

WIT 28-55K-US L2 Storage/Hybrid Inverter User Manual

Contents

1 Notes on this manual 1

1.1 Introduction 1

1.2 Target Group 1

1.3 Product Range 1

2 Safety Precautions 2

2.1 Safety Instructions 2

2.2 Symbol Conventions 4

2.3 Label Description 5

3 Product Description 6

3.1 Overview 6

3.2 Basic Data 10

3.3 Nameplate 12

3.4 Operating Principle 13

3.4.1 Operating Principle of WIT 28-55K-A-US L2 13

3.4.2 Operating Principle of WIT 28-55K-H-US L2 13

3.4.3 Operating Principle of WIT 28-55K-AU-US L2 14

3.4.4 Operating Principle of WIT 28-55K-HU-US L2 14

3.5 Storing the WIT Inverter 15

3.6 Supported Grid Types 15

3.7 AFCI Function 15

3.7.1 AFIC function description 15

3.7.2 Clearing the alarm 16

3.8 Anti-PID Function 17

4 Inspection upon delivery 18

5 Installation 20

5.1 Basic Installation Requirements 20

5.2 Installation Environment Requirements 21

5.3 Moving the WIT Inverter 22

5.4 Mounting the WIT Inverter 23

6 Electrical Connection 25

6.1 Connecting the Ground Cables 29

6.2 Connection on the AC Side 30

6.3 Connection on the PV Side 33
6.4 Connection on the Battery Side 35
6.4.1 Connecting the Main Power Cable of the Battery 36
6.4.2 Connecting the Battery BMS-AC Terminal 37
6.5 Connecting Communication Cables 37
6.5.1 Battery Communication Connection 37
6.5.2 External Communication Connection 39
6.5.3 Parallel Communication Connection 41
6.5.4 Monitoring Device Terminal 44
6.5.5 DRMS Port 45
6.5.6 Rapid Shutdown Device (RSD) 46
6.6 Post-installation Checks 47
7 Commissioning 50
7.1 Powering on/off the System 50
7.2 Commissioning the WIT Inverter 51
7.2.1 Set the Communication Address 51
7.2.2 Set the Time and Date 51
7.3 Mode of operation 52
7.3.1 Waiting Mode 52
7.3.2 Operating Mode 53
7.3.3 Fault Mode 54
7.3.4 Shutdown Mode 54
7.4 LED and OLED Display Panel 54
8 Monitoring 58
8.1 Remote Monitoring 58
8.1.1 Connect the WIT inverter to the internet on ShineTools 58
8.1.2 Remote Monitoring on the APP (ShinePhone) 61
8.1.3 Remote Monitoring on the ShineServer Webpage 77
9 System Maintenance 98
9.1 Routine Maintenance 98
9.1.1 Clean the Chassis 98
9.1.2 Fan Maintenance 98
9.2 Troubleshooting 100

9.2.1 Warning 100
9.2.2 Error 108
10 Product specifications 117
Table 10.1 WIT 28/35/40/55K-A-US L2 specification 117
Table 10.2 WIT 28/35/40/55K-H-US L2 specification 120
Table 10.3 WIT 28-55K-AU-US L2 specification 124
Table 10.4 WIT 28-55K-HU-US L2 specification 127
11 Decommissioning the WIT Inverter 131
12 Warranty 132
12.1 Conditions 132
12.2 Disclaimer 132
13 Contact Us 133

1 Notes on this manual

1.1 Introduction

This manual is intended to introduce the WIT 28-55K-US L2 Storage/Hybrid Inverters manufactured by Shenzhen Growatt New Energy Co., Ltd. (hereinafter referred to as Growatt) in terms of their installation, operation, commissioning, maintenance and troubleshooting. Please read this manual carefully before using the product and keep it in a convenient place for further reference. The content of this manual is continually reviewed and amended, where necessary. Growatt reserves the right to make changes to the material at any time and without notice.

Note:
"WIT" refers to the product name. "28-55K" refers to the power range. The WIT inverters include both Storage Inverter models and Hybrid Inverter models.

1.2 Target Group

This document is intended for qualified technicians. Only qualified and well-trained technicians are allowed to install and operate the WIT inverter. Should any questions arise during installation, you can visit www.growatt.com to leave a message, or call our 24-hour service hotline at 866-686-0298.

1.3 Product Range

The WIT 28-55K-US L2 (208V/220V) inverters consist of four models, each offering four power options: 28kW, 35kW, 40kW, and 55kW. In total, there are 16 products available in this series. This manual is valid for the following models:

Table 1.1 WIT 28-55K-US L2 Series Models Product model introduction

WIT 28K-A-US L2	Three-phase Storage Inverter	WIT 28K-H-US L2	Three-phase Hybrid Inverter
WIT 35K-A-US L2		WIT 35K-H-US L2	
WIT 40K-A-US L2		WIT 40K-H-US L2	
WIT 55K-A-US L2		WIT 55K-H-US L2	
WIT 28K-AU-US L2	Three-phase Storage Inverter with UPS function	WIT 28K-HU-US L2	Three-phase Hybrid Inverter with UPS function
WIT 35K-AU-US L2		WIT 35K-HU-US L2	
WIT 40K-AU-US L2		WIT 40K-HU-US L2	
WIT 55K-AU-US L2		WIT 55K-HU-US L2	

Safety Precautions 2

2.1 Safety Instructions

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

Transportation:

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

Installation:

 **NOTICE**	• Please read this manual carefully before installation. Damages caused by failure to observe instructions specified in this manual are not covered under any warranty.
 **DANGER**	• Do not connect any cables before installation.
 **WARNING**	• Please observe the installation instructions specified in this manual, including the installation environment and clearance requirements. • Install the WIT Inverter 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 DC switches of the WIT Inverter are OFF, and turn off the switch and breaker on the AC side and the battery side. Otherwise, high voltages may cause severe injuries. • 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 Inverter 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 Inverter 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 Inverter. • Ensure the correct polarity of the terminals before connecting the PV array to the WIT Inverter.

Maintenance and replacement:

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

Others:

	• Upon receiving the product, check if the contents are intact and complete. If any damage is found or any component is missing, please contact your distributor.
WARNING	• The maximum PV input voltage cannot exceed 1100V. The battery input voltage cannot exceed 1000V. • For the WIT Inverter that will not be put into operation in the future, you should properly dispose of them by yourself.

2.2 Symbol Conventions

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

2.3 Label Description

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

Product Description 3

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

3.1 Overview

Front view:

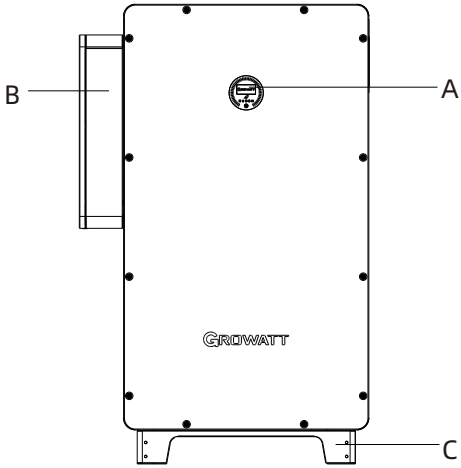


Fig 3.1 Front view

Bottom view:

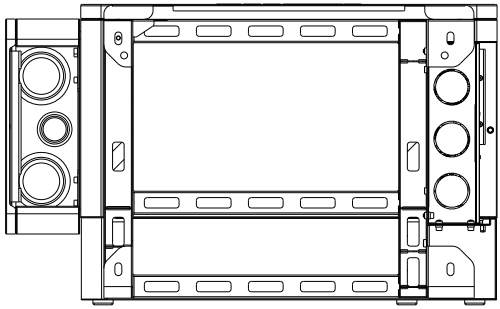


Fig 3.2 Bottom view

Left view:

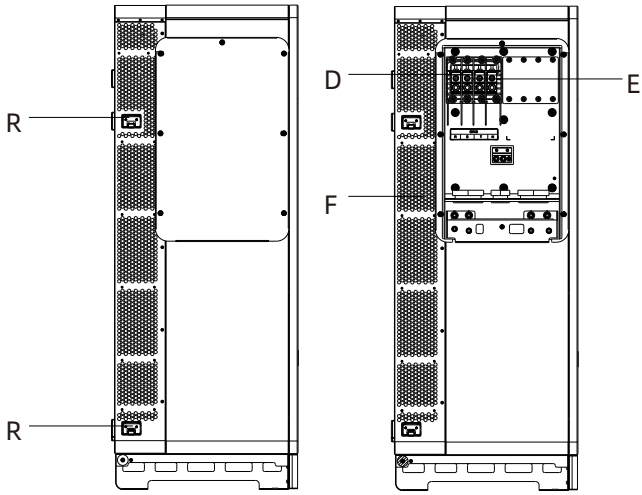


Fig 3.3 Left view of WIT 28-55K-A-US L2 and WIT 28-55K-H-US L2

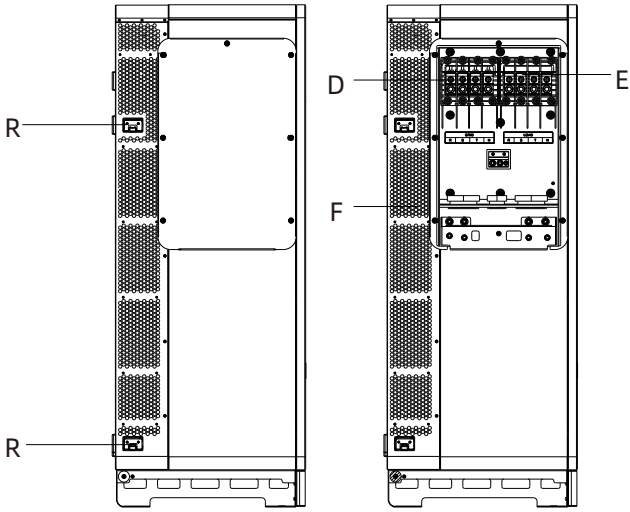


Fig 3.4 Left view of WIT 28-55K-AU-US L2 and WIT 28-55K-HU-US L2

Right view:

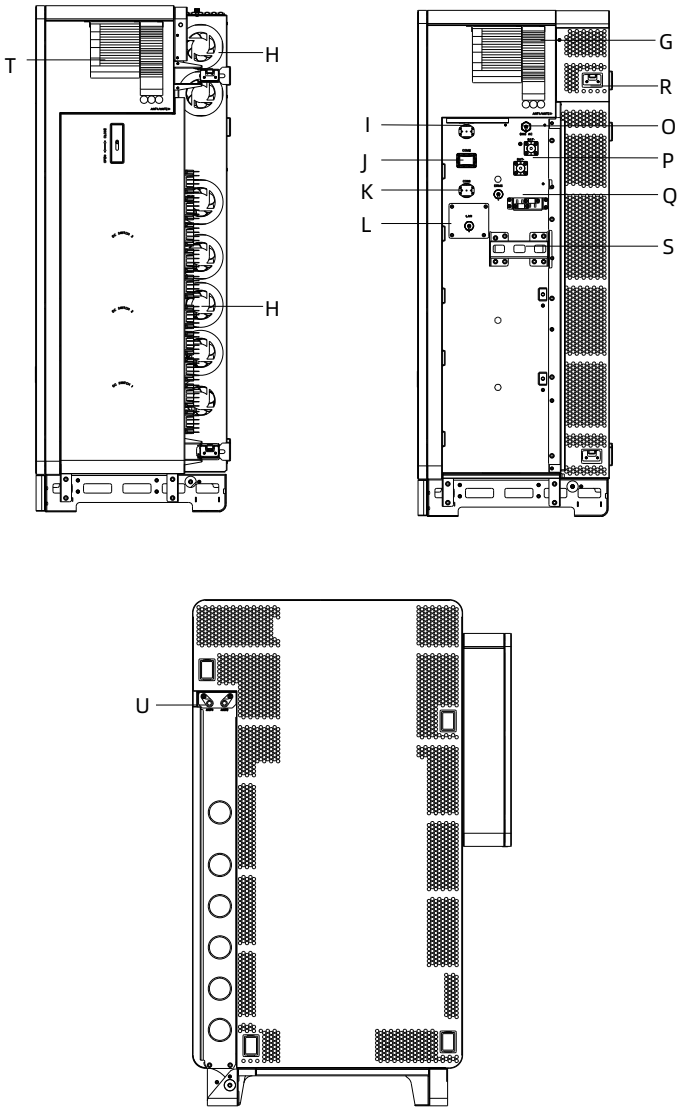


Fig 3.5 Right view of WIT 28-55K-A-US L2, WIT 28-55K-AU-US L2

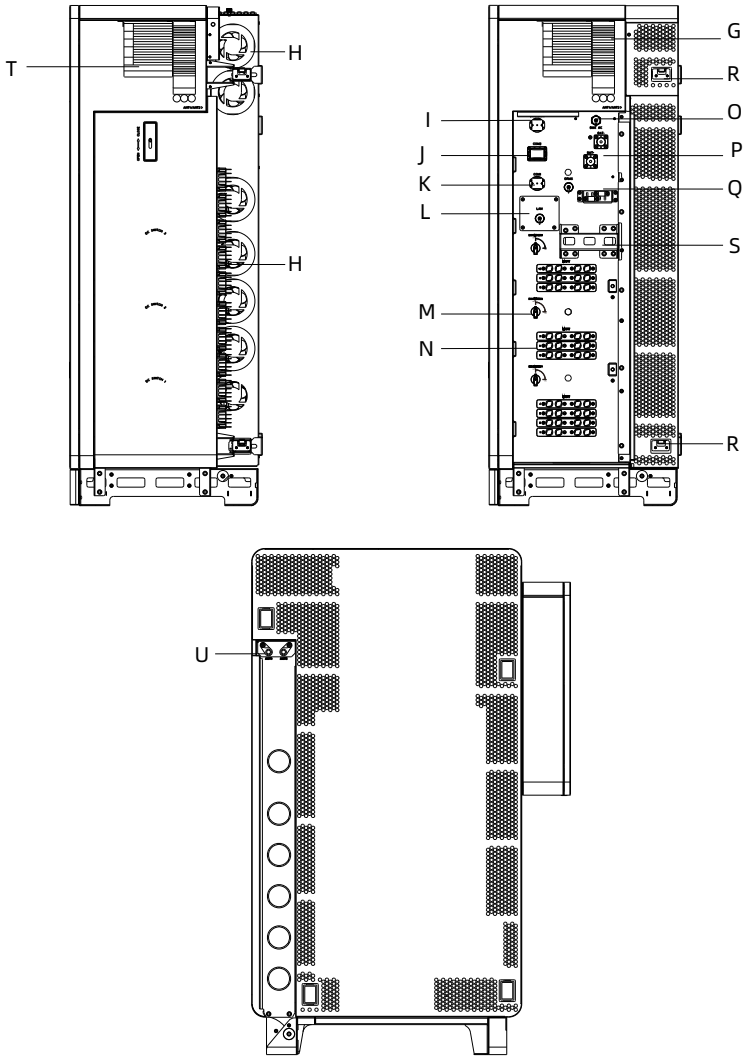


Fig 3.6 Right view of WIT 28-55K-H-US L2 and WIT 28-55K-HU-US L2

Table 3.1 Component description

No.	Description	No.	Description
A	Display	B	AC junction box
C	Base	D	Power grid connection terminal
E	Load wiring terminal	F	Heat sink
G	Nameplate	H	Fan
I	16-pin terminal(BMS COM)	J	30-pin terminal(COM2)
K	16-pin terminal(COM1)	L	Network communication port
M	DC Switch	N	PV terminal
O	Battery supply terminal(BMS AC)	P	Battery terminal
Q	DRMS port	R	Flexible handle(4 groups)
S	Fixed handle	T	Indicator description label
U	Communication port(Wifi&4G)		

3.2 Basic Data

Table 3.2 Dimensions and weight

	Model	Size(in)			Weight (Lb)
		Height	Width	Depth	
The WIT Inverter without package	WIT 28/35/40/55K-A-US L2	53.2	33.5	20.1	230/230/230/230
	WIT 28/35/40/55K-H-US L2				309/309/324/324
	WIT 28/35/40/55K-AU-US L2				317/317/317/317
	WIT 28/35/40/55K-HU-US L2				346/346/346/346
The WIT Inverter with package	WIT 28/35/40/55K-A-US L2	60.0	38.9	28.9	456/456/456/456
	WIT 28/35/40/55K-H-US L2				485/485/500/500
	WIT 28/35/40/55K-AU-US L2				494/494/494/494
	WIT 28/35/40/55K-HU-US L2				522/522/540/540

Unit: inch

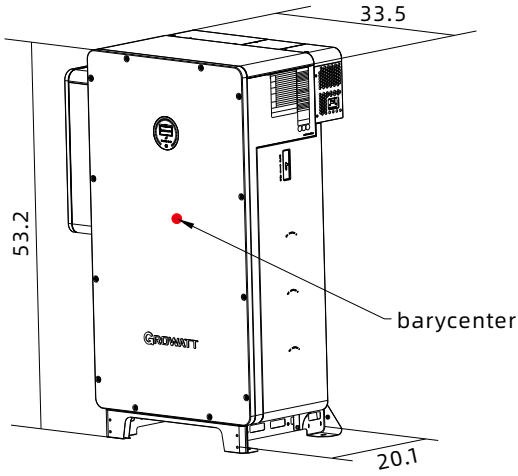


Fig 3.7

3.3 Nameplate

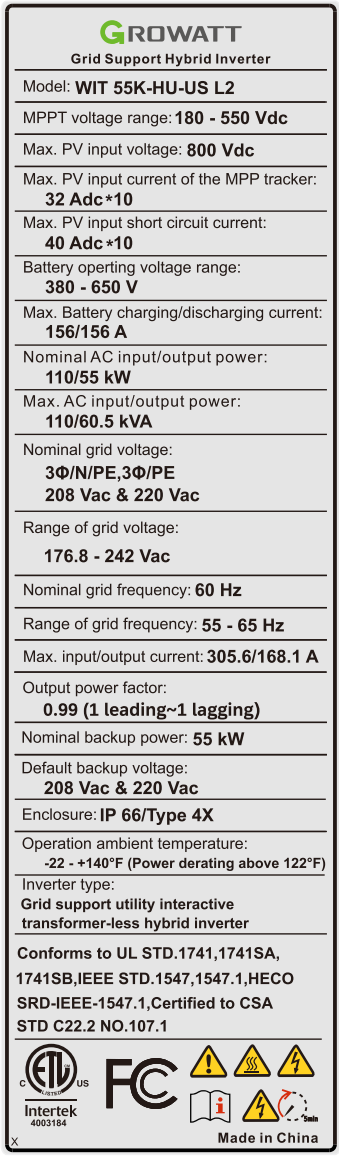


Fig 3.8 Nameplate

NOTE: The figure above shows the nameplate of WIT 55K-HU-US L2 as an example. The nameplate figure is for reference only. The actual nameplate prevails. For the specifications, please refer to Section 10 Product Specifications.

3.4 Operating Principle

3.4.1 Operating Principle of WIT 28-55K-A-US L2

1> Converts DC power into AC power consistent with the voltage and power quality requirements of the utility grid through an inverter circuit to supply power to the loads and feed power into the grid;
2> Converts AC power into DC power through a rectifying circuit to charge the battery.

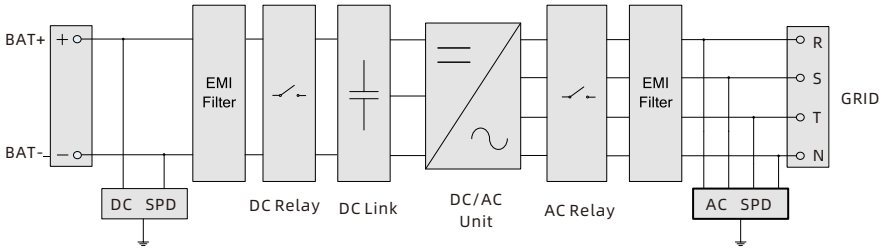


Fig 3.9 WIT 28-55K-A-US L2 Grid-connected conceptual diagram

3.4.2 Operating Principle of WIT 28-55K-H-US L2

1> The hybrid inverter receives DC inputs form the PV strings which go through the MPPT routes. The DC power is then converted to AC power through an inverter circuit to power the loads and feed power into the grid;
2> The PV strings can put out 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.

NOTE: WIT 28K-H-US L2 models have 5 MPPT routes. WIT 35K-H-US L2 models have 7 MPPT routes. WIT 40K-H-US L2 have 8 MPPT routes and WIT 55K-H-US L2 models have 10 MPPT routes.

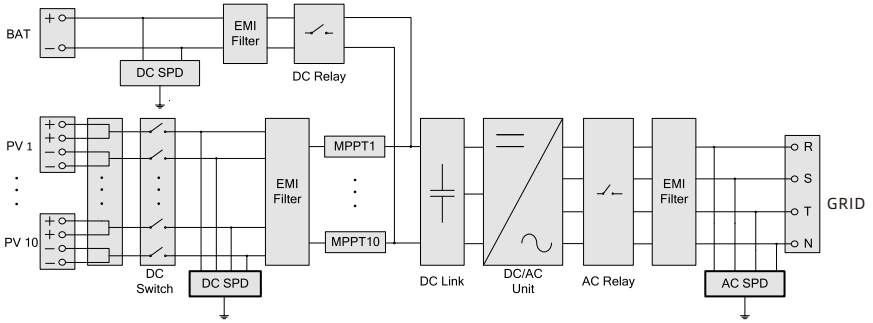


Fig 3.10 WIT 28-55K-H-US L2 Grid-connected conceptual diagram

3.4.3 Operating Principle of WIT 28-55K-AU-US L2

1> Converts battery power to AC power to power the loads and export energy to the grid;
2> Charges the battery from the grid through a rectifier circuit;
3> Converts the battery power into AC power through the inverter circuit to provide power to critical loads connected to the LOAD port.

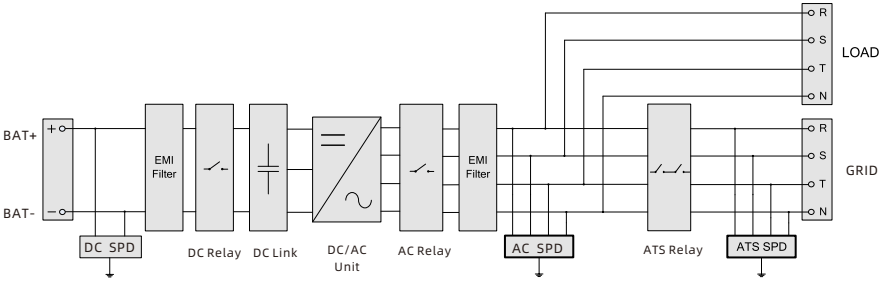


Fig 3.11 WIT 28-55K-AU-US L2 Grid-connected conceptual diagram

3.4.4 Operating Principle of WIT 28-55K-HU-US L2

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 power is fed into the grid;
2> The PV strings can supply power to charge the battery through the MPPT routes;
3> Can convert battery power to AC power supplies for the loads and feeds into the grid;
4> Charges the battery from the grid through a rectifier circuit;
5> Converts the DC power from PV strings and the battery power into AC power through the inverter circuit to power critical loads.

NOTE: WIT 28K-H-US L2 models have 5 MPPT routes. WIT 35K-H-US L2 models have 7 MPPT routes. WIT 40K-H-US L2 have 8 MPPT routes and WIT 55K-H-US L2 models have 10 MPPT routes.

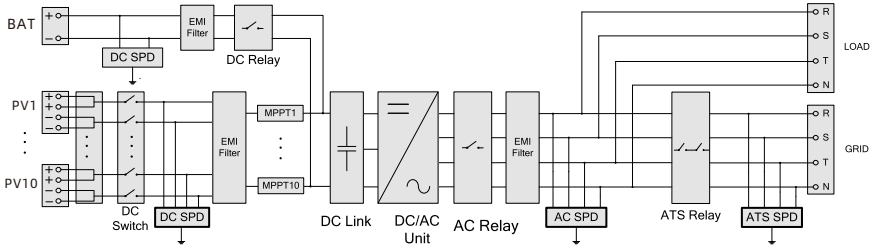


Fig 3.12 WIT 28-55K-HU-US L2 Grid-connected conceptual diagram

3.5 Storing the WIT Inverter

1> Place the WIT Inverter in the original package and store it in a dry and well-ventilated place.
2> Keep the storage temperature from -22°F to +158°F and the humidity from 0%-95% RH.
3> A maximum of three WIT Inverters can be stacked. Do not stack the inverters without packaging.
4> If the WIT Inverter has been long-term stored, inspections and tests should be conducted by qualified personnel before installation.

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

3.6 Supported Grid Types

Grid connection modes for WIT 28-55K-US L2 Storage/Hybrid Inverters are shown in Fig 3.12.

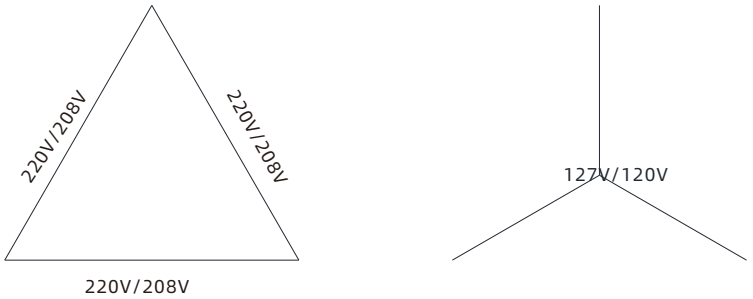


Fig 3.13 208V/220V system(type Y/△)

3.7 AFCI Function

3.7.1 AFCI function description

An AFCI, or Arc-Fault Circuit Interrupter, is a solution designed to detect and mitigate the risk of electrical arcing in a photovoltaic (PV) system, supported by an 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 system components. The AFCI continuously monitors the system for potential arc faults and if detected, interrupts the circuit to prevent a fire or other damage. AFCIs are required by the National Electrical Code (NEC) in certain parts of a PV system, such as the DC side of the inverter, to improve safety and reduce the risk of fires.

NOTE:

1. The AFCI function of the WIT Inverter is enabled by default.
2. Do not wire the Maximum Power Point Trackers (MPPTs) on the DC side in parallel as it might trigger the AFCI mistakenly.

3.7.2 Clearing the alarm

In the event that the WIT Inverter reports "Error 200" and the PV indicator turns red, an arc fault might have been detected. Please perform the following steps to clear the alarm.

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

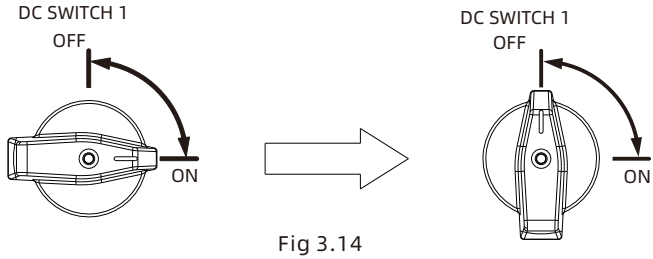


Fig 3.14

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.

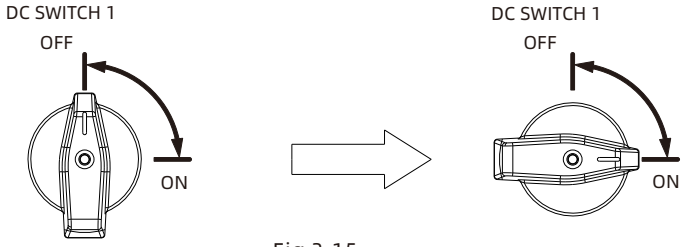


Fig 3.15

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

3.8 Anti-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 Anti-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.

Inspection upon delivery 4

Unpacking and inspection

1. Before unpacking the WIT Inverter, check the shipping box for any externally visible damage. If damage is found, contact the shipping company as soon as possible.
2. After unpacking the WIT Inverter, check if the scope of delivery is intact and complete. If any damage is found or any component is missing, contact your distributor.

Check the following items:



Fig 4.1 Packing list of WIT 28-55K-A-US L2 and WIT 28-55K-AU-US L2

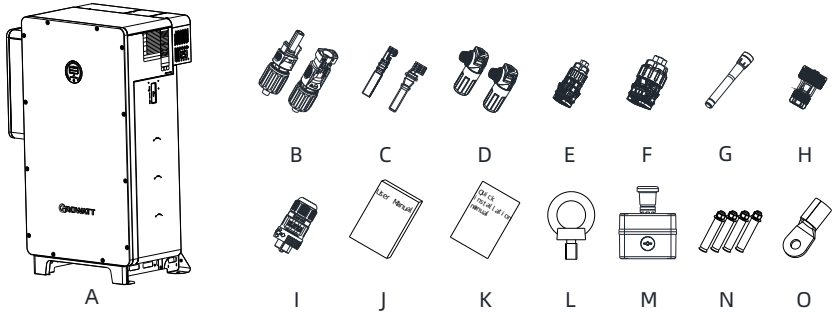


Fig 4.2 Packing list of WIT 28-55K-H-US L2 and WIT 28-55K-HU-US L2

Table 4.1 Packing list

NO.	Description	Quantity
A	The WIT Inverter	1
B	PV+connector, PV-connector	20/20
C	PV+metal contact, PV-metal contact	20/20
D	Battery+ terminal, Battery- terminal	1/1
E	16-pin terminal	2
F	30-pin terminal	1
G	Antenna	1 or 2
H	RJ45 connector protector	1 or 2
I	BMS power supply terminal	1
J	User manual	1
K	Quick installation guide	1
L	Hoist ring	2
M	RSD and accessories	1
N	Expansion bolt	4
O	Housing ground terminal	1

NOTE:

1. For the WIT 28-55K-H-US L2 and WIT 28-55K-HU-US L2 inverters please reference the table below for the list PV terminal equipment and Metal Contacts based on the inverter's size.

Inverter Model	PV Terminals	Metal Contacts
28kW Models	10 pairs	10 pairs
35kW Models	14 pairs	14 pairs
40kW Models	16 pairs	16 pairs
55kW Models	20 pairs	20 pairs

2. For remote monitoring, if the WiFi&LAN datalogger is selected, one antenna (WiFi) and two RJ45 connectors are provided; if the WiFi&4G datalogger is selected, two antennas (WiFi and 4G) and one RJ45 connector are provided.
3. Models with the RSD function are delivered with the "M" component.
4. Sturdy and durable though the packing is, please carry and handle it with caution.

5.1 Basic Installation Requirements

A. Ensure that the installation surface is solid enough to bear the weight of the WIT Inverter. (Refer to Table 3.2 for the weight of the WIT Inverter)
B. Ensure that the installation position is suitable for the dimensions of the WIT Inverter.
C. Do not install the WIT Inverter in areas with flammable or thermolabile materials.
D. The WIT Inverter is protected to IP66/Type 4X and can be installed indoors or outdoors.
E. Do not expose the WIT Inverter to direct sunlight. Otherwise, excessive temperature may lead to power reduction.
F. Keep the humidity at 0% to 95% RH.
G. Keep the ambient temperature at -13°F to +140°F.
H. The WIT inverter can only be vertically mounted on a flat ground . Please refer to the following figures:

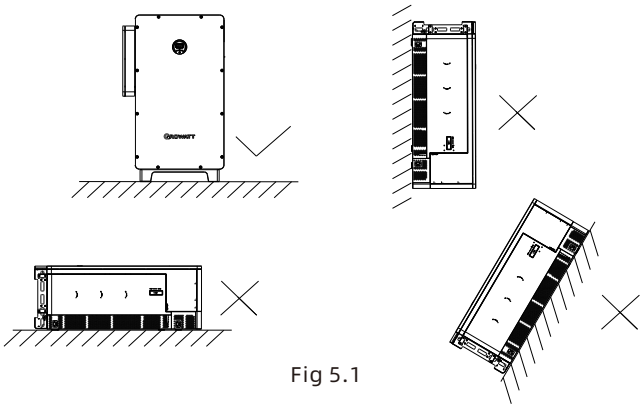


Fig 5.1

I. Reserve enough clearance around the WIT Inverter to ensure sufficient space for heat dissipation and operation. Ensure that there are no objects within 40 inches of the left, right and top of the WIT Inverter; In ground-mounted installation, keep the back of the chassis at least 12 inches away from the wall surface to ensure the performance of the WIT Inverter.

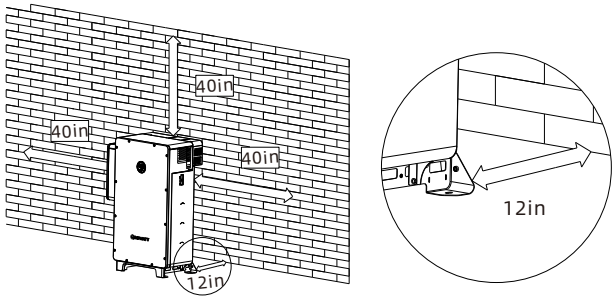


Fig 5.2

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

5.2 Installation Environment Requirements

A. Though the WIT Inverter is protected to IP66/Type 4X, do not expose it to direct sunlight, rain and snow. Please refer to the figures below:

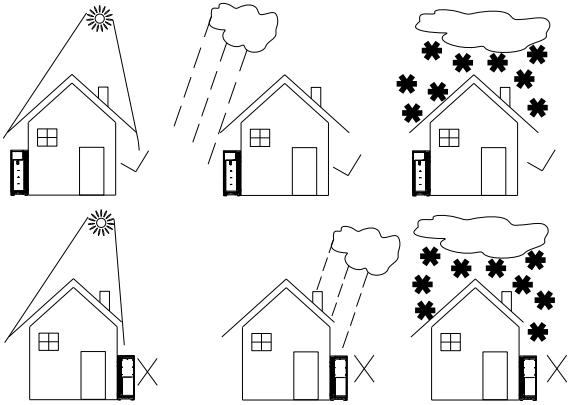


Fig 5.3

B. It is recommended an awning be installed over the WIT Inverter to extend its service life and avoid performance de-rating. Ensure that a distance of at least 39.37 inches exists between the frame of the awning and the top of the WIT Inverter and 59.06 inches m between the sides of the awning and the WIT Inverter. Please refer to the figures below.

Unit: inch

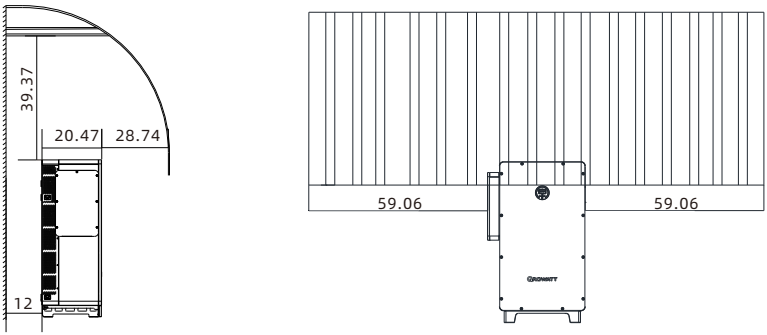


Fig 5.4

C. Do not place the WIT Inverter in an enclosed or narrow space.

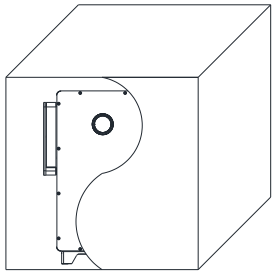


Fig 5.5

5.3 Moving the WIT Inverter

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

Plan 1 Hoisting:

1> As shown in Fig 5.6 below, unpack the WIT Inverter (remove the top panel and the support plates). Then piece the support plates together with the bottom panel. Install the hoisting rings and pull out the handles. Grasp the handles to turn the WIT Inverter upright. 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 Inverter.

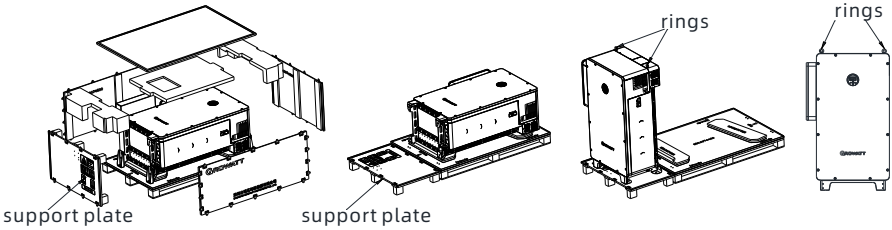


Fig 5.6 Hoisting the WIT Inverter

Plan 2 Forklift handling:

1> Unpack the WIT Inverter (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 5.7, 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 16.54 inches);

3> Keep balance when lifting and moving the WIT Inverter.

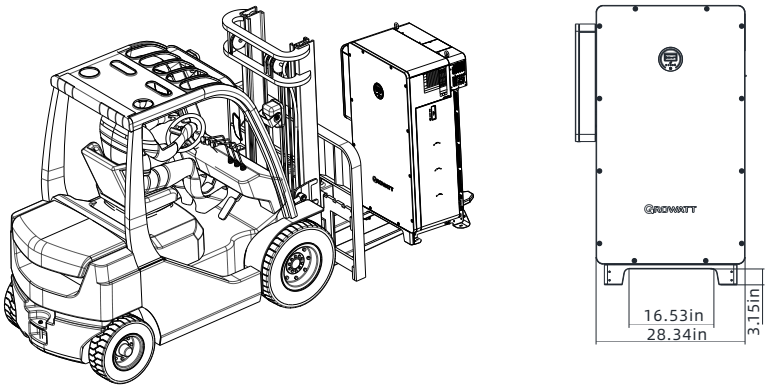


Fig 5.7 Moving the WIT Inverter with a forklift

Option 3 Lifting:

1> Unpack the WIT Inverter (remove the top panel and the support plates) and pull out the handles, as shown in Fig 5.8 below. It requires four people to lift the WIT Inverter and move it to the installation position;

2> Keep balance when lifting and moving the WIT Inverter.

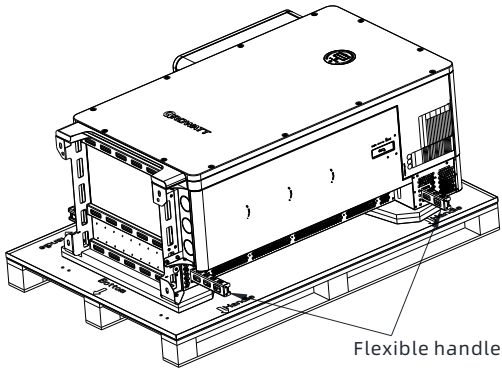
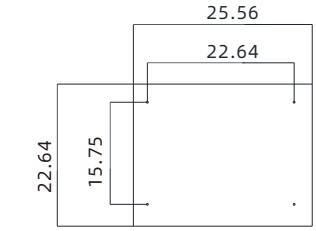


Fig 5.8 Lifting the WIT inverter

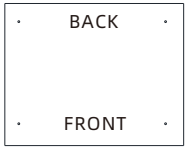
5.4 Mounting the WIT Inverter

The WIT 28-55K-US L2 Storage/Hybrid Inverters can be installed on the ground. Determine the hole positions using the marking-off template and drill holes into the ground. Insert nuts (ϕ12) 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 5.9.

Unit: inch



Dimensions of the marking-off template



Marking-off template

Fig 5.9 Floor-mounted installation hole positions

Refer to figure 5.10 for floor-mounting installation.

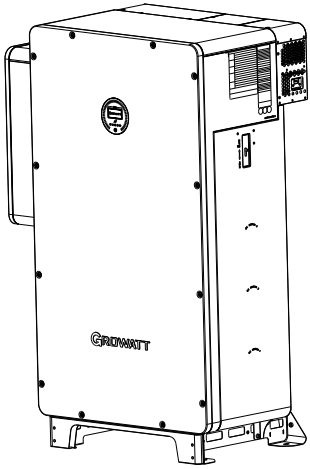
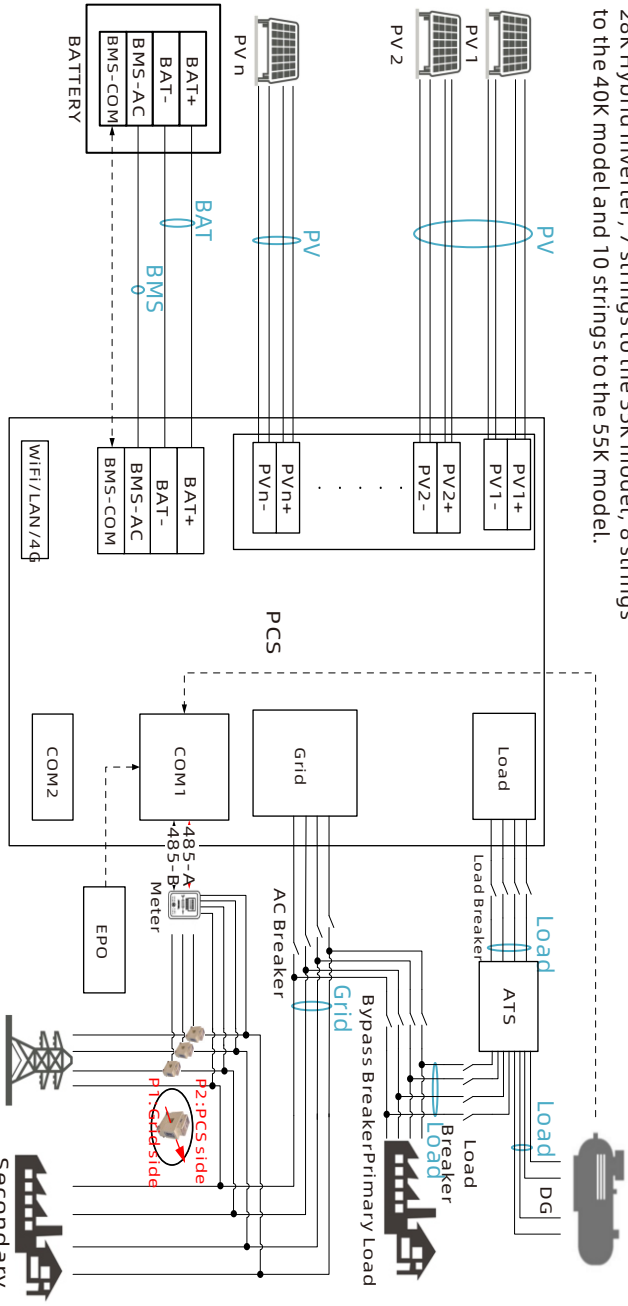


Fig 5.10 Floor-mounting installation

6 Electrical Connection

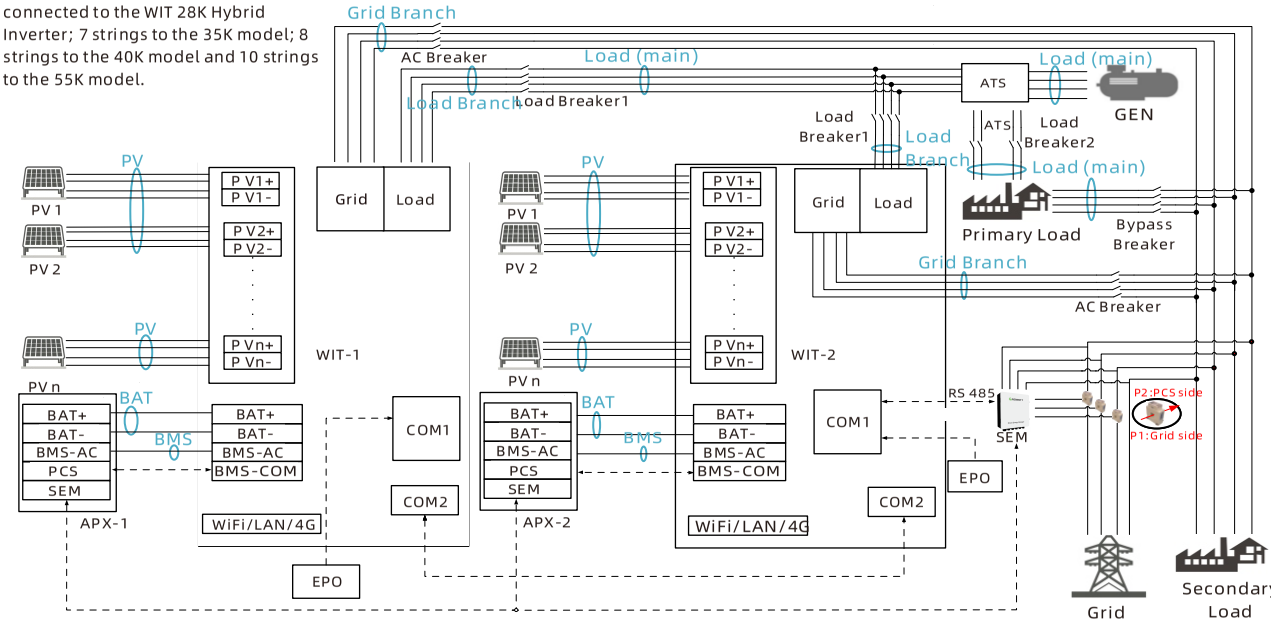
A maximum of 5 PV strings can be connected to the WIT 28K Hybrid Inverter; 7 strings to the 35K model; 8 strings to the 40K model and 10 strings to the 55K model.



	PV	BAT	BMS	Load	Grid	Load Breaker	AC Breaker	Bypass Breaker
28K	10-12 AWG	1 AWG	16 AWG	2 AWG	2/0 AWG	150A	300A	150A
35K	10-12 AWG	1 AWG	16 AWG	1 AWG	4/0 AWG	150A	300A	150A
40K	10-12 AWG	1 AWG	16 AWG	1/0 AWG	250 kcmil	250A	400A	250A
55K	10-12 AWG	1 AWG	16 AWG	3/0 AWG	400 kcmil	250A	400A	250A

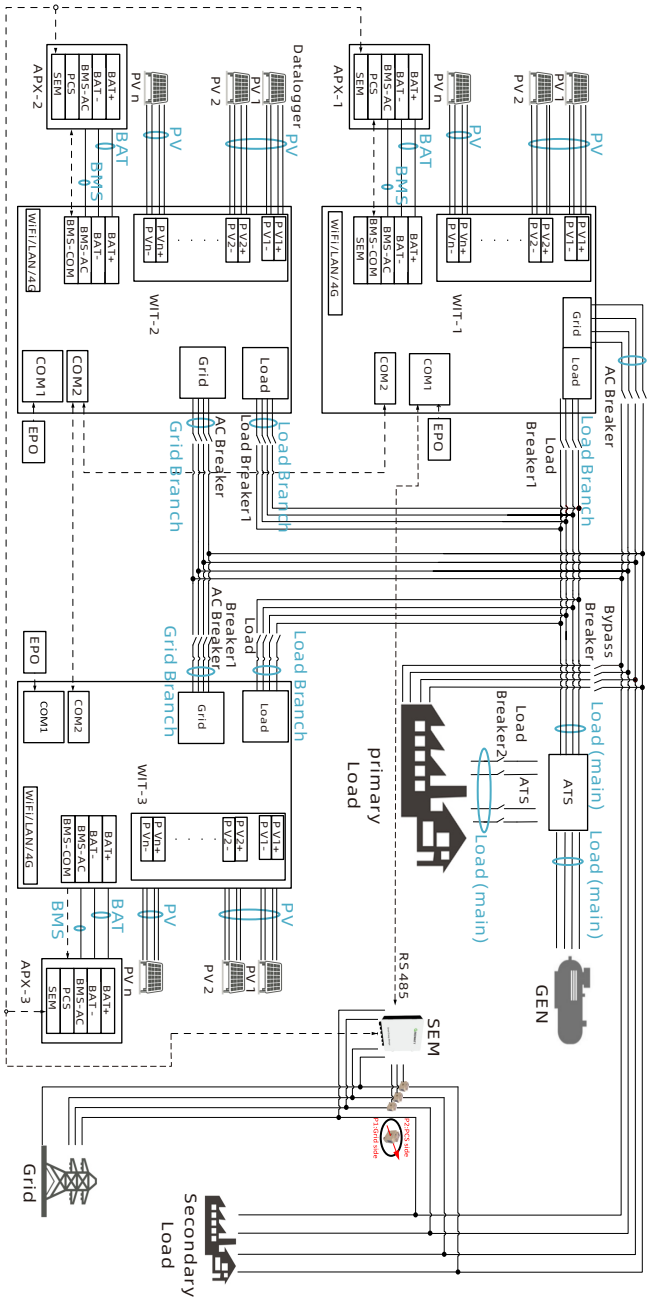
Wiring diagram of the system with a single WIT 28-55K-HU-US L2 inverter

A maximum of 5 PV strings can be connected to the WIT 28K Hybrid Inverter; 7 strings to the 35K model; 8 strings to the 40K model and 10 strings to the 55K model.



	PV	BAT	BMS	Load Branch	Grid Branch	Load (main)	Load Breaker1	Load Breaker2	AC Breaker	Bypass Breaker		PV	BAT	BMS	Load Branch	Grid Branch	Load (main)	Load Breaker 1	Load Breaker 2	AC Breaker	Bypass Breaker
28K	10-12 AWG	1 AWG	16 AWG	2 AWG	2/0 AWG	3/0 AWG	150A	300A	300A	300A	40K	10-12 AWG	1 AWG	16 AWG	1/0 AWG	250 kcmil	300 kcmil	250A	400A	400A	400A
35K	10-12 AWG	1 AWG	16 AWG	1 AWG	4/0 AWG	3/0 AWG	150A	300A	300A	300A	55K	10-12 AWG	1 AWG	16 AWG	3/0 AWG	400 kcmil	300 kcmil	250A	400A	400A	400A

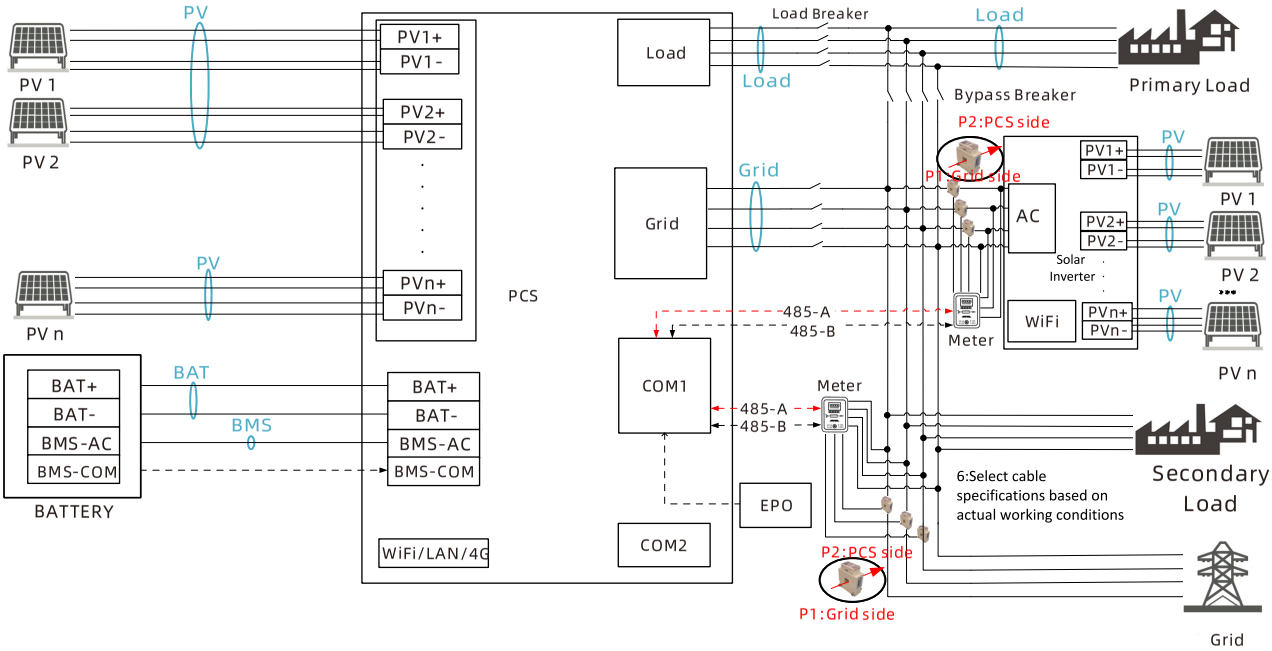
Wiring diagram of the system with two WIT 28-55K-HU-US L2 inverters connected in parallel



Wiring diagram of the system with three WIT 28-55K-HU-US L2 inverters connected in parallel

A maximum of 5 PV strings can be connected to the WIT 28K Hybrid Inverter; 7 strings to the 35K model; 8 strings to the 40K model and 10 strings to the 55K model.

	PV	BAT	BMS	Load Branch	Grid Branch(main)	Load Breaker1	Load Breaker2	AC Breaker	Bypass Breaker
28K	10-12 AWG	1 AWG	16 AWG	2 AWG	2/0 AWG	150A	400A	300A	400A
35K	10-12 AWG	1 AWG	16 AWG	1 AWG	4/0 AWG	150A	400A	300A	400A
40K	10-12 AWG	1 AWG	16 AWG	1/0 AWG	250 kcmil	300 kcmil	250A	600A	400A	600A
55K	10-12 AWG	1 AWG	16 AWG	3/0 AWG	400 kcmil	300 kcmil	250A	600A	400A	600A



Wiring diagram of the system with a single WIT 28-55K-HU-US L2 inverter and two meters

A maximum of 5 PV strings can be connected to the WIT 28K Hybrid Inverter; 7 strings to the 35K model; 8 strings to the 40K model and 10 strings to the 55K model.

	PV	BAT	BMS	Load	Grid	Load Breaker	AC Breaker	Bypass Breaker		PV	BAT	BMS	Load	Grid	Load Breaker	AC Breaker	Bypass Breaker
28K	10-12 AWG	1 AWG	16 AWG	2 AWG	2/0 AWG	150A	300A	150A	40K	10-12 AWG	1 AWG	16 AWG	1/0 AWG	250 kcmil	250A	400A	250A
35K	10-12 AWG	1 AWG	16 AWG	1 AWG	4/0 AWG	150A	300A	150A	55K	10-12 AWG	1 AWG	16 AWG	3/0 AWG	400 kcmil	250A	400A	250A

6.1 Connecting The Ground Cables

1. It is essential to connect the ground cable to the WIT inverter before connecting other cables to prevent personal injury or device damage.
2. All non-current-carrying metal parts and the enclosures of the devices of the energy storage system, including the rack and the enclosures of the combiner box, the distribution panel, the inverter and the battery should be properly grounded.
3. For a single WIT inverter, connect a ground cable to the ground point on the chassis shell. For a system with multiple WIT inverters connected in parallel, ensure that the enclosures of the WIT Inverters, the metal racks of the PV modules and the batteries are connected to the same area to achieve equipotential bonding.
4. The position of the ground points of the WIT 28-55K-HU-US L2 Storage/Hybrid Inverter is shown in fig 6.1. You can find the ground points after removing the right cover plate.

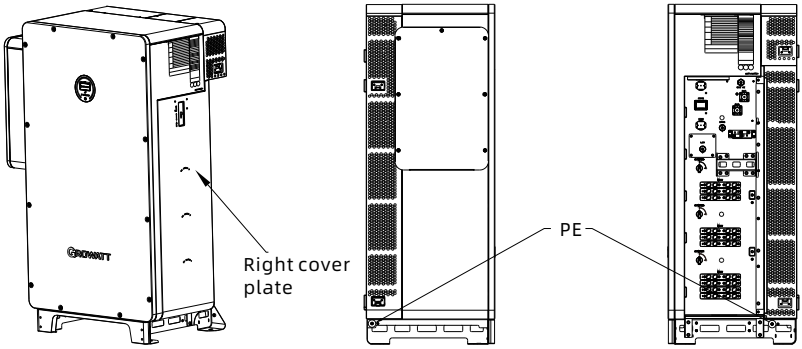


Fig 6.1 Ground points

NOTE:

1. Keep the lightning protection grounding at the greatest possible distance from the protective grounding.
2. Protect the terminals of the ground cables against rain and do not expose the them to open air.
3. Tighten the screws to a torque of 4.34 lbf·ft.

6.2 Connection on the AC Side

 **DANGER**	• Before connecting cables, ensure that the DC switches on the WIT Inverter are OFF. Turn off the switches and breakers on the AC side and the battery side. Otherwise, the high voltages of the WIT Inverter 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 Inverter.
 **WARNING**	• Each WIT Inverter must be equipped with an 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 Inverter 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 that will damage the device. Ensure that the terminals are properly connected before starting the WIT Inverter. • After connecting the cables, apply the fireproof mud evenly on the waterproof silica gel pad inside the AC junction box to prevent water from entering into the box.

Preparation:
1> Ensure the grid voltage and the grid frequency are within the acceptable range;
2> Disconnect the DC switches and the breakers on the AC side and the battery side.

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

1. Recommended circuit breaker specifications for WIT 28-55K-A-US L2 and WIT 28-55K-H-US L2 models

Device type	Rated voltage of the circuit breaker	Rated current of the circuit breaker
WIT 28K-A/-H-US L2	220V	150A
WIT 35K-A/-H-US L2	220V	150A
WIT 40K-A/-H-US L2	220V	200A
WIT 55K-A/-H-US L2	220V	200A

2. Recommended circuit breaker specifications for WIT 28-55K-AU-US L2 and WIT 28-55K-HU-US L2 models.

Device type	Rated voltage of the circuit breaker	Rated current of the circuit breaker on the grid side	Rated current of the circuit breaker on the load side
WIT 28K-AU/-HU-US L2	220V	300A	150A
WIT 35K-AU/-HU-US L2	220V	300A	150A
WIT 40K-AU/-HU-US L2	220V	400A	200A
WIT 55K-AU/-HU-US L2	220V	400A	200A

Recommended power cable specifications:

1. Recommended AC power cable specifications forWIT 28-55K-A-US L2 and WIT 28-55K-H-US L2 models.

Device type	Recommended cable specification
WIT 28K-A/-H-US L2	1AWG
WIT 35K-A/-H-US L2	1AWG
WIT 40K-A/-H-US L2	2/0AWG
WIT 55K-A/-H-US L2	2/0AWG

2. Recommended AC power cable specifications for WIT 28-55K-AU-US L2 and WIT 28-55K-HU-US L2 models.

Device type	Recommended cable on the AC side	Recommended cable on the load side
WIT 28K-AU/-HU-US L2	4/0AWG	1AWG
WIT 35K-AU/-HU-US L2	4/0AWG	1AWG
WIT 40K-AU/-HU-US L2	400kcmil	2/0AWG
WIT 55K-AU/-HU-US L2	400kcmil	2/0AWG

NOTE: The wires should be tinned and are not frayed or cracked.

AC side connection steps:

1. Open the cover of the AC junction box. The position of the cover is shown in Fig 6.2;
2. Connect a ground cable to the copper grounding bar in the AC junction box. Fig 6.2 shows the position of the grounding bar inside the AC junction box;
3. Connect the main power cables according to the label. Fig 6.2 shows the position of the label and the AC terminals;

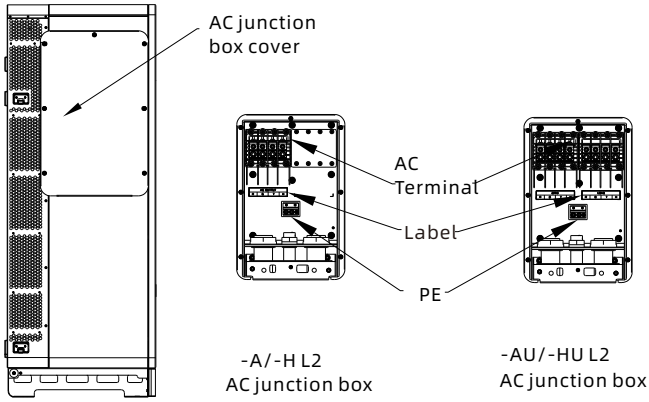


Fig 6.2 AC terminal wiring position and diagram

NOTE:

1. Determine the stripped length according to the wiring position (recommendation: 0.87-1.03 inches for power cables and 0.87-1.03 inches for ground cables). Remove the protective plugs and install the cable conduits correctly. Then route the cables through the holes at the bottom of the AC junction box, referring to Fig 6.4. After that, connect the cables to the corresponding terminals and secure them with American standard threads.

Unit: inch



Fig 6.3 Crimping a cable

2. WIT 28-55K-AU-US L2 and WIT 28-55K-HU-US L2 models differ from WIT 28-55K-A-US L2 and WIT 28-55K-H-US L2 models with an additional type of terminal in the AC junction box. Therefore, please connect cables according to the label.

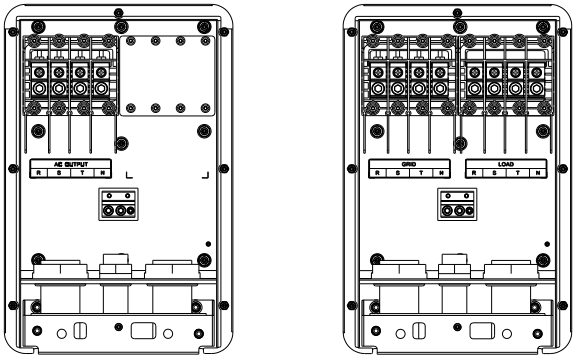


Fig 6.4 AC junction box

6.3 Connection on the PV Side

NOTICE	• Only WIT 28-55K-H-US L2 and WIT 28-55K-HU-US L2 models need to be connected on the PV side.
DANGER	• Before connecting cables, ensure that the DC switches of the WIT Inverter are OFF, and turn off the breakers on the AC side and the battery side. Otherwise, the high voltages of the WIT Inverter may cause electric shocks. • 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 Inverter. • 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 Inverter.
WARNING	• The maximum open-circuit voltage of each string should not exceed 800Vdc. • Ensure that the following conditions are met; Otherwise, fire hazard or inverter damage may occur. Growatt is not liable for the consequence and it is beyond the warranty scope.

NOTE:

1. The solar irradiance on the PV modules generates voltage and high voltages presented in the PV strings connected in series could be fatal. Therefore, shield the PV modules from sunlight before connecting the DC input power cable and ensure that the DC switches on the WIT Inverter are OFF.
2. The PV modules connected in series should be of the same model.
3. The maximum short-circuit current of each PV string must be lower than or equal to 40A.
4. The total panel power should not exceed twice the WIT Inverter input power.
5. For optimal system configuration, it is recommended to connect two DC inputs with an equal number of PV modules.

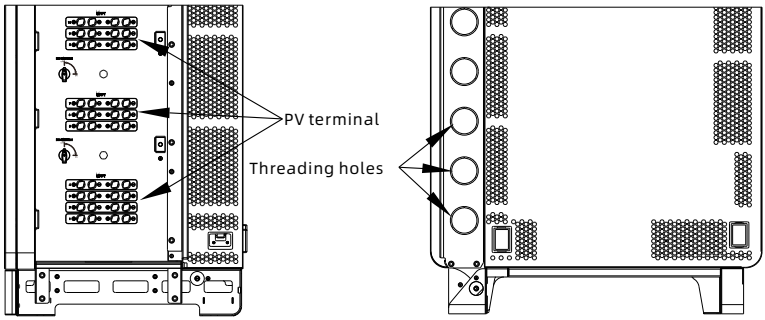


Fig 6.5 PV terminals

Procedure for connecting cables on the PV side:

1. Open the right cover plate of the WIT inverter, the position of which is shown in Fig 6.1;
2. Strip 0.24-0.32 inches of the insulation layer of the DC cables.
3. Insert the exposed core wires into the crimping area of the wiring terminal and crimp them using a crimping plier;
4. 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;
5. Insert the positive and negative connectors of the PV modules to the corresponding terminals of the inverter. For the maximum input current of different models, please see Table 6.1. For the cable specifications, please see Table 6.2.

Table 6.1 Maximum current of a single MPPT route

Device type	Max. current of a single MPPT route
WIT 28-55K-H-US L2	16A*2
WIT 28-55K-HU-US L2	16A*2

Table 6.2 Cable specifications on the PV side

Device type	Recommendation cable specifications
WIT 28-55K-H-US L2	12AWG
WIT 28-55K-HU-US L2	12AWG

NOTE:

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

6.4 Connection on the Battery Side

DANGER	• Before connecting cables, ensure that the DC switches of the WIT Inverter are OFF, and turn off the breakers on the AC side and the battery side. Otherwise, the high voltages of the WIT Inverter may cause electric shocks. • 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 Inverter.
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 Inverter. 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.

6.4.1 Connecting the Main Power Cable of the Battery

Preparation:

1. Check that the battery terminals of the WIT Inverter are intact;
2. Disconnect the DC switches on the WIT inverter, the AC breaker and the DC switch on the battery;
3. Take out the battery terminals from the accessory kit delivered with the package. See Packing List in Section 4;
4. Open the cover plate on the right side of the inverter, the position of which is shown in Fig 6.1.

Procedure for connecting the main battery power:

1. Connect the ground cable to the battery power ground bar, as shown in Fig 6.6;
2. Strip 0.71-0.79 inches of the insulation layer of the DC cables;
3. Crimp the battery cables and the battery terminals using crimping pliers, and then tighten the insulation sleeve;
4. Connect the battery cables to the battery terminals on the inverter, as shown in Fig 6.6;
5. After connecting the main battery power cables, bind power cables at the reserved position, as shown in Fig 6.6.

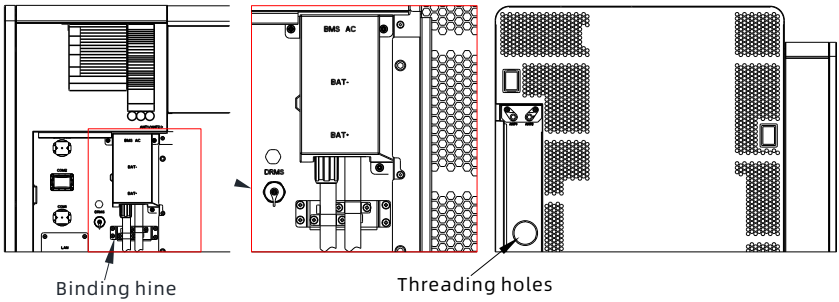


Fig 6.6 Position of the battery terminals

NOTE:

1. Connect the ground cable before connecting the battery cable; the ground point is shown in Fig 6.6.
2. Bind the battery power cables at the designated place after connecting them to the WIT Inverter.
3. Lock the right cover plate after connecting the cables.

6.4.2 Connecting the Battery BMS-AC Terminal

NOTE: Perform operations according to on-site requirements.

Procedure for connecting the battery BMS-AC terminal:
1. Open the cover plate on the right side of the inverter, the position of which is shown in Fig 6.6;
2. Find the corresponding terminals from the accessory kit. Refer to Table 6.3 to connect the terminals;
3. Remove the dustproof cover from the BMS-AC terminal, insert the terminals that have been crimped with cables to the BMS-AC terminal, and tighten them.

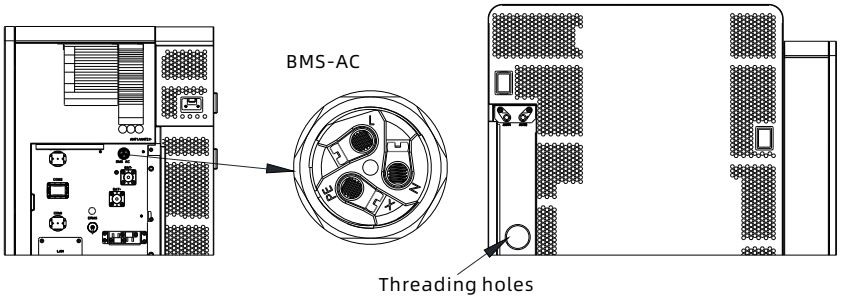


Fig 6.7 BMS-AC termina

Table 6.3 Definitions of BMS-AC terminal

BMS-AC terminal port definition			
Number	**Label**	**Definition**	**Note**
1	L	L1	Supply power to the BMS
2	N	L2	
3	PE	PE	Grounding

NOTE:
1. Do not touch or remove the dustproof cover if the BMS-AC terminal is idle.
2. The terminal is used only with APX batteries"
3. Reinstall the battery protective plate and the right cover plate after the cable connection is completed.

6.5 Connecting Communications Cables

6.5.1 Battery Communication Connection

The BMS-COM terminal of the WIT 28-55K-US L2 Inverter is a 16-pin connector. The matching male terminals are delivered with the package.
1. Connect the communication cables to the corresponding terminals as required. For details, see Table 6.4;
2. Remove the dustproof cover from the BMS-COM terminal, insert the 16-pin terminal (the client side) to the corresponding position, and ensure that it is tightly connected;

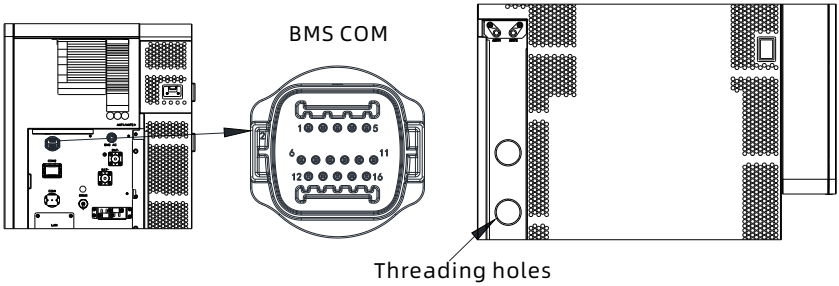


Fig 6.8 BMS-COM communication terminals

Ttable 6.4 Battery communication terminal description

Definition of battery communication terminal		
Number	**Definition of signal**	**Note**
1	Wakeup+	Battery wake up signal
2	Wakeup-	
3	RS485A3	The PCS communicates with the battery via RS485
4	RS485B3	
5	CANH	The PCS communicates with the battery via CAN
6	CANL	
7	CAN.GND	
8	DI1	Battery shutdown input signal
9	DI2	
10	NA	NA
11	NA	
12	NA	
13	NA	
14	NA	
15	NA	
16	PE	Grounding

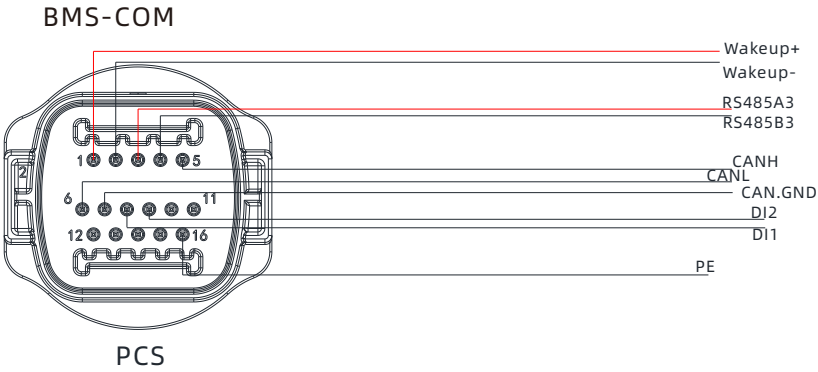


Fig 6.9 BMS-COM communication connection

6.5.2 External Communication connection

NOTE:
When connecting to external devices, such as the PC, please use isolated communication devices.

The external communication terminal of the WIT 28-55K-US L2 Inverter is a 16-pin connector. The matching terminal is in the accessory kit. The connection procedure is as follows:

1. Connect the communication cable to the corresponding terminal as required. For details, see Table 6.5;
2. Remove the dustproof cover from the COM1 terminal and insert the 16-pin terminal (the client side) to the corresponding position;

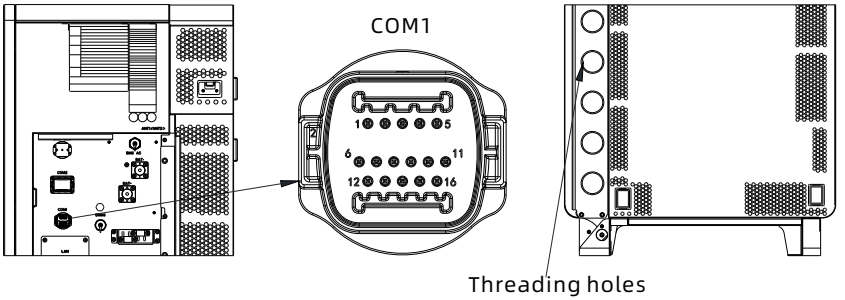


Fig 6.10 External communication terminal

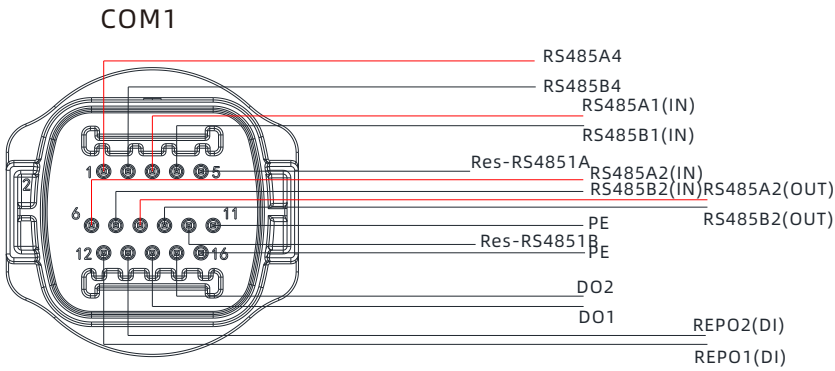


Fig 6.11 COM1 communication connection

3. The external communication terminals of the WIT 28-55K-US L2 Inverters are described in Table 6.5. Short Pin 5 and pin 10 when the host computer is used.

Table 6.5 External communication terminal description

Definition of battery communication terminal		
Number	**Definition of signal**	**Note**
1	PCS_RS485A_4	RS485_4
2	PCS_RS485B_4	
3	RS485A1 (IN)	RS485 terminal for external communication
4	RS485B1 (IN)	
5	Res_RS4851A	RS485 matching resistor
6	RS485A2 (IN)	RS485 input port for the meter
7	RS485B2 (IN)	
8	RS485A2 (OUT)	RS485 output port for the meter
9	RS485B2 (OUT)	
10	Res_RS4851B	RS485 matching resistor
11	PE	Grounding
12	REPO1	The WIT Inverter shutdown input dry contact signal
13	REPO2	
14	DO1	Generator start-up output dry contact signal
15	DO2	
16	PE	Grounding

6.5.3 Parallel Communication Connection

The parallel signal terminal (COM2) of WIT 28-55K-US L2 Inverters uses a 30-pin terminal. The matching terminal is in the accessary kit. The connection steps are as follows:

1. Connect the communication cables to the corresponding terminals as required. For details, see Table 6.6 and Table 6.7;
2. Remove the dustproof cover from the COM2 terminal and insert the 30-pin terminal (the client side) to the corresponding position.

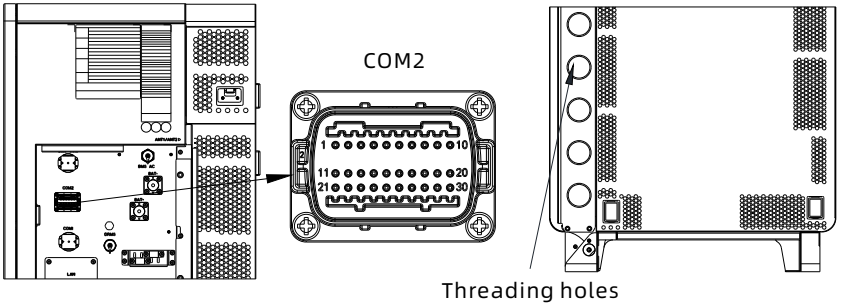
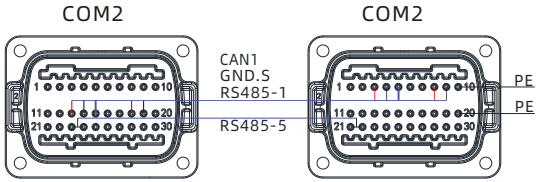
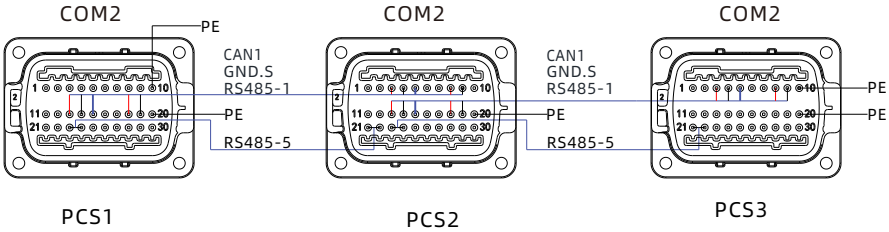


Fig 6.12 Parallel communication terminal



Parallel communication wiring diagram (dual PCS)



Parallel communication wiring diagram (three PCS)

Fig 6.13 COM2 communication connection

Table 6.6 Parallel communication terminal description

Pin definition of the parallel communication terminal (WIT 28-55K-A-US L2 and WIT 28-55K-H-US L2)		
Number	**Definition of signal**	**Note**
1	24V.S	Output 24V signal
2	GND.S	
3	CAN1_H (IN)	Parallel communication CAN1 signal (input)
4	CAN1_L (IN)	
5	GND.S	
6	CAN2_H (IN)	Parallel communication CAN2 signal (input)
7	CAN2_L (IN)	
8	RS485_1A (IN)	Parallel communication 485-1 signal (input)
9	RS485_1B (IN)	
10	PE	Grounding
11	24V.S	Output 24V signal
12	GND.S	
13	CAN1_H (OUT)	Parallel communication CAN1 signal (output)
14	CAN1_L (OUT)	
15	GND.S	
16	CAN2_H (OUT)	Parallel communication CAN2 signal (output)
17	CAN2_ L(OUT)	
18	RS485_1A (OUT)	Parallel communication 485 signal (output)
19	RS485_1B (OUT)	
20	PE	Grounding
21	RS485_5A (IN)	Low frequency synchronization 485 signal (input)
22	RS485_5B (IN)	
23	RS485_5A (OUT)	Low frequency synchronization 485 signal (output)
24	RS485_5B (OUT)	
25	RS485_4A (IN)	Parallel RS4854_4 communication (input) (PCS)
26	RS485_4B (IN)	
27	RS485_4A (OUT)	Parallel RS4854_4 communication (output) (PCS)
28	RS485_4B (OUT)	
29	NA	NA
30	NA	

Table 6.7 Description of parallel signal terminal interface

Pin definition of the parallel communication terminal (WIT 28-55K-HU-US L2, WIT 28-55K-AU-US L2)		
Number	**Definition of signal**	**Note**
1	24V.S	Output 24V signal
2	GND.S	
3	CAN1_H (IN)	Parallel communication CAN1 signal (input)
4	CAN1_L (IN)	
5	GND.S	
6	CAN2_H (IN)	Parallel communication CAN2 signal (input)
7	CAN2_L (IN)	
8	RS485_1A (IN)	Parallel communication RS485 signal (input)
9	RS485_1B (IN)	
10	PE	Grounding
11	24V.S	Output 24V signal
12	GND.S	
13	CAN1_H (OUT)	Parallel communication CAN1 signal (output)
14	CAN1_L (OUT)	
15	GND.S	
16	CAN2_H (OUT)	Parallel communication CAN2 signal (output)
17	CAN2_L (OUT)	
18	RS485_1A (OUT)	Parallel communication 485 signal (output)
19	RS485_1B (OUT)	
20	PE	Grounding
21	RS485_5A (IN)	Low frequency sync 485 signal (input)
22	RS485_5B (IN)	
23	RS485_5A (OUT)	Low frequency sync 485 signal (output)
24	RS485_5B (OUT)	
25	RS485_4A (IN)	Parallel RS4854_4 communication (input)
26	RS485_4B (IN)	
27	RS485_4A (OUT)	Parallel RS4854_4 communication (output)
28	RS485_4B (OUT)	
29	CAN3_H	Parallel communication CAN signal
30	CAN3_L	

6.5.4 Monitoring Device Terminal

The WIT 50-100K-US Storage/Hybrid inverters support remote monitoring when working with the optional WiFi&LAN datalogger or the WiFi&4G datalogger. If the WiFi&LAN datalogger is used, you need to connect a WiFi antenna and a network cable. If the WiFi&4G datalogger is used, you need to connect a WiFi antenna and a 4G antenna. The installation steps are as follows:

For the WiFi & LAN datalogger:

1. Remove the waterproof cover from the ANT1 port, then plug the WiFi antenna into the jack and screw tight. Please ensure that the antenna is correctly and securely connected.
2. Remove the waterproof cover of the LAN port and plug the network cable into the jack.

For the WiFi&4G datalogger:

1. Remove the waterproof cover from the ANT1 port then plug the WiFi antenna into the jack and screw tight.
2. Remove the waterproof cover from the ANT2 port and plug the 4G antenna into the jack.

Note:

1. Please ensure that the WiFi antenna, the 4G antenna and the network cable are connected to the correct port and securely in place. Otherwise, the monitoring function might fail.
2. If the monitoring device is removed, please reinstall the waterproof cover to avoid water penetration.

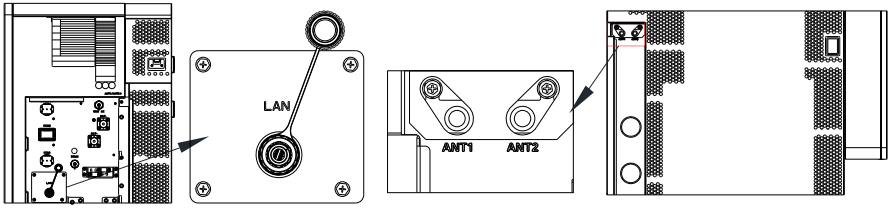


Fig 6.14 Connecting the monitoring device

6.5.5 DRMS Port

The WIT 28-55K-US L2 Inverters have a DRMS port. Users can choose to connect this terminal if required by local regulations. The connection procedure is as follows:

1. Connect the communication cable to the port as required. The DRMS port is a standard RJ45 terminal block, so you can follow the Ethernet cable connection method.
2. Remove the dustproof cover from the DRMS port and check whether there is a waterproof silica gel pad. Insert the cable and tighten the rubber ring to prevent loose connection.
3. After the cable connection, reinstall the dustproof cover. The position of the DRMS port is shown in Fig 6.15 below.

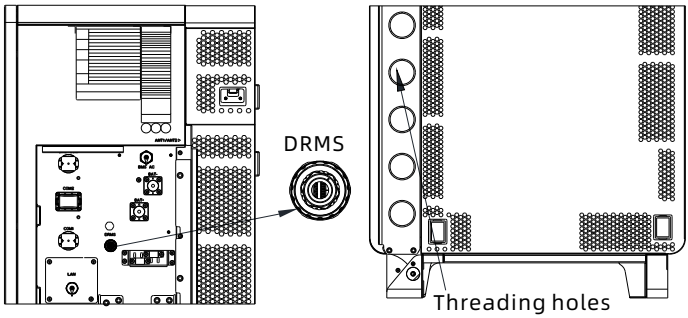


Fig 6.15 DRMS port

Table 6.8 Demand Response Modes (DRMs)

Mode	Socket asserted by shorting pins	Requirement
DRM0	5, 6	Operate the disconnection device
DRM1	1, 6	Do not consume power
DRM2	2, 6	Do not consume at more than 50% of rated power
DRM3	3, 6	Do not consume at more than 75% of rated power AND Source reactive power if capable
DRM4	4, 6	Increase power consumption (subject to constraints from other active DRMs)
DRM5	1, 5	Do not generate power
DRM6	2, 5	Do not generate at more than 50% of rated power
DRM7	3, 5	Do not generate at more than 75% of rated power AND Sink reactive power if capable
DRM8	4, 5	Increase power generation (subject to constraints from other active DRMs)

6.5.6 Rapid Shutdown Device (RSD)

The Rapid Shutdown Device (RSD) is used to shut down the WIT 28-55K-US L2 system and stop the PV side from supplying power to the inverter. The RSD is a normally closed (NC) contact. Once the RSD button is pushed, the inverter will be disconnected from the PV side and shut down.

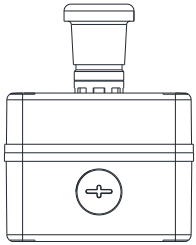


Fig 6.16 Rapid shutdown device (RSD)

Installation:

1. Unscrew the four plastic screws assembled on the RSD in the accessory kit using a cross-head screwdriver.
2. Drill four holes in the wall using an electrical drill with an M6 drill bit.
3. Insert the four green plastic pipes into the holes.
4. Align the RSD with the hole positions and screw the 4 self-tapping screws into the pipes

unit: inch

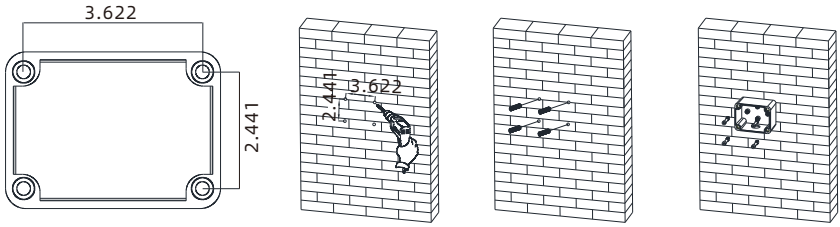


Fig 6.17 Installing the RSD

Connect the cables (18-22 AWG) crimped with the pipe-shaped terminal to Pin 12 and Pin 13 of the 16-pin terminal and insert the terminal into the COM1 port as the figure below shows. Open the cover of the RSD, route the other end of the cables through the hole on the RSD and connect them to the RSD contact. Reinstall the cover and secure it with screws.

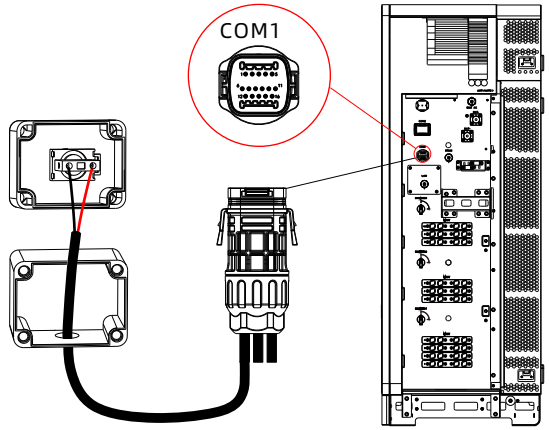


Fig 6.18

NOTE:

1. Before powering on the WIT, please pull the button up to ensure that the RSD is at the NC contact.
2. It's recommended that the RSD be installed in a convenient place for the ease of operation.

6.6 Post-installation Checks

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

Position	Item	Check item
	Ground cable connected to the chassis	Check the cable specifications; ensure that the cable has been securely fastened
AC side	Ground cable on the AC side	Check the cable specifications; ensure that the cable has been securely fastened
	Grid side (-AU/-HU)	Check the cable specifications; ensure that the cable has been securely fastened

Position	Item	Check item
AC side	Load side	Check the cable specifications; ensure that the cable has been securely fastened
	Waterproof silica gel pad	No gap exists; the fireproof mud has been evenly applied
	AC junction box cover	Install the cover after the items on the AC side are checked
PV side	Ground cable on the PV side	Check the cable specifications; ensure that the cable has been securely fastened
	PV+/PV-	Check the cable specifications; ensure that the cable has been securely fastened; confirm that the number of PV modules matches the rated power
Battery side	Ground cable on the battery side	Check the cable specifications; ensure that the cable has been securely fastened
	BAT+/BAT-	Ensure that the positive and negative terminals are connected correctly and securely; the sealing rubber ring is properly seated into the gland
	BMS-AC	Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland
	Cable bundling	The cables are bundled in the specified position
	Battery terminal protective plate	Ensure that the protective plate is correctly installed and all screws are firmly tightened.
Communication terminals	BMS-COM	Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland
	COM1	Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland

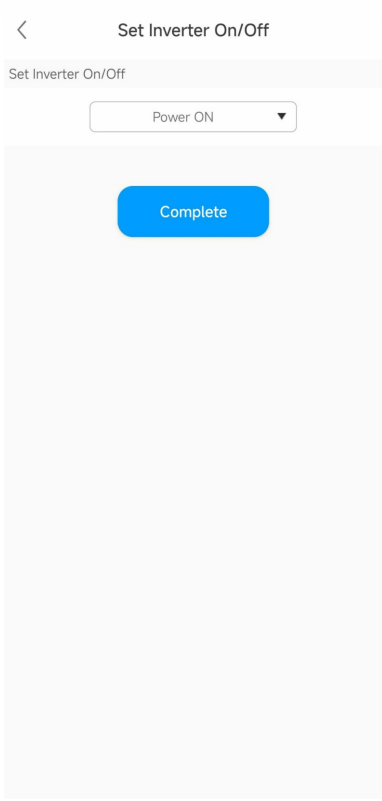
Position	Item	Check item
Communication terminals	COM2	Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland
	WiFi+LAN WiFi+4G	Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland
	DRMS	Ensure that the connection is correct and secured; the sealing rubber ring is properly seated into the gland
Cover plate	Right cover plate	Reinstall the right cover plate after all the items are checked

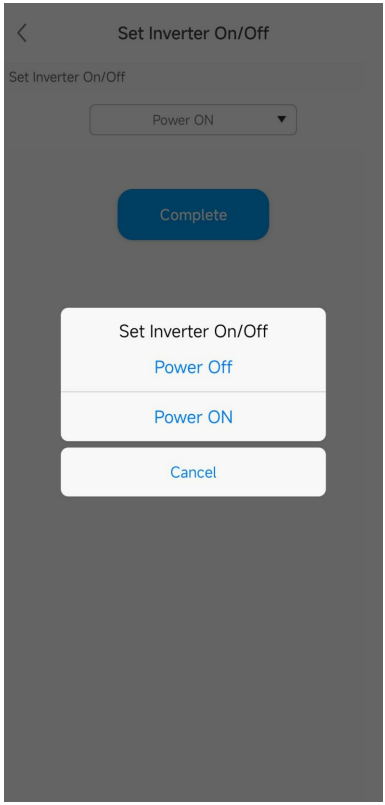
7.1 Powering on/off the System

1. Turn the DC switches on the WIT Inverter to the "ON" position.
2. Turn on the breaker between the grid and the inverter.
3. Turn on the breaker between the battery and the inverter, then turn on the switch on the battery to power it on.
4. Once the start-up requirements of all terminals are fulfilled, the system will be powered on automatically.

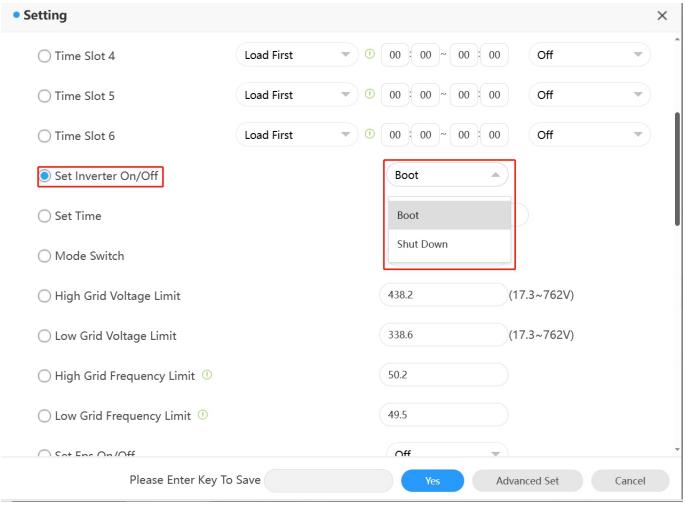
To shut down the system, please send a shutdown command on the APP or the webpage prior to performing any operations on the device. Then perform the steps in reverse order as described above.

APP:





Webpage:



7.2 Commissioning the WIT Inverter

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

7.2.1 Set the Communication Address

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

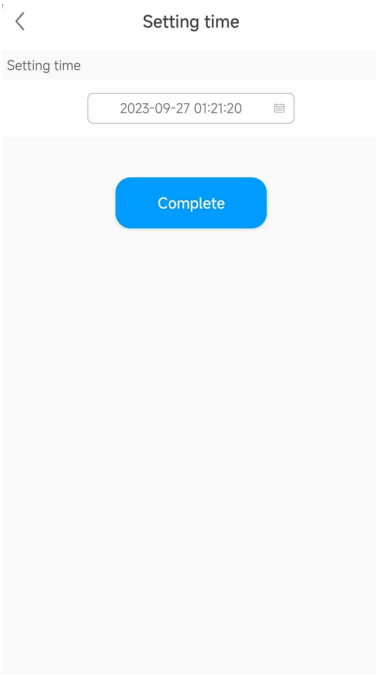
NOTE: The communication address of the WIT Inverter ranges from 1 to 254. By connecting the WIT Inverter to the host computer through RS485 communication, you can change its communication address via ShineBus. This operation should be performed by professional personnel.

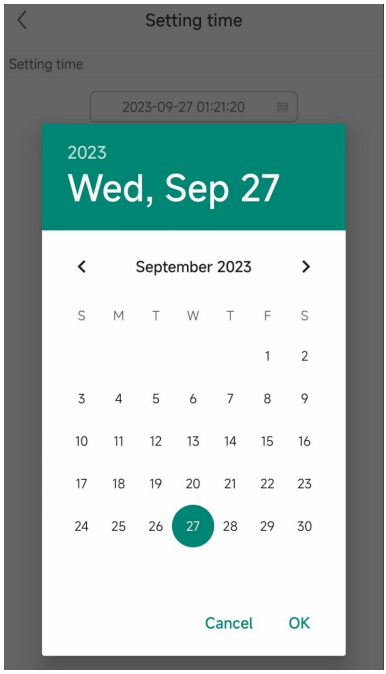
7.2.2 Set the Time and Date

7.2.2.1Set the time and date on the APP

Follow the instructions in Section 6.5.4 to connect the datalogger. When the inverter is powered in, you can set inverter time and date referring to Section 8.1.1.
Tap Control > Set Inverter Time, then enter the password "growatt+date". For instance, if the date is July 18, 2023, the password would be "growatt20230718". After that, tap "Yes".

1. Set the correct date, then click "OK". Proceed to set the time, and click "OK".





7.2.2.2 Set the Date & Time Automatically

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

7.3 Mode of operation

7.3.1 Waiting Mode

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

7.3.2 Operating Mode

7.3.2.1 Operating Mode of WIT 28-55K-A-US L2, and WIT 28-55K-AU-US L2

Standby mode: The WIT Inverter enters the standby mode when the operating requirements are not met.
Charging mode: Charge the battery from the grid (the AC Charging function should be enabled) You need to set this mode manually and configure the charging period and charging power.
Discharging mode: The battery discharges to supply power to the AC side
You should set this mode manually and configure the discharging period and discharging power.

NOTE:
1. It is recommended to charge batteries with grid power during off-peak times and discharge battery power during peak hours to lower your electric bills.
2. The working modes listed above are applicable to the grid-tied power system. For the off-grid system, the WIT Inverter converts battery power to power the loads.

7.3.2.2 Operating Mode of WIT 28-55K-H-US L2, and WIT 28-55K-HU-US L2

Load First:
When the WIT inverter works in the Load First mode, the WIT storage unit controls the battery to charge and discharge according to the amount of electricity fed into the grid and drawn from the grid. When there is electricity fed into the grid, the WIT inverter adjusts this part of the electricity to charge the battery, reducing the amount of electricity fed into the grid; when there is power from the grid, the WIT inverter adjusts the battery discharge to reduce the amount of electricity drawn from the grid. When the WIT inverter disable the Load First mode, it does not respond to the change of the power fed into the grid and taken from the grid. It will keep the battery power, and enters other priority modes.
Battery First:
When the WIT inverter works in this mode, the battery will ignore the forward and reverse current power and give priority to charging the battery. The user needs to set the mode ON and OFF time. lf the customer does not enable AC CHG (AC power grid charging function), the WIT will charge the battery through PV power. If the customer enables AC CHG, the WIT will charge the battery through PV panel and the grid.
Grid First:
When the WIT inverter works in the Grid First mode, the load will be powered firstly, then export power to the grid. The user can choose to work in this mode when the electricity rate is high, and the user needs to set the on and off time of the mode.

7.3.3 Fault Mode

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

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

7.3.4 Shutdown Mode

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

NOTE: When the DC input voltage is less than or equal to 180Vdc or the battery voltage is lower than 750V, the WIT Inverter enters the shutdown mode automatically.

7.4 LED and OLED Displays Panel

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

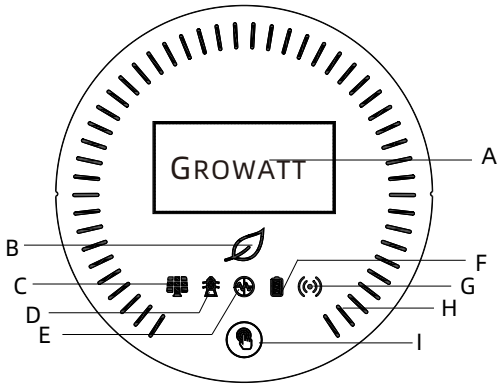


Fig 7.1 Display panel

Table 7.1 Symbol Description

Number	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 indicator	Indicates the operation status on the grid side
E	Off-grid indicator	Indicates whether the off-grid mode is enabled
F	Battery indicator	Indicates the status of the battery
G	Communication indicator	Indicates the communication status
H	Battery status indicator	Indicates the charging and discharging mode of the battery
I	Button	You can switch the information displayed on the OLED by pressing the button

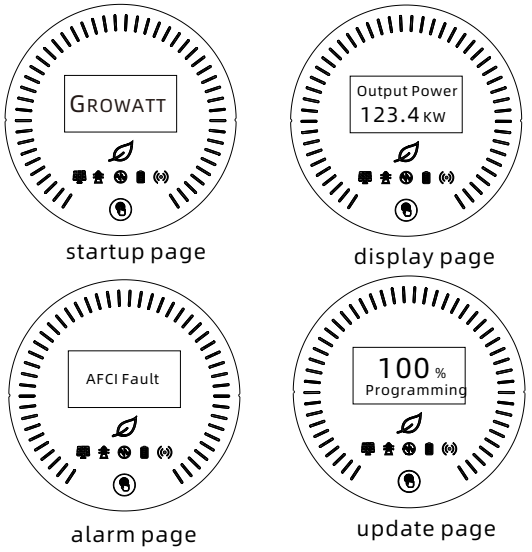


Fig 7.2 User interfaces

Table 7.2 Indicator description

	Status	Meaning
	Off	The system is not operating
	Steady green	The system is operating properly
	Blinking green at long intervals	The system is in standby mode or performing an upgrade
	Steady red	System failure
	Off	The PV voltage is below the operating voltage
	Steady green	The PV voltage reaches the operating voltage
	Steady red	A fault or alarm occurs on the PV side
	Off	The grid voltage is below the operating voltage
	Steady green	Successfully connected to the grid
	Steady red	A fault or alarm is reported on the grid side
	Off	Off-grid mode is disabled
	Steady green	Off-grid mode is enabled and has no faults or alarms
	Steady red	Off-grid mode is enabled and a fault or alarm is reported on the AC side
	Off	The battery voltage dose not reach the operating voltage
	Steady green	The battery voltage reaches the operating voltage
	Steady red	SOC(state of charge) is low; a fault or alarm of the battery is reported
	Steady green	External communication is normal, such as RS485, Wi-Fi, 4G, etc.
	Blinking green at long intervals	The WIT Inverter is upgrading or the USB interface is reading and writing data
	Steady red	External communication fails or a system fault occurs

	Status	Meaning
	Steady white	Battery is in standby mode
	Rotates clockwise	Charging mode
	Rotates anticlockwise	Discharging mode
	Displays critical system information. Users can call up and switch the interface by tapping the button. When a fault or alarm occurs in the system, the fault or alarm is displayed.	
	The OLED will wake up when the button is pressed. The OLED will turn off if there is no operation for 5 minutes.	

8.1 Remote Monitoring

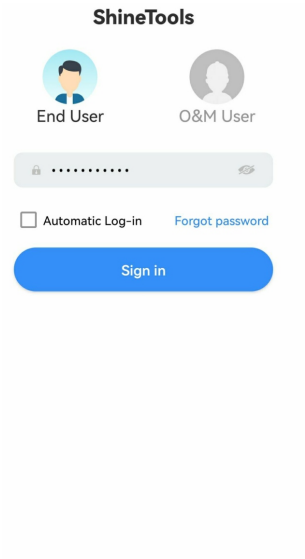
Growatt WIT 28-55K-US L2 Storage/Hybrid inverters support remote monitoring, which can be enabled by installing a datalogger. The operation and configuration methods are illustrated below.

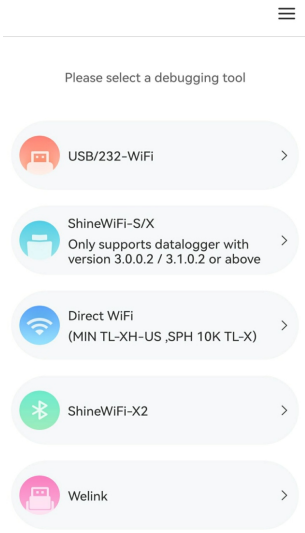
Scan the following QR code or search for "ShinePhone" in Google/Apple Store to download and install the mobile APP.

NOTE:
(1) Download and install the latest version of ShinePhone.
(2) See https://server-us.growatt.com/?lang=en for details.

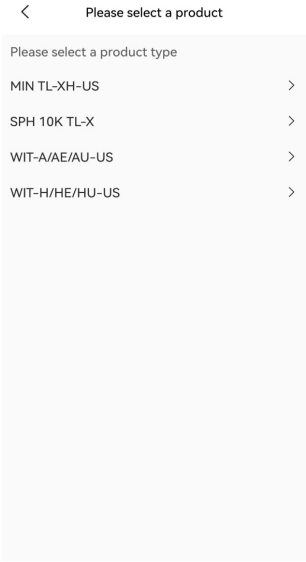
8.1.1 Connect the WIT inverter to the internet on ShineTools

Open the ShineTools APP. On the login screen, tap "End User" and enter the password, which is in the format of "oss + the current date". E.g. oss20230925. Then click "Sign in".

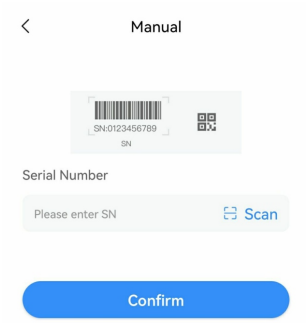


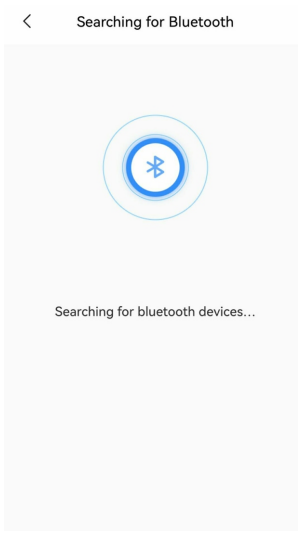


Select “Direct WiFi” > “WIT-A/AU-US” or “WIT-H/HE/HU-US” . For the SN (serial number), you can scan the SN barcode on the enclosure or enter it manually. Then tap “Confirm” and it will start searching for Bluetooth devices.

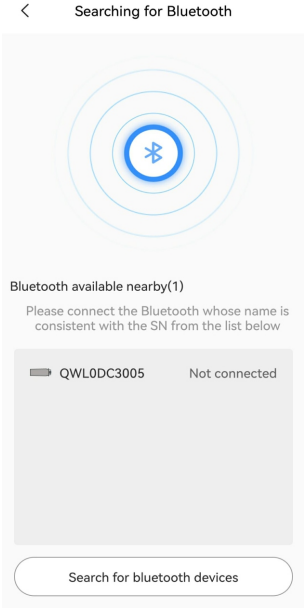


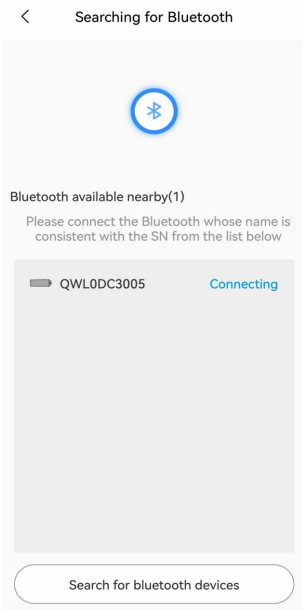




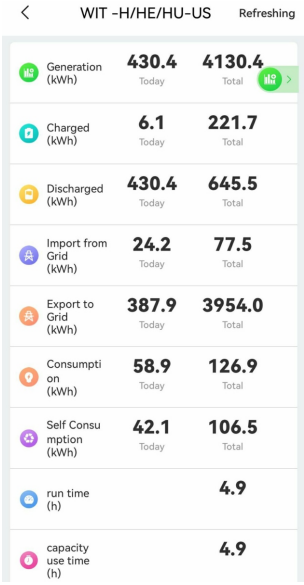


Click “Connect” after the target Bluetooth device is displayed.

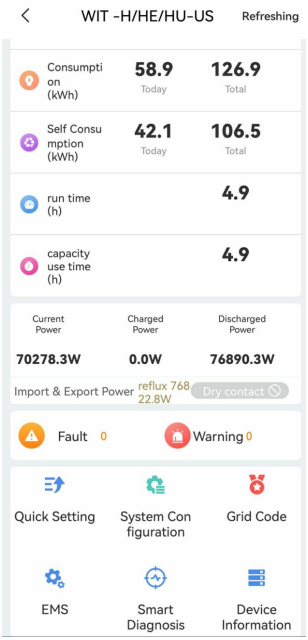


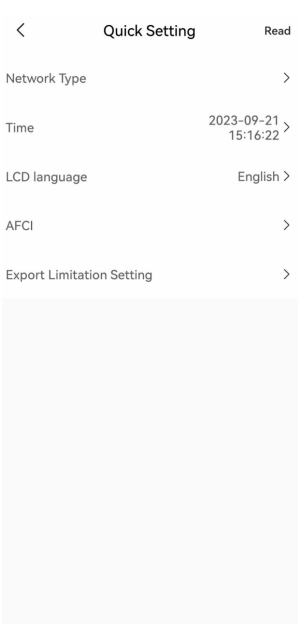


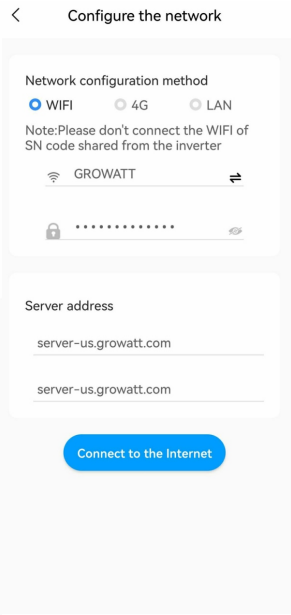
When the device is successfully connected, the screen as demonstrated below will appear, ensuring that the communication between the WIT inverter and the mobile phone has been established via Bluetooth.



Then connect the WIT inverter to the WiFi network.
Tap “Quick Setting” > “Network Type” > “WiFi”. Insert the WiFi name and password and tap “Connect to the Internet”, which configures the inverter to the server via the network.

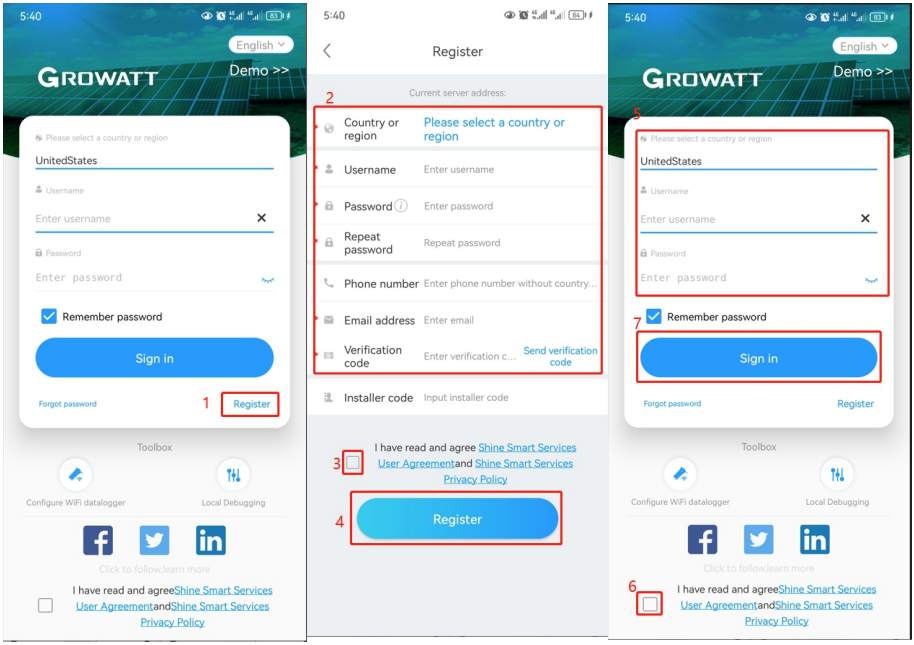






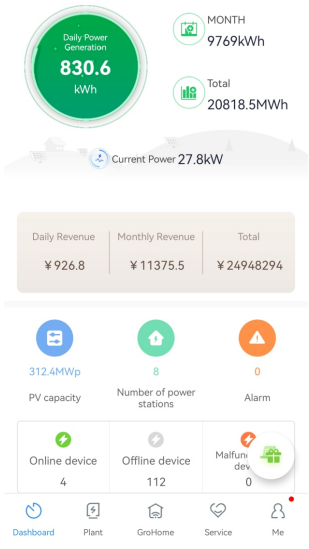
8.1.2 Remote Monitoring on the APP (ShinePhone)

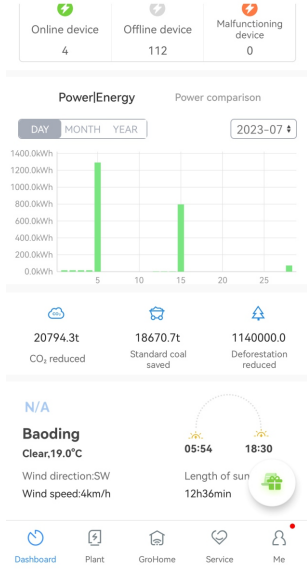
Account Registration on ShinePhone
Run the APP and tap “Create account” on the login page. Fill in the information as required. Fields marked with * are mandatory. Tick the checkbox to agree to the Privacy Policy. Once the account is successfully registered, you can log in to the home screen. The registration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



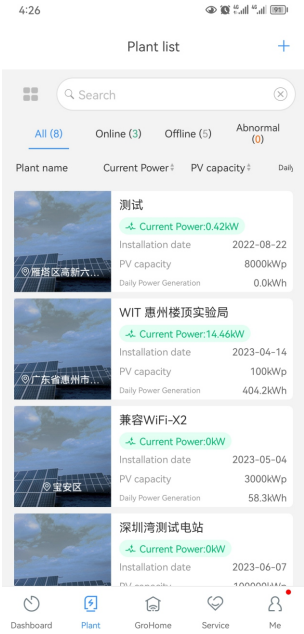
Home Screen of ShinePhone

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





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



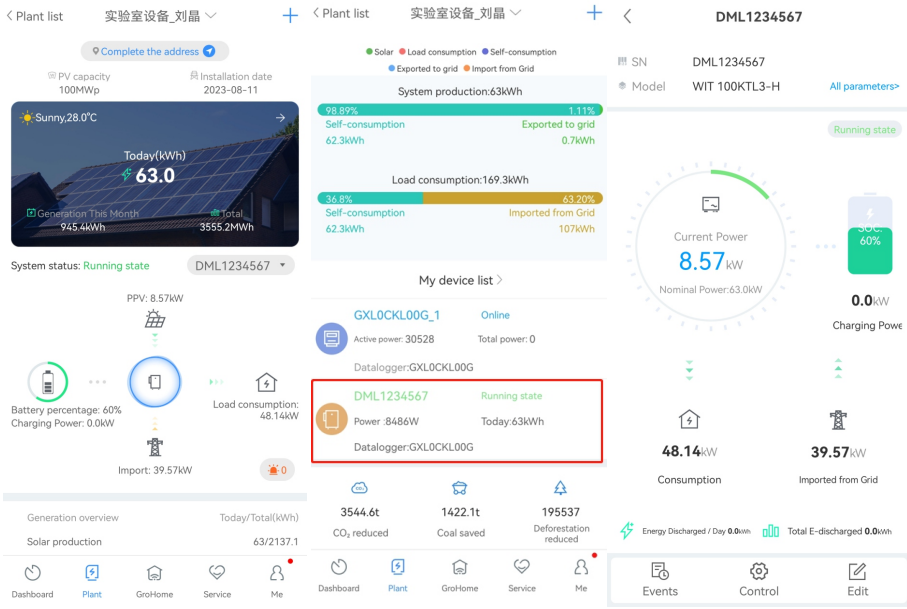
Detail Page of the WIT Inverter:

To access details about the WIT Inverter or related devices:

(1) Tap “Plant” and the “Plant List” will be displayed. Select your target plant, then you can access the real-time data and history record of the power plant;

(2) Select the WIT Inverter marked with its SN from “My device list”. The figures below show QWL0DC3008 as an example;

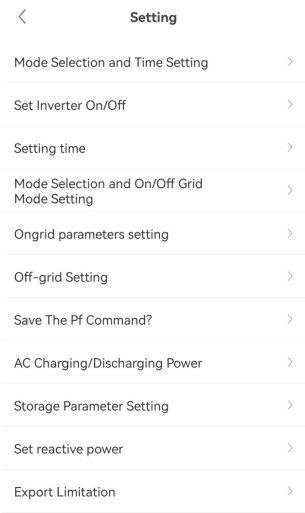
(3) On the Detail Page, you can view information about the inverter and related devices. Three sections - “Events”, “Control” and “Edit”, are available at the bottom.

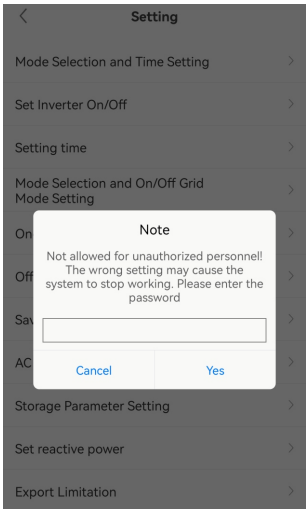


(4) On the "Log" screen, you can view the fault/warning message and suggested trouble-shooting measures.



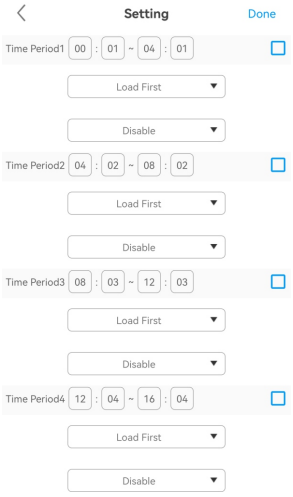
(5) On the “Control” screen, you can configure the WIT Inverter. The password is in the format of “Growatt + the current date”, e.g. Growatt20230718.

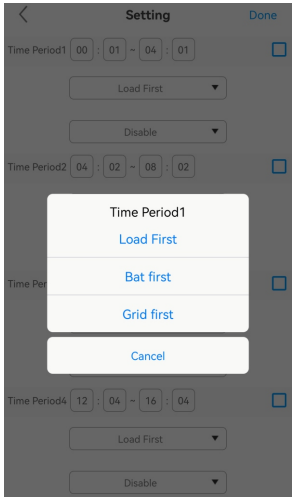


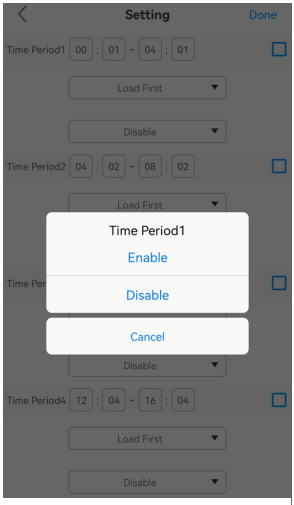


➢ Set Working Modes for Different Time Periods

Tap Control > Mode Selection and Time Setting; 6 time segments are configurable. You can set the start and end time of each period, the corresponding working mode, including Load First, Battery First and Grid First, and whether to enable/disable the selected working mode. Choose the appropriate working mode considering the corresponding electricity rates and power consumption during the specific time period.

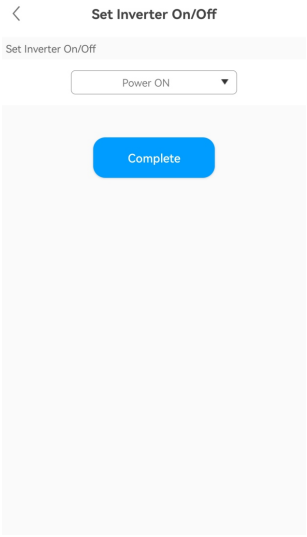






➢ Set Inverter On/Off

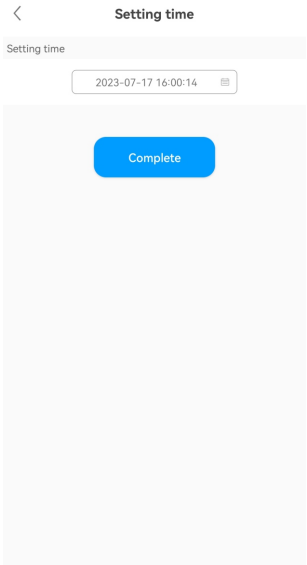
Tap Control > Set Inverter On/Off; you can power on/off the inverter, as the figure shows.

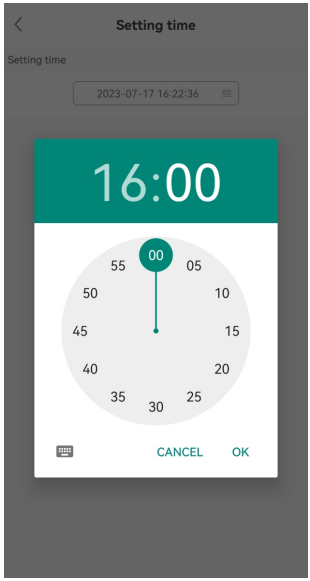




➢ Set the Time of the Inverter

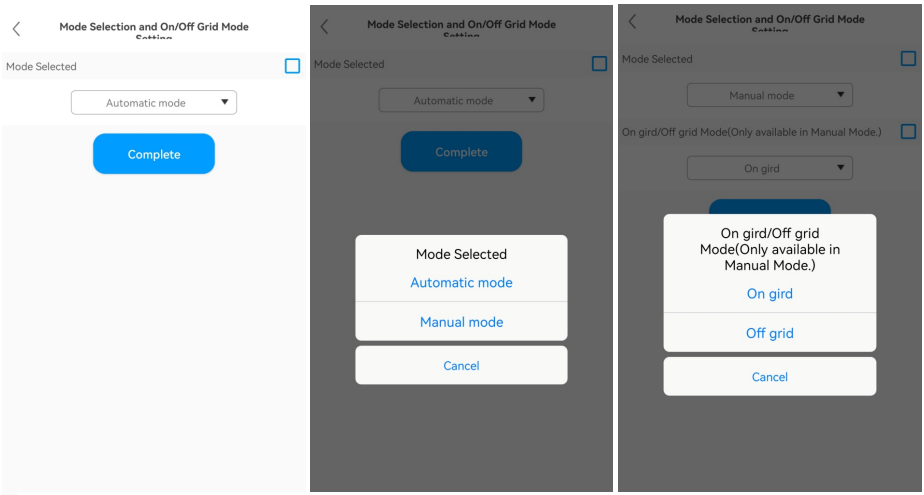
Tap Control > Set Inverter Time; you can set the local time, as the figure shows.





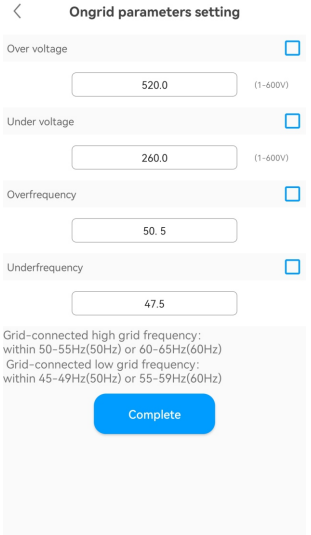
➢ Set the Working Mode and the On-/Off-grid mode

Tap Control > Mode selection and On/off grid mode setting. Two options are available: Automatic mode and Manual mode. If the Manual mode is selected, you can set the inverter to work in the on-grid or off-grid mode, as the figure shows. The Automatic Mode is recommended.



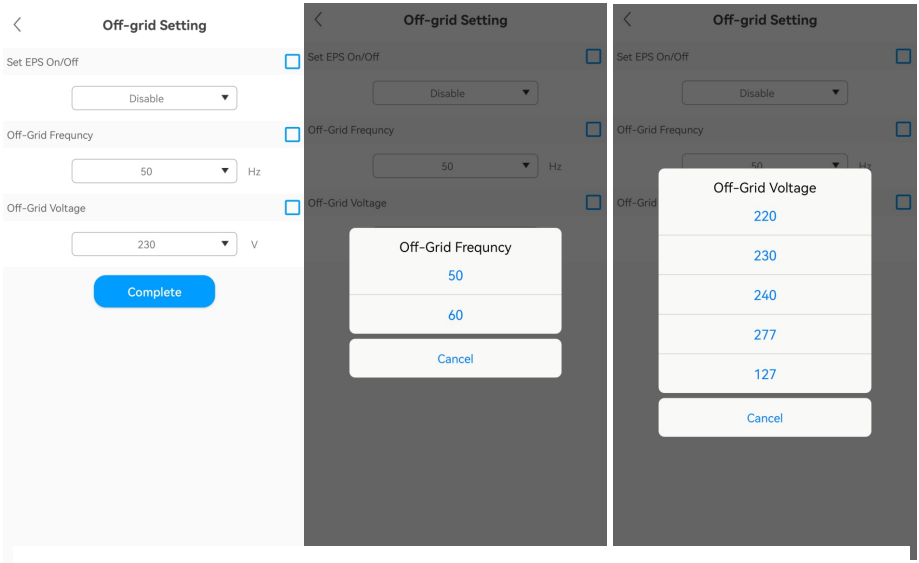
➢ Set the Grid Parameters

Tap Control > Grid parameters, you can set the voltage upper/lower threshold of grid connection and the frequency upper/lower threshold of grid connection, as the figure shows.



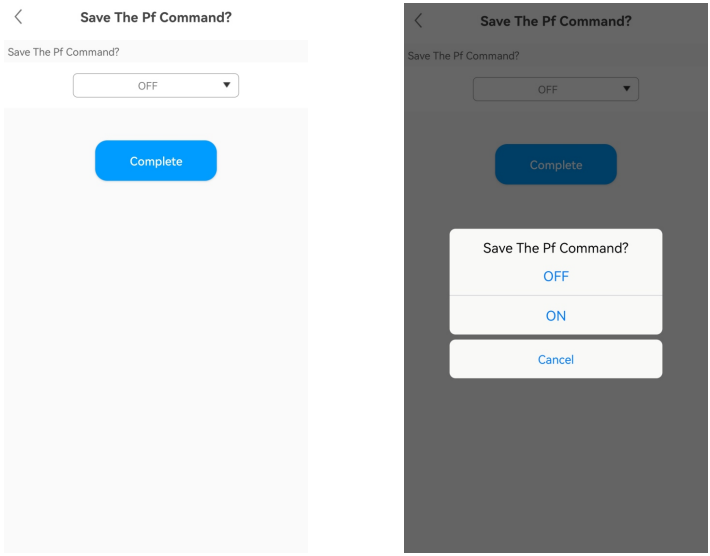
➢ Set the Off-grid Parameters

Tap Control > Off-grid Setting, you can enable/disable the off-grid mode, set the off-grid frequency (50Hz/60Hz) and the off-grid voltage (220V/230V/240V/277V/127V), complying with the safety regulations.



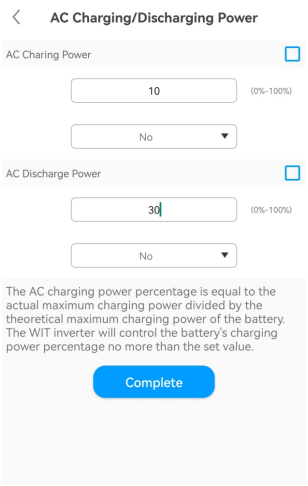
➢ Set Whether to Apply the Following PF Command

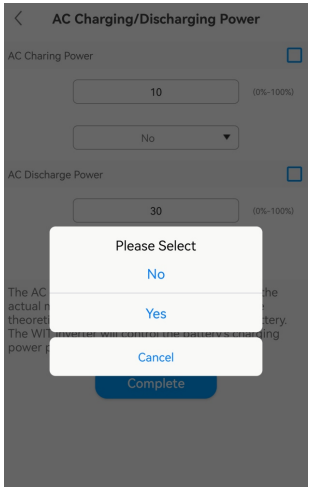
Tap Control > Whether to apply the following PF command, you can select whether to apply the following PF command, as the figure shows.



➢ Set AC Charging and Discharging Power

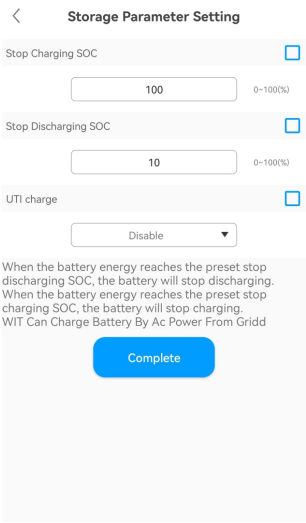
Tap Control > AC Charging and Discharging Power, you can configure the AC charging/discharging power and choose whether to remember your settings, as the figure shows.

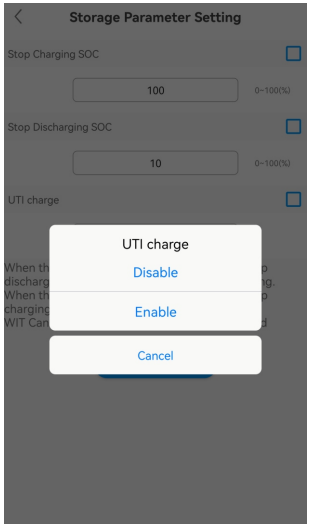




➢ Set the Storage Parameters

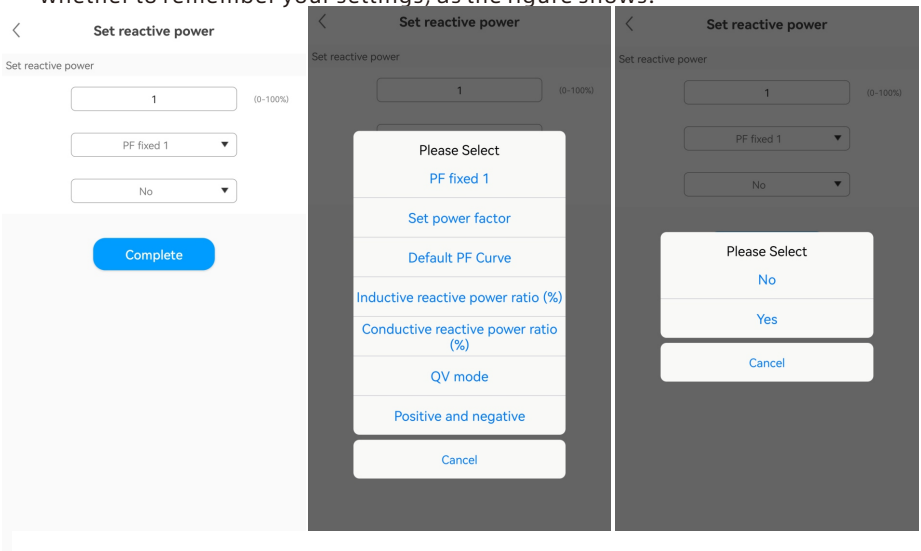
Tap Control > Storage Parameter Setting, you can enable/disable the AC charging function (Charge from grid), the charging cutoff SOC (100 is recommended) and the discharging cutoff SOC (10 is recommended), as the figure shows.





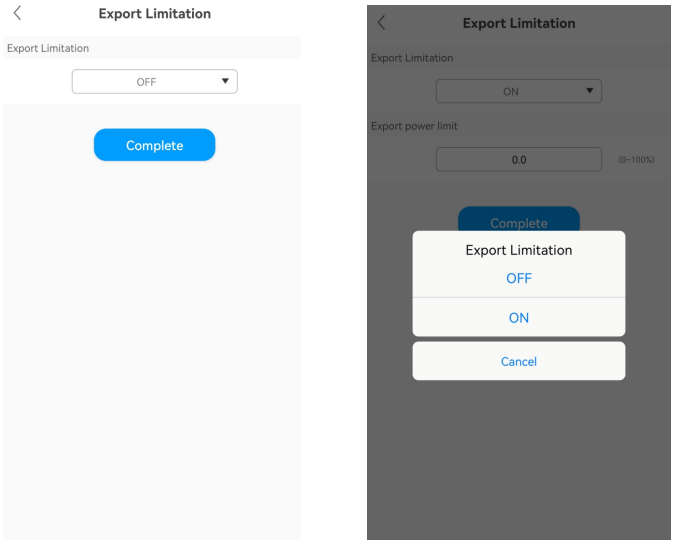
➢ Set the Reactive Power

Tap Control > Set reactive power, you can select the corresponding PF mode and whether to remember your settings, as the figure shows.



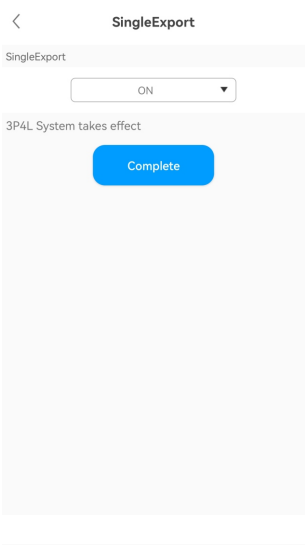
➢ Set the Export Limitation Parameters

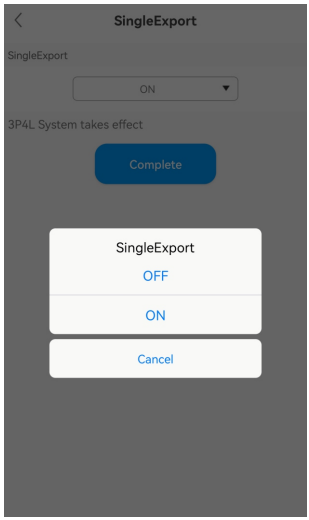
Tap Control > Export Limitation, you can enable/disable the export limitation function according to local regulations. If the Export Limitation function is enabled, you can set the Export power limit, as the figure shows.



➢ Set the Single-phase Export Limitation

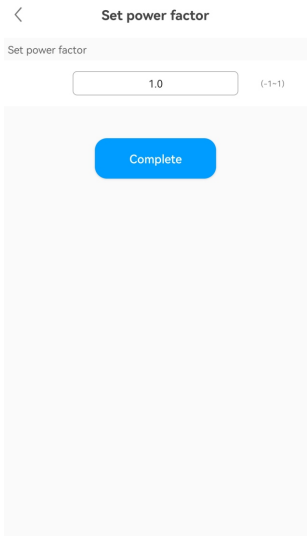
Tap Control > Single Export, you can enable/disable the single-phase export limitation function, as the figure shows.



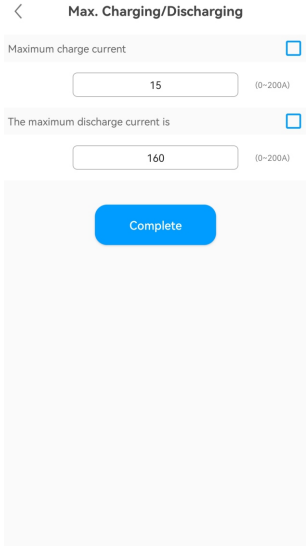


➢ Set the Power Factor

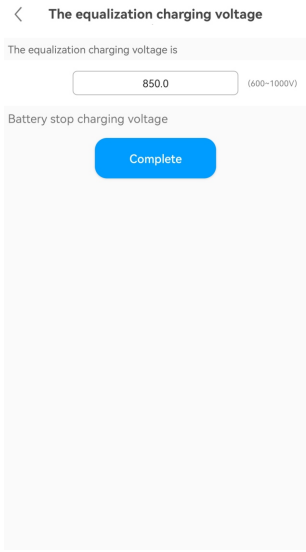
Tap Control > Set power factor, you can set the PF value, ranging from -1 to 1, as the figure shows.



➢ Set the Maximum Charging/Discharging Current
Tap Control > Max. Charging/Discharging Current, you can set the maximum charging/discharging current, ranging from 0 to 200A, as the figure shows.

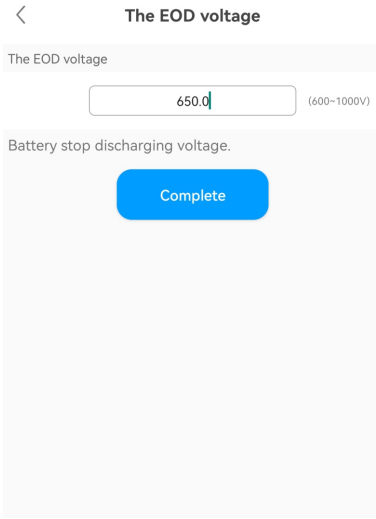


➢ Set the Equalization Voltage
Tap Control > Equalization Voltage, you can set the battery maximum charging voltage, ranging from 380 V to 650V, as the figure shows.



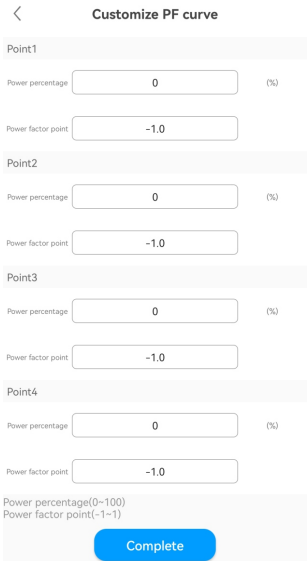
➢ Set the EOD voltage

Tap Control > EOD Voltage, you can set the battery discharge cutoff voltage, ranging from 380 V to 650V, as the figure shows.

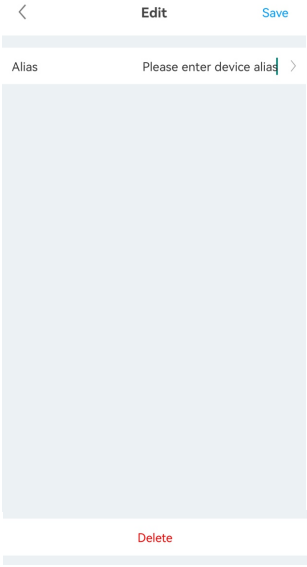


➢ Set the Customized PF Curve

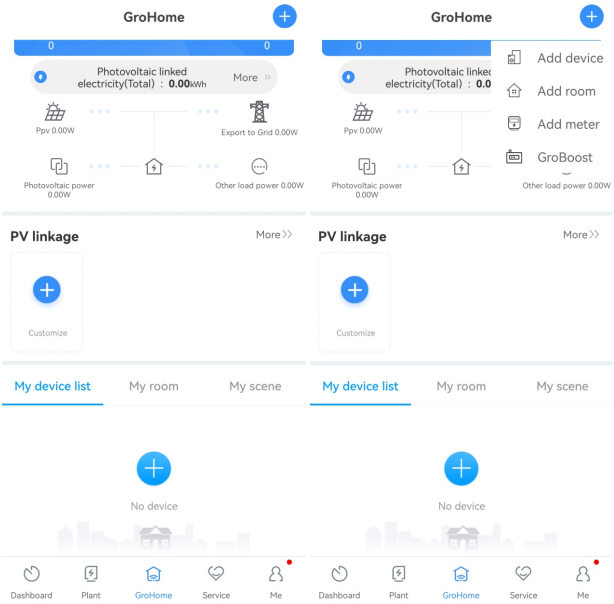
Tap Control > Custom PF curve, you can set the power percentage and the power factor of each point, as the figure shows.

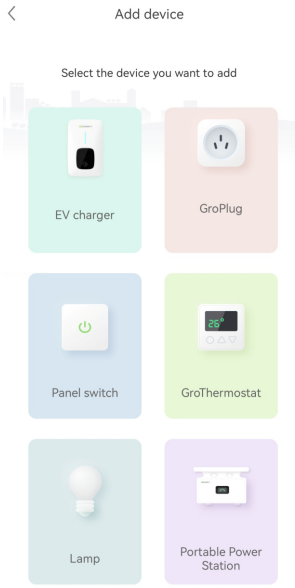


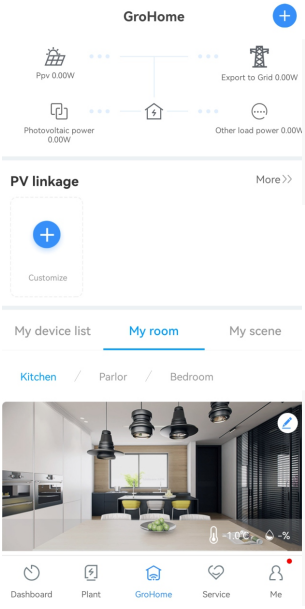
(6) Edit: you can change the device name as the figure shows.

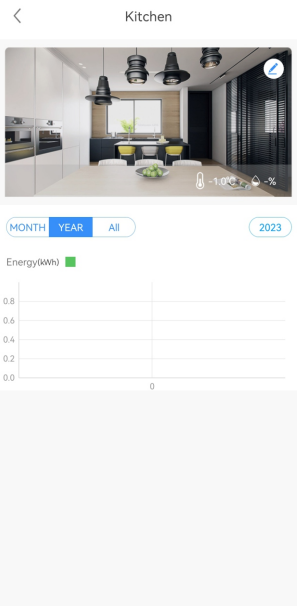


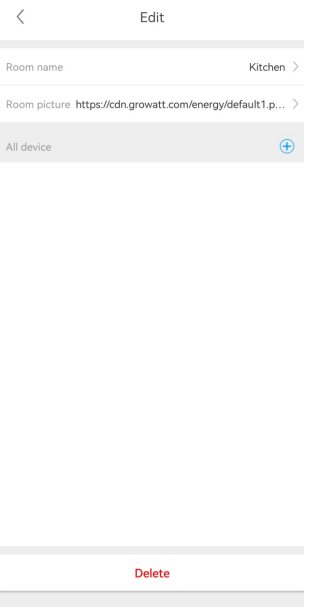
3. GroHome: displays the home energy system, including four sections: “PV linkage”, “My device list”, “My room” and “My scenario”.

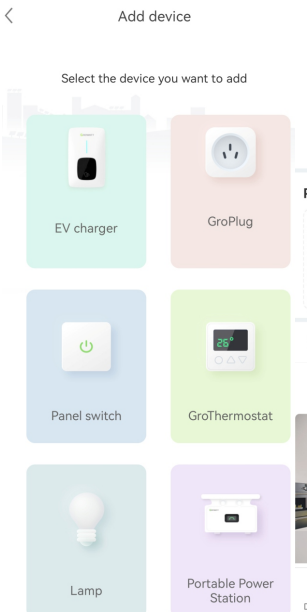


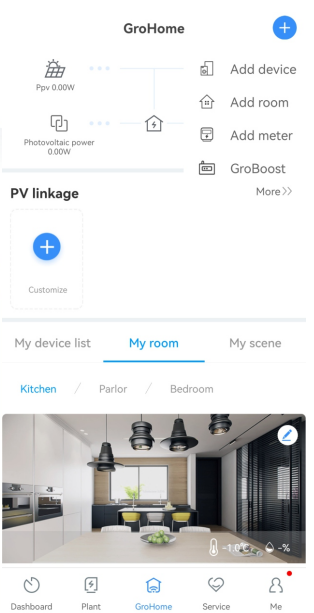


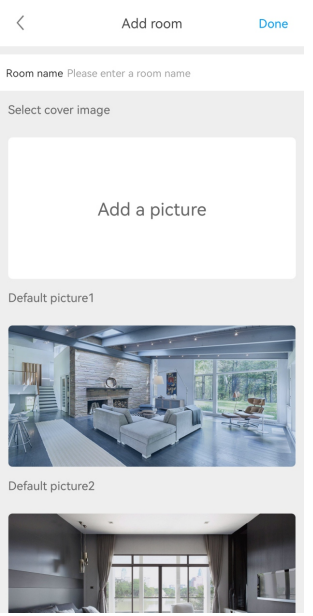

GroHome
Ppv 0.00W
Export to Grid 0.00W
Photovoltaic power 0.00W
Other load power 0.00W
PV linkage
More
Customize
My device list
My room
My scene
Kitchen
Parlor
Bedroom
Dashboard
Plant
GroHome
Service
Me


Kitchen
MONTH
YEAR
All
2023
Energy(kWh)
0.8
0.6
0.4
0.2
0.0
0

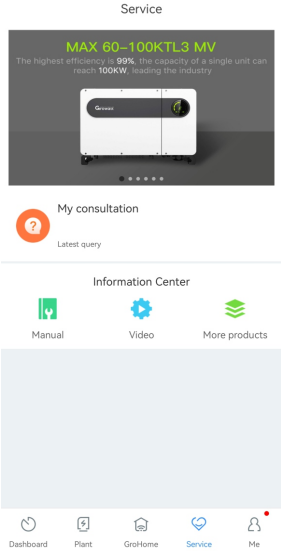

Edit
Room name
Kitchen
Room picture
https://cdn.growatt.com/energy/default1.p...
All device
Delete


Add device
Select the device you want to add
EV charger
GroPlug
Panel switch
GroThermostat
Lamp
Portable Power Station

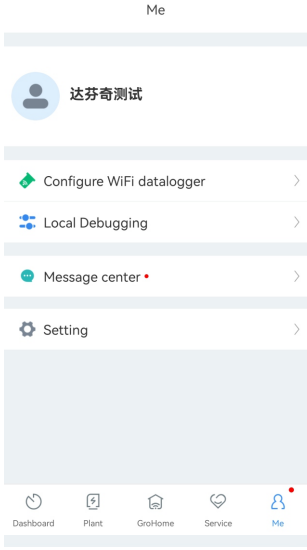

GroHome
Ppv 0.00W
Photovoltaic power 0.00W
Add device
Add room
Add meter
GroBoost
More
PV linkage
Customize
My device list
My room
My scene
Kitchen
Parlor
Bedroom
Dashboard
Plant
GroHome
Service
Me


Add room
Done
Room name
Please enter a room name
Select cover image
Add a picture
Default picture1
Default picture2

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

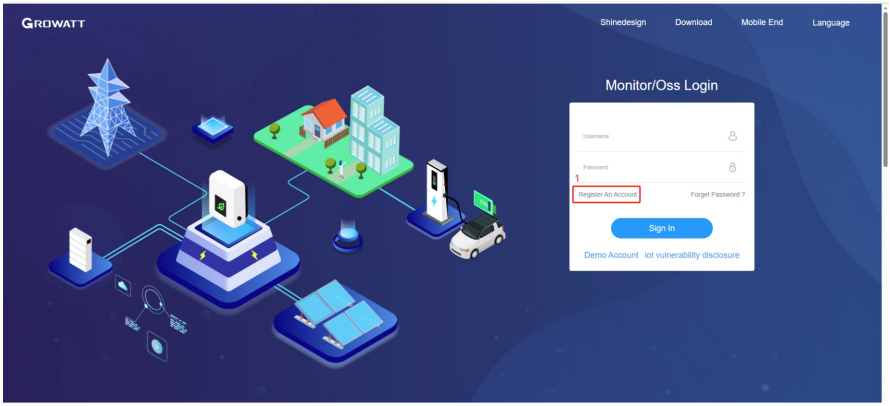


5. Me: You can check the account information, configure the datalogger or view notifications, as shown in the figure below.

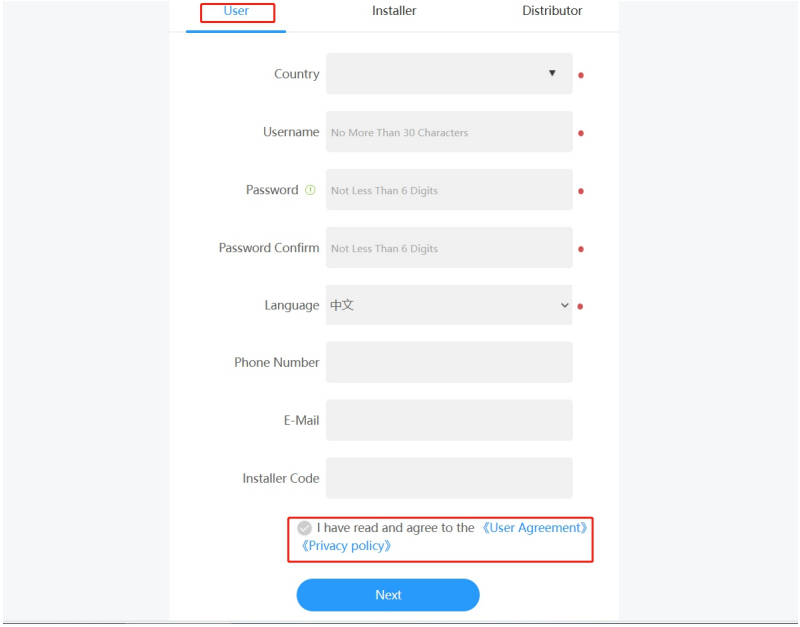


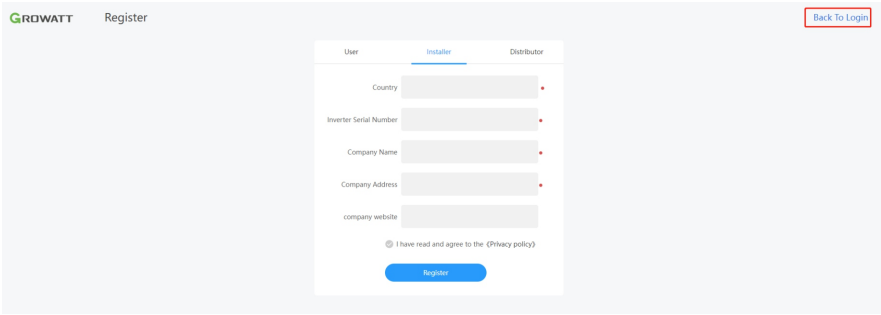
8.1.3 Remote Monitoring on the ShineServer Webpage

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



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

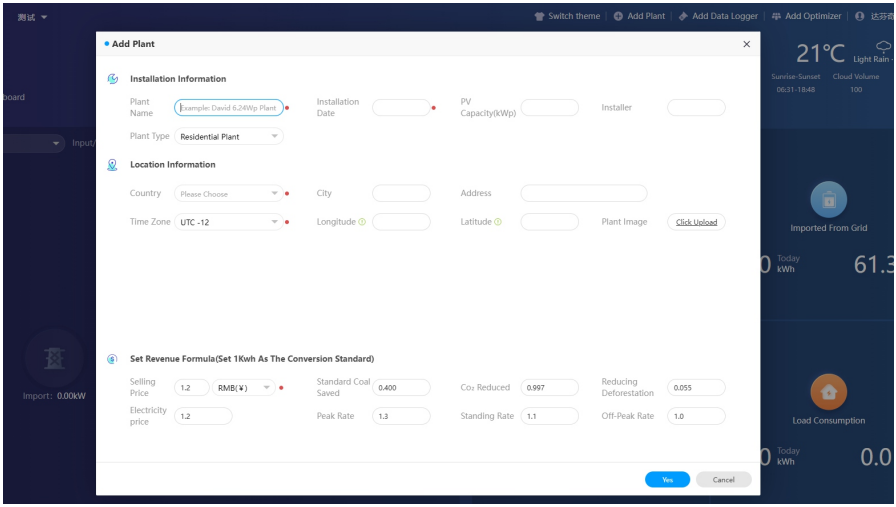




3. On the Login screen, enter the username and the password to log in to the home screen.

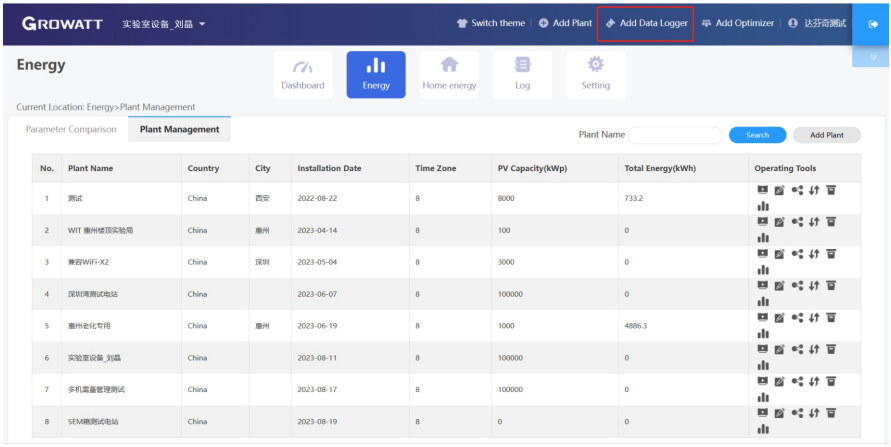


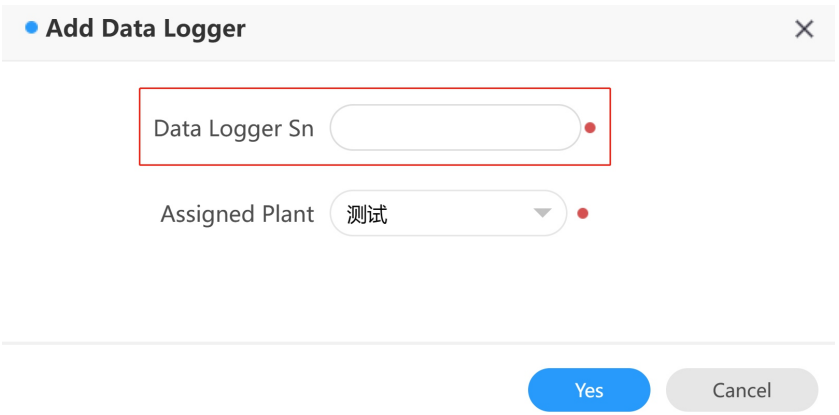
4. After accessing the home screen, the “Add Plant” window will pop up. Fill in the information as required (marked with “·”) and click “Yes”. If the plant has been created, you can select the target plant on the home screen.



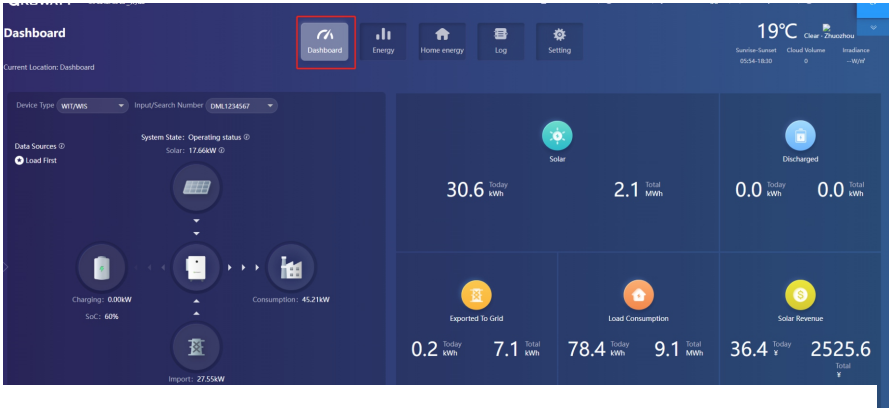


5. Click the target plant and the detailed page will be displayed, click “Add Data Logger” on the upper right corner to add the datalogger connected to the inverter.
   1) Enter the serial number (SN) of the datalogger
   2) Enter the verification code of the datalogger





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



Dashboard:

1. Running status and energy display

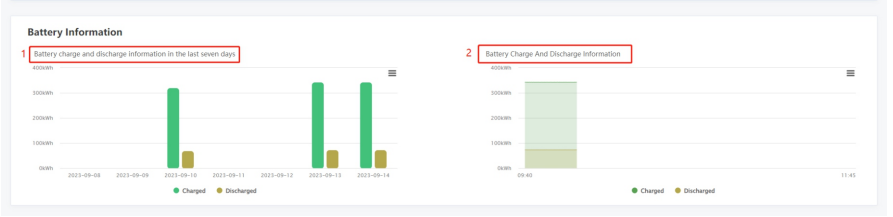


1) Plant List: select the target plant from the drop-down list
2) Device Type: Select the device from the drop-down list
3) Input/Search Number: Upon the initial search, enter the serial number of the specific device; If you have searched for it before, you can select the device from the drop-down list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

2. Energy Trend

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

3. Battery Information



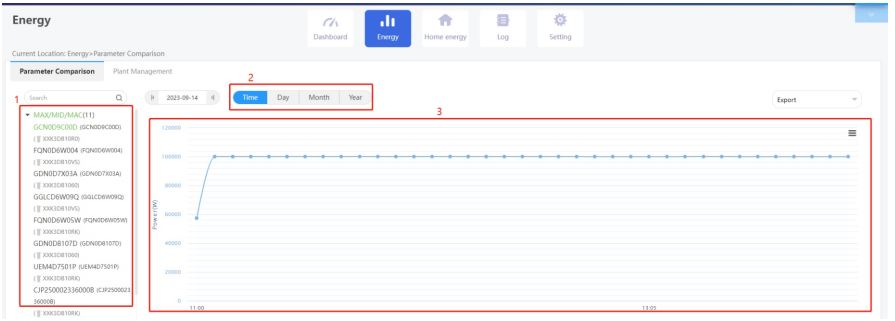
1) Battery charged and discharged: display the battery charge and discharge power
2) Battery real-time SOC: display the battery SOC

4. My PV devices

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

Energy

1. Parameter comparison



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

2. Plant Management

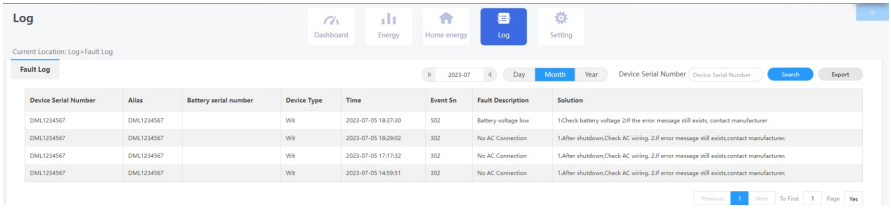


Click Plant Management and you can view all PV plants associated with the current account.

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

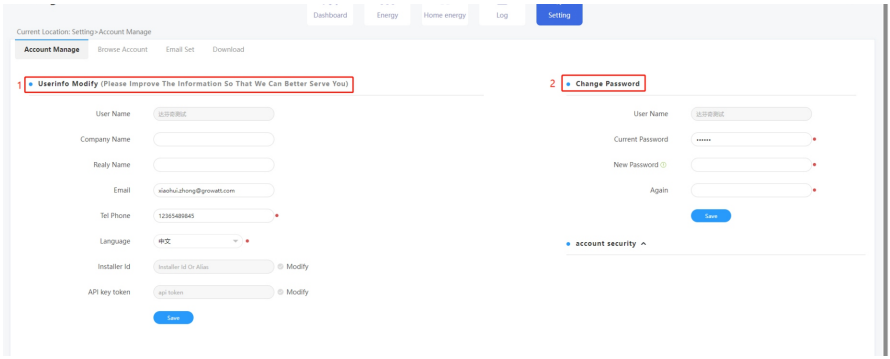
Log

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



Setting

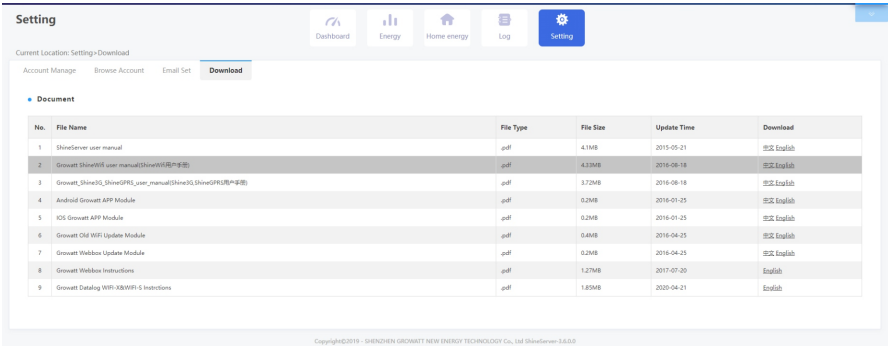
1. Account management



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

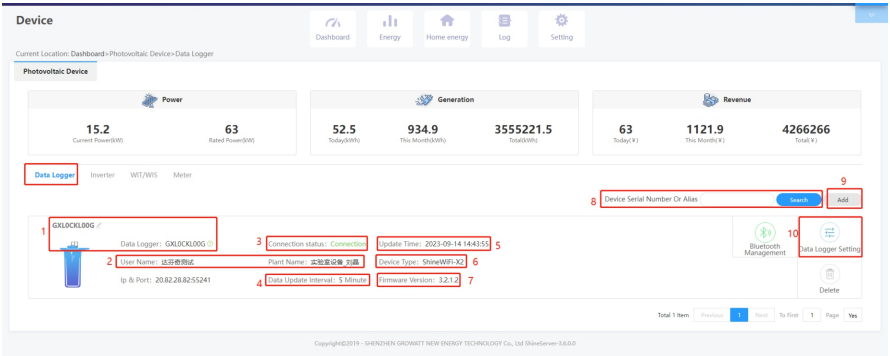
2. Download

A range of documents are available for download.



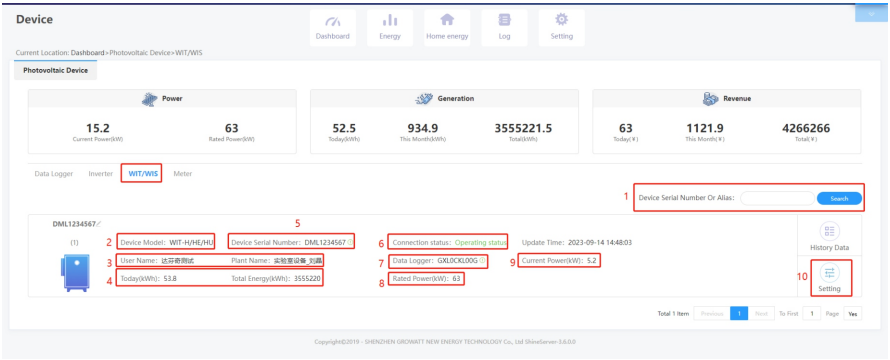
Device

1. Datalogger

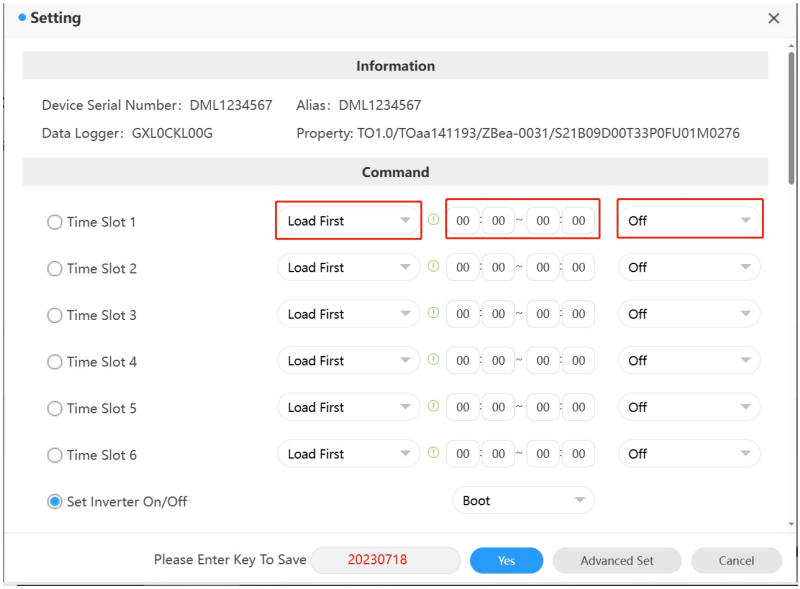


1) Serial number: each datalogger has a specific SN, which can be used to search for the device;
2) User name and the PV plant to which the datalogger is connected;
3) Connection status: connected or disconnected;
4) Data update interval;
5) Update time;
6) Device type;
7) Firmware version;
8) Enter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

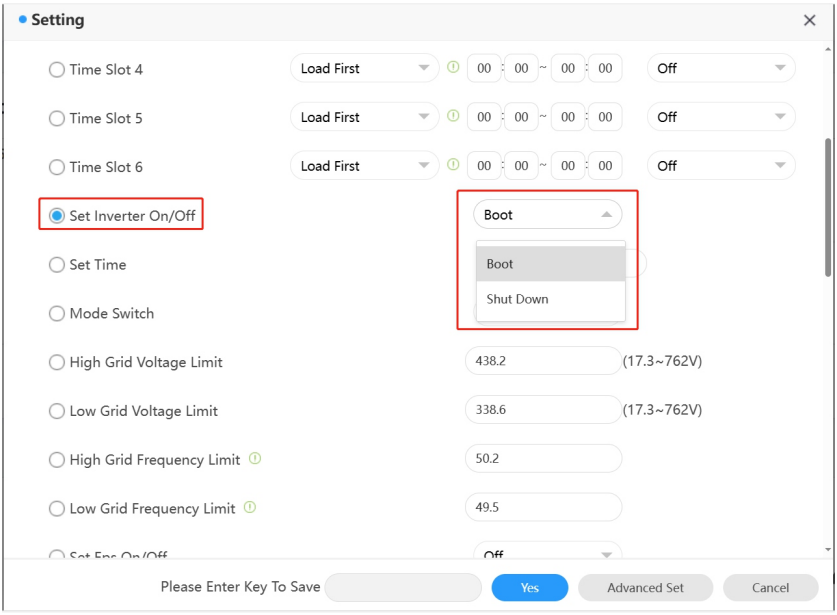
2. WIT



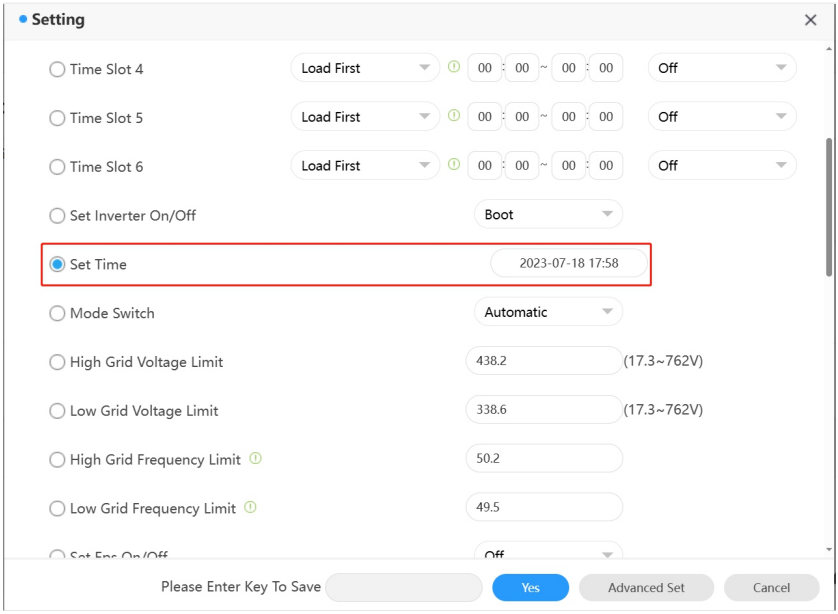
1) Enter the serial number to find the device;
2) Device model;
3) User name and the PV plant to which the device is connected;
4) Daily and monthly energy yield;
5) Serial number of the selected device;
6) Operating status: operating, standby, disconnected or faulty;
7) Serial number of the datalogger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



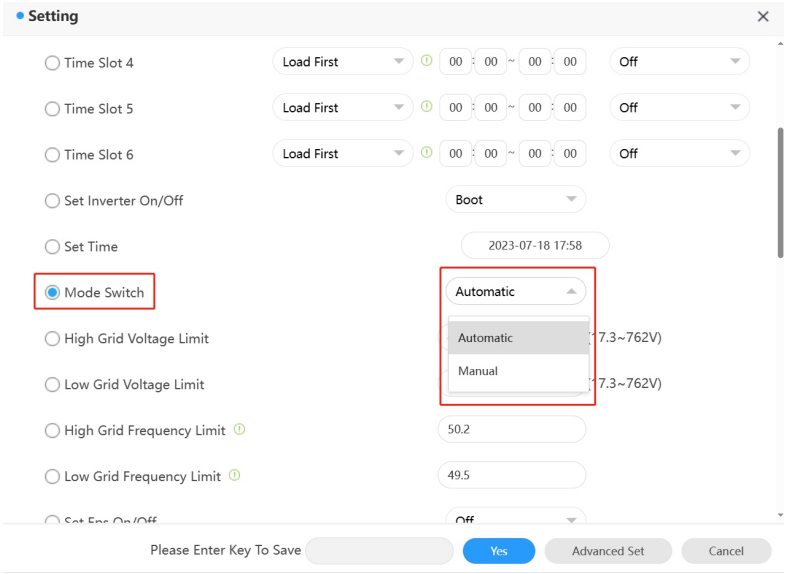
10.2) Powering on/off the device: you can power on/off the device remotely



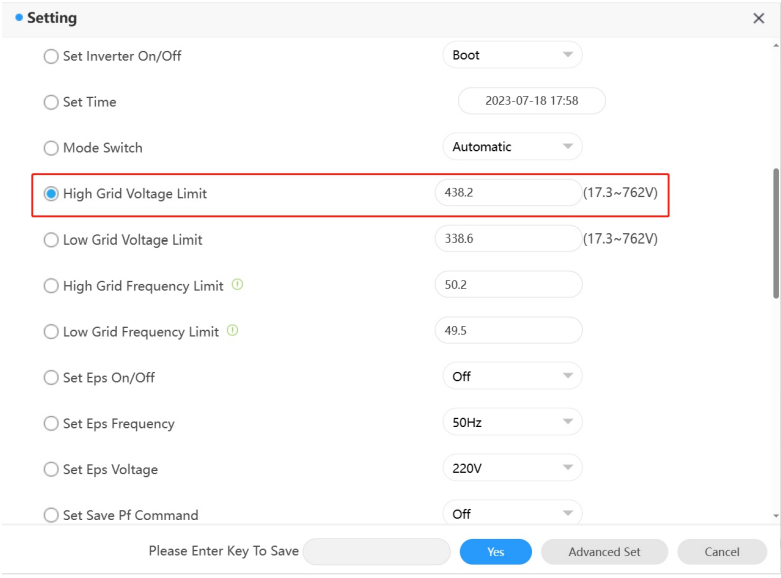
10.3) Set the time: you can set the time for the device



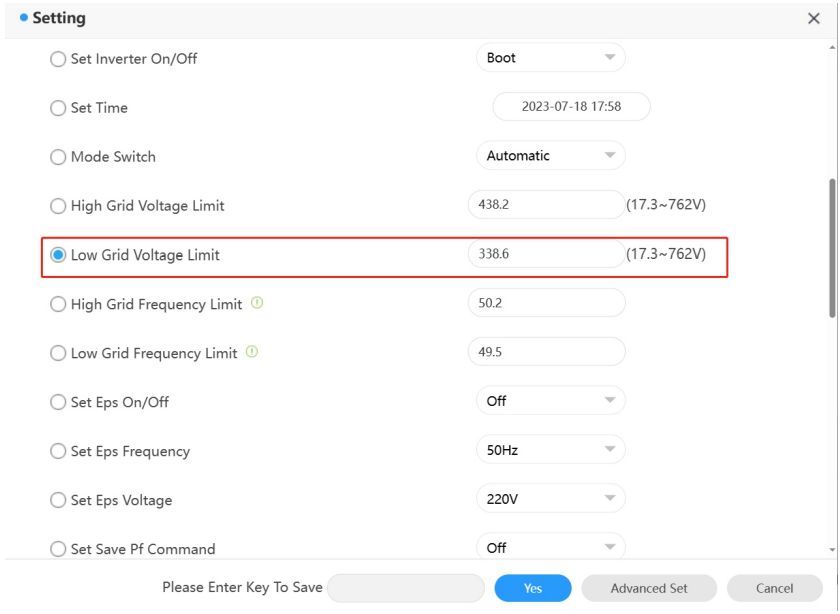
10.4) Mode switch: you can choose to switch the working mode manually or automatically. If “Manual” is selected, you can set the device to operate in on-grid or off-grid mode. Generally, you are advised to select “Automatic” mode switch.



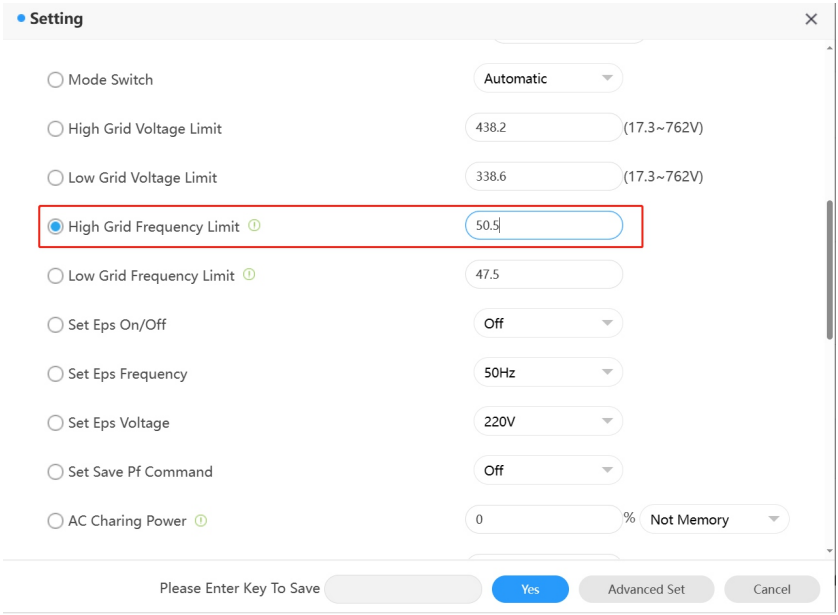
10.5) High grid voltage limit (voltage upper threshold of grid connection)



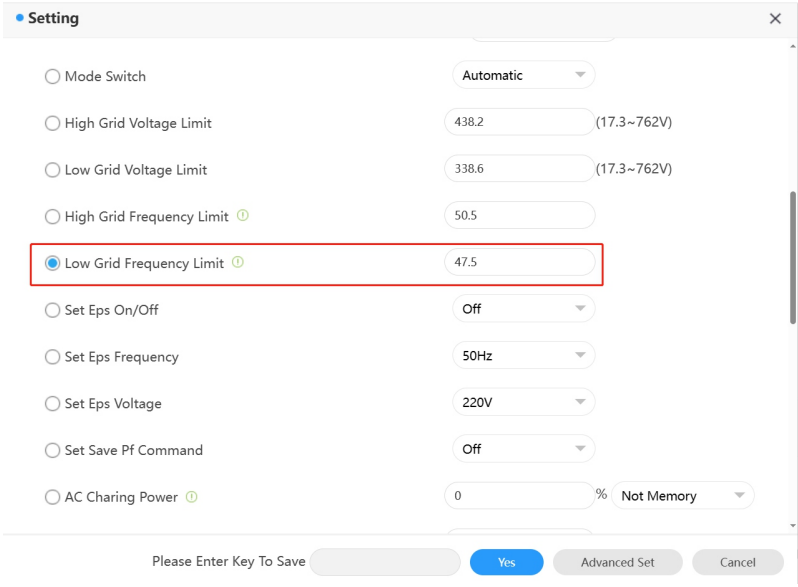
10.6) Low grid voltage limit (voltage lower threshold of grid connection)



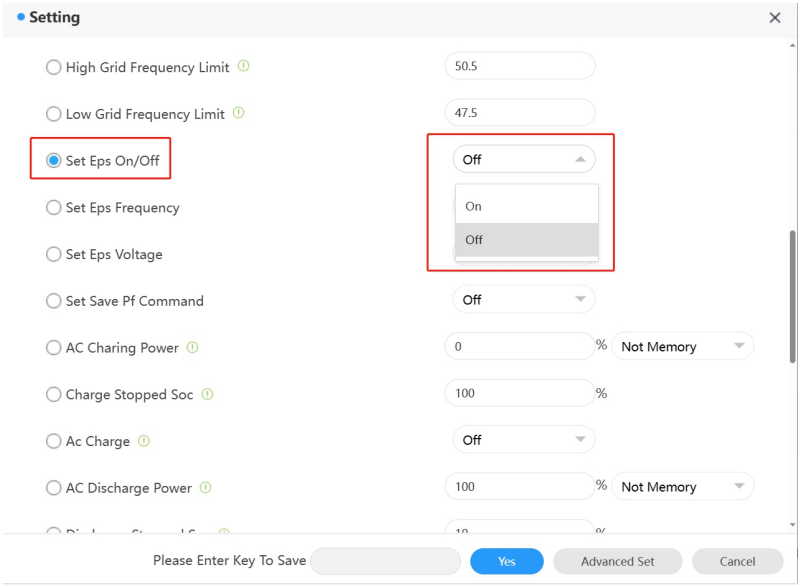
10.7) High grid frequency limit (frequency upper threshold of grid connection)



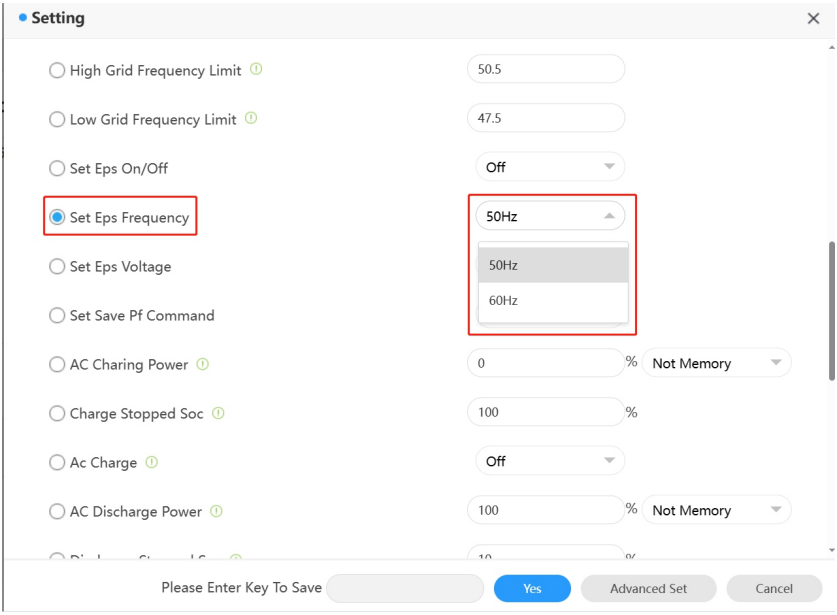
10.8) Low grid frequency limit (frequency lower threshold of grid connection)



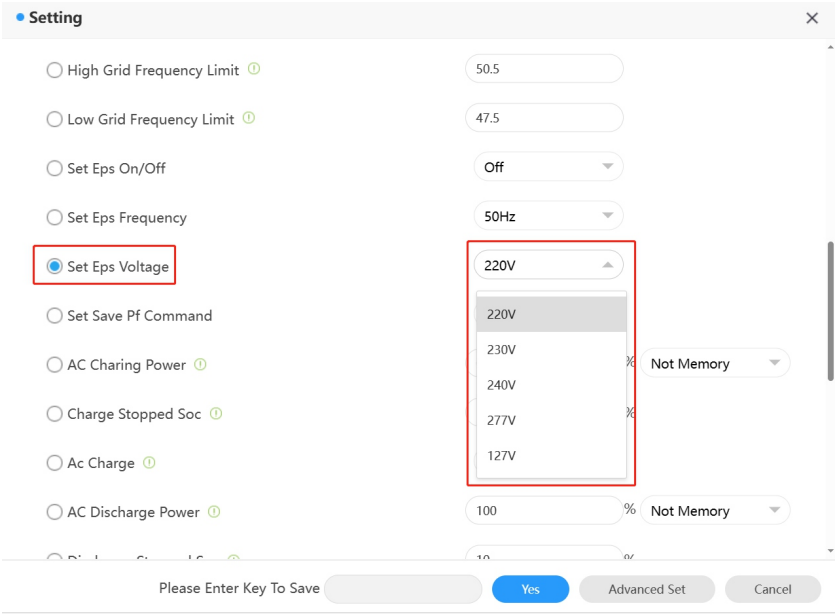
10.9) Set off-grid mode on/off: you can set whether to operate the inverter in the off-grid mode



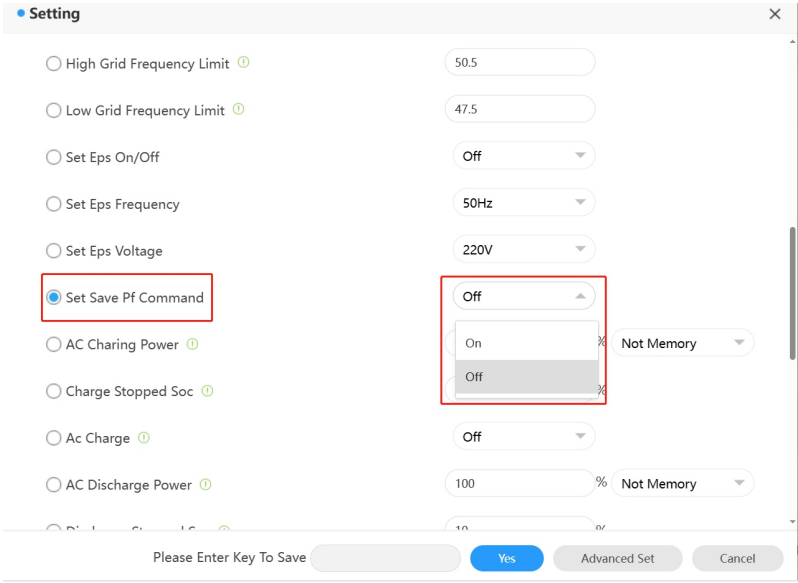
10.10) Off-grid frequency: two options are available: 50Hz/60Hz



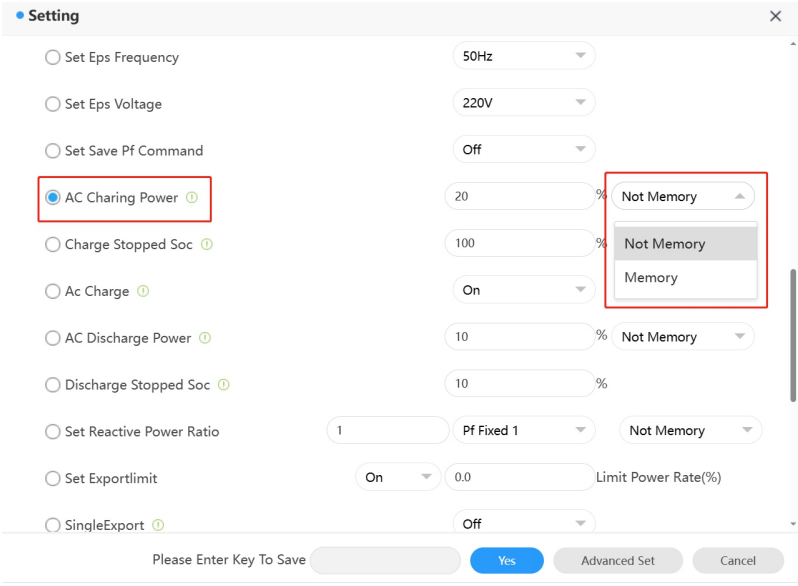
10.11) Off-grid voltage: you can set the value to 220V/230V/240V/277V/127V



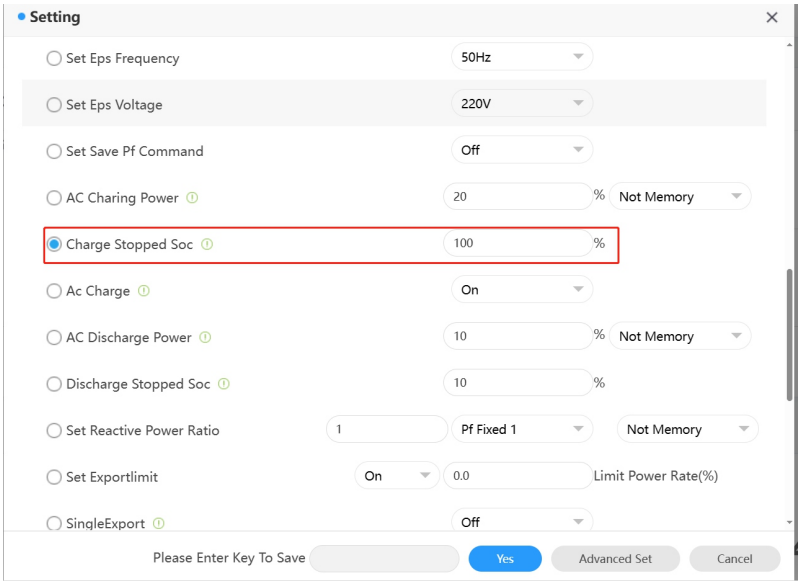
10.12) Save the PF Command: you can set whether to save the PF command setting



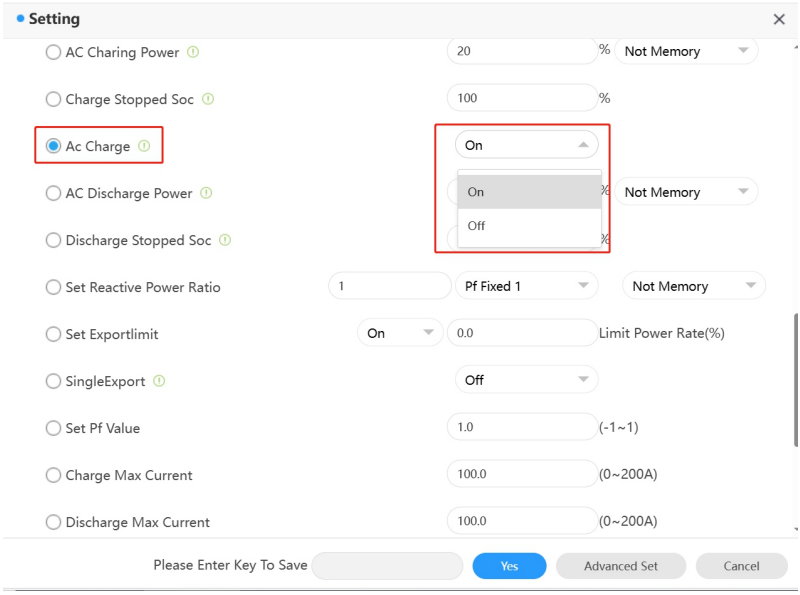
10.13) AC charging power: you can set the inverter's maximum output power



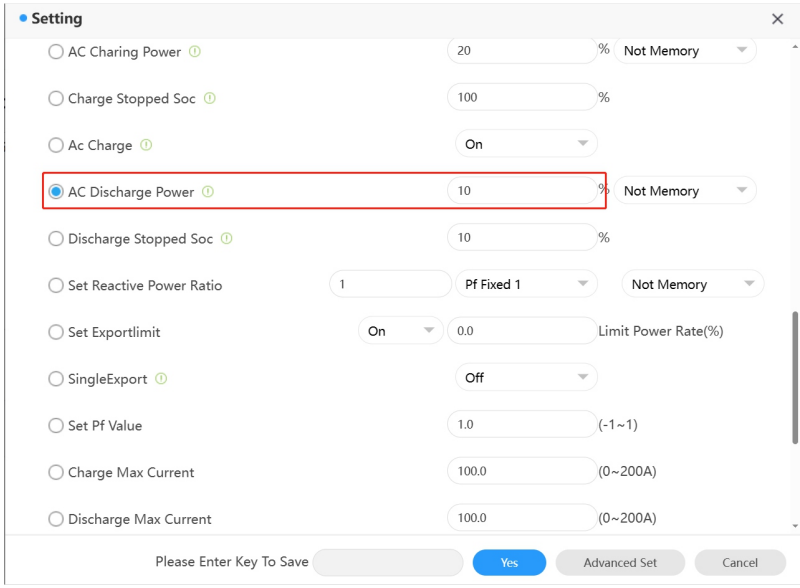
10.14) Charge cutoff SOC: you can set the battery charge cutoff SOC (100 is recommended)



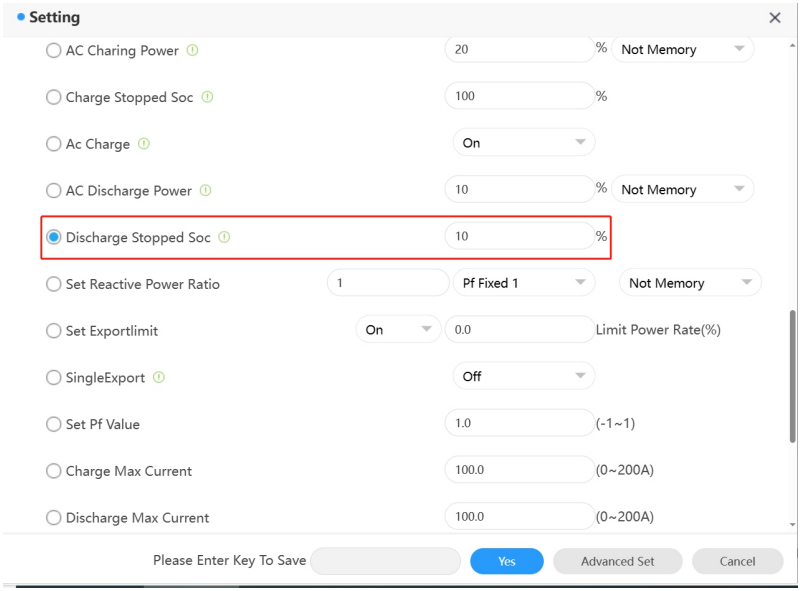
10.15) Enable AC charging:



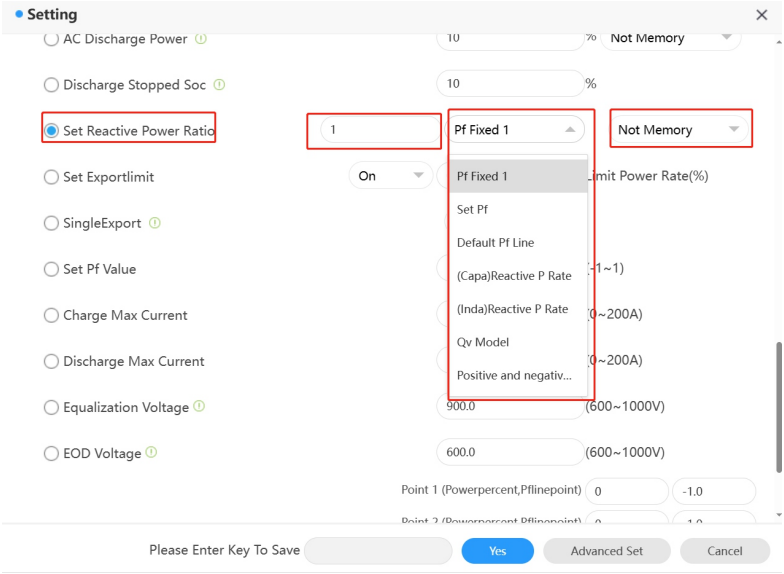
10.16) AC discharge power: you can set the battery discharge power



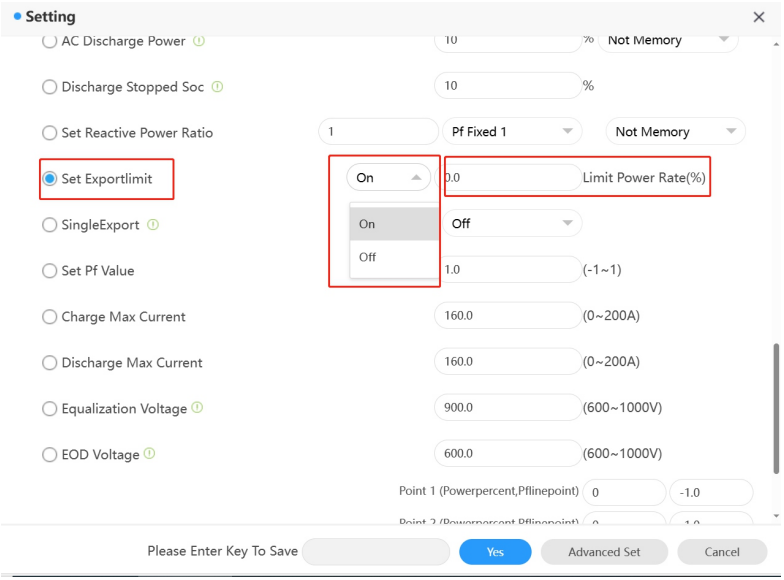
10.17) Discharge cutoff SOC: you can set the battery discharge cutoff SOC (10 is recommended)



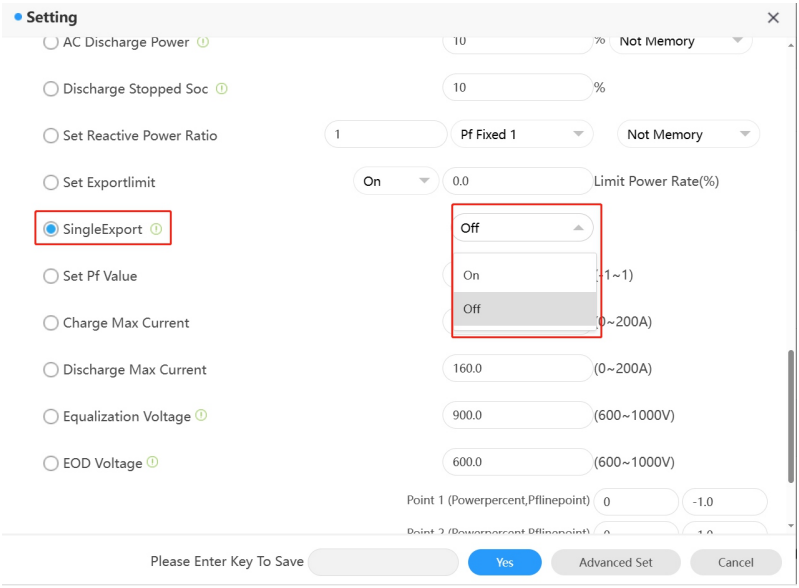
10.18) Set Reactive Power: you can set the corresponding PF mode and select whether to save the configured values



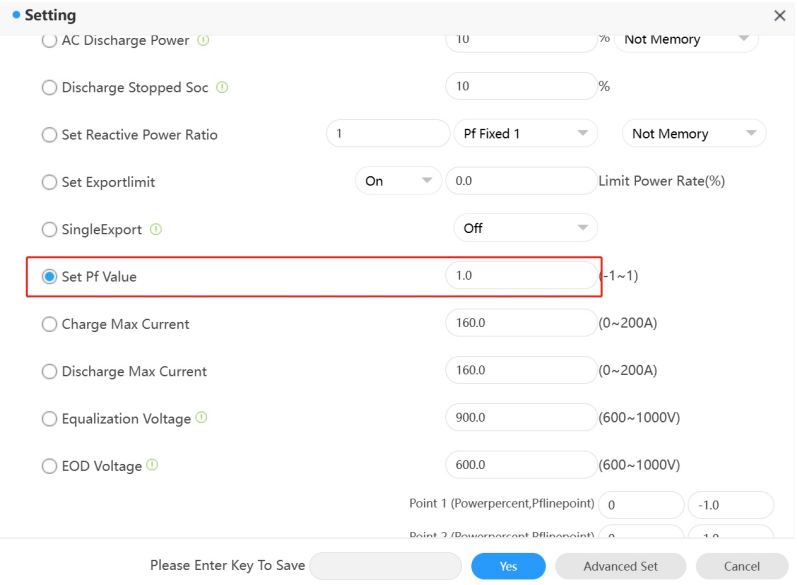
10.19) Export Limitation: You can enable/disable the export limitation function according to the local applicable regulations and set the export limit power rate if it is enabled



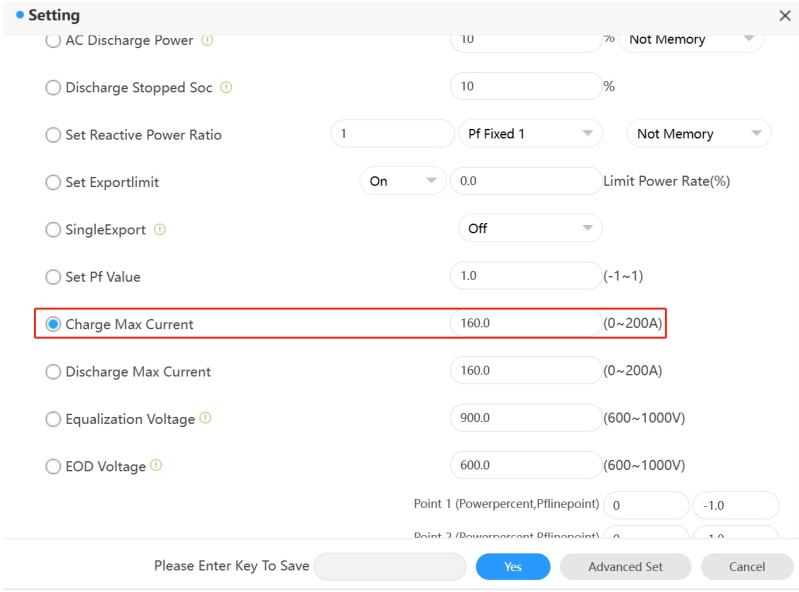
10.20) Single-phase Export Limitation



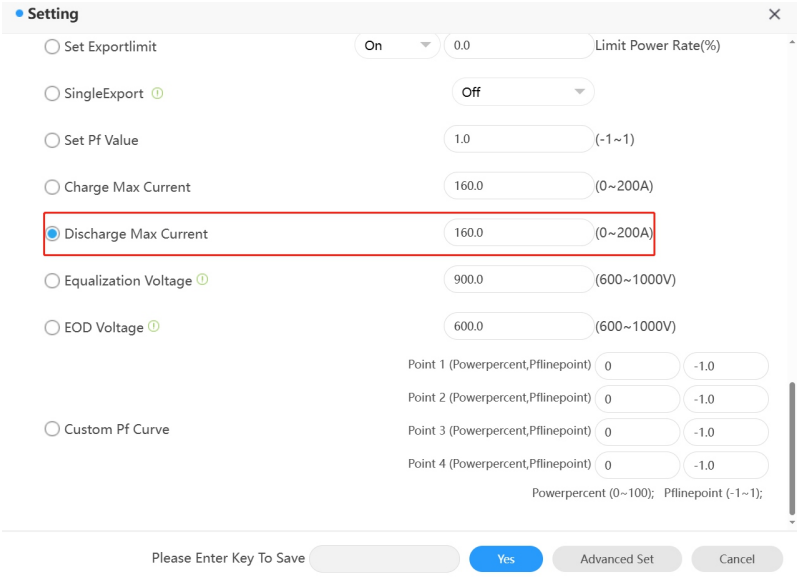
10.21) Set PF value: you can set the PF value, ranging from -1 to 1.



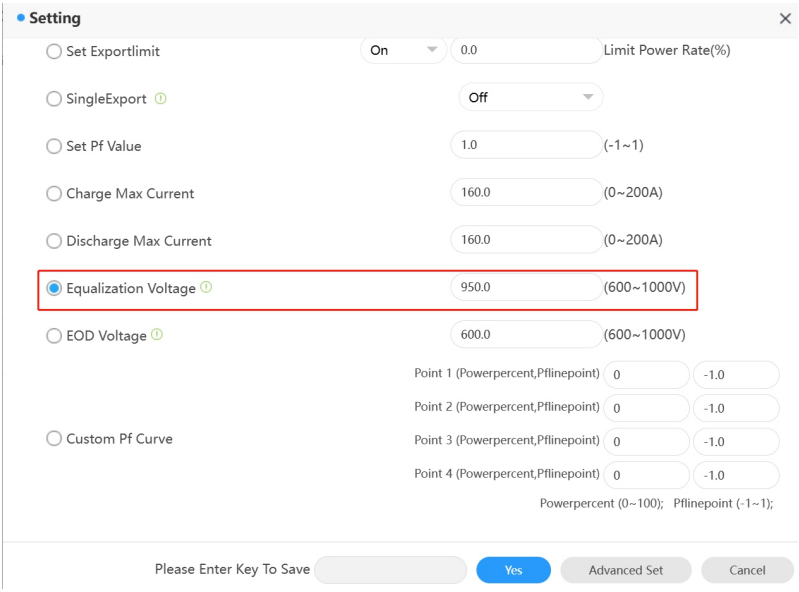
10.22) Charge Max. Current: you can set the battery maximum charge current



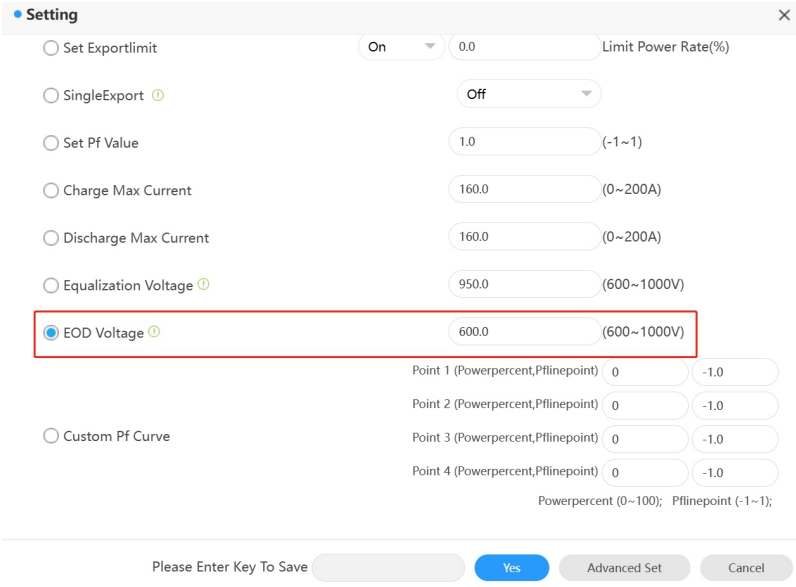
10.23) Discharge Max. Current: you can set the battery maximum discharge current



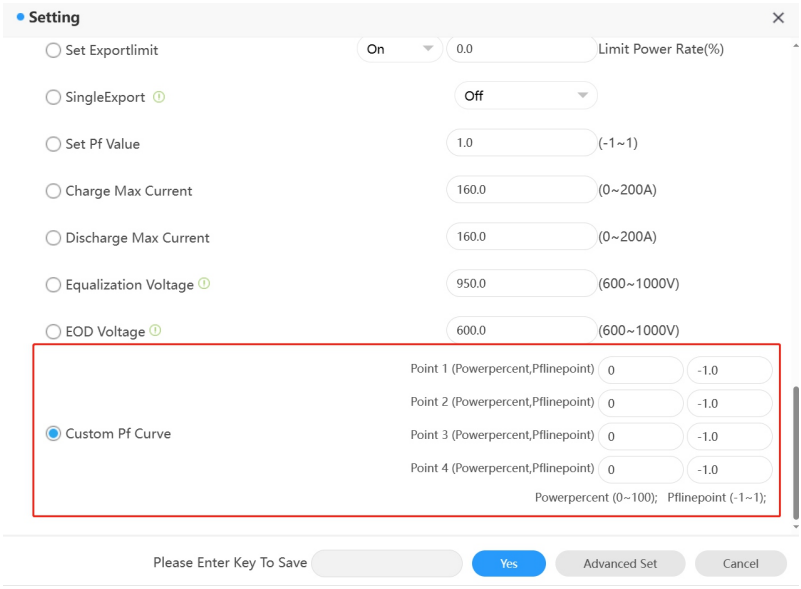
10.24) Equalization voltage: you can set the battery maximum charge voltage



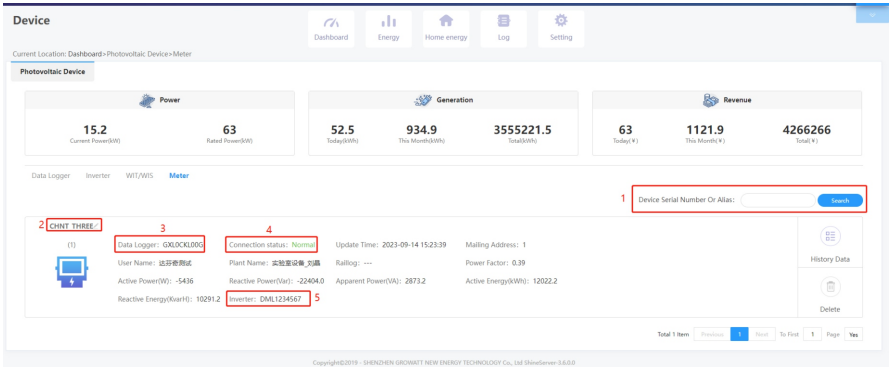
10.25) EOD voltage: you can set the battery discharge cutoff voltage



10.26) Customized PF curve: you can set the power percentage and the power factor for each point of the PF curve



Meter



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

System Maintenance 9

9.1 Routine Maintenance

9.1.1 Clean the Chassis

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

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

9.1.2 Fan Maintenance

DANGER	• Only qualified and trained electrical technicians are allowed to perform operations. Technicians must observe instructions in this manual 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 Inverter from performance de-rate due to excess heat. The fan in the WIT Inverter works to cool the components and the heat sink when the temperature is too high. Check the following possible causes and measures when an exception occurs:

1> The fan is stuck with foreign objects or there is dust accumulation on the heat sink; clean the fan cover, fan blades and the heat sink.
2> The fan is damaged and needs to be replaced.
3> The installation position of the WIT Inverter is not well-ventilated. Select an appropriate installation position that meets the basic installation requirements.

Cleaning and replacing the fan:

1> Before cleaning or replacing a fan, disconnect the DC and AC power supply and wait for at least 5 minutes.
2> Remove the fan fixing plate using a cross-head screwdriver, as shown in Fig 9.1:

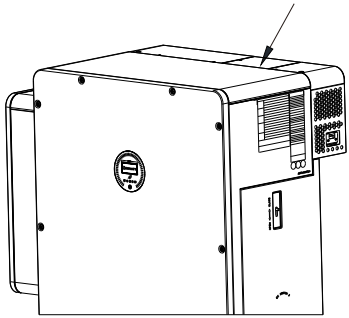


Fig 9.1 Position of the fan fixing plate

3> Disconnect the fan connector, remove the fan fixing plate with a screwdriver, and remove the fan, as shown in Fig 9.2:

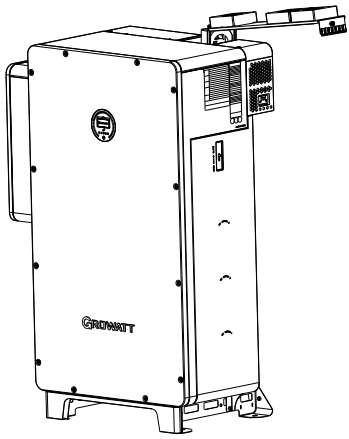


Fig 9.2 Position of the fan

NOTE:
① WIT 28-55K-A-US L2 and WIT 28-55K-H-US L2 models have five external fans;
② WIT 28-55K-AU-US L2 and WIT 28-55K-HU-US L2 models have seven external fans;

4> Clean the fan cover, fan blades, and the heat sink, or replace the fan.
(1) Use an air pump to clean the heat sink, and use a brush or wet cloth to clean the fan and the its cover;
(2) Remove the fan for cleaning if necessary;
(3) Remove the fan that needs to be replaced using a cross-head screwdriver and install a new fan.
(4) Bind the cables and fix them with a cable tie.
(5) Reinstall the fan, the fan fixing plate, and the WIT Inverter.

9.2 Troubleshooting

 DANGER	• It must be operated by trained and professional electrical technicians. Technicians must observe instructions in this manual and local regulations. • If the WIT Inverter 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.

9.2.1 Warning

Warnings indicate abnormal situations of WIT 28-55K-US L2 Storage/Hybrid Inverters, leading to a reduction in the output power. The warning sign will disappear once the fault is rectified by restarting the inverter or reconfiguring the system. The warning codes are shown in Table 9.1:

Table 9.1Warning codes

Warning	Description	Suggestion
Warning 200	String fault	1. Check if the PV panels are normal after shutdown. 2. If the error message persists, contact Growatt support.
Warning 201	PV string/PID quick-connect terminals abnormal	1. Check the wiring of the string terminals after shutdown. 2. If the error message persists, contact Growatt support.
Warning 202	DC SPD function abnormal	1. Check the DC SPD after shutdown. 2. If the error message persists, contact Growatt support.
Warning 203	PV1 or PV2 short circuited	1. Check if PV1 or PV2 is short circuited. 2. If the error message persists, contact Growatt support.
Warning 204	Dryconnect function abnormal	1.After shutdown,Check the dry Dryconnect wiring. 2.If the error message still exists, contact Growatt support.
Warning 205	PV Boost driver abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.

Warning	Description	Suggestion
Warning 206	AC SPD function abnormal	1. After shutdown, check the AC SPD. 2. If the fault persists, contact Growatt.
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 Growatt support.
Warning 208	DC fuse blows	1. Power off the system and check the fuse. 2. If the fault persists, contact Growatt.
Warning 209	DC input voltage exceeds the upper threshold	1. Turn off the DC switch immediately and check the DC voltage. 2. If the DC voltage is within the specified range and the error message persists, contact Growatt support.
Warning 210	PV string is reversely connected	1. Check the polarity of the PV terminals. 2. If the error message persists, contact Growatt support.
Warning 217	BDC Abnormal	1.Restart inverter. 2.If error message still exists,contact Growatt support.
Warning 218	BDC Bus DisConnect	1.Restart inverter. 2.If error message still exists,contact Growatt support.
Warning 219	PID function abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 220	PV string disconnected	1. Check if the PV string is properly connected. 2. If the error message persists, contact Growatt support.

Warning	Description	Suggestion
Warning 221	PV string current unbalanced	1. Check if the PV panels of the corresponding string are normal. 2. If the error message persists, contact Growatt support.
Warning 300	No utility grid connected or utility grid power failure	1. Check if the grid is down. 2. If the error message persists, contact Growatt support.
Warning 301	Grid voltage is beyond the permissible range	1. Check if the grid voltage is within the specified range. 2. If the error message persists, contact Growatt support.
Warning 302	Grid frequency is beyond the permissible range	1. Check if the grid frequency is within the specified range. 2. If the error message persists, contact Growatt support.
Warning 303	Overload	1. Please reduce the load connected to the EPS output terminal. 2. If the error message persists, contact Growatt support.
Warning 304	CT Open or Wrong	1.Check if AC current sensor is connected well 2.If the error message still exists,contact Growatt support.
Warning 305	CT line reversed or Ground fail	Check the L line and N line of SP-CT is reversed or not. 2.If the error message still exists,contact Growatt support.
Warning 306	Communication fault, M3 didn't receive SP-CT data	1.Check communication wire 2.If error message still exists,contact Growatt support.
Warning 307	Communication fault	1.Check communication wire 2.If error message still exists,contact Growatt support.

Warning	Description	Suggestion
Warning 308	Meter disconnected	1. Check if the meter is properly connected. 2. If the error message persists, contact Growatt support.
Warning 309	Meter is reversely connected	1. Check if the L line and the N line of the meter are reversely connected. 2. If the error message persists, contact Growatt support.
Warning 310	The voltage difference between the N line and the PE cable is abnormal	1. Check if the PE cable is reliably connected after shutdown. 2. If the error message persists, contact Growatt support.
Warning 311	Phase sequence error	No operation is required. The PCS will automatically adjust the phase sequence.
Warning 400	Fan failure	1. Check if the fan is properly connected after shutdown. 2. If the error message persists, contact Growatt support.
Warning 401	Meter abnormal	1. Check if the meter is turned on. 2. If the meter is correctly connected to the inverter.
Warning 402	Communication between the optimizer and the inverter is abnormal	1. Check if the optimizer is turned on. 2. If the optimizer is correctly connected to the inverter.
Warning 403	String communication	1.After shutdown,Check the string panel wiring. 2.If the error message still exists, contact Growatt support .
Warning 404	EEPROM abnormal	1.Restart inverter. 2.If the error message still exists,contact Growatt support.
Warning 405	DSP and COM firmware version unmatch	1.Check the firmware version. 2.If the error message still exists,contact Growatt support
Warning 406	Boost module error	1.Restart inverter. 2.If the error message still exists, contact Growatt support.

Warning	Description	Suggestion
Warning 407	Over-temperature	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 408	NTC temperature sensor is broken	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 409	Reactive power scheduling No response warning	1.Check if shinemaster is open. 2.If the error message still exists, contact Growatt support.
Warning 410	CPU Run abnormal	1. Restart inverter. 2. If the error message still exists, contact Growatt support.
Warning 411	Sync signal abnormal	1. Check if the sync cable is abnormal. 2. If the error message persists, contact Growatt support.
Warning 412	Startup requirements of grid connection are not met	1. Check if the grid voltage is within the specified range and check if the grid-connection startup voltage configuration is correct. 2. Check if the PV voltage is within the specified range. 3. Restart the inverter. If the error message persists, contact Growatt support.
Warning 500	The inverter failed to communicate with the battery	1. Check if the battery is turned on. 2. Check if the battery is correctly and securely connected to the inverter.
Warning 501	Battery disconnected	1. Check if the battery is properly connected. 2. If the error message persists, contact Growatt support.
Warning 502	Battery voltage too high	1. Check if the battery voltage is within the permissible range. 2. Check if the battery is correctly connected. 3. If the error message persists, contact Growatt support.

Warning	Description	Suggestion
Warning 503	Battery voltage too low	1. Check if the battery voltage is within the permissible range. 2. Check if the battery is correctly connected. 3. If the error message persists, contact Growatt support.
Warning 504	Battery terminals are reversely connected	1. Check if the positive and negative terminals of the battery are reversely connected. 2. If the error message persists, contact Growatt support.
Warning 505	Temperature sensor of the lead-acid battery is disconnected	1. Check if the temperature sensor of the lead-acid battery is installed or not. 2. Check if the temperature sensor is well-connected. 3. If the error message persists, contact Growatt support.
Warning 506	Battery temperature is out of range	1. Check if the ambient temperature of the battery is within the specified range. 2. If the error message persists, contact Growatt support.
Warning 507	BMS reported a fault; both charging and discharging failed	1. Figure out the cause according to the BMS error code. 2. If the error message persists, contact Growatt support.
Warning 508	Lithium battery overload protection	1. Check if the power of the load exceeds the BAT rated discharge power. 2. If the error message persists, contact Growatt support.
Warning 509	BMS communication abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 510	BAT SPD function abnormal	1. Check the BAT SPD after powering off the device. 2. If the error message persists, contact Growatt support.

Warning	Description	Suggestion
Warning 600	DCI bias abnormal	1.Restart inverter. 2.If the error message still exists,contact Growatt support.
Warning 601	DC component over high in output voltage	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 602	Off-grid output voltage is too low	1.Restart inverter. 2.If the error message still exists, contact Growatt support.
Warning 603	The off-grid output voltage is too high	1.Restart inverter. 2.If the error message still exists, contact Growatt support.
Warning 604	The off-grid output current is overcurrent	1.Check whether the load exceeds the inverter specification. 2.Restart inverter,If the error message still exists,contact Growatt support.
Warning 605	Off-grid bus voltage too low	1. Check if the load power exceeds the upper limit. 2. Restart the inverter. If the error message persists, contact Growatt support.
Warning 606	The off-grid output is overloaded	1.Check whether the load exceeds the inverter specification. 2.Restart inverter,If the error message still exists,contact Growatt support.
Warning 607	Abnormal communication alarm with off-grid box	1.Check and off-grid box communication wiring after shutdown. 2.If the error message still exists,contact Growatt support.
Warning 608	Off-grid box abnormal alarm	1.Restart inverter. 2.If the error message still exists,contact Growatt support.

Warning	Description	Suggestion
Warning 609	Balanced circuit abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 700	The off-grid box fan is faulty	1.Check the fan wiring after powering it down. 2.If the error message still exists,contact Growatt support.
Warning 701	The generator started abnormally	1.Check the generator and wiring after shutdown. 2.If the error message still exists,contact Growatt support.
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 error message persists, contact Growatt support.
Warning 801	PID Boost input overvoltage	1.Shutdown and restart. 2.If the error message still exists, contact Growatt support.
Warning 802	Fan Abnormal Alarm	1.Shut down the device and check whether the fan is blocked. 2.If the error messaget persists, contact Growatt support.

9.2.2 Error

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

Table 9.2 Error codes

Error Code	Description	Suggestion
Error 200	An arc fault has been detected	1. After shutdown, check the connection of the PV string. 2. Restart the inverter. 3. If the error message persists, please contact Growatt support.
Error 201	An excessively high leakage current has been detected	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 202	DC input voltage exceeds the upper threshold	1. Disconnect the DC switch immediately and check the voltage. 2. If the DC input voltage is within the permissible range and the error message persists, please contact Growatt support.
Error 203	PV panels have low insulation resistance	1. Check if the PV strings are properly grounded. 2. If the error message persists, please contact Growatt support.
Error 204	PV string reversely connected	1. After shutdown, check if the PV string is reversely connected to the inverter. 2. Restart the inverter. 3. If the error message persists, please contact Growatt support.
Error 300	Grid voltage is beyond the permissible range	1. Check the grid voltage. 2. If the grid voltage is within the permissible range and the error message persists, please contact Growatt support.
Error 301	AC terminals reversed	1.Check AC terminals 2.If the error message still exists,contact Growatt support.

Error Code	Description	Suggestion
Error 302	No utility grid connected or utility grid power failure	1. After shutdown, check the AC wiring. 2. If the error message persists, please contact Growatt support.
Error 303	The voltage difference between the N line and the PE cable is abnormal	1. After shutdown, check if the ground cable is reliably connected. 2. If the error message persists, please contact Growatt support.
Error 304	Grid frequency is beyond the permissible range	1. Check the grid frequency and restart the inverter. 2. If the error message persists, please contact Growatt support..
Error 305	Over Load Fault	1.Check whether output load over range; If load too large, please reduce load 2.If the error message still exists, contact Growatt support.
Error 306	CT LN Reversed	1.After shutdown，Check the SP-CT connection. 2.If the error message still exists,contact Growatt support.
Error 307	Communication fault, M3 didn't receive SP-CT data	1.Check communication wire 2.If the error message still exists,contact Growatt support.
Error 308	Communication fault;Pairing time too long	1.Restart pairing 2.If the error message still exists,contact Growatt support.
Error 309	Grid ROCOF (Rated of Change of Frequency) abnormal	1. Check the grid frequency and restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 310	Neutral-to-Ground voltage is too low	1. Check whether the N line on the inverter side with PV negative grounding is short-circuited with the ground cable and whether the output side is isolated with a transformer. 2. If the error message persists, please contact Growatt support.

Error Code	Description	Suggestion
Error 311	Export limitation fail-safe	1. After shutdown, check the connection of the CT and the meter. 2. If the error message persists, please contact Growatt support.
Error 400	DCI bias abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Error 401	DC Voltage High Fault	1.Restart inverter. 2.If the error message still exists,contact Growatt support.
Error 402	High DC component in output current	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Error 403	Output current unbalance	1.After shutdown,Check the output current is not balanced. 2.If the error message still exists, contact Growatt support.
Error 404	Bus voltage sampling abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 405	Relay fault	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 406	Init model fault	1.Reset mode 2.If the error message still exists,contact Growatt support.
Error 407	AutoTest failure	1.Restart inverter. 2.If the error message still exists,contact Growatt support.
Error 408	Over-temperature	1. After shutdown, check the temperature of the inverter and restart the inverter after the temperature is within the acceptable range. 2. If the error message persists, please contact Growatt support.
Error 409	Bus voltage abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.

Error Code	Description	Suggestion
Error 410	Communication board and control panel sampling battery voltage is inconsistent	1.Restart inverter 2.If the error message still exists, contact Growatt support
Error 411	Internal communication failure	1. Check the wiring of the communication board after shutdown. 2. If the error message persists, please contact Growatt support.
Error 412	Temperature sensor disconnected	1. Check if the temperature sensor module is properly connected. 2. If the error message persists, please contact Growatt support.
Error 413	IGBT drive fault	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 414	EEPROM error	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 415	Auxiliary power supply abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 416	DC/AC overcurrent protection	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 417	Communication protocol mismatch	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 418	DSP and COM firmware version mismatch	1. Check the firmware version. 2. If the error message persists, please contact Growatt support.
Error 419	DSP software and hardware version mismatch	1. Check the firmware version. 2. If the error message persists, please contact Growatt support.
Error 420	GFCI Module damage	1.After shutdown,Check the leakage current module. 2.If the error message still exists, contact Growatt support.
Error 421	CPLD abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.

Error Code	Description	Suggestion
Error 422	Redundancy sampling inconsistent	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 423	PWM pass-through signal failure	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 424	INV current abnormal	1.Restart inverter. 2.If the error message still exists,contact Growatt support.
Error 425	AFCI self-test failure	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 426	PV current sampling abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 427	AC current sampling abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 428	Boost Short Out	1.contact Growatt support.
Error 429	Bus voltage softstart fail	1.Restart inverter 2.If the error message still exists, contact Growatt support.
Error 430	EPO fault	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 431	Monitoring chip BOOT verification failed	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 432	The system battery model is not compatible	1.Replacing the System Battery Model 2.If the error message still exists, contact Growatt support.
Error 433	The system battery software is not compatible	1.Update the System Battery Software 2.If the error message still exists, contact Growatt support.
Error 434	High frequency synchronization fault	1.Check High frequency synchronization cable after shutdown. 2.If the error message still exists,contact Growatt support.

Error Code	Description	Suggestion
Error 435	System config fault	1.Check system config after shutdown 2.If the error message still exists,contact Growatt support.
Error 500	BMS failed to communicate with the inverter	1. Check the connection of the RS485 cable between the inverter and the battery. 2. Check if the battery is in the sleep mode. 3. If the error message persists, please contact Growatt support.
Error 501	The BMS reports that the battery failed to charge/discharge	1. Check the connection of the RS485 cable between the inverter and the battery. 2. Check if the battery is in the sleep mode. 3. If the error message persists, please contact Growatt support.
Error 502	The battery voltage is below the lower threshold	1. Check the battery voltage. 2. If the error message persists, please contact Growatt support.
Error 503	The battery voltage exceeds upper threshold	1. Check the battery voltage. If it is within the permissible range, please restart the inverter. If not, please replace the battery. 2. If the error message persists, please contact Growatt support.
Error 504	The battery temperature is beyond the range for charging/discharging	1. Check the temperature of the battery. 2. If the error message persists, please contact Growatt support.
Error 505	Battery terminals reversed	1. Check if the battery terminals are reversely connected. 2. If the error message persists, please contact Growatt support.
Error 506	Battery open-circuited	1. Check the wiring of the battery terminals. 2. If the error message persists, please contact Growatt support.

Error Code	Description	Suggestion
Error 507	Battery overload protection	1. Check if the power of the load exceeds the battery rated discharge power. 2. If the error message persists, please contact Growatt support.
Error 508	BUS2 Volt Abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 509	BAT Charge OCP (Overcurrent Protection)	1. Check if the PV voltage is oversized. 2. If the error message persists, please contact Growatt support.
Error 510	BAT Discharge OCP (Overcurrent Protection)	1. Check if the battery discharge current configuration is proper. 2. If the error message persists, please contact Growatt support.
Error 511	BAT soft start failed	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 512	Off-grid output short-circuited	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 600	Off-grid output short circuited	1.Restart the inverter. 2.If the error message persists, please contact Growatt support.
Error 601	Off-grid BUS Volt Low	1. Check if the battery is working properly or the battery experiences capacity loss. 2. If the error message persists, please contact Growatt support.
Error 602	Abnormal Volt at the off-grid terminal	1. Check if a voltage is present at the AC port. 2. If the error message persists, please contact Growatt support.
Error 603	Soft start failed	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.

Error Code	Description	Suggestion
Error 604	Off-grid output voltage abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 605	Balanced circuit self-test failed	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 606	High DC component in output voltage	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 607	Off-grid output overload	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 608	Off-grid parallel signal abnormal	1. Check if the communication cables are properly connected. 2. If the error message persists, please contact Growatt support.
Error 609	The off-grid box is not detected	1.Check the off-grid box after shutdown to identify the signal wiring 2.If the error message still exists,contact Growatt support.
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 Growatt support.
Error 700	Abnormal communication with the inverter	1.Check and communicate with the inverter after shutdown 2.If the error message still exists,contact Growatt support.
Error 701	Off-grid box grid-side relay failure	1.Restart the off-grid box 2.If the error message still exists,contact Growatt support.
Error 702	Off-grid box generator access relay fault	1.Restart the off-grid box 2.If the error message still exists,contact Growatt support.

Error Code	Description	Suggestion
Error 703	Off-grid boxes are overloaded	1.Restart the off-grid box 2.If the error message still exists,contact Growatt support.
Error 704	Off-grid boxes are overloaded off-grid split-phase	1.Reduce the load 2.If the error message still exists,contact Growatt support.
Error 705	Overheat inside the off-grid box	1.Restart the off-grid box 2If the error message still exists,contact Growatt support.
Error 800	PID communication fault	1.After shutdown, adjust the communication sequence between Master2.0; 2.Check the configurations of Master2.0 port 485. 3.If the error message still exists,contact Growatt support.
Error 801	PID output overcurrent	1.Check whether PID output is short circuit after shutdown. 2.If the fault information still exists, contact Growatt support.
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 Growatt support.
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 Growatt support.
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 Growatt support.

10 Product Specifications

Table 10.1 WIT 28/35/40/55K-A-US L2 Specification

Model / Specifications	WIT 28K-A-US L2	WIT 35K-A-US L2	WIT 40K-A-US L2	WIT 55K-A-US L2
Battery data(DC)				
Continuous charging / discharging power	31700W	39700W	45300W	62300W
Battery voltage range	380V-650V			
Max. charging / discharging current	79A	99A	113A	156A
BMS communication	RS485/CAN			
Types of Battery	Lithium-ion			
Input/Output data (AC)				
Rated AC input/output power	28000W/ 28000W	35000W/ 35000W	40000W/ 40000W	55000W/ 55000W
Max.input/output apparent power	30800VA/ 33600VA	38500VA/ 42000VA	44000VA/ 48000VA	60500VA/ 66000VA
Rated AC voltage	208V/220V			
AC voltage range	-15% ~ +10%			
Rated AC voltage range	50/60 Hz			
AC grid frequency range	45~55Hz/55-65 Hz			
Rated input/output current	77.8A@208V 73.5A@220V	97.2A@208V 91.9A@220V	111.1A@208V 105A@220V	152.8A@208V 144.4A@220V
Max. input/output current	85.6A@208V 80.8A@220V	106.9A@208V 101A@220V	122.2A@208V 115.5A@220V	168.1A@208V 158.8A@220V
Power factor (@nominal power)	>0.99			
Adjustable power factor	1 leading ~ 1 lagging			
THDi	<3%			
AC grid connection type	3P+PE/3P+N+PE			
Stand alone (AC power)				
Rated AC output power	28000W	35000W	40000W	55000W
Max. AC apparent power	33600VA	42000VA	48000VA	66000VA
Rated AC output voltage	120V/127V(L-N) 208V/220V(L-L)			

Specifications \ Model	WIT 28K-A-US L2	WIT 35K-A-US L2	WIT 40K-A-US L2	WIT 55K-A-US L2
Rated AC output frequency	50/60 Hz			
Max. output current	93.3A@208V 88.2A@220V	116.7A@208V 110A@220V	133.3A@208V 126A@220V	183.3A@208V 173.2A@220V
Voltage accuracy	1%			
Frequency accuracy	0.1Hz			
THDv	< 3% (Linear load)			
Unbalanced load	100% three-phase unbalanced			
Overload capacity	≤110%, continuous; 110%~120%:10min >120%, 200ms			
Efficiency				
Max. efficiency	98.20%	98.20%	98.20%	98.20%
Protection devices				
Battery reverse protection	Yes			
AC/DC surge protection	Yes (Class II)			
Insulation resistance monitoring	Yes			
Residual-current monitoring unit	Yes			
AC short-circuit protection	Yes			
Anti-islanding protection	Yes			
Ground fault monitoring	Yes			
Grid monitoring	Yes			
Display and communication				
Display	OLED+LED/WiFi+APP			
RS485	Yes			
LAN	Optional			
4G	Optional			
WIFI	Optional			

Model / Specifications	WIT 28K-A-US L2	WIT 35K-A-US L2	WIT 40K-A-US L2	WIT 55K-A-US L2
General data				
Dimensions (W /H / D)	33.5/53.1/20.1 inch (850/1350/510mm)			
Weight	230 lb			
Operating temperature range	-22°F~+140°F >122°F, derating			
Noise emission (typical)	≤65dB(A)	≤65dB(A)	≤65dB(A)	≤65dB(A)
Relative humidity	0~100%			
Altitude	≤13123ft (4000m)			
Nighttime power consumption	20W			
Standby power consumption	250W			
Topology	Transformerless			
Cooling	Smart air cooling			
Protection degree	IP66/Type 4X			
Warranty	5/10 years (Optional)			
Standard compliance				
Safety	UL 1741:2021, CSA22.2 NO107.1-2016			
EMC	FCC Part 15			
Grid connection standards	IEEE 1547:2018, IEEE1547.1:2020, HECO Rule 14, UL 1741 SA/SB:2020			

Table 10.2 WIT 28/35/40/55K-H-US L2 Specification

Model / Specifications	WIT 28K-H-US L2	WIT 35K-H-US L2	WIT 40K-H-US L2	WIT 55K-H-US L2
Input data (DC)				
Max. recommended PV power	54000W	75600W	86400W	108000W
Max. PV voltage	800V			
Start-up voltage	195V			
Rated voltage	360V			
MPP voltage range	180V-550V			
Full power MPPT voltage range	360V-550V			
Max. input current per MPP tracker	32A			
Max. short-circuit current per MPP tracker	40A			
No. of MPP trackers	5	7	8	10
No. of PV strings per MPP tracker	2			
Battery data (DC)				
Continuous charging / discharging power	31700W	39700W	45300W	62300W
Battery voltage range	380V-650V			
Max. charging / discharging current	79A	99A	113A	156A
BMS communication	RS485/CAN			
Types of Battery	Lithium-ion			
Input/Output data (AC)				
Rated AC input/output power	28000W/ 56000W 28000W/ 30800W	35000W/ 70000W 35000W/ 38500W	40000W/ 80000W 40000W/ 44000W	55000W/ 110000W 55000W/ 60500W
Max.input/output apparent power	30800VA/ 56000VA 30800VA	38500VA/ 70000VA 38500VA	44000VA/ 80000VA 44000VA	60500VA/ 110000VA 60500VA
Rated AC voltage	208V/220V			
Rated AC voltage range	-15%~+10%			

Model / Specifications	WIT 28K-H-US L2	WIT 35K-H-US L2	WIT 40K-H-US L2	WIT 55K-H-US L2
AC grid frequency	50/60 Hz			
AC grid frequency range	45~55Hz/55-65 Hz			
Rated input/output current	77.8A/155.6A@208V 73.5A/147A@220V 77.8A@208V 73.5A@220V	97.2A/194.4A@208V 91.9/183.7A@220V 97.2A@208V 91.9A@220V	111.1A/222.2A@208V 105A/210A@220V 111.1A@208V 105A@220V	152.8A/305.6A@208V 144.4A/288.7A@220V 152.8A@208V 144.4A@220V
Max. input/output current	85.6A/155.6A@208V 80.8A/147A@220V 85.6A@208V 80.8A@220V	106.9A/194.4A@208V 101A/183.7A@220V 106.9A@208V 101A@220V	122.2A/222.2A@208V 115.5A/210A@220V 122.2A@208V 115.5A@220V	1681A/305.6A@208V 158.8A/288.7A@220V 168.1A@208V 158.8A@220V
Power factor (@Rated power)	>0.99			
Adjustable power factor	1 leading ~ 1 lagging			
THDi	<3%			
AC grid connection type	3P+PE/3P+N+PE			
Stand alone (AC power)				
Rated AC output power	28000W	35000W	40000W	55000W
Max. AC apparent power	33600VA	42000VA	48000VA	66000VA
Rated AC output voltage	120V/127V(L-N) 208W/220V(L-L)			
Rated AC output frequency	50/60 Hz			
Max. output current	93.3A@208V 88.2A@220V	116.7A@208V 110A@220V	133.3A@208V 126A@220V	183.3A@208V 173.2A@220V
Voltage accuracy	1%			
Frequency accuracy	0.1Hz			
THDv	<3% (Linear load)			
Unbalanced load	100% three-phase unbalanced			

Model / Specifications	WIT 28K-H-US L2	WIT 35K-H-US L2	WIT 40K-H-US L2	WIT 55K-H-US L2
Overload capacity	≤110%, continuous; 110%~120%:10min >120%, 200ms			
Efficiency				
Max. efficiency	98.20%	98.20%	98.20%	98.20%
MPPT efficiency	99.90%	99.90%	99.90%	99.90%
Protection devices				
PV reverse polarity protection	Yes			
Battery reverse protection	Yes			
AC/DC surge protection	Yes(Class II)			
Insulation resistance monitoring	Yes			
Residual-current monitoring unit	Yes			
AC short-circuit protection	Yes			
Anti-islanding protection	Yes			
Ground fault monitoring	Yes			
Grid monitoring	Yes			
String monitoring	Yes			
Anti-PID function	Yes			
AFCI protection	Optional			
Display and communication				
Display	OLED+LED/WiFi+APP			
RS485	Yes			
LAN	Optional			
4G	Optional			
WIFI	Optional			
General data				
Dimensions (W /H / D)	33.5/53.1/20.1 inch (850/1350/510mm)			

Model / Specifications	WIT 28K-H-US L2	WIT 35K-H-US L2	WIT 40K-H-US L2	WIT 55K-H-US L2
Weight	309 lb	309 lb	324 lb	324 lb
Operating temperature range	-22°F~+140°F >122°F, derating			
Noise emission (typical)	≤65dB(A)	≤65dB(A)	≤65dB(A)	≤65dB(A)
Relative humidity	0~100%			
Altitude	≤13123ft (4000m)			
Nighttime power consumption	20W			
Standby power consumption	250W			
Topology	Transformerless			
Cooling	Smart air cooling			
Protection degree	IP66/Type 4X			
Warranty	5/10 years (Optional)			
Standard compliance				
Safety	UL 1741:2021, CSA22.2 NO107.1-2016			
EMC	FCC Part 15			
Grid connection standards	IEEE 1547:2018, IEEE1547.1:2020, HECO Rule 14, UL 1741 SA/SB:2020			

Table 10.3 WIT 28/35/40/55K-AU-US L2 Specification

Model / Specifications	WIT 28K-AU-US L2	WIT 35K-AU-US L2	WIT 40K-AU-US L2	WIT 55K-AU-US L2
Battery data (DC)				
Continuous charging / discharging power	31700W	39700W	45300W	62300W
Battery voltage range	380V-650V			
Max. charging / discharging current	79A	99A	113A	156A
BMS communication	RS485/CAN			
Types of Battery	Lithium-ion			
Input/Output data (AC)				
Rated AC input/output power	28000W/ 56000W	35000W/ 70000W	40000W/ 80000W	55000W/ 110000W
Max.input/output apparent power	30800VA/ 56000VA 30800VA	38500VA/ 70000VA 38500VA	44000VA/ 80000VA 44000VA	60500VA/ 110000VA 60500VA
Rated AC voltage	208V/220V			
Rated AC voltage range	-15% ~ +10%			
AC voltage frequency	50/60 Hz			
AC voltage frequency range	45~55Hz/55-65 Hz			
Rated input/output current	77.8A/155.6A @208V 73.5A/147A @220V 77.8A@208V 73.5A@220V	97.2A/194.4A @208V 91.9/183.7A @220V 97.2A@208V 91.9A@220V	111.1A/222.2 A@208V 105A/210A @220V 111.2A@208V 105A@220V	152.8A/305.6A @208V 144.4A/288.7A @220V 152.8A@208V 144.4A@220V
Max. input/output current	85.6A/155.6A @208V 80.8A/147A @220V 85.6A@208V 80.8A@220V	106.9A/194.4 A@208V 101A/183.7A @220V 106.9A@208V 101A@220V	122.2A/222.2 A@208V 115.5A/210A @220V 122.2A@208V 115.5A@220V	1681A/305.6A @208V 158.8A/288.7A @220V 168.1A@208V 158.8A@220V
Power factor (@Rated power)	>0.99			
Adjustable power factor	1 leading ~ 1 lagging			

Model / Specifications	WIT 28K-AU-US L2	WIT 35K-AU-US L2	WIT 40K-AU-US L2	WIT 55K-AU-US L2
THDi	<3%			
AC grid connection type	3P+PE/3P+N+PE			
Backup power (AC)				
Rated AC output power	28000W	35000W	40000W	55000W
Max. AC apparent power	33600VA	42000VA	48000VA	66000VA
Rated AC output voltage	208V/220V			
Rated AC output frequency	50/60 Hz			
Max. output current	93.3A@208V 88.2A@220V	116.7A@208V 110A@220V	133.3A@208V 126A@220V	183.3A@208V 173.2A@220V
Voltage accuracy	1%			
Frequency accuracy	0.1Hz			
THDv	<3% (Linear load)			
Unbalanced load	100% three-phase unbalanced			
Overload capacity	≤110%，continuous; 110%~120%:10min >120%，200ms			
Switch time from on-grid to off-grid	≤16.6ms			
Switch time from off-grid to on-grid	0ms			
Efficiency				
Max. efficiency	98.20%	98.20%	98.20%	98.20%
Protection devices				
Battery reverse protection	Yes			
AC/DC surge protection	Yes（Class II）			
Insulation resistance monitoring	Yes			
Residual-current monitoring unit	Yes			
AC short-circuit protection	Yes			

Model / Specifications	WIT 28K-AU-US L2	WIT 35K-AU-US L2	WIT 40K-AU-US L2	WIT 55K-AU-US L2
Display and communication				
Display	OLED+LED/WiFi+APP			
Rs485	Yes			
LAN	Optional			
4G	Optional			
WIFI	Optional			
General data				
Dimensions (W /H / D)	33.5/53.1/20.1 inch (850/1350/510mm)			
Weight	317 lb			
Operating temperature range	-22°F~+140°F >122°F, derating			
Noise emission (typical)	≤65dB(A)	≤65dB(A)	≤65dB(A)	≤65dB(A)
Relative humidity	0~100%			
Altitude	≤13123ft (4000m)			
Nighttime power consumption	20W			
Standby power consumption	250W			
Topology	Transformerless			
Cooling	Smart air cooling			
Protection degree	IP66/Type 4X			
Warranty	5/10 years(Optional)			
Standard compliance				
Safety	UL 1741:2021, CSA22.2 NO107.1-2016			
EMC	FCC Part 15			
Anti-islanding protection	Yes			
Ground fault monitoring	Yes			
Grid monitoring	Yes			
Grid connection standards	EEE 1547:2018, IEEE1547.1:2020, HECO Rule 14, UL 1741 SA/SB:2020			

Table 10.4 WIT 28/35/40/55K-HU-US L2 Specification

Model / Specifications	WIT 28K-HU-US L2	WIT 35K-HU-US L2	WIT 40K-HU-US L2	WIT 55K-HU-US L2
Input data (DC)				
Max. recommended PV power	54000W	75600W	86400W	108000W
Max. PV voltage	800V			
Start-up voltage	195V			
Rated voltage	360V			
MPP voltage range	180V-550V			
Full power MPPT voltage range	360V-550V			
Max. input current per MPP tracker	32A			
Max. short-circuit current per MPP tracker	40A			
No. of MPP trackers	5	7	8	10
No. of PV strings per MPP tracker	2			
Battery data (DC)				
Continuous charging / discharging power	31700W	39700W	45300W	62300W
Battery voltage range	380V-650V			
Max. charging / discharging current	79A	99A	113A	156A
BMS communication	RS485/CAN			
Types of Battery	Lithium-ion			
Input/Output data (AC)				
Rated AC input/output power	28000W/ 56000W	35000W/ 70000W	40000W/ 80000W	55000W/ 110000W
Max.input/output apparent power	30800VA/ 56000VA 30800VA	38500VA/ 70000VA 38500VA	44000VA/ 80000VA 44000VA	60500VA/ 110000VA 60500VA
Rated AC voltage	208V/220V			
Rated AC voltage range	-15%~+10%			
AC voltage frequency	50/60 Hz			

Specifications \ Model	WIT 28K-HU-US L2	WIT 35K-HU-US L2	WIT 40K-HU-US L2	WIT 55K-HU-US L2
AC voltage frequency range	45~55Hz/55-65 Hz			
Rated input/output current	77.8A/155.6A @208V 73.5A/147A @220V 77.8A@208V 73.5A@220V	97.2A/194.4A @208V 91.9/183.7A @220V 97.2A@208V 91.9A@220V	111.1A/222.2A@208V 105A/210A @220V 111.2A@208V 105A@220V	152.8A/305.6A@208V 144.4A/288.7A@220V 152.8A@208V 144.4A@220V
Max. input/output current	85.6A/155.6A @208V 80.8A/147A @220V 85.6A@208V 80.8A@220V	106.9A/194.4A@208V 101A/183.7A @220V 106.9A@208V 101A@220V	122.2A/222.2A@208V 115.5A/210A @220V 122.2A@208V 115.5A@220V	168.1A/305.6A @208V 158.8A/288.7A@220V 168.1A@208V 158.8A@220V
Power factor(@Rated power)	>0.99			
Adjustable power factor	1 leading ~ 1 lagging			
THDi	<3%			
AC grid connection type	3P+PE/3P+N+PE			
Backup power (AC)				
Rated AC output power	28000W	35000W	40000W	55000W
Max. AC apparent power	33600VA	42000VA	48000VA	66000VA
Rated AC output voltage	208V/220V			
Rated AC output frequency	50/60 Hz			
Max. output current	93.3A@208V 88.2A@220V	116.7A@208V 110A@220V	133.3A@208V 126A@220V	183.3A@208V 173.2A@220V
Voltage accuracy	1%			
Frequency accuracy	0.1Hz			
THDv	<3%(Linear load)			
Unbalanced load	100% three-phase unbalanced			

Model / Specifications	WIT 28K-HU-US L2	WIT 35K-HU-US L2	WIT 40K-HU-US L2	WIT 55K-HU-US L2
Overload capacity	≤110%, continuous; 110%~120%:10min >120%, 200ms			
Switch time from on-grid to off-grid	≤16.6ms			
Switch time from off-grid to on-grid	0ms			
Efficiency				
Max. efficiency	98.20%	98.20%	98.20%	98.20%
MPPT efficiency	99.90%	99.90%	99.90%	99.90%
Protection devices				
PV reverse polarity protection	Yes			
Battery reverse protection	Yes			
AC/DC surge protection	Yes (Class II)			
Insulation resistance monitoring	Yes			
Residual-current monitoring unit	Yes			
AC short-circuit protection	Yes			
Anti-islanding protection	Yes			
Ground fault monitoring	Yes			
Grid monitoring	Yes			
String monitoring	Yes			
AFCI protection	Optional			
Anti-PID function	Yes			
Display and communication				
Display	OLED+LED/WiFi+APP			
RS485	Yes			
4G	Optional			

Specifications \ Model	WIT 28K-HU-US L2	WIT 35K-HU-US L2	WIT 40K-HU-US L2	WIT 55K-HU-US L2
LAN	Optional			
WIFI	Optional			
General data				
Dimensions (W /H / D)	33.5/53.1/20.1 inch (850/1350/510mm)			
Weight	346 lb			
Operating temperature range	-22°F~+140°F >122°F, derating			
Noise emission (typical)	≤65dB(A)	≤65dB(A)	≤65dB(A)	≤65dB(A)
Relative humidity	0~100%			
Altitude	≤13123ft (4000m)			
Nighttime power consumption	20W			
Standby power consumption	250W			
Topology	Transformerless			
Cooling	Smart air cooling			
Protection degree	IP66/Type 4X			
Warranty	5/10 years (Optional)			
Standard compliance				
Safety	UL 1741:2021, CSA22.2 NO107.1-2016			
EMC	FCC Part 15			
Grid connection standards	IEEE 1547:2018, IEEE1547.1:2020, HECO Rule 14, UL 1741 SA/SB:2020			

11 Decommissioning the WIT Inverter

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

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

Warranty 12

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

12.1 Conditions

1. Before maintaining the equipment, you will be required to fill in a form to provide information about the product including the date of purchase and installation, the serial number of the WIT Inverter, fault description and other information.
2. Return the defective product to Growatt for recycling and disposal.

12.2 Disclaimer

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

1. Unauthorized removal of the product, such as removing the tamper-proof label and the upper cover of the WIT Inverter.
2. Damage caused during transportation.
3. Improper operations during installation and commissioning.
4. Failure to observe the operation instructions regarding the installation, operation and storage of the WIT Inverter.
5. Unauthorized modifications or improper maintenance on the WIT Inverter.
6. Improper use and operation.
7. Damage caused by storage conditions that do not meet the requirements specified in this manual.
8. Failure to follow the safety precautions and applicable laws and regulations due to customer's negligence.
9. Damage due to force majeure, such as lightning, floods, storms, fire.
   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.n 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. We require the following information in order to provide you with the necessary assistance:

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

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Download Manual

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