



PV Master APP



SEMS Portal APP



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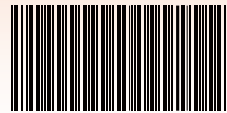


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340-00330-00

BT SERIES USER MANUAL

AC-COUPLED BATTERY STORAGE RETORFIT

TABLE OF CONTENTS

01 INTRODUCTION

1.1 OPERATION MODES INTRODUCTION	01
1.2 SAFETY & WARNINGS	02
1.3 PRODUCT OVERVIEW	04

02 INSTALLATION INSTRUCTIONS

2.1 UNACCEPTABLE INSTALLATIONS	05
2.2 PACKING LIST	05
2.3 MOUNTING	06
2.3.1 SELECT MOUNTING LOCATION	06
2.3.2 MOUNTING	07
2.4 ELECTRICAL WIRING CONNECTION	08
2.4.1 BATTERY CONNECTION	08
2.4.2 ON-GRID & BACK-UP CONNECTION	09
2.4.3 SMART METER & CT CONNECTION	12
2.5 DRED & EARTH FAULT ALARM	13
2.5.1 DRED CONNECTION	13
2.5.2 EARTH FAULT ALARM	14

03 MANUAL OPERATION

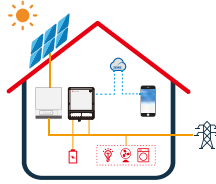
3.1 WI-FI CONFIGURATION & WI-FI RELOAD	17
3.2 GEI AUTO-TEST INSTRUCTION	18
3.3 CEI AUTO-TEST FUNCTION	18

04 OTHERS

4.1 ERROR MESSAGE AND TROUBLESHOOTING	19
4.2 DISCLAIMER	25
4.3 TECHNICAL PARAMETERS AND CERTIFICATES	26
4.4 WARINING QUICK CHECK LIST	28

01 INTRODUCTION

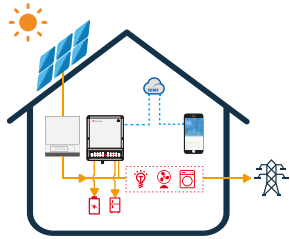
GoodWe BT series bi-directional inverter is designed for both indoor and outdoor use, which could be used with or without existing grid-tied inverter systems to store energy with batteries. Energy produced from grid-tied inverters shall be used to optimize self-consumption, then charge battery, exceed power from grid-tied system could export to grid. Loads will be supported in priority by grid-tied system, then battery power, exceed consumption power will be drained from grid.



Note:
The introduction describes a general behavior of ET system.
The operation mode can be adjusted on GoodWe PV Master APP depends on the system layout. Below are the general operation modes for BT system:

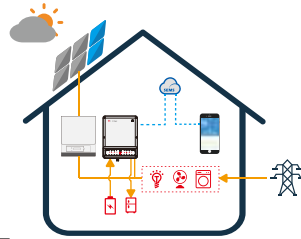
1.1 OPERATION MODES INTRODUCTION

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



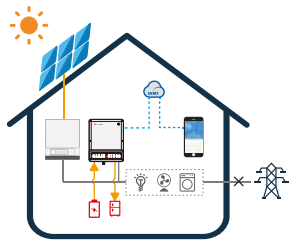
Mode I

Energy from grid-tied inverters optimize loads, then charge battery, exceed power export to grid.



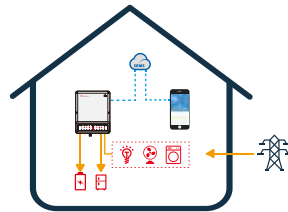
Mode II

When energy from grid-tied inverters is weak, battery discharge to support loads in priority, together with 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 BT series inverter of Jiangsu GoodWe Power Supply Technology Co., Ltd. (hereinafter called as GoodWe) strictly comply 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!
Failing 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 that the arrows always point upwards.



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



Product should not be disposed as household waste.



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.



Inverter will be touchable or operable after minimum 5 minutes of being turned off or totally disconnected, in case of any electrical shock or injury.



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 to insert or pull 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 working, so please make sure it is cooled down before touching it, and make sure the inverter is untouchable for children

Do not open inverter cover or change any components without GoodWe'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 useless and warranty 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 GoodWe.

Battery negative(BAT-) on inverter side is not grounded as default design. Connecting BAT- to EARTH are strictly forbidden.

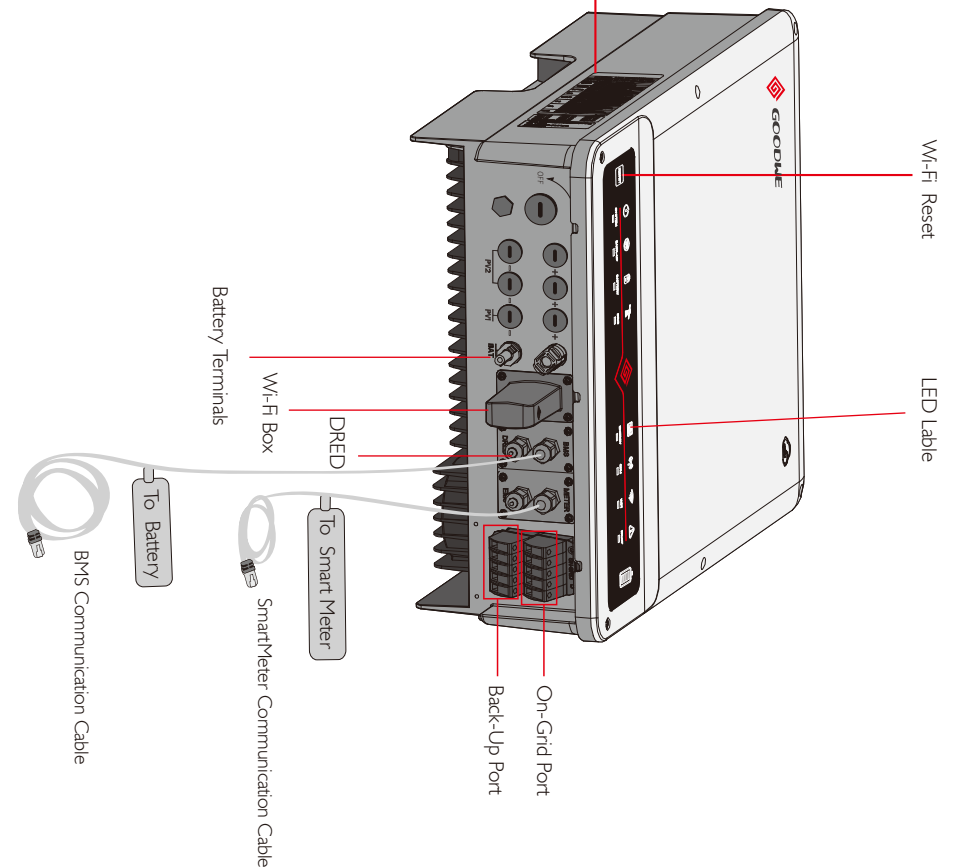
The inverter, with built-in RCMU, will exclude possibility of DC residual current to 6mA, thus in the system an external RCD (type A) can be used($\geq 30\text{mA}$).

In Australia, the inverter internal switching does not maintain neutral integrity, which must be addressed by external connection arrangements like in the s Off-Grid System Connection Diagram in page 16.

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'.

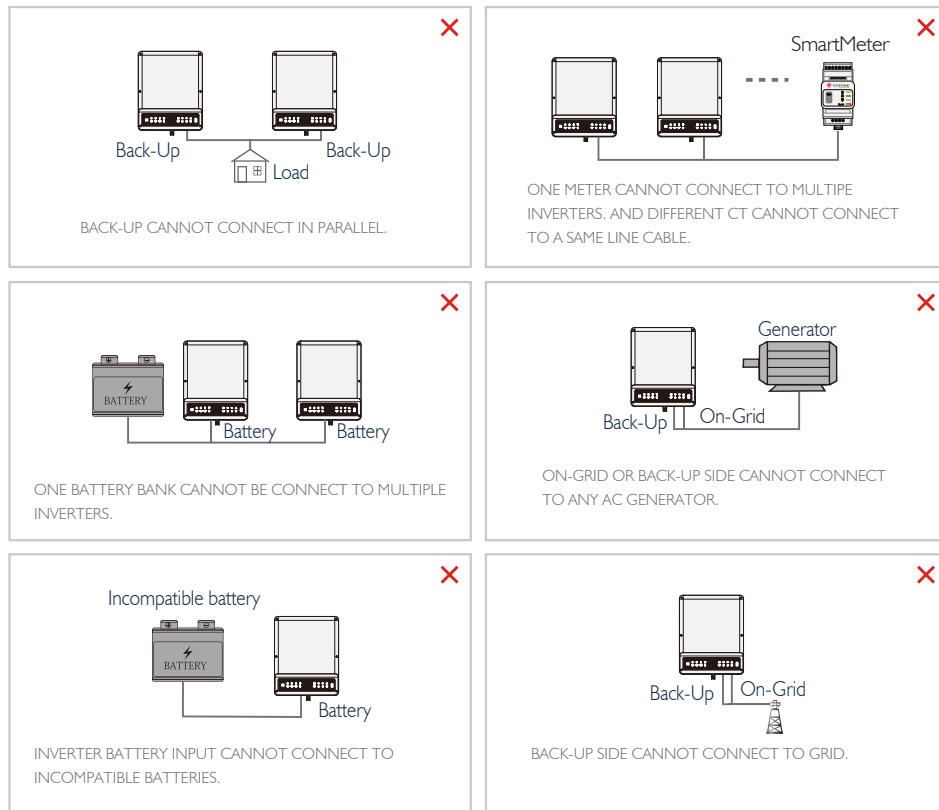
I.3 PRODUCT OVERVIEW

INDICATOR	STATUS	EXPLANATION	HYBRID LED INDICATORS								
			SYSTEM	BACK-UP	BATTERY	GRID	ENERGY	COM	WIFI	FAULT	
SYSTEM	ON	SYSTEM IS READY	Green	Green	Green	Green	Green	Green	Green	Green	Green
SYSTEM	BLINK	SYSTEM IS STARTING UP	Green	Green	Green	Green	Green	Green	Green	Green	Green
SYSTEM	OFF	SYSTEM IS NOT OPERATING	Green	Green	Green	Green	Green	Green	Green	Green	Green
BACK-UP	ON	BACK-UP IS READY / POWER AVAILABLE	Green	Green	Green	Green	Green	Green	Green	Green	Green
BACK-UP	OFF	BACK-UP IS OFF / ON POWER AVAILABLE	Green	Green	Green	Green	Green	Green	Green	Green	Green
BATTERY	ON	BATTERY IS CHARGING	Green	Green	Green	Green	Green	Green	Green	Green	Green
BATTERY	BLINK 1	BATTERY IS DISCHARGING	Green	Green	Green	Green	Green	Green	Green	Green	Green
BATTERY	BLINK 2	BATTERY IS LOW / SOC IS LOW	Green	Green	Green	Green	Green	Green	Green	Green	Green
BATTERY	OFF	BATTERY IS DISCONNECTED / NOT ACTIVE	Green	Green	Green	Green	Green	Green	Green	Green	Green
GRID	ON	GRID IS ACTIVE AND CONNECTED	Green	Green	Green	Green	Green	Green	Green	Green	Green
GRID	BLINK	GRID IS ACTIVE BUT NOT CONNECTED	Green	Green	Green	Green	Green	Green	Green	Green	Green
GRID	OFF	GRID IS NOT ACTIVE	Green	Green	Green	Green	Green	Green	Green	Green	Green
ENERGY	ON	CONSUMING ENERGY FROM GRID / BURNING	Green	Green	Green	Green	Green	Green	Green	Green	Green
ENERGY	BLINK 1	SHIPPING ENERGY TO GRID / ZEROING	Green	Green	Green	Green	Green	Green	Green	Green	Green
ENERGY	BLINK 2	SHIPPING ENERGY TO GRID / SELLING	Green	Green	Green	Green	Green	Green	Green	Green	Green
ENERGY	OFF	GRID NOT CONNECTED / SYSTEM NOT OPERATING	Green	Green	Green	Green	Green	Green	Green	Green	Green
COM	ON	BMS AND METER COMMUNICATION OK	Green	Green	Green	Green	Green	Green	Green	Green	Green
COM	BLINK 1	METER COMMUNICATION OK	Green	Green	Green	Green	Green	Green	Green	Green	Green
COM	BLINK 2	BMS COMMUNICATION OK	Green	Green	Green	Green	Green	Green	Green	Green	Green
COM	OFF	BMS AND METER COMMUNICATION FAIL	Green	Green	Green	Green	Green	Green	Green	Green	Green
WIFI	ON	WIFI CONNECTED / ACTIVE	Green	Green	Green	Green	Green	Green	Green	Green	Green
WIFI	BLINK 1	WIFI SYSTEM RESETTING	Green	Green	Green	Green	Green	Green	Green	Green	Green
WIFI	BLINK 2	WIFI NOT CONNECT TO ROUTER	Green	Green	Green	Green	Green	Green	Green	Green	Green
WIFI	BLINK 4	WIFI SERVER PROBLEM	Green	Green	Green	Green	Green	Green	Green	Green	Green
WIFI	OFF	WIFI NOT ACTIVE	Green	Green	Green	Green	Green	Green	Green	Green	Green
FAULT	ON	FAULT HAS OCCURRED	Green	Green	Green	Green	Green	Green	Green	Green	Green
FAULT	BLINK 1	OVERLOAD OF BACK-UP	Green	Green	Green	Green	Green	Green	Green	Green	Green
FAULT	BLINK 2	OVERLOAD OF GRID	Green	Green	Green	Green	Green	Green	Green	Green	Green
FAULT	BLINK 4	CT WIRING FAULT	Green	Green	Green	Green	Green	Green	Green	Green	Green
FAULT	OFF	NO FAULT	Green	Green	Green	Green	Green	Green	Green	Green	Green



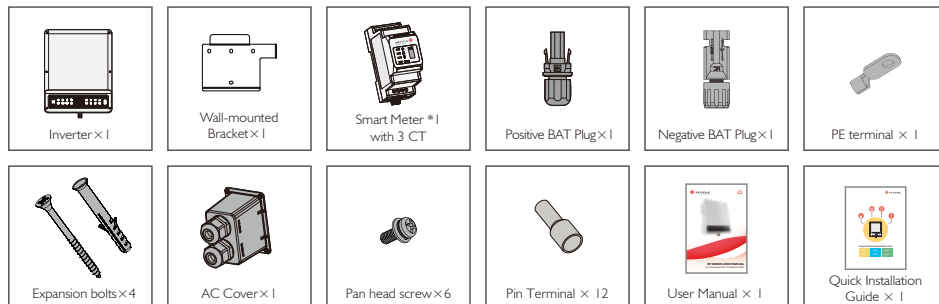
2.1 UNACCEPTABLE INSTALLATIONS

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



2.2 PACKING LIST

On receiving the hybrid 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

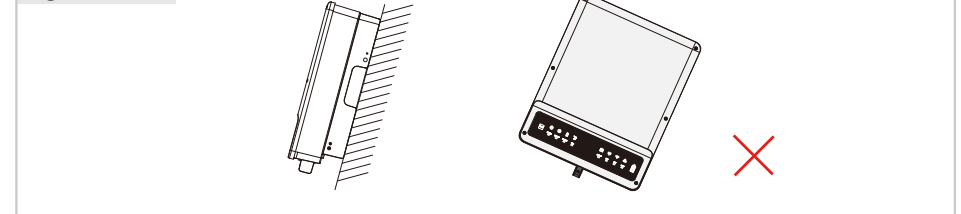
For inverter's protection and convenient maintenance, mounting location for inverter should be selected carefully based on the following rules:

Any part of this system shouldn't block the switch and breaker to disconnected 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 max 15° (Figure 2.3.1-1)

Figure 2.3.1-1

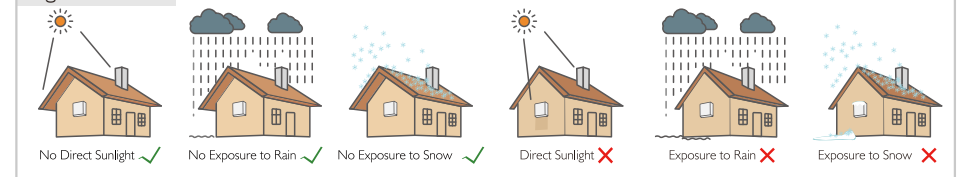


Rule 3. Ambient temperature should be lower than 45°C

(High ambient temperature will cause power derating of inverter.)

Rule 4. The installation of inverter should be protected under shelter from direct sunlight or bad weather like snow, rain, lightning etc. (Figure 2.3.1-2)

Figure 2.3.1-2

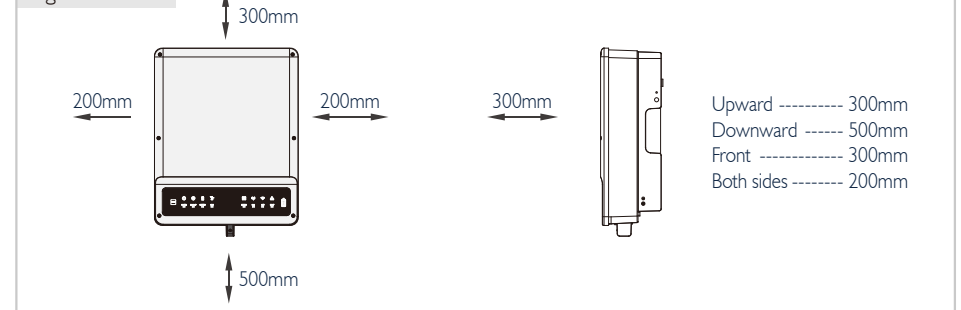


Rule 5. Inverter should be installed at eye level for convenient maintenance.

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


Rule 7. Leave enough space around inverter following the values in Figure 2.3.1-3.

Figure 2.3.1-3



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

2.3.2 MOUNTING

 Remember that this inverter is heavy! Please be careful when lifting out from the package.^[2]

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 4 holes on right positions. (10mm in diameter, and 80mm in depth) (Figure 2.3.2-1)
- 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 may not be able to keep inverter from dropping.

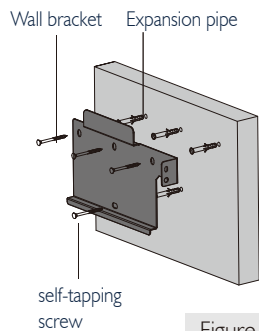
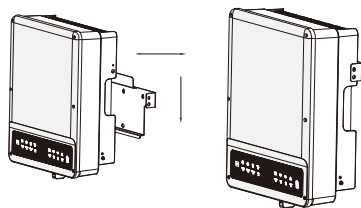


Figure 2.3.2-1

Step 2



Carry the inverter by holding the heating sink on two sides and Place the inverter on the mounting bracket. (Figure 2.3.2-2)
Note: Make sure the heat sink on inverter is right joint with mounting bracket.

Figure 2.3.2-2

Step 3

Ground cable shall be connected to ground plate on grid side (Figure 2.3.2-3)

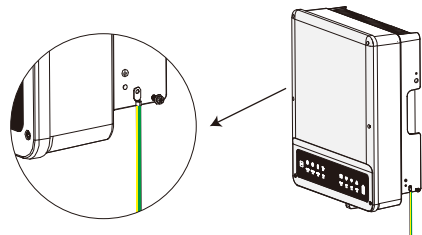
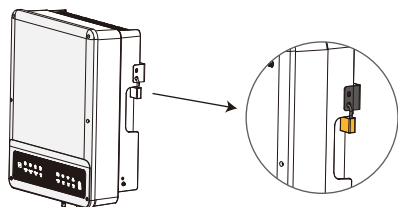


Figure 2.3.2-3

Step 4



A lock could be used for anti-theft if it is necessary for individual requirement. (Figure 2.3.2-4)

Figure 2.3.2-4

2.4 ELECTRICAL WIRING CONNECTION

2.4.1 BATTERY WIRING CONNECTION

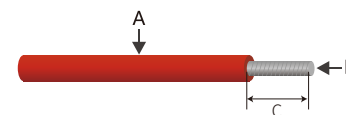
- Please be careful against any electric shock or chemical hazard.
- Make sure there is an external DC breaker ($\geq 40A$) connected for battery without build-in DC breaker.

Make sure battery switch is off and battery nominal voltage meet BT series' specification before connecting battery to inverter and make sure inverter is totally isolated from AC power.^[4]



Please following requirements and step below strictly. Use improper wire may cause bad contact and high impedance, which is dangerous to the system.

- Use the right BAT plugs in the accessory box.
- Use the tin-plated cables with a conductor cross section of 4 to 6 mm² (AWG 10) because the maximum battery current is 25A. Battery cable requirements are as (Figure 2.4.1-1).



Grade	Description	Value
A	Outside diameter insulation	5.5-8.0 mm
B	Conductor core section	4-6 mm ²
C	Conductor core length	7 mm

Figure 2.4.1-1

Battery wiring connection steps as below:

Step 1

Prepare BAT cables and BAT plugs (Figure 2.4.1-2)

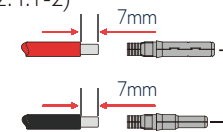


Figure 2.4.1-2

Note:

- Please use BAT plugs and connectors in GoodWe accessory box
- BAT cable should be standard, 4-6mm² BAT cable

Step 2

Connect BAT cables to BAT connectors (Figure 2.4.1-3)

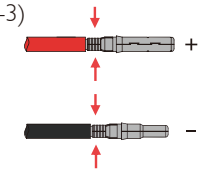


Figure 2.4.1-3

Note:

- BAT cable must be tightly crimped into the connectors
- There will be a click sound if connectors are inset correctly into BAT plugs

Step 3

Screw the cap on and plug onto inverter side (Figure 2.4.1-4)

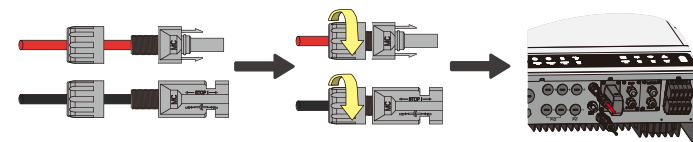


Figure 2.4.1-4

Note:

- There will be a click sound if connectors are inset correctly into BAT plugs.

Note: For the compatible lithium batteries (Pylon/BYD) connection, please refer to battery connection part in BT quick installation instructions.

2.4.2 ON-GRID & BACK-UP CONNECTION

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

Inverter model	AC breaker specification
GW5K-BT	25A / 400V (e.g. DZ47-60 C25)
GW6K-BT	25A / 400V (e.g. DZ47-60 C25)
GW8K-BT	32A / 400V (e.g. DZ47-60 C32)
GW10K-BT	32A / 400V (e.g. DZ47-60 C32)

Note: The absence of AC breaker on Back-up side will lead to inverter damage if only electrical short circuit happen on back-up side.

1. Use separate AC breaker for individual inverter (Figure 2.4.2-1)

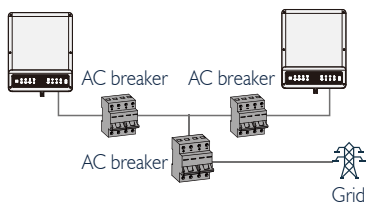


Figure 2.4.2-1

2. On AC side, the individual breaker should be connected before loads (between inverter and loads) (Figure 2.4.2-2)

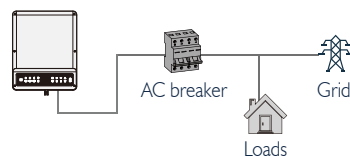


Figure 2.4.2-2

• Requirement of AC cable connected to On-Grid and Back-Up side (Figure 2.4.2-3)

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

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 AC cable slips or taken out, the protecting earth conductor will be the last to take the strain.

Step 1

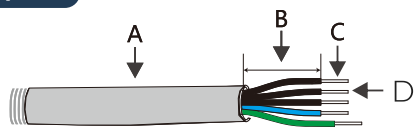


Figure 2.4.2-3

Grade	Description	Value
A	Outside diameter	13-18 mm
B	Separated wire length	20-25 mm
C	Conductor wire length	7-9 mm
D	Conductor core section	4-6 mm ²

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

Step 3

Put AC cable through terminal cover follow the sequence as on the right (Figure 2.4.2-4)

Note: Please use the terminals in GoodWe components box

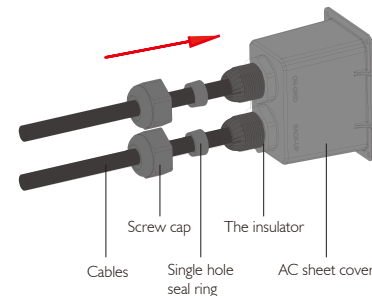


Figure 2.4.2-4

Step 3

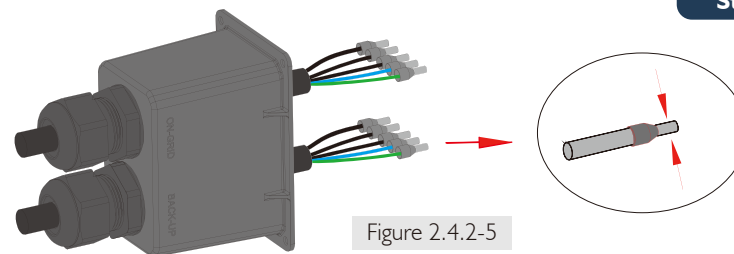


Figure 2.4.2-5

Press the 10 connectors on cable conductor core tightly (Figure 2.4.2-5)

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

Step 4

Screwing torque
2.0-2.5N.m

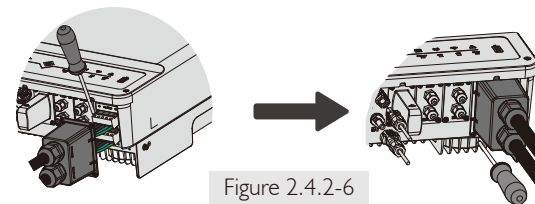


Figure 2.4.2-6

1. Connect the assembled AC cables into AC terminals with fastening torque about 2.0-2.5N.m.

Note: Connecting Back-up terminals before connect On-grid terminals.

Make sure it is not connected to a wrong side.

2. Lock the cover and screw the cap on (Figure 2.4.2-6)

Special Adjustable Setting

The inverter has filed adjustable setting like tripping point, tripping time, reconnect time, active and invalid of QU/PU curves etc. by special firmware. Please contact GoodWe after sales for the special firmware and adjust methods.

Declaration For Back-Up Function

GoodWe BT series bi-directional inverters are able to supply over load output power at its' back-up. For details please refer to the technical parameters of GoodWe BT series inverter(4.3 se) And the inverter has self-protection derating at high ambient temperature.

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

1. 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 case of systems not connected to the batteries, the Back-Up function is strongly not advised to use. GoodWe shall not cover the standard warranty and be liable for any consequences arising from users not following this instruction.

2. 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.

Accepted loads as below:

- Inductive Load: 1.5P non-frequency conversion air-conditioner can be connect to back-up side. Two or more non-frequency conversion air-conditioner connect to back-up side may cause UPS mode unstable.
- Capacitive Load: Total power $\leq 0.6 \times$ nominal power of model. (Any load with high inrush current at start-up is not accepted.)
- For complicated application, please contact GoodWe's after service.

Note:

For a convenient maintenance, Please installed a "4Pole3Throw" on Back-Up and On-Grid side. Then it is adjustable to support load by Back-Up or by grid or just leave it there. (Figure 2.4.2-7)

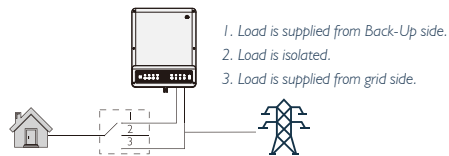


Figure 2.4.2-7

Declaration For Back-Up Overload Protection

Inverter will restart itself as overload protection happens. The preparation time for restarting will be longer and longer (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 → Advanced Setting → Click "Reset Back-Up Overload History".

2.4.3 SMART METER & CT CONNECTION



Make sure AC cable is totally isolated from AC power before connecting Smart Meter & CT.^[6]

The Smart Meter with CT in GoodWe product box is compulsory for BT system installation, used to detect grid voltage and current direction and magnitude, further to instruct the operation condition of BT inverter via RS485 communication.

Note

1. The Smart Meter with CT is well configured, please do not change any setting on Smart Meter.
2. One Smart Meter can only be used for one BT inverter.
3. Three CTs must be used for one Smart Meter, and must be connected on the same phase with Smart Meter power cable.

•Smart Meter & CT Connection Diagram (Figure 2.4.2-7)

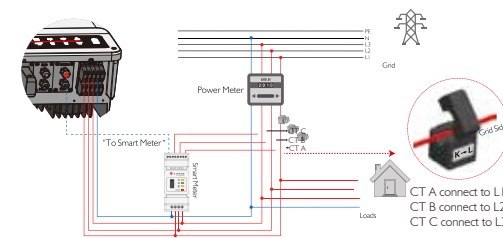


Figure 2.4.2-7

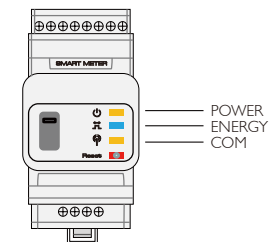
Note:

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

•Detailed pin function of each port on BT

Note:For BMS cable, 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	RS485
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	Blink one time when it transfer data to inverter		

Anti-Reverse Function Connection

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

1. This diagram is only for installation where has exporting power limit function requirement.
2. For anti-reverse function, will also need set on PV Master App→Advanced Setting→Power Limit.
3. This diagram only be reasonable if grid-tied inverter has anti-reverse function itself. And the power limitation value shall be set on grid-tied inverter.
4. When using anti-reverse function, it would buy about 150W from the grid.

•Connection Diagram as below (Figure 2.4.2-8)

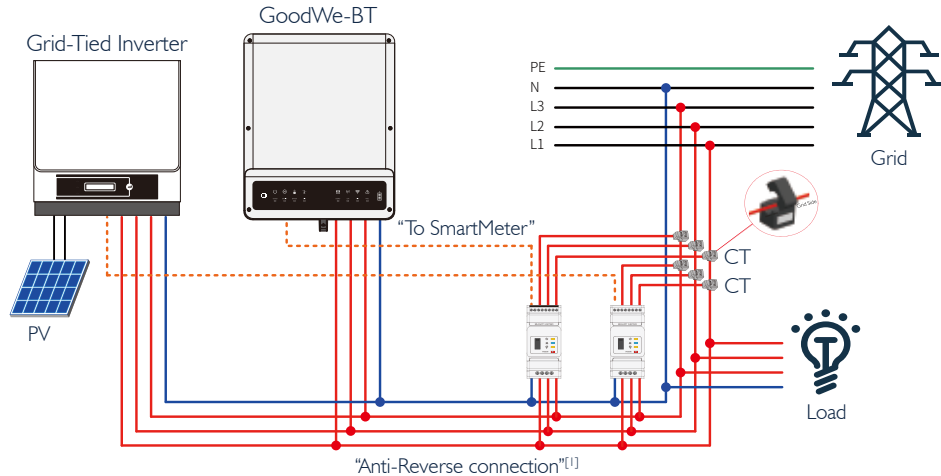


Figure 2.4.2-8

[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 inverter. (Figure 2.5.1-1)
Note: DRED device should be connected through "DRED port" as the figure shows.

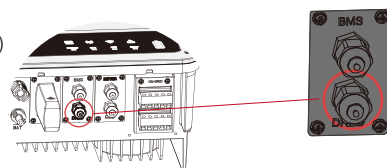


Figure 2.5.1-1

Step 2

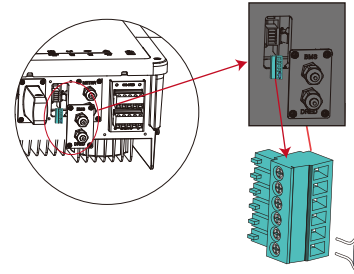


Figure 2.5.1-2

1. Plug out the 6-pin terminal and dismantle the resistor on it (Figure 2.5.1-2).
2. Plug the resistor out, leave the 6-pin terminal for next step.

Note: The 6-pin terminal in the inverter has the same function of DRED device. Please leave it in the inverter if no external device connected.

Step 3-1 For DRED

1. Put DRED cable through the plate as shown in Figure 2.5.1-3.
2. Connect DRED cable on the 6-pin terminal. The function of each connection position

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

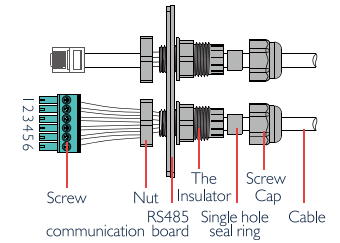


Figure 2.5.1-3

Step 3-2 For Remote Shutdown

1. Put the cable through the plate as shown in Figure 2.5.1-4.
2. Wiring from the No. 5 and 6 holes respectively.

NO	5	6
Function	REFGEN	COM / DRMO

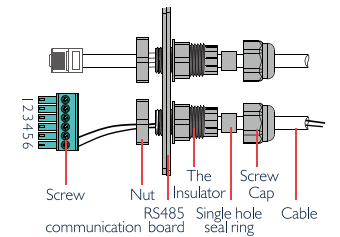


Figure 2.5.1-4

Step 4

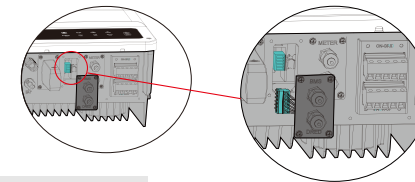


Figure 2.5.1-5

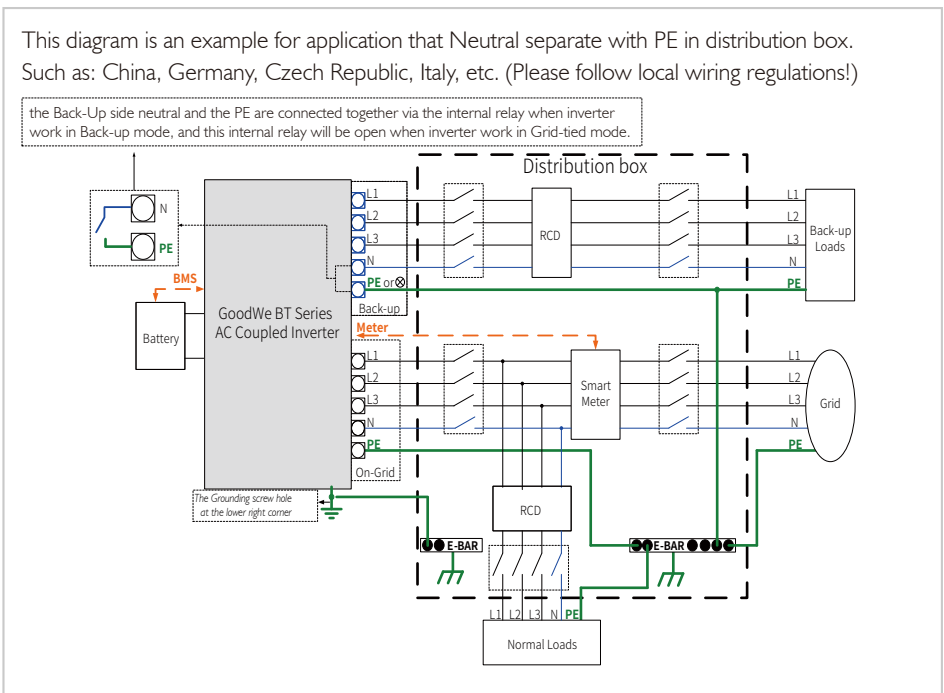
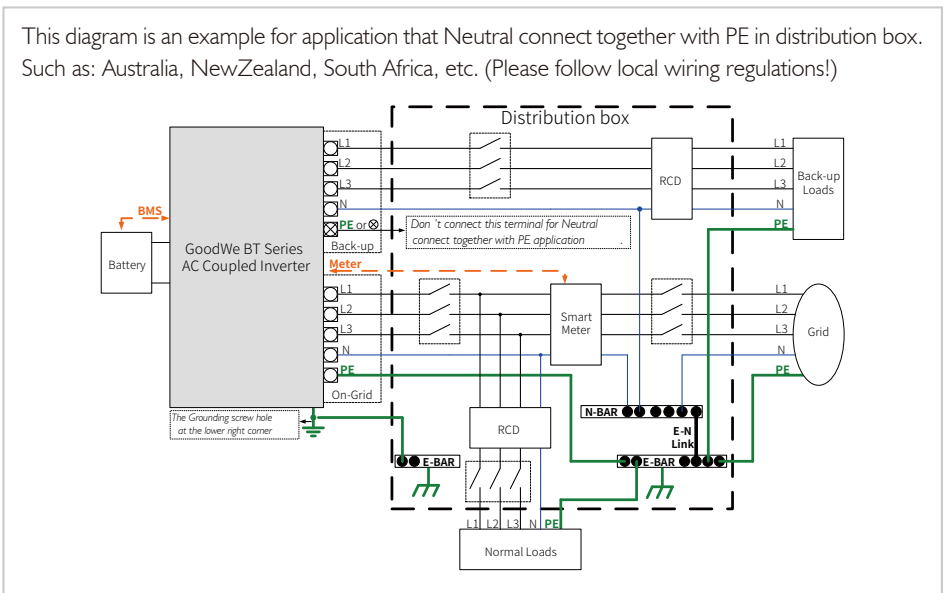
Connect DRED terminal to the right position onto the inverter. (Figure 2.5.1-5)

2.5.2 EARTH FAULT ALARM CONNECTION

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

•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.



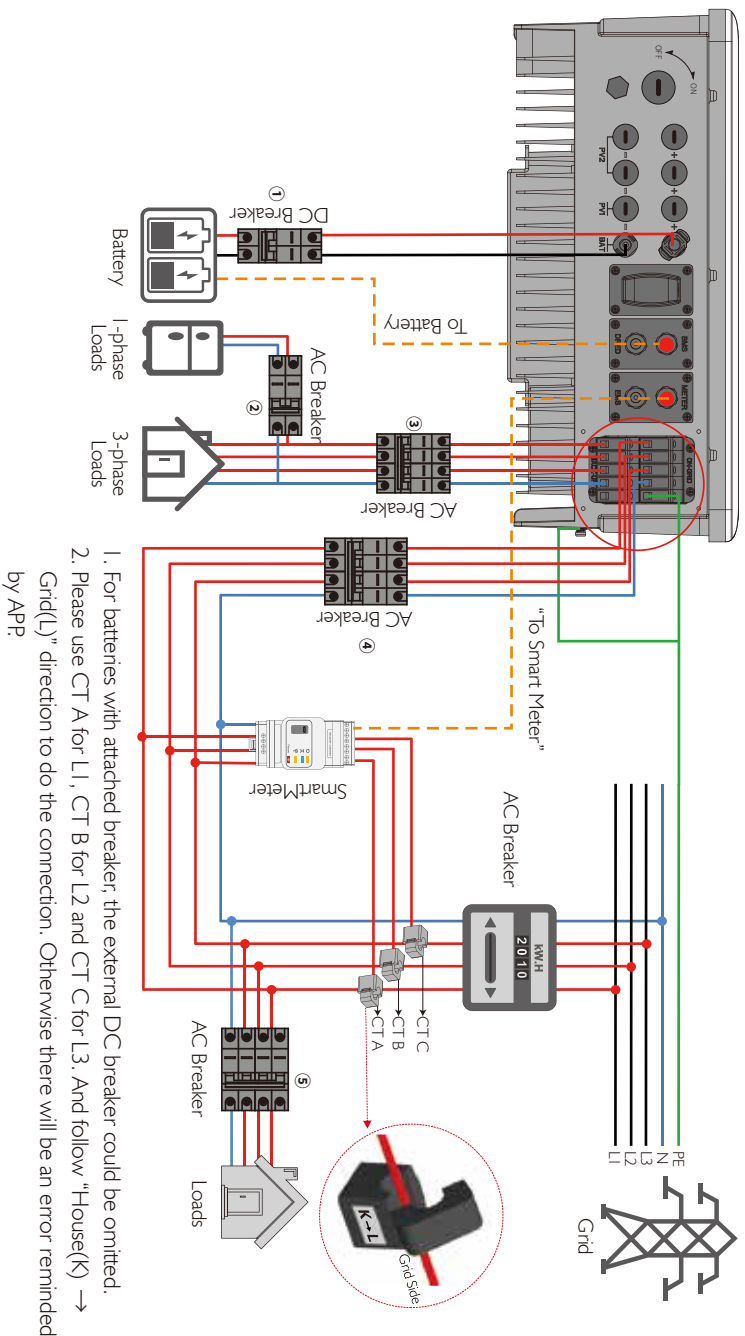
•WIRING SYSTEM FOR BT SERIES HYBRID INVERTER

Note: This diagram indicated wiring structure of BT series AC coupled inverter, not the electric wiring standard.

Please select Breaker according to the specification below

GW5K-BT	①	②	③	④	⑤
GW6K-BT					
GW8K-BT					
GW10K-BT					
		25A/400V AC breaker	25A/400V AC breaker	25A/400V AC breaker	Depends on household loads
		40A/600V DC breaker	32A/400V AC breaker	32A/400V AC breaker	

Please select Breaker according to the specification below



1. For batteries with attached breaker, the external DC breaker could be omitted.
2. Please use CT A for L1, CT B for L2 and CT C for L3. And follow "House(K) → Grid(L)" direction to do the connection. Otherwise there will be an error reminded by APP.

3.1 WIFI CONFIGURATION

- This part shows configuration on web page.
- Wi-Fi configuration is absolutely necessary for online monitoring and after-sales maintenance.

PREPARATION:

1. Inverter must be powered up with Battery or grid power.
2. Need a router with available internet access to GoodWe portal <https://www.semsportal.com>

Step 1

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

Step 2

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

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

Cannot join the network, may be caused by:
router doesn't exist, or signal is too weak, or password is incorrect

★ **Help:** Wizard will help you to complete setting within one minute.

Start Setup

Please select your current wireless network:

SSID	Sec mode	Enc type	Channel	RSSI
WiFi Test	WAP2-PSK	AES	6	54%

- ★ **Note:** When RSSI of the selected WiFi Network is lower than 10%, the connection may be unstable, please select other available network or shorten the distance between the device and the router.
If your wireless router does not broadcast SSID, please click "Next" and add a wireless network manually.
- Back** **Next**

Step 3

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

Add wireless network manually

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

Please enter the wireless network password:

Password (8-63 bytes)	hellogoodwe
-----------------------	-------------

show psk

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

Back **Next**

Save success!

Click 'Complete', the current configuration will take effect after restart.

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

Configuration is completed, you can log on the Management page to restart device by Click on 'OK' button.

Confirm to complete?

Back **Complete**

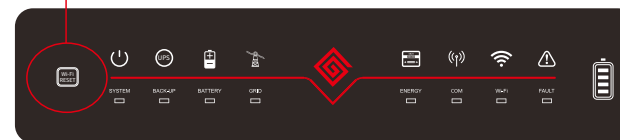
Note:

1. Please make sure the password, Encryption Method/Algorithm is right the same with the router's.
2. If everything is right well, the Wi-Fi LED on inverter will change from double blink to quartic blink then to solid status, which means Wi-Fi is connected to GoodWe server successfully.
3. Wi-Fi configuration could also be done on PV Master, 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 Button



Wi-Fi Reset

short press Reset button
Wi-Fi Led will blink for a few seconds

Wi-Fi Reload

long press Reset button (longer than 3s)
Wi-Fi Led will double blink until doing Wi-Fi configuration again.

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 OPERATION

PV Master is an external monitoring/ configuration application for GoodWe hybrid inverters, used on smart phones or pad for both Android and iOS system, main functions as below:

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

Please download PV Master OPERATION INSTRUCTIONS from <https://en.goodwe.com/>



3.3 CEI AUTO-TEST FUNCTION

PV Auto-Test function of CEI is integrated in PV Master APP for Italy safety country requirement. For detailed instruction of this function please refer to PV Master Operation Instructions.

4.1 ERROR MESSAGE AND TROUBLESHOOTINGS

• ERROR MESSAGE

The error message below will be displayed on PV Master APP or reported by Email if the error really happens.

ERROR MESSAGE	EXPLANATION	REASON	SOLUTIONS
Utility Phase Failure	The sequence of On-grid wire is wrong	Inverter detects that phase angle of L2 and L3 are reversed	Reverse connection order of L2 and L3 cable
Utility Loss	Not available of public grid power (power lost or on-grid connection fails)	Inverter does not detect the connection of grid	<ol style="list-style-type: none"> 1. Check (use multi-meter) if AC side has voltage. Make sure grid power is available. 2. Make sure AC cables are connected tightly and right 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	<ol style="list-style-type: none"> 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) <ol style="list-style-type: none"> a. if AC voltage is high, then make sure AC cable complies with that required 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 Efficiency is not within permissible range	Inverter detects that Grid frequency is beyond the normal range required by the safety country	<ol style="list-style-type: none"> 1. Make sure safety country of the inverter is set right. 2. If safety country is right, then please check on inverter display if AC frequency (Fac) is within a normal range. 3. If FAC failure only appear a few times and resolved soon, it should be caused by occasional grid frequency instability.
BAT Over Voltage	BAT voltage is too high	The battery voltage is higher than the max BAT input voltage of the inverter.	Check battery voltage is lower than Max Battery Input Voltage of the inverter. If voltage of Battery is high, please reduce battery module.
Over Temperature	Temperature inside of the inverter is too high	Inverter working environment leads to a high temperature condition	<ol style="list-style-type: none"> 1. Try to decrease surrounding temperature. 2. Make sure the installation complies with the instruction on inverter user manual. 3. Try to close inverter for 15 mins, then start up again.
Isolation Failure	Ground insulation impedance of Battery is too low	Isolation failure could be caused by multi reasons like Battery are not grounded well, DC cable is broken, battery are aged or surrounding humidity is comparatively heavy, etc.	<ol style="list-style-type: none"> 1. Use multi meter to check if the resistance between earth & inverter frame is about zero. If it's not, Please make the connection between earth & inverter frame well. 2. If the humidity is very high, there maybe Isolation Failure occur. 3. Check the resistance between BAT to earth, if the resistance is lower than 33.3k, check the system wiring connection. 4. Try to restart the inverter, check if the fault is still happens, if not, means it is just an occasional situation, or contact GoodWe.
Ground Failure	Ground leakage current is over-high	Ground I failure could be caused by multi reasons like neutral cable on AC side is not connected well or surrounding humidity is comparative heavy, etc.	Check (use multi-meter) if there is voltage (normally should be close to 0V) between earth & inverter frame. If there is a voltage, it means the neutral & ground cable are not connected well on AC side. If it happened only at early morning, dawn or on rainy days with higher air humidity, and recover soon, it should be normal.
Relay Check Failure	Self checking of relay fails	Neutral & ground cable are not connected well on AC side or just occasional failure	Check (use multi-meter) 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 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 happens. If not, it is just an occasional situation. Otherwise, contact GoodWe immediately.
EEPROM R/W Failure	/	Caused by a strong external magnetic field etc.	Try to restart inverter, check if it still happens. If not, it is just an occasional situation. Otherwise, contact GoodWe immediately.
SPI Failure	Internal communication fails	Caused by a strong external magnetic field etc.	Try to restart inverter, check if it still happens. If not, it is just an occasional situation. Otherwise, contact GoodWe immediately.
DC Bus High	BUS voltage is over-high	/	Try to restart inverter, check if it still happens. If not, it is just an occasional situation. Otherwise, contact GoodWe immediately.
Back-Up Over Load	Back-up side is over loaded	Total Back-Up load power is higher than the nominal backup 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).

• TROUBLE SHOOTINGS

Checking Before Turning On AC power

- **Battery Connection:** Confirm the connection between BT and battery : polarities (+/-) not reversed, refer to Figure 4.1-1
- **On-Grid & Back-Up Connection:** Confirm ON-GRID connected to power grid and Back-Up to loads: polarity (L1/L2/L3/N) not reversed, refer to Figure 4.1-2.
- **Smart Meter & CT Connection:** Make sure Smart Meter & CT are connected between house loads and grid, follow the Smart Meter direction sign on CT, refer to Figure 4.1-3.

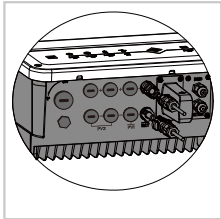


Figure 4.1-1

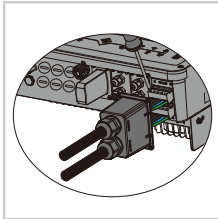


Figure 4.1-2

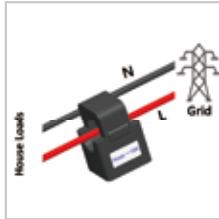
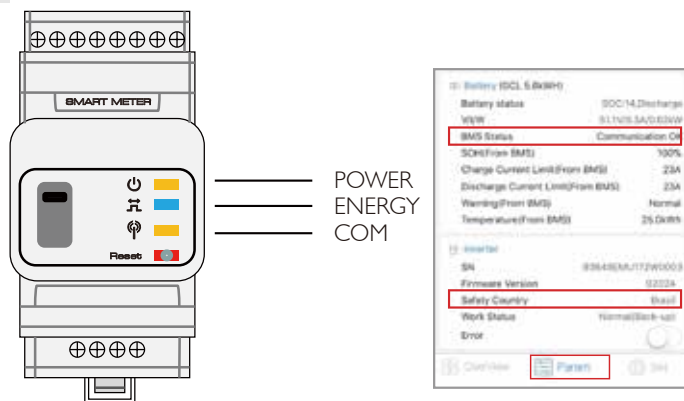


Figure 4.1-3

Checking as Start BT up and Turn On AC power

- **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, please set it right in "Set" .(Figure 4.1-4)

Figure 4.1-4



Note:

For compatible lithium batteries, BMS status is "communication OK" after selecting the right battery company.

Problems During Operation

BT not Start Up With Only Battery

Solution:

Make sure the voltage of battery is higher than 180V, otherwise battery cannot start BT up

High Power Fluctuation on Battery Charge or Discharge:

Solution:

Check if there is a fluctuation on load power.

Battery Does Not Charge:

Solution:

1. Make sure BMS communication is OK on PV Master.
2. Check if CT connected in the right position and to right direction as on the user manual page 12
3. Check if the total load power is much higher than PV power.

Operation & Answers (Q & A)

About Wi-Fi Configuration

Q: Why cannot see Solar-WiFi* signal on mobile devices

A: Normally Solar-WiFi* signal could be searched right after inverter powered up. But Solar-WiFi signal will disappear when BT connected to internet. If need to change settings, can connect to the router to change. If cannot see Wi-Fi signal even not connect to router, then please try to reload Wi-Fi (please refer to BT user manual page 17).

Q: Why cannot connect Solar-WiFi* signal on my phone?

A: It is the character of the Wi-Fi module that it can connect to only one device at a time. If the signal is connected to another device at the time for some reason, then you cannot connect to the signal.

About Battery Operation

Q: Why battery does not discharge when grid is not available, while it discharges 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 there is no output on Back-Up side?

A: For Back-Up supply, the "Back-Up Supply" on PV Master App must be turned on. Under Off-Grid mode or grid power is disconnected, "Off-Grid Output Switch" function must be turned on as well.

Note: As turn "Off-Grid Output Switch" on, don't restart inverter or battery, otherwise the function will switch off automatically.

Q: On Portal, why battery SOC has a sudden jump up to 95%?

A: This normally happens on when BMS communication fail on lithium. If battery enter float charge, SOC will be reset to 95% compulsively.

Q: Why battery cannot be fully charged to 100%?

A: Battery will stop charge when battery voltage reaches charge voltage set on PV Master APP.

Q: Why battery switch always trip when starts it up (Lithium battery)?

A: The switch of lithium battery normally trips for following reasons:

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

Q: Which battery should I use for BT?

A: For BT series inverter, it could connect lithium batteries which have compatibility with BT series inverter with nominal voltage from 180V to 600V. Compatible lithium batteries can see on battery list in PV Master APP .

About PV Master Operation and Monitoring

Q: Why Cannot save settings on PV Master App

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

1. Make sure you connected Solar-WiFi* (make sure no other devices connected) or router (if connected Solar-WiFi* to router) and on APP home page shows connection well.
2. Make sure restart inverter 10mins later after you do some settings because inverter will save settings every 10 mins under normal mode. We recommend you change setting parameters when inverter under waiting mode.

Q: On the App, why the data on the homepage and Param page is different, like charge/discharge, PV value, load value or grid value?

A: As the data on APP is from inverter and on home page and Param page, the data refresh frequency is different, so there will be a data inconformity between different pages on APP as well as between that on portal and APP .

Q: On 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 because communication problem, such as battery communication, and communication between inverter and the APP.

About Smart Meter and Power Limit Function

Q: How to Act Output Power Limit function?

A: For BT system, the function could be realized by:

1. Make sure Smart Meter connection and communication well.
2. Turn on Export Power Limit function and set the max output power to grid on APP.

Note: If out-put power limit set as 0W, then there might still have deviation max 100W exporting to grid.

Q: Why there is still power exporting to grid after I set power limit as 0W?

A: Export limit could theoretically to minimum 0W, but there will have a deviation of around 50-100W for BT system.

Q: Can I use other brand Meter to take over Smart Meter in BT system or change some settings on Smart Meter?

A: No, because the communication protocol is inset between inverter and Smart Meter, other brand Meter cannot communicate. Also any manual setting change could cause 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 BT QUICK INSTALLATION INSTRUCTIONS and PV MASTER APP INSTRUCTION.

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

A: Please refer to user manual on page 12.

Q: Whether the warranty of the inverter still valid if the installation or operation does not follow the user manual instructions, for some special conditions when we cannot 100% follow them?

A: Normally if any problem caused by disobeys the instructions on user manual, we can provide technical support to help to solve the problem, but cannot guarantee a replacement or returns. So if there is any special conditions when you cannot 100% follow the instructions, please contact GoodWe for suggestions.

4.2 DISCLAIMER

The BT series inverters are transported, used and operated under environmental and electrical conditions. GoodWe has the right not providing after-sales services or assistance under following conditions:

- Inverter is damaged during transferring.
- Inverter is out of warranty year and extended warranty is not bought.
- Inverter is installed, refitted or operated in improper ways without authority from GoodWe.
- Inverter is installed or used under improper environment or technical condition mentioned in this user manual, without authority from GoodWe.
- Installation or configuration of the inverter does not follow requirements mentioned in this user manual.
- The inverter is installed or operated against the requirements or warnings that are mentioned in this user manual.
- Inverter is broken or damaged by any force majeure like lightning, earthquake, fire hazard, storm and volcanic eruption etc.
- Inverter is disassembled, changed or updated on software or hardware without authority from GoodWe.
- 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.

Note: GoodWe will keep right to explain all the contents in this user manual. To insure IP65, inverter must be sealed well, please install the inverters in one day after unpacking, otherwise please seal all unused terminals/holes, not allowed to keep any terminals/holes open, confirm there is no risk to have water & dust in.

Maintenance

The inverter requires periodically maintenance, details as below:

- Make sure inverter is totally isolated from all DC and AC power for at least 5 mins before maintenance.
- Heat sink: Please use 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.

4.3 TECHNICAL PARAMETERS AND CERTIFICATES

• TECHNICAL PARAMETERS OF BT INVERTERS

Technical Data	GW5K-BT	GW6K-BT	GW8K-BT	GW10K-BT
Battery Input Data				
Battery Type	Li-Ion			
Battery Voltage Range (V)	180~600			
Max. Charging Current (A)	25			
Max. Discharging Current (A)	25			
Charging Strategy for Li-Ion Battery	Self-adaption to BMS			
AC Output Data (On-grid)				
Nominal Apparent Power Output to Utility Grid (VA)	5000	6000	8000	10000
Max. Apparent Power Output to Utility Grid (VA) *	5500	6600	8800	11000
Max. Apparent Power from Utility Grid (VA)	10000	12000	15000	15000
Nominal Output Voltage (V)	400/380, 3L/N/PE			
Nominal Output frequency (Hz)	50/60			
Max. AC Current Output to Utility Grid (A)	8.5	10.5	13.5	16.5
Max. AC Current From Utility Grid (A)	15.2	18.2	22.7	22.7
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)			
Output THDi (@Nominal Output)	<3%			
AC Output Data (Back-up)				
Max. Output Apparent Power (VA)	5000	6000	8000	10000
Peak Output Apparent Power (VA) **	10000, 60sec	12000, 60sec	15000, 60sec	15000, 60sec
Max. Output Current (A)	8.5	10.5	13.5	16.5
Nominal Output Voltage (V)	400/380			
Nominal Output Frequency (Hz)	50/60			
Output THDv (@Linear Load)	<3%			
Efficiency				
Max. Battery to Load Efficiency	97.6%			
Max. Charge Efficiency	97.6%			
Protection				
Anti-islanding Protection	Integrated			
Insulation Resistor Detection	Integrated			
Residual Current Monitoring Unit	Integrated			
Output Over Current Protection	Integrated			
Output Short Protection	Integrated			
Battery Input Reverse Polarity Protection	Integrated			
Output Over Voltage Protection	Integrated			
General Data				
Operating Temperature Range (°C)	-35~60			
Relative Humidity	0~95%			
Operating Altitude (m)	≤4000			
Cooling	Nature Convection			
Noise (dB)	<30			
User Interface	LED & APP			
Communication with BMS	RS485; CAN(***)			
Communication with Meter	RS485			
Communication with EMS	RS485 (Insulated)			
Communication with Portal	Wi-Fi;LAN			
Weight (kg)	21			
Size (Width*Height*Depth mm)	516*415*180			
Mounting	Wall Bracket			
Protection Degree	IP65			
Standby Self Consumption (W) ****	<15			
Topology	Transformerless			
Certifications & Standards				
Grid Regulation	CEI 0-21; VDE-AR-N 4105; G98/1; G100; EN 50438			
Safety Regulation	IEC/EN 62477			
EMC	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN61000-4-16, EN61000-4-18, EN61000-4-29			

* According to the local grid regulation

** Can be reached only if battery capacity is enough, otherwise will shut down.

*** CAN communication is configured by default. If 485 communication is used, please replace the corresponding communication line.

**** No Back-up Output

• **CERTIFICATES OF BT SERIES**



G100 CEI 0-2I VDE 0126-1-1 VDE-AR-N 4105 EN 50438

• **OTHER TEST**

For Austria requirements, in the THDi test, there should add Zref 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

4.4 WARNING QUICK CHECK LIST

[1] Inverter cannot be installed near flammable, explosive or strong electro-magnetic equipment, page 06

[2] Remember that this inverter is heavy! Please be careful when lifting out from the package, page 07

[3] Make sure battery breaker is off and battery nominal voltage meet BH specification before connecting battery to inverter and make sure inverter is totally isolated from PV and AC power, page 09

[4] Make sure inverter is totally isolated from any DC or AC power before connecting AC cable, page 11

[5] Make sure AC cable is totally isolated from AC power before connecting Smart Meter & CT, page 13

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 and 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

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

Environment Category Definition

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

Pollution Degree Definition

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