

GBL5.8K3



Emergency
Power Back-up



Flexible
Installation



Cost-
effective



Scalable



Peak Load
Shifting

About this manual

This manual is intended for the GS Energy GBL5.8K3 Energy Storage battery, but the hybrid inverter and any other equipment is not included. The GS Energy hot line +86-574-65292531 and <https://www.gsmarte.com/> are both available if you want to get additional information.

Statement

Compliant to Best Practice Guide for Battery Storage Equipment—Electrical Safety Requirements- version 1- Pre-assembled integrated battery energy storage system equipment – Method 1 mandatory requirements and Optional requirement.

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1. Safety introduction

1.1 Important Safety Instructions








This manual contains important instructions for:

GBL5.8K3 Energy Storage product and this manual must be followed when installing and using this product.

The product is designed and tested in accordance with international safety requirements IEC 60364, but as with all electrical and electronic equipment, certain precautions must be observed when installing and/or operating the product. To reduce the risk of personal injury and ensure the safe installation and operation of the product, you must carefully read and follow all instructions, cautions and warnings in this manual.

1.2 Warnings in this Document

A warning describes a hazard to equipment or personnel. It calls attention to a procedure or practice, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the GS Energy equipment and/or other equipment connected to the GS Energy equipment or personal injury.

Symbol	Description
	Caution, risk of electric shock
	Heavy enough may cause severe injury
	Keep the battery away from open flame or ignition sources
	Keep the battery away from children
	Do not dispose of the product with household waste
	Recycling
	Read this manual before installation and operation

For safety reasons, installers are responsible for familiarizing themselves with the contents of this manual and all warnings before performing installation.

1.3 Battery handling guide

- Use the battery pack only as directed.
- If the battery defective, appears cracked, broken or otherwise damaged, or fails to operate, contract the GS Energy hot line immediately.
- Do not attempt to open, disassemble, repair, tamper with, or modify the battery. The battery pack is not user serviceable.
- To protect the battery and its components from damage when transporting, handle with care.

- Do not subject it to any strong force.
- Do not insert foreign objects into any part of the battery pack.
- Do not use cleaning solvents to clean the battery.
- The battery shall not be connected directly to SELV circuit.

1.4 Response to emergency situations

The GS Energy battery is designed with multiple safety strategies to prevent hazards resulting from failures. However, GS Energy cannot guarantee their absolute safety for uncertain situations.

1.4.1 Leaking batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If one is exposed to the leaked substance, do these actions:

Inhalation: Evacuate the contaminated area, and seek medical attention immediately.

Eyes contact: Rinse eyes with flowing water for 15 minutes, and seek medical attention immediately.

Skin contact: Wash the affected area thoroughly with soap and water, and seek medical attention immediately.

Ingestion: Induce vomiting as soon as possible, and seek medical attention immediately.



1.4.2 Fire

In case of a fire, make sure that an ABC or carbon dioxide extinguisher is nearby and does not use water to extinguish the fire.

WARNING

The battery pack may catch fire when heated above 150°C.

If a fire breaks out where the battery is installed, do these actions:

1. Extinguish the fire before the battery catches fire.
2. If the battery has caught fire, do not try to extinguish the fire. Evacuate people immediately.

WARNING

If the battery catches fire, it will produce poisonous gases. Do not approach.

1.4.3 Wet battery

If the battery is wet or submerged in water, do not try to access it. Contact hot line or your distributor for technical assistance.

1.4.4 Damaged battery

If the battery damaged, please contract GS Energy hot line or your distributor for help as soon as possible, because damaged battery is dangerous and must be handled with extreme caution. Damaged battery is not suit for use and may pose a danger to people or property. If the battery seems to be damaged, return it to GS Energy or your distributor.

CAUTION

Damaged battery might export electrolyte or flammable gas, so contact GS Energy for advice and information immediately we will deal with it within 48h.

1.5 Installers

GS Energy Storage battery is suggested installing by skilled worker or electrician. A skilled worker is defined as a people who had been trained and qualified electrician or had all of the following skills and experience:

- Knowledge of the functional principles and operation of on-grid Energy Storage systems.
- Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.
- Knowledge of the installation of electrical devices
- Knowledge of and adherence to this manual and all safety precautions and best practices.

1.6 Scrap battery

For scrap battery(-ies), please treat with local laws or regulations to recycle or scrap.

1.7 Contact information

Use the contacts below for technical assistance. This phone numbers is available only during business hours on weekdays.

China

Phone number: +86-574-65292531

Address: No.20 Meishen Road, Meilin Street, Ninghai
County, Ningbo City, Zhejiang Province, China

E-mail: service@gsmarte.com

2. Product Introduction

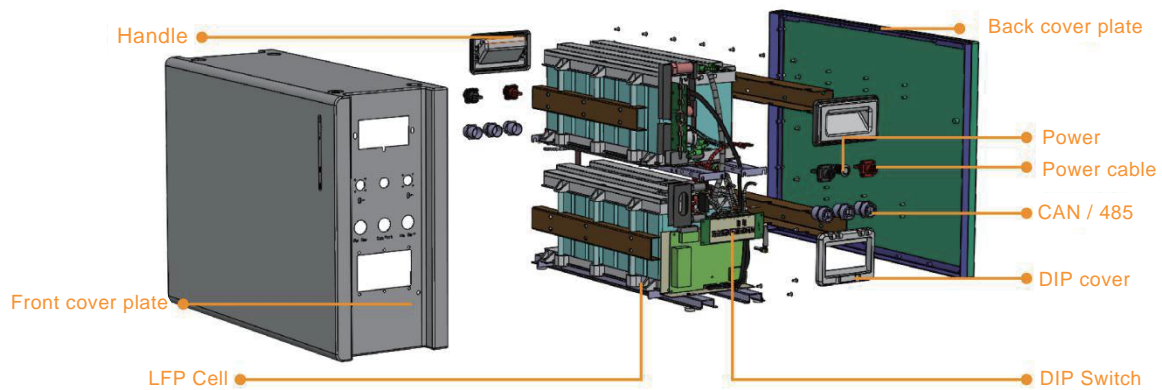
2.1 Technical dat

Model	GBL5.8K3(LFP)
Total energy (kWh)	5.8kWh
Usable energy (kWh)	5.3kWh
Nominal charge/discharge power	2.75 kW
Peak power(Only discharge)	7kW for 5 seconds
Constant current(Only discharge)	100A
Maximum charge power	2.75kW
Maximum discharge power	2.75kW
Maximum charge current	57A
Maximum discharge current	57A
Fault current	Charge 100A >3s, Discharge 135A >3s
Voltage	42~54Vd.c
Nominal voltage	48Vd.c
Nominal current	57A
Max.charge voltage	54Vd.c
Weight (kg)	70kg
Dimensions (W*H*D) (mm)	650*480*256mm
Max. recommended DOD	90%
Operating condition	Indoor or outdoor
Operating temperature	From-10~50 C
Humidity	4~100% (No condensed water)
Pollution degree	3
Over voltage category	II
Cooling type	Natural cooling
Installation	Free standing/Wall mounting
IP rating	IP 65
Protective class	I
Max.number of parallel connection	4
Warranty	10 Years Battery Warranty
Design Life	>15 years
Communication	CAN/RS485

Testing conditions based on temperature 25°C at the beginning of life.

*Total Energy/Usable Energy measured under specific conditions from GS Energy0.2C CC-CV.

2.2 Exploded views of battery



2.3 Indicator and ports

2.3.1 Indicator

There are four LED indicators on the front of the battery to show its operating status.

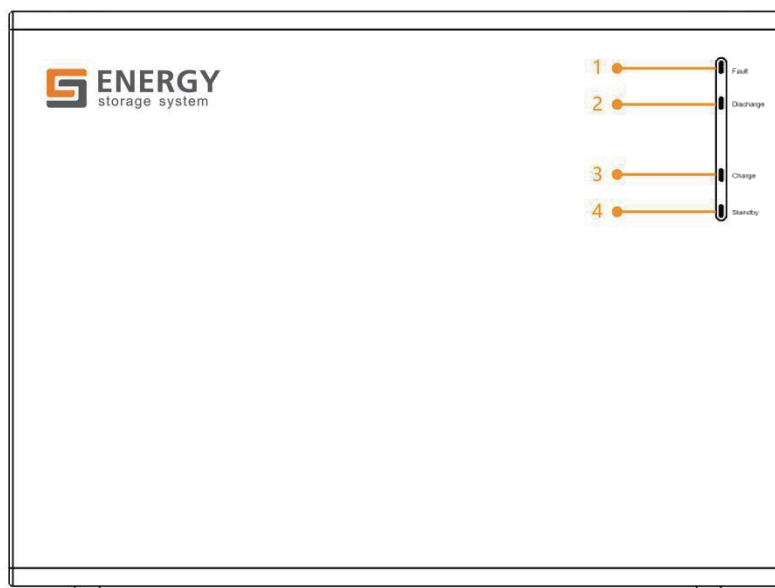
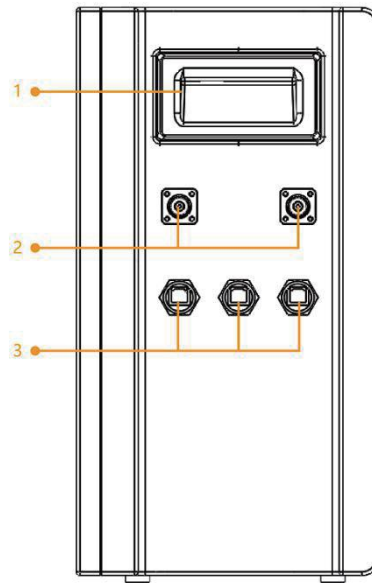


Table 2-1 Designations on the battery

Item	Designation	Definition
1	Fault	Battery no power output or input
2	Discharge	Battery is charging
3	Charge	Battery is discharging
4	Standby	Battery is in a warning state, see troubleshooting in Chapter 6

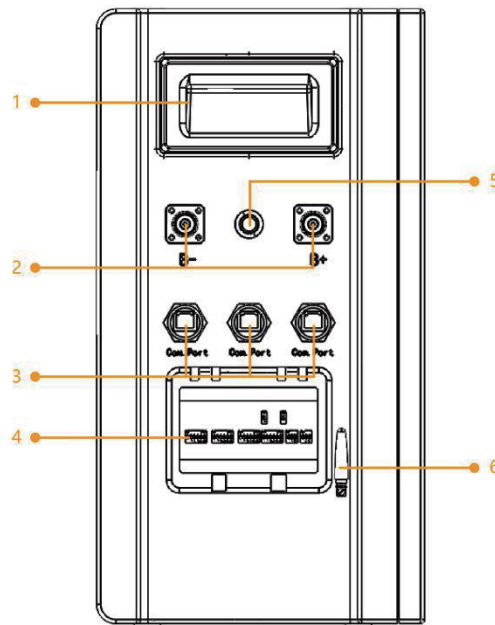
2.3.2 Ports

2.3.2.1 The left side of power cable connectors and communication cable



1. Handle
2. Power cable sockets
3. CAN/485

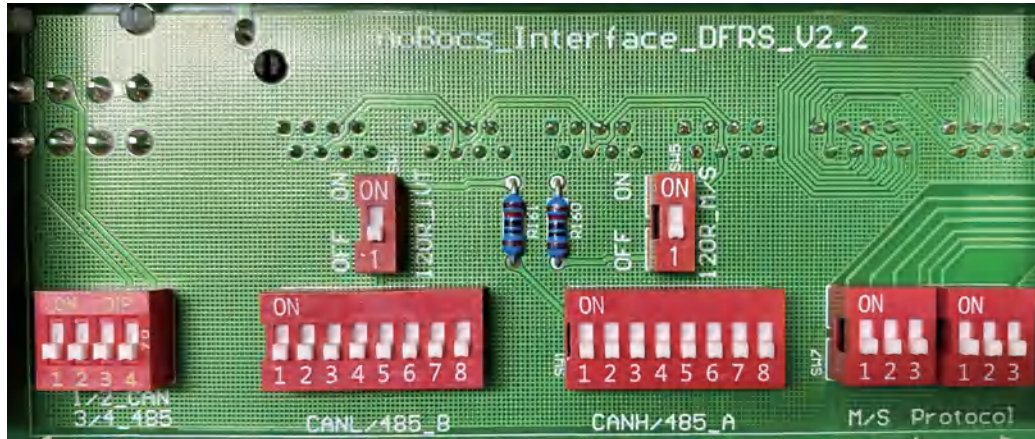
2.3.2.2 The right side of power cable connectors and communication cable



1. Handle
2. Power cable sockets
3. CAN/485

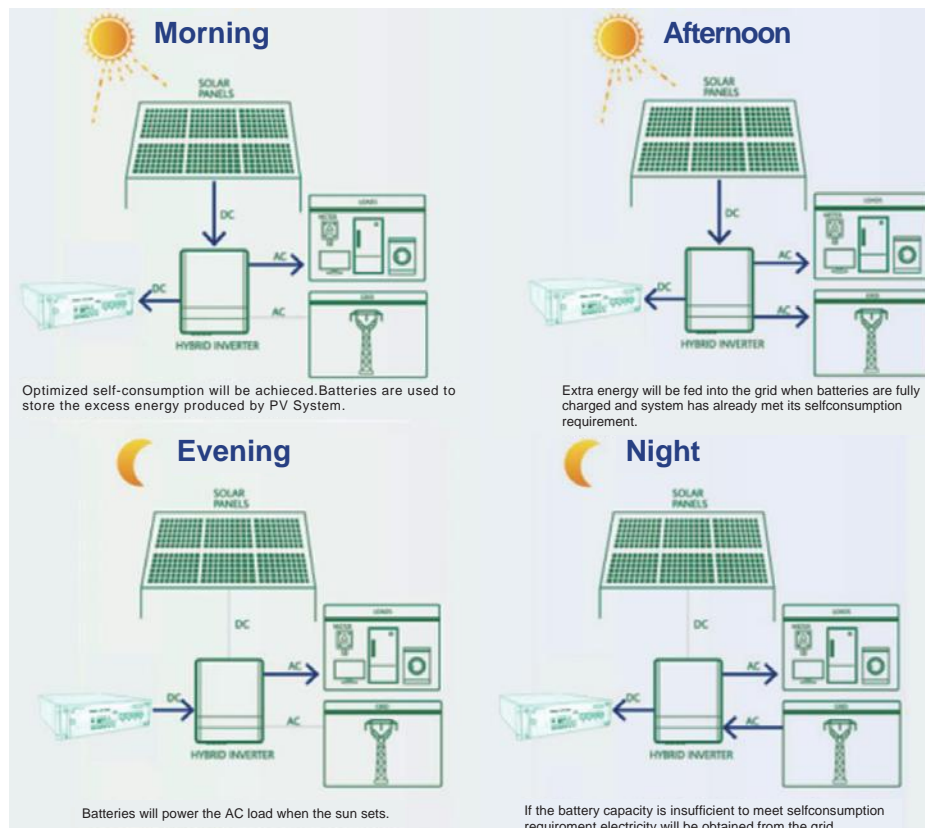
4. DIP Switch
5. Power ON/OFF
6. WIFI Sticker

2.4 Communication interface plat (DVC-A2 voltage)



J2	Communication interface for battery or master battery with Inverter
J3&J4	Communication interfaces for batteries between parallel connected batteries
SW1&SW2&SW3	DIP switches for CAN and RS485, see part 6.2
SW4	DIP switch select for CAN or RS485
SW7	DIP switch select for master and slave battery, see part 6.1
SW8	DIP switch to select default protocol type, 0002 is the default configuration

2.5 How it works



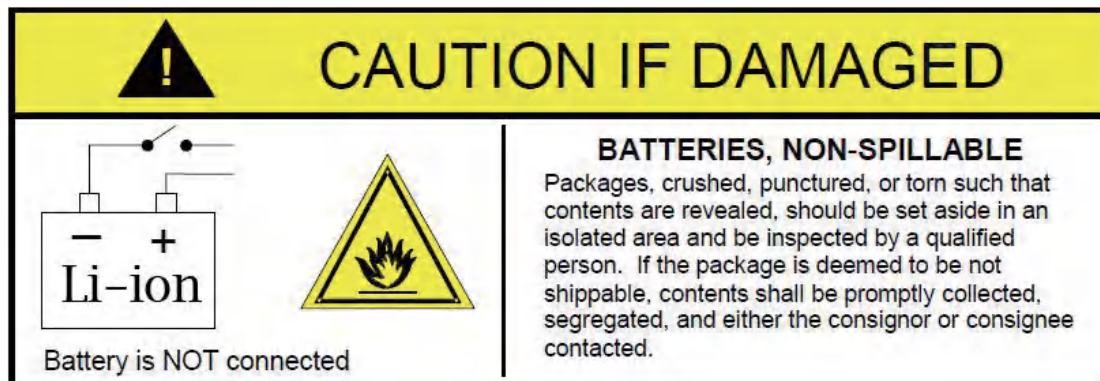
2.6 Feature

The GS Energy Storage battery has following features:

- **Energy storage unit:** This battery is suit for photovoltaic system compatibility.
- **Battery management system (BMS):** The battery built-in BMS monitors its operation and prevents the battery from operating outside design limitations.
- **Expandability:** The battery capacity can be increased by adding another battery. See **part 5.6 Parallel connection** on page 20.

3. Guidance for disconnection of batteries during shipment

- 3.1 GBL5.8K3 is not suit for air transport.
- 3.2 Cartons that have been crushed, punctured, or torn in such a way that contents are revealed shall be set aside in an isolated area and inspected by a skilled person. If the package is deemed to be not shippable, the contents shall be promptly collected, segregated, and either the consignor or consignee contacted.
- 3.3 An additional DC breaker of GS Energy GBL5.8K3 battery is in the packaging. It should be connected by skilled installer before use.
- 3.4 A precautionary label had been affixed to the shipping carton to alert individuals as to the battery within the package have been disconnected; otherwise, the battery should not be transported.
- 3.5 We have conducted comprehensive tests to ensure the equipment they distribute around the world is safe for shipping transport. These products shall be handled with care and immediately inspected if visibly damaged. If the cartoon visibly damaged, please contract with GS Energy hot line to confirm whether the battery could be used safely or not.



4. Installation Prerequisites

4.1 Installation location

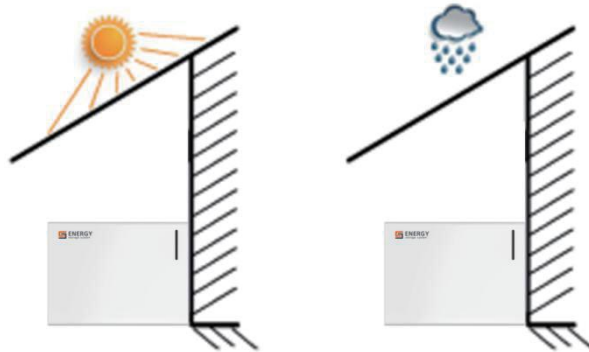
Make sure that the installation location meets the following conditions:

- The building is designed to withstand earthquakes.
- Far away from the sea to avoid salt water and humidity.
- The floor is flat and level.
- No flammable or explosive materials nearby.

- Optimal ambient temperature is between 15 °C and 30°C.
- Temperature and humidity stays at a constant level.
- Minimal dust and dirt in the area.
- No corrosive gases present, including ammonia and acid vapor.

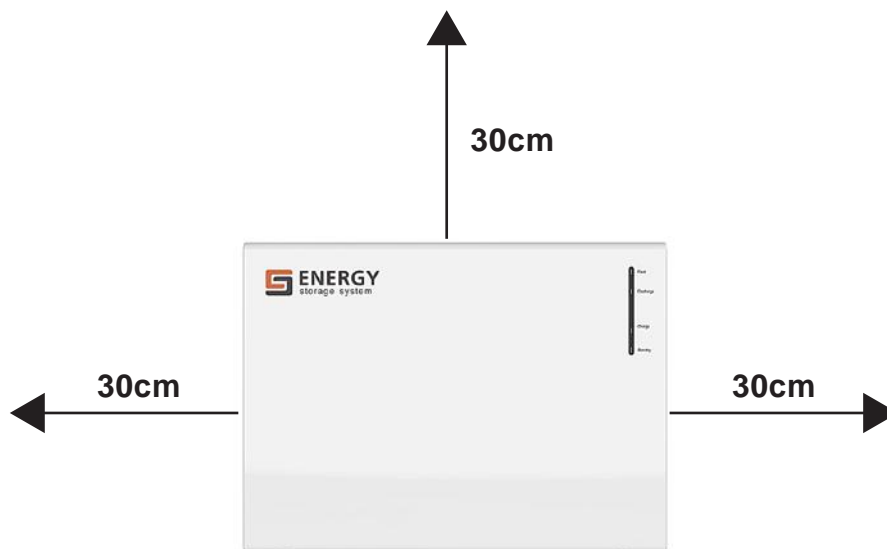
The GS Energy battery is rated at IP65, so the battery could be installed outdoors as well as indoors.

But if installed outdoors, do not allow the battery to be exposed to direct sunlight or moisture.



If the ambient temperature is outside the operating range, battery will protect itself by shutting down. The battery optimal operate temperature is 15°C to 30°C. Frequent exposure to severe operating condition would exacerbate the performance and lifetime of the battery.

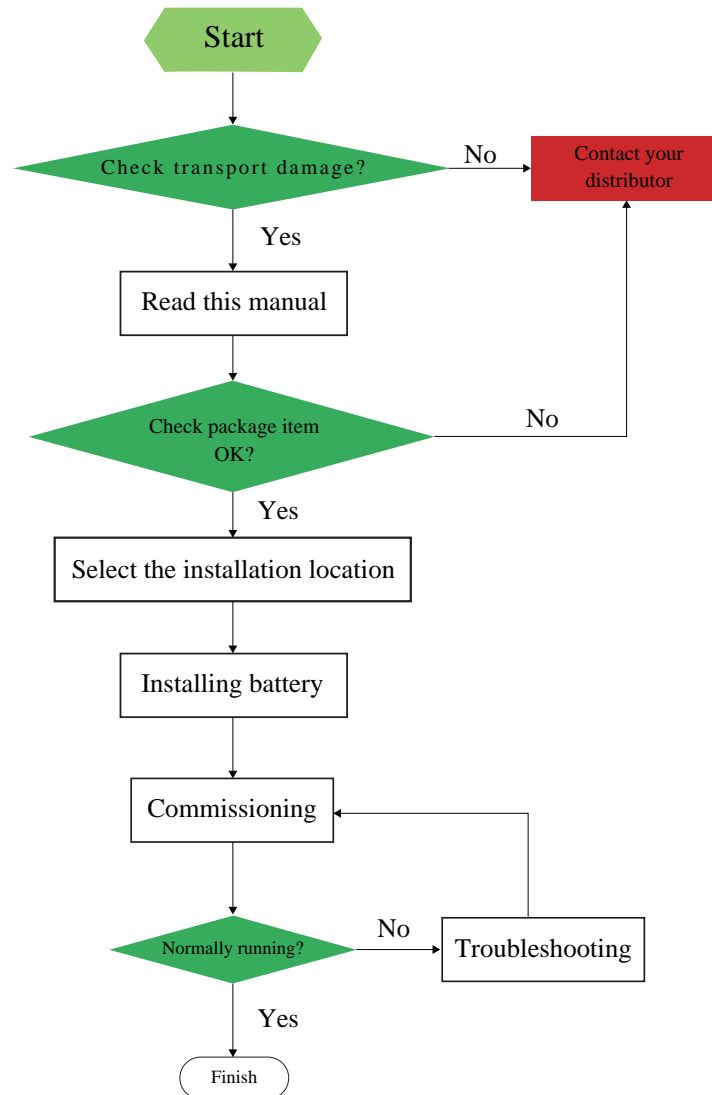
4.2 Installation clearance



4.3 Installation process

The battery should be installed according to the following flow chart. The detail

installation process described in chapter 4 Install process.



4.4 Installation materials

Following installation materials should be prepared by installers.

- Power cable
- Data cable
- Ground wire
- RJ45 plug
- Bipolar external isolator (must be installed), when two or more battery systems in parallel, each of them shall have a bipolar isolator.

NOTICE

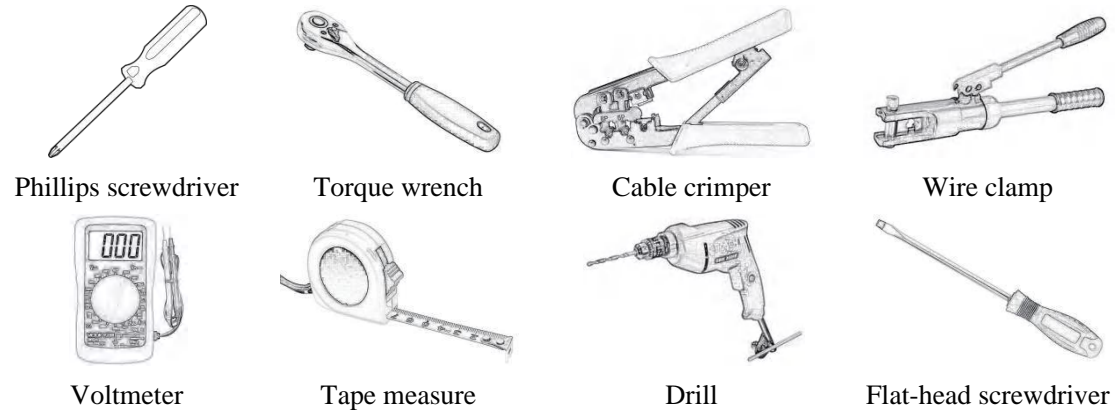
Make sure the cross-sectional area of charging cables is 25 to 35 mm².

NOTICE

A bipolar breaker between GS Energy battery and inverter was required to install, and the breaker's min. current should be over 150A or following with local regulations.

4.5 Tools

To install the battery pack, those following tools are required:



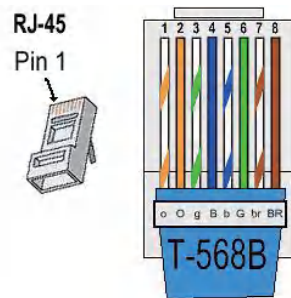
In order to protect operator and installer's safety, please select and use suitable tools and measuring instruments that are certified for precision and accuracy.

4.6 Safety instruments

When dealing with the battery, following safety gears should be equipped. Installers must meet the relevant requirements of IEC 60364 or the domestic legislation and other relevant international standards.



4.7 Making network cable



The network cable between GS Energy battery and inverter should be made like that diagram. If available, use a LAN cable tester to see whether the cable is faulty.

4.8 Storage

If the battery is not to be installed immediately, or removed from operation and needs to be stored for a long period, please choose an appropriate location to store it.

Instructions for storage are:

- Do not stack more than four battery boxes.
- The temperature of battery stored recommended in the range of -20°C to 45°C.
- Do not expose to water

The battery box should be upright as shown in the following figure and not stacked upside down when storing the battery box.



If the battery needs to be stored over 3 months, the main breaker of battery suggests be disconnecting. Otherwise, the battery would discharge at a minimum rate and capacity degrades depended on storage time, the battery self-consumption less than 5w. And, if the battery stored over 6 months, it is suggested to connect the battery with inverter and commission the system.

5. Battery Installation

5.1 Unpacking

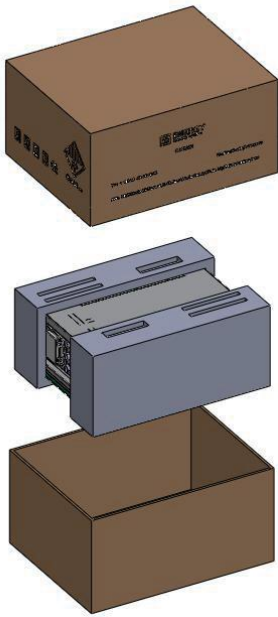
WARNING

The battery is 69kg and it is too heavy for one to carry. Make sure that two or more persons are available.

1. Cut the packing belt and remove the packing box top cover.



2. Take out the battery.



3. Pull out the battery pack and stand it upright. Check if the battery pack is damaged.

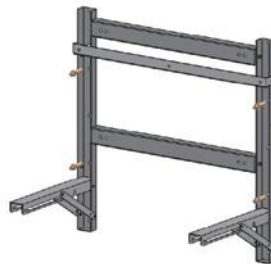


5.2 Package items

These items are included in the package.



Battery*1



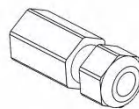
Bracket*1



Screw anchors M6*4



Screws M5*2



Waterproof terminal*1



Data cable*1

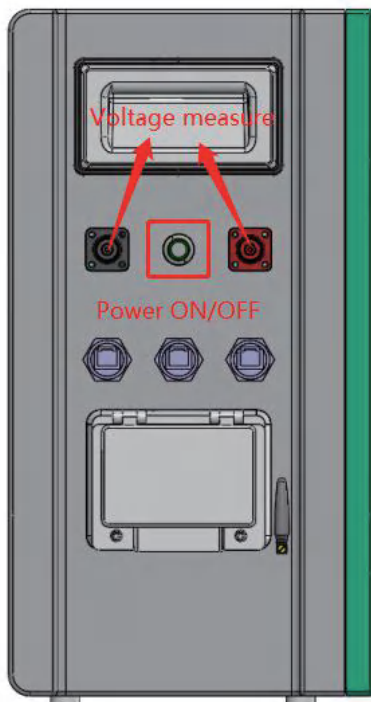
5.3 Checks before installation

There are a few things to check before installing the battery to ensure that it has no defects.

Check item : Check the battery voltage.

WARNING

If this checking process is executed for any reason after the battery is fully installed, make sure that the inverter is turned off or break the connection between battery and inverter while checking the battery.




Press and hold the Power ON/OFF button for about 4s and then release it after the two LED lights on, measure the voltage at the terminal interface with a voltmeter. If the voltage is lower than 48 V, do not use the battery and contact hot line +86-574-65292531 or your distributor.

5.4 Installation the battery

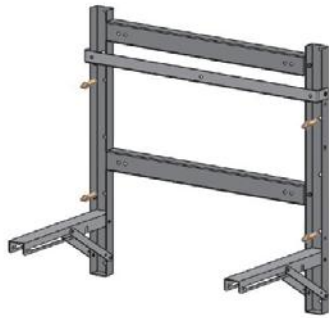
To prevent the battery from moving, make sure the battery fixed to a wall.

NOTICE

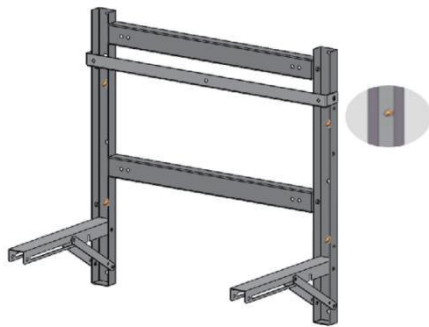
 The symbol located on the back cover plate, and the earth wire between battery and inverter is not compulsive but recommended.

NOTICE

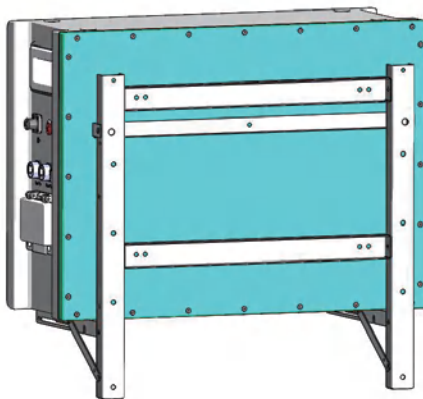
If the battery is installed above the floor or on a platform, make sure that the wall or platform is capable of supporting the battery's weight.



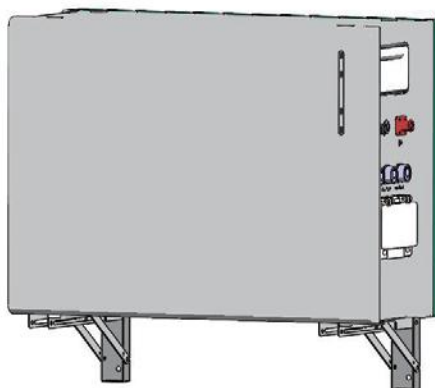
1. Determine bracket mounting place to be fixed using the bracket.
2. Drill holes in the wall for the M6 (0.25 in) screw anchors, and the hole depth should be at least 50 mm.



3. Drive the screw anchors through the mounting bracket into the holes.
4. Tighten the screws to a torque of 2.5 N·m.



5. Fasten the mounting beam to battery.



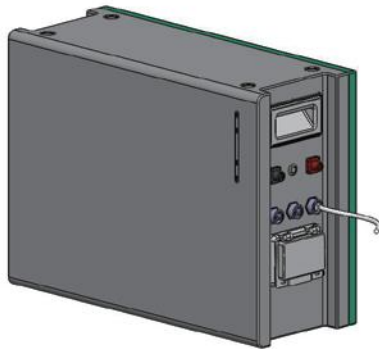
6. Fixing the battery to bracket with screws.

5.5 Cable connections

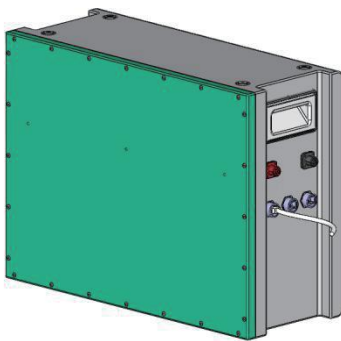
WARNING

Before connecting battery with inverter, please make sure that no inverter connected or the inverter turned off.

5.5.1 Connect the communication cable from inverter

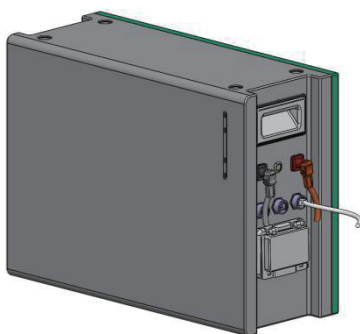


or

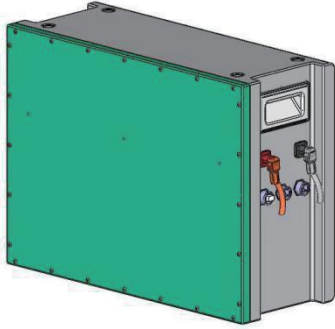


Plug in the communication cable from inverter to the CAN/485 port. The ports on both sides of battery are optionally used.

5.5.2 Connecting the power cables for battery



Take off the covers of power cable sockets, then plug in a pair of power cables (to inverter) into them through the correct positive and negative directions, and the sockets on both sides of battery are optionally used.

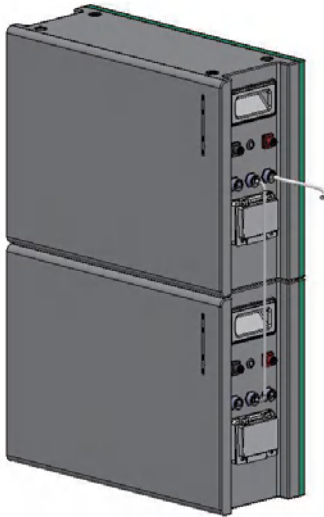


CAUTION

Pay attention not to reverse polarity. Connection with reversed polarity will cause severe damage to the battery and even fire.

5.6 Parallel connection

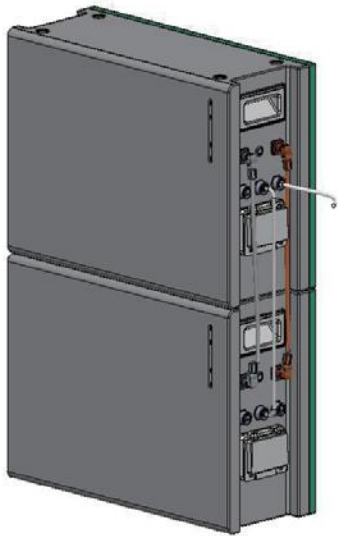
5.6.1 Communication cable connect between batteries



Plug in an additional communication cable between two batteries. The ports on both sides of battery are optionally used.



5.6.2 Power cables connect between batteries



Take off the covers of the other side power sockets, and plug in another pair of power cables to the sockets between two batteries, positive to positive, and negative to negative.



CAUTION

GBL5.8K3 energy storage battery only could be used by **parallel mode** if two or more batteries installed.

NOTICE

Before two or more batteries installed in parallel, please check the voltage of each battery and make sure the voltage different less than 1.0V.

6. Configuration

DIP switch should be set correctly for proper communication between inverter and battery

If parallel connecting multiple batteries, please set the DIP switches as following:

6.1 Setting for communication interface

For GS Energy GBL5.8K3 Energy Storage battery, the limit of parallel number is 4. For each connecting mode, the DIP switch SW7 dial mode like following tables 6-1.

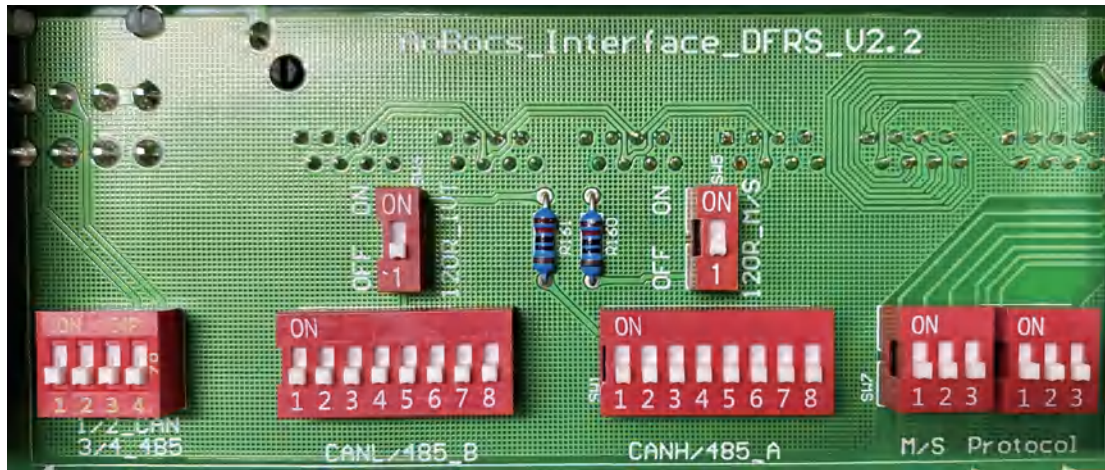
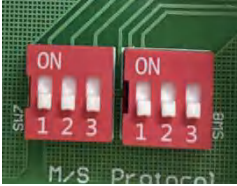




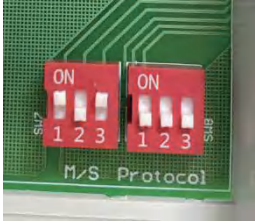
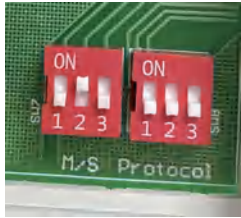
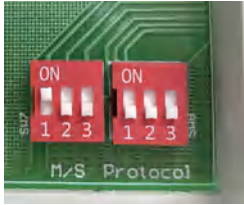
Table 6-1 The DIP switch SW7 selected for 1 battery connected with inverter

Parallel battery	Group	Group DIP Switch	120R_INV	120R M/S
1	—	000	ON	ON
				

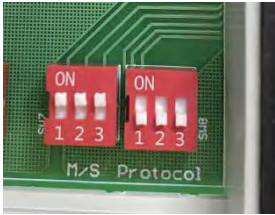
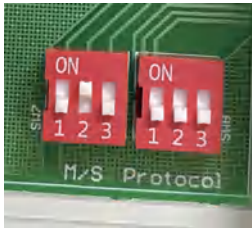
The DIP switch SW7 selected for 2 batteries connected with inverter

Parallel batteries	Group	DIP Switch	120R_INV	120R M/S
2	Master	011	ON	ON
	Slave	010	OFF	ON
				
				

The DIP switch SW7 selected for 3 batteries connected with inverter

Parallel batteries	Group	DIP Switch	120R_INV	120R M/S
3	Master	101 	ON	ON
	Slave 1	010 	OFF	OFF
	Slave 2	100 	OFF	ON

The DIP switch SW7 selected for 4 batteries connected with inverter

Parallel batteries	Group	DIP Switch	120R_INV	120R M/S
4	Master	111 	ON	ON
	Slave 1	010 	OFF	OFF

	Slave 2	100	OFF	OFF
	Slave 3	110	OFF	ON

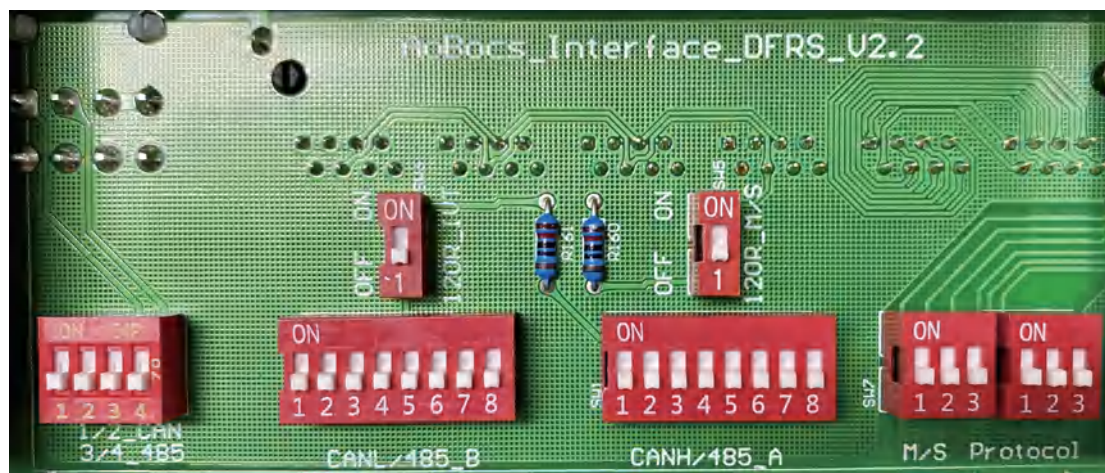
NOTICE

If two or more batteries connected with parallel mode, batteries need to be restarted.

6.2 Settings for CAN /485 bus pins

Confirm that the CANL/485B DIP switch is set to SW2 which pin is used for CAN high signal by inverter (4-CANH/485A), and the CANL/485B DIP switch is set to SW1 which pin is used for CAN low signal by inverter (5-CANL/485B).

As SW3 the CAN/485 GND DIP switch, installer should confirm which pin is used for ground by inverter or not.



NOTICE

The battery default protocol is CAN bus, if a inverter communication mode is RS485 or other protocol, please contact GSMARTE hot line before installed the battery.

7.Commissioning

7.1 Commissioning battery

If there is only one battery installed, use the following steps to put it in operation:

1. Move the DC breaker to the ON position.
2. Press and hold the panel button on the side of the unit for about 4s, after the four indicator lights on, release the panel button.
3. Make sure that the Standby light is on. If it stays off, do not use the battery and contact GS Energy or your distributor.
4. Turn the inverter on, and wait for the start-up sequence to complete fully.

When there are two or more batteries connected with parallel mode, after the charging cable and the data cable has been connected correctly, follow these steps to put them in operation:

1. Check battery voltage level is above 45V
 - a) If battery voltage is under 42V contact your distributor or GS Energy after service hot line for help.
2. Move the DC breaker to the ON position. Press and **HOLD** the panel button for about 4s, after four seconds the indicator lights will turn on.
3. Release the panel button.
 - a) For all batteries, make sure that the Standby light is on.
 - b) Make sure the maximum voltage different between batteries less than 1.0V.
 - c) If not, the installer should balance the battery voltage and then parallel connect batteries together.
 - d) Set the DIP switches like part.
4. Turn the inverter on, and wait for the start-up sequence to complete fully.

7.2 Power on strategy

1. Turn on the main switch of the battery, and press switch 4 s long time, the button lights will be on;
2. After hearing the closing sound of the keypad relay, release the button;
3. When there is no power on fault, BMS closes the auxiliary relay;
4. After waiting for 100ms, BMS will close the main relay when there is no power failure
5. After waiting for 200ms, close the auxiliary relay;
6. BMS power on is completed.

7.3 Shutting down battery

Shut down the battery only when the battery is no charge or discharge current

1. Press and hold the Panel Button about 5s, after a disconnect voice of relay come can release it.
2. Make sure that every light on the battery is off.