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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.

1.1 Operation Modes Introduction

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

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 explanation

- ⚠️ 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.
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 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 (≥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.

- Backup cannot be connected to grid.
- Backup cannot be connected in parallel.
- One meter cannot connect to multiple inverters, and different CT cannot connect to a Smart Meter.
- Incompatible battery.
- 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 slope 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

**Warning:**

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 purchased 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.

<table>
<thead>
<tr>
<th>Cable</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Outside Diameter</td>
<td>10-12mm</td>
</tr>
<tr>
<td>B</td>
<td>Isolation section</td>
<td>NA</td>
</tr>
<tr>
<td>C</td>
<td>Conductor Core</td>
<td>20-35mm²</td>
</tr>
</tbody>
</table>

- 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:

1. **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

2. **Step 2**
   Make battery terminals:
   - Strip cable coat, revealing 10mm length of metal core
   - Use special crimper to compress battery terminal tightly

3. **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 safeguards the battery to failing 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.
Step 1
Prepare the terminals and AC cables according to the right table.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Outside diameter</td>
<td>11-12 mm</td>
</tr>
<tr>
<td>B</td>
<td>Isolation section</td>
<td>NA</td>
</tr>
<tr>
<td>C</td>
<td>Conductor wire length</td>
<td>7-9 mm</td>
</tr>
<tr>
<td>D</td>
<td>Conductor core section</td>
<td>4-6 mm²</td>
</tr>
</tbody>
</table>

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.

---

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.

Declaration 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 SPST 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.
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 the 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.

![CT Connection Diagram](image)

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

![Single-Phase Connection Diagram](image)

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

![Three-Phase Connection Diagram](image)

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.

<table>
<thead>
<tr>
<th>Position</th>
<th>Color</th>
<th>BMS Function</th>
<th>Short Note/Function</th>
<th>BMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orange/white</td>
<td>485_A2</td>
<td>NC</td>
<td>485_A</td>
</tr>
<tr>
<td>2</td>
<td>Orange</td>
<td>NC</td>
<td>NC</td>
<td>485_B</td>
</tr>
<tr>
<td>3</td>
<td>Green/white</td>
<td>485_B1</td>
<td>NC</td>
<td>485_B</td>
</tr>
<tr>
<td>4</td>
<td>Blue</td>
<td>CAN_H</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>5</td>
<td>Blue/white</td>
<td>CAN_L</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>6</td>
<td>Green</td>
<td>485_A1</td>
<td>NC</td>
<td>485_A</td>
</tr>
<tr>
<td>7</td>
<td>Brown/white</td>
<td>485_B1</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>8</td>
<td>Brown</td>
<td>NC</td>
<td>485_A1</td>
<td>NC</td>
</tr>
</tbody>
</table>

Smart Meter LED indications

<table>
<thead>
<tr>
<th></th>
<th>OFF</th>
<th>ON</th>
<th>Blinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>Not working</td>
<td>Working</td>
<td>/</td>
</tr>
<tr>
<td>ENERGY</td>
<td>/</td>
<td>Importing</td>
<td>Exporting</td>
</tr>
<tr>
<td>COM</td>
<td>Blinks once when transferring data to inverter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

![Anti-Reverse Connection Diagram](image)

[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.*

![Image 1](image1.png)

**Step 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.*

![Image 2](image2.png)

**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:

<table>
<thead>
<tr>
<th>NO</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RPM/US</td>
</tr>
<tr>
<td>2</td>
<td>RPM/AS</td>
</tr>
<tr>
<td>3</td>
<td>RPM/L</td>
</tr>
<tr>
<td>4</td>
<td>RPM/A/8</td>
</tr>
<tr>
<td>5</td>
<td>RPM/GEN</td>
</tr>
<tr>
<td>6</td>
<td>COM/DM/O</td>
</tr>
</tbody>
</table>

**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:

<table>
<thead>
<tr>
<th>NO</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>RPM/GEN</td>
</tr>
<tr>
<td>6</td>
<td>COM/DM/O</td>
</tr>
</tbody>
</table>

![Image 3](image3.png)

**Step 4**

Connect the terminal to the right position onto the inverter.

![Image 4](image4.png)

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"

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.

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, House → Grid direction to do the connection, AC Breaker ≥ 40A for GW3600-SP, ≥ 50A for GW5000-SP.
3. Direction of the CT cannot be connected in reverse, please follow "House → Grid" direction to do the connection.

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.

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.
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.semportal.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 your router, then click “Next”.
2. Click “Complete”.

Please select you current wireless network
- SSID: 12345678
- Encryption method: WPA2-PSK
- Encryption algorithm: AES
- Please enter the wireless network password:
  - Passkey (8-63 bytes): [Password]

Note: Care sensitivity for SSID and password. Please make sure all parameters of wireless network are matched with router, including password.

Save success!
- Click “Complete”, the current configuration will take effect after restart.

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.

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".
### 4.1 Error Message

The error messages below will be displayed on PV Master App or report by Email if the error occurs.

<table>
<thead>
<tr>
<th>ERROR MESSAGE</th>
<th>EXPLANATION</th>
<th>REASON</th>
<th>SOLUTIONS</th>
</tr>
</thead>
</table>
| 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 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 unsteadiness. |
| 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 is high voltage (normally should be lower than 10V) between N&PT cable on AC side.  
If the voltage higher than 10V, it means the neutral & 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. |
| Backup Over Load | Backup side is overloaded                                                 | 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 22). |

**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 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 page 13 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 6 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".

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 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;
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 outout 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 disconnect 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 instruc-
   tions 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 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

<table>
<thead>
<tr>
<th>Technical Data</th>
<th>GW3600S-BP</th>
<th>GW5000S-BP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Battery Input Data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supported Battery Type[1]</td>
<td>Li-Ion or Lead-Acid</td>
<td>Li-Ion or Lead-Acid</td>
</tr>
<tr>
<td>Nominal Battery Voltage (V)</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Max. Charging Voltage (V)</td>
<td>≤60 (Configurable)</td>
<td>≤60 (Configurable)</td>
</tr>
<tr>
<td>Max. Charging Current (A)[2]</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>Max. Discharging Current (A)[3]</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>Battery Capacity (Ah)</td>
<td>50-2000</td>
<td>50-2000</td>
</tr>
<tr>
<td>Battery Over-CURRENT Protection (A)</td>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>Battery Backfeed Current</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Charge Patten for Li-Ion battery</td>
<td>Self-adaption to BMS</td>
<td>Self adaption to BMS</td>
</tr>
</tbody>
</table>

| AC Output Data (Back-Up)            |            |            |
| Max. Output Apparent Power (VA)     | 3680       | 5500       |
| Peak Output Apparent Power (VA)[4]  | 4416, 10s  | 5500, 10s  |
| Automatic Switch Time (ms)          | <10        | <10        |
| Nominal Output Voltage (V)          | 230 (+/-2%) single phase | 230 (+/-2%) single phase |
| Nominal 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 THD (Linear Load)            | <3%        | <3%        |

| AC Output Data (Back-up)            |            |            |
| Nominal Active Power Output to Grid (W)| 3680 | 4600/5000[4] |
| Max. Apparent Power From Grid (VA)   | 7380       | 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 THD (@Nominal Outpit)         | <3%        | <3%        |
| AC Overvoltage Category              | III        | III        |

[1] Lead acid battery use refer 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.
### Technical Data

<table>
<thead>
<tr>
<th>Feature</th>
<th>GW3600S-BP</th>
<th>GWS000S-BP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Efficiency</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Efficiency</td>
<td>97.6%</td>
<td></td>
</tr>
<tr>
<td><strong>AC Output Data (Back-up)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation Temperature Range</td>
<td>25–50</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>-20–65</td>
<td></td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>0–95%</td>
<td></td>
</tr>
<tr>
<td>Moisture Location Category</td>
<td>4K4H</td>
<td></td>
</tr>
<tr>
<td>External Environment Pollute Degree</td>
<td>1.2, 3</td>
<td></td>
</tr>
<tr>
<td>Environment Category</td>
<td>Outdoor &amp; Indoor</td>
<td></td>
</tr>
<tr>
<td>Operation Altitude (m)</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>Cooling System</td>
<td>Nature convection</td>
<td></td>
</tr>
<tr>
<td>Noise (dBA)</td>
<td>&lt;25</td>
<td></td>
</tr>
<tr>
<td>User Interface</td>
<td>LED, APP</td>
<td></td>
</tr>
<tr>
<td>Communication With BMS</td>
<td>RS485, CAN, [7]</td>
<td></td>
</tr>
<tr>
<td>Communication With Smart Meter</td>
<td>RS485</td>
<td></td>
</tr>
<tr>
<td>Communication With Pental</td>
<td>Wi-Fi</td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>18.5</td>
<td></td>
</tr>
<tr>
<td>Size (Width<em>Height</em>Depth mm)</td>
<td>347<em>432</em>190</td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>Wall Bracket</td>
<td></td>
</tr>
<tr>
<td>Protective Rating</td>
<td>IP65</td>
<td></td>
</tr>
<tr>
<td>Standby Self-Consumption (W)</td>
<td>&lt;15</td>
<td></td>
</tr>
<tr>
<td>Topology</td>
<td>High Frequency Isolation</td>
<td></td>
</tr>
<tr>
<td>Protective Class</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Protection

- Anti-islanding Protection
- Output Over-current Protection
- Output Short-circuit Protection
- Output Over-voltage Protection

### Certifications & Standards

- **Grid Regulation**
  - AS/NZS 4777.2: 2015, G83/2, G100, CEI 0-21, EN50438, VDE-AR-N 4105, VDE0126-1-1, UNE06006, R01699
  - AS/NZS 4777.2: 2015, G59/3, G100, CEI 0-21, EN50438, VDE-AR-N 4105, VDE0126-1-1, UNE06006, R01699

- **Safety Regulation**
  - IEC / EN62477-1, IEC62261-1

- **EMC**
  - EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN61000-4-16, EN61000-4-18, EN61000-4-29

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### 4.5 Other Test

For Australian requirements, in the THDI test, Zref should be added between inverter and mains.
RA, XA for Line conductor
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 definition

**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.
### Moisture location category definition

<table>
<thead>
<tr>
<th>Moisture Parameters</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3K3</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>0~40°C</td>
</tr>
<tr>
<td>Moisture Parameters</td>
<td>5%~85%</td>
</tr>
</tbody>
</table>

### Environment category definition

<table>
<thead>
<tr>
<th>Environment Condition</th>
<th>Ambient Temperature</th>
<th>Relative Humidity</th>
<th>Applied to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor</td>
<td>-20~50°C</td>
<td>4%~100%</td>
<td>PD3</td>
</tr>
<tr>
<td>Indoor Unconditioned</td>
<td>-20~50°C</td>
<td>5%~95%</td>
<td>PD3</td>
</tr>
<tr>
<td>Indoor conditioned</td>
<td>0~40°C</td>
<td>5%~85%</td>
<td>PD2</td>
</tr>
</tbody>
</table>

### Pollution degree definition

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