



GOODWE
YOUR SOLAR ENGINE



User Manual

AC-Coupled Inverter
SBP Series

V1.5-2021-01-21

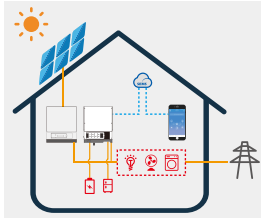
TABLE OF CONTENTS

01 Introduction	1
1.1 Operation Modes Introduction.....	1
1.2 Safety and Warning	2
1.3 Product Overview	4
02 Installation Instructions	5
2.1 Unacceptable Installations.....	5
2.2 Packing List	5
2.3 Mounting	6
2.3.1 Select Mounting Location	6
2.3.2 Mounting	7
2.4 Electrical Wiring Connection	9
2.4.1 PE Cable Connection	9
2.4.2 Battery Wiring Connection	9
2.4.2 On-Grid & Back-Up Connection	11
2.4.3 Smart Meter & CT Connections	13
2.5 DRED & Earth Fault Alarm	15
2.5.1 DRED Connection.....	15
2.5.2 Earth Fault Alarm Connection	16
03 MANUAL OPERATION	19
3.1 Wi-Fi Configuration	19
3.2 PV Master	20
3.3 CEI Auto-Test Function.....	21
3.4 Startup/shutdown Procedure	21
3.4.1 Startup Procedure	21
3.4.2 shutdown Procedure.....	21
3.5 SEMS Portal	21

04 OTHER.....	22
4.1 Error Messages.....	22
4.2 Troubleshooting	23
4.3 Disclaimer	27
4.4 Technical Parameters.....	29
4.5 Quick Checklist To Avoid Dangerous Conditions.....	33
Appendix	34

01 Introduction

S-BP series bi-directional inverter is designed for both indoor and outdoor use, which could be used with or without existing grid-tied inverter systems to store energy using batteries. Energy produced from grid-tied inverters shall be used to optimize self-consumption, excess energy will be used to charge the batteries, if the battery is already full, power excess power could be exported to the grid. Loads will be supported in priority by grid-tied system, then battery power, if there is insufficient energy, power will be supported by the grid.

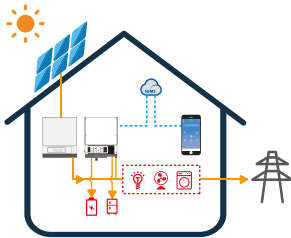


Note:

The introduction describes a general behavior of S-BP system. The operation mode can be adjusted on PV Master App depending on the system layout. Below are the general operation modes for SBP system:

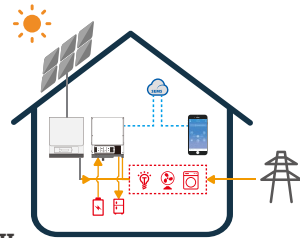
1.1 Operation Modes Introduction

SBP system normally has the following operation modes based on your configuration and layout conditions.



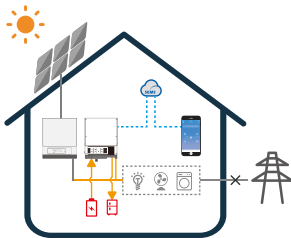
Mode I

Energy from grid-tied inverters optimize loads, excess energy will be used to charge the battery, anymore will be exported to the grid.



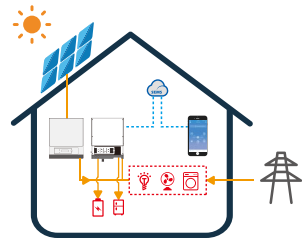
Mode II

When energy from grid-tied inverters is weak, battery will discharge to support the load in priority together with the grid.



Mode III

When grid power fails, battery will discharge to support back-up Loads.



Mode IV

Battery could be charged by grid, and charge time/power could be set flexibly on PV Master APP.

1.2 Safety and Warning

The SBP series of inverters from Jiangsu Goodwe Power Supply Technology Co.,Ltd (also called GoodWe) strictly complies with related safety rules for product design and testing. Please read and follow all of the instructions and cautions appearing on the inverter or in the User Manual during installation, operation and maintenance, as any improper operation might cause personal injury or property damage.



These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that specified in the operating instructions.

Symbol Explanation



Caution!
Failure to observe any warnings contained in this manual may result in injury.



Danger - high voltage and electric shock!



Danger - hot surface!



The components of the product can be recycled.



This side up! This package must always be transported, handled and stored in such a way that the arrows always point upwards.



No more than six (6) identical packages being stacked on each other.



Products shall not be disposed as household waste.



Fragile - The package/product should be handled carefully and never be tipped over or slung.



Refer to the operating instructions.



Keep dry! The package/product must be protected from excessive humidity and must be stored under cover.



This symbol indicates that you should wait at least 5mins after disconnecting the inverter from the utility grid and from the PV panel before touching any inner live parts.



CE mark.

Safety Warnings

Any installation or operations on the inverter must be performed by qualified electricians in compliance with standards, wiring rules and the requirements of local grid authorities or companies (such as AS 4777 and AS/NZS 3000 in Australia).

Prohibit inserting and pulling the AC and DC terminals when the inverter is running.

Before any wiring connection or electrical operation on inverter, all DC and AC power must be disconnected from inverter for at least 5 minutes to make sure inverter is totally isolated to avoid electric shock.

The temperature of inverter surface might exceed 60°C during operation, so please make sure it has cooled down before touching it, and make sure the inverter is out of reach of children.

Do not open the inverter's cover or change any components without manufacturer's authorization, otherwise the warranty commitment for the inverter will be invalid.

Usage and operation of the inverter must follow instructions in this user manual, otherwise the protection design might be impaired and warranty commitment for the inverter will be invalid.

Appropriate methods must be adopted to protect inverter from static damage. Any damage caused by static is not warranted by manufacturer.

The inverter, with built-in RCMU, will exclude possibility of DC residual current to 6mA, thus in the system an external RCD (type A) can be used($\geq 30\text{mA}$).

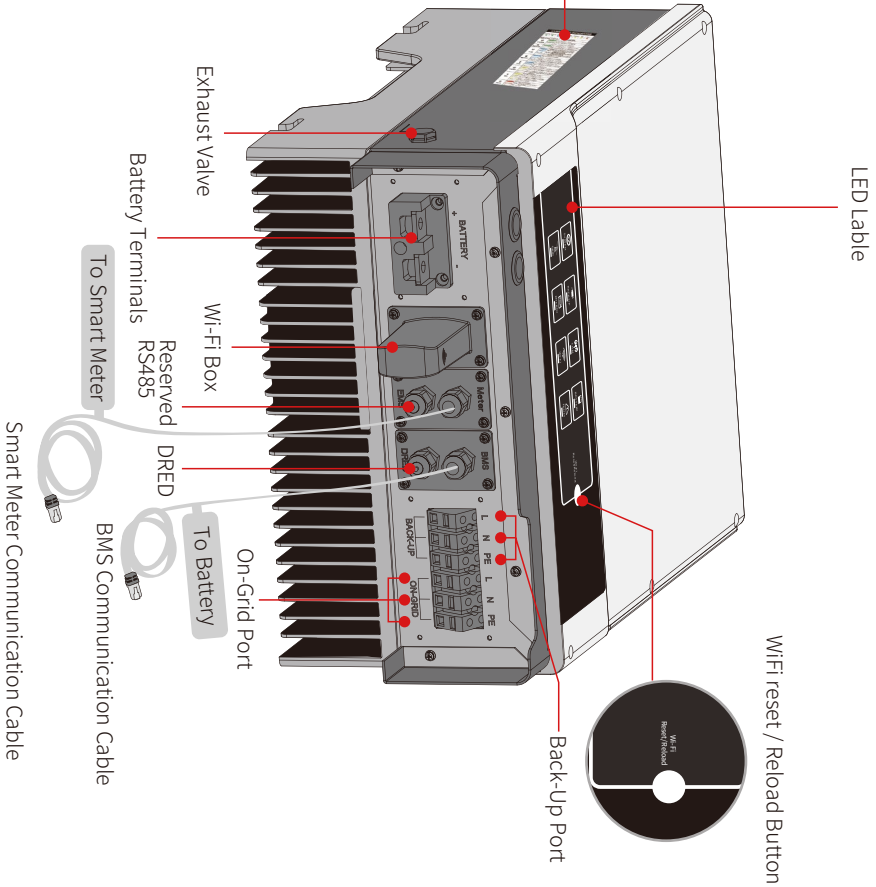
In Australia, the inverter internal switching does not maintain neutral integrity, which must be addressed by external connection arrangements like in the System Connection Diagrams for Australia.

In Australia, output of back-up side in switchbox should be labeled "Main Switch UPS Supply", the output of normal load side in switch box should be labeled "Main Switch Inverter Supply".



1.3 Product Overview

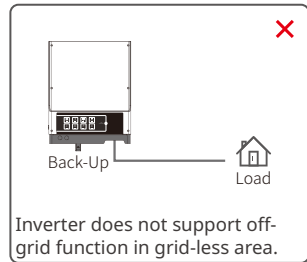
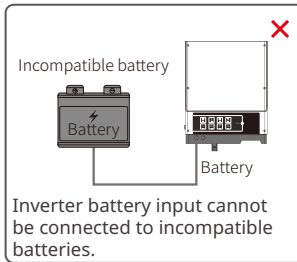
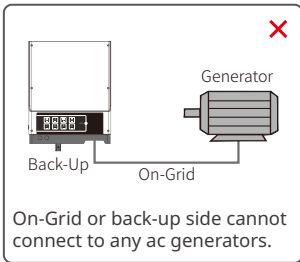
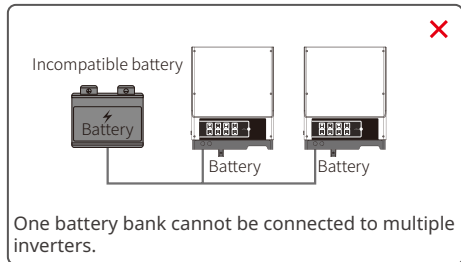
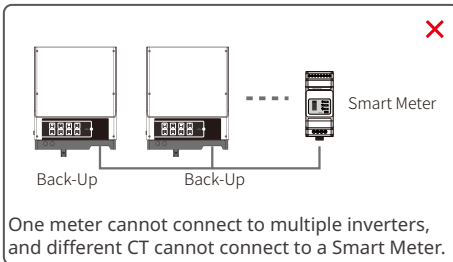
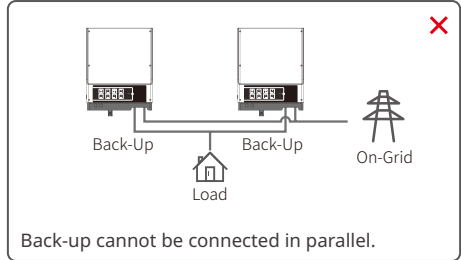
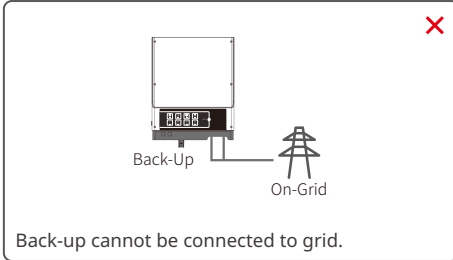
HYBRID LED INDICATORS			
INDICATOR	STATUS	EXPLANATION	
SYSTEM		ON = SYSTEM IS READY	SYSTEM
BACK-UP		ON = BACK-UP IS READY / POWER AVAILABLE	BACK-UP
SYSTEM		BLINK = SYSTEM IS STARTING UP	SYSTEM
SYSTEM		OFF = SYSTEM IS NOT OPERATING	SYSTEM
COM		ON = BMS AND METER COMMUNICATION OK	COM
COM		BLINK 1 = METER COMMUNICATION OK / BMS COMMUNICATION FAIL	COM
COM		BLINK 2 = BMS COMMUNICATION OK / METER COMMUNICATION FAIL	COM
BATTERY		OFF = BMS AND METER COMMUNICATION FAIL	BATTERY
BATTERY		ON = BATTERY IS CHARGING	BATTERY
BATTERY		BLINK 1 = BATTERY IS DISCHARGING	BATTERY
BATTERY		BLINK 2 = BATTERY IS LOW / SOC IS LOW	BATTERY
GRID		OFF = BATTERY IS DISCONNECTED / NOT ACTIVE	GRID
GRID		ON = BATTERY IS ACTIVE AND CONNECTED	GRID
GRID		BLINK = GRID IS ACTIVE BUT NOT CONNECTED	GRID
GRID		OFF = GRID IS NOT ACTIVE	GRID
GRID		ON = CONSUMING ENERGY FROM GRID / BIKING	GRID
ENERGY		BLINK 1 = SPRINKLING ENERGY TO GRID / PAVING	ENERGY
ENERGY		BLINK 2 = SPRINKLING ENERGY TO GRID / SAILING	ENERGY
ENERGY		OFF = GRID NOT CONNECTED OR SYSTEM NOT OPERATING	ENERGY
ENERGY		ON = WIFI CONNECTED / ACTIVE	ENERGY
ENERGY		BLINK 1 = WIFI SYSTEM RESETTING	ENERGY
ENERGY		BLINK 2 = WIFI NOT CONNECT TO ROUTER	ENERGY
ENERGY		BLINK 3 = WIFI SERVER PROBLEM	ENERGY
ENERGY		BLINK 4 = WIFI SERVER PROBLEM	ENERGY
ENERGY		OFF = WIFI NOT ACTIVE	ENERGY
ENERGY		ON = FAULT HAS OCCURRED	ENERGY
ENERGY		BLINK 1 = OVERLOAD OR BACKUP OUTPUT / REDUCE LOAD	ENERGY
ENERGY		OFF = NO FAULT	ENERGY
FAULT			FAULT



02 Installation Instructions

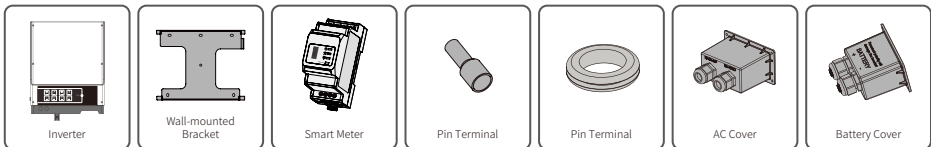
2.1 Unacceptable Installations

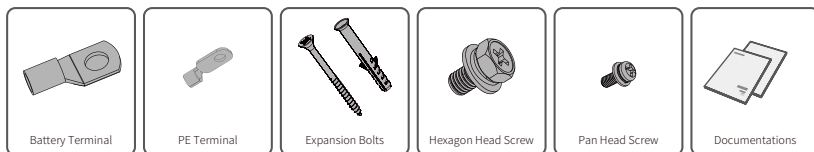
Please avoid the following installations which will damage the system or the Inverter. The following installations should be avoided. Any damage caused will not be covered by the warranty policy.



2.2 Packing List

Upon receiving the hybrid inverter, please check if any of the components as shown below are missing or broken.





2.3 Mounting

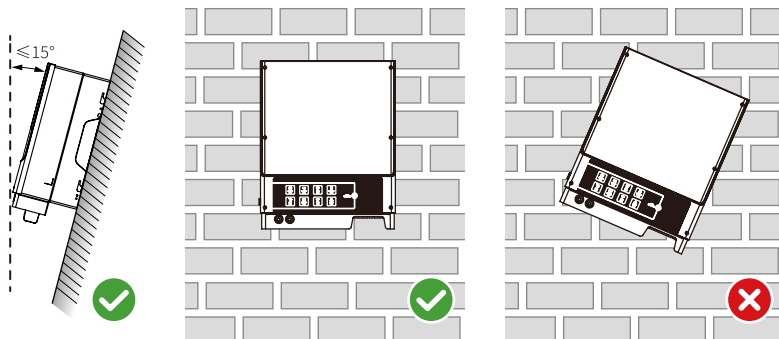
2.3.1 Select Mounting Location

For inverter's protection and convenient maintenance, mounting location for inverter should be selected carefully based on the following rules:

Rule 1. Any part of this system shouldn't block the switch and breaker from disconnecting the inverter from DC and AC power.

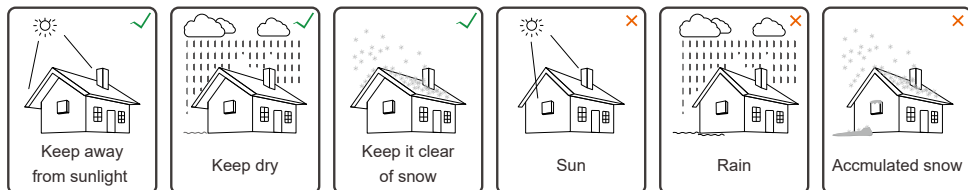
Rule 2. Inverter should be installed on a solid surface, where it is suitable for inverter's dimensions and weight.

Rule 3. Inverter should be installed vertically with a max rearward tilt of 15°.



Rule 4. Ambient temperature should be lower than 45°C. The temperature and humidity at the installation site should be within the appropriate range (60 °C for outdoor unconditioned with solar effects).

Rule 5. It is recommended that the installation of the inverter should be prevented from direct sunlight, snow, rain and other negative influences which may cause function impact or life aging.

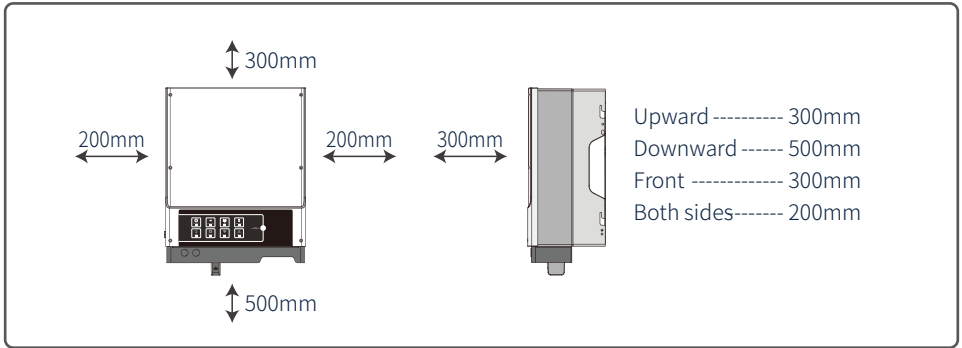


Rule 6. Inverter should be installed at eye level for convenient maintenance.

Rule 7. Product label on inverter should be clearly visible after installation. Do not damage the label.

Rule 8. Do not install the inverter when it is snowing or raining. If you have to, pay attention to the waterproof and moisture-proof of the inverter and distribution box.

Rule 9. Leave enough space around the inverter according to the below figure for natural heat dissipation.



Mounting Support Requirements

- The mounting support shall be nonflammable and fireproof.
- Make sure that the support surface is solid enough to bear the product weight load.
- Do not install the product on the support with poor sound insulation to avoid the noise generated by the working product, which may annoy the residents nearby.
- Do not install the product near equipment with strong electromagnetism.

2.3.2 Mounting



Deliver the inverter carefully.

- Pack the inverter securely for transport.
- Carefully transport the inverter using the carrying handles in the boxes.
- Do not subject the inverter to shocks during the transport.
- Make sure that the arrows on the box always point upwards during the transport.
- Secure the inverter firmly in place for transport.



Inverter cannot be installed near flammable, explosive or strong electro-magnetic equipment.[1]

The inverter is suitable for mounting on concrete or other non-combustible surface only.



Lift the inverter from the packing case and move it to the specified installation position.

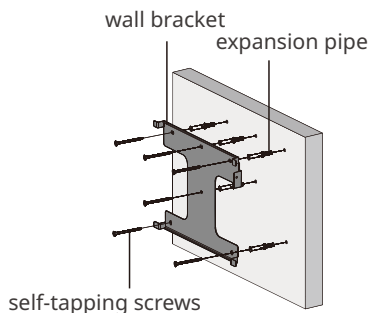
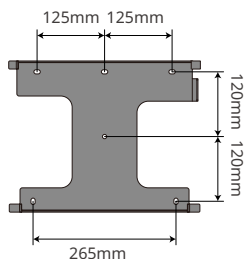
Note:

- *Move the inverter with care to prevent device damage and personal injury.*
- *Do not use the wiring terminals and ports at the bottom to support any weight of the inverter.*
- *Place a foam pad or cardboard under the inverter to protect the inverter enclosure from damage.*

**1**

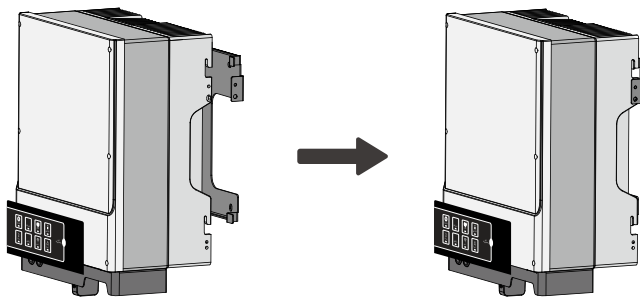
- Please use the mounting bracket as a template to drill 6 holes in right positions (10mm in diameter, and 80mm in depth).
- Use expansion bolts in accessory box and fix the mounting bracket onto the wall tightly.

Note: Bearing capacity of the wall must be higher than 25kg, otherwise it may not be able to keep inverter from dropping.

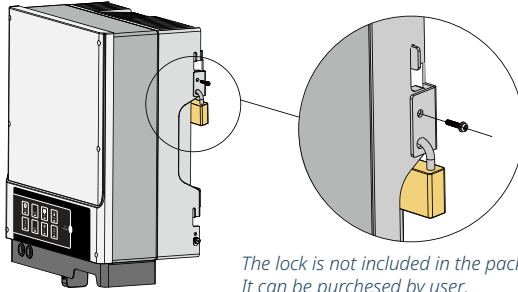
**2**

Carry the inverter by holding the heating sink on both sides and place the inverter on the mounting bracket.

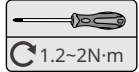
Note: Make sure the heat sink on the inverter joints with mounting bracket.



- 3 A lock could be used for anti-theft purposes if it is necessary for individual requirement.

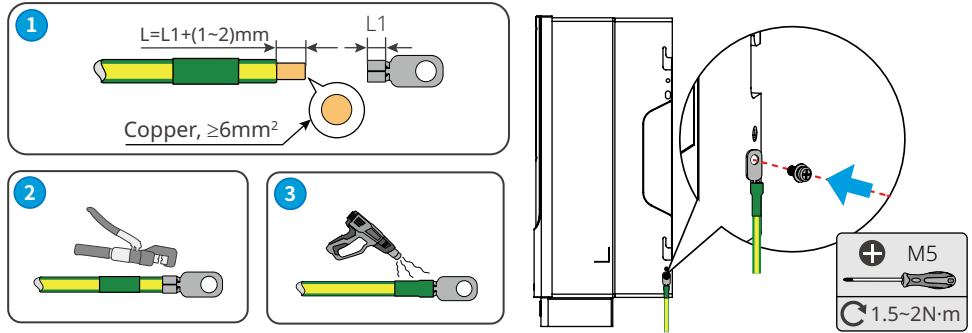


The lock is not included in the package, It can be purchased by user.



2.4 Electrical Wiring Connection

2.4.1 PE Cable Connection



- Disconnect the PE cable after dismantling the equipment if needed.
- To improve the corrosion resistance of the terminal, it is recommended to apply silica gel or paint on the ground terminal after installing the PE cable.
- The PE cable should be prepared by customers. Recommended specifications:
 - Type: single-core outdoor copper cable.
 - Conductor cross-sectional area $S \geq 6\text{mm}^2$.

2.4.2 Battery Wiring Connection

- For lithium battery (pack) the capacity should be 50Ah or larger. Battery cable requirement are shown below.



Cable	Description	Value
A	Outside Diameter	10-12mm
B	Isolation section	NA
C	Conductor Core	25-35mm ²

- Please be careful against any electric shock or chemical hazard
- Make sure there is an external DC breaker ($\geq 125A$) connected for batteries without build-in DC breaker.
- +: Positive polarity; -: Negative polarity

Battery wiring connection process



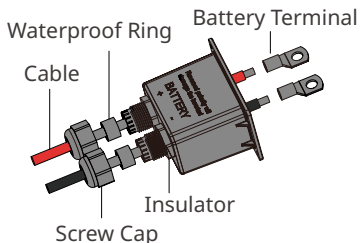
Make sure battery switch is off and battery nominal voltage meet S-BP specification before connecting battery to inverter and make sure inverter is totally isolated from PV and AC power.[4]

1

Prepare battery cables and accessories and put battery power cable through battery cover.

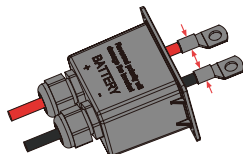
Note:

1. Please use delivered accessories.
2. Battery power cable should be 25-35mm².



2

Use Special Tool to Crimp



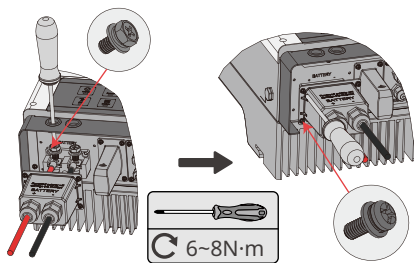
Make battery terminals:

- Strip cable coat, revealing 10mm length of metal core.
- Use special crimper to compress battery terminal tightly.

3

Connect battery terminal onto inverter.

Note: Please make sure polarity (+/-) of battery are not reversed.



* For the compatible lithium batteries (LG / PYLON / BYD / GCL / DYNESS / ALPHA) connection, please visit www.goodwe.com.

Battery Protection Description

Battery will act as protective charge/discharge current limitation under any condition as below:

- Battery SOC is lower than I-DOD
- Battery voltage lower than discharge voltage
- Battery over temperature protection
- Battery communication abnormal for lithium battery
- BMS limitation for lithium battery

When charge/discharge current limitation protection happens:

- Under on-grid mode, battery charge/discharge operation could be abnormal
- Under off-grid mode, Back-Up supply will shut down

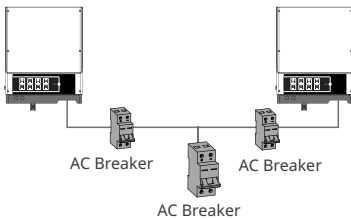
Note:

1. Under on-grid mode, battery is protected from over discharge by DOD and discharge voltage, under off-grid mode, it is protected by only discharge voltage in priority.
2. The DOD setting of a battery prevents the inverter from discharging battery reserve power. As soon as the DOD is reached the load of building will only be supported by either PV power or from the grid. If there are continuous days when little or no battery charging occurs, the battery may continue to self-consume energy to support communications with the inverter. This behaviour is different between battery manufactures products, however, if the SOC of the battery reaches a certain level the inverter will boost the SOC back up. This protection mechanism safeguards the battery to falling to 0% SOC.

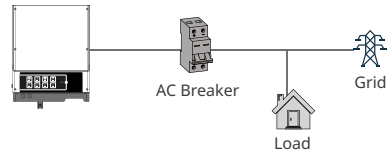
2.4.3 On-Grid & Back-Up Connection

An external AC breaker is needed for On-Grid connection to be isolated from grid when necessary. Below are the requirements of On-Grid AC breaker.

1. Use a separate AC break for individual inverter.



2. On AC side, the individual break should be connected before loads (between inverter and loads).

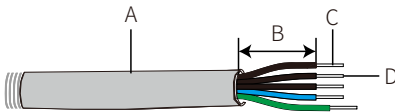


• On-grid wiring connection process is as below:



Make sure inverter is totally isolated from any DC or AC power before connecting AC cable.[5]

1 Prepare the terminals and AC cables according to the right table.



Cable	Description	Value
A	Outside Diameter	11-12 mm
B	Isolation section	NA
C	Conductor wire length	7-9 mm
D	Conductor core section	6 mm ²

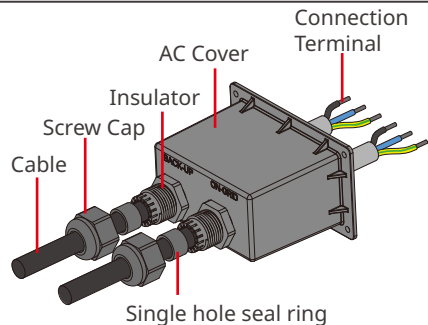
Note:

1. Neutral cable shall be blue, line cable is black or brown (preferred) and protective earth cable yellow-green.
2. For AC cables, PE cable shall be longer than N&L cables, so that if in any case the AC cable slips or is taken out, the protecting earth conductor will be the last to take the strain.

2

Put AC cable through the terminal cover in the following sequence.

Note: Please use the terminals in the accessories box.

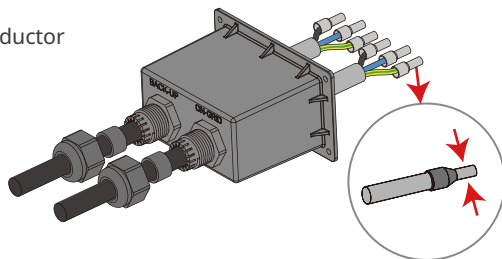




3

Press the six connectors on cable conductor core tightly.

Note: Make sure cable jacket is not locked within the connector.

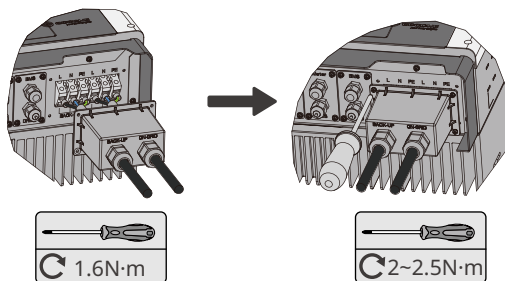


4

1. Connect the assembled AC terminals onto the inverter.

Note: Make sure it is not connected to a wrong side.

2. Lock the cover and screw the cap on.



Declaration for back-up function

The below statement lays out manufacturer's general policies governing the energy storage inverters of the series ES, EM, SBP, ET, EH and BH.

- For Hybrid inverters (Series ES, EM, EH and ET), the standard PV installation typically consists of the connection of the inverter with both panels and batteries. In the case where the systems are not connected to the batteries, the back-up function is strongly not advised for use. GoodWe shall not cover the standard warranty and be liable for any consequences arising from users not following this instruction.

- Under normal circumstances, the back-up switching time is less than 10 ms (the minimal condition to be considered as the UPS level). However, some external factors may cause the system to fail on Back-Up mode. As such, we recommend the users to be aware of conditions and follow the instructions as below:

1. Do not connect loads if they are dependent on a stable energy supply for a reliable operation.
2. Do not connect the loads which may in total exceed the maximum back-up capacity.
3. Try to avoid those loads which may create very high start-up current surges such as Inverter Air-conditioner, high-power pump etc.
4. Due to the condition of battery itself, battery current might be limited by some factors including but not limited to the temperature, weather etc.

Declartion for back-up loads

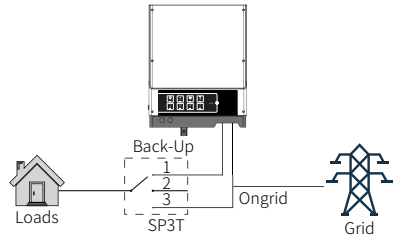
GoodWe S-BP inverter is able to supply a continuous 5000VA output(max 5500VA within 10s) on Back-Up side. And the inverter will shutdown when it is full loading with high ambient temperature if grid is absent.

- Accepted Back-Up loads: television, computer, fridge, fan, illumination lamps, microwave oven, electrical rice cooker and router etc.

- Unacceptable house loads for Back-Up side: air conditioner, water pump, heaters, washing machine, electromagnetic oven, compression engine, hair drier and dust cleaner etc. with high power and other loads with high inrush current at start-up.

Special adjustable settings

The inverter has field adjustable setting like tripping point, tripping time, reconnect time, active and invalid QU/PU curves etc. They can be adjusted using special firmware, please contact after-sales for the special firmware and adjustment methods. For a convenient maintenance, an SP3T switch could be installed on Back-Up and On-Grid side. Then it is adjustable to support load by Back-Up or by grid or left alone.



- 1: Load is supplied from Back-Up side
- 2: Load is isolated
- 3: Load is supplied from grid side

Declaration for Back-Up overload protection

Inverter will restart itself if overload protection occurs. The preparation time for restarting will extend (max one hour) if overload protection repeats. Take following steps to restart inverter immediately:

- Decrease Back-Up load power within max limitation.
- On PV Master APP → Advanced Setting → Click "Reset Back-Up Overload History"

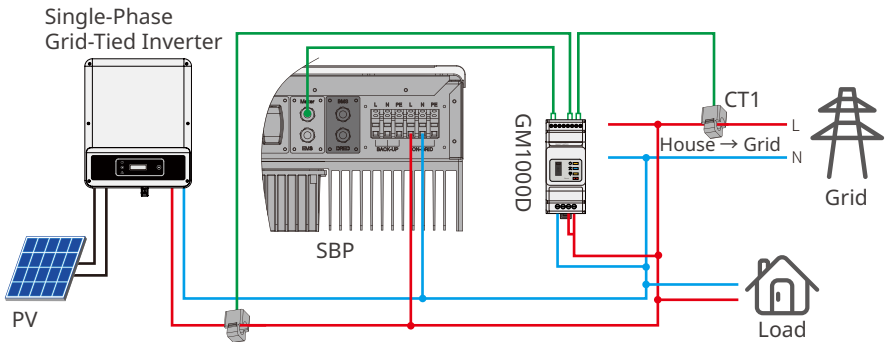
2.4.4 Smart Meter & CT Connections

The single-phase Smart Meter with 2 CTs or 3-phase in product box is compulsory for S-BP system installation, used to detect grid voltage, current direction and magnitude, further to instruct the operation condition of S-BP inverter via RS485 communication.



Make sure S-BP and grid-tied inverters are totally isolated from AC and DC power before connecting Smart Meter and CT.

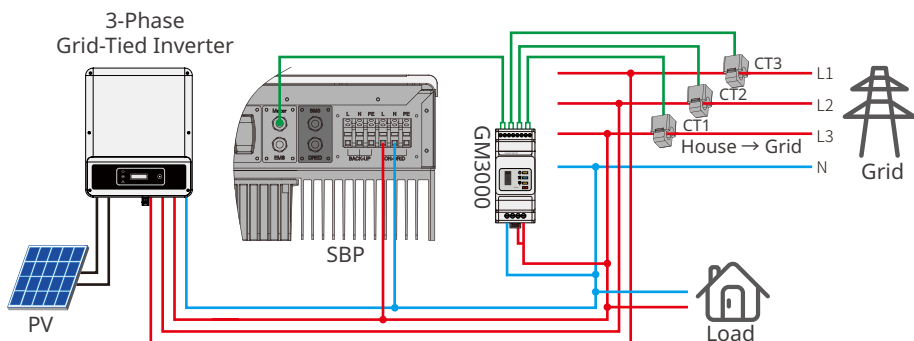
Single-phase Smart Meter & CT connection diagram



Note:

1. The Smart Meter and CT are well configured, please do not change any setting of the Smart Meter.
2. CT must be connected to the same phase with Smart Meter power cable.
3. Do not connect CT2 to the power line when the CT2 is not in use.

Three-phase Smart Meter & CT connection diagram



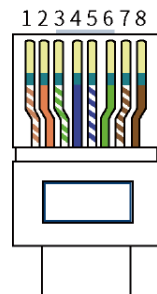
Note:

1. Please use the Smart Meter with 3 CTs in GoodWe product box.
2. CT cable is 3m as default, could be extended to a max of 5m.
3. Smart Meter communication cable (RJ45) is attached on the inverter ("To Smart Meter" cable), could be extended to a max of 100m, standard RJ45 cable and plug must be used, as below:

Detailed pin functions of each port on the SBP

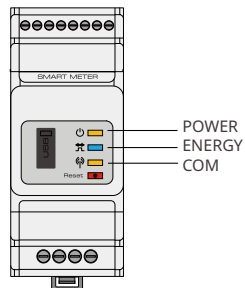
BMS: CAN communication is configured by default. If 485 communication is used, please contact the after-sales service to replace this with the correct communication cable.

Position	Color	BMS Function	Smart Meter	EMS
1	Orange & white	485_A2	NC	485_A
2	Orange	NC	NC	485_B
3	Green & white	485_B2	485_B1	485_A
4	Blue	CAN_H	NC	NC
5	Blue & white	CAN_L	NC	NC
6	Green	NC	485_A1	485_B
7	Brown & white	NC	485_B1	NC
8	Brown	NC	485_A1	NC



Smart Meter LED indications

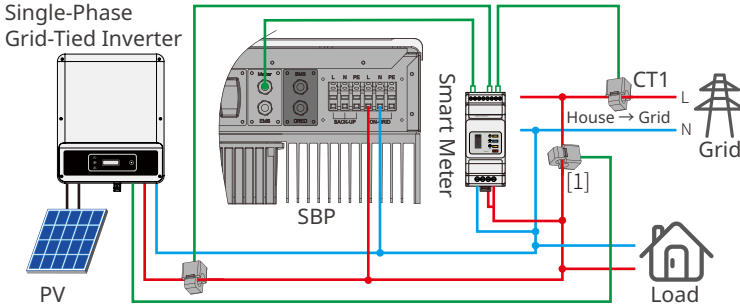
STATUS	OFF	ON	Blinking
POWER	Not working	Working	/
ENERGY	/	Importing	Exporting
COM	Single blink when data are transferred to the inverter		



Anti-reverse function connection

If S-BP system (connected with grid-tied inverters) requires anti-reverse function, it is operable but please note:

1. This diagram is only for installation where there is exporting power limit function requirement.
2. For anti-reverse function, it can be set on PV Master App → Advanced Setting → Power Limit.
3. This diagram will only applies if grid-tied inverter has anti-reverse function build-in. And the power limitation value can be set on grid-tied inverter.
4. When using anti-reverse function, it would buy about 100W from the grid.



[1] This cable is a theoretical connection supporting anti-reverse function, which could be different for different grid-tied inverters.

2.5 DRED & Earth Fault Alarm

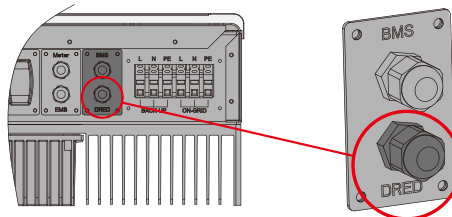
2.5.1 DRED Connection

DRED is used for Australia and New Zealand installation (also used as remote shutdown function in European countries), in compliance with Australia and New Zealand safety requirements(or European countries). And DRED device is not provided by GoodWe.

Detailed connection of DRED device is shown below:

- 1 Screw this plate off from the inverter.

Note: DRED / Remote Shutdown device should be connected through "DRED port" as the figure shows.





2

1. Plug out the 6-pin terminal and dismantle the resistor on it.
2. Plug the resistor out, leave the 6-pin terminal for next step.

Note: The 6-pin terminal in the inverter serves the same function as DRED / Remote shutdown device. Please leave it in the inverter if no external device are connected.

3-1 For DRED

1. Put the cable through the plate.
2. Connect the cable on the 6-pin terminal.

The function of each connection position as below:

NO	1	2	3	4	5	6
Function	DRM1/5	DRM2/6	DRM3/7	DRM4/8	REFGEN	COM /DRMO

Single hole seal ring
 RS485 communication board
 Cable
 Screw
 Nut
 Insulator
 Screw Cap

3-2 For Remote Shutdown

1. Put the cable through the plate.
2. Connect cable on the 6-pin terminal.

(Wiring from the No. 5 and 6 holes respectively.)

The function of each connection position as below:

NO	5	6
Function	REFGEN	COM /DRMO

Single hole seal ring
 RS485 communication board
 Cable
 Screw
 Nut
 Insulator
 Screw Cap

4

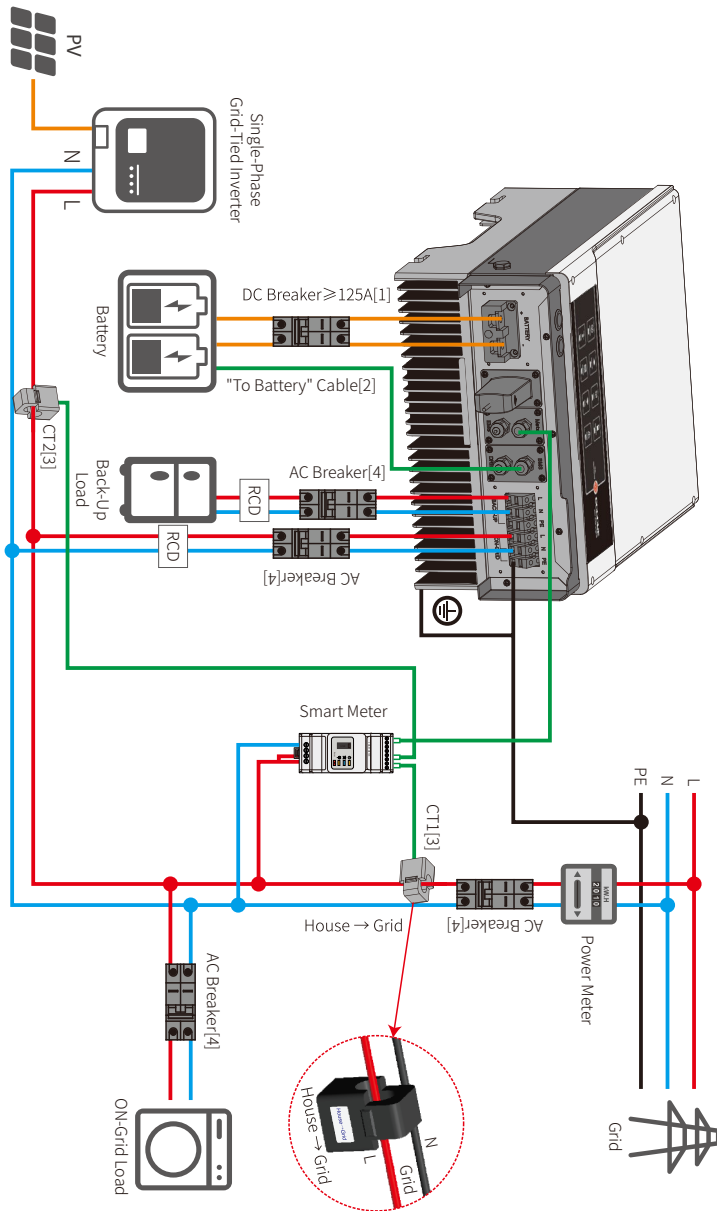
Plug the terminal to the right position of the inverter.

2.5.2 Earth Fault Alarm Connection

S-BP series inverter complies with IEC 62109-2 13.9. Fault indicator LED on the inverter cover will light up and the system will email the fault information to customer.

Wiring System For S-BP Series hybrid inverter

For 3-phase Smart Meter wiring connection, please refer to "3-phase Smart Meter & CT Connection Diagram". Inverters should not be installed in multiple phase combination.



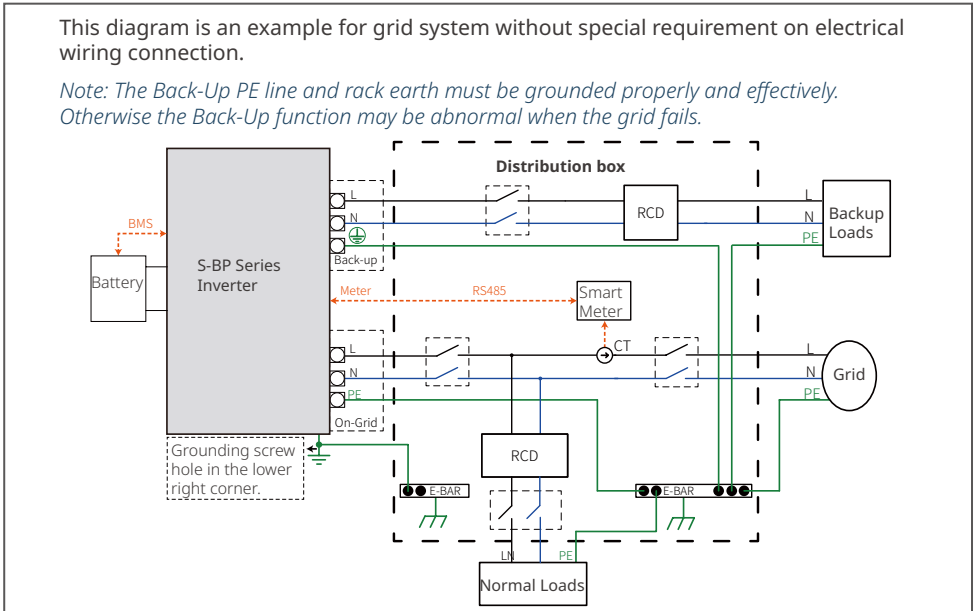
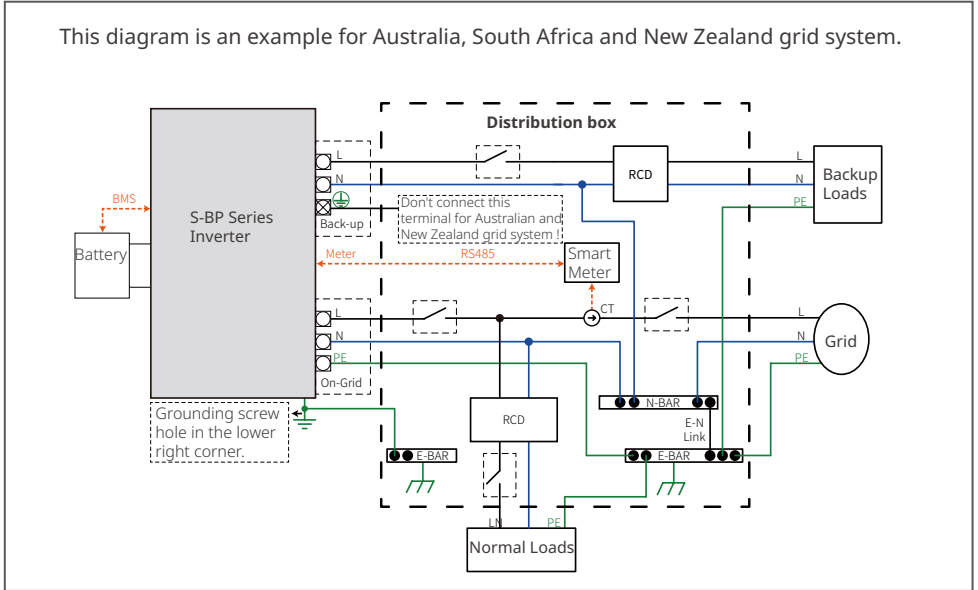
Please select the breaker according to the specifications below:

Inverter	①	②	③④
GW3600S-BP	125A/60V DC breaker	40A/230V AC breaker	Depends on household loads
GW5000S-BP		50A/230V AC breaker	

1. For batteries with attached switch, the external DC switch is not necessary.
2. Only for lithium battery which has BMS communication.
3. Direction of the CT cannot be connected in reverse, please follow "House → Grid" direction to do the connection.
4. AC Breaker ≥40A for GW3600S-BP, and ≥50A for GW5000S-BP.

System connection diagrams

Note: According to Australian safety requirements, the neutral cables of the on-grid side and backup side must be connected together. Otherwise, the backup function will not work.



Note: After the inverter is installed and in order to avoid problems connected, please turn off the grid power to check whether the Back-Up function is normal, in order to avoid problems in subsequent uses.

03 MANUAL OPERATION

3.1 Wi-Fi Configuration

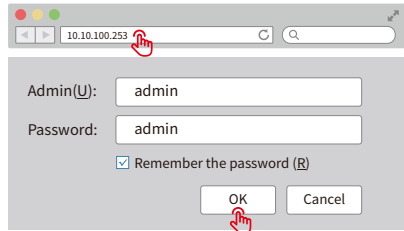
This part shows the configuration using a web page. Wi-Fi configuration is absolutely necessary for online monitoring and maintenance.

Preparation:

1. The inverter must be powered up with battery or grid power.
2. A router with internet access to the website www.semsportal.com is required.

1

1. Connect Solar-Wi-Fi* to your PC or smart phone (* its name is the last 8 characters of the inverter's serial number); Password:12345678.
2. Open your browser and logon to 10.10.100.253 Admin (User): admin; Password: admin.
3. Then click "OK".



2

1. Click "Start Setup" to choose your router.
2. Then click "Next".

Device information	
Firmware version	1.6.9.3.38.2.1.38
MAC address	60:C5:A8:60:33:E1
Wireless AP mode	Enable
SSID	Solar-Wi-Fi
IP address	10.10.100.253
Wireless STA mode	Disable
Router SSID	WiFi_Bum-in
Encryption method	WAP/WAP2-PSK
Encryption algorithm	AES
Router Password	WiFi_Bum-in

A "cannot join the network" error may be caused by:
No router, weak Wi-Fi signal, or the password is not correct
 ★ Help: The wizard will help you to complete setup within one minute.



Please select your current wireless network

SSID	AUTH/ENCRY	RSSI	Channel
<input type="radio"/> Wi-Fi_Bum-in	WPAPSKWPA2PSK/TKIPAES	66	1
<input type="radio"/> Wi-Fi_Bum-in	WPAPSKWPA2PSK/TKIPAES	100	1
<input type="radio"/> Wi-Fi_Bum-in	WPAPSKWPA2PSK/TKIPAES	70	1
<input type="radio"/> Wi-Fi_Bum-in2	WPAPSKWPA2PSK/TKIPAES	72	1



★ Help: When the RSSI of the selected Wi-Fi network is below 15%, the connection may be unstable. Please select another available network or decrease the distance between the device and router. If your wireless router does not broadcast its SSID, please click "Next" and manually add the wireless network.



3

1. Fill in the password of the router, then click "Next".
2. Click "Complete".

Add the wireless network manually

Network name (SSID)	Wi-Fi-Test
Encryption method	WPA/WPA2-PSK
Encryption algorithm	AES

Please enter the wireless network password:

Password (8-63 characters)	Router password
	Show psk

Note: The SSID and password are case sensitive. Please make sure all parameters of the wireless network match those of the router, including the password.



Save success!

Click "Complete". The current configuration will take effect after a restart.

If you still need to configure the other pages of information, please proceed to complete your required configuration.

The configuration is complete. You can now log on to the Management page to restart the device by clicking on the "OK" button.

Click Confirm to complete?



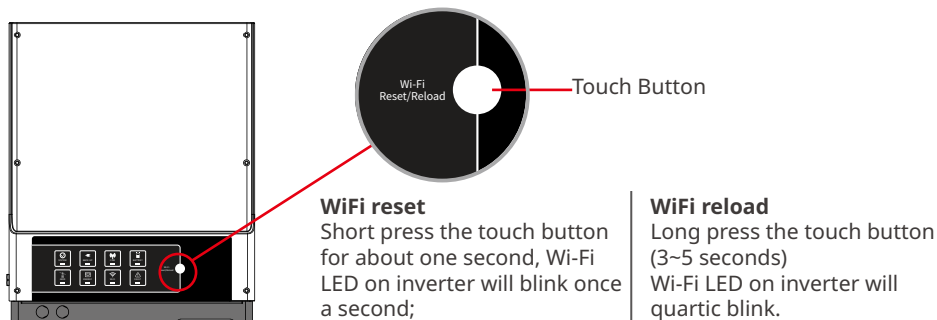


Note:

1. Please make sure the password and encryption method/algorithm are the same as those of the router.
2. If everything went well, the WiFi indicator on the inverter will change from a double blink to 4 blink and then to a steady status, which means that the WiFi has successfully connected to the server.

WiFi Reset & Reload

WiFi reset means restarting the WiFi module. The WiFi settings will automatically be reprocessed and saved. WiFi Reload means setting the WiFi module to the default factory settings.



Note: Wi-Fi Reset & Reload function is only used when:

1. Wi-Fi lost connection to internet or cannot connect to PV Master APP successfully.
2. Cannot find "Solar-WiFi signal" or have other Wi-Fi configuration problem.
3. Please do not use this button if Wi-Fi monitoring works well.

3.2 PV Master

PV Master is an external monitoring and configuration application for hybrid inverters and is used on smart phones or tablets for both Android and iOS systems. The main functions are listed as below:

1. Configure the system to customize functions by the user.
2. Monitor and check the performance of the hybrid system.
3. Access and change the regional settings.
4. Check the inverter firmware version.
5. Set export power limit.
6. Check fault alarms.

Search PV Master in Google Play or Apple App Store, or scan the QR code to download the app.

Operation steps are the same for Android system and iOS system although the two interfaces are slightly different.

For more detailed operation instructions, please refer to PV Master user manual in www.goodwe.com.



PV Master App

Note:

For Australian customers please select from Australia Region A/B/C to comply with AS/NZS 4777.2:2020. Contact local grid operator to see which Region to select. After setting the safety region, some parameters in the inverter system will take effect according to the corresponding safety regulations, such as PU curve, QU curve, trip protection, etc. If you need to change the configuration parameters, please refer to the PV Master user manual.

3.3 CEI Auto-Test Function

The PV auto-test function of CEI is integrated into the PV Master App to satisfy Italian safety requirements. For detailed instructions regarding this function, please refer to "PV Master Operation Instructions".

3.4 Startup/shutdown Procedure

3.4.1 Startup Procedure

Note: Before closing the AC breaker between the inverter and the grid, you need to use a multimeter to measure whether the AC voltage is within the allowable range.

step 1 Turn on the breaker between the inverter and the battery.

step 2 Turn on the AC breaker between the inverter and the grid.

step 3 Please wait for about 1 minute, observe the LED indicator of the inverter, and check the running status of the inverter.

3.4.2 shutdown Procedure

Note: After the inverter system is shut down, the machine still has residual electricity and heat, which may cause electric shock or burns. So after the inverter system is powered off for 5 minutes, wear protective gloves before operating the inverter.

step 1 Turn off the AC breaker between the inverter and the grid.

step 2 Turn off the DC breaker between the inverter and the battery.

3.5 SEMS Portal

SEMS Portal is an online monitoring system. After completing the installation of communication connection, you can access www.semsportal.com or download the app by scanning the QR code to monitor your PV plant and device.

Please contact the after-sales for more operation of SEMS Portal.



SEMS Portal App



04 OTHER

4.1 Error Messages.

The error messages below will be displayed on PV Master App or reported by e-mail if an error occurs.

ERROR MESSAGE	EXPLANATION	REASON	SOLUTIONS
Utility Loss	Public grid power is not available (power lost or on-grid connection fails)	Inverter does not detect the connection of grid	<ol style="list-style-type: none"> 1. Check (use multi-meter) if AC side has voltage . Make sure grid power is available. 2. Make sure AC cables are connected tightly and well. 3. If all is well, please try to turn off AC breaker and turn on again in 5 mins.
VAC Failure	Grid voltage is not within permissible range	Inverter detects that AC voltage is beyond the normal range required by the safety country	<ol style="list-style-type: none"> 1. Make sure safety country of the inverter is set right. 2. Check (use multi-meter) if the AC voltage (Between L & N) is within a normal range (also on AC breaker side) <ol style="list-style-type: none"> a. If the AC voltage is high, then make sure the AC cable complies with that required on user manual and the AC cable is not too long. b. If the voltage is low, make sure the AC cable is connected well and the jacket of the AC cable is not compressed into the AC terminal. 3. Make sure the grid voltage of your area is stable and within normal range.
FAC Failure	Grid frequency is not within permissible range	Inverter detects that the grid frequency is beyond the normal range required by the safety country	<ol style="list-style-type: none"> 1. Make sure the safety country of the inverter is set right. 2. If safety country is right, then please check on the inverter display if AC frequency (Fac) is within a normal range. 3. If FAC failure only appears a few times and is resolved soon, it should be caused by occasional grid frequency instability.
Over Temperature	Temperature inside of the inverter is too high	The inverter's working environment leads to a high temperature condition	<ol style="list-style-type: none"> 1. Try to decrease surrounding temperature. 2. Make sure the installation complies with the instruction on inverter user manual. 3. Try to close the inverter for 15 mins, then start up again.

Relay Check Failure	Self checking of relay failure	Neutral & ground cables are not connected well on AC side or just an occasional failure	Check (use multi-meter) if there is high voltage (normally should be lower than 10V) between N & PE cable on the AC side. If the voltage is higher than 10V, it means the Neutral & ground cable are not connected well on AC side or restart inverter.
DC Injection High	/	The inverter detects a higher DC component in AC output	Try to restart the inverter, check if it still occurs. If not, it is just an occasional situation. Otherwise, contact after-sales immediately.
EEPROM R/W Failure	/	Caused by a strong external magnetic field etc.	Try to restart the inverter, check if it still occurs. If not, it is just an occasional situation. Otherwise, contact after-sales immediately.
SPI Failure	Internal communication failure	Caused by a strong external magnetic field etc.	Try to restart the inverter, check if it still occurs. If not, it is just an occasional situation. Otherwise, contact after-sales immediately.
DC Bus High	BUS voltage is over-high	/	Try to restart the inverter. Check if the fault still occurs. If not, it means it is caused by an occasional situation, or contact after-sales.
Back-Up Over Load	Back-up side is over loaded	Total back-up load power is higher than the back-up nominal output power	Decrease back-up loads to make sure the total load power is lower than back-up nominal output power (please refer to 2.4.2 On-Grid & Back-Up Connection).

NOTE: All the errors about battery happen only on Lithium battery with BMS communication.

4.2 Troubleshooting

Checking Before Starting S-BP Up

Battery connection:

Confirm the connection between S-BP and battery: polarity (+/-) are not reversed, refer to 4.2-1.

On-Grid & Back-Up connection:

Confirm On-Grid connected to power grid and Back-Up to loads: polarity (L/N) are not reversed, refer to 4.2.2.

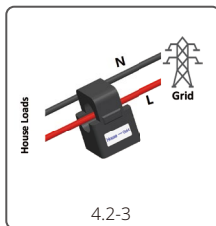
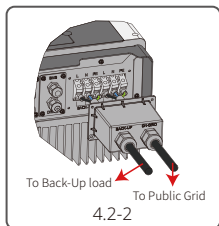
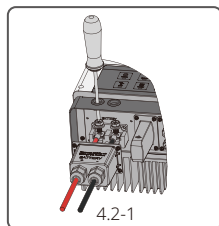
Smart Meter & CT Connection:

1. If connection between Smart Meter and CT (port 1 and 4 on Smart Meter) is OK.

Note: After turn on AC power, the COM led on Smart Meter should be blinking.

2. Make sure CT is connected between house loads and grid. And it follows the House Grid direction on CT, refer to 4.2.3.

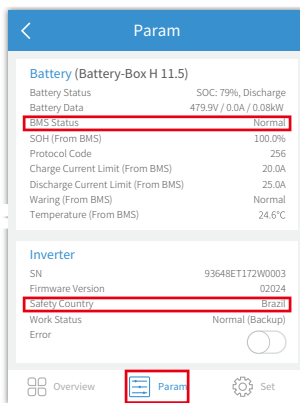
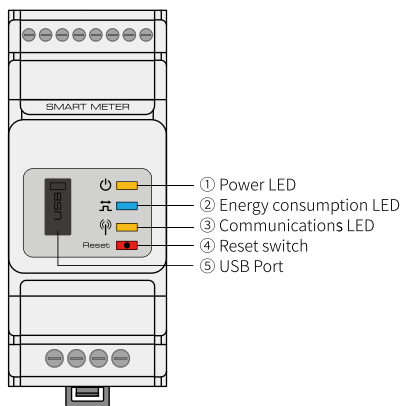
Note: For three-phase Smart Meter, please refer to **2.4.3 Smart Meter & CT Connection** to check if the connection and communication of Smart Meter is OK.



Battery Settings, BMS Communication and Safety Country:

After connecting Solar-WiFi* (* means the last 8 characters of the inverter serial No.), check on PV Master APP Param to make sure battery type is right what you have installed, and Safety Country is right. If not right, please set it right in "Set".

For lithium batteries, BMS status is "Communication OK".



Note: If BMS Status says "NG", then please make sure battery communication cable wiring connection and all settings are all right, refer to battery connection SOP in S-BP QUICK INSTALLATION INSTRUCTIONS.

Problems During Operation

S-BP does not start up with only battery

Solution:

Make sure the voltage of battery is higher than 48V, otherwise battery cannot start S-BP up.

No discharge or output from S-BP to support loads

Possible Reason:

1. There is grid-tied inverter connected in the system, and the output power is higher than power.
2. Load is connected between grid and CT, thus the system cannot detect load power, which is supported by grid power.

3. Load power is lower than 150W, as battery will only discharge if load power is higher than 150W.
4. Smart Meter communication fails or CT connected in a wrong direction, which gives S-BP wrong data.
5. Battery is not in the condition for discharging, such as low SOC, battery communication fail for lithium batteries etc.

Solution:

1. Make sure communication between S-BP and SmartMeter is OK;
2. Make sure load power is higher than 150W;
 - a. Battery will not discharge continuously unless load power is higher than 150W;
 - b. If battery still not discharge when Meter power is higher than 150W, then please check SmartMeter & CT connection and direction;
3. Make sure SOC is higher than I-DOD. Or if battery discharged to below I-DOD, than battery will only discharge again when SOC charged to $[20\% + (I-DOD)]/2$ and $SOC > 105\% - DOD$ (if battery discharge is required immediately, battery should be restarted);
4. Check on App if it is charge time,, during charge time, battery will not discharge (battery will charge in priority during coincident time of charge/ discharge).

Battery does not charge:**Possible reason:**

1. Smart Meter communication fails or CT connected in a wrong direction, which gives S-BP wrong data.
2. Battery is not in the condition for charging, such as high SOC, battery communication fail for lithium batteries etc.

Solution:

1. Make sure BMS communication is OK on PV Master (for lithium batteries);
2. Check if CT is connected in the right position and in the right direction as stated in the user manual page 13.

Questions & Answers (Q & A)**About the Wi-Fi Configuration**

Q: Why can't I find the Solar-Wi-Fi* signal on mobile devices?

A: Normally Solar-Wi-Fi* signal can be found after inverter powered up.

Please check if Wi-Fi module is connected well, and make sure inverter is powered up normally.

Note: If Wi-Fi LED on inverter is single-blinking (0.5s on & off), then it means Wi-Fi module is not connected or not connected well.

Q: Why can't I connect to the Solar-Wi-Fi* signal on my phone?

A: It can connect to only device at a time. So please make sure other devices are not already connected to the signal.

Note: Please make sure the password of the Wi-Fi signal (12345678) is not wrong.

About Battery Operation

Q: Why does the battery not discharge when the grid is not available but it discharges normally when the grid is available?

A: On the APP, the off-grid output and backup function should be turned on to force the battery to discharge under off-grid mode.

Q: Why is there no output on the backup side?

A: For back-up supply, the Back-Up function on PV Master App must be turned on. Under off-grid mode or grid power is disconnected, Off-Grid output function must be turned on as well.



Note: When turning on Off-Grid output, don't restart inverter or battery, otherwise the function will switch off automatically.

Q: Why does the battery switch always trip when it starts up (lithium battery)?

A: For lithium battery like LG, normally the switch trips for following reasons:

1. BMS communication fails.
2. Battery SOC is too low, battery trips to protect itself.
3. An electrical short circuit occurred on battery connection side. Or other reasons please contact GoodWe for details.

Q: Which battery should I use for S-BP?

A: For S-BP inverters, it could connect lithium batteries, with nominal voltage 48V, max charge voltage 60V.

Compatible lithium batteries please refer to S-BP QUICK INSTALLATION INSTRUCTIONS

About PV Master Operation And Monitoring

Q: Why can't I save settings on the PV Master App?

A: This could be caused by losing the connection to Solar-Wi-Fi*.

1. Make sure you are connected to Solar-WiFi* (make sure no other devices connected) or router (if connected Solar-WiFi* to router) and on APP home page shows connection is stable.
2. Make sure S-BP is under wait mode (on App) before you change any settings on PV Master App disconnect grid/load, only leave battery connected and then restart S-BP till the work mode displays "wait" on the App.

Q: Why are the data displayed on the homepage different from the param page, like charge/discharge, PV value, load value, or grid value?

A: The data refresh frequency is different, so there will be data discrepancies between different pages on the APP as well as between these shown on the portal and APP.

Q: On the App, why are the data displayed on the homepage and param page different, like charge/discharge, load or grid value?

A: The data refresh frequency is different, so there will be a data inconformity between different pages on App as well as between that on the portal and App.

Q: On the App, some columns show NA, like battery SOH, etc. why is that?

A: NA means App does not receive data from inverter or server, normally it is due to communication problem, such as battery communication, and communication between inverter and the App.

About Smart Meter and Power Limit Function

Q: Is power limit function possible for S-BP system?

A: Please refer to 2.4.3 Smart Meter & CT Connection for details of this function on S-BP system.

Q: Can I use other brand's Meter to take over Smart Meter in S-BP system or change some settings on Smart Meter?

A: No, because the communication protocol between inverter and Smart Meter is in-build in the Smart Meter, other brand's Meter cannot communicate. Also any setting change could cause Smart Meter communication failure.

Q: What is the max current allowed going through CT on Smart Meter?

A: The max current for CT is 120A.

Other Questions

Q: Is there a quick way to make the system work?

A: The shortest way, please refer to S-BP QUICK INSTALLATION INSTRUCTIONS.

Q: What kind of load can I connect on Back-Up side?

A: Please refer to user manual on page 11.

Q: Will the warranty of the inverter still be valid if for some special conditions we cannot 100% follow the installation or operation instructions of the user manual?

A: Normally we still provide technical support to problems caused from disobeying the instructions of the user manual, but we cannot guarantee a replacement or returns. So if there is any special condition when you cannot 100% follow the instructions, please contact after-sales for suggestions.

4.3 Disclaimer

The S-BP series inverters are transported, used and operated under environmental and electrical conditions. Manufacturer has the right not to provide after-sales services or assistance under following conditions:

- Inverter is damaged during transfer.
- Inverter's warranty has expired and extended warranty is not bought.
- Inverter is installed, refitted or operated in improper ways without authorisation from manufacturer.
- Inverter is installed or used under improper environment or technical condition mentioned in this user manual, without authorisation from manufacturer.
- Installation or configuration of the inverter does not follow requirements mentioned in this user manual.
- The inverter is installed or operated against the requirements or warnings that are mentioned in this user manual.
- Inverter is broken or damaged by any force majeure like lightning, earthquake, fire hazard, storm and volcanic eruption etc.
- Inverter is disassembled, changed or updated on software or hardware without authorisation from manufacturer.
- Inverter is installed, used or operated against any related items in international or local policies or regulations.
- Any non-compatible batteries, loads or other devices connected to BT system.
- The Battery-Ready inverter activation code is obtained through illegal channels.

Note: Manufacturer will keep right to explain all the contents in this user manual. To insure IP65, inverter must be sealed well, please install the inverters within one day after unpacking, otherwise please seal all unused terminals/holes, terminals/holes are not allowed to be kept open, confirm that there is no risk of water or dust entering the terminals/holes.

Maintenance

Maintaining Item	Maintaining Method	Maintaining Period
System Clean	Check the heat sink, air intake, and air outlet for foreign matter or dust.	Once 6-12 months
DC Switch	Turn the DC switch on and off ten consecutive times to make sure that it is working properly.	Once a year
Electrical Connection	Check whether the cables are securely connected. Check whether the cables are broken, or whether there is any exposed copper core.	Once 6-12 months
Sealing	Check whether all the terminals and ports are properly sealed. Reseal the cable hole if it is not sealed or too big.	Once a year
THDi Test	For Australia requirements, in the THDi test, there should add Zref between inverter and mains. L: $0.24 \Omega + j0.15 \Omega$; N: $0.16 \Omega + j0.10 \Omega$ L: $0.15 \Omega + j0.15 \Omega$; N: $0.1 \Omega + j0.1 \Omega$	As needed

Notice: If you need to repair or replace parts, contact the after sales service.

4.4 Technical Parameters

Technical Data	GW3600S-BP	GW5000S-BP
Battery Input Data		
Battery Type*1	Li-Ion	Li-Ion
Rated Battery Voltage (V)	48	48
Battery voltage range (V)	40~60	40~60
Max. Charging Voltage (V)	≤60 (Configurable)	≤60 (Configurable)
Max. Charging Current (A)*1	75	100
Max. Discharging Current (A)*1	75	100
Max charge power (W)	3500	4700
Max discharge power (W)	3900	5300
Battery Capacity (Ah)*2	50~2000	50~2000
Charging Strategy for Li-Ion Battery	Self-adaption to BMS	Self-adaption to BMS
AC Input Data (On-grid)		
Nominal Apparent Power Output to Utility Grid (VA)	3680	5000
Nominal Power Output to Utility Grid (W)	3680	5000*3
Max. Apparent Power Output to Utility Grid (VA)*4	3680	5000
Nominal Apparent Power from Utility Grid (VA)	7360	9200
Max. Apparent Power from Utility Grid (VA)	7360	9200
Nominal Output Voltage (V)	230	230
Output Voltage Range (V)	0~300	0~300
Nominal Output Frequency (Hz)	50/60	50/60
AC Grid Frequency Range (Hz)	45~65	45~65
Nominal Output Current (A)	16	21.7
Max. AC Current Output to Utility Grid (A)	16	22.8
Max. AC Current From Utility Grid (A)	32	40
Inrush Current(peak and duration) (A)	100A,20us	100A,20us

Maximum output overcurrent protection (A)	40	50
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)	
Output THDi (@Nominal Output)	<3%	<3%
Max. Output Fault Current(peak and duration) (A)	70A,3us	70A,3us
AC Output Data (Back-up)		
Back-up Rated apparent power (VA)	3680	5000
Max. Output Apparent Power (VA)*5	3680	5000
Peak Output Apparent Power (VA)*5	4416, 10sec	5500, 10sec
Rated Output Current (A)	16	21.7
Max. Output Fault Current(peak and duration) (A)	70A,3us	70A,3us
Inrush Current(peak and duration) (A)	100A,20us	100A,20us
Maximum output overcurrent protection (A)	40	50
Automatic Switch Time (ms)	<10	<10
Rated Output Voltage (V)	230 (±2%)	230 (±2%)
Rated Output Frequency (Hz)	50/60 (±0.2%)	50/60 (±0.2%)
Max. Output Current (A)	16	22.8
Output THDv (@Linear Load)	<3%	<3%
Efficiency		
Max. Efficiency	95.5%	95.5%
European Efficiency	94%	94%
Max. Battery to Load Efficiency	95.5%	95.5%
Protection		
Anti-islanding Protection	AFDPF + AQDPF *6	AFDPF + AQDPF *6
Output Over Current Protection	Integrated	Integrated
Output Short Protection	Integrated	Integrated
Output Over Voltage Protection	Integrated	Integrated
General Data		
Operating Temperature Range (°C)	-25~60	-25~60
Relative Humidity	0~95%	0~95%

Operating Altitude (m) ^{*9}	4000	4000
Cooling	Nature Convection	Nature Convection
Noise (dB)	<25	<25
User Interface	LED & APP	LED & APP
Communication with BMS ^{*7}	RS485; CAN	RS485; CAN
Communication with Meter	RS485	RS485
Communication with Portal	Wi-Fi	Wi-Fi
Weight (kg)	18.5	18.5
Size (Width*Height*Depth mm)	347*432*190	347*432*190
Mounting	Wall Bracket	Wall Bracket
Protection Degree	IP65	IP65
Protective class	Class I	
Over voltage category	DC: II, AC: III	
Standby Self Consumption (W)	<15	<15
Topology	Non-isolated	
DC Connector	Battery terminal(20-35mm ²)	
AC Connector	Pin terminal (4-6 mm ²)	
Environmental Category	4K4H	
Storage environments(°C)	-40~85°C	
Pollution Degree	III	
The Decisive Voltage Class (DVC)	Battery: A AC: C Com: A	
Type of electrical supply system	Single phase TN/TT	
Certifications & Standards		
Grid Regulation	VDE-AR-N 4105;VDE 0126-1-1 EN 50549-1;G98,G100; CEI 0-21;AS/NZS 4777.2 NRS 097-2-1	VDE-AR-N 4105;VDE 0126-1-1 EN 50549-1;G98,G100; CEI 0-21;AS/NZS 4777.2 NRS 097-2-1
Safety Regulation	IEC62477-1, IEC62040-1	IEC62477-1, IEC62040-1

EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4 EN 61000-4-16, EN 61000-4-18, EN 61000-4-29	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4 EN 61000-4-16, EN 61000-4-18, EN 61000-4-29
<p>*1: The actual charge and discharge current also depends on the battery.</p> <p>*2: Battery capacity could be not less than 100Ah where the back-up function is to be applied.</p> <p>*3: 4600 for VDE0126-1-1&VDE-AR-N 4105 and CEI 0-21.</p> <p>*4: For CEI 0-21 GW3600S-BP is 4050, GW5000S-BP is 5100; For VDE-AR-N4105 GW5000S-BP is 4600.</p> <p>*5: Can be reached only if battery capacity is enough, otherwise will shut down.</p> <p>*6: AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback.</p> <p>*7: CAN communication is configured by default. If 485 communication is used, please replace the corresponding communication line.</p> <p>*8: Not all certifications & standards listed, check the official website for details.</p> <p>*9: 2000m for Australia.</p>		

4.5 Quick Checklist To Avoid Dangerous Conditions

1. Inverter cannot be installed near flammable, explosive or strong electro-magnetic equipment.
2. Remember that this inverter is heavy! Please be careful when lifting out from the package.
3. Make sure battery breaker is off and battery nominal voltage meets S-BP specification before connecting battery to inverter and make sure inverter is totally isolated from AC power.
4. Make sure inverter is totally isolated from any DC or AC power before connecting AC cable.
5. Make sure AC cable is totally isolated from AC power before connecting Smart Meter & CT.



Appendix

Protection category definition

Moisture location category definition

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

Environment category definition

Environment Condition	Ambient Temperature	Relative Humidity	Applied to
Outdoor	-20~50°C	4%~100%	PD3
Indoor Unconditioned	-20~50°C	5%~95%	PD3
Indoor conditioned	0~40°C	5%~85%	PD2

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. Examples are appliances, portables tools and other plug-connected equipment.
Category III	Applies to a fixed equipment downstream, including the main distribution board. Examples are 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). Examples are electricity meters, primary over-current protection equipment and other equipment connected directly to outdoor open lines.


Pollution degree definition

Pollution Degree I	No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.
Pollution Degree II	Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.
Pollution Degree III	Conductive pollution occurs, or dry, non-conductive pollution occurs, which becomes conductive due to condensation, which is expected.
Pollution Degree IV	Persistent conductive pollution occurs, for example, the pollution caused by conductive dust, rain or snow.

JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO.,LTD

 No. 90 Zijin Rd., New District, Suzhou, 215011, China

 www.goodwe.com

 service@goodwe.com



Local Contacts