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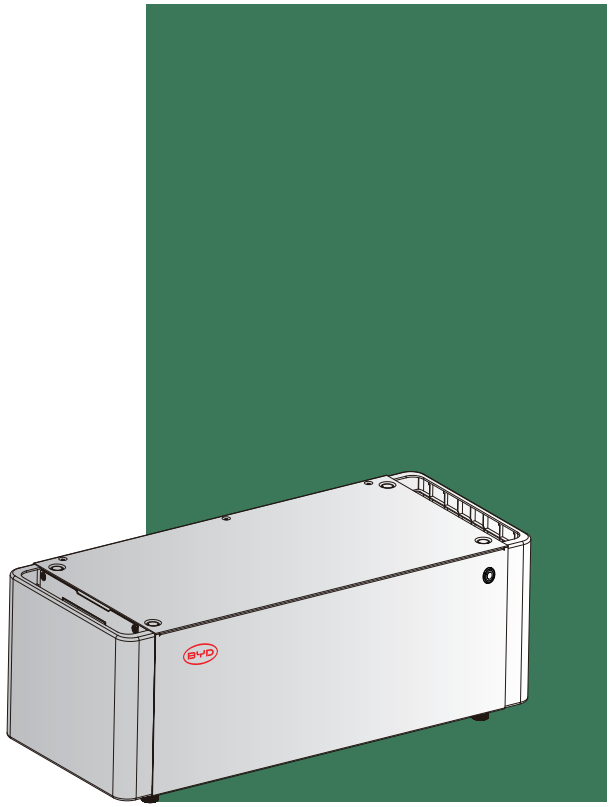

BYD Battery-Box
LV5.0 Battery Module
User Manual

EN-Manual Dec-2024
Version03

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Limited Warranty
You can download the latest Limited Warranty from the Internet at www.bydenergy.com.

Technical Information
You can download the latest Technical Information from the Internet at www.bydenergy.com.

Service Guideline
You can download the latest Service Guideline from the Internet at www.bydenergy.com.

BYD Company Limited
3009, BYD Road, Pingshan, Shenzhen, P.R.China.

Manufacturer
FinDreams Battery Guangxi ASEAN Co.,Ltd

Content

1. Information on this Document

DISCLAIMER

When installing, operating, and maintaining the equipment, read this manual first and follow all safety precautions on the equipment and in the manual.
BYD shall not be liable if any of the following situations occur.

- Not operate in the conditions described in this manual.
- Installation and using environments not comply with relevant international, national or regional standards.
- Disassembly, change the product or modify the software code without authorization.
- Not operate according to the safety instructions and precautions on the product and in the manual.
- Damages caused by abnormal natural environment (force majeure, such as earthquakes, fires, windstorms, floods, mudslides, etc.).
- Damages caused by the customer's transport.
- Damages caused by unqualified storage conditions that do not meet the requirements mentioned in the manual.
- Damages to the hardware or data due to negligence, improper operation, or intentional damage by the customer.
- Damages to the system caused by a third party or the customer, including damages caused by improper transport and installation that do not comply with the requirements of this manual, as well as adjustment, alteration, or removal of identification signs that do not comply with the requirements of this manual.

Reverse engineering, decompiling, disassembling, adapting, implanting or other derivative operations of the equipment's software are prohibited. Researching the internal implementation of the equipment, obtaining the source code of the equipment's software and stealing intellectual property in any way are prohibited. Disclosing the results of any performance tests of the equipment's software is prohibited.

1.1. Validity

This document is valid for the LV5.0 battery module.

1.2. Target Group

The instructions in this document may only be performed by qualified persons who must have the following skills:

- Knowledge of how batteries work and are operated.
- Knowledge of how an inverter works and is operated.
- Knowledge of, and adherence to the locally applicable connection requirements, standards, and directives.
- Knowledge of, and adherence to this document and the associated system documentation, including all safety instructions.
- Training in dealing with the hazards associated with the installation and operation of electrical equipment and batteries.
- Training in the installation and commissioning of electrical equipment.

Failure to do so will make any manufacturer's warranty, guarantee or liability null, and void unless you can prove that the damage was not due to non-compliance.

1.3. Content and Structure of this Document

This document contains safety information and instructions, scope of delivery, battery module overview, installation, electrical connection, commissioning, operation, decommissioning, extension, troubleshooting, maintenance and storage, disposal of the battery module, technical parameters and contact information. Please finish reading this document before taking any actions on the battery module.

1.4. Loading and Unloading Requirements

Batteries need to be loaded and unloaded in accordance with the local laws, regulations and industry standards. Rough loading and unloading can lead to short-circuiting or damages to the batteries, which may result in leakage, rupture, explosion

or fire.
Transport requirements:

- Before shipment, the batteries must be inspected to ensure that they are intact, and that there is no unusual smell, smoke, fire, etc. Otherwise, shipment is prohibited.
- The package must be firm. The product must be handled with care during transport and moisture-proof measures should be taken. Considering the influence of external environment (such as temperature, transport, storage, etc.), the specification parameters are subject to the factory date.
- The following situations must be prohibited during transport: direct contact with rain, snow or submerging in water; falling or mechanical shock; inversion or tilt.

1.5. Declaration of Conformity

The battery module described in this document complies with the applicable South Africa directives. The certificate is available in the download area at www.bydenergy.com.

1.6. Levels of Warning Messages

The following levels of warning messages may occur when handling the battery module.

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates a situation which, if not avoided, can result in property damage.

1.7. Symbols in the Document

QUALIFIED PERSON

Sections describing activities to be performed by qualified persons only.

1.8. Designation in the Document

No.	Term	Explanation
1	Discharge	Battery output power for load.
2	Charge	Store electrical energy.
3	Full charged	Battery had been full charged, SOC is 100%.
5	Shutdown mode	Power off.
4	Idle	Battery is on status of neither charge nor discharge and has not been fully charged.
7	Firmware	Software in BMS.
6	SOC	State of Charge.
9	Module voltage	The voltage between P+/P-.
10	Cell voltage	Single cell voltage.
11	Failure	Battery or BMS are broken, and unit needs to be replaced.
12	Alarm	Send alarm information.
13	Protection	Battery stops charging or discharging (e.g. cell is overvoltage). Operation can resume at a later stage.

2. Safety

DISCLAIMER

BYD shall not be liable for any functional failures, component damages, personal safety accidents or property losses suffered by the following reasons:

- The customer does not charge in time, result in loss of capacity or other irreversible damages to the battery, etc.
- Falling, liquid leakage or other damages caused by improper operation or connection.
- The user does not set the battery operation and management parameters correctly.
- The customer or a third party changes the battery usage scenario without consulting BYD.
- Mix the batteries provided by BYD with other batteries, including but not limited to: mix with other brands' batteries, mix with batteries of different rated capacities, etc.
- Direct damages to the battery because the operating environment or external power parameters can not meet the environmental requirements for normal operation.
- The customer does not maintain the battery properly according to the user manual.
- Batteries that have exceeded the warranty period.
- Battery damage caused by using an inverter other than the one in the configuration list (TECHNICAL INFORMATION).
- Not use accessories in recommended specification.

2.1. Intended Use

The battery module is for residential use and works with a photovoltaic system. It is a lithium iron phosphate(LFP) battery storage system, with the control module on itself. It could be operated in on-grid, backup and off-grid modes with compatible inverters.

The battery module could be connected to the PC through data cable for maintenance and firmware updating.

The battery module must only be used as stationary equipment.

The battery module is suitable for indoor use under the conditions mentioned in Section 5.1.

The battery module must only be operated in connection with a compatible inverter. The list (LV5.0 TECHNICAL INFORMATION) of these inverters could be found at www.bydenergy.com.

The battery module is not suitable for supplying life-sustaining medical devices. Please ensure that no personal injury would lead due to the power outage of the battery system.

Alterations to the battery, e.g., changes or modifications are not allowed unless the written permission of BYD is achieved. Unauthorized alterations will void the guarantee and warranty claims. BYD shall not be held liable for any damage caused by such changes.

The type label should always be attached to the battery module.

2.2. IMPORTANT SAFETY INSTRUCTIONS

2.2.1. Battery Module Leakage

The battery module has been designed and tested in accordance with international safety requirements. However, in order to prevent personal injury and property damage and ensure long-term operation of the battery module, please read this section carefully and observe all safety information at all times.

If the battery modules leak electrolytes, contacting with the leaking liquid or gas should be avoided. The electrolyte is corrosive, and the contact may cause skin irritation and chemical burns. If one is exposed to the leaked substance, follow these

steps:
Accidental inhalation: Evacuate the contaminated area, and seek medical help immediately.
Eye exposure: Rinse eyes with flowing water for 15 minutes and seek medical help immediately.
Skin contact: Wash the affected area thoroughly with soap and water and seek medical help immediately.
Accidental ingestion: Induce vomiting and seek medical help immediately.

2.2.2. Fire fighting Measures

The battery modules may catch fire when it is put into the fire. In case of fire, please make sure that an ABC or carbon dioxide extinguisher is nearby. Water cannot be used to extinguish the fire.

Full protective clothing and self-contained breathing apparatus are required for the firefighters to extinguish the fire.

2.2.3. Battery Modules Handling and Storage Guide

- The battery module and its components should be protected from damage when transporting and handling.
- Do not impact, pull, drag, or step on the battery module.
- Do not insert unrelated objects into any part of the battery module.
- Do not throw the battery module into a fire.
- Do not soak the battery module in water or seawater.
- Do not expose to strong oxidizers.
- Do not short circuit the battery module.
- The battery module cannot be stored at high temperatures (≥ 50°C).
- The battery module cannot be stored directly under the sun.
- The battery module cannot be stored in a high humidity environment.
- Do not use cleaning solvents to clean the battery module.

- Do not open or damage the battery. The released electrolyte is harmful to skin and eyes so contact should be avoided.
- Do not stand, lean or sit on the battery.
- Measure the voltage at the contact point before contacting any conductor surface or terminal, in a move to confirm that there is no risk of electric shock.
- Do not affect the terminals during transport and lifting the battery through terminal bolts is forbidden.
- Batteries must be stored separately in the package. Avoid storing the battery with other items. Storing it in the open air and stacking too high are prohibited.
- Do not use damaged batteries (batteries that have been dropped, crashed, or other damages such as case dents).
- Do not store damaged batteries near intact products. The storage location of damaged batteries should not contain flammable materials. Only professionals can access.
- Damaged batteries should be monitored during storage to ensure that there are no signs of smoke, flame, electrolyte leakage, or heat.

2.2.4. Warning of Overvoltages

⚠ DANGER

Danger to life due to electric shock in case of overvoltages and if surge protection is missing

Overvoltages (e.g. in the event of a flash of lightning) can be further conducted into the building and to other connected devices in the same network via the network cables or other data cables if there is no surge protection. Touching live parts and cables results in death or lethal injuries due to electric shock.

- Ensure that all devices in the same network and the inverter are integrated into the existing surge protection.

2.2.5. Caution of Weight

⚠ CAUTION

Risk of injury due to weight of the battery module

Injuries may result if the battery modules are lifted incorrectly or dropped while being transported or installed.

- Transport and lift the battery module carefully. Take the weight of the battery module into account.
- Wear suitable personal protective equipment for all work on the battery module.

2.2.6. Notice of Property Damage

NOTICE

Damage to the battery module due to sand, dust and moisture ingress

Sand, dust and moisture penetration can damage the battery module and impair its functionality.

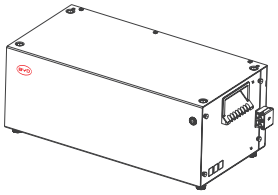
- Only open the battery module if the humidity is within the thresholds and the environment is free of sand and dust.

NOTICE

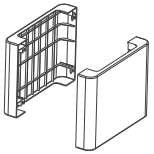
Damage to the battery module due to under voltages

- If the battery module doesn't start at all, please contact BYD local after-sales service within 48 hours. Otherwise, the battery could be permanently damaged.

3. Scope of Delivery

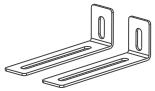


Battery Module x 1

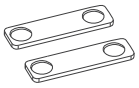


Protective Cover x 2

Terminal Resistor X 1



Hanger x 2



PE Link x 2

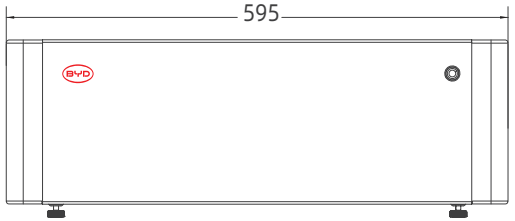
Foot x 4

Screw M5 x 6

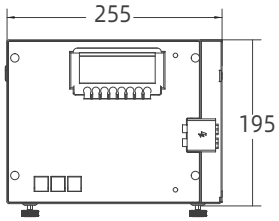
Documents x 3
(UM x 1 / QSG x 1 / MSDS x 1)

4. Battery Module Overview

4.1. Structure dimension drawing

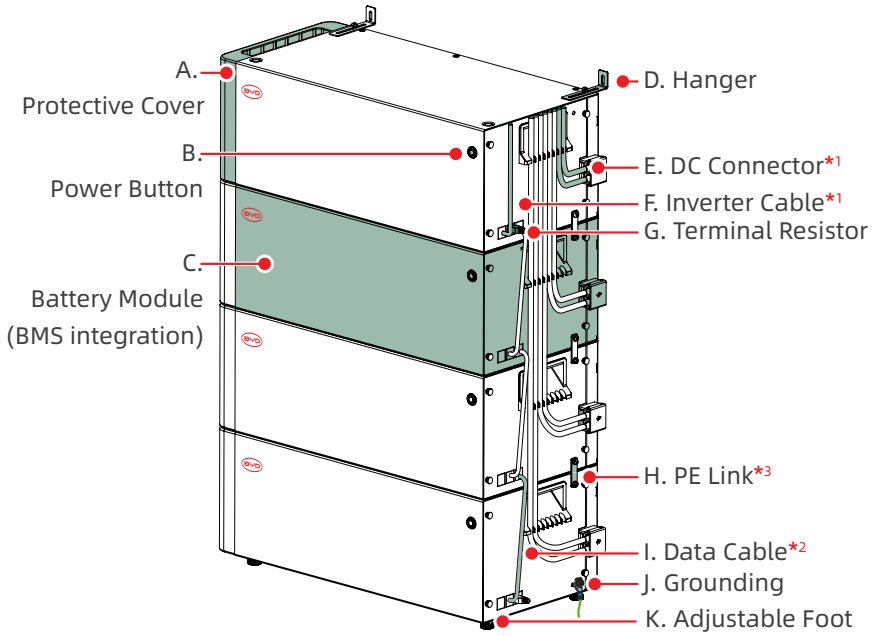


Front View



Left View
unit:mm

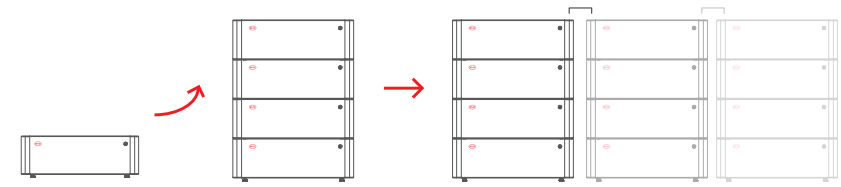
4.2. Battery Module Description



*1. DC Connector & Inverter wire length need to be customized, please contact your distributor.
* 2. Data Cable is suitable for the tower (2~4 modules).
* 3. PE Link must be used for more than one battery module.

4.3. Battery Module Scalable

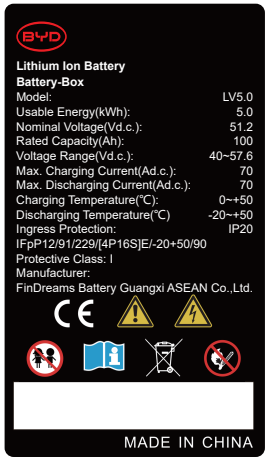
One tower could be made up by 1 to 4 battery modules, and 8 towers could be connected in parallel at most.



4.4. Symbols on the System

Symbol	Explanation
	Observe the documents Observe all documents supplied with the system.
	WEEE designation Do not dispose of the system together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.
	CE marking The system complies with the requirements of the applicable EU directives.
	Keep the battery modules away from open flame or ignition sources.
	Beware of electrical voltage.
	Beware of a danger zone This symbol indicates that the system must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.
	Keep the battery modules away from children.
	Grounding conductor This symbol indicates the position for connecting a grounding conductor.
	This side up.
	Handle with care.
	Keep dry.

4.5. Rating label



4.6. LED Signals

Normal		
Module	**Indicator Status**	**Status Description**
Any Module	Constant **green**	Idle / BMS firmware updating
	Flashing **green** slowly	Charging
	Flashing **green** quickly	Discharging
	Orange light flashes 6 times and then turns **green**	Power on after pressing any battery switch button for 1s
	Orange light flashes slowly and then goes out	Shutdown after pressing any battery switch button for 2~3s

Abnormal		
Module	**Indicator Status**	**Status Description**
Master	**Orange** light flashes continuously	Battery-inverter communication timeout Battery to battery communication timeout
	Constant **red**	Battery failure, shutdown after a period of time Slave shutdown due to failure, system shutdown delayed for 7 days **Note: Please Contact with BYD local after-sales service as soon as possible**
	Red light flashing	Battery protection, shutdown in a short-time
	The light goes out directly	Failure causes system shutdown
Slave	**Orange** light flashes continuously	Battery to battery communication timeout
	Constant **red**	Battery failure, shutdown after a period of time
	Red light flashing	Battery protection, shutdown in a short-time
	The light goes out directly	Failure causes battery shutdown

5. Installation

5.1. Instruction

5.1.1. Requirements for Installation

• Before installing the battery, check whether the package is intact or not. Battery with damaged package can not be used.

• During the process of installation, pay attention to the positive and negative terminals. It is prohibited to short-circuit the positive and negative terminals.

• Ensure that the screws are tightened during the process of installation and check regularly.

• The rest packing materials should be removed after finishing installation, such as package, foam board, plastic, cable ties, etc.

5.1.2. Emergency Measures for Battery Drops

• When installing the battery, falling or mechanical shock may cause internal damage to the equipment. It is strictly prohibited to continue to use if these situations occur, otherwise it may result in safety risks.

• After the battery has been dropped, if there is an obvious smell, breakage, smoke, fire, etc., evacuate people immediately and contact the professionals. Use fire-fighting facilities to extinguish the fire under the guidance of the professionals,

• After the battery has been dropped, if there is no obvious smell, smoke or fire and no obvious deformation or breakage, contact the professionals to transfer it to an open and safe place or contact a recycling company for disposal.

5.1.3. Installation Scene

Note: Battery module must be installed indoors instead of outdoors.

Installation and operating environment

The installation and operating environment need to comply with local laws as well as relevant international, national and regional standards for lithium-ion product.

• When installing the equipment in the basement, it is necessary to ensure ventilation and air exchange. Do not put flammable, explosive materials around the equipment. Avoid water retention.

• Ensure a clean environment without large amounts of infrared radiation, organic solvents and corrosive gases.

• Keep away from water sources such as taps, sewers, sprinklers, etc. to avoid water infiltration.

• The battery's temperature will be high when operating, so do not install it in a location easily to be touched.

• It is prohibited to place the equipment in an environment of flammable and explosive gases or fumes. No operations should be performed in such environment.

• A solid support surface must be available (e.g., concrete or masonry).

• The installation location must be inaccessible to children.

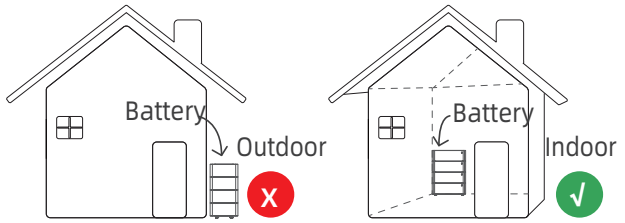
• The installation location must be suitable for the weight and dimensions of the battery system.

• The installation location must not be close to the fire.

• The altitude of the installation location should be less than 4000m.

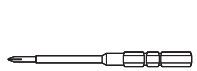
• The ambient temperature should be between 0°C and +50°C.

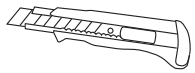
• The ambient humidity should be between 5-95%.

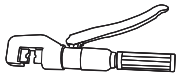


5.1.4. Tools

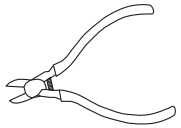
The tools in the following table could be needed during the installation.


Screwdriver

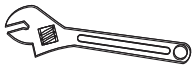

Knife

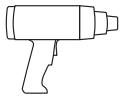

Hydraulic Clamp


Gradienter


Diagonal Pliers


Pen


Wrench


Heat Gun


Electric Drill

5.1.5. Safety Gear

Wear the following safety gear when dealing with the battery module.


Insulated gloves


Safety shoes


Goggles


2 qualified people

5.1.6. Additional Accessories


DC Cable (16mm²)


Anchor Bolt


Cat5 Shield (Metal Shielded RJ45 of Cat5 or higher)


PE with Terminal (terminal,5mm; cable≥10mm²)


OT Terminal (16mm²-M6)


Heat Shrink Tubing (R6)


Busbar Box


Cable Tie (4*250mm)

5.2. Floor Installation

Qualified Person

CAUTION

Risk of injury due to weight of the battery module

Injuries may result if the battery module is lifted incorrectly or dropped while being transported or installed.

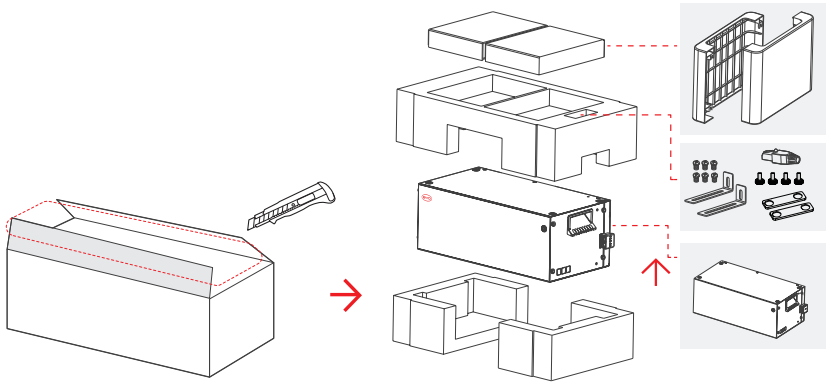
- Transport and lift the battery module carefully. Take the weight of the battery module into account.
- Wear suitable personal protective equipment for all work on the battery module.

Additionally required installation material (**not included in the scope of delivery**):

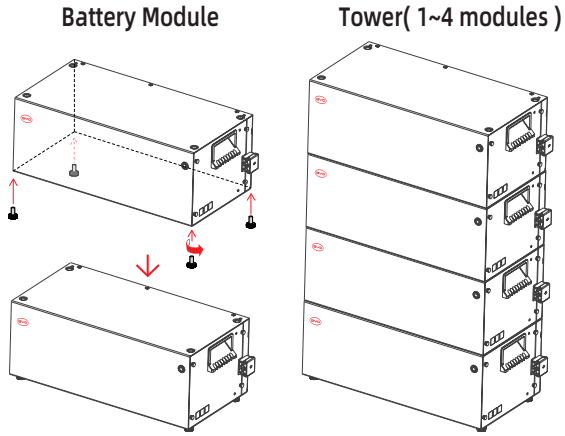
1. Four screws suitable for the support surface (diameter: 8 mm)
2. Where necessary, four screw anchors suitable for the support surface and the screws.

Procedure:

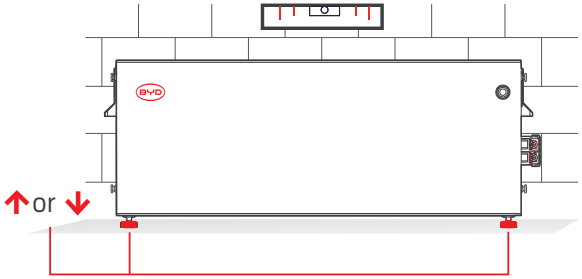
1. Open the box, take out battery module and accessories.



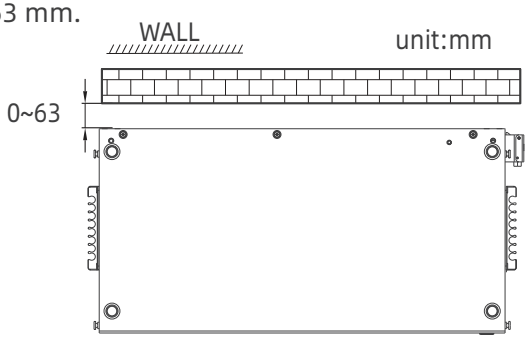
2. Install the feet to the battery module. When stacking 2 or more modules, only the bottom one installs the foot.



3. Adjust the feet to ensure that the battery remains horizontal (**Tilt is not allowed!**).



4. Put the battery module along the wall, and keep a distance of 0~63 mm.

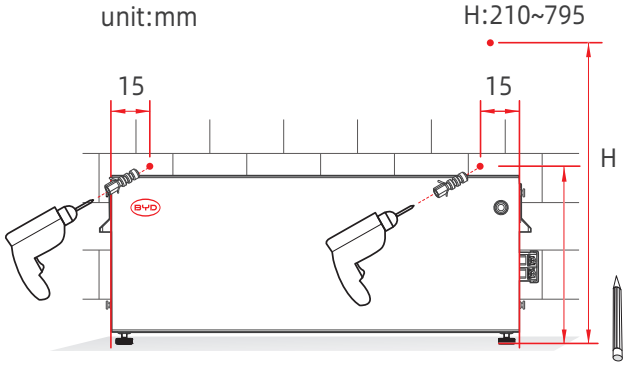


5. Install the Anchor Bolt in the wall.

Safety of Drilling

The following issues need to be taken into account when drilling holes in walls:

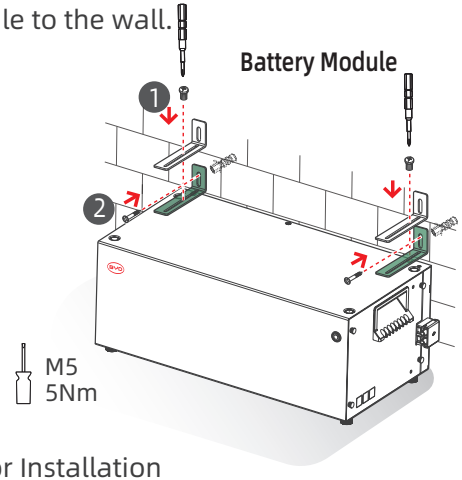
- Wear goggles and protective gloves when drilling.
- During the process of drilling, the equipment should be covered to prevent debris from falling into the equipment. The debris should be cleaned in time after drilling.



6. Battery module floor Installation

① Fasten hangers to the battery module by screws.

② Then fix the battery module to the wall.



6. Tower(1~4 modules) floor Installation

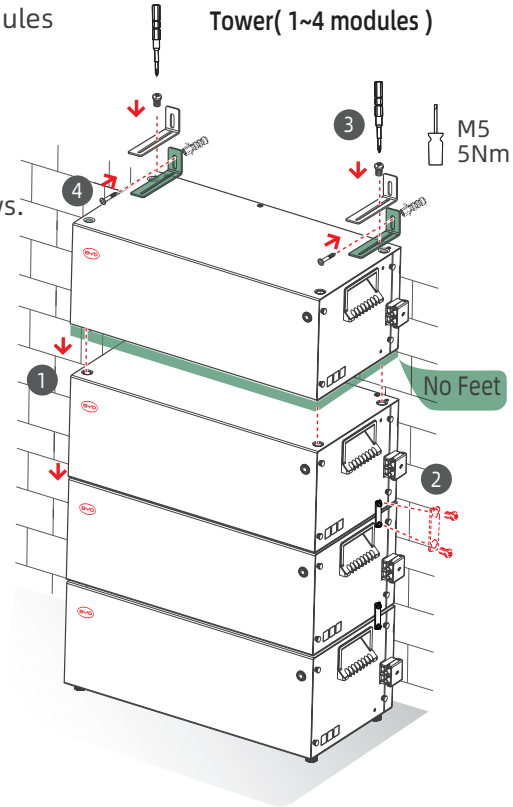
① Stack the battery modules one by one.

② Connect the battery modules with PE links.

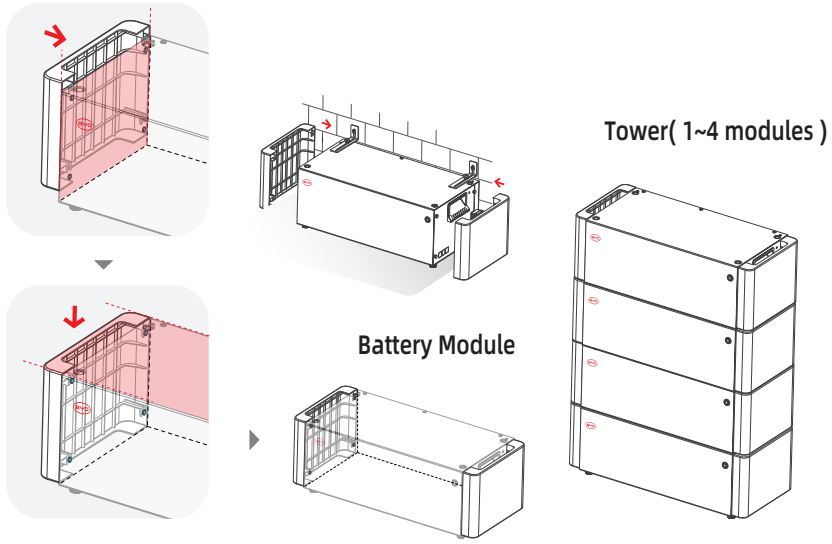
③Fasten hangers to the battery module by screws.

④ Then fix the battery module to the wall.

(PE links have the functions of connecting battery and grounding)

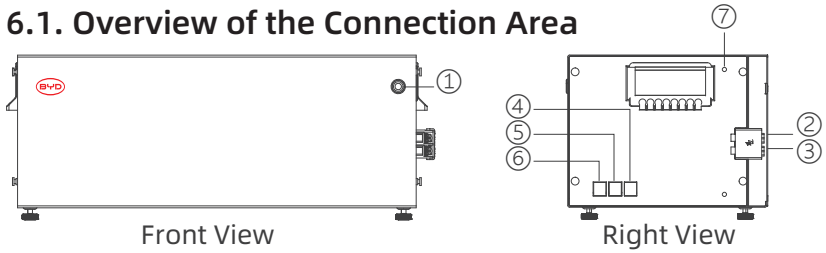


7. Tighten protective covers tighten on both sides.



6. Electrical Connection

6.1. Overview of the Connection Area

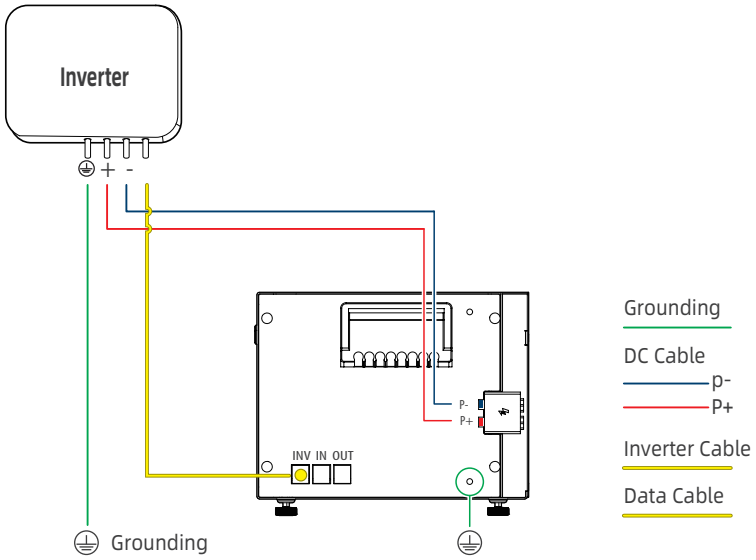


Front View　　Right View

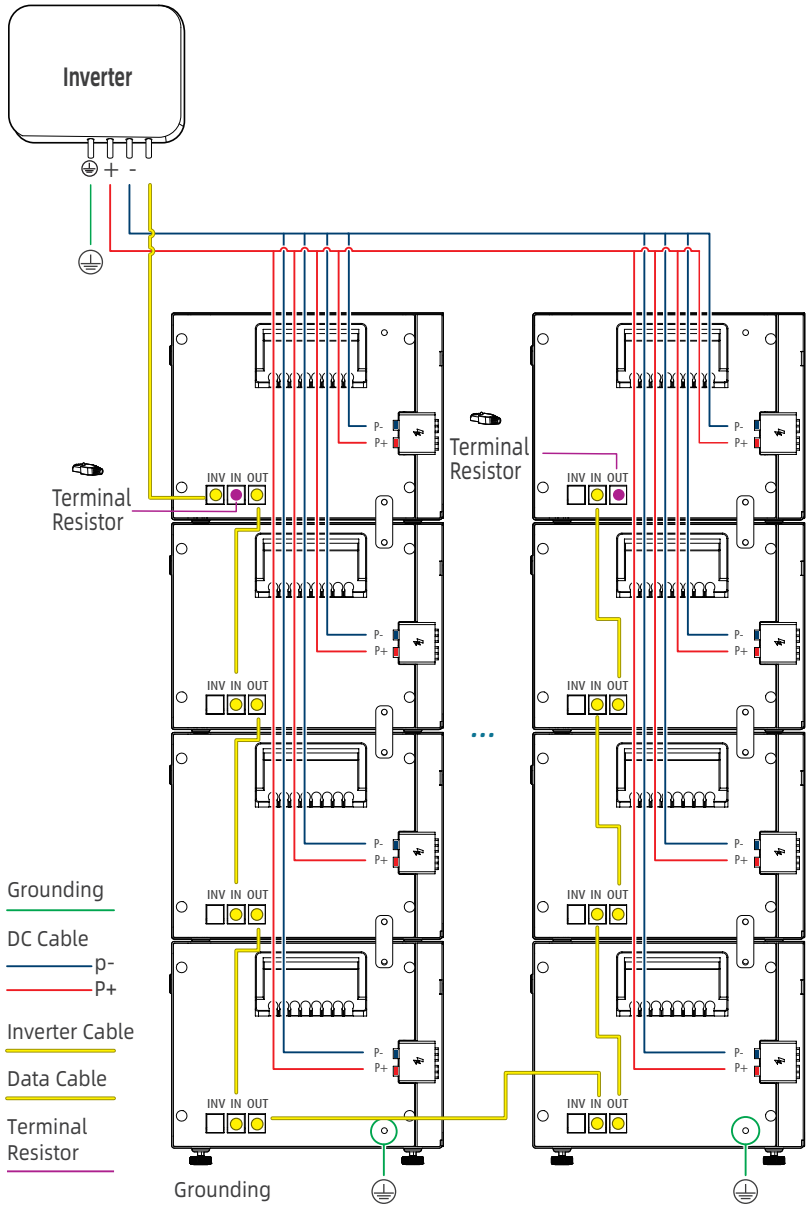
No.	Description	Explanation
①	ON/OFF	Power on/power off.
②	P-	Connect to negative terminal of external device.
③	P+	Connect to positive terminal of external device.
④	COM-OUT	Port for data cable out.
⑤	COM-IN	Port for data cable in.
⑥	INV	Port for data cable in, Connect to inverter.
⑦	Grounding	Grounding connection.

6.2. Connection Diagram

6.2.1.One Battery Module



6.2.2. One Tower & Multiple Towers



6.3. Connecting the PE

Grounding

The grounding wire must be installed first in the process of installing; when removing the equipment, the grounding wire must be removed at last.

Additionally required mounting material (not included in the scope of delivery):PE with Terminal

PE and Terminal Requirement

a) Terminal, 5mm.

b) Minimum terminal cross-section: 10 mm^2

c) The cross-section of the grounding terminal must comply with the locally applicable standards and directives

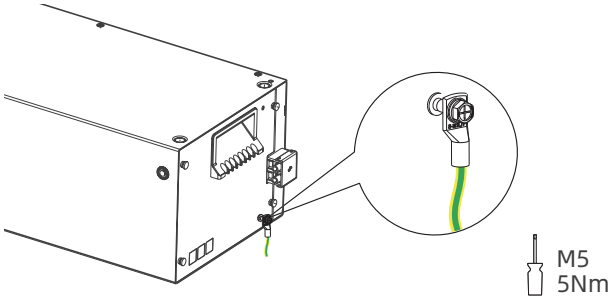
d) PE cross-section≥10mm^2

e) PE Material: Copper wire

f) OT Terminal:10-5

Procedure:

1. Take out the grounding screw, and get the PE conductor through it.
2. Fix them together, with a cylinder screwdriver M5, and tighten it (torque, 5 Nm).



6.4. Data Cable Connection

6.4.1. Data Cable Connection between Inverter and Battery Module

Additionally required mounting material (not included in the scope of delivery):

One data cable

Data cable requirements:

The length and quality of cable affect the quality of the signal. Observe the following requirements.

- Cable category: Cat5, Cat5e or higher
- Plug type: Metal Shielded RJ45 of Cat5, Cat5e or higher
- Shielding: Yes
- UV-resistant for outdoor use
- Straight-through wired cables
- Maximum cable length: 10 m.

Procedure:

Read the designation of the INVERTER port on Battery Module and the inverter manual, and decide whether to modify the data cable.

The designation of INVERTER port on Battery Module could be read below.

Data Cable Connection
between **Inverter** and **Battery Module**

INV

No.	Assignment
1	485-B
2	485-A
3	Unused
4	CAN_H
5	CAN_L
6	Unused
7	Unused
8	Unused

Data Cable Connection
between **Battery Modules** or **Towers**

IN / OUT

No.	Assignment
1	Unused
2	Unused
3	CAN_H
4	Unused
5	Unused
6	CAN_L
7	CAN_L
8	CAN_H

Procedure:
1. Please cut the cable, arrange the wire positions, and crimp the RJ45 connector with a network wire clamp.
2. Plug the RJ45 connector to the Battery Module INV port.
3. Plug the connector to the corresponding port at the inverter.

6.4.2. Cover the Terminal Resistor

Procedure:
Plug the terminal resistor to the Battery Module rest IN & OUT port. Two terminal resistors are required for more than 2 battery modules.

Attention: No terminal resistor is required for a single battery module.

6.4.3. Data Cable Connection between Towers

This is only applicable when there are multiple towers to be connected in parallel. Maximum four battery modules could be installed in one tower, and maximum 8 towers could be connected in parallel.

The connection diagram could be read below.
Data cable requirements:
The length and quality of cable affect the quality of the signal.
Observe the following cable's requirements.

- Cable category: Cat5, Cat5e or higher
- Plug type: Metal shielded RJ45 of Cat5, Cat5e or higher
- Shielding: Yes
- UV-resistant for outdoor use
- Straight- through wired cables
- Maximum cable length between two towers: 10 m.

Procedure:
1. Remove the terminal resistor from the OUT port of the first tower.
2. Plug the RJ45 connector to the OUT port of the Battery Module at the first tower, and to the IN port of the Battery Module at the second tower.
3. Repeat Step 2 for the following towers.
4. Cover the terminal resistor on the battery module tower, referring to 6.4.2 in this manual.

6.5. DC Connection

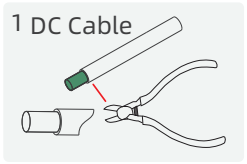
⚠ QUALIFIED PERSON

When multiple towers are connected, the positive power cable length for all the towers should be approximately equal, and so are the negative power cables. A junction box is needed to combine these cables. Please follow the local, state, provincial, federal, or national laws, regulations, and instructions from the inverter manufacturer to choose the right junction box.

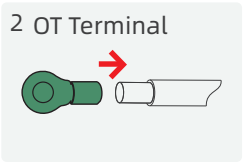
Additionally required mounting material (not included in the scope of delivery):
Two DC cables
Cable requirements:

- Conductor cross-section:one options are available, 16mm.Please choose the correct one according to application and also the requirements of the inverter manufacturer.
- Maximum cable length:10m

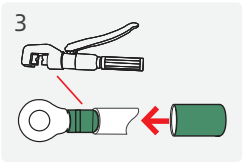
Procedure



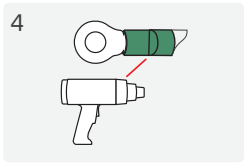
Wire stripping



Connect the OT terminal to the core cable

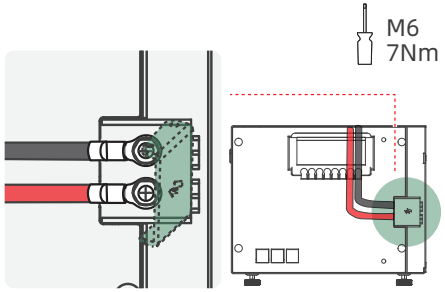


Press the hydraulic clamp to the OT terminal and the wire core



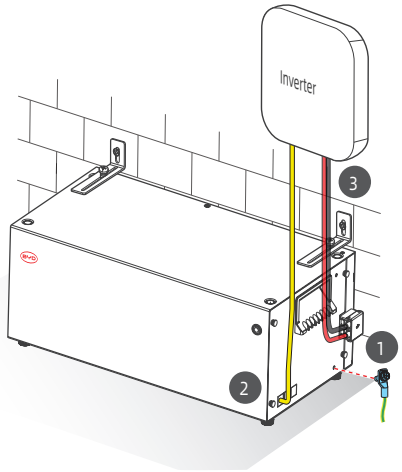
Put a heat shrink tube on the DC cable, and then heat it with a heat gun

Another DC cable is processed in the same way

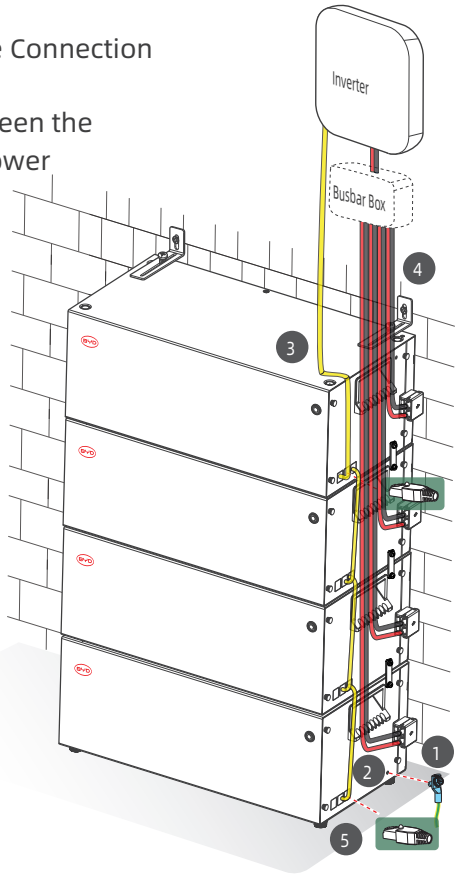


Unscrew and connect the DC cable

Battery Module Cable Connection
① Connect ground cable
② Connect data cable
③ Connect DC cable



Tower(1~4 modules) Cable Connection
① Connect ground cable
② Connect data cable between the battery modules in the tower
③ Connect data cable
④ Connect DC cable
⑤ Connect terminal resistor (IN & OUT)



7. Commissioning

7.1. Operation

7.1.1. Switch on the Battery Module

1. After the battery and inverter are installed, **the equipment starts up in this order: Battery →Switch*→ Inverter**.

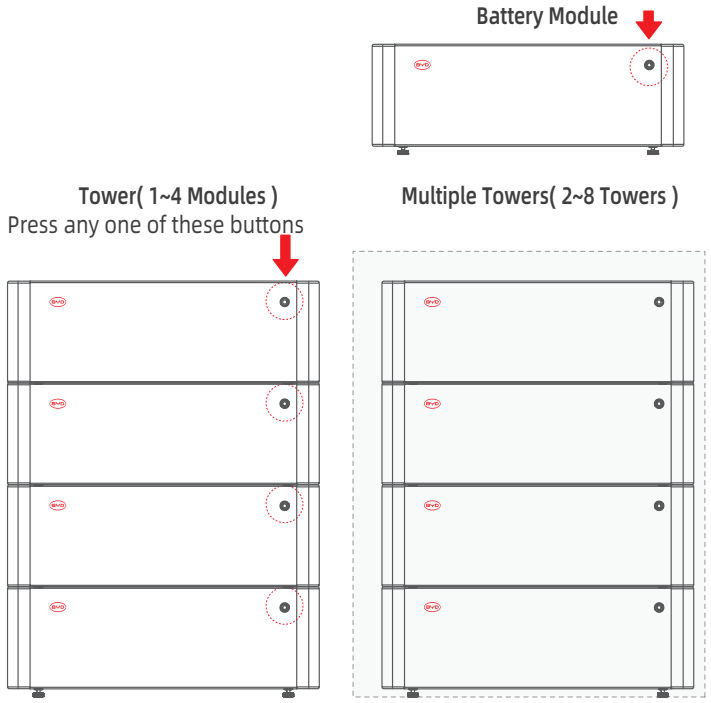
* Turn on the air switch between battery and inverter if there is any.

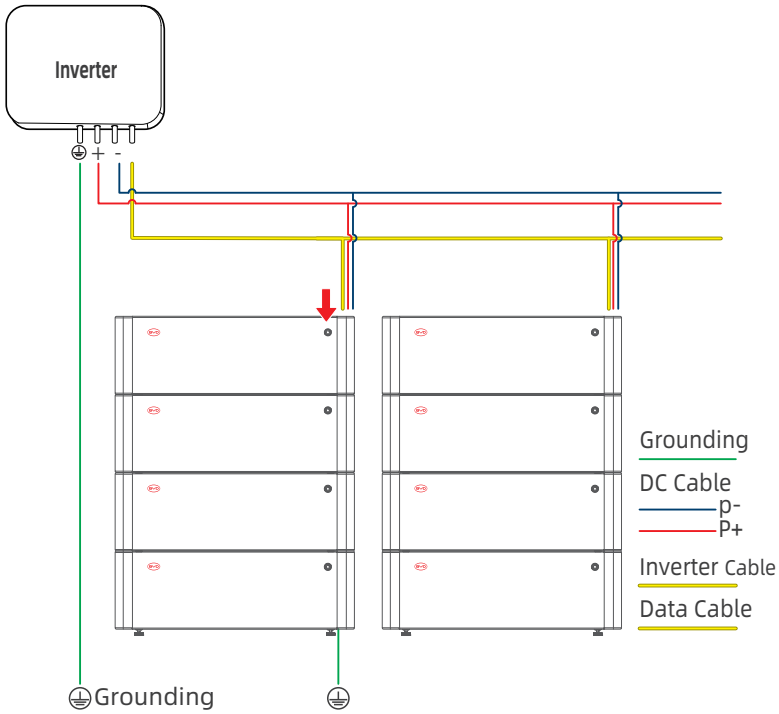
2. Press the button, after 1s, the battery module or tower will be activated. Then they will match automatically. The green LED light indicates that the battery runs normally.

7.1.2. Switch off the Battery Module

1. Press the button for around 2~3s to shut down the equipment, **the equipment shuts down in this order: Inverter → Battery→ Switch***.

* Turn off the air switch between battery and inverter if there is any.





7.2. Configure the Battery System

1. Download the APP " **BYD Energy**". Ensure that your device (cell phone) can access the Internet during the configuration.

2. Open the APP, allow APP to access photos, media, and files on your device. The default language is English, select the corresponding language as needed.

3. A welcome page will appear and then jump to the login screen, you need to register a new account for the first time to login the APP.

4. When registering for an account, you need to choose different identity information and fill in the relevant information for

identity authentication. View and agree to the relevant privacy agreement. Click register and prompt successful registration, then login.

5. Scan the SN code of device to add the device.

6. When connecting for the first time, the Bluetooth window of the corresponding device pops up automatically, click to connect.

7. After successful Bluetooth connection, the device is added successfully. If the connected device is a master, it can read the battery information of the master and slave. Detect the battery firmware version information and prompt to update the device firmware version to the latest.

8. After adding the device successfully, the device is offline. Follow the prompts to network and connect the battery to the Internet.

7.3. Switch on and Commission the Inverter

Requirements:

Procedure:

1. Mount and connect the inverter according to the inverter manufacturer's instruction.
2. Commission and configure the inverter according to the inverter manufacturer's instruction.

If the battery information could be read correctly, it means the connection between the battery system and the inverter is all right. Normally, the LED light will also turn to green then, and the battery system is ready to work.

7.4. Protective Devices

The battery module could protect itself (switch off)if the LV5.0 battery module Configuration List is not complied.

If external protective devices are needed, please follow the local, state, provincial, federal, or national laws, regulations, and instructions from the inverter manufacturer.

8. Decommissioning

⚠ QUALIFIED PERSON

⚠ CAUTION

Risk of injury due to the weight of the battery module
Injuries may result if the battery module is lifted incorrectly or dropped while being transported or installed.

- Transport and lift the battery module carefully. Take the weight of the battery module into account.
- Wear suitable personal protective equipment for all work on the battery module.

Procedure:

1. Shut off the inverter.
2. Switch off the battery module.
3. Switch off the breaker between the inverter and the battery module if there is any.
4. Disconnect the DC cables between inverter and the battery module, PE, and data cable among battery module, inverter, router (if applicable).
5. Loosen the screws on hangers between module and the wall. And then take off the hangers.
6. Loosen the screws between battery modules.
7. Before lifting the battery module, ensure that the screws on both sides of them are removed.

If the battery module is to be stored or shipped, module the system. Use the original packaging or packaging that is suitable for the weight and dimensions of the system.

Dispose of the battery module in accordance with the locally applicable disposal regulations for electronic waste.

9. Expansion

The battery module could be expanded at any time. The original SOC of the new battery module is around 30%.
In order to avoid capacity loss, it is recommended that the SOC difference is about 5%.

Procedure:

1. Shut off the inverter.
2. Switch off the battery module.
3. Switch off the breaker between the inverter and the battery module if there is any.
4. Add the new module on top of other battery modules.
5. Switch on the battery module.
6. Switch on the breaker between the inverter and the battery module if there is any.
7. Start the inverter.

10. Troubleshooting

10.1. Battery Module Behavior under Fault Conditions Red light flashing

The detailed designation for errors of each LED lights could be read in 10.2.

Except the LED light, we can also get the faulty messages of the battery through the PC Tool and mobile app. For detailed steps, please refer to the latest Service Guideline, Website: www.bydenergy.com.

The battery module is not able to be turned on / off.
Check the system has been constructed according to the Battery-Box LV5.0 Technical Information. If the problem still cannot be solved, contact with BYD local after-sales service within 48 hours.

NOTICE

Damage to the battery module due to under voltages

- If the battery module doesn't start at all, please contact BYD local after-sales service within 48 hours. Otherwise, the battery could be permanently damaged.

10.2. LED Light Designation for Errors

Orange light flashes continuously	Battery-inverter communication timeout [**Master**]; Battery to battery communication timeout.
Constant red	Battery failure: Voltage/temperature sensor failed; Charge/discharge circuit fault; The batteries are damaged; AFE communications failed; AFE failure; Slave shuts down due to a fault, causing the red light of the master to be on constantly [**Master**].
Red light flashing	Battery Protection: Undervoltage; Charge and Discharge Over Temperature; Charge and Discharge Low Temperature; Charge-discharge overcurrent; Charge short circuit; Discharge short circuit; Parallel short circuit.
The light goes out directly	Failure causes battery shutdown.
Flashing orange quickly	The battery communication timeout.

11. Storage

The battery module should be stored in an environment with a temperature range between -20℃～+50℃, and charged regularly according to the table below with no more than 0.5 C (C-rate is a measure of the rate at which a battery is discharged relative to its maximum capacity.) to the SOC of 40% after a long time of storage.

Storage environment temperature	Relative humidity of the storage environment	Storage time	SOC
Below-20℃	/	Not allowed	/
-20~28℃	5%~95%	≤6 months	20%≤SOC≤30%
25~40℃	5%~95%	≤1 months	20%≤SOC≤30%
40~50℃	5%~95%	≤15days	20%≤SOC≤30%
Above50℃	/	Not allowed	/

NOTICE

Damage to the module due to under voltages

- If the battery module doesn't start at all, please contact BYD local after-sales service within 48 hours. Otherwise, the battery could be permanently damaged.

12. Maintenance & Replacement

- Maintain the equipment only if you are familiar with the contents of this manual and have the appropriate tools and test equipment.
- Professional technicians and operators should be fully trained, having the knowledge of the safe operation and maintenance of the equipment. They should operate with adequate precautions and personal protective equipment.
- The equipment must be powered down before maintaining, and the safety precautions in this manual and other relevant documents must be strictly followed.
- During the process of maintenance, try to avoid unrelated personnel entering the site.
- The equipment cannot be powered up again unless all failures have been settled. Otherwise, it may cause more problems or damage of equipment.
- Do not open the cover without authorization as there is a risk of electric shock. Any faults due to the above reason are not covered under the warranty.
- Please replace the battery with the same type.
- After completing the maintenance, immediately check to ensure that no tools or other parts are left in the equipment.
- When the battery remains idle for long periods of time, it is necessary to store and charge the battery according to this manual.

13. Disposal of the Battery Module

Disposal of the module must comply with the local applicable disposal regulations for electronic waste and used batteries.

- Do not dispose the battery module with your household waste.
- Avoid exposing the batteries to high temperatures or direct sunlight.
- Avoid exposing the batteries to high humidity or corrosive atmospheres.
- For more information, please contact BYD.

14. Technical Parameters

Usable Energy [1]	5 kWh
Max. Charge and Discharge Current [2][3]	70 A
Peak Charge and Discharge Current [3]	200 A, 10 s
Dimension (H/W/D)	195 mm x 595 mm x 255 mm
Weight	42 kg
Nominal Voltage	51.2 V
Operating Voltage	40 ~ 57.6 V
Charge Cut-Off Voltage	57.6 V
Discharge Cut-Off Voltage	40 V
Scalability	Max. 32 in Parallel (160kWh)
Installation Mode	Floor installation
Communication	CAN / RS485 / Bluetooth / Wi-fi
Round-trip Efficiency	≥95%
Applications	On Grid / On Grid + Backup / Off Grid
Operating Temperature	Charge 0~50℃ & Discharge -20~50℃
Protection Class	IP20
Storage Humidity	5%~95%
Altitude	< 4000 m
Certification	CE / IEC62619 / UN38.3
Compatible Inverter	Refer to BYD Battery-Box LV5.0 Technical information

[1] Test conditions: 0.2C charge & discharge at 25℃. System Usable Energy may vary with different inverter brands.

[2] Charge derating will occur between 0℃ and +10℃.

[3] The current varies with different compatible inverters.

15. Contact Information

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