GOODWE
YOUR SOLAR ENGINE

User Manual

Grid-Tied PV Inverter

SMT Series

V3.0-2021-11-22

Contents

01 Symbols

	Improper handling of this device will pose a risk of injury.
	Recyclable materials
	Danger of high voltage & electric shock
	This side up - The package must always have the arrows point up
	Don't touch, hot surface!
	No more than six (6) identical packages be stacked on each other
	Special disposal instructions
	Fragile
	Keep Dry
	Refer to operation instructions
	Wait at least 5 minutes after disconnecting the inverter before touching internal parts
	CE mark.

02 Safety and warning

This manual contains important instructions for SMT series inverter that shall be followed during installation of the inverter.
The SMT series for Three MPPT, Three-Phase solar inverter without transformer.
SMT Series have been designed and tested strictly according to the international safety regulation. As electrical and electronic equipment, safety instructions related to them must be complied with during installation, commissioning, operation. Incorrect or improper work may result in damage to:

1. The life and well-being of the operator or a third party.
2. The inverter and other properties that belong to the operator or a third party.

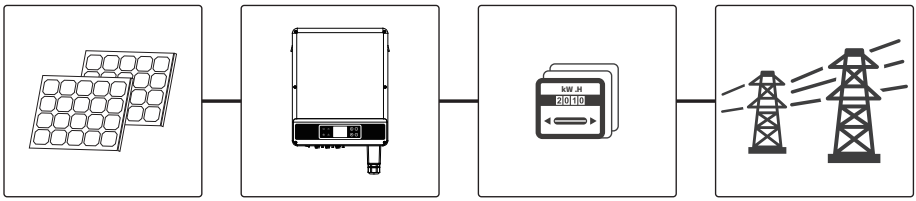
Therefore the following safety instructions must be read and always kept in mind prior to any work. All detailed work-related safety warnings and notes will be specified at the critical points in corresponding chapter.
All installation and electrical work must only be performed by qualified personnel. They have been trained specially;
• Already completely read through and understood the manual and related documents.
• Be familiar with safety requirements for electrical systems.
The inverter must be installed and maintained by professionals in compliance with local electrical standards regulations and the requirements of local power authorities or companies.
• Improper handling of this device will pose a risk of injury.
• Always follow the instructions contained in the manual when moving or positioning the inverter.
• The weight of the equipment can cause injuries, serious wounds or bruise if improperly handled.
• Please install it in the place beyond children's reach.
• Prior to installing and maintaining the inverter, it is crucial to make certain that the inverter is not electrically connected.• Before maintaining the inverter, disconnect the connection between the AC grid and the inverter firstly, and then disconnect the connection between the DC input and the inverter, you should wait at least 5mins after these disconnection in case of electric shock.
• All cables must be firmly attached, undamaged, properly insulated, and adequately dimensioned.
• The temperature of some parts of the inverter may exceed 60°C during operation. To avoid being burnt, do not touch the inverter during operation. Let it cool before touching it.
• Without permission, opening the front cover of the inverter is not allowed. Users should not touch/replace any components of the inverter except the DC/AC connectors. Manufacturer will not bear any consequences caused by unauthorized actions which will lead to potential injury to people and damage to inverters.
• Static electricity may damage electronic components. Appropriate method must be adopted to prevent such damage to the inverter; otherwise the inverter may be damaged and the warranty will be annulled.
• Ensure that the output voltage of the proposed PV array is lower than the maximum rated input voltage of the inverter; otherwise the inverter may be damaged and the warranty will be annulled.
• If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
• When exposed to sunlight, the PV array will generate very high voltage which can cause electrical shock hazard. Please strictly follow the instruction we provided.
• PV modules should have an IEC61730 class A rating.
• Prohibit inserting or pulling the AC or DC terminals when the inverter is operational. Or the inverter will be destroyed.
Only DC connectors provided by Manufacturer are permitted for use, otherwise the inverter may be damaged and the warranty will be annulled.
• The inverter can exclude the possibility of DC residual currents to 6mA in the system,Where an external RCD is required in addition to the built-in RCMU, type A RCD must be used to avoid tripping.
• The default photovoltaic module is not grounded.

• It is recommended to add a fuse when there is more than two PV string inputs into one MPPT.

The IP65 premise is that the machine is completely sealed. Please install it within one day after unpacking, otherwise please block the unconnected port and do not open it to ensure that the machine is not exposed to water and dust.

3.1 Intended usage

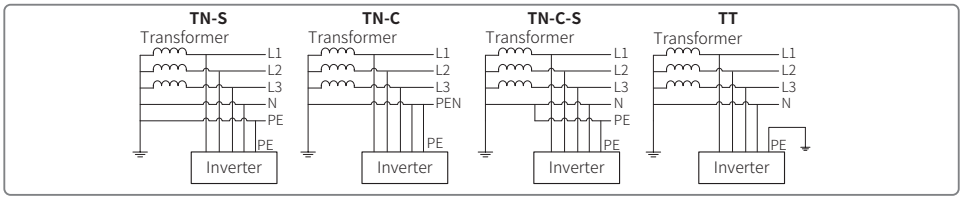
The SMT series which is a Three MPPT, three phase transformer-less grid-connected inverter is a crucial unit between the PV string and the utility grid in the PV power system.
Inverter is dedicated to converting directing current generated by the PV module into alternating current, and feeding it into the utility grid, this conforms to parameters of the local utility grid.
The intended usage of inverter is illustrated in the below figure.



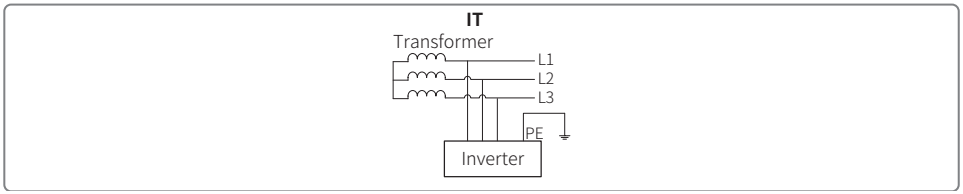
The DC input side of the inverter cannot be connected to a PV module where the positive or negative terminal are already grounded, unless the AC side of the inverter has been connected to the grid via a transformer.

Item	Description	Note
A	PV string	Monocrystalline silicon, polycrystalline silicon and else.
B	Inverter	SMT Series.
C	Meter device	Meter cupboard with distributed generation system.
D	Utility grid	TN-S, TN-C, TN-C-S, TT, IT (different Model types with different types of utility grid as below) .

Note:
SMT series GW12KLV-MT, GW15KLV-MT, GW20KLV-MT, GW25K-MT, GW29.9K-MT, GW30K-MT, and GW36K-MT support four different types(TN-S,TN-C,TN-C-S, TT) of grid.



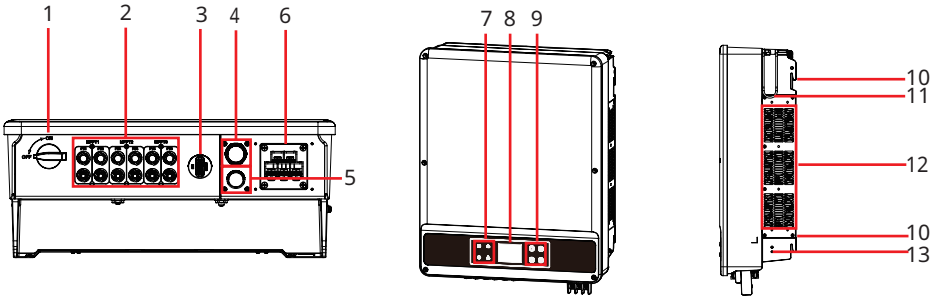
When neutral wire of inverter is not connected to grid, "Delta Grid" should be selected in grid type(IT) setting page.



3.2 Inverter Overview

Check the product once unpacking it to make sure the model is the right one you purchased. As the figure below shows, ports or terminals in different SMT inverters may differ.

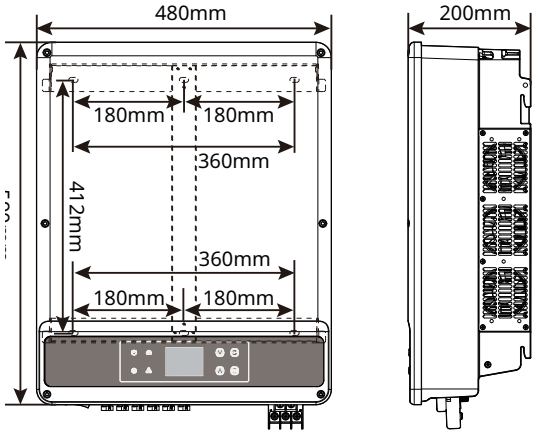
Parts



1.	DC Switch	2.	PV Input Terminal	3.	Communication Module
4.	USB/DRED/Remote Shutdown	5.	RS485	6.	AC Output Port
7.	Indicator	8.	LCD[1]	9.	Button[2]
10.	Mounting Plate	11.	Handle[3]	12.	Fan
13.	PE Terminal				

[1]: LCD: optional
[2]: Button: optional
[3]: Handle: optional

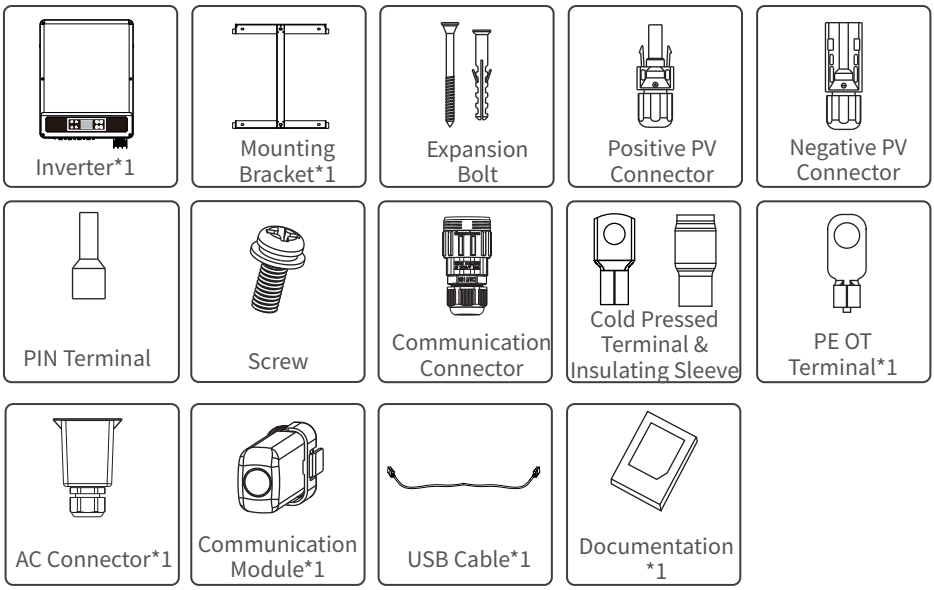
Dimension



3.3 Packing List

The unit is thoroughly tested and strictly inspected before delivery. Damage may still occur during shipping.

1. Check the packing for any visible damage upon receiving.
2. Check the inner contents for damage after unpacking.
3. Check the package list below.

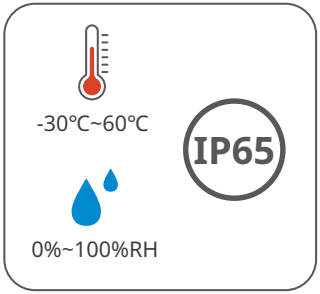


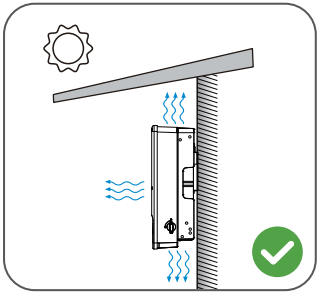
- Number of expansion bolts, PIN terminals, screws, COM connector, PV connectors are various depending on different inverters. The actual accessories may be different.
- Communication module types: WiFi/4G/LAN/GPRS etc. The actual module delivered depends on the communication method of the selected inverter.
- The COM connector is used to connect DRED, RS485, and remote shutdown communication cables.
- USB cable is optional.

04 Installation

4.1 Mounting Instructions

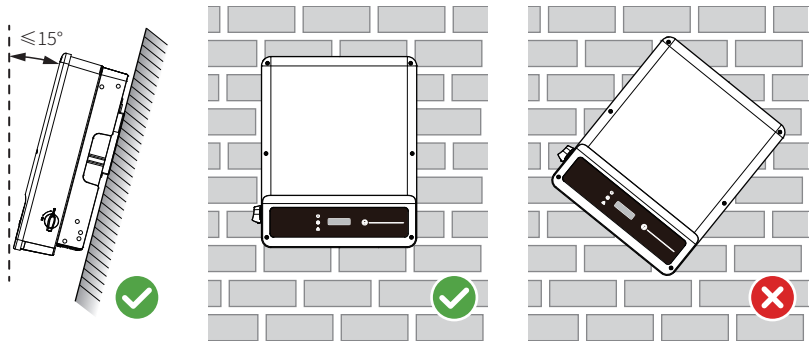
- In order to achieve optimal performance, the ambient temperature should be lower than 45°C.
- For easy maintenance, we suggest to install the inverter at eye level.
- Inverters should not be installed near flammable and explosive items. Strong electro-magnetic charges should be kept away from installation site.
- Product label and warning symbols should be placed at a location that is easy to read by the users.
- Make sure to install the inverter at a place where it is protected from direct sunlight, rain and snow.



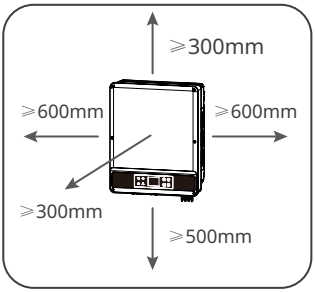


4.2 Select The Installation Location

- Take the bearing capacity of the wall into account. The wall (such as concrete walls and metal structures) should be strong enough to hold the weight of the inverter over a long period of time.
- Install the unit where it is accessible to service or do the electrical connection.
- Do not install the unit on the wall of flammable material.
- Make sure the installation location is well ventilated.
- Inverters should not be installed near flammable or explosive items. Any strong electro-magnetic equipment should be kept away from installation site.
- Install the unit at eye level to for convenient operation and maintenance.
- Install the unit vertically or tilted backwards of no more than 15 degrees, and wiring area should be facing downwards. Horizontal installation requires more than 500mm off the ground.

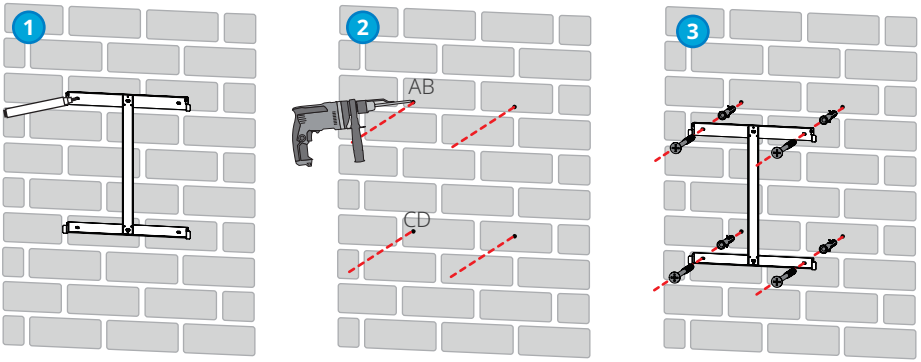


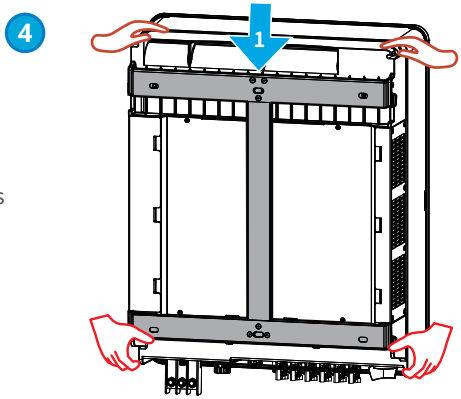
To ensure heat dissipation and convenient disassembly, the minimum clearance around the inverter should not be less than the following values.



4.3 Inverter Installation

Avoid the water pipes and cables buried in the wall when drilling holes.

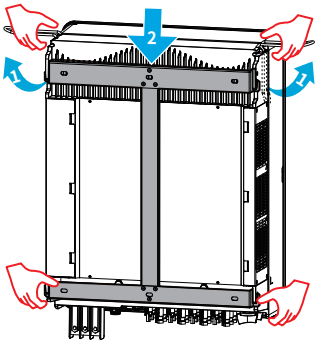


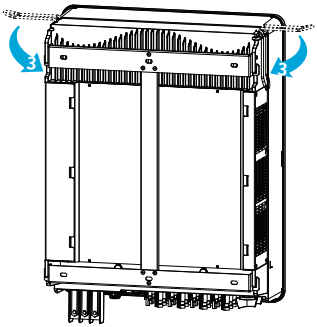


Installing inverters without handles

4

Installing inverters with handles





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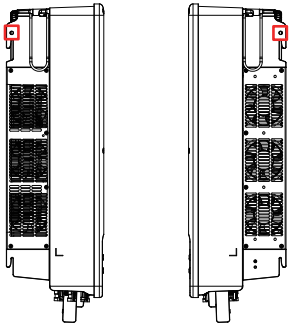
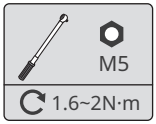


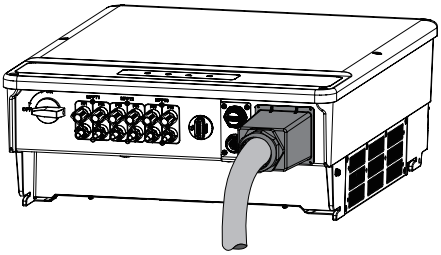


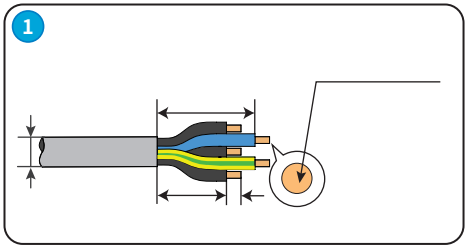
4.4 Electrical Connection

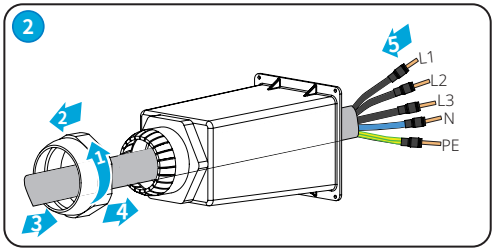
4.4.1 Connection To Grid (AC Side Connection)

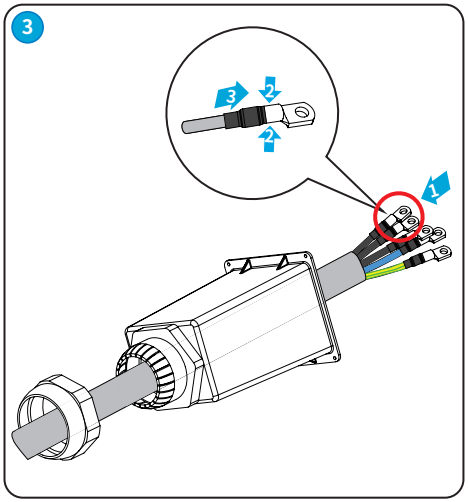
1. Measure the voltage and frequency of grid-connected access point, and make sure it is accordance with the grid-connected standard of inverter.
2. It is recommended to add a breaker or fuse to AC side, the specification should be more than 1.25 times of rated of AC output current.
3. The PE line of inverter should be connected to the earth, make sure that the impedance between the neutral wire and earth wire is less than 10 ohm.
4. Disconnect the breaker or fuse between the inverter and the utility.
5. Connect the inverter to the grid as follows:

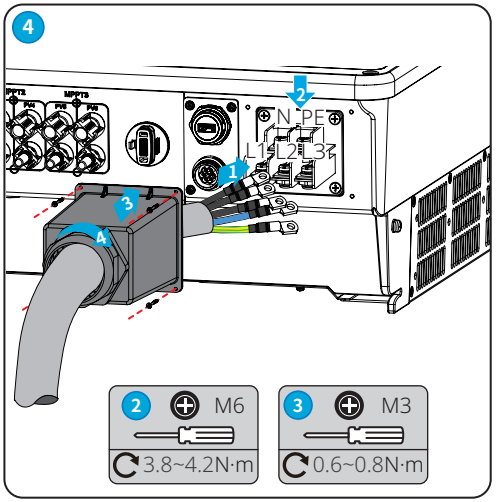
- Install the wiring on the AC output side.
- Fix (Torque: 1.2~2 N.m) the connector of AC cable to the corresponding terminals.
- Color of the cables listed in the figure is for referrence only. Specifications of the cable should meet local regulations and requirements.
- The AC line construction shall be such that if the cord should slip in its anchorage, placing a strain on conductors, the protective earthing conductor will be the last to take the strain.




1


2
5
L1
L2
L3
N
PE
2
1
3
4


3
3
2
2
1


4
2
N PE
L1 L2 L3
1
3
4
2 M6
3.8~4.2N·m
3 M3
0.6~0.8N·m

4.4.2 AC Circuit Breaker And Residual Current Device

An independent three or four pole circuit breaker for each inverter must be installed at the output side to ensure that the inverter can be securely disconnected from the grid.

Inverter model	Recommended nominal current of AC breaker
GW12KLV-MT	>40A
GW15KLV-MT	>50A
GW20KLV-MT	>68A
GW25K-MT	>50A
GW29.9K-MT	>55A
GW30K-MT	>60A
GW36K-MT	>66A

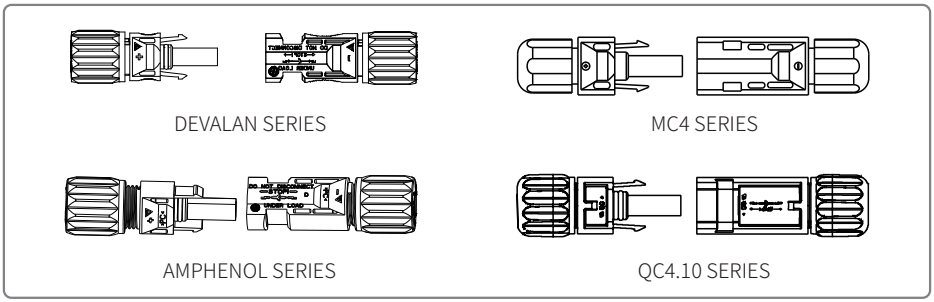
Note:
It's not allowed for several inverters to use the same circuit breaker.
It's not allowed to connect loads between inverter and circuit breaker.

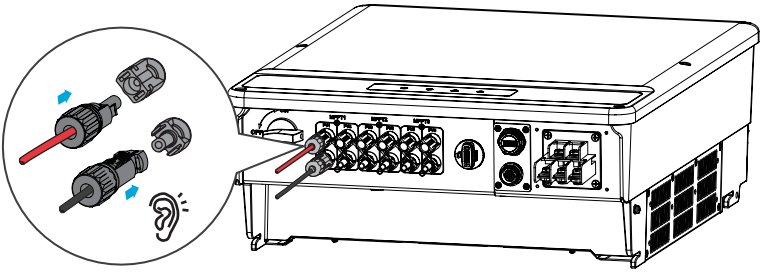
Where an external RCD (Residual Current Device) is required in addition to the built-in RCMU (Residual Current Monitoring Unit), and a type A RCD must be used to avoid tripping. Recommended RCD specifications: 400mA or higher.

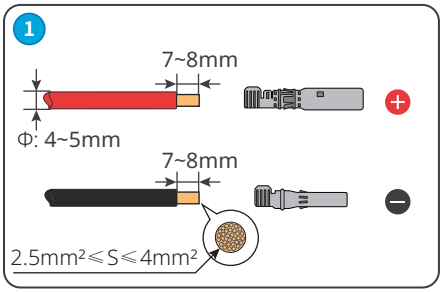
4.4.3 Connecting the DC Cable

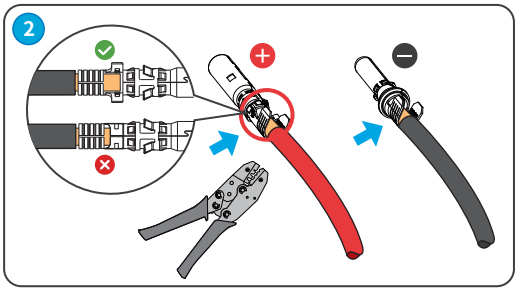
1. Make sure the DC switch is turned off before connecting PV string to the inverter.
2. Make sure polarity of PV string complys with DC connector, otherwise, it will damage the inverter.
3. Make sure the maximum open circuit voltage (Voc) of each PV string does not exceed the maximum input voltage of the inverter under any condition.
4. Make sure that maximum short circuit current of each DC input is less than the inverter allowable limit.
5. Do not connect positive or negative pole of PV string to earth (PE terminal). Otherwise, it will permanently destroy the inverter.
6. positive wire shall be red, negative wire shall be black.
7. The minimum insulation resistance to ground of the PV panels must exceed 33.7kΩ, there is a risk of shock hazard if the requirement of minimum resistance is not met.

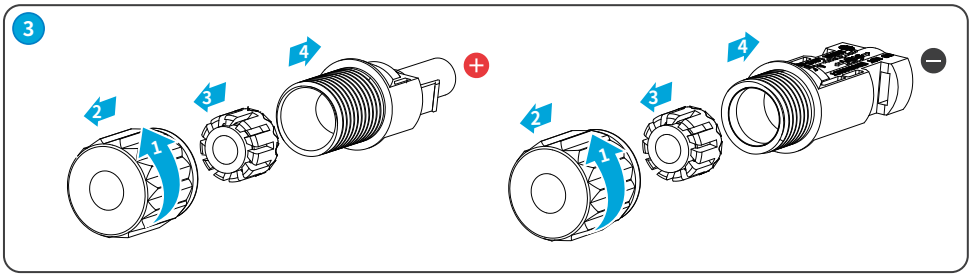
There are four types of DC connectors, DEVALAN, MC4, AMPHENOL H4 and QC4.10 series.

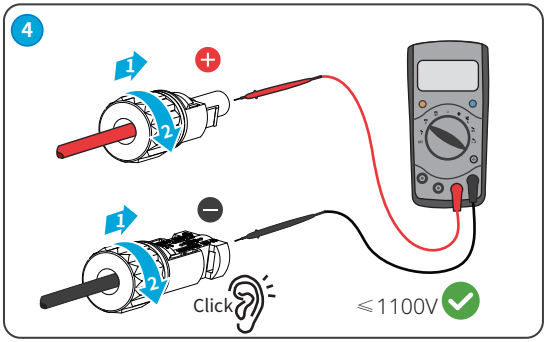


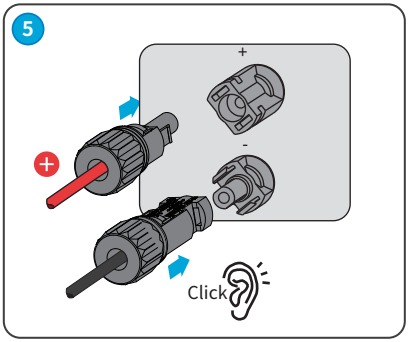



1
7~8mm
Φ: 4~5mm
7~8mm
2.5mm²≤S≤4mm²


2

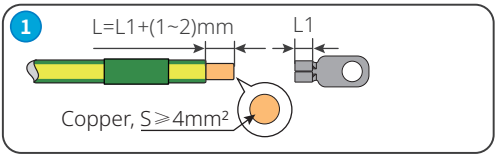

3
1
2
3
4

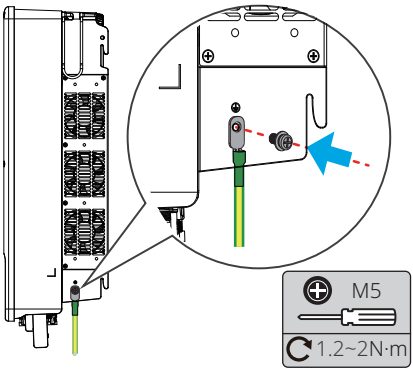

4
Click
≤1100V


5
Click

4.4.4 Earth Terminal Connection

The inverter is equipped with earth terminal according to the requirement of EN 50178.
All non-current carrying exposed metal parts of the equipment and other enclosures in the PV power system should be grounded.

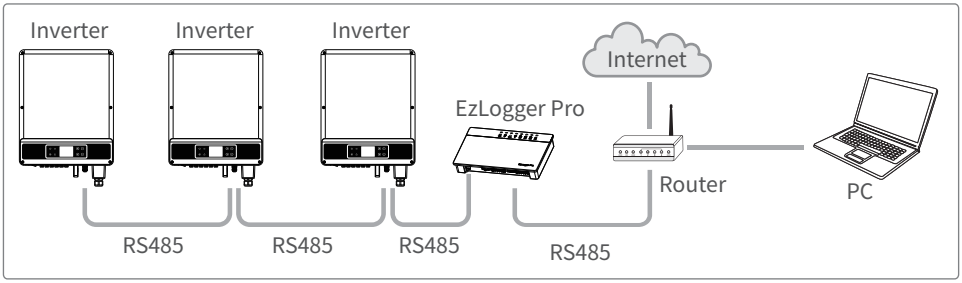




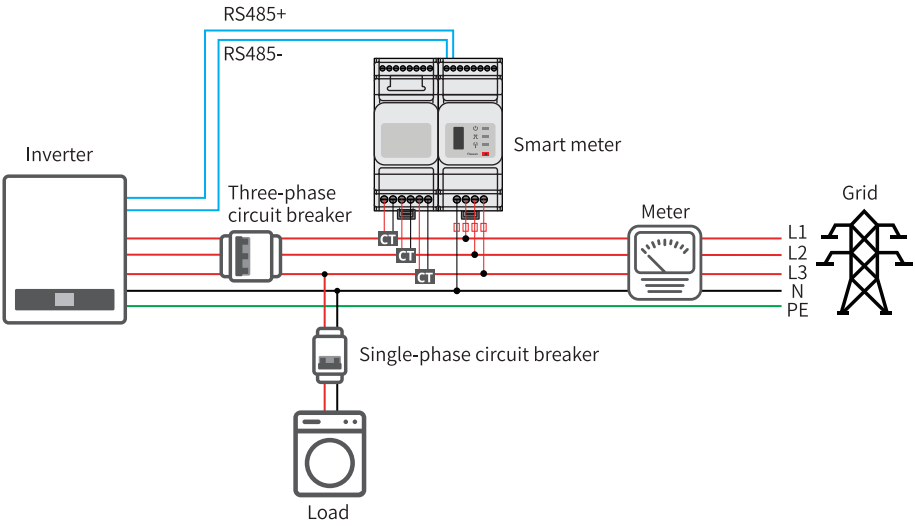
4.5 Communication Connection

1. This function only applies to the inverter with RS485 ports.
2. The RS485 port of inverter is used to connect the EzLogger Pro, and the total length of connecting cable should not exceed 1000m.
3. Communication lines must be separated from other power lines to prevent the communication from being interfered.
4. DRM function is achieved by Ezlogger Pro or DRED COM port, please connect the Ezlogger Pro through RS485 port.

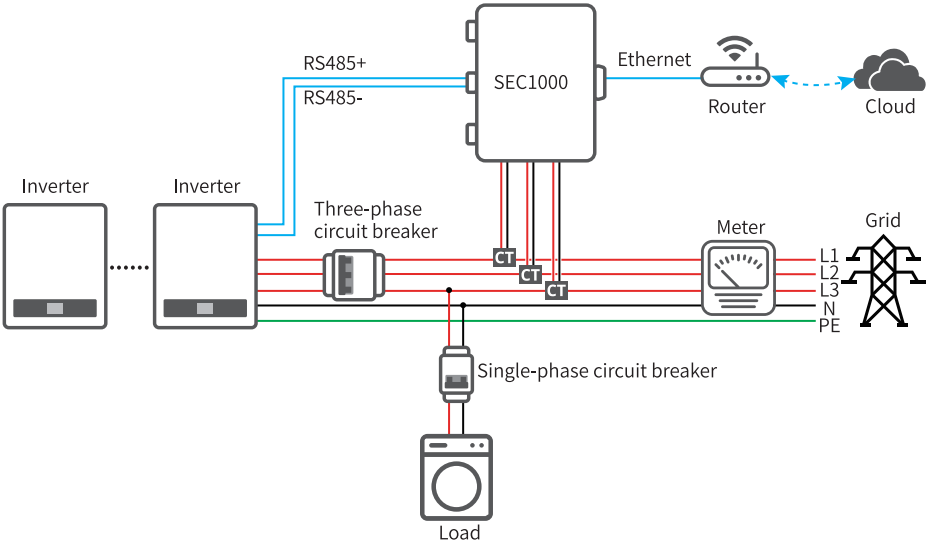
You can refer to EzLogger Pro SERIES USER MANUAL. Visit https://en.goodwe.com/Public/Uploads/sersups/GW_EzLogger%20Pro_User%20Manual-EN.pdf to get the user manual



Power limit networking scenario (single inverter)

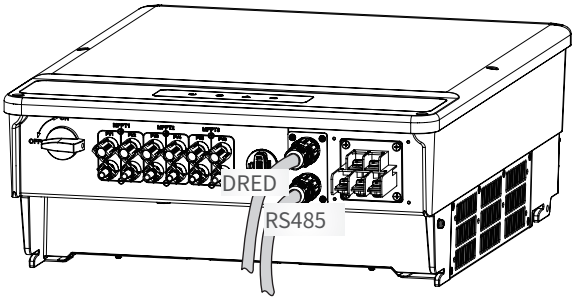


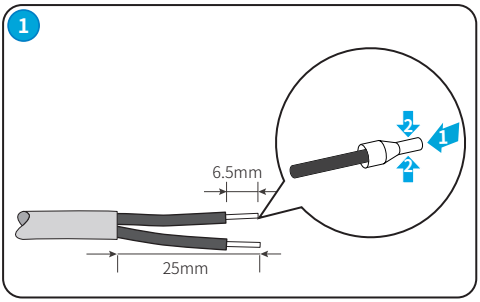
Power limit networking scenario (multi inverters)

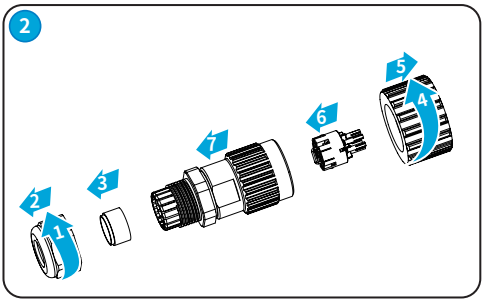


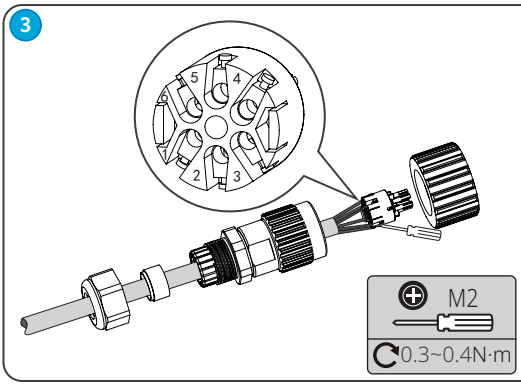
Connecting DRED or RS485 6pin Communication Cable (optional)

Contat the after-sales service to get the DRED terminal if you need to use DRED function.



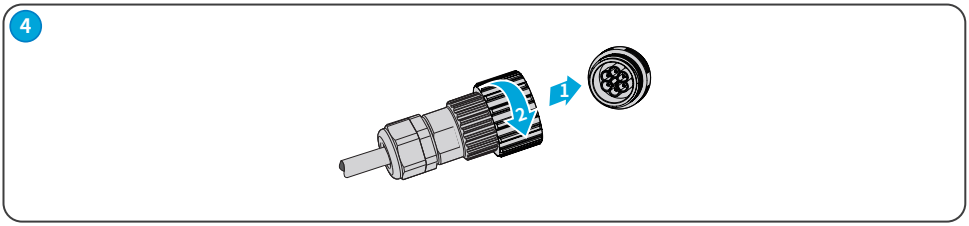




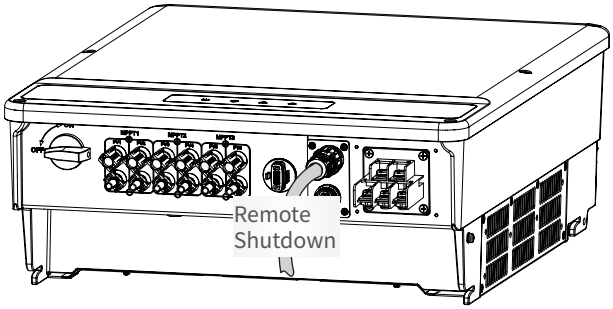


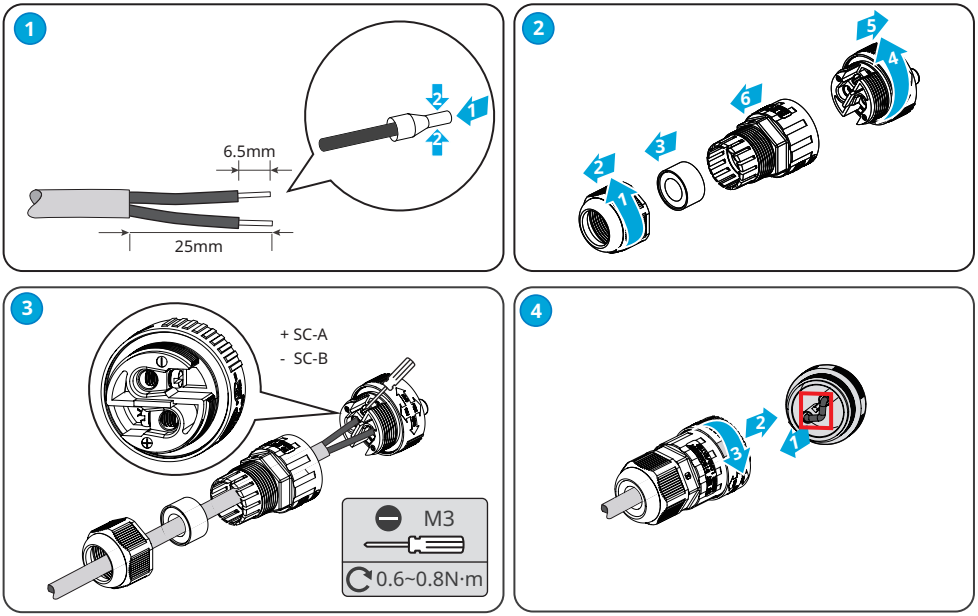
NO.	DRED
1	DRED1
2	DRED2
3	DRED3
4	DRED4
5	REF1
6	REF2

NO.	RS485
1	RS485-A1
2	RS485-B1
3	RS485-A1
4	RS485-B1
5	RS485-A2
6	RS485-B2

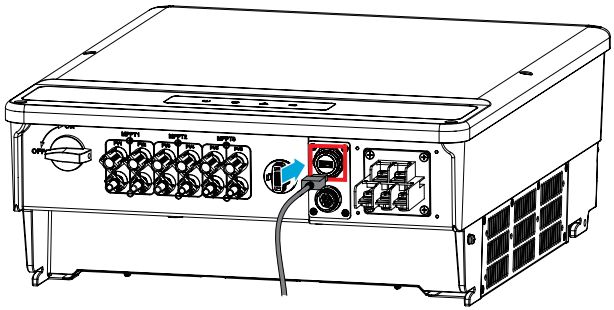


Connecting Remote Shutdown 2pin Communication Cable (optional)

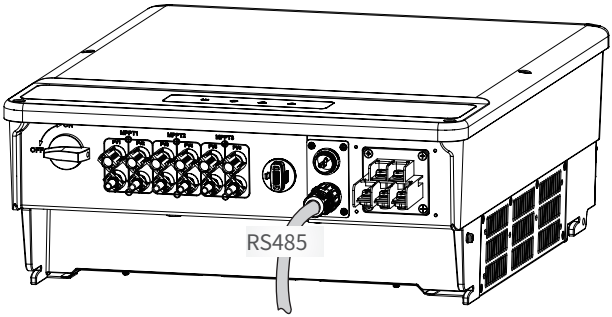


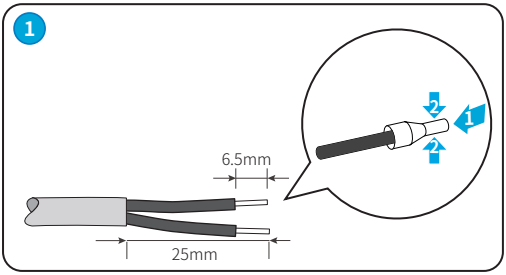


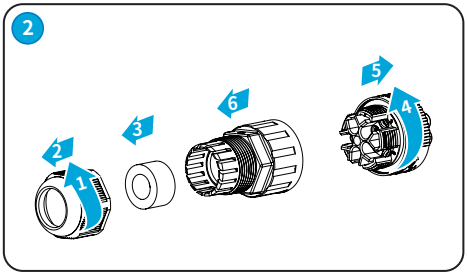
Connecting USB Cable (optional)

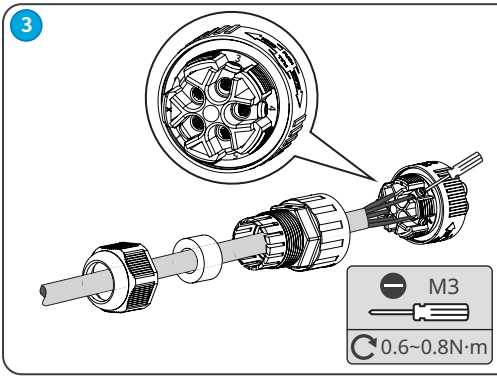


Connecting RS485 5pin Communication Cable (optional)

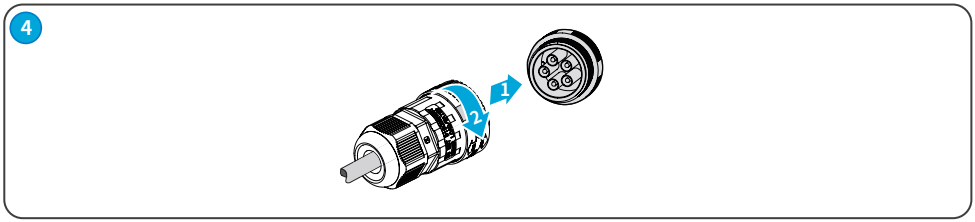






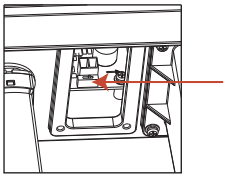


NO.	Function
1	RS485-A1
2	RS485-B1
3	RS485-A1
4	RS485-B1
5	Gen

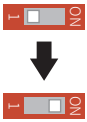


Control the Ethernet communication via the dial switch

Turn the dial switch to ON, the Ethernet will be connected; turn the dial switch to OFF, the Ethernet will be disconnected. The dial switch beside the RS485 port is OFF by default. Turn the switch to ON when a single inverter is in the communication state, the terminal resistance of RS485 will be 120ohm.

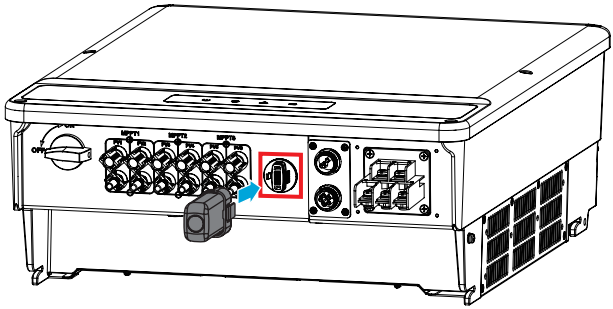


The terminal resistance of RS485 will be 120ohm



Installing the Communication Module

This function is only applicable for WiFi model, for specific configurations, please refer to WiFi Connection Configurations in the attachment, and you can also refer to the description of "Demo Videos of Monitoring Installation" on the http://www.goodwe.com/DownLoad.aspx website. After the configurations are completed, please register on the website http://www.goodwe.com . Note: The name and password of WiFi cannot use symbols, only Arabic numerals or uppercase / lowercase letters.



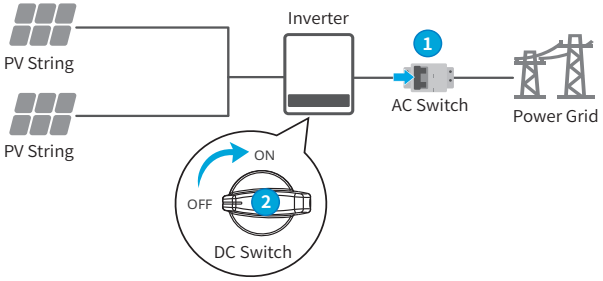
05 Power On

5.1 Check Before Power ON

No.	Check Item
1	The inverter is firmly installed at a clean place where is well-ventilated and easy to operate.
2	The PE cable, DC input cable, AC output cable, and communication cable are connected correctly and securely.
3	Cable ties are routed properly and evenly, and no burrs.
4	Unused ports and terminals are sealed.
5	The voltage and frequency at the connection point meet the on-grid requirements.

5.2 Powering On the System

1. If it displays **Select Country/Region** on the LCD when you power on the equipment for the first time, you can set the safety country via the LCD or SolarGo APP. For more details, refer to Commissioning part. For other settings, please refer to the user manual.
2. Observe the indicators to check the inverter status. If any fault exists, please refer to the Troubleshooting part in the user manual.

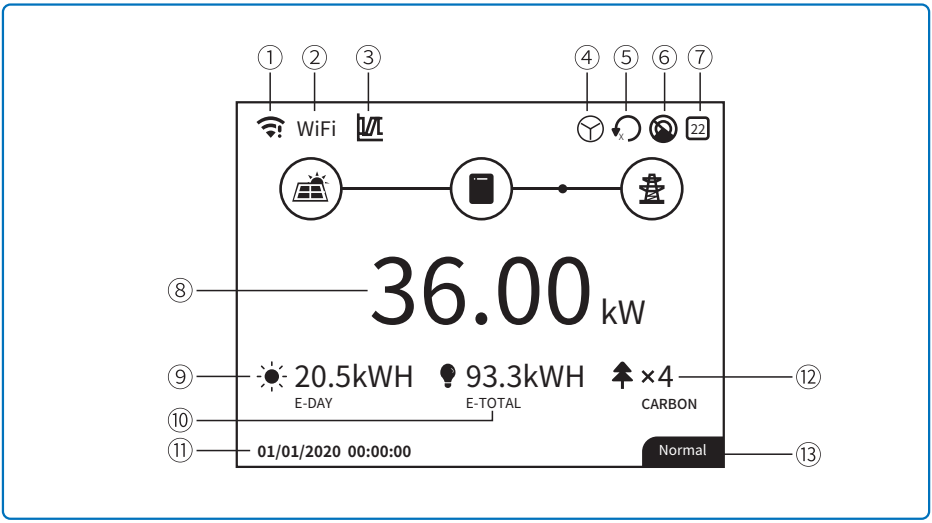


Indicator	Status		Description
Power		Steady green	Power on
		Off	Power off
Operating		Steady green	The grid is working normally. The inverter is connected to the grid.
		Off	The inverter is not connected to the grid.
		Single green slow blinking	Self-check before connecting to the grid.
		Single green fast blinking	The inverter is going to connect to the grid.
SEMS		Steady green	The Communication module is working properly.
		Single green fast blinking	Communication is reseting or restarting.
		Double green blinking	The inverter is not connected to the router.
		Quartic green blinking	The inverter is not connected to the server.
		Single green slow blinking	RS485 is working normally.
		Off	WiFi module is restoring.
Alarming		Steady Red	System Fault.
		Off	No fault.

06 Configure Setting

6.1 Commissioning via LCD

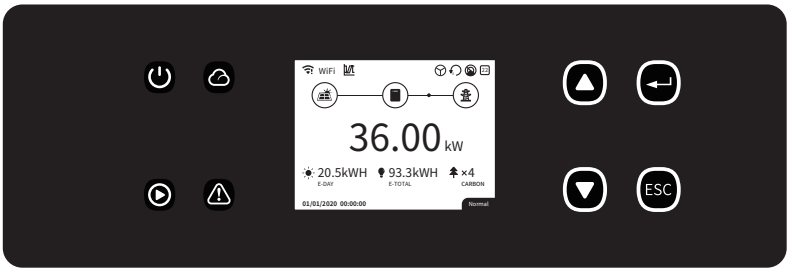
6.1.1 User Interface Introduction



①: Communication information icon:GPRS and WiFi show the signal strength, RS485 shows the communication address.
②: Communication icon:The way of communication,There are GPRS, WiFi and RS485
③: LVRT/HVRT icon:The icon indicates that the system LVRT/HVRT function is on
④: Grid Type icon:The icon indicates that the system select Delta Grid/Star Grid
⑤: Power limit icon:The Power limit icon indicates that the Power limit function is on
⑥: Shadow scan:The icon indicates that the Shadow scan function is on
⑦: Safety icon:The number represents the safety country number
⑧: Real-time power
⑨: E-day：daily generation
⑩: E-Total:Total generation
⑪: System date and time
⑫: System status information
⑬: Carbon:Energy conservation and emission reduction

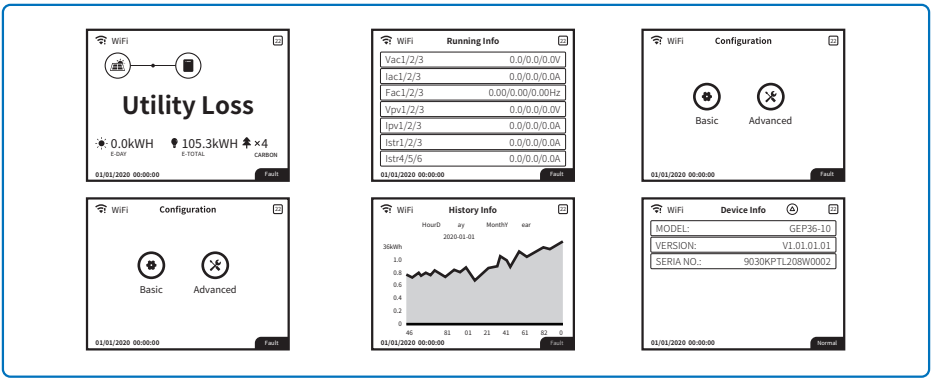
6.1.2 User Interface Introduction

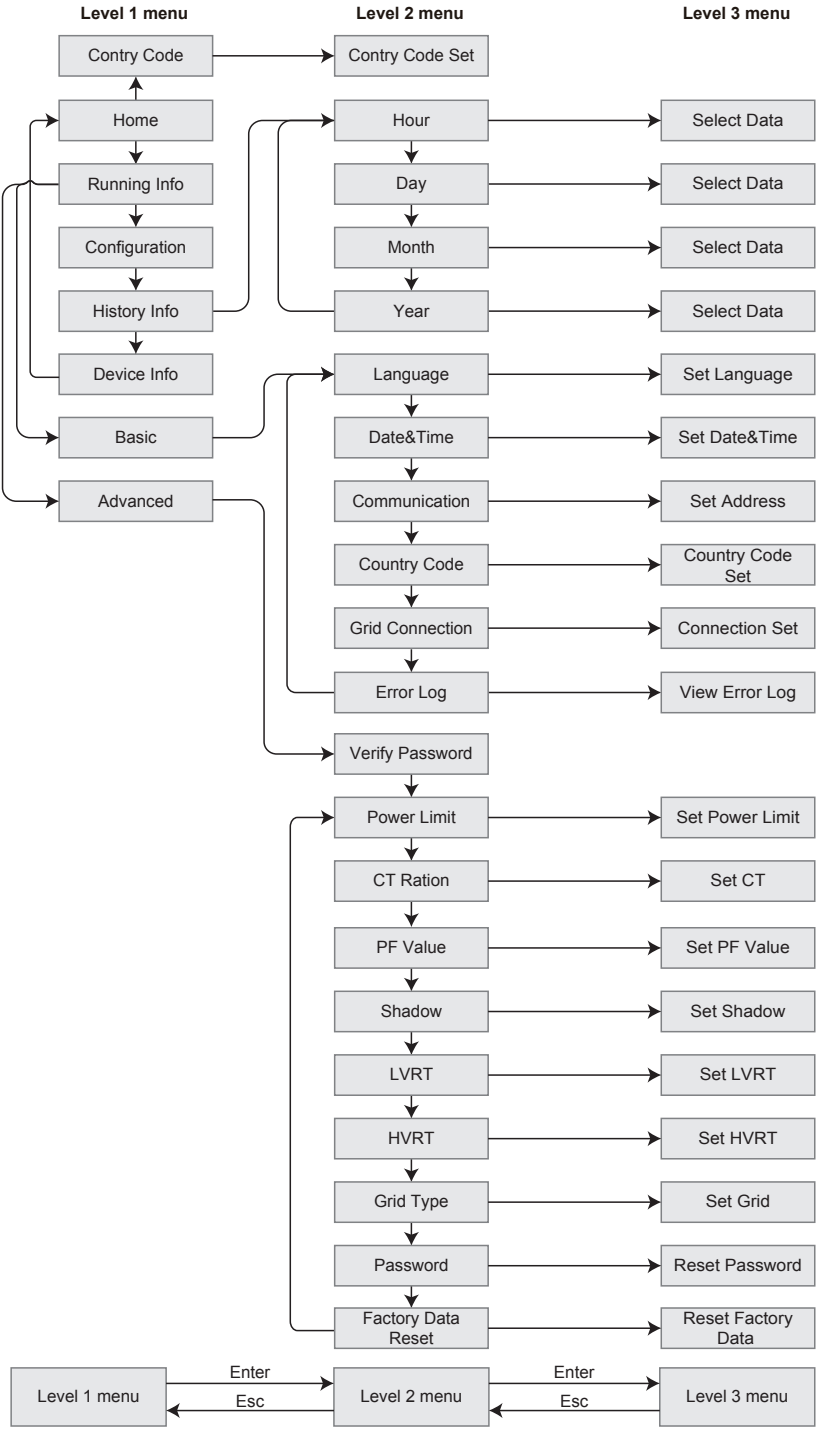
The display menu through the Up, Down, Enter, Esc key to operate the menu, which Enter key is divided into long press (greater than 3s)and short press, so a total of five key operation. Press the Enter Esc key to toggle the 123 menu, use the up and down keys to select the item and change the parameters, and long press the Enter (short press is also ok for some item) to set the parameters. The display and keys of series is shown in the below figure.



6.1.3 Level 1 Menu

Level 1 menu interface through the up and down key cycle, in the historical information, configuration, advanced settings interface, pressing the Enter key will enter the Level 2 menu. To enter the Level 2 menu, select the item from the up and down keys. Press Enter to enter the project setup menu, go to the Level 3 menu, change the setting contents by pressing the up and down keys, and press the Enter key to set the contents. If country safety setting is not selected (shows 'Configure Safety' on display at home page), press any key will enter country safety setting page.

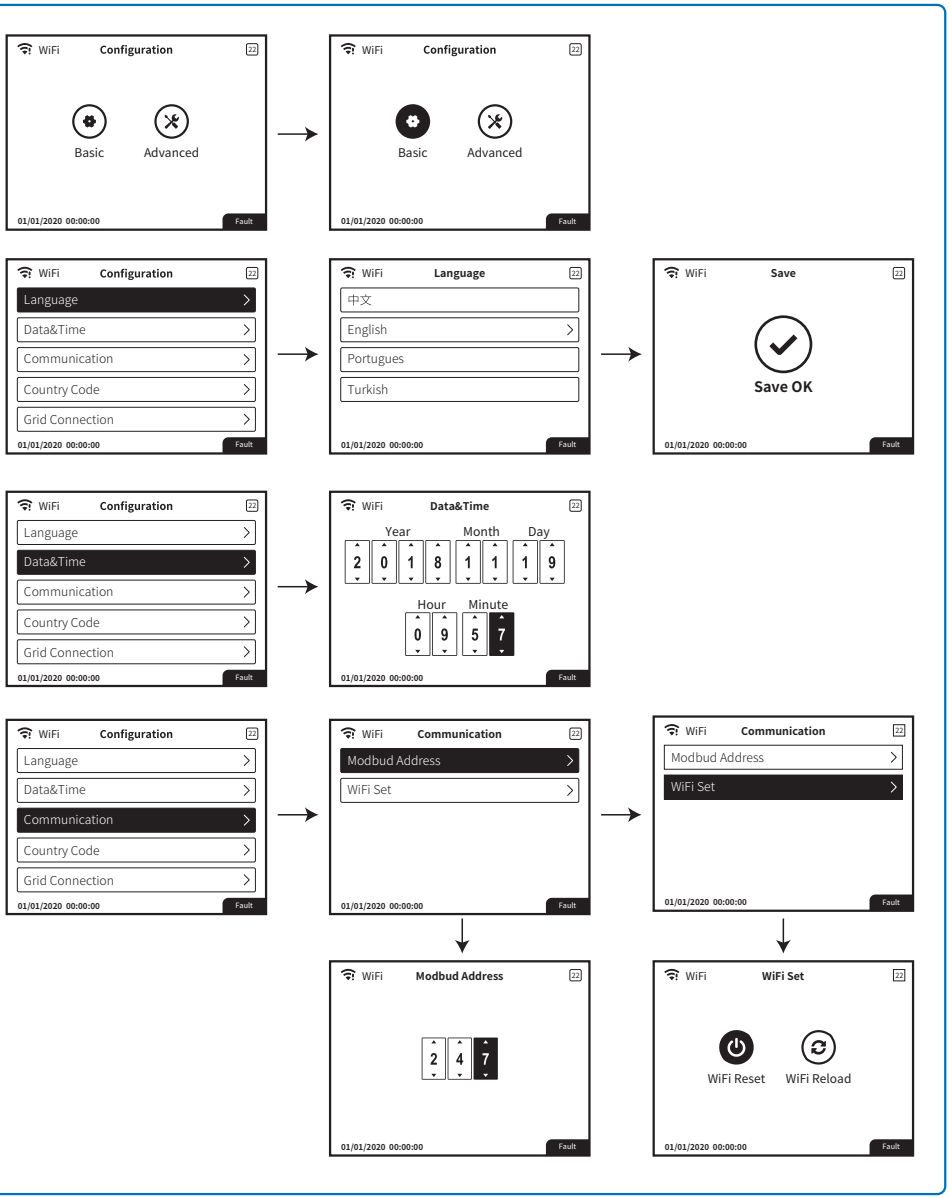


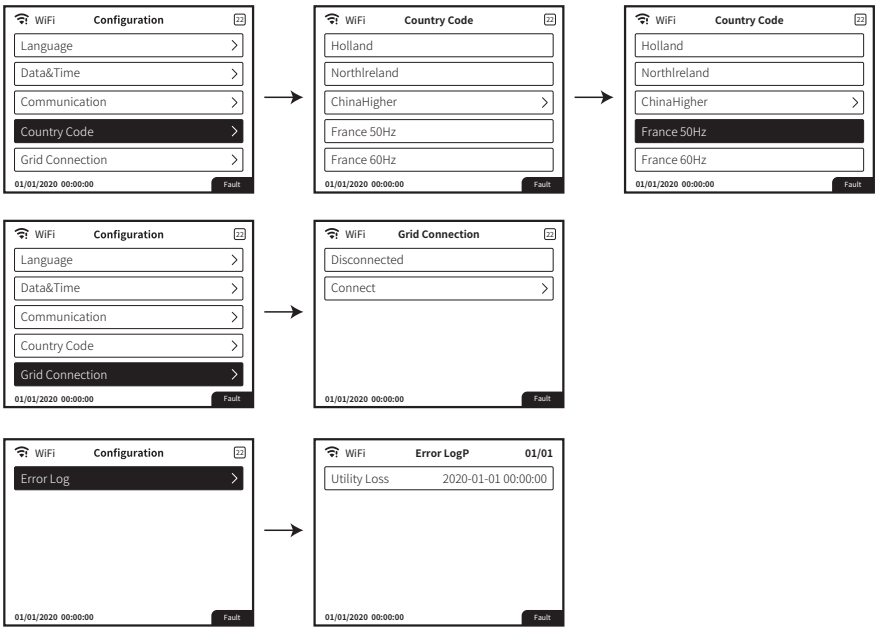

Level 1 menu
Level 2 menu
Level 3 menu
Contry Code
Contry Code Set
Home
Running Info
Configuration
History Info
Device Info
Basic
Advanced
Hour
Day
Month
Year
Language
Date&Time
Communication
Country Code
Grid Connection
Error Log
Verify Password
Power Limit
CT Ration
PF Value
Shadow
LVRT
HVRT
Grid Type
Password
Factory Data Reset
Select Data
Select Data
Select Data
Select Data
Set Language
Set Date&Time
Set Address
Country Code Set
Connection Set
View Error Log
Set Power Limit
Set CT
Set PF Value
Set Shadow
Set LVRT
Set HVRT
Set Grid
Reset Password
Reset Factory Data
Level 1 menu
Enter
Esc
Level 2 menu
Enter
Esc
Level 3 menu

6.1.4 System Configuration

Basic Settings

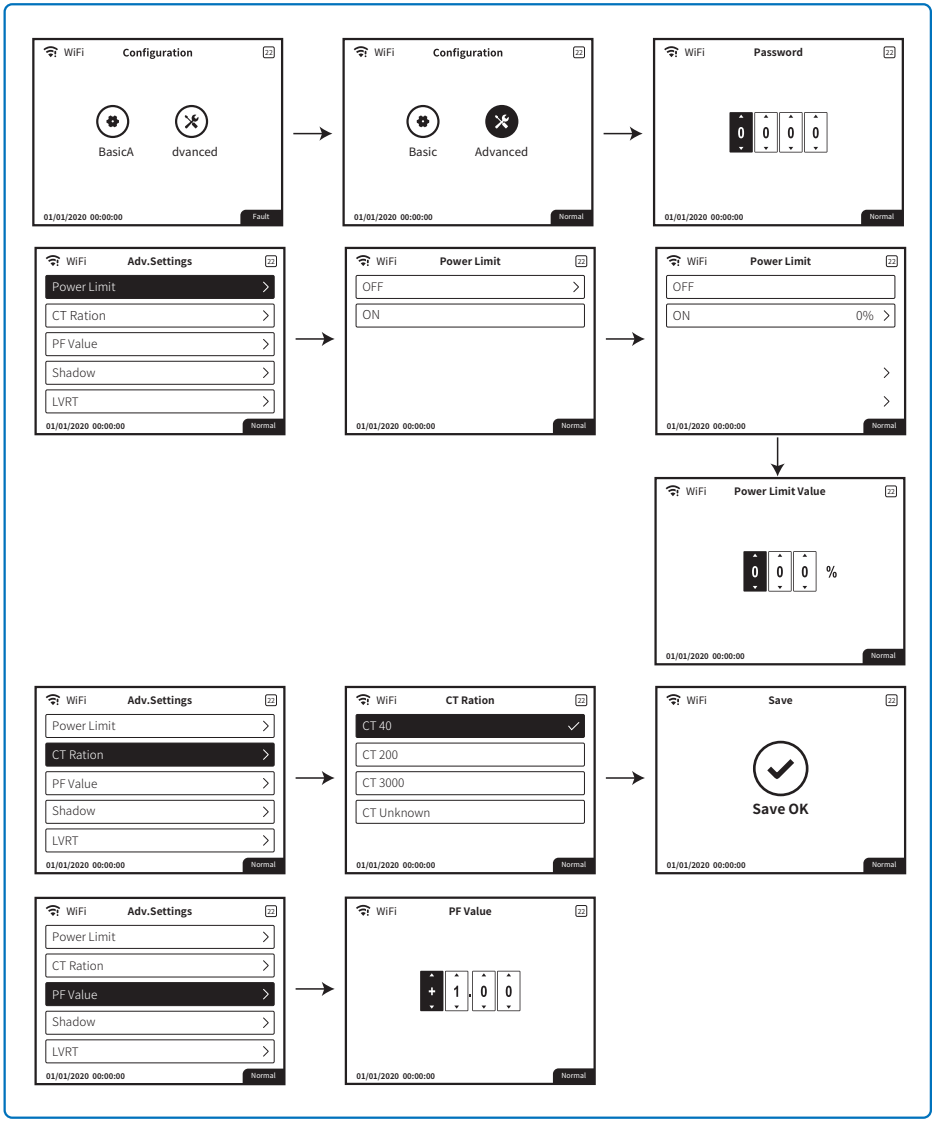
Basic Settings is mainly used to set the commonly used parameters, including language settings, time settings, communication settings and safety settings for projects. And these parameters could be set by App.

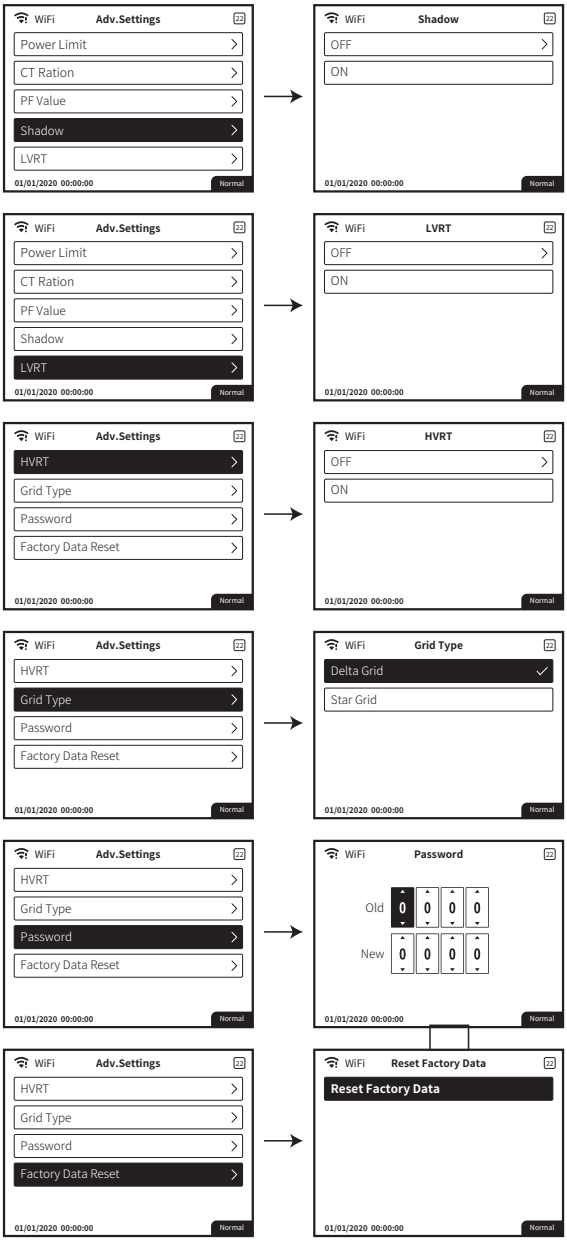



WiFi
Configuration
Language
Data&Time
Communication
Country Code
Grid Connection
01/01/2020 00:00:00
Fault
WiFi
Country Code
Holland
Northlreland
ChinaHigher
France 50Hz
France 60Hz
01/01/2020 00:00:00
Fault
WiFi
Country Code
Holland
Northlreland
ChinaHigher
France 50Hz
France 60Hz
01/01/2020 00:00:00
Fault
WiFi
Configuration
Language
Data&Time
Communication
Country Code
Grid Connection
01/01/2020 00:00:00
Fault
WiFi
Grid Connection
Disconnected
Connect
01/01/2020 00:00:00
Fault
WiFi
Configuration
Error Log
01/01/2020 00:00:00
Fault
WiFi
Error LogP
01/01
Utility Loss
2020-01-01 00:00:00
01/01/2020 00:00:00
Fault

Advanced Settings

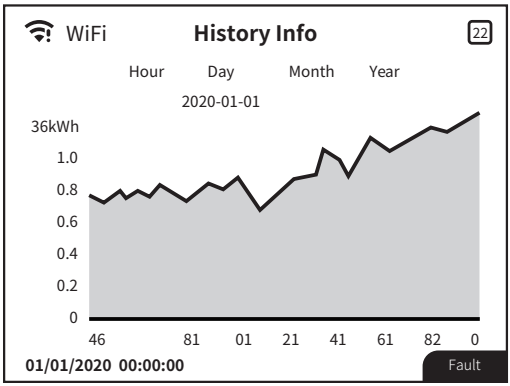
User must enter password to operate advanced settings because permission is required.
Note: Initial password：“1111”.
Advanced Settings include nine Settings: 1. Power limit; 2. CT ratio; 3. Power factor; 4. Shadow scanning; 5. Low Voltage Ride Through; 6. High Voltage Ride Through; 7. Type of power grid; 8. Reset the password; 9. Recovery parameters;



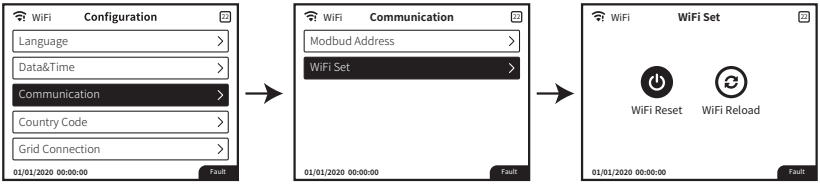

WiFi
Adv.Settings
Power Limit
CT Ration
PF Value
Shadow
LVRT
01/01/2020 00:00:00
Normal
WiFi
Shadow
OFF
ON
01/01/2020 00:00:00
Normal
WiFi
Adv.Settings
Power Limit
CT Ration
PF Value
Shadow
LVRT
01/01/2020 00:00:00
Normal
WiFi
LVRT
OFF
ON
01/01/2020 00:00:00
Normal
WiFi
Adv.Settings
HVRT
Grid Type
Password
Factory Data Reset
01/01/2020 00:00:00
Normal
WiFi
HVRT
OFF
ON
01/01/2020 00:00:00
Normal
WiFi
Adv.Settings
HVRT
Grid Type
Password
Factory Data Reset
01/01/2020 00:00:00
Normal
WiFi
Grid Type
Delta Grid
Star Grid
01/01/2020 00:00:00
Normal
WiFi
Adv.Settings
HVRT
Grid Type
Password
Factory Data Reset
01/01/2020 00:00:00
Normal
WiFi
Password
Old
New
0
01/01/2020 00:00:00
Normal
WiFi
Adv.Settings
HVRT
Grid Type
Password
Factory Data Reset
01/01/2020 00:00:00
Normal
WiFi
Reset Factory Data
Reset Factory Data
01/01/2020 00:00:00
Normal

History Information

The history information mainly includes the information of the generating capacity of the equipment, the power generation information mainly includes the amount of electricity generation, daily power generation, monthly power generation and annual power generation information.



Wi-Fi Reset & Wi-Fi Reload



Please press the "Enter" over 3 seconds to save the setting.

6.2 Setting Inverter Parameters via App

SolarGo is an application used to communicate with the inverter via Bluetooth module, WiFi module, or GPRS module. Commonly used functions:

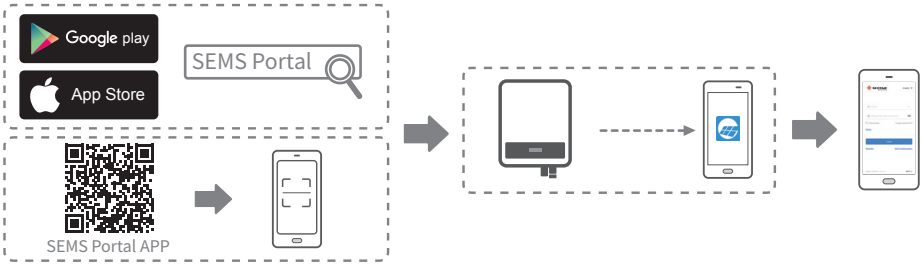
1. Check the operating data, software version, alarms of the inverter, etc.
2. Set grid parameters and communication parameters of the inverter.
3. Maintain the equipment.

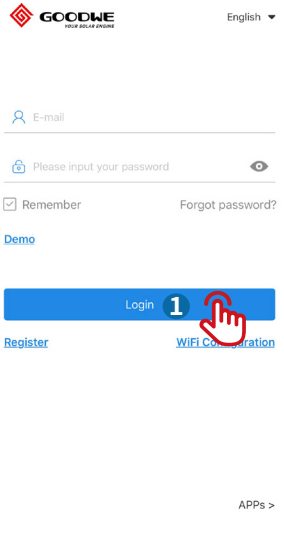
For more details, refer to the SolarGo APP User Manual. Scan the QR code or visit https://www.goodwe.com/ to get the user manual.

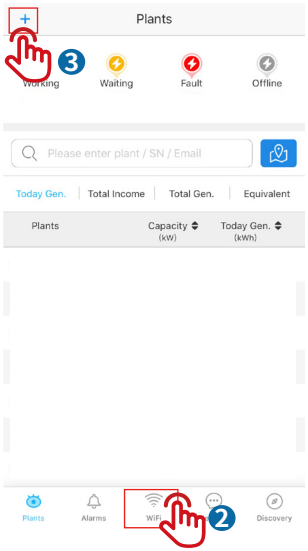
SolarGo App

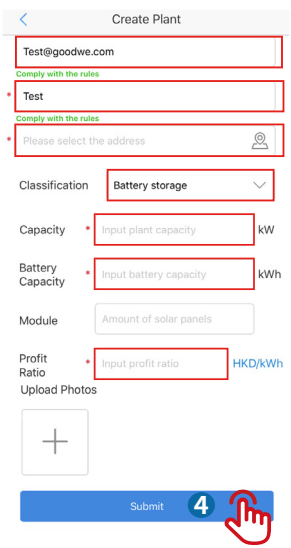
SolarGo App User Manual

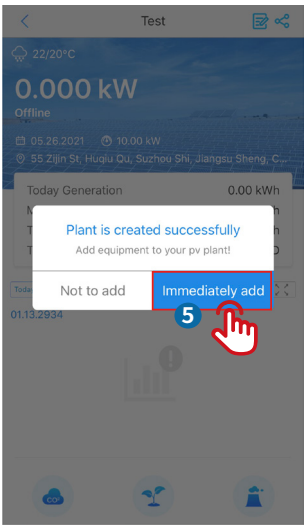
6.3 Monitoring via SEMS Portal App

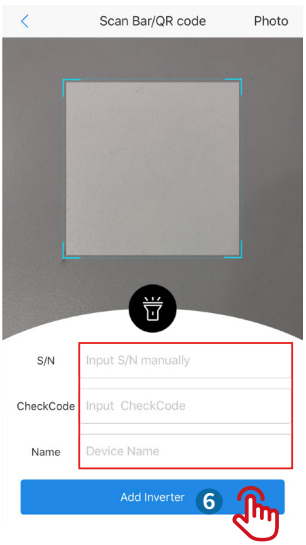


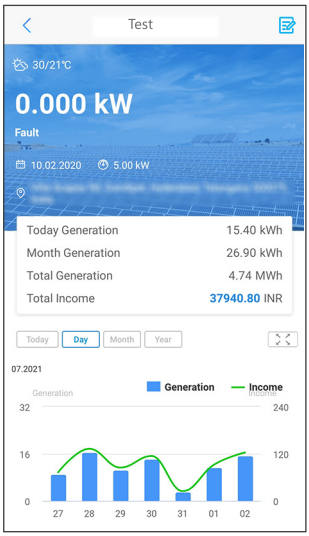












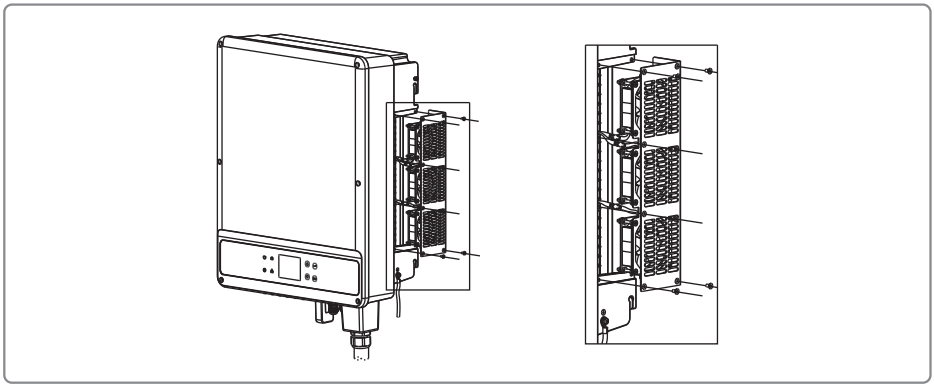
07 Maintenance

Regular maintenance ensures a long operating life and optimal efficiency of the entire PV plant.

Before maintenance please disconnect the AC breaker first and then disconnect DC breaker. Wait 5 minutes until the residual voltage has been released.

7.1 Clearing The Fan

Series inverter is equipped with three fans on its left side. The fan intakes and handle covers should be cleaned yearly with a vacuum cleaner. For more thorough cleaning, completely remove the fans.
Disconnect the AC breaker first and then disconnect DC breaker.
Wait 5 minutes until the residual voltage has been released and the fans are no longer turning.
Disassemble the fans (refer to the below figure).
1. Loosen the five screws with a crosshead screwdriver, then remove the fans out the cabinet about 50mm slowly.
2. Open the lockers of the three fans connectors and remove them from housing, then take the fans away.
• Clean the ventilation net and the fan with a soft brush, a paint brush, a cloth, or compressed air.
• Reassemble the fans into the cabinet
• Please use towel to clean the heatsink once a year.



7.2 Checking The DC Switch

DC switch does not require any maintenance.
It is recommended, though not compulsory, to:
• Check the DC switch regularly.
• Activate the DC switch 10 times in a row once a year.
Operating the switch will clean the contacts and will extend the life of the DC switch.
Boot order:
1. Turn on the breaker on AC side.
2. Turn on the DC switch.
3. Turn on the breaker on DC side.
Caution: if there is no switch, step 2 is not required.

Shutdown order:
1. Turn off the breaker on AC side.
2. Turn off the DC switch.
3. Turn off the breaker on DC side.
Caution: if there is no switch, step 2 is not required.

7.3 Checking The Electrical Connection

1. Check if the AC or DC wire is loose.
2. Check if the earth wire is reliably grounded .
3. Check if the waterproof covers of RS485 /WiFi port are fasten.
Caution: Maintenance cycle is once every half a year.
4. please use torque wrench to tighten the AC terminal wiring connection once a year;
Caution: Maintenance cycle is once every half a year.

08 Troubleshooting

In most situations, the inverter requires very little maintenance. However, if the inverter is not working properly, please try the following solutions:

Type of fault	Alarm	Troubleshooting
System Failure	Isolation Failure	1.Disconnect DC switch, take off DC connector, check the impedance between PV (+) & PV (-) to earth. 2. If impedance is less than 100 kΩ, please check the insulation of PV string wiring to the earth. 3. If impedance is larger than 100 kΩ, please contact local service office. 4. Take off AC connector, measure the impedance between neutral and PE. If it is larger than 10 kΩ, please check AC wiring.
	Ground I Failure	1. Disconnect DC switch, check the insulation of PV string wiring to earth. 2. Reconnect the DC switch again. 3. If the problem still exists, please call the local service office.
	AC Voltage Failure	1. Disconnect DC switch, take off AC connector, measure the voltage between line and neutral in connector, make sure if it conforms to the grid-connected specification of inverter. 2. If it does not, please check grid wiring. 3. If it does, please connect AC connector, reconnect DC switch, inverter will connect to automatically. If the problem still exists, please call the local service office.
	AC Frequency Failure	1. The PV inverter will automatically restart if the Fac returns to nornal. 2. If the problem still exists, please call the local service office.
	Utility Loss	1. Disconnect the DC switch, take off AC connector, measure the voltage between line and neutral in connector, make sure if it conforms to the grid-connected specification of inverter. 2. If it does not, please check if the distribution switch is connected and the grid is normal. 3. If it does, reconnect AC connector and DC connector; If the problem still exists, please call the local service office.
	PV Over Voltage	1. Disconnect the DC switch, take off DC connector, check PV string voltage, check if it exceeds the input voltage in inverter specification. 2. If it does, please reconfigurate PV panel string. 3. If the problem still exists, please call the local service office.
	Over Temperature	1. Disconnect the DC switch, take off DC connector, check PV string voltage, check if it exceeds the input voltage in inverter specification. 2. If it does, please reconfigurate PV panel string. 3. If the problem still exists, please call the local service office.

Type of fault	Alarm	Troubleshooting
Inverter Failure	Relay-check Failure	1. Disconnect the DC connector. 2. Reconnect the DC connector. 3. If the problem still exists, please call the local service office.
	DCI High	
	EEPROM R/W Failure	
	SPI Failure	
	DC Bus High	
	GFCI Failure	
Others	No display	1. Disconnect the DC switch, take off DC connector, measure the voltage of PV string. 2. Plug in DC connector, and reconnect DC switch. 3.If the voltage is less than 70 V, please check the PV string configuration. 4. If the voltage is higher than 180V and still no display please contact local service office.

Earth Fault Alarm

Inverters sold in Australia and New Zealand will also alarm as following when Isolation Fail occurs.

1. Inverters support WiFi communication: Anemail about the fault will be sent to the user automatically.
2. Inverters do not support WiFi communication: The buzzer in the inverter will sound for 1minute. If the problem persists, the buzzer willsound every 30 min.

9.1 Technical Parameters

Technical Data	GW12KLV-MT	GW15KLV-MT	GW20KLV-MT
Input (DC)			
Max. DC Input Power (Wp)	15600	19500	26000
Max. DC Input Voltage (V)	800		
MPPT Operating Voltage Range (V)	200~650		
MPPT Operating Voltage Range for Full Load (V)	360~600		
Start-up Voltage (V)	180		
Nominal DC Input Voltage (V)	370		
Max. Input Current per MPPT(A)	30/30/30		
Max. Short Circuit Current per MPPT (A)	37.5/37.5/37.5		
No. of MPP Trackers	3		
No. of Input Strings per Tracker	2/2/2		
Output (AC)			
Nominal Output Power (W)	12000	15000	20700
Nominal Active power(W)	12000	15000	20700
Nominal Apparent Power (VA)	12000	15000	20700
Max. Output Power (W)	11300@208V, 12000@220V, 13100@240V	14400@208V, 15000@220V, 16600@240V	19600@208V, 20700@220V, 22600@240V
Max. Output Apparent Power (VA)	13100	16600	22600
Nominal Output Voltage (V)	220V, 3L/N/PE or3L/PE		
Nominal Output Current (A)	31.5	39.4	54.3
Nominal Output Frequency (Hz)	50/60		
Max. Output Current (A)	31.5	40.0	54.5
Output Power Factor	~1(adjustable from 0.8 lagging and 0.8 leading)		
Output THDi (@Nominal Output)	＜3%		
Efficiency			
Max. Efficiency	98.7%	98.7%	98.8%
European Efficiency	98.4%	98.5%	98.5%
Protection			
PV String Current Monitoring	Integrated		
Residual Current Monitoring Unit	Integrated		

Technical Data	GW12KLV-MT	GW15KLV-MT	GW20KLV-MT
DC Insulation Resistance Detection	Integrated		
Anti-islanding Protection	Integrated		
DC Reverse Polarity Protection	Integrated		
Insulation Resistance Detection	Integrated		
DC Surge Arrester	Type III (Type II optional)		
AC Surge Arrester	Type III (Type II optional)		
Output Over current Protection	Integrated		
Output Short Protection	Integrated		
Output Over voltage Protection	Integrated		
DC Switch	Integrated		
DC Arc Fault Circuit Interrupter	Optional		
Anti-PID Function for Module	Optional		
Ground Fault Circuit Interrupter	Optional		
PID Recovery	Optional		
AFCI	Optional		
Terminal Temperature Detection	Optional		
General Data			
Operating Temperature Range (°C)	-30~60		
Relative Humidity	0~100%		
Operating Altitude (m)	⩽3000		
Cooling Method	Smart Fan Cooling		
User Interface	LCD & LED or APP & LED		
Communication	Bluetooth or RS485 or WIFI or PLC or 4G		
Communication protocols	modbus-RTU (SunSpec compliant)		
Weight (kg)	40		
Dimensions (W*H*D mm)	480*590*200		
Protection Degree	IP65		
Protective class	Class I		
Nighttime Power Consumption	＜1		
Topology	Transformerless		

Technical Data	GW25K-MT	GW29.9K-MT	GW30K-MT	GW36K-MT
Input (DC)				
Max. DC Input Power (Wp)	32500	39000	39000	42900
Max. DC Input Voltage (V)	1100			
MPPT Operating Voltage Range (V)	200~950			
MPPT Operating Voltage Range for Full Load (V)	510~860			
Start-up Voltage (V)	180			
Nominal DC Input Voltage (V)	600			
Max. Input Current per MPPT(A)	30/30/30			
Max. Short Circuit Current per MPPT (A)	37.5/37.5/37.5			
No. of MPP Trackers	3			
No. of Input Strings per Tracker	2/2/2			
Output (AC)				
Nominal Output Power (W)	25000	29900	30000	36000[1]
Nominal Active power(W)	25000	29900	30000	36000[1]
Rated Apparent Power (VA)	25000	29900	30000	36000[1]
Max. Output Power (W)	27500[2]	29900	33000[2]	36000[2]
Max. Output Apparent Power (VA)	27500[2]	29900	33000[3]	36000[2]
Nominal Output Voltage (V)	400,3L/N/PE or 3L/PE			
Nominal Output Current (A)	36.1	43.2	43.4	52.0
Nominal Output Frequency (Hz)	50/60			
Max. Output Current (A)	40.0	43.3	48.0	53.3
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)			
Output THDi (@Nominal Output)	<3%			
Efficiency				
Max. Efficiency	98.7%	98.8%	98.8%	98.8%
European Efficiency	98.4%	98.5%	98.5%	98.5%
Protection				
PV String Current Monitoring	Integrated			
Internal Humidity Detection	Integrated			

Technical Data	GW25K-MT	GW29.9K-MT	GW30K-MT	GW36K-MT
Residual Current Monitoring Unit	Integrated			
DC Insulation Resistance Detection	Integrated			
Anti-islanding Protection	Integrated			
DC Reverse Polarity Protection	Integrated			
DC Surge Arrester	Type III (Type II Optional)			
AC Surge Arrester	Type III (Type II Optional)			
Output Overcurrent Protection	Integrated			
Output Short Protection	Integrated			
Output Overvoltage Protection	Integrated			
DC Arc Fault Circuit Interrupter	Optional			
Anti-PID Function for Module	Optional			
AC Terminal Temperture Detection	Optional			
Ground Fault Circuit Interrupter	Optional			
DC Switch	Integrated			
PID Recovery	Optional			
Rapid Shuntdown	Optional			
General Data				
Operating Temperature Range (°C)	-30 ~ 60			
Relative Humidity	0~100%			
Operating Altitude (m)	⩽3000			
Cooling Method	Smart Fan Cooling			
User Interface	LCD or LED+APP			
Communication	Bluetooth or RS485 or WIFI or PLC or 4G			
Communication protocols	modbus-RTU (SunSpec compliant)			
Weight (kg)	40			
Dimensions (W*H*D mm)	480*590*200			
Protection Degree	IP65			
Nighttime Power Consumption	＜1			

Technical Data	GW25K-MT	GW29.9K-MT	GW30K-MT	GW36K-MT
Protective class	Class I			
Topology	Transformerless			

[1]: 33kW for Italy,36kW for other country.
[2]For Belgium Max. Output Power (W)：GW25K-MT is 25000；GW30K-MT is 30000；GW36K-MT is 36000.
[3]:For Belgium Max. Output Apparent Power (VA)：GW25K-MT is 25000；GW30K-MT is 3000；GW36K-MT is 36000.

Note:

Overvoltage Category Definition

Category I: applies to equipment connected to a circuit where measures have been taken to reduce transient overvoltage to a low level.

Category II: applies to equipment not permanently connected to the installation. For example, appliances, portable tools and other plug-connected equipment;

Category III: applies to fixed downstream equipment, including the main distribution board. For example,switchgear and other equipment in an industrial installation;

Category IV: applies to equipment permanently connected at the origin of an installation (upstream of the main distribution board).For example, electricity meters, primary overcurrent protection equipment and other equipment connected directly to outdoor open lines.

Moisture Location Category Definition

Moisture parameters	Level		
	3K3	4K2	4K4H
Temperature Range	0~+40°C	-33~+40°C	-20~+55°C
Humidity Range	5%～85%	15%～100%	4%～100%

Environment Category Definition

Outdoor : the ambient air temperature is -20~50°C. Relative humidity range is from 4% to 100%, applied to PD3.

Indoor unconditioned: the ambient air temperature is -20~50 °C. Relative humidity range is from 5% to 95%, applied to PD3.

Indoor conditioned: the ambient air temperature is 0~40 °C. Relative humidity range is from 5% to 85%, applied to PD2

Pollution Degree Definition

Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.

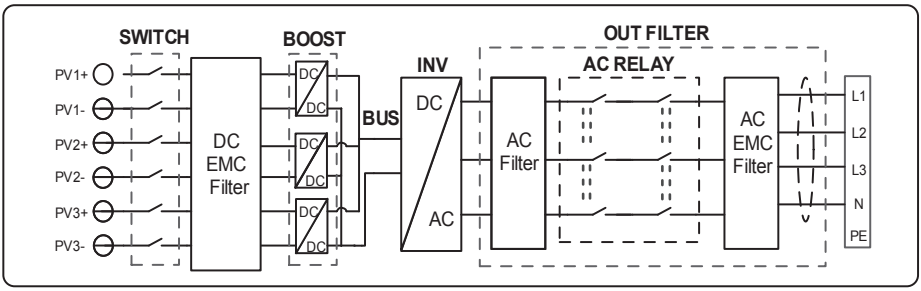
Pollution degree 2: Normally only non-conductive pollution occurs. However, a temporary conductivity occasionally caused by condensation must be expected.

Pollution degree 3: Conductive pollution occurs. Or dry, non-conductive pollution becomes conductive due to condensation, which is expected.

Pollution degree 4: Persistent conductive pollution occurs. For example, the pollution cause by conductive dust, rain and snow

9.2 Block Diagram

SMT series main circuit is shown in the below figure:



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