



WIT 50-125K-XHU User Manual

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1 Notes on this Manual

1.1 Introduction

This manual provides detailed product information and installation/operation instructions for users of Shenzhen Growatt New Energy Co., Ltd. (hereinafter referred to as "Growatt New Energy") WIT 50-125K-XHU Hybrid Inverters. Please read this manual carefully before using the product and keep it in an accessible location for installation, operation, and maintenance personnel. This manual may be updated based on user feedback or product upgrades, and Growatt New Energy assumes no responsibility for notifying users of such changes.

Notes:

"WIT" refers to the product name. "50-125K" 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. Should any questions arise during installation, you can visit en.growatt.com to leave a message.

1.3 Product Range

WIT 50-125K-XHU (AC 380V/400V/415V) inverters offering seven power options: 50kW, 63kW, 75kW, 85kW, 99.9kW, 100kW and 125kW. In total, there are 7 products available in this series. This manual is valid for the following models:

Table 1.1 WIT 50-125K-XHU series model introduction

Model	Description
WIT 50K-XHU(t)	3-Phase Hybrid Inverter with UPS function
WIT 63K-XHU	
WIT 75K-XHU	
WIT 85K-XHU	
WIT 99.9K-XHU	
WIT 100K-XHU	
WIT 125K-XHU	

2 Safety Precautions

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.
- 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 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, or injury caused by a falling inverter as it is heavy. Please transport and lift the inverter carefully.
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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. Install the WIT in a dry and well-ventilated location; otherwise, performance de-rate may be initiated due to excessive temperature. 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 are OFF, and turn off the switch and breaker on the AC side and the battery side. Otherwise, high voltages may cause severe injuries. It must be operated by qualified and trained electrical technicians. Technicians should observe instructions in this manual and local regulations. High voltages may cause electric shocks and serious injury. Please do not touch the WIT in operation. 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. Do not connect the load between the WIT and the circuit breaker. 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. Ensure the correct polarity of the terminals before connecting the PV array to the WIT.

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. For the WIT 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.

2.3 Label Description

Symbol	Name	Meaning
	High voltage	High voltages exist after the WIT 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 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.
	DC	Direct Current.
	AC	Alternating Current.

3 Product Description

**NOTICE**

The views of all models are completely identical.

3.1 Overview

Front view:

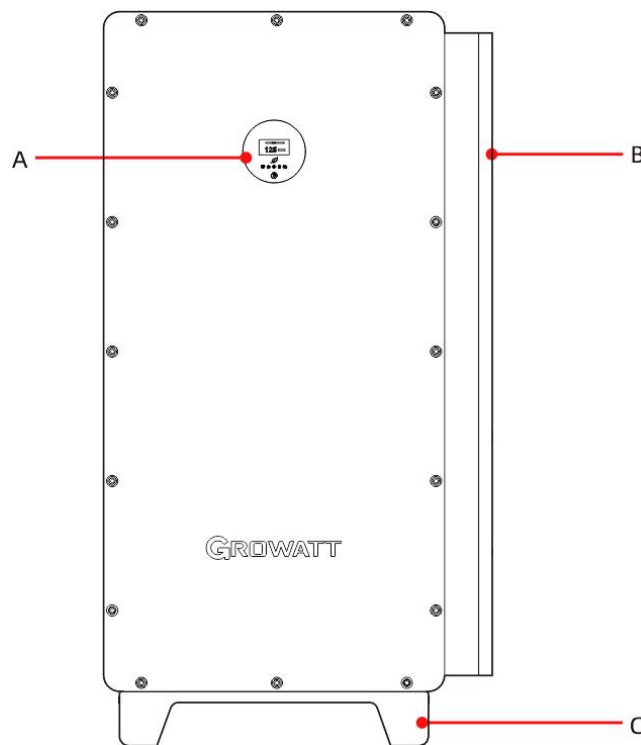


Fig 3.1 Front view

Bottom view:



Fig 3.2 Bottom view

Left view:

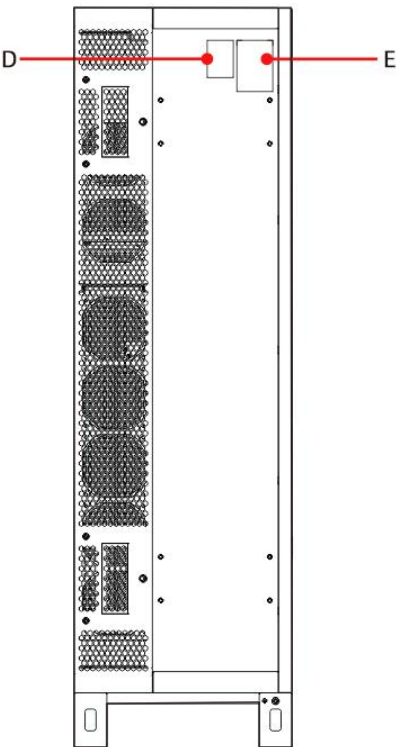


Fig 3.3 Left view

Right view:

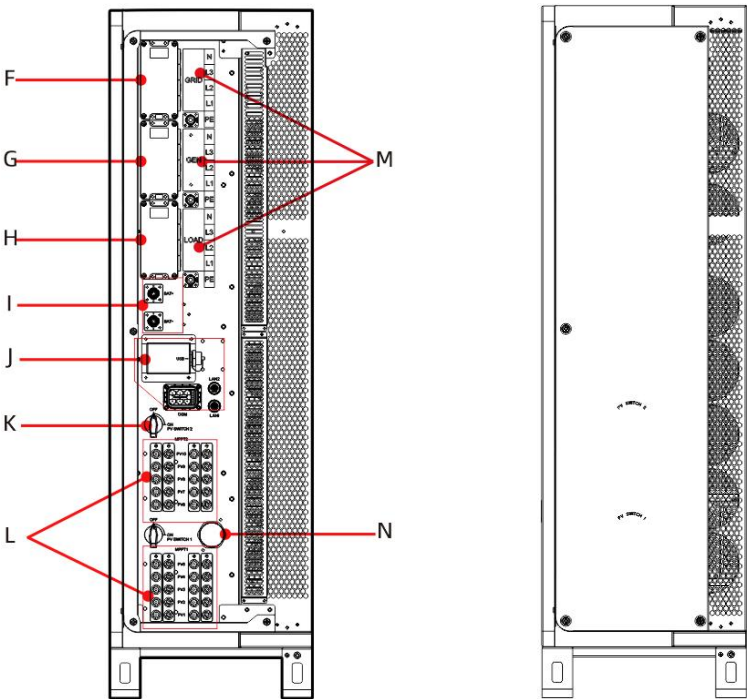


Fig 3.4 Right view

Table 3.1 Component description

No.	Description	No.	Description
A	Display screen	B	Side cover plate
C	Base	D	Lable
E	Nameplate	F/G/H	Terminal protective cover
I	BAT terminal	J	Communication port
K	PV switch	L	PV terminal
M	AC ground terminal	N	Ventilation value

3.2 Basic Data

Table 3.2 Dimensions and weight

	Model	Size (mm)			Weight (kg)
		Height	Width	Depth	
The WIT without package	WIT 50-125K-XHU	1360	720	400	172
The WIT with package	WIT 50-125K-XHU	1469	814	619	200

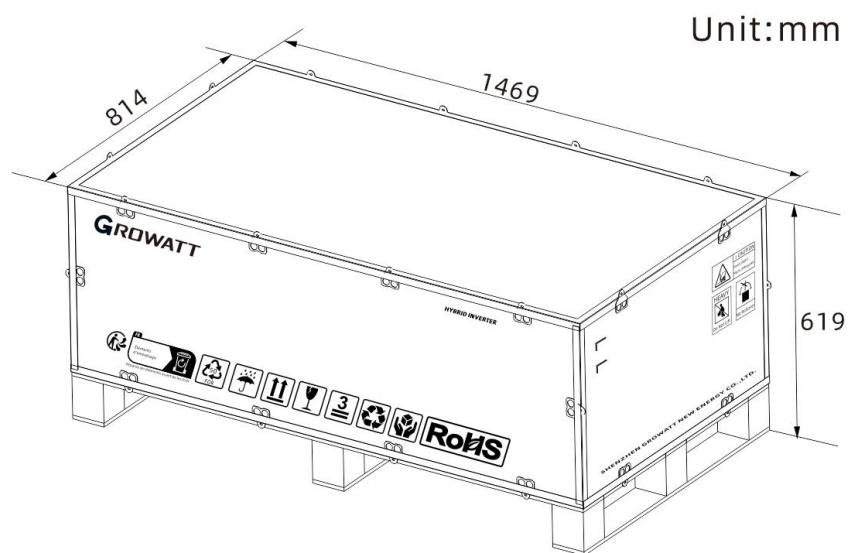


Fig 3.5

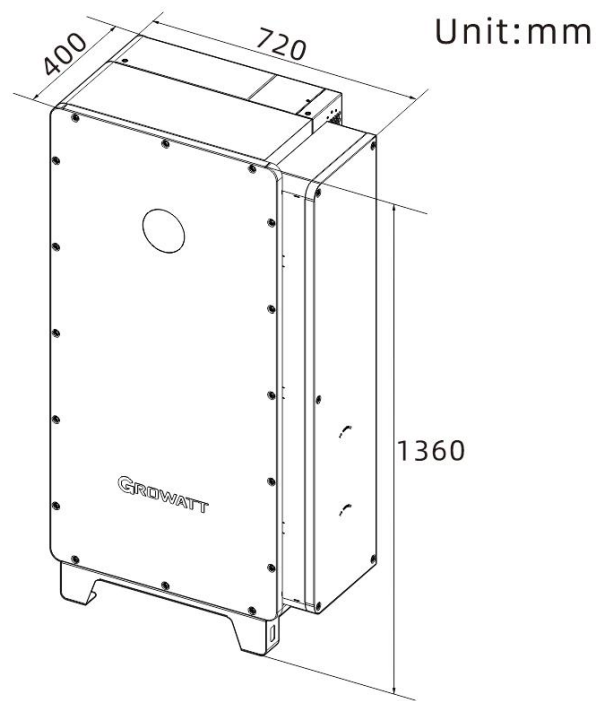


Fig 3.6

3.3 Nameplate

The figure below shows the nameplate of WIT 125K-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.

GROWATT	
Hybrid Inverter WIT 125K-XHU	
PV Data	
Max. PV voltage	1100d.c.V
PV voltage range	180~1000d.c.V
PV Isc	50 d.c.A *10
Max. input current	42 d.c.A *10
AC Data	
Nominal input/output power	125 kW
Max. input/output apparent power	137.5 kVA
Nominal voltage	3W/N/PE 230/400 a.c.V
Max. input/output current	208.3 a.c.A
Nominal frequency	50/60 Hz
Power factor range	1 leading~1 lagging
Max. AC passthrough	250 a.c.A
Load Data	
Nominal AC output power	125 kW
Nominal AC output voltage	230/400 a.c.V
Nominal AC output frequency	50/60 Hz
Max. GEN passthrough	250 a.c.A
Battery Data	
Battery voltage range	180~1000 d.c.V
Max. charging and discharging current	200 d.c.A
Type of battery	Lithium-ion
General Data	
Safety level	Class I
Ingress protection	IP66
Operation ambient temperature	-30°C~+60°C
Integrated with AFCI	
	
 	
Download Manual	
Made in China	

Fig 3.7 Nameplate

3.4 Operating Principle

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 $\leq 50\%$ 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.

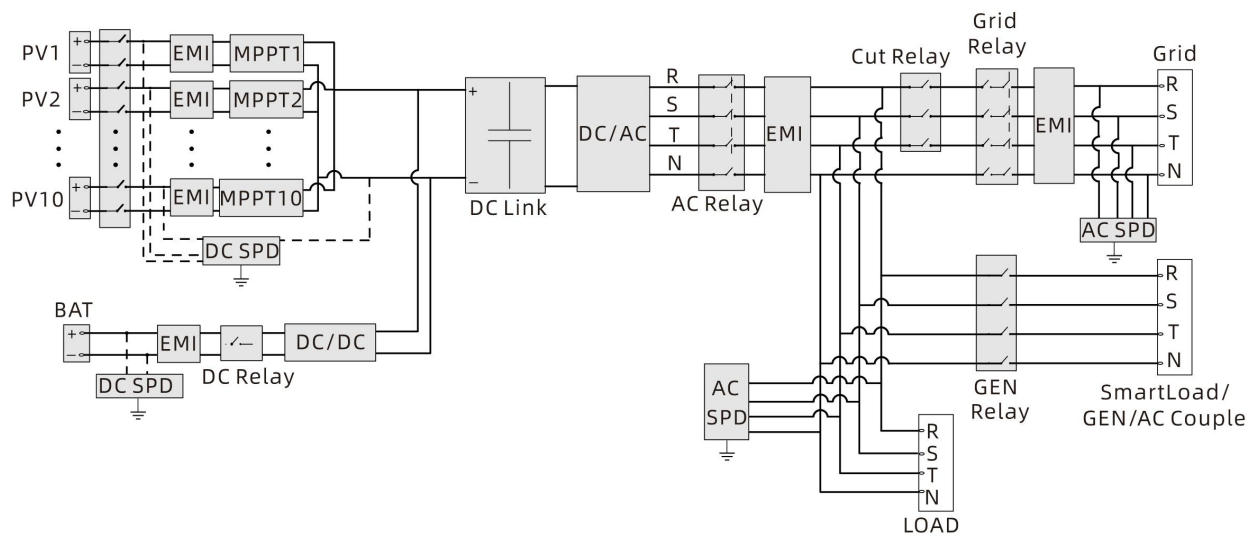


Fig 3.8 WIT 50-125K-XHU Grid-connected conceptual diagram

3.5 Supported Grid Types

Grid connection modes for WIT 50-125K-XHU hybrid Inverters are shown in Fig 3.9.

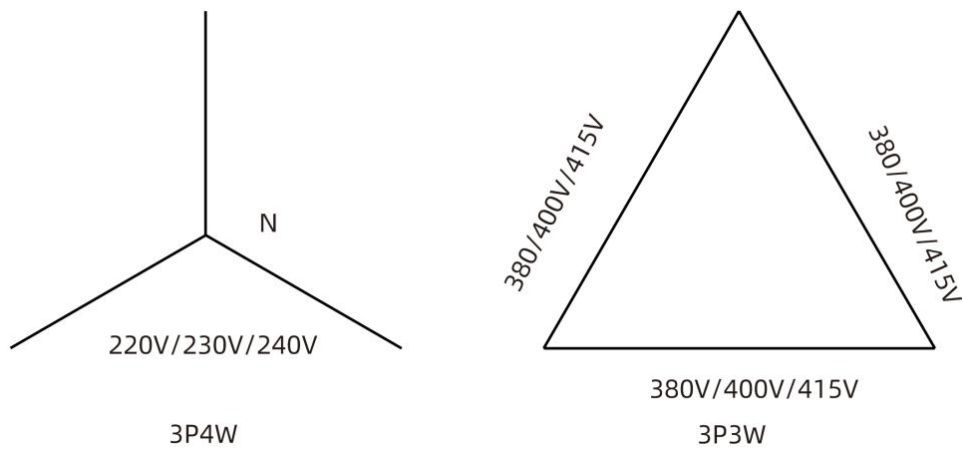


Fig 3.9 380V/400V/415V system (type Y/Δ)

3.6 AFCI Function

3.6.1 AFCI Description

AFCI (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. AFCI function is optional in some countries;
2. The AFCI function of the WIT is disabled by default. Please contact Growatt support to enable the AFCI function.
3. Do not connect the Maximum Power Point Trackers (MPPTs) on the DC side in parallel as it might trigger the AFCI mistakenly.

3.6.2 Clearing the Alarm

In the event that the WIT 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 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.

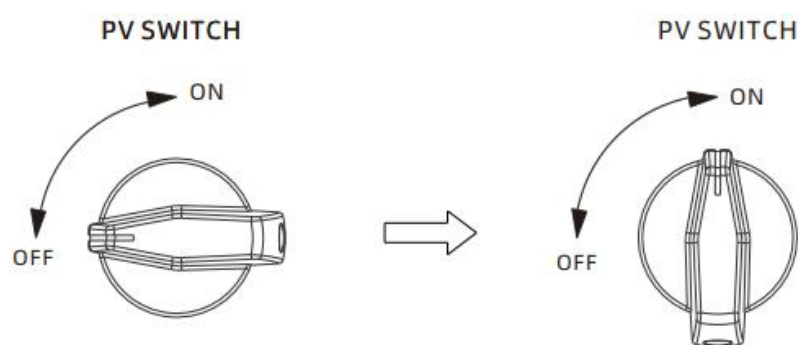


Fig 3.11

If the WIT 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 again, please disconnect all power sources and contact Growatt support.

3.7 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



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

Unpacking and inspection

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

Check the following items:

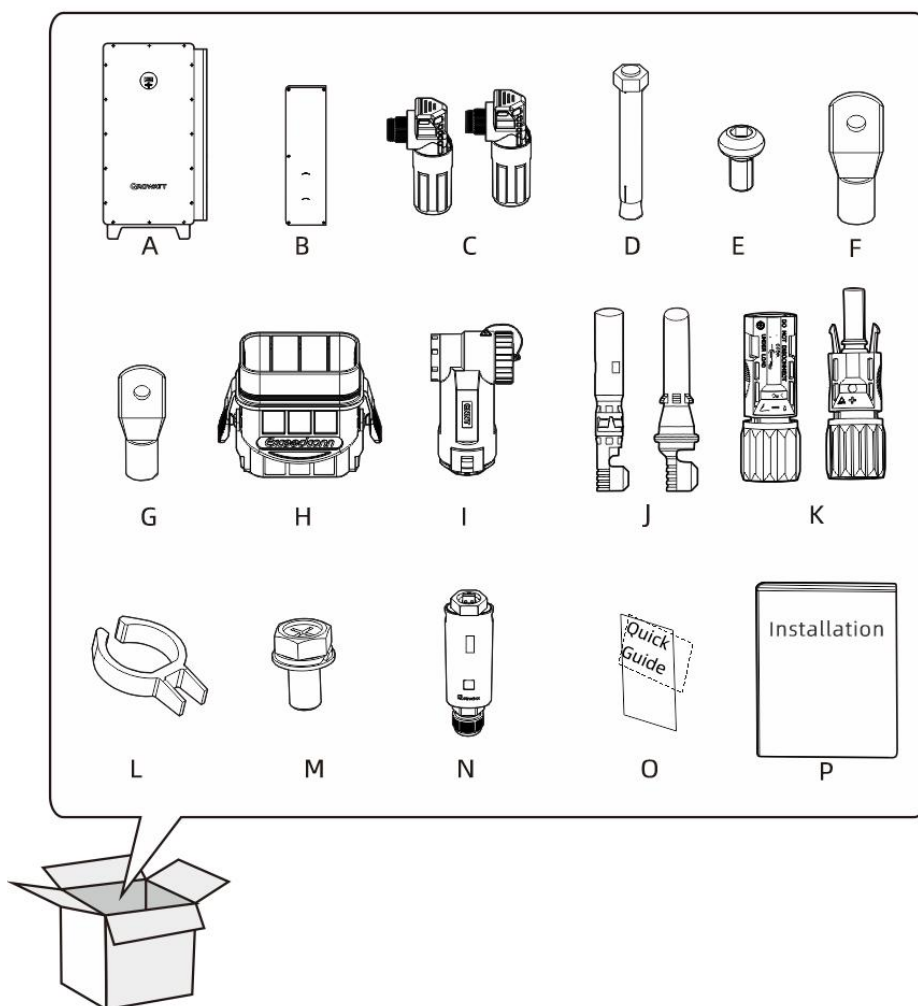


Fig 4 WIT 50-125K-XHU Attachment

Table 4.1 Packing list

No.	Description	Quantity	No.	Description	Quantity
A	The WIT inverter	1	I	AC ground terminals	3
B	Side cover plate	1	J	PV+(-)metal contact	40
C	BAT terminal	2	K	PV+(-) connector	40
D	Mechanical expansion anchor	4	L	PV connector disconnect tool	1
E	M6*12 screw	6	M	M8*16 screw	1
F	Terminal SC70-8	8	N	ShineWiLan-X2 Pro	1
G	Terminal SC50-8	4	O	Quick guide	1
H	Signal terminal accessories	1	P	User manual	1

Note:

Please handle with care and dispose of the packaging box properly.

5 Installation

5.1 Storing the WIT

- 1> Put the WIT in the original package and place it in a dry and well-ventilated place.
- 2> Keep the storage temperature from -40°C to $+70^{\circ}\text{C}$ and the humidity from 0%-95% RH.
- 3> A maximum of three WIT can be stacked. Do not stack the inverters without package.
- 4> If the WIT 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 has been stored for over one month. Please fix the time and date before connecting the inverter to the grid.

5.2 Moving the WIT



To prevent personal injury caused by a falling inverter, keep balance and be careful when moving the WIT as it is heavy.

Plan 1 Hoisting:

- 1> As shown in Fig 5.1 below, unpack the WIT (remove the top panel and side enclosures). Install the lifting ring, lift the machine from the pallet onto the ground (handling position as shown in Figure 5.3), Run a rope strong enough to bear the inverter through the hoisting rings and hoist the equipment, and then move the inverter to the installation position;
- 2> Keep balance when hoisting and moving the WIT.

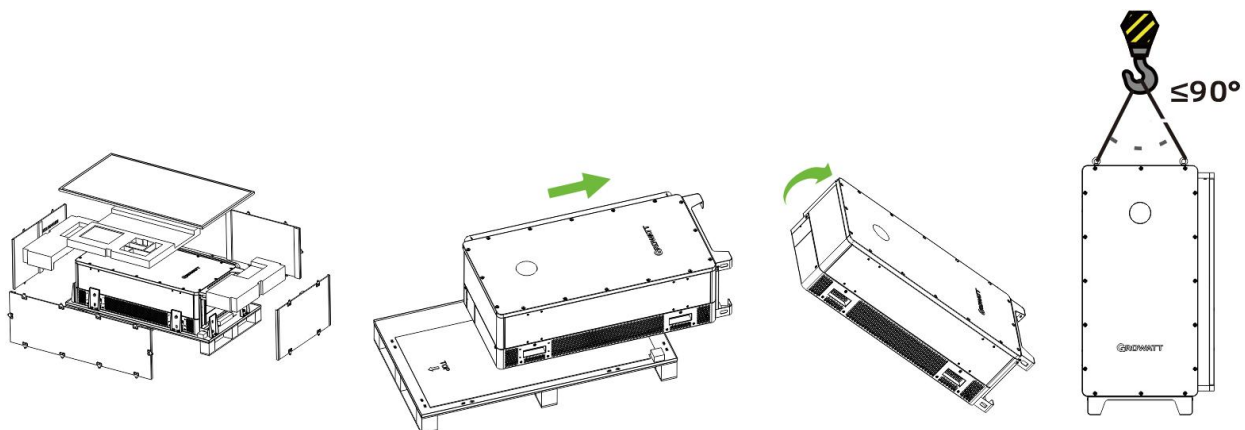


Fig 5.1 Hoisting the WIT

Plan 2 Forklift handling:

- 1> Unpack the WIT (remove the top panel and the support plates); turn the equipment

upright (place it on a flat ground or a floor support);

2> As shown in Fig 5.2, operate the forklift to insert the tines into the pallet openings to lift the inverter and then transport it to the installation position. (The fork width should be smaller than 354mm);

3> Keep balance when lifting and moving the WIT.

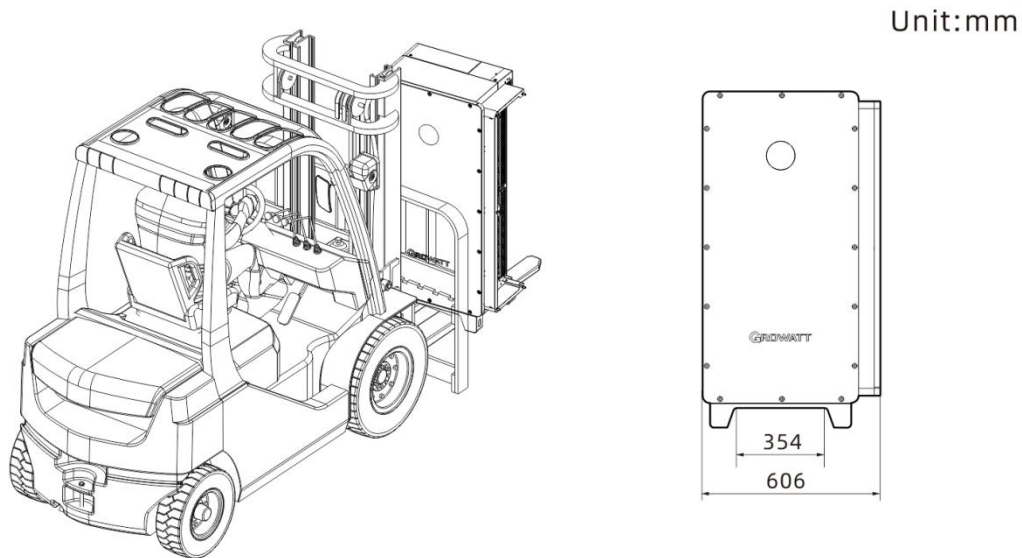


Fig 5.2 Moving the WIT with a forklift

Option 3 Lifting:

1> Unpack the WIT (remove the top panel and the side enclosures), as shown in Fig 5.3 below. It requires four people to lift the WIT and move it to the installation position;

2> Keep balance when lifting and moving the WIT.

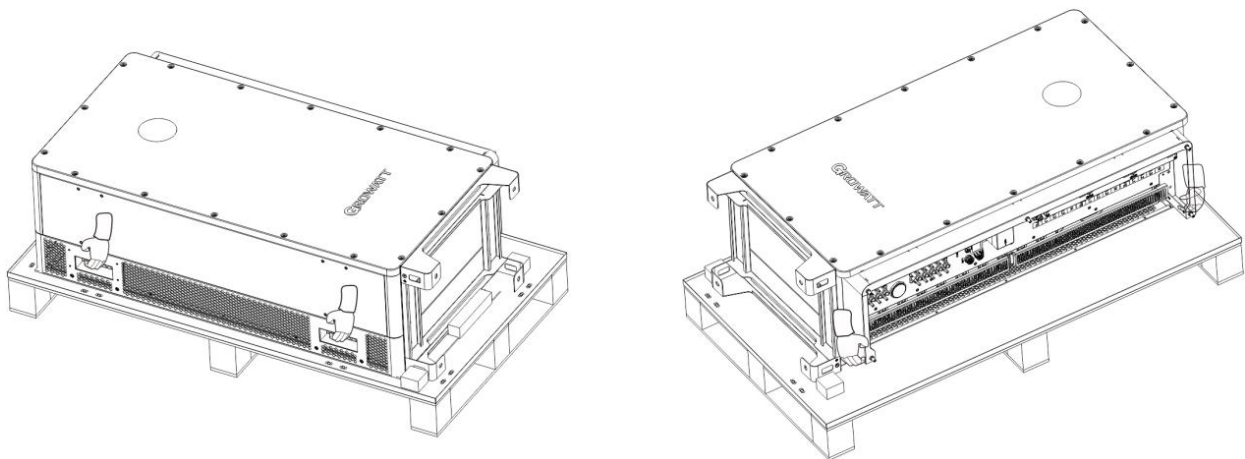


Fig 5.3 Lifting the WIT

5.3 Mounting the WIT

5.3.1 Installation Environment 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);

B. Ensure that the installation position is suitable for the dimensions of the WIT;

C. Do not install the WIT in areas with flammable or non heat-resistant materials;

D. The WIT is protected to IP66 and can be installed indoors or outdoors;



Fig 5.4

E. Do not expose the WIT to direct sunlight. Otherwise, excessive temperature may lead to power reduction. For outdoor installation, we recommend installing a sunshade /awning. Please refer to the figure below for the distance parameters between the awning and the WIT :

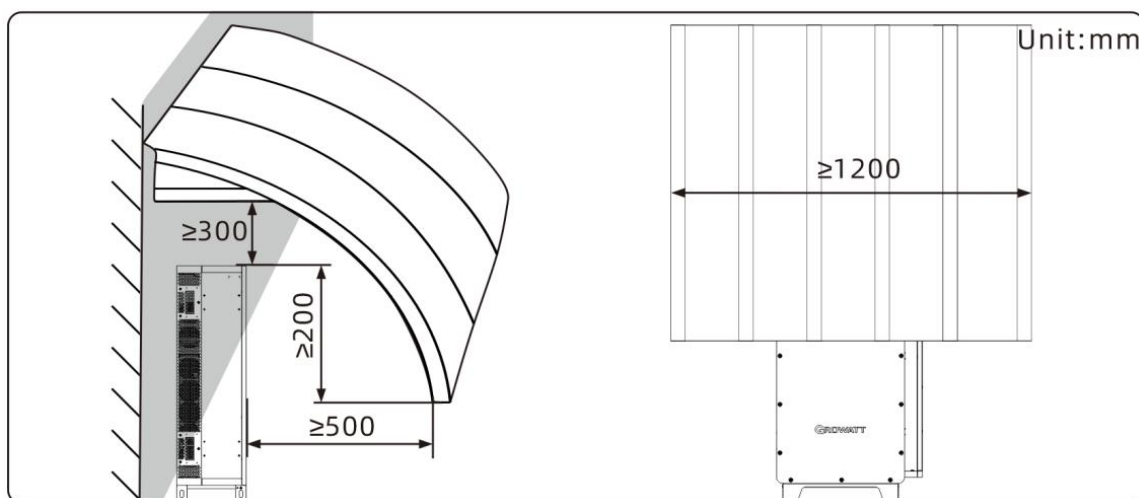


Fig 5.5

F. Keep the humidity at 0% to 95% RH.

G. Keep the ambient temperature at -30°C to 60°C.

H. The WIT can be installed vertically or backward tilted. Please refer to the figures below:

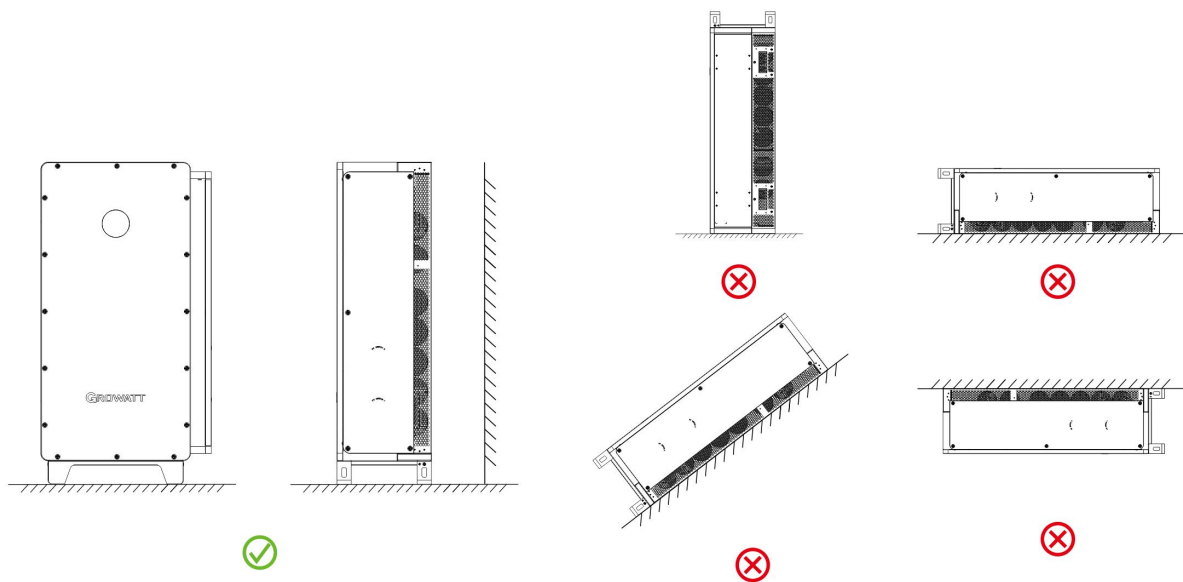


Fig 5.6

J. Keep the WIT away from strong interference sources.

K. Ensure that the WIT is not accessible to children.

5.3.2 Installation Distance Requirements

1. Reserve enough clearance around the WIT to ensure sufficient space for heat dissipation and operation. Ensure that there are no objects within 600mm of the left, right and top of the WIT; In ground-mounted installation, keep the back of the chassis at least 300mm away from the wall surface to ensure the performance of the WIT.

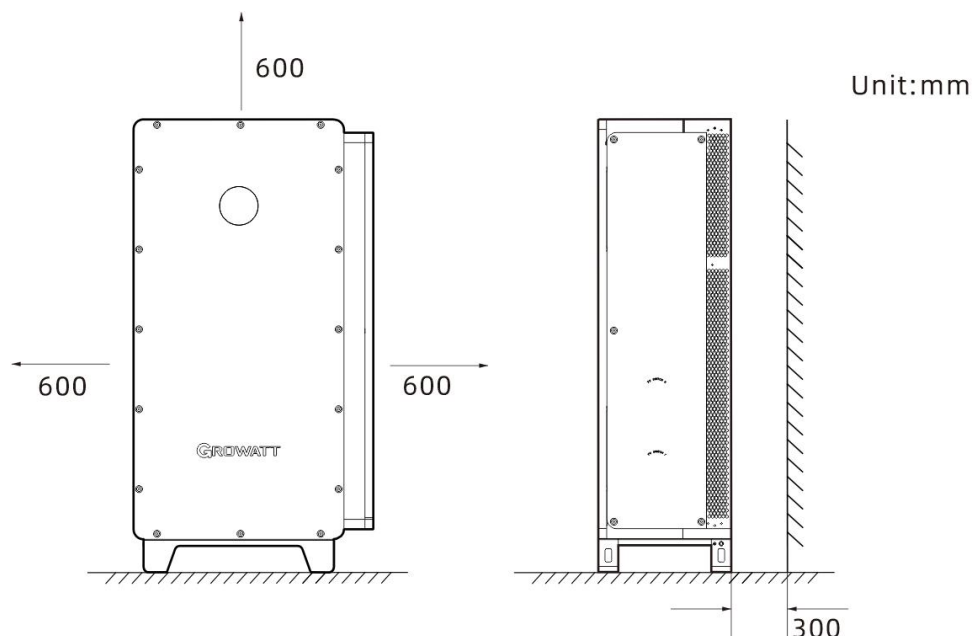


Fig 5.7

2. When you install multiple WIT inverters on one surface, inverters should be installed as following drawing.

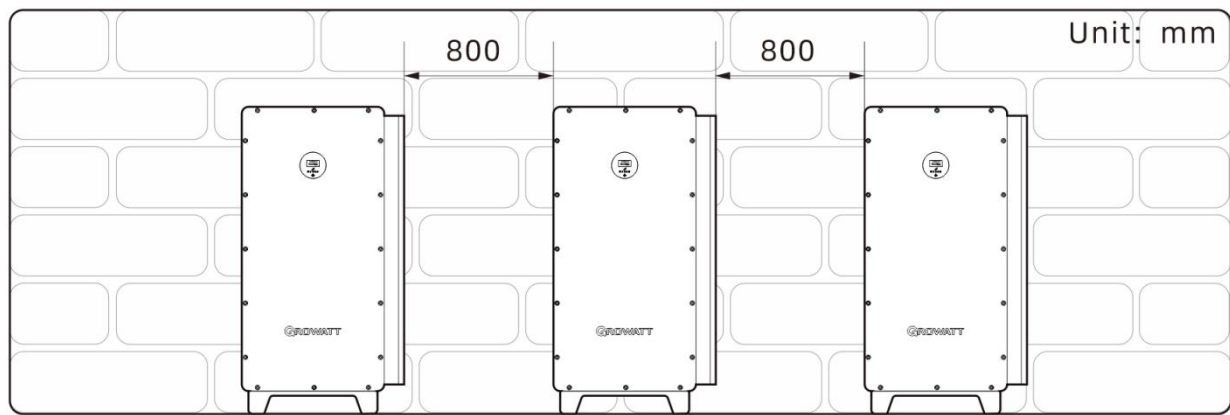


Fig 5.8

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

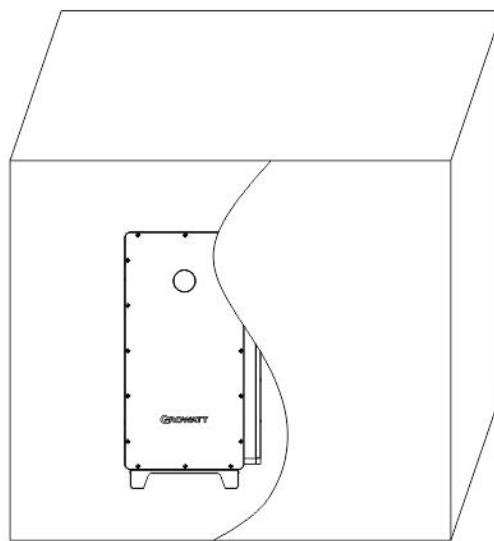


Fig 5.9

5.4 Mounting the WIT Inverter

5.4.1 Mounting the WIT Inverter

The WIT 50-125K-XHU Inverters can be installed on the ground. Determine the hole positions using the marking-off template and drill holes into the ground. Insert nuts ($\phi 12$) into the ground, and then place the inverter in the correct position and tighten the screws. The dimensions of the marking-off template are shown in Fig 5.10.

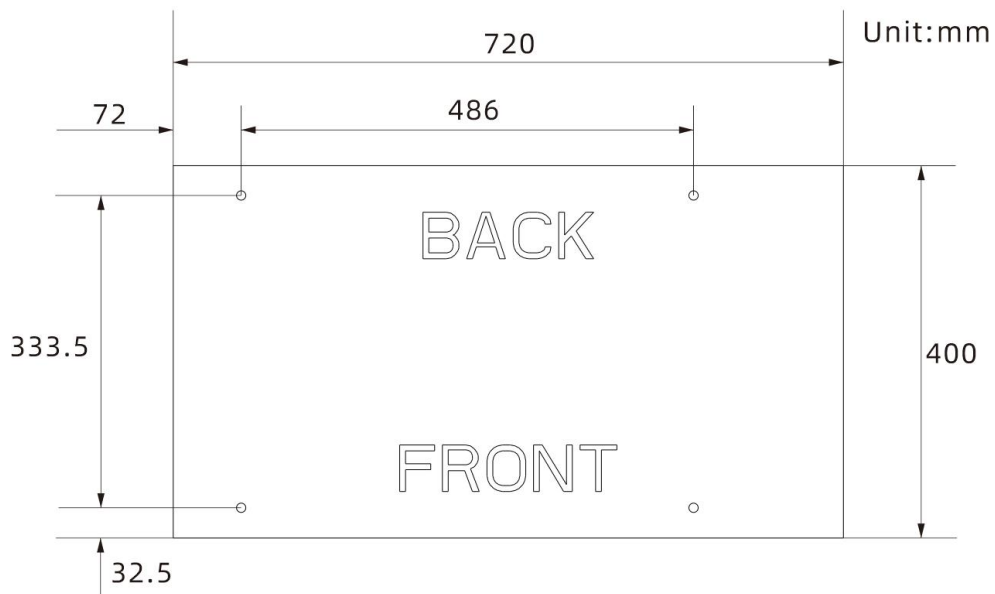


Fig 5.10 Floor-mounting installation hole positions

Refer to Fig 5.11 for floor-mounting installation.

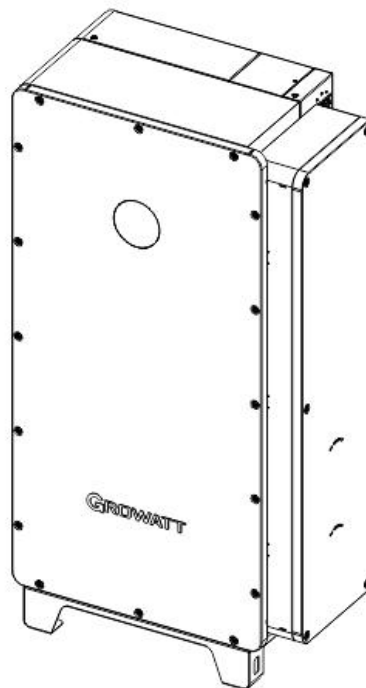


Fig 5.11 Floor-mounting installation

6 Electrical Connection

6.1 System Electrical Connection Diagram

6.1.1 WIT Wiring Diagram

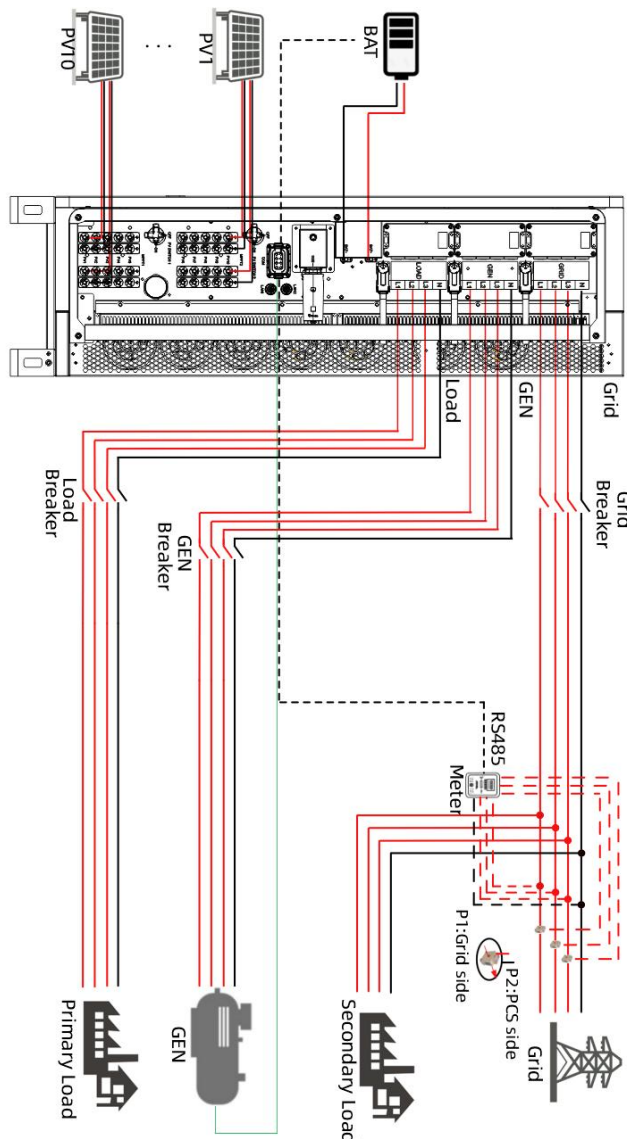


Fig 6.1 Wiring diagram of the system with a single WIT 125K-XHU inverter (Gen mode)

NOTE:

1. Connect the signal wires of the generator and the meter to the relevant positions of the COM terminal according to Table 6.7.
2. Set the parameters on the client. Take ShineTools as an example:
 (1)Tap Generator And Smart Load> Type of Device Connected to GEN Port> Generator;
 (2) Tap Type of Device Connected to GEN Port > Generator Enable, And set other parameters as required.

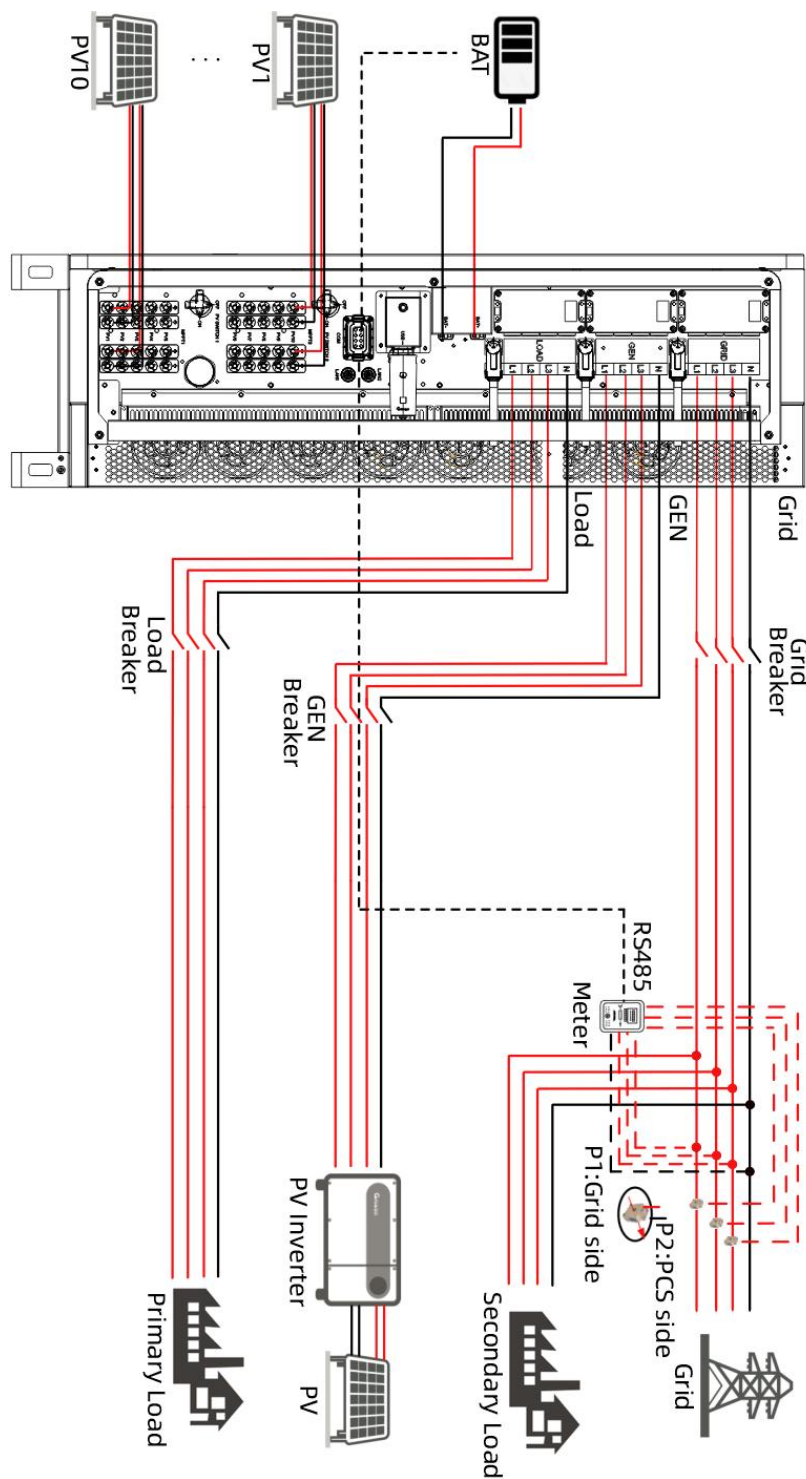


Fig 6.2 Wiring diagram of the system with a single WIT 125-XHU inverter (AC couple mode)

NOTE:

1. Connect the signal wires of the meter to the relevant positions of the COM terminal according to Table 6.7.
2. Perform related Settings on the client. Take ShineTools as an example: Tap Type of Device Connected to GEN Port> Photovoltaic Inverter, And set other parameters as required.

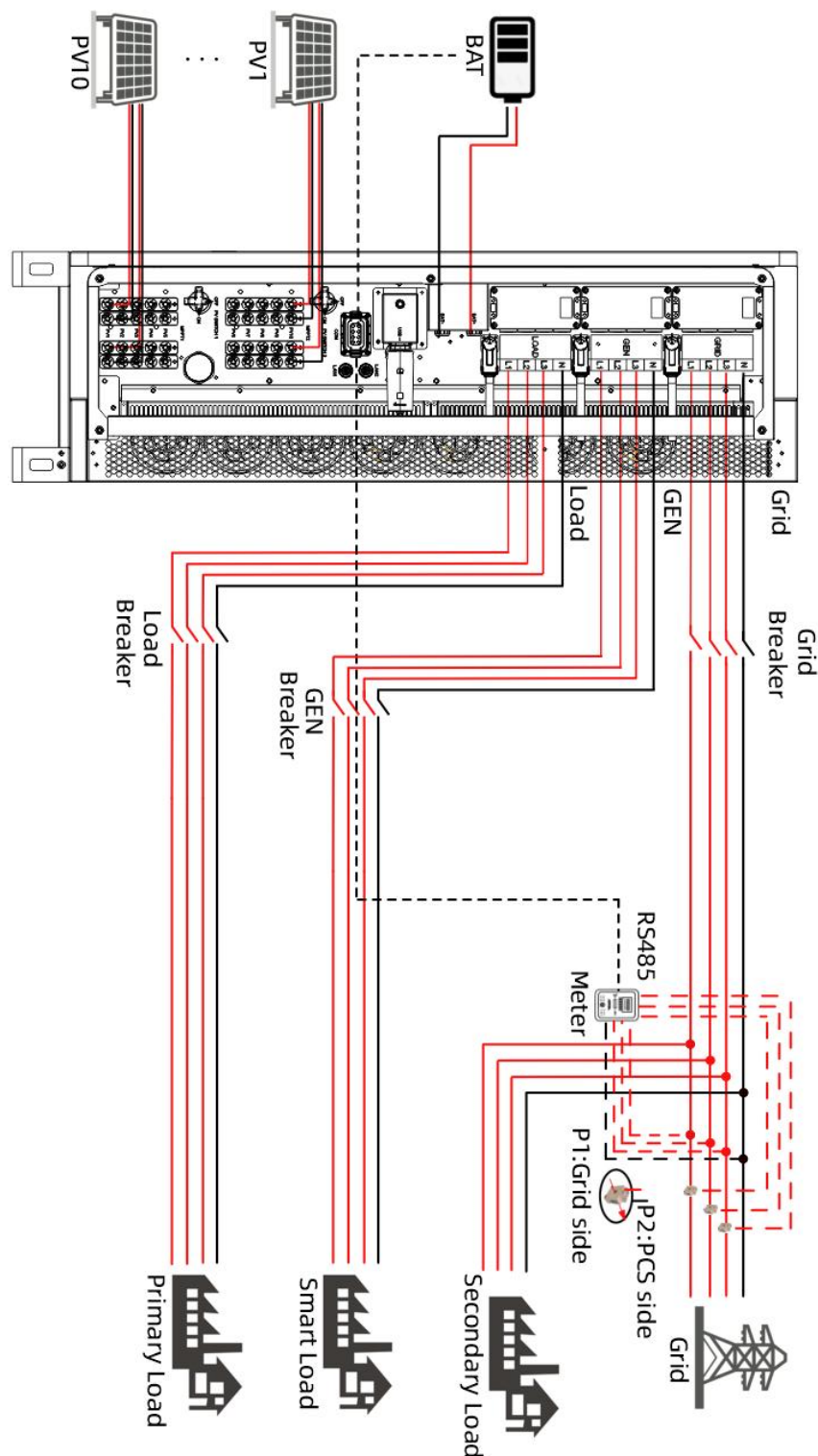


Fig 6.3 Wiring diagram of the system with single WIT 125K-XHU inverters (smart load mode)

NOTE:

1. Connect the signal wires of the meter to the relevant positions of the COM terminal according to Table 6.7.
2. Perform related Settings on the client. Take ShineTools as an example: Tap Type of Device Connected to GEN Port> Smart Load, And set other parameters as required.

6.1.2 Wiring diagram of the system with WIT 50-125K-XHU inverters connected in parallel

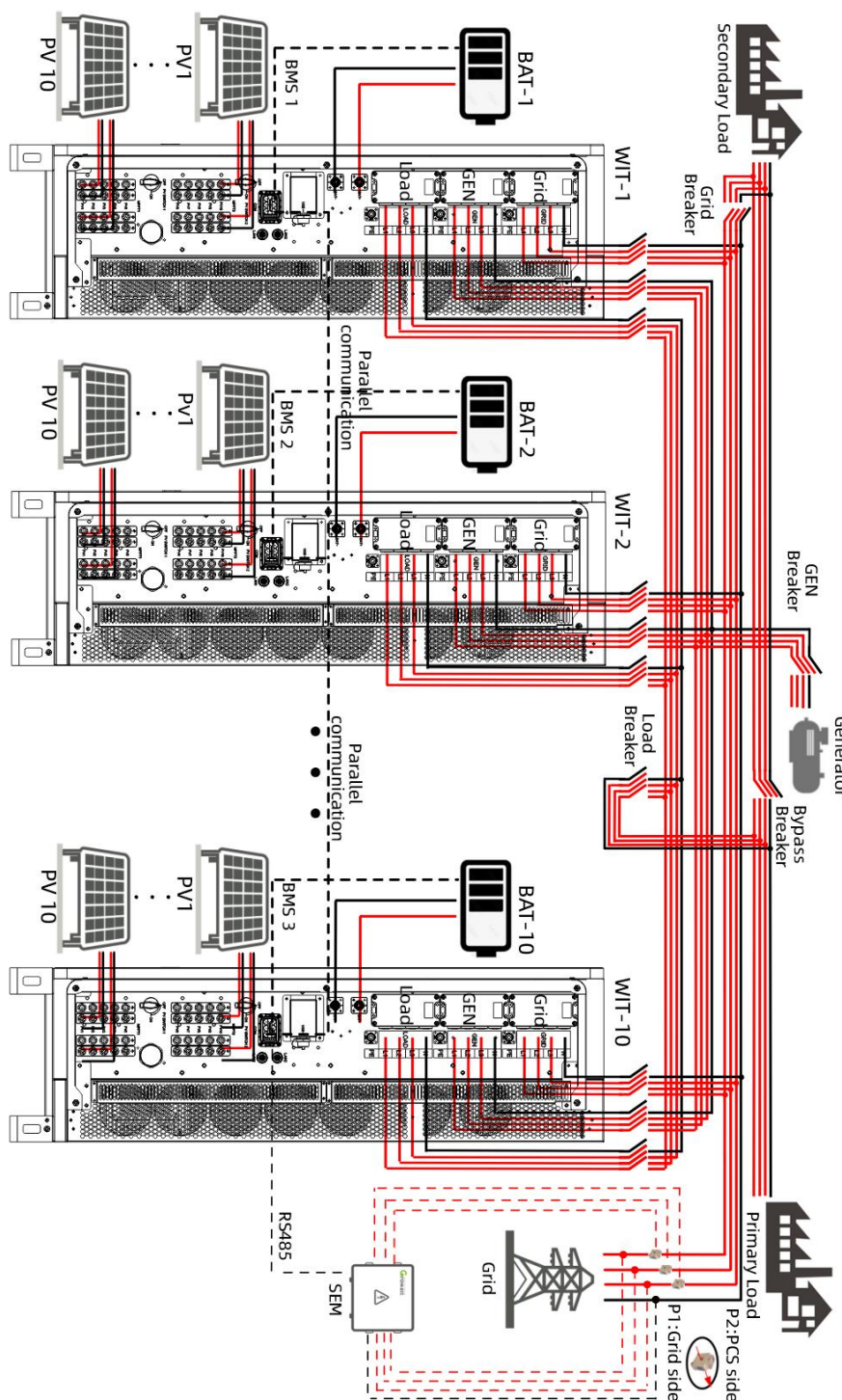
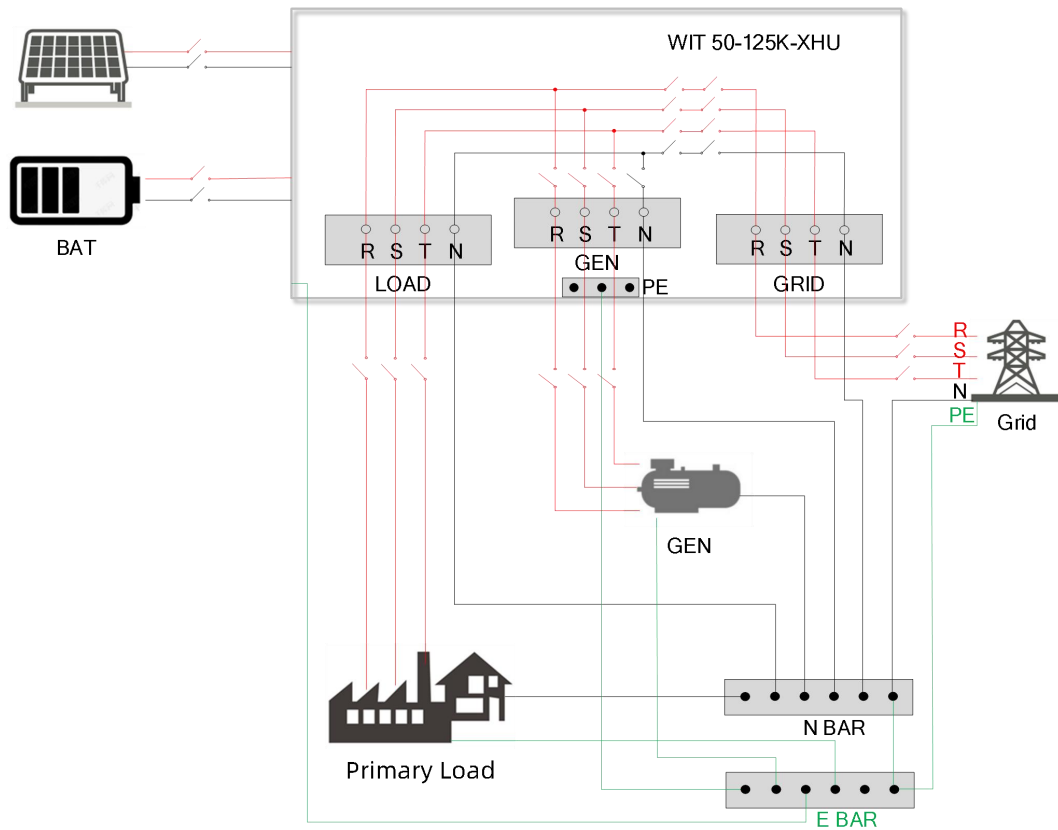


Fig 6.4 Wiring diagram of the system with three WIT 125K-XHU inverters connected in parallel

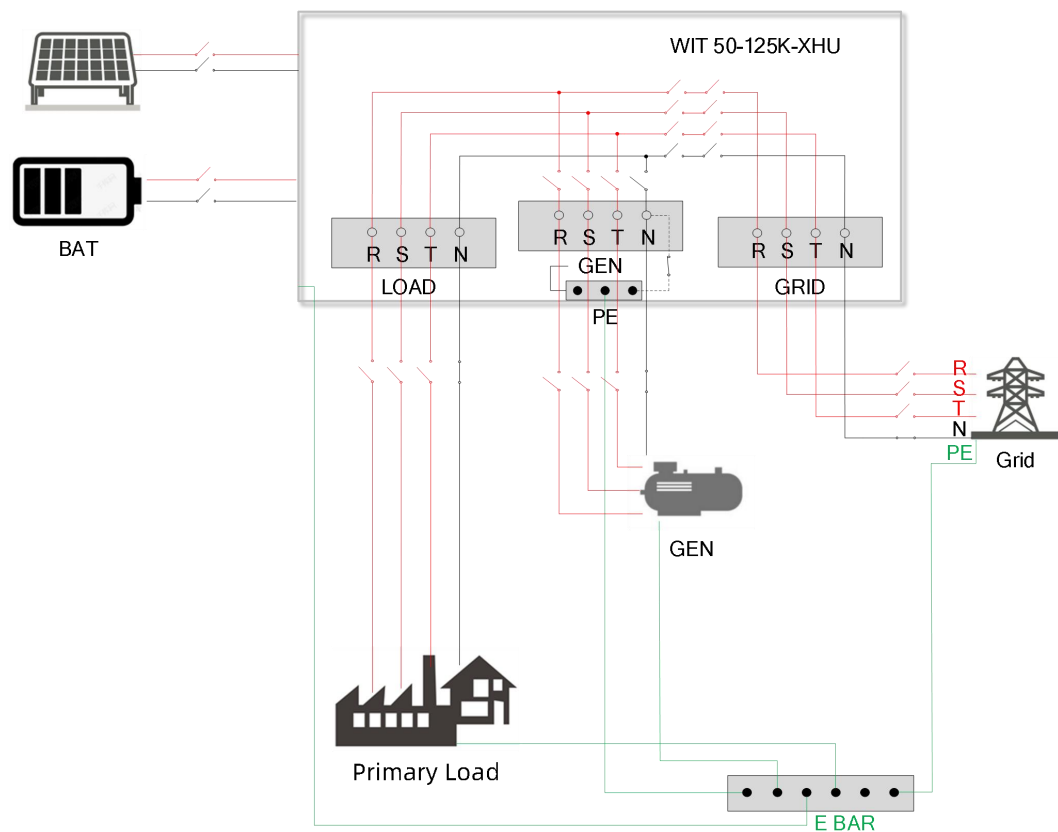
NOTE:

1. Perform related Settings on the client. Take ShineTools as an example: Tap Quick Setting > Parallel parameter setting > Parallel enable > Enable.
2. The wiring methods for different regions are shown in Fig 6.5 below, please select the wiring method according to the local safety regulations.

6.1.3 Wiring in Different Grid Types



(a) AU/NZ wiring



(b) General grid wiring

Fig 6.5 N-PE wiring in different grid types

6.2 Power Cable Wiring

6.2.1 Connecting Ground Cables

6.2.1.1 Grounding Preparation

	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 them to open air.
---	---

1. It is essential to connect the ground cable to the WIT 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, the metal racks of the PV modules and the batteries are connected to the same area to achieve equipotential bonding.
4. The position of the ground points of the WIT 50-125K-XHU hybrid inverter is shown in fig 6.1. You can find the ground points after removing the right cover plate.

6.2.1.2 Recommendation Ground cable specifications

Cable Name	Type	Specifications	Terminals Type	Torque
Grounding cable	Multiple-core copper cable (yellow and green)	35mm ²	SC35-6	2.5N·M

6.2.1.3 Grounding Procedure

Step1: Verify the WIT Protective Grounding Location, The position of the ground points of the WIT 50-125K-XHU Hybrid Inverter is shown in Fig 6.6.

Step2: Connect the ground wire to the protective grounding location shown in the figure below.

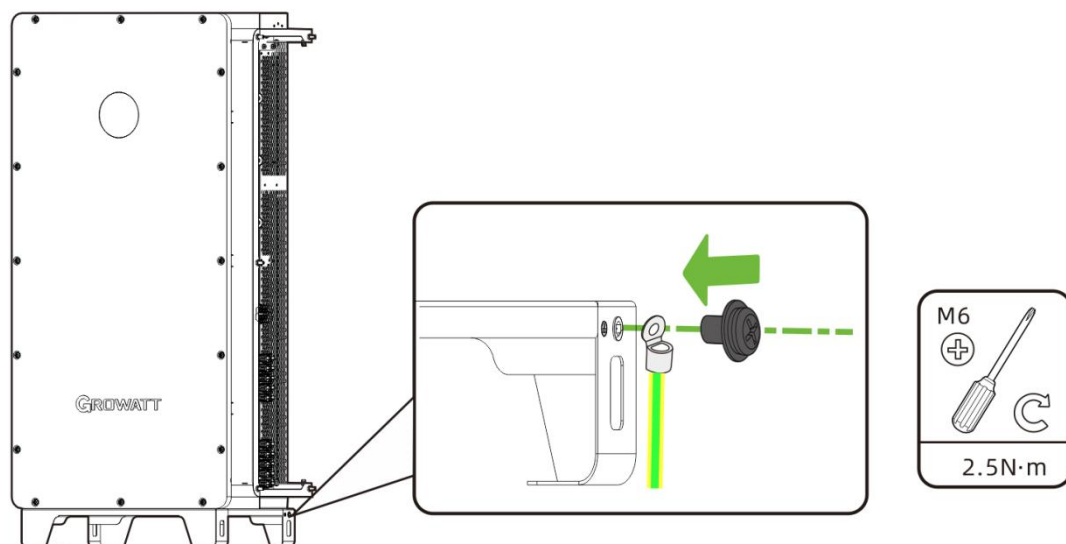


Fig 6.6 Protective earthing position

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 them to open air.
3. Tighten the screws to a torque of 25.5 kgf·cm.

6.2.2 Connection on the AC Side

 DANGER	Before connecting cables, ensure that the DC switches on the WIT 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 may result in electric shocks. Only qualified and trained electrical technicians are allowed to perform operations. Technicians must observe instructions in this manual and local regulations. High voltages may cause electric shocks and serious injury. Please do not touch the inverter in operation. Do not place inflammable and explosive materials around the WIT.
--	---

	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). Please do not connect loads between the WIT and the circuit breaker. 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. Upon completion of the AC wiring, remember to lock the terminal protective cover to ensure good waterproof performance.
---	---

6.2.2.1 Wiring 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.

6.2.2.2 Recommended power cable and circuit breaker specifications

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 and the upstream input when an exception occurs.

1. Recommended Grid/GEN breaker specifications for WIT 50-125K-XHU models.

Device type	Rated voltage of the circuit breaker	Rated current of the circuit breaker
WIT 50K-XHU(t)	415V	225A
WIT 63K-XHU		250A
WIT 75K-XHU		320A
WIT 85K-XHU		320A
WIT 99.9K-XHU		320A
WIT 100K-XHU		320A
WIT 125K-XHU		320A

2. Recommended Load breaker specifications for WIT 50-125K-XHU models

Device type	Rated voltage of the circuit breaker	Rated current of the circuit breaker
WIT 50K-XHU(t)	415V	125A
WIT 63K-XHU		160A
WIT 75K-XHU		160A
WIT 85K-XHU		200A
WIT 99.9K-XHU		225A
WIT 100K-XHU		225A
WIT 125K-XHU		225A

NOTE:

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

1.Recommended Grid/GEN power cable specifications for WIT 50-125K-XHU models.

Device Type	Cable Name	Type	Specifications	Terminals Type	Torque
WIT 50K-XHU(t)	AC power cable	Multi-core copper cable	50mm ²	SC50-8	6 N·M
WIT 63K-XHU	AC power cable	Multi-core copper cable	70mm ²	SC70-8	6 N·M
WIT 75K-XHU	AC power cable	Multi-core copper cable	95mm ²	SC95-8	6 N·M
WIT 85K-XHU	AC power cable	Multi-core copper cable	95mm ²	SC95-8	6 N·M
WIT 99.9K-XHU	AC power cable	Multi-core copper cable	95mm ²	SC95-8	6 N·M
WIT 100K-XHU	AC power cable	Multi-core copper cable	95mm ²	SC95-8	6 N·M

WIT 125K-XHU	AC power cable	Multi-core copper cable	95mm ²	SC95-8	6 N·M
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2.Recommended Load power cable specifications for WIT 50-125K-XHU.

Device Type	Cable Name	Type	Specifications	Terminals Type	Torque
WIT 50K-XHU(t)	AC power cable	Multi-core copper cable	35mm ²	SC35-8	6 N·M
WIT 63K-XHU	AC power cable	Multi-core copper cable	35mm ²	SC35-8	6 N·M
WIT 75K-XHU	AC power cable	Multi-core copper cable	35mm ²	SC35-8	6 N·M
WIT 85K-XHU	AC power cable	Multi-core copper cable	50mm ²	SC50-8	6 N·M
WIT 99.9K-XHU	AC power cable	Multi-core copper cable	50mm ²	SC50-8	6 N·M
WIT 100K-XHU	AC power cable	Multi-core copper cable	50mm ²	SC50-8	6 N·M
WIT 125K-XHU	AC power cable	Multi-core copper cable	70mm ²	SC70-8	6 N·M

Note: Before wiring, please ensure the cable is well tinned and no fraying or breaks.

6.2.2.3 AC Side Connection Steps:

1. Opening the right cover;
2. Connect the AC-side power ground wire to the AC PE terminal, as shown in Figure 6.7;
- 3.Connect the AC-side power cable to the inverter. The silkscreen markings and AC terminal locations are shown in Fig 6.9;

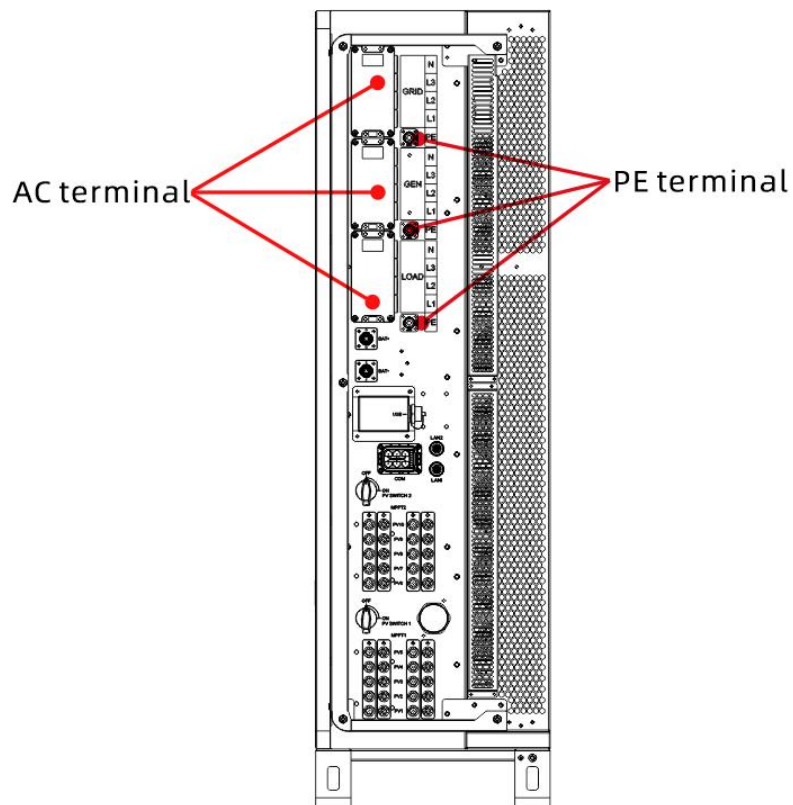
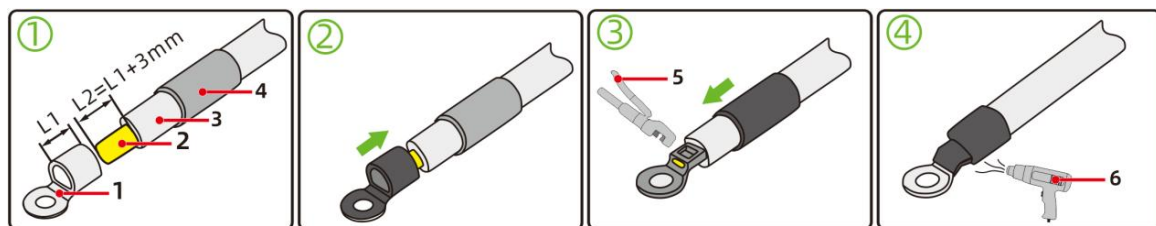


Fig 6.7



(1) OT terminal

(2) Core wire

(3) Cable

(4) Heat shrink tubing

(5) Hydraulic pliers

(6) Heat gun

Fig 6.8 OT Terminal wiring Steps

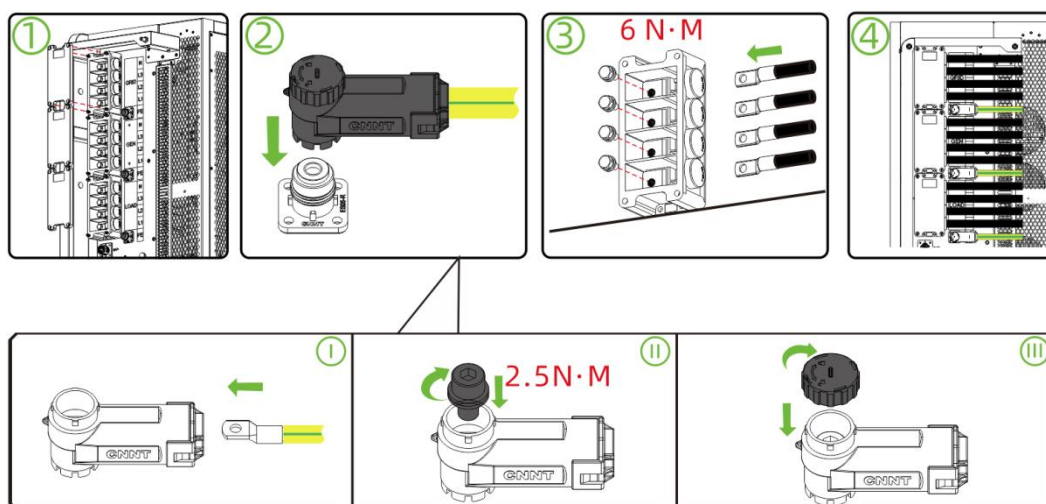


Fig 6.9 AC side connection steps

4. Once the cable connections are complete, check if the cable feed- through pipes and cables are secured in place, and finally lock the terminal protective cover.

6.2.3 Connection on the PV Side

	Before connecting cables, ensure that the PV SWITCH of the WIT are OFF, and turn off the breakers on the AC side and the battery side. Otherwise, the high voltages of the WIT may cause electric shocks. Only qualified and trained electrical technicians are allowed to perform operations. Technicians must observe instructions in this manual and local regulations. Check the positive and negative terminals before connecting the PV module to the WIT. High voltages may cause electric shocks and serious injury. Please do not touch the inverter in operation. Please do not place inflammable and explosive materials around the WIT.
	The maximum open-circuit voltage of each string should not exceed 1100Vdc. 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.

6.2.3.1 Wiring Preparation

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 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 input power.
5. For optimal system configuration, it is recommended to connect two DC inputs with an equal number of PV modules.

6.2.3.2 Cable Specifications on the PV Side

Table 6.1 Maximum current of a single MPPT route

Device type	Max. current of a single MPPT route
WIT 50-125K-XHU	42A

Table 6.2 Cable specifications on the PV side

Device type	Cable Name	Type	Recommendation cable specifications
WIT 50-125K-XHU	PV Cable	Photovoltaic cable	6mm ²

Note: Before wiring, please ensure the cable is well tinned and no fraying or breaks.

6.2.3.3 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 into 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.

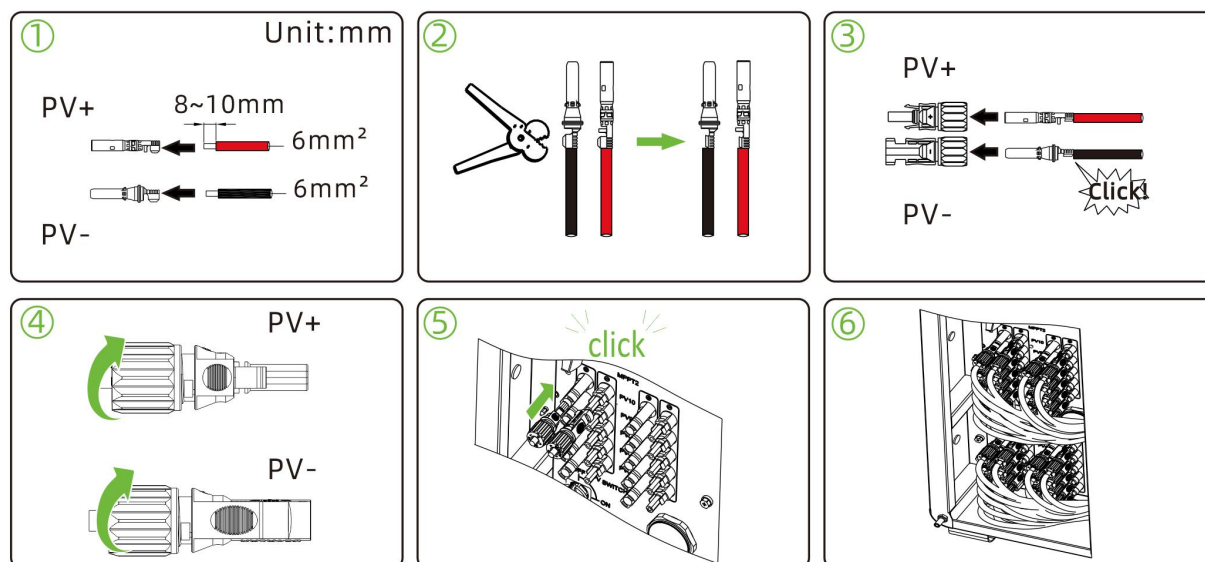


Fig 6.10 PV terminals connection steps

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, Ensure the positive pole of the PV module is connected to the PV input terminal marked "+" on the unit, and the negative pole to the terminal marked "-" ;

3. Matching PV connectors are included in the product accessories. Please select them according to your actual wiring requirements;

4. The total current of all strings cannot exceed the WIT's maximum input current;

5. Do not touch the solar panels in operation.

6.2.4 Cable Specifications on the Battery Side

6.2.4.1 Wiring Preparation

 DANGER	Before connecting cables, ensure that the DC switches of the WIT are OFF, and turn off the breakers on the AC side and the battery side. Otherwise, the high voltages of the WIT may cause electric shocks. Only qualified and trained electrical technicians are allowed to perform operations. Technicians must observe instructions in this manual and local regulations. High voltages may cause electric shocks and serious injury. Please do not touch the inverter in operation. Please do not place inflammable and explosive materials around the WIT.
 WARNING	If the cable is thick, do not shake the cable after fastening it. Ensure that all cables are securely connected before powering on the WIT. Loose connection may cause overheating that will damage the device. The battery terminals are protected by a plate. Upon completion of wiring on the battery side, reinstall the protective plate to prevent accidental touch.

1. Check that the battery terminals of the WIT are intact;
2. Disconnect the DC switches on the WIT, 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;

6.2.4.2 Cable Specifications on the Battery Side

Table 6.3 Cable specifications on the battery side

Device type	Recommendation cable specifications
WIT 50-125K-XHU	50mm ²

Note:

It is recommended that the battery cable length does not exceed 10 meters.

6.2.4.3 Procedure for Connecting the Main Battery Power:

- 1. Strip 0.71-0.79 inches of the insulation layer of the DC cables;
- 2. Crimp the battery cables and the battery terminals using crimping pliers, and then tighten the insulation sleeve;
- 3. Connect the battery cables to the battery terminals on the inverter, as shown in Fig 6.11.

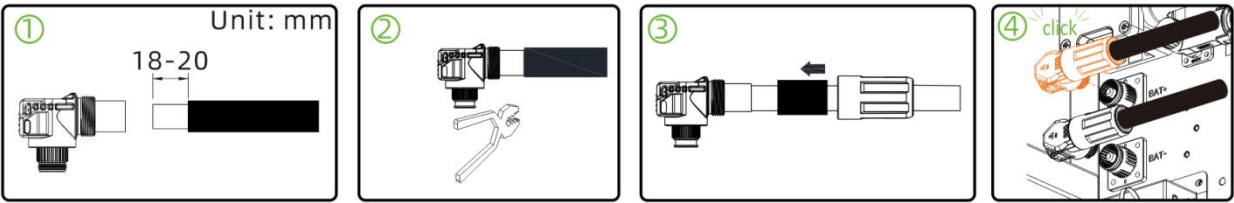


Fig 6.11 Battery terminals connection steps

6.3 Connecting Communications Cables

The COM terminal of the WIT 50-125K-XHU includes 6 RJ45 ports and a side 8pin terminals . It is used for parallel connection via PARA-IN and PARA-OUT communication terminals, battery communication via BMS terminals, and external equipment communication via RS485 and DRMS function.

6.3.1 Wiring Procedure

Follow the steps:

- Steps1:** Remove the waterproof cover from the network communication port;
- Steps2:** Crimp the communication cable as shown in Figure 6.12;
- Steps3:** Insert a network cable into the port and tighten the protective cover;
- Steps4:** Ensure that the connection is correct and secured, the sealing rubber ring is properly seated into the gland as shown in Figure 6.13.

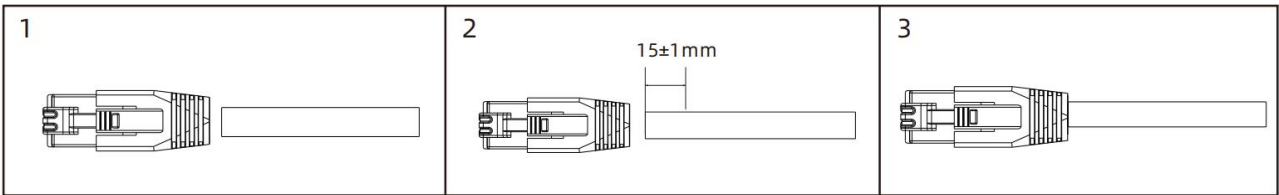


Fig 6.12

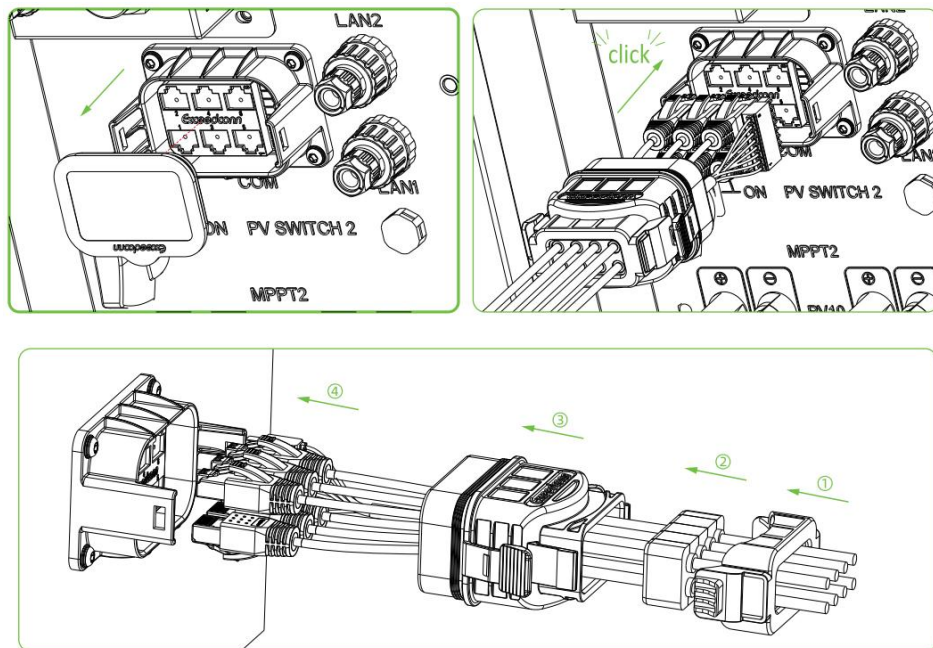


Fig 6.13 RJ45 communication terminal connection steps

6.3.2 Battery Communication Connection

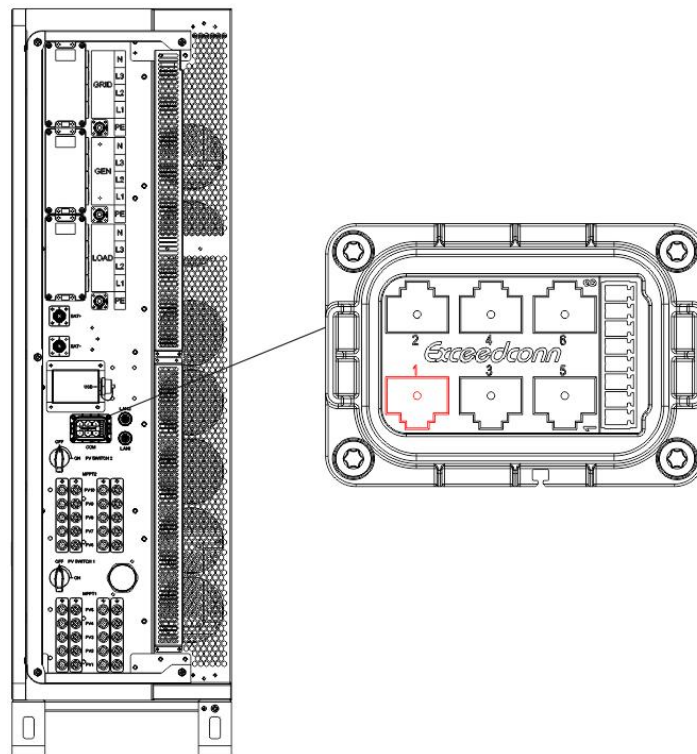


Fig 6.12 BMS communication terminal

Table 6.4 Definition of battery communication terminal

Pin Definition Description		
Pin	Signal Definition	Function
1	BAT RS485 B	Communication of battery
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+	

6.3.3 Connecting RS485 Communications Cables

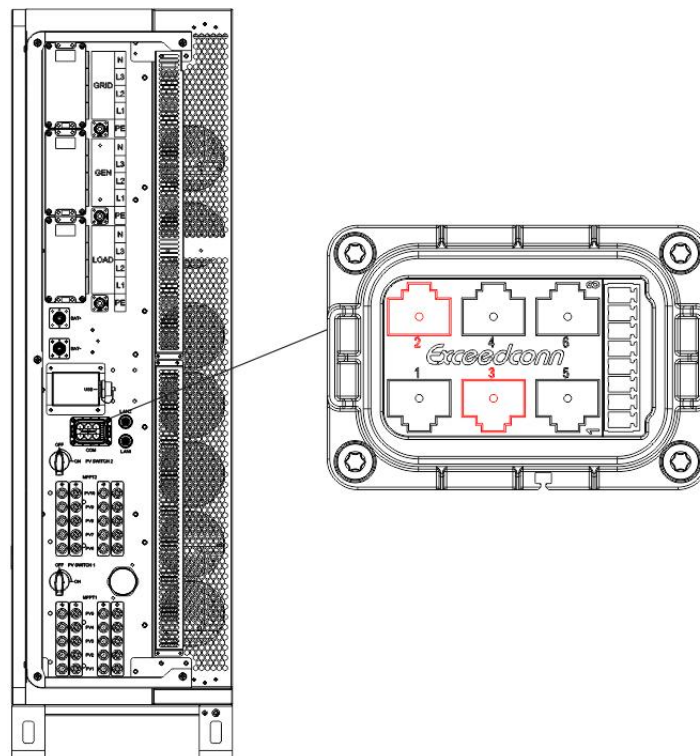


Fig 6.14 RS485 communication terminal

Table 6.5 Definition of RS485 communication terminal

RS485_IN/RS485_OUT Definition Description		
Pin	Signal Definition	Function
1	RS485_1B	\
2	GND.S	\
3	\	\
4	RS485_1B	SEM/EMS /WiLan-X2
5	RS485_1A	
6	\	\
7	RS485_3B	SEM /EMS/Meter 2
8	RS485_3A	

6.3.4 DI Communication Connection

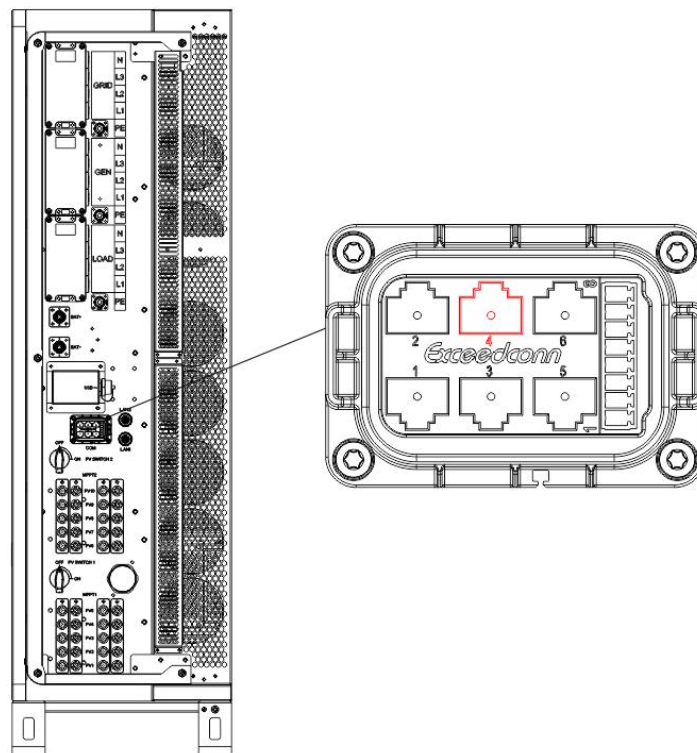


Fig 6.15 DI communication terminal

Table 6.6 Definition of DI communication terminal

DI Definition Description		
Pin	Signal Definition	Function
1	DRM1/5	DRMS/RCR/DI function
2	DRM1/5	
3	DRM1/5	
4	DRM1/5	
5	RFE	
6	COM	
7	\	
8	\	

6.3.5 Parallel Communication Connection

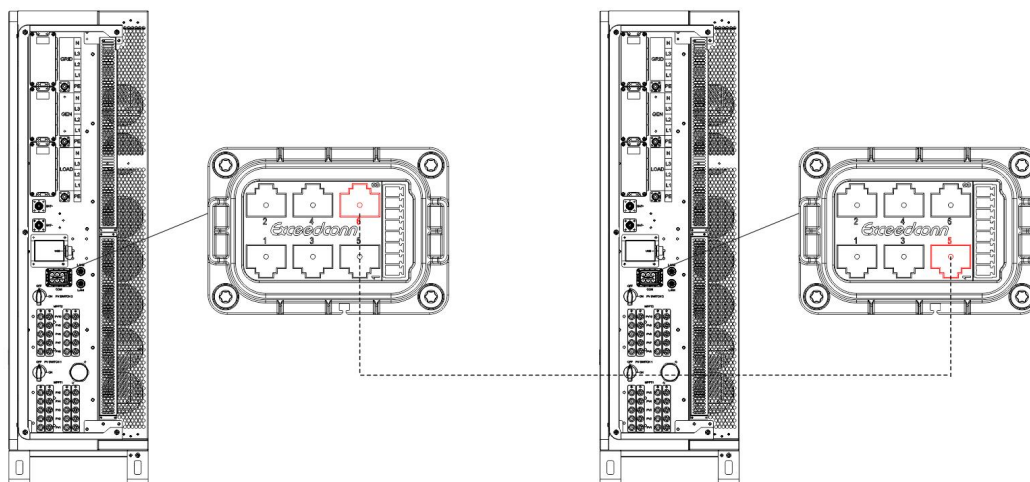


Fig 6.16 Parallel communication terminal

NOTE: Just use a standard Ethernet cable to connect.

6.4 Side 8Pin Port Description

Table 6.7 Side 8Pin port description

Definition Description		
Pin	Signal Definition	Function
1	EPRO.WIT	Emergency stop
2	GND.S	
3	DG START+	GEN Wake up
4	DG START-	
5	RS485 2A	Meter
6	RS485 2B	
7	USB RLY	Datalogger switch
8	GND.S	

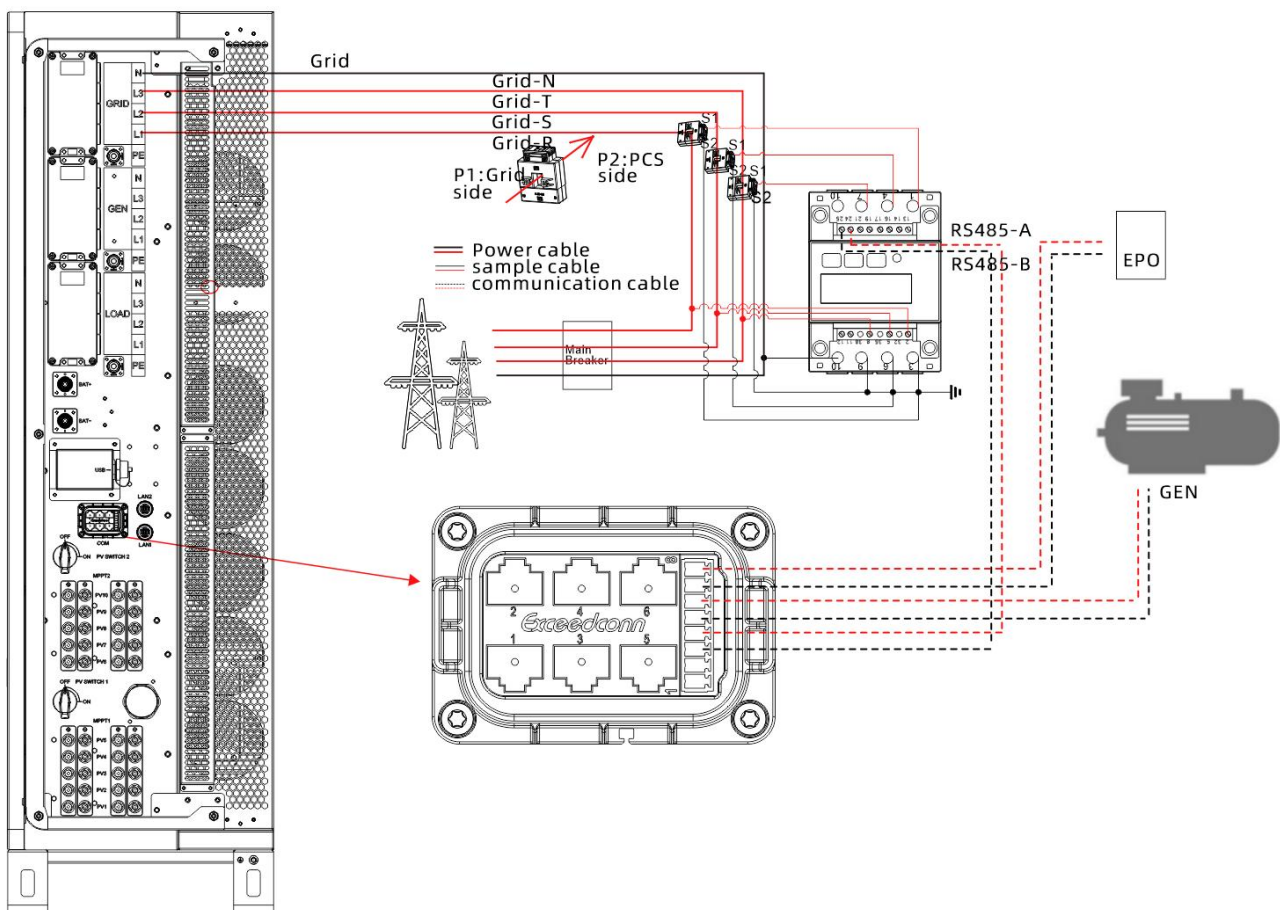


Fig 6.17 Side 8Pin port communication terminal

NOTE:

1. For the CT, P1 faces the grid side, and P2 faces the device side.

6.5 USB connection

The WIT-XHU series inverter is equipped with a USB interface as standard, which can be connected to a USB to ShineWiLan-X2 Pro monitoring module for remote monitoring. In addition, you can also quickly upgrade the inverter software via USB flash drive.

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 ShineWiLan-X2 Pro module into the USB interface, and the LED indicator of the ShineWiLan-X2 Pro module will be on.

If a USB interface is not used, please ensure waterproof cover is tightened to prevent water entering.

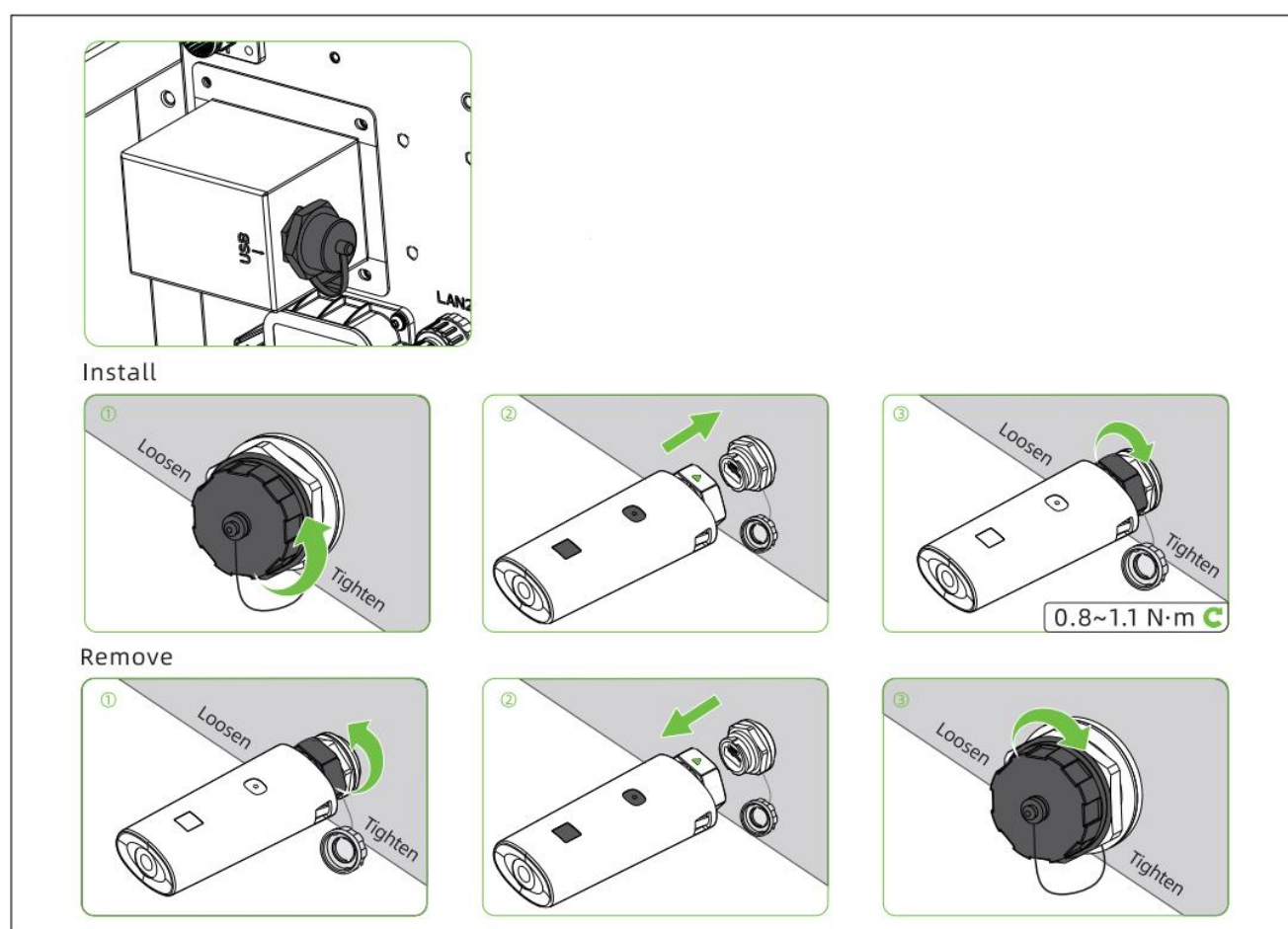


Fig 6.18 WiLan-X2 module connection steps

6.6 Post-Installation Checks

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

Position	Wiring Interfaces	Check Item
	Ground cable connected	Check the cable specifications; ensure that the

	to the chassis	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
	Right cover plate	Re-install the cover and secure it with screws after checking all items on the AC side
Position	Item	Check item
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	BAT+/BAT-	Ensure that the positive and negative terminals are connected correctly and securely; the sealing rubber ring is properly seated into the gland
	Cable bundling	The cables are bundled in the specified position
Communication terminals	COM	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
	LAN	Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland

7 System Configuration and Function Description

Description

Growatt WIT 50-125K-XHU Hybrid inverters support Bluetooth/remote monitoring, which can be enabled by installing a datalogger. For more information on operation and configuration methods, see the following link.

Compatible Datalogger	Installation & Operation Guide Linkage
ShineWiLan-X2 Pro	

7.1 ShineTools User Guide

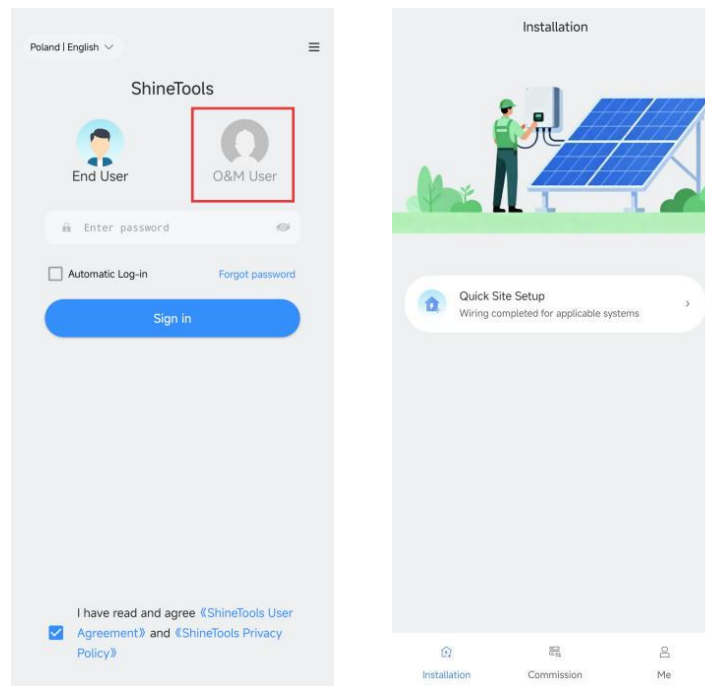
Scan the following QR code or search for “Shinetools” in Google/Apple Store to download and install the mobile APP. After logging in with your account and password, you will be able to view device information or configure relevant settings.



7.1.1 Quick Site Setup

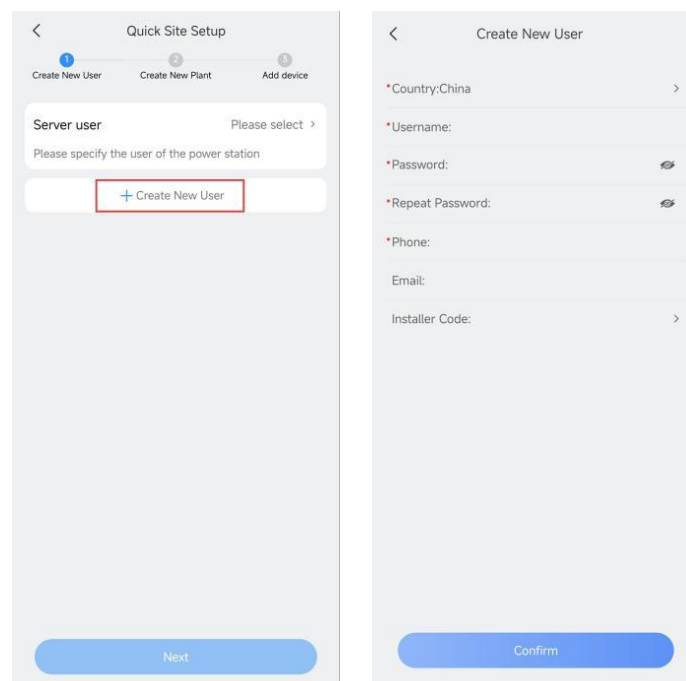
After downloading the latest version of ShineTools from the app store, select your login region, language, and account type, then enter your account and password to log in. On the Site Setup screen, click Quick Site Setup to proceed.

	For O&M user account, please contact Growatt customer service to activate.
---	--



➤ 7.1.1.1 Create New User

When creating a new user (power station administrator) for the first time, click “Create New User”, fill in the relevant information to apply for an account. To add a new power station to a previously registered user, click “Server user” to locate the user records you have added previously.



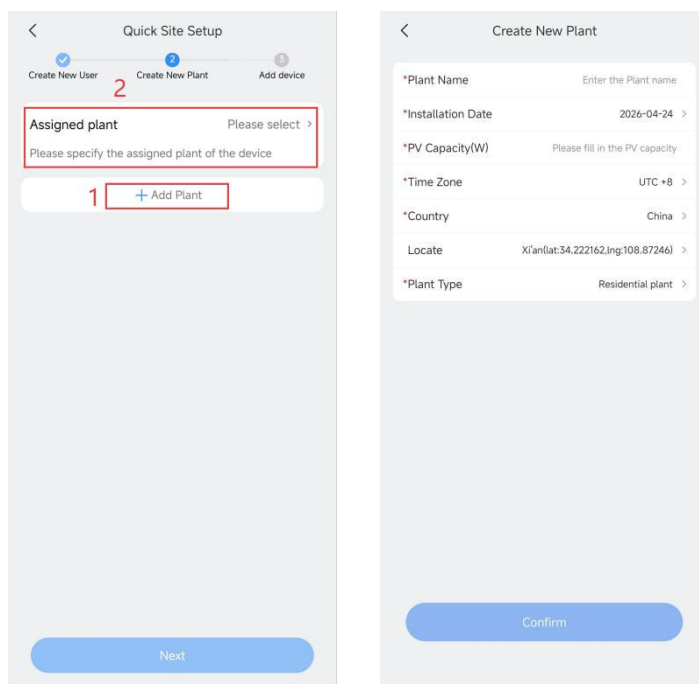
After adding the user, click Next to adding plant.

7.1.1.2 Create New Plant

Step1: Click red box 1 to fill in the relevant information and add a new plant under the

user selected in Section 7.7.7.1;

Step2: Click red box 2 to find the plants managed by the user selected in Section 7.7.1.1.

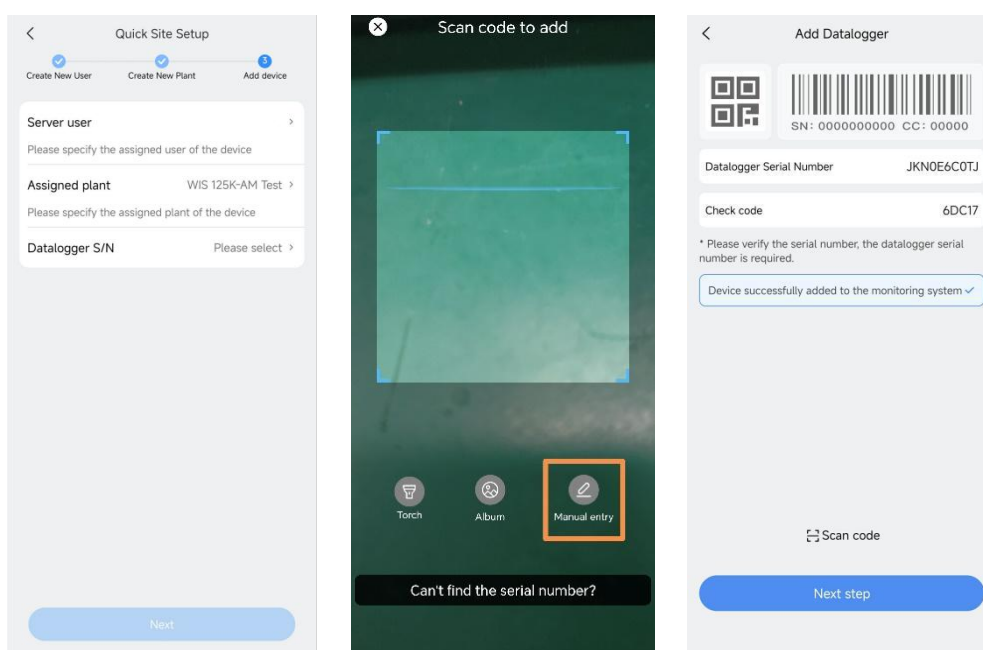


After adding the plant, click Next to adding device.

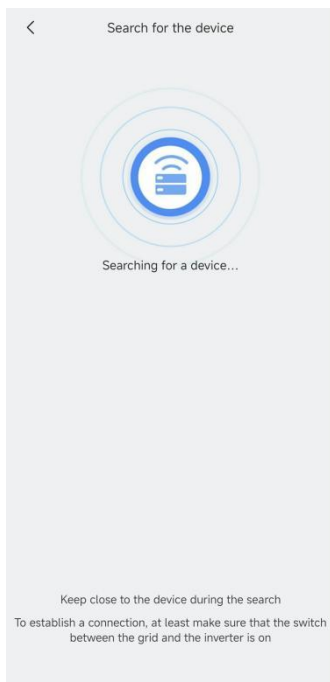
7.1.1.3 Add Device

Click “Datalogger S/N” to scan the QR code on the datalogger or the bar code on its reverse side to establish connection with the datalogger, or click the ‘Manual entry’ below the scan box to manually enter the S/N code of the datalogger.

When connecting, ensure the indicator light on the datalogger remains solid blue. If it is flashing, briefly press the button once to make it solid.



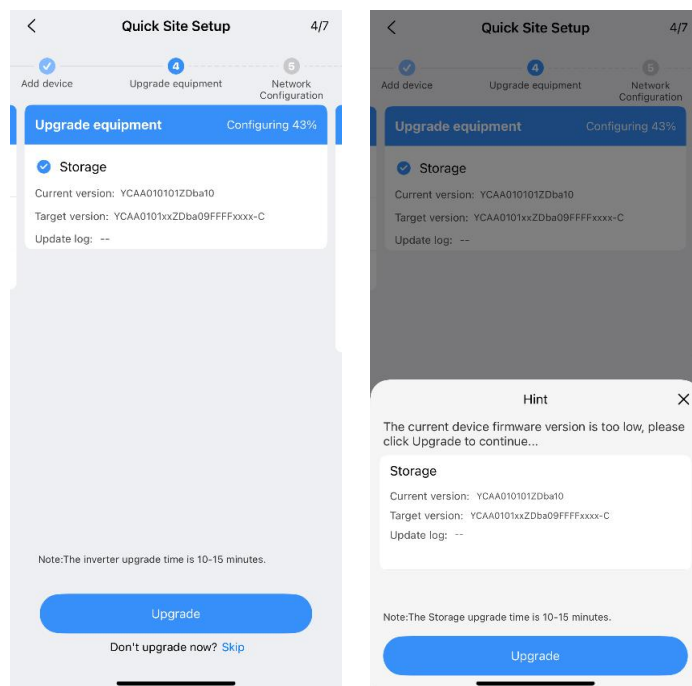
After clicking "Confirm", the system will automatically prompt that the datalogger has been successfully bound to the plant in about 5 seconds. Once successful, click "Next" to proceed to the next step – Program Upgrade.



7.1.1.4 Upgrade Equipment

“Upgrade equipment” automatically detects the current firmware version of the WIT, compares it with the latest available upgradeable firmware version, and performs a Quick Site Setup upgrade. This upgrading process is based on network, please ensure the network is stable before upgrading.

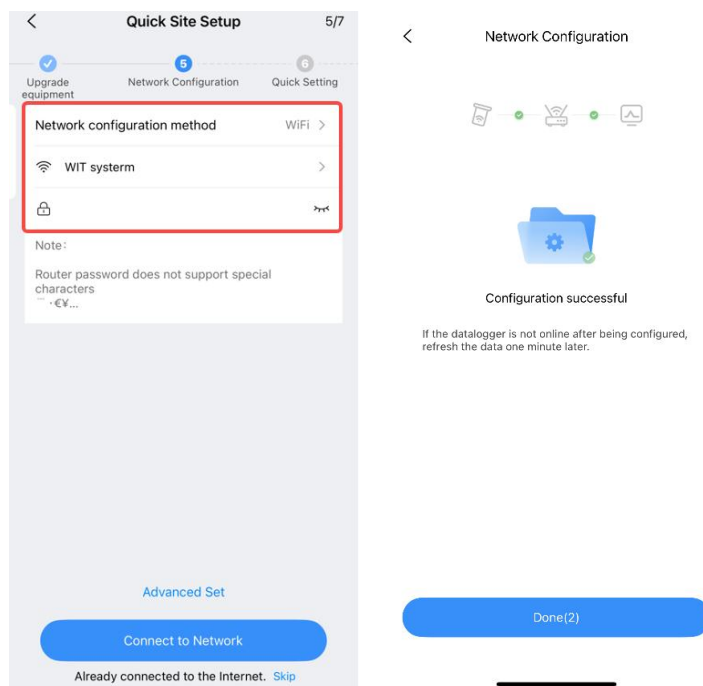
 NOTICE	1. The latest firmware version of the current device is available on the OSS platform. 2. If there is no network available on-site, please contact Growatt customer service to obtain the latest firmware version for the device, and then perform the upgrade locally using a USB drive.
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7.1.1.5 Network Configuration

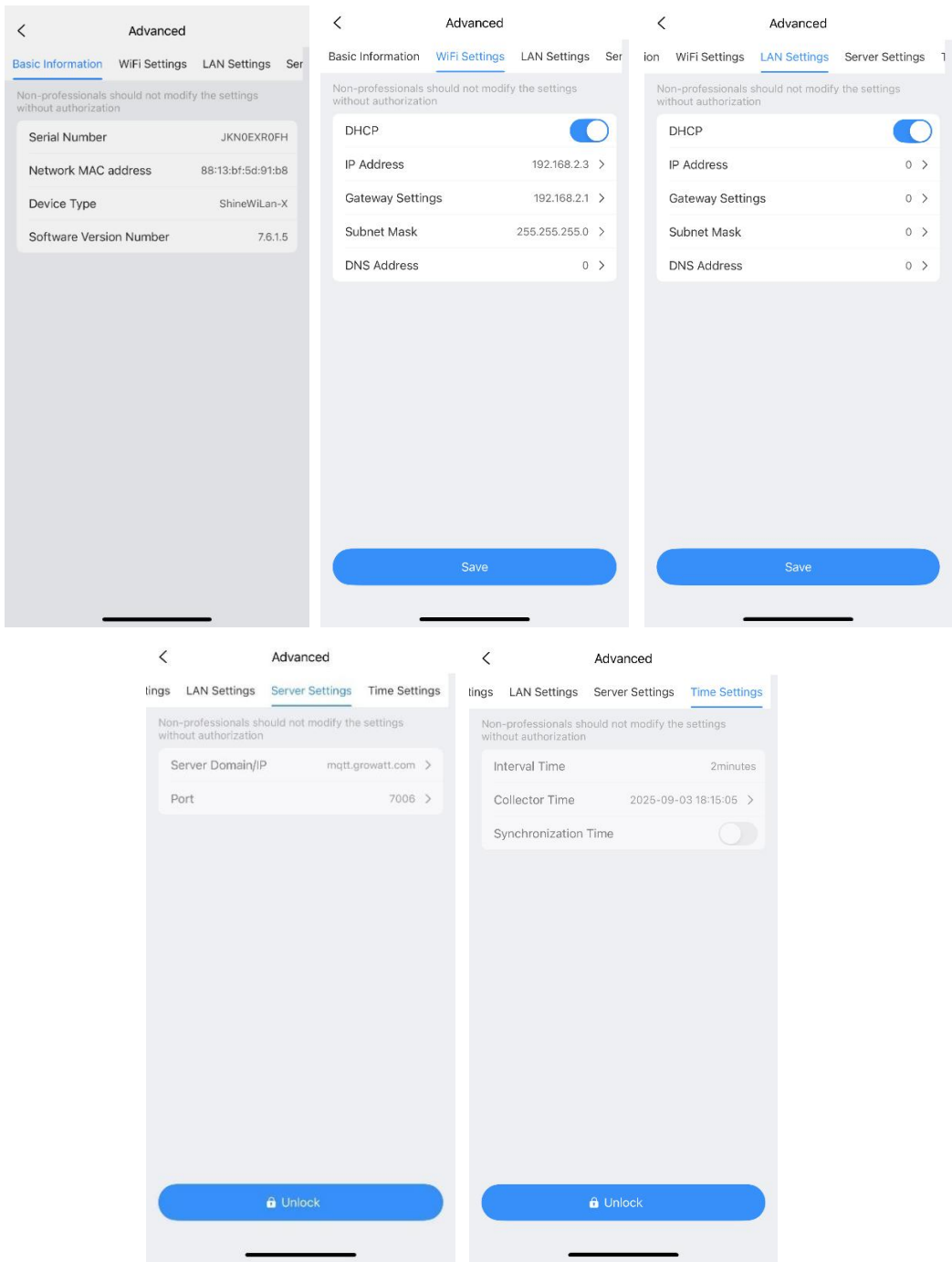
After selecting the WiFi network within the red box, connect to the 2.4GHz network to upload device data to the cloud. This enables remote viewing of information and parameter configuration via OSS/GroMinder.

Selecting LAN allows direct connection via an Ethernet cable inserted into the rear of the datalogger.



The "Advanced Settings" at the bottom of the network configuration page can be used to configure and change time, network, servers, and other settings. Password format: growattYYYYMMDD (e.g., growatt20260312 for March 12, 2026). (this is the universal

admin password for ShineTools).



7.1.1.6 Quick Setup

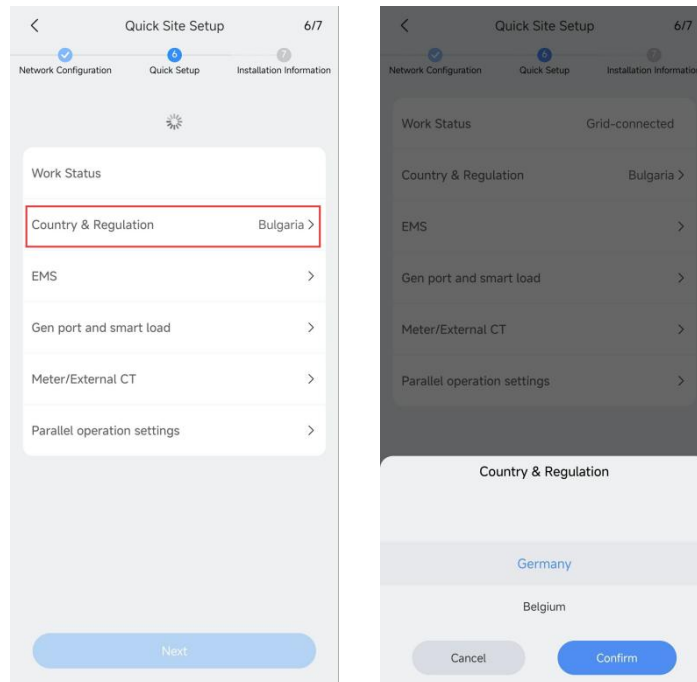
1. Upon completing the " Quick Site Setup" step, the device is ready for operation. If there are other parameter settings, please refer to next sections to continue with the settings.

2. Parameters not included in the Quick Site Setup are optional and can be skipped.

Step1: Country & Regulation

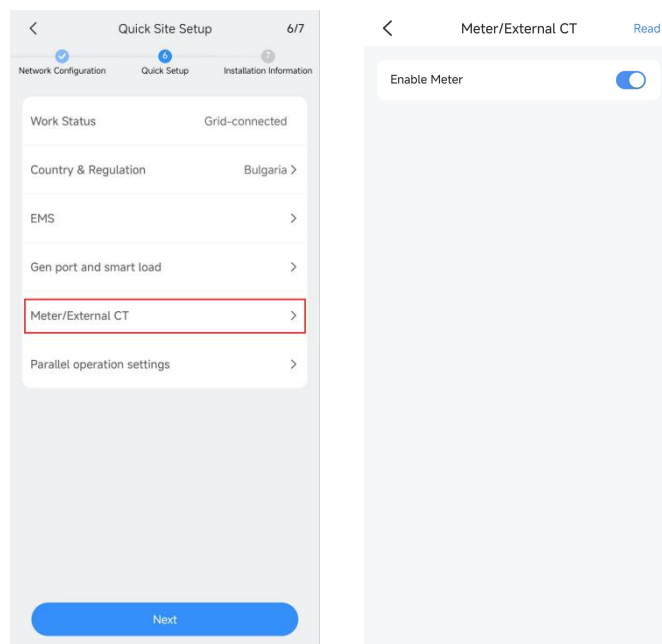
This step allows you to select the required national regulations. Please configure the

settings according to your requirements as shown in the diagram below.



Step2: Meter Enable

If the customer connects an external anti-backflow meter on-site, the meter enable function must be activated.



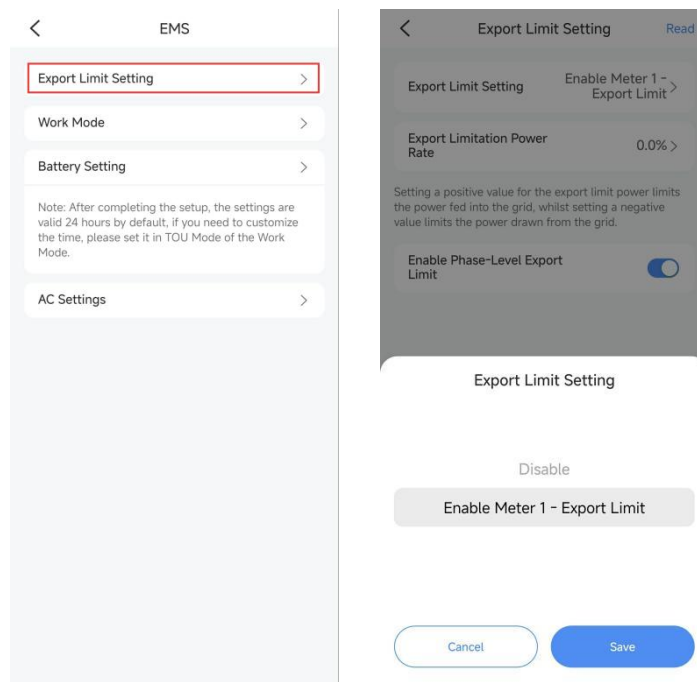
Step3: Export Limitation Setting

The EMS parameters include Export Limit Setting, Work Mode ,Battery Setting and AC Settings, etc.

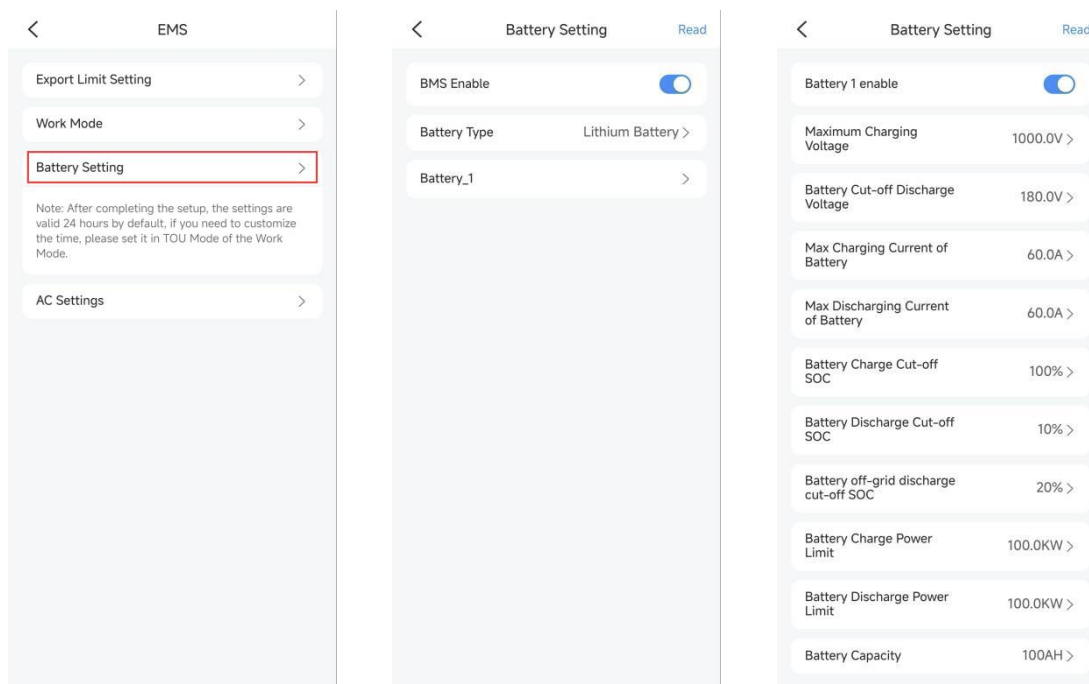
If export limitation enable needs to be activated on-site, configuration must be carried out as shown in the diagram below.



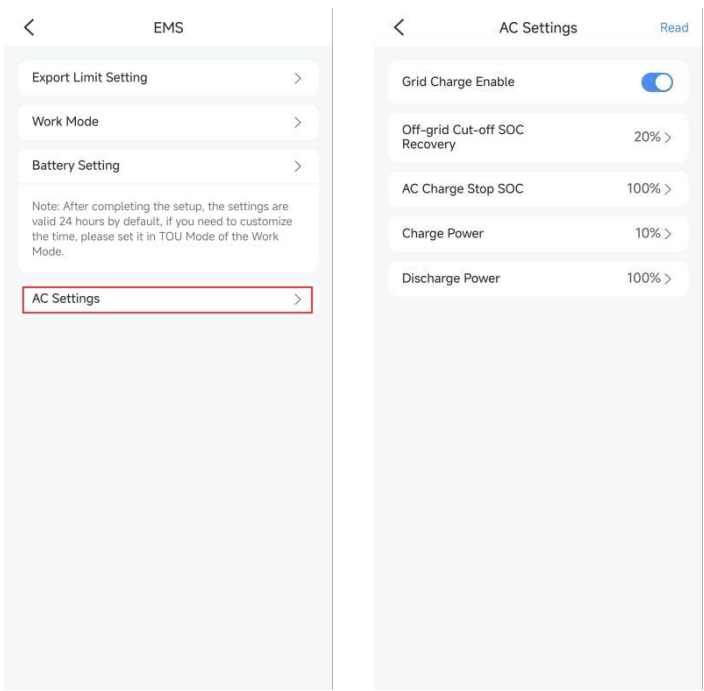
To use the Export Limitation function, it must be paired with a meter purchased from GROWATT.



"Battery Settings" allows for the configuration of all battery parameters, including Battery Discharge/Charge Power Limit, Max Charging/Discharging Current of Battery, and Battery charge/Discharge Cut-off SOC."

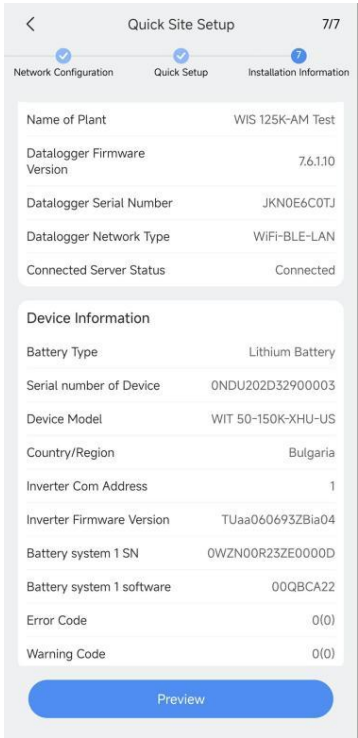


The "AC Settings" section includes Off-grid Cut-off SOC Recovery, the Grid Discharge / Charge Power



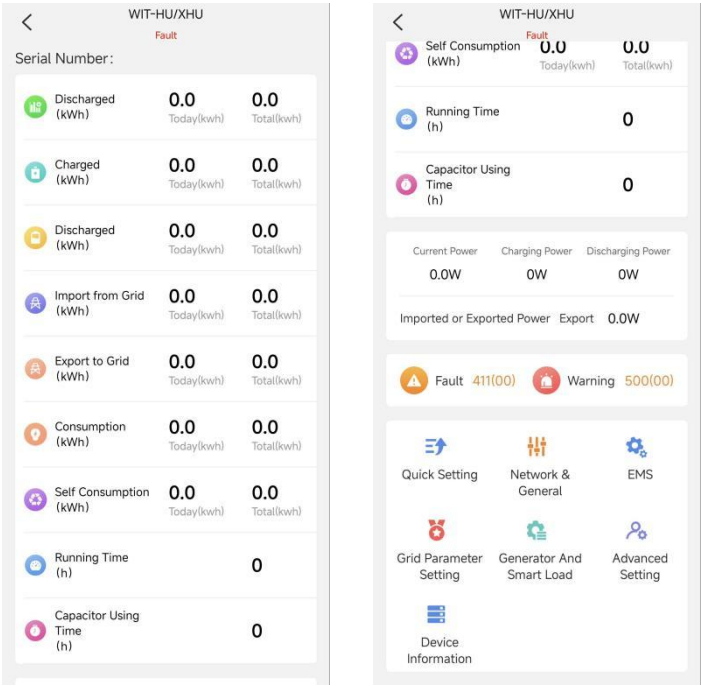
7.1.1.7 Installation Information

After completing all the above steps, you may view the device information and configure parameters.



7.1.2 ShineTools Interface Demonstration

Upon accessing the device interface, one may view the system battery status, daily power generation from the grid, and total power generation. Additionally, fault information and alarm notifications for the equipment can be reviewed. At the bottom of the page, system parameters can be read and configured.



7.1.3 Common Parameter Settings

Wrong time and date may occur if the WIT has been stored for over one month. Please check andFix the time and date before connecting the inverter to the grid.

7.1.3.1 Time of Use

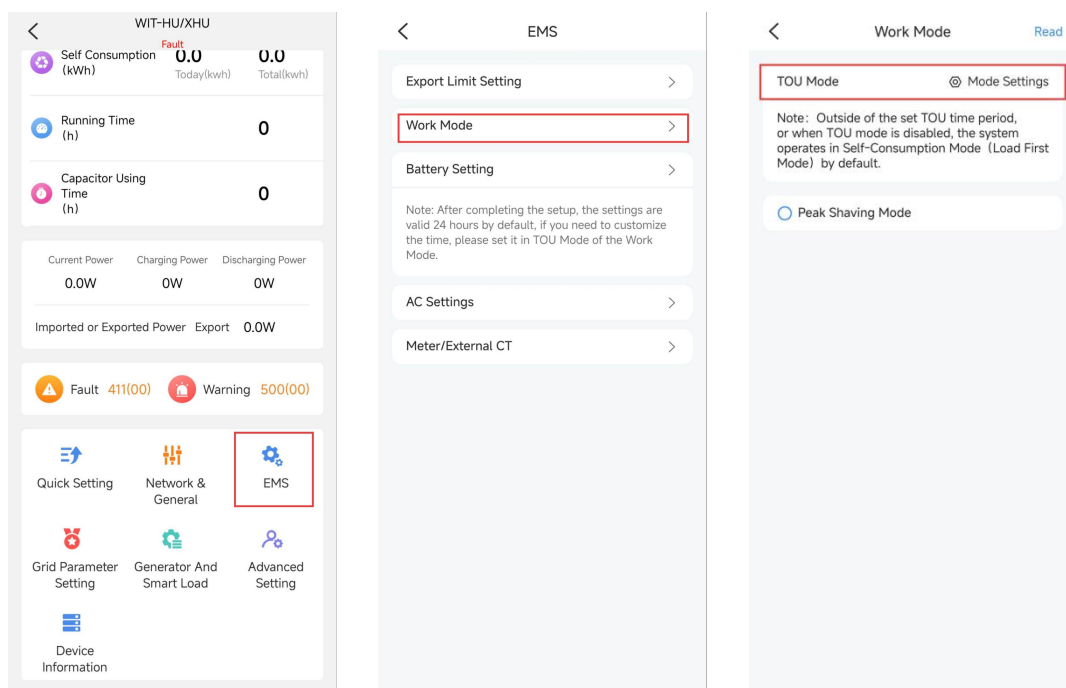
TOU settings allow the system to operate in different modes during various time periods, with a daily cycle of execution.

1. A maximum of six time periods can be configured.

2. The scheduled time periods must not overlap.

3. TOU settings override the default operation mode. The system will revert to the default mode during periods when TOU is not active.

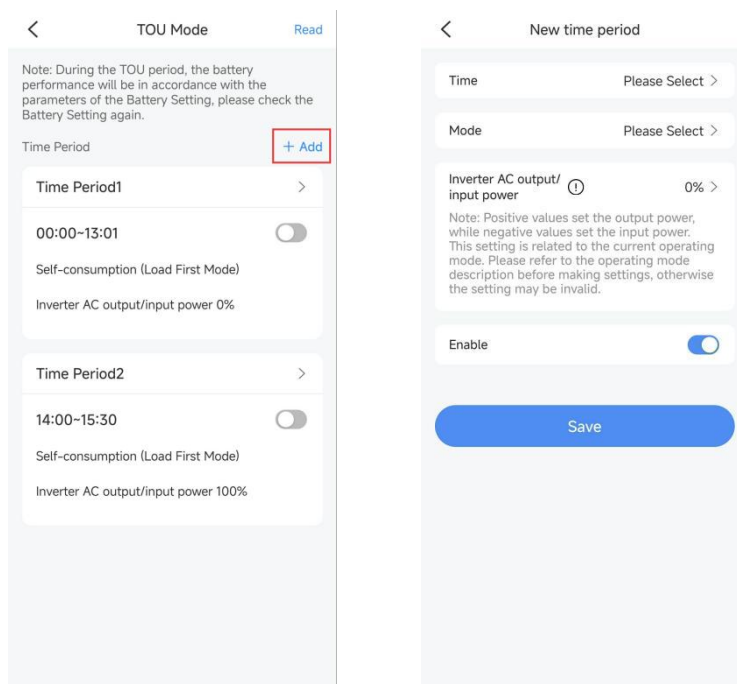
- Step 1:** Locate "EMS" in the parameter table on the ShineTools home page and click to enter.
- Step 2:** Click to enter the "Working Mode" settings.
- Step 3:** Enter the settings for "TOU mode".



Step 4: Enter any time period to configure it. If the available time periods are insufficient, click the upper right corner to add more.

Step 5: Set the parameters for the time period, such as the duration, the working mode during this period, and the AC power.

Step 6: After confirming that all settings are complete and correct, enable the time period and save. The settings will then take effect.



The “ Inverter AC Input/Output Power ” represents the total power of the AC side (including LOAD and GRID side) as a percentage of the inverter's nominal power. If the value is positive, it limits output power and does not limit input power. If the value is

negative, it limits input power and does not limit output power.

7.1.3.2 Export Limitation Setting

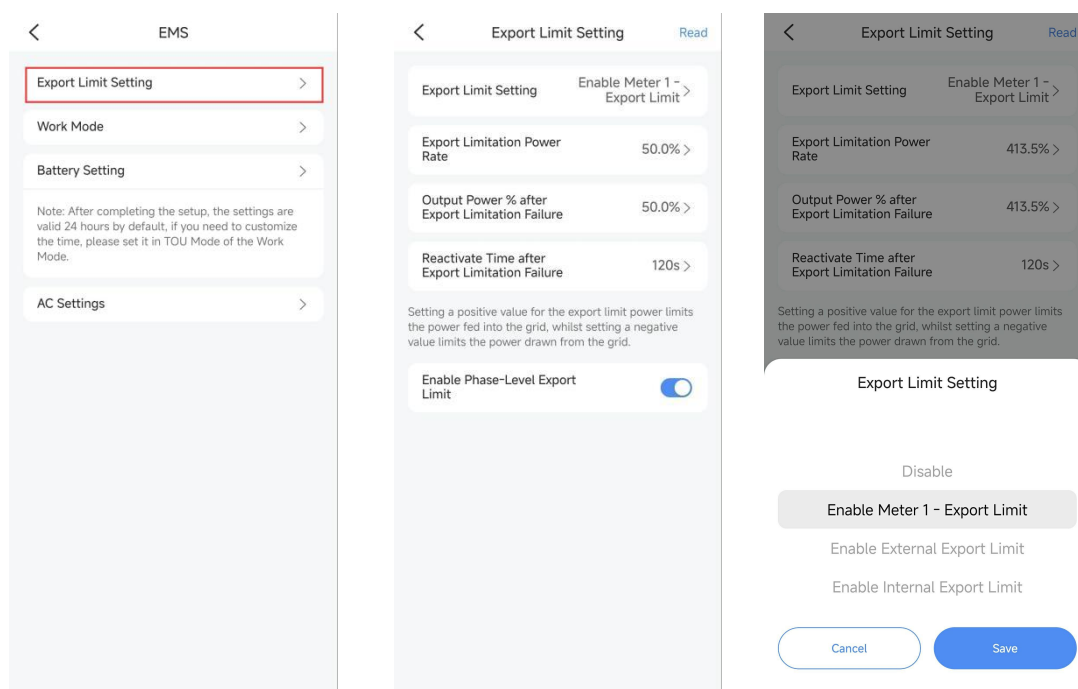
The Export Limitation can precisely regulate the export power from the system to the grid to meet local safety regulations.

Step 1: On the ShineTools home page, find "EMS" in the parameter table and click to enter.

Step 2: Find "Export Limit Setting" and click to enter the specific parameter configuration.

Step 3: Configure the relevant parameters, such as the Export Limit power and Export Limit failure time.

There are two Export Limitation modes: single-phase Export Limitation and three-phase Export Limitation. Please confirm, based on actual needs, whether to enable phase-level anti-reverse current. For detailed setup methods, please refer to the figure below.



Setting the Export Limit power percentage to 0% means that no Export power flows to the grid. In some sites with strict Export Limit requirements, it can be set to -1% or -2%; a negative value will cause the system to draw power from the grid instead.

When the system receives no feedback data from the meter, or the meter is offline for longer than the Reactivate Time after Export Limitation Failure time, the system's Export Limit power value change to the setting of the Export Limitation failure power.

Three- phase Export Limit control limits the total three- phase power from exceeding the Export Limit value. When single- phase Export Limit is enabled, it ensures that the Export power on each phase (R, S and T) does not exceed the set value.

7.1.3.3 Peak Shaving

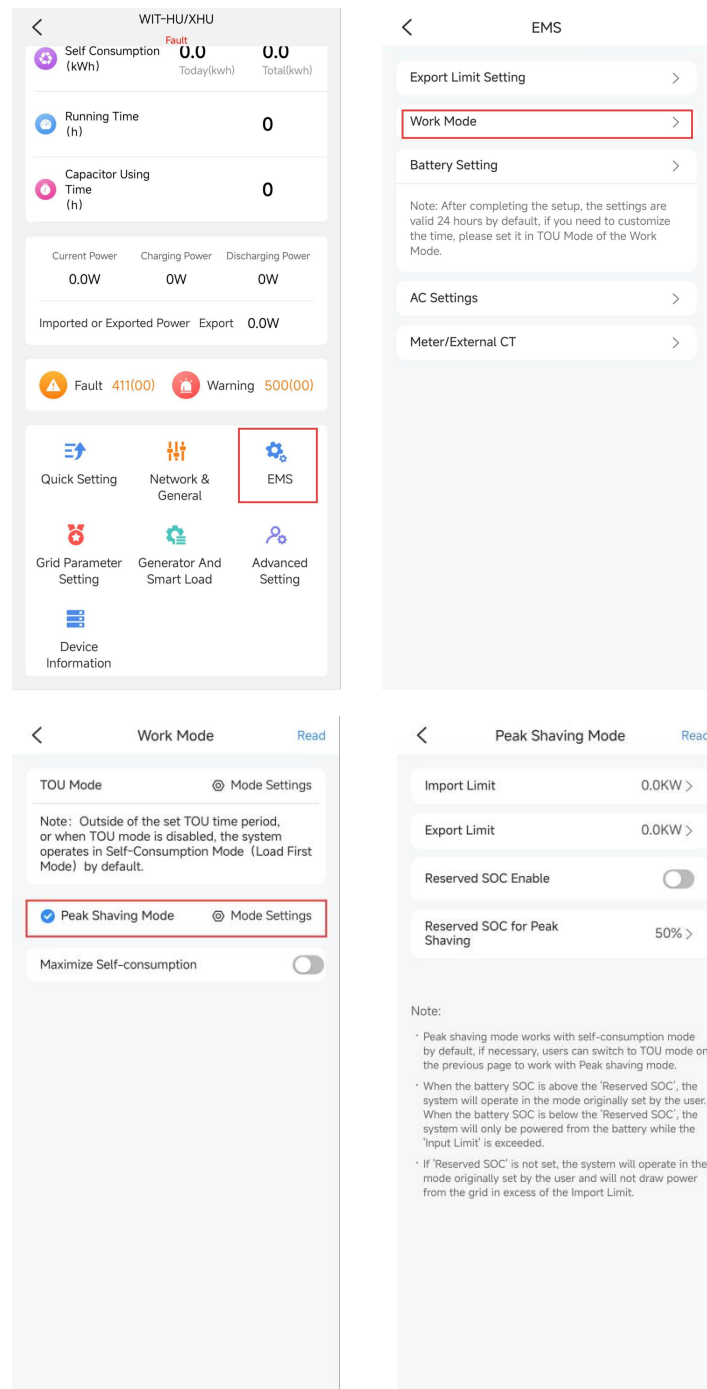
The peak shaving regulating the AC-side power output and battery power output of the WIT to more precisely controll grid-side downstream power and counter-current power.

It can be access as the following steps:

Step 1: On the ShineTools home page, locate "Peak Shaving" in the parameter table and click to enter.

Step 2: Click "Work Mode", then click "Peak Shaving Mode".

Step 3: Configure the relevant Peak Shaving parameters, such as "Import limit", "Export Limit", and "Reserved SOC for Peak Shaving".



After peak shaving and reserved SOC is enabled, the WIT can realize the following

application:

During the low peak of power consumption, the excess power of the WIT is converted into battery energy to realize battery power reserve and maximize the benefit of power consumption;

During the high peak of power consumption and when the SOC value of the battery is greater than backup SOC, the system will limit the power taken from the grid to the "Import Limit" value, and increase the output power of the WIT to ensure the load demand.

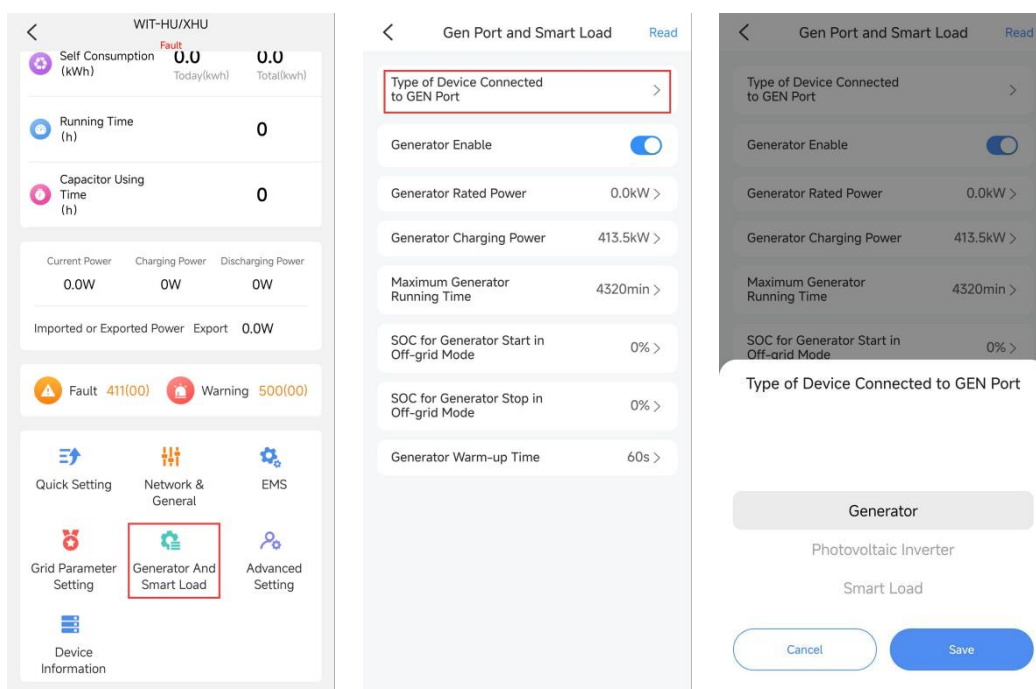
When the SOC of the battery is not more than the "Reserved SOC for Peak Shaving", the battery stops discharging. If the system load is less than the set "Import Limit" power value, the inverter will try to keep it to the "Reserved SOC for Peak Shaving", use exceed power to charge the battery.

7.1.3.4 Generator And Smart Load

Step 1: On the ShineTools home page, locate "Generator And Smart Load" in the parameter table and click to enter.

Step 2: Find the parameter "Type of Device Connected to GEN Port" and select the device as actual.

Step 3: Different device type has different settings. Configure the parameters as actual needs.

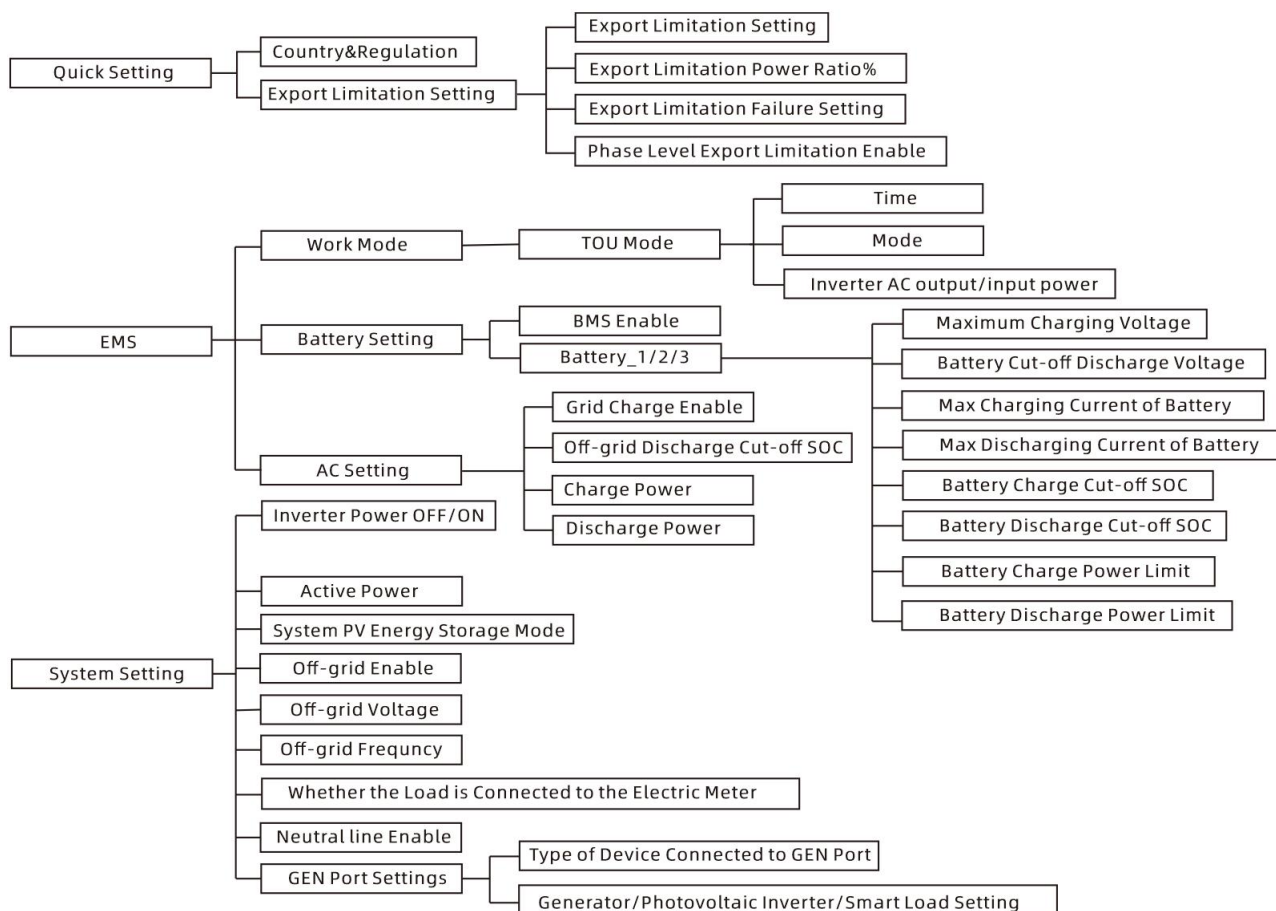


When the device type is set to "Generator", the WIT will control the operate logic of the generator as follows:

When the grid is abnormal and the battery SOC falls below the “SOC for Generator Start in Off-grid Mode”, the generator will start, and the STS of WIT will switch to connect in the generator after the “Generator Warm- up Time” .

The “Generator Charging Power” is the maximum charging power that the generator can deliver (the actual charging power is the smaller of the generator rated power minus the load power and “Generator Charging Power”).

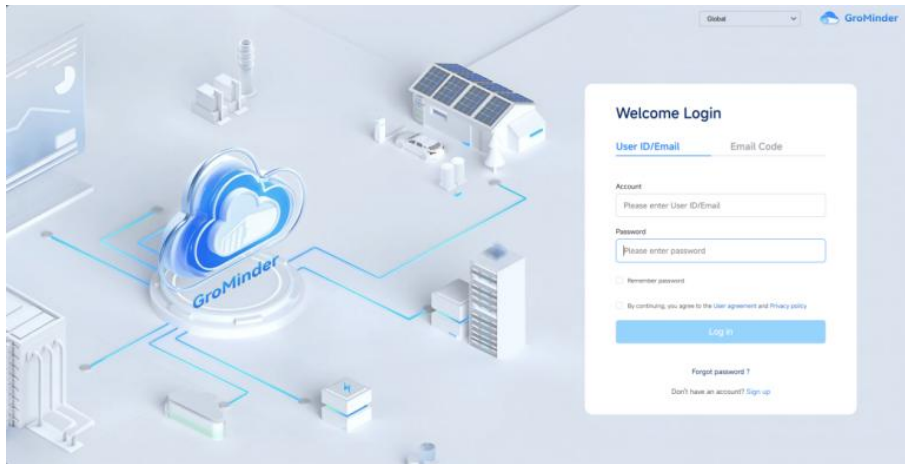
7.1.3.5 ShineTools Settings Tree



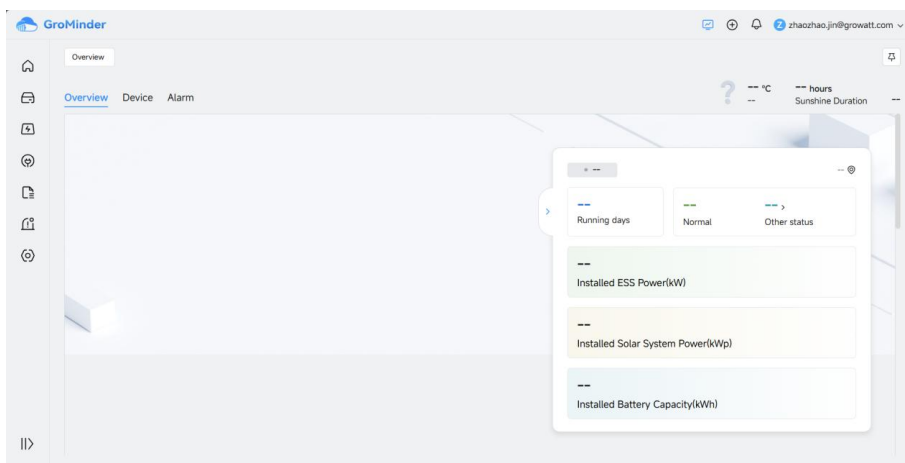
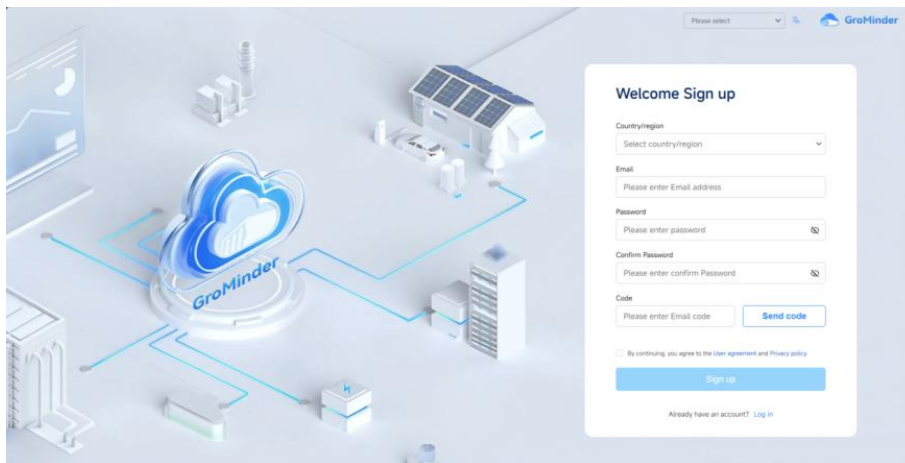
7.2 GroMinder Commisiong&Monitoring Guideline

7.2.1 GroMinder Account Registration

1.Open the browser, then enter <https://grominder.growatt.com> in the address box to access the login page. Click “Register an Account” for initial use.



2. After the registration page is displayed, fill in the information as required and click to agree to the Privacy Policy. Click “Sign up” and it will automatically log in.



7.2.2 Add Power Station and Datalogger in GroMinder

1. After accessing the home screen, click the “Add Power Station”. Fill in the information as required and click “Yes”. If you have existing plant, you can select the target plant on the home screen.

Add Power Station

1 Power station info

Basic info

Power station name

Installer number

Optional
Installer phone number

Installation time

AC coupled systems

PV installed capacity kWp

Storage inverter installed capacity kWh

Total storage inverter installed power kW

Optional
Description of power station

Cancel Next

Add Power Station

2 Set electricity price

Effective time

Electricity price configuration

Template application

1 Basic configuration

Optional
Electricity price name

Charging efficiency coefficient

Discharging efficiency coefficient

Grid feed-in tariff

2 Set electricity price

☐ Time differentiated by weekdays / weekends

Back Next

Add Power Station

3 Set earnings

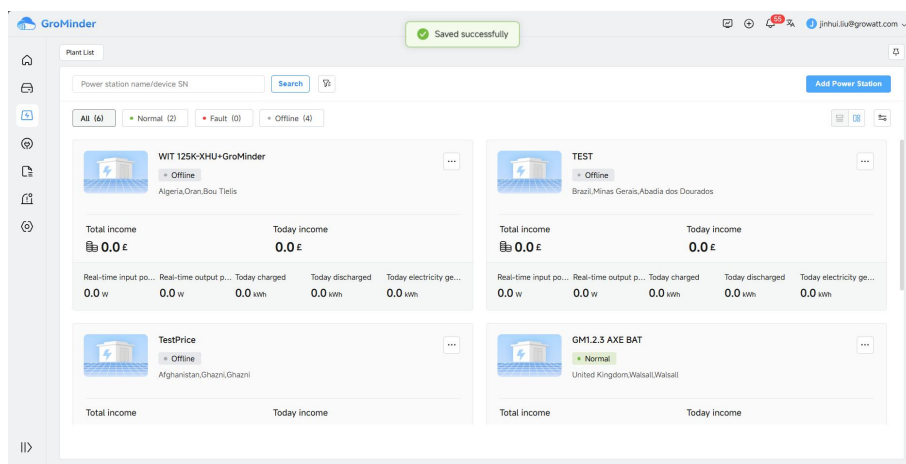
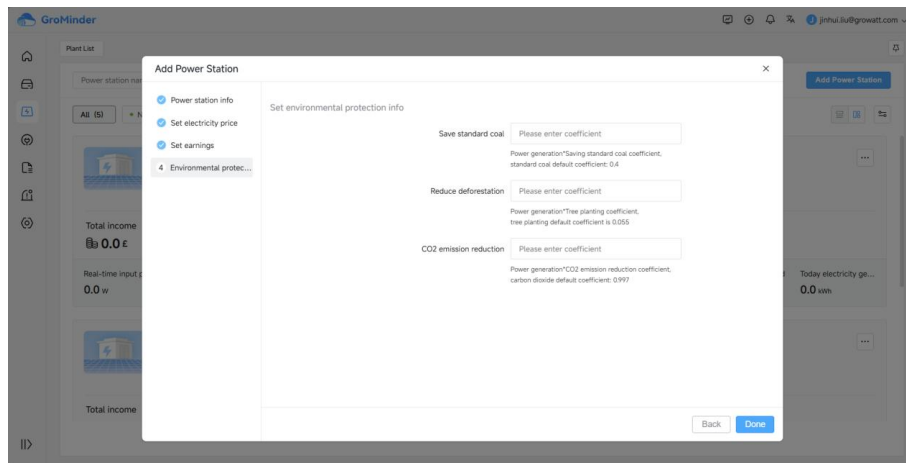
Subsidy type

Subsidy benefit type

Subsidized unit price

+
Add subsidy type

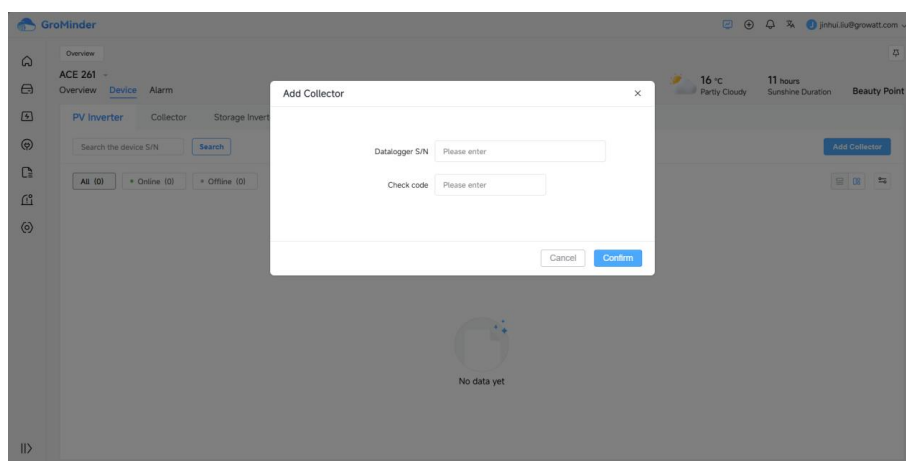
Back Next



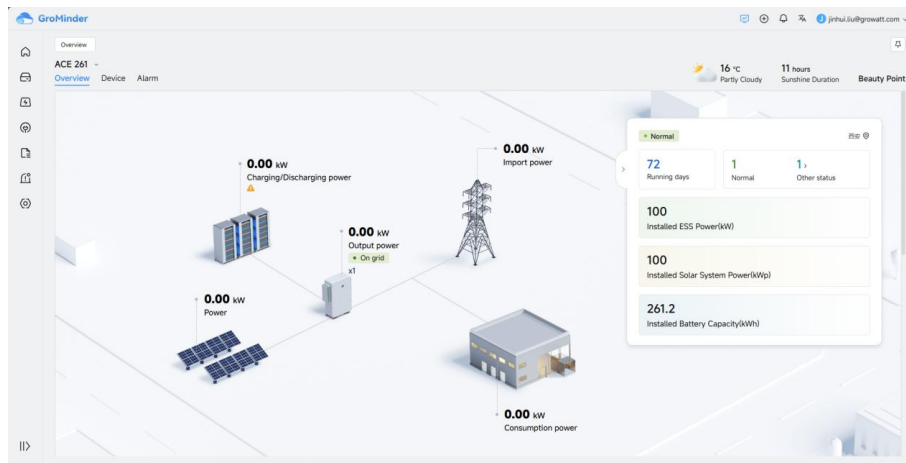
2. Click the target plant and the detailed page will be displayed, click “Add Collector” on the upper right corner to add the datalogger connected to the inverter.

Step1: Enter the serial number (SN) and the check code of the datalogger;

Step2: Select the target power plant to add.



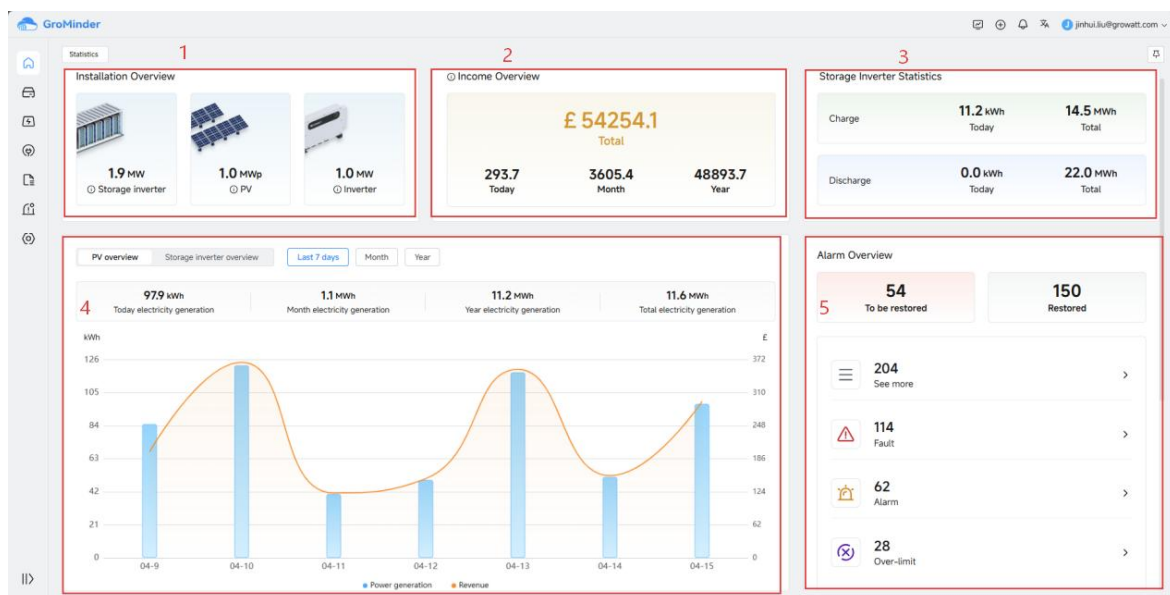
3. After adding the datalogger successfully, you can click Overview to check the system operation overview.



7.2.3 GroMinder Interface Introduction

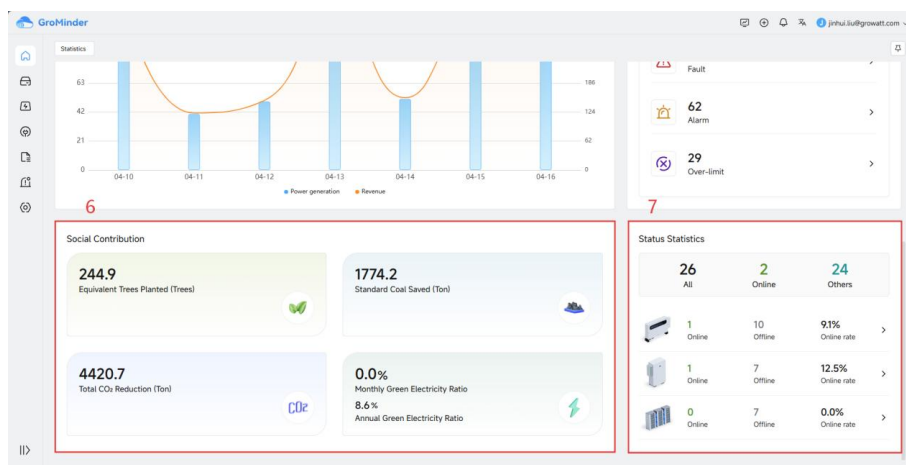
1. Statistics

This page offer a dashboard for the plant which consist of multiple plates. Some statistics information can be checked in this interface.



The plates of the interface are as follows:

- 1) The total capacity of storage inverter, PV and inverter in the plant;
- 2) The total revenue of the plant;
- 3) The charging/discharging statistics of the storage inverters;
- 4) PV generation, battery charge/discharge, and their revenue for the last 7 days, the current month, and the current year;
- 5) All faults, warnings, and their details under this account.

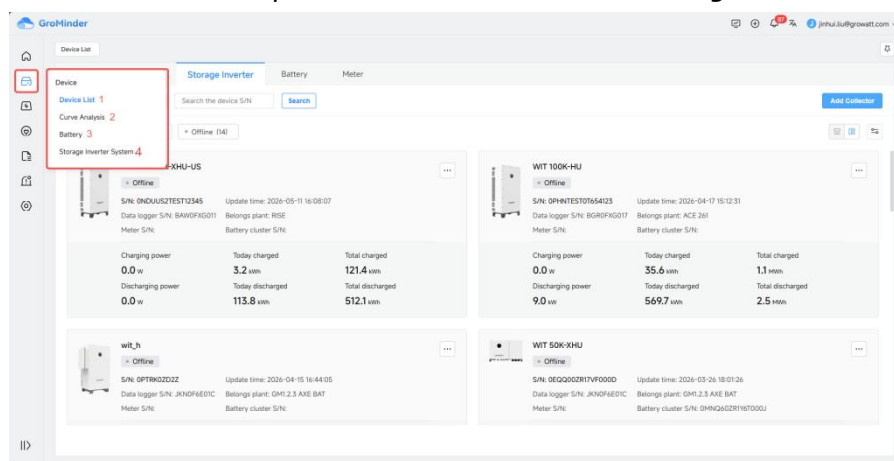


6) This section displays the equivalent social contributions.

7) The online status of batteries, PV inverters, and storage inverters.

2. Device

In this page, all devices in the plant can be checked and configured.



1) Device List: Allows you to view different types of devices (e.g., dataloggers, inverters, etc.) for a specific power station or all power stations under the account;

2) Curve Analysis: Display the parameter curve charts of different data types for the device in the plant;

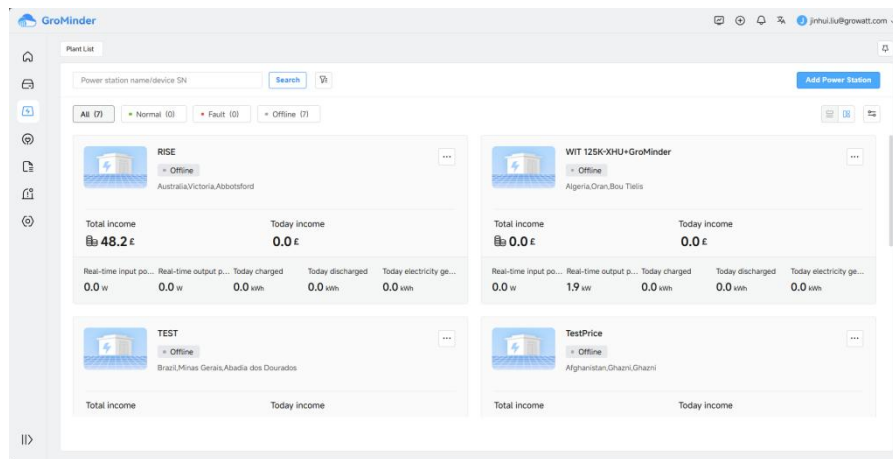
3) Battery: Display detailed battery data such as SOC, voltage, current, and view data of the battery pack and its individual cells;

4) Storage Inverter System: Display the charging/discharging power and energy storage of the selected device, real-time battery SOC, charge/discharge power curve, and detailed data of the battery pack.

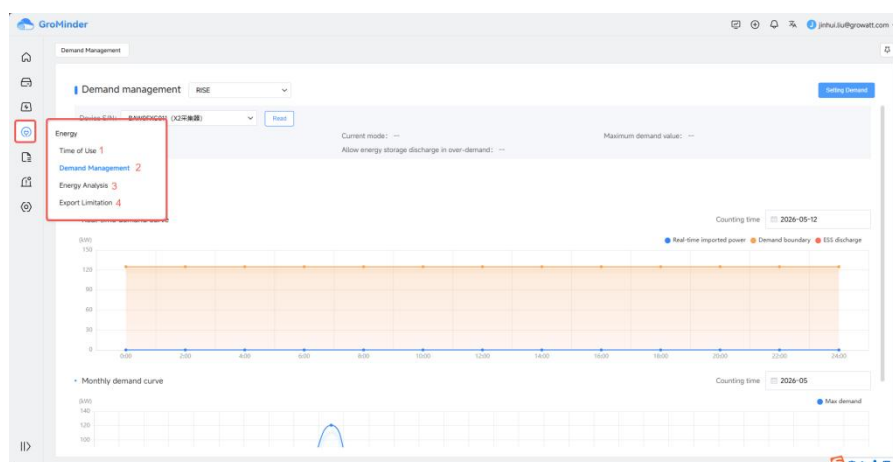
3. plant list

On this page, you can view all power plants under your account and some of their key data. You can click “Add Power Station” in the top-right corner to add a new power

station.



4. Energy

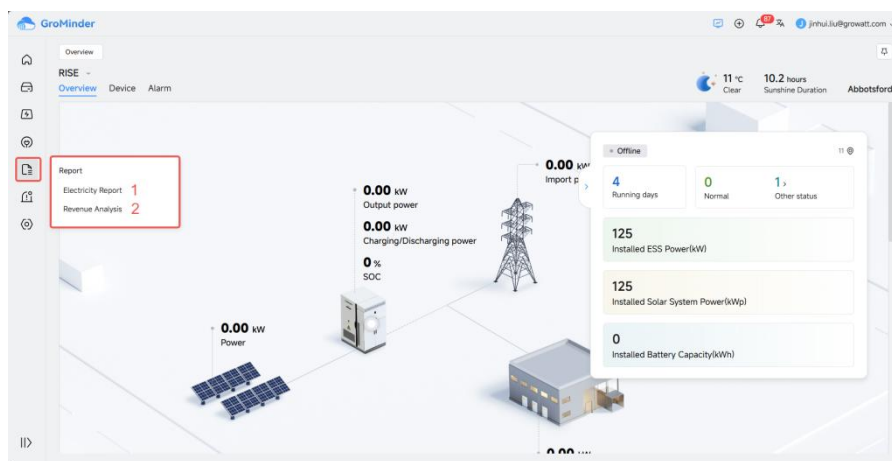


This part includes the settings of energy management, such as “Time of Use”, “Demand Management” and “Export Limitation”. The setting guideline can be referred to Section 7.3.4.

The “Energy Analysis” displays the status of power plant, inverter and battery.

- 1) Time of Use: Set the TOU operating mode (see section 7.3.4.1 for detailed settings);
- 2) Demand Management: Set Demand Management (see section 7.3.4.3 for detailed settings);
- 3) Energy Analysis: View Power station statement, Inverter statement, and Energy storage statements;
- 4) Export Limitation: Set Export Limitation (see section 7.3.4.2 for detailed settings).

5. Report



1) Electricity Report: On this page, you can click on different entries to view various energy data in the power plant report, inverter report, and energy storage report. Click “Export” in the top-right corner to export the data as an Excel file.

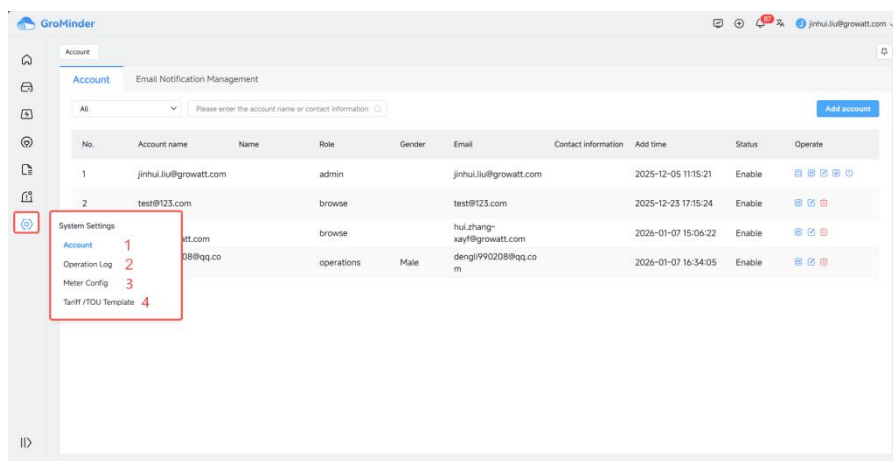
2) Revenue Analysis: Click on different entries to view total revenue, PV revenue, and energy storage revenue respectively. Revenue details can be viewed at the bottom of the page. Click “Export” in the top-right corner to export the data as an Excel file.

6. Alert

No.	Device S/N	Alarm level	Event ID	Describe	Processing status	Trigger type	Trigger time	Operate
1	0HL50000000000002	---	506	Battery disconnected	Not processed	Fault	2026-05-12 17:34:43	
		---	302	No utility grid connected or utility grid power failure	Not processed	Fault	2026-05-12 09:01:42	
3	VML1CH04F	---	401	Meter abnormal	Not processed	Alarm	2026-05-12 05:31:07	
4	VML1CH04F	---	1	full power hours beyond limits	Not processed	Over-limit	2026-05-12 05:31:07	
5	0NDUUS2TEST12345	---	405	Relay failed	Not processed	Fault	2026-05-11 15:59:06	

1) Alert List: On this page, you can view all anomaly alerts for all power stations or for a specific power station. Alarm details can be viewed at the bottom of the page.

2) Overlimiting Setting: Configure over-limit settings and view over-limit information.

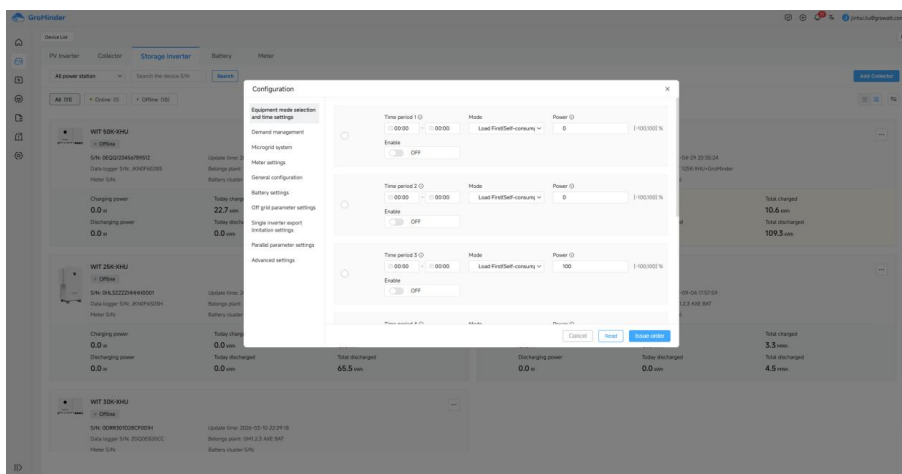


- 1) Account: Add and manage accounts, such as setting account permissions (e.g., operation and maintenance accounts or browsing accounts).
- 2) Operation Log: View the operation logs of all power stations under this account, including log content, log type, execution status, and other information.
- 3) Meter Config: View information such as the power station to which the meter belongs and its sampling points and configure the meter.
- 4) Tariff/TOU Template: View and configure electricity price settings and operation strategy settings.

7.2.4 GroMinder Configuration

7.2.4.1 TOU(Time of Use)

TOU settings allow the system to operate in different modes during various time periods, with a daily cycle of execution.





1. A maximum of six time periods can be configured.
2. The scheduled time periods must not overlap.
3. TOU settings override the default operation mode. The system will revert to the default mode during periods when TOU is not active.
4. The “Inverter AC Input/Output Power” represents the total power of the AC side (including LOAD and GRID side) as a percentage of the inverter's nominal power. If the value is positive, it limits output power and does not limit input power. If the value is negative, it limits input power and does not limit output power.

Step 1: Set the operating mode of the time period.

Step 2: Set the time periods.

Step 3: Set the system output power percentage.

Step 4: Enable the settings.

7.2.4.2 Single inverter export limitation settings

The Export Limitation can precisely regulate the export power from the system to the grid to meet local safety regulations.

The screenshot shows a 'Configuration' window with a sidebar on the left containing the following menu items: Equipment mode selection and time settings, Demand management, Microgrid system, Meter settings, General configuration, Battery settings, Off grid parameter settings, Single inverter export limitation settings (highlighted), Parallel parameter settings, and Advanced settings. The main area displays five settings, each with a radio button and a label:

- Export limitation enable:** A radio button followed by a dropdown menu currently set to 'Disable'.
- Export power limit:** A radio button followed by a text input field containing '0.0' and a range indicator '[-100.0,100.0] %'.
- Export limitation fail-safe power:** A radio button followed by a text input field and a range indicator '[0.0,100.0] %'.
- Export limitation failure time:** A radio button followed by a text input field and a range indicator '[1,5000] s'.
- Phase-level export limitation enable:** A radio button followed by a dropdown menu currently set to 'Three-phase total export'.

At the bottom right of the window are three buttons: 'Cancel', 'Read', and 'Issue order'.

Step 1: On the device page, locate the configuration page and click to enter.

Step 2: Find “Single inverter export limitation settings” and click to enter the detailed parameter configuration.

Step 3: Customize settings according to your needs.

For detailed function description, see section 7.1.3.2 Export Limitation Setting.

7.2.4.3 Demand Management

Demand management is a refined energy mannage technique that reduces a business's basic electricity charges through real-time monitoring and active intervention. It uses inverters, energy storage, and intelligent algorithms to precisely control the power drawn from the grid based on user settings, making it a key enabler for industrial and commercial users to reduce costs and improve efficiency.



Note: When using the ShineWiLan X2 Pro, users can configure settings either on the Configure page of WIT under the Device List or on this page. When using the SEM-X, settings can only be configured on this page.

Configuration

Equipment mode selection and time settings

Demand management

Microgrid system

Meter settings

General configuration

Battery settings

Off grid parameter settings

Single inverter export limitation settings

Parallel parameter settings

Advanced settings

Enable ☐ Disable ☐

Import power limit ☐ 7.0 kW

Export power limit ☐ 7.0 kW

Reserve SOC enable ☐ Disable ☐

Reserve SOC ☐ 50 [10,100] %

Cancel Read Issue order

Step1: Enable "Demand management" ;

Step2: Enable "Demand management backup SOC" ;

Step3: Set "Export power limit", "Import power limit" and "Reserve SOC".

For detailed function description, see section 7.1.3.3 Peak Shaving.

7.2.4.4 Microgrid System

Step1: Click "Micro System" of WIT configuration interface;

Step2: Select the device type as actual connection;

Step3: Different device type has different setting items. Modify the settings according to the actual requirements.

Configuration

Equipment mode selection and time settings

Demand management

Microgrid system

Meter settings

General configuration

Battery settings

Off grid parameter settings

Single inverter export limitation settings

Parallel parameter settings

Advanced settings

GEN port device type

Diesel generator

Diesel generator

PV inverter

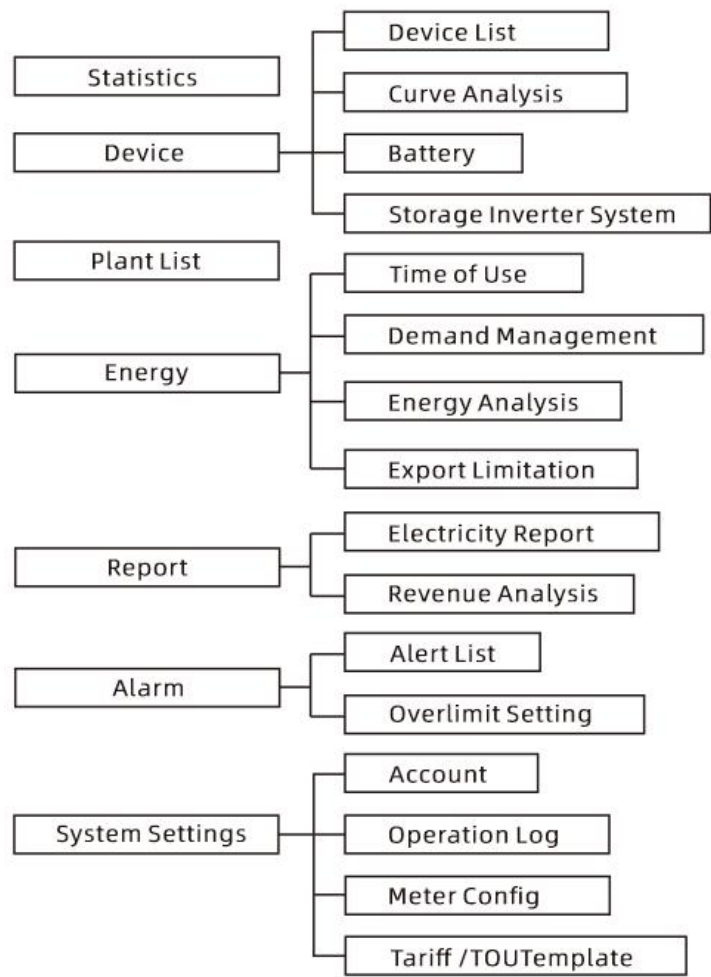
Smart load

Cancel

Read

Issue order

7.2.4.5 GroMinder Settings Display



8 Light Indication & Fault Query

8.1 LED and OLED Displays Panel

The LED and OLED display panel demonstrating the running status of the WIT is shown in the Fig 8.1. The symbol description is shown in Table 8.1; The user interfaces are shown in Fig 8.2, and the LED indicator description is shown in Table 8.2.

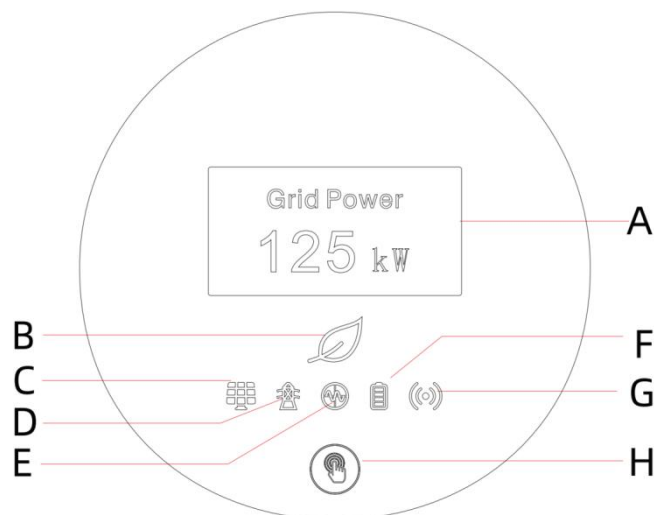


Fig 8.1 Display panel

Table 8.1 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	Button	You can switch the information displayed on the OLED by pressing the button

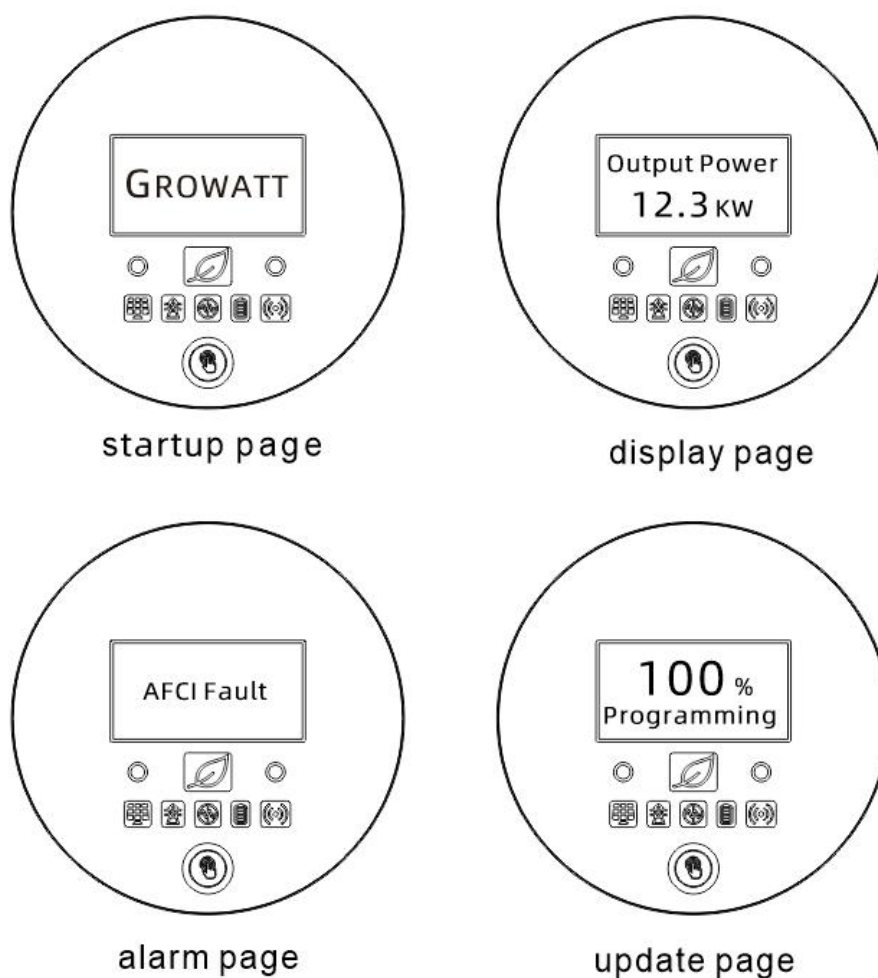
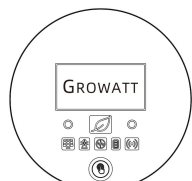
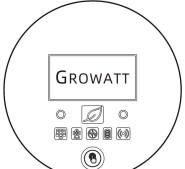


Fig 8.2 User interfaces

Table 8.2 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
	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 is upgrading or the USB interface is reading and writing data
	Steady red	External communication fails, or a system fault occurs
	Displays critical system information. Users can call up and switch the interface by tapping the button. 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.; After 3s, the system, PV, grid, off-grid, battery and communication indicators are steady green for 8s.	

8.2 Troubleshooting

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

8.2.1 Warning

Warnings indicate abnormal situations of WIT 50-125K-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 8.3:

Table 8.3 Warning codes

Warning	Description	Suggestion
Warning 200	String fault	1.After shutdown,Check the panel is normal. 2.If error message still exists, contact manufacturer.

Warning 201	String PID quick connect terminal detection error	1.After shutdown,Check the string terminal wiring. 2. If the error message still exists, contact the manufacturer.
Warning 202	DC SPD function abnormal	1.After shutdown,Check the DC SPD. 2.If error message still exists,contact manufacturer.
Warning 203	PV Circuit short	1: Check the PV1 or PV2 wiring is short-circuited 2: If error message still exists,contact manufacturer.
Warning 204	Dryconnect function abnormal	1.After shutdown,Check the dry Dryconnect wiring. 2.If the error message still exists, contact manufacturer.
Warning 205	PV Boost driver broken	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Warning 206	AC SPD function abnormal	1.After shutdown,Check the AC SPD. 2.If error message still exists,contact manufacturer.
Warning 207	U disk over-current protection	1: unplug the U disk 2: Re-access U disk after shutdown 3.If the error message still exists, contact manufacturer.
Warning 208	DC Fuse Open	1.After shutdown,Check fuse. 2.If error message still exists, contact manufacturer.
Warning 209	The DC input voltage is exceeding the maximum tolerable value.	1.Immediately disconnect the DC switch and check the voltage 2:.If the fault code still exists after the normal voltage is restored, contact manufacturer

Warning 210	PV Reversed	1:Check PV input terminals 2:If error message still exists,contact manufacturer.
Warning 217	BDC Abnormal	1:Restart inverter. 2:If error message still exists,contact manufacturer.
Warning 218	BDC Bus Disconnect	1:Restart inverter. 2:If error message still exists,contact manufacturer.
Warning 219	PID function abnormal	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Warning 220	Sting Disconnect	1.Check string Connect is normal 2.If error message still exists,contact manufacturer.
Warning 221	Sting Current Unbalance	1.Check Pv panel is normal. 2.If error message still exists,contact manufacturer.
Warning 300	No Utility	1. Please confirm grid is lost or not. 2.If error message still exists,contact manufacturer.
Warning 301	Grid voltage outrange	1.Check the AC voltage is in the range of standard voltage in specification. 2. If error message still exists,contact manufacturer.
Warning 302	Grid frequency outrange	1.Check the frequency is in the range of specification or not. 2.If error message still exists,contact manufacturer.
Warning 303	EPS mode, over load	1.Please reduce the load of EPS output. 2.If error message still exists,contact manufacturer.
Warning 304	CT Open or Wrong	1: Check if AC current sensor is connected well

		2: If error message still exists,contact manufacturer.
Warning 305	CT line reversed or Ground fail	1: Check the L line and N line of SP-CT is reversed or not. 2: If error message still exists,contact manufacturer.
Warning 306	Communication fault, M3 didn't receive SP-CT data	1: Check communication wire 2: If error message still exists,contact manufacturer.
Warning 307	Communication fault	1: Check communication wire 2: If error message still exists,contact manufacturer.
Warning 308	Meter Open or Wrong	1: Check if Meter is connected well 2: If error message still exists,contact manufacturer.
Warning 309	Meter line reversed or Ground fail	1: Check the L line and N line of Meter is reversed or not. 2: If error message still exists,contact manufacturer.
Warning 310	NE abnormal	1.Check PE,to ensure that the PE line contact good. 2.If error message still exisits,contact Manufacturer
Warning 311	Sequence Err	No operation is required, the PCS automatically adjusts the phase sequence
Warning 313	Abnormal generator condition	1.Check the generator status. 2. If the error message persists, please contact Growatt support.
Warning 400	Fan function abnormal	1.After shutdown,Check the fan connection. 2. replace the fan. 3. If the error message still exists, contact manufacturer.

Warning 401	Meter abnormal	1: Check if the meter is on 2: Check the machine and the meter connection is normal
Warning 402	Optimizer and inverter communication is abnormal	1. Check if the optimizer is on. 2. Check whether the connection between the optimizer and the inverter is normal.
Warning 403	String communication	1.After shutdown,Check the string panel wiring. 2. If the error message still exists, contact manufacturer .
Warning 404	EEPROM abnormal.	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Warning 405	DSP and COM firmware version unmatched	1.Check the firmware version. 2.If error message still exists,contact manufacturer.
Warning 406	Boost module error	1.Restart inverter 2.If error message still exists, contact manufacturer.
Warning 407	NTC Temperature too high or NTC is broken	1.Restart inverter 2.If error message still exists, contact manufacturer.
Warning 408	NTC Broken	1.Restart inverter 2.If error message still exists, contact manufacturer.
Warning 409	Reactive power scheduling No response warning	1.Check if shinemaster is open 2.If error message still exists, contact manufacturer.
Warning 410	CPU Run abnormal	1.Restart inverter 2.If error message still exists, contact manufacturer.
Warning 411	synchronization signal Abnormal	1、 check the synchronizing signal is abnormal. 2.If error message still exists, contact

		manufacturer.
Warning 412	The grid-connected startup condition of the inverter is not met	1. Check whether the grid voltage is out of range or whether the grid-connected voltage setting of the inverter is correct; 2. Check whether the PV voltage is too high or too low; 3. Check battery voltage and the BMS EOD voltage setting; 4. Check battery BMS is OK; 5. Check off-grid setting; 6. Check M3 and DSP versions; 7. Restart the inverter. If error message still exists, contact manufacturer.
Warning 501	Battery terminal open (only for lithium battery)	1: Check the battery is connected 2: If error message still exists, contact manufacturer.
Warning 502	Battery Voltage high	1. Check the voltage of battery is in the range of specification or not. 2. Check the battery connection is right or not. 3. If error message still exists, contact manufacturer.
Warning 503	Battery Voltage Low	1. Check the voltage of battery is in the range of specification or not. 2. Check the battery connection is right or not. 3. If error message still exists, contact manufacturer.
Warning 504	Battery terminals reversed	1: Check the positive and negative of battery is reversed or not. 2: If error message still exists, contact manufacturer.
Warning 505	Lead-acid battery temperature sensor was open	1. Check the temperature of lead-acid battery is installed or not..

		2. Check the temperature of lead-acid battery is connected well or not. 3: If error message still exists, contact manufacturer.
Warning 506	Battery temperature outrange	1: Check the environment temperature of battery is in the range of specification or not. 2: If error message still exists, contact manufacturer.
Warning 507	BMS failure and neither charge and discharge is allowe	1: Depend on BMS error code 2: If error message still exists, contact manufacturer.
Warning 508	Lithium battery Over Load Fault	1: Check whether output load over Lithium battery rate power; If load too large, please reduce load 2: If error message still exists, contact manufacturer.
Warning 509	BMS Battery Msg Failure	1. Restart inverter 2. If error message still exists, contact manufacture.
Warning 510	BAT SPD function abnormal	1. After shutdown, Check the BAT SPD. 2. If error message still exists, contact manufacturer.
Warning 600	DCI bias abnormal	1. Restart inverter. 2. If error message still exists, contact manufacturer.
Warning 601	DC Voltage High Fault	1. Restart inverter. 2. If error message still exists, contact manufacturer.
Warning 602	Off-grid output voltage is too low	1. Restart inverter 2. If error message still exists, contact manufacturer.
Warning 603	The off-grid output voltage is too high	1. Restart inverter 2. If error message still exists, contact

		manufacturer.
Warning 604	The off-grid output current is overcurrent	1.Check whether the load exceeds the inverter specification 2.Restart inverter,If error message still exists,contact manufacturer.
Warning 605	The off-grid Bus voltage is too low	1.Check whether the load exceeds the inverter specification 2.Restart inverter,If error message still exists,contact manufacturer.
Warning 606	The off-grid output is overloaded	1.Check whether the load exceeds the inverter specification 2.Restart inverter,If error message still exists,contact manufacturer.
Warning 607	Abnormal communication alarm with off-grid box	1.Check and off-grid box communication wiring after shutdown. 2.If error message still exists,contact manufacturer.
Warning 608	Off-grid box abnormal alarm	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Warning 609	Balance Circuit OverLoad	1.Reduce unbalanced loads 2.If error message still exists,contact manufacturer.
Warning 700	The off-grid box fan is faulty	1.Check the fan wiring after powering it down. 2.If error message still exists,contact manufacturer.
Warning 701	The generator started abnormally	1.Check the generator and wiring after shutdown. 2.If error message still exists,contact manufacturer.
Warning 800	The ambient temperature /SPS temperature is too high	1. Check whether the fan is abnormal. 2. Check whether the PID box is properly

		installed. 3. Check whether the air inlet and outlet of the PID box are unblocked. 4. If the fault persists, contact the manufacturer.
Warning 801	PID Boost input overvoltage	1: Shutdown and restart. 2: If the fault information still exists, contact the manufacturer.
Warning 802	Fan Abnormal Alarm	1. Shut down the device and check whether the fan is blocked. 2. If the fault persists, contact the manufacturer.

8.2.2 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 8.4 Error codes

Error Code	Description	Suggestion
Error 200	AFCI Fault	1.After shutdown,Check the panel terminal. 2.Restart inverter. 3.If error message still exists,contact manufacturer.
Error 201	Leakage current too high.	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 202	The DC input voltage is exceeding the maximum tolerable value.	1.Immediately disconnect the DC switch and check the voltage 2:..If the fault code still exists after the normal voltage is restored, contact manufacturer
Error 204	PV Reversed	1.After shutdown,Check the inverter terminal. 2.Restart inverter. 3.If error message still exists,contact manufacturer.

Error 300	AC V Outrange	1.Check grid voltage. 2.If the error message still exists despite the grid voltage being within the tolerable range, contact manufacturer.
Error 301	AC terminals reversed	1:Check AC terminals 2:If error message still exists,contact manufacturer.
Error 302	No AC Connection	1.After shutdown,Check AC wiring. 2.If error message still exists,contact manufacturer.
Error 303	NE abnormal	\
Error 304	AC F Outrange	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 305	Over Load Fault	1.Check whether output load over range; If load too large, please reduce load 2.If error message still exists, contact manufacturer.
Error 306	CT LN Reversed	1: After shutdown, Check the SP-CT connection. 2: If error message still exists,contact manufacturer.
Error 307	Communication fault, M3 didn't receive SP-CT data	1: Check communication wire 2: If error message still exists,contact manufacturer.
Error 308	Communication fault;Pairing time too long	1: Restart pairing 2: If error message still exists,contact manufacturer.
Error 309	ROCOF Fault	1.Check grid frequency and restart inverter 2.If error message still exists,contact manufacturer.
Error 310	NE Fault	1: confirm whether the N line at the inverter side with PV negative grounding is short circuited with the ground wire, and whether the output

		side is isolated with a transformer. 2.If error message still exists,contact Manufacturer
Error 311	BackflowFail	1: After shutdown, Check the CT or meter connection. 2: If error message still exists,contact manufacturer.
Error 313	Abnormal generator condition	1. After shutdown, check the generator status. 2. If the error message persists, please contact Growatt support.
Error 400	DCI bias abnormal	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 401	DC Voltage High Fault	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 402	Output DC current too high.	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 403	Output current unbalance	1: After shutdown,Check the output current is not balanced. 2: If the error message still exists, contact manufacturer
Error 404	bus sample fault	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 405	Relay fault	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 406	Init model fault	1.Reset mode 2.If error message still exists,contact manufacturer.
Error 407	AutoTest failure	1.Restart inverter. 2.If error message still exists,contact

		manufacturer.
Error 408	NTC Temperature too high	1. .After shutdown,Check the temperature, normal restart the inverter 2. If the error message still exists, contact manufacturer
Error 409	Bus voltage abnormal	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 410	Communication board and control panel sampling battery voltage is inconsistent	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 411	Communication fault	1.After shutdown,Check communication board wiring 2. If the error message still exists, contact manufacturer
Error 412	Temperature sensor connection is abnormal	1.After shutdown,Check the temperature sampling module is connected properly 2.If the error message still exists, contact manufacturer
Error 413	IGBT drive fault	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 414	EEPROM fault	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 415	Internal power test fail (PV Power low)	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 416	Over current protected by software	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 417	System communication protocol does not match	1.Restart inverter 2.If error message still exists, contact

		manufacturer.
Error 418	DSP and COM firmware version unmatched	1.Check the firmware version. 2.If error message still exists,contact manufacturer.
Error 419	DSP software version and Hardware version unmatched	1.Check the firmware version. 2.If error message still exists,contact manufacturer.
Error 420	GFCI Module damage	1: After shutdown,Check the leakage current module 2: If the error message still exists, contact manufacturer
Error 421	CPLD is abnormal	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 422	sampling is inconsistent	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 423	AC PWM Bypass Protect	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 424	INV current abnormal	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 425	AFCI self-test fault	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 426	Communication board and control panel sampling battery voltage is inconsistent	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 427	Communication board and control panel sampling battery voltage is inconsistent	1.Restart inverter 2.If error message still exists, contact manufacturer.

Error 428	BOOST Short Out	contact manufacturer.
Error 429	Bus voltage softstart fail	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 430	EPO Fault	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 431	Monitoring chip BOOT verification failed	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 432	The system battery model is not compatible	1.Replacing the System Battery Model 2.If error message still exists, contact manufacturer.
Error 433	The system battery software is not compatible	1.Update the System Battery Software 2.If error message still exists, contact manufacturer.
Error 434	High frequency synchronization fault	1.Check High frequency synchronization cable after shutdown 2.If error message still exists,contact manufacturer.
Error 435	System config fault	1.Check system config after shutdown 2.If error message still exists,contact manufacturer.
Error 436	Incompatible parameter settings	1. Check if the parameter settings of the parallel equipment are consistent. 2. Restart the inverter. 3. If the error message persists, please contact Growatt support.
Error 437	Incompatible serial number settings	1. Check if the serial number of the parallel equipment are consistent. 2. Restart the inverter. 3. If the error message persists, please contact Growatt support.

Error 500	BMS Communication fault	1.Check 485 cable between SP and battery 2.Check if battery is sleeping 3.If error message still exists,contact manufacturer.
Error 501	BMS failure and neither charge and discharge is allowe	1: Depend on BMS error code 2: If error message still exists,contact manufacturer.
Error 502	Battery voltage low	1: Check battery voltage 2: If error message still exists,contact manufacturer.
Error 503	Battery Voltage High	1: Check whether the battery volttagge too high; if battery OK, please restart the inverter; if not, please replace battery 2: If error message still exists,contact manufacturer.
Error 504	Battery temperature out of specified range for charge or discharge	1.Check battery temperature 2.If error message still exists,contact manufacturer.
Error 505	Battery terminals reversed	1:Check battery terminals 2:If error message still exists,contact manufacturer.
Error 506	Battery terminal open (only for lithium battery)	1:Check battery terminal 2:If error message still exists,contact manufacturer.
Error 507	Lithium battery Over Load Fault	1: Check whether output load over Lithium battery rate power; If load too large, please reduce load 2: If error message still exists, contact manufacturer.
Error 508	BUS2 Volt Abnomal	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 509	Bat Charge Ocp	1、 Check whether the PV voltage is overconfigured

		2.If error message still exists,contact manufacturer.
Error 510	Bat DisCharge Ocp	1、 Check whether the battery discharge current is properly set 2.If error message still exists,contact manufacturer.
Error 511	BatSoftStartFault	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 512	BatUncontrolledRectification	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 600	EPS OP Short Fault	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 601	Bus low	1、 Check whether the battery works properly 2.If error message still exists,contact manufacturer.
Error 602	AC port volt Abnormal	1、 Check whether the AC port has voltage 2.If error message still exists,contact manufacturer.
Error 603	Soft start run out of time	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 604	Off-grid output voltage is too low	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 605	Balance Circuit fault	1.Restart inverter 2.If error message still exists, contact manufacturer.
Error 606	DC Voltage High Fault	1.Restart inverter. 2.If error message still exists,contact manufacturer.
Error 607	EPS output over load	1.Restart inverter.

		2.If error message still exists,contact manufacturer.
Error 608	OfflineSignError	1、 Check offline parallel signle 2.If error message still exists,contact manufacturer.
Error 609	The off-grid box is not detected	1.Check the off-grid box after shutdown to identify the signal wiring 2.If error message still exists,contact manufacturer.
Error 610	The off grid split phase voltage is abnormal	1、 Powering off the System, Check whether the control relay of off-grid box split phase transformer is abnormal 2. Restart the system. If the fault persists, contact the manufacturer
Error 700	Abnormal communication with the inverter	1.Check and communicate with the inverter after shutdown 2.If error message still exists,contact manufacturer.
Error 701	Off-grid box grid-side relay failure	1.Restart the off-grid box 2.If error message still exists,contact manufacturer.
Error 702	Off-grid box generator access relay fault	1.Restart the off-grid box 2.If error message still exists,contact manufacturer.
Error 703	Off-grid boxes are overloaded	1.Restart the off-grid box 2.If error message still exists,contact manufacturer.
Error 704	Off-grid boxes are overloaded off-grid split-phase	1.Reduce the load 2.If error message still exists,contact manufacturer.
Error 705	Overheat inside the off-grid box	1.Restart the off-grid box 2.If error message still exists,contact manufacturer.
Error 800	PID communication fault	1.After shutdown, adjust the communication

		sequence between Master2.0; 2.Check the configurations of Master2.0 port 485.
Error 801	PID output overcurrent	1.Check whether PID output is short circuit after shutdown. 2.If the fault information still exists, contact the manufacturer.
Error 802	PID output overvoltage	1. Turn off the AC switch immediately and check whether the PID connection is abnormal. 2. After the restart, if the fault persists, contact the manufacturer.
Error 803	SPS Input overvoltage	1. Check the power grid voltage. 2. If the power grid voltage is restored to the permissible range and the fault persists, contact the manufacturer.
Error 804	AC overvoltage/AC undervoltage	1. Check the power grid voltage. 2. If the power grid voltage is restored to the permissible range and the fault persists, contact the manufacturer.

9 System Maintenance

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. Wipe the dust off the chassis and clean the chassis with a moistened cloth.
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- 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. 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 from performance de-rate due to excess heat. The fan in the WIT 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.
- 3>The installation position of the WIT is not well-ventilated. Select an appropriate installation position that meets the basic installation requirements.

Cleaning and replacing the fan:

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

Remove the fan fixing plate using a cross-head screwdriver, as shown in Fig 9:

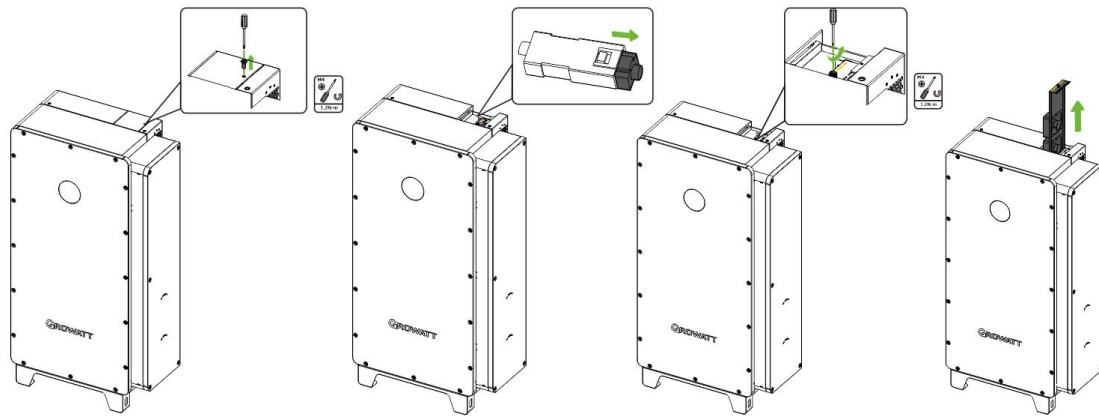


Fig 9 Position of the fan fixing plate

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.

10 Product Specifications

Model	WIT 50K -XHU(t)	WIT 63K-XHU	WIT 75K-XHU	WIT 85K-XHU	WIT 99.9K-XHU	WIT 100K-XHU	WIT 125K-XHU
Input data(PV)							
Max. recommended PV power	100kW	126kW	150kW	170kW	200kW	200kW	250kW
Max. DC voltage	1100V						
Start voltage	195V						
Max. open circuit voltage of PV	1000V						
MPPT nominal voltage /range	180V~1000V						
No. of MPP trackers	10						
No. of PV strings per MPP tracker	2						
Max. input current per MPP tracker	42						
Max.short-circuit current per MPP tracker	50						
Battery data (DC)							
Battery Type	Lithium/Lead-acid battery						
Recommended battery voltage	Not Recommended Rating						
Battery voltage range	180V~1000V(> 900V derating)						
No. of battery input	1						
Max. charging/ discharging current	200A						
BMS communication	RS485/CAN						
Input AC (GRID)							
AC input nominal power	50kW	63kW	75kW	85kW	99.9kW	100kW	125kW
Max. AC input apparent power	55kVA	69.3kVA	82.5kVA	93.5kVA	99.9kW	110kVA	137.5kVA
Nominal AC voltage/range	380/400/415V,-15%~+10%						
AC grid connection type	3P3W+PE/3P4W+PE						
Nominal AC grid Frequency range	50/60Hz,45-55Hz/55-65Hz						
Max. Input current	250A						
Input AC (GEN)							
AC nominal power	50kW	63kW	75kW	85kW	99.9kW	100kW	125kW
Max. input current(GEN/AC Couple)	55kVA	69.3kVA	82.5kVA	93.5kVA	99.9kW	110kVA	137.5kVA
Nominal AC grid Voltage range	380/400/415V,-15%~+10%						
Model	WIT 50K -XHU(t)	WIT 63K-XHU	WIT 75K-XHU	WIT 85K-XHU	WIT 99.9K-XHU	WIT 100K-XHU	WIT 125K-XHU

AC connection type	3P3W+PE/3P4W+PE						
Nominal AC grid Frequency range	50/60Hz,45-55Hz/55-65Hz						
Max. Input current	250A						
AC Output (GRID)							
AC output nominal power	50kW	63kW	75kW	85kW	99.9kW	100kW	125kW
Max. AC output apparent power	55kVA	69.3kVA	82.5kVA	93.5kVA	99.9kW	110kVA	137.5kVA
Max. output current	83.3A	105A	125A	141.7A	151.4A	166.7A	208.3A
Nominal AC voltage/range	380/400/415V,-15%~+10%						
AC connection type	3P3W+PE/3P4W+PE						
Nominal AC grid Frequency range	50/60Hz,45-55Hz/55-65Hz						
Adjustable power factor	-1...+1						
THDi	<3% (@nominal power)						
AC Output (Load)							
AC nominal output power	50kW	63kW	75kW	85kW	99.9kW	100kW	125kW
Max. AC apparent power	55kVA	69.3kVA	82.5kVA	93.5kVA	109.89kW	110kVA	137.5kVA
Max. output current	83.3A	105A	125A	141.7A	166.5A	166.7A	208.3A
Max. output current	220V/230V/240V(L-N),380V/400V/415V(L-L)						
Nominal AC grid Frequency range	50/60Hz,45-55Hz/55-65Hz						
THDv	<2% (Linear full load)						
Load unbalance factor	100% Three-phase unbalanced load						
Load connection	3P3W+PE/3P4W+PE						
Overload Capability	1.6 time of rated power, 10 S						
On/off grid transfer time	≤10ms						
Efficiency							
Max. efficiency	98.50%						
European efficiency	TBD						
Protection Devices							
PV reverse polarity protection	YES						
Battery reverse protection	YES						
AC short-circuit protection	YES						
AC/DC surge protection	Type II						
Insulation resistance monitoring	YES						
Ground fault monitoring	YES						
Grid monitoring	YES						
Model	WIT 50K -XHU(t)	WIT 63K-XHU	WIT 75K-XHU	WIT 85K-XHU	WIT 99.9K-XHU	WIT 100K-XHU	WIT 125K-XHU
Residual-current monitoring unit	YES						
Anti-islanding protection	YES						

String monitoring	YES
PID function	YES
AFCl protection	YES
General data	
Dimensions (W / H / D)	720/1360/400mm
Weight	160kg
Operating temperature range	-30 °C~60 °C (> 50°C, Derating)
Relative humidity	0~100%
Max mum operating altitude	4000m
Protection degree	IP66
Topology	Transformerless
Cooling	Smart air cooling
Display	OLED+LED/WiFi+APP
Communication RS485/ CAN/USB	RS485/CAN/USB
Interfaces: WIFI/LAN	Opt
Warranty: 5 / 10 years	Yes/Opt.

11 Decommissioning the WIT

Handle the WIT 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.

12 Warranty

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, 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.
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.
5. Unauthorized modifications or improper maintenance on the WIT.
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
2. Serial number of the WIT
3. Error code of the WIT
4. Information indicated on the LED display
5. DC input voltage and AC output voltage of the WIT
6. Communication method of the WIT

Shenzhen Growatt New Energy Co., Ltd.

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

Appendix 1 Function Introduction

1.1 Mode of WIT operation

1.1.1 Waiting Mode

When the PV voltage is greater than 180V or the battery voltage is greater than 190V, the WIT will be powered on and enters the waiting mode.

In waiting mode, the WIT 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 will attempt to turn on.

1.1.2 Operating Mode

Load First:

In Load First mode, the WIT 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 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 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.

Priority of power supplied to the loads:

1. Solar panels;
2. 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.

1.1.3 Fault Mode

The intelligent control system of the WIT monitors and adjusts the system status in real time. When the WIT detects an alarm, the corresponding status light will turn red and the OLED will display the alarm. When the WIT 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.

1.1.4 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 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.

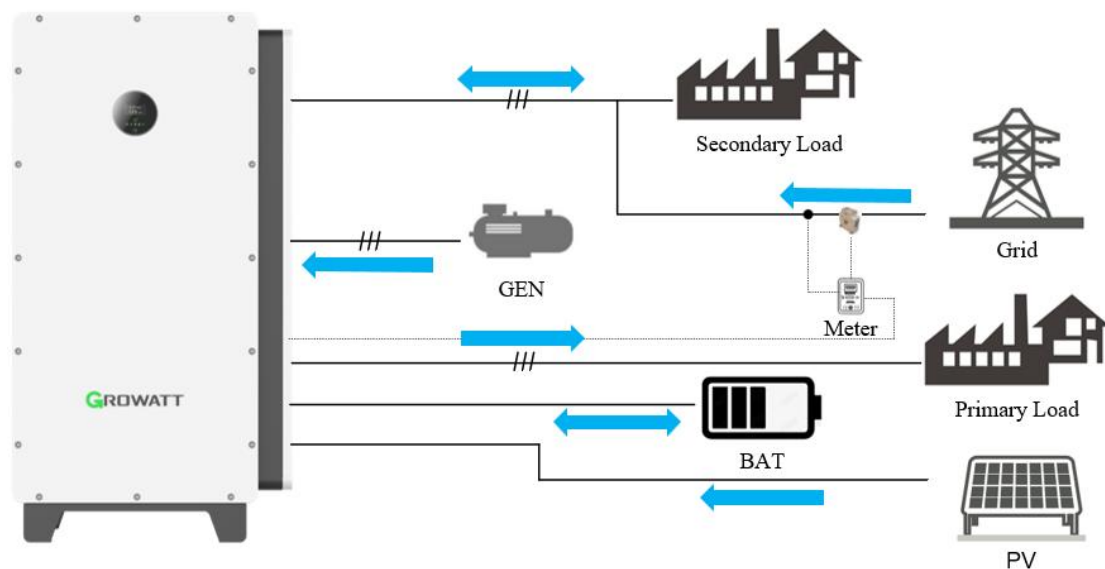
NOTE:

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

1.2 Zero export Function

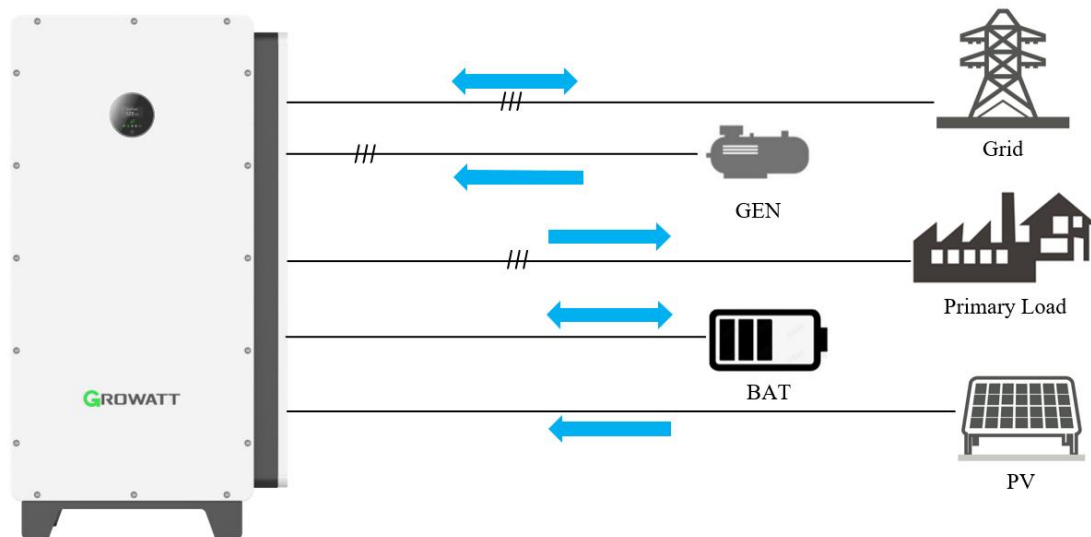
1.2.1 Zero export to meter

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.



1.2.2 Zero export to GRID

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



1.3 GEN Port Operation Mode

1.3.1 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 6.3.

1.3.2 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 and generating power. The wiring method is shown in Chapter 6 Fig 6.2.

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

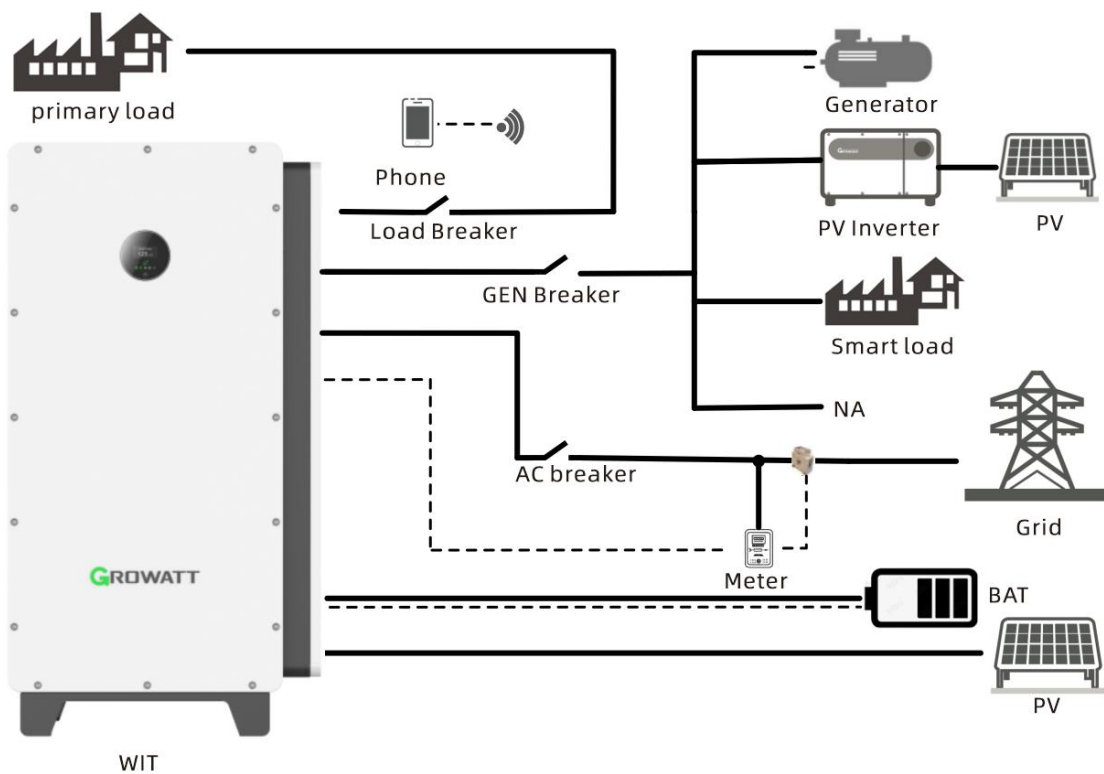


Table1.1 Introduction to GEN Port Multiplexing

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 $\leq 50\%$, the smart load will be cut off.
NA	No external device	\

1.4 Self-consumption:

Self-consumption:

the WIT 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.

1.5 Grid Peak Shaving:

Grid Peak Shaving:

By regulating the AC-side power output and battery power output of the WIT, 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 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 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.

1.6 Micro-grid (PV-ESS-DG Power System):

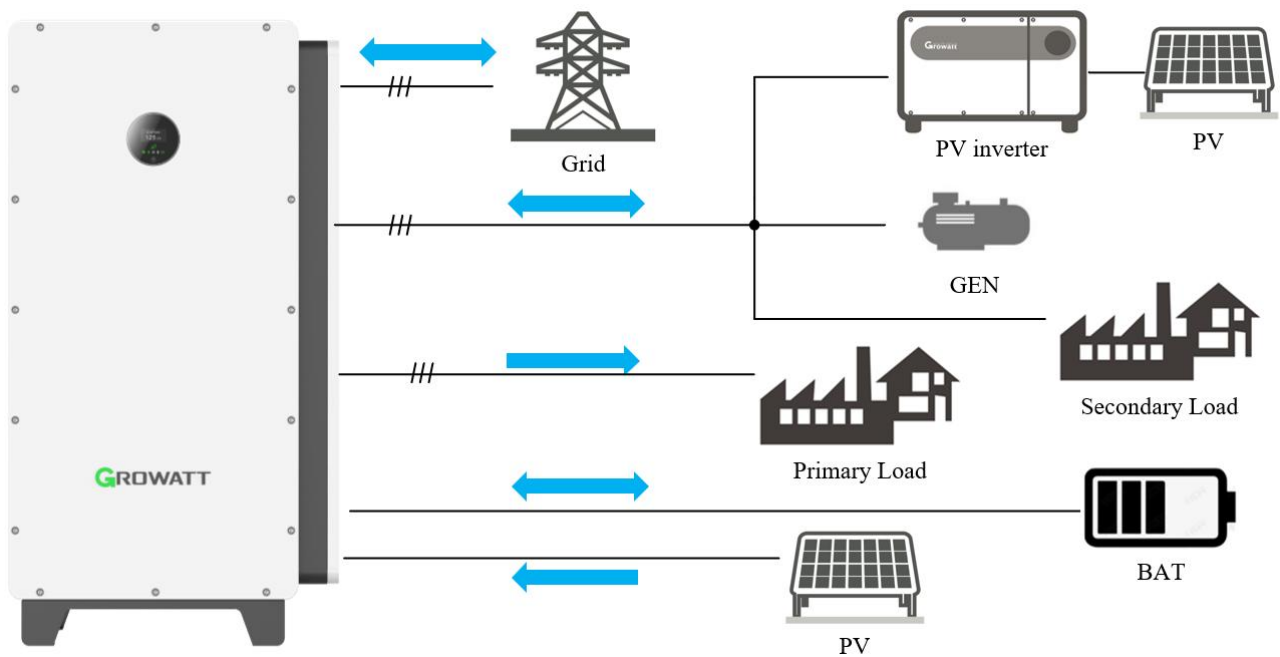
A generator is connected to the GEN port:

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

1. The solar power of the WIT is supplied to the loads first, and the surplus power is sent to charge the battery.
2. If the solar power of the WIT 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.



1.7 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.