User Manual

Lithium Ion Battery System

CGS Series 5.1-20.4 kWh

Ver. 2.0 / Last Updated - Mar. 2025

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Attention

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1 Preface

This manual mainly sets down the methods for installation, electrical connection, commissioning, maintenance and troubleshooting of CGS seires batteries (hereinafter referred to as "the batteries", "the equipment" or "the product"). Prior to installing and using batteries, please read through this manual in order to know about the safety information and get familiar with batteries' functions and characteristics. We may update the contents in this manual irregularly. For information about the latest version and product details, please log in to the official website.

1.1 Applicable Models

This file is applicable to CGS series battery system.

1.2 Objects of This Manual

This manual is intended for:

- Users
- Installation & maintenance personnel
- Professionals familiar with local regulations and standards, and electrical system, who have undergone specialized training and are familiar with relevant knowledge about the batteries.

1.3 Symbols

The following symbols are used in this manual in order to highlight relevant important information. Please read the symbols and descriptions carefully.

Danger
"Danger" means highly potential dangers, which will lead to personal death or serious personal injury.
Warning
"Warning" refers to moderate potential dangers, which may lead to personal death or serious personal injury.
Care
"Care" refers to low potential dangers, which may lead to moderate or mitigated personal injury.
Attention
"Attention" means the contents that have been underlined and supplemented or skills for optimal use of the product. It could help you solve some specific problems or save your time. "Attention" does not belong to safety warning information and will not lead to personal injury or equipment and environment damage.

1.4 Version Record

This manual of the latest version includes the contents updated in all previous versions.
File ver. : 2.0 (March 5, 2025)

2 Safety Precautions

Operators of the equipment shall read through this manual first and abide by the marks on equipment and all safety precautions in this manual.

2.1 General Safety

All the contents in the "Attention" , "Warning" and "Danger" in this manual do not represent all safety requirements that shall be abided by and they supplement all safety precautions only.
The Company is not held liable for any responsibilities arising from breach of any general safety operation requirements or safety standards for the design, production and use of equipment.

Danger ⚠

- Please use the equipment under the environment complying with requirements of design specification; otherwise, the equipment may become faulty.
  Equipment malfunction or part damage, personal safety accident, property loss, etc. arising there from do not fall into the scope of quality warranty of the equipment.
- Hot-line work is forbidden during installation.
- It is forbidden to install, use or operate outdoor equipment and cables under severe weather conditions such as thunder and lightning, rain, snow and strong wind above scale 6 (including but not limited to handling equipment, operation equipment and cables, signal interface connected outdoors through plugging, aloft work, outdoor installation, etc.)
- In case of any fire accident, withdraw from buildings or equipment region and press fire alarm bell or dial fire telephone. In no case it is allowed to enter the burning buildings again.
- Batteries are designed according to safety regulations and have passed tests. However, please operate the equipment, which is classified as electrical equipment, according to the relevant safety instructions. Any improper operation may lead to serious injury or property loss.
- Any paint scratch in process of equipment transportation and installation must be repaired in time. The scratched part cannot be exposed to an outdoor environment in the long run.
- It is forbidden to alter, damage or cover the identification and nameplate on equipment or open the host panel of batteries.

Attention

- We may update this file at all times along with the upgrade of product version or due to other reasons. The contents contained in this file cannot replace the safety precautions in product label or user manual, unless otherwise specified. All descriptions in this file are used for use guidance only.
- The equipment must be operated by professional and eligible electrical technicians, who shall be familiar with relevant local standards and safety specifications of the site where projects are located.
- Please learn the composition and working principle of the entire grid-connected PV system as well as relevant standards of country/region where projects are located.
- Make sure to use insulating tools and PPEs when operating the batteries in order to ensure personal safety. Before contacting electronic devices, wear antistatic gloves, antistatic bracelet, antistatic clothing, etc. in order to prevent batteries from static damage.
- It is forbidden to carry out derivative operations against equipment software and/or hardware, such as reverse engineering, decompilation, disassembling, dismantling, rearrangement or implanting or study the internal part of equipment, obtain source code of equipment software, steal IPRs, etc. by any means or disclose the results of any performance test of equipment software.
- If you detect any fault that may lead to personal injury or equipment damage while operating the equipment, stop immediately, report it to the person in charge, and take effective protective measures.
- Please learn the correct method of using the tools before operating them to avoid personal injury and equipment damage.
- The shell temperature becomes high when the equipment is running, which may cause burns. Please avoid contact with it.
- Before installing the equipment, please read through this file carefully in order to familiar about the products and precautions contained herein.

Please install, operate and maintain the equipment as per local laws, regulations and specifications. The safety precautions in this manual serve as the supplement to local laws, regulations and specifications. The Company does not bear responsibilities for any one of the following circumstances:

1	Failure to operate the product in line with the requirements specified in this manual or to operate the product as per the operation instructions and safety warnings in the product.
2	Install and use the product in an environment that does not meet relevant international or national standards.
3	Product is damaged by transport arranged by the customer.
4	Equipment damage or personal injury ascribed to arbitrary dismantling of internal components, product modification or modification of software code.
5	Equipment damage caused by abnormal natural environment (force majeure such as earthquake, fire disaster,storm wind,etc.)
6	Damage to the product caused by storage in an environment that does not meet the requirements specified in the product documentation.

Personal Safety

- Please wear proper PPEs while operating the equipment.
- Please ensure reliable earthing prior to using the equipment, in order to ensure personal safety and normal use.
- If the batteries become faulty, the temperature of the accessible surface may exceed the scorching threshold. Please avoid contact with the surface.
- Do not open or damage the battery, and avoid contact with any released electrolyte, as it is harmful to skin and eyes.
- Do not place any irrelevant object at the top of equipment or insert into any position of the equipment. Please do not place any flammable materials near the equipment.
- Do not place batteries in fire to avoid explosion, which may endanger personal safety. Do not immerse the battery module in water or any other liquid.
- Do not short-circuit the battery terminals, as this may lead to combustion.
- Batteries may lead to the risks of electric shock and large short circuit current. While using batteries, please make sure to:
  1. Take off watch, ring or other metal objects.
  2. Use tools with insulated handle.
  3. Wear rubber gloves and boots.
  4. Do not place any tools or metal parts at the top of batteries.
  5. Disconnect the charging power supply before connecting or disconnecting battery terminal.
- Check if batteries are earthed by accident. If accidental earthing exists, please remove power supply from the ground. Contact with any part of earthing battery will lead to electric shock. The possibility of electric shock will be lowered, if removing the earthing prior to installation and maintenance. Do not clean the inside of cabinet or external electrical parts with water or cleaning agent.
- Do not stand above, lean against or sit on the equipment. Do not damage various equipment modules.
- Equipment may be damaged, if battery module drops or is impacted intensively during module installation process. In such a case, do not use the battery any longer; otherwise, safety risks may happen (such as leakage of electrolyte, electric shock, etc.)

Danger and Toxicity Grade

- Danger: Contact of battery terminal with other metals may lead to heating or leakage of electrolyte. Electrolyte is flammable. Remove battery from fire immediately once electrolyte leaks.
- Toxicity: Steam generated by battery combustion may irritate eyes, skin and throat.
- First-aid measures
  If the electrolyte inside battery leaks, please make treatment by referring to the "Measures for Battery Electrolyte Leakage Treatment"

Measures for Battery Electrolyte Leakage Treatment

- Take battery away from fire with absorbent cloth.
- The product contains organic electrolyte. Please take the following measures if any leakage of electrolyte occurs:
  - Inhalation: Move to a place with fresh air and receive treatment.
  - Skin contact: Clean contacted area with plenty of water and soap immediately. Improper procedures may lead to skin pains.
  - Eye contact: Flush eyes with plenty of clean water immediately for at least 15 min and do not rub eyes. Receive treatment. Improper procedure may lead to eye irritation.
  - Swallowing: Rinse the mouth immediately and then see a doctor immediately.

Attention for Installation Site

- Installing the equipment near sources of high-frequency noise is prohibited.
- It is forbidden to install the equipment near electrical products easily subject to the influence of electrical noise. Use of communication device may lead to mutual interference, resulting in the failure of normal work.
- It is forbidden to install the equipment near the influence of amateur wireless antenna. If solar power generation system is installed near the site of amateur wireless antenna, the highly sensitive amateur wireless equipment may receive electrical noise generated by solar power generation equipment and wiring, probably causing communication barriers.
- It is forbidden to install the equipment under other special conditions which may lead to electric shock, fire disaster, fault, and electromagnetic noise.
- Keep a certain distance between the installation position, and TV antenna or radio antenna cable.
- Do not connect gas pipeline or water pipeline, telephone or earthing circuit of lightning rod or earthing circuit of products designed with earthing circuit breaker.
- When the equipment is running, do not use power supply for the following purposes:
  - Medical devices directly related to people's life.
  - Control equipment such as train and elevator, which may lead to personal injury.
  - Computer system with social and public importance.
  - Equipment in the same type with those described above.
  - With medical devices.

2.2 Personnel Requirements

- The personnel responsible for Xiamen Well Energy equipment shall undergo strict training first, in order to grasp safety precautions and the correct operation methods.
- Professionals with the corresponding qualifications or well-trained personnel are allowed to install, operate and maintain the equipment only.
- Professionals with the corresponding qualifications are allowed to dismantle safety facilities and overhaul equipment.
- All equipment operation-related personnel, including operators, well-trained personnel and professionals, shall have the special operation qualifications required by the local country, such as qualifications for aloft work, operation of special kind of equipment, etc.
- Professionals or authorized personnel are allowed to change the equipment or parts (including software) only.
- Professionals: Refer to the personnel having undergone training or with equipment operation experience, who are clear about the source and seriousness of various kinds of potential dangers during equipment installation, operation and maintenance.
- Well-trained personnel: Refer to the personnel having undergone the corresponding technical training with required experience, who could be aware of the risks that may be caused by some specific operations and take measures to minimize the risks of themselves or others.
- Operators: Refer to the operators that may contact the equipment, in addition to well-trained personnel and professionals.

2.3 Electrical Safety

Earthing requirements

- Install protective earthing lead before installing the equipment that needs earthing but dismantle it at last when dismantling equipment.
- It is forbidden to damage earthing conductor.
- It is forbidden to operate the equipment before installing earthing conductor.
- The equipment shall be connected to protection earthing lead permanently. Check the electrical connection of the equipment prior to operation, in order to ensure the equipment has been earthed reliably.

Conventional Requirements

- Before electrical connection, make sure the equipment is free of any damage. Otherwise, electric shock or fire disaster may occur.
- All electrical connections must satisfy the electrical standards of local country/region.
- Grid connection for power generation is not allowed before the permission from local country/region is obtained.
- Wire provided by user shall satisfy the requirements of local laws and regulations.

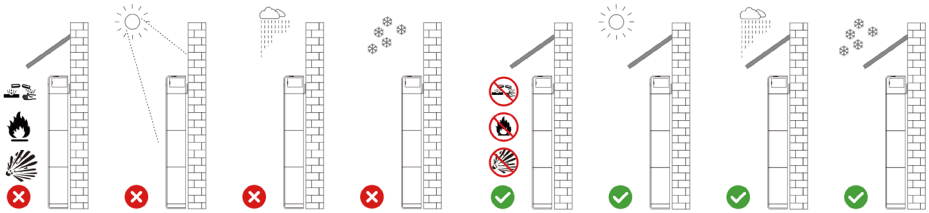
DC Operation

Danger

- It is forbidden to install or remove power cord before power-off. Electric arc or spark mat be generated at the moment when power cord core meets conductor, which may lead to fire disaster or personal injury.
- If any electrified part may be touched before electrical connection of equipment, cut off the breaking device corresponding to the backing stage of equipment.
- Prior to connecting power cord, confirm if the label and identification of power cord are correct.
- If the equipment has several channels of inputs, cut off all these inputs of equipment and do not operate the equipment until it is totally powered off.

2.4 Requirements for Installation Environment

- Install the equipment under a dry and well-ventilated environment in order to ensure favorable heat dissipation effect.
- It is recommended to install the equipment in places with shielding measures or where a sunshade is set.
- Avoid direct sunlight or rain and ensure the surroundings are clean and free of a large amount of infrared ray, radioactive ray, organic solvent, corrosive gas, etc.
- Do not install the equipment near fire source. Keep the equipment beyond children's reach.
- Avoid installing the equipment near water source, such as faucet, underground pipeline and water sprinkler, in order to avoid the possibility of water seepage.
- Install the equipment on a solid and level surface.
- Avoid any inflammable and explosive articles near the equipment.
- Do not shield ventilation opening or heat dissipation system while the equipment is running in order to avoid fire disaster due to high temperature.
- Do not place or operate the equipment in an environment with inflammable and explosive gas or fume.



The equipment can be installed either indoors or outdoors, as long as the requirements above can be met.

Attention

- Working temperature plays a key role in influencing the equipment's running and service life. Please install the equipment in an environment that meets or exceeds the conditions outlined above.

2.5 Transportation Requirements

UN No.: 3480 (lithium ion battery)

- Ensure the batteries will not be damaged during transportation and storage. Handle with care and consider its weight when lifting batteries.
- Do not impact, pull, drag or pedal the equipment or place any irrelevant object into any part of the battery system.
- Make sure the equipment is transported by well-trained professionals and record operation details in the entire process.
- Ensure the equipment is placed securely and level, as tilting may cause damage to the equipment and pose a risk of personal injury.
- Make ensure carbon dioxide, Novac1230 or FM-200 fire extinguisher is available nearby.
- Please use fire extinguishers with recommended materials for putting out fire instead of with water or ABC dry powder fire extinguisher. Firefighters must wear protection suit and self-contained breathing apparatus.
- Batteries may be exposed to the risks of explosion when the ambient temperature is greater than 150℃.
- Please use proper tools and take protective measures when installing and maintaining heavy equipment. Improper operation may lead to personal injury.
- Cable used under a high temperature may lead to aging and damage of insulation layer. Please ensure the distance between cable and heating elements, or between the surroundings of heat source region is 30mm at least.
- The same kind of cables should be bound while cables of different kinds should be arranged by leaving a distance of 30mm at least. It is forbidden to twine or overlap the cables.

2.6 Handling and Storage

- It is forbidden to contact battery terminals or contact the terminals with other metals while packaging batteries. Instead, place clapboard inside the packaging box or package batteries with independent plastic bags so as to avoid mixing batteries.
- The packaging boxes should be made of solid materials and avoid damaging the boxes during transportation by vibration, impaction, dropping or stacking.
- Prevent water from permeating packaging box when the box is stored and transported.
- Store batteries under a room temperature and ensure the charging capacity is 30%-40% of the full capacity.
- Do not store batteries at any place over 35℃ or under direct sunshine or near furnace. Do not store batteries in an environment with high humidity.
- Do not expose batteries in condensate and water drops or ensure the batteries will not be exposed under a frozen condition during transportation process.
- It is forbidden to contact battery terminals mutually or contact the terminals with other metals when installing batteries according to the decree of local government or the minimum standards issued by relevant government.
- If batteries are left unused for a long period of time, store and charge them according to the battery requirements.

2.7 Battery Charge

Battery Storage

1. Environment temperature: -10℃~45℃, Recommended storage temperature: 25℃~35℃.
2. Storage relative humidity range: 5%~70%.
3. Store in a dry, clean, and ventilated environment, away from direct sunlight.
4. When storing the battery, place it correctly. Do not put the battery upside down or on its side.
5. If the battery is stored for a long time, recharge the battery periodically.

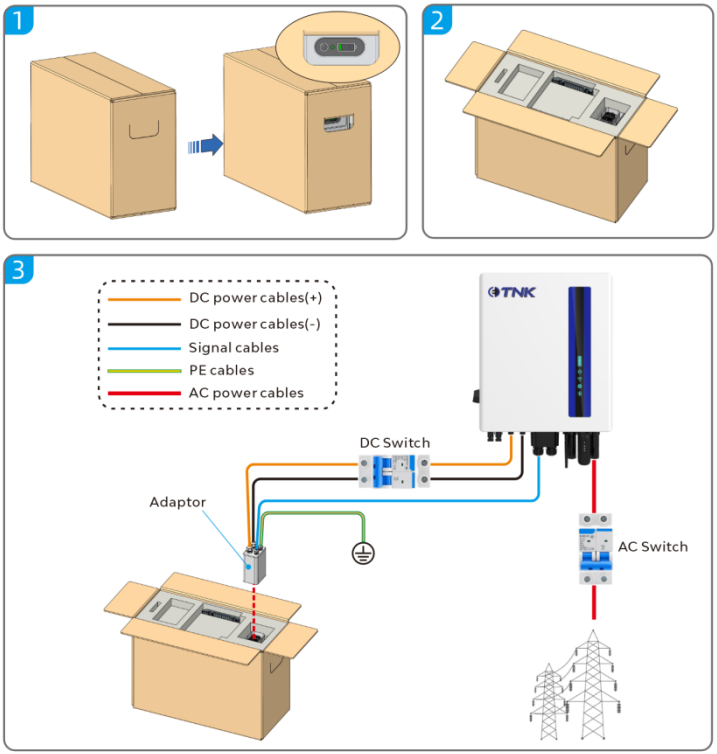
Recharge conditions

When the battery is stored for a long time, you need to perform regular maintenance. When the battery storage time is close to the table below, it is best to recharge in time, which is the most beneficial to the battery performance.

Recharge conditions when in storage

Storage Environment Temperature	Relative Humidity of Storage Environment	Storage Time	SOC [1]
< -10℃	/	Prohibit	/
-10℃~25℃	5%~70%	≤ 12 months	30% ≤ SOC ≤ 60%
25℃~35℃	5%~70%	≤ 6 months	30% ≤ SOC ≤ 60%
35℃~45℃	5%~70%	≤ 3 months	30% ≤ SOC ≤ 60%
> 45℃	/	Prohibit	/

1 Remarks:The SOC of the battery after the last recharge.



Note

Ensure that the charge process is supervised to prevent any abnormality.

- If a battery experiences an abnormality such as bulging or smoking, stop charging immediately and dispose of it.
- Ensure that only trained professionals perform charge operations.
- If the battery SOC is 0%, the battery cannot be activated by holding down the power button. The battery can be started only after both the DC and AC power supplies to the inverter are connected.
- It is recommended that a battery be charged to 40% SOC. If a lithium battery is stored for extended periods of time, capacity loss may occur. After a lithium battery is stored for 12 months at the recommended storage temperature, the irreversible capacity loss rate is 3%~10%.

Step 1
Press the power button of the energy storage module for a long time through the packaging window to check whether it needs to be recharged.

Step 2
If the energy storage module is should be recharged, open the carton top.

Step 3
Connect the cable correctly as he wiring diagram above.

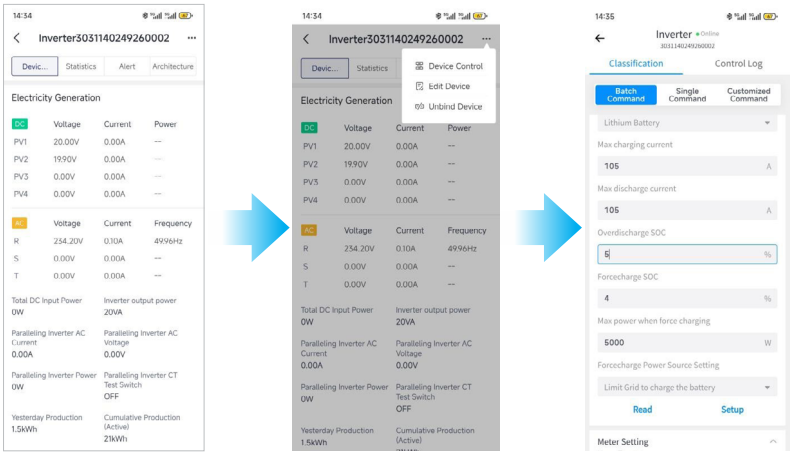
Step 4
Turn on the AC breaker between the inverter and the power grid, turn on the DC breaker between the inverter and the energy storage module.

Step 5
Press the power button of the energy storage module for a long time.

Step 6
Connect the inverter on the Clenergise APP, verify that the inverter and energy storage module are working normally.

Step 7
Choose device control > Battery Setting, and set the battery overdischarge SOC, forcecharge SOC, max. charging current parameters.

Step 8
When the forced charging is finished, turn off the AC breaker between the inverter and the grid, and the DC breaker between the inverter and the energy storage module, then press the power button of energy storage module for a long time to ensure that it is turned off.



3 Product Introduction

3.1 Introduction to Product

Functions

The CGS series BESS is a low voltage lithium battery especially designed for residential applications, it is mainly consists of CGB E5.0L Energy Storage Modules (also referred to as battery expansion modules or battery packs) and CGD C100L distribution unit. It can store and release energy base on the residential energy management, with a wide capacity range from 5.1~20.4 kWh, and mainly used for self-consumption and backup applications.

Model Description

The model of the BESS is E5.1/E10.2/E15.3/E20.4L

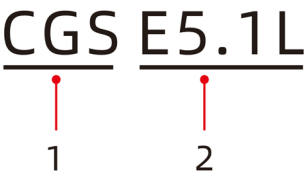


Figure 3-1 Model Identification

No.	Meaning	Description
1	Product	CGS Series battery system
2	Energy level	Rated energy is 5.1 kWh, low voltage

Table 3-1 Model descriptions

The model of the distribution unit In the BESS is CGD C100L.

Figure 3-2 Model descriptions

No.	Meaning	Description
1	Product	CGD Series battery distribution unit
2	Energy level	Rated current is 100 A, low voltage

Table 3-2 Model Descriptions

The model of the Energy Storage Module In the BESS is CGB E5.1L.

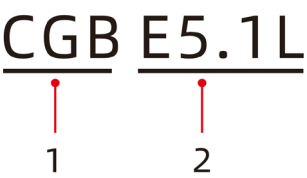


Figure 3-3 Model Descriptions

No.	Meaning	Description
1	Product	CGB Series Energy Storage Module
2	Energy level	Rated energy is 5.1 kWh, low voltage

Table 3-3 Model Descriptions

Battery Capacity Description

The BESS supports capacity expansion with a maximum of 4 energy storage modules. An energy storage module has a capacity of 5.1 kWh.

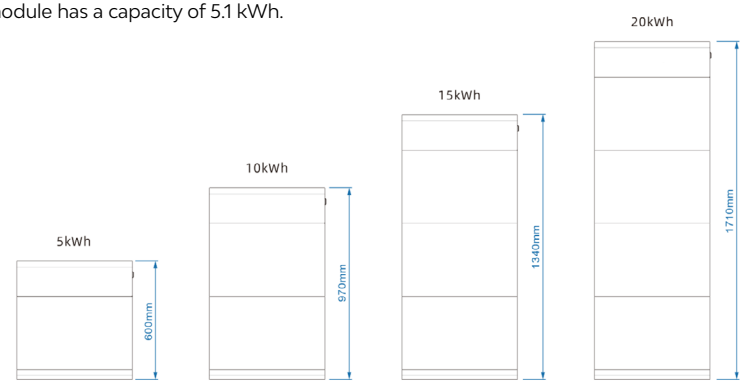


Figure 3-4 Capacity Expansion with Energy Storage Modules

4 energy storage modules and 1 distribution unit can be at most.
The product installation and wiring steps are described in this manual by taking the installation of 3 batteries as an example.

3.2 Appearance

Overall Appearance

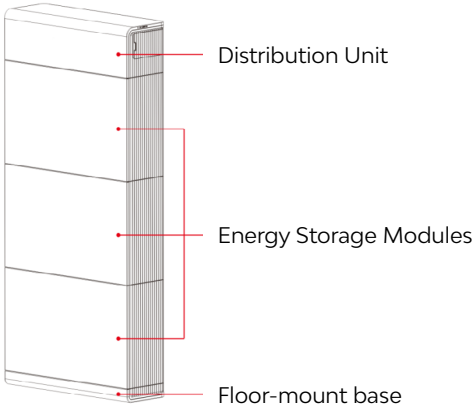


Figure 3-5 Overall Appearance

Appearane of Distribution Unit

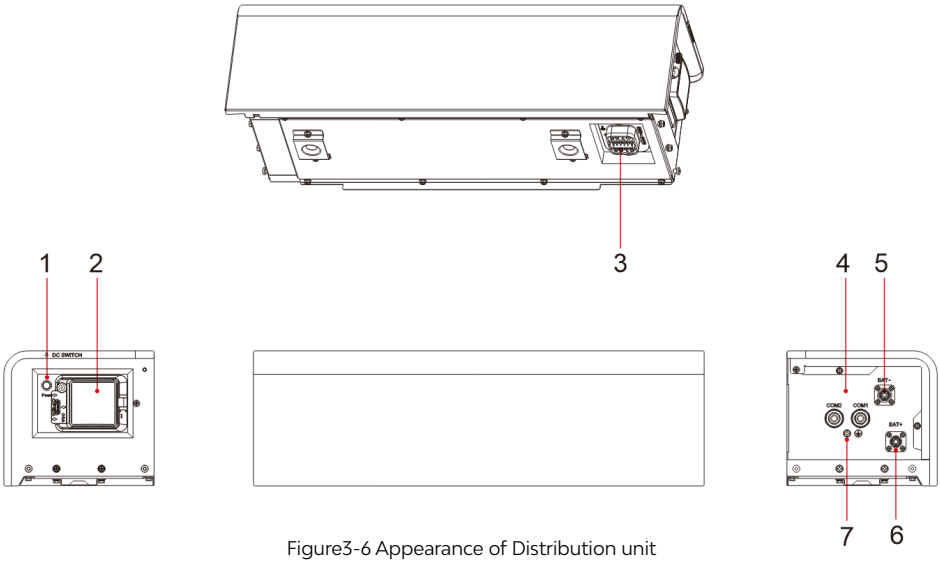


Figure3-6 Appearance of Distribution unit

No.	Parts
1	Power button
2	DC switch
3	Battery cascading port (lower)
4	COM port (RJ45)
5	Battery connector (BAT-, connecting inverter)
6	Battery connector (BAT+, connecting inverter)
7	Ground point

Appearance of Energy Storage Modules

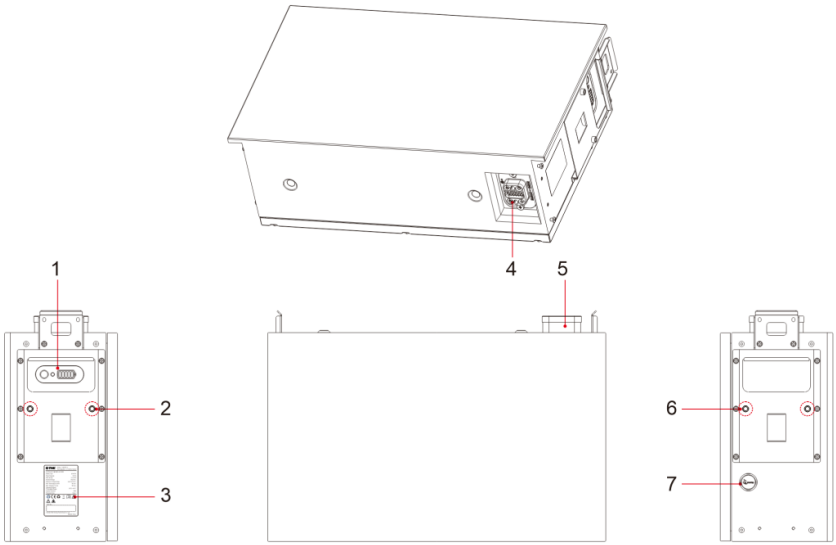
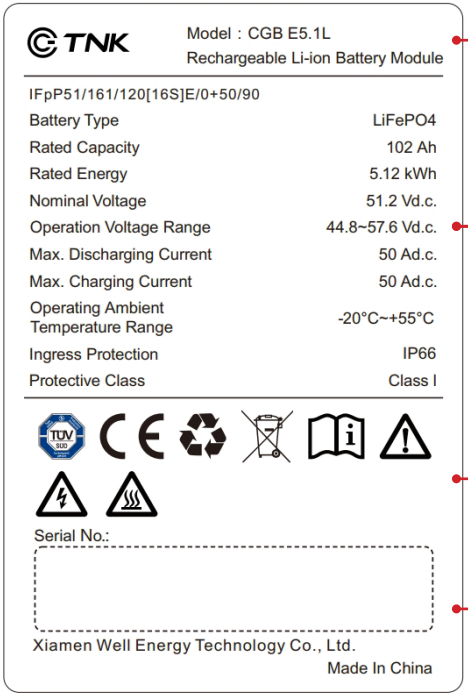


Figure 3-7 Appearance of Energy Storage Modules

No.	Parts
1	LED indicators
2	Lifting handle holes
3	Parameter labels
4	Battery cascading port (lower)
5	Battery cascading port (upper)
6	Lifting handle holes
7	Explosion proof valve

Parameter Labels



Product trademark, and product type and model

Technical parameters of product

Safety mark and certification mark of products

Manufacturer and serial No.

4 System Installation

4.1 Pre-installation Check

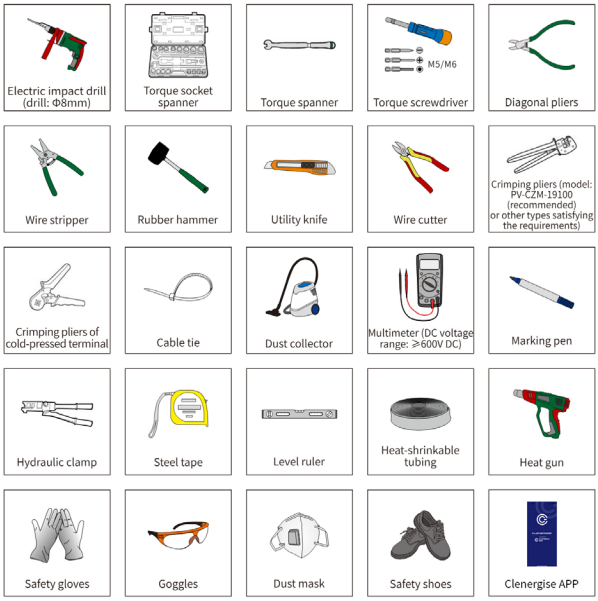
Checking Outer Packaging

Prior to unpacking the outer package, please check if the outer package is damaged, such as holes, cracks or other internal damages and the product model. Do not unpack the product and contact your dealer as soon as possible, if the package is abnormal or the product model does not meet the requirements.

Checking Deliverables

After unpacking the outer package, please check if the parts inside are intact and have any obvious appearance damage. Please contact your dealer, if there is any missing part or damaged part.
Remarks: See the packing list inside the packaging box for the quantity of the parts delivered inside the box.

4.2 Preparations of Tools and Instruments



If a CGH/TNK series hybrid inverter is used in the ESS, the CGS series batteries can be monitored via the hybrid inverter's app. Please download the "Clenergise" app from Google Play Store or iOS App Store.

4.3 Installation Requirements

Installation Position Requirements

Install the BESS on a solid brick concrete structure or concrete wall or floor. If other types of walls and floors are used, they must be made of fire-retardant materials and meet the load bearing requirements of the equipment. (The weight of an energy storage module is 50 kg)

The temperature of chassis is very high when battery is running so please avoid installing it in a place where it is frequently touched.

Do not install the equipment in locations where flammable or explosive materials are stored.

Do not install the equipment within children's reach.

Installation Angle Requirements

The BESS can be mounted either on the ground or on walls;

Do not install the BESS in a forward-tilted, backward-tilted, sideways-tilted, horizontal, or upside-down position.

Installation Clearance Requirements

During installation, ensure the BESS is free from surrounding equipment and flammable or explosive materials. Maintain adequate space for heat dissipation and safety isolation.

When mounting the ESS on a wall, do not place any objects under the ESS. (see Figure 4-1 for reference)

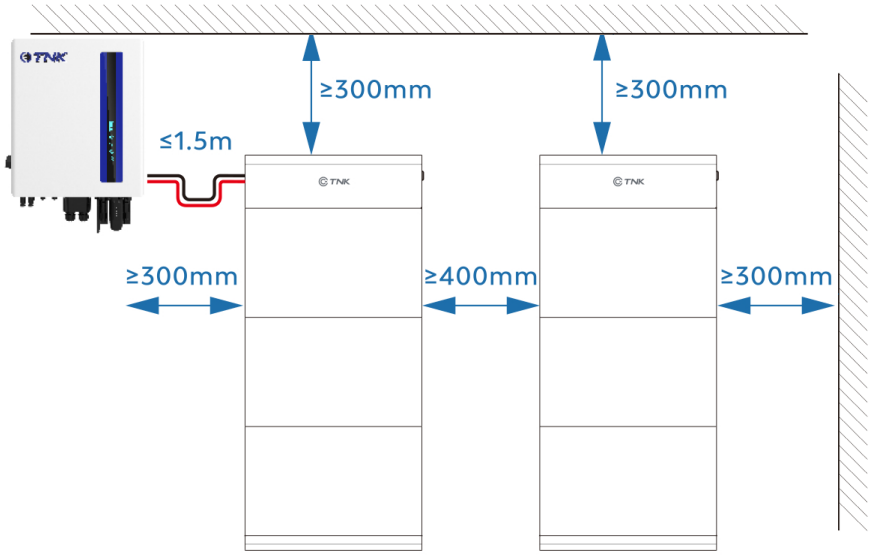


Figure 4-1 Mounting Space

4.4 Installing the BESS

Floor Mounting

Figure 4-2 shows the floor mounting hole dimensions and location details. Follow the steps below to securely mount the BESS on the floor.

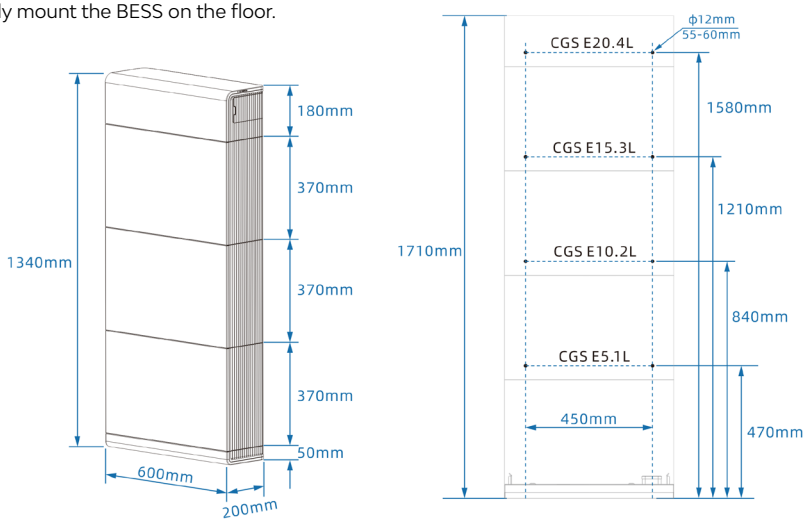


Figure 4-2 Dimensions for Floor Mounting

Danger

- Avoid the water and electricity cables inside walls during drilling in order to avoid danger.

Note

- Operators must wear goggles and a dust mask during drilling to prevent dust from entering their eyes or respiratory tract.
- Cover the equipment with materials like cardboard during drilling to prevent dust from falling onto it.
- Use a dust collector to clean dust from both the inside and outside of all holes. Then, measure the hole distances and reposition or re-drill any holes with significant errors.

Warning

- Fix both batterys and distribution unit on wall surface in order to avoid any damage after titling.

Attention

- When the battery is fixed on wooden wall surface, fix it with tapping screws and ensure the load bearing requirements can be met (weight of 1 battery: 50 kg).
- If the distance between battery system and wall is larger due to raised waterproof groove on wall surface, L-shaped fixed part accompanied with the box may not satisfy the fixing requirements. In such case, user should buy the L-shaped fasteners by ensuring they meet the load-bearing requirements (weight of 1 battery: 50 kg).

Option 1 (Recommend)

Step 1
Fold the positioning cardboard as needed and place it 20-25mm away from the wall. Mark the screw hole positions on the floor, then attach the cardboard template to the wall and mark the screw hole positions. Drill out the marked holes with a drill bit.
PS: Adjust the cardboard template placement based on the number of battery modules being installed.

Step 2
Loosen the two side fixing screws, detach the battery bottom bracket from the distribution unit, and remove the battery bottom bracket.

Step 3
Clean the floor, place the battery bottom bracket in position, and rotate the adjustable leveling nuts. Use a spirit level to adjust the bracket, then secure it to the floor with expansion bolts.

Step 4
To install the first battery module, use the hand lift stick to carry the battery module and place it on the floor-mount base, fix the screws on both sides, and remove the hand lift sticks on both sides.

Step 5
Follow the steps above to install the rest of the energy storage module separately.

Step 6
Install the L-shaped mounting brackets.

Step 7
Install the distribution unit, tighten the screws on both sides.

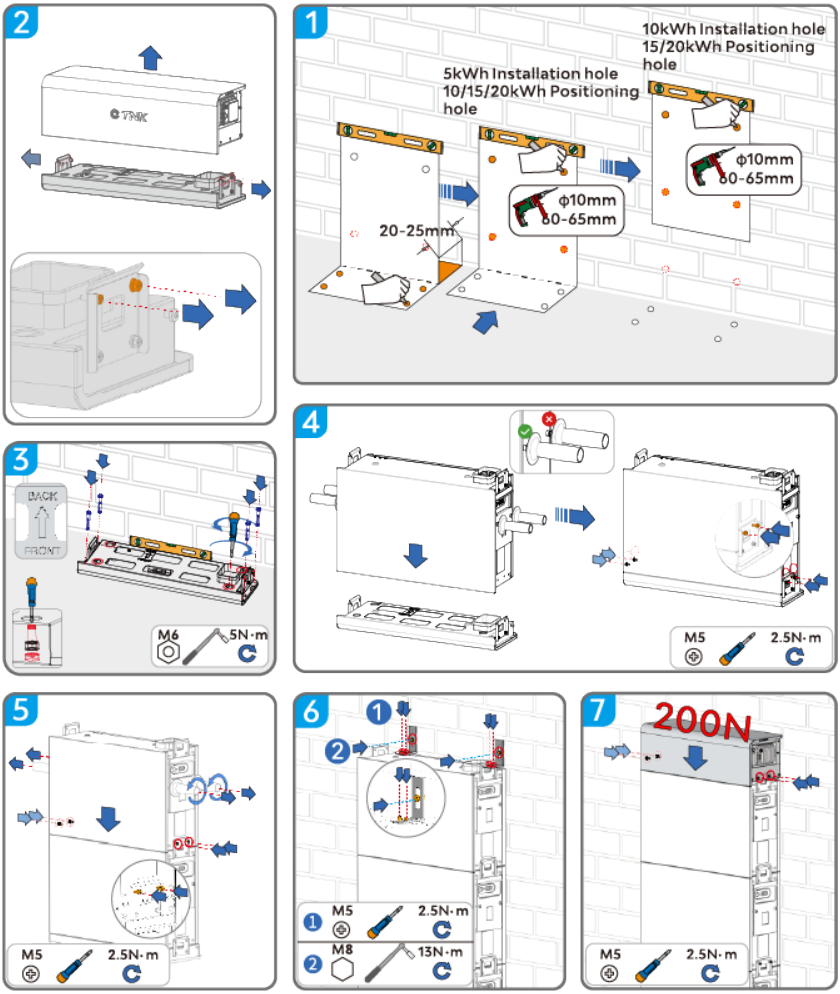

2
1
10kWh Installation hole
15/20kWh Positioning
hole
5kWh Installation hole
10/15/20kWh Positioning
hole
ϕ10mm
60-65mm
ϕ10mm
60-65mm
20-25mm
3
BACK
FRONT
M6
5N·m
4
M5
2.5N·m
5
M5
2.5N·m
6
1
2
M5
2.5N·m
M8
13N·m
7
200N
M5
2.5N·m

Figure 4-3

Option 2 (The installation floor is not suitable for drilling)

Step 1
Fold the positioning cardboard as needed, attach it to the wall, and mark the screw hole positions. Drill out the marked holes with a drill bit.
PS: Adjust the cardboard according to the number of battery modules being installed.

Step 2
Loosen the two side fixing screws, detach the battery bottom bracket from the distribution unit, and remove the battery bottom bracket.

Step 3
Clean the floor, position the bracket, and rotate the adjustable leveling nut. Use a leveling tool to align the bracket, then secure it to the floor with expansion screws.
PS: This step applies to floor-mounted installation.

Step 4
Secure the base mounting block onto the bracket with screws.

Step 5
Attach the base wall mounting plate to the base mounting block with screws, ensuring a 20-25mm gap.

Step 6
Clean the floor, place the bracket, rotate the adjustable leveling nut, use a leveling tool to align the bracket, and secure it with expansion bolts.

Step 7
To install the first battery module, use the hand lift stick to carry the battery module and place it on the floor-mount base, fix the screws on both sides, and remove the hand lift sticks on both sides.

Step 8
Follow the steps above to install the rest of the energy storage module separately.

Step 9
Install the L-shaped mounting brackets.

Step 10
Install the distribution unit, tighten the screws on both sides.

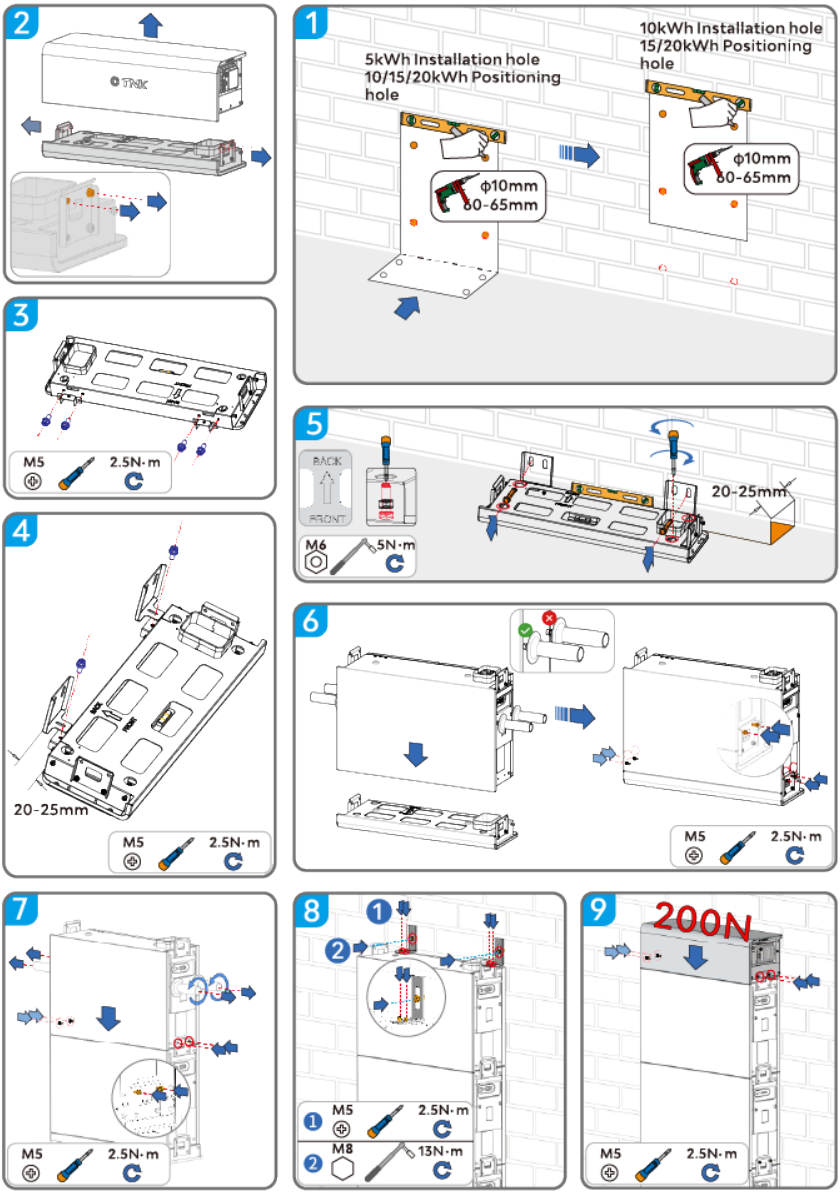

2
1
5kWh Installation hole
10/15/20kWh Positioning hole
10kWh Installation hole
15/20kWh Positioning hole
ϕ10mm
80-65mm
ϕ10mm
80-65mm
3
M5
2.5N·m
5
BACK
FRONT
M6
5N·m
20-25mm
4
20-25mm
M5
2.5N·m
6
M5
2.5N·m
7
M5
2.5N·m
8
1
2
1
M5
2.5N·m
2
M8
13N·m
9
200N
M5
2.5N·m

Figure 4-4

Wall Mounting

Figure 4-5 shows the wall mounting hole dimensions and location details. Follow the steps below to securely mount the BESS on the wall.

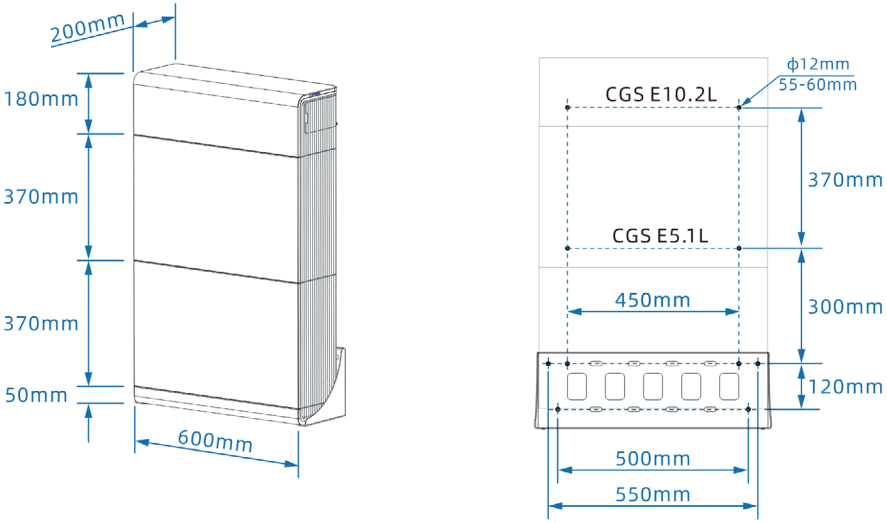


Figure 4-5 Dimensions for Wall Mounting

Danger

- Avoid the water and electricity lines inside walls during drilling in order to avoid danger.

Note

- Operators must wear goggles and a dust mask during drilling to prevent dust from entering their eyes or respiratory tract.
- Cover the equipment with materials like cardboard during drilling to prevent dust from falling onto it.
- Use a dust collector to clean dust from both the inside and outside of all holes. Then, measure the hole distances and reposition or re-drill any holes with significant errors.

Warning

- Fix both battery and distribution unit on wall surface in order to avoid any damage after titling.

Attention

- When the battery is fixed on wooden wall surface, fixit with tapping screw and ensure the load bearing requirements can be met (weight of 1 battery: 50 kg).
- If the distance between battery system and wall is larger due to raised waterproof groove on wall surface, L-shaped fixed part accompanied with the box may not satisfy the fixing requirements. In such case, user should buy the L-shaped fasteners by ensuring they meet the load-bearing requirements (weight of 1 battery: 50 kg).
- A maximum of two battery modules can be installed on a solid wall for wall mouting.

Step 1
Attach the positioning cardboard to the appropriate position on the wall, use a leveling tool to ensure it is even, and mark the screw hole positions on the wall. Then, drill out the marked holes with a drill bit.

Step 2
Clean the wall surface, then secure the Wall-Mounting Component to the wall using bolts.

Step 3
Loosen the two side fixing screws, detach the battery bottom bracket from the distribution unit, and remove the battery bottom bracket.

Step 4
Place the bracket onto the wall-mounting component, rotate the adjustable leveling nut, use a leveling tool to align the bracket, and then install the fixing screws.

Step 5
To install the first battery module, use the hand lift stick to carry the battery module and place it on the floor mounting bracket, fix the screws on both sides, and remove the hand lift sticks on both sides.

Step 6
Follow the steps above to install the rest of the battery packs separately.

Step 7
After installing the L-shaped mounting bracket, install the distribution unit and fix the screws on both sides.

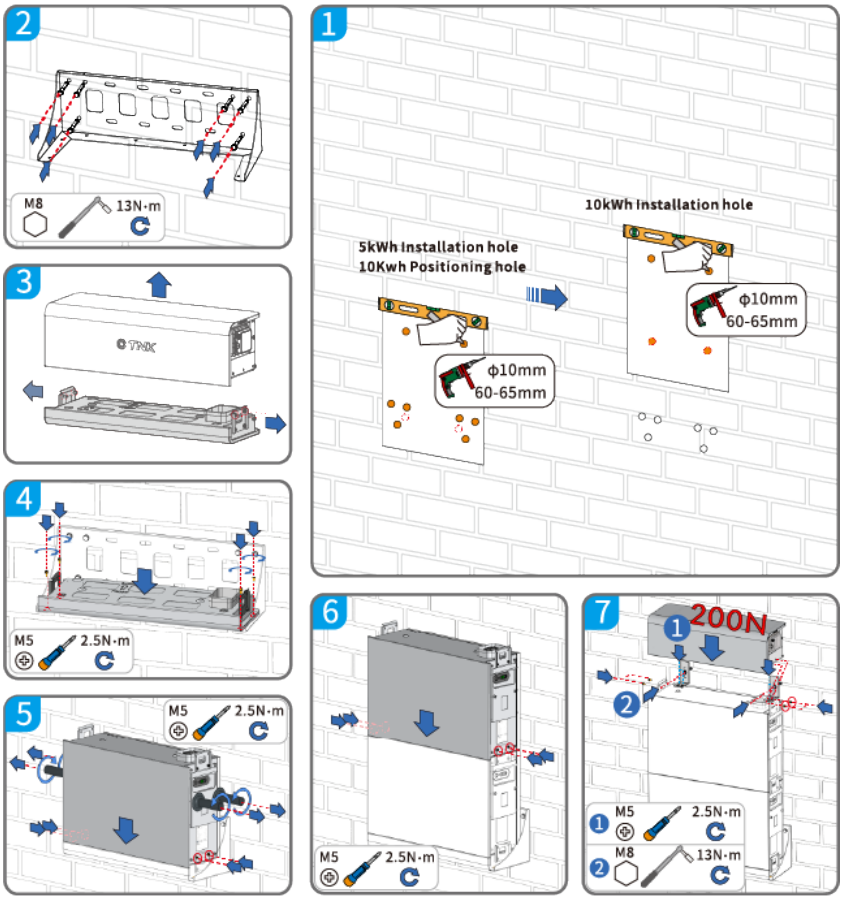

2
M8
13N·m
1
10kWh Installation hole
5kWh Installation hole
10Kwh Positioning hole
Φ10mm
60-65mm
Φ10mm
60-65mm
3
4
M5
2.5N·m
5
M5
2.5N·m
6
M5
2.5N·m
7
200N
1
2
M5
2.5N·m
M8
13N·m

Figure 4-6

5 Electrical Connection

Precautions

Danger

- Before making electrical connections, ensure the 'DC Breaker' of the battery and all switches connected to the battery are turned 'OFF'; otherwise, there is a risk of electric shock.

Warning

- Equipment damage caused by incorrect wiring does not fall into the scope scope of warranty.
- Electrical connection must be finished by professional electrical technicians only.
- Operators must wear PPEs during electrical connection.

Attention

- The cable colors in all electrical connection diagrams of this chapter are for reference only. Please choose cables according to the local cable standards (cables with yellow and green colors can be used for earthing protection only).

5.1 Preparing Cables

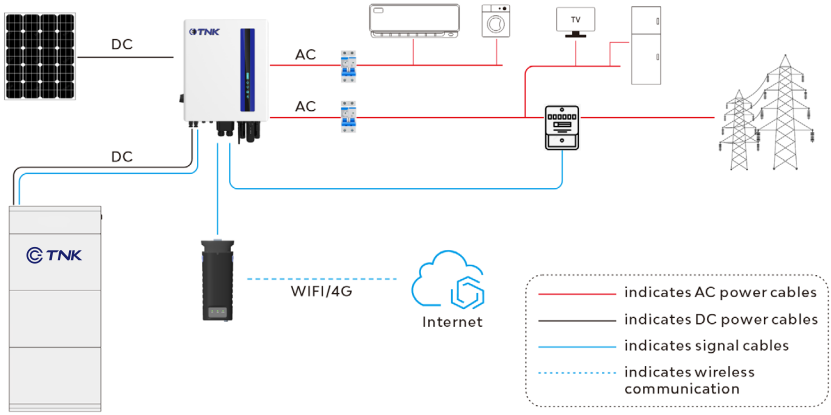


Figure 5-1 Schematic Diagram of System Connection

Cables accompanied with battery

No.	Cables	Type	Recommended Specifications	Source
1	DC power cables (between distribution unit and inverter)	Outdoor photovoltaic cable universally used in the industry	• Conductor cross-sectional area: 35 mm^2 • Cable outer diameter: 12.5 mm	Prepared by the customer
2	Signal cables (between distribution unit and inverter)	Recommended: CAT 6 outdoor shielded network cable (internal resistance ≤ 1.5 ohms/10 m), and shielded RJ45 connector	• Conductor cross-sectional area: 0.12~0.2 mm^2 (recommended: 0.2 mm^2) • Cable outer diameter: 4~8 mm	Delivered with distribu-tion unit together
3	PE cables	Outdoor single copper core cable	Conductor cross-sectional area: 10 mm^2	Prepared by the customer

Attention

- The minimum diameter of cable should be determined according to local cable standards. Choose cables by considering the following factors, including rated current, cable type, laying mode, ambient temperature and max. expected line loss.

5.2 Installing a PE Cable

The internal connection cables are delivered with box. See the Packing List for the parts inside the packing box.

Mounting of Earthing Lead

Danger

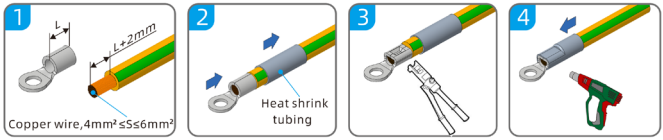
- Please confirm the earthing lead has been connected reliably. Electric shock may happen if the lead is not connected or becomes loose.

Attention

- It is suggested to apply silica gel or paint onto the external side of earthing terminal after the earthing lead is mounted.

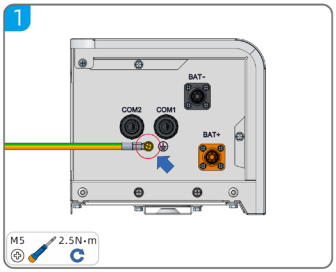
Step 1

Crimp an OT terminal.



Step 2

Connect the ground point of the distribution unit the external ground point.



5.3 Installing DC power cables

Note

- Pull back the DC power cables after anode and cathode connectors are set in place to make sure the line has been connected and fastened firmly.
- A 'click' sound will be heard once the anode and cathode connectors are properly seated. Then, rotate the DC input line to the right and left to ensure the connections are secure.

Connect the anode and cathode connectors delivered together with the battery to the power terminal of the battery distribution unit(BAT+, BAT-) (as shown in Figure 5-2).

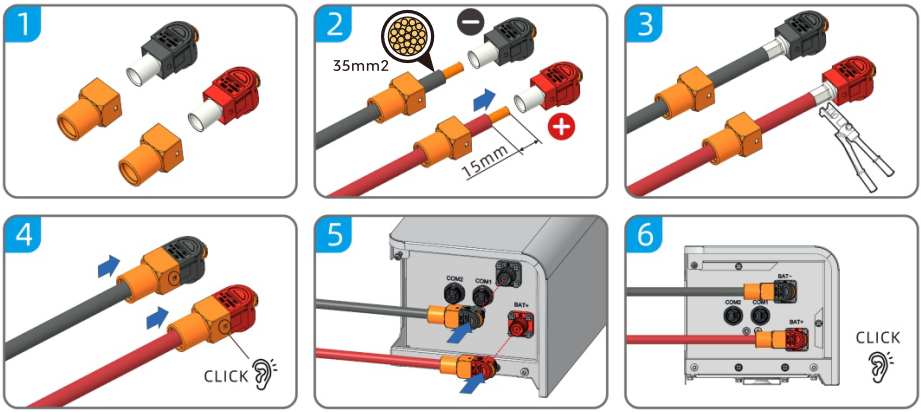


Figure 5-2 DC Power Cables Connection of Battery System

5.4 Installing Signal Cables

Communication between the distribution unit and the inverter is established via an signal cable

Figure 5-3 Signal Cable Preparation

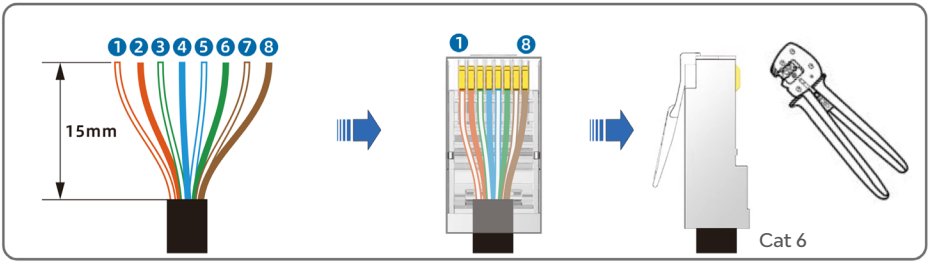
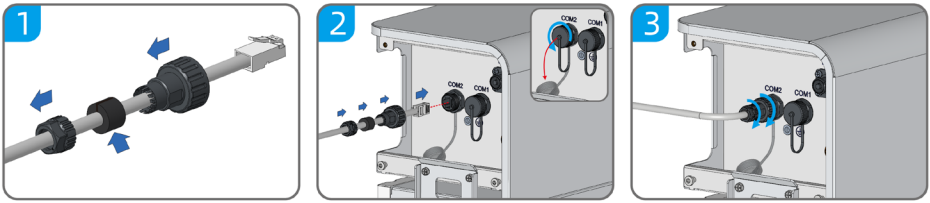


Figure 5-4 Signal Port Connections



	1	2	3	4	5	6	7	8
Com 2	-	-	-	CAN-H	CAN-L	-	-	-

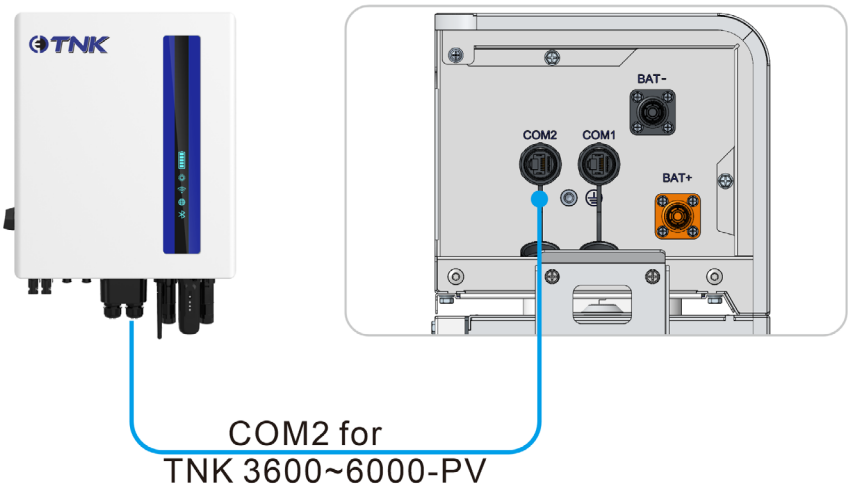


Figure 5-5

5.5 Installing Decorative Covers

After completing the electrical connections and system debugging, verify that the cables are connected correctly and securely, then install the external decorative covers.

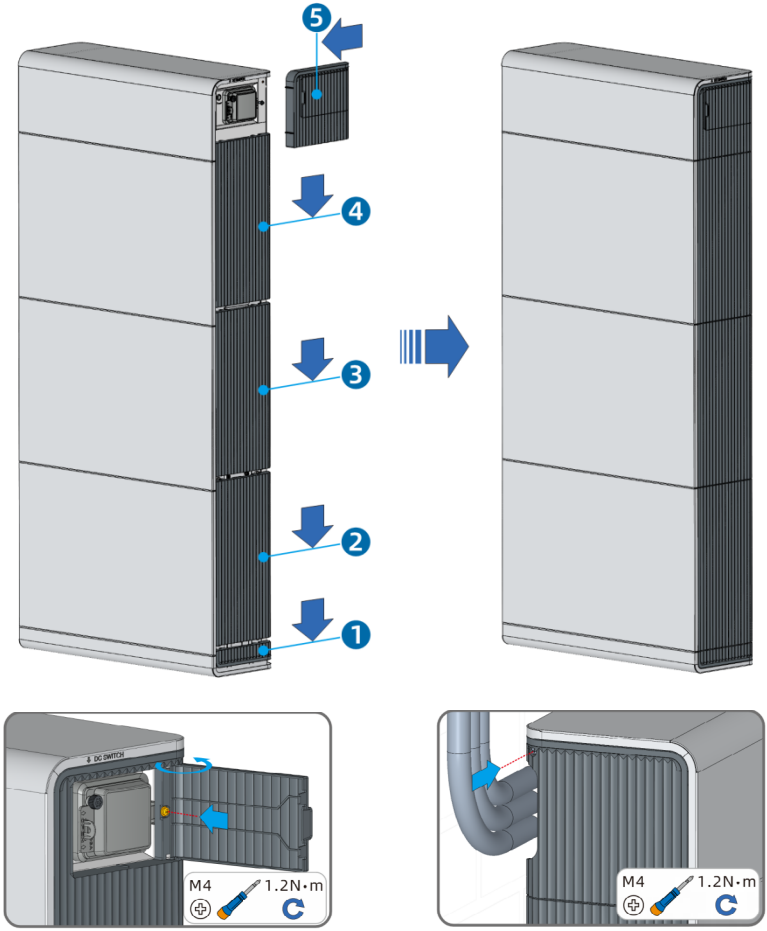


Figure 5-6

6 System Debugging and Testing

Ensure that parameters are set correctly by professionals when the equipment is powered on for the first time. Incorrect settings may result in non-compliance with local country/region certifications, affecting the proper functioning of the equipment.

6.1 Check Prior to Power-on

Table 6-1 Check Items and Acceptance Standards

No.	Items	Acceptance Standard
1	The battery has been installed	The battery should be installed correctly, firmly and reliably.
2	The cable ties are neatly bound	The cable tie should be evenly applied, and no sharp corners should be present at the cut site.
3	Reliable earthing	Earthing lead should be connected correctly, firmly and reliably.
4	Switch disconnection	“DC Breaker” and all switches connected with battery are under “OFF” state.
5	Cables have been connected in place	AC output lead, DC output lead, battery line and signal line should be connected correctly, firmly and reliably.
6	Sealing without terminal and interface	Waterproof cover should be used at the site where neither terminal nor interface is used.
7	Installation environment satisfies the requirements	The installation space should be adequate, clean, tidy, and free of any construction debris.

Table 6-1

6.2 System Power-on

See Figure 6-1 for Panel Introduction:

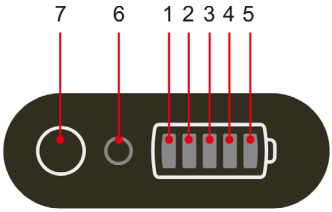


Figure 6-1

No.	Parts	Remarks
1	Power indicator light 1	0 < SOC ≤ 20%
2	Power indicator light 2	20 < SOC ≤ 40%
3	Power indicator light 3	40 < SOC ≤ 60%
4	Power indicator light 4	60 < SOC ≤ 80%
5	Power indicator light 5	80 < SOC ≤ 100%
6	Status indicator light	Running/Warning
7	Buttons	Awakening/Sleep

Note

- Press Awakening/Sleeping button (for 3-6s) to awaken battery (for parallel operation of several batteries, awaken host first) and close circuit breaker.
- It is suggested to install the external decorative covers after finishing debugging.

Status	Normal/Warning/ Protection	Status Indicator Light		Power Indicator Light					Remarks
		○	○	▮	▮	▮	▮	▮	
Shutdown	Sleep	Off	Off	Off	Off	Off	Off	Off	All off
Standby	Normal	Flash 1	Off	Subject to power indication					Standby status
	Warning	Off	Flash 3						Module low voltage
Charging	Normal	Flash 2	Off	Subject to power indication (The max. power indicator light flashes, flash 2)					The max. power Indicator light flashes (flash 2). Warning indicator light does not flash if there is an overcharge warning
	Warning	Off	Flash 3						
	Overcharge protection	Normally on	Off	Normally on					-
	Temperature/Over current/Failure protection	Off	Normally on	Off					-
Discharge	Normal	Flash 3	Off	Subject to power indication					-
	Warning	Off	Flash 3						
	Under voltage protection	Off	Normally on	Off					Stop discharging
	Temperature/Over current/Short circuit/Reverse connection/Failure protection	Off	Normally on	Off					Stop discharging
Failure	-	Off	Normally on	Off					Stop charging and discharging

Table 6-2 LED indicator light description

Status	Capacity	Capacity Indication	Remarks
Charging	0 < SOC ≤ 20%		The max. power indicatorlight will flash during charging (Flash 2)
	20 < SOC ≤ 40%		
	40 < SOC ≤ 60%		
	60 < SOC ≤ 80%		
	80 < SOC ≤ 100%		
Discharging	0 < SOC ≤ 20%		The power indicator light is normally on (the max. power indicator light does not flash)
	20 < SOC ≤ 40%		
	40 < SOC ≤ 60%		
	60 < SOC ≤ 80%		
	80 < SOC ≤ 100%		

Table 6-3 Capacity indicator light description

Flashing Mode	On	Off
Flashing 1	0.25S	3.75S
Flashing 2	0.5S	0.5S
Flashing 3	0.5S	1.5S

Table 6-4 Flashing Descriptions

6.3 Outage of Battery System

Please follow the sequence below when shutting down the battery system in order to avoid damaging the system:

1. Take offthe battery and plastic board of distribution unit.
2. Disconnect the battery and the circuit breaker of the distribution unit.
3. Disconnect the communication between the battery system and the inverter (unplug the communi cation wire or turn off the inverter).
4. Press the Awakening/Sleep button (for 3-6s) and all the indicator lights will be OFF.
5. Assemble the plastic board.

7 Technical Parameters

Technical Parameters				
-	CGS E5.1L	CGS E10.2L	CGS E15.3L	CGS E20.4L
Batteries	CGB E5.1L (5.12 kWh, 51.2 V)			
Number of Batteries	1	2	3	4
Rated Energy	5.12 kWh	10.24 kWh	15.36 kWh	20.48 kWh
Battery Dimensions (W*H*D) MM	600×600×200	600×970×200	600×1340×200	600×1710×200
Weight	60 KG	110 KG	160 KG	210 KG
Recommended Charging/ Discharging Current	50 A	100 A	100 A	100 A
Battery Model	LiFePO4 (LFP)			
Nominal Voltage	51.2 V			
Range of Working Voltage	44.8-57.6 V			
Protection Grade	IP66			
Installation Mode	Floor / Wall			
Working Temperature	-20 to +55℃			
Communication Mode	RS485 and CAN compatible			
Standardsand Certifications	IEC62619, IEC61000-6-1/-3, IEC60730, 1EC62040, UN38.3, RoHS, and TuV			

8 Maintenance

No.	Maintenance Items	Cycle
1	If the battery is not put into use, charge the battery fully first and then discharge it by 30%-40%	For every 3 months
2	Check if the exposed cables/wires are worn. If yes, please change the corresponding cables/wires or contact our after-sales service center.	For every 6 months
3	Check if the enclosure is damaged. If yes, make repairing through painting or contact our after-sales service center	For every 6 months
4	Check if the wall bracket is installed firmly. If not, fasten the corresponding position.	For every 6 months
5	Check if there are any foreign objects around the battery. If so, clean them to ensure proper heat dissipation of the battery.	For every 6 months
6	Check if there is any water or insect in order to avoid damaging the battery.	For every 6 months

Attention

- Upon discovering any problem that may damage the battery or the inverter system, please contact our after-sales service specialist and do not attempt to dismantle it.
- Do not touch the exposed internal copper wire, as high voltage may pose a risk. Please contact our after-sales service specialist and do not attempt to dismantle it.
- In case of any other emergencies, please contact the after-sales service specialist immediately and follow their guidance, or wait for the specialist to handle the situation on-site.

Danger

- Electric shock may occur while the equipment is running, causing personal injury and death, or serious property loss. Therefore, power OFF the equipment before performing any maintenance and follow the safety precautions outlined in this manual and other relevant documents.
- Please perform maintenance on the equipment only after familiarizing yourself with the contents of this manual and using the proper tools and test devices.
- Prior to maintenance, power off the equipment. Wait for a certain period of time specified in the delayed discharge label and operate the equipment after ensuring it has been powered OFF.
- During maintenance, avoid any irrelevant personnel from entering the site. Set a temporary warning mark or fence for isolation, where necessary.
- If the equipment malfunctions, please contact your dealer promptly for assistance/solution.
- Do not power on the equipment again until fault is totally removed. Otherwise, fault may become more serious or lead to equipment damage.
- It is forbidden to open the cover plate without authorization; as it may result in electric shock. Any fault arising from this action above does not fall into the scope of warranty.
- Operating and maintenance personnel, as well as professional technicians, must undergo thorough training on safety and equipment maintenance. They should carry out the corresponding tasks with full preventive measures and proper personal protective equipment (PPE).
- If the wire needs to be moved to another location or rewiring is required, please cut off the power supply. Begin maintenance only after the energy has been fully discharged from the equipment and confirm with a multimeter that the DC bus and the area to be repaired are free of dangerous voltage.
- Replace batteries with the batteries or energy storage modules of the same type.
- After finishing maintenance, check if there is any tool or other parts left inside the equipment.
- If the equipment will not be used for a long period of time, store batteries and recharge the equipment according to this manual.

THE NEXT KILOWATT

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