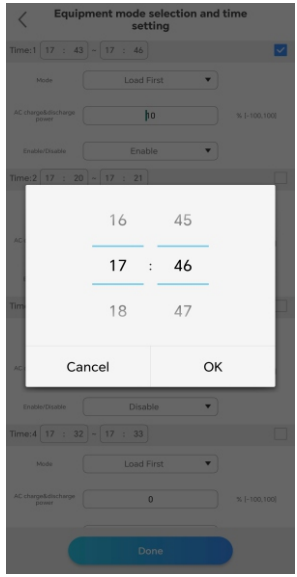


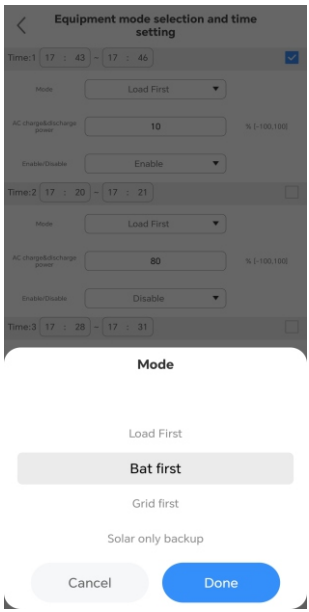



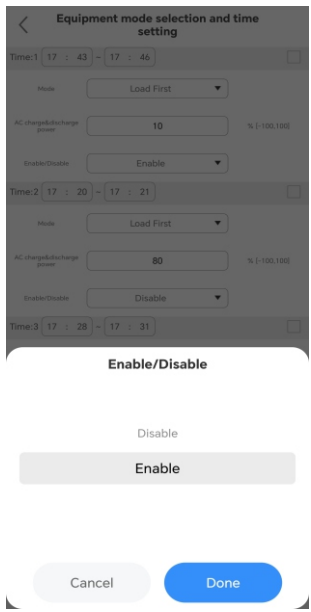
➢ Equipment mode selection and time setting: you can set 1.time period, 2. operating mode, include load first, battery first, grid first, solar only backup, Idle, PTO, ECO, 3. power percentage, 4. enable/disable. A total of 6 time slots are available for setting.



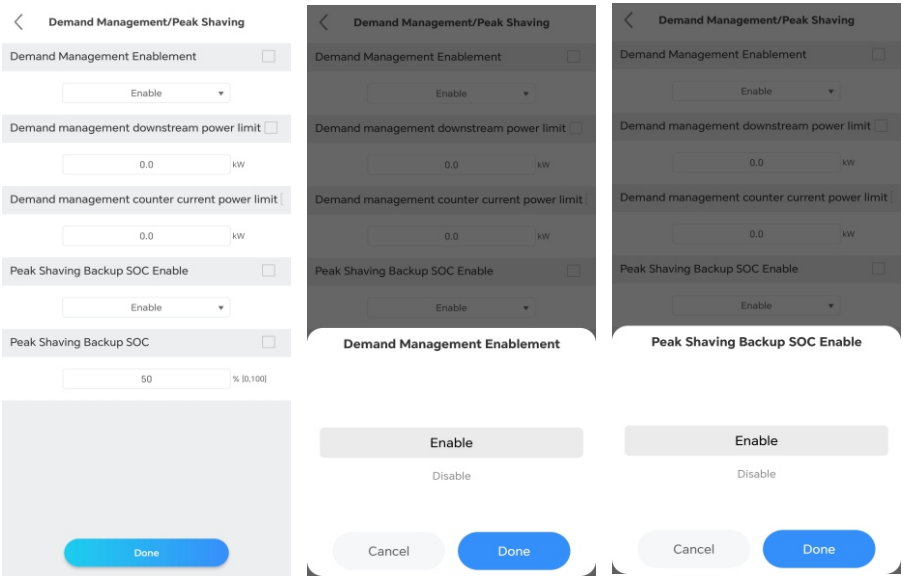



➢ Peak Shaving: you can select to enable/disable peak shaving. If select disable, this function doesn't work. If select enable, you can set demand management downstream power limit and demand management counter current power limit.




➢ Microgrid system:

Types of access for GEN port devices: you can set generator or PV Inverter or smart load.

Generator Enable: you can select to enable/disable generator.

Generator rating: you can set rated power of generator.

Off grid oil engine startup/stops SOC: you can set the off grid oil engine startup/stops SOC.

Heat up time: you can set the heat up time.

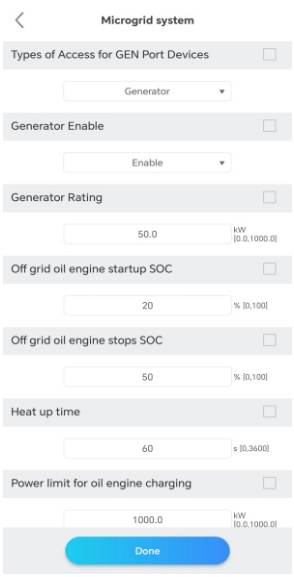
Power limit for oil engine charging: you can set the power limit for oil engine charging.

Electricity Meter 2 Enable: you can select to enable/disable electricity meter.

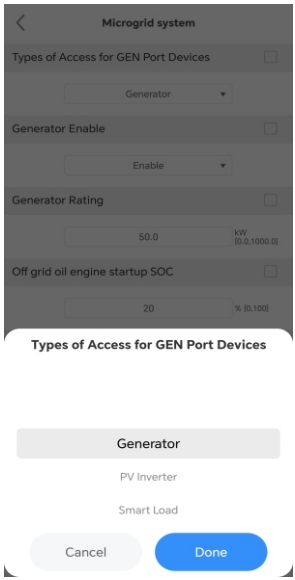
AC Couple enable: you can select to enable/disable AC couple.

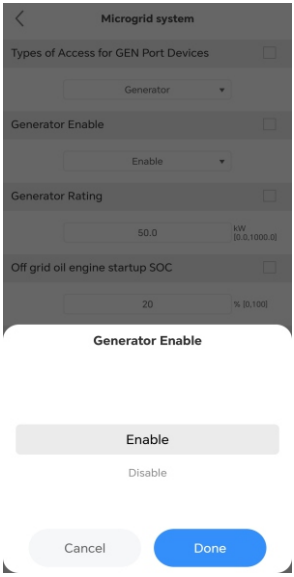
AC couple charging start/stop SOC: you can set the AC couple charging start/stop SOC.

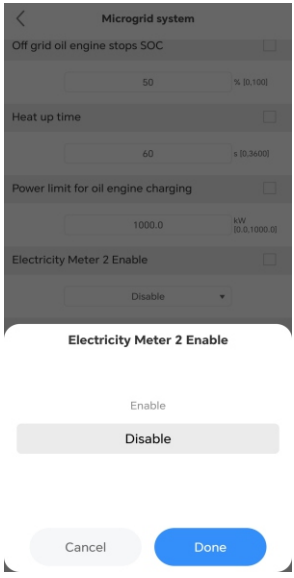
SOC under secondary load: you can set the soc under secondary load.

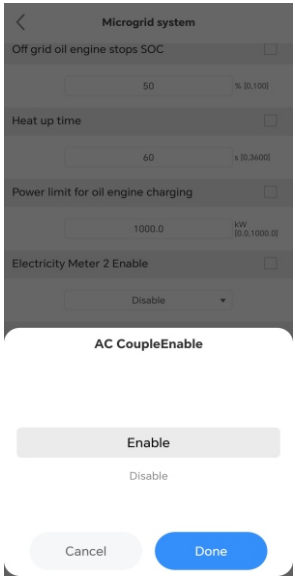

Microgrid system
Types of Access for GEN Port Devices
Generator
Generator Enable
Enable
Generator Rating
50.0
kW [0.0,1000.0]
Off grid oil engine startup SOC
20
% [0,100]
Off grid oil engine stops SOC
50
% [0,100]
Heat up time
60
s [0,3600]
Power limit for oil engine charging
1000.0
kW [0.0,1000.0]
Done


Microgrid system
60
s [0,3600]
Power limit for oil engine charging
1000.0
kW [0.0,1000.0]
Electricity Meter 2 Enable
Disable
AC CoupleEnable
Enable
AC Couple Charging Start SOC
80
% [0,100]
AC Couple Charging Stop SOC
40
% [0,100]
SOC under secondary load
0
% [0,100]
Done


Microgrid system
Types of Access for GEN Port Devices
Generator
Generator Enable
Enable
Generator Rating
50.0
kW [0.0,1000.0]
Off grid oil engine startup SOC
20
% [0,100]
Types of Access for GEN Port Devices
Generator
PV Inverter
Smart Load
Cancel
Done


Microgrid system
Types of Access for GEN Port Devices
Generator
Generator Enable
Enable
Generator Rating
50.0
kW [0.0,1000.0]
Off grid oil engine startup SOC
20
% [0,100]
Generator Enable
Enable
Disable
Cancel
Done


Microgrid system
Off grid oil engine stops SOC
50
% [0,100]
Heat up time
60
s [0,3600]
Power limit for oil engine charging
1000.0
kW [0.0,1000.0]
Electricity Meter 2 Enable
Disable
Electricity Meter 2 Enable
Enable
Disable
Cancel
Done

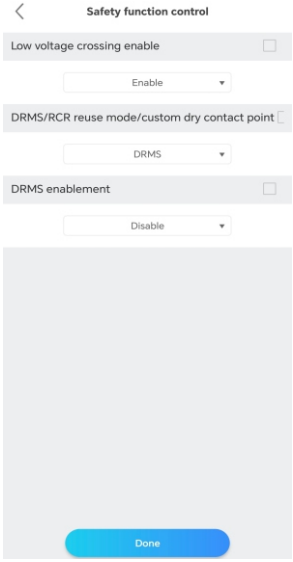

Microgrid system
Off grid oil engine stops SOC
50
% [0,100]
Heat up time
60
s [0,3600]
Power limit for oil engine charging
1000.0
kW [0.0,1000.0]
Electricity Meter 2 Enable
Disable
AC CoupleEnable
Enable
Disable
Cancel
Done

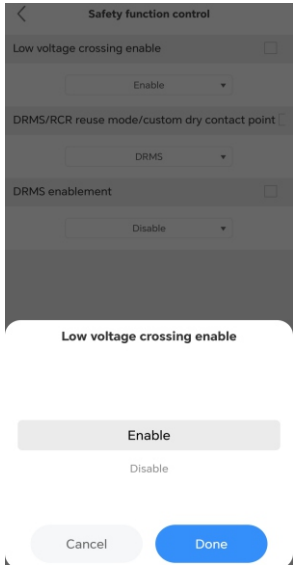
➢ Safety function control:

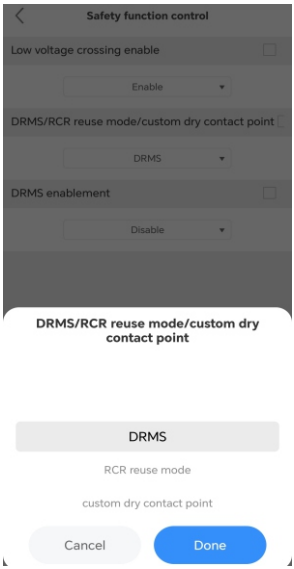
Low voltage crossing enable: you can select to enable/disable low voltage crossing.

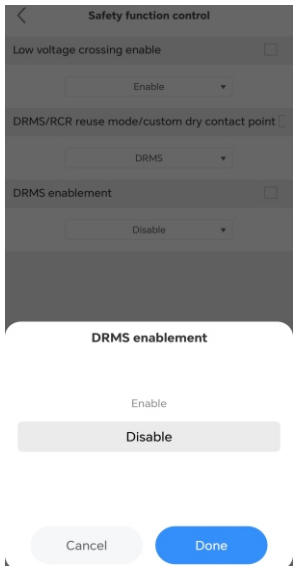
DRMS/RCR reuse mode/custom dry contact: you can set DRMS, RCR or custom dry contact.

DRMS enablement: you can select to enable/disable DRMS.

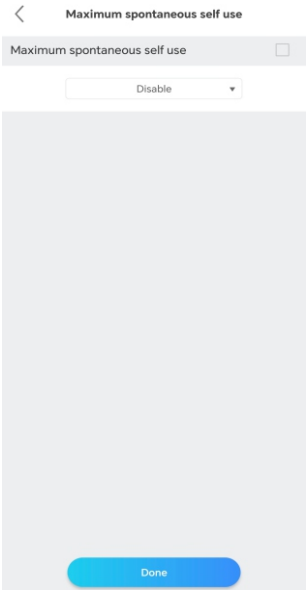


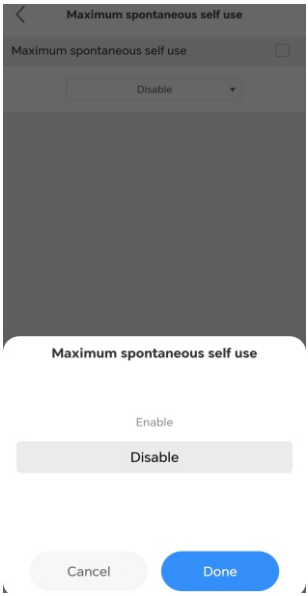



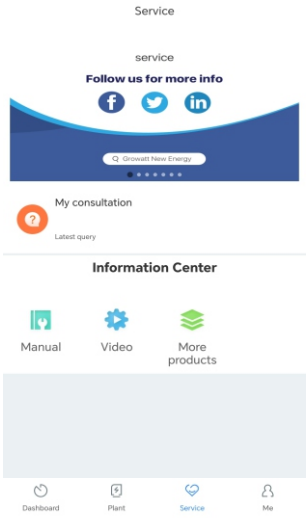



➢ Maximum spontaneous self use: you can select to set enable/disable maximum spontaneous self use.

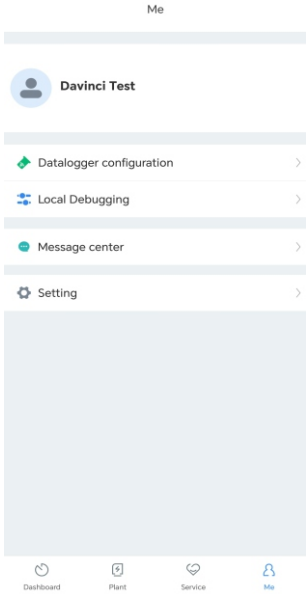



3. **Service:** includes the common faults and troubleshooting suggestions, as shown in the figure below. Should you encounter any problem about our product, you can contact the Growatt after-sales support or refer to the related documents.

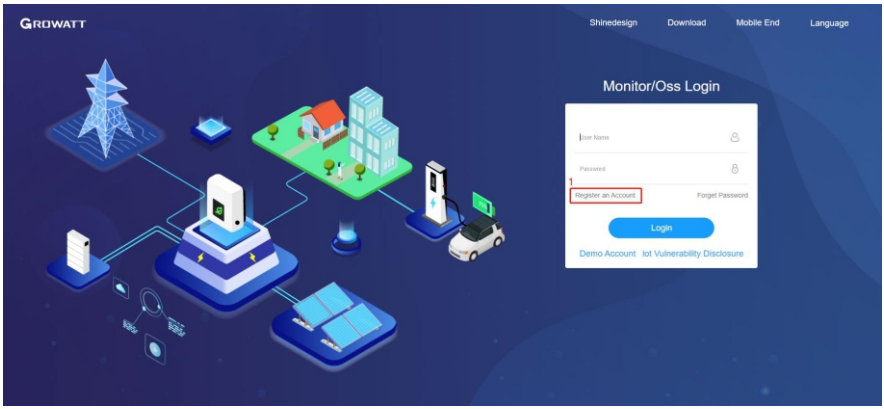


4. Me: You can check the account information, configure the datalogger or view notifications, as shown in the figure below.

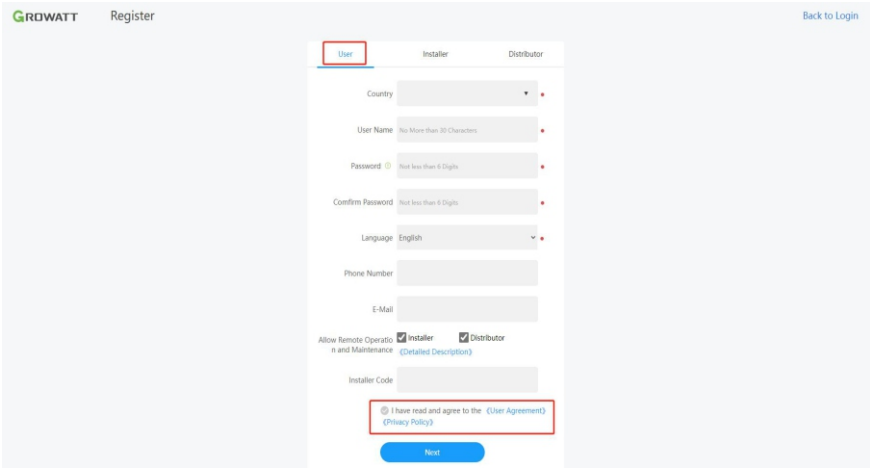


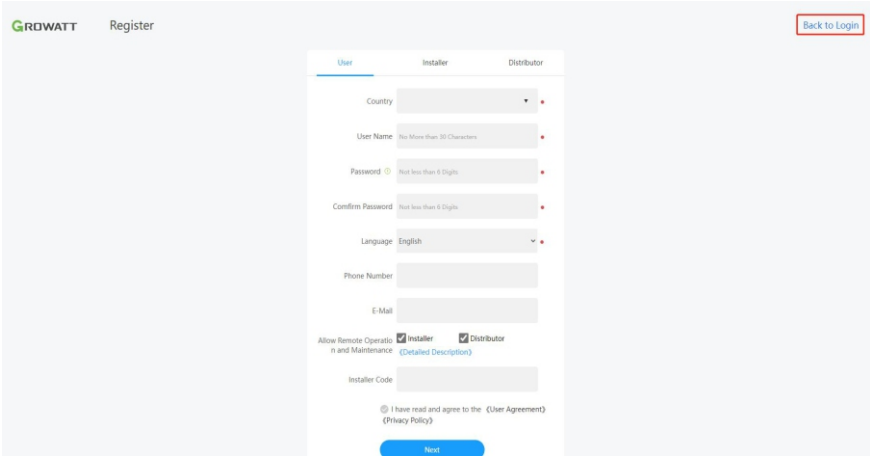

### 8.1.2 Remote Monitoring on the ShineServer Webpage

1.Open the browser, then enter https://server.growatt.com/login?lang=en in the address box to access the login page. Click "Register an Account" if you do not have an account.

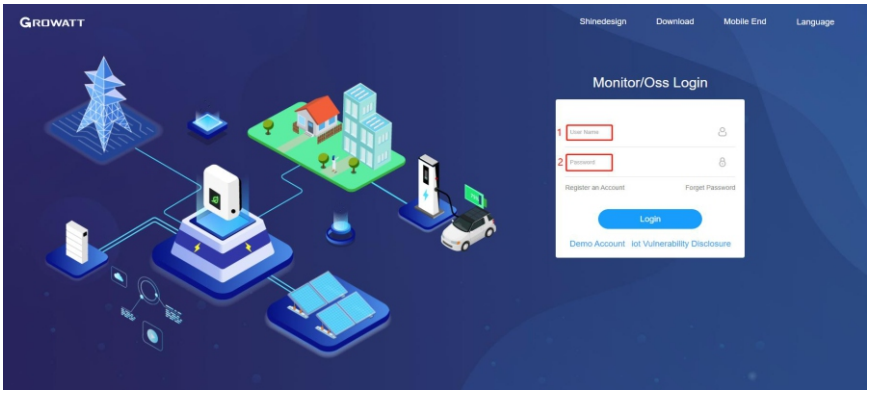


2. After the Registration Page is displayed, fill in the information as required and click to agree to the Privacy Policy. Fields marked with the "·" icon are mandatory. Click next, it will bring you to the "Add Plant" page. Then click "Back to Login" on the top right corner.

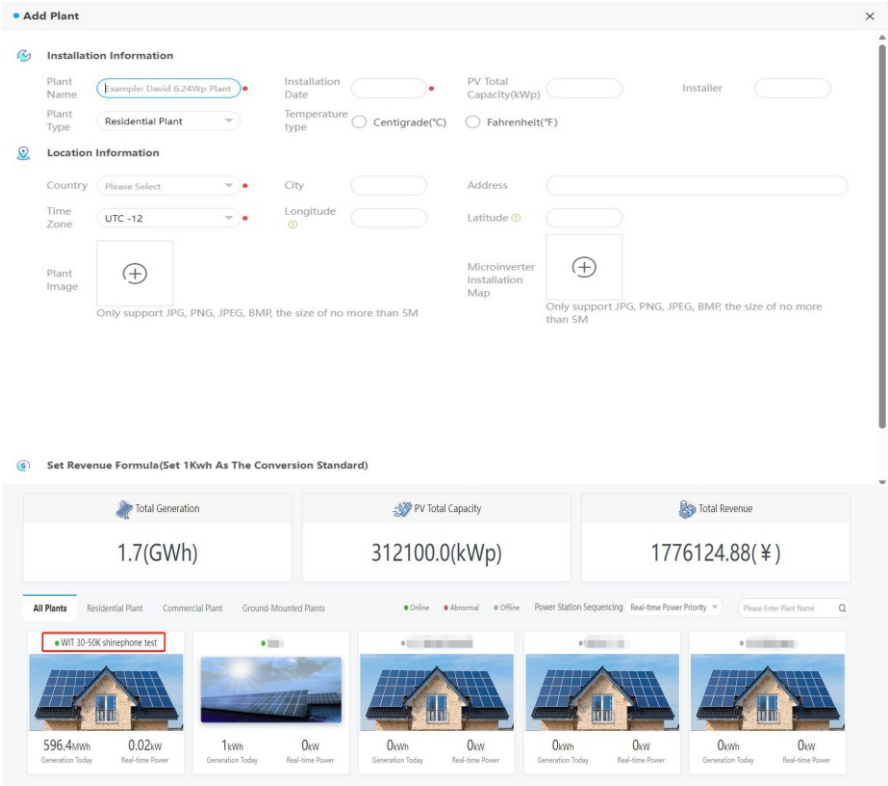


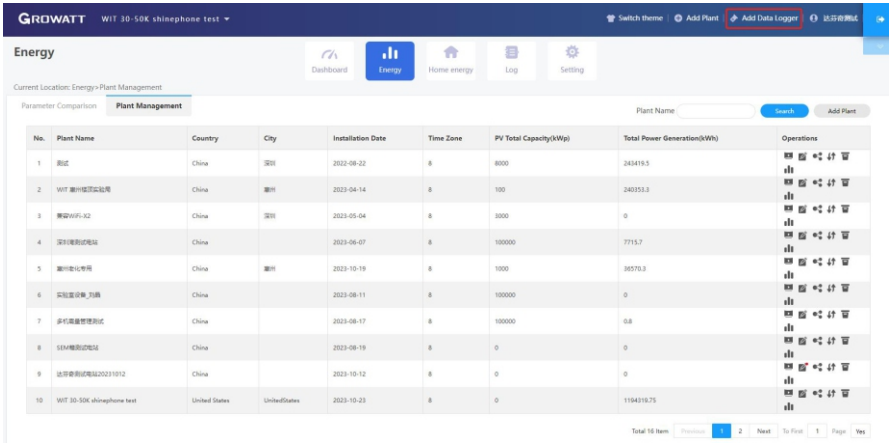
3. On the Login screen, enter the username and the password to log in to the home screen.

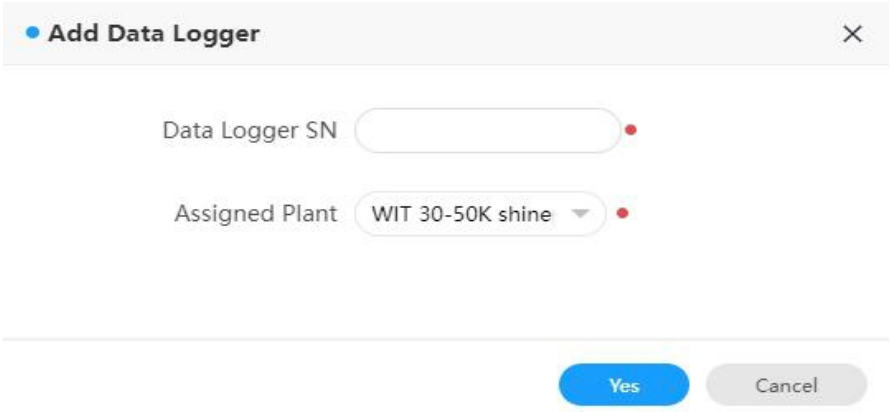



4. After accessing the home screen, the "Add Plant" window will pop up. Fill in the information as required (marked with "·") and click "Yes". If the plant has been created, you can select the target plant on the home screen.

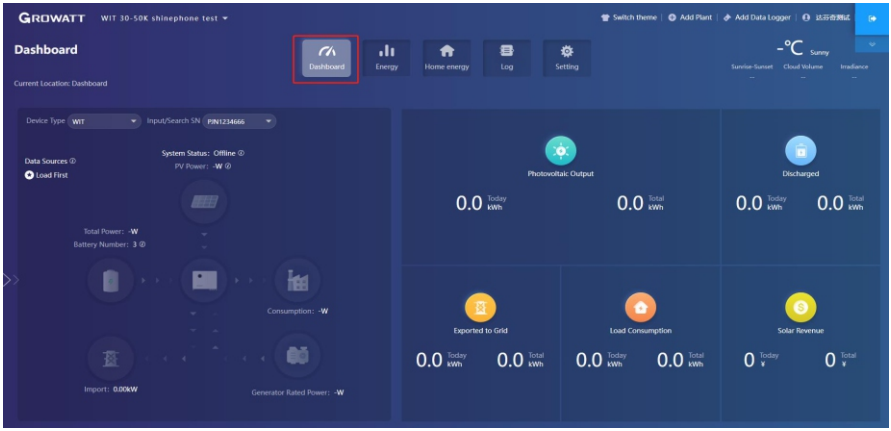


5. Click the target plant and the detailed page will be displayed, click “Add Data Logger” on the upper right corner to add the datalogger connected to the inverter.
   1) Enter the serial number (SN) of the datalogger
   2) Select the target power plant. You might need to enter the verification code of the datalogger as prompted.



6. After adding the datalogger successfully, you can click Dashboard to view details about related devices.




**Dashboard:**

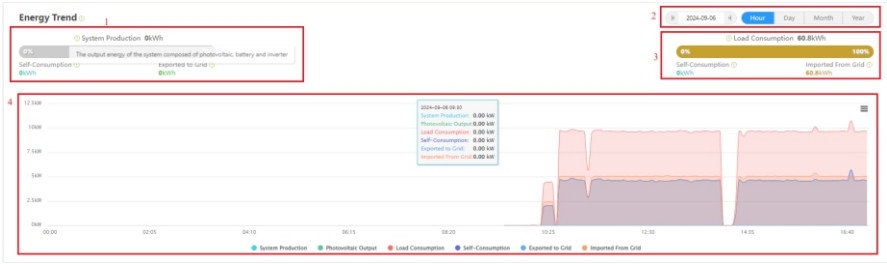
**1. Running status and energy display**



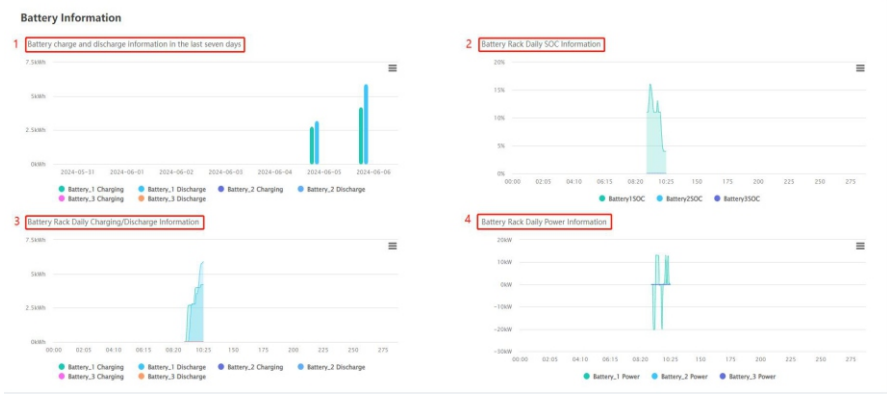

1) Plant List: select the target plant from the drop-down list
2) Device Type: Select the device from the drop-down list
3) Input/Search Number: Upon the initial search, enter the serial number of the specific device; If you have searched for it before, you can select the device from the drop-down list
4) Data Sources: displays the data source of the selected device: Load First, Battery First and Grid first
5) System Status: displays the running status of the selected device: operating, faulty, standby and off-line
6) System Running Graph: displays the power flow between the PV modules, the battery, the generator and the AC side
7) Energy: displays today's/total PV generation, power imported from grid, power exported to the grid and the load consumption

## 2. Energy Trend

1) System Production: displays the power for self-consumption and the power exported to the grid
2) Date: select a specific date, you can view the energy data in a specific period, day, month or year
3) Load Consumption: displays the power for self-consumption and the power drawn from the grid
4) Display options: to show/hide the content by clicking the corresponding color circle. By placing the cursor on the specific color circle for a long period, it will display the energy trend of the selected item only




## 3. Battery Information



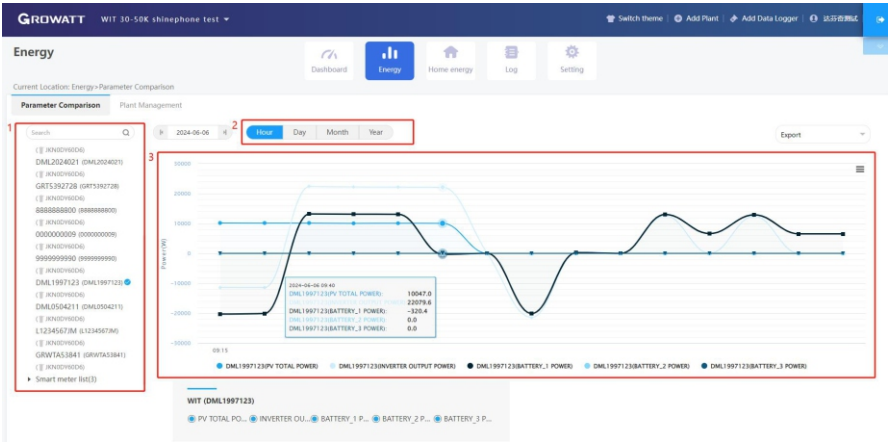

1) Battery charge and discharge information over the last seven days: it can display the charge and discharge history of the battery clusters over the past seven days.
2) Battery rack daily SOC information: displays the battery SOC.
3) Battery rack daily charge/discharge information: displays the charging and discharging information of the battery cluster on the current day.
4) Battery rack daily power information: it can display the power of the battery cluster on the current day.

## 4. My PV devices

This section displays all devices involved in the selected PV plant (online devices are shown first, followed by offline devices).

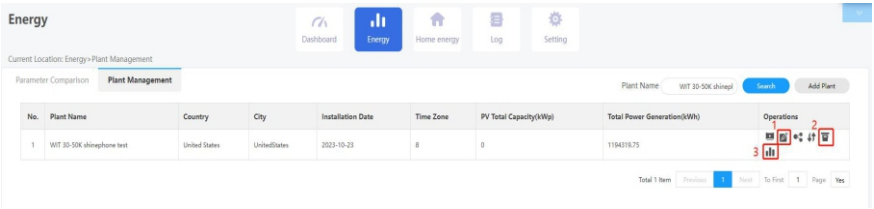
### Energy

### 1. Parameter comparison




1) Device type: Select the device type for comparison, such as the WIT inverter or the meter
2) Date: select a specific date, you can view the energy data in a specific period, day, month or year.
3) Data line graphs： displays the data of WIT.

### 2. Plant Management

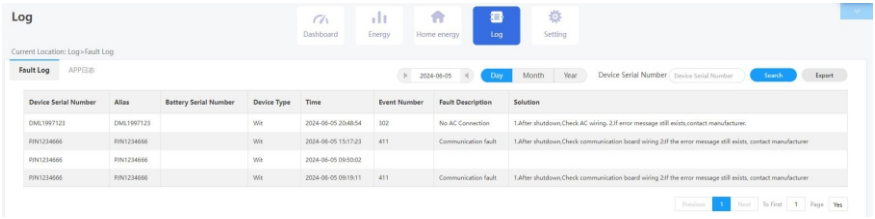



Click Plant Management and you can view all PV plants associated with the current account.

1) Edit: Click the “Edit” icon (indicated in the figure above) to modify the PV plant information
2) Delete: Click the “Delete” icon (indicated in the figure above) to delete the selected PV plant
3) Data: Click the “Data” icon (indicated in the figure above) to view the energy yield and power of the selected plant

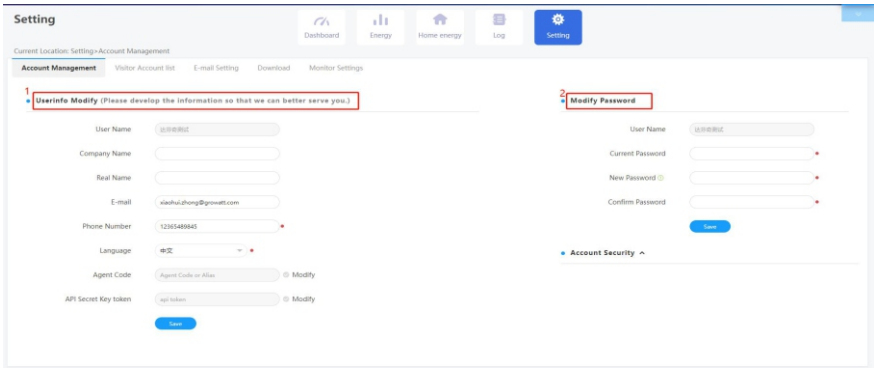
## Log

On the Log page, you can view the error code and the fault description.




## Setting

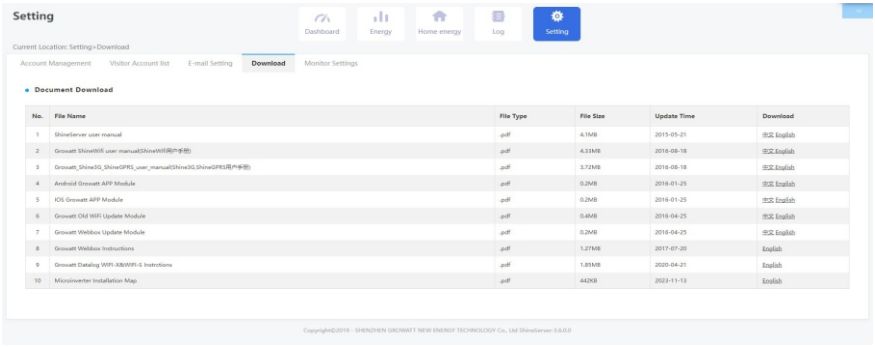
### 1. Account management




1) Modify your account information
2) Change the password: you can change the password on this page

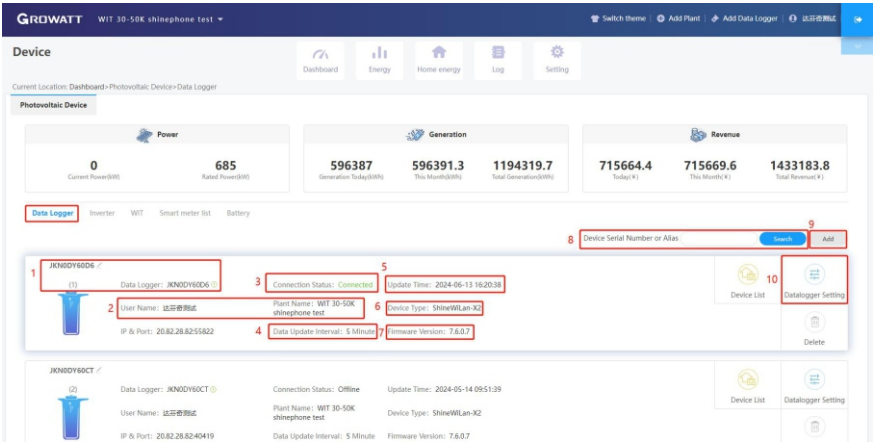
### 2. Download

A range of documents are available for download.



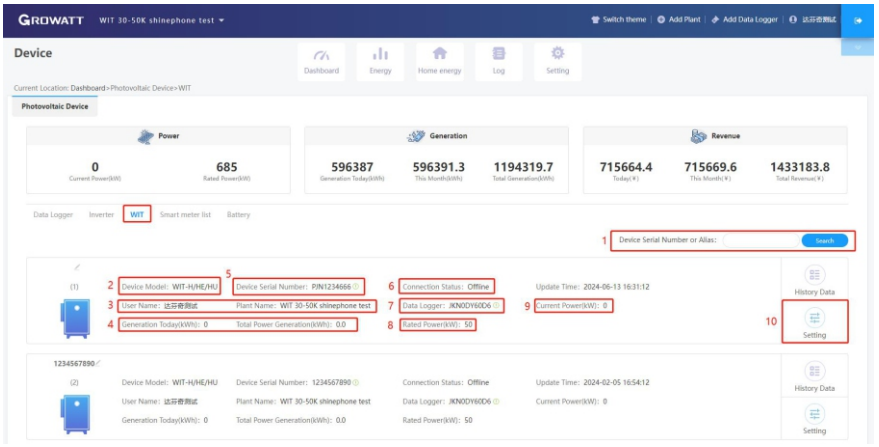
## Device

### 1. Datalogger



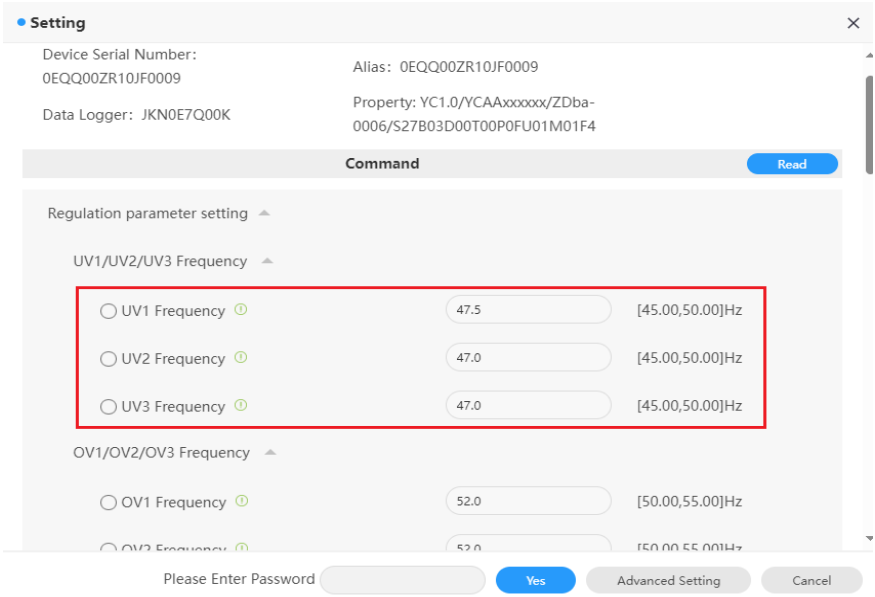

1) Serial number: each datalogger has a specific SN, which can be used to search for the device
2) User name and the PV plant to which the datalogger is connected;
3) Connection status: connected or disconnected;
4) Data update interval;
5) Update time;
6) Device type;
7) Firmware version;
8) Enter the serial number to search for the target datalogger;
9) Add a datalogger: enter the serial number to add the datalogger;
10) Datalogger settings: you can set the update time for the datalogger

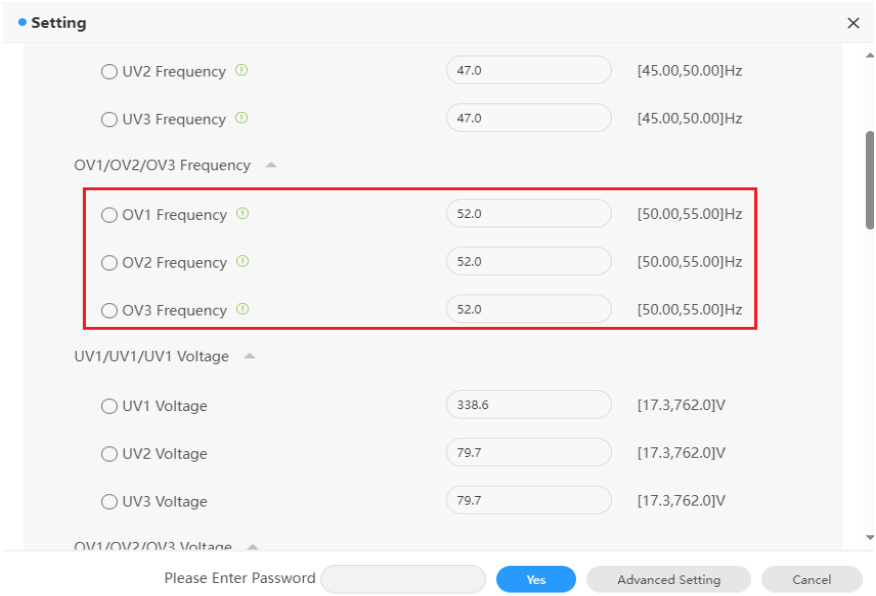
### 2. WIT

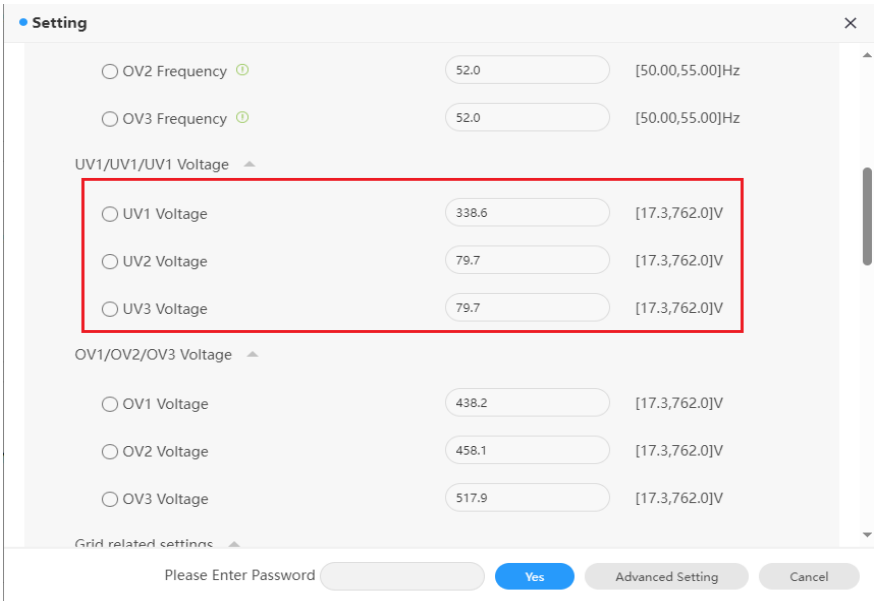


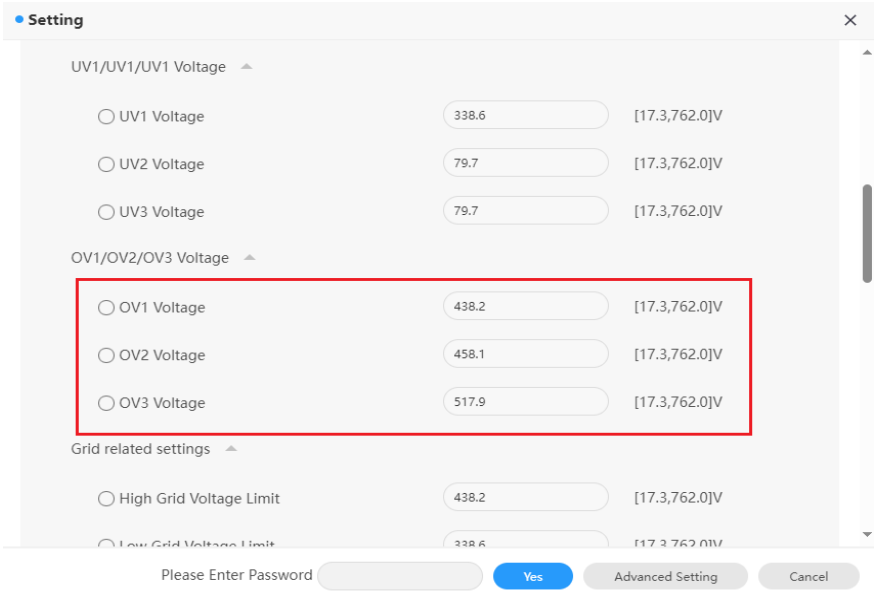
1) Enter the serial number to find the device;
2) Device model;
3) User name and the PV plant to which the device is connected;
4) Daily and monthly energy yield;
5) Serial number of the selected device;
6) Operating status: operating, standby, disconnected or faulty;
7) Serial number of the datalogger connected to the device;
8) Rated power;
9) Current power;
10) Parameter settings.

➢ Safety Parameters: include UV1/UV2/UV3 Frequency, OV1/OV2/OV3 Frequency UV1/UV2/UV3 Voltage and OV1/OV2/OV3 Voltage.

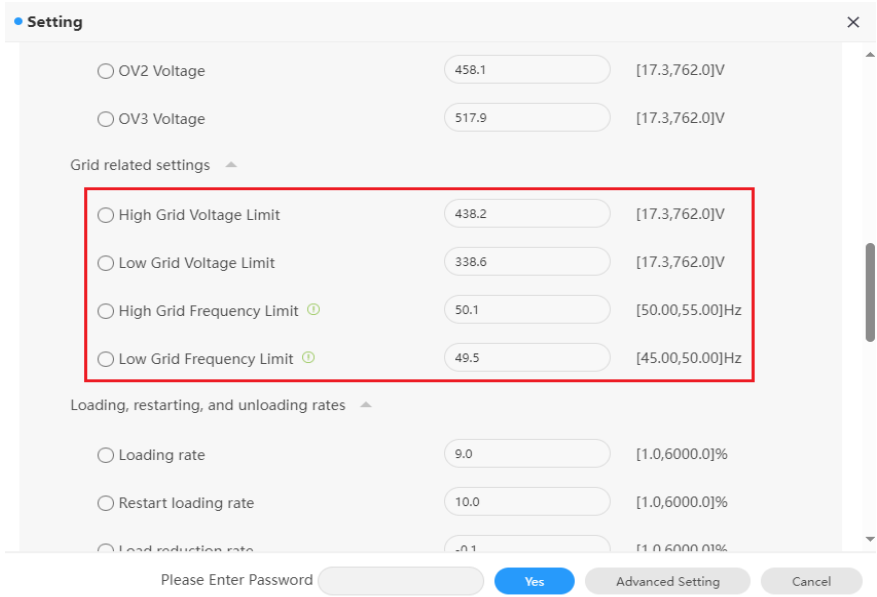



Setting
UV2 Frequency
47.0
[45.00,50.00]Hz
UV3 Frequency
47.0
[45.00,50.00]Hz
OV1/OV2/OV3 Frequency
OV1 Frequency
52.0
[50.00,55.00]Hz
OV2 Frequency
52.0
[50.00,55.00]Hz
OV3 Frequency
52.0
[50.00,55.00]Hz
UV1/UV1/UV1 Voltage
UV1 Voltage
338.6
[17.3,762.0]V
UV2 Voltage
79.7
[17.3,762.0]V
UV3 Voltage
79.7
[17.3,762.0]V
Please Enter Password
Yes
Advanced Setting
Cancel

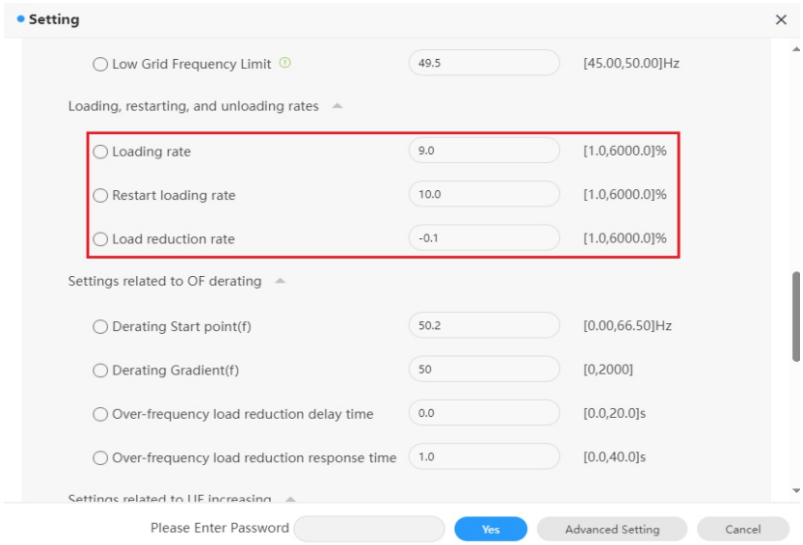

Setting
OV2 Frequency
52.0
[50.00,55.00]Hz
OV3 Frequency
52.0
[50.00,55.00]Hz
UV1/UV1/UV1 Voltage
UV1 Voltage
338.6
[17.3,762.0]V
UV2 Voltage
79.7
[17.3,762.0]V
UV3 Voltage
79.7
[17.3,762.0]V
OV1/OV2/OV3 Voltage
OV1 Voltage
438.2
[17.3,762.0]V
OV2 Voltage
458.1
[17.3,762.0]V
OV3 Voltage
517.9
[17.3,762.0]V
Please Enter Password
Yes
Advanced Setting
Cancel



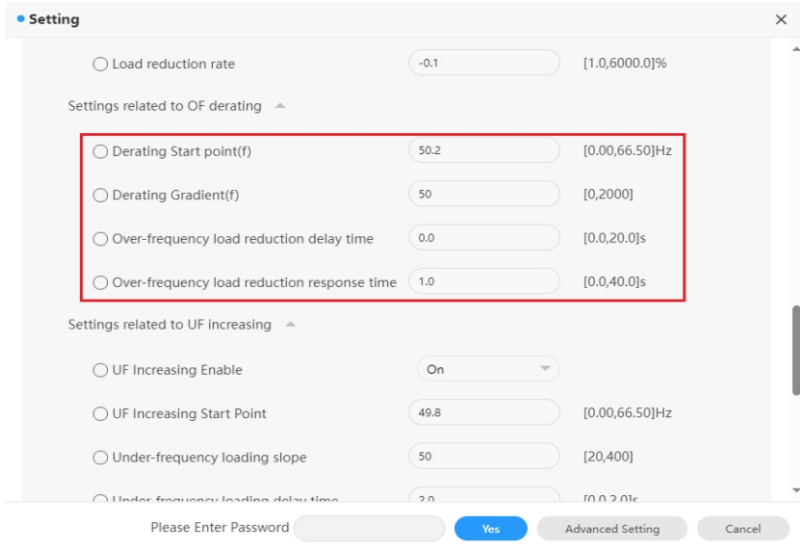

➢ Grid related settings: include High Grid Voltage Limit, Low Grid Voltage Limit, High Grid Frequency Limit, Low Grid Frequency Limit.



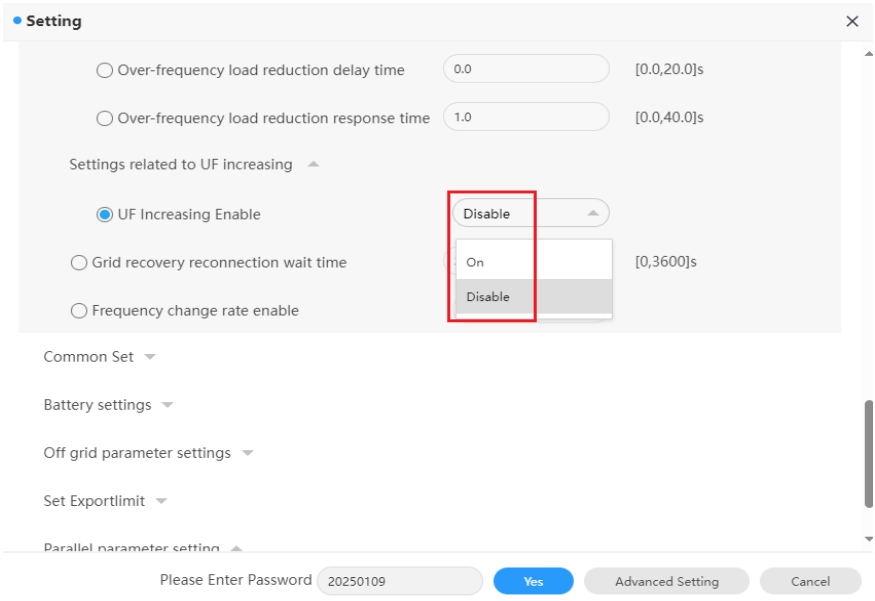
➢ Loading, restarting, and unloading rates, include Loading rate, Restart loading rate and Load reduction rate.

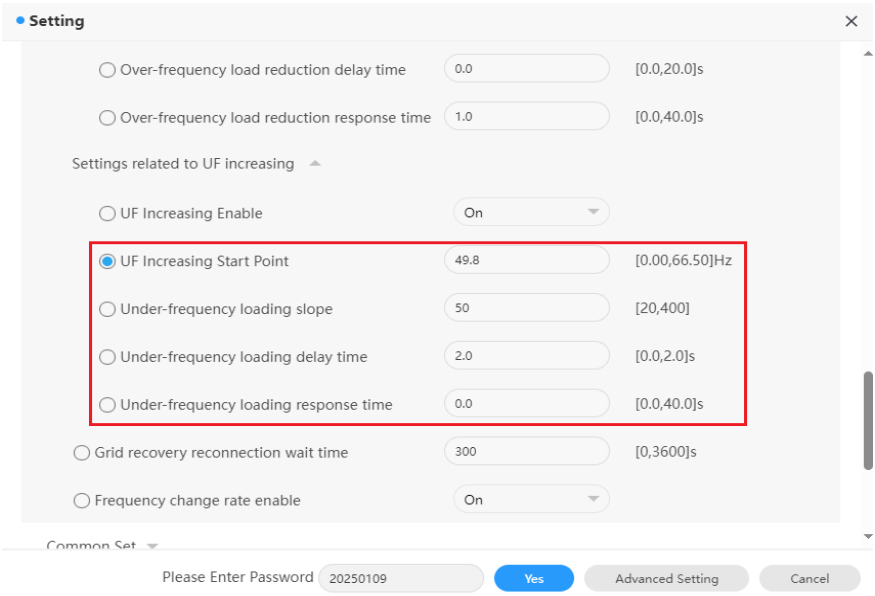



➢ Settings related to OF derating, include Derating Start point(f), Derating Gradient(f), Over-frequency load reduction delay time and Over-frequency load reduction response time.

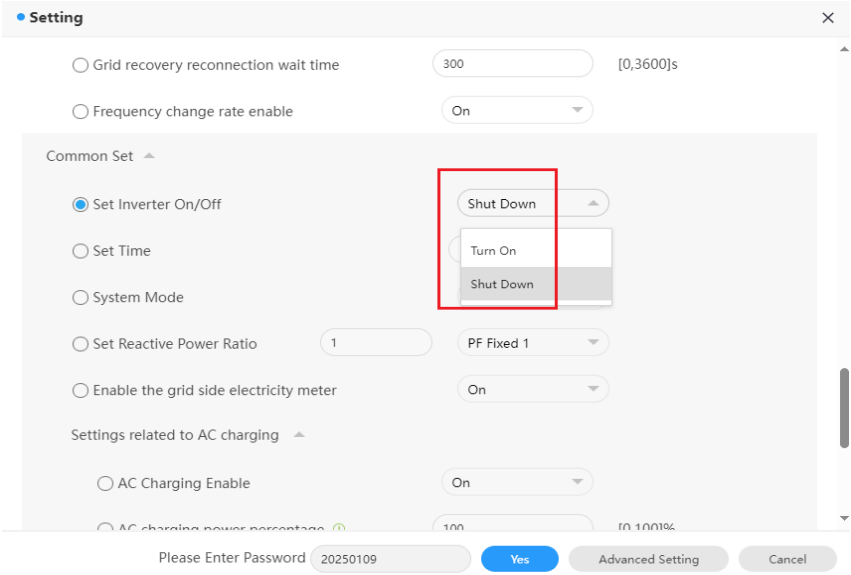


➢ Settings related to UF increasing: before enable UF increasing, the capability is not available; after enable UF increasing, you can set UF Increasing Start Point, Under-frequency loading slope, Under-frequency loading delay time and Under-frequency loading response time.

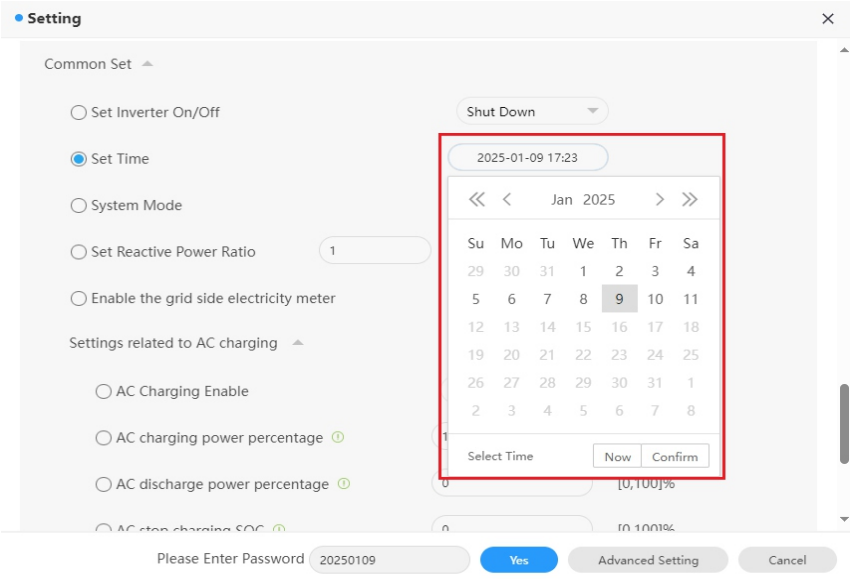


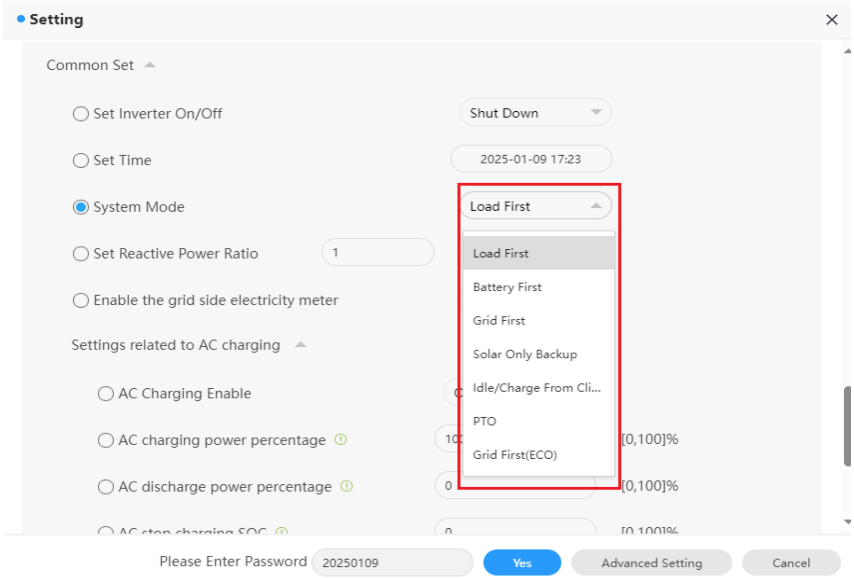
➢ Set Inverter On/Off: you can set inverter on/off.



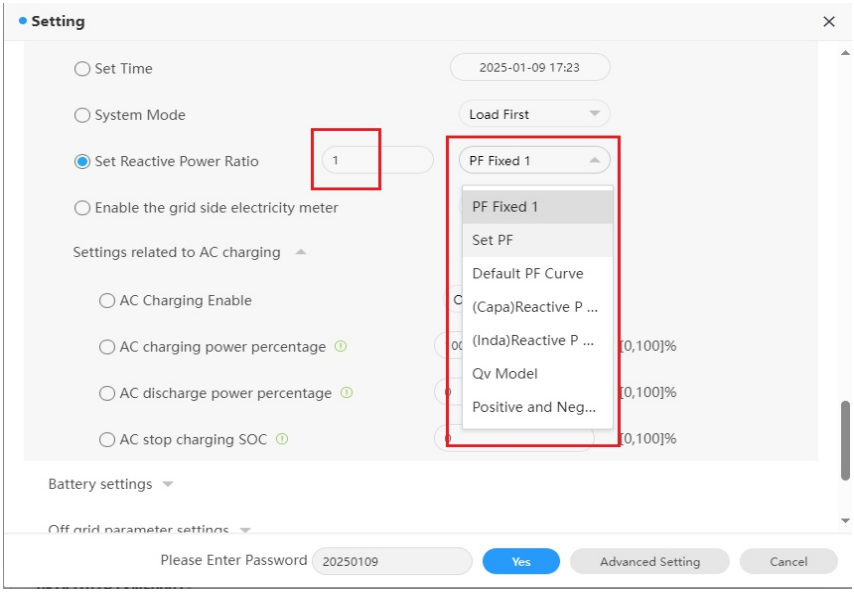

➢ Set Time: you can set the time for the device.



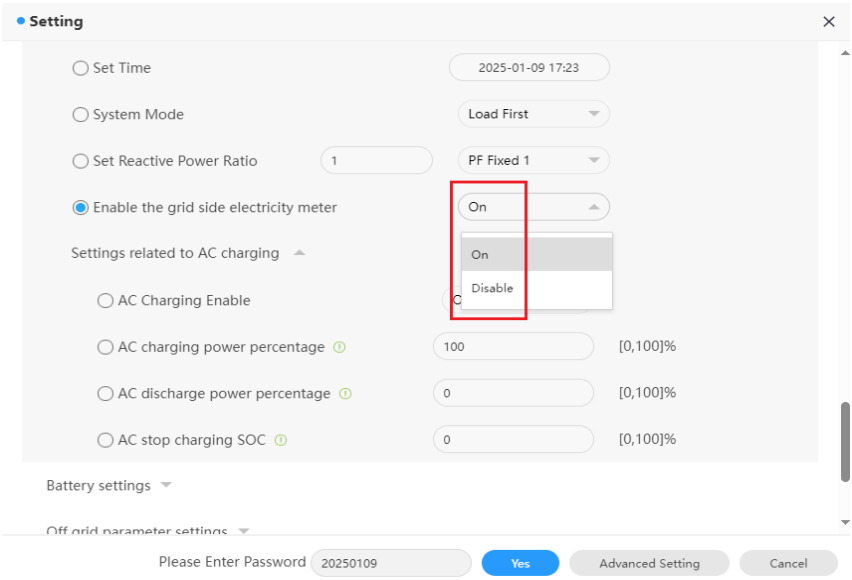
➢ System Mode: you can set the system mode, including Load first, Battery first, Grid first, Solar only backup,Idle, PTO, ECO.



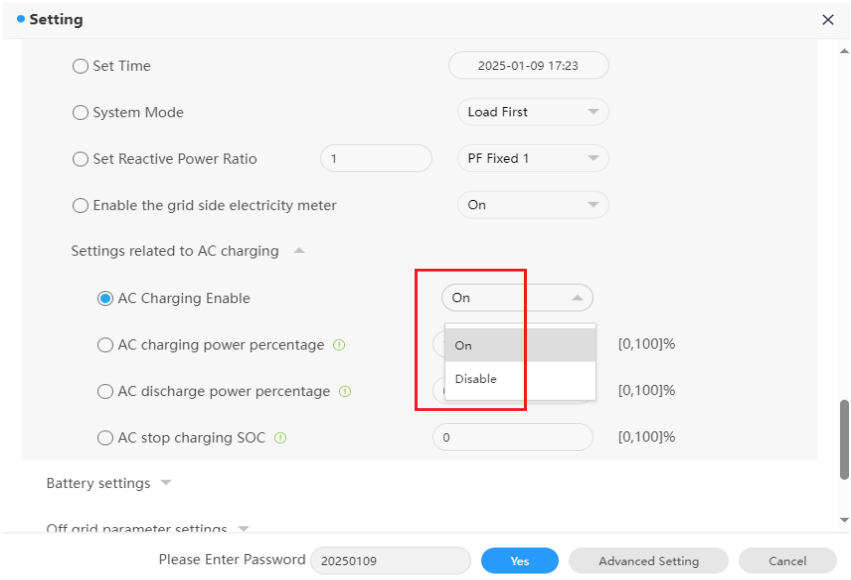

➢ Set Reactive Power Ratio: you can set the corresponding PF mode.



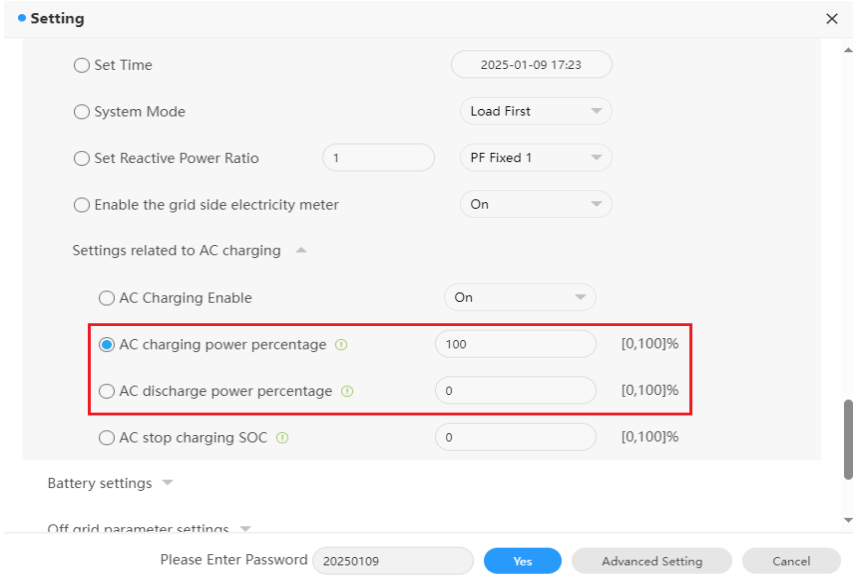
➢ Enable the grid side electricity meter: you can select to enable/disable the grid side electricity meter.



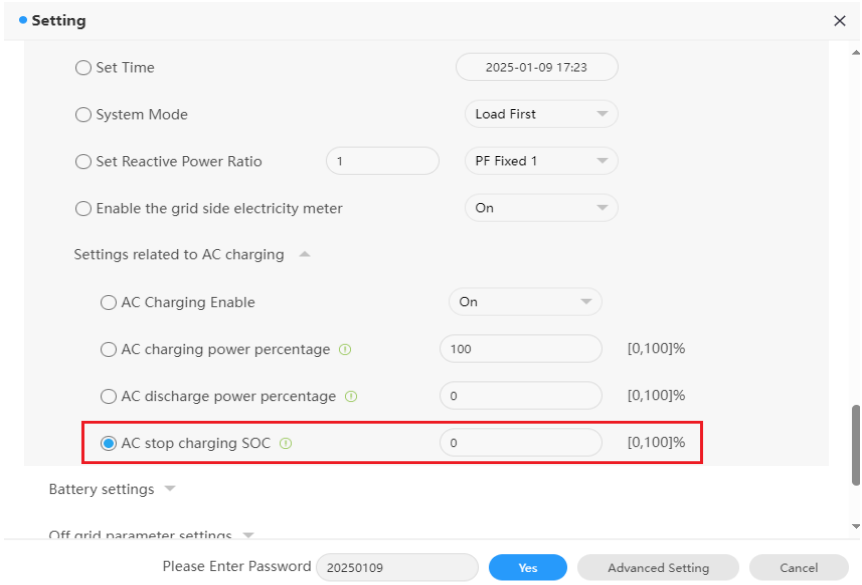

➢ AC Charging Enable: you can select to enable/disable the AC Charging.



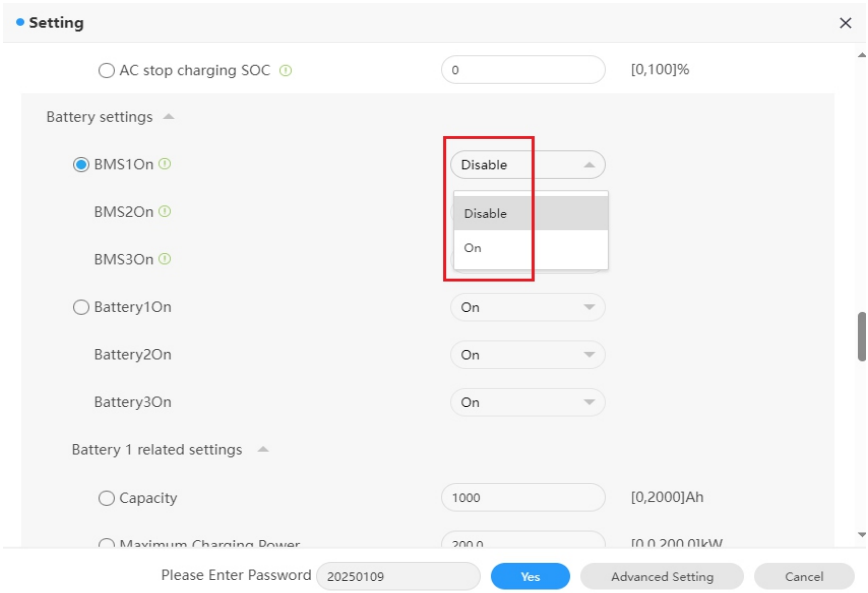
➢ AC Charge/Discharge power percentage: You can set the AC discharge power percentage and AC charging power percentage separately.



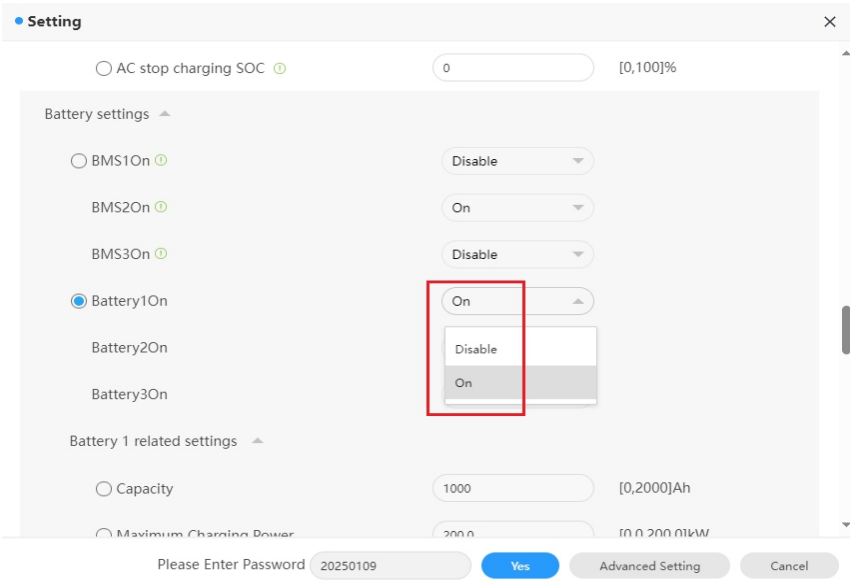

➢ AC stop charging SOC: you can set the AC stop charging SOC.



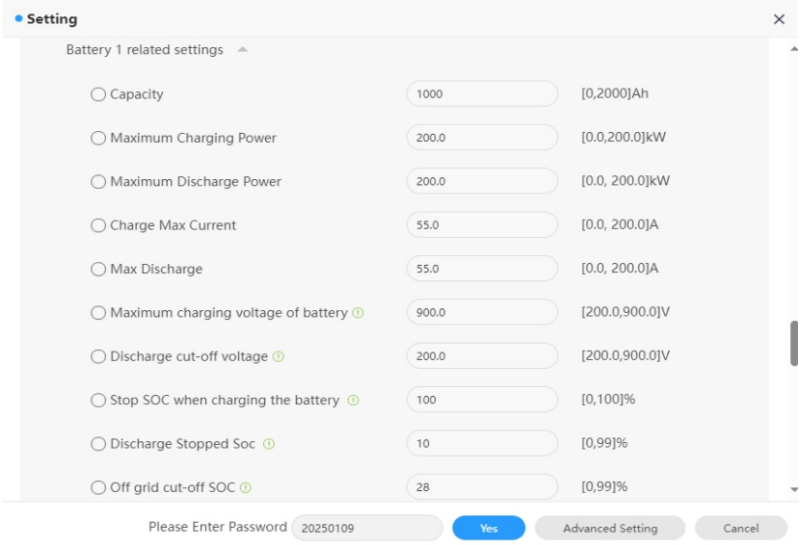
➢ BMS1/2/3 On: you can select to enable/disable the BMS1/2/3.

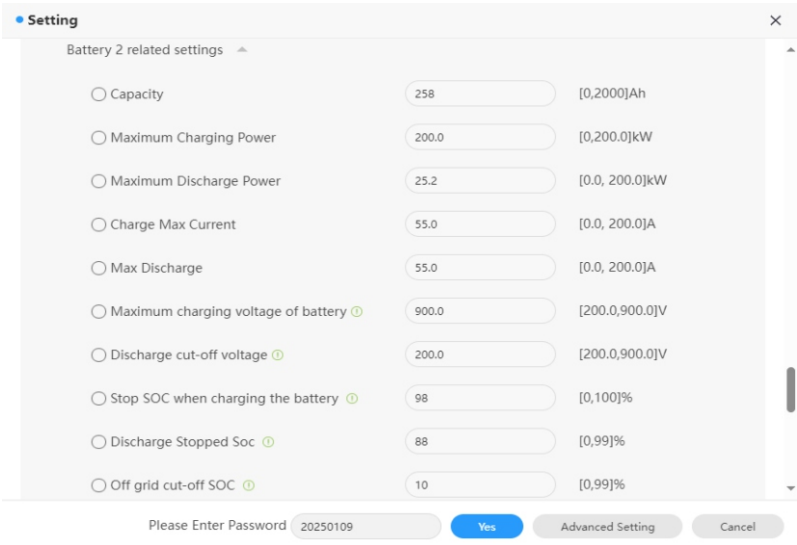


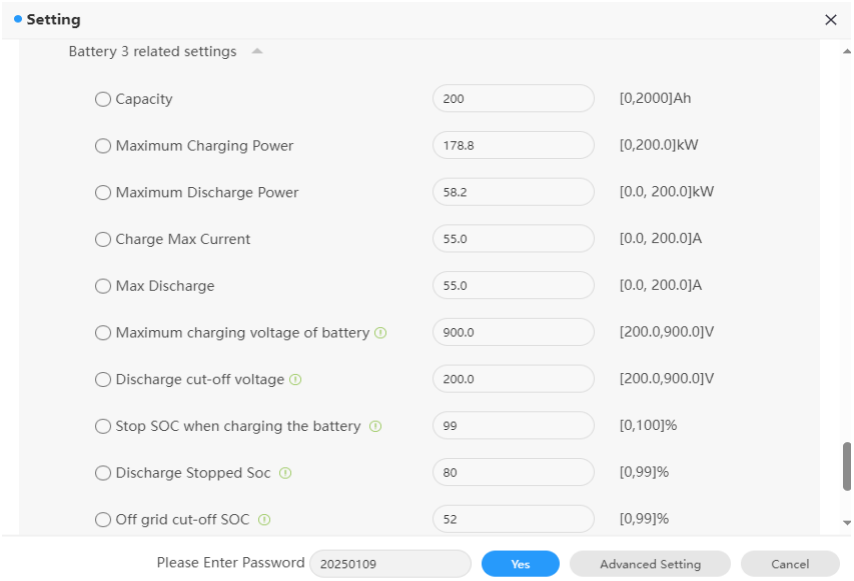

➢ Battery1/2/3 On: you can select to enable/disable the Battery1/2/3.



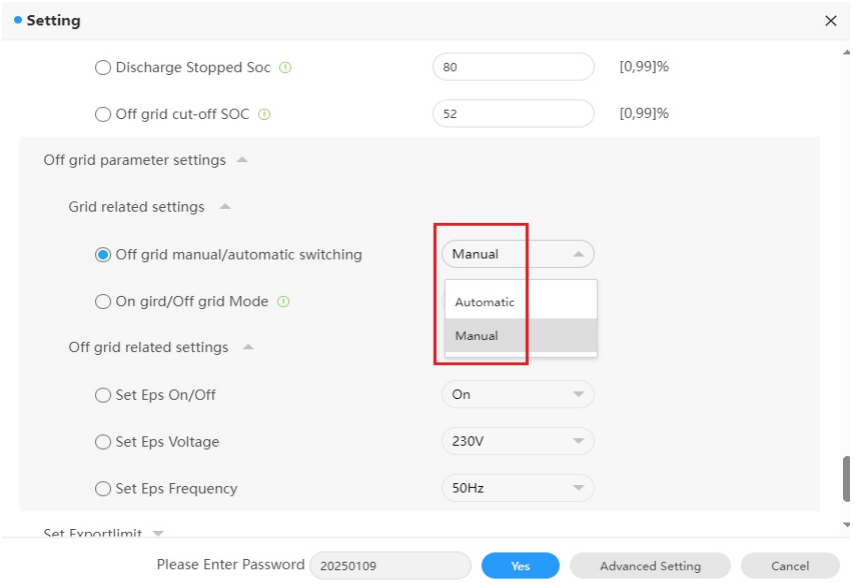
➢ Battery 1/2/3 related settings: you can set Battery-related parameters, including the battery capacity, ranging from 0 to 2000 Ah; the maximum charging/discharging power, ranging from 0 to 200 kW; the maximum charging/discharging current, ranging from 0 to 200A; the maximum battery charging voltage, ranging from 200V to 900V; and the battery discharge cutoff voltage, ranging from 200 V to 900V、Charging/Discharging stop SOC and off grid cut-off SOC.

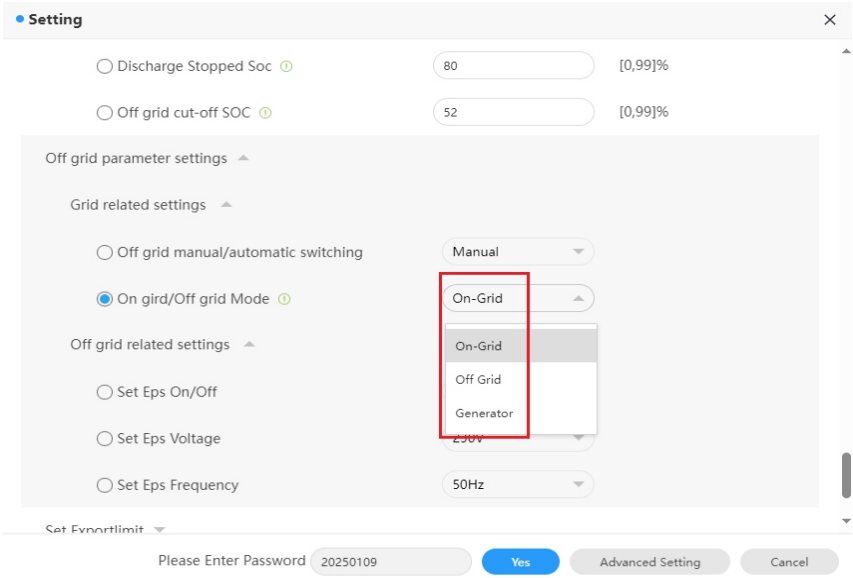




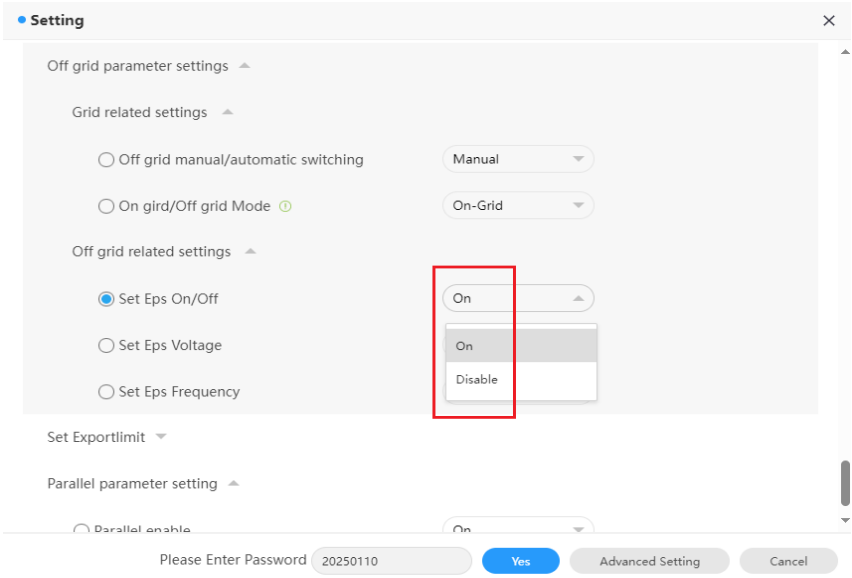

➢ Off grid manual/automatic switching: you can choose to switch the working mode manually or automatically. If "Manual" is selected, you can set the device to operate in on-grid or off-grid or generator mode. Generally, you are advised to select "Automatic" mode switch.

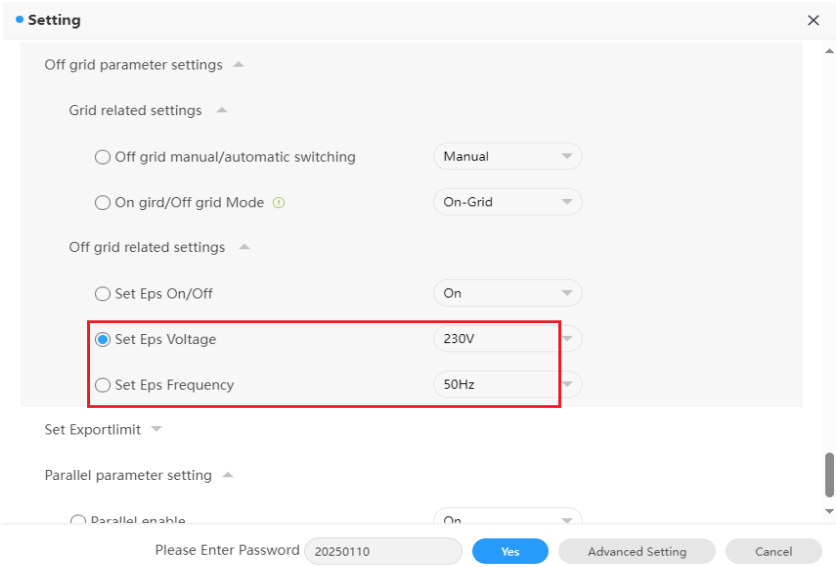





➢ Off grid related settings: you can set whether to enable the off-grid function. If select disable, this function doesn't work. If select enable, you can set EPs voltage and Eps frequency.

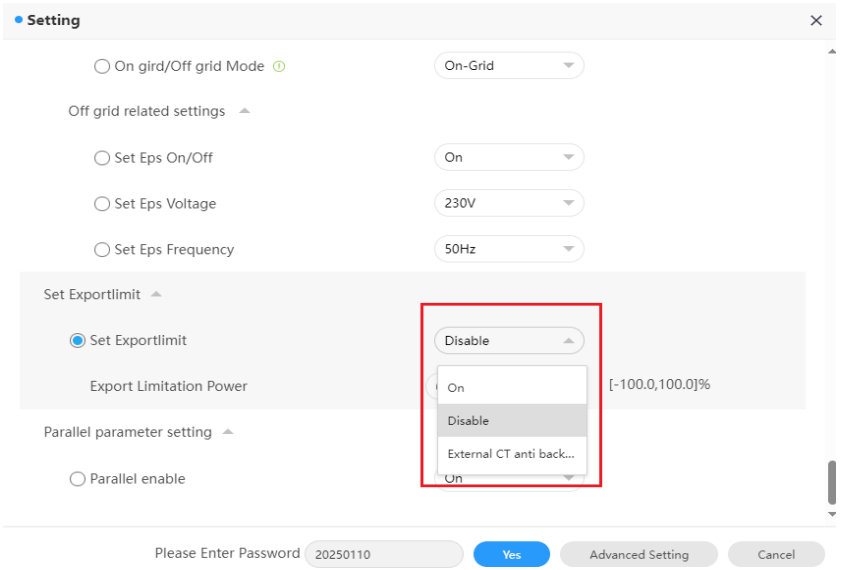
**Note:** Factory default off-grid enable.

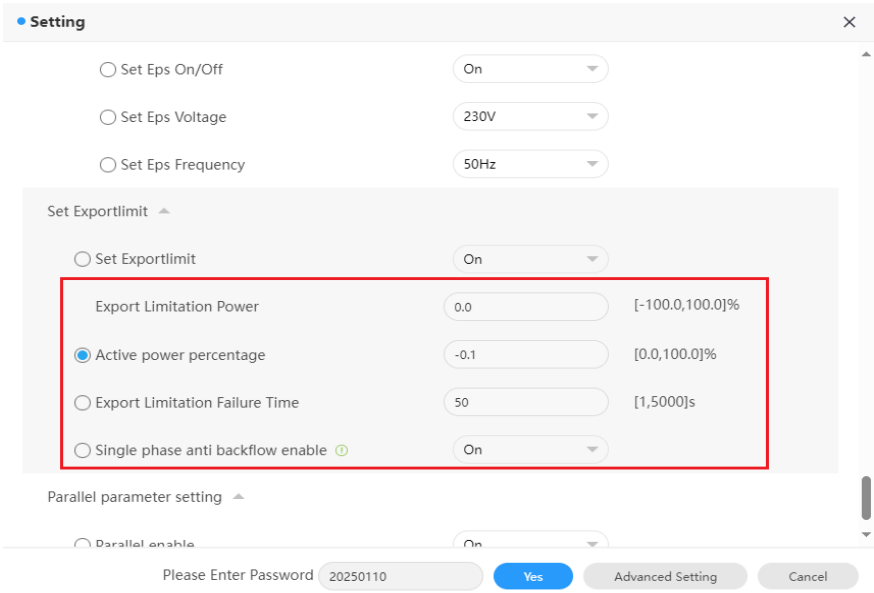


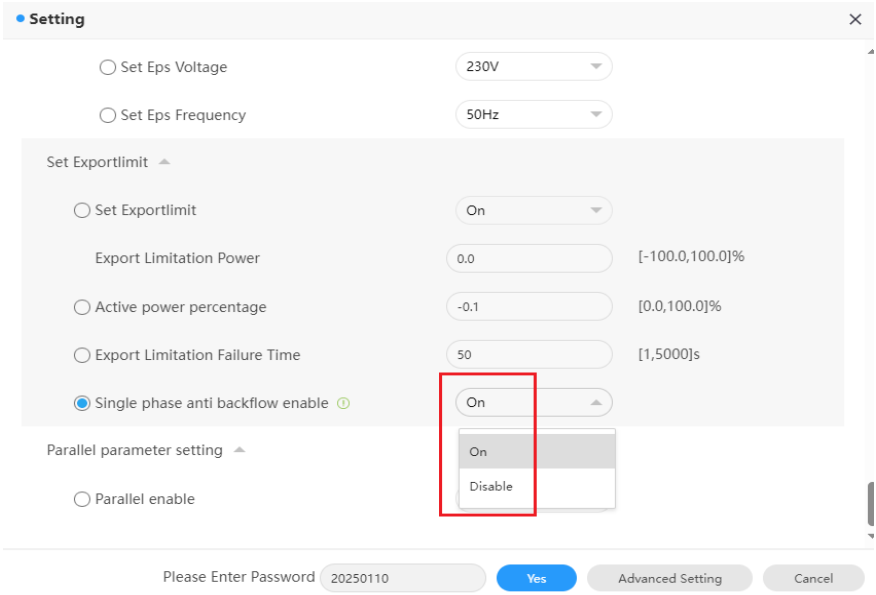



- Set Export limit: you can select to enable/disable export limit. If select disable, this function doesn't work. If select enable, you can set Export Limitation Power, active power percentage, export limitation failure time and single phase anti backflow enable.

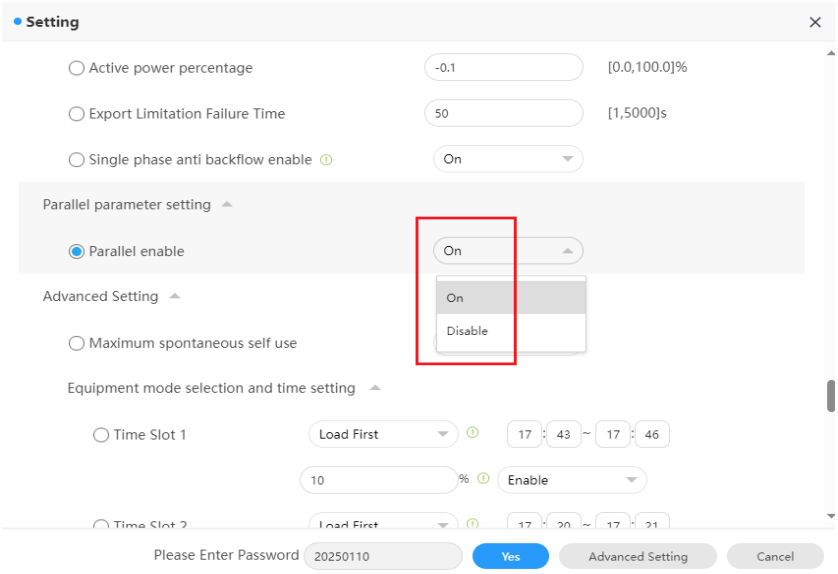
**Note:** The meter must be connected to export limit.



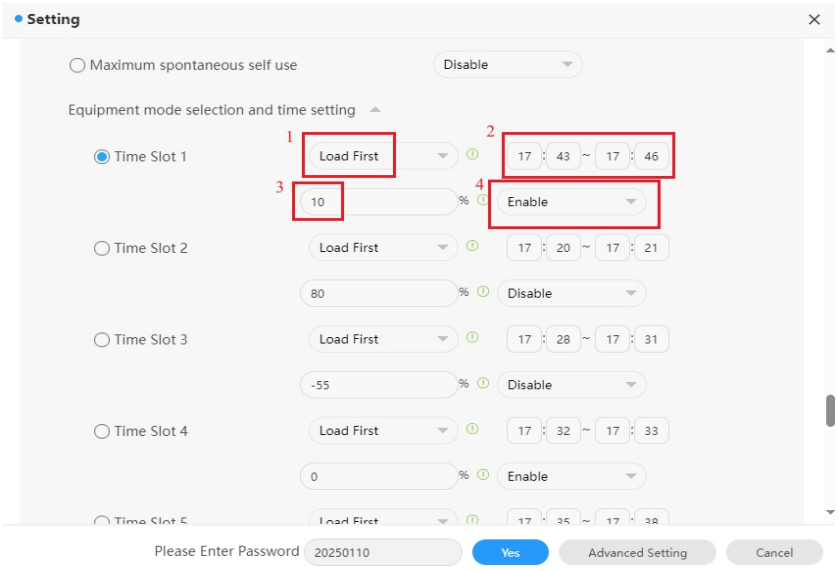

Setting
Set Eps On/Off
On
Set Eps Voltage
230V
Set Eps Frequency
50Hz
Set Exportlimit
Set Exportlimit
On
Export Limitation Power
0.0
[-100.0,100.0]%
Active power percentage
-0.1
[0.0,100.0]%
Export Limitation Failure Time
50
[1,5000]s
Single phase anti backflow enable
On
Parallel parameter setting
Please Enter Password
20250110
Yes
Advanced Setting
Cancel

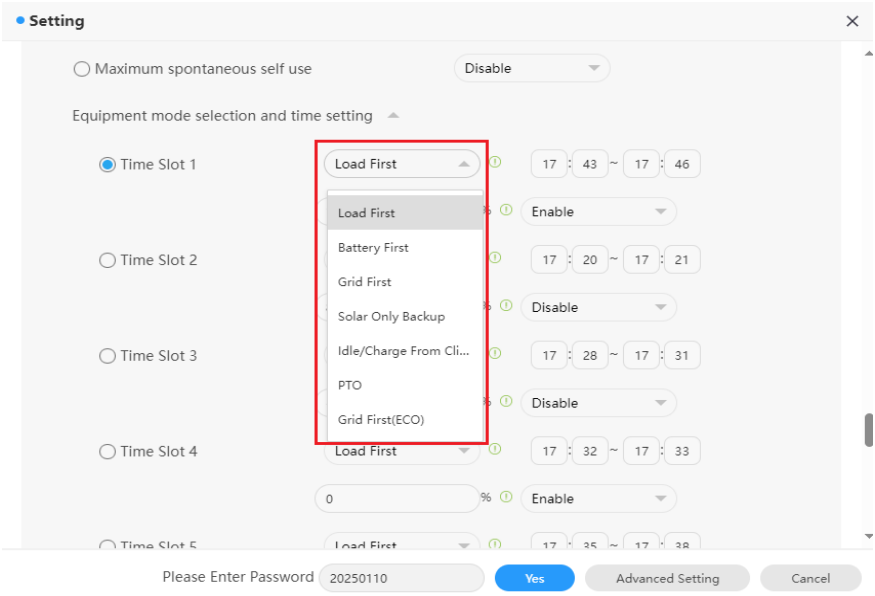

Setting
Set Eps Voltage
230V
Set Eps Frequency
50Hz
Set Exportlimit
Set Exportlimit
On
Export Limitation Power
0.0
[-100.0,100.0]%
Active power percentage
-0.1
[0.0,100.0]%
Export Limitation Failure Time
50
[1,5000]s
Single phase anti backflow enable
On
On
Disable
Parallel parameter setting
Parallel enable
Please Enter Password
20250110
Yes
Advanced Setting
Cancel

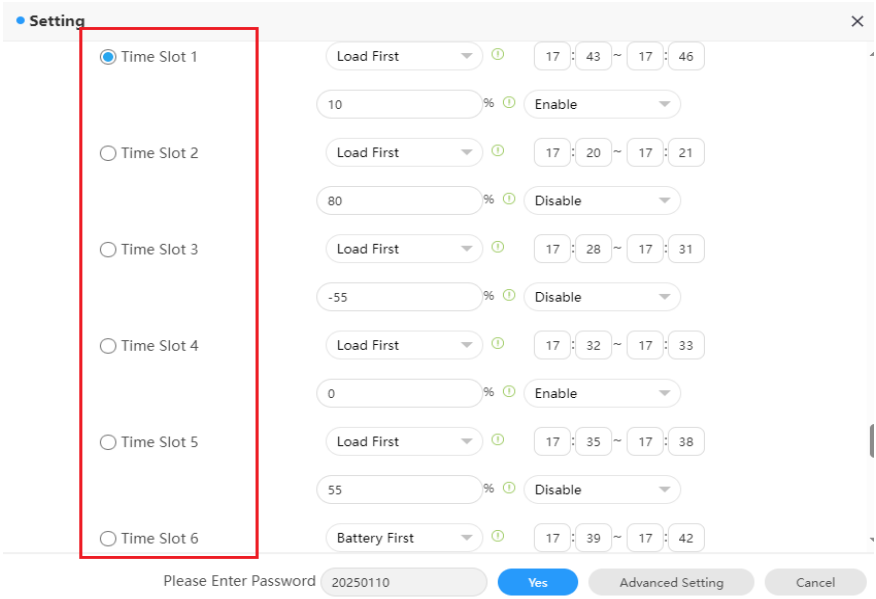
➢ Parallel enable: you can select to enable/disable parallel.



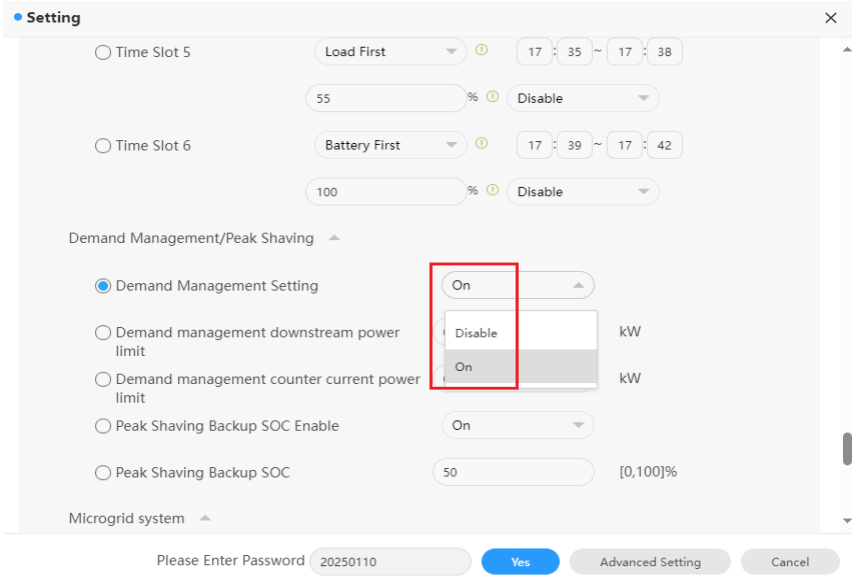

➢ Equipment mode selection and time setting: you can set 1. operating mode, include load first, battery first, grid first, solar only backup, Idle, PTO, ECO, 2. time period, 3. power percentage, 4. enable/disable. A total of 6 time slots are available for setting.

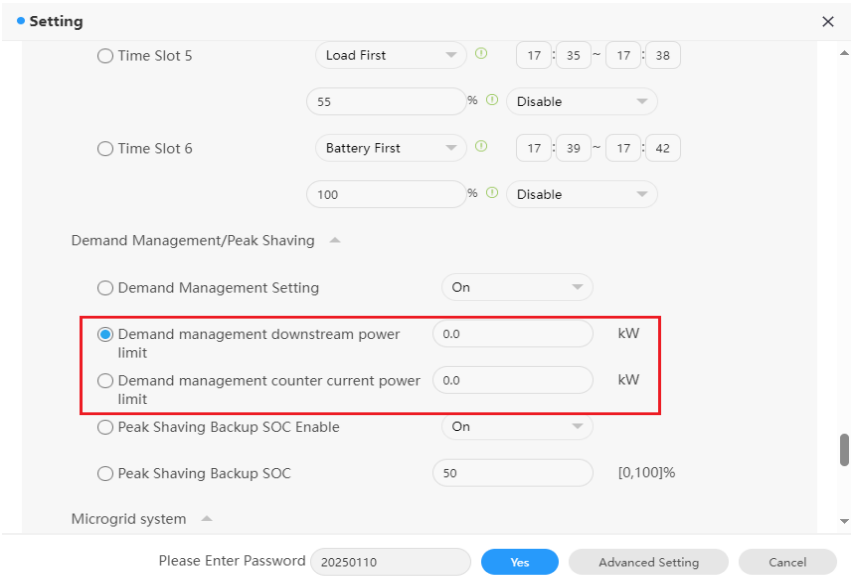



Setting
Maximum spontaneous self use
Disable
Equipment mode selection and time setting
Time Slot 1
Load First
17 : 43 ~ 17 : 46
Load First
Battery First
Grid First
Solar Only Backup
Idle/Charge From Cli...
PTO
Grid First(ECO)
Enable
Time Slot 2
17 : 20 ~ 17 : 21
Disable
Time Slot 3
17 : 28 ~ 17 : 31
Disable
Time Slot 4
Load First
17 : 32 ~ 17 : 33
0
%
Enable
Time Slot 5
Load First
17 : 35 ~ 17 : 38
Please Enter Password
20250110
Yes
Advanced Setting
Cancel

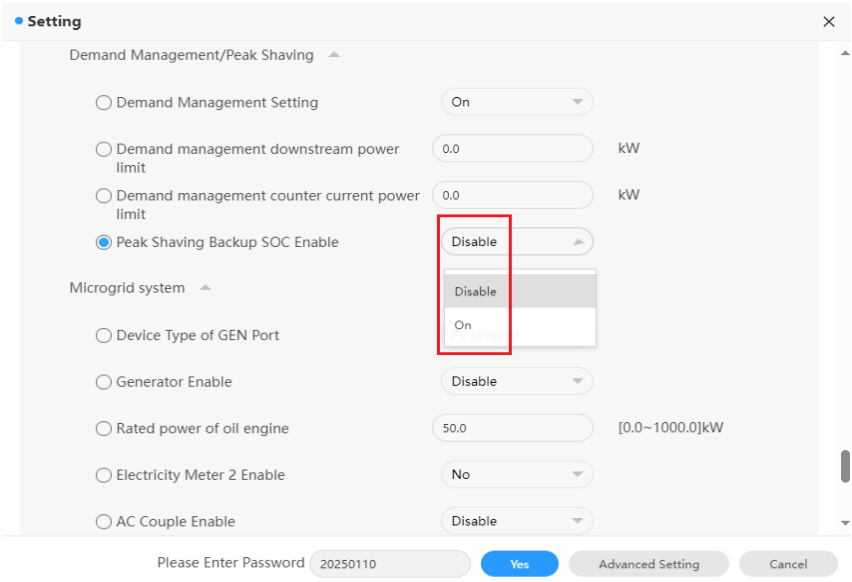

Setting
Time Slot 1
Load First
17 : 43 ~ 17 : 46
10
%
Enable
Time Slot 2
Load First
17 : 20 ~ 17 : 21
80
%
Disable
Time Slot 3
Load First
17 : 28 ~ 17 : 31
-55
%
Disable
Time Slot 4
Load First
17 : 32 ~ 17 : 33
0
%
Enable
Time Slot 5
Load First
17 : 35 ~ 17 : 38
55
%
Disable
Time Slot 6
Battery First
17 : 39 ~ 17 : 42
Please Enter Password
20250110
Yes
Advanced Setting
Cancel

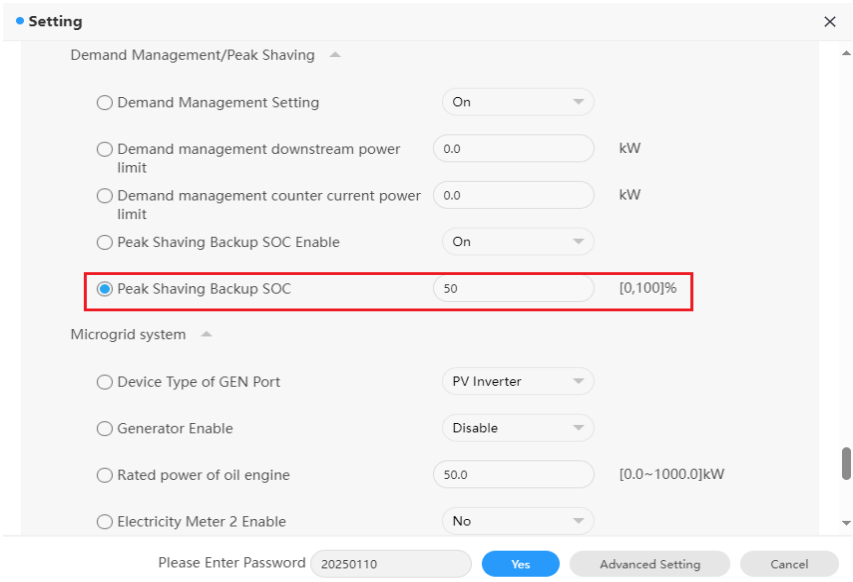
➢ Peak Shaving: you can select to enable/disable peak shaving. If select disable, this function doesn't work. If select enable, you can set demand management downstream power limit and demand management counter current power limit.



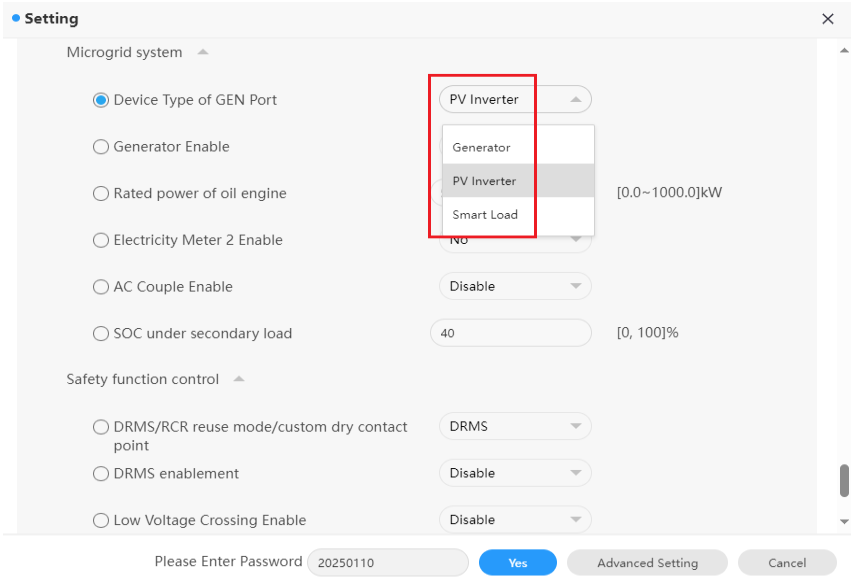



➢ Peak Shaving backup SOC enable：you can select to enable/disable peak shaving backup soc. If select disable, this function doesn't work. If select enable, you can set peak shaving backup soc.

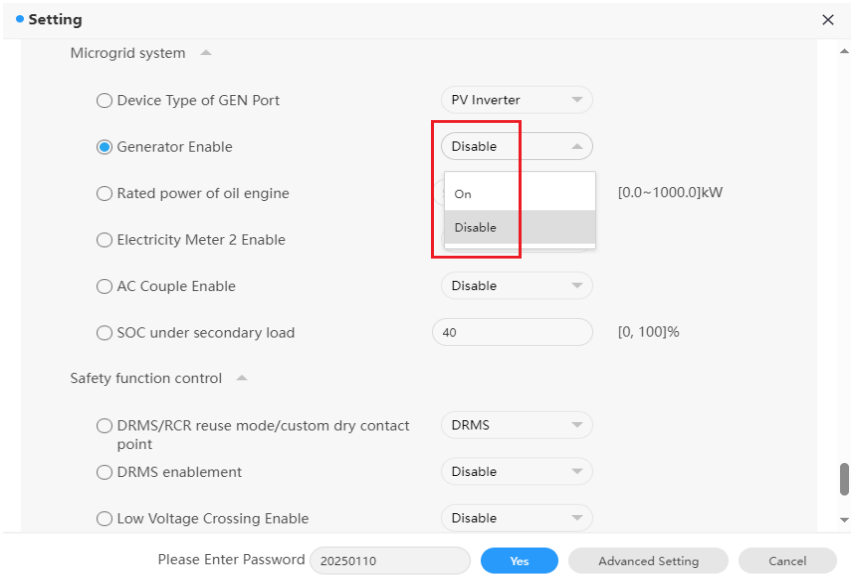


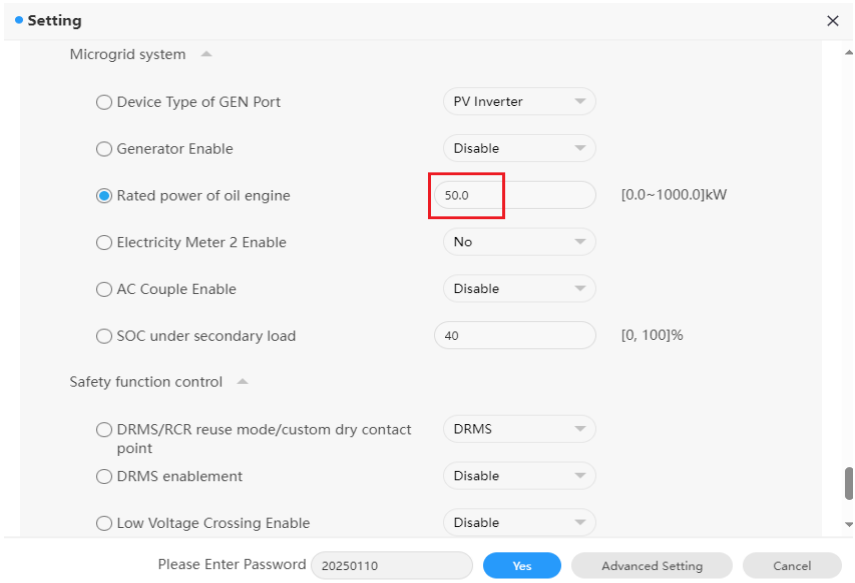
➢ Device Type of GEN Port: you can set generator or PV Inverter or smart load.



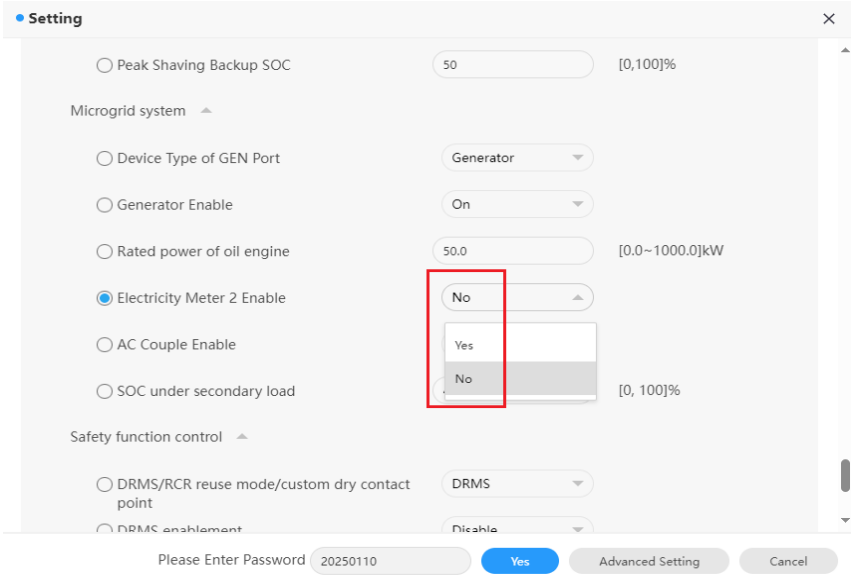

➢ Generator Enable: you can select to enable/disable generator.



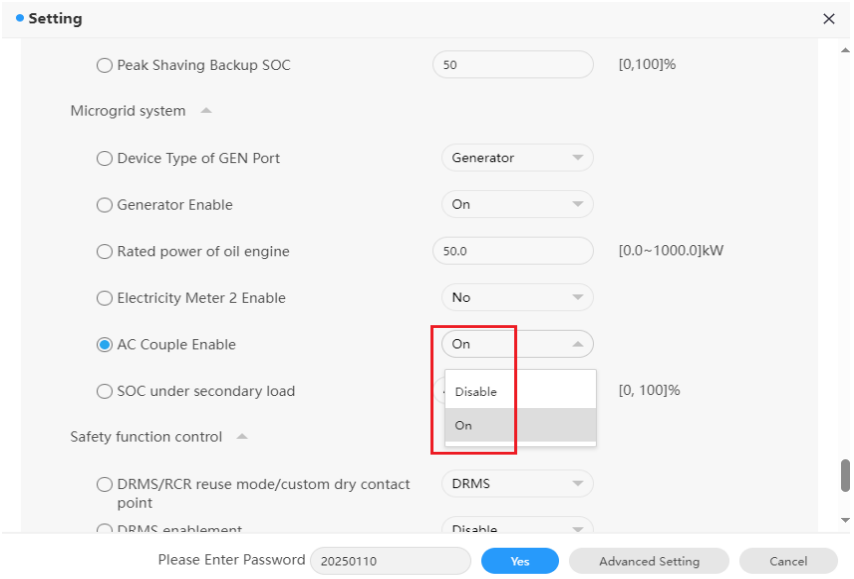
➢ Rated power of oil engine: you can set rated power of oil engine.



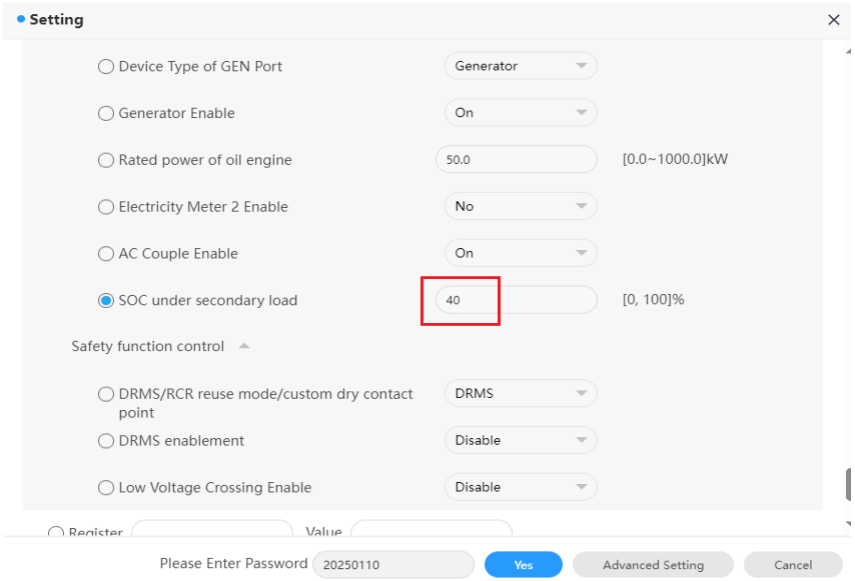

➢ Electricity Meter 2 Enable: you can select to enable/disable electricity meter.



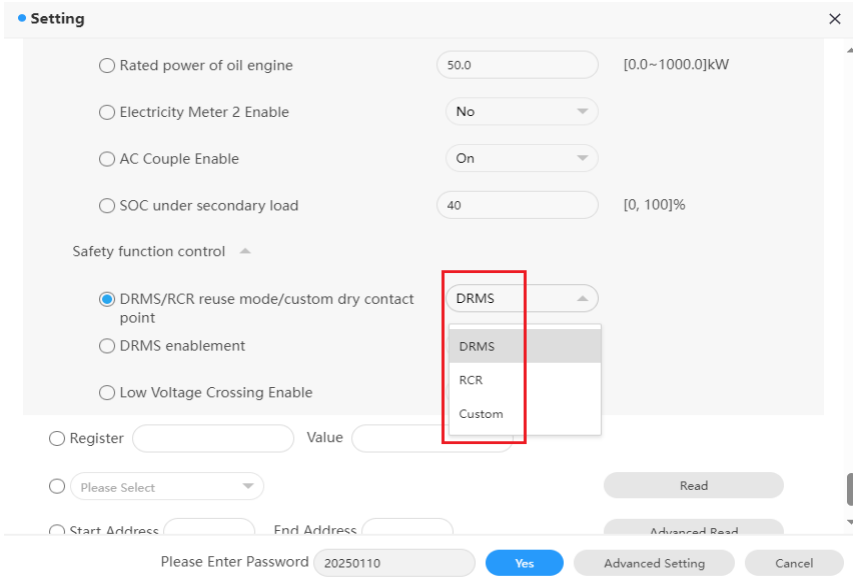
➢ AC Couple enable: you can select to enable/disable AC couple.



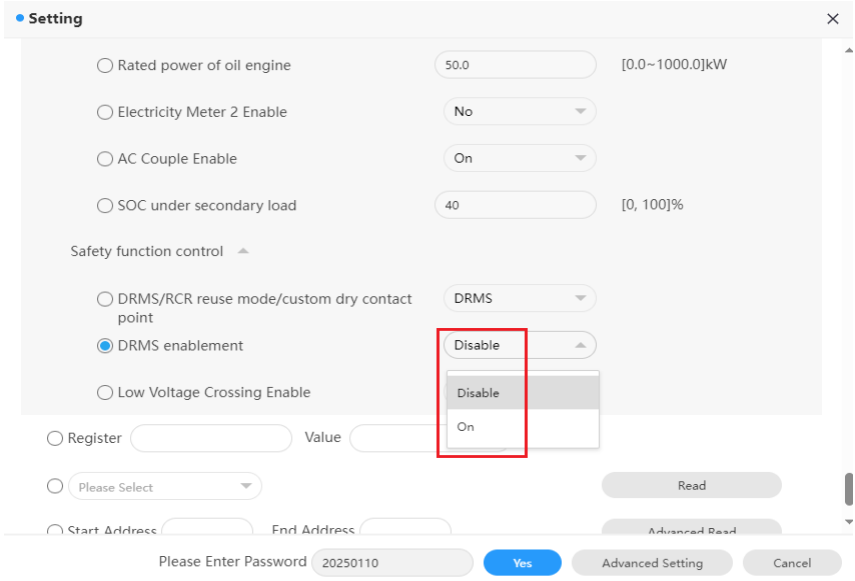

➢ SOC under secondary load: you can set the soc under secondary load.



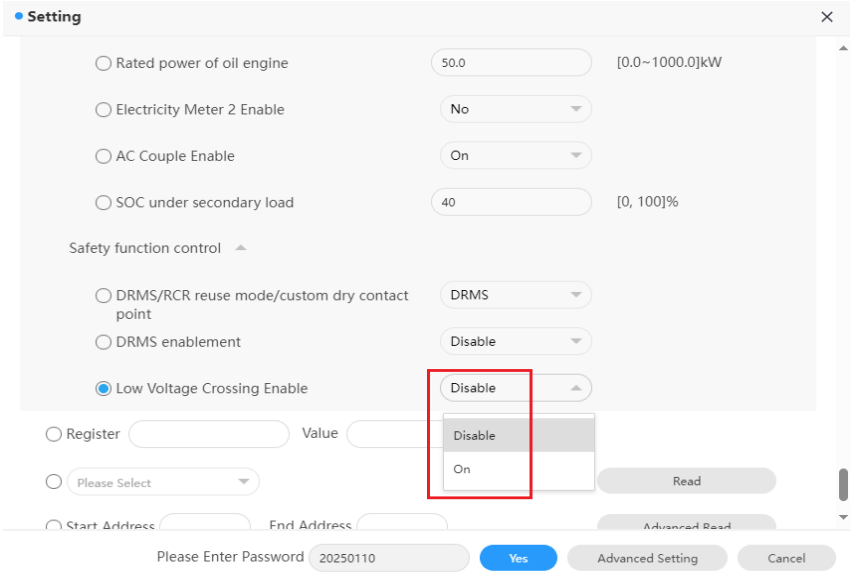
➢ DRMS/RCR reuse mode/custom dry contact: you can set DRMS, RCR or custom dry contact.



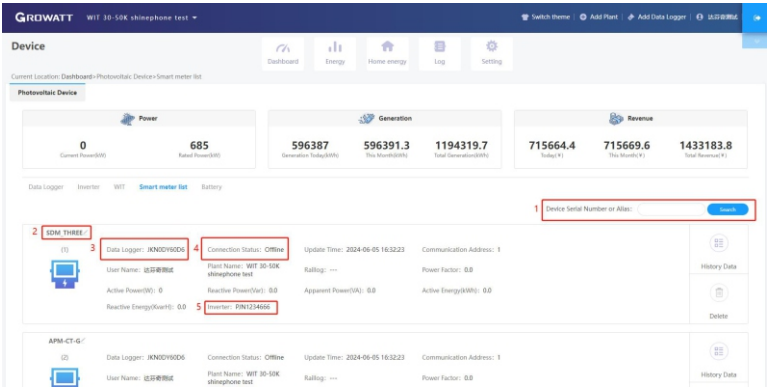

➢ DRMS enablement: you can select to enable/disable DRMS.



➢ Low Voltage Crossing Enable: you can select to enable/disable low voltage crossing.




3.Meter




1) Enter the serial number of the meter or the datalogger to search for the desired meter
2) Meter type
3) The datalogger worked in conjunction with the meter
4) Status of the meter
5) The serial number of the WIT inverter to which the meter is connected

# System Maintenance 9

## 9.1 Routine Maintenance

### 9.1.1 Clean the Chassis

| | |
|---|---|
| DANGER | • Before performing any operation, disconnect the AC and DC power supply and wait for 5 minutes after the system is powered off.<br>• Wipe the dust off the chassis and clean the chassis with a moistened cloth. |

1) Check periodically that the humidity is within the acceptable range and keep it away from dust;
2) Check the ventilation and heat dissipation of the equipment regularly. For details, see Section 9.1.2.

### 9.1.2 Fan Maintenance

| | |
|---|---|
| DANGER | • Only qualified and trained electrical technicians are allowed to perform operations. Technicians must observe instructions in this manual and comply with local regulations.<br>• Before performing any operation, disconnect all power supplies and wait for 5 minutes until the residual voltage is completely discharged. |
| WARNING | • Do not use the air pump to clean the fan. Otherwise, the fan may be damaged. |

Ventilation and heat dissipation is essential to protect the WIT Inverter from performance de-rate due to excess heat. The fan in the WIT Inverter works to cool the components and the heat sink when the temperature is too high. Check the following possible causes and measures when an exception occurs:

1> The fan is stuck with foreign objects or there is dust accumulation on the heat sink; clean the fan cover, fan blades and the heat sink.

2> The fan is damaged and needs to be replaced.
The installation position of the WIT Inverter is not well-ventilated. Select an appropriate installation position that meets the basic installation requirements.

**Cleaning and replacing the fan:**

1> Before cleaning or replacing a fan, disconnect the DC and AC power supply and wait for at least 5 minutes.

2> Remove the fan fixing plate using a cross-head screwdriver, as shown in Fig 9.1:

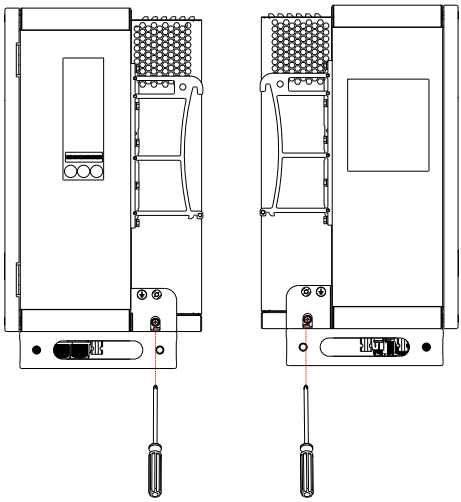


Fig 9.1

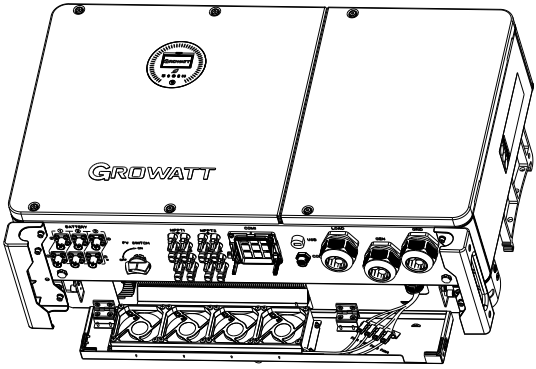



Fig 9.2 Position of the fan fixing plate

3> Disconnect the fan connector, remove the fan fixing plate with a screwdriver, and remove the fan.

4> Clean the fan cover, fan blades, and the heat sink, or replace the fan.

(1) Use an air pump to clean the heat sink, and use a brush or wet cloth to clean the fan and the its cover;

(2) Remove the fan for cleaning if necessary;

(3) Remove the fan that needs to be replaced using a cross-head screwdriver and install a new fan.

(4) Bind the cables and fix them with a cable tie.

(5) Reinstall the fan, the fan fixing plate, and the WIT Inverter.

## 9.2 Troubleshooting

| | |
|---|---|
|  DANGER | • It must be operated by trained and professional electrical technicians. Technicians must observe instructions in this manual and local regulations.<br>• If the WIT Inverter reports the "PV Isolation low" alarm, do not touch the equipment as a ground fault might have occurred.<br>• Beware of high voltages which can cause electric shocks. |

### 9.2.1 Warning

Warnings indicate abnormal situations of WIT 29.9-50K-XHU Hybrid Inverters, leading to a reduction in the output power. The warning sign will disappear once the fault is rectified by restarting the inverter or reconfiguring the system. The warning codes are shown in Table 9.1:

Table 9.1 Warning codes

| Warning | Description | Suggestion |
|---|---|---|
| Warning 200 | String fault | 1. Check if the PV panels are normal after shutdown.<br>2. If the error message persists, contact Growatt support. |
| Warning 201 | PV string/PID quick-connect terminals abnormal | 1. Check the wiring of the string terminals after shutdown.<br>2. If the error message persists, contact Growatt support. |
| DC SPD Warning | DC SPD function abnormal | 1. Check the DC SPD after shutdown.<br>2. If the error message persists, contact Growatt support. |
| Warning 203 | PV1 or PV2 short circuited | 1. Check if PV1 or PV2 is short circuited.<br>2. If the error message persists, contact Growatt support. |
| Boost Warning | PV Boost driver abnormal | 1. Restart the inverter.<br>2. If the error message persists, contact Growatt support. |
| AC SPD Warning | AC SPD function abnormal | 1. After shutdown, check the AC SPD.<br>2. If the fault persists, contact Growatt. |
| Warning 208 | DC fuse blows | 1. Power off the system and check the fuse.<br>2. If the fault persists, contact Growatt. |

| Warning | Description | Suggestion |
|---|---|---|
| Warning 209 | DC input voltage exceeds the upper threshold | 1. Turn off the DC switch immediately and check the DC voltage.<br>2. If the DC voltage is within the specified range and the error message persists, contact Growatt support. |
| PV Reversed | PV string is reversely connected | 1. Check the polarity of the PV terminals.<br>2. If the error message persists, contact Growatt support. |
| Warning 219 | PID function abnormal | 1. Restart the inverter.<br>2. If the error message persists, contact Growatt support. |
| Warning 220 | PV string disconnected | 1. Check if the PV string is properly connected.<br>2. If the error message persists, contact Growatt support. |
| Warning 221 | PV string current unbalanced | 1. Check if the PV panels of the corresponding string are normal.<br>2. If the error message persists, contact Growatt support. |
| Warning 300 | No utility grid connected or utility grid power failure | 1. Check if the grid is down.<br>2. If the error message persists, contact Growatt support. |
| Warning 301 | Grid voltage is beyond the permissible range | 1. Check if the grid voltage is within the specified range.<br>2. If the error message persists, contact Growatt support. |
| Warning 302 | Grid frequency is beyond the permissible range | 1. Check if the grid frequency is within the specified range.<br>2. If the error message persists, contact Growatt support. |
| Warning 303 | Overload | 1. Please reduce the load connected to the EPS output terminal.<br>2. If the error message persists, contact Growatt support. |
| Warning 308 | Meter disconnected | 1. Check if the meter is properly connected.<br>2. If the error message persists, contact Growatt support. |

| Warning | Description | Suggestion |
|---|---|---|
| Warning 309 | Meter is reversely connected | 1. Check if the L line and the N line of the meter are reversely connected.<br>2. If the error message persists, contact Growatt support. |
| Warning 310 | The voltage difference between the N line and the PE cable is abnormal | 1. Check if the PE cable is reliably connected after shutdown.<br>2. If the error message persists, contact Growatt support. |
| Warning 311 | Phase sequence error | No operation is required. The PCS will automatically adjust the phase sequence. |
| Warning 313 | Abnormal generator condition | 1. Check the generator status.<br>2. If the error message persists, please contact Growatt support. |
| Warning 400 | Fan failure | 1. Check if the fan is properly connected after shutdown.<br>2. If the error message persists, contact Growatt support. |
| Warning 401 | Meter abnormal | 1. Check if the meter is turned on.<br>2. If the meter is correctly connected to the inverter. |
| Warning 402 | Communication between the optimizer and the inverter is abnormal | 1. Check if the optimizer is turned on.<br>2. If the optimizer is correctly connected to the inverter. |
| Warning 407 | Over-temperature | 1. Restart the inverter.<br>2. If the error message persists, contact Growatt support. |
| Warning 408 | NTC temperature sensor is broken | 1. Restart the inverter.<br>2. If the error message persists, contact Growatt support. |
| Warning 411 | Sync signal abnormal | 1. Check if the sync cable is abnormal.<br>2. If the error message persists, contact Growatt support. |

| Warning | Description | Suggestion |
|---|---|---|
| Warning 412 | Startup requirements of grid connection are not met | 1. Check if the grid voltage is within the specified range and check if the grid-connection startup voltage configuration is correct.<br>2. Check if the PV voltage is within the specified range.<br>3. Restart the inverter. If the error message persists, contact Growatt support. |
| Warning 500 | The inverter failed to communicate with the battery | 1. Check if the battery is turned on.<br>2. Check if the battery is correctly and securely connected to the inverter. |
| Warning 501 | Battery disconnected | 1. Check if the battery is properly connected.<br>2. If the error message persists, contact Growatt support. |
| Warning 502 | Battery voltage too high | 1. Check if the battery voltage is within the permissible range.<br>2. Check if the battery is correctly connected.<br>3. If the error message persists, contact Growatt support. |
| Warning 503 | Battery voltage too low | 1. Check if the battery voltage is within the permissible range.<br>2. Check if the battery is correctly connected.<br>3. If the error message persists, contact Growatt support. |
| Warning 504 | Battery terminals are reversely connected | 1. Check if the positive and negative terminals of the battery are reversely connected.<br>2. If the error message persists, contact Growatt support. |
| Warning 505 | Temperature sensor of the lead-acid battery is disconnected | 1. Check if the temperature sensor of the lead-acid battery is installed or not.<br>2. Check if the temperature sensor is well-connected.<br>3. If the error message persists, contact Growatt support. |

| Warning | Description | Suggestion |
|---|---|---|
| Warning 506 | Battery temperature is out of range | 1. Check if the ambient temperature of the battery is within the specified range.<br>2. If the error message persists, contact Growatt support. |
| Warning 507 | BMS reported a fault; both charging and discharging failed | 1. Figure out the cause according to the BMS error code.<br>2. If the error message persists, contact Growatt support. |
| Warning 508 | Lithium battery overload protection | 1. Check if the power of the load exceeds the BAT rated discharge power.<br>2. If the error message persists, contact Growatt support. |
| Warning 509 | BMS communication abnormal | 1. Restart the inverter.<br>2. If the error message persists, contact Growatt support. |
| Warning 510 | BAT SPD function abnormal | 1. Check the BAT SPD after powering off the device.<br>2. If the error message persists, contact Growatt support. |
| Warning 601 | DC component over high in output voltage | 1. Restart the inverter.<br>2. If the error message persists, contact Growatt support. |
| Warning 605 | Off-grid bus voltage too low | 1. Check if the load power exceeds the upper limit.<br>2. Restart the inverter. If the error message persists, contact Growatt support. |
| Warning 606 | The off-grid output is overloaded | 1. Check whether the load exceeds the inverter specification.<br>2. Restart inverter,If error message still exists, contact manufacturer. |
| Warning 609 | Balanced circuit abnormal | 1. Restart the inverter.<br>2. If the error message persists, contact Growatt support. |

### 9.2.2 Error

The error code indicates that the device is damaged or the configurations are abnormal. Only qualified and trained electrical technicians are allowed to rectify the faults. The error message will disappear after the fault is rectified. If the problem persists, please contact Growatt.

Table 9.2 Error codes

| Error Code | Description | Suggestion |
|---|---|---|
| AFCI Fault | An arc fault has been detected | 1. After shutdown, check the connection of the PV string.<br>2. Restart the inverter.<br>3. If the error message persists, please contact Growatt support. |
| GFCI High | An excessively high leakage current has been detected | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| PV Voltage High | DC input voltage exceeds the upper threshold | 1. Disconnect the DC switch immediately and check the voltage.<br>2. If the DC input voltage is within the permissible range and the error message persists, please contact Growatt support. |
| PV Isolation Low | PV panels have low insulation resistance | 1. Check if the PV strings are properly grounded.<br>2. If the error message persists, please contact Growatt support. |
| PV Reversed | PV string reversely connected | 1. After shutdown, check if the PV string is reversely connected to the inverter.<br>2. Restart the inverter.<br>3. If the error message persists, please contact Growatt support. |
| AC V Outrange | Grid voltage is beyond the permissible range | 1. Check the grid voltage.<br>2. If the grid voltage is within the permissible range and the error message persists, please contact Growatt support. |
| No AC | No utility grid connected or utility grid power failure | 1. After shutdown, check the AC wiring.<br>2. If the error message persists, please contact Growatt support. |

| Error Code | Description | Suggestion |
|---|---|---|
| NE Abnormal | The voltage difference between the N line and the PE cable is abnormal | 1. After shutdown, check if the ground cable is reliably connected.<br>2. If the error message persists, please contact Growatt support. |
| AC F Outrange | Grid frequency is beyond the permissible range | 1. Check the grid frequency and restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 309 | Grid ROCOF (Rated of Change of Frequency) abnormal | 1. Check the grid frequency and restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| NE Fault | Neutral-to-Ground voltage is too low | 1. Check whether the N line on the inverter side with PV negative grounding is short-circuited with the ground cable and whether the output side is isolated with a transformer.<br>2. If the error message persists, please contact Growatt support. |
| Error 311 | Export limitation fail-safe | 1. After shutdown, check the connection of the CT and the meter.<br>2. If the error message persists, please contact Growatt support. |
| Error 313 | Abnormal generator condition | 1. After shutdown, check the generator status.<br>2. If the error message persists, please contact Growatt support." |
| Error 400 | DCI bias abnormal | 1. Restart the inverter.<br>2. If the error message persists, contact Growatt support. |
| Error 402 | High DC component in output current | 1. Restart the inverter.<br>2. If the error message persists, contact Growatt support. |
| Error 404 | Bus voltage sampling abnormal | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 405 | Relay fault | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |

| Error Code | Description | Suggestion |
|---|---|---|
| Error 408 | Over-temperature | 1. After shutdown, check the temperature of the inverter and restart the inverter after the temperature is within the acceptable range.<br>2. If the error message persists, please contact Growatt support. |
| Error 409 | Bus voltage abnormal | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 411 | Internal communication failure | 1. Check the wiring of the communication board after shutdown.<br>2. If the error message persists, please contact Growatt support. |
| Error 412 | Temperature sensor disconnected | 1. Check if the temperature sensor module is properly connected.<br>2. If the error message persists, please contact Growatt support. |
| Error 413 | IGBT drive fault | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 414 | EEPROM error | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 415 | Auxiliary power supply abnormal | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 416 | DC/AC overcurrent protection | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 417 | Communication protocol mismatch | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 418 | DSP and COM firmware version mismatch | 1. Check the firmware version.<br>2. If the error message persists, please contact Growatt support. |
| Error 419 | DSP software and hardware version mismatch | 1. Check the firmware version.<br>2. If the error message persists, please contact Growatt support. |
| Error 421 | CPLD abnormal | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |

| Error Code | Description | Suggestion |
|---|---|---|
| Error 422 | Redundancy sampling inconsistent | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support |
| Error 423 | PWM pass-through signal failure | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 425 | AFCI self-test failure | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 426 | PV current sampling abnormal | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 427 | AC current sampling abnormal | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 430 | EPO fault | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 431 | Monitoring chip BOOT verification failed | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 500 | BMS failed to communicate with the inverter | 1. Check the connection of the RS485 cable between the inverter and the battery.<br>2. Check if the battery is in the sleep mode.<br>3. If the error message persists, please contact Growatt support. |
| Error 501 | The BMS reports that the battery failed to charge/discharge | 1. Figure out the fault based on the BMS error code.<br>2. If the error message persists, please contact Growatt support. |
| Bat Voltage Low | The battery voltage is below the lower threshold | 1. Check the battery voltage.<br>2. If the error message persists, please contact Growatt support. |
| Error 503 | The battery voltage exceeds upper threshold | 1. Check the battery voltage. If it is within the permissible range, please restart the inverter. If not, please replace the battery.<br>2. If the error message persists, please contact Growatt support. |

| Error Code | Description | Suggestion |
|---|---|---|
| Error 504 | The battery temperature is beyond the range for charging / discharging | 1. Check the temperature of the battery.<br>2. If the error message persists, please contact Growatt support. |
| Bat Reversed | Battery terminals reversed | 1. Check if the battery terminals are reversely connected.<br>2. If the error message persists, please contact Growatt support. |
| Error 506 | Battery open-circuited | 1. Check the wiring of the battery terminals.<br>2. If the error message persists, please contact Growatt support. |
| Error 507 | Battery overload protection | 1. Check if the power of the load exceeds the battery rated discharge power.<br>2. If the error message persists, please contact Growatt support. |
| Error 508 | BUS2 Volt Abnormal | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 509 | BAT Charge OCP (Overcurrent Protection) | 1. Check if the PV voltage is oversized.<br>2. If the error message persists, please contact Growatt support. |
| Error 510 | BAT Discharge OCP (Overcurrent Protection) | 1. Check if the battery discharge current configuration is proper.<br>2. If the error message persists, please contact Growatt support. |
| Error 511 | BAT soft start failed | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| EPS Output Short | Off-grid output short-circuited | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 601 | Off-grid BUS Volt Low | 1. Check if the battery is working properly or the battery experiences capacity loss.<br>2. If the error message persists, please contact Growatt support. |

| Error Code | Description | Suggestion |
|---|---|---|
| Error 602 | Abnormal Volt at the off-grid terminal | 1. Check if a voltage is present at the AC port.<br>2. If the error message persists, please contact Growatt support. |
| Error 603 | Soft start failed | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 604 | Off-grid output voltage abnormal | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 605 | Balanced circuit self-test failed | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 606 | High DC component in output voltage | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| EPS Overload | Off-grid output overload | 1. Restart the inverter.<br>2. If the error message persists, please contact Growatt support. |
| Error 608 | Off-grid parallel signal abnormal | 1. Check if the communication cables are properly connected.<br>2. If the error message persists, please |

# 10 Product Specifications

Table 10.1 WIT 29.9/30/36/40/50K-XHU specification

| Model / Specifications | WIT 29.9K -XHU | WIT 30K -XHU | WIT 36K -XHU | WIT 40K -XHU | WIT 50K -XHU |
|---|---|---|---|---|---|
| Input data(PV) | | | | | |
| Max. recommended PV power(for module STC) | 59.8kW | 60kW | 72kW | 80kW | 100kW |
| Max. DC voltage | 1100V | | | | |
| Start voltage | 195V | | | | |
| Nominal voltage | 620V | | | | |
| MPP voltage range | 180V-1000V | | | | |
| Full Load DC Voltage Range | 375V-850V | 375V-850V | 450V-850V | 500V-850V | 620V-850V |
| No. of MPP trackers | 4 | | | | |
| No. of PV strings per MPP tracker | 2 | | | | |
| Max. input current per MPP tracker | 40A | | | | |
| Max. short-circuit current per MPP tracker | 50A | | | | |
| Battery data（DC） | | | | | |
| Battery voltage range | 200-900V | | | | |
| Full load battery voltage range | 200V-800V | 200V-800V | 225V-800V | 250V-800V | 310V-800V |
| Recommended battery voltage | 512V | | | | |
| No. of battery input | 3 | | | | |
| Max. charging / discharging current | 55A*3 | | | | |
| BMS communication | RS485/CAN | | | | |
| Input/Output AC(GRID) | | | | | |
| AC input/output nominal power | 59.8KW/ 29.9KW | 60KW/ 30KW | 72KW/ 36KW | 80KW/ 40KW | 100KW/ 50KW |
| Max. AC input/output apparent power | 59.8KVA /29.9KVA | 66KVA/ 33KVA | 79.2KVA/ 39.6KVA | 88KVA/ 44KVA | 110KVA/ 55KVA |
| Nominal AC voltage/range | 380V/400V -15%~10% | | | | |

| Model / Specifications | WIT 29.9K -XHU | WIT 30K -XHU | WIT 36K -XHU | WIT 40K -XHU | WIT 50K -XHU |
|---|---|---|---|---|---|
| Nominal AC grid frequency/range | 50Hz/60Hz 45-55Hz/55-65Hz | | | | |
| Max. input/output current | 90.6A/ 45.3A@220V | 100A/ 50A@220V | 120A/ 60A@220V | 133.3A/ 66.7A@220V | 166.7A/ 83.3A@220V |
| Max. Continuous AC Passthrough | 200A | | | | |
| Power factor (@nominal power) | >0.99 | | | | |
| Adjustable power factor | -1...+1 | | | | |
| THDi | <3% @100% load<br><5% @30%/60%/100% load | | | | |
| AC grid connection type | 3P3W+PE/3P4W+PE | | | | |
| Input/Output Generator（GEN） | | | | | |
| AC nominal power | 59.8KW/ 29.9KW | 60KW/ 30KW | 72KW/ 36KW | 80KW/ 40KW | 100KW/ 50KW |
| Max. input current(GEN/AC Couple) | 90.6A/ 45.3A | 100A/ 45.5A | 120A/ 54.5A | 133.3A/ 60.7A | 166.7A/ 75.7A |
| Max.Continuous AC Passthrough | 200A | | | | |
| Nominal AC voltage | 380V/400V | | | | |
| Nominal AC grid frequency | 50Hz/60Hz | | | | |
| AC connection type | 3P3W+PE/3P4W+PE | | | | |
| Stand alone(Back up) | | | | | |
| AC nominal output power | 29.9KW | 30KW | 36KW | 40KW | 50KW |
| Max. AC apparent power | 29.9KVA | 45KVA | 54KVA | 60KVA | 75KVA |
| Nominal AC voltage | 220V/230V(L-N)<br>380V/400V(L-L) | | | | |
| Nominal AC frequency | 50/60HZ | | | | |
| Max. output current | 68.0A | 68.2A | 81.8A | 91A | 113.6A |
| Overload Capability | 1.5 time of rated power, 10 S | | | | |
| THDv | <3%（Linear full load） | | | | |

| Model / Specifications | WIT 29.9K -XHU | WIT 30K -XHU | WIT 36K -XHU | WIT 40K -XHU | WIT 50K -XHU |
|---|---|---|---|---|---|
| Switch time | ≤10ms | | | | |
| Efficiency | | | | | |
| Max. efficiency | 98.10% | | | | |
| European efficiency | 97.2% | | | | |
| Protection devices | | | | | |
| DC reverse polarity protection | Yes | | | | |
| Battery reverse protection | Yes | | | | |
| Insulation resistance monitoring | Yes | | | | |
| AC/DC surge protection | Type II | | | | |
| AC short-circuit protection | Yes | | | | |
| Ground fault monitoring | Yes | | | | |
| Grid monitoring | Yes | | | | |
| String monitoring | Yes | | | | |
| Anti-islanding protection | Yes | | | | |
| Residual-current monitoring unit | Yes | | | | |
| PID function | Optional | | | | |
| AFCI protection | Optional | | | | |
| General data | | | | | |
| Dimensions (W / H / D) | 920/585/320mm | | | | |
| Weight | 92kg | | | | |
| Operating temperature range | -30°C - 60°C (>50°C, derating) | | | | |
| Noise emission (typical) | ≤55dB | | | | |
| Altitude | 4000m | | | | |
| Topology | Transformerless | | | | |
| Cooling | Smart air cooling | | | | |

| Model / Specifications | WIT 29.9K -XHU | WIT 30K -XHU | WIT 36K -XHU | WIT 40K -XHU | WIT 50K -XHU |
|---|---|---|---|---|---|
| Protection degree | IP66 | | | | |
| Relative humidity | 0~95% | | | | |
| PV connection | MC4 | | | | |
| AC connection | Cable gland +SC terminal | | | | |
| Battery connection | Quick connection plug | | | | |
| Interfaces | | | | | |
| Display | OLED+LED/APP | | | | |
| RS485/CAN/USB | RS485/CAN/USB | | | | |
| WIFI/4G/LAN | WIFI/LAN | | | | |
| Warranty: 5 / 10 years | Yes/Opt. | | | | |
| Certificates and approvals | | | | | |
| Grid regulation | NRS 097-2-1:2017, EN50549-1, NC RFG, PSE-2018, PTPiREE-2021, IEC62116, IEC61727, G99:2020,VDE 4105 | | | | |
| EMC | IEC/EN61000-6-1, IEC/EN61000-6-3 | | | | |
| Safety | IEC/EN62109-1, IEC/EN62109-2, IEC/EN62477-1 | | | | |

# 11 Decommissioning the WIT Inverter

Handle the WIT Inverter that will not be operated in the future properly.

1> Disconnect the external AC circuit breaker and prevent accidental reconnection due to improper operation.
2> Set the DC switches to the OFF position.
3> Disconnect the upstream battery circuit breaker.
4> Wait at least 5 minutes before performing operations on it.
5> Disconnect the AC output power cables.
6> Disconnect the DC input power cables.
7> Remove the inverter from the bracket.
8> Dispose of the inverter according to local disposal rules.

# Warranty 12

Growatt guarantees maintenance and replacement of the defective product under warranty.

## 12.1 Conditions

1. Growatt will ask users to provide product information by filling a form before making warranty repairs, including the date of purchase and installation, the serial number of the WIT Inverter, fault description and other information.
2. The defected product shall be returned to Growatt for recycling and disposal.

## 12.2 Disclaimer

Growatt shall not be liable for any consequences of the following circumstances:

1. Unauthorized removal of the product, such as removing the tamper-proof label and the upper cover of the WIT Inverter.
2. Damage caused during transportation.
3. Improper operations during installation and commissioning.
4. Failure to observe the operation instructions regarding the installation, operation and storage of the WIT Inverter.
5. Unauthorized modifications or improper maintenance on the WIT Inverter.
6. Improper use and operation.
7. Damage caused by storage conditions that do not meet the requirements specified in this manual.
8. Failure to follow the safety precautions and applicable laws and regulations due to customer's negligence.
9. Damage due to force majeure, such as lightning, floods, storms, fire.
10. Power off the PCS before upgrading the firmware; otherwise it will shut down automatically during the upgrade process and supply no power to the loads.

In the event of a product malfunction or failure caused by the circumstance mentioned above, Growatt can provide paid maintenance services after conducting a fault diagnosis if required.

# 13 Contact Us

If you have technical problems with our products, please contact Growatt for technical support. To provide you with the necessary assistance, please have the following information ready:

1. Model number of the WIT Inverter
2. Serial number of the WIT Inverter
3. Error code of the WIT Inverter
4. Information indicated on the LED display
5. DC input voltage and AC output voltage of the WIT Inverter
6. Communication method of the WIT Inverter

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**E** service@growatt.com
**W** en.growatt.com

**For local customer support, please visit https://en.growatt.com/support/contact**

Download Manual

Growatt New Energy

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GR-UM-419-A-02 (PN: 044.0131802)