PV Master App

SEMS Portal App

SEMS Portal website
www.semsportal.com

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Company's
offical website

GOODWE
YOUR SOLAR ENGINE

SEMS

JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO.,LTD

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

www.goodwe.com

service@goodwe.com

340-00087-05

SBP SERIES USER MANUAL

AC-COUPLED BATTERY STORAGE RETROFIT

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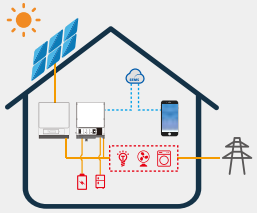
01 INTRODUCTION

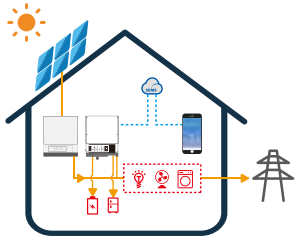
GoodWe S-BP series bi-directional inverter is designed for both indoor and outdoor use, which could be used with or without existing grid-tied inverter systems to store energy using batteries. Energy produced from grid-tied inverters shall be used to optimize self-consumption, excess energy will be used 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 BT system:

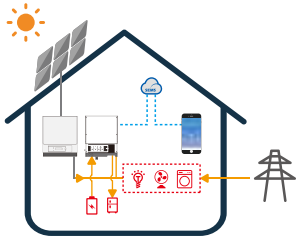
1.1 Operation Modes Introduction

S-BP system normally has the following operation modes based on your configuration and layout conditions.



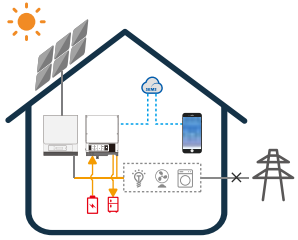
Mode I

Energy from grid-tied inverters optimize loads, excess energy will be used to charge the battery, if it is full, the excess power



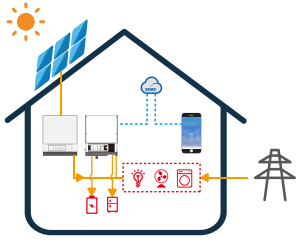
Mode II

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 & Warning

The S-BP series inverter of Jiangsu GoodWe Power Supply Technology Co., Ltd. (hereinafter called as GoodWe) strictly complies with related safety rules for product design and testing. Please read and follow all the instructions and cautions on the inverter or user manual during installation, operation or maintenance, as any improper operation might cause personal or property damage.

Symbols explantion

	Caution! Failure to observe a warning indicated in this manual may result in injury
	Danger of high voltage and electric shock!
	Danger of hot surface!
	Components of the product can be recycled.
	This side up! The package must always be transported, handled and stored in such a way as the arrows always point upwards.
	No more than six (6) identical packages being stacked on each other.
	Products should 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.
	Signals danger due to electric shock and indicates the time to wait (5 minutes) before it is safe to touch the internal parts of the inverter after it has been disconnected from it power source
	CE Mark

Safety warning

Any installation and operation on inverter must be performed by qualified electricians, in compliance with standards, wiring rules or requirements of local grid authorities or companies (like 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 impared and warranty commitment for the inverter will be invalid.

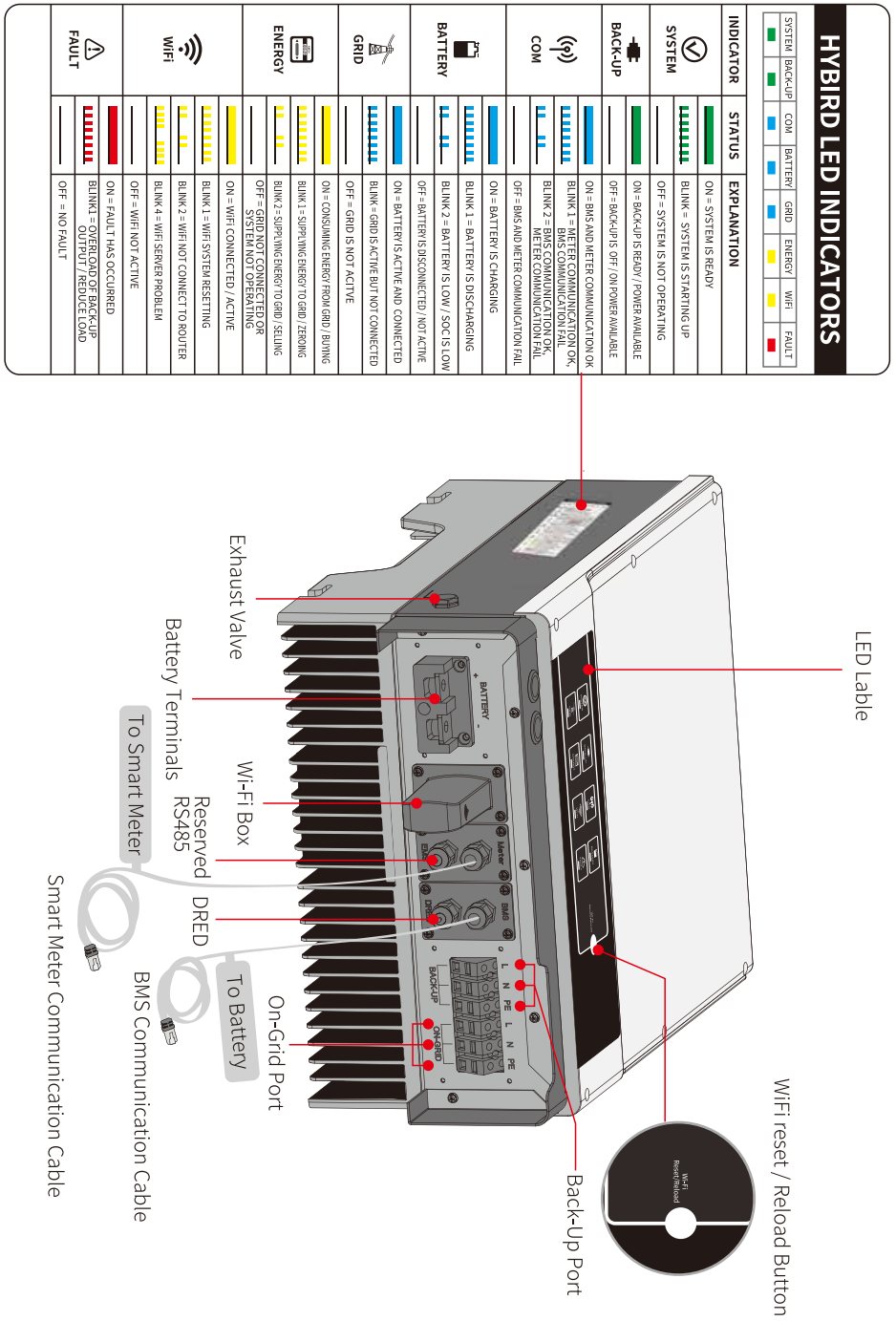
Appropriate methods must be adopted to protect inverter from static damage. Any damage caused by static is not warranted by manufacturer.

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(⩾30mA).

In Australia, the inverter internal switching does not maintain neutral integrity, which must be addressed by external connection arrangements like in the Off-Grid System Connection Diagram in page 17.

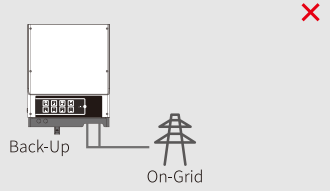
In Australia, output of back-up side in switchbox should be labeled "Main Switch UPS Supply", the output of normal load side in switch box should be labeled "Main Switch Inverter Supply".

1.3 Product Overview

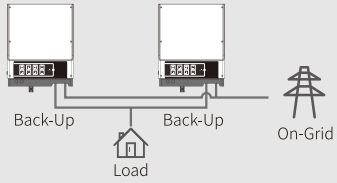


2.1 Unacceptable Installations

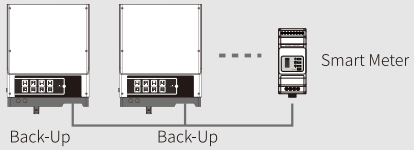
Please avoid the following installations, which will damage the system or the Inverter.



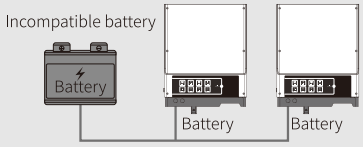
Back-up cannot be connected to grid.



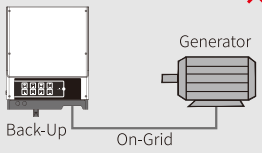
Back-up cannot be connected in parallel.



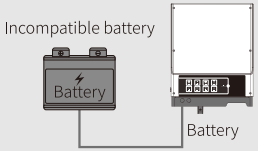
One meter cannot connect to multiple inverters, and different CT cannot connect to a Smart Meter.



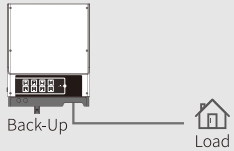
One battery bank cannot be connected to multiple inverters.



On-Grid or back-up side cannot connect to any ac generators.



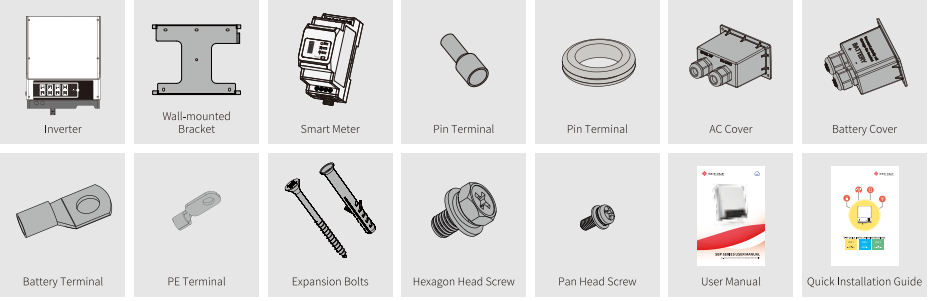
Inverter battery input cannot be connected to incompatible batteries.



Inverter does not support off-grid function in grid-less area.

2.2 Packing List

On receiving the S-BP series inverter, please check to make sure all the components as below are not missing or broken.



2.3 Mounting

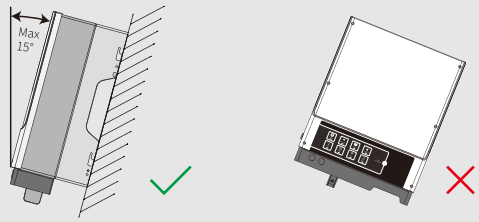
2.3.1 Select Mounting Location

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

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

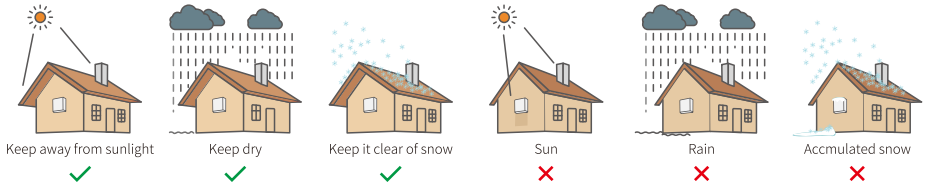
Rule 1. Inverter should be installed on a solid surface, where is suitable for inverter's dimensions and weight.

Rule 2. Inverter installation should stand vertically or lie on a slop by a max of 15° .



Rule 3. Ambient temperature should be lower than 45°C.
(High ambient temperature will cause power derating of inverter.)

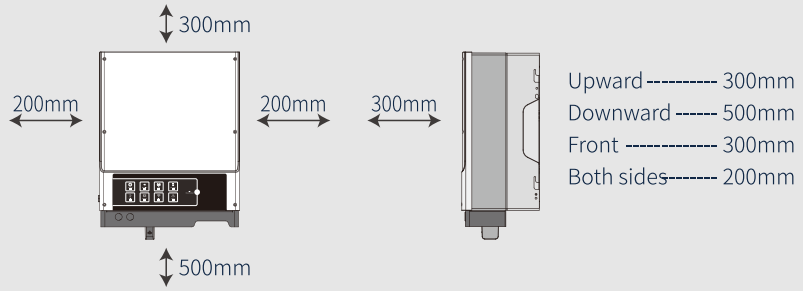
Rule 4. The inverter installation should be protected under shelter from direct sunlight or bad weather like snow, rain, lightning etc.



Rule 5. Inverter should be installed at eye level for convenient maintenance.

Rule 6. Product label on inverter should be clearly visible after installation.

Rule 7. Leave enough space around the inverter according to the below figure.



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

2.3.2 Mounting

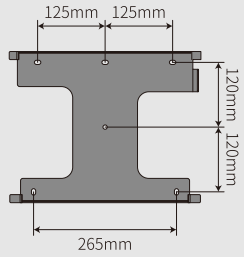
Inverter cannot be installed near flammable, explosive or strong electro-magnetic equipment.[1]

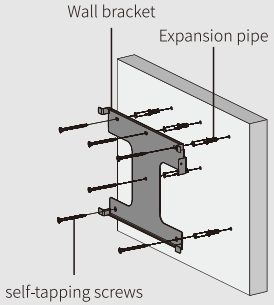
The inverter is suitable for mounting on concrete or other non-combustible surface only.

Step 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.

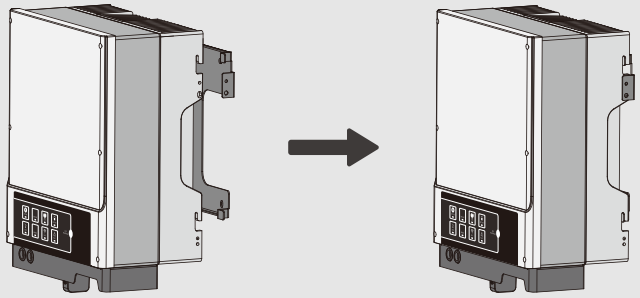




Step 2

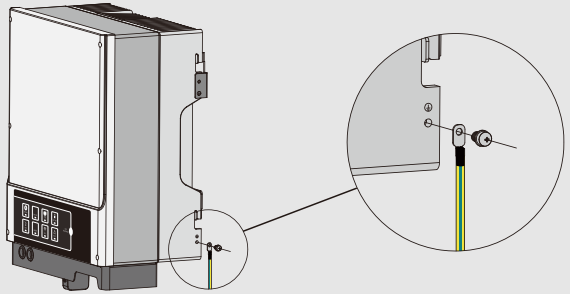
Carry the inverter by holding the heating sink on both sides and place the inverter on the mounting bracket.

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



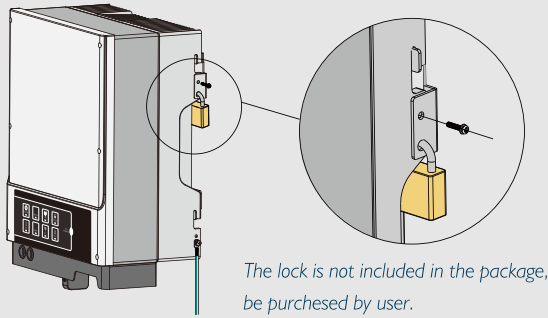
Step 3

Ground cable shall be connected to the ground plate on grid side.



Step 4

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 purchesed by user.

2.4 Electrical Wiring Connection

2.4.1 Battery Wiring Connection

• For lithium battery (pack) the capacity should be 50Ah or larger. lead acid batteries are not allowed for use with GoodWe hybrid inverters without GoodWe's authority. Battery cable requirement are shown below.

Cable	Description	Value
A	Outside Diameter	10-12mm
B	Isolation section	NA
C	Conductor Core	20-35mm²

• Please be careful against any electric shock or chemical hazard
• Make sure there is an external DC breaker (⩾125A) connected for batteries without build-in DC breaker

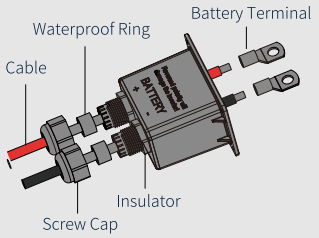
Battery wiring connection steps as below:

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

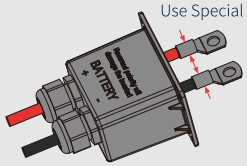
Step 1

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

Note:
1.Please use accessories from GoodWe box
2. Battery power cable should be 25-35mm²



Step 2

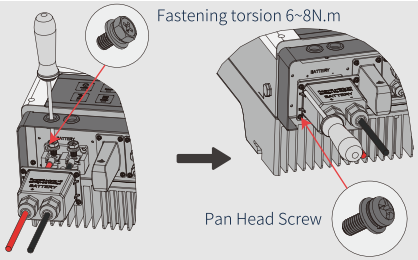


Make battery terminals:
• Strip cable coat, revealing 10mm length of metal core
• Use special crimper to compress battery terminal tightly

Step 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 refer to battery connection part in S-BP QUICK INSTALLATION INSTRUCTIONS.

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:

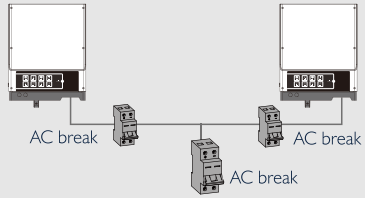
1. Under on-grid mode, battery is protected from over discharge by DOD and discharge voltage, under off-grid mode, it is protected by only discharge voltage in priority.

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 safegurads the battery to falling to 0% SOC.

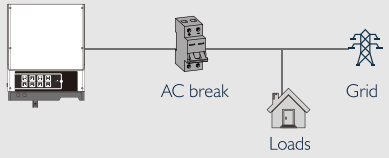
2.4.2 On-Grid & Back-Up Connection

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)

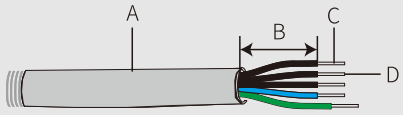


• On-grid wiring connection process is as below:

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

Step 1

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



Grade	Description	Value
A	Outside diameter	11-12 mm
B	Isolation section	NA
C	Conductor wire length	7-9 mm
D	Conductor core section	4-6 mm²

Note:

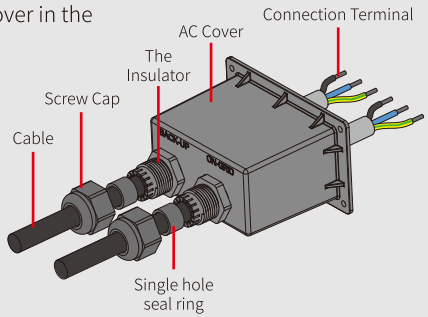
1. Neutral cable shall be blue, line cable is black or brown (preferred) and protective earth cable yellow-green.

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.

Step 2

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

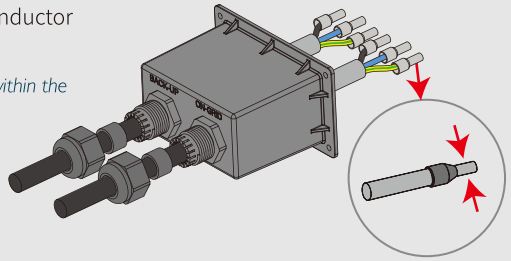
Note: Please use the terminals in GoodWe components box



Step 3

Press the six connectors on cable conductor core tightly.

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

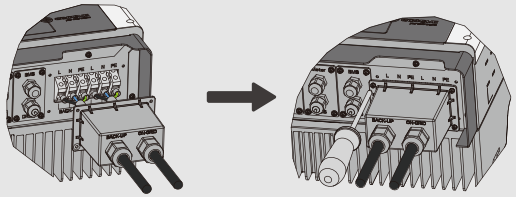


Step 4

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.



Fastening torsion 2~2.5N.m

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

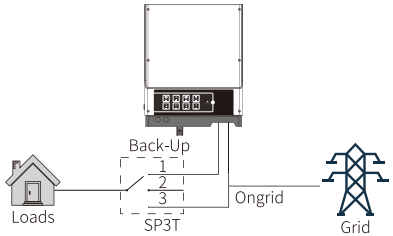
GoodWe S-BP inverter is able to supply a continuous 5000VA output(max 5500VA within 10s) on Back-Up side. And the inverter will shutdown when it is full loading with high ambient temperature if grid is absent.

- 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

Declartion 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.

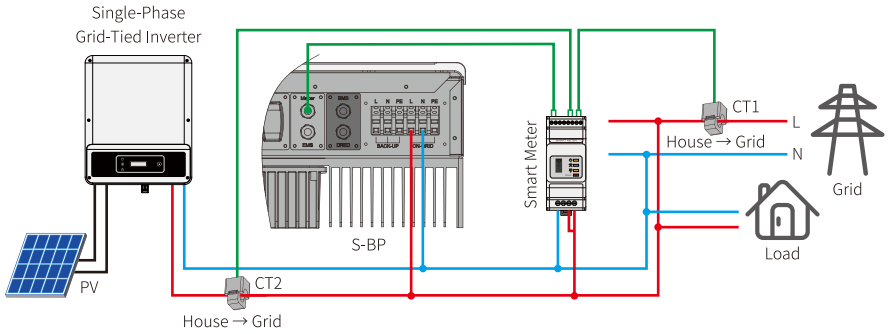
• On PV Master APP → Advanced Setting → Click "Reset Back-Up Overload History"

2.4.3 Smart Meter & CT Connection

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



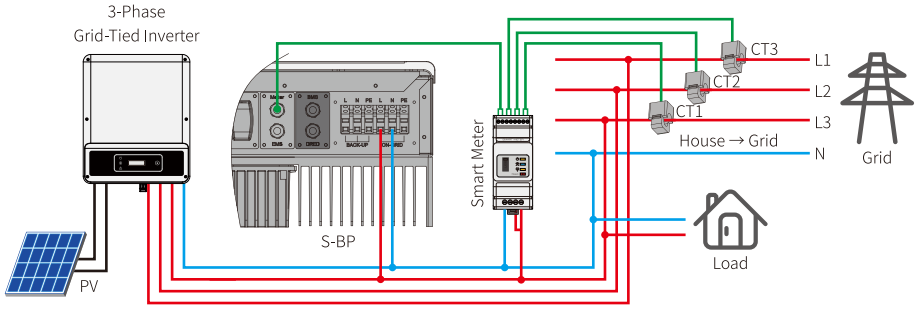
Note:

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:

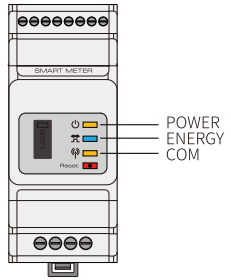
Detailed pin function of each port on S-BP

BMS：CAN communication is configured by default. If 485 communication is used, please contact GOODWE to replace with the corresponding communication line.

Position	Color	BMS Function	Smart Meter Function	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

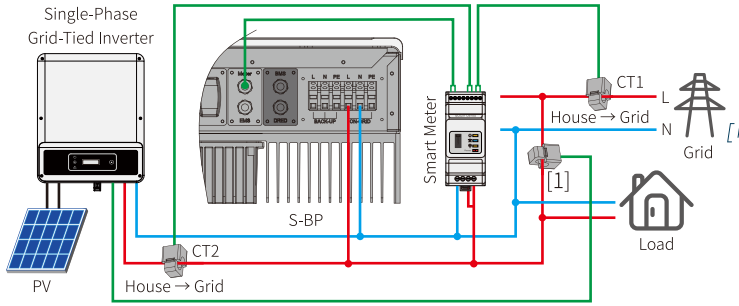
	OFF	ON	Blinking
POWER	Not working	Working	/
ENERGY	/	Importing	Exporting
COM	Blinks once when transferring data to inverter		



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

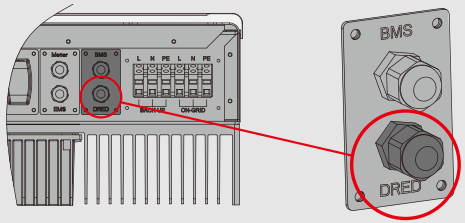
2.5.1 DRED Connection

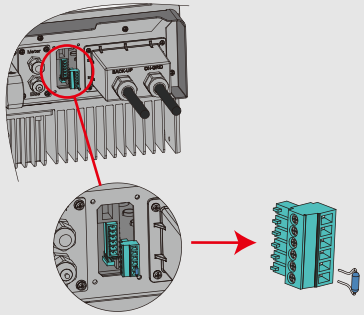
DRED is used for Australia and New Zealand installation (also used as remote shutdown function in European countries), in compliance with Australia and New Zealand safety requirements(or European countries). And DRED device is not provided by GoodWe.
Detailed connection of DRED device is shown below:

Step 1

Screw this plate off from the inverter.

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





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.

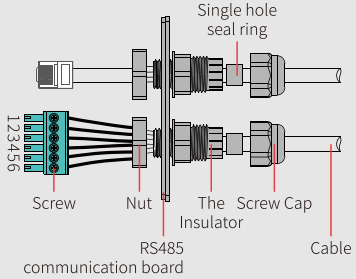
Note: The 6-pin terminal in the inverter serves the same function as DRED / Remote shutdown device. Please leave it in the inverter if no external device are connected.

Step 3-1 For DRED

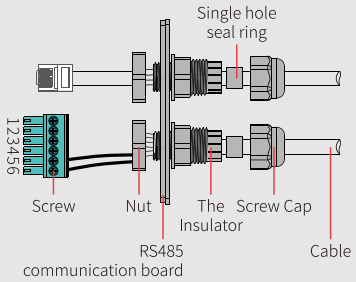
1. Put the cable through the plate.
2. Connect the cable on the 6-pin terminal.

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



Step 3-2 For Remote Shutdown



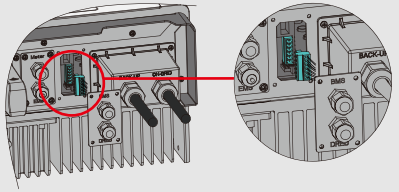
1. Put the cable through the plate.
2. Connect cable on the 6-pin terminal.(Wiring from the No. 5 and 6 holes respectively.)

The function of each connection position as below:

NO	5	6
Function	REFGEN	COM / DRMO

Step 4

Connect the terminal to the right position onto the inverter.

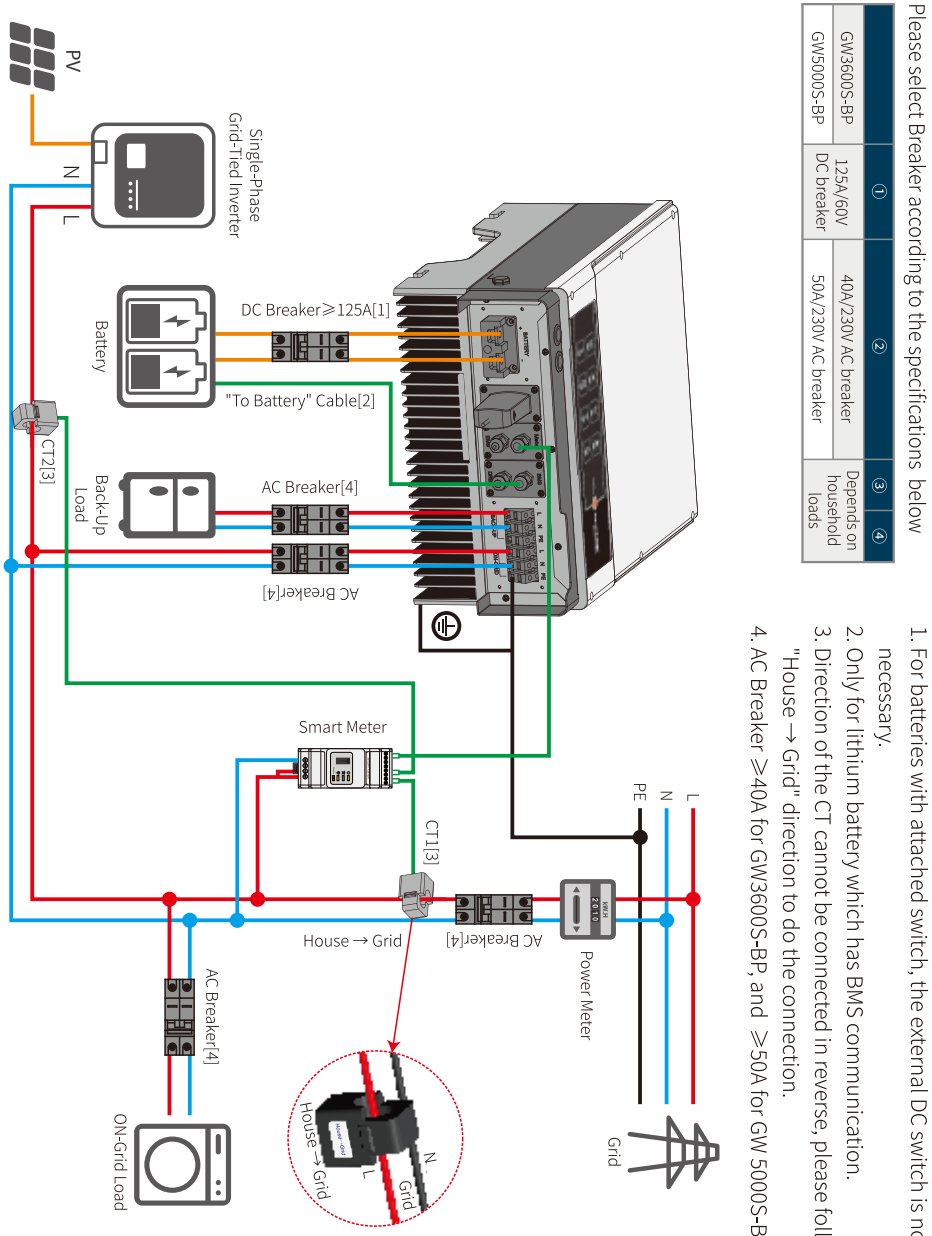


2.6 Earth Fault Alarm Connection

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"**



	GW3600S-BP	GW5000S-BP
DC breaker	125A/60V	
	①	
	40A/230V AC breaker	50A/230V AC breaker
	②	
household loads	Depends on	
	③	
	④	

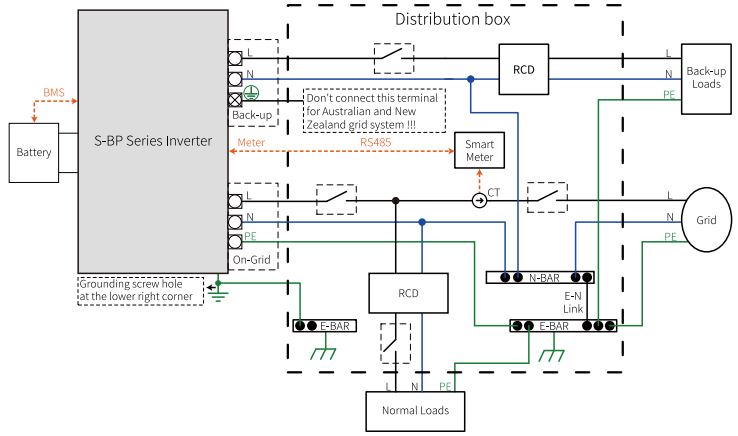
Please select Breaker according to the specifications below

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 GW 5000S-BP.

SYSTEM CONNECTION DIAGRAMS

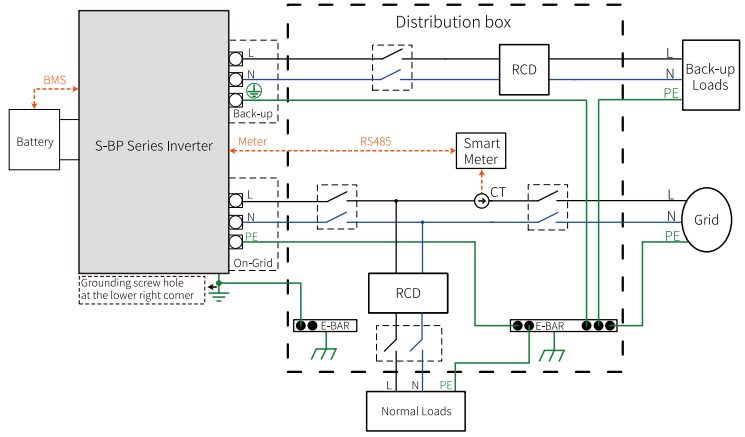
Note: For Australia safety country, the neutral cable of on-grid side and back-up side must be connected together, otherwise back-up function will not work.

This diagram is an example for Australia, South Africa and New Zealand grid system.



This diagram is an example for grid system without special requirement on electrical wiring connection.

Note: The Back-Up PE line and rack earth must be grounded properly and effectively. Otherwise the Back-Up function may be abnormal when the grid fails.



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 MAMUAL OPERATION

3.1 Wi-Fi Configuration

This part shows configuration on the web page.

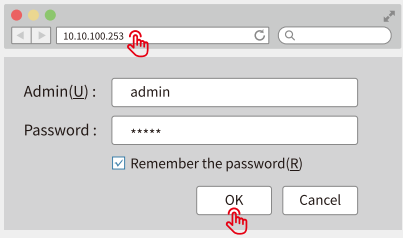
Wi-Fi configuration is absolutely necessary for online monitoring and maintenance.

Preparation:

1. Inverter must be powered up with battery or grid power.
2. Router with available internet access to the website www.semsportal.com is required.

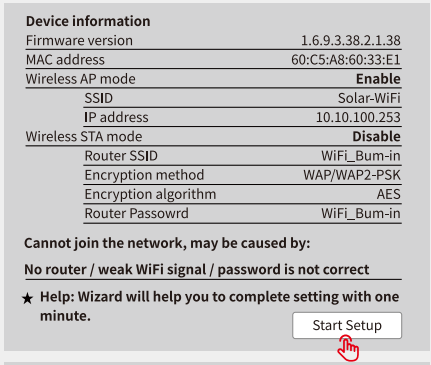
Step 1

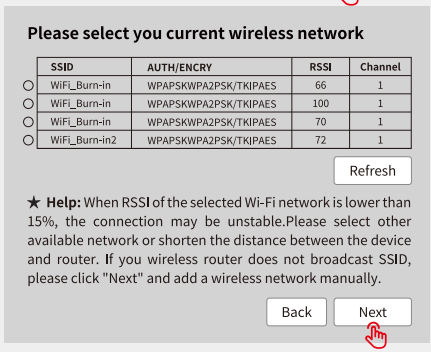
1. Connect Solar-WiFi* to your PC or smart phone (* its named the last 8 character of the inverter's serial No.).
2. Open browser and login 10.10.100.253 Admin (User): admin; Password: admin.
3. Then click "OK".



Step 2

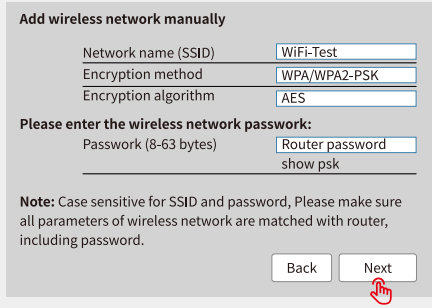
1. Click "Start Setup" to choose your router.
2. Then click "Next".

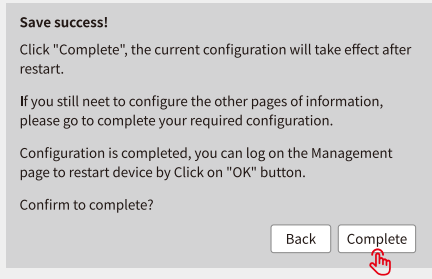




Step 3

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



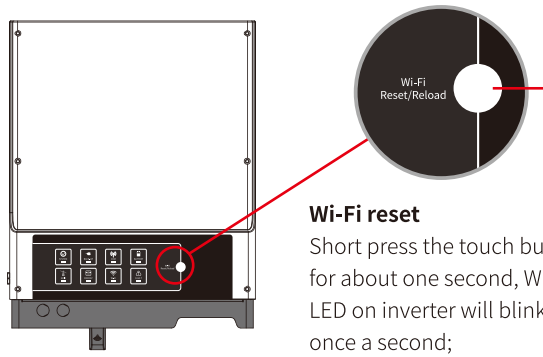


Note:

1. Please make sure the password, Encryption method / algorithm is the same with the router's.
2. If everything is correct, the Wi-Fi LED on inverter will change from double blink to quartic blink then to solid status, which means Wi-Fi has connected to the server successfully.
3. Wi-Fi configuration could also be done on PV Master App, details please check on PV Master App.

Wi-Fi reset & reload

Wi-Fi reset means restarting Wi-Fi module. Wi-Fi settings will be reprocessed and saved automatically. Wi-Fi Reload means setting Wi-Fi module back to default factory setting.



Wi-Fi reset
Short press the touch button for about one second, Wi-Fi LED on inverter will blink once a second;

Wi-Fi reload
Long press the touch button (3~5 seconds)
Wi-Fi LED on inverter will quartic blink

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 App

PV Master is an external monitoring/ configuration application for hybrid inverters, used on smart phones or tablet for both Android and iOS system. Main functions are as below:

1. Edit system configuration to make the system work as customer needs.
2. Monitor and check the performance of the hybrid system.
3. Wi-Fi configuration.

Please download "PV Master App" from www.goodwe.com or scan the QR code on the back of this user manual.

3.3 CEI Auto-Test Function

PV auto-test function of CEI is integrated in PV Master App for Italy's safety country requirements. For detailed instruction of this function please refer to "PV Master Operation Instructions".

04 OTHERS

4.1 Error Message

The error messages below will be displayed on PV Master App or report by Email if the 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	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 after 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	1. Make sure safety country of the inverter is set right. 2. Check (use multi-meter) if AC voltage (Between L & N) is within a normal range (Also on AC breaker side) a. If AC voltage is high, then make sure AC cable complies with the requirements on user manual and AC cable is not too long. b. If voltage is low, make sure AC cable is connected well and the jacket of AC cable is not compressed into 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 Grid frequency is beyond the normal range required by the safety country	1. Make sure safety country of the inverter is set right. 2. If safety country is right, then please check the inverter display if AC frequency (Fac) is within normal range. 3. If FAC failure only appear a few times and is resolved soon, it should be caused by occasional grid frequency unstability.
Over Temperature	Temperature inside of the inverter is too high	Inverter working environment leads to a high temperature condition	1. Try to decrease surrounding temperature. 2. Make sure the installation complies with the instruction of the inverter user manual. 3. Try to turn off the inverter for 15 mins, then start up again.
Relay Check Failure	Self checking of relay fails	Neutral & ground cable are not connected well on AC side or just occasional failure	Check using multi-meter if there if there is high voltage (normally should be lower than 10V) between N&PE cable on AC side. If the voltage higher than 10V, it means the netural & ground cable are not connected well on AC side or restart inverter.
DC Injection High	/	Inverter detects a higher DC component in AC output	Try to restart inverter, check if it still occurs, if not, means it is just an occasional situation or contact GoodWe.
EEPROM R/W Failure	/	Caused by a strong external magnetic field etc.	Try to restart inverter, check if it still occurs, if not, means it is just an occasional situation or contact GoodWe.
SPI Failure	Internal communication fails	Caused by a strong external magnetic field etc.	Try to restart inverter, check if it still occurs, if not, means it is just an occasional situation or contact GoodWe.
DC Bus High	BUS voltage is too high	/	Try to restart inverter, check if it still occurs, if not, means it is just an occasional situation or contact GoodWe.
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 page 12).

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

4.2 Troubleshootings

Checking Before Starting S-BP Up

Battery connection:

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

On-Grid & Back-Up conntecion:

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

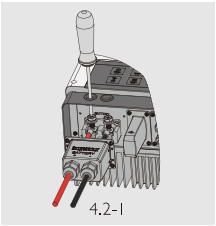
Smart Meter & CT Connection:

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

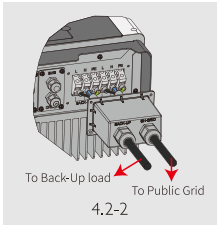
   Note: After turn on AC power, the COM led on Smart Meter should be blinking.

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.

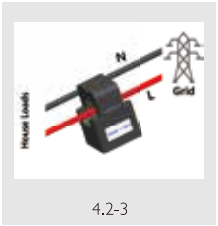
   Note: For three-pahse Smart Meter, please refer to page 13 to check if the connection and communication of Smart Meter is OK.



4.2-1



4.2-2

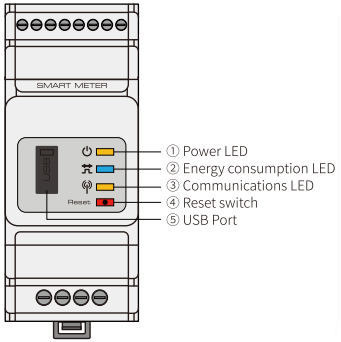


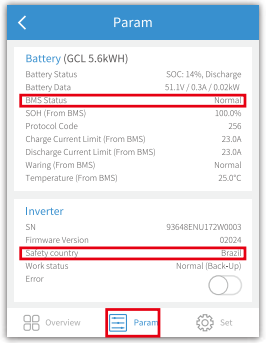
4.2-3

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".

1. For lead-acid battery: All the settings should comply with the parameter of the battery, and please contact after-sales for advices before use it.
2. 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.

Possible 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 gird 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 fort 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 does 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;

Question & Answers (Q&A)

About Wi-Fi configuration

Q: Why can't I find the Solar-WiFi* signal on smart phone?

A: Normally Solar-WiFi* 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 find the Solar-WiFi* signal on smart 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 grid is not available, while it discharge normally when grid is available?

A: On App, off-grid output and back-up function should be turned on to make battery discharge under off-grid mode.

Q: Why is there output on Back-Up 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 battery switch always trip when starts it 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 PV Master APP

A: This could be caused by losing connection to Solar-WiFi*.

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 disconect grid/load, only leave battery connected and then restart S-BP till the work mode displays "wait" on the 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. (For lead-acid battery, NA is normal)

About Smart Meter and Power Limit Function

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

A: Please refer to page 11 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 INSTRUCITONS

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 instrucions, 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 lightening, 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

The inverter requires periodical maintenance, details are shown below:

- Make sure inverter is totally isolated from all DC and AC power for at least 5 mins before maintenance.
- Heat sink: Please use a clean towel to clean up heat sink once a year.
- Torque: Please use torque wrench to tighten AC and DC wiring connection once a year.
- DC breaker: Check DC breaker regularly, active the DC breaker 10 times in a row once a year.
- Operating DC breaker will clean contacts and extend lifespan of DC breaker.
- Water-proof covers: Check if water-proof covers of RS485 and other part are replaced once a year.

4.4 Technical Parameters

Technical Data	GW3600S-BP	GW5000S-BP
Battery Input Data		
Supported Battery Type[1]	Li-Ion or Lead-Acid	Li-Ion or Lead-Acid
Nominal Battery Voltage (V)	48	48
Max. Charging Voltage (V)	⩽60 (Configurable)	⩽60 (Configurable)
Max. Charging Current (A)[1]	75	100
Max. Discharging Current (A)[1]	75	100
Battery Capacity (Ah)[2]	50~2000	50~2000
Battery Over-Current Protection (A)	125	125
Battery Backfeed Current	0	0
Charge Patten for Li-Ion battery	Self-adaption to BMS	Self-adaption to BMS
AC Output Data (Back-Up)		
Max. Output Apparent Power (VA)	3680	5500
Peak Output Apparent Power (VA)[3]	4416, 10s	5500, 10s
Automatic Switch Time (ms)	<10	<10
Norminal Output Voltage (V)	230 (+/-2%) single phase	230 (+/-2%) single phase
Norminal Output Frequency (Hz)	50/60 (+/-0.2%)	50/60 (+/-0.2%)
Back-Up Over Current Protection (A)	40A	50A
Output Inrush Current (Peak/Duration)	60A, 5μs	60A, 5μs
Max. Output Fault Current (Peak/Duration)	70A, 3μs	70A, 3μs
Max. Output Current (A)	16	22.8
Output THDv (Linear Load)	<3%	<3%
AC Output Data (Back-up)		
Norminal Active Power Output to Grid (W)	3680	4600/5000[4]
Max. Apparent Power Output to Grid (VA)	3680[5]	4600/5000/5100[5]
Max. Apparent Power From Grid (VA)	7360	9200
Nominal Output Voltage (V)	230 single phase	230 single phase
Nominal Output frequency (Hz)	50/60	50/60
Max. AC Output Current to Grid (A)[6]	16	22.8
Max. AC Current from Grid (A)	32	40
AC Over Current Protection (A)	40	50
AC Backfeed Current (A)	0	0
Max. Output Fault Current (Peak/Duration)	70A, 3μs	70A, 3μs
Output Inrush Current (Peak/Duration)	60A, 5μs	60A, 5μs
Input Inrush Current (Peak/Duration)	< 100A, 20μs	< 100A, 20μs
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 Lagging)	
Output THDi (@Nominal Output)	<3%	<3%
AC Overvoltage Category	III	III

[1] Lead acid battery use refers to Approved Battery Statement. The actual charge and discharge current also depends on the battery.
[2] If there is a need for S-BP under off-grid mode, battery capacity should be min 100Ah.
[3] On condition of battery and PV power being enough.
[4] 4600 for VDE-AR-N 4105 and CEI 0-21, 5000 for other country.

Technical Data	GW3600S-BP	GW5000S-BP
Effciency		
Max. Efficiency	97.6%	
AC Output Data (Back-up)		
Operation Temperature Range ()	-25~60	
Storage Temperature Range ()	-30~65	
Relative Humdity	0~95%	
Moisture Location Category	4K4H	
External Enviroment Pollute Degree	Grade 1,2,3	
Environment Category	Outdoor & Indoor	
Operation Altitude (m)	⩽4000	
Cooling System	Nature convection	
Noise (dB)	<25	
User Interface	LED, APP	
Communication With BMS	RS485, CAN[7]	
Communication With Smart Meter	RS485	
Communication With Portal	Wi-Fi	
Weight (kg)	18.5	
Size (Width*Height*Depth mm)	347*432*190	
Mounting	Wall Bracket	
Protective Rating	IP65	
Standby Self-Consumption (W)	<15	
Topology	High Frequency Isolation	
Protective Class		
Protection		
Anti-islanding Protection		
Output Over-current Protection		
Output Short-circuit Protection		
Output Overvoltage Protection		
Certifications & Standards		
Grid Regulation	AS/NZS 4777.2: 2015, G83/2, G100, CEI 0-21, EN50438, VED-AR-N4105, VDE0126-1-1, UNE206006, RD1699	AS/NZS 4777.2: 2015, G59/3, G100, CEI 0-21, EN50438, VED-AR-N4105, VDE0126-1-1, UNE206006, RD1699
Safety Regulation	IEC / EN62477-1, IEC62040-1	
EMC	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN61000-4-16, EN61000-4-18, EN61000-4-29	

[5] GW3600S-BP: 4050 for CEI 0-21, GW5000S-BP: 5100 for CEI 0-21, 4600 for VDE-AR-N 4105.
[6] GW5000S-BP: 21.7A for AS/NZS 4777.2, GW3600S-BP: 18A for CEI 0-21.
[7] Default communication with BMS is CAN, requirment RS485 needs special configuration process.

CERTIFICATES OF S-BP SERIES

G98 G59 CE

G100 IEC62109-1
CEI 0-21 RD1699 VDE0126-1-1
VDE-AR-N 4105 NRS 097-2-1

4.5 Other Test

For Australian requirements, in the THDi test, Zref should be added between inverter and mains.

RA, XA for Line conduvtor

RN, XN for Neutral conductor

Zref:

RA=0, 24; XA=j0,15 at 50Hz;

RN=0, 16; XN=j0,10 at 50Hz

4.6 Quick Check List To Avoid Danger

1. Inverter cannot be installed near flammable, explosive or strong electro-magnetic equipment, please refer to page 06
2. Remember that this inverter is heavy! Please be careful when lifting out from the package, please refer to page 07
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, please refer to page 10
4. Make sure inverter is totally isolated from any DC or AC power before connecting AC cable, please refer to page 11
5. Make sure AC cable is totally isolated from AC power before connecting Smart Meter & CT, please refer to page 14

Appendix protection category defintion

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 euiquipment 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.

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 Termperature	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

Pollution degree definition

Pollution Degree I	No pollution or only dry, non-conductive polllution 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.